ATTACHMENT C

NF Membrane Technical Submittal from Pure Aqua

PURE AQUA, INC.®

Purification Customized

PREPARED FOR VILLAGE SAFE WATER

Technical Submittal for S.O. 5-8672

OCTOBER 23, 2018

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Contents

1.0 Process description

Pure Aqua's scope of the plant is according to P&ID 5-8672-NF108K-PID (attached). Pure Aqua will supply an antiscalant dosing system, a Nano filtration system to produce 51 GPM of permeate water, and a membrane cleaning system. The equipment will be installed on one skid, with the exception of the antiscalant dosing system. Water storage tanks, level switches, and piping/wiring between such and the system are some of the required items outside of Pure Aqua's scope and will need to be sourced elsewhere. The NF will operate at 80% recovery. The system is designed to treat 60 GPM of influent water, with 51 GPM being produced as permeate, 9 GPM as reject and 10 gpm will be for internal recirculation.

The feed water is assumed to be free of suspended solids and residual chlorine. Existing filtration is in place and is assumed to be sized correctly and fully operational.

1.1 Pretreatment

1. A filtered and dechlorinated raw water feed of 60 gpm @ 40 psi will be provided to the NF system.
2. The pressurized feed water will be dosed with an antiscalant chemical to help prevent the formation of mineral scale on the NF membrane surface.

1.2 NF System

3. The NF feed flow will be monitored with a feed flowmeter.
4. Water will pass through a 5-micron cartridge filter. The pre-filter and post filter pressures will be indicated by pressure gauges and transducers.
5. After the cartridge filter a pH, ORP, conductivity, and temperature gauge will monitor the respective process parameters.
6. 70 GPM of water will enter the high pressure pump and will be boosted to about 150-175 psi. At the inlet of the pump, a low-pressure switch will protect the pump from running dry. At the outlet of the pump, a high-pressure switch will protect the high pressure equipment from over pressure. A VFD and globe valve will enable the operator to change the flow rate and system pressure. Pressure gauges and transducers will indicate the pump pressure and the system pressure. A reject control valve will set the back pressure on the membranes.
7. The pressurized water will enter the membrane pressure vessels. About 80% of the flow (51 GPM) will exit the vessels as low total dissolved solids (TDS) NF permeate. The remaining flow (9 GPM) will exit the system as high TDS reject. 10 GPM will be recirculated internally. Flow meters will indicate the amount of each of these flows.
8. The NF permeate quality will be monitored by a conductivity meter.
9. The NF permeate line will be protected with a pressure switch and a flowmeter for flow monitoring.
10. The reject pressure will be indicted by a pressure gauge and transducer.
11. The inter-stage pressure will be indicted by a pressure gauge and transducer.

2.0 Water Analysis

The water analysis table below is used to design the NF system. Any changes in the feed water characteristics will require additional pretreatment, modification to the current design, and can impact the membrane life/performance.

Test	Units	Value
Hardness (as $CaCO_3$)	mg/l	9.75 – 10
Iron (Total)	mg/l	No Data
Potassium	mg/l	No Data
Calcium	mg/l	No Data
Magnesium	mg/L	No Data
Sodium	mg/l	No Data
Silica	mg/l	No Data
Alkalinity, Total (as $CaCO_3$)	mg/l	32 – 33
Bicarbonate	mg/l	No Data
Chloride	mg/l	No Data
Fluoride	mg/l	0.05
pH	units	5.5 – 6.6
Sulfate	mg/l	No Data
Total Dissolved Solids	mg/l	38 – 60
Total Organic Carbon	mg/l	4 – 7
Temperature	°C	3.5 – 12.2
Turbidity	NTU	< 0.1
Color	PCU	< 5

3.0 RO System Membrane Projection

The membrane projection below indicates important membrane design parameters such as: recovery, flowrates, pressures, number of membranes, element type, and flux. It is important to note the membrane projection is a computer model that serves as a system design guideline and helps estimate water qualities. This projection does not guarantee the system/membrane performance and permeate water quality. With changes in temperature, feed quality, and element age the performance of the system changes.

3.1 Summary of Membrane Projection

Parameter	**Value**
Membrane Manufacturer	Hydranautics
Membrane Type	ESNA1-LF-LD
Membrane Size	48” x 40”
Membrane Quantity	15
Number of stages	2
Number of Vessels	3 (Two in 1st stage & One in 2nd stage)
Average Flux	12.2 GFD (gallon per square foot per day
Feed Flow	60 GPM
Feed TDS	Less than 100 ppm
Membrane Feed Pressure	150-175 psi
Feed Temperature	38°F
Permeate Flow	51 GPM
Permeate TDS	Less than 50 ppm
Reject Flow	9 GPM
Reject TDS	Around 1,000 ppm

3.2 Membrane Projection

4.0 Main components details

The equipment comprises of many components. Main items listed below.

Main Component Summary

Item #	***Tag #***	***Component***	***Make/Model #***	***Brief Description***
1	-	System piping, low pressure	Spears	SCH 80 PVC plumbing fittings, ball valves, unions, flanges etc.
2	-	System piping, high pressure		SS316 SCH10-40 Plumbing fittings, unions, flanges, ball valves, globe valves etc.
3	-	Instrument tubing	John Guest	LLDPE tubing
4	-	Instrument fittings	DM Fit	Acetal copolymer
5	MBV-201	RO Feed Inlet Valve	GF Type 127	2” Electrically actuated ball valve
6	CFH-204, CFH-311	Cartridge Filter Housing	SSC-20-316	Cartridge filter housing to fit 2.5”x40” elements
7	CFH-204, CFH-311	Filter Cartridges	PA-405	Spun polypropylene 5-micron filter cartridges, 2.5”D x 40”H
8	PV-241, 242, 243	Membrane Pressure Vessels	Protec PRO-8-300-SP-5	8” Side port RO membrane pressure vessel, 5 elements long, 300 PSI, 2.5” ports
9	P-219	High Pressure Pump	CRN 15-7	SS316 centrifugal, multi stage pump. 15 HP motor.
10	PI-202, 220, 221, 222, 223, 234, 316	Pressure Gauges	Pure Aqua	Industrial pressure gauge, liquid fillable, 304 SS case, 316L SS wetted parts.
11	FE-227, 228, 229	Flowmeters & Installation Tee	GF 3-2537-6C-P0	Paddlewheel digital flowmeters
12	CE-217, CE-218	Feed & Permeate Conductivity Sensor	GF 3-2850-52-41V & 3-2850-51-40V	Contacting electrode, PVDF and 316 Stainless. 1.0 cell, 0.1 cell.
13	PSL-212, PSH-236	Low pressure Switches	Ifm, PK 6224	Stainless steel, 0-145 psi range, with intuitive switch point setting
14	PSH-213, 235	High pressure Switches	Ifm, PK 6222	Stainless steel, 0-1450 psi range, with intuitive switch point setting

15	CD-238	Chemical Metering Pumps	Grundfos DDE6-10	Digital dosing pump
16	CD-238	Chemical Dosing Tank	Clack	High density polyethylene
17	AE-214, 215	Feed ORP / pH electrode	GF 3-2725-60, 3-2726-00	pH/ORP Electrodes General Purpose
18	AE-214, 215	Feed ORP / pH electronics	3-2751-2	DryLoc pH/ORP Smart Sensor Electronics
19	PT-252, 253	Pressure transmitter	Ifm, PT-2415	Pressure transmitters, 0-100 psi range
20	PT-254, 255, 256, 257	Pressure transmitter	Ifm, PT-2443	Pressure transmitters, 0-500 psi range
21	-	Membranes	Hydranautics, ESNA1-LF-LD	Nanofiltration membranes, 8”D x 40”L
22	SA-271, 272, 273	Sample valves	Asahi	¼” Labcock valve
23	-	Grooved couplings	Piedmont Styles B & K	Grooved couplings to connect piping to high pressure pump and NF pressure vessels
24	-	Flange gaskets	Garlock	EPDM flange gaskets, full-face
25	CD-238	Membrane Antiscalant	Pure Aqua, PA0100-55	Proprietary membrane Antiscalant
26	-	Braided Hose	Finger Lakes Extrusion	Various size of flexible clear hose
27	P-306	CIP Pump	CRN15-3	SS316 centrifugal, multi stage pump. 7.5 HP motor.
28	TT-210, 330	NF Feed / CIP temperature sensor	Ifm, TA2313	Temperature transmitter TA-050FLEN12-A-ZVG/US
29	LSL-258, 302	Antiscalant & CIP Low level switch	Erecta Switch, 10-782	Bulk Head Vertical Mounted Shielded Level Switch Set (Polypropylene)
30	HT-331	CIP Heater	OEM Heater, K410673-5	316 SS Screwplug Heater, 3"NPT, 15000W, 26" Immersed Length, NEMA 7/9
31	TK-301	CIP tank		HDPE, ~ 250 gallons
32	-	Carbon steel skid		Carbon steel, sand blasted, primed with blue powder coat.

33	-	Hardware		Stainless steel 18/8 – 304 bolts, nuts, and washers.
34	-	Various Lubricants		Teflon, lubricants, grease, antiseize, PVC solvent etc.
35	-	Control panel	See electrical section	

5.0 Electrical Specification

5.1 Electrical

5.1.1 General

A. Individual electrical equipment shall be listed by and shall bear the mark of UL, ETL, TUV, or other NRTL.

B. Assembly of the system shall comply with the following standards:

(1). NEC (NFPA 70)	National Electric Code
(2). NEMA 250	Enclosures for Electrical Equipment (1000 Volts Maximum)
(3). NEMA MG-1	Motors and Generators
(4). UL 508A	Standard for Industrial Control Panels

C. Pure Aqua will coordinate with the installation contractor as needed.

D. All components shall be new and listed, approved, or registered as appropriate by an NRTL.

E. Equipment shall be clean and in new condition upon shipment.

F. Equipment shall be packaged to prevent mechanical and finish damage during shipping by reasonable causes.

5.1.2 Signage

A. The control panel will have signage per UL508A.

B. The nameplate shall be fabricated from white-letter, black-face laminated plastic engraving stock. Lettering shall be 1/8” high or greater. The nameplate shall be adhered to the panel in a prominent location.

C. Conductors shall be identified by machine-printed heatshrink tubing. The identification of instrumentation and control cables shall include the process tag of the connected equipment and the circuit numbers of the individual conductors.

D. Control panel components shall be labeled per UL508A.

E. Collar plates shall be used where appropriate.

5.1.3 Rigid Conduit, Conduit Bodies, and Fittings

A. Rigid conduit, conduit bodies, and fittings shall be NRTL-listed rigid non-metallic conduit (RNC) PVC schedule 40 manufactured by Cantex, Carlon, JM Eagle, or Sceptre.

B. All wire shall be run in conduit. Between instruments or actuators with only a removable connector instead of a cable entrance, a minimal length of a jacketed multi-conductor cable shall be exposed (individual conductors shall not be exposed). A strain relief gland shall provide a liquid tight connection where the cable enters the conduit.

C. A run of conduit shall be complete before wire and cables are pulled.

D. Factory elbows and conduit bodies shall be preferred, with bends used sparingly as needed.

E. Separate conduits shall be provided for analog signals, 24VDC discrete signals & power, 120VAC power, and for each 480VAC device.

F. Analog 4-wire instruments shall have power and signal wiring carried in separate conduits.

G. Conduit shall not obstruct access for operation or maintenance.

H. Conduit shall run in parallel or perpendicular to skid structure.

I. The maximum number of 14 AWG wires installed in conduit shall not exceed: 8 for ¾”, 16 for 1”, 32 for 1 ¼”, 48 for 1 ½”, and 72 for 2”.

J. Conduit used shall be between ¾” and 2”.

5.1.4 Flexible Conduit

A. Flexible conduit shall be liquid-tight flexible metallic conduit (LFMC) with PVC jacket manufactured by Anaconda or AFC/Kaf-tech.

B. Lengths of flexible conduit up to 3 ft shall be used to connect to equipment subject to vibration, such as pump motors, or subject to removal for maintenance, such as a sensor or valve actuator.

C. The minimum flexible conduit size for motor power conductors shall be ¾”.

D. The minimum flexible conduit size for instrument and valve electric actuator conductors shall be ½”.

5.1.5 Junction Boxes

A. Junction boxes without built-in terminals shall be molded PVC manufactured by Cantex, Carlon, or Sceptre.

B. Junction boxes shall have liquid-tight rubberized gaskets.

C. Conductors may be terminated in a terminal and DIN rail assembly inside a junction box. Conductors shall not be spliced without termination in an affixed terminal. Alternatively, conductors may be pulled through a junction box without termination.

5.1.6 Control Panel

A. The control panel shall be assembled and marked by a UL508A panel shop.

B. The system main control panel enclosure shall be 16 or 14 gauge thickness, 304 or 316L stainless steel, and rated NEMA 4X manufactured by Rittal, Saginaw, or equal.

C. The panel door shall use a door handle for closure.

D. Assembly and cut-outs shall be free from deformation and burrs.

E. Standalone terminals and assembled terminal blocks shall have identifying number plates. Bussed terminals shall be assigned a common number.

F. Analog input and output signals and discrete inputs shall utilize a 3-wire fused terminal, Weidmuller KDKS 1 # 953245.

G. A spare fuse for every 10 fused circuits of same current rating shall be supplied, minimum 2 spare fuses of each type.

H. A spare fuse box shall be mounted on the panel interior wall, Plano 1061 Accessory Box.

I. The panel shall include a LED light fixture and a 120VAC receptacle.

J. All cable entries shall be from the bottom of the enclosure.

K. The control panel shall be mounted on the NF system skid.

L. Discrete signaling outputs shall be dry-contact, rated at least 2A 24VDC or 5A 120VAC.

M. The control panel shall be supplied with a ¼ x 1 inch copper ground bus for an incoming 4 AWG grounding conductor.

N. Signaling and interior controls shall operate on 24VDC.

O. Main power entry shall connect to terminals supplied on panel main disconnect switch.

P. A 120VAC UPS shall be supplied, sized for the connected kVA load plus a minimum of 20% and 10 minutes minimum operation. The UPS shall interlock with the PLC. The UPS shall be APC Smart-UPS w/ dry contact Smartslot card or equal.

Q. A 24VDC power supply shall be supplied, 5A minimum. The power supply shall be compatible with the UPS. The power supply shall be TDK-Lambda # DPP-120-24 or equal.

R. A 120VAC three-stage surge protector shall be provided in the panel. The surge protector shall include a first stage inline inductor, a second stage MOV to ground with a thermal fuse, and a third stage array of MOVs to provide a small amount of capacitance. The surge protector shall include an LED to indicate the status of the second stage MOV. The unit shall be DIN rail-mounted. The protector shall be Axiomatic # TSP-WG6-120VAC-10A-01, Emerson Islatrol Elite # IE-110 or equal.

S. If space permits, a 1” deep data pocket holder shall be installed on the panel door.

T. Wiring not exiting the panel shall be run in slotted plastic wire channel. Wiring outside channel may be permitted for wiring between adjacent terminals and wiring to front panel mounted components. Parallel wire runs outside of wire channel shall be organized into bundles using wire ties and/or looms. Wiring across a hinge shall be routed to ensure flexibility without straining conductors or terminals and secured on both sides of the hinge.

U. The control panel shall require 120VAC/1ph and 480VAC/3ph 60Hz power. The 480VAC incoming shall connect directly to the main disconnect 3-pole switch. The 120VAC line incoming shall connect to an auxiliary pole attached to the same switch. The 120VAC neutral incoming shall connect to an un-switched terminal block.

V. Single pole UL489 circuit breakers shall be used for 120VAC circuits.

W. Manual motor protectors shall be used for pump motors and the CIP heater.

X. The PLC shall be Allen-Bradley CompactLogix with a PanelView Plus 7 10” OIT.

5.1.7 Wire and Cable

A. Conductors shall be copper, bear the UL mark, bear the manufacturer’s trademark, and bear identifying information such as type, voltage rating, and conductor size. Cables assembled of multiple conductors shall bear additional marking identifying the quantity and size of conductors in the assembly.

B. Pump power wiring external to control panels shall be separate conductors in conduit, not less than 12 AWG.

C. Control power wiring external to control panels for e.g. valves and metering pumps, shall be separate conductors in conduit, not less than 14 AWG.

D. Solenoid-type and stepper motor-type Metering pumps shall be manufactured and supplied with a built in pig tail to be terminated at time of installation.

E. Conductors in conduit not part of original-assembled cables shall be class B type THWN-2 or THWN, rated to 600V.

F. Instrumentation cables with a molded-in M12 connector appropriate for certain 4-20mA sensors or switches shall be 4 x 22 AWG, 80 °C, 300V, AWM style manufactured by IFM.

G. Instrumentation cables without molded-in connectors shall be single pair 18 AWG Belden part # 9341 or single triad 16 AWG Belden part # 1119A or equal. Cable shields shall be terminated at one end and in the control panel only.

H. Pump power conductors shall connect to affixed terminals and/or be fitted with compression lug fittings. Compression lug-to-compression lug connections shall be insulated by layers of cambric tape, then layers of self-vulcanizing tape, and outer layers of polyvinyl insulating electric tape.

I. Pump power leads shall be neatly organized and shall not interfere with the closure of the termination box.

J. Twist-on wire nuts or similar shall not be used.

K. Individual conductors not exiting the control panel shall be 14 AWG minimum, 300V, type MTW or class B type THWN-2 or THWN, rated to 600V. Between the PLC analog I/O and terminal block, single-pair shielded 18 AWG cable shall be used.

L. 120VAC conductors with any termination outside the control panel shall be:

(1). Line (constantly on) – Black

(2). Line (switched on/off) – Black

(3). Motorized valve close – Black

(4). Motorized valve open – Red

(5). Neutral – White

(6). Ground – Green

M. 480VAC conductors with any termination outside the control panel shall be:

(1). Line A, B, & C – Black

(2). Ground – Green

N. 120VAC conductors not exiting the control panel shall be:

(1). Line – Red

(2). Neutral – White

(3). Ground – Green

O. 480VAC conductors not exiting the control panel shall be:

(1). Line A, B, & C – Black

(2). Ground – Green

P. 24VDC conductors not exiting the control panel shall be blue.

Q. Externally powered conductors not exiting the control panel (such as for dry contact signaling) shall be yellow.

5.1.8 Pump Motors

A. Pump motors shall be the standard model supplied by the pump manufacturer. Pump motors shall be manufactured by Grundfos or manufactured for Grundfos by Baldor-Reliance.

B. Pump motors shall be totally-enclosed fan-cooled (TEFC).

C. Pump motors shall be AC-induction squirrel cage type, operated via VFD at constant set speed (variable torque).

D. Pump motors shall be NEMA Design B with Class F insulation minimum.

E. Pump motors shall have standard-equipped metal conduit boxes.

F. Pump motors shall be supplied with standard-equipped name plates.

G. Pump motors shall be supplied as standard-equipped with thermal protection (up to 7.5 HP) or without (over 7.5HP).

H. The NF booster pump shall be powered by a VFD. The VFD shall be NEMA 4X or enclosed in a NEMA 4X enclosure capable of dissipating the heat generated.

I. The CIP pump shall be powered direct-on-line (DOL).

5.1.9 Fasteners and Mounting Hardware

A. Stainless steel 18-8, 304 and 316 will be the preferred material for nuts, bolts, washers, and other mounting hardware. Fasteners of other materials integrated into products by the original manufacturer shall not be changed.

5.1.10 Strut Channel

A. Strut channel for mounting raceways and equipment shall be powder coated steel. 1-5/8" channel shall be 12 gauge. 13/16" channel shall be 12-19 gauge.

5.1.11 Drawings and Submittals

A. Material list with manufacturers and brands for each item or class of items.

B. Front and interior views of control panel with component identification.

C. Standard component datasheets from the manufacturers.

D. Wiring diagram with circuit and terminal numbers.

E. Control panel name plate including voltage requirement, phases, and current.

F. Operation manuals.

G. Reporting for tests as specified in section 1.1.12.

5.1.12 Testing

A. Visual check of cables, circuit breakers, and connections.

B. Control and instrumentation cables shall be tested for continuity, polarity, undesirable ground, and point-to-point determination.

C. Overload devices with adjustment shall be field adjusted and tabulated.

D. Functional factory and field tests with adjustment and tabulation of process setpoints, limit signals, signaling devices, valve actuator operation, and pump operation.

E. Faulty equipment shall be replaced as according to warranty policies.

F. Check pumps for proper rotation at factory and after installation.

G. Control panel shall be tested for operability and function at the factory and in the field.

5.2 Out of Scope

5.2.1 General

A. Pure Aqua makes no claim regarding the following standards:

(1). NETA International Electrical Testing Association

B. Pure Aqua makes no claim regarding UL or NSF compliance of the assembled system as a whole, notwithstanding the stated compliance of individual components.

5.2.2 Rigid Conduit, Conduit Bodies, and Fittings

A. Pure Aqua shall not furnish galvanized rigid steel conduit nor other raceway materials omitted from Section 1.1.3.

5.2.3 Wire and Cable

A. Pure Aqua shall not furnish wiring with colors not included in section 1.1.7.

5.2.4 Control Panel

A. Pure Aqua shall not furnish a fold-out shelf in the control panel.

5.2.5 Pump Motors

A. Pure Aqua does not guarantee motor bearing life to 100,000 hours.

5.2.6 Drawings and Submittals

A. Pure Aqua shall not furnish electrical documentation not specified in section 1.1.11.

B. Pure Aqua shall not augment component manufacturers' datasheets.

5.2.7 Testing

A. Pure Aqua shall not conduct testing not specified in section 1.1.12.

B. Pure Aqua shall not conduct destructive testing nor cover damages not outlined in the product warranty, e.g. damage due to incorrect operation or installation.

C. Pure Aqua shall not supply EPDM jacketed electrical cables subject to third party testing.

D. Pure Aqua shall not supply GFI receptacles or breakers.

E. Valve actuators shall not have recorded testing by the valve manufacturer's representative.

F. Motors shall not be removed from pumps for testing.

G. Pure Aqua shall not conduct insulation tests (megger tests).

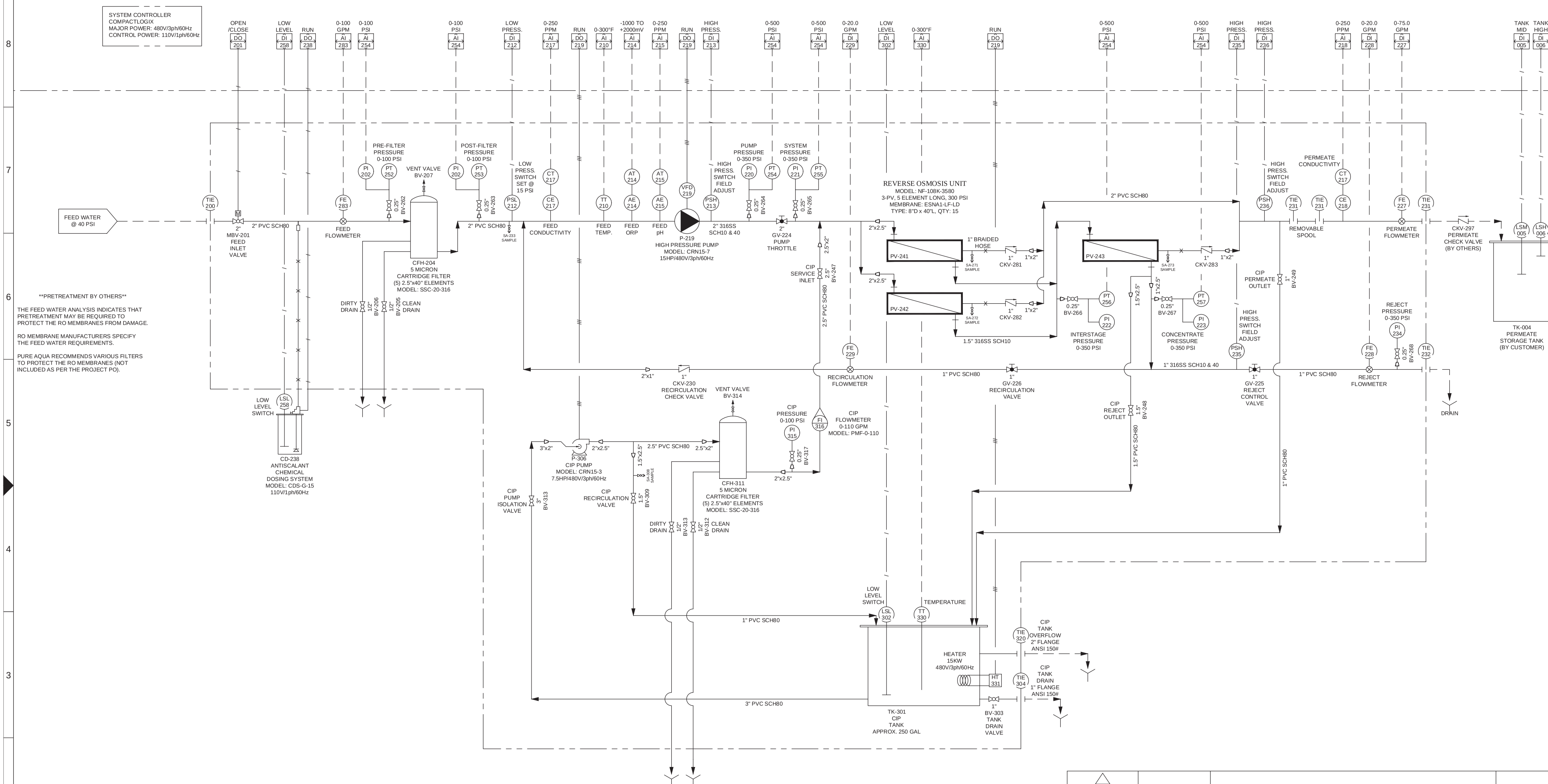
5.2.8 Installation

A. Pure Aqua shall not perform the installation work.

B. Pure Aqua shall not provide materials required to interconnect the system with other equipment.

C. Pure Aqua shall not provide materials required to connect the system to mains.

6.0 P&ID



LETTER	DATE	DESCRIPTION	DRAWN

REVISION BLOCK

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TITLE: PROCESS & INSTRUMENTATION DIAGRAM (P&ID)

PROJECT: NF-108K-3580

CUSTOMER: VILLAGE SAFE WATER
THORNE BAY, ALASKA

DRAWN: R. ZANE	REVIEWED: K. AGHASI	VERIFIED:	VALIDATED:	DWG NO.: 5-8672-NF108K-PID	SCALE: NONE	REVISION
DATE: 2018.09.26	DATE: 2018.10.24	DATE:	DATE:	JOB NO.:	SHEET: 1 OF 1	1

CONNECTIONS

TAG-#	NAME	TYPE
TIE-200	FEED WATER INLET	2" 150 LB. ANSI FLANGE
TIE-231	PERMEATE OUTLET	2" 150 LB. ANSI FLANGE
TIE-232	REJECT OUTLET	1" 150 LB. ANSI FLANGE
TIE-304	CIP TANK DRAIN	1" 150 LB. ANSI FLANGE
TIE-320	CIP TANK OVERFLOW	2" 150 LB. ANSI FLANGE

CUSTOMER APPROVAL DATE

7.0 Sheets

http://www.apc.com

APC DIN Rail-Control Panel UPS

120V

>

A proven, reliable, flexible, cost-effective uninterruptible power source for control panels ensuring continuity of process control during a power event or power failure

Benefits include:

- Flexible Installation
- High Availability and Reliability
- Easy To Maintain
- Manageable

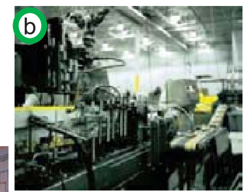
230V

APC by Schneider Electric

April 2015

APC DIN Rail-Control Panel UPS

500 VA / 325 W



Segments

- Water/Waste Water
- Mining/Metals/Minerals
- Biotech / Pharmaceutical
- Transportation
- Chemical
- Food & Beverage
- Semiconductor
- Automotive
- Oil/Gas

Applications:

- Manufacturing Equipment: a
  - Machine controllers; Process control;
  - Sensitive equipment; Safety Infrastructure
- Material & Packaging handling: b
  - Fillers; Packaging robots;
  - Panel feeders/stackers
- Automation Control: c
  - PLCs; I/O Controllers; Industrial PCs;
  - SCADA systems; OIT's and RTU's
- IP-based Devices: d
  - Industrial Ethernet; Imaging;
  - Material-analysis; Motion sensors

Benefit: Flexible Installation

Features:

- Control Panel or DIN Rail Mountable 1
- Hardwired AC Input / Output (120 or 230Vac) 2
- **Internal or External Battery** Installation 3
  - Chassis knockout - right side or bottom
  - External battery mounting allows for compliance with United States NEC 480.9(A)

Benefit: Manageable

Features:

- Integrated **Dry Contact Relay I/O** 4
- DB-9 **Serial Port** Communications RS232 protocol 5
- APC SmartSlot: Optional **Network Management**, Modbus, or Relay I/O Contacts Card. 6
- **LED Status Indicators** – External status LEDs indicate the state of the UPS: On-Line or On-Battery; Battery disconnected or needs to be replaced. 7
- **Audible Alarms** – Notify the end-user of the following conditions: On-Battery; Low Battery; Replace Battery.

Benefit: Easy to Maintain

Features:

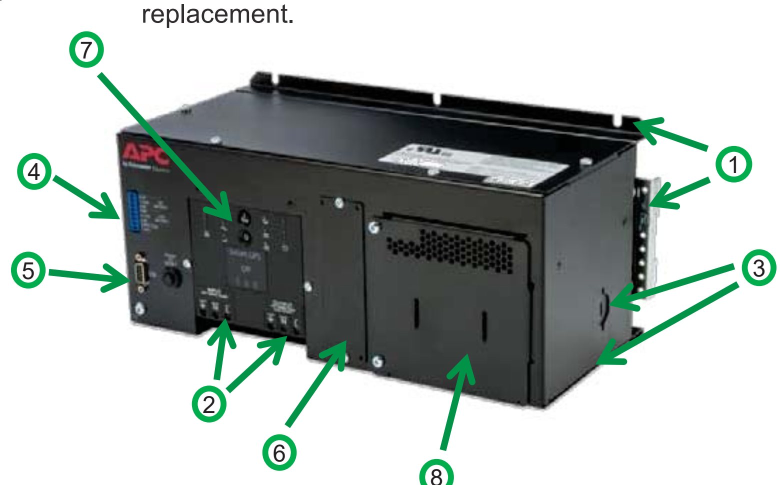
- **Simple battery replacement:** Trained service personnel can replace the battery even while the UPS is operating on utility power. 8
- **Simple testing:** Easily schedule "Automatic Self Test"

Benefit: High Availability & Reliability

Features:

- **Temperature-compensated battery charging:** Prolongs battery life by regulating the charge voltage according to battery temperature.
- **Automatic Self-Test:** Periodic battery self-test provides early detection of a battery in need of replacement.

SUA500PDR-H shown



April 2015

APC by Schneider Electric

SKU	SUA500PDR-S (standard battery) SUA500PDR-H (high temperature battery)	SUA500PDRI-S (standard battery) SUA500PDRI-H (high temperature battery)
Input		
Nominal Input Voltage	120V	230V
Input Voltage Range	82 - 144VAC	160 - 280VAC
Input Frequency	45 - 65Hz; Auto-Selecting	
Input Connections	Hardwired Input (3-Wire; H-N-G)	
Output		
Nominal Output Capacity	500 VA / 325 W	
Topology	Line Interactive	
Waveform	Sine wave	
Nominal Output Voltage	120V	Default: 230V (User Configurable: 220/230/240)
Output Frequency	50/60 +/- 3Hz; Sync To Mains	
Efficiency (Full-Load)	>94%	
Output Voltage Distortion (Full Load)	<2% (100% Linear Load); <8% (100% Non-Linear Load)	
Output Connections	Hardwired Output (3-Wire; H-N-G)	
Protection		
Surge Energy Rating	540 Joules	340 Joules
Filtering	Full time multi-pole noise filtering : 0.3% IEEE surge let-through : zero clamping response time : meets UL 1449	
Thermal Protection	Yes	
Communications and Controls		
Serial Port	DB9; UPS Status, and Control of User Configurable Parameters	
SmartSlot	SmartSlot Accessories; AP9630 and AP9631 Network Cards, AP9610 Relay I/O Card, AP9622 Modbus Card	
Emergency Power Off (EPO)	Terminal Block	
Front Display Panel Buttons	On/Off, Self-Test, Alarm Silence, Cold-Start	
Visual and Audible Status Indicators		
LEDs	On-Line, On-Battery, Overload, Replace Battery; and Load and Battery Bar-Graphs	
Audible Alarm	On-Battery, Low-Battery, Overload	
Physical		
Dimensions (HxWxD)	5.84"x14.24"x7.72" (148x362x171 mm)	
Net Weight	18lb (8.18kg)	
Color	Black	
Environment		
Operating Temperature / Humidity	+32 to 104 °F (0 to 40 °C) / 0 - 95% (Non-Condensing) (with Standard Battery) (-S SKUs) +32 to 122 °F (0 to 50 °C) / 0 - 95% (Non-Condensing) (with High-Temp Battery) (-H SKUs)	
Storage Temperature / Humidity	+23 to 140 °F (-5 to 60 °C) / 0 - 95% (Non-Condensing)	
Mounting	Panel or DIN-Rail Mounting	
Conformance		
Regulatory Certifications	cUL, Recognized UL 1778, FCC (Class A), CE (Class A), VDE	
Battery Cartridge	APCRBC135	APCRBC136
Battery		
Battery Type	Maintenance-Free, Sealed Lead Acid Battery	
Nominal Battery Voltage	24VDC	
Runtime (Full Load)	8.5 minutes	
Recharge Time (To 90%)	<3 Hours	
Expected Battery Life	3 to 5 Years at 68 °F (20°C)	up to 8 Years at 68 to 77 °F (20-25°C)
Physical		
Dimensions (HxWxD)	4.22"x4.20"x5.65" (107x107x144 mm)	
Net Weight	10.3lb (4.68kg)	7.26lb (3.3kg)
Environment		
Operating Temperature / Humidity	+32 to 104 °F (0 to 40 °C) / 0 - 95% (Non-Condensing)	+32 to 122 °F (0 to 50 °C) / 0 - 95% (Non-Condensing)
Storage Temperature / Humidity	+5 to 113 °F (-15 to 45°C) / 0 - 95% (Non-Condensing)	

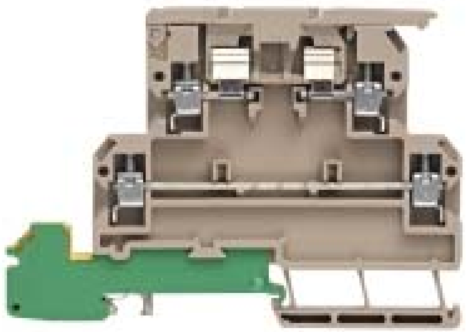
April 2015

APC by Schneider Electric

Data sheet

W-Series
KDKS 1/PE/35 DB

Weidmüller Interface GmbH & Co. KG
Klingenbergstraße 16
D-32758 Detmold
Germany
Fon: +49 5231 14-0
Fax: +49 5231 14-292083
www.weidmueller.com



Klippon® Connect with clamping yoke Technology
The high reliability and variety of designs of the terminal blocks with clamping yoke connections make planning easer and optimises operational safety. Klippon® Connect provides a proven response to a range of different requirements.

General ordering data

Type	KDKS 1/PE/35 DB
Order No.	9532450000
Version	W-Series, Fuse terminal, Rated cross-section: 4 mm², Screw connection
GTIN (EAN)	4032248039210
Qty.	50 pc(s).

W-Series
KDKS 1/PE/35 DB

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Klingenbergstraße 16
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Fon: +49 5231 14-0
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www.weidmueller.com

Technical data

Dimensions and weights

Width	8 mm	Width (inches)	0.315 inch
Height	91 mm	Height (inches)	3.583 inch
Depth	65 mm	Depth (inches)	2.559 inch
Net weight	28.6 g		

Temperatures

Continuous operating temp., min.	-50 °C	Continuous operating temp., max.	120 °C

Material data

Material	Wemid	Colour	Dark Beige
UL 94 flammability rating	V-0		

System specifications

Version	Screw connection, Fuse isolator, With PE connection, One end without connector	Tightening torque (clamping screw for copper conductors)	0.5...1 Nm
End cover plate required	Yes	Number of potentials	3
Number of levels	3	No. of clamping points per level	2
Number of potentials per tier	1	Levels cross-connected internally	No
PE connection	Yes	Mounting rail	TS 35
N-function	No	PE function	Yes
PEN function	No		

2 clampable conductors (H05V/H07V) with equal cross-section (rated connection)

Wire connection cross section, finely stranded, two clampable wires, min.	0.5 mm²	Wire cross-section, finely stranded, two clampable wires, max.	1 mm²
Wire connection cross section, finely stranded with wire-end ferrules DIN 46228/1, 2 clampable wires, min.	0.5 mm²	Wire connection cross section, finely stranded with wire-end ferrules DIN 46228/1, 2 clampable wires, max.	1 mm²

Additional technical data

Explosion-tested version	No	Number of similar terminals	1
Open sides	right	Type of mounting	Snap-on

CSA rating data

Certificate No. (CSA)	12400-281	Wire cross section max. (CSA)	12 AWG
Wire cross section min. (CSA)	26 AWG		

Conductors for clamping (additional connection)

Conductor cross-section, flexible plus plastic collar DIN 46228/1, further connection, max.	4 mm²

Data sheet

W-Series
KDKS 1/PE/35 DB

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Klingenbergstraße 16
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Fax: +49 5231 14-292083
www.weidmueller.com

Technical data

Conductors for clamping (rated connection)

Blade size	0.6 x 3.5 mm	Clamping range, max.	4 mm²
Clamping range, min.	0.33 mm²	Clamping screw	M 3
Connection cross-section, stranded, max.	4 mm²	Connection cross-section, stranded, min.	1.5 mm²
Connection direction	on side	Gauge to IEC 60947-1	A3
Number of connections	3	Stripping length	9 mm
Tightening torque, max.	1 Nm	Tightening torque, min.	0.5 Nm
Torque level with DMS electric screwdriver	2	Type of connection	Screw connection
Wire connection cross section AWG, max.	AWG 12	Wire connection cross section AWG, min.	AWG 22
Wire connection cross section, finely stranded, max.	4 mm²	Wire connection cross-section, finely stranded with wire-end ferrules DIN 46228/1, max.	4 mm²
Wire connection cross-section, finely stranded with wire-end ferrules DIN 46228/1, min.	0.5 mm²	Wire connection cross-section, finely stranded, min.	0.5 mm²
Wire connection cross-section, solid core, max.	4 mm²	Wire connection cross-section, solid core, min.	0.5 mm²

Fuse terminals

Cartridge fuse	G-Si. 5 x 20	Permitted power loss for fuse with semiconductor protection	
Power loss, 1-pole ; 2-pole ; 3-pole			

PE rating data

Rated short-time current	300 A (2.5 mm²)	PEN function	No

Rating data

Rated cross-section	4 mm²	Rated voltage	250 V
Rated voltage to adjoining terminal	500 V	Rated current	6.3 A
Current at maximum wires	6.3 A	Standards	IEC 60947-7-1, IEC 60947-7-2, IEC 60947-7-3
Volume resistance according to IEC 60947-7-x	2 mΩ	Rated impulse withstand voltage	6 kV
Pollution severity	3	Surge voltage category	III

UL rating data

Certificate No. (UR)	E60693	Conductor size Factory wiring max. (UR)	12 AWG
Conductor size Factory wiring min. (UR)	26 AWG	Conductor size Field wiring max. (UR)	12 AWG
Conductor size Field wiring min. (UR)	22 AWG		

Classifications

ETIM 3.0	EC000899	ETIM 4.0	EC000900
ETIM 5.0	EC000900	ETIM 6.0	EC000899
UNSPSC	30-21-18-11	eClass 5.1	27-14-11-28
eClass 6.2	27-14-11-28	eClass 7.1	27-14-11-28
eClass 8.1	27-14-11-16	eClass 9.0	27-14-11-16
eClass 9.1	27-14-11-16		

W-Series
KDKS 1/PE/35 DB

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Technical data

Approvals

Approvals	
ROHS	Conform

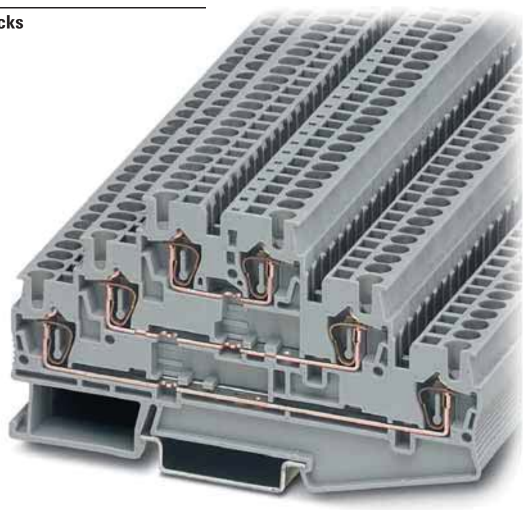
Downloads

Approval/Certificate/Document of Conformity	DE_PT1004_20160418_189_ISSUE01.pdf
Engineering Data	EPLAN, WSCAD

Safety note

Safety notice	Safety Information

Triple Level Blocks



Contents

Triple Level Blocks

Product Description

The spring cage triple level terminal block incorporates three feed-through levels in a 5.2 mm wide housing. This is ideal for high density wiring, especially important when switchgear space is restricted. There is a bridge shaft on each level allowing use of this block as a compact potential distributor or as a sensor terminal.

The XBPTK25PV has all six terminal points interconnected. All the triple level blocks can be labeled on each level.

Product Selection

XBPTK25

Spring Cage Connection Triple Level Blocks

Terminal Width	Maximum Wire Size	IEC 60 947-7-1 in V/A/AWG	UL-cUL Ratings in V/A/AWG	Color	Standard Pack	Catalog Number
5.2 mm	12 AWG/2.5 mm^2	500/28/28–12	600/20/26–12	Gray	50	**XBPTK25**
5.2 mm	12 AWG/2.5 mm^2	500/28/28–12	600/20/26–12	Gray	50	**XBPTK25PV** ①

Note

① Terminal block with potential distribution between the levels.

Accessories

Spring Cage Connection Triple Level Blocks

Description	Color	Number of Positions	Standard Pack	XBPTK25 Catalog Number	XBPTK25PV Catalog Number
End cover	Gray	—	50	**XBACPT25K**	**XBACPT25K**
Plug-in bridge—for cross connections in the bridge shaft	Red	2	10	**XBAFBS25**	**XBAFBS25**
		3	50	**XBAFBS35**	**XBAFBS35**
		5	50	**XBAFBS55**	**XBAFBS55**
		10	10	**XBAFBS105**	**XBAFBS105**
		50	10	**XBAFBS505**	**XBAFBS505**
Test adapter	—	—	10	**XBATSPAI4**	**XBATSPAI4**
Modular test plug	—	—	10	**XBATSPS5**	**XBATSPS5**
Blank marker strip (strip of 10)	White	—	10	**XBMZBF5** ①	**XBMZBF5** ①

Technical Data and Specifications

Spring Cage Connection Triple Level Blocks

Description	XBPTK25	XBPTK25PV
Technical Data in Accordance with IEC		
Maximum load current in A/cross-section in mm^2	28/4	28/4
Rated surge voltage in kV/contamination class	6/3	6/3
Surge voltage category/insulating material group	III/I	III/I
Connection Capacity		
Stranded with ferrule with plastic sleeve in mm^2	0.25–2.5	0.25–2.5
Stranded with ferrules without plastic sleeve in mm^2	0.25–2.5	0.25–2.5
Stranded with twin ferrule with plastic sleeve in mm^2	0.5	0.5
Stripping length in inches (mm)	0.39 (10)	0.39 (10)

Dimensions

Approximate Dimensions in Inches (mm)

Spring Cage Connection Triple Level Blocks

Catalog Number	Width	Length	Cover Length	Height for— 35 x 7.5 in	35 x 15 in
XBPTK25	0.20 (5.2)	3.92 (99.5)	0.09 (2.2)	2.28 (58.0)	2.58 (65.5)
XBPTK25PV	0.20 (5.2)	3.92 (99.5)	0.09 (2.2)	2.28 (58.0)	2.58 (65.5)

Notes

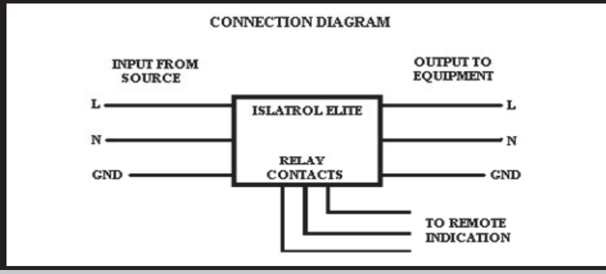
① For information on Printed Marking Tag Options, see **Page V7-T8-98**.

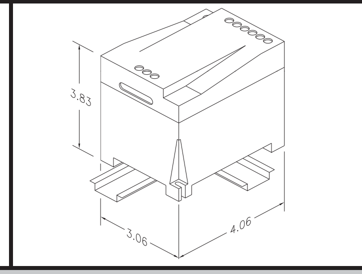
For additional accessories, see **Page V7-T8-90**.

Technical Specification

Islatrol
IE Series

IE-110





The Islatrol Elite is a series connected high-frequency noise filter with built in high-energy transient protection. The IE-110 is a hard-wired device used to protect 120 volt critical loads up to 10 amps. Din rail mounting bracket makes the Islatrol Elite ideal for control panel applications.

Nominal Operating Voltage	120 VAC, Single Phase
Operating Voltage Range	120 VAC +/- 25%
Operating Frequency Range	47 - 63 Hz
Rated Output (Amps)	10 Amperes
ANSI/IEEE C62.41 Category	Category A & B
SPD Location Type	Type 4
Nominal Discharge Current (I_N)	3kA
Connection/Mounting Type	Series Terminal (Finger Safe) / Din or Flange
Phase Configuration	2 Wire + Gnd
Size	4.06 x 3.06 x 3.83 in. Max
Enclosure	High Impact Plastic
Weight	<3 lbs.
Modes Of Protection	L - N, L - G, N - G
Indication of Suppression Status	Green LED, Form C Contacts
Response Time	< .5 ns Normal mode
Operating Temperature	-40°C TO 45°C
Operating Humidity	0% TO 95% Non-condensing
Certifications	UL 1283, UL 1449 Third Edition (2009), CUL, CE, ROHS
Warranty	10 Year
Maximum Continuous Operating Voltage (MCOV)	
Line to Neutral	150 VRMS
Peak Surge Current Capability (8 x 20µs)	
Line to Neutral	15,000 Amps
Line to Ground	15,000 Amps
Neutral to Ground	15,000 Amps
Total	45,000 Amps
Load Surge Current Rating	
10 MSEC	5 x Nominal
1 SEC	3 x Nominal
10 SEC	2 x Nominal
ANSI/IEEE C62.41 Cat A Ringwave (6 kV, 200A, 100 kHz)	
Normal Mode	0.7 V
Common Mode	300 V
ANSI/IEEE C62.41 Cat B Ringwave (6 kV, 500A, 100 kHz)	
Normal Mode	153 V
Common Mode	300 V
Frequency Response	
Normal Mode (Forward-Reverse)	100 kHz to 50 MHz – 60 dB Min
Common Mode (Forward-Reverse)	5 MHz to 50 MHz – 60 dB Min

Technical Datasheet# TD0100AX

AC SURGE PROTECTOR

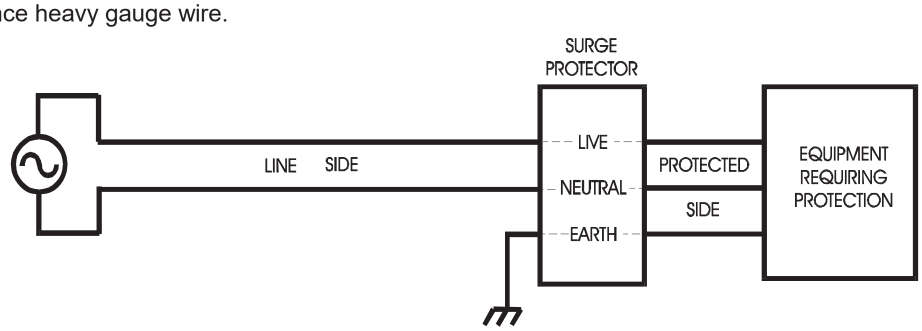
P/N: TSP-WG6-xxxVAC-10A-01
Where: xxx = Input Voltage

Features:

- Handles large current surges and voltage spikes without wear and tear to the circuitry of the protector
- Protection against closer (stronger) lightning strikes
- Hybrid design features reflection of surge energy as well as MOV suppression
- LED indicator ensures continued protection and avoids unnecessary replacement costs
- 100% redundancy
- CE marking
- Compact WEG 6 pin DIN rail mount

Application: Transient surge protectors provide common and differential mode protection for toll booths, drawbridges, street light controllers and railroad crossing gates/signals. Electronic equipment is extremely susceptible to transient voltages and surge currents due to its relatively fragile semiconductor construction. A surge protector is a cost effective method of ensuring that equipment will have maximum life.

Function: The module has a PROTECTED - LIVE, NEUTRAL and EARTH side which is connected to the equipment supply lines requiring protection. It also has a LINE - LIVE, NEUTRAL and EARTH side which is connected to the AC supply power conductors. The EARTH connection of the modules must be terminated to earth by low impedance heavy gauge wire.



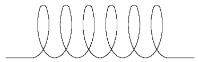
Description: The TSP-WG6-xxxVAC-10A-01 is a three-stage transient protection module which provides over-voltage and surge current protection for single phase supply lines. The first stage provides transient rise time reduction. The second stage provides the primary transient voltage clamping and a LED circuit to indicate that the device is still fully functional. This second stage will be removed from the circuit well before the useful life of the device has expired. This will provide ample time for the device to be replaced ensuring continued protection of the connected equipment. The third stage is the most rugged and provides the bulk of the transient protection.

Ordering Part Number:

18VAC 10A ... TSP-WG6-18VAC-10A-01
24VAC 10A ... TSP-WG6-24VAC-10A-01
48VAC 10A ... TSP-WG6-48VAC-10A-01
120VAC 10A ... TSP-WG6-120VAC-10A-01
240VAC 10A ... TSP-WG6-240VAC-10A-01

Axiomatic Technologies Corporation
5915 Wallace Street, Mississauga, Ontario Canada L4Z 1Z8
TEL: (905) 602-9270 FAX: (905) 602-9279 E-mail: sales@axiomatic.com
www.axiomatic.com

STAGE 1



Consists of an inductor that results in an impedance mismatch which reflects some of the energy back down the line in the case of a surge. None of the actual clamping occurs at this stage.

STAGE 2

Consists of a fuse, LED and a single MOV. Provides less than 5% of the protection, but it does start clamping some surges.After many clamping cycles, the MOV will become resistive and the fuse will blow. The indicator LED will go out, whichis an advanced warning that the surge protector is starting to wear out. It will still function, but it should be replaced soon.

STAGE 3

The bulk of the protection takes place at this stage. It consists of numerous MOVs that clamp surges and can handle large amounts of power.

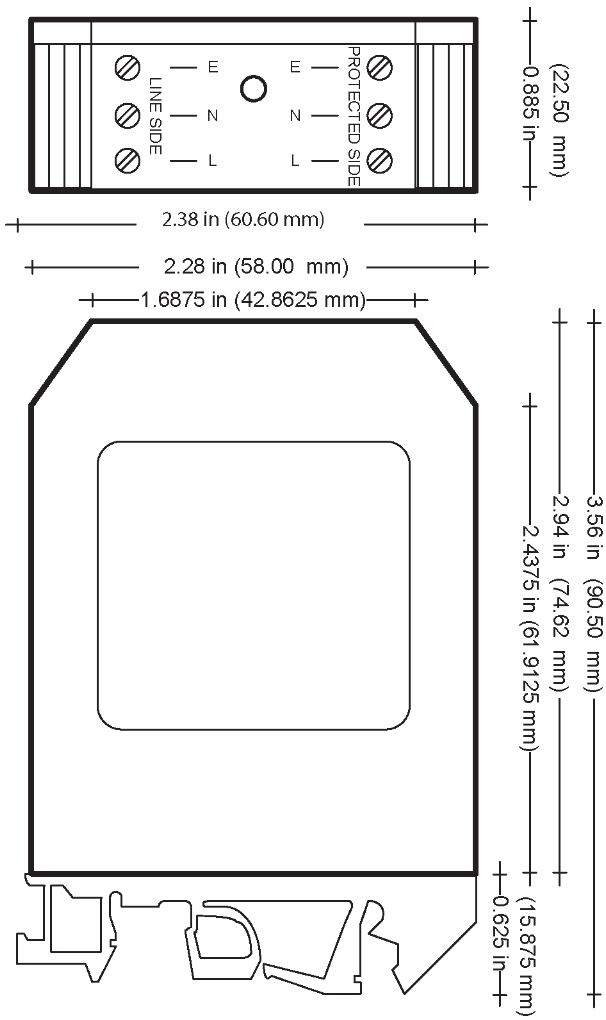
Part Number	MOV Stage 2	MOV Stage 3
TSP-WG6-120VAC-10A-01 (120Vac)	S10V-S14K130	S10V-S520K140
TSP-WG6-240VAC-10A-01 (240Vac)	S10V-514K275	S10V-S520K300

Technical Specifications: All voltages are RMS unless otherwise specified.
All specifications are typical at nominal input voltage and 25 degrees C unless otherwise specified.

Operating Voltage:		**18VAC**	**24VAC**	**48VAC**	**120VAC**	**240VAC**
LINE Side Max. Input Voltage		20VAC	30VAC	60VAC	130VAC	270VAC
PROTECTED Side Voltage Level Suppression Begins:						
Stage Two		30V	42V	90V	175V	390V
Stage Three		35V	50V	110V	195V	440V
Max. Clamp Volts for Maximum Transients on Line:						
Stage Two		65V	93V	165V	340V	710V
Stage Three		77V	110V	200V	360V	775V
Surge Current:						
8/20μSec Pulse	L to N	9000A	9000A	30500A	36500A	28500A
	L to E	4000A	4000A	13000A	16000A	16000A
	N to E	4000A	4000A	13000A	16000A	8000A
2mSec Pulse	L to N	94J	139J	177J	346J	590J
	L to E	44J	66J	80J	156J	346J
	N to E	44J	66J	80J	156J	173J
Maximum Load		10A	10A	10A	10A	10A
Response Time		<5 nSec	<5 nSec	<5 nSec	<5 nSec	<5 nSec
Resistance to Earth:						
Max. Over-Voltage		0.01 Ohm	0.01 Ohm	0.01 Ohm	0.01 Ohm	0.01 Ohm
Operating Voltage		>1 MOhm	>1 MOhm	>1 MOhm	>1 MOhm	>1 MOhm

Packaging / Dimensions: WEG 6 terminal modular housing, #12 to #22 AWG terminals
Size: 60.6 mm x 90.5 mm x 22.5 mm (2.39" x 3.56" x 0.89") (W x H x D excluding DIN Rail)

TSP-WG6-XXXVAC-XXA-01



Operating Conditions: -40 to +85°C (-40 to 185°F), 0 to 93% Relative Humidity

Storage Temperature: -55 to 125°C (-67 to 257°F)

Weights: 24VAC model: 94.2 g; 120VAC model: 83.8 g; 240 VAC model: 85.8 g

Approvals: CE marking

Indicator: LED ON indicates the device is fully functional. If the LED turns OFF, this means the unit has experienced a surge and provided the protection it was designed to do. This indicates it is time to replace the protector.

Specifications are subject to change without notice. Form: TD0100AX-10/02/18

B

2 CO relay interface modules, 15.8 mm wide

Ideal interface for PLC and electronic systems

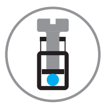
Type 48.P5
- 2 CO 8 A
- Push-in terminals

Type 48.52
- 2 CO 8 A
- Screw terminals

- AC coils or DC sensitive coils
- Supply status indication and EMC coil suppression module as standard
- Identification label
- UL Listing (certain relay/socket combinations)
- 35 mm rail (EN 60715) mounting
- Cadmium-free contact material

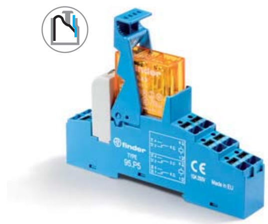
48.P5
Push-in terminal

48.52
Screw terminal

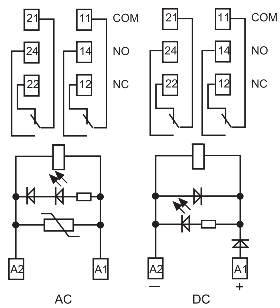


For outline drawing see page 11

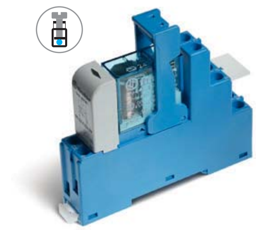
48.P5



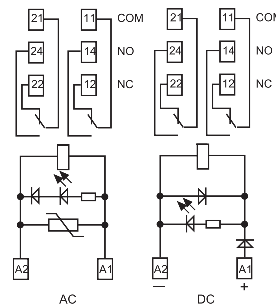
- 2 CO 8 A
- Push-in terminals



48.52



- 2 CO 8 A
- Screw terminals



		48.P5	48.52
Contact specification			
Contact configuration		2 CO (DPDT)	2 CO (DPDT)
Rated current/Maximum peak current	A	8/15	8/15
Rated voltage/ Maximum switching voltage	V AC	250/250	250/250
Rated load AC1	VA	2000	2000
Rated load AC15 (230 V AC)	VA	400	400
Single phase motor rating (230 V AC)	kW	0.3	0.3
Breaking capacity DC1: 30/110/220 V	A	8/0.3/0.12	8/0.3/0.12
Minimum switching load	mW (V/mA)	300 (5/5)	300 (5/5)
Standard contact material		AgNi	AgNi
Coil specification			
Nominal voltage (U_N)	V AC (50/60 Hz)	12 - 24 - 110 - 120 - 230	12 - 24 - 110 - 120 - 230
	V DC	12 - 24 - 125	12 - 24 - 125
Rated power AC/sens. DC	VA (50 Hz)/W	1.2/0.5	1.2/0.5
Operating range	AC	(0.8…1.1)U_N	(0.8…1.1)U_N
	sens. DC	(0.73…1.5)U_N	(0.73…1.5)U_N
Holding voltage	AC/DC	0.8 U_N / 0.4 U_N	0.8 U_N / 0.4 U_N
Must drop-out voltage	AC/DC	0.2 U_N / 0.1 U_N	0.2 U_N / 0.1 U_N
Technical data			
Mechanical life	cycles	$10 \cdot 10^6$	$10 \cdot 10^6$
Electrical life at rated load AC1	cycles	$100 \cdot 10^3$	$100 \cdot 10^3$
Operate/release time	ms	7/4 (AC) - 12/12 (DC)	7/4 (AC) - 12/12 (DC)
Insulation between coil and contacts (1.2/50 µs)	kV	6 (8 mm)	6 (8 mm)
Dielectric strength between open contacts	V AC	1000	1000
Ambient temperature range	°C	–40…+70	–40…+70
Protection category		IP 20	IP 20
Approvals relay (according to type)		RINA	

B

Ordering information

Example: 48 series, 35 mm rail (EN 60715) mount, Push-in terminal relay interface module, 2 CO 8 A contacts, 24 V sensitive DC coil, green LED + diode, 99.02 coil indication.

4 8	.	P	5	.	7	.	0 2 4	.	0 (A)	0 (B)	5 (C)	0 (D)

Series

Type
Screw terminal
1 = 35 mm rail (EN 60715) mount, forcibly guided contacts relay
3 = 35 mm rail (EN 60715) mount
5 = 35 mm rail (EN 60715) mount
6 = 35 mm rail (EN 60715) mount
Push-in terminal
P = 35 mm rail (EN 60715) mount

Type
Screw terminal
1 = for 48.31, 1 pole, 10 A
48.61, 1 pole, 16 A
2 = for 48.12/48.32 (DC only), 48.52, 2 poles, 8 A
48.62 (DC only), 2 poles, 10 A
Push-in terminal
3 = for 48.P3, 1 pole, 10 A
5 = for 48.P5, 2 pole, 8 A
6 = for 48.P6, 1 pole, 16 A
8 = for 48.P8 (DC only), 2 pole, 10 A

Coil version
7 = Sensitive DC
8 = AC (50/60 Hz)
9 = DC (for 48.12 only)

Coil voltage
See coil specifications

A: Contact material
0 = Standard AgNi for 48.P3/P5/P8/31/52/62
AgCdO, Standard for 48.P6/61
4 = $AgSnO_2$, for 48.P6/P8/61/62 only
5 = AgNi + Au, for 48.12 and 48.P3/P5/31/52 only
Standard for 48.32

B: Contact circuit
0 = CO (nPDT)

D: Special versions
0 = Standard
7 = Standard (for 48.12 only)

C: Options
0 = Standard (for 48.12 only)
5 = Standard for DC: green LED + diode (polarity +A1)
6 = Standard for AC and 48.32: green LED + Varistor

Selecting features and options: only combinations in the same row are possible.
Preferred selections for best availability are shown in **bold**.

Type	Coil version	A	B	C	D
48.12	DC	**5**	**0**	**0**	**7**
48.32	DC	**5**	**0**	**6**	**0**
48.P3/P5/31/52	AC	**0** - 5	0	**6**	0
48.P3/P5/31/52	Sensitive DC	**0** - 5	0	**5**	0
48.P6/61	AC	**0** - 4	0	**6**	0
48.P6/61	Sensitive DC	**0** - 4	0	**5**	0
48.P8/62	Sensitive DC	**0** - 4	0	**5**	0

Technical data

Insulation			**48.12/31/32/61/P3/P6**	**48.52/P5**	**48.12/31/61/62/P3/P6/P8**
Insulation according to EN 61810-1	insulation rated voltage	V	250	250	400
	rated impulse withstand voltage	kV	4	4	4
	pollution degree		3	2	2
	overvoltage category		III	III	III
Insulation between coil and contacts (1.2/50 µs)		kV	6 (8 mm)		
Dielectric strength between open contacts		V AC	1000; 1500 (48.12/32)		
Dielectric strength between adjacent contacts		V AC	2000 (48.P5/52); 2500 (48.P8/62) 3000 (48.12/32)		
Insulation between coil terminals					
Rated impulse voltage (surge) differential mode (according to EN 61000-4-5)		kV(1.2/50 µs)	2		
Other data					
Bounce time: NO/NC		ms	2/5; 2/10 (48.12/32)		
Vibration resistance (10…200)Hz: NO/NC		g	20/5 (for 1 pole)	15/3; 20/6 (48.12/32) for 2 pole	
Power lost to the environment	without contact current	W	0.7		
	with rated current	W	1.2 (48.12/31/32/P3)	2 (48.52/P5/61/62/P6/P8)	
Wire strip length		mm	8		
Screw torque (only for 48.12/31/32/52/61/81)		Nm	0.5		

		Screw terminal		Push-in terminal	
Min. wire size		solid cable	stranded cable	solid cable	stranded cable
	mm²	0.5	0.5	0.5	0.5
	AWG	21	21	21	21
Max. wire size		**Screw terminal**		**Push-in terminal**	
		solid cable	stranded cable	solid cable	stranded cable
	mm²	1 x 6 / 2 x 2.5	1 x 4 / 2 x 2.5	2 x 1.5 / 1 x 2.5	2 x 1.5 / 1 x 2.5
	AWG	1 x 10 / 2 x 14	1 x 12 / 2 x 14	2 x 16 / 1 x 14	2 x 16 / 1 x 14

Coil specifications

B

DC coil data (0.5 W sensitive)

Nominal voltage U_N	Coil code	Operating range U_{min}*	U_{max}	Rated coil consumption I at U_N
V		V	V	mA
12	**7**.012	8.8	18	41
24	**7**.024	17.5	36	22.2
125	**7**.125	91	188	4

* U_{min} = 0.8 U_N for 48.61, 48.62, 48.P6, 48.P8

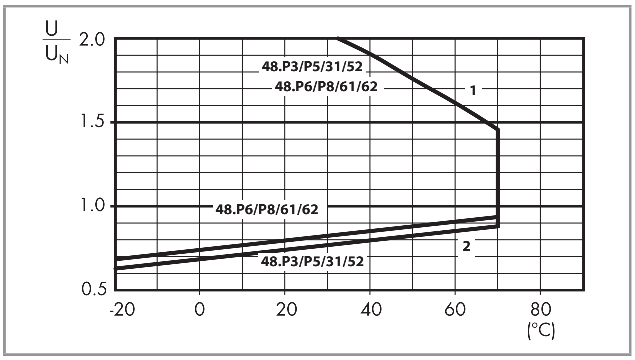
AC coil data

Nominal voltage U_N	Coil code	Operating range U_{min}	U_{max}	Rated coil consumption I at U_N (50 Hz)
V		V	V	mA
12	**8**.012	9.6	13.2	90.5
24	**8**.024	19.2	26.4	46
110	**8**.110	88	121	10.1
120	**8**.120	96	132	11.8
230	**8**.230	184	253	7.0

DC coil data, 2 pole relay - Type 48.12, for 48.32 (24 V only)

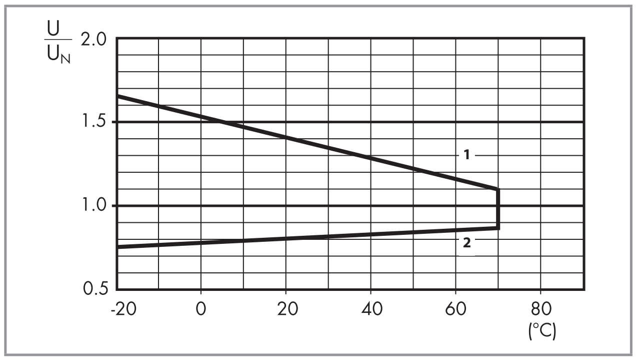
Nominal voltage U_N	Coil code	Operating range U_{min}	U_{max}	Resistance R	Rated coil consumption I at U_N
V		V	V	Ω	mA
12	**9**.012	9	14.4	205	58.5
24	**9**.024	18	28.8	820	29.3

R 48 - DC coil operating range v ambient temperature



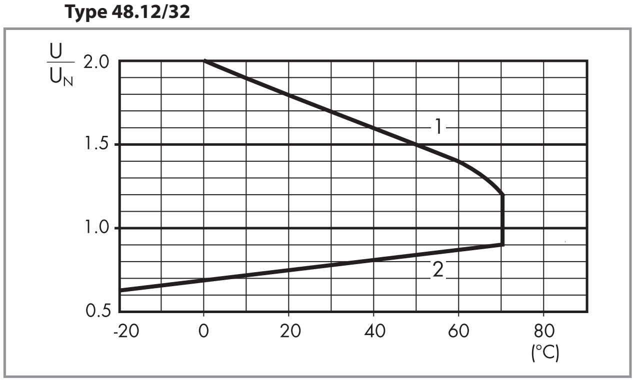
1 - Max. permitted coil voltage.
2 - Min. pick-up voltage with coil at ambient temperature.

R 48 - AC coil operating range v ambient temperature



1 - Max. permitted coil voltage.
2 - Min. pick-up voltage with coil at ambient temperature.

R 48 - DC coil operating range v ambient temperature
Type 48.12/32



1 - Max. permitted coil voltage.
2 - Min. pick-up voltage with coil at ambient temperature.

TDK·Lambda DPP120-240 Series

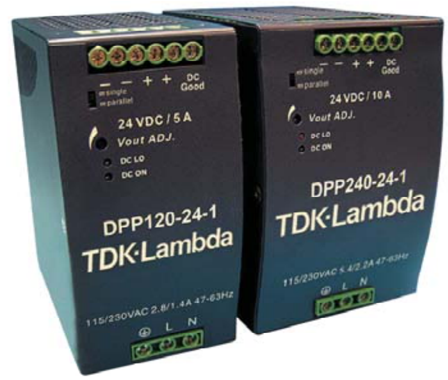
120W & 240W DIN Rail Mount Power Supplies

Features

- ◆ Low Cost
- ◆ 12V, 24V or 48V Outputs
- ◆ Auto-ranging input (no manual switching)
- ◆ Parallel Function Switch
- ◆ -40(2) to +71°C Operation

Key Market Segments & Applications

Industrial



RoHS

Specifications

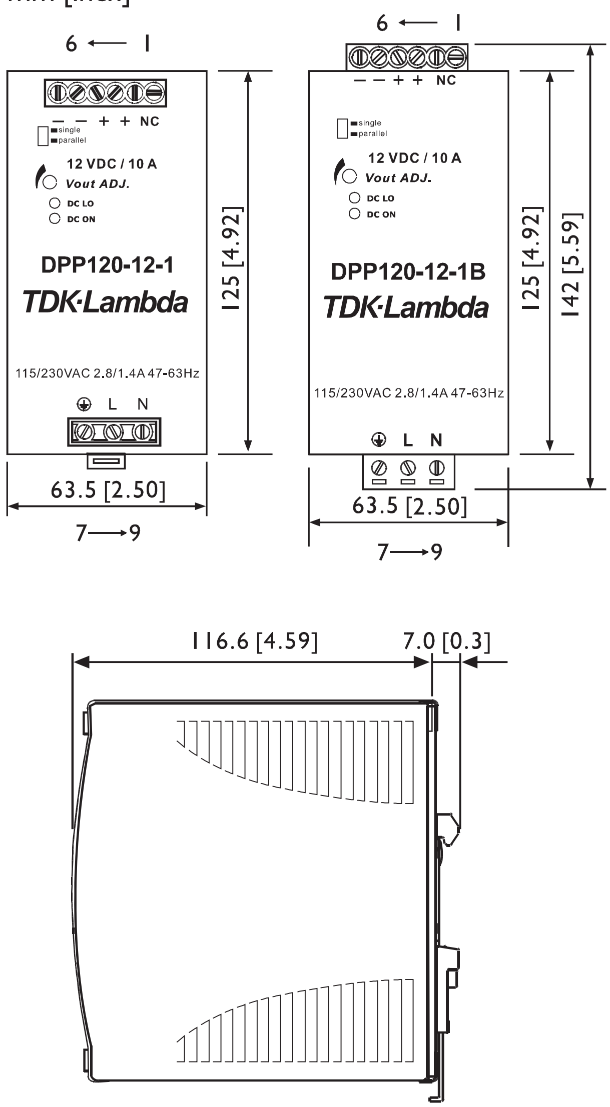
Model		DPP120-xx-1	DPP240-xx-1
AC Input Voltage range	VAC	93 - 132 / 186 - 264VAC, single phase. Auto select	
Input Frequency	Hz	47 - 63Hz	
DC Input Voltage range	VDC	210 - 370VDC*	
Inrush Current (115 / 230VAC)	A	24 / 48A	30 / 60A
Power Factor	-	Meets EN61000-3-2	
Input Current (115 / 230VAC)	A	2.8 / 1.4A	5.4 / 2.2A
Leakage Current	mA	3.5mA	
Output Voltage Accuracy	%	-0, +1% of Nominal	
Line Regulation	%	±0.5%	
Load Regulation	%	±1% (±5% when set in parallel mode)	
Ripple and Noise (20MHz BW)	mV	50mV	100mV
Overcurrent Protection (Typ)	-	110 - 145%	
Overvoltage Protection	V	See model selector	
Overtemperature Protection	-	-	
Hold Up Time (230VAC input)	ms	> 30ms	
Parallel operation	-	Set in parallel (droop) mode - maximum of 3 units	
LED Indicators	-	Green LED = On, Red LED = DC Output Low	
DC Good Relay (24V model only)	-	0.3A rated normally open relay contacts, closes when output is above 17.6 - 19.4V	
Operating Temperature	°C	-40(2) to +71°C (Derate linearly 2.5%/°C from 61 to 71°C)	
Storage Temperature	°C	-40 to +85°C	
Operating Humidity	-	20 - 95% RH (non condensing)	
Cooling (1)	-	Convection	
Withstand Voltage	-	Input to Output 3kVAC for 1 min.	
Isolation Resistance	-	>100M at 25C & 70%RH, Output to Ground 500VDC	
Vibration (Operating)	-	IEC 60068-2-6 (Mounting by rail: Random wave, 10-500 Hz, 2G, ea. along X, Y, Z axes 10 min/cycle, 60 min)	
Shock (Operating)	-	IEC 60068-2-27 (Half sine wave, 4G, 22ms, 3 axes, 6 Faces, 3 times for each face)	
Safety Agency Approvals	-	UL508 Listed, UL60950-1, EN60950-1, CE	
Conducted & Radiated EMI	-	EN55022 class B	EN55022 class A
Immunity	-	IEC 61000-4-2, -3, 4, -5, -6. -8, -11	
Weight (Typ)	g	920	1000
Size (WxHxD) (1)	in	2.5 x 4.92 x 4.59”	3.27 x 4.92 x 4.57”
Case material	-	Metal	
Warranty	yrs	Three years	

(1) Recommend 1” clearance on all sides
(2) DPP120 -35°C

*Safety certified for AC input only

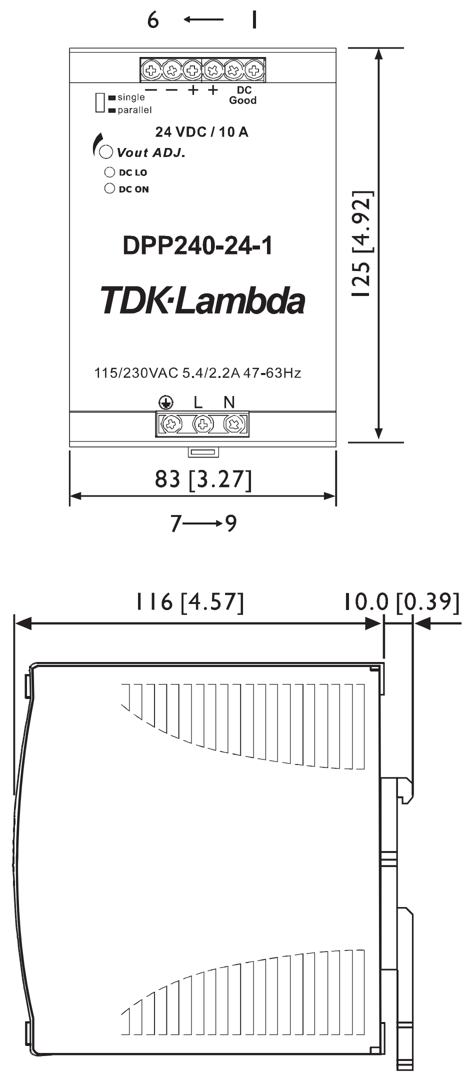
Outline Drawing (DPP120)

mm [inch]



Outline Drawing (DPP240)

mm [inch]



Model Selector

Model	Voltage	Adjust. Range	Output Curr.	Over-voltage	Eff.
DPP120-12-1	12V	11.4 - 14.5V	10A	15 - 17.4V	84%
DPP120-24-1	24V	22.5 - 28.5V	5A	30 - 34.8V	86%
DPP120-48-1	48V	45 - 55V	2.5A	60 - 69.6V	87%
DPP240-24-1	24V	22.5 - 28.5V	10A	30 - 34.8V	89%
DPP240-48-1	48V	47 - 56V	5A	60 - 69.6V	90%

Terminal Assignments

#	Function
1	DC Good relay
2	DC Good relay
3	+V
4	+V
5	-V
6	-V
7	Chassis ground
8	L
9	N

Snap-on Mounting: snap onto DIN Rail TS35/7.5 or TS35/15. (no tools required)

Other DIN Rail Products

DPP	15W to 100W
DPP480	480W single and three phase
DSP	10W to 100W low profile
DLP	75W to 240W single phase

Options

Suffix	Description
Blank	Non detachable connectors
B	Detachable input and output connectors

For Additional Information, please visit
us.tdk-lambda.com/lp/products/dpp-series.htm

CompactLogix 5370 L1 Controllers with Embedded I/O

The CompactLogix 5370 L1 controller comes with:

- A built-in, 24V DC isolated[1] Power Supply module.[2]
- Dual Ethernet ports for linear and ring topologies.
- USB port for firmware updates and programming.
- Embedded digital I/O (16 DC inputs, 16 DC outputs).
- Support for 1734 POINT I/O.

Characteristic	1769-L16ER-BB1B	1769-L18ER-BB1B	1769-L18ERM-BB1B	1769-L19ER-BB1B
Available user memory	384 KB	512 KB	512 KB	1 MB
Memory card	• 1784-SD1 (1 GB), shipped with controller • 1784-SD2 (2 GB)			
Communication ports	• 2 EtherNet/IP • 1 USB			
Embedded I/O	• 16 sinking 24V DC digital input points • 16 sourcing 24V DC digital output points			
EtherNet/IP connections	• 256 EtherNet/IP • 120 TCP			
EtherNet/IP nodes in one Logix Designer application, max	4	8		
Integrated motion on an EtherNet/IP network	—		Supports up to 2 axes	—
Module expansion capacity	6 POINT I/O modules	8 POINT I/O modules		
Battery	None			
Embedded power supply	10…28.8V DC 24V DC nominal			
Programming software support	• Version 20 - For controllers that use firmware revision 20. • Version 21 or later - For controllers that use firmware revision 21 or later.			Version 28 or later - For controllers that use firmware revision 28 or later.

(1) Only series B Power Supply modules are isolated. Series A Power supply modules are non-isolated.

(2) For more information on how to connect a 24V DC power source to the 24V DC nonisolated power supply of the CompactLogix 5370 L1 controller, see the CompactLogix 5370 Controllers User Manual, publication 1769-UM021.

CompactLogix 5370 L2 Controllers with Embedded I/O

The CompactLogix 5370 L2 controller comes with:
- A built-in, 24V DC Power Supply module.
- Dual Ethernet ports for linear and ring topologies.
- USB port for firmware updates and programming.
- A combination of embedded digital, analog, and high-speed counter I/O.
- A 1769-ECR right-end cap.
- Support for 1769 Compact I/O.

Characteristic	1769-L24ER-QB1B	1769-L24ER-QBFC1B, 1769-L24ER-QBFC1BK	1769-L27ERM-QBFC1B
Available user memory	0.75 MB	0.75 MB	1 MB
Memory card	• 1784-SD1 (1 GB), shipped with controller • 1784-SD2 (2 GB)		
Communication ports	• 2 EtherNet/IP • 1 USB		
Embedded I/O	• 16 sinking/sourcing 24V DC digital input points • 16 sourcing 24V DC digital output points	• 16 sinking/sourcing 24V DC digital input points • 16 sourcing 24V DC digital output points • 4 universal analog input points • 2 analog output points • 4 high-speed counters	
EtherNet/IP connections	• 256 EtherNet/IP • 120 TCP	• 256 EtherNet/IP • 120 TCP	• 256 EtherNet/IP • 120 TCP
EtherNet/IP nodes in one Logix Designer application, max	8		16
Integrated motion on an EtherNet/IP network	—	—	Supports up to 4 axes
Module expansion capacity	4 1769 modules		
Battery	None		
Embedded power supply	24V DC		
Programming software support	• Version 20 - For controllers that use firmware revision 20. • Version 21 or later - For controllers that use firmware revision 21 or later.		

These controllers replace previous catalog numbers.

New Controller	Replaces Previous Controller	Differences
1769-L24ER-QBFC1B	1769-L23-QBFC1B 1769-L23E-QBFC1B	• Additional memory • Integrated motion on EtherNet/IP support (1769-L27ERM-QBFC1B) • USB port instead of RS-232 port • Dual-port EtherNet/IP support • SD card support addition • Support for additional expansion I/O modules
1769-L24ER-QB1B	1769-L23E-QB1B	
1769-L27ERM-QBFC1B	1769-L23E-QBFC1B	

CompactLogix 5370 L3 Controllers

In a CompactLogix 5370 L3 controller system, the 1769 Compact I/O modules can be placed to the left and the right of the power supply. As many as eight modules can be placed on each side of the power supply. The CompactLogix 5370 L3 controller comes with:

- Dual Ethernet ports for linear and ring topologies.
- USB port for firmware updates and programming.
- Support for 1769 Compact I/O.

Use the 1769-L30ER-NSE controller for mining applications. You can deplete the residual stored energy of the 1769-L30ER-NSE controller to 200 µJ or less before you transport it into or out of a mine. The 1769-L30ER-NSE controller does not maintain the real-time clock on power cycle.

Characteristic	1769-L30ER	1769-L30ERM 1769-L30ERMK	1769-L30ER-NSE	1769-L33ER	1769-L33ERM 1769-L33ERMK	1769-L36ERM	1769-L37ERM 1769-L37ERMK	1769-L38ERM 1769-L38ERMK
Available user memory	1 MB	1 MB	1 MB No capacitor	2 MB	2 MB	3 MB	4 MB	5 MB
Memory card	1784-SD1 (1 GB), shipped with controller 1784-SD2 (2 GB)							
Communication ports	• 2 EtherNet/IP • 1 USB							
EtherNet/IP connections	• 256 EtherNet/IP • 120 TCP							
EtherNet/IP nodes in one Logix Designer application, max	16			32		48	64	80
Integrated motion on an EtherNet/IP network	—	Supports up to 4 axes	—	—	Supports up to 8 axes	Supports up to 16 axes		
Module expansion capacity	8 1769 modules 1 bank of modules			16 1769 modules 2 banks of modules		30 1769 modules 3 banks of modules		
Battery	None							
Power supply distance rating	4 modules			4 modules		4 modules		
Programming software support	• Version 20 - For controllers that use firmware revision 20. • Version 21 or later - For controllers that use firmware revision 21 or later.						Version 31 or later	

These controllers replace previous catalog numbers.

New Controller(1)	Replaces Previous Controller	Differences
1769-L30ER 1769-L30ERM 1769-L30ER-NSE	1769-L31 1769-L32C(2) 1769-L32E	• Additional memory • Integrated motion on EtherNet/IP support (1769-L30ERM, 1769-L33ERM, 1769-L36ERM) • USB port instead of RS-232 port • Dual-port EtherNet/IP support • SD card instead of CompactFlash card
1769-L33ER 1769-L33ERM	1769-L35CR(2) 1769-L35E	
1769-L36ERM	Any previous 1769-L3*x* controller	

(1) IMPORTANT: Typically, you can use any of the new controllers that are listed in each row as replacements for any of the previous controllers that are listed in the corresponding cell to the right. For example, you can replace a 1769-L32E controller with a 1769-L30ER, 1769-L30ERM, or 1769-L30ER-NSE controller.
In some rare cases, system configuration helps to prevent controller replacement as shown in the previous table. For example, if your system uses a 1769-L32E controller with 12 expansion modules, you cannot replace that controller with a 1769-L30ER, 1769-L30ERM, or 1769-L30ER-NSE controller. Those controllers support no more than 8 expansion modules. You must replace the 1769-L32E controller with a 1769-L33ER, 1769-L33ERM, or 1769-L36ERM controller.
We recommend that before you upgrade your controllers, consider your application requirements to verify that the replacements that are listed previously apply.

(2) Requires converting from ControlNet connections to EtherNet/IP connections.

PanelView Plus 7 Operator Interfaces

Allen-Bradley

Graphic Terminals Designed to Improve Performance

Features and Benefits

Increased Scalability

- Form factor includes sizes from 4" to 19" with wide screen options to meet a variety of application needs
- Using less than 2-inch cabinet depth saves space and reduces cost

Improved Performance

- Windows CE 6.0 standard features, including email and text notification and secure FTP server
- Embedded Ethernet ports that support device-level ring, linear or star network topologies
- Embedded PDF Viewer displays user manuals and installation guides

Mobile Enabled

- Monitor applications from a secure remote location with VNC connectivity
- Email and texting capabilities provide real-time notifications

Enhanced Development Experience

- Faceplates and Add-on Instructions can save 50%-90% of complex screen development time
- Use an SD card to copy and restore the operator interface applications
- Increase operator productivity by creating intuitive interface with gradient shading and PNG support

The PanelView™ Plus 7 operator interfaces form a comprehensive portfolio, with Standard and Performance models that provide operators at the machine level a view into the control system. The use of FactoryTalk® View Machine Edition helps simplify configuration and strengthen your Integrated Architecture solution.

The operator terminals are ideal for applications that require monitoring, controlling and displaying information in dynamic ways, where operators must quickly understand machine status and make better decisions.

Performance Models

Offered in six sizes from 7" to 19" with widescreen options, the PanelView Plus 7 Performance is designed for all applications, ranging from small to complex machines. They include high performing processors, increased memory options and embedded Ethernet ports that support device-level ring, linear, or star network topologies. Additionally, the PanelView Plus 7 Performance models include enhanced features including an RDP client that creates a thin client terminal and web browser ActiveX functionality to embed HTML pages inside the application.

Standard Models

With sizes ranging from 4" to 15", the PanelView Plus 7 Standard terminals provide basic features, ideal for small and mid-size machine applications. They include single or DLR Ethernet port options for network connectivity and ATEX Zone 2/22 certification. FactoryTalk Machine Edition 9.0 provides connection to one controller, 50 screens (25 replace and 25 on-top faceplate screens), and 500 alarms. Previous FactoryTalk Machine Edition versions offer connection to one controller, 25 screens and 200 alarms.

PanelView Plus 7 Operator Interfaces

RDP client feature creates thin client application

Web browser ActiveX embeds HTML pages inside application

PERFORMANCE MODEL

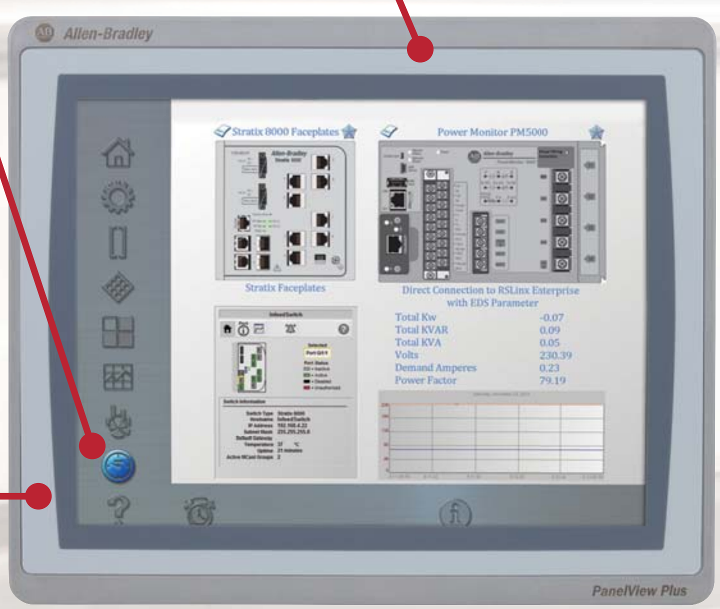
SD storage card slot for data storage, data logging, recipe management and terminal replication

USB ports for printer, RFID reader and web camera support

Embedded PDF Viewer shows user manuals and installation guides

Faceplates and Add-on Instructions saves time on complex screen development time

ATEX 2/22 certification



STANDARD MODEL

New installation clamps provide fast and simple terminal installation and removal

Single or DLR-embedded Ethernet ports for connectivity in Standard terminals and embedded Ethernet port with DLR in Performance terminals

Quick and Easy Terminal Copy and Restore

Use an SD card to quickly create copies of a terminal to reduce your time to market or restore a terminal.

- Operating system
- Network configuration and terminal settings
- FactoryTalk® View Machine Edition (ME) runtime file
- Datalogs and Recipe files

FactoryTalk View Machine Edition

Offers simplified project maintenance with improved handling of multiple FactoryTalk View Machine Editions applications on same terminal

- Added domain authentication options
- Manages security configuration within a running application
- Includes improved audit trail
- Provides recipe management, multi-language capabilities and intuitive animations

Fast Troubleshooting with Real Time Diagnostics

- Capture terminal environmental data at runtime such as temperature, load and battery voltage
- Mobile ready with VNC support and FactoryTalk Viewpoint

PanelView Plus 7 Standard and Performance Specifications

For up-to-date specifications, accessories, manuals and service information, visit:
http://ab.rockwellautomation.com/Graphic-Terminals

	PanelView Plus 7 Standard	PanelView Plus 7 Performance
Display Size	4 inch display (110 x 135 mm) 6 inch display (152 x 176 mm) 7 inch display (170 x 212 mm) 9 inch display (190 x 280 mm) 10 inch display (252 x 297 mm) 12 inch display (240 x 340 mm) 15 inch display (318 x 381 mm)	7 inch display (170 x 212 mm) 9 inch display (190 x 280 mm) 10 inch display (252 x 297 mm) 12 inch display (240 x 340 mm) 15 inch display (318 x 381 mm) 19 inch display (411 x 485 mm)
Display Type	Color TFT LCD, 18-Bit Color Graphics	
Operating System	Microsoft Windows CE 6.0 R3	
Open Architecture	Yes	
CPU	ARM – 1.0 GHz	X86 – 1.3 GHz
RAM	512 MB	512 MB
Internal Storage	512 MB storage 80 MB nonvolatile storage for applications	
Real-time clock	Yes, battery-backed time clock timestamps critical data. Accuracy +/-2 minutes per month	
Environmental Operating Temperature	0...55 °C (32...131 °F)	
Ratings	NEMA 12, 13, 4X, IP54, IP66	
Certifications	ATEX Zone 2, ATEX Zone 22; cULus listed; Class I, Div 2, Groups A,B,C,D, T4; Class II, Div 2, Groups F, G; Class III; Class I, Zone 2, Groups 11C T4; KCC; CE (EMC); CE (LVD); RoHS; EAC; INMETRO	cULus listed; Class I, Div 2, Groups A,B,C,D, T4; Class I, Zone 2, Groups 11C T4; KCC; CE (EMC); CE (LVD); RoHS
Conformally Coated	–	Available for 9 inch and 12 inch displays
SD	1 x SDHC	
USB	1 USB-A and 1 USB-B (v2.0 high speed)	2 USB-A and 1 USB-B (v2.0 high speed)
Ethernet	Either 1 RJ45 10/100 MB port or 2 10/100Base-T Auto MDI/MDI-X Ethernet ports that support DLR, linear or star network topologies	2 10/100Base-T, Auto MDI/MDI-X Ethernet ports that support DLR (device-level ring), linear or star network topologies
Input Power	DC (18...30V DC)	DC (18...30V DC) and AC (100...240V AC)
Standard Software	FactoryTalk Machine Edition 7.0 or later, FactoryTalk Viewpoint, PDF viewer, ActiveX controls, Remote terminal control, FTP server	

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Publication 2711P-PP013G-EN-P – July 2018
Supersedes Publication 2711P-PP013F-EN-P – February 2017

Description

The 3RV20x MSPs are UL approved as Self Protected Combination Motor Controllers which are also called Type E. In this application, all the required functions for a motor branch are provided in one device: disconnect, short circuit protection, motor control and overload protection. A type E terminal adaptor is required. The 3RV20x MSPs are also approved for use as follows:

– Manual Motor Controller: Motor starter, motor disconnect, control and overload—protection.
– Group Installation: Motor starter only, motor disconnect, control and overload protection.
– Tap conductor Protection in Group Installation acc. NEC: Motor starter only; motor disconnect, control and overload protection.

When the 3RV20x is used with one of the 3 above mentioned approvals, the 3RV20x can be installed downstream of one circuit breaker or fuse set.

For more detailed application information and rules how to apply, size and rate the 3RV20x in control panels in general, in group installations or in accordance to international IEC standards visit our website: www.usa.siemens.com/controlpaneldesign

Ordering Information

- ON/OFF rotary handle with lockout and visible trip indication.
- Adjustment dial for setting to motor FLA.
- Class 10 overload trip characteristics.
- Short circuit trip at 13 times the maximum setting of the FLA adjustment dial.
- Short circuit current rating:
- Ambient compensated up to 140° F (applies to side by side mounting).
- Phase loss sensitivity.
- Test trip function.
- Terminal versions: screw, spring, ring lug.
- Auxiliaries and Accessories see pages 1/7–1/17.
- General Information see pages 1/29–1/32.
- Technical Data see pages 1/18–1/28.
- Dimensions see page 1/33.

Note: **Select MSP by motor Full Load Amperes. Horsepower ratings are for reference only.**

Illustration	FLA Adjustment Range [A]	Single-Phase HP Ratings 115V	Single-Phase HP Ratings 230V	Three-Phase HP Ratings 1) 200V	Three-Phase HP Ratings 1) 230V	Three-Phase HP Ratings 1) 460V	Three-Phase HP Ratings 1) 575V	Instantaneous short circuit release [A]	UL short-circuit breaking capacity @ 480V [kA]	Size S00 2) 4) Order Number	Size S0 2) 4) Order Number
	0.11-0.16	—	—	—	—	—	—	2.1	65	3RV2011-0AA●●	—
	0.14-0.2	—	—	—	—	—	—	2.6	65	3RV2011-0BA●●	—
	0.18-0.25	—	—	—	—	—	—	3.3	65	3RV2011-0CA●●	—
	0.22-0.32	—	—	—	—	—	—	4.2	65	3RV2011-0DA●●	—
	0.28-0.4	—	—	—	—	—	—	5.2	65	3RV2011-0EA●●	—
	0.35-0.5	—	—	—	—	—	—	6.5	65	3RV2011-0FA●●	—
	0.45-0.63	—	—	—	—	—	—	8.2	65	3RV2011-0GA●●	3RV2021-0GA●●
	0.55-0.8	—	—	—	—	—	—	10	65	3RV2011-0HA●●	3RV2021-0HA●●
	0.7-1	—	—	—	—	—	½	13	65	3RV2011-0JA●●	3RV2021-0JA●●
	0.9-1.25	—	—	—	—	½	½	16	65	3RV2011-0KA●●	3RV2021-0KA●●
	1.1-1.6	—	⅒	—	—	¾	¾	21	65	3RV2011-1AA●●	3RV2021-1AA●●
	1.4-2	—	⅛	—	—	¾	1	26	65	3RV2011-1BA●●	3RV2021-1BA●●
	1.8-2.5	—	⅙	½	½	1	1 ½	33	65	3RV2011-1CA●●	3RV2021-1CA●●
	2.2-3.2	⅒	¼	½	¾	1 ½	2	42	65	3RV2011-1DA●●	3RV2021-1DA●●
	2.8-4	⅛	⅓	¾	¾	2	3	52	65	3RV2011-1EA●●	3RV2021-1EA●●
	3.5-5	⅙	½	1	1	3	3	65	65	3RV2011-1FA●●	3RV2021-1FA●●
	4.5-6.3	¼	½	1	1 ½	3	5	82	65	3RV2011-1GA●●	3RV2021-1GA●●
	5.5-8	⅓	1	2	2	5	5	104	65	3RV2011-1HA●●	3RV2021-1HA●●
	7-10	½	1 ½	2	3	5	7 ½	130	65	3RV2011-1JA●●	3RV2021-1JA●●
	9-12.5	½	2	3	3	7 ½	10	163	65	3RV2011-1KA●●	3RV2021-1KA●●
	11-16	1	2	3	5	10	—	208	65	3RV2011-4AA●●	3RV2021-4AA●●
	14-20	1 ½	3	5	5	10	—	260	65	—	3RV2021-4BA●●
	17-22	1 ½	3	5	7 ½	15	—	286	65	—	3RV2021-4CA●●
	20-25	2	3	5	7 ½	15	—	325	65	—	3RV2021-4DA●●
	23-28	2	5	7 ½	10	20	—	364	50	—	3RV2021-4NA●●
	27-32	2	5	7 ½	10	20	—	400	50	—	3RV2021-4EA●●
	30-36 3)	3	5	10	10	25	—	432	12	—	3RV2021-4PA●●
	34-40 3)	3	7 ½	10	10	30	—	480	12	—	3RV2021-4FA●●

Screw terminals, no auxiliary: ●● = 10
Screw Terminals, with 1NO/1NC Aux: ●● = 15
Spring terminals, no auxiliary: ●● = 20
Spring Terminals, with 1NO/1NC Aux: ●● = 25
Ring Lug Terminals, no Auxiliary: ●● = 40

1) Select motor starter protector by motor full load amps. Horsepower ratings for reference only.

2) The motor starter protectors rated up to 32 A can be used as manual motor controllers or as Type E combination motor controllers. For use as a Type E combination motor controller, a Type E terminal is required. See accessories page 1/10.

3) These products are NOT certified as Type E combination motor controllers. They can only be used as manual motor controllers.

4) 3RV2 MSPs can only be used with Innovations contactors and accessories

For Motor Protection

3RV10 Class 10 & 20 – up to 100A

Description

The 3RV203 /204 MSPs are UL approved as Self Protected Combination Motor Controllers which are also called Type E. In this application, all the required functions for a motor branch are provided in one device: disconnect, short circuit protection, motor control and overload protection. A type E terminal adaptor is required for all S2 frame 3RV2031 above 45A and all S2 frame 3RV2032 as well as for all S3 frame motor starter protectors.

The 3RV203 /204 MSPs are also approved for use as follows:
– Manual Motor Controller: Motor starter, motor disconnect, control and overload protection.
– Group Installation: Motor starter only, motor disconnect, control and overload protection.
– Tap conductor Protection in Group Installation acc. NEC: Motor starter only; motor disconnect, control and overload protection.

When the 3RV203 /204 is used with one of the 3 above mentioned approvals, they can be installed downstream of one circuit breaker or fuse set.

For more detailed application information and rules how to apply, size and rate these MSPs in control panels in general, in group installations or in accordance to international IEC standards visit our website: www.usa.siemens.com/controlpaneldesign

Ordering Information

- ON/OFF rotary handle with lockout and visible trip indication.
- Adjustment dial for setting to motor FLA.
- Class 10 overload trip characteristics.
- Short circuit trip at 13 times the maximum setting of the FLA adjustment dial.
- Short circuit current rating:
- Ambient compensated up to 140° F (applies to side by side mounting).
- Phase loss sensitivity.
- Test trip function.
- Auxiliaries and Accessories see pages 1/7–1/17.
- General Information see pages 1/29–1/32.
- Technical Data see pages 1/18–1/28.
- Dimensions see page 1/33.

Note: **Select MSP by motor Full Load Amperes. Horsepower ratings are for reference only.**

Illustration	FLA Adjustment Range [A]	Single Phase HP rating [1] 115V	Single Phase HP rating [1] 240V	3 Phase HP Rating [1] 200V	3 Phase HP Rating [1] 230V	3 Phase HP Rating [1] 460V	3 Phase HP Rating [1] 575V	Inst. Short-Circuit Release [A]	UL AIC (480V) [kA] [6]	Trip Class 10 Order Number[4]	Trip Class 20 Order Number[4]
	3RV203 Frame Size S2										
	9.5 - 14	1.5	3	5	5	10	15	208	65	**3RV2031-4SA10**	**3RV2031-4SB10**
	12 - 17	1.5	3	5	7.5	15	15	260	65	**3RV2031-4TA10**	**3RV2031-4TB10**
	14 - 20	1.5	3	7.5	7.5	15	20	260	65	**3RV2031-4BA10**	**3RV2031-4BB10**
	18 - 25	2	5	7.5	10	20	25	325	65	**3RV2031-4DA10**	**3RV2031-4DB10**
	22 - 32	3	5	10	10	25	30	416	65	**3RV2031-4EA10**	**3RV2031-4EB10**
	28 - 36	3	7.5	15	15	30	40	520	65	**3RV2031-4PA10**	**3RV2031-4PB10**
	32 - 40	3	7.5	15	15	30	40	585	65	**3RV2031-4UA10**	**3RV2031-4UB10**
	35 - 45	3	10	15	15	40	50	650	65	**3RV2031-4VA10**	**3RV2031-4VB10**
	42 - 52	5	10	15	20	40	50	741	65	**3RV2031-4WA10**	**3RV2031-4WB10**
	49 - 59	5	15	20	25	50	60	845	30	**3RV2031-4XA10**	**3RV2031-4XB10**
	54 - 65	5	15	20	25	50	60	845	30	**3RV2031-4JA10**	**3RV2031-4JB10**
	3RV204 Frame Size S3										
	28 - 40	3	7.5	15	15	30	40	520A	65	**3RV2041-4FA10**	**3RV2042-4FB10**
	36 - 50	5	10	15	20	40	50	650A	65	**3RV2041-4HA10**	**3RV2042-4HB10**
	45 - 63	5	15	20	25	50	60	819A	65	**3RV2041-4JA10**	**3RV2042-4JB10**
	57 - 75	7.5	15	25	25	60	75	975A	65	**3RV2041-4KA10**	**3RV2042-4KB10**
	70 - 90	10	20	30	30	75	100 [3]	1170A	65	**3RV2041-4LA10**	**3RV2042-4LB10**
	80 - 100	10	25	40	40	75	100 [3]	1235A	65	**3RV2041-4MA10**	**3RV2042-4MB10**

1) Select motor starter protector by motor full load amps. Horsepower ratings for reference only.

2) Size S2 and S3 are listed as type E combination motor controllers. For required Type E terminals see page 1/10. 3RV2031 MSPs with a current setting limit of 45A or less do not require a type E terminal and fulfill the spacing requirements of UL508.

3) Shaded ratings apply for group installation only. These ratings do not apply as UL listed manual combination starters.

4) Pre-assembled motor starter protector and transverse auxiliary switch with 1NO + 1NC is available. Replace the last digit of the order no. with a "5".

5) 3RV1 MSPs can only be used with 3RT1 contactors and accessories. 3RV2 MSPs can only be used with 3RT2 contactors and accessories.

6) For 100kA SCCR rated MSPs, change the part number from 3RV2031 to 3RV2032. (applies to S2 frame only through 65A).

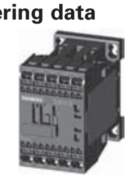
Refer to pages 1/18 to 1/20 when using an MSP in a Manual Motor Starter or a Manual Self-Protected Combination Motor Controller.

Contactors for Switching Motors

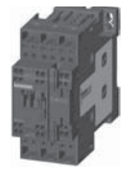
3RT contactors, 3-pole – Size S00 to S3

Selection and ordering data


3RT201.-1A


3RT201. -2A. . .


3RT2028-1N...


3RT2025-2B...


3RT2035-1A...


3RT2045-1A...

Frame Size	Amp Ratings AC3	Amp Ratings AC1	Single-phase HP ratings 115V	208V	230V	Three-phase HP ratings 208V	230V	460V	575V	Auxiliary contacts NO	NC	Screw Terminals Order No.	Spring-Loaded Terminals[1] Order No.	Weight approx. kg
3RT 3-pole contactors														
S00	**6**	18	0.25	0.5	0.75	1.5	2	**3**	5	1	0	**3RT2015-1□●●1**	**3RT2015-2□●●1**	0.24/0.29
										0	1	**3RT2015-1□●●2**	**3RT2015-2□●●2**	
	9	22	0.33	1	1	2	3	**5**	7.5	1	0	**3RT2016-1□●●1**	**3RT2016-2□●●1**	
										0	1	**3RT2016-1□●●2**	**3RT2016-2□●●2**	
	12	22	0.5	1.5	2	3	3	**7.5**	10	1	0	**3RT2017-1□●●1**	**3RT2017-2□●●1**	
										0	1	**3RT2017-1□●●2**	**3RT2017-2□●●2**	
	16	22	1	2	2	3	5	**10**	10	1	0	**3RT2018-1□●●1**	**3RT2018-2□●●1**	
										0	1	**3RT2018-1□●●2**	**3RT2018-2□●●2**	
S0	**9**	40	1	1	1	2	3	**5**	7.5	1	1	**3RT2023-1□●●0**	**3RT2023-2□●●0**	0.42/0.60
	12	40	1	2	2	3	3	**7.5**	10	1	1	**3RT2024-1□●●0**	**3RT2024-2□●●0**	
	17	40	1	2	3	5	5	**10**	15	1	1	**3RT2025-1□●●0**	**3RT2025-2□●●0**	
	25	40	2	3	3	7.5	7.5	**15**	20	1	1	**3RT2026-1□●●0**	**3RT2026-2□●●0**	
	32	50	2	5	5	10	10	**20**	25	1	1	**3RT2027-1□●●0**	**3RT2027-2□●●0**	
	38	50	3	5	5	10	10	**25**	25	1	1	**3RT2028-1□●●0**	**3RT2028-2□●●0**	
S2	**40**	60	3	5	7.5	10	15	**30**	40	1	1	**3RT2035-1□●●0**	**3RT2035-3□●●0**	0.99/1.121
	50	70	3	7.5	10	15	15	**40**	50	1	1	**3RT2036-1□●●0**	**3RT2036-3□●●0**	
	65	80	5	10	10	20	20	**50**	50	1	1	**3RT2037-1□●●0**	**3RT2037-3□●●0**	
	80[2]	90	5	10	15	20	25	**50**	60	1	1	**3RT2038-1□●●0**	**3RT2038-3□●●0**	
S3	**80**	125	7.5	10	15	25	30	**60**	60	1	1	**3RT2045-1□●●0**	**3RT2045-3□●●0**	1.8/2.8
	95	130	10	10	20	30	30	**75**	75	1	1	**3RT2046-1□●●0**	**3RT2046-3□●●0**	
	110	130	10	10	20	30	40	**75**	100	1	1	**3RT2047-1□●●0**	**3RT2047-3□●●0**	
	Size S2 only: Replace "B" with "K" for 24VDC coil only Size S0 and S2 only: UC Electronic with integrated varistor											**□ AC Coil = A DC Coil = B UC Coil = N**	**□ A B N**	

NEMA Size	Amp Ratings	Single-phase HP ratings 115V	230V	Three-phase HP ratings 208V	230V	460V	575V	Auxiliary contacts NO	NC	Screw Terminals with AC coil Order No.	Screw Terminals with 24 VDC coil Order No.	Weight approx. kg
NEMA Labeled Contactors												
0	**18**	1	2	3	3	**5**	5	1	0	**3RT2018-1A●●1-0UA0**	**3RT2018-1BB41-0UA0**	0.28
1	**27**	2	3	7.5	7.5	**10**	10	1	1	**3RT2027-1A●●0-0UA0**	**3RT2027-1BB40-0UA0**	0.42
2	**45**	3	7.5	10	15	**25**	25	1	1	**3RT2036-1A●●0-0UA0**	**3RT2036-1NB30-0UA0**	0.986/1.121
3	**90**	7.5	15	25	30	**50**	50	1	1	**3RT2046-1A●●0-0UA0**	**3RT2046-1NB40-0UA0**	1.8 / 2.8

1) All terminals are spring loaded on frame sizes S00 & S0. Only the coil terminals are spring loaded on frame sizes S2 & S3.

2) Max UL FLA = 65A at 460V

Note: Ring lug terminals are also available in size S00 & S0 contactors, except contactors with communication interface or UC coil. Change the 8th digit of the order number to a "4", e. g. 3RT2015-4AK61.

For further coil voltages, see page 2/49.
For auxiliaries and accessories, see page 2/66-2/83.
For spare parts, see page 2/94-2/99.
For technical data, see page 2/121-2/142.
For description, see page 2/104-2/105.
For int. circuit diagrams, see page 2/190-2/197.
For dimension drawings, see page 2/209-2/212.

AC Coil Selection for 3RT201 through 3RT204

●●Coil Code	C2[2]	H2[3]	K6	P6	U6	V6	T6
60 Hz	24 V	48 V	120 V	240 V	277 V	480 V	600 V
50 Hz	24 V	48 V	110 V	220 V	—	—	—

2) Use Code **B0** for 3RT201, S00
3) Use Code **H0** for 3RT201, S00

DC Coil Selection for 3RT201 & 3RT202 (for 3RT203 & 3RT204 see UC)

●●Coil Code	A4[4]	B4	W4	E4	F4	G4	M4
DC	12 V	24 V	48 V	60 V	110 V	125 V	220 V

4) 3RT201 and 3RT202 only

UC Coil Selection for 3RT202

●●Coil Code	B3	F3	P3[4]
UC	21-28V	95-130V	200-280V

UC Coil Selection for 3RT203 & 3RT204

●●	B3	F3	P3[5]
	20-33V	83-155V	175-280V

5) at upper limit = 1.1 x U_S

Switch-disconnectors 16...3150 Amperes
High performance, compact solution

Manual operation

IEC	OTDC16F	OT16F	OT63F	OT100F	OT160EV		OT315E
	OTDC25F	OT25F	OT80F	OT125F	OT200E		OT400E
	OTDC32F	OT40F			OT250E		
UL		OT16F	OT63F	OT30F		OT200U	
		OT25F	OT80F	OT60F			
		OT40F		OT100F			

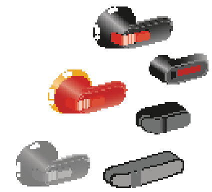
Switch size	**16 25 32**	**16 25 40**	**63 80**	**30 60 100 125**	**160 200 250**	**200**	**315 400**
IEC I_{th} [A]	25 32 45	25 32 40	63 80	115 125	160 200 250		315 400
I_e /AC22A, 415V [A]		16 25 40	63 80	100 125	160 200 250		315 400
I_e /AC23A, 415V [A]		16 20 23	45 75	80 90	160 200 250		315 400
I_e /DC21, 660V [A]	16 25 32	16 25 25			160 200 250		
I_e /DC21, 1000V [A]	16 25 32				160 200 250		315 400
I_e /DC21, 1200V [A]	16 25 32						
UL Ampere rating [A]		20 30 40	60 80	30 60 100		200	

Motor operation

IEC	OTM160E	OTM315E
	OTM200E	OTM400E
	OTM250E	

Switch size [A]	**160 200 250**	**315 400**

Accessories	
Optional handles	N & PE terminals
Extended shafts	Terminal shrouds
Legend plates	Connecting accessories
Auxiliary contacts	Conversion kits
Fourth poles	Locking accessories

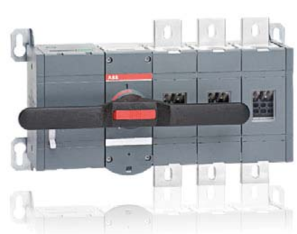






	OT630E	OT1000E	OT2000E	OETL3150K
	OT800E	OT1250E	OT2500E	
		OT1600E		
OT400U	OT600U	OT800U		OETL-NF1600
		OT1200U		OETL-NF2000

400	600 630 800	800 1000 1200 1250 1600	2000 2500	1600 2000 3150
	630 800	1000 1250 1600	2000 2500	3150
	630 800	1000 1250 1600	2000 2500	
	630 800	1000 1250 1600		
	600			
400	600	800 1200		1600 2000

OTM630E	OTM1000E	OTM1600E	OTM2000E
OTM800E	OTM1250E		OTM2500E

630 800	1000 1250	1600	2000 2500

Technical data
Switch-disconnectors OT16...160

Technical data according to IEC 60947-3		Size	A	16
		Switch type		OT16
Rated insulation voltage and rated operational voltage AC20/DC20	Pollution degree 3		V	750
Dielectric strength		50 Hz 1min.	kV	6
Rated impulse withstand voltage			kV	8
Rated thermal current and rated operational current AC20/DC20	ambient 40°C[2]	In open air	A	25
	ambient 40°C[2]	In enclosure	A	25
	ambient 60°C	In enclosure	A	20
..with minimum conductor cross section		Cu	mm^2	4
Rated operational current, AC-21A		up to 415 V	A	16
		440...690 V	A	16
Rated operational current, AC-22A		up to 415 V	A	16
		440...500 V	A	16
		690 V	A	16
Rated operational current, AC-23A		up to 415 V	A	16
		440 V	A	16
		500 V	A	16
		690 V	A	10
Rated operational current / poles in series, DC-21A		24...48 V[1]	A	16/1
		110 V	A	16/2
		220 V	A	16/3
		440 V	A	16/4
		500 V	A	16/4
		750 V	A	16/8
Rated operational current / poles in series, DC-22A		24...48 V[1]	A	16/1
		110 V	A	16/2
		220 V	A	16/3
		440 V	A	10/4
		750 V	A	16/8
Rated operational current / poles in series, DC-23A		24...48 V[1]	A	16/1
		110 V	A	16/2
		220 V	A	16/4
		440 V	A	10/4
		750 V	A	16/8
Rated operational power, AC-23A		220...240 V	kW	3
(These values are given		400...415 V	kW	7.5
for guidance and may vary		440 V	kW	7.5
acc. to the motor manufacturer)		500 V	kW	7.5
		690 V	kW	7.5
Rated breaking capacity, AC-23A		up to 415 V	A	128
		440 V	A	128
		500 V	A	128
		690 V	A	80
Rated breaking capacity/poles in series, DC-23A		24...48 V	A	64/1
		110 V	A	64/2
		220 V	A	64/3
		440 V	A	40/4
		750 V	A	64/8
Rated conditional short-circuit				
current I_p (r.m.s.) and corresponding	I_p (r.m.s.)	50 kA	kA	6.5
max. allowed cut-off current $\hat{i}_c$	Max. OFA_ fuse size gG/aM	≤ 415 V	A	40/32
	I_p (r.m.s.)	100 kA	kA	
	Max. OFA_ fuse size gG/aM	≤ 500 V	A	
The cut-off current $\hat{i}_c$ refers to values	I_p (r.m.s.)	10 kA	kA	
listed by fuse manufacturers	Max. OFA_ fuse size gG/aM	≤ 690 V	A	
(single phase test acc. to IEC60269)	I_p (r.m.s.)	50 kA	kA	4
	Max. OFA_ fuse size gG/aM	≤ 690 V	A	25/16
Rated short-time withstand current	r.m.s. -value I_{cw}	690 V, 0.25 s	kA	
	r.m.s. -value I_{cw}	690 V, 1 s	kA	0.5
Rated short circuit making capacity	Peak value I_{cm}	690 V/500 V	kA	0.705
Rated capacitor power				
(The capacitor ratings are limited by the fuse link.)		400...415 V	kVAr	6.5
Power loss / pole	At rated operational current		W	0.3
Mechanical endurance	Divide by two for operation cycles		Oper.	20 000
Weight without accessories	3-pole		kg	0.11
	4-pole		kg	0.15
Cable size	Cu-wire size suitable for terminal clamps		mm^2	0.75...10
			AWG	18-8
Terminal tightening torque	Counter torque required		Nm	0.8
Operating torque	3-pole switch-disconnector		Nm	1

[1] Below 48 V, two poles in parallel up to OT80 are recommended particularly in polluted atmosphere.
[2] Acc. to IEC 60947-1, § 6.1.1.

25	40	63	80	100	125
OT25	OT40	OT63	OT80	OT100	OT125
750	750	750	750	750	750
6	6	6	6	6	6
8	8	8	8	8	8
32	40	63	80	115	125
32	40	63	80	115	125
25	32	50	63	80	100
6	10	16	25	35	50
25	40	63	80	100	125
25	40	63	80	100	125
25	40	63	80	100	125
25	40	63	80	100	125
25	40	63	80	100	125
20	23	63	75	80	90
20	23	63	65	65	78
20	23	45	58	60	70
11	12	20	20	40	50
25/1	32/1	63/1	80/1	100/1	125/1
25/2	32/2	63/2	80/2	100/2	125/2
25/3	32/3	63/4	80/4	100/4	125/4
16/4	16/4	16/4	16/4		
16/4	16/4	16/4	16/4		
25/8	32/8				
25/1	32/1	63/1	80/1	100/1	125/1
25/2	32/2	63/2	80/2	100/2	125/2
25/3	32/4	45/4	45/4	63/4	80/4
10/4	10/4	10/4	10/4		
25/8	25/8				
25/1	32/1	63/1	80/1	100/1	125/1
25/2	32/2	63/2	80/2	100/2	125/2
25/4	32/4	45/4	45/4	63/4	63/4
10/4	10/4	10/4	10/4		
16/8	16/8				
4	5.5	11	22	22	22
9	11	22	37	37	45
9	11	22	37	37	45
9	11	22	37	37	45
9	11	15	18.5	37	45
160	184	360	640	640	720
160	184	360	448	520	624
160	184	360	464	480	560
88	96	160	160	320	40
100/1	128/1	180/1	252/1	400/1	500/1
100/2	128/2	180/2	252/2	400/2	500/2
100/4	128/4	180/4	180/4	252/4	252/4
40/4	40/4	40/4	40/4		
64/8	64/8				
6.5	6.5	13	13	16.5	16.5
40/32	40/32	100/80	100/80	125/125	125/125
		17	17		
		100/80	100/80		
				8.2	8.2
				125/100	125/100
4	4	11	11	10	10
25/16	25/16	80/63	80/63	63/63	63/63
0.5	0.5	1	1.5	2.5	2.5
0.705	0.705	1.4	2.1	3.6	3.6
10	15	25	30	40	50
0.6	1.6	2.8	4.5	4.0	6.3
20 000	20 000	20 000	20 000	20 000	20 000
0.11	0.11	0.27	0.27	0.36	0.36
0.15	0.15	0.35	0.35	0.50	0.50
0.75...10	0.75...10	1.5...35	1.5...35	10...70	10...70
18-8	18-8	14-4	14-4	8-00	8-00
0.8	0.8	2	2	6	6
1	1	1.2	1.2	2	2

Ordering information
Accessories

OH_1_
S00395A

OH_3_
S00687A

OH_2_
S00396A

OHBS2_AJEH

Selector type handles, for base and DIN-rail mounted switches

For shaft diameter 6 mm, door drilling 22.5 mm. The type and the ordering numbers are for one piece. Indication I-O and ON-OFF.

Colour	Suitable for switches	Type	Order number	Delivery batch [pcs]	Weight/ unit [kg]
IP54 handles, NEMA 1					
Black	OT16...80F, OTDC16…32F	OHBS1AH	1SCA102680R1001	150	0.05
Red-yellow	OT16...80F, OTDC16…32F	OHYS1AH	1SCA105290R1001	150	0.05
Silver	OT16...80F, OTDC16…32F	OHSS1AH	1SCA105274R1001	150	0.05
Grey	OT16...80F, OTDC16…32F	OHGS1AH	1SCA105261R1001	150	0.05
Door interlock in ON-position					
Black	OT16...80F, OTDC16…32F	OHBS1AH1	1SCA105210R1001	150	0.05
Red-yellow	OT16...80F, OTDC16…32F	OHYS1AH1	1SCA105291R1001	150	0.05
Silver	OT16...80F, OTDC16…32F	OHSS1AH1	1SCA105275R1001	150	0.05
Grey	OT16...80F, OTDC16…32F	OHGS1AH1	1SCA105262R1001	150	0.05
Padlockable with one padlock with bail diameter 5...6.3 mm					
Black	OT16...125F, OTDC16…32F	OHBS3AH	1SCA105234R1001	150	0.05
Red-yellow	OT16...125F, OTDC16…32F	OHYS3AH	1SCA105325R1001	150	0.05
Silver	OT16...125F, OTDC16…32F	OHSS3AH	1SCA105283R1001	150	0.05
Grey	OT16...125F, OTDC16…32F	OHGS3AH	1SCA105270R1001	150	0.05
Padlockable with one padlock with bail diameter 5...6.3 mm, door interlock in ON-position					
Black	OT16...125F, OTDC16…32F	OHBS3AH1	1SCA105235R1001	150	0.05
Red-yellow	OT16...125F, OTDC16…32F	OHYS3AH1	1SCA105326R1001	150	0.05
Silver	OT16...125F, OTDC16…32F	OHSS3AH1	1SCA105284R1001	150	0.05
Grey	OT16...125F, OTDC16…32F	OHGS3AH1	1SCA105271R1001	150	0.05
IP65 handles, NEMA 1, 3R, 12					
Padlockable with max. 3 padlocks with bail diameter 5...8 mm, door interlock in ON-position, defeatable					
Black	OT16...125F, OTDC16…32F	OHBS2AJ	1SCA105213R1001	120	0.07
Red-yellow	OT16...125F, OTDC16…32F	OHYS2AJ	1SCA105296R1001	120	0.07
Silver	OT16...125F, OTDC16…32F	OHSS2AJ	1SCA105278R1001	120	0.07
Grey	OT16...125F, OTDC16…32F	OHGS2AJ	1SCA105265R1001	120	0.07
Padlockable with max. 3 padlocks with bail diameter 5...8 mm, door interlock in ON-position					
Black	OT16...125F, OTDC16…32F	OHBS2AJ1	1SCA105215R1001	120	0.07
Red-yellow	OT16...125F, OTDC16…32F	OHYS2AJ1	1SCA105297R1001	120	0.07
Silver	OT16...125F, OTDC16…32F	OHSS2AJ1	1SCA105279R1001	120	0.07
Grey	OT16...125F, OTDC16…32F	OHGS2AJ1	1SCA105266R1001	120	0.07

Selector type handle with metal hasp

IP65 handles, NEMA 1, 3R, 12					
Padlockable with max. 3 padlocks, door interlock in the ON-position, defeatable					
Black	OT16...125F, OTDC16…32F	OHBS2AJEH	1SCA108230R1001	120	0.07

- Door interlocking in ON-position means that the door can not be opened, when the handle is in ON-position. This can be defeated in IP65 types to allow authorized personnel access for inspection.

HW Series — 22mm IEC Style Global Pushbuttons

Key features:

- Locking lever removable contact blocks
- Finger-safe IP20 contacts
- Tamperproof construction
- All E-stops meet EN60947-5-5, and are compliant with SEMI S2 standards
- Worldwide approvals
- Easy to assemble
- Choice of black plastic or metallic front bezels
- LED illumination
- Transformer or full voltage
- Slow make double break contacts

HW: The Best Engineered Switch in the World

IDEC's HW switches are "The best engineered switch in the world" for a reason. Carrying the CE mark, UL, CSA, CCC (Chinese), and TUV approvals, these switches are designed for use in almost any part of the world.

Complete with finger-safe contact blocks offering IP20 protection, these 7/8" (22mm) switches include illuminated and non-illuminated pushbuttons, pilot lights, selector switches, and emergency stop switches.

All switches also incorporate mechanically keyed safety locking levers, ensuring correct installation and maintaining safety in high-vibration applications.

File No. E68961 File No. LR21451

TÜV Rheinland Certificate No. R50086203_HW_e-stop R50391189_HW

Certificate No. 2017010305987846

Specifications

Electrical	Rated Operational Characteristics	AC-15: A600 or Ue = 250V, Ie = 3A (NO, NC, NO-EM, NC-LB) DC-13: P600 or Ue = 125V, Ie = 1.1A (NO, NC) DC-13: Q600 or Ue = 125V, Ie = 0.9A (NO-EM, NC-LB)
Electrical	Rated Insulation Voltage	600V
Electrical	Rated Switching Over-Voltage	Less than 4kV, conforming to IEC60947-1
Electrical	Rated Impulse Withstanding Voltage	4kV for contact circuit, 2.5kV for lamp circuit
Electrical	Rated Thermal Current	10 Amp
Electrical	Minimum Switching Capacity	5 mA at 3V AC/DC
Electrical	Electrical Reliability	MTBF < 1 fault for 10 million operation cycles (3V DC, 5mA)
Electrical	Lamp Ratings	LEDs: 6V/17mA max, 12V & 24V/11mA max, 120 & 240V/10mA max
Mechanical	Contact Operation	Slow break NC or NO
Mechanical	Positive Action Operation (Emergency Stops with NC contacts)	5.5mm to 10mm travel to latch, 45N minimum force to latch 10mm maximum travel, 1,800 operations per hour maximum for a Pushlock Turn Reset 900 operations per hour maximum for a Push-Pull
Mechanical	Operating Force	Flush and extended pushbuttons—with 1NO or 1NC contact: 6.2±2N (momentary), 7.0±2N (maintained) Additional contacts—1NO or 1NC: +3.2N (momentary), + 3.3N (maintained)

Mechanical — Recommended Terminal Torque / Applicable Wire Size

Unit	Wire		Number of Wires	Recommended Tightening Torque (Nm)	Terminal Screw
HW-U Contact Block	Crimping Terminal		2	1.0 to 1.3	M3.5
	Solid Wire	ø0.5 to 1.6 mm (AWG14 to 22)	2	1.0 to 1.3	
		ø1.7 to 2.0 mm (AWG12)	1	1.2 to 1.3	
	Stranded Wire	0.3 to 2.0 mm^2 (AWG14 to 22)	2	1.0 to 1.3	
		2.1 to 3.5 mm^2 (AWG12)	1	1.2 to 1.3	
Illuminated Unit (*1)	Crimping Terminal		2	1.0 to 1.3	M3.5
	Solid Wire	ø0.5 to 1.6 mm (AWG14 to 22)			
	Stranded Wire	0.3 to 2.0 mm (AWG14 to 22)			
Pilot Light	Crimping Terminal		2	0.6 to 1.0 (M3.0) 1.0 to 1.3 (M3.5)	
	Solid Wire	ø0.5 to 1.6 mm (AWG14 to 22)			
	Stranded Wire	ø0.3 to 2.0 mm (AWG14 to 22)			

1. * refers to the lamp terminals of the illuminated push buttons and selector switches.

Mechanical	Applicable Wire Size	Minimum 1 x 22 AWG, max. 2 x 14 AWG or 1 x 12 AWG
Mechanical	Contact Resistance	Initial contact resistance of 50mΩ or less
Mechanical	Contact Gap	4mm (NO and NC), 2mm (NO-EM and NC-LB)
Mechanical	Horsepower Rating	Reference Value: 1/4 HP @ 120V (1ø non-reversing), 1HP @ 240V (3ø non-reversing)
Mechanical	Contact Material	Silver (gold plated contacts available - contact IDEC)
Mechanical	Operating Temperature	Operation: –25 to +50°C (without freezing), Storage: –40 to +70°C (without freezing)
Mechanical	Vibration Resistance	10 to 55Hz, 98 m/sec^2 (10G) conforming to IEC6068-2-6
Mechanical	Shock Resistance	980 m/sec^2 (100G) conforming to IEC6068-2-7
Mechanical	Mechanical Life	Momentary pushbuttons: 5,000,000 (900 operations per hour), All other switches: 500,000

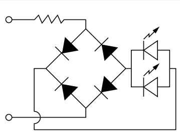
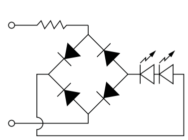
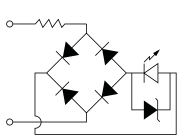
Standards & Approvals	Conforming to Standards	EN60947-1, EN60947-5-1, VDE0660-200, UL508, CSA C22-2 No.14						
	Approvals File No. E68961 File No. LR92374 TÜV Rheinland Certificate No. 2005010305145656 Registration No. R9551089 (E-stops) Registration No. R50054316 (Dual Pushbuttons) Registration No. J9650511 (Pilot Lights) Registration No. J9551458 (all other switches)	CSA: pushbuttons and selector switches: A600 pilot lights and illuminated pushbuttons, direct supply pilot lights and illuminated pushbuttons with integral transformer (100/110, 115, 120, 200/220, 230, 240, 380, 400/440, 480V) UL: pushbuttons and selector switches: A600 pilot lights and illuminated pushbuttons, direct supply pilot lights and illuminated pushbuttons with integral transformer (100/110, 115, 120, 200/220, 230, 240, 380, 400/440, 480V) TÜV: pushbuttons and selector switches: A600=P600 (NO, NC)/Q600 (NO-EM, NC-LB) pilot lights and illuminated pushbuttons, direct supply pilot lights and illuminated pushbuttons with integral transformer (100/110, 115, 120, 200/220, 230, 240, 380, 400/440, 480V)						
	Electric Shock Protection	Class 2 conforming to IEC60664-7						
	Degree of Protection (conforming to IEC60529 and UL50)	UL Type 1, 4X, 12, 13 [1] IP65 (from front of the panel) IP20 (Type HW-U contact block)						
	Pollution Degree (conforming to IEC60947-1)	3						
	External Short-Circuit Protection	10A 250V fuse conforming to IEC60269-1						
Contact Ratings	Pushbuttons Illuminated Pushbuttons Selector Switches Illuminated Selector Switches Pushbutton Selectors	Contact Block	Type HW-U					
		Rated Insulation Voltage	600V					
		Rated Continuous Current	10A					
		Contact Ratings by Utilization Category IEC 60947-5-1	AC-15 (A600) DC-13 (P600)					

Characteristics			24V	48V	50V	110V	220V	440V
Operational Current	AC 50/60 Hz	AC-12 Control of resistive loads & solid state loads	10A	—	10A	10A	6A	2A
		AC-15 Control of electromagnetic loads (> 72VA)	10A	—	7A	5A	3A	1A
	DC	DC-12 Control of resistive loads & solid state loads	10A	5A	—	2.2A	1.1A	—
		DC-13 Control of electromagnets	5A	2A	—	1.1A	0.6A	—

(Header row: Operational Voltage)

For dimensions, see page 660.
Note 1. Except HW2B

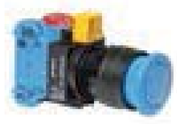
LED Lamp Ratings (LSTD Type)

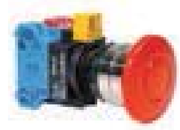
Model			LSTD-6②	LSTD-1②	LSTD-2②	LSTD-H2②	LSTD-M4②
Lamp Base			BA9S/13				
Rated Voltage			6V AC/DC	12V AC/DC	24V AC/DC	120V AC	240V AC
Voltage Range			6V AC/DC ±10%	12V AC/DC ±10%	24V AC/DC ±10%	120V AC ±5%	240V AC ±5%
Current Draw	AC	A, R, W: G, S:	17mA 8mA	11mA	11mA	10mA	10mA
	DC	A, R, W: G, S:	14mA 5.5mA	10mA	10mA	–	–
Color Code			A (amber), G (green), R (red), S (blue), W (white)				
Lamp Base Color			Same as illumination color				
Voltage Marking			Die stamped on the base				
Life (reference value)			Approx. 50,000 hours (The luminance reduces to 50% the initial intensity when used on complete DC.)				
Internal Circuit			A, R, W 	A, R, W 			
			G, S 				

LED Chip
Protection Diode
Zener Diode

In place of ②, specify the Lens/LED Color Code.

Non-Illuminated Mushroom Head Pushbuttons (Assembled)



		ø29mm Mushroom Head		ø40mm Mushroom Head	
Function	Contacts	Plastic Bezel	Metal Bezel	Plastic Bezel	Metal Bezel
Momentary	*Operator Only*	*HW1B-M3-①*	*HW4B-M3-①*	*HW1B-M4-①*	*HW4B-M4-①*
	1NO	HW1B-M3F10-①	HW4B-M3F10-①	HW1B-M4F10-①	HW4B-M4F10-①
	1NC	HW1B-M3F01-①	HW4B-M3F01-①	HW1B-M4F01-①	HW4B-M4F01-①
	1NO-1NC	HW1B-M3F11-①	HW4B-M3F11-①	HW1B-M4F11-①	HW4B-M4F11-①
	2NO	HW1B-M3F20-①	HW4B-M3F20-①	HW1B-M4F20-①	HW4B-M4F20-①
	2NC	HW1B-M3F02-①	HW4B-M3F02-①	HW1B-M4F02-①	HW4B-M4F02-①
	2NO-2NC	HW1B-M3F22-①	HW4B-M3F22-①	HW1B-M4F22-①	HW4B-M4F22-①
Maintained	*Operator Only*	*HW1B-A3-①*	*HW4B-A3-①*	*HW1B-A4-①*	*HW4B-A4-①*
	1NO	HW1B-A3F10-①	HW4B-A3F10-①	HW1B-A4F10-①	HW4B-A4F10-①
	1NC	HW1B-A3F01-①	HW4B-A3F01-①	HW1B-A4F01-①	HW4B-A4F01-①
	1NO-1NC	HW1B-A3F11-①	HW4B-A3F11-①	HW1B-A4F11-①	HW4B-A4F11-①
	2NO	HW1B-A3F20-①	HW4B-A3F20-①	HW1B-A4F20-①	HW4B-A4F20-①
	2NC	HW1B-A3F02-①	HW4B-A3F02-①	HW1B-A4F02-①	HW4B-A4F02-①
	2NO-2NC	HW1B-A3F22-①	HW4B-A3F22-①	HW1B-A4F22-①	HW4B-A4F22-①

		ø60mm Mushroom Head
Function	Contacts	Plastic Bezel
Momentary	*Operator Only*	*HW1B-M5-① **
	1NO	HW1B-M5F10-①*
	1NC	HW1B-M5F01-①*
	1NO-1NC	HW1B-M5F11-①*
	2NO	HW1B-M5F20-①*
	2NC	HW1B-M5F02-①*
	2NO-2NC	HW1B-M5F22-①*

① Button Color Code

Color	Code
Black	B
Green	G
Red	R
Blue	S
White	W
Yellow	Y

1. In place of ①, specify the Button Color Code from table.
2. *60mm mushroom available only in red, green, black, and yellow.
3. For nameplates and accessories, see page 655 and 658.
4. For dimensions, see page 660.
5. For contact assembly part numbers, see page 659.
6. All assembled part numbers in catalog include standard spring-up Finger-Safe (HW-U...) contacts.
7. Operator only models include operator plus button.
8. Additional contact configurations available (up to 6 total contacts).

Part Number Structure

H W 1 B - M 3 F 10 – R

Bezel
- 1: Plastic Bezel
- 4: Metal Bezel (Not available for 60mm mushroom)

Function
- M: Momentary Action
- A: Maintained Action (Not available for 60mm jumbo mushroom pushbutton.)

Operator
- 3: ø29mm Mushroom
- 4: ø40mm Mushroom
- 5: ø60mm Mushroom

Terminals
- F: Finger-Safe Spring-Up Contacts

Contact Arrangement
- 10: 1NO
- 01: 1NC
- 11: 1NO-NC
- 20: 2NO
- 02: 2NC
- 22: 2NO-2NC

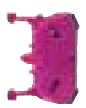
Button Colors
- B: Black
- G: Green
- R: Red
- S: Blue
- W: White
- Y: Yellow

Note: Use only for interpreting part numbers. Do not use for developing part numbers.

Non-Illuminated Mushroom Head Pushbuttons (Replacement Parts)

Contact Blocks	+	Mounting Adaptor	+	Safety Lever Lock	+	Anti-Rotation Ring	+	Operator	+	Button	=	Completed Unit

Contact Blocks

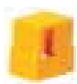
Style	Contacts	1NO	1NC
	Finger-Safe Spring-Up Terminal	HW-U10	HW-U01
		HW-U10R (early make)	HW-U01R (late break)
	Dummy Block	HW-DB	

Contact Block Mounting Adaptor

Style	Part Number
	HW-CB2C

1. Used to mount contact blocks to operator.
2. IDEC strongly recommends using the safety lever lock to prevent heavy vibration or maintenance personnel from inadvertently unlocking contacts.

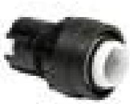
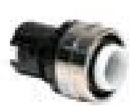
Safety Lever Lock

Style	Part Number
	HW9Z-LS

Anti-Rotation Ring

Appearance	Part Number
	HW9Z-RL

Operators

Style		Plastic Bezel	Metal Bezel
ø29mm Mushroom ø40mm Mushroom 	Momentary	HW1B-M0L	HW4B-M0L
	Maintained	HW1B-A0L	HW4B-A0L
Ø60mm Jumbo Mushroom 	Momentary	HW1B-M5-①*	–

1. *60mm mushroom operator includes non-removable button (available in red, black, green and yellow only).
2. For nameplates and accessories, see page 655 and 658.
3. For dimensions, see page 660.

Buttons

Style	Part Number
ø29mm Mushroom Cap 	HW1A-B3-①
ø40mm Mushroom Cap 	HW1A-B4-①

1. In place of ①, specify the Button Color Code from table.

① Button Color Code

Color	Code	Color	Code
Black	B	Blue	S
Green	G	White	W
Red	R	Yellow	Y

HW1B-M5 available only in black, red, green and yellow.

Stainless Steel Enviroline® Series Wall-Mount Enclosures with 3-Point Hardware

Application -
Designed to house electrical and electronic controls, instrumentation and components in indoor or outdoor locations. For outdoor applications a drip shield is recommended. For installation information, consult our Installation Manual at www.saginawcontrol.com.

Construction -
- 0.075" stainless steel Type 304 & 316/316L.
- Seams continuously welded and ground smooth.
- Flange trough collar around all sides of door opening.
- Collar studs provided for mounting optional sub-panels.
- Mounting holes in back of the enclosure for wall mounting.
- Mounting hardware, sealing washers and hole plugs included.
- Stainless steel concealed hinges.
- Removable and interchangeable doors.
- Black zinc die cast keylocking/padlocking handles.
- 3-point latching mechanism.
- Black quarter turn latches as required.
- Removable print pocket.
- Oil and water resistant gasket.
- Ground stud on door and body.

Finish -
#4 brushed finish on all exterior surfaces. Optional sub-panels powder coated white.

IS6 - Industry Standards -
NEMA Type 3R, 4, 4X, 12 & Type 13
UL Listed Type 3R, 4, 4X & 12
CSA Type 3R, 4, 4X & 12
IEC 60529 IP66

***Special Instructions apply for IS3, IS4 and IS6 to maintain the environmental rating of Type 3R for these parts. See the Special Instructions on the Industry Standards page in the Technical Information Section.

304 STAINLESS STEEL ENVIROLINE® SERIES WALL-MOUNT ENCLOSURES WITH 3-POINT HARDWARE

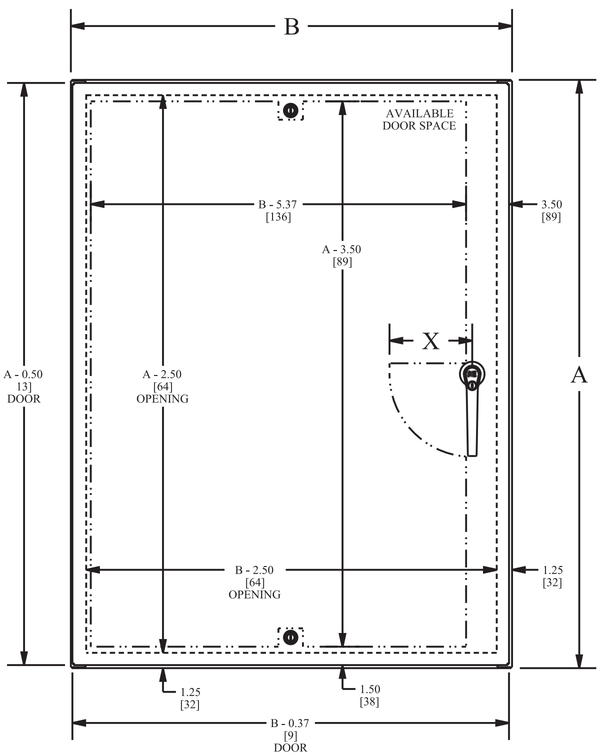
ENCLOSURE PRODUCT CODE S9						SUB-PANEL (P3)			
Catalog No.	Height (A)	Width (B)	Depth (C)	Industry Standard	List Price	Catalog No.	Panel Height (E)	Panel Width (F)	List Price
SCE-24EL2010SSLPPL	24.00	20.00	10.00	IS6	1,119.15	SCE-24P20	21.00	17.00	45.57
SCE-24EL2410SSLPPL	24.00	24.00	10.00	IS6	1,218.22	SCE-24P24	21.00	21.00	53.18
SCE-30EL2412SSLPPL	30.00	24.00	12.00	IS6	1,454.07	SCE-30P24	27.00	21.00	63.29
SCE-30EL3012SSLPPL	30.00	30.00	12.00	IS6	1,630.53	SCE-30P30	27.00	27.00	83.55
SCE-36EL2412SSLPPL	36.00	24.00	12.00	IS6	1,611.48	SCE-36P24	33.00	21.00	75.96
SCE-36EL3012SSLPPL	36.00	30.00	12.00	IS6	1,829.72	SCE-36P30	33.00	27.00	101.27
SCE-36EL3612SSLPPL	36.00	36.00	12.00	IS6	2,059.70	SCE-36P30	33.00	27.00	101.27
SCE-42EL3612SSLPPL	42.00	36.00	12.00	IS6	2,227.75	SCE-42P36	39.00	33.00	136.72
SCE-48EL3612SSLPPL	48.00	36.00	12.00	IS6	2,458.17	SCE-48P36	45.00	33.00	154.46
SCE-48EL3616SSLPPL	48.00	36.00	16.00	IS6	2,681.29	SCE-48P36	45.00	33.00	154.46
SCE-60EL3612SSLPPL	60.00	36.00	12.00	IS6	2,881.32	SCE-60P36	57.00	33.00	189.89
SCE-60EL3616SSLPPL	60.00	36.00	16.00	IS6	3,108.87	SCE-60P36	57.00	33.00	189.89
SCE-60EL3624SSLPPL	60.00	36.00	24.00	IS6	3,716.74	SCE-60P36	57.00	33.00	189.89
SCE-72EL3624SSLPPL	72.00	36.00	24.00	IS6	4,517.69	SCE-72P36	69.00	33.00	225.33

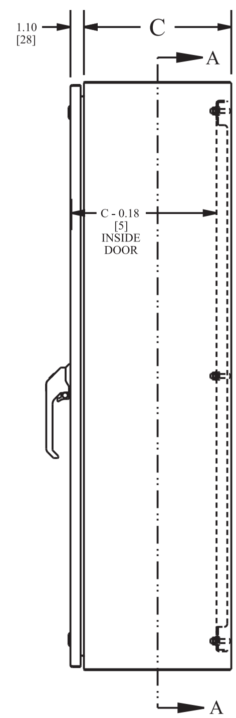
316 STAINLESS STEEL ENVIROLINE® SERIES WALL-MOUNT ENCLOSURES WITH 3-POINT HARDWARE

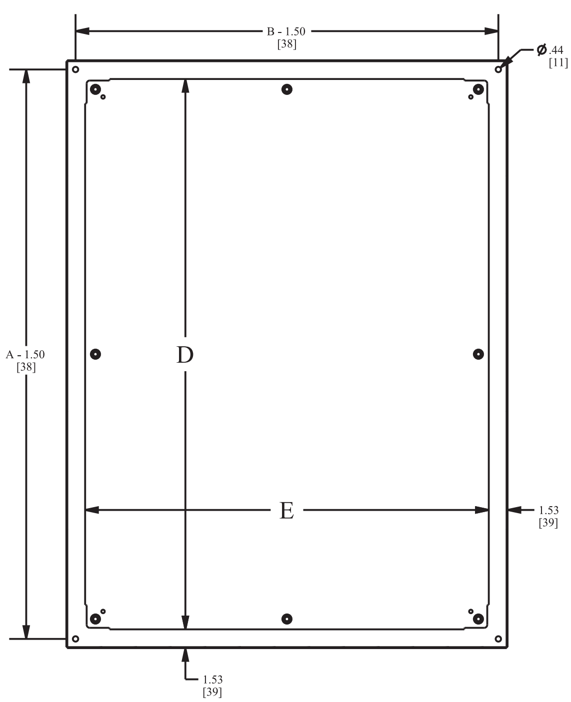
ENCLOSURE PRODUCT CODE S7						SUB-PANEL (P3)			
Catalog No.	Height (A)	Width (B)	Depth (C)	Industry Standard	List Price	Catalog No.	Panel Height (E)	Panel Width (F)	List Price
SCE-24EL2010SS6LPPL	24.00	20.00	10.00	IS6	1,342.98	SCE-24P20	21.00	17.00	45.57
SCE-24EL2410SS6LPPL	24.00	24.00	10.00	IS6	1,461.86	SCE-24P24	21.00	21.00	53.18
SCE-30EL2412SS6LPPL	30.00	24.00	12.00	IS6	1,744.88	SCE-30P24	27.00	21.00	63.29
SCE-30EL3012SS6LPPL	30.00	30.00	12.00	IS6	1,956.64	SCE-30P30	27.00	27.00	83.55
SCE-36EL2412SS6LPPL	36.00	24.00	12.00	IS6	1,933.78	SCE-36P24	33.00	21.00	75.96
SCE-36EL3012SS6LPPL	36.00	30.00	12.00	IS6	2,195.66	SCE-36P30	33.00	27.00	101.27
SCE-42EL3612SS6LPPL	42.00	36.00	12.00	IS6	2,673.30	SCE-42P36	39.00	33.00	136.72
SCE-60EL3612SS6LPPL	60.00	36.00	12.00	IS6	3,457.58	SCE-60P36	57.00	33.00	189.89

STAINLESS STEEL ENVIROLINE® SERIES WALL-MOUNT ENCLOSURES WITH 3-POINT HARDWARE

TECHNICAL DATA







LATCH NOTES:

OMIT CENTER LATCH TOP AND BOTTOM OF DOOR WHEN DOOR WIDTH IS < 30.00 [762]

HANDLE NOTES:

WHEN ENCLOSURE HEIGHT <= 42.00 [1067]
"X" = 5.50 [140]

WHEN ENCLOSURE HEIGHT > 42.00 [1067]
"X" = 6.75 [172]

SCE SAGINAW CONTROL & ENGINEERING
Your Enclosure Source®
Phone (989) 799-6871
Fax (989) 799-4524

System accessories Page 421 **WM carbon steel** Page 46

Material:
- Housing: Stainless steel 1.4301 (AISI 304)
- Door: Stainless steel 1.4301 (AISI 304), all-round foamed-in PU seal
- Mounting plate: Carbon steel

Surface finish:
- Housing and door: Brushed, grain 240
- Mounting plate: Zinc-plated

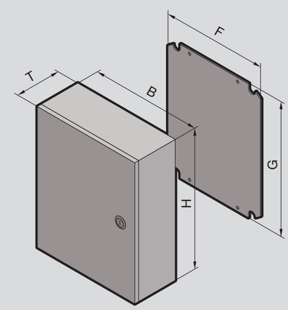
Protection category IP to IEC 60 529:
- IP 55
- IP 66

Protection category NEMA:
- NEMA 12, 3R, 4X

Approvals:
- UL
- cUL

Supply includes:
- Housing with hinged door(s), of all-round solid construction, door catch on the left on single-door housing
- Mounting plate
- Blind rivet nuts for wall mounting
- Lock: 1 slotted lock insert for a housing height up to 500 mm, 2 slotted lock inserts for a housing height up to 600 – 900 mm, L-handle from housing height 1050 mm

Technical details:
Available on the Internet



Stainless Steel

Height (H) inches (mm)	Packs of	12 (300)	16 (400)	16 (400)	20 (500)	20 (500)	16 (400)	Page
Width (B) inches (mm)		12 (300)	12 (300)	16 (400)	16 (400)	20 (500)	12 (300)	
Depth (T) inches (mm)		6 (150)	6 (150)	6 (150)	6 (150)	6 (150)	8 (210)	
Mounting plate height (G) inches (mm)		11 (275)	15 (375)	15 (375)	19 (475)	19 (475)	15 (375)	
Mounting plate width (F) inches (mm)		10 (254)	10 (254)	14 (354)	14 (354)	18 (449)	10 (254)	
Material thickness, housing ga (mm)		16 (1.5)	16 (1.5)	16 (1.5)	16 (1.5)	16 (1.5)	16 (1.5)	
Material thickness, door ga (mm)		16 (1.5)	16 (1.5)	16 (1.5)	16 (1.5)	16 (1.5)	16 (1.5)	
Model No.	1 pc(s).	**8017.620**	**8017.614**	**8017.610**	**8017.613**	**8017.616**	**8017.608**	
Model No. US	1 pc(s).	**WM121206N4**	**WM161206N4**	**WM161606N4**	**WM201606N4**	**WM202006N4**	**WM161208N4**	
Door(s)		1	1	1	1	1	1	
Weight lb (kg)		16 (7)	20 (9)	22 (10)	31 (14)	37 (17)	22 (10)	
Accessories								
Wall mounting bracket	4 pc(s).	2433.000	2433.000	2433.000	2433.000	2433.000	2433.000	504
T handle	1 pc(s).	8018.577	8018.577	8018.577	8018.577	8018.577	8018.577	487

Metric measurements are exact, imperial measurements are rounded.

Wall-Mounted Housing WM

Stainless Steel

Height (H) inches (mm)	Packs of	20 (500)	20 (500)	24 (600)	24 (600)	24 (600)	30 (760)	Page
Width (B) inches (mm)		16 (400)	20 (500)	16 (400)	20 (500)	24 (600)	24 (600)	
Depth (T) inches (mm)		8 (210)	8 (210)	8 (210)	8 (210)	8 (210)	8 (210)	
Mounting plate height (G) inches (mm)		19 (475)	19 (470)	22 (570)	22 (570)	22 (570)	29 (730)	
Mounting plate width (F) inches (mm)		14 (354)	18 (449)	14 (354)	18 (449)	22 (549)	22 (549)	
Material thickness, housing ga (mm)		16 (1.5)	16 (1.5)	16 (1.5)	16 (1.5)	16 (1.5)	16 (1.5)	
Material thickness, door ga (mm)		16 (1.5)	16 (1.5)	16 (1.5)	16 (1.5)	14 (2.0)	14 (2.0)	
Model No.	1 pc(s).	**8017.605**	**8018.478**	**8017.621**	**8017.603**	**8017.600**	**8017.607**	
Model No. US	1 pc(s).	**WM201608N4**	**WM202008N4**	**WM241608N4**	**WM242008N4**	**WM242408N4**	**WM302408N4**	
Door(s)		1	1	1	1	1	1	
Weight lb (kg)		33 (15)	40 (18)	40 (18)	46 (21)	57 (26)	70 (32)	
Accessories								
Wall mounting bracket	4 pc(s).	2433.000	2433.000	2433.000	2433.000	2433.000	2433.000	504
T handle	1 pc(s).	8018.577	8018.577	8018.577	8018.577	8018.577	8018.577	487

Stainless Steel

Height (H) inches (mm)	Packs of	30 (760)	35 (900)	35 (900)	24 (600)	30 (760)	Page
Width (B) inches (mm)		30 (760)	24 (600)	30 (760)	20 (500)	30 (760)	
Depth (T) inches (mm)		8 (210)	8 (210)	8 (210)	10 (250)	10 (250)	
Mounting plate height (G) inches (mm)		29 (730)	34 (870)	34 (870)	22 (570)	29 (730)	
Mounting plate width (F) inches (mm)		28 (704)	22 (549)	28 (704)	18 (449)	28 (704)	
Material thickness, housing ga (mm)		16 (1.5)	16 (1.5)	14 (2.0)	16 (1.5)	16 (1.5)	
Material thickness, door ga (mm)		14 (2.0)	14 (2.0)	14 (2.0)	16 (1.5)	14 (2.0)	
Model No.	1 pc(s).	**8017.611**	**8017.618**	**8017.615**	**8017.622**	**8018.903**	
Model No. US	1 pc(s).	**WM303008N4**	**WM362408N4**	**WM363008N4**	**WM242010N4**	**WM303010N4**	
Door(s)		1	1	1	1	1	
Weight lb (kg)		86 (39)	90 (41)	110 (50)	49 (22)	88 (40)	
Accessories							
Wall mounting bracket	4 pc(s).	2433.000	2433.000	2433.000	2433.000	2433.000	504
T handle	1 pc(s).	8018.577	8018.577	8018.577	8018.577	8018.577	487

Stainless Steel

Height (H) inches (mm)	Packs of	36 (900)	24 (600)	30 (760)	35 (900)	35 (900)	Page
Width (B) inches (mm)		30 (760)	24 (600)	24 (600)	30 (760)	35 (900)	
Depth (T) inches (mm)		10 (250)	12 (300)	12 (300)	12 (300)	12 (300)	
Mounting plate height (G) inches (mm)		34 (870)	22 (570)	29 (730)	34 (870)	34 (870)	
Mounting plate width (F) inches (mm)		28 (704)	22 (549)	22 (549)	28 (704)	33 (840)	
Material thickness, housing ga (mm)		14 (2.0)	16 (1.5)	16 (1.5)	14 (2.0)	14 (2.0)	
Material thickness, door ga (mm)		14 (2.0)	14 (2.0)	14 (2.0)	14 (2.0)	14 (2.0)	
Model No.	1 pc(s).	**8017.619**	**8018.474**	**8017.612**	**8017.606**	**8017.602**	
Model No. US	1 pc(s).	**WM363010N4**	**WM242412N4**	**WM302412N4**	**WM363012N4**	**WM363612N4**	
Door(s)		1	1	1	1	1	
Weight lb (kg)		111 (53)	62 (28)	77 (35)	121 (55)	146 (66)	
Accessories							
Wall mounting bracket	4 pc(s).	2433.000	2433.000	2433.000	2433.000	2433.000	504
T handle	1 pc(s).	8018.577	8018.577	8018.577	8018.577	8018.577	487

Stainless Steel

Height (H) inches (mm)	Packs of	41 (1050)	47 (1200)	59 (1500)	47 (1200)	59 (1500)	Page
Width (B) inches (mm)		35 (900)	35 (900)	35 (900)	35 (900)	35 (900)	
Depth (T) inches (mm)		12 (300)	12 (300)	12 (300)	16 (400)	16 (400)	
Mounting plate height (G) inches (mm)		40 (1020)	45 (1155)	57 (1455)	45 (1155)	57 (1455)	
Mounting plate width (F) inches (mm)		33 (840)	33 (840)	33 (840)	33 (840)	33 (840)	
Material thickness, housing ga (mm)		14 (2.0)	14 (2.0)	14 (2.0)	14 (2.0)	14 (2.0)	
Material thickness, door ga (mm)		14 (2.0)	14 (2.0)	14 (2.0)	14 (2.0)	14 (2.0)	
Model No.	1 pc(s).	**8017.617**	**8017.601**	**8017.604**	**8018.515**	**8018.521**	
Model No. US	1 pc(s).	**WM423612N4**	**WM483612N4**	**WM603612N4**	**WM483616N4**	**WM603616N4**	
Door(s)		1	1	1	1	1	
Weight lb (kg)		169 (77)	189 (86)	229 (104)	205 (93)	210 (95)	
Accessories							
Wall mounting bracket	4 pc(s).	2433.000	2433.000	2433.000	2433.000	2433.000	504
L-handle	1 pc(s).	8018.691	8018.691	8018.691	8018.691	8018.691	487

WM stainless steel Page 171 **WM stainless steel, with roof slope** Page 174

Material:
- Housing: Stainless steel 1.4301 (AISI 304)
- Door: Stainless steel 1.4301 (AISI 304), all-round foamed-in PU seal
- Mounting plate: Carbon steel

Surface finish:
- Housing and door: Brushed, grain 240
- Mounting plate: Zinc-plated

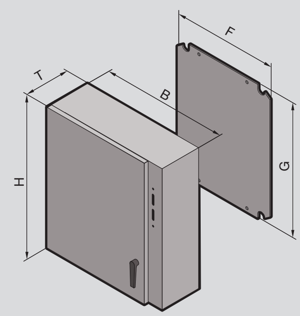
Protection category IP to IEC 60 529:
- IP 55
- IP 66

Protection category NEMA:
- NEMA 12, 3R, 4X

Approvals:
- UL
- cUL

Supply includes:
- Housing with hinged door(s), of all-round solid construction, door catch on the left on single-door housing
- Universal disconnect cutout
- Mounting plate
- Blind rivet nuts for wall mounting
- 2- or 3-point latching L-handle

Technical details:
Available on the Internet



Stainless Steel, for Isolator Lock

Height (H) inches (mm)	Packs of	24 (600)	35 (900)	41 (1050)	47 (1200)	Page
Width (B) inches (mm)		26 (650)	32 (825)	32 (825)	38 (975)	
Depth (T) inches (mm)		8 (210)	12 (300)	12 (300)	16 (400)	
Mounting plate height (G) inches (mm)		22 (570)	34 (870)	40 (1020)	45 (1155)	
Mounting plate width (F) inches (mm)		22 (549)	28 (704)	33 (840)	33 (840)	
Material thickness, housing ga (mm)		16 (1.5)	14 (2.0)	14 (2.0)	14 (2.0)	
Material thickness, door ga (mm)		14 (2.0)	14 (2.0)	14 (2.0)	14 (2.0)	
Model No.	1 pc(s).	**8018.627**	**8018.633**	**8018.629**	**8018.634**	
Model No. US	1 pc(s).	**WM242608X4**	**WM363212X4**	**WM423212X4**	**WM483816X4**	
Door(s)		1	1	1	1	
Locking points		2	2	3	3	
Weight lb (kg)		57 (26)	124 (56)	163 (74)	207 (94)	
Accessories						
Wall mounting bracket	4 pc(s).	2433.000	2433.000	2433.000	2433.000	504
L-handle	1 pc(s).	8018.691	8018.691	8018.691	8018.691	487

Metric measurements are exact, imperial measurements are rounded.

SCEPTER RIGID PVC CONDUIT & FITTINGS

1/2" - 6" (12mm - 200mm)

Professional electricians ask for Scepter conduit by name for the quality and superior performance that ensures a long trouble free life. Scepter conduit is light weight and offers excellent chemical resisitance, high tensile and impact strength, and the FT-4 rating permits use in noncombustible construction.

Suitable for exposed, concrete encased and direct burial applications, Scepter conduit requires no extra protection and is third party certified by CSA and NSF (sizes 1/2" - 6").

SHORT FORM SPECIFICATIONS

All wiring shall be installed in Rigid PVC conduit and secured to PVC boxes and cabinets by means of proper fittings. All boxes, access fittings and covers shall be furnished with threaded brass inserts, brass screws and PVC gaskets.

Rigid PVC fittings and junction boxes shall be used for all outlets, pull boxes and junction points. All PVC junction boxes shall be NEMA 1, 2, 3, 4, 4X, 6P, 12 and 13 rated and UL Listed for wet locations.

Exposed conduit shall be securely held in place by suitable hangers or straps with the maximum spacing of points for supports not exceeding those specified in the CEC or NEC. Except when embedded in concrete, rigid conduit pipe shall not be clamped tightly. It shall be supported in such a manner as to permit adequate linear movement, allowing for expansion and contraction of conduit due to temperature change. Where a temperature change exceeding 25°F (14°C) is anticipated, rigid PVC expansion joints shall be installed in accordance with the manufacturer's recommendations.

Proper care shall be taken when field bending, to maintain the internal diameter and wall thickness of the conduit.

The contractor shall furnish and install Scepter Rigid PVC conduit pipe and fittings made by IPEX. Where the engineer's specifications indicate Scepter products or equivalent, the equivalent shall be CSA certified and accepted by the Canadian Electrical Code. Due to broad manufacturing tolerances, all pipe and fitting products shall be of the same manufacturer.

APPLICATIONS

- Utilities
- Cable
- Communications
- Residential
- Airports
- Subways
- Bridges & tunnels
- Water treatment plants
- Sewage treatment plants
- Pulp & paper industries
- Street & highway lighting
- Food processing plants
- Agricultural, dairy, hogs, cattle, chicken, etc.
- Parking garages
- Car washes
- Fish plants
- Mines
- Marinas
- Steel mills

STANDARDS

Scepter Rigid PVC Conduit conforms to: CSA C22.2 No. 211.2, CSA C22.2 No. 211.0
NSF Certified to UL651
Sunlight Resistant
Rated for use with 90°C conductors
NEMA TC2
Corps. of Engineers Spec. CE 303:01
Military Spec, Federal Spec. WC 1094A

Scepter Rigid PVC boxes and fittings conform to: CSA C22.2 No. 85

UL Listed UL514B - UL514C

DID YOU KNOW?

Compared to metal, PVC products reduce labour on a typical installation by up to two-thirds. The reason? PVC is easy to work with. It can also be cut and joined without the usual pipe vices, cutters, threading equipment, and reamers associated with metal conduit.

WEIGHT COMPARISON OF SCHEDULE 40 CONDUIT

Nominal Size inches	Sch 40 PVC lbs/100ft	Sch 80 PVC lbs/100ft	Aluminum lbs/100ft	Rigid Steel lbs/100ft
1/2	15	21	28	79
3/4	21	28	27	105
1	31	41	53	153
1-1/4	42	57	70	201
1-1/2	53	70	86	249
2	71	96	116	334
2-1/2	112	146	183	527
3	166	195	239	690
3-1/2	200	-	288	831
4	236	286	340	982
5	321	397	465	1334
6	417	546	613	1771

PHYSICAL PROPERTIES OF PVC TYPE II

Properties	Unit	Value	ASTM Test Method
Electrical			
Dielectric Strength	volts/mil	1215	D149
Dielectric Constant	60 cps at 30°C 1000 cps at 30°C	3.55 3.22	D150 D150
Power Factor	60 cps at 30°C 1000 cps at 30°C	4.04 4.71	D150 D150
Physical			
Specific Gravity		13.5	D792
Hardness	Durometer D	78	D676
Izod Impact Strength @ 73°F (23°C)	ft.lb/in. notch	15.0	D256
Tensile Strength @ 73°F (23°C)	psi	6000	D638
Compressive Strength	psi	8600	D695
Flexural Strength	psi	11500	D790
Thermal			
Coefficient of Thermal Conductivity	BTU/sec/in^2/°F/in.	0.11	C177
Coefficient of Linear Expansion	per °F x 10^{-5}	5.5	D696
Heat Distortion Temperature at 264 psi	°F	158	D648
Others			
Flammability		self-extinguishing	D635
Water Absorption in 30 days	%	0.6	
Color		charcoal grey	
Light Transmission		opaque	D791

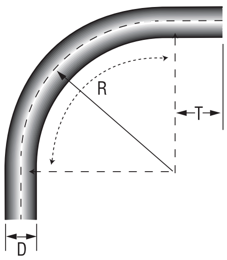
All technical data is believed to be accurate and is presented soley for information and guidance.

PRODUCT SELECTION CHART & DIMENSIONS

Nominal Size inches	10' Product Code	20' Product Code	O.D. inches	I.D. inches	Min. Wall inches	Weight lbs./100	Standard 10' ft./crate
Schedule 40 Heavy Wall in 10' or 20' Lengths							
1/2	032405	032406	0.840	0.622	0.109	15	6,000
3/4	032407	032408	1.050	0.824	0.113	21	4,400
1	032410	032411	1.315	1.049	0.133	31	3,600
1-1/4	032412	032414	1.660	1.380	0.140	42	3,300
1-1/2	032415	032416	1.900	1.610	0.145	53	2,250
2	032420	032421	2.375	2.067	0.154	71	1,400
2-1/2	032425	032426	2.875	2.469	0.203	112	930
3	032430	032431	3.500	3.068	0.216	166	880
3-1/2	032435	032436	4.000	3.548	0.226	200	630
4	032440	032441	4.500	4.026	0.237	236	570
5	032450	032451	5.563	5.047	0.258	321	380
6	032460	032461	6.625	6.065	0.280	417	260
Schedule 80 Extra Heavy Wall in 10' or 20' Lengths							
1/2	032505	032506	0.840	0.546	0.147	21	6,000
3/4	032507	032508	1.050	0.724	0.154	28	4,400
1	032510	032511	1.315	0.957	0.179	41	3,600
1-1/4	032512	032514	1.660	1.278	0.191	57	3,300
1-1/2	032515	032516	1.900	1.500	0.200	70	2,250
2	032520	032521	2.375	1.939	0.218	96	1,400
2-1/2	032525	032526	2.875	2.323	0.276	146	930
3	032530	032531	3.500	2.900	0.300	195	880
4	032540	032541	4.500	3.826	0.337	286	570
5	032550	032551	5.563	4.813	0.375	397	380
6	032560	032561	6.625	5.761	0.432	546	260

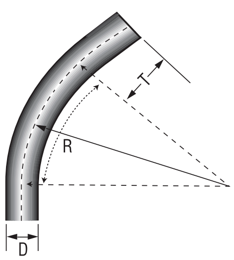
CONDUIT ELBOWS

90° Elbows Schedule 40 Standard Radius



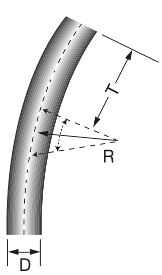
Size inches	Part Number	Product Code	D inches	T inches	R inches
1/2	EE1090	068580	0.840	1.500	4.00
3/4	EE1590	068581	1.050	1.500	4.50
1	EE2090	068582	1.315	1.875	5.75
1-1/4	EE2590	068583	1.660	2.000	7.25
1-1/2	EE3090	068584	1.900	2.000	8.25
2	EE3590	056585	2.375	2.000	9.50
2-1/2	EE4090	068586	2.875	3.000	10.50
3	EE4590	068587	3.500	3.125	13.00
3-1/2	EE5090	068588	4.000	3.250	15.00
4	EE5590	068589	4.500	3.375	16.00
5	EE6090	068591	5.563	3.625	24.00
6	EE6590	068592	6.625	3.750	30.00

45° Elbows Schedule 40 Standard Radius



Size inches	Part Number	Product Code	D inches	T inches	R inches
1/2	EE1045	068600	0.840	1.500	4.00
3/4	EE1545	068601	1.050	1.500	4.50
1	EE2045	068602	1.315	1.875	5.75
1-1/4	EE2545	068603	1.660	2.000	7.25
1-1/2	EE3045	068604	1.900	2.000	8.25
2	EE3545	068605	2.375	2.000	9.50
2-1/2	EE4045	068606	2.875	3.000	10.50
3	EE4545	068607	3.500	3.125	13.00
3-1/2	EE5045	068608	4.000	3.250	15.00
4	EE5545	068609	4.500	3.375	16.00
5	EE6045	068611	5.563	3.625	24.00
6	EE6545	068612	6.625	3.750	30.00

30° Elbows Schedule 40 Standard Radius

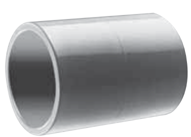


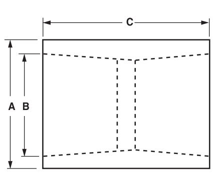
Size inches	Part Number	Product Code	D inches	T inches	R inches
1/2	EE1030	068620	0.840	1.500	4.00
3/4	EE1530	068621	1.050	1.500	4.50
1	EE2030	068622	1.315	1.875	5.75
1-1/4	EE2530	068623	1.660	2.000	7.25
1-1/2	EE3030	068624	1.900	2.000	8.25
2	EE3530	068625	2.375	2.000	9.50
2-1/2	EE4030	068626	2.750	3.000	10.50
3	EE4530	068627	3.500	3.125	13.00
3-1/2	EE5030	068628	4.000	3.250	15.00
4	EE5530	068629	4.500	3.375	16.00
5	EE6030	068631	5.563	3.625	24.00
6	EE6530	068632	6.625	3.750	30.00

CONDUIT FITTINGS

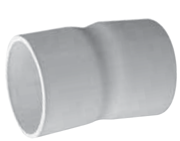
Size inches	Part Number	Product Code
Pipe straps Coated Steel 2 Hole		
2	CS35	077818
2-1/2	CS40	077819
3	CS45	077820
3-1/2	CS50	077821
4	CS55	077822
5	CS60	077824
6	CS65	077823
Poly Plugs		
2 - 2-1/2	PP3540	077433
3 - 3-1/2	PP4550	077434
4	PP55	077435
5	PP60	077436
6	PP65	077437

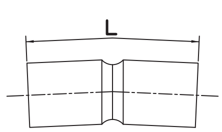
Size inches	Part Number	Product Code	A inches	B inches	C inches
Couplings					
1/2	EC10	068000	1.060	0.844	1.400
3/4	EC15	068001	1.310	1.056	1.640
1	EC20	077003	1.590	1.315	2.031
1-1/4	EC25	077004	2.000	1.660	2.156
1-1/2	EC30	077005	2.230	1.900	2.281
2	EC35	077006	2.720	2.375	2.406
2-1/2	EC40	077007	3.320	2.875	3.187
3	EC45	077008	4.000	3.500	3.437
3-1/2	EC50	077009	4.500	4.000	3.625
4	EC55	077010	5.000	4.500	3.750
5	EC60	077011	6.120	5.563	4.187
6	EC65	077012	7.370	6.625	4.562
8	EC80	178192	–	–	–

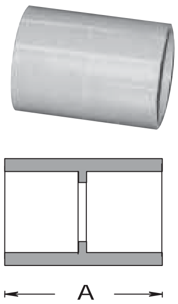




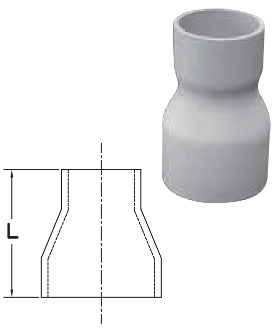
Size inches	Part Number	Product Code	L inches
5° couplings			
2	5EC35	077100	4.0
2-1/2	5EC40	077101	5.5
3	5EC45	077103	6.0
3-1/2	5EC50	077102	7.0
4	5EC55	077104	7.0
5	5EC60	077105	7.5
6	5EC65	077106	11.0



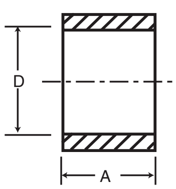




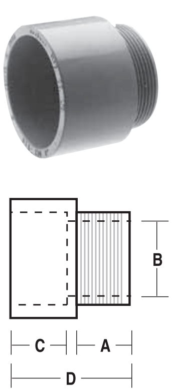
Size inches	Part Number	Product Code	A inches
Long Line Couplings			
1-1/2	LLC30	077192	2.740
2	LLC35	077193	3.675
2-1/2	LLC40	077194	4.280
3	LLC45	077195	4.800
4	LLC55	077196	6.200
5	LLC60	078068	8.220
6	LLC65	077198	8.220



Size inches	Part Number	Product Code	L inches
Fabricated Swedge Reducer Couplings			
2 x 1-1/4	SW3525	077320	4
3 x 2	SW4535	077321	6
3 x 2-1/2	SW4540	077335	6.5
4 x 2	SW5535	077322	7
4 x 2-1/2	SW5540	069282	-
4 x 3	SW5545	077333	7

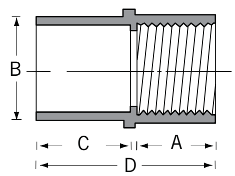


Size inches	Part Number	Product Code	A inches	D Miin inches	D Max inches
Repair Coupling Sleeve					
1-1/2	REC30	077292	2.300	1.912	1.924
2	REC35	077293	2.405	2.367	2.399
2-1/2	REC40	077294	3.450	2.883	2.897
3	REC45	077295	3.600	3.507	3.523
4	REC55	077296	3.920	4.506	4.524
5	REC60	077297	4.275	5.583	5.603
6	REC65	077298	4.620	6.647	6.669



Size inches	Part Number	Product Code	A inches	B inches	C inches	D inches
Terminal Adapters - 1/2" - 1-1/4" Tapered Thread; 1-1/2" - 6" Non-Tapered Thread						
1/2	TA10	077021	0.700	0.591	0.750	1.550
3/4	TA15	077022	0.675	0.790	1.000	1.750
1	TA20	077023	0.625	1.000	1.115	1.860
1-1/4	TA25	077024	0.640	1.311	1.300	2.125
1-1/2	TA30	077025	0.725	1.530	1.425	2.250
2	TA35	077026	0.800	1.970	1.150	2.100
2-1/2	TA40	077027	0.800	2.346	1.900	2.930
3	TA45	077028	0.815	2.915	2.000	3.055
3-1/2	TA50	077029	1.000	3.385	1.715	3.055
4	TA55	077030	0.815	3.850	1.990	3.215
5	TA60	077031	1.105	4.810	2.000	5.985
6	TA65	077032	1.105	5.825	2.130	6.500
8	TA80	178190	–	–	–	–

Female Adapters NPT Tapered Thread

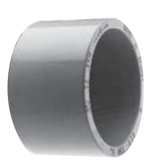


Size inches	Part Number	Product Code	A inches	B inches	C inches	D inches
1/2	FA10	077041	0.800	0.620	0.825	1.725
3/4	FA15	077042	0.800	0.820	1.000	1.900
1	FA20	077043	1.000	1.065	1.200	2.300
1-1/4	FA25	077044	1.015	1.395	1.300	
1-1/2	FA30	077045	1.050	1.575	1.290	2.440
2	FA35	077046	1.075	2.050	1.375	2.550
2-1/2	FA40	077047	1.675	2.470	1.985	3.760
3	FA45	077048	1.630	3.090	2.150	4.100
3-1/2	FA50	077049	1.800	3.540	2.000	3.985
4	FA55	077050	1.755	4.025	2.185	4.210
5	FA60	077051	2.065	5.035	3.000	5.240
6	FA65	077052	2.065	6.045	3.000	5.235
8	FA80	178189	–	–	–	–

End Caps

Size inches	Part Number	Product Code
1/2	CAP10	077421
3/4	CAP15	077422
1	CAP20	077423
1-1/4	CAP25	077424
1-1/2	CAP30	077425
2	CAP35	077426
2-1/2	CAP40	077427
3	CAP45	077428
3-1/2	CAP50	077429
4	CAP55	077430
5	CAP60	077431
6	CAP65	077432

Reducer Bushings



Size inches	Part Number	Product Code
3/4 x 1/2	1805	077300
1 x 1/2	1805-1	077301
1 x 3/4	1806	077302
1-1/4 x 3/4	1807-1	077303
1-1/4 x 1	1807	077304
1-1/2 x 1	1808-1	077305
1-1/2 x 1-1/4	1808	077306
2 x 1	1809-1	077313
2 x 1-1/4	1809	077307
2 x 1-1/2	1810	077308
2-1/2 x 2	1811	077309
3 x 2	1812-1	077310
3 x 2-1/2	1812	077311
4 x 2	1813-1	077319
4 x 3	1813	077312
4 x 3-1/2	1814	077317

Threaded Reducer Bushings

Size inches	Part Number	Product Code
3/4 x 1/2	1825	077314
1 x 1/2	1826	077315
1 x 3/4	1827	077316

End Bells

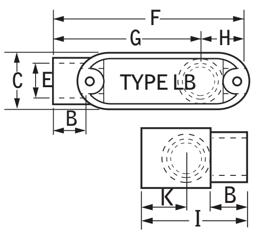
Size inches	Part Number	Product Code
1/2	EB-10	077406
3/4	EB-15	077085
1	EB-20	077323
1-1/4	EB-25	077324
1-1/2	EB-30	077325
2	EB-35	077326
2-1/2	EB-40	077327
3	EB-45	077328
3-1/2	EB-50	077329
4	EB-55	077330
5	EB-60	077331
6	EB-65	077332

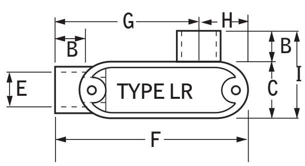
ACCESS FITTINGS

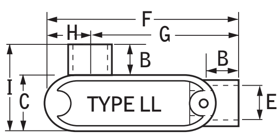
ACCESS FITTINGS

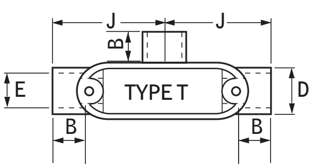
No other manufacturer offers such an extensive range of access fitting sizes (1/2” to 4”) or hub configurations (LB, T, LL, LR, TB, C, E). CSA certified and UL listed, Scepter access fittings come fully factory assembled so parts cannot be misplaced during shipping and handling.

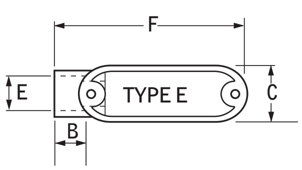
Manufactured with threaded brass screws and inserts, and flexible PVC gaskets, Scepter access covers can be removed as often as needed without wear or cracking. Stainless steel screws are available on request.

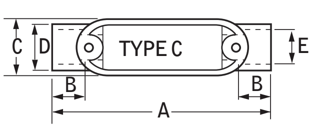


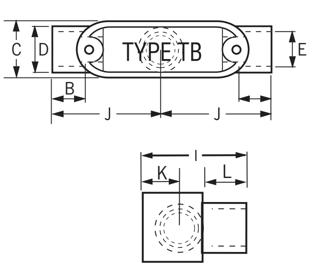












Access Fitting Dimensions

Size inches	A inches	B inches	C inches	D inches	E inches	F inches
1/2	5.6	0.6	1.3	1.1	0.8	4.3
3/4	5.6	0.8	1.5	1.3	1.1	5.4
1	6.5	0.9	1.7	1.6	1.3	6.3
1-1/4	7.9	1.1	2.3	2.0	1.7	7.6
1-1/2	8.5	1.1	2.7	2.3	1.9	8.3
2	10.9	1.2	3.2	2.8	2.4	10.5
2-1/2	14.6	1.8	4.5	4.0	2.9	13.6
3	14.6	1.9	4.5	4.0	3.5	13.6
3-1/2	17.0	2.1	5.5	5.0	4.0	16.0
4	17.0	2.1	5.5	5.0	4.5	16.0

Access Fitting Dimensions

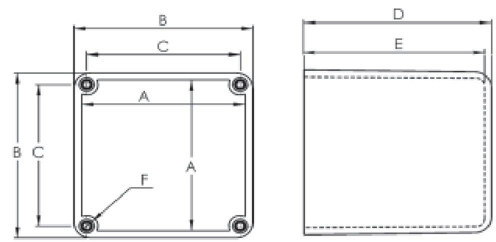
Size inches	G inches	H inches	I inches	J inches	K inches	L inches
1/2	4.1	1.3	2.5	2.3	1.0	0.8
3/4	4.1	1.3	2.5	2.8	1.0	0.8
1	4.8	1.5	2.1	3.3	1.1	1.1
1-1/4	5.8	1.8	3.6	4.0	1.6	1.0
1-1/2	6.5	1.8	3.9	4.3	1.7	1.1
2	8.2	2.3	4.5	5.4	2.0	1.2
2-1/2	9.8	3.8	6.2	7.3	2.6	-
3	10.9	2.7	6.2	7.3	2.6	-
3-1/2	11.5	4.5	7.5	8.5	3.0	-
4	11.5	4.5	7.5	8.5	3.0	-

All access fittings are CSA certified and UL listed for wet locations, except Type TB.
Supplied with threaded brass inserts, combination brass head screws and PVC gasketing.
Stainless steel screws are available upon request.

JUNCTION BOXES

NEMA rated 1, 2, 3, 4, 4X, 6P, 12, 13 and UL approved for use in wet locations, Scepter's JB PVC molded JUNCTION BOXES are available in sizes from 4" x 4" x 2" to 12" x 12" x 8" and supplied with threaded brass screws and inserts, flexible PVC gaskets and external mounting feet. Nylon or stainless steel screws, as well as larger sizes are available on request.

Part Number	Product Code	A inches	B inches	C inches	D inches	E inches	F inches
PVC Molded Junction Boxes							
JB442	077659	3.71	4.05	3.42	2.15	1.99	8-32
JB444	077696	3.65	4.00	3.43	4.17	4.02	8-32
JB446	077669	3.65	4.02	3.43	6.23	6.00	8-32
JB552	077670	4.66	5.00	4.50	2.00	1.85	8-32
JB664	077697	6.08	6.41	5.80	4.20	4.00	8-32
JB666	077698	6.02	6.38	5.80	6.00	6.21	8-32
JB884	077664	8.06	8.60	7.95	4.18	3.97	1/4-20
JB887	077671	8.10	8.60	7.95	7.24	7.00	1/4-20
JB12124	077672	11.93	12.48	11.84	4.26	4.00	1/4-20
JB12126	077666	11.97	12.36	11.80	6.25	5.99	1/4-20
JB12128	077668	11.90	12.50	11.84	8.24	7.96	1/4-20



Scepter PVC Junction Boxes are:
NEMA 1, 2, 3, 4, 4X, 6P, 12, 13
UL listed for wet locations

Fabricated Boxes

Unflanged PVC fabricated boxes of any size may be made to customers' specifications and come complete with lids, gaskets and screws.These boxes are not UL Certified and are not returnable.

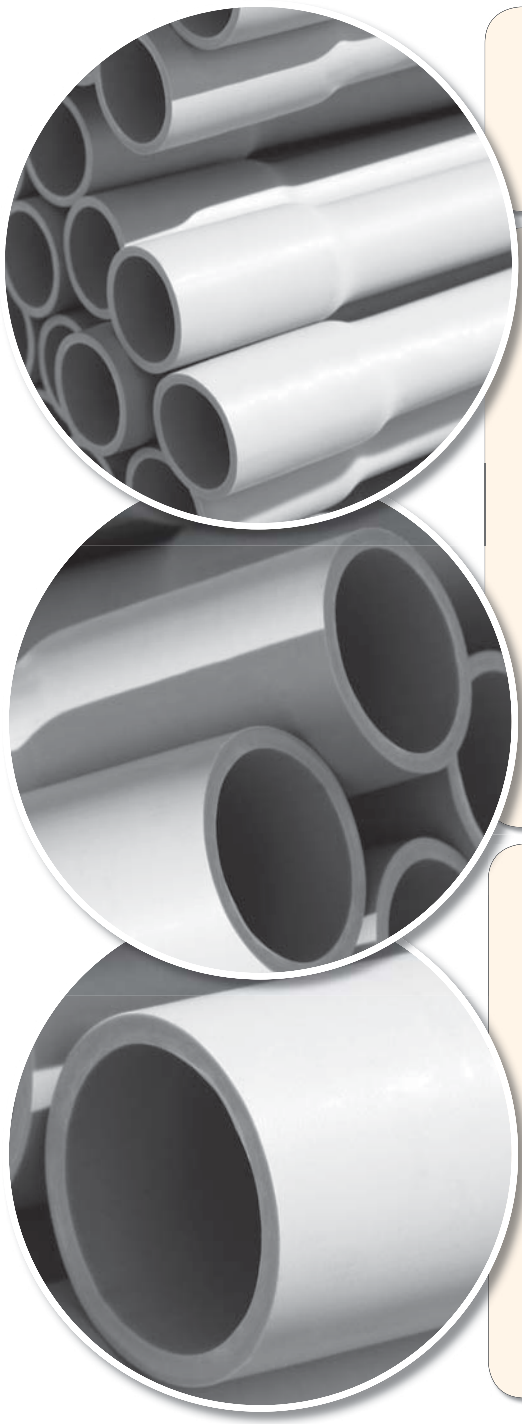
Description	Part Number	Product Code
Threaded Junction Boxes		
	LFB150C	077250
	LFB150T *	077251

*LFB150T complete with 1/2 threaded" hole in center of cover

Building essentials
for a better tomorrow™

ELECTRICAL CONDUIT AND DUCT

MEETS ANSI/UL 651 AND NEMA TC-2, ASTM F512 AND NEMA TC-6 & 8.



APPLICATIONS

JM Eagle Electrical Conduit and Power Duct products are suitable for power, telephone and other electrical systems.

DESCRIPTION

JM Eagle offers a complete line of Electrical Conduit and Power Duct pipe that includes Schedule 40 and 80 Conduit (NEMA TC-2, ANSI/UL651), Encased and Direct Burial Conduit (ASTM F512, NEMA TC-6 & 8; and/or ANSI/UL 651A), and Type C Telephone Duct.

The products may be used for above-ground and underground installations, concrete encasements, and direct burials, as well as telephone applications.

They are available in ½- to 6-inch diameters, in 10- and/or 20-foot lengths, with one bell end, and come in gray.

The solvent-weld joints are designed to provide a rigid (or restrained) joint connection, and the schedule-rated products are specifically engineered for use in partial support systems above ground.

A complete line of Schedule 40 and 80, utility duct and junction box fittings complements the conduit products.

BENEFITS

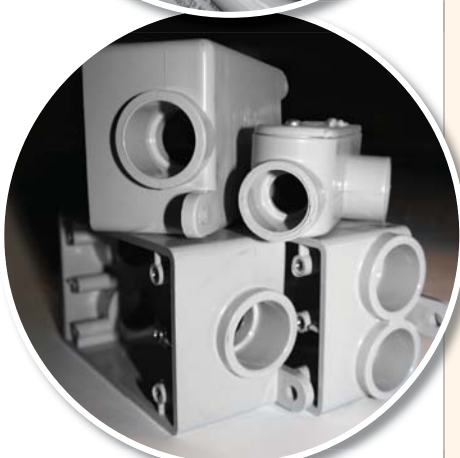
JM Eagle Electrical Conduit and Power Duct products are lightweight, cost-effective and long-lasting.

- They can be field-cut with a power saw or ordinary handsaw without the use of expensive or complicated machinery.
- Easy to load, transport and handle, installers prefer them because they go into the ground quickly, saving installation costs.
- They maintain performance against external galvanic soil conditions without lining wrapping, coating or cathodic protection, and offer superior dielectric strength.
- They are rated for use with 90-degree C conductors, and come with UV protection.

JM Eagle™

Building essentials for a better tomorrow™

ELECTRICAL FITTINGS



APPLICATIONS

JM Eagle Electrical Fittings are suitable for use with all JM Eagle Electrical Conduit products for power, telephone and other electrical systems applications.

DESCRIPTION

JM Eagle offers a complete line of more than 3,000 electrical fitting items, including:

SCHEDULE 40 FITTINGS
- Couplings
- Terminal adapters
- Female adapters

SCHEDULE 40 AND 80 STANDARD RADIUS ELBOWS
- Belled end
- Plain end
- UL listed

SPECIAL RADIUS SWEEPS
- Schedule 40 and 80
- DB (direct burial)
- C Duct
- Belled and plain end
- ½" though 6"

BOXES
- FS/Junction boxes
- Access fittings

DUCT SPACERS
- Vertical slide connection for easy assembly.
- Locking tab to prevent floating.
- Only two components needed, base and intermediate.
- Designed for use with plastic duct only.

COUPLINGS
- Swedge
- Repair
- 5-degree
- Swedge reducers
- Caps and end bells

The products may be used for above-ground and underground installations, concrete encasements, and direct burials, as well as telephone and gas applications.

BENEFITS

JM Eagle Electrical Fittings are cost-effective and long-lasting.

- They maintain performance against external galvanic soil conditions without lining wrapping, coating or cathodic protection, and offer superior dielectric strength.
- They are rated for use with 90-degree C conductors, and come with UV protection.
- Now produced and distributed throughout the United States, customers can have the convenience of placing a complete electrical order with one call.

Revised 11/1/2010. This information may have been updated. Please download the latest version at www.jmeagle.com/onesheets.

ELECTRICAL CONDUIT AND DUCT

SUBMITTAL AND DATA SHEET

JM Eagle™

Building essentials for a better tomorrow™

SCHEDULE 40 CONDUIT

Rated for 90°C Conductors

SIZE	AVERAGE O.D.	NOM. I.D.	MIN. T.	APPROX. WT/100 FT
½	0.840	0.622	0.109	18
¾	1.050	0.824	0.113	24
1	1.315	1.049	0.133	33
1¼	1.660	1.380	0.140	45
1½	1.900	1.610	0.145	56
2	2.375	2.067	0.154	76
2½	2.875	2.469	0.203	126
3	3.500	3.068	0.216	163
3½	4.000	3.548	0.226	197
4	4.500	4.026	0.237	234
5	5.563	5.047	0.258	319
6	6.625	6.065	0.280	411

Schedule 40 is furnished in standard 10' lengths with one bell end. 20' lengths are available upon request.

SCHEDULE 80 CONDUIT

Rated for 90°C Conductors

SIZE	AVERAGE O.D.	NOM. I.D.	MIN. T.	APPROX. WT/100 FT
½	0.840	0.546	0.147	22
¾	1.050	0.742	0.154	30
1	1.315	0.957	0.179	42
1¼	1.660	1.278	0.191	60
1½	1.900	1.500	0.200	72
2	2.375	1.939	0.218	98
2½	2.875	2.323	0.276	160
3	3.500	2.900	0.300	213
3½	4.000	3.364	0.318	256
4	4.500	3.826	0.337	310
5	5.563	4.813	0.375	430
6	6.625	5.761	0.432	590

Schedule 80 is furnished in standard 10' lengths with one bell end. 20' lengths are available upon request.

CAO 8546 TYPE C : :

Rated for 90 ° C Cable

SIZE	AVERAGE O.D.	NOM. I.D.	*MIN. T.	APPROX. WT/100 FT
4	4.350	4.044	0.149	147

* Based on 500,000 psi Modulus
* 400,000 psi Modulus available upon request.
: : GTS - 8342 and HDPE Tele Duct available upon request
: : JM Eagle™ Type C PVC duct is designed for direct burial installations of telephone cables and complies with CAO 8546.

I.D. : Inside Diameter
O.D. : Outside Diameter
T. : Wall Thickness

TYPE DB60 : :

Rated for 90°C Cable

SIZE	AVERAGE O.D.	NOM. I.D.	* MIN. T.	APPROX. WT/100 FT
2	2.375	2.255	0.060	36
3	3.500	3.316	0.092	79
4	4.500	4.258	0.121	129
5	5.563	5.259	0.152	197
6	6.625	6.261	0.182	279

* Based on 500,000 psi Modulus

TYPE DB100 : :

Rated for 90°C Cable

SIZE	AVERAGE O.D.	NOM. I.D.	*MIN. T.	APPROX. WT/100 FT
3	3.500	3.276	0.112	91
3½	4.000	3.744	0.128	120
4	4.500	4.212	0.145	152
5	5.563	5.207	0.179	231
6	6.625	6.201	0.213	328

* Based on 500,000 psi Modulus

TYPE DB120 : :

Rated for 90ºC Cable

SIZE	AVERAGE O.D.	NOM. I.D.	*MIN. T.	APPROX. WT/100 FT
1	1.315	1.195	0.060	20
1½	1.900	1.780	0.060	29
2	2.375	2.221	0.077	44
3	3.500	3.264	0.118	97
4	4.500	4.192	0.154	160
5	5.563	5.181	0.191	245
6	6.625	6.171	0.227	347

* Based on 500,000 psi Modulus
: : Conduit furnished with one (1) bell end per 20' length.
: : JM Eagle™ Type DB duct is designed for direct burial installations and complies with NEMA TC-6 & 8 and ASTM F512.

TYPE EB20* : :

Rated for 90°C Cable

SIZE	AVERAGE O.D.	NOM. I.D.	* MIN. T.	APPROX. WT/100 FT
2	2.375	2.255	0.060	36
3	3.500	3.378	0.061	56
4	4.500	4.336	0.082	91
5	5.563	5.357	0.103	141
6	6.625	6.375	0.125	198

[1] Type EB20 also complies with ANSI/UL 651 A

TYPE EB35* : : †

Rated for 90°C Cable

SIZE	AVERAGE O.D.	NOM. I.D.	* MIN. T.	APPROX. WT/100 FT
3	3.500	3.348	0.076	68
4	4.500	4.300	0.100	109
5	5.563	5.311	0.126	168
6	6.625	6.321	0.152	235

* Based on 500,000 psi Modulus
: : Conduit furnished with one bell end per 20-foot length.
: : JM Eagle™ Type EB duct is designed for concrete encasement installations and complies with NEMA TC-6 & TC-8 and ASTM F512.

Revised 5/1/2012. This information may have been updated. Please download the latest version at www.jmeagle.com/onesheets.

Carlon® Rigid Nonmetallic Conduit (RNC), Fittings & Accessories

Carlon® manufactures the most complete line of nonmetallic conduits and fittings in the electrical industry. Carlon Schedule 40 and Schedule 80 conduits are designed for use aboveground and underground as described in the National Electrical Code. Specify only Carlon conduits and fittings to insure raceway system integrity.

Features

Ease of Installation Nonmetallic conduits are 1/4 to 1/5 the weight of metallic systems, can be installed in less than half the time, and are easily fabricated on the job.

Safety Nonmetallic conduits are nonconductive, assuring a safe system.

Impact Resistant Carlon Schedule 40 and Schedule 80 nonmetallic conduits are resistant to sunlight and are listed for exposed or outdoor usage. The use of expansion fittings allows the system to expand and contract with temperature variations.

Corrosion Resistant Carlon conduits and fittings are nonmetallic and will not rust or corrode.

Carlon nonmetallic Schedule 40 and Schedule 80 conduits and elbows are manufactured to NEMA TC-2, Federal specification WC1O94A and UL 651 specifications. Fittings are manufactured to NEMA TC-3, Federal specification WC1094A and UL514B. Both conduit and fittings carry respective UL or ETL Listings and UL or ETL labels.

Schedule 40 PVC Rigid Nonmetallic Conduit (RNC).

(Heavy Wall EPC)

ETL Listed to UL 651 in compliance to the NEC

LISTED E35297

RUS Listed

Listed for underground applications encased in concrete or direct burial. Also for use in exposed or concealed applications aboveground.

• Sunlight resistant • Rated for use with 90°C conductors • Superior weathering characteristics

With Integral Bell*

Schedule 40 Heavy Wall

Part No. 10'	Part No. 20'	Nom. Size	Std. Crate Qty. 10'	Std. Crate Qty. 20'	Wt. Per 100'	Dimensions O.D.	Dimensions I.D.	Wall
49005-010		1/2"	6000'		17	.840	.622	.109
49007-010	49007-020	3/4"	4400'	8800'	23	1.050	.824	.113
49008-010	49008-020	1"	3600'	7200'	34	1.315	1.049	.133
49009-010	49009-020	1 1/4"	3300'	6600'	46	1.660	1.380	.140
49010-010	49010-020	1 1/2"	2250'	4500'	55	1.900	1.610	.145
49011-010	49011-020	2"	1400'	2800'	73	2.375	2.067	.154
49012-010	49012-020	2 1/2"	930'	1860'	124	2.875	2.469	.203
49013-010	49013-020	3"	880'	1760'	163	3.500	3.068	.216
49014-010	49014-020	3 1/2"	630'	1260'	196	4.000	3.548	.226
49015-010	49015-020	4"	570'	1140'	232	4.500	4.026	.237
49016-010	49016-020	5"	380'	760'	315	5.563	5.047	.258
49017-010	49017-020	6"	260'	520'	409	6.625	6.065	.280

Rigid nonmetallic conduit is normally supplied in standard 10' lengths, with one belled end per length. For specific requirements, it may be produced in lengths shorter or longer than 10', with or without belled ends.

Use RNC Fittings with Schedule 40 and Schedule 80 Conduit.

Notes: 1. Special fittings and conduit sizes will be quoted on request.
2. DON'T FORGET TO ORDER CEMENT.
3. Carlon reserves the right to ship to the nearest unitized quantity.

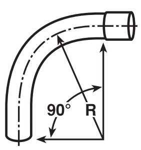
Schedule 40 Elbows Standard Radius

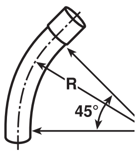
Available in plain and integral belled end for use with nonmetallic solvent weld fittings.

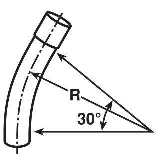
ETL Listed to UL 651 in compliance to the NEC

LISTED E35297

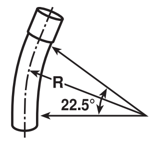
Item	Plain End Part No.	Belled End Part No.	Size	Plain End Std. Ctn. Qty.	Belled End Std. Ctn. Qty.
90° Elbow	UA9AD	UA9ADB	1/2"	50	50
	UA9ADR-CAR	UA9ADB	1/2"	25	50
	UA9AE	UA9AEB	3/4"	25	25
	UA9AFR-CTN	UA9AFB-CTN	1"	25	25
	UA9AG	UA9AGB	1 1/4"	20	20
	UA9AH	UA9AHB	1 1/2"	25	25
	UA9AJ	UA9AJB	2"	20	20
	UA9AJ-CAR	UA9AJB	2"	5	20
	UA9AK-CAR	UA9AKB-CAR	2 1/2"	10	10
	UA9AL	UA9ALB-CAR	3"	1	5
	UA9AM	UA9AMB	3 1/2"	1	20
	UA9AN	UA9ANB	4"	1	1
	UA9AP	UA9APB	5"	1	1
	UA9AR	UA9ARB	6"	1	1
45° Elbow	UA7AD	UA7ADB	1/2"	50	50
	UA7AE	UA7AEB	3/4"	25	25
	UA7AER-CAR	UA7AEB	3/4"	15	25
	UA7AF	UA7AFB	1"	20	20
	UA7AF-CAR	UA7AFB	1"	15	20
	UA7AG	UA7AGB	1 1/4"	20	20
	UA7AH	UA7AHB	1 1/2"	20	20
	UA7AJ	UA7AJB	2"	20	20
	UA7AJ-CAR	UA7AJB-CAR	2"	4	4
	UA7AK	UA7AKB	2 1/2"	20	20
	UA7AK-CAR	UA7AKB-CAR	2 1/2"	5	5
	UA7AL-CAR	UA7ALB	3"	5	25
	UA7AL-CAR	UA7ALB-CAR	3"	5	10
	UA7AM	UA7AMB	3 1/2"	1	20
	UA7AN	UA7ANB	4"	1	20
	UA7AP	UA7APB	5"	1	1
	UA7AR	UA7ARB	6"	1	1
30° Elbow	UA6AD	UA6ADB	1/2"	50	50
	UA6AE	UA6AEB	3/4"	25	25
	UA6AF	UA6AFB	1"	25	1
	UA6AG	UA6AGB	1 1/4"	20	20
	UA6AH	UA6AHB	1 1/2"	25	1
	UA6AJ	UA6AJB	2"	20	20
	UA6AK	UA6AKB	2 1/2"	10	20
	UA6AL	UA6ALB	3"	1	1
	UA6AM	UA6AMB	3 1/2"	1	1
	UA6AN	UA6ANB	4"	1	1
	UA6AP	UA6APB	5"	1	1
	UA6AR	UA6ARB	6"	1	1

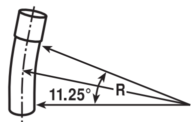




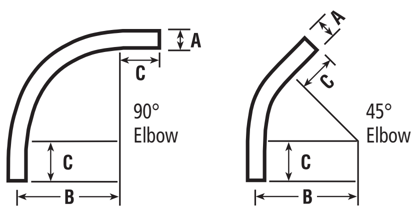


Item	Plain End Part No.	Belled End Part No.	Size	Plain End Std. Ctn. Qty.	Belled End Std. Ctn. Qty.
22 1/2° Elbow	UA5AD	–	1/2"	1	–
	UA5AE	–	3/4"	1	–
	UA5AF	–	1"	1	–
	UA5AG	–	1 1/4"	1	–
	UA5AH	–	1 1/2"	1	–
	UA5AJ	UA5AJB	2"	25	1
	UA5AK	–	2 1/2"	20	–
	UA5AL	UA5ALB	3"	5	1
	UA5AM	–	3 1/2"	1	–
	UA5AN	UA5ANB	4"	1	1
	UA5AP	UA5APB	5"	1	1
	UA5AR	UA5ARB	6"	1	1
11 1/4° Elbow	UA3AD	–	1/2"	1	–
	UA3AE	–	3/4"	1	–
	UA3AF	–	1"	1	–
	UA3AG	–	1 1/4"	1	–
	UA3AH	–	1 1/2"	1	–
	UA3AJ	–	2"	1	–
	UA3AK	–	2 1/2"	1	–
	UA3AL	–	3"	1	–
	UA3AM	–	3 1/2"	1	–
	UA3AN	UA3ANB	4"	1	1
	UA3AP	–	5"	1	–
	UA3AR	–	6"	1	–



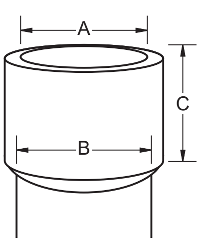


Standard Radius Elbow Dimensions



Size	A	B Min. (Radius)	C Min.
1/2"	.840	4"	1 1/2"
3/4"	1.050	4 1/2"	1 1/2"
1"	1.315	5 3/4"	1 7/8"
1 1/4"	1.660	7 1/4"	2"
1 1/2"	1.900	8 1/4"	2"
2"	2.375	9 1/2"	2"
2 1/2"	2.875	10 1/2"	3"
3"	3.500	13"	3 1/8"
3 1/2"	4.000	15"	3 1/4"
4"	4.500	16"	3 3/8"
5"	5.563	24"	3 5/8"
6"	6.625	30"	3 3/4"

Integral Belled End Dimensions



Trade Size	A At Entrance Max.	A At Entrance Min.	B At Bottom Max.	B At Bottom Min.	C Socket Depth Max.	C Socket Depth Min.
1/2"	.860	0.844	0.844	0.828	1.500	0.652
3/4"	1.074	1.054	1.056	1.036	1.500	0.719
1"	1.340	1.320	1.320	1.300	1.875	0.875
1 1/4"	1.689	1.665	1.667	1.643	2.000	0.938
1 1/2"	1.930	1.906	1.906	1.882	2.000	1.062
2"	2.405	2.381	2.381	2.357	2.000	1.125
2 1/2"	2.905	2.875	2.883	2.853	3.000	1.469
3"	3.530	3.500	3.507	3.477	3.125	1.594
3 1/2"	4.065	3.965	4.007	3.977	3.250	1.687
4"	4.565	4.465	4.506	4.476	3.375	1.750
5"	5.643	5.543	5.583	5.523	3.625	1.937
6"	6.708	6.608	6.644	6.584	3.750	2.125

Couplings

Special Long Line Couplings – Sleeve Couplings

Sleeve Coupling *(For Repair Work)*
No Internal Stop

Part No.	Size	Std. Ctn. Qty.	Std. Ctn. Wt. (lbs.)
► E948H	1 1/2	25	6
► E948J	2	25	5
► E948K	2 1/2	25	16
► E948L	3	25	13
► E948N	4	10	8
► E948P	5	14	33
► E948R	6	6	16
► E948JR	2" (6" long)	15	8
► E948JS	2" (Sch. 40 Split Duct)	25	6
► E948L12	3" (12" long)	1	1
► E948L6	3" (6" long)	15	15
► E948LS	3" (Sch. 40 Split Duct)	25	17
► E948N12	4" (12" long)	10	28
► E948N7	4" (7" long)	15	25
► E948NS	4" (Sch. 40 Split Duct)	10	15
► E948PS	5" (Sch. 40 Split Duct)	1	2
► E948R10	6" (10" long)	6	25
► E948R12	6" (12" long)	6	25
► E948RS	6" (Sch. 40 Split Duct)	1	2

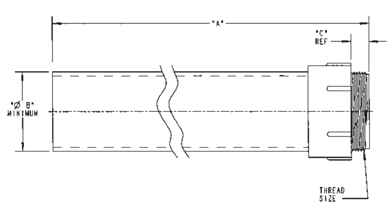
Special Schedule 40 Swedge Couplings

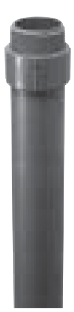
*Consult factory for additional sizes

Part No.	Size	Std. Ctn. Qty.	Std. Ctn. Wt. (lbs.)
► E442K	2 1/2	20	13
► E442R	6	6	27
► E442T	8	2	17

Risers

Schedule 40





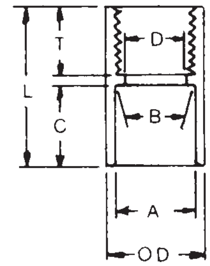
Part No.	Size	A (Length)	B (Min.)	C	Thread Size	Std. Ctn. Qty.	Std. Ctn. Wt. (lbs.)
E954HX	1 1/2	80.00	1.567	.950	1 1/2" NPT	1	3.8
E954J	2	60.00	2.024	.825	2" NPT	1	3.7
E954JX	2	80.00	2.024	.825	2" NPT	1	5.0
E954K	2 1/2	60.00	2.418	.812	2 1/2" NPSC	1	6.0
E954KX	2 1/2	80.00	2.418	.812	2 1/2" NPSC	1	8.4
E954L	3	60.00	3.012	.798	3" NPSC	1	8.7
E954LX	3	80.00	3.012	.798	3" NPSC	1	11.0

Adapters

LISTED
E32447
Except where noted by ►

Female Adapters

For adapting nonmetallic conduits to threaded fittings, metallic systems. Female threads on one end, socket end on other.

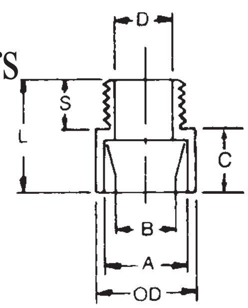


Part No.	Size	Std. Ctn. Qty.	A Typical	B Typical	Min. D	Max. OD	C Typical	T Typical	L Typical
E942D	1/2	150	.852	.836	.620	1 7/64	11/16	3/4	1 9/16
E942E	3/4	100	1.064	1.046	.822	1 5/16	13/16	3/4	1 5/8
E942F	1	50	1.330	1.310	1.046	1 5/8	15/16	7/8	1 15/16
E942G	1 1/4	30	1.677	1.655	1.377	1 63/64	1	7/8	2
E942H	1 1/2	25	1.918	1.894	1.607	2 5/32	1 1/8	7/8	2 7/32
E942J	2	30	2.393	2.369	2.064	2 47/64	1 3/16	1	2 5/16
E942K	2 1/2	20	2.890	2.868	2.450	3 11/32	1 5/8	1 1/8	2 15/16
E942K-CAR	2 1/2	4	2.890	2.868	2.450	3 11/32	1 5/8	1 1/8	2 15/16
E942L	3	25	3.515	3.492	3.000	3 31/32	1 3/4	1 1/8	3 1/16
E942L-CAR	3	3	3.515	3.492	3.000	3 31/32	1 3/4	1 1/8	3 1/16
E942M	3 1/2	20	4.015	3.992	3.500	4 1/2	1 7/8	1 1/8	3 1/4
E942N	4	15	4.515	4.491	4.000	5 1/64	2	1 1/8	3 13/64
E942N-CAR	4	7	4.515	4.491	4.000	5 1/64	2	1 1/8	3 13/64
E942NX9*	4	15	(Call for information)						
E942P	5	8	5.593	5.553	5.047	6 1/4	1 15/16	1 1/16	3 3/16
E942R	6	6	6.658	6.614	6.055	7 1/4	2 1/8	1 1/16	3 3/8
E942RX*	6	6	(Call for information)						

* Long Line Adapter

Male Terminal Adapters

For adapting nonmetallic conduits to boxes, threaded fittings, metallic systems. Male threads on one end, socket end on other.

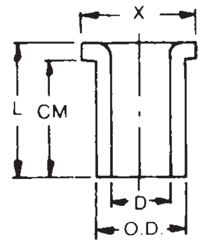


Part No.	Size	Std. Ctn. Qty.	A Typical	B Typical	Min. D	Max. OD	C Typical	S Typical	L Typical
E943D	1/2	150	.852	.836	.597	1 1/8	5/8	9/16	1 5/16
E943E	3/4	125	1.064	1.046	.800	1 11/32	3/4	9/16	1 3/8
E943F	1	50	1.330	1.310	1.018	1 5/8	1	11/16	1 25/32
E943G	1 1/4	50	1.677	1.655	1.332	2 1/32	1	3/4	1 15/16
E943H	1 1/2	25	1.918	1.894	1.566	2 5/32	1 3/16	3/4	2 1/16
E943J	2	50	2.393	2.369	2.000	2 21/32	1 3/16	3/4	2 1/8
E943K	2 1/2	25	2.890	2.868	2.376	3 5/16	1 3/4	7/8	2 7/8
E943K-CAR	2 1/2	5	2.890	2.868	2.376	3 5/16	1 3/4	7/8	2 7/8
E943L	3	45	3.515	3.492	2.954	4	1 15/16	7/8	3 1/16
E943L-CAR	3	5	3.515	3.492	2.954	4	1 15/16	7/8	3 1/16
E943M	3 1/2	30	4.015	3.992	3.440	4 1/2	2 7/16	1 7/8	3 7/16
E943N	4	20	4.515	4.491	3.940	5 3/32	2 3/8	7/8	3 1/2
E943N-CAR	4	20	4.515	4.491	3.940	5 3/32	2 3/8	7/8	3 1/2
E943P	5	5	5.593	5.553	4.815	6 1/4	2 1/3	1	3 15/16
E943R	6	10	6.658	6.614	5.860	7 1/2	2 3/8	1	3 3/8

Adapters

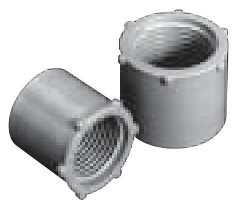
Box Adapters for Enclosures

Adapts nonmetallic conduit to all electrical enclosures by inserting adapter through knockout and cementing into Carlon couplings.



Part No.	Size	Std. Ctn. Qty.	Min D	OD Typical	Max X	CM Typical	L Typical
E996D	1/2	100	.662	.840	17/64	23/32	27/32
E996E	3/4	100	.824	1.050	1 21/64	25/32	29/32
E996F	1	100	1.049	1.315	15/8	61/64	13/32
E996G	1 1/4	50	1.380	1.660	1 31/32	1 1/16	1 1/4
E996H	1 1/2	50	1.610	1.900	2 13/64	1 3/16	1 3/8
E996J	2	25	2.067	2.375	2 29/32	1 1/4	1 7/16
E996K-CAR	2 1/2	10	2.469	2.875	3 7/16	1 7/8	1 15/16
E996L	3	20	3.068	3.500	4 1/8	2	2 1/16
E996L-CAR	3	5	3.068	3.500	4 1/8	2	2 1/16
E996N	4	10	4.026	4.500	5 1/8	2 1/2	2 1/4

Threaded Adapters



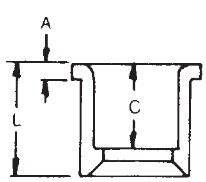
Part No.	Size	Std. Ctn. Qty.
E9842D [1]	1/2	25
E9842E [2]	3/4	25

[1] Fits 3/4" sockets [2] Fits 1" sockets

Reducers

Reducer Bushings

For connecting different sizes of conduit. Bell x Spigot.



Part No.	Size	Std. Ctn. Qty.	L Typical	A Typical	C Typical
E950ED	3/4" x 1/2"	100	1 5/32	13/64	1 1/32
E950FD-CAR	1" x 1/2"	25	1 11/32	3/16	57/64
E950FE	1" x 3/4"	100	1 11/32	3/16	1 1/64
E950GE-CAR	1 1/4" x 3/4"	10	1 15/32	3/16	1 1/64
E950GF	1 1/4" x 1"	50	1 15/32	3/16	1 9/64
E950HF-CAR	1 1/2" x 1"	10	1 19/32	3/16	1 9/64
E950HG-CAR	1 1/2" x 1 1/4"	10	1 19/32	3/16	1 17/64
E950JG-CAR	2" x 1 1/4"	10	1 3/4	7/32	1 17/64
E950JH-CAR	2" x 1 1/2"	10	1 3/4	7/32	1 25/64
E950KJ-CAR	2 1/2" x 2"	10	2 5/32	3/8	1 27/64
E950LJ-CAR	3" x 2"	10	2 1/8	1/4	1 7/8
► E950LK	3" x 2 1/2"	25	1 15/16	1/4	1 11/16
E950NL	4" x 3"	25	2 3/4	5/16	1 15/16

Reducers

LISTED
E32447
Except where noted by ►

Fabricated Reducers

Fabricated Reducers (Male x Male)

Part No.	Size	Std. Ctn. Qty.	Std. Ctn. Wt. (lbs.)
► E952KJ	2 1/2" x 2"	48	28
► E952LJ	3" x 2"	36	21
► E952LK	3" x 2 1/2"	36	31
► E952NL	4" x 3"	15	23
► E952NM	4" x 3 1/2"	15	25
► E952PN	5" x 4"	12	26
► E952RP	6" x 5"	10	31

Plugs

Reducer Plugs

Part No.	Size	Std. Ctn. Qty.	Std. Ctn. Wt. (lbs.)
► E971C	3/4" x 1/2"	100	2
► E971D	1" x 3/4"	100	3

Plugs (Polyethylene)

Part No.	Size	Std. Ctn. Qty.	Std. Ctn. Wt. (lbs.)
► P258H	1 1/2"	50	2
► P258K	2 1/2"	25	1.5

Plugs with Pull Tabs (Polyethylene)

Part No.	Size	Std. Ctn. Qty.	Std. Ctn. Wt. (lbs.)
► P258JT	2	60	3
► P258LT	3	30	3
► P258NT	4	48	8
► P258PT	5	30	6
► P258RT	6	30	9

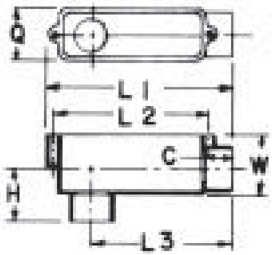
Conduit Bodies

• Hubs are not threaded • Textured lids • Foam-in-place gasket

UL LISTED E42728

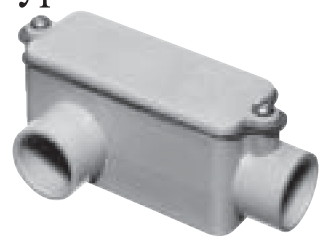
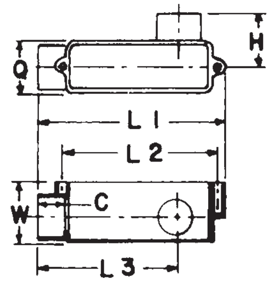
Except where noted by ▶

Type LB

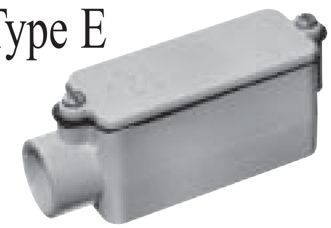
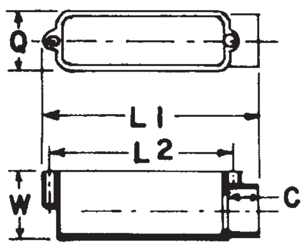
Part No.	Size	Std. Ctn. Qty.	C Typical	Max. L1	L2 Typical	L3 Typical	Max H	Max Q	Max. W	Vol. Cu. In.
E986D-CAR	1/2	10	11/16	4 5/16	3 7/32	3 1/16	1 5/16	1 11/32	1 1/2	4.0
E986E-CAR	3/4	10	29/32	6 9/32	5 9/32	4 25/32	1 25/32	1 3/4	2 1/32	12.0
E986F-CAR	1	10	29/32	6 9/32	5 9/32	4 25/32	1 25/32	1 3/4	2 1/32	12.0
E986G-CAR	1 1/4	5	1 3/32	7 31/32	6 13/32	6	2 5/16	2 1/2	2 3/4	32.0
E986H-CAR	1 1/2	5	1 3/32	7 31/32	6 13/32	6	2 5/16	2 1/2	2 3/4	32.0
E986J	2	10	1 5/32	9 31/32	8 13/32	7 1/4	2 9/16	3 5/32	3 15/32	63.0
▶ E986K	2 1/2	4	1 5/8	14 7/8	13 1/4	11 31/32	3 3/4	4 11/32	4 5/8	210.
▶ E986L	3	4	1 5/8	14 7/8	13 1/4	11 31/32	3 3/4	4 11/32	4 5/8	210.
▶ E986M	3 1/2	4	1 25/32	17 23/32	15 7/8	14 17/64	4 7/16	5 11/32	5 21/32	390.
▶ E986N	4	4	1 25/32	17 23/32	15 7/8	14 17/64	4 7/16	5 11/32	5 21/32	390.

Type LR

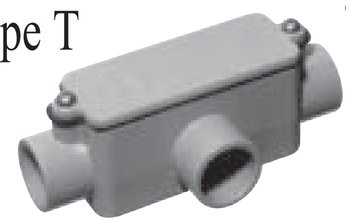
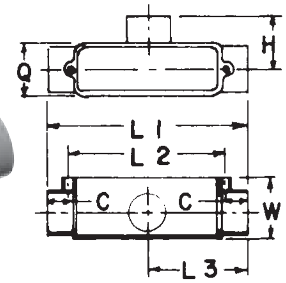
Part No.	Size	Std. Ctn. Qty.	C Typical	Max. L1	L2 Typical	L3 Typical	Max. H	Max. Q	Max. W	Vol. Cu. In.
E985D-CAR	1/2	10	11/16	4 5/16	3 7/32	3 1/16	1 5/16	1 11/32	1 1/2	4.0
E985E-CAR	3/4	10	29/32	6 9/32	5 9/32	4 25/32	1 25/32	1 3/4	2 1/32	12.0
E985F-CAR	1	10	29/32	6 9/32	5 9/32	4 25/32	1 25/32	1 3/4	2 1/32	12.0
E985G-CAR	1 1/4	5	1 3/32	7 31/32	6 13/32	6	2 5/16	2 1/2	2 3/4	32.0
E985H-CAR	1 1/2	5	1 3/32	7 31/32	6 13/32	6	2 5/16	2 1/2	2 3/4	32.0
E985J	2	10	1 5/32	9 9/32	8 13/32	7 1/4	2 9/16	3 5/32	3 15/32	63.0

Type E

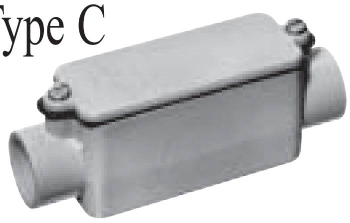
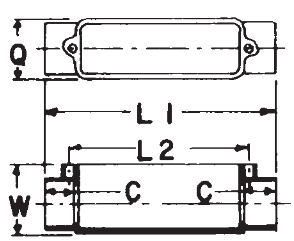
Part No.	Size	Std. Ctn. Qty.	C	L1	L2	Q	W	Vol. Cu. In.
E988D-CAR	1/2	5	11/16	4 5/16	3 1/2	1 11/32	1 1/2	4.0
E988E	3/4	20	29/32	6 11/32	5 9/32	1 3/4	2 1/32	12.0
E988F-CAR	1	10	29/32	6 11/32	5 9/32	1 3/4	2 1/32	12.0
E988G-CAR	1 1/4	5	1 3/32	8	6 13/32	2 1/2	2 3/4	32.0
E988H-CAR	1 1/2	5	1 3/32	8	6 13/32	2 1/2	2 3/4	32.0
E988J	2	5	1 5/32	9 15/32	8 13/32	3 5/32	3 15/32	63.0

Type T

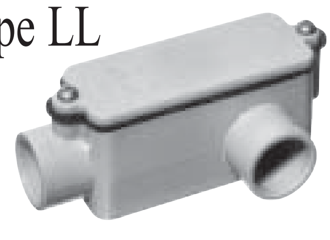
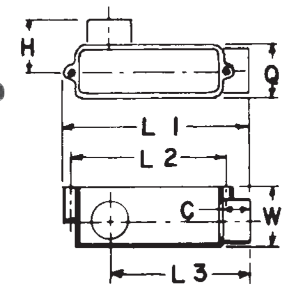
Part No.	Size	Std. Ctn.Qty.	C Typical	Max. L1	L2 Typical	L3 Typical	Max H	Max Q	Max. W	Vol. Cu. In.
E983D-CAR	1/2	10	11/16	4 11/16	3 7/32	2 11/32	1 5/16	1 11/32	1 1/2	4.0
E983E-CAR	3/4	10	29/32	6 7/8	5 9/32	4 7/16	1 25/32	1 3/4	2 1/32	12.0
E983F	1	20	29/32	6 7/8	5 9/32	3 7/16	1 25/32	1 3/4	2 1/32	12.0
E983G	1 1/4	10	1 3/32	8 21/32	6 13/32	4 21/64	2 5/16	2 1/2	2 3/4	32.0
E983H-CAR	1 1/2	4	1 3/32	8 21/32	6 13/32	4 21/64	2 5/16	2 1/2	2 3/4	32.0
E983J	2	10	1 5/32	10 5/16	8 13/32	5 5/32	2 9/16	3 5/32	3 15/16	63.0

Type C

Part No.	Size	Std. Ctn. Qty.	C Typical	Max. L1	L2 Typical	Max Q	Max. W	Vol. Cu. In.
E987D-CAR	1/2	10	11/16	4 11/16	3 1/2	1 11/32	1 1/2	4.0
E987E-CAR	3/4	10	29/32	6 7/8	5 32/64	1 3/4	2 1/32	12.0
E987F-CAR	1	10	29/32	6 7/8	5 9/32	1 3/4	2 1/32	12.0
E987G-CAR	1 1/4	5	1 3/32	8 21/32	6 13/32	2 1/2	2 3/4	32.0
E987H-CAR	1 1/2	4	1 3/32	8 21/32	6 13/32	2 1/2	2 3/4	32.0
E987J	2	15	1 5/32	10 5/16	8 13/32	3 5/32	3 15/32	63.0

Type LL

Part No.	Size	Std. Ctn. Qty.	C Typical	Max. L1	L2 Typical	L3 Typical	Max H	Max Q	Max. W	Vol. Cu. In.
E984D-CAR	1/2	10	11/16	4 5/16	3 7/32	3 1/16	1 5/16	1 11/32	1 1/2	4.0
E984E-CAR	3/4	8	2 29/32	6 9/32	5 9/32	4 25/32	1 25/32	1 3/4	2 1/32	12.0
E984F-CAR	1	10	2 29/32	6 9/32	5 9/32	4 25/32	1 25/32	1 3/4	2 1/32	12.0
E984G-CAR	1 1/4	5	1 3/32	7 31/32	6 13/32	6	2 5/16	2 1/2	2 3/4	32.0
E984H-CAR	1 1/2	5	1 3/32	7 31/32	6 13/32	6	2 5/16	2 1/2	2 3/4	32.0
E984J	2	10	1 5/32	9 9/32	8 13/32	7 1/4	2 9/16	3 5/32	3 15/32	63.0
E984J-CAR	2	3	1 5/32	9 9/32	8 13/32	7 1/4	2 9/16	3 5/32	3 15/32	63.0

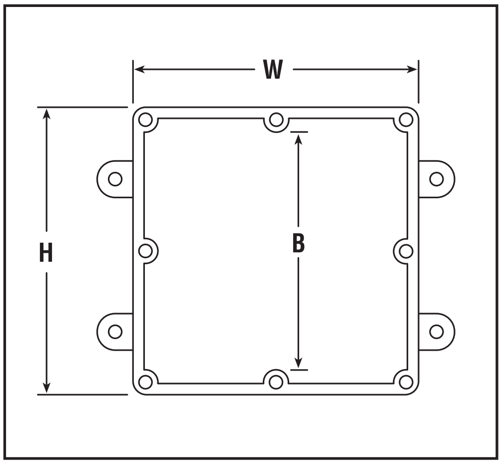
Molded Nonmetallic Junction Boxes 6P Rated

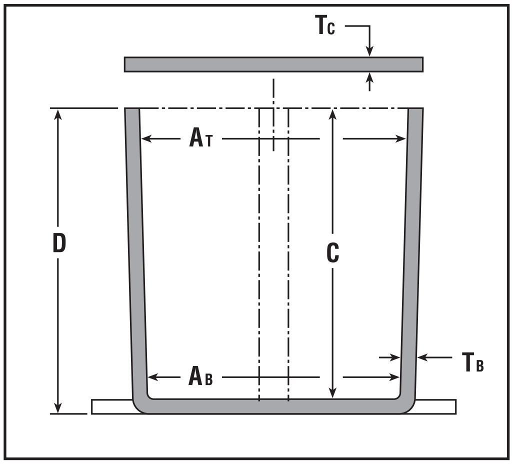
Except where noted by ✝

LISTED E42728

It's another first from Carlon® - the first nonmetallic junction boxes UL Listed with a NEMA 6P rating per Section 314.29, Exception of the National Electrical Code. Manufactured from PVC or PPO thermoplastic molding compound and featuring foam-in-place gasketed lids attached with stainless steel screws, these rugged enclosures offer all the corrosion resistance and physical properties you need for direct burial applications.

Type 6P enclosures are intended for indoor or outdoor use, primarily to provide a degree of protection against contact with enclosed equipment, falling dirt, hose-directed water, entry of water during prolonged submersion at a limited depth, and external ice formation.





- All Carlon Junction Boxes are UL Listed and maintain a minimum of a NEMA Type 4/4x Rating.
- Parts numbers with an asterisk (*) are UL Listed and maintain a NEMA Type 6P Rating and Type 4/4X Rating.

Part No.	Size in Inches H x W x D	Std. Ctn. Qty.	Min A_T	Min. A_B	Min. B	Min. C	Ta (Typical)	Tc (Typical)	Material PVC	Material Thermo-plastic	Std. Ctn. Wt. (Lbs.)
E989NNJ-CAR*	4 x 4 x 2	5	3 11/16	3 5/8	N/A	2	.160	.155	X		3
E987N-CAR*	4 x 4 x 4	5	3 11/16	3 1/2	N/A	4	.160	.155	X		4
✝E989NNR-CAR*	4 x 4 x 6	4	3 11/16	3 3/8	N/A	6	.160	.200	X		5
E989PPJ-CAR*	5 x 5 x 2	4	4 11/16	4 1/2	N/A	2	.110	.150		X	3
E987R-CAR*	6 x 6 x 4	2	6	5 5/8	N/A	4	.190	.190		X	3
E989RRR-UPC*	6 x 6 x 6	8	5 5/8	5 3/8	N/A	6	.160	.150		X	14
E989N-CAR	8 x 8 x 4	1	8	8	N/A	4	.185	.190		X	2
E989SSX-UPC	8 x 8 x 7	2	7 21/32	7 5/16	N/A	7	.160	.150		X	6
E989UUN	12 x 12 x 4	3	11 5/8	11 1/2	11 1/8	4	.160	.150		X	12
E989R-UPC	12 x 12 x 6	2	11 15/16	11 7/8	11 7/16	6	.265	.185		X	10

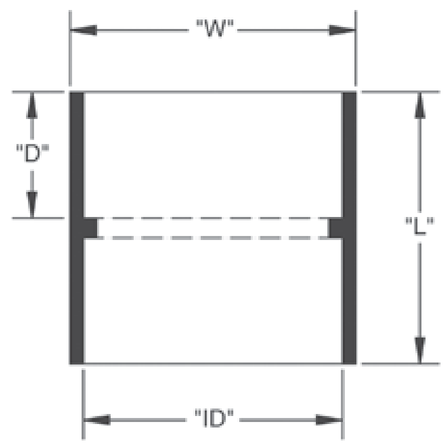
Standard UL Coupling

Part Number	Trade Size	Carton Qty.	"W"	"L"	"ID"	"D"
6141623	1/2	200	1.063	1.500	.875	.625
6141624	3/4	125	1.313	1.563	1.063	.625
6141625	1	70	1.625	2.000	1.313	1.000
6141626	1-1/4	40	2.000	2.125	1.688	1.000
6141627	1-1/2	30	2.250	2.375	1.938	1.063
6141628	2	40	2.688	2.600	2.375	1.192
6141629	2-1/2	20	3.250	3.500	2.875	1.750
6141630	3	40	4.000	3.875	3.500	1.188
6141631	3-1/2	30	4.1250	4.000	4.000	1.938
6141632	4	20	5.000	4.188	4.500	2.000
6141633	5	10	6.125	5.375	5.625	2.500
6141634	6	8	7.250	6.375	6.625	3.000
* 6141635D	8	1	--	--	--	--

* Not UL Listed

Dimensions are nominal

A connector used to join lengths of conduit pipe. The fitting consists of two solvent weld female ends with a center stop. Both pieces of pipe should seat at the stop for proper positioning.



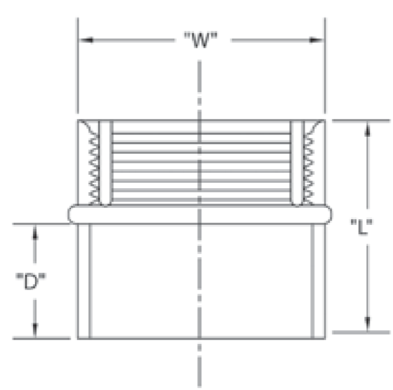
Female Adapter

Part Number	Trade Size	Carton Qty.	"W"	"L"	"D"
5140043	1/2	200	1.000	1.438	.688
5140044	3/4	125	1.250	1.625	.688
5140045	1	70	1.563	1.875	.875
5140046	1-1/4	40	2.000	1.938	.938
5140047	1-1/2	30	2.250	2.125	.938
5140048	2	40	2.688	2.125	.938
5140049	2-1/2	20	3.313	3.000	1.313
5140050	3	40	4.000	3.063	1.250
5140051	3-1/2	30	4.500	3.000	1.188
5140052	4	20	5.000	3.250	1.375
5140053	5	10	6.125	3.688	1.313
5140054	6	8	7.250	4.375	1.625
* 5140055D	8	2	9.313	7.000	2.250

* Not UL Listed

Dimensions are nominal

A connector often used to transition threaded metal conduit to PVC conduit. It can also be used to join PVC to PVC. The fittings consist of two female ends. One end is threaded and the other is solvent weld. Both ends will fit the same diameter conduit.

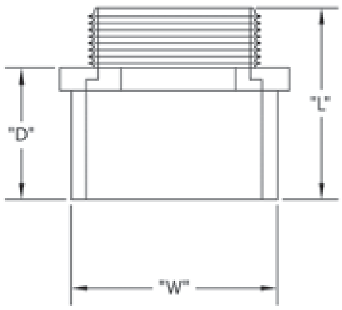


Schedule 40 / Schedule 80 Fittings & Accessories

Terminal (Male) Adapter

A connector used to transition from plain end PVC conduit to a threaded metal or plastic female bell. Can also be used to connect PVC conduit to a box or other threaded body with use of a lock nut. The fitting consists of one solvent weld female end and one threaded male end. Both ends will fit the same diameter conduit.

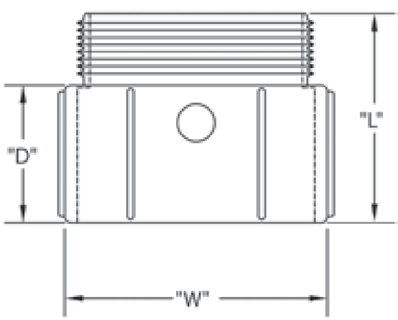
1/2" thru 1-1/2" Terminal (Male) Adapter



Part Number	Trade Size	Carton Qty.	"W"	"L"	"D"
5140103	1/2	200	1.063	1.688	1.125
5140104	3/4	125	1.250	1.750	1.188
5140105	1	70	1.625	2.188	1.500
5140106	1-1/4	40	2.000	2.125	1.313
5140107	1-1/2	30	2.000	2.063	1.313

Dimensions are nominal

2" thru 6" Terminal (Male) Adapter

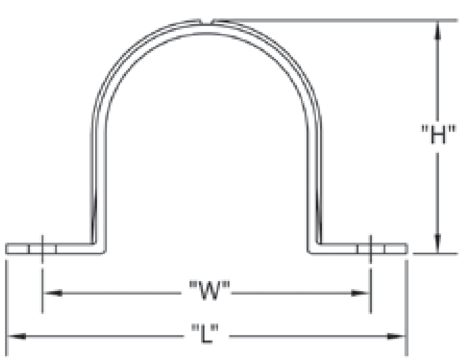


Part Number	Trade Size	Carton Qty.	"W"	"L"	"D"
5140108	2	40	2.688	2.188	1.375
5140109	2-1/2	20	3.313	2.875	2.000
5140110	3	40	3.938	3.000	2.188
5140111	3-1/2	30	4.500	3.188	2.563
5140112	4	20	5.000	3.438	2.563
5140113	5	10	6.250	4.750	3.000
5140114	6	8	7.313	4.938	2.688
5140115D	8	2	--	--	--

Dimensions are nominal

Conduit Clamps (Pipe Straps)

A u-shaped conduit support device used to anchor conduit to interior or exterior surfaces. Two holes in the feet of the clamp allow mounting with screws or nails.



Part Number	Trade Size	Carton Qty.	"W"	"L"	"H"
5133736	1/2	300	1.688	2.188	1.000
5133737	3/4	200	2.000	2.500	1.250
5133738	1	200	2.250	2.813	1.500
5133733	1-1/4	200	2.500	3.125	1.813
5133734	1-1/2	200	2.688	3.375	2.125
5133735	2	200	3.313	4.000	2.563
5133739	2-1/2	100	4.563	5.500	3.000
5133740	3	100	5.125	6.000	3.563
5133353	4	100	6.000	7.000	4.625

Dimensions are nominal

Schedule 40 / Schedule 80 Fittings & Accessories

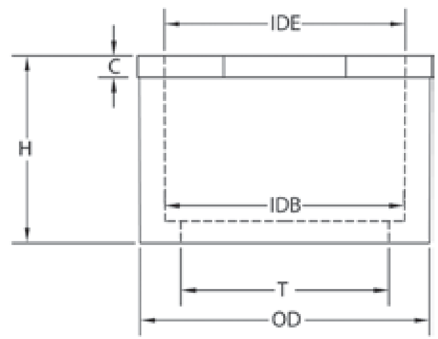
Reducers

Part Number	Trade Size	Carton Qty.	"H"	"C"	"T"	"OD"	"IDE"	"IDB"
5142220	3/4 x 1/2	100	1.000	.120	.630	1.050	.852	.836
5142230	1 x 1/2	100	--	--	--	--	--	--
5142221	1 x 3/4	100	1.180	.120	.834	1.315	1.064	1.046
5142222	1-1/4 x 1	50	1.420	.140	1.059	1.660	1.330	1.310
5142251	1-1/2 x 1	25	--	--	--	--	--	--
5142223*	1-1/2 x 1-1/4	50	1.370	.180	1.392	1.900	1.677	1.655
5142224*	2 x 1-1/2	25	1.600	.250	1.622	2.375	1.918	1.894
5142225*	2-1/2 x 2	25	1.900	.250	2.076	2.875	2.391	2.370
5140867	3 x 2	25	2.24	.250	2.085	3.500	2.393	2.362
5142226*	3 x 2-1/2	25	2.250	.250	2.484	3.500	2.890	2.868
5142227*	4 x 3	20	2.600	.370	3.083	4.500	3.515	3.492
5142229*	4 x 3-1/2	20	2.600	.400	3.598	4.500	4.015	3.992

* CSA Certified

Dimensions are nominal

A bushing designed to fit into a bell end or female fitting to reduce from one diameter to the next smaller conduit diameter. Male and female elements of the bushing are solvent weld.



Box Adapters

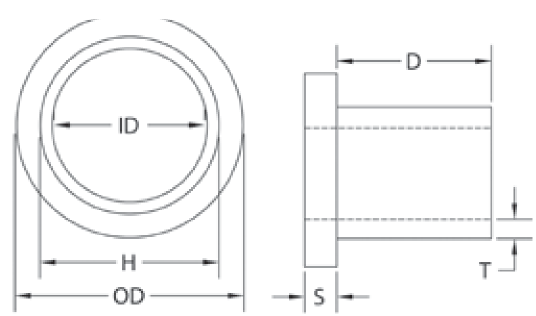
Part Number	Trade Size	Carton Qty.	"D" (Min)	"S" (Min)	"OD"	"ID" (Min)	"H"	"T" (Min)
5133715	1/2	100	.700	.140	1.200	.578	.840	.095
5133716	3/4	100	.725	.140	1.400	.780	1.050	.095
5133717	1	100	.950	.140	1.700	1.004	1.315	.100
5133718	1-1/4	50	.990	.250	2.000	1.335	1.660	.120
5133719	1-1/2	50	1.100	.200	2.000	1.564	1.900	.120
5133720	2	25	1.175	.200	2.750	2.021	2.375	.130
5133721*	2-1/2	10	1.650	.300	3.350	2.424	2.875	.165
5133722	3	10	1.800	.325	4.200	3.008	3.500	.216
5133723*	3-1/2	10	1.870	.325	4.500	3.486	4.000	.226
5133724*	4	10	2.020	.250	4.910	3.961	4.500	.237

* CSA Certified

Dimensions are nominal

Meets NEMA TC3 Requirements
Made of Rigid PVC

Adapter used with the hub inside a box or enclosure. The cylinder protrudes through a hole in the box wall and is solvent welded to a female fitting outside the box or enclosure.



CANTEX

CANTEX INC. 301 COMMERCE STE. 2700 FORT WORTH, TEXAS 76102 817-215-7000 FAX: 817-215-7001 www.cantexinc.com

Rigid Nonmetallic Sch. 40 Elbows - Standard Radius

Schedule 40 90° Elbow - Plain End

Part Number	Trade Size	Carton Qty.	“R”	“O”	“H’	“S” MIN	“L”
5133823	1/2	50	4.000	4.000	4.000	1.500	6.250
5133824	3/4	35	4.500	4.500	4.500	1.500	7.125
5133825	1	20	5.750	5.750	5.750	1.875	9.000
5133826	1-1/4	30	7.250	7.250	7.250	2.000	11.375
5133827	1-1/2	30	8.250	8.250	8.250	2.000	13.000
5133828	2	15	9.500	9.500	9.500	2.000	15.000
5133829	2-1/2	18	10.500	10.500	10.500	3.000	16.500
5133830	3	14	13.000	13.000	13.000	3.125	20.375
5133831	3-1/2	12	15.000	15.000	15.000	3.250	23.500
5133832	4	10	16.000	16.000	16.000	3.375	25.125
5133835	5	30*	24.000	24.000	24.000	3.625	37.625
5133834	6	25*	30.000	30.000	30.000	3.750	47.125

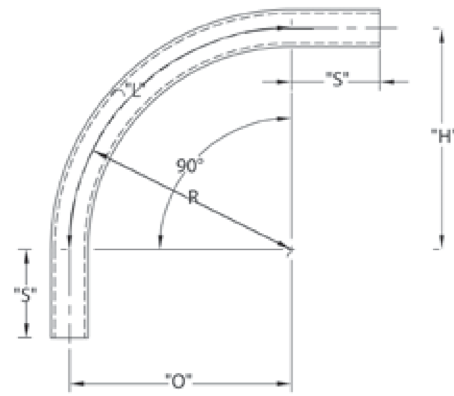
* Pallet Quantity

Dimensions are nominal

Conforms to UL651 and NEMA TC3

Material is Rigid PVC

Bend Tolerance is ±2°



Schedule 40 45° Elbow - Plain End

Part Number	Trade Size	Carton Qty.	“R”	“O”	“H’	“S” MIN	“L”
5133763	1/2	50	4.000	1.188	2.875	1.500	3.125
5133764	3/4	25	4.500	1.313	3.188	1.500	3.500
5133765	1	20	5.750	1.688	4.000	1.875	4.500
5133766	1-1/4	25	7.250	2.125	5.125	2.000	5.688
5133767	1-1/2	20	8.250	2.375	5.875	2.000	6.500
5133768	2	10	9.500	2.813	6.750	2.000	7.500
5133769	2-1/2	20	10.500	2.563	7.375	3.000	8.250
5133770	3	8	13.000	3.813	9.188	3.125	10.250
5133771	3-1/2	5	15.000	4.375	10.625	3.250	11.875
5133772	4	20	16.000	4.688	11.438	3.375	12.625
5133773	5	30*	24.00	7.000	17.000	3.625	18.875
5133774	6	25*	30.000	8.813	21.250	3.750	22.875

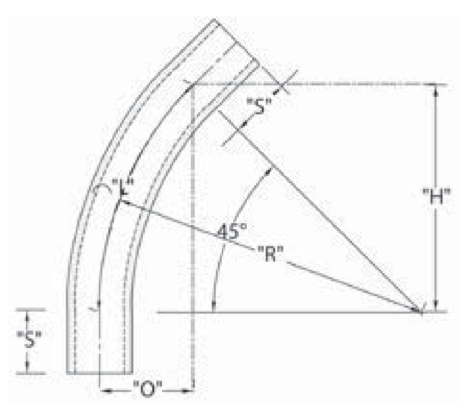
* Pallet Quantity

Dimensions are nominal

Conforms to UL651 and NEMA TC3

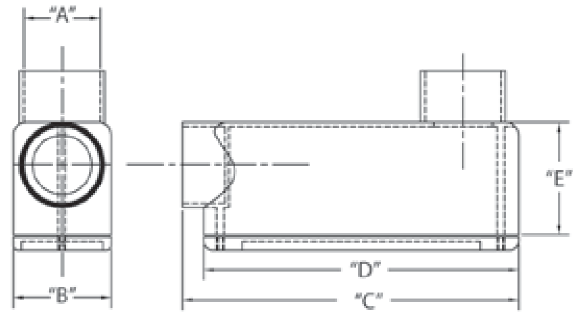
Material is Rigid PVC

Bend Tolerance is ±2°



Conduit Bodies - Type LB

1/2" THROUGH 2"



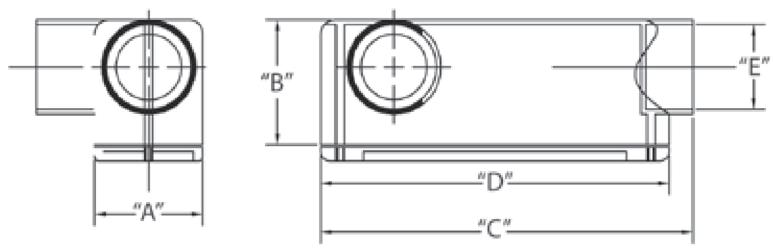
2-1/2" THROUGH 4"

Part Number	Trade Size	Carton Quantity	"A"	"B"	"C"	"D'	"E"	Volume Cu. In.	3-Wire Fill
5133663	1/2	25	.875	1.313	4.188	4.000	1.438	4.3	#6 or smaller
5133664	3/4	15	1.063	1.500	4.938	4.625	1.625	6.5	#6 or smaller
5133665	1	10	1.313	1.750	5.875	5.375	2.000	11.8	#6 or smaller
5133666	1-1/4	10	1.688	2.500	7.563	7.188	2.375	25.0	XHHW #1
5133667	1-1/2	10	1.875	2.625	8.563	8.000	2.750	36.5	XHHW #2/0
5133668	2	5	2.375	3.125	9.813	9.563	3.375	63.5	XHHW #4/0
5133669	2-1/2	5	2.875	4.625	15.000	12.875	4.563	198.0	XHHW 500 MCM
5133670	3	5	3.643	4.625	15.125	12.875	4.563	198.0	XHHW 500 MCM
5133671	3-1/2	4	4.000	5.625	16.188	12.875	5.500	305.0	XHHW 500 MCM
5133672	4	4	4.000	5.625	16.188	12.875	5.500	305.0	XHHW 500 MCM

Dimensions are nominal

Conduit Bodies - Type LL

1/2" THROUGH 2"



2-1/2" THROUGH 4"

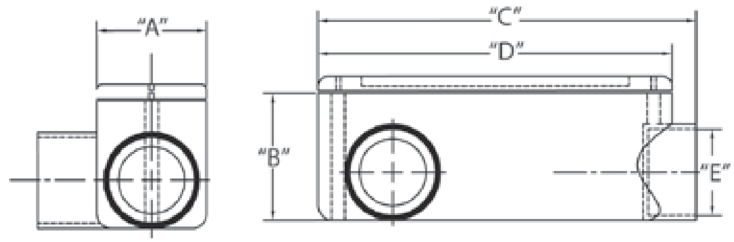
Part Number	Trade Size	Carton Quantity	"A"	"B"	"C"	"D'	"E"	Volume Cu. In.	3-Wire Fill
5133660	1/2	25	1.313	1.438	4.250	4.000	.875	4.3	#6 or smaller
5133661	3/4	15	1.500	1.625	4.938	4.625	1.063	6.5	#6 or smaller
5133662	1	10	1.750	2.000	6.000	5.375	1.313	11.8	#6 or smaller
5133649	1-1/4	10	2.438	2.438	7.625	7.188	1.625	25.0	XHHW #1
5133648	1-1/2	10	2.625	2.813	8.563	8.000	1.938	36.5	XHHW #2/0
5133647	2	5	3.063	3.438	9.875	9.500	2.375	63.5	XHHW #4/0
5133644	2-1/2	5	4.625	4.625	14.938	12.750	2.875	198.0	XHHW 500 MCM
5133646	3	5	4.625	4.625	15.000	12.813	3.500	198.0	XHHW 500 MCM
5133640	3-1/2	4	5.625	5.500	16.188	12.813	4.000	305.0	XHHW 500 MCM
5133645	4	4	5.625	5.500	15.938	12.813	4.500	305.0	XHHW 500 MCM

Dimensions are nominal

Rigid Nonmetallic PVC Conduit Bodies

Conduit Bodies - Type LR

1/2” THROUGH 2”



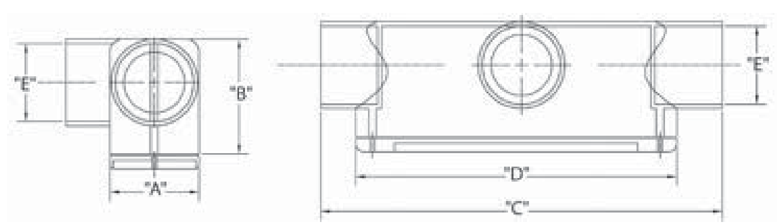
2-1/2” THROUGH 4”

Part Number	Trade Size	Carton Quantity	“A”	“B”	“C”	“D’	“E”	Volume Cu. In.	3-Wire Fill
5133650	1/2	25	1.313	1.438	4.250	4.000	.875	4.3	#6 or smaller
5133651	3/4	15	1.500	1.625	4.938	4.625	1.063	6.5	#6 or smaller
5133652	1	10	1.750	2.000	6.000	5.375	1.313	11.8	#6 or smaller
5133653	1-1/4	10	2.438	2.438	7.625	7.188	1.625	25.0	XHHW #1
5133654	1-1/2	10	2.625	2.813	8.563	8.000	1.938	36.5	XHHW #2/0
5133655	2	5	3.063	3.438	9.875	9.500	2.375	63.5	XHHW #4/0
5133658	2-1/2	5	4.625	4.625	14.938	12.750	2.875	198.0	XHHW 500 MCM
5133656	3	5	4.625	4.625	15.000	12.813	3.500	198.0	XHHW 500 MCM
5133659	3-1/2	4	5.625	5.500	16.188	12.813	4.000	305.0	XHHW 500 MCM
5133657	4	4	5.625	5.500	15.938	12.813	4.500	305.0	XHHW 500 MCM

Dimensions are nominal

Conduit Bodies - Type T

1/2” THROUGH 2”



2-1/2” THROUGH 4”

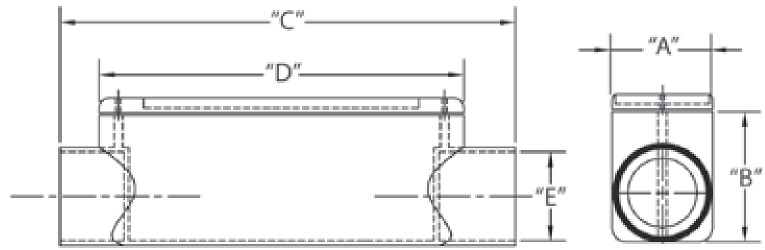
Part Number	Trade Size	Carton Quantity	“A”	“B”	“C”	“D’	“E”	Volume Cu. In.	3-Wire Fill
5133563	1/2	25	1.938	1.500	4.625	4.000	.875	4.3	#6 or smaller
5133564	3/4	15	1.500	1.688	5.375	4.625	1.063	6.5	#6 or smaller
5133565	1	10	1.750	2.000	6.563	5.375	1.313	11.8	#6 or smaller
5133566	1-1/4	10	2.500	2.500	8.188	7.188	1.688	25.0	XHHW #1
5133567	1-1/2	10	2.625	2.813	9.250	8.000	1.938	36.5	XHHW #2/0
5133568	2	5	3.125	3.375	10.375	9.500	2.375	63.5	XHHW #4/0
5133569	2-1/2	2	4.625	4.625	19.000	12.875	3.500	198.0	XHHW 500 MCM
5133570	3	2	4.625	4.625	19.000	12.875	3.500	198.0	XHHW 500 MCM
5133572	3-1/2	1	5.563	5.563	20.375	13.750	4.000	305.0	XHHW 500 MCM
5133571	4	1	5.563	5.563	20.375	13.875	4.500	305.0	XHHW 500 MCM

Dimensions are nominal

Conduit Bodies - Type C

1/2" THROUGH 2"

2-1/2" THROUGH 4"



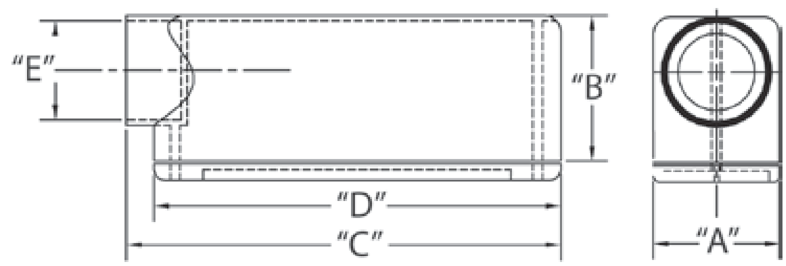
Part Number	Trade Size	Carton Quantity	"A"	"B"	"C"	"D'	"E"	Volume Cu. In.	3-Wire Fill
5133101	1/2	25	1.938	1.500	4.625	4.000	.875	4.3	#6 or smaller
5133102	3/4	15	1.500	1.688	5.375	4.625	1.063	6.5	#6 or smaller
5133103	1	10	1.750	2.000	6.563	5.375	1.313	11.8	#6 or smaller
5133104	1-1/4	10	2.500	2.500	8.188	7.188	1.688	25.0	XHHW #1
5133105	1-1/2	10	2.625	2.813	9.250	8.000	1.938	36.5	XHHW #2/0
5133106	2	5	3.125	3.375	10.375	9.500	2.375	63.5	XHHW #4/0
5133108	2-1/2	5	4.625	4.625	19.000	12.875	2.875	198.0	XHHW 500 MCM
5133107	3	5	4.625	4.625	19.000	12.875	3.500	198.0	XHHW 500 MCM
5133110	3-1/2	4	5.563	5.563	20.375	13.750	4.000	305.0	XHHW 500 MCM
5133109	4	4	4.000	5.563	20.188	13.875	4.500	305.0	XHHW 500 MCM

Dimensions are nominal

Conduit Bodies - Type E

1/2" THROUGH 2"

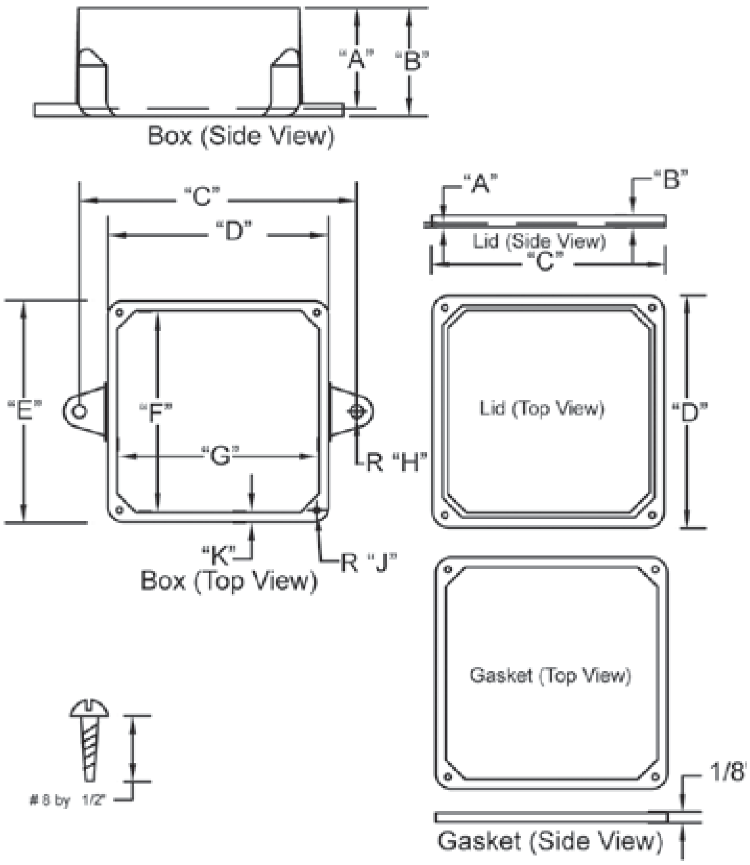
2-1/2" THROUGH 4"



Part Number	Trade Size	Carton Quantity	"A"	"B"	"C"	"D'	"E"	Volume Cu. In.	3-Wire Fill
5133151	1/2	25	1.313	1.438	4.250	4.000	.875	4.3	#6 or smaller
5133152	3/4	15	1.500	1.625	4.938	4.625	1.063	6.5	#6 or smaller
5133153	1	10	1.750	2.000	6.000	5.375	1.313	11.8	#6 or smaller
5133154	1-1/4	10	2.438	2.438	7.625	7.188	1.625	25.0	XHHW #1
5133155	1-1/2	10	2.625	2.813	8.563	8.000	1.938	36.5	XHHW #2/0
5133156	2	5	3.063	3.438	9.875	9.500	2.375	63.5	XHHW #4/0
5133157	2-1/2	5	4.625	4.625	14.938	12.750	2.875	198.0	XHHW 500 MCM
5133158	3	5	4.625	4.625	15.000	12.813	3.500	198.0	XHHW 500 MCM
5133160	3-1/2	4	5.625	5.500	16.188	12.813	4.000	305.0	XHHW 500 MCM
5133159	4	4	5.625	5.500	15.938	12.813	4.500	305.0	XHHW 500 MCM

Dimensions are nominal

Junction Box



Molded Junction Box

UL Catagory - QCUP
UL File #E205935
Control #92CM

Fabricated Junction Box

Part Number	Trade Size	Description	Carton Qty.	Junction Box Base										Cover				Screws
				"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"	"J"	"K"	"A"	"B"	"C"	"D"	
5133705[1]	4x4x2	Molded	10	2.000	2.150	5.375	4.400	4.400	4.000	4.000	.250	.125	.160	.240	.370	4.375	4.375	#8 x 1/2"
5133709[1]	4x4x4	Molded	10	4.000	4.150	5.375	4.400	4.400	4.000	4.000	.250	.188	.160	.240	.700	4.375	4.375	#8 x 1/2"
5133707[1]	4x4x6	Molded	10	6.000	6.150	5.375	4.400	4.400	4.000	4.000	.250	.188	.160	.240	.370	4.375	4.375	#8 x 1/2"
5133706[1]	5x5x2	Molded	10	2.000	2.170	6.375	5.375	5.375	5.000	5.000	.250	.188	.170	.180	.267	5.375	5.375	#8 x 1/2"
5133710[1]	6x6x4	Molded	10	4.000	4.200	7.375	6.438	6.438	6.000	6.000	.250	.188	.220	.180	.350	6.750	6.750	#8 x 1/2"
5133711[1]	6x6x6	Molded	5	6.000	6.250	7.375	6.438	6.438	6.000	6.000	.250	.188	.220	.180	.350	6.750	6.750	#8 x 1/2"
5133712[1]	8x8x4	Molded	5	4.000	4.250	9.375	8.625	8.625	8.000	8.000	.250	.188	.220	.180	.350	9.000	9.000	#10 x 3/4"
5133164[1]	8x8x6	Molded	4	6.000	6.250	9.375	8.625	8.625	8.000	8.000	.250	.188	.220	.180	.350	9.000	9.000	#10 x 3/4"
5133708[1]	8x8x7	Molded	4	7.000	7.250	9.375	8.625	8.625	8.000	8.000	.250	.188	.220	.180	.350	9.000	9.000	#10 x 3/4"
5133714[1]	12x12x4	Molded	2	4.000	4.250	13.625	12.625	12.625	11.875	11.875	.250	.188	.220	.220	.437	13.000	13.000	#10 x 3/4"
5133713[1]	12x12x6	Molded	2	6.000	6.250	13.750	12.625	12.625	11.875	11.875	.250	.188	.220	.220	.437	13.000	13.000	#10 x 3/4"
**5133163	16x14x6	Fab	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
*5133165	24x18x8	Fab	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
*5133161	24x18x12	Fab	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
*5133166	24x24x8	Fab	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
*5133173	36x24x8	Fab	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Dimensions are nominal

* Not UL Listed - 4X NEMA Rating

** UL Listed with only a Type 1 NEMA Rating

1. NEMA Ratings for Types, 1, 3, 3S, 4, 4X, 5, 6, and 6P

Rigid Nonmetallic Schedule 40 Conduit

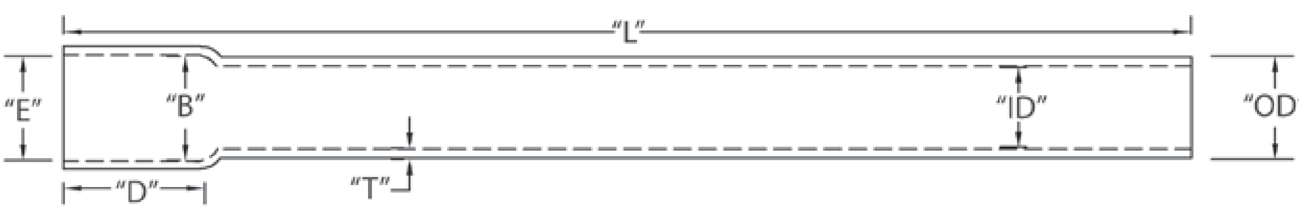
Meets specifications of UL 651 and NEMA TC2
Rated for 90°C Cable
Sunlight Resistant
10’ Lengths

Nonmetallic PVC Schedule 40 Conduit
Belled End - 10’ Lengths

Part No.	Size	Feet per Pack	T Min	OD	ID Min	E	B	D Nom	L Min
A52AE12	1/2	6,000	.109	.840	.578	.852	.836	1.500	120
A52AE12H	1/2	3,000	.109	.840	.578	.852	.836	1.500	120
A52AG12	3/4	4,400	.113	1.050	.780	1.064	1.046	1.750	120
A52AG12H	3/4	2,200	.113	1.050	.780	1.064	1.046	1.750	120
A52BA12	1	3,600	.133	1.315	1.004	1.330	1.310	2.000	120
A52BA12H	1	1,800	.133	1.315	1.004	1.330	1.310	2.000	120
A52BC12	1-1/4	3,300	.140	1.660	1.335	1.677	1.655	2.250	120
A52BC12H	1-1/4	1,650	.140	1.660	1.335	1.677	1.655	2.250	120
A52BE12	1-1/2	2,250	.145	1.900	1.564	1.918	1.894	2.500	120
A52BE12H	1-1/2	900	.145	1.900	1.564	1.918	1.894	2.500	120
A52CA12	2	1,400	.154	2.375	2.021	2.393	2.369	3.000	120
A52CE12	2-1/2	930	.203	2.875	2.414	2.890	2.868	3.250	120
A52DA12	3	880	.216	3.500	3.008	3.515	3.492	3.750	120
A52DE12	3-1/2	630	.226	4.000	3.486	4.015	3.992	4.000	120
A52EA12	4	570	.237	4.500	3.961	4.515	4.491	4.500	120
A52FA12	5	380	.258	5.563	4.975	5.593	5.553	5.500	120
A52GA12	6	260	.280	6.625	5.986	6.658	6.614	6.125	120
A52JA12*	8	180	.322	8.625	7.853	8.670	8.610	6.375	120

* Not ETL Listed

Dimensions are nominal



Note: 20’ length available on request with the exception of the 1/2 inch conduit sizes.
Schedule 40 conduit complies with federal and military specifications by conforming to UL 651

Miniature Circuit Breakers FAZ-NA, FAZ-RT, FAZ-DU

SG56912

FAZ-NA/-RT/-DU

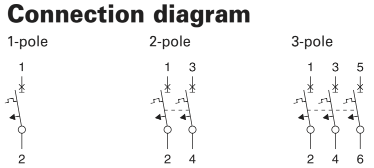
- According to UL 489, CSA C22.2 No. 5 and also IEC 60947-2 standard
- For Applications, wich are permitted for UL 1077 or CSA C22.2 No. 235
- Auxiliary switch and voltage trips suitable for subsequent installation
- Serie with removable terminal screws (Type FAZ-..-RT/-DU), for use with ring cable lug
- Contact position indicator red - green
- Easy mounting at DIN-rail

Specifications FAZ-NA, -RT, -DU

Technical data UL

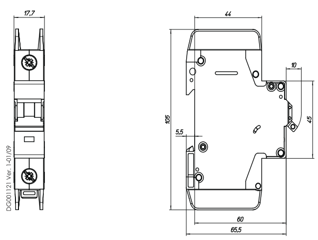
		FAZ-...-NA, -RT, -DU
Productstandard		UL 489 CSA C22.2 No. 5-02
Number of poles		1, 2, 3
Mechanical specifications		
Device width		0.697 in. (1-pole), 1.394 in. (2-poles), 2.090 in. (3-poles)
Frame size		1.772 in.
Socket size		4.134 in.
Device depth		2.362 in.
Terminals		lift terminal / ring-tongue
Terminal capacity		1 Wire: #18-6 AWG (Cu only) 2 Wires: #18-10 AWG (Cu only)
Terminal screw		M5 (with slotted screw Pozidriv PZ2)
Terminal torque		#18-12 AWG: 21 lb-in #10-8 AWG: 25 lb-in #6 AWG: 36 lb-in
Snap on fixing		tristable (on DIN Rail acc. to IEC/EN 60715)
Contact position indicator		red / green
Electrical specifications		
Rated voltage	U_n	0.5-32 A: 480Y/277 V AC, 35-40 A: 240 V AC
Rated current	I_n	0.5, 1, 1.5, 2, 3, 4, 5, 6, 7, 8, 10, 13, 15, 16, 20, 25, 30, 32, 35, 40 A
Tripping characteristic		
Conventional non-tripping current		I_{nt}=1.00 I_n
Conventional tripping current		I_t=1.35 I_n
Reference temperature		40 °C
Temperature factor		0.5% /K
Instantaneous tripping current	I_{mt}	type C: 5 $I_n < I_{mt} = 10\ I_n$:t (I_{mt}) < 0.1 sec type D: 10 $I_n < I_{mt} = 20\ I_n$:t (I_{mt}) < 0.1 sec
Current interrupting rating		10 kA, 14 kA (types D13, B/C/D15, 16, 20, B/C25 A)
Current-Limiting at 240 V / 10 kA		1p, 2p, 3p to I^2t = 43 kA^2s and I_{peak} = 6.2 kA
Current-Limiting at 480Y/277 V / 10 kA		1p, 2p, 3p to I^2t = 60 kA^2s and I_{peak} = 6.2 kA
Current-Limiting at 480Y/277 V / 14 kA		1p, 2p, 3p to I^2t = 65 kA^2s and I_{peak} = 7.5 kA
Selectivity class		3 (acc. to EN 60898)
Number of electrical operations		6000
Number of mechanical operations		10000
Climatic conditions		acc. to IEC 68-2 (25..55°C / 90..95% RH)
Operating temperature range		-5°C to +40°C

Connection diagram

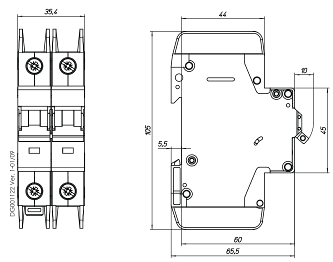


Dimensions (mm) FAZ-...-NA, -RT, -DU

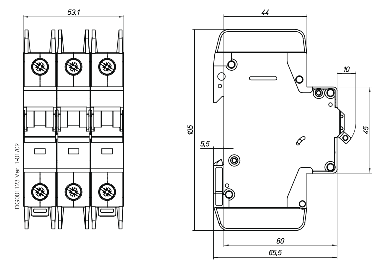
1-pole



2-pole

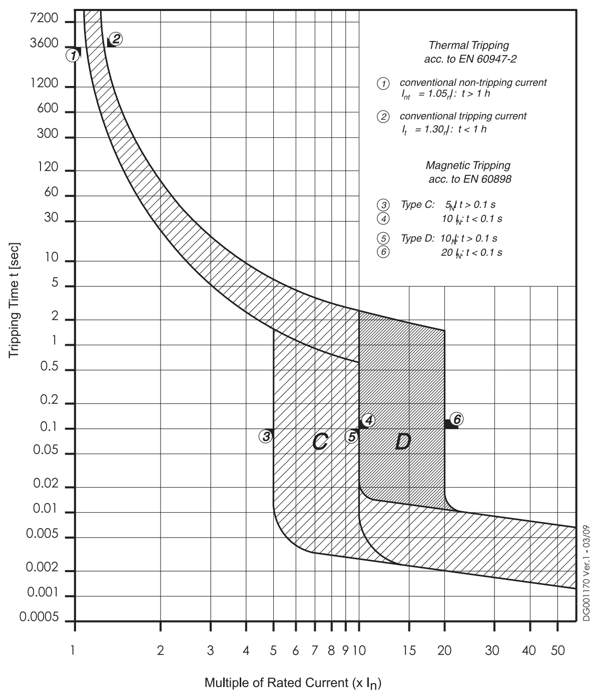


3-pole

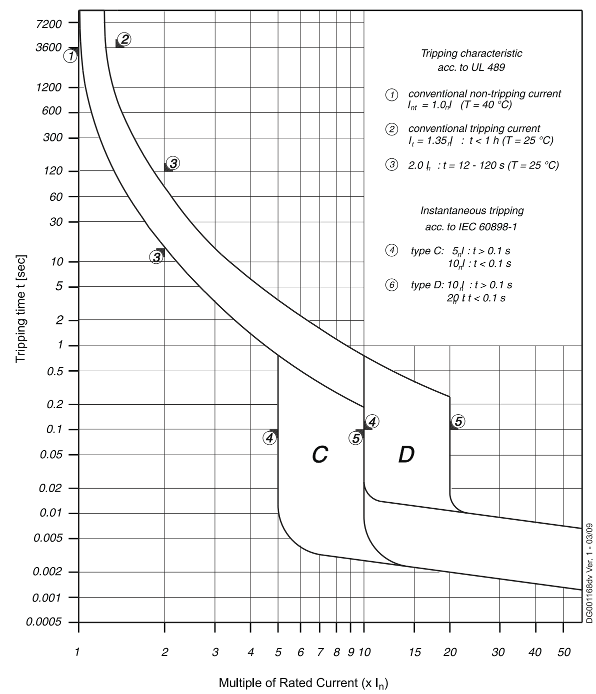


Tripping Characteristic FAZ-...-NA, -RT, -DU

Characteristics C and D - EN/IEC 60947-2



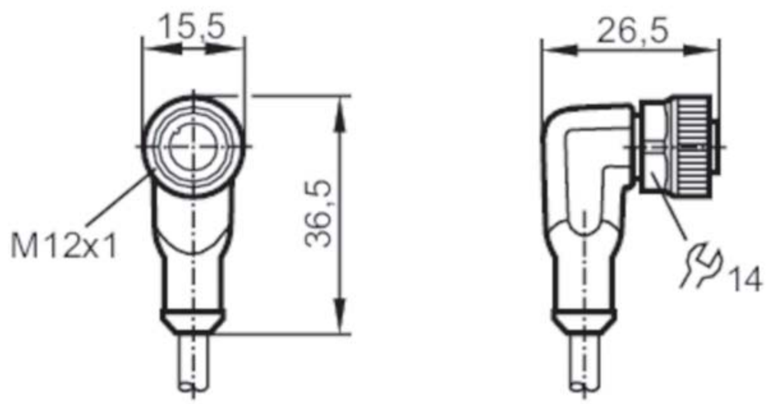
Characteristics C and D - UL 489



EVC006

Female cordset

ADOAH040MSS0010H04



CE cULus LISTED

Application		
Free from silicone		yes

Electrical data		
Operating voltage	[V]	< 250 AC / < 300 DC
Protection class		II
Max. current load total	[A]	4

Operating conditions		
Ambient temperature	[°C]	-25...90
Note on ambient temperature		cULus: ...75
Ambient temperature (moving)	[°C]	-25...90
Note on ambient temperature (moving)		cULus: ...75
Protection		IP 65; IP 67; IP 68; IP 69K

Mechanical data			
Weight	[g]	326	
Dimensions	[mm]	26.5 x 15.5 x 36.5	
Material		housing: TPU (urethane) orange; sealing: FKM	
Material nut		brass	
Drag chain suitability		Bending radius for flexible applications	min. 10 x cable diameter
		Travel speed	max. 3.3 m/s for a horizontal travel length of 5 m and max. acceleration of 5 m/s²
		Bending cycles	> 5 Mio.
		Torsional strain	± 180 °/m
Drag chain suitability		yes	

EVC006

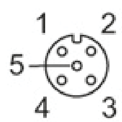
Female cordset

ADOAH040MSS0010H04

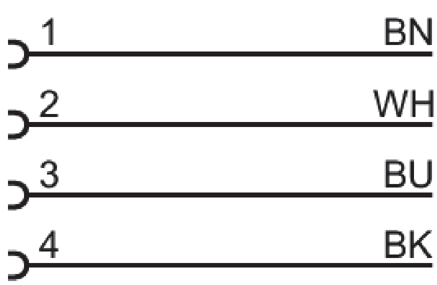
Remarks	
Pack quantity	1 pcs.

Electrical connection
Cable: 10 m, PUR, Halogen-free, black, Ø 4.9 mm; 4 x 0.34 mm² (42 x Ø 0.1 mm)

Electrical connection - Socket
Connector: 1 x M12, angled; Locking: brass, nickel-plated; Contacts: gold-plated; Tightening torque: 0.6...1.5 Nm



Connection



	Core colors :
BK =	black
BN =	brown
BU =	blue
WH =	white

Part Number: 9341

600V Tray, (1 pr) 18 AWG (19x30) TC, PVC-NYL/PVC, Foil Shld, TC

Request Sample

Product Description

One 18 AWG pair stranded (19x30) tinned copper conductors, PVC/Nylon insulation, overall Beldfoil® Shield (100% coverage, PVC jacket.

Technical Specifications

Physical Characteristics (Overall)

Conductor

AWG	Stranding	Material	No. of Pairs
18	19x30	TC - Tinned Copper	1

Conductor Count:	2
Total Number of Pairs:	1
Total Number of Triads:	N/A
Conductor Size:	18 AWG

Insulation

Material
PVC/Nylon - Polyvinyl Chloride/Nylon

Color Chart

Number	Color
1	Black & Red

Outer Shield Material

Type	Material	Material Trade Name	Coverage [%]	Drainwire Material	Drainwire AWG	Drainwire Construction n x D
Tape	Aluminum/Polyester	Beldfoil®	100 %	TC - Tinned Copper	18	19x30 mm

Outer Jacket Material

Material	Nominal Diameter	Nominal Wall Thickness	Ripcord
PVC - Polyvinyl Chloride	0.274 in	0.047 in	Yes

Electrical Characteristics

Conductor DCR

Nominal Conductor DCR	Nominal Outer Shield DCR
5.86 Ohm/1000ft	5.86 Ohm/1000ft

Capacitance

Nom. Capacitance Conductor to Conductor	Nom. Capacitance Conductor to Other Conductor to Shield
43 pF/ft	74 pF/ft

Inductance

Nominal Inductance
0.19 µH/ft

Current

Max. Recommended Current [A]
6 Amps per conductor @ 30°C A

Voltage

UL Voltage Rating
600 V RMS (NEC Type TC)
150 (NPLF) V RMS

Temperature Range

UL Temp Rating:	75°C Dry, 90°C Wet
Operating Temp Range:	Wet: -30°C To +75°C , Dry: -30°C To +90°C
Wet Temp Range:	-30°C To +75 °C
Dry Temp Range:	-30°C To +90 °C

Mechanical Characteristics

Bulk Cable Weight:	44 lbs/1000ft
Max Recommended Pulling Tension:	26 lbs
Min Bend Radius/Minor Axis:	2.75 in

Standards

NEC/(UL) Specification:	NPLF, TC
Other Specification:	ICEA S-73-532, S-61-402

Applicable Environmental and Other Programs

EU Directive 2000/53/EC (ELV):	Yes
EU Directive 2003/96/EC (BFR):	Yes
EU Directive 2011/65/EU (ROHS II):	Yes
EU Directive 2012/19/EU (WEEE):	Yes
EU Directive 2015/863/EU:	Yes
EU Directive Compliance:	EU Directive 2003/11/EC (BFR)
EU CE Mark:	Yes
EU RoHS Compliance Date (yyyy-mm-dd):	2005-04-01
CA Prop 65 (CJ for Wire & Cable):	Yes
MII Order #39 (China RoHS):	Yes

Suitability

Suitability - Burial:	Yes
Suitability - Sunlight Resistance:	Yes

Flammability, LS0H, Toxicity Testing

C(UL) Flammability:	FT4
UL Flammability:	UL1685 UL Loading
IEEE Flammability:	1202
UL voltage rating:	600 V RMS (NEC Type TC)

Plenum/Non-Plenum

Plenum (Y/N):	No

Part Number

Variants

Item #	Color	Footnote
9341 0101000	Black	C
9341 010500	Black	C
9341 0105000	Black	
9341 01010000	Black	

Footnote:	C - CRATE REEL PUT-UP.

BELDEN
SENDING ALL THE RIGHT SIGNALS

Part Number: 1119A

600V Tray, (1 triad) 16 AWG (7x24) BC, PVC-NYL/PVC, Foil Shld, TC-ER

Request Sample

Product Description

One 16 AWG triad stranded (7x24) bare copper conductors, twisted triads, PVC/Nylon insulation, overall Beldfoil® shield (100% coverage), PVC jacket.

Technical Specifications

Physical Characteristics (Overall)

Conductor

AWG	Stranding	Material	No. of Triads
16	7x24	BC - Bare Copper	1

Conductor Count:	3
Total Number of Pairs:	1
Total Number of Triads:	N/A
Conductor Size:	16 AWG

Insulation

Material	Nominal Diameter
PVC/Nylon - Polyvinyl Chloride/Nylon	0.101 in

Color Chart

Number	Color
1	Red
2	Black
3	Blue

Color Chart 2

Number	Color
1	Black & Red & Blue

Inner Shield Material

Drainwire Construction n x D
7x26 mm

Outer Shield Material

Type	Material	Material Trade Name	Coverage [%]	Drainwire Material	Drainwire AWG
Tape	Aluminum/Polyester	Beldfoil®	100 %	TC - Tinned Copper	18

Outer Jacket Material

Material	Nominal Diameter	Nominal Wall Thickness	Ripcord
PVC - Polyvinyl Chloride	0.315 in	0.047 in	Yes

Electrical Characteristics

Conductor DCR

Nominal Conductor DCR	Nominal Outer Shield DCR
3.67 Ohm/1000ft	4.99 Ohm/1000ft

Voltage

UL Voltage Rating

600 V RMS
150 V RMS

Temperature Range

UL Temp Rating:	75°C Dry, 90°C Wet
Wet Temp Range:	-30°C To +75 °C
Dry Temp Range:	-30°C To +90 °C

Mechanical Characteristics

Bulk Cable Weight:	67 lbs/1000ft
Max Recommended Pulling Tension:	129 lbs
Min Bend Radius/Minor Axis:	3.1 in

Standards

NEC/(UL) Specification:	NPLF, TC-ER
Other Specification:	ICEA S-73-532 (WC57), S-61-402

Applicable Environmental and Other Programs

EU Directive 2000/53/EC (ELV):	Yes
EU Directive 2011/65/EU (ROHS II):	Yes
EU Directive 2012/19/EU (WEEE):	Yes
EU Directive 2015/863/EU:	Yes
EU Directive Compliance:	EU Directive 2003/11/EC (BFR)
EU CE Mark:	Yes
EU RoHS Compliance Date (yyyy-mm-dd):	2005-04-01
CA Prop 65 (CJ for Wire & Cable):	Yes
MII Order #39 (China RoHS):	Yes

Suitability

Suitability - Burial:	Yes
Suitability - Indoor:	Yes
Suitability - Outdoor:	Yes
Suitability - Sunlight Resistance:	Yes

Flammability, LS0H, Toxicity Testing

UL Flammability:	UL1685 UL Loading
CSA Flammability:	FT4
ICEA Flammability:	T-29-520
IEEE Flammability:	1202
UL voltage rating:	600 V RMS

Plenum/Non-Plenum

Plenum (Y/N):	No

Part Number

Variants

Item #	Color	Footnote
1119A 0101000	Black	C Z
1119A 01010000	Black	C Z
1119A 010500	Black	C Z

Footnote:	C - CRATE REEL PUT-UP.
Footnote:	Z - FINAL PUT-UP MAY VARY (= OR -) 10% FOR SPOOLS OR REELS AND (+ OR -) 5% FOR UNREEL CARTONS FROM LENGTH SHOWN.

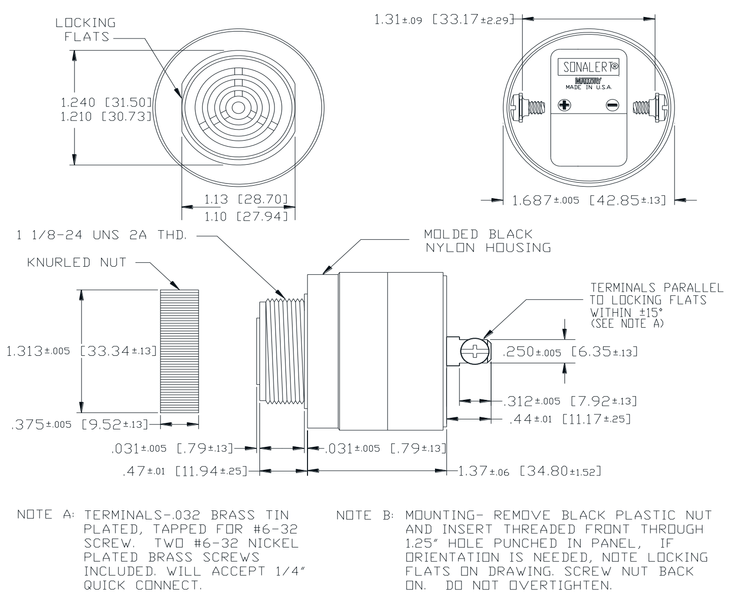
Mallory Sonalert Products, Inc.	Part #: SC250R
Sales Outline Drawing	Revision: F

Specifications:

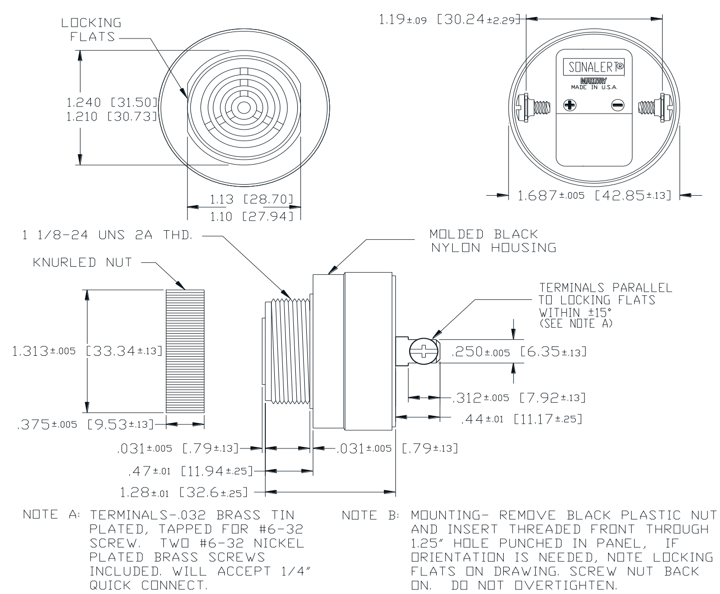
Sound Level Category	Medium
Mode of Operation	Continuous
Voltage Rating	60 to 250 VAC/DC
Frequency	2900 ± 500 Hz
Loudness @ 2 FT	77 to 88 dB(A) Typ.
Loudness @ Min V	68 dB(A) @ 2 Feet and 60 Vac/dc
Loudness @ Max V	80 dB(A) @ 2 Feet and 250 Vac/dc
Current Draw	5-18mA
Housing Material	6/6 Nylon, Color: Black
Storage Temperature	-40° to +85° C
Operating Temperature	-30° to +65° C
Panel Mounting	Recommended hole size is 1.25"(31.75mm). Thread front will fit standard 30mm(1.181") hole.
Knurled Nut	Used to attach part to panel. The max recommended torque is 10 in-lbs.
Weight (Typical)	1.6 oz (45g)
NEMA 3R,4X, & 12	Approved with use of ACC03.
Options	Please contact factory.

Dimensions: Inches (mm) **cUL Recognized** **ROHS Compliant**

PART DIMENSIONS BEFORE CODE DATE: 0824 5

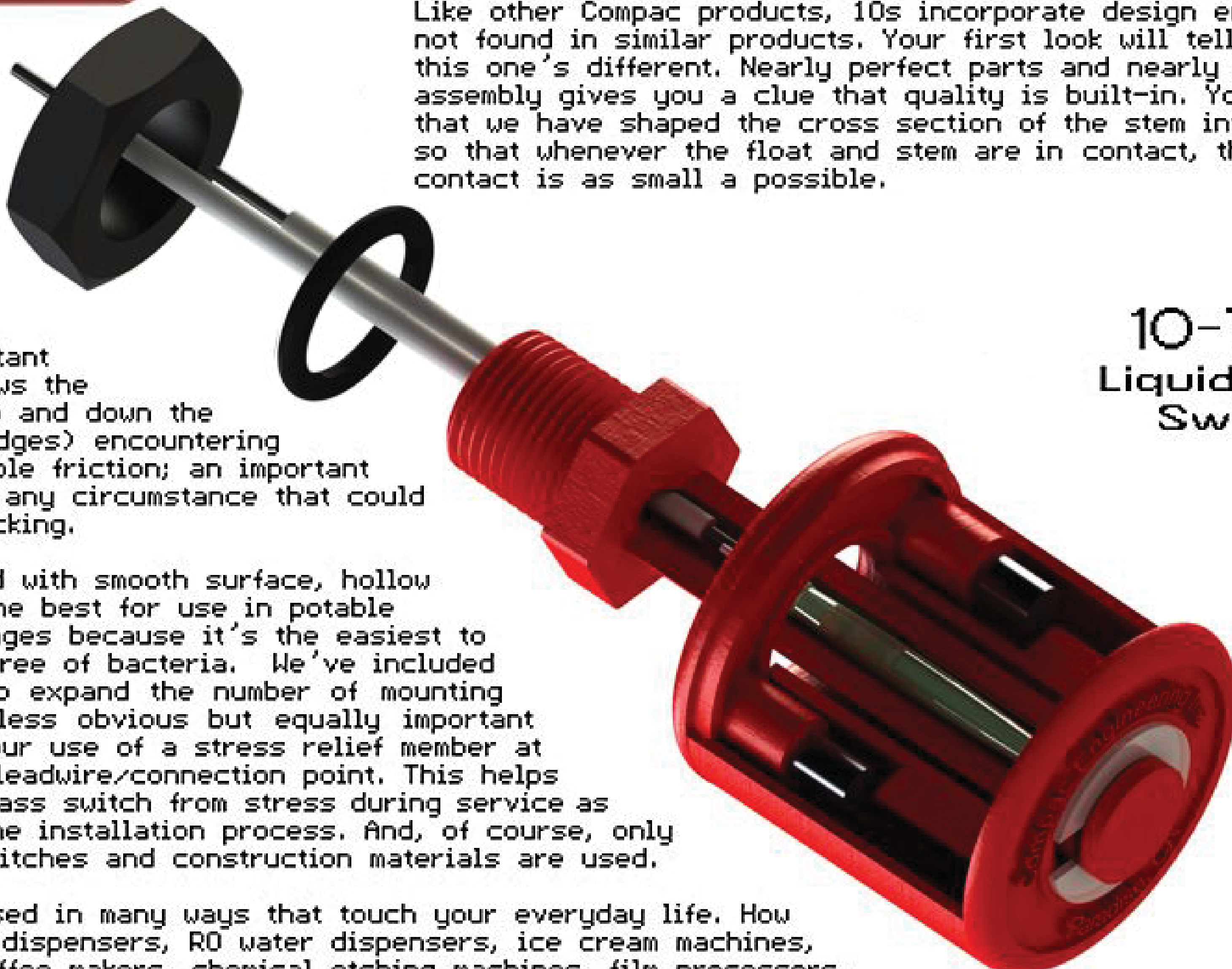


PART DIMENSIONS AFTER CODE DATE: 0825 1



This ubiquitous switch is the *key switching element of the Series 10 ERECTA SWITCH product group*. It can be used alone or as the switching component of a larger ERECTA SWITCH instrument construction. It's a simple product based on a simple idea. A magnetic float rising or falling in response to liquid level change actuates a hermetically sealed magnetic reed switch. This straight forward method of converting motion into an electrical signal is so uncomplicated that many years of reliable service can be expected.

Like other Compac products, 10s incorporate design enhancements not found in similar products. Your first look will tell you that this one's different. Nearly perfect parts and nearly perfect assembly gives you a clue that quality is built-in. You'll see that we have shaped the cross section of the stem into a square so that whenever the float and stem are in contact, the area in contact is as small a possible.



10-782
Liquid Level Switch

This is an important feature that allows the float to scoot up and down the stem (on knife edges) encountering the lowest possible friction; an important consideration in any circumstance that could lead to float sticking.

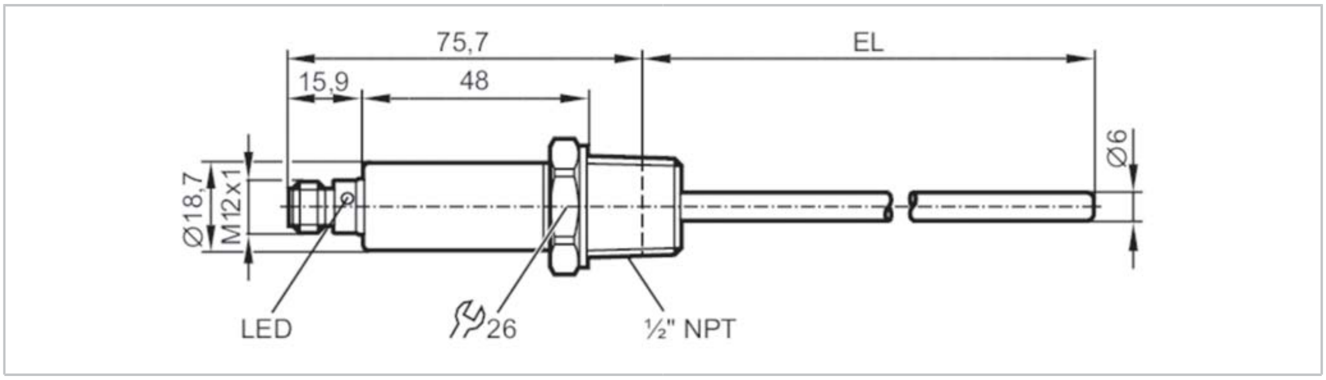
10s are equipped with smooth surface, hollow floats. This is the best for use in potable water and beverages because it's the easiest to keep clean and free of bacteria. We've included a mounting nut to expand the number of mounting possibilities. A less obvious but equally important enhancement is our use of a stress relief member at the reed switch leadwire/connection point. This helps to isolate the glass switch from stress during service as well as during the installation process. And, of course, only the best reed switches and construction materials are used.

10s are being used in many ways that touch your everyday life. How about soft drink dispensers, RO water dispensers, ice cream machines, food warmers, coffee makers, chemical etching machines, film processors, poultry feeders, copy machines, dishwashers, equipment lubricators, fuel tanks . . . .

TA2313

Temperature transmitter

TA-050FLEN12-A-ZVG/US



Application	
Measuring element	1 x Pt 1000; (to DIN EN 60751, class A)
Media	liquids and gases
Pressure rating [bar]	300
Note on pressure rating	sensor When mounted in adapters the specifications of the adapter data sheet apply.
Electrical data	
Operating voltage [V]	18...32 DC; (cULus - Class 2 source required)
Current consumption [mA]	< 50
Protection class	III
Reverse polarity protection	yes
Power-on delay time [s]	1
Inputs / outputs	
Number of inputs and outputs	Number of analog outputs: 1
Outputs	
Total number of outputs	1
Output signal	analog signal; IO-Link; (configurable)
Number of analog outputs	1
Analog current output [mA]	4...20
Max. load [Ω]	250; ((18...19 V); 19...32 V: 300 Ω)
Short-circuit protection	yes
Overload protection	yes
Measuring/setting range	
Measuring range [°F]	-58...302
Factory setting	0...300 °F
Resolution	
Resolution of analog output [K]	0.04
Accuracy / deviations	
Precision analog output [K]	± 0,3 + (± 0,1 % MS)
Temperature coefficient [% of the span / 10 K]	0,1; (In case of deviation from the reference condition 25 ± 5 °C)

TA2313

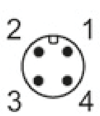
Temperature transmitter

TA-050FLEN12-A-ZVG/US

Reaction times			
Dynamic response T05 / T09	[s]	1 / 3	
Interfaces			
Communication interface		IO-Link	
Transmission type		COM2 (38,4 kBaud)	
IO-Link revision		1.1	
Operating conditions			
Ambient temperature	[°C]	-25...80	
Storage temperature	[°C]	-40...100	
Protection		IP 67; IP 68; IP 69K	
Tests / approvals			
EMC		DIN EN 61000-6-2	
Shock resistance		DIN IEC 68-2-27	50 g (11 ms)
Vibration resistance		DIN IEC 68-2-6	20 g (10...2000 Hz)
MTTF	[years]	572	
UL approval		UL approval number	K002
Mechanical data			
Weight	[g]	125.8	
Dimensions	[mm]	Ø 18.7	
Material		stainless steel (1.4404 / 316L); PEI; FKM	
Materials (wetted parts)		stainless steel (1.4404 / 316L)	
Process connection		threaded connection 1/2" NPT	
Probe diameter	[mm]	6	
Installation length EL	[mm]	50	
Displays / operating elements			
Display		operating status	1 x LED, green
Remarks			
Remarks		MS = set measuring span	
Pack quantity		1 pcs.	

Electrical connection

Connector: 1 x M12; Contacts: gold-plated

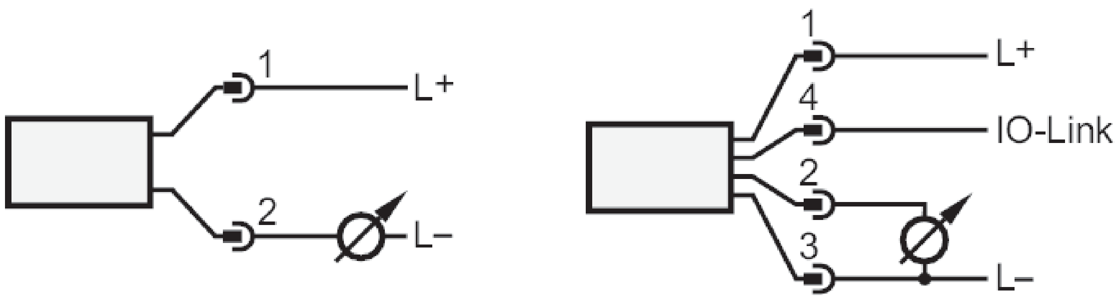


TA2313

Temperature transmitter

TA-050FLEN12-A-ZVG/US

Connection



Vertical Multistage High Pressure Pumps

GRUNDFOS **CRN**

The Grundfos CRN high pressure series provides all the benefits of the renowned Grundfos CR in a solution tailored to handle a variety of liquids from potable water to industrial liquids within a very wide temperature, flow and pressure scale.

Key Features and Benefits

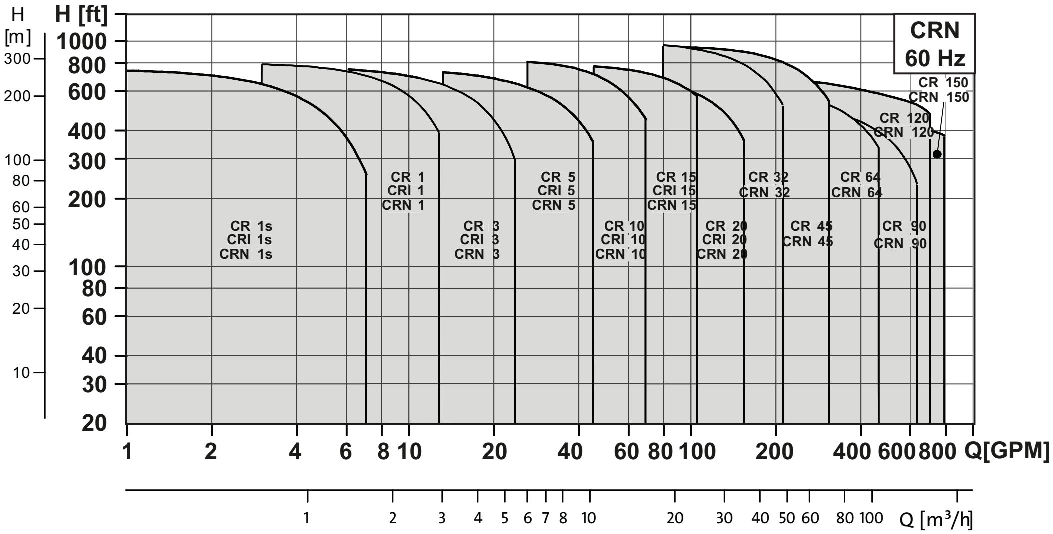
- Compact, inline design fits into small footprint
- Easy installation and operation with settings and internal connections done at factory
- Highly efficient design reduces energy consumption by up to half compared to fixed speed pumps
- Unique cartridge seal design can be replaced in minutes
- Spacer coupling allows motor to be left in place during seal replacement
- Remote control/fieldbus monitoring and data collection
- Building management system compatible
- User friendly controller interface with advanced features and functionality
- Laser welded stainless impellers promote class leading efficiency
- Optional CR Cool-Top™ allows pump to withstand liquid temperatures of up to 356°F
- Integrated sensor available
- Eleven flow sizes, with a variety of shaft seals, rubber materials and supply voltages
- MAGdrive option available for demanding industrial applications where zero-leakage is required operating range
- AISI 316 stainless steel throughout

APPLICATIONS

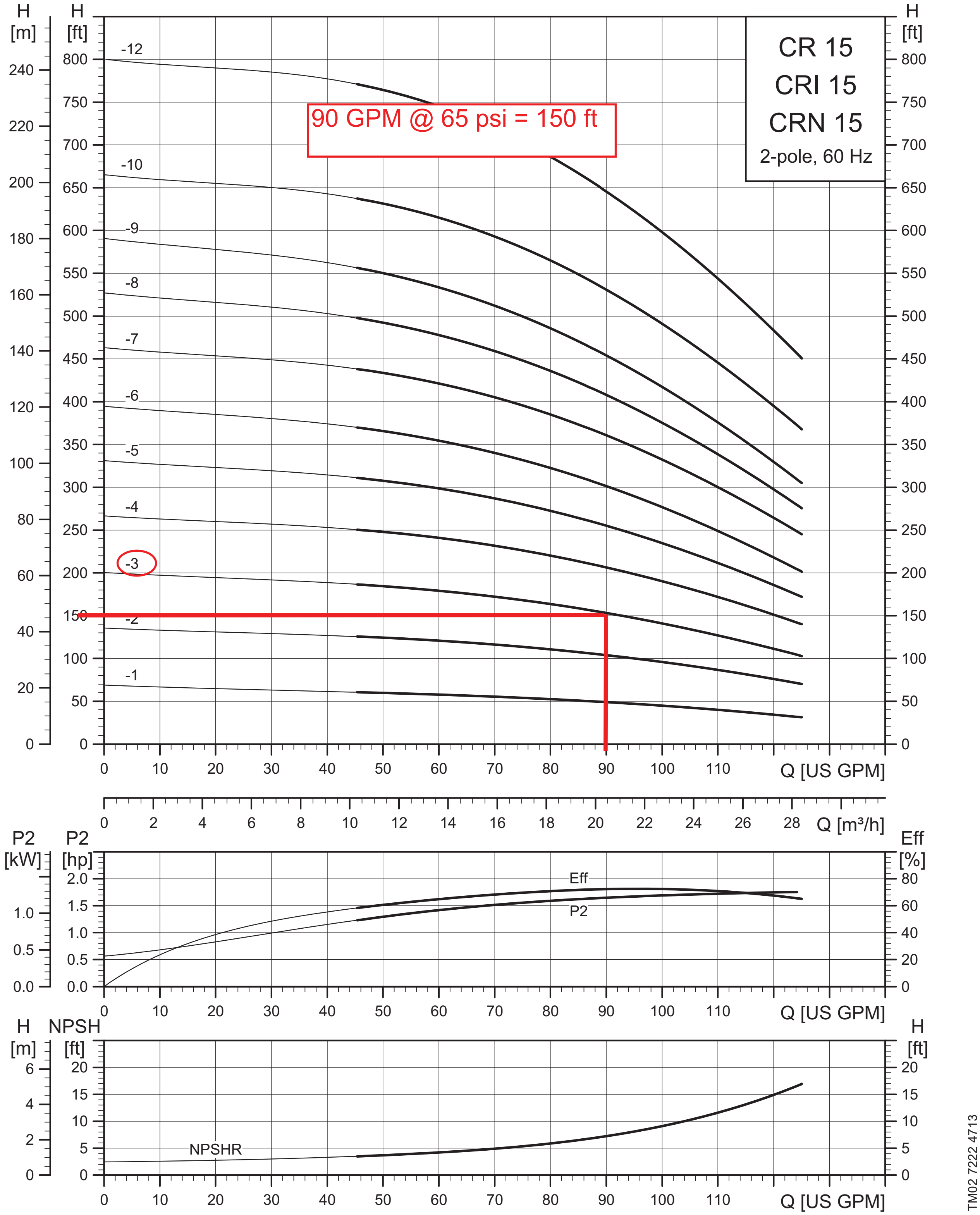
- Industrial process water
- Washing and cleaning
- High pressure washdown
- Boiler feed and condensate
- Ultra-filtration
- Reverse osmosis

CRN Technical Data

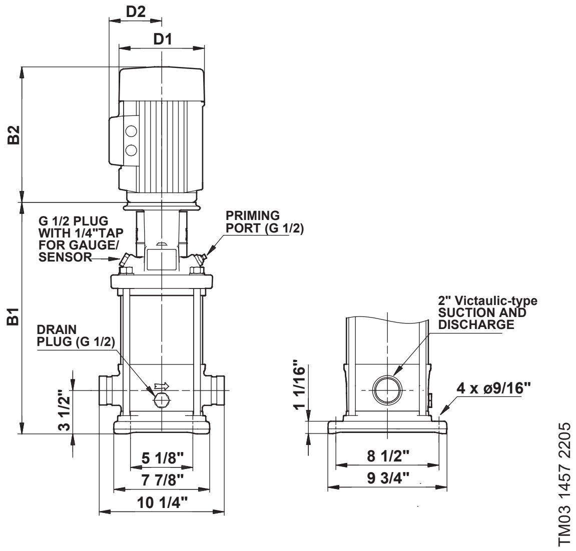
CRN Information	
Flow, Q:	max. 790 gpm (179.4 m³/h)
Head, H:	max. 985 ft. (300 m.)
Liquid temp:	-22°F to +248°F (-30°C to 120°C)
Working press:	max. 435 psi (30 bar)

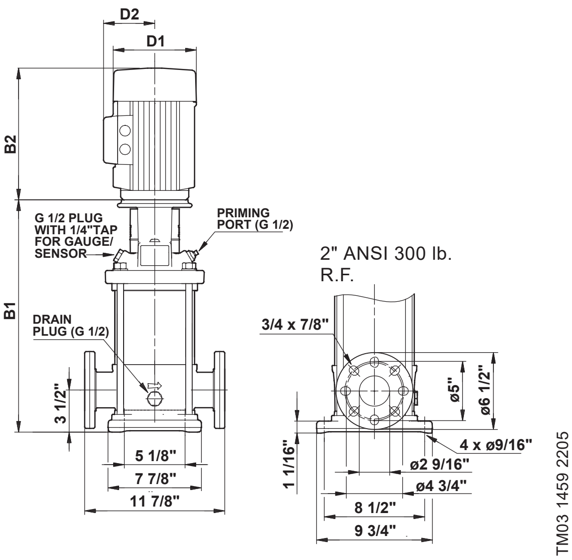


CR, CRI, CRN 15


CR 15
CRI 15
CRN 15
2-pole, 60 Hz
90 GPM @ 65 psi = 150 ft
H [m]
H [ft]
-12
-10
-9
-8
-7
-6
-5
-4
-3
-2
-1
Q [US GPM]
Q [m³/h]
P2 [kW]
P2 [hp]
Eff [%]
Eff
P2
H [m]
NPSH [ft]
NPSHR
TM02 7222 4713

CRN 15



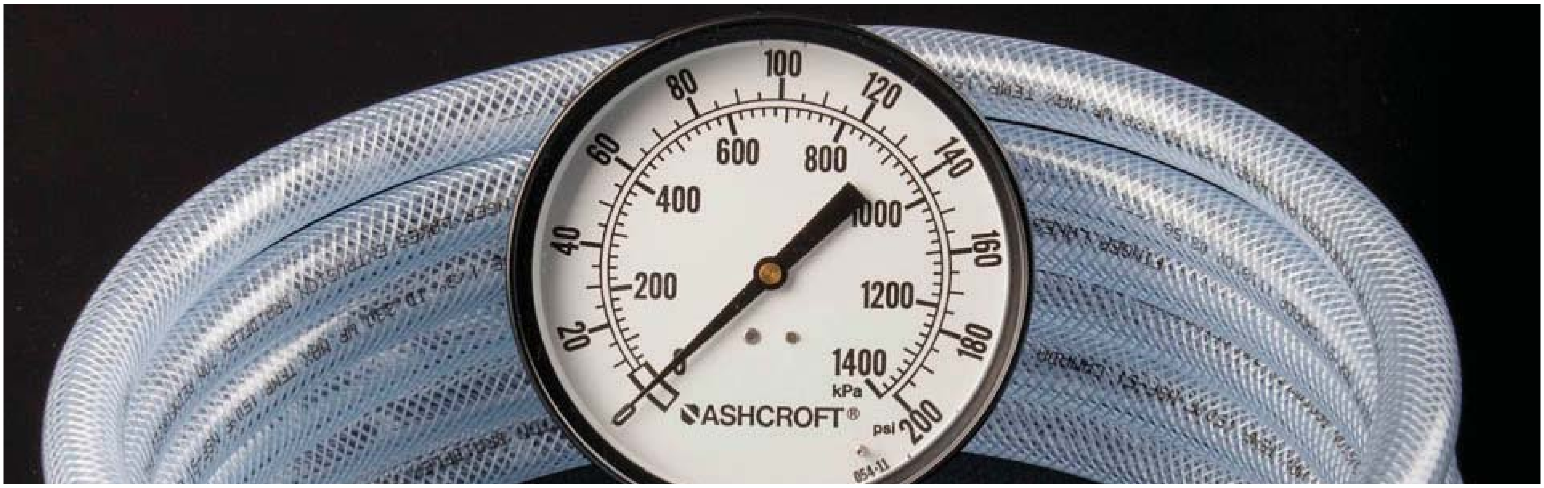


Pump type	P2 [Hp]	Ph.	PJE*	ANSI dimensions [inch (mm)]							Ship. wt. [lbs (kg)]
				B1	TEFC			ODP			
					D1	D2	B1+B2	D1	D2	B1+B2	
CRN 15-1	2	1	•	16.38 (417)	7.19 (183)	5.73 (146)	28.94 (736)	-	-	-	130 (59)
		3	•	16.38 (417)	7.01 (179)	4.33 (110)	27.6 (702)	-	-	-	121 (55)
CRN 15-2	5	1	•	17.44 (443)	10.62 (270)	7.46 (190)	32.96 (838)	-	-	-	203 (93)
		3	•	17.13 (436)	8.66 (220)	5.28 (135)	32.64 (830)	-	-	-	195 (89)
CRN 15-3	7 1/2	1	•	19.21 (488)	10.22 (260)	7.62 (194)	34.74 (883)	-	-	-	216 (98)
		3	•	19.21 (488)	8.66 (220)	5.28 (135)	34.72 (882)	-	-	-	205 (93)
CRN 15-4	7 1/2	1	•	20.98 (533)	10.22 (260)	7.62 (194)	36.51 (928)	-	-	-	218 (99)
		3	•	20.98 (533)	8.66 (220)	5.28 (135)	36.49 (927)	-	-	-	207 (94)
CRN 15-5	10	1	•	22.76 (579)	10.23 (260)	10.30 (262)	38.83 (987)	-	-	-	335 (152)
		3	•	22.76 (579)	10.24 (261)	6.26 (160)	37.49 (953)	-	-	-	214 (98)
CRN 15-6	15	3	•	27.05 (688)	12.36 (314)	8.00 (204)	45.59 (1158)	10.62 (270)	7.33 (187)	43.36 (1102)	336 (153)
CRN 15-7	15	3	•	28.82 (733)	12.36 (314)	8.00 (204)	47.36 (1203)	10.62 (270)	7.33 (187)	45.13 (1147)	369 (168)
CRN 15-8	15	3	•	30.59 (777)	12.36 (314)	8.00 (204)	49.13 (1248)	10.62 (270)	7.33 (187)	46.90 (1192)	402 (183)
CRN 15-9	20	3	•	32.36 (822)	12.36 (314)	8.00 (204)	50.90 (1293)	11.50 (293)	8.92 (227)	52.05 (1323)	410 (186)
CRN 15-10	20	3	•	34.13 (867)	12.36 (314)	8.00 (204)	52.67 (1338)	11.50 (293)	8.92 (227)	53.82 (1368)	413 (188)
CRN 15-12	25	3	•	37.05 (942)	12.36 (314)	8.00 (204)	59.44 (1510)	11.50 (293)	8.94 (228)	57.86 (1470)	413 (188)

All dimensions in inches unless otherwise noted.

* PJE flanged pump B1 and B1+B2 dimension is equal to ANSI flanged pump and weight is approximately 9 lbs. less.

• Available.



BraidFLEX™ 70N

Product Features

The BraidFLEX™ 70N product line is very similar to our ClearFLEX™ 70-1 product line, but with the added inner nylon braid it can withstand much higher pressure applications. It maintains a clear color and flexible nature to allow for easy installation like all of our other ClearFLEX™ product lines along with visual flow monitoring.

BraidFLEX™ 70N PVC Tubing

- Embedded braid prevents material entrapment, ensures easy cleaning
- Easy to bend into place
- Flexible; permits tight clamping for leakproof connections
- Maximum working pressure clearly printed on tubing
- Clear tubing allows full visual flow monitoring
- Complies with NSF-51
- Complies with FDA CFR21 for food packaging

Typical Applications

- Transfer lines
- Phneumatic circuitry
- Cell culture
- General Laboratory
- Use with insert/barbed fittings, do not allow pressure against cut end of the tube
- High pressure applications including lab, food and beverage
- NOT recommended for vacuum applications

Specifications

All BraidFLEX™ 70N tubing products offer the following:

- Complies with the NSF (National Sanitation Foundation) requirements for contact with aqueous, oil, dairy, acidic, and alcohol containing food; and is accordingly listed as approved under NSF-51;
- Manufactured from ingredients whose usage is sanctioned by the U.S. Food & Drug Administration under Title 21 of the Code of Federal Regulations for food packaging applications, per the following:

Ingredients & CRF Paragraph No.	
Polyvinyl Chloride	175.300
Plasticizers	181.27
Stabilizers	178.2010
Colorants	178.3970

Chemical Resistance

Ratings for ideal conditions 73°F / 25°C

Strong Mineral Acids	Fair
Organic Acids	Good
Weak Acids	Excellent
Bases - Weak	Excellent
Bases - Strong	Good
Solvents	Not Recommended

P: 585-905-0632 | 2437 Route 21 | Canandaigua, NY 14424

BraidFLEX™ 70N Size & Physical Properties

Size Chart

Catalog Number	ID Size In.	OD Size In.	Wall	Operating Pressure PSIG 73°F	Case Qty. Ft.
8470-4300	3/16	3/8	3/32	276	100
8470-7300	3/16	3/8	3/32	276	250
8470-4340	1/4	7/16	3/32	276	100
8470-7340	1/4	7/16	3/32	276	250
8470-4395	5/16	1/2	3/32	276	100
8470-4435	3/8	9/16	3/32	250	100
8470-7435	3/8	9/16	3/32	250	250
8470-4515	1/2	3/4	1/8	230	100
8470-7515	1/2	3/4	1/8	230	250
8470-4570	5/8	7/8	1/8	230	100
8470-7570	5/8	7/8	1/8	230	250
8470-2605	3/4	1	1/8	176	50
8470-7605	3/4	1	1/8	176	250
8470-2680	1	1-5/16	5/32	140	50
8470-7680	1	1-5/16	5/32	140	250
8470-2715	1-1/4	1-5/8	3/16	100	50
8470-2750	1-1/2	1-7/8	3/16	80	50
8470-2790	2	2-1/2	1/4	70	50

Physical Properties

Properties	ASTM Method	Value Rating
Hardness; Shore A (+/- 5)	D2240	70
Vacuum		Not Recommended
Operating temperature range		-5°F - 180° F -21°C - 82°C
Maximum Working Pressure		73°F / 276PSI 125°F / 138PSI
Testing Size		1/4"ID x 3/32"W
Color		Clear
Odor		Slight
Taste		None
Specific Gravity; g/cm³	D792	1.20
Tensile Strength; psi	D638	2000
Ultimate Elongation; %	D638	350
Flame Resistance	D568	Self-extinguishing

* The above is accurate to the best of the Company's knowledge, however, these are typical values and should not be used as a certification. All materials should be tested for suitability in their intended use.

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RO Chemicals

Antiscalant Chemical

PA0100
CHEMICAL

Pure Aqua's **PA0100** antiscalant chemical offers superior quality performance characteristics over a wide range of applications. The antiscalant chemical from Pure Aqua, Inc. is designed to eliminate scale and reduce fouling in membrane systems. Pure Aqua's **PA0100** is a liquid antiscalant/dispersant blended to inhibit scale and disperse colloidal particles in cellulose acetate and thin film membrane separation systems. The formulation has been certified by the National Sanitation Foundation (NSF) under ANSI/NSF Standard 60 for use in producing potable water.

NSF®

Performance

- Powerful inhibitor against a variety of scales including:

$CaCO_3$	CCPP ≤ 900 (LSI ≤ 2.8)
$CaSO_4$	3.0 x Ksp
$BaSO_4$	105 x Ksp
$SrSO_4$	20 x Ksp
CaF_2	1000 x Ksp
SiO_2	120 ppm

- Highly effective at low dose rates in a wide range of feed water types and pH ranges
- Compatible with polyelectrolytes
- Provides both scale and inorganic fouling control
- Compatible with all membrane types
- Certified under ANSI/NSF Standard 60

Application

PA0100 performance is optimized when the chemical is injected upstream of the membrane system and cartridge filters.

Dosing Guidelines

The typical dosing range is between 2 to 10 ppm.

Dilution

If dilution is required, **PA0100** should be diluted with de-mineralized water or RO permeate. If neither of these water sources is available, softened water may be substituted. **PA0100** should not be diluted to less than 10% by weight.

Packaging and Storage

Standard regional pack sizes are listed below. Custom packaging can be provided worldwide to meet customer's needs. Information on drum-less or bulk tanker delivery is available upon request.

Packaging Specifications

Packaging formats	Americas	EMEA
Pails	45 lbs. (5 gal)	21 kg. (18.9 L)
Drums	500 lbs. (55 gal)	227 kg. (208 L)
IBC's (totes)	2,500 lbs. (275 gal)	1,130 kg. (1,041 L)

Chemical Specifications

Appearance	Clear yellow liquid
Odor	Odorless
pH (2% solution)	5.0 - 6.5
Specific gravity @ 20°C	1.1 ± 0.05

Pure Aqua, Inc.®
Reverse Osmosis & Water Treatment Systems

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+1 (844) 309-7501

Get a Quote
www.pureaqua.com

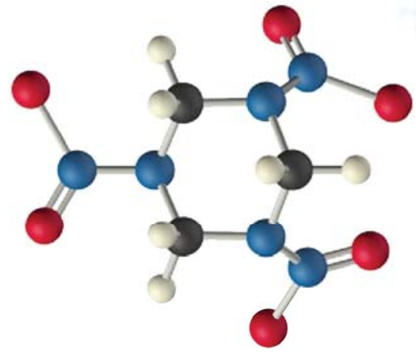
RO Chemicals
Antiscalant Chemical

PA0100
CHEMICAL

PA0100 improves the performance and solves fouling problems in your membrane system.
Pure Aqua's PA0100 antiscalant is very versatile and will control scale in most applications treating naturally occurring feed water.
Contact Pure Aqua with your water chemistry and operating conditions to determine & solve the membrane fouling issues.

Advantages of using PA0100 antiscalant:

- Reduces membrane cleaning frequency
- Eliminates acid injection
- Controls iron, silica, and mineral scale
- Extends membrane life
- Lower operating and capital costs
- Does not react with other chemicals
- Certified under ANSI/NSF Standard 60



PA0100 antiscalant is used to process very poor quality feed water at very high rates of recovery. When used properly, PA0100 extends the time between membrane cleanings from a few weeks to years in some cases. Without antiscalant, membrane systems would not be as successful serving the water treatment industry.

Other RO Chemicals from Pure Aqua
Membrane Cleaners

Regular chemical cleaning of RO membranes will ensure that they continue to perform and extend their useful life. The key factor with cleaning is to do it before the situation gets too bad, because if you wait too long, the membrane may become irretrievably fouled. Cleaning should be undertaken when either the normalized permeate flux is reduced by 10 – 15% or, when the differential pressure decreases. Depending on the characteristics of the water supply, membrane fouling may be inorganic, organic, colloidal or microbiological in nature and often a combination. Each type of fouling or scaling requires a different cleaning strategy.

PAClean-HPH is an alkaline reverse osmosis membrane cleaner for removing fouling caused by organic, biological and colloidal fouling of RO and UF membranes.

PAClean-LPH is a mildly-acidic RO membrane cleaner for removing fouling caused by iron salts, oxides and hydroxides. It can also be used to remove calcium carbonate scaling.

Cleaning system is used to clean membranes with Pure Aqua's PAClean-LPH and PAClean-HPH

Garlock
an EnPro Industries family of companies

Garlock NSF/ANSI 61

Certified Gasket Materials for Potable (Drinking) Water Systems

Leaders in Sealing Integrity

Garlock NSF/ANSI 61

Certified Gasket Materials for Potable (Drinking) Water Systems

NSF standards ensure that drinking water is clean, safe and cover almost all components used in municipal water systems. In the past, Garlock has received numerous inquiries about gaskets that are NSF/ANSI 61 Certified, but recently this certification has become a requirement for many customers.

When a gasket is submitted for testing, the formulation is reviewed for prohibited substances, and then tested for contaminants that could leach out of the gasket into your drinking water.

Garlock proudly offers 6 different gasketing products that are NSF/ANSI 61 certified: GYLON® 3505, GYLON® 3522, MULTI-SWELL™ 3760-U, STRESS SAVER® XP, 3505 STRESS SAVER® and Style 98206 (EPDM).

GYLON® 3505

Style 3505 is the Oxygen service version of our famous 3504 BLUE GYLON® and is newly tested and certified to NSF/ANSI 61. GYLON® Style 3505 is a high performance restructured PTFE material with glass microsphere filler, which provides the necessary compression to conform to and seal less than perfect flanges. This material is designed for use in raised face and most metallic flat face flanges.

SPECIFICATIONS

Color	Blue GYLON®
Composition	PTFE with glass microspheres
Temperature[1]	Min -450°F (-260° C) Cont. Max. +500°F (+260°C)
PxT (max)[1] (psig x °F)(bar x °C)	350,000 (12,000) 1/16" and 1/32" 250,000 (8,600) 1/8"
Pressure[1]	800 psig (55 bar)

NOTE: [1] Based on ANSI RF Flanges at our preferred torque. When approaching maximum pressure, temperature or 50% of maximum PxT, consult Garlock Engineering.

The excellent dielectric resistance of this material makes it perfect for pipelines requiring cathodic protection. It can be cut or welded into any flange shape using our patented Thermal Bonding process, eliminating the need for dovetails on large gaskets. All thermally bonded gaskets will be stamped GARLOCK to ensure that you receive genuine Garlock product.

GYLON® STYLE 3505/STRESS SAVER® 3505

Restructured PTFE material designed for use on higher pressure raised face or flat face flanges. Available in sheet, cut gaskets, or as a Stress Saver® 3505.

MULTI-SWELL™ STYLE 3760-U

Aramid fiber gasket with a proprietary rubber binder designed to swell upon contact with water to create a seal; used in both raised and flat face flanges.

STRESS SAVER® XP

Molded fluoroelastomer product designed for use in both metallic and non-metallic, flat faced flanges up to 24" pipe.

RUBBER SHEET STYLE 98206

High performance EPDM sheet material intended for use in standard and non-standard flat face flanges.

GYLON® 3522 GASKET AND DIAPHRAGM

Made using a proprietary process which optimizes quality and uniformity, this material offers the longest cycle life in the industry.

MULTI-SWELL™ STYLE 3760-U

Over 70% of gasket failures are due to lack of load.

MULTI-SWELL™ Style 3760-U Gaskets react with water or oil to create its own load. Problems with low load applications and leakage are a thing of the past.

MULTI-SWELL™ can replace vegetable fiber gaskets in many applications – it won't weep, improving plant safety. It also performs well in higher load flanges where elastomeric or rubber gaskets may otherwise be crushed.

-the world's only premier self-loading general service gasket.

SPECIFICATIONS

Composition	Synthetic fiber sheet with a proprietary rubber binder
Temperature	Min -40°F (-40° C) Cont. oper. +400°F (+205°C)
PxT (max) (psig x °F)(bar x °C)	150,000 (5,1000) 1/16" and 1/32" 100,000 (3,400) 1/8"
Pressure[1]	500 psig (35 bar)

NOTE: [1] Based on ANSI RF Flanges at our preferred torque. When approaching maximum pressure, temperature or 50% of maximum PxT, consult Garlock Engineering.

*NSF/ANSI 61 certified for use in the following:

» 1" through 144" flange/pipe sizes up to 1/8" thickness

NOTE: Please request 3760-U, the unbranded version of 3760.

STRESS SAVER® XP

The XP is a molded fluoroelastomer designed to form a tight, long lasting seal with the low gasket stresses typically associated with non-metallic piping systems. The XP is available in standard 150# class configuration up to 24". This gasket incorporates raised ribs that concentrate the loading force and enable a seal with less torque than expanded PTFE gaskets; a key benefit given the torque limitations on PVC, CPVC, FRP, and other non-metallic flanges.

SPECIFICATIONS

Color	Black
Composition	Proprietary blend of fluoroelastomers (70 durometer)
Temperature	Min -15°F (-26° C) Max. +400°F (+240°C)
PxT max (psig x °F) (bar x °C)	50,000 (1717)
Pressure	250 psig (17 bar)

Unlike other elastomeric gaskets, the STRESS SAVER® XP is free of the plasticizing oils that can degrade non-metallic piping systems, such as PVC, and CPVC. For this reason, the gasket is suitable for use with FlowGuard Gold®, Corzan® CPVC and BlazeMaster® pipe and fittings, and carries the Lubrizol FBC™ System Compatible certification. At this time, the STRESS SAVER® XP is the only gasket to carry this FBC™ System Compatible certification.

GARLOCK STYLE 98206

Style 98206 EPDM sheet gasket material has improved crush resistance; a clear advantage over other elastomeric gasket materials. It is also available in roll form and it can be easily cut to fit any size flange.

SPECIFICATIONS

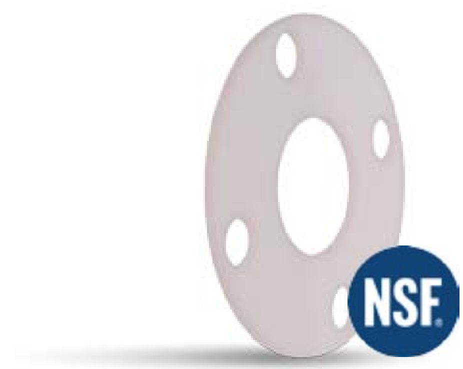
Color	Black
Composition	EPDM with Sulfur Cure (85 durometer)
Temperature	Min -40°F (-40° C) Max. +275°F (+135°C)
PxT max (psig x °F) (bar x °C)	30,000 (900)
Pressure	175 psig (12 bar)

Additionally, Garlock 98206 seals with lower loads than those typically associated with compressed non-asbestos gasket material. This creates savings by enabling the use of lower yield, less expensive bolts.

Style 98206 EPDM is also available in custom molded products used within the water infrastructure; products such as gate valves, butterfly valves, and pipe gaskets.

GYLON® STYLE 3522

Exclusive to Garlock, this time proven product is made using a proprietary process which optimizes quality and uniformity. Using the best available technology GYLON® PTFE diaphragms offer the longest cycle life in the industry, and continue to outperform all competitive materials.



SPECIFICATIONS

Color	Clear, translucent
Composition	PTFE
Temperature (Cont. Max.)	+500°F (+260°C)
Pressure	800 psig (55 bar)

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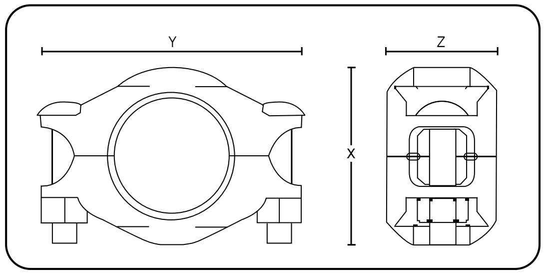
STYLE K
LOW PRESSURE

Pressure Rating:
300 psi (20 bar), SCH 40s (or thicker),cut grooves[1].

Pressure ratings for pipe schedules thinner than schedule 40s and groove types, roll grooves consult with Piedmont.



Description

• Housing - 316 stainless steel, Grade CF8M (UNS# J92900), conform to ASTM A351/A351M.

• Gaskets - EPDM rubber, suitable for hot and cold water service. Two shapes of gaskets available: C-shaped or Flush-fit. NSF/ANSI 61 approved or equivalent for drinking water system components.
Not suitable for petroleum service

• Bolts / nuts - Round-head, square-neck, 316 stainless steel bolts and heavy hex nuts conform to ASME B18.5 and B18.2, respectively.

Note

For the use of Piedmont's couplings on cyclic axial displacement systems, please consult with Piedmont for design and installation guidance.

[1] Working pressures have been determined based on generally accepted standard specification for performance of gasketed mechanical couplings, in accordance with ASTM F1476. For use on pipes thinner than schedule 40s and for rolled grooves, please consult with Piedmont. Pipe's schedule and material must comply with the requirements of ASME B31.1.

Style K Specifications

Nominal size inch	Dimensions inch (mm)			Approx. weight lb (kg)	Working pressure* psi (bar)
	X	Y	Z		
3/4	1.82 (46.2)	2.90 (73.7)	1.68 (42.7)	0.63 (0.28)	300 (20)
1	2.18 (55.4)	3.50 (89.0)	1.70 (43.2)	0.72 (0.33)	300 (20)
1-1/4	2.42 (61.5)	3.60 (91.4)	1.70 (43.2)	0.77 (0.35)	300 (20)
1-1/2	2.66 (67.6)	3.79 (96.3)	1.70 (43.2)	0.79 (0.36)	300 (20)
2	3.14 (79.8)	4.13 (104.9)	1.70 (43.2)	0.85 (0.39)	300 (20)
2-1/2	3.69 (93.7)	5.00 (127.0)	1.70 (43.2)	1.40 (0.64)	300 (20)
3	4.36 (110.7)	5.70 (144.8)	1.85 (47.0)	1.83 (0.83)	300 (20)
4	5.70 (144.8)	7.50 (190.5)	2.02 (51.3)	3.25 (1.47)	300 (20)
6	7.80 (198.1)	9.75 (247.7)	1.90 (48.3)	5.11 (2.32)	300 (20)
8	9.94 (252.5)	12.13 (308.1)	2.25 (57.2)	8.71 (3.95)	300 (20)
10	12.12 (307.8)	14.26 (362.2)	2.25 (57.2)	11.07 (5.02)	300 (20)
12	14.18 (360.2)	16.26 (413.0)	2.25 (57.2)	12.64 (5.73)	300 (20)
14	16.44 (417.7)	20.30 (515.6)	2.99 (75.8)	45.89 (20.81)	300 (20)
16	18.94 (481.0)	21.85 (555.0)	2.93 (74.4)	67.76 (30.73)	300 (20)

*For schedule 40s cut-groove pipes

Piedmont

DEFLECTION & GASKETS

Gaskets

A complete coupling consists of coupling housing, nuts, bolts, and gasket. The coupling housing contains and compresses the gasket, which effects proper sealing of the joint. Piedmont gaskets are designed for a tight seal in high pressure industrial applications

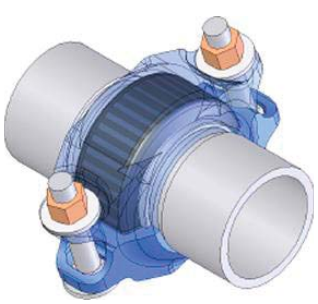
Gasket materials: Piedmont gaskets are EPDM (Ethylene Propylene Diene Monomer) rubber based. NSF (ANSI 61) approved for potable water.

Temperature range: -20° F to 230° F (-29° C to 110° C)

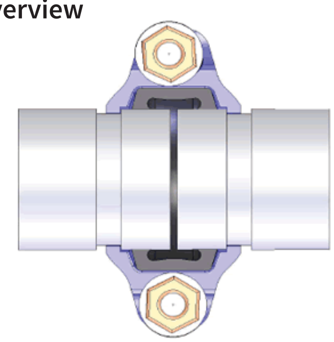
Service recommendations: Hot water service within the temperature range, seawater, and brinewater, dilute acids, oil-free air and many chemical services. Potable water.
NOT SUITABLE FOR PETROLEUM SERVICES

For other services, please contact Piedmont.

Piedmont offers two different shapes of gaskets: C-Shaped and Flush-fit.
The Flush-fit type is recommended for vacuum services. The inner lip minimzes turbulence in high-velocity applications.



Gasket Overview

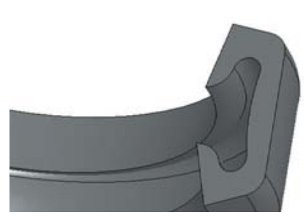


Allowable Pipe End Separation

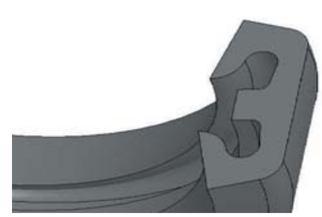
Pipe End Separation & Allowable Deflection

Piedmont maximum allowed pipe end separation and maximum deflection values are for standard roll-grooved pipe joints. For cut groove pipe joints, these values may be doubled. Please note that these values are maximum values. We recommend that for design and installation these values be reduced by 50% for 3/4-3'' sizes and 25% for 4'' and larger.

Flexible Coupling Performance			
Nominal Size	Allowable End Pipe Separation	Maximum Deflection	
inches	inches mm	degrees	inches/ft mm/m
3/4	0-0.06 0-1.6	3.44°	0,72 60
1	0-0.06 0-1.6	2.72°	0,57 48
1-1/4	0-0.06 0-1.6	2.15°	0,45 38
1-1/2	0-0.06 0-1.6	1.91°	0,40 33
2	0-0.06 0-1.6	1.53°	0,32 27
2-1/2	0-0.06 0-1.6	1.24°	0,26 22
3	0-0.06 0-1.6	1.05°	0,22 18
4	0-0.13 0-3.2	1.62°	0,34 28
6	0-0.13 0-3.2	1.10°	0,23 19
8	0-0.13 0-3.2	0.86°	0,18 15
10	0-0.13 0-3.2	0.62°	0,13 11
12	0-0.13 0-3.2	0.53°	0,11 9



C-Shaped Gasket



Flush-fit Gasket

760-305-7616 | sales@piedmontpacific.com | piedmontpacific.com

Specifications

Size: 1/4"
Bodies: PVC
Seats: EPDM
Seals: EPDM
Models: Male Thread x Male Thread
Male Thread x Hose (ID 3/8")
Male Thread x Female Thread
Hose x Hose / Male Thread x Hose
Female Thread x Female Thread
Male Thread x Elbow (OD .63")

Sizes 1/4" PVC/EPDM Models
NSF-61 Certified

Standard Features (Size 1/4")

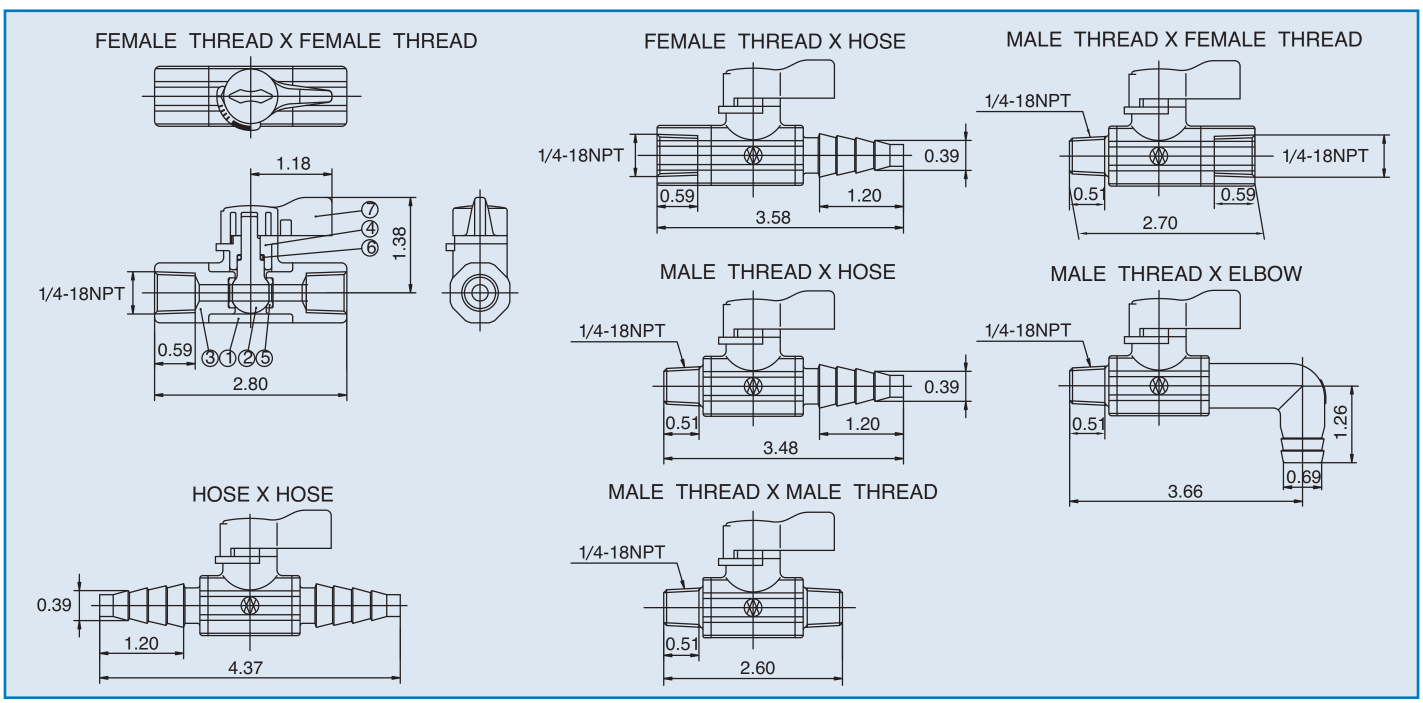
- Pressure rated at 150psi at 120° F (water)
- Precise fingertip control
- Calibrated flow indicator
- Rugged unibody construction, sturdy stem
- Full vacuum rated, 29.9" Hg
- 90 degree turn operation with lever handle
- Cv = 1.6

Sample Specification

All Labcock® valves shall be of compact, unibody construction having a lever handle, calibrated flow indicator and male threads, female threads, hose ends or elbow as part of the valves' integral construction. Valves shall be constructed of PVC conforming to ASTM D1784 Cell Classification 12454A. All O-rings shall be EPDM. Labcock® valves are rated to 150psi at 70° F, as manufactured by Asahi/America, Inc.

Parts List (Size 1/4")

PARTS			
NO.	DESCRIPTION	PCS.	MATERIAL
1	Body	1	PVC
2	Ball and Stem	1	PVC
3	End Connector	2	PVC
4	Gland	1	PVC
5	Seat	2	EPDM, Others
6	O-Ring	1	EPDM, Others
7	Handle	1	ABS



www.asahi-america.com • asahi@asahi-america.com • Tel: 800-343-3618 • 781-321-5409 • Fax: 800-426-7058

Membrane Element **ESNA1-LF-LD**

(Low Fouling Technology)

Stable Performance	Permeate Flow :	8,400 gpd (31.8 m^3/d)
	$CaCl_2$ Rejection:	92%
	$CaCl_2$ Rejection (minimum/maximum) :	87%/96%

* Expected calcium rejection for a typical 500 ppm well water is 96% at 13 gfd operating flux and 25ºC.

Type	Configuration:	Low Fouling Spiral Wound
	Membrane Polymer:	Composite Polyamide
	Membrane Active Area:	400 ft^2 (37.1m^2)
	Feed Spacer:	34 mil (0.864 mm)

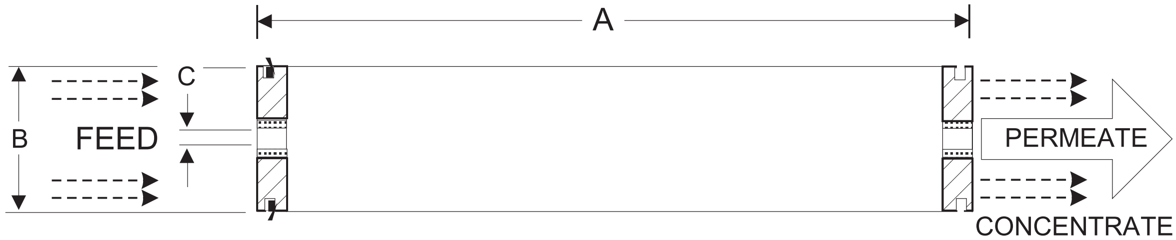
Application Data*	Maximum Applied Pressure:	600 psig (4.14 MPa)
	Maximum Chlorine Concentration:	< 0.1 PPM
	Maximum Operating Temperature:	113 °F (45 °C)
	pH Range, Continuous (Cleaning):	2-10 (1-12)*
	Maximum Feedwater Turbidity:	1.0 NTU
	Maximum Feedwater SDI (15 mins):	5.0
	Maximum Feed Flow:	75 GPM (17.0 m^3/h)
	Minimum Ratio of Concentrate to Permeate Flow for any Element:	5:1
	Maximum Pressure Drop for Each Element:	15 psi

* The limitations shown here are for general use. For specific projects, operating at more conservative values may ensure the best performance and longest life of the membrane. See Hydranautics Technical Bulletins for more detail on operation limits, cleaning pH, and cleaning temperatures.

Test Conditions

The stated performance is initial (data taken after 30 minutes of operation), based on the following conditions:

500 ppm $CaCl_2$
75 psi (0.52 MPa) Applied Pressure
77 °F (25 °C) Operating Temperature
15% Permeate Recovery
6.5 – 7.0 Feed pH



A, inches (mm)	B, inches (mm)	C, inches (mm)	Weight, lbs. (kg)
40.0 (1016)	7.89 (200)	1.125 (28.6)	33 (15)

Notice: Permeate flow for individual elements may vary -20/+25 percent. Membrane active area may vary +/-4%. Element weight may vary. All membrane elements are supplied with a brine seal, interconnector, and o-rings. Elements are enclosed in a sealed polyethylene bag containing less than 1.0% sodium meta-bisulfite solution, and then packaged in a cardboard box.

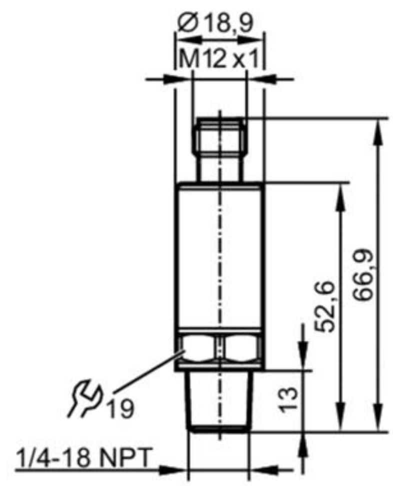
 3/17/16

Hydranautics Corporate: 401 Jones Road, Oceanside, CA 92058
1-800-CPA-PURE Phone: 760-901-2500 Fax: 760-901-2578 info@Hydranautics.com

PT2443

Pressure transmitter

PT-050PSEN14-A-ZVG/US/ /W



Application		
Application		for industrial applications
Media		liquids and gases
Medium temperature	[°C]	-40...90
Pressure rating	[psi]	1450
Note on pressure rating		static
Min. bursting pressure	[psi]	11600
Vacuum resistance	[psi]	-14.5
Type of pressure		relative pressure
MAWP (for applications according to CRN)	[psi]	1450
Electrical data		
Operating voltage	[V]	8.5...36 DC
Min. insulation resistance	[MΩ]	100; (500 V DC)
Protection class		III
Reverse polarity protection		yes
Inputs / outputs		
Number of inputs and outputs		Number of analog outputs: 1
Outputs		
Total number of outputs		1
Output signal		analog signal
Number of analog outputs		1
Analog current output	[mA]	4...20
Max. load	[Ω]	720; (Ub = 24 V; (Ub - 8,5 V) / 21,5 mA)
Short-circuit proof		yes
Overload protection		yes

PT2443

Pressure transmitter

PT-050PSEN14-A-ZVG/US/   /W

Measuring/setting range	
Measuring range [psi]	0...500
Accuracy / deviations	
Repeatability [% of the span]	< ± 0,05; (with temperature fluctuations < 10 K)
Characteristics deviation [% of the span]	< ± 0,5; (incl. drift when overtightened, zero point and span error, non-linearity, hysteresis)
Linearity deviation [% of the span]	< ± 0,1 (BFSL) / < ± 0,2 (LS)
Hysteresis deviation [% of the span]	< ± 0,2
Long-term stability [% of the span]	< ± 0,1; (per 6 months)
Temperature coefficient zero point and span [% of the span / 10 K]	< 0,1 (-25...90 °C) / < 0,2 (-40...-25 °C)
Reaction times	
Step response time analogue output [ms]	1
Operating conditions	
Ambient temperature [°C]	-40...90
Storage temperature [°C]	-40...100
Protection	IP 67; IP 69K

Tests / approvals		
EMC	DIN EN 61000-6-2	
	DIN EN 61000-6-3	
Shock resistance	DIN EN 60068-2-27	50 g (11 ms)
Vibration resistance	DIN EN 60068-2-6	20 g (10...2000 Hz)
MTTF [years]	784	
Pressure equipment directive	sound engineering practice; can be used for group 2 fluids; group 1 fluids on request	

Mechanical data	
Weight [g]	57.5
Material	1.4542 (17-4 PH / 630); stainless steel (1.4404 / 316L); PEI
Materials (wetted parts)	1.4542 (17-4 PH / 630)
Min. pressure cycles	60 million; (at 1.2 times nominal pressure)
Tightening torque [Nm]	< 50; (recommended tightening torque; Depends on lubrication, seal and pressure rating)
Process connection	threaded connection 1/4 NPT external thread
Restrictor element integrated	no (can be retrofitted)
Remarks	
Remarks	BFSL = Best Fit Straight Line LS = limit value setting
Pack quantity	1 pcs.

Electrical connection

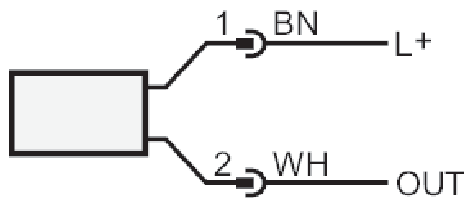
Connector: 1 x M12

PT2443

Pressure transmitter

PT-050PSEN14-A-ZVG/US/   /W

Connection

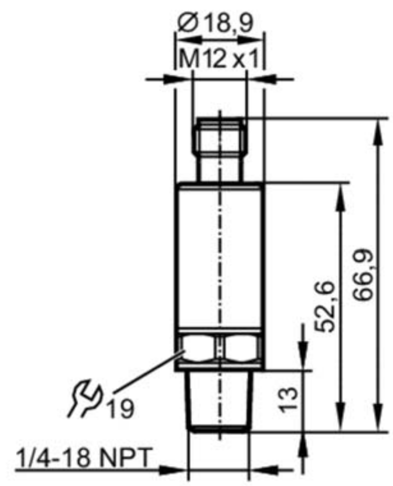


OUT	analog output
	Colours to DIN EN 60947-5-2
	Core colors :
BN =	brown
WH =	white

PT2415

Pressure transmitter

PT-010PSEN14-A-ZVG/US/   /W



Application

Application		for industrial applications
Media		liquids and gases
Medium temperature	[°C]	-40...90
Pressure rating	[psi]	150
Note on pressure rating		static
Min. bursting pressure	[psi]	1900
6acuum resistance	[psi]	-V4.5
Type of pressure		relative pressure
MAWP (for applications according to CRN)	[psi]	150

Electrical data

Operating voltage	[6]	8.5...3D ΩC
Min. insulation resistance	[M;]	V00I (500 6 ΩC)
Protection class		:::
Reverse polarity protection		yes

Inputs / outputs

Number of inputs and outputs		Number of analog outputs2V

Outputs

Total number of outputs		V
Output signal		analog signal
Number of analog outputs		V
Analog current output	[mA]	4...10
Max. load	[;]	710I (Ub = 14 6I (Ub - 8,5 6) / 1V,5 mA)
Short-circuit proof		yes
Overload protection		yes

PT2415

Pressure transmitter

PT-010PSEN14-A-ZVG/US/   /W

Measuring/setting range

Measuring range	[psi]	0...V00

Accuracy / deviations

Repeatability	[% of the span]	< ± 0,05I (with temperature fluctuations < V0 K)
Characteristics deviation	[% of the span]	< ± 0,5I (incl. drift when overtightened, zero point and span error, non-linearity, hysteresis)
Linearity deviation	[% of the span]	< ± 0,V (BFSL) / < ± 0,1 (LS)
Hysteresis deviation	[% of the span]	< ± 0,1
Long-term stability	[% of the span]	< ± 0,VI (per D months)
Temperature coefficient zero point and span	[% of the span / V0 K]	< 0,V (-15...90 °C) / < 0,1 (-40...-15 °C)

Reaction times

Step response time analogue output	[ms]	V

Operating conditions

Ambient temperature	[°C]	-40...90
Storage temperature	[°C]	-40...V00
Protection		:P D7I :P D9K

Tests / approvals

EMC	Ω:N EN DV000-D-1	
	Ω:N EN DV000-D-3	
Shock resistance	Ω:N EN D00D8-1-17	50 g (VV ms)
6ibration resistance	Ω:N EN D00D8-1-D	10 g (V0...1000 Hz)
MTTF [years]	784	
Pressure equipment directive	sound engineering practiceI can be used for group 1 fluidsI group V fluids on request	

Mechanical data

Weight	[g]	57.5
Material		V.4541 (V7-4 PH / D30)I stainless steel (V.4404 / 3VDL)I PE:
Materials (wetted parts)		V.4541 (V7-4 PH / D30)
Min. pressure cycles		D0 millionI (at V.1 times nominal pressure)
Tightening torque	[Nm]	< 50I (recommended tightening torqueI Ωepends on lubrication, seal and pressure rating)
Process connection		threaded connection V/4 NPT external thread
Restrictor element integrated		no (can be retrofitted)

Remarks

Remarks	BFSL = Best Fit Straight Line
	LS = limit value setting
Pack quantity	V pcs.

Electrical connection

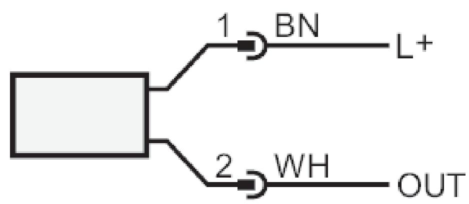
Connector2V x MV1

PT2415

Pressure transmitter

PT-010PSEN14-A-ZVG/US/   /W

Connection



OUT	analog output
	Colours to Ω:N EN D0947-5-1
	Core colors 2
BN =	brown
WH =	white

Signet 2751 DryLoc® pH/ORP Smart Sensor Electronics

In-line
2751-1

In-line EasyCal
2751-2

Submersible
2751-3 or 2751-4

DryLoc® Electrodes sold separately

The Signet 2751 pH/ORP Smart Sensor Electronics featuring the DryLoc® connector, is the solution for field-free calibration, out of range glass impedance and broken glass detection, alerting the operator to probe failure or maintenance needs.

The 2751 features two different outputs: a two-wire 4 to 20 mA loop output with optional EasyCal function or a digital (S^3L) output which allows for longer cable lengths and is compatible with all Signet 8900, 9900 and 9950* instruments or in blind, 4 to 20 mA.

The Smart Sensor Electronics will allow for calibration of electrodes in a laboratory setting and installation of pre-calibrated probes in the field, reducing system downtime. Memory chip enabled electrodes will store operational data such as minimum and maximum pH/mV readings, runtime, minimum and maximum temperature (pH only), for troubleshooting and operational evaluation. To take full advantage of all features and benefits of the 2751, use with Signet 9900 (Generation IV or later), 9950 Transmitter or 0486 Profibus Concentrator.

The 2751 self-configures for pH or ORP operation via automatic recognition of the electrode type. The optional EasyCal feature allows simple push-button calibration and includes an LED indicator for visual feedback.

The 2751 submersible Smart Sensor Electronic can also be used in-line when used with the 3/4" or 1" threaded sensors including the 272X, 273X, 275X, 276X and 277X series of electrodes. The 2751 in-line sensor electronics can be used with Signet fittings up to DN100 (4 in.) and Wet-Tap assemblies.

*Users of 9950 Gen I and 9950 (Gen 2a) should update to 9950 (Gen 2b, available in Q4) to take full advantage of the 2751 features and benefits. Visit www.gfsignet.com for the latest software update.

Features

- **Probe health monitoring, glass impedance and broken glass detection**
- **Memory chip interface that allows for transferable calibration, runtime data, and manufacturing information**
- **In-line integral mount and submersible installation versions**
- **Automatic temperature compensation**
- **Auto configuration for pH or ORP operation**
- **Optional EasyCal calibration aid with automatic pH buffer recognition for 4, 7 and 10 pH and ORP solutions: quinhydrone saturated pH 4 or 7 buffers and Light's Solution +469 mV**
- **Junction boxes for convenient wiring**
- **Patented DryLoc® connector provides a quick and secure connection to the sensor****

Applications

- **Water and Wastewater Treatment**
- **Neutralization Systems**
- **Scrubber Control**
- **Effluent Monitoring**
- **Surface Finishing**
- **Flocculent Coagulation**
- **Heavy Metal Removal and Recovery**
- **Toxics Destruction**
- **Sanitization Systems**
- **Pool & Spa Control**
- **Aquatic Animal Life Support Systems**

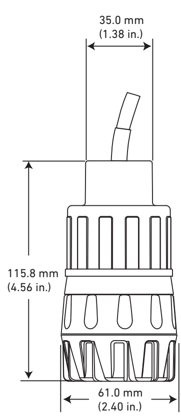
**U.S. Patent No.: 6,666,701

Specifications

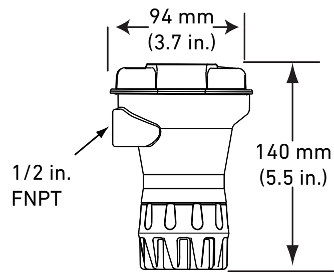
General				
Compatible Electrodes				
	Signet DryLoc® pH and ORP Electrodes, Models 2724-2726, 2734-2736, 2756-2757 Wet-Tap, 2764-2767, 2774-2777			
Operating Range	pH		-1 to 15 pH	
	ORP		±2000 mV	
Response Time	pH		< 6 sec. for 95% of change	
	ORP		Application dependent	
Materials	In-line		PBT (thermal plastic polyester) and polypropylene (retaining nut)	
	Submersible		CPVC	
Electrical				
Cable	4.6 m	15 ft	3-conductor shielded (3-2751-1 in-line and the 3-2751-3 or -4 submersible sensor electronics only)	
	22 AWG		For 9900, 9950 and 4 to 20 mA max. cable length is 300 m (1000 ft.). For 8900, please refer to the Cable Calculation Table of the Signet catalog for max. cable length.	
Power	12 to 24 VDC		±10%, regulated for 4 to 20 mA output	
	5 to 6.5 VDC		±5% regulated recommended, 3 mA max., for digital (S^3L) output	
Current Output	pH		Fixed 4 to 20 mA, isolated, = 0 to 14 pH (custom scaling available with 0252 tool)	
	ORP		Fixed 4 to 20 mA, isolated, = -1000 to +2000 mV (custom scaling available from ± 2000 mV with 0252 tool)	
Max Loop Resistance	100 Ω max. @ 12 V		325 Ω max. @ 18 V	600 Ω max. @ 24 V
Accuracy	±32 µA			
Resolution	±5 µA			
Update Rate	0.5 seconds			
Error Indication	3.6 mA, 22 mA, or none			
Digital (S^3L) Output	Serial ASCII, TTL level 9600 bps			
Accuracy	pH		± 0.02 pH @ 25 °C	± 0.02 pH @ 77 °F
	ORP		± 1.5 mV @ 25 ° C	± 1.5 mV @ 77 °F
	Temperature		≤ 0.4 °C	0.72 °F
Resolution	pH		≤ 0.01 pH	
	ORP		1.5 mV	
Update Rate	0.5 seconds			
Available Data	Raw mV, pH or ORP, Temperature (pH), Glass Impedance (pH), Minimum mV (pH), Maximum mV (pH), Minimum Temperature (pH), Maximum Temperature (pH), Model Number, Serial Number, Manufacturing Date, Runtime, Slope pH/mV, Measurement Offset, and Temperature			
Error Indication	Open input diagnostic, broken glass detection (pH), High Impedance			
Input Impedance, Z	$>10^{11}\Omega$			
Environmental				
Enclosure	3-2751-1 & -2		NEMA 4X/IP65 with electrode connected	
	3-2751-3 & -4		NEMA 6P/IP68 with electrode and watertight conduit and/or extension pipe connected	
Max. Temperature/Pressure Rating				
Operating Temperature				
Submersible	0 °C to 85 °C		32 °F to 185 °F	
In-line	0 °C to 85 °C		32 °F to 185 °F	
Storage Temperature	-20 °C to 85 °C		-4 °F to 185 °F	
Relative Humidity	0 to 95%, non-condensing (without electrode connected)			
Shipping Weight				
	2751-2		0.75 kg	1.65 lb
	2751-1, -3 & -4		0.64 kg	1.41 lb
Standards and Approvals				
	CE, FCC			
	RoHS compliant, China RoHS			
	Manufactured under ISO 9001 for Quality and ISO 14001 for Environmental Management and OHSAS 18001 for Occupational Health and Safety			

Dimensions

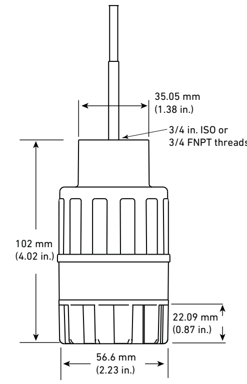
3-2751-1



3-2751-2

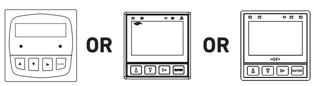
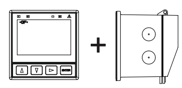
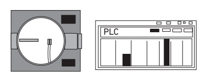
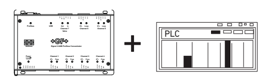


3-2751-3, -4



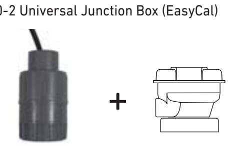
System Overview

In-Line Installation

Panel Mount	Pipe, Tank, Wall	4 to 20 mA Input	Automation System
Signet Instruments 8900 9900 9950 	Signet Instrument 9900 and Rear Enclosure 	3-2751 Smart Sensor Electronics and Customer Supplied Chart Recorder, Programmable Logic Controller, or Programmable Automation Controller 	3-0486 Profibus Concentrator and Customer Supplied Programmable Logic Controller or Programmable Automation Controller 

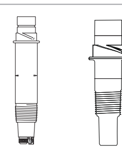
Signet 2751 Smart Sensor Electronics

Signet 2751 Smart Sensor Electronics
with Signet 3-8050-2 Universal Junction Box (EasyCal)



Signet 2751 Smart Sensor Electronics

Signet Electrodes
2724-2726
2734-2736
2764-2767
2774-2777

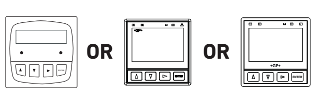
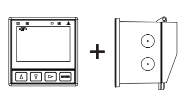
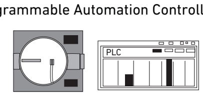
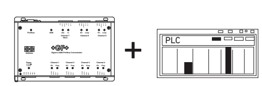


2724-2726 and 2734-2736 DryLoc Electrodes: Use GF fittings* or customer supplied 3/4 in. NPT fittings
2764-2767 and 2774-2777 DryLoc Electrodes: Use customer supplied 3/4 in. or 1 in. NPT fittings

All sold separately

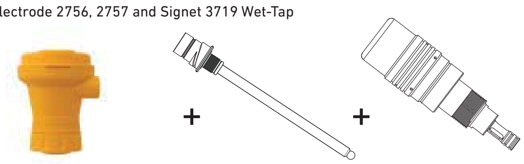
Submersible Installation

Wet-Tap Installation

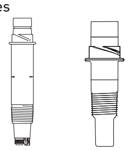
Panel Mount	Pipe, Tank, Wall	4 to 20 mA Input	Automation System
Signet Instruments 8900 9900 9950 	Signet Instrument 9900 and Rear Enclosure 	2751 Smart Sensor Electronics and Customer Supplied Chart Recorder, Programmable Logic Controller , or Programmable Automation Controller 	0486 Profibus Concentrator and Customer Supplied Programmable Logic Controller or Programmable Automation Controller 

Signet 2751 Smart Sensor Electronics
with customer supplied pipe extension or conduit, 3/4 in. NPT or ISO 7/1-R 3/4 threads**

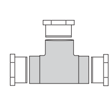
Signet 2751 Smart Sensor Electronics
with Signet Wet-Tap Electrode 2756, 2757 and Signet 3719 Wet-Tap



Signet Electrodes
2724-2726
2734-2736
2764-2767
2774-2777



GF Tees and Fittings
see model 3719 for more info



All sold separately

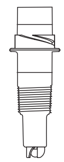
* See fittings section for more information.
**Refer to the Signet Submersion Kit brochure (3-0000.707) located on our website for installation suggestions and options.

2751 Product Selection Guide

1. Choose the Electrode

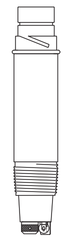
2724-2726, 2734-2736

Can use Any 3-272X or 273X series Electrode



2764-2767 Differential

3-2764-1
3-2764-2
3-2766-1
3-2766-2



2774-2777

ORP electrodes must have 10K ID resistor use: 3-2775, 3-2777

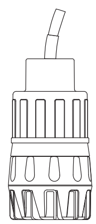
pH Electrodes can be either the 1K or 3K use: 3-2774, 3-2774-1, 3-2776, 3-2776-1

2756 and 2757 Wet-Tap

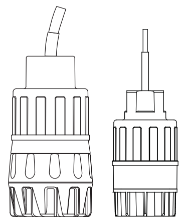
Can use any Wet-Tap 275X series electrode

2. Determine the mounting style:

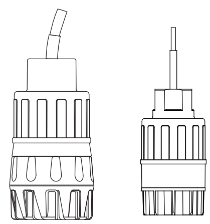
In-line



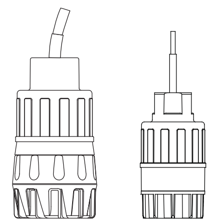
2751-1 or -2



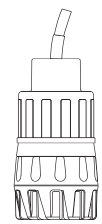
2751-1 or -2 | 2751-3 or -4



2751-1 or -2 | 2751-3 or -4



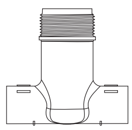
2751-1 or -2 | 2751-3 or -4



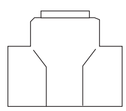
2751-1 or -2

And

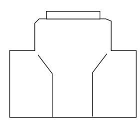
-In-line fitting



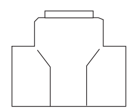
Signet fitting



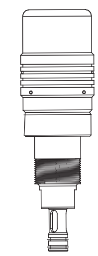
¾"
reducing tee



1" threaded tee



¾" reducing tee



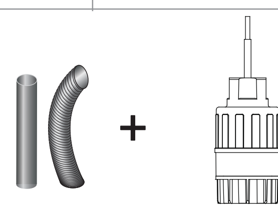
3719 Wet-Tap Assembly

(Submersible not applicable with Wet-Tap assembly)

Or

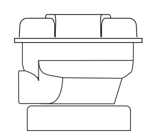
Submersible

2751-3 or -4
and cable conduit (customer supplied)
connected to ¾" sensor electronics



3. Junction Boxes

3-8050-1: Use when extending the submersible cable over long distance.
3-8050-2: Use with the submersible 2751-3 or -4 and the in-line 2751-1 for best calibration results with the EasyCal function when using the blind 4 to 20 mA output.

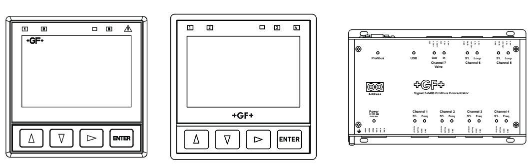


4. Choose the output instrument

Digital (S^3L)

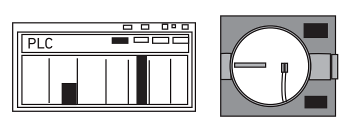
Or

4 to 20 mA



9900 or 9950 Instruments, Profibus Concentrator

OR



PLCs or Chart Recorders

Model 2751 Ordering Information

1) Model 2751 requires 12 to 24 VDC to function as a blind 4 to 20 mA output transmitter.

2) Order a 3-2751-2 or any other 2751 with a junction box 3-8050-2 if the EasyCal feature is desired.

3) Conduit and mounting brackets for submersion installation must always be used (customer supplied).

4) The 3-2759 System Tester must be ordered with the adapter cable 3-2759.391 for exclusive use with the 2751.

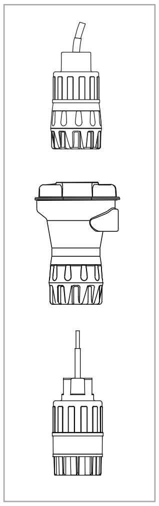
5) All sensor electronics, preamplifiers and connectors require a DryLoc electrode for full system installation.

6) The 2751 Smart Sensor Electronics is compatible with all Signet 8900, 9900 and 9950 instruments. To take full advantage of the advanced features use the 9900 SmartPro Transmitters (Generation IV or greater), 9950 and 0486 Profibus Concentrator.

Application Tips

- The EasyCal feature automatically recognizes standard 4.0, 7.0, and 10.0 pH buffer or ORP quinhydrone solutions of +87 and +264 mV or Light's Solution, +469 mV, and simplifies calibration. For EasyCal ORP only single point calibration is used.
- Frequency of calibration of electrodes is dependent upon the application.

Ordering Information



Mfr. Part No.	Code	Description
In-line Smart Sensor Electronics (Yellow body)		
3-2751-1	**159 001 804**	with 4.6 m (15 ft) cable, recommended for 9900 or 9950 instruments
3-2751-2	**159 001 805**	with junction box and EasyCal, recommended for 4 to 20 mA use
Submersible Smart Sensor Electronics (Gray body)		
3-2751-3	**159 001 806**	with 4.6 m (15 ft) cable and ¾ in. NPT threads - when 4 to 20 mA is required use the 3-8050-2 junction box with EasyCal
3-2751-4	**159 001 807**	with 4.6 m (15 ft) cable and ISO 7/1-R 3/4 threads - when 4 to 20 mA is required use the 3-8050-2 junction box with EasyCal

Sensor Electronics with preamplified signal and Digital (S^3L) output (for use with the SmartPro Instruments) or 4 to 20 mA output - power supplied to unit dictates output type.

Note:
The 2751 Smart Sensor Electronics is compatible with 8900, 9900 and 9950 SmartPro Transmitters, and Signet 0486 Profibus Concentrator. To take full advantage of the 2751 features, use 9900 (Generation IV or later), 9950 or 0486 Profibus Concentrator.

Accessories and Replacement Parts

Mfr. Part No.	Code	Description
Calibration		
3-2700.395	**159 001 605**	Calibration kit: includes 3 polyproplyene cups, box used as cup stand, 1 pint pH 4.01, 1 pint pH 7.00
3822-7115	**159 001 606**	20 gm bottle quinhydrone for ORP calibration (must use pH 4.01 and/or pH 7.00 buffer solutions)
3-2759	**159 000 762**	pH/ORP system tester (adapter cable sold separately)
3-2759.391	**159 000 764**	2759 adapter cable for use with 2751 DryLoc sensor electronics
3-0700.390	**198 864 403**	pH buffer kit (1 each 4, 7, 10 pH buffer in powder form, makes 50 ml of each)
3822-7004	**159 001 581**	pH 4 buffer solution, 1 pint (473 ml) bottle
3822-7007	**159 001 582**	pH 7 buffer solution, 1 pint (473 ml) bottle
3822-7010	**159 001 583**	pH 10 buffer solution, 1 pint (473 ml) bottle
Mounting		
3-8050.390-3	**159 310 116**	Retaining nut replacement kit, Black Polypropylene
3-8050-1	**159 000 753**	Universal mount junction box
3-8050-2	**159 000 754**	Universal mount junction box w/EasyCal (for submersible applications, use with 3-2751-3 and -4 where 4 to 20 mA is required)
3-9000.392-1	**159 000 839**	Liquid tight connector kit, NPT (1 connector)
3-9000.392-2	**159 000 841**	Liquid tight connector kit, PG 13.5 (1 connector)
Other		
5523-0322	**159 000 761**	Sensor cable (per ft), 3-cond. plus shield, 22 AWG, black/red/white (for use with 2751)
P31515-0P200	**159 000 630**	Universal Pipe Adapter PVC
P31515-0C200	**159 000 631**	Universal Pipe Adapter CPVC
P31515-0V200	**159 000 459**	Universal Pipe Adapter PVDF
7310-1024	**159 873 004**	24 VDC power supply, 10W, 0.42 A
7310-2024	**159 873 005**	24 VDC power supply, 24W, 1.0 A
7310-4024	**159 873 006**	24 VDC power supply, 40W, 1.7 A
7310-6024	**159 873 007**	24 VDC power supply, 60W, 2.5 A
7310-7024	**159 873 008**	24 VDC power supply, 96W, 4.0 A

3401 Aero Jet Avenue, El Monte, CA 91731-2882 U.S.A. • Tel. (626) 571-2770 • Fax (626) 573-2057 • www.gfsignet.com • e-mail: signet.ps@georgfischer.com

Signet 2724-2726 pH/ORP Electrodes

General Purpose

Compatible with ALL Signet pH/ORP instruments and SmartPro transmitters

Flat Glass

Protected Bulb

The Signet 2724-2726 pH and ORP electrodes are general purpose sensors ideal for a wide range of applications. These feature a patented reference design and uses the unique foul-proof patented DryLoc® connector. The large area PE reference junction and pathway is constructed to increase the total reference effectiveness and ensures long service life.

The DryLoc® connector with corrosion resistant gold plated contacts readily connects the sensor to the mating 2751 pH/ORP Smart Sensor Electronics or the 2760 Preamplifier. The robust Ryton® threaded sensor body and choice of flat pH, bulb pH, or flat ORP sensing elements allows a broad range of chemical and mechanical compatibility for a wide variety of applications.

There are two optional pH sensing versions available, HF and LC. The HF version is for applications where traces of hydrofluoric acid (2% or less) will attack standard pH glass. The LC version can be used for low conductivity fluids 20 - 100 µS/cm nominal and below 20 µS when mounted under controlled conditions.

The quick temperature response is available in either a Pt1000 or 3 KΩ temperature sensor and allows compatibility with all Signet pH/ORP instruments. The 2724-2726 electrodes incorporate ¾ inch NPT or ISO 7/1-R 3/4 threads for installing into standard pipe-tees. They can also be mounted directly into Signet standard fittings, DN15 to DN100 (½ to 4 inch).

Features

- **Patented reference design for exceptional performance and prolonged life in harsh environments***
- **Memory chip enabled for access to a wide range of unique features when connected to the Signet 2751 pH/ORP Smart Sensor Electronics**
- **Ryton® (PPS) body for broad range of chemical compatibility**
- **Patented DryLoc® connector with gold plated contacts**
- **Special design allows for installation at any angle, even inverted or horizontal**
- **¾" NPT or ISO 7/1-R 3/4 threaded sensors for use with reducing tees DN15 to DN100 (½ to 4 in.)**
- **Mounts in Signet standard fittings from DN15 to DN100 (½ to 4 in.)**
- **Quick temperature response**
- **Bulb and flat HF resistant glass available for trace HF, in less than 2% concentration applications**
- **Low conductivity sensor available for liquids down to 20 µS/cm**

Applications

- **Water & Wastewater Treatment**
- **Neutralization Systems**
- **Effluent Monitoring**
- **Sanitization Systems**
- **Pool & Spa Control**
- **Aquatic Animal Life Support Systems**
- **Process Control**
- **Cooling Towers**

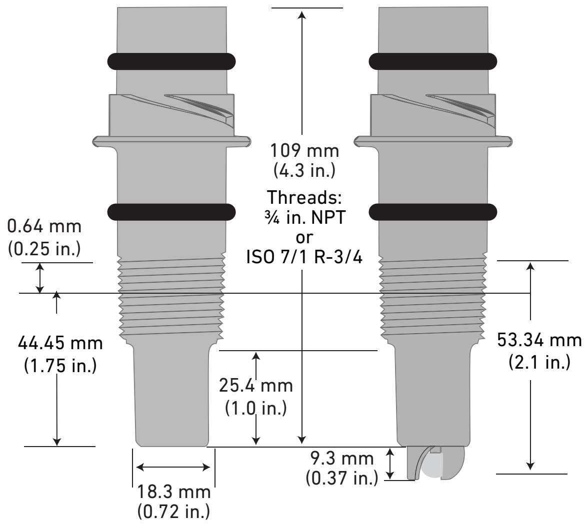
*U.S. Patent Nos.: 6,666,701, 7,799,193 B2, 7,867,371 B2 and 8,211,282 B2

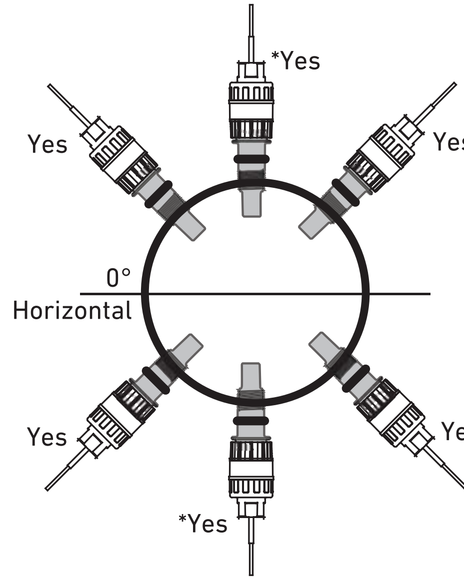
Specifications

General			
Performance	Efficiency	>97% @ 25 °C (77 ° F)	
Operating Range	pH	0 to 14 pH	
	ORP	±2000 mV	
	3-2726-LC	Low conductivity fluids; 20 - 100 µS/cm nominal < 20 µS; flow must be less than 150 ml/min in a properly grounded system	
	3-2724-HF, 3-2726-HF	Hydrofluoric acid resistant glass, pH 6 or below; trace HF ≤2%	
Compatibility			
	2751 Smart Sensor Electronics (for 8900, 9900, 9950, 4 to 20 mA or Profibus Concentrator), 2760 Preamplifier		
Temperature Sensor			
	Pt1000 versions	Compatible with Signet 2751 pH/ORP Smart Sensor Electronics for connection to a PLC or to the Signet 8900, 9900 or 9950 instruments	
	3 KΩ Balco versions	Compatible with Signet 2751 pH/ORP Smart Sensor Electronics or with Signet 2760 pH/ORP Preamplifier for connection to the Signet 8750 pH/ORP Transmitter	
Process Connection			
	¾ in. NPT	ISO 7/1-R 3/4	Mounts into Signet fittings
Wetted Materials			
	pH	Ryton® (PPS), glass, UHMW PE, FKM	
	ORP	Ryton® (PPS), glass, UHMW PE, FKM, Platinum	
Max. Temperature/Pressure Rating			
Operating Temperature Range*		-10 °C to 85 °C	14 °F to 185 °F
Operating Pressure Range		6.8 bar @ -10 to 65 °C (100 psi @ 14 to 150 °F)	
		4 bar @ 65 to 85 °C (58 psi @ 150 to 185 °F)	
*Best performance for 2724-HF, 2726-HF sensors is above 10 °C (50 °F)			
Recommended Storage Temperature			
		0 °C to 50 °C	32 °F to 122 °F
The electrode glass will shatter if shipped or stored at temperature below 0 °C (32 °F)			
The performance life of the electrode will shorten if stored at temperatures above 50 °C (122 °F)			
Mounting			
In-line Mounting	Use the sensor threads		
	Use a Signet standard fitting up to 4 in.		
	Sensor can be mounted at any angle		
Submersible Mounting	Use threads on models 2751 or 2760		
	Requires ¾ inch NPT or ISO 7/1-R 3/4 male threaded liquid tight extension conduit.		
Shipping Weight			
	0.25 kg	0.55 lb	
Standards and Approvals			
	RoHS compliant, China RoHS		
	Manufactured under ISO 9001 for Quality, ISO 14001 for Environmental Management and OHSAS 18001 for Occupational Health and Safety		

See Temperature and Pressure graphs for more information

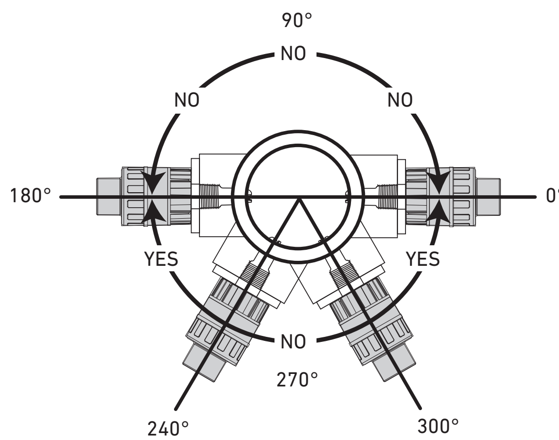
Dimensions



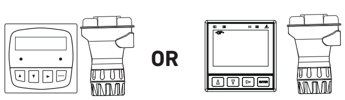
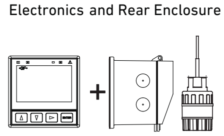
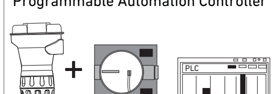
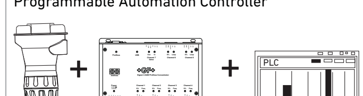


Mounting Angle
Models 2724-2726 may be mounted at any angle without affecting the performance.
*Avoid locations with air pockets and sediment.

When mounting in standard threaded fittings the electrode must be mounted horizontally to 60 degrees below horizontal position only.



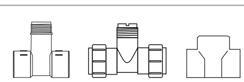
System Overview

Panel Mount	Pipe, Tank, Wall Mount	4 to 20 mA Output	Automation System
Signet Instruments 8900 9900 or 9950 with 2751 Smart Sensor Electronics	Signet Instruments 9900 with 2751 Smart Sensor Electronics and Rear Enclosure	2751 Smart Sensor Electronics and Customer Supplied Chart Recorder or Programmable Logic Controller or Programmable Automation Controller	2751 Smart Sensor Electronics with 0486 Profibus Concentrator and Customer Supplied Programmable Logic Controller or Programmable Automation Controller
			

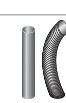
Signet 2724-2726
DryLoc® pH/ORP Electrodes

All sold separately

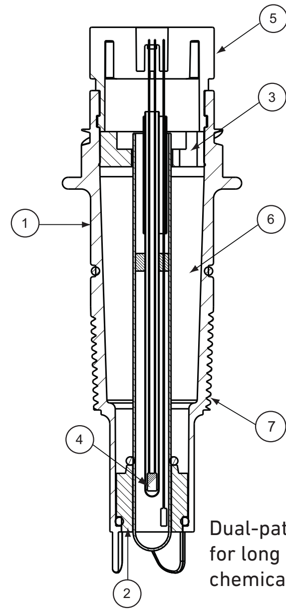
In-Line Installation -
Signet and threaded fittings only



Submersible Installation -
Customer supplied pipe extension or conduit with 3/4 in. NPT or ISO 7/1-R 3/4 threads



Electrode Key Features and Benefits:



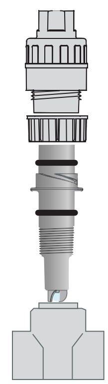
Dual-patented reference design for long life in conductivity or chemicals.

1. Ryton® body for chemical compatibility with most harsh chemicals.
2. Porous UHMW PE (ultra high molecular weight polyethylene) junction resists fouling and build-up.
3. Memory chip enabled for convenient data storage and access (calibration data, operational data, and manufacturing data), electrode health monitoring via glass impedance measurement when used in connection with the 2751 pH/ORP Smart Sensor Electronics.
4. Internal temperature sensor located in the glass stem for a quick temperature response.
5. DryLoc® connector with corrosion resistant gold plated pins for quick and easy sensor removal. Resists moisture and dirt intrusion.
6. Dual-patented reference design with a 406 mm (16 in.) reference pathway for prolonged life in harsh environments. This enables the sensor to last significantly longer than other standard pH/ORP electrodes in most applications.

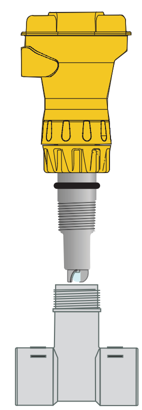
6a. With the patented reference design, the Signet 2726-LC version performs better in low conductivity water between 20 - 100 µS and lasts longer than previous "DI" electrodes.

6b. The 2726-LC sensor also performs in applications with extremely low (less than 20 µS) conductivity. Special precautions must be taken to avoid measurement complications.
Please note the following.
   - Electrostatic charges (streaming potentials) can cause dramatic offsets in a system with very low conductivity water. To minimize this, sensors should be placed in a well grounded system.
   - To enhance performance, a low flow cell is recommended to provide a steady flow rate (150 ml/minute). Sensors placed in high flow applications will experience noisier readings due to streaming potential.

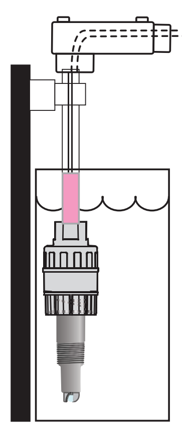
7. Threads for NPT or ISO process connection into reducing tees
   - Use off-the-shelf GF reducing tees DN20 to DN100 (¾ to 4 in.).
8. Mounts directly into Signet fittings (½ to 4 in.) for easy sensor retrofitting.
9. Mount submersed into a tank via the 2751 or 2760 back threads.



⑦ Sensor in threaded reducing tee



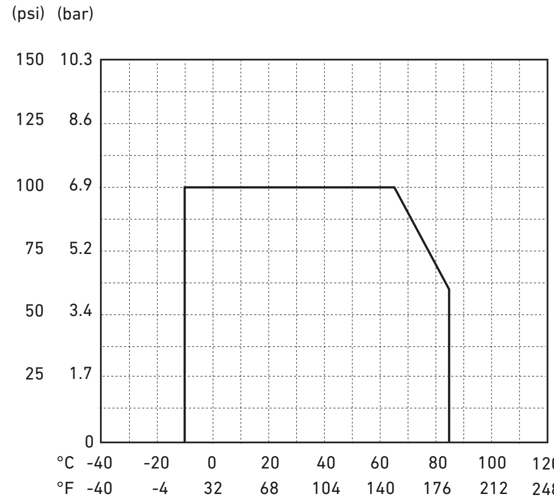
⑧ Sensor in Signet fitting



⑨ Sensor submersible installation

Temperature/Pressure Graph

Note:
The pressure/temperature graphs are specifically for the Signet sensor. During system design the specifications of all components must be considered. In the case of a metal piping system, a plastic sensor will reduce the system specification.



Application Tips
- Use the flat glass electrodes when a self-cleaning feature is desired; especially useful in applications with abrasive chemicals for in-line installations.
- Use bulb protected electrodes for low temperature applications or where fast response is required.
- ORP electrodes are generally used for chemical reaction monitoring, not control.
- Ensure that sensor materials are chemically compatible with the process liquid.
- Keep electrode tip wet, avoid air pockets and sediment.

Model 2724-2726 Ordering Notes
1) pH and ORP electrodes require connection to model 2751 pH/ORP Smart Sensor Electronics or 2760 Preamplifier.
2) The 2751 "EasyCal" feature recognizes common pH and ORP buffer values of 4, 7 and 10 pH and +87, +264 and +469 mV for ORP.

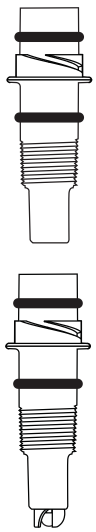
Buffer Solutions
3822-7004
3822-7007
3822-7010

Quinhydrone
3822-7115

The Signet pH buffers are ideal for calibration. The liquid solutions are conveniently packaged in one pint (473 ml) bottles. pH buffer kits in powder pillows are available for mixing fresh solutions with water at the time of use.

All pH buffers are color coded for easy identification; 4.01 pH is red, 7.00 pH is yellow, and 10.00 pH is blue. All pH buffers are traceable to NIST standards. The 4.01 and 7.00 pH buffer solutions can be used to calibrate ORP sensors when saturated with quinhydrone.

Ordering Information



Mfr. Part No.	Code	Tip Design	Process Connection Thread Options
pH Electrodes			
Temperature element Pt1000; use with 2751 pH/ORP Smart Sensor Electronics* and Profibus Concentrator			
3-2724-00	**159 001 545**	Flat	¾ in. MNPT, Thread
3-2724-01	**159 001 546**	Flat	ISO 7/1-R 3/4 Thread
3-2726-00	**159 001 553**	Bulb	¾ in. MNPT, Thread
3-2726-01	**159 001 554**	Bulb	ISO 7/1-R 3/4 Thread
3-2726-HF-00	**159 001 549**	Bulb, HF Resistant[1]	¾ in. MNPT, Thread
3-2726-HF-01	**159 001 550**	Bulb, HF Resistant[1]	ISO 7/1-R 3/4 Thread
3-2726-LC-00	**159 001 557**	Bulb, Low Conductivity[2]	¾ in. MNPT, Thread
3-2726-LC-01	**159 001 558**	Bulb, Low Conductivity[2]	ISO 7/1-R 3/4 Thread
Temperature element 3 KΩ Balco; Compatible with both the 2751 pH/ORP Smart Sensor Electronics* and the 2760 Preamplifier**			
3-2724-10	**159 001 547**	Flat	¾ in. MNPT, Thread
3-2724-11	**159 001 548**	Flat	ISO 7/1-R 3/4 Thread
3-2724-HF-10	**159 001 771**	Flat, HF Resistant[1]	3/4 in. NPT, Thread
3-2724-HF-11	**159 001 772**	Flat, pH Resistant[1]	ISO 7/1-R 3/4 Thread
3-2726-10	**159 001 555**	Bulb	¾ in. MNPT, Thread
3-2726-11	**159 001 556**	Bulb	ISO 7/1-R 3/4 Thread
3-2726-HF-10	**159 001 551**	Bulb HF Resistant[1]	¾ in. MNPT, Thread
3-2726-HF-11	**159 001 552**	Bulb HF Resistant[1]	ISO 7/1-R 3/4 Thread
3-2726-LC-10	**159 001 559**	Bulb, Low Conductivity[2]	¾ in. MNPT, Thread
3-2726-LC-11	**159 001 560**	Bulb, Low Conductivity[2]	ISO 7/1-R 3/4 Thread
ORP Electrodes; Compatible with both the 2751 pH/ORP Smart Sensor Electronics* and the 2760 Preamplifier**			
3-2725-60	**159 001 561**	Flat	¾ in. MNPT, Thread
3-2725-61	**159 001 562**	Flat	ISO 7/1-R 3/4 Thread

*The 2751 pH/ORP Smart Sensor Electronics has a digital (S^3L) output which is used with 8900, 9900 or 9950 instruments, and the Profibus Concentrator.
It also has a 4 to 20 mA output for connections to PLC's, data recorders, etc.

**The 2760 Preamplifier is used for connection directly to 8750 transmitter or other analog transmitters.

[1]HF resistant ≤2%HF

[2]Low conductivity applications, 20 - 100 μS/cm recommended

> **Note:**
> The 3 KΩ Balco temperature element electrodes are compatible with the 2751 pH/ORP Smart Sensor Electronics, 8900, 9900 and 9950 instruments.

Accessories and Replacement Parts

Mfr. Part No.	Code	Description
1220-0021	**198 801 000**	O-ring, FKM (2 required per sensor)
3-2700.395	**159 001 605**	Calibration kit: includes 3 polypropylene cups, box used as cup stand, 1 pint pH 4.01, 1 pint pH 7.00
3822-7115	**159 001 606**	20 gm bottle quinhydrone for ORP calibration (must use pH 4.01 and/or pH 7.00 buffer solutions)
3-2759	**159 000 762**	pH/ORP System Tester (adapter cable sold separately)
3-2759.391	**159 000 764**	2759 DryLoc adapter cable (for use with 2750 and 2760)
3-0700.390	**198 864 403**	pH Buffer Kit (1 each 4, 7, 10 pH buffer in powder form, makes 50 ml of each)
3822-7004	**159 001 581**	pH 4.01 buffer solution, 1 pint (473 ml) bottle
3822-7007	**159 001 582**	pH 7.00 buffer solution, 1 pint (473 ml) bottle
3822-7010	**159 001 583**	pH 10.00 buffer solution, 1 pint (473 ml) bottle
3800-5000	**159 838 107**	3.0M KCl storage solution for pH and ORP, 1 pint (473 ml) bottle
3-2700.397	**159 001 870**	Protective cap for pH/ORP electrodes, 5 pieces

3-2724.099 Rev H (02/18)

3401 Aero Jet Avenue, El Monte, CA 91731-2882 U.S.A. • Tel. (626) 571-2770 • Fax (626) 573-2057 • www.gfsignet.com • e-mail: signet.ps@georgfischer.com

Low-cost chemical storage tanks made for years of dependable service.

110 Series Solution Tanks

ORDER NUMBER	DESCRIPTION	UNITS PER CARTON/WEIGHT
G21424*N7C00	15 gallon with closure	1/7
G21832*N7C00	35 gallon with closure	1/19

** A=Almond, B=Blue, P=Polynatural. Almond not available in the 35-gallon size.*

Clack's line of low-cost, high-quality chemical feed and storage tanks are manufactured from rugged high density polyethylene** for years of dependable service, even in the toughest environments.

Available in several colors, Clack's 110 Series Solution Tanks are designed with 110 mm openings for easy access and convenient filling. The wide diameter openings also allow adequate clearance to reach inside for assembly of fittings.

Clack's child-resistant closure deters accidental entry, while the special cap liner prevents accidental leaks when cap is properly applied.

Convenient 15-gallon size is perfect for use in tight spaces. The larger 35-gallon size accommodates pumps, mixers, and other accessories for light commercial and industrial use.

Call Clack today and find out how you can save substantially on 15-gallon and 35-gallon chemical storage tank costs by using 110 Series Solution Tanks.

*** Materials are compliant with 21 CFR 177.1520 (c) 3.1 and 3.2a, 178.3297, 178.2010, 175.320, 177.1640 and 181.32.*

110 Series Solution Tanks

Features:

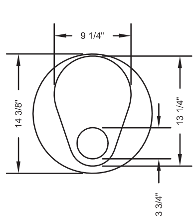
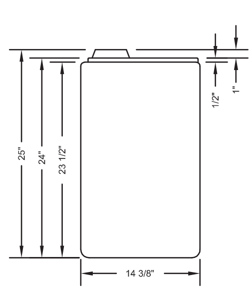
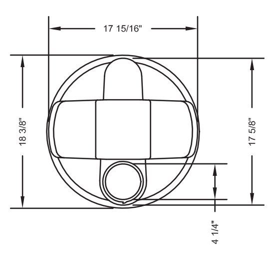
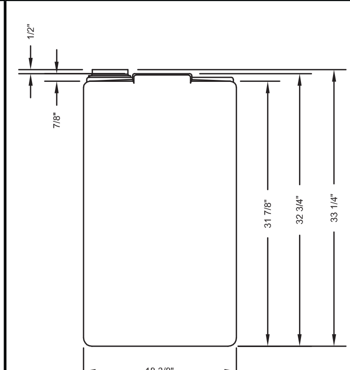
INTEGRATED MOUNTING PLATFORM:
Clack's 110 Series tanks have a mounting platform molded right into the top. This allows you to attach a chemical feed pump quickly, easily, and permanently. The 35-gallon tank also allows for installation of mixers and other accessories.

EASY-TO-READ GALLON/LITER SCALE:
Clack's 110 Series tanks have large, easy-to-read volume scale molded in. No more guessing.

CHILD RESISTANT CLOSURE:
All of Clack's 110 Series tanks come with Squeeze-Lok® closures. This unique cap locking system provides visible and touch-sensitive indication when the tank lock tab is engaged.

SPECIAL CAP LINER:
Special cap liner acts as a tight seal to prevent accidental leakage.

Dimensions:

15 gallon		35 gallon	
Top View	**Front View**	**Top View**	**Front View**
			

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Form No. 1514 • 5/26/2010

SMART Digital S - DDE

up to 15 l/h

Installation and operating instructions

Further languages

http://net.grundfos.com/qr/i/95725839

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think
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1.6 Diaphragm breakage

If the diaphragm leaks or is broken, dosing liquid escapes from the drain opening (fig. 10, pos. 11) on the dosing head. Observe section *7.4 Diaphragm breakage*.

Warning

Danger of explosion, if dosing liquid has entered the pump housing!

Operation with damaged diaphragm can lead to dosing liquid entering the pump housing.

In case of diaphragm breakage, immediately separate the pump from the power supply!

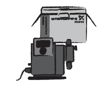
Make sure the pump cannot be put back into operation by accident!

Dismantle the dosing head without connecting the pump to the power supply and make sure no dosing liquid has entered the pump housing. Proceed as described in section *7.4.1 Dismantling in case of diaphragm breakage*.

To avoid any danger resulting from diaphragm breakage, observe the following:

- Perform regular maintenance. See section *7.1 Regular maintenance*.
- Never operate the pump with blocked or soiled drain opening.
  - If the drain opening is blocked or soiled, proceed as described in section *7.4.1 Dismantling in case of diaphragm breakage*.
- Never attach a hose to the drain opening. If a hose is attached to the drain opening, it is impossible to recognise escaping dosing liquid.
- Take suitable precautions to prevent harm to health and damage to property from escaping dosing liquid.
- Never operate the pump with damaged or loose dosing head screws.

2. General information



The DDE dosing pump is a self-priming diaphragm pump. It consists of a housing with stepper motor and electronics and a dosing head with diaphragm and valves.

Excellent dosing features of the pump:

- Optimal intake even with degassing media, as the pump always works at full suction stroke volume.
- Continuous dosing, as the medium is sucked up with a short suction stroke, regardless of the current dosing flow, and dosed with the longest possible dosing stroke.

2.1 Applications

The pump is suitable for liquid, non-abrasive, non-flammable and non-combustible media strictly in accordance with the instructions in these installation and operating instructions.

Areas of application

- Drinking water treatment
- Wastewater treatment
- Swimming pool water treatment
- Boiler water treatment
- CIP (Clean-In-Place)
- Cooling water treatment
- Process water treatment
- Wash plants
- Chemical industry
- Ultrafiltration processes and reverse osmosis
- Irrigation
- Paper and pulp industry
- Food and beverage industries.

2.2 Improper operating methods

The operational safety of the pump is only guaranteed if it is used in accordance with section *2.1 Applications*.

Warning

Other applications or the operation of pumps in ambient and operating conditions, which are not approved, are considered improper and are not permitted. Grundfos cannot be held liable for any damage resulting from incorrect use.

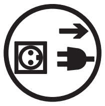
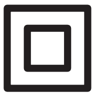
Warning

The pump is NOT approved for operation in potentially explosive areas!

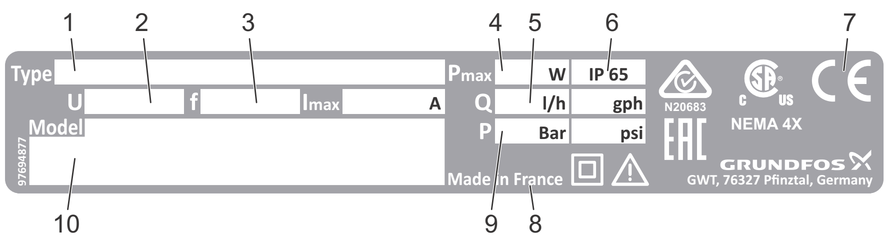
Warning

A sunscreen is required for outdoor installation!

2.3 Symbols on the pump

Symbol	Description
	Indication of universally dangerous spot.
	In case of emergency and prior to all maintenance work and repairs, take the mains plug out of the mains supply!
	The device complies with electrical safety class II.
	Connection for deaeration hose at dosing head. If the deaeration hose is not correctly connected, danger will arise due to possible leakage of dosing liquid!

2.4 Nameplate



TM04 8144 1716

Fig. 1 Nameplate

Pos.	Description	Pos.	Description
1	Type designation	6	Enclosure class
2	Voltage	7	Mark of approval, CE mark, etc.
3	Frequency	8	Country of origin
4	Power consumption	9	Max. operating pressure
5	Max. dosing flow	10	Model

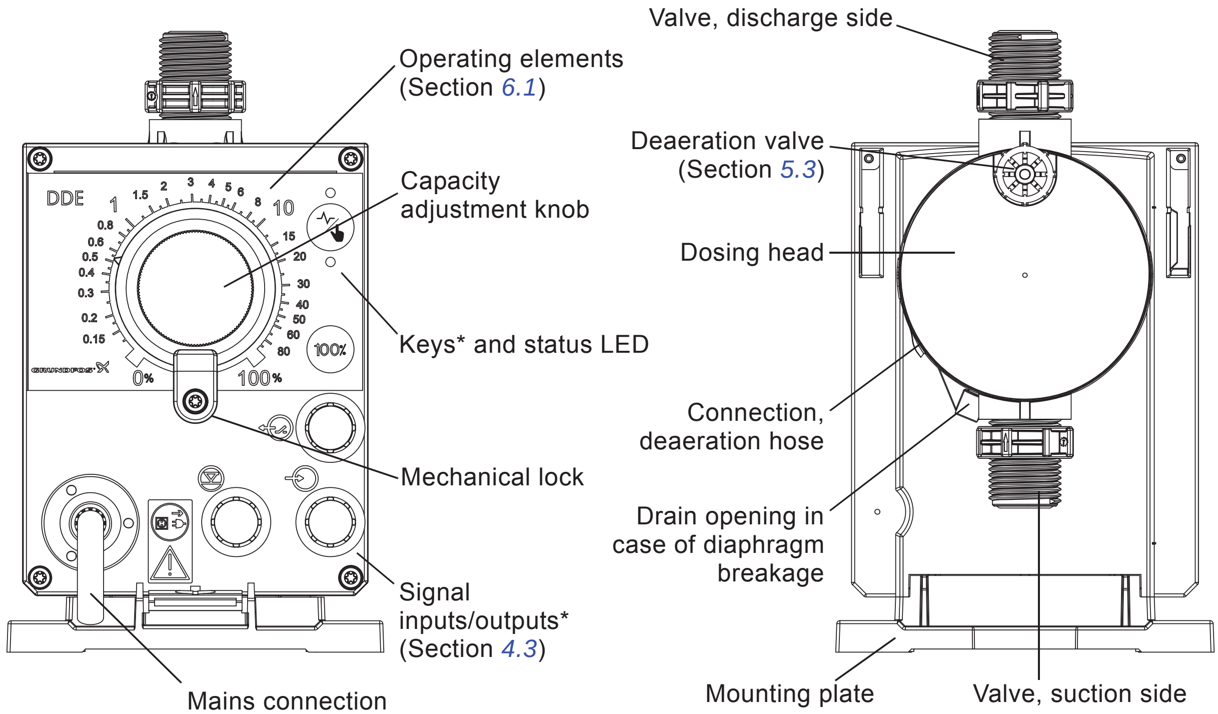
2.5 Type key

The type key is used to identify the precise pump and is not used for configuration purposes.

Code	Example	DDE	6-	10	P-	PP/	V/	C-	X-	3	1	U2U2	F	G
	Pump type													
	Max. flow [l/h]													
	Max. pressure [bar]													
	Control variant													
B	Basic													
P	B with pulse mode													
PR	P with relay output													
	Dosing head material													
PP	Polypropylene													
PVC	PVC (polyvinyl chloride, only up to 10 bar)													
PV	PVDF (polyvinylidene fluoride)													
SS	Stainless steel DIN 1.4401													
	Gasket material													
E	EPDM													
V	FKM													
T	PTFE													
	Valve ball material													
C	Ceramic													
SS	Stainless steel DIN 1.4401													
	Control cube position													
X	No control cube													
	Voltage													
3	1 x 100-240 V, 50/60 Hz													
	Valve type													
1	Standard													
2	Spring-loaded (HV version)													
	Suction/discharge side connection													
U2U2	Hose, 4/6 mm, 6/9 mm, 6/12 mm, 9/12 mm													
U7U7	Hose 0.17" x 1/4"; 1/4" x 3/8"; 3/8" x 1/2"													
AA	Threaded Rp 1/4", female (stainless steel)													
VV	Threaded 1/4" NPT, female (stainless steel)													
XX	No connection													
	Installation set*													
I001	Hose, 4/6 mm (up to 7.5 l/h, 13 bar)													
I002	Hose, 9/12 mm (up to 60 l/h, 9 bar)													
I003	Hose, 0.17" x 1/4" (up to 7.5 l/h, 13 bar)													
I004	Hose, 3/8" x 1/2" (up to 60 l/h, 10 bar)													
	Mains plug													
F	EU													
B	USA, Canada													
G	UK													
I	Australia, New Zealand, Taiwan													
E	Switzerland													
J	Japan													
L	Argentina													
	Design													
G	Grundfos													

* Including: 2 pump connections, foot valve, injection unit, 6 m PE discharge hose, 2 m PVC suction hose, 2 m PVC deaeration hose (4/6 mm).

2.6 Product overview



* only control variant DDE-PR/P

Fig. 2 Overview

3. Technical data / Dimensions

3.1 Technical data

Data			6-10	15-4
Mechanical data	Turn-down ratio (setting range)	[1:X]	1000	1000
	Max. dosing capacity	[l/h]	6.0	15.0
		[gph]	1.5	4.0
	Min. dosing capacity	[l/h]	0.006	0.015
		[gph]	0.0015	0.0040
	Max. operating pressure	[bar]	10	4
		[psi]	150	60
	Max. stroke frequency	[strokes/min]	140	180
	Stroke volume	[ml]	0.81	1.58
	Accuracy of repeatability	[%]	± 5	
	Max. suction lift during operation[1)]	[m]	6	
	Max. suction lift when priming with wet valves[1)]	[m]	2	3
	Min. pressure difference between suction and discharge side	[bar]	1	

Data			6-10	15-4
Mechanical data	Max. inlet pressure, suction side	[bar]	2	
	Max. viscosity with spring-loaded valves[2)]	[mPas] (= cP)	600	500
	Max. viscosity without spring-loaded valves[2)]	[mPas] (= cP)	50	
	Min. internal hose/pipe diameter suction/discharge side[1), 3)]	[mm]	4	6
	Min. internal hose/pipe diameter suction/discharge side (high viscosity)[3)]	[mm]	9	
	Min./Max. liquid temperature	[°C]	-10/45	
	Min./Max. ambient temperature	[°C]	0/45	
	Min./Max. storage temperature	[°C]	-20/70	
	Max. relative humidity (non-condensing)	[%]	96	
	Max. altitude above sea level	[m]	2000	
Electrical data	Voltage	[V]	100-240 V, - 10 %/+ 10 %, 50/60 Hz	
	Length of mains cable	[m]	1.5	
	Max. inrush current for 2 ms (100 V)	[A]	8	
	Max. inrush current for 2 ms (230 V)	[A]	25	
	Max. power consumption P_1	[W]	19	
	Enclosure class		IP65, Nema 4X	
	Electrical safety class		II	
	Pollution degree		2	
Signal input	Max. load for level input		12 V, 5 mA	
	Max. load for pulse input		12 V, 5 mA	
	Max. load for external stop input		12 V, 5 mA	
	Min. pulse length	[ms]	5	
	Max. pulse frequency	[Hz]	100	
	Max. resistance in level/pulse circuit	[Ω]	1000	
Signal output	Max. ohmic load on relay output	[A]	0.5	
	Max. voltage on relay output	[V]	30 VDC/30 VAC	
Weight/size	Weight (PVC, PP, PVDF)	[kg]	2.4	
	Weight (stainless steel)	[kg]	3.2	
	Diaphragm diameter	[mm]	44	50
Sound pressure	Max. sound pressure level	[dB(A)]	60	
Approvals			CE, CB, CSA-US, NSF61, EAC, ACS, RCM	

1) Data is based on measurements with water

2) Maximum suction lift: 1 m, dosing capacity reduced (approx. 30 %)

3) Length of suction line: 1.5 m, length of discharge line: 10 m (at max. viscosity)

3.2 Dimensions

The indicated dimensions are the same for all control variants of the DDE range.
The following drawing shows the DDE-PR control variant.

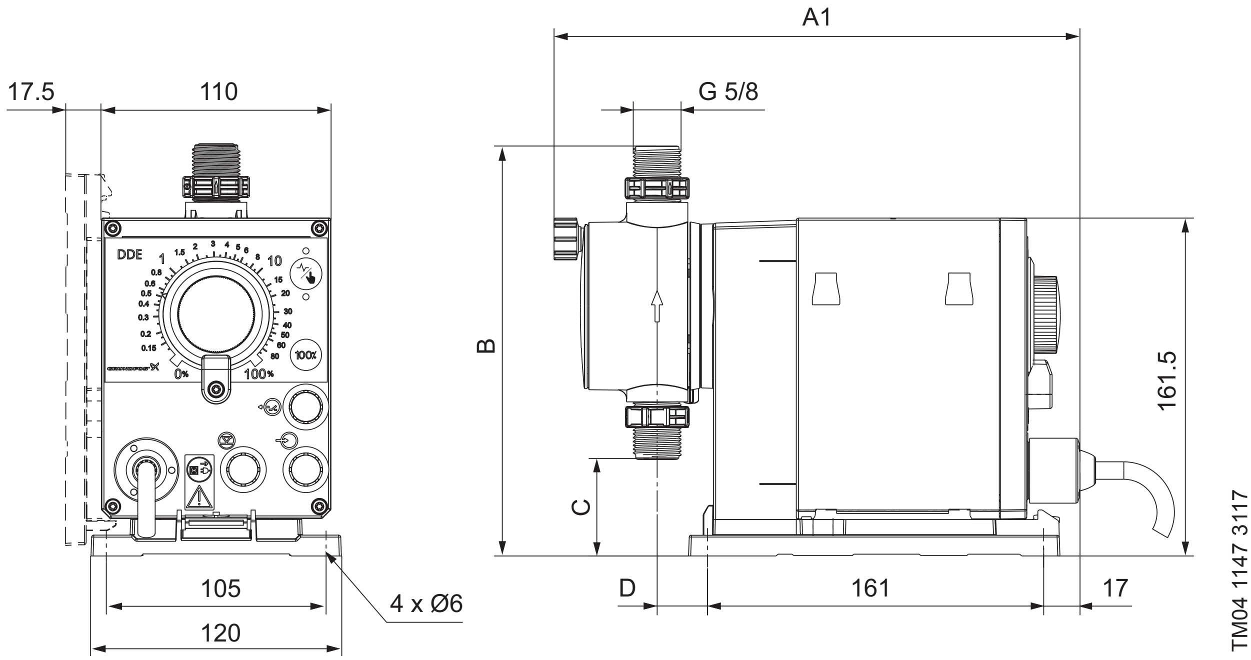


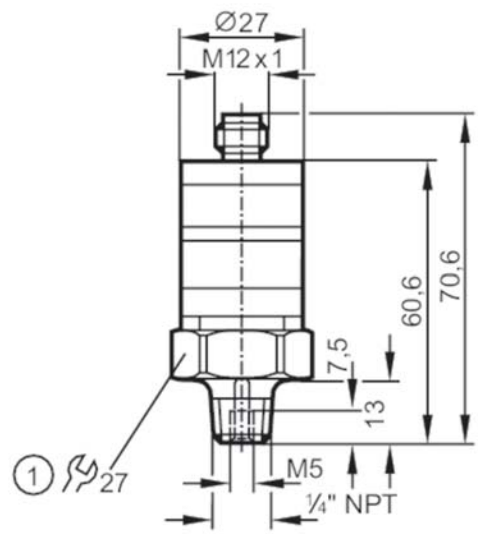
Fig. 3 Dimensional sketch

Pump type	A1 [mm]	B [mm]	C [mm]	D [mm]
DDE 6-10	251	196	46.5	24
DDE 15-4	251	200.5	39.5	24

PK6222

Pressure switch with intuitive switch point setting

PK-100-SFN14-HCPKG/US/   /W



1 Tightening torque 25 Nm

Application			
Media		liquids and gases	
Medium temperature	[°C]	-25...80	
Pressure rating		200 bar	2900 psi
Min. bursting pressure		1000 bar	14500 psi
Type of pressure		relative pressure	
Electrical data			
Operating voltage	[V]	9.6...32 DC	
Current consumption	[mA]	< 25	
Min. insulation resistance	[MΩ]	100; (500 V DC)	
Protection class		III	
Reverse polarity protection		yes	
Inputs / outputs			
Number of inputs and outputs		Number of digital outputs: 2	

PK6222

Pressure switch with intuitive switch point setting

PK-100-SFN14-HCPKG/US/   /W

Outputs		
Total number of outputs	2	
Output signal	switching signal	
Electrical design	PNP	
Number of digital outputs	2	
Output function	complementary	
Max. voltage drop switching output DC [V]	2	
Permanent current rating of switching output DC [mA]	500	
Switching frequency DC [Hz]	100	
Short-circuit protection	yes	
Type of short-circuit protection	yes (non-latching)	
Overload protection	yes	
Measuring/setting range		
Measuring range	0...100 bar	0...1450 psi
Set point SP	5...100 bar	75...1450 psi
Reset point rP	3...98 bar	50...1420 psi
Accuracy / deviations		
Switch point accuracy [% of the final value]	< ± 2,5; (Setting accuracy)	
Repeatability [% of the final value]	< ± 0,5; (with temperature fluctuations < 10 K)	
Characteristics deviation [% of the final value]	< ± 1,5 (BFSL) / < ± 2,5 (LS); (BFSL = Best Fit Straight Line; LS = limit value setting)	
Temperature drift per 10 K	< ± 0.5	
Software / programming		
Adjustment of the switch point	setting rings	
Operating conditions		
Ambient temperature [°C]	-25...80	
Storage temperature [°C]	-40...100	
Protection	IP 67	
Tests / approvals		
EMC	EN 61000-4-2 ESD	4 kV CD / 8 kV AD
	EN 61000-4-3 HF radiated	10 V/m
	EN 61000-4-4 Burst	2 kV
	EN 61000-4-5 Surge	1 kV signal for DC units
	EN 61000-4-6 HF conducted	10 V
Shock resistance	DIN IEC 68-2-27	50 g (11 ms)
Vibration resistance	DIN IEC 68-2-6	20 g (10...2000 Hz)
MTTF [years]	713	

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Pressure switch with intuitive switch point setting

PK-100-SFN14-HCPKG/US/   /W

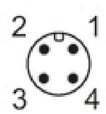
Mechanical data		
Weight	[g]	93
Material		PBT; PC; FKM; stainless steel (1.4404 / 316L)
Materials (wetted parts)		stainless steel (1.4404 / 316L)
Min. pressure cycles		50 million
Process connection		threaded connection 1/4 NPT external thread Internal threadM5

Displays / operating elements		
Display	Power	LED, green
	Switching status	LED, yellow
With scale	yes	

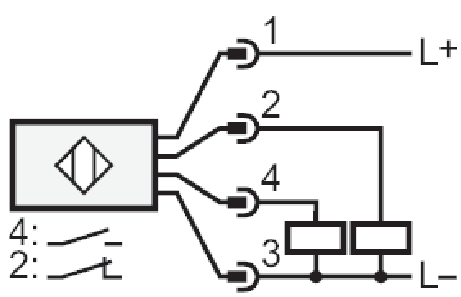
Remarks	
Pack quantity	1 pcs.

Electrical connection

Connector: 1 x M12



Connection



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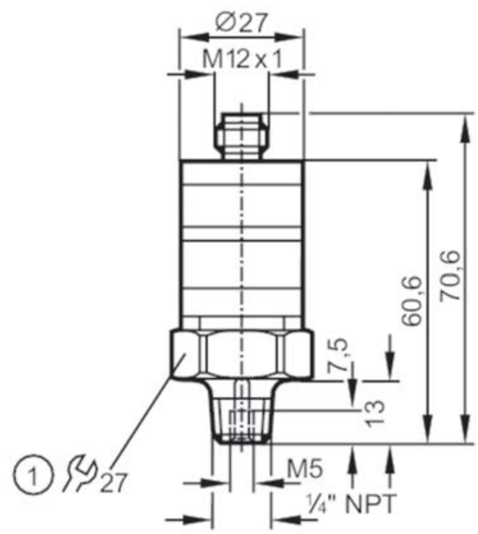
Pressure switch with intuitive switch point setting

PK-0F0-RN4 F1-HCPKG/US/ /W



1 Tightening torque 25 Nm

Application		
Mddal stion	por in[u°trisasddal stion°	
Ce[is	aiqui[° sn[gs°e°	
Ce[ium temdersture].8 0	-25PPb9	
4re°°ure rsting	25 ysr	f v2 d°i
CinPyur°ting dre°°ure	f 99 ysr	Cf 59 d°i
TVde opdre°°ure	reasti6e dre°°ure	
CM3 4 Dpor sddal stion° sl l or[ing to 8c NA	25 ysr	f v2 d°i
Electrical data		
< dersting 6oatsge]Ω0	; RvPPP 2 (8	
8urrent l on°umdtion]mM0	) 25	
CinPin°uastion re°i°tsnl e]Cl 0	199R D599 Ω (8A	
4rotel tion l as°°	:::	
c e6er°e doasritV drotel tion	Ve°	
Inputs / outputs		
Numyer opindut° sn[outdut°	Numyer op[igitsaoutdut° w2	

PK6221

Pressure switch with intuitive switch point setting

PK-0F0-RN4 F1-HCPKG/US/ /W

Outputs		
Totsanumyer opoutdut°	2	
< utdut °ignsa	°Eitl hing °ignsa	
x ael tril sa[e°ign	4 N4	
Numyer op[igitsaoutdut°	2	
< utdut punl tion	l omdaementsrV	
CsSP6oatsge [rod °Eitl hing outdut (8]Ω0	2	
4ermsnent l urrent rsting op °Eitl hing outdut (8]mM0	599	
HEitl hing prequenl V (8]z 70	199	
Hhort-l irl uit drotel tion	Ve°	
TVde op°hort-l irl uit drotel tion	Ve° Dnon-astl hingA	
< 6eraos[drotel tion	Ve°	
Measuring/setting range		
Ces°uring rsnge	9PPP19 ysr	9PPP1C5 d°i
Het doint H4	9P5PPP19 ysr	%P5PPP1C5 d°i
c e°et doint r4	9P PPP; Pb ysr	5PPP1C2 d°i
Accuracy / deviations		
HEitl h doint sl l ursl V]± opthe pinsa6saue0	), 2k5R DHetting sl l ursl VA	
c edestsyiatV]± opthe pinsa6saue0	), 9k5R DEith temdersture paul tustion°) 19 BA	
8hsrsl teri°til ° [e6istion]± opthe pinsa6saue0	), 1k5 DFLH/ A=), 2k5 D/ HA R DFLH/ j Fe°t Lit Htrsight / ineR/ H j aimit 6saue °ettingA	
Temdersture [ript der 19 B	), 9P5	
Software / programming		
M[ku°tment opthe °Eitl h doint	°etting ring°	
Operating conditions		
Mmyient temdersture].8 0	-25PPPb9	
Htorsge temdersture].8 0	-C9PPP199	
4rotel tion	:4 v%	
Tests / approvals		
x C 8	(:N x N v1999-v-2	
	(:N x N v1999-v-f	
Hhol Wre°i°tsnl e	(:N x N v99vb-2-2%	59 g D11 m°A
Ωiyrstion re°i°tsnl e	(:N x N v99vb-2-v	29 g D19PPP2999 z 7A
CTTL]Vesr°0	599	
4re°°ure equidment [irel ti6e	°oun[engineering drsl til eRl sn ye u°e[por groud 2 paui[°Rgroud 1 paui[° on reque°t	

PK6221

Pressure switch with intuitive switch point setting

PK-0F0-RN4 F1-HCPKG/US/ /W

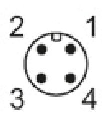
Mechanical data	
3 eight]g0	; 9Rv
Csterisa	4FTR4 8 RLBCR°tsinae°° °teeaD1RCO9O=f 1v/ A
Csterisa° DEette[dsrt°A	°tsinae°° °teeaD1RCO9O=f 1v/ A
CinPdre°°ure l Vl ae°	59 miaion
4rol e°° l onnel tion	thres[e[l onnel tion 1=ON4T eSternsathres[:nternsathres[C5

Displays / operating elements		
(i°dasV	4oEer	/ x(Kgreen
	HEitl hing °tstu°	/ x(KVeaoE
3 ith °l sae	Ve°	

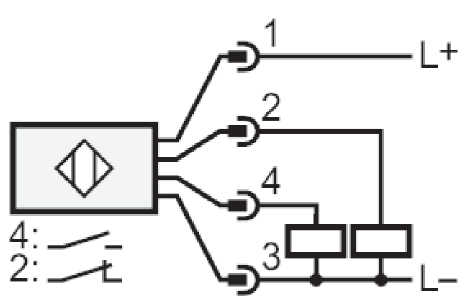
Remarks	
4sl Wqusntit V	1 dl °P

Electrical connection

8onnel torw1 SC12



Connection



English

Signet 2850 Conductivity/Resistivity Sensor Electronics (PVDF)

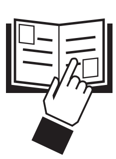
3-2850.090-2   Rev. C   03/15

Operating Instructions

3-2850-51, 3-2850-52
with ¾-in. adapter

3-2850-61, 3-2850-62, 3-2850-63
with Universal adapter

3-2850-51-XXV(D), 3-2850-52-XXV(D)
PVDF Integral System



- English
- Deutsch
- Français
- Español
- Italiano

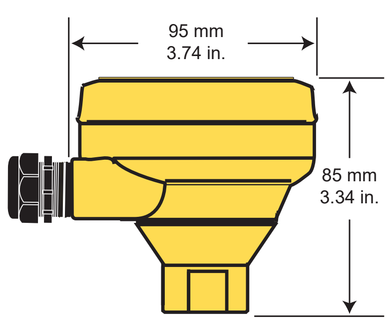
Description

- Signet 2850 Conductivity/Resistivity Sensor Electronics provides either a two-wire 4 to 20 mA output or Digital (S^3L) format.
- The 4 to 20 mA output models provide eight ranges for each electrode cell constant, plus the ability to invert each range.
- The EasyCal feature allows the devices to automatically recognize standard conductivity test solution values for simple field calibration.
- The Conductivity Sensor provided with integral systems will have its custom cell constant information programmed into the electronics at the factory to provide a 2% sensor accuracy. See page 6 for details.

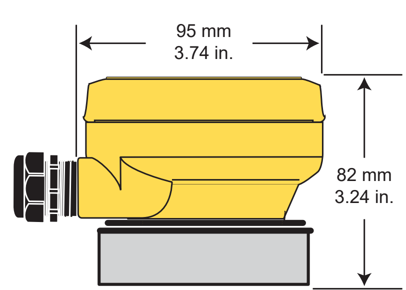
Table of Contents

Dimensions

2850-51, -52 Integral mount



2850-61, -62, -63 Universal mount



Warranty Information

Refer to your local Georg Fischer Sales office for the most current warranty statement.

All warranty and non-warranty repairs being returned must include a fully completed Service Form and goods must be returned to your local GF Sales office or distributor. Product returned without a Service Form may not be warranty replaced or repaired.

Signet products with limited shelf-life (e.g. pH, ORP, chlorine electrodes, calibration solutions; e.g. pH buffers, turbidity standards or other solutions) are warranted out of box but not warranted against any damage, due to process or application failures (e.g. high temperature, chemical poisoning, dry-out) or mishandling (e.g. broken glass, damaged membrane, freezing and/or extreme temperatures).

Product Registration

Thank you for purchasing the Signet line of Georg Fischer measurement products.
If you would like to register your product(s), you can now register online in one of the following ways:

- Visit our website **www.gfsignet.com.** Under **Service and Support** click on **Product Registration Form**
- If this is a pdf manual (digital copy), **click here**

Safety Information

1. Depressurize and vent system prior to installation or removal.
2. Confirm chemical compatibility before use.
3. Do not exceed maximum temperature/pressure specifications.
4. Wear safety goggles or faceshield during installation/service.
5. Do not alter product construction.
6. When using chemicals or solvents, care should be taken and appropriate eye, face, hand, body, and/or respiratory protection should be used.

	Caution / Warning / Danger Indicates a potential hazard. Failure to follow all warnings may lead to equipment damage, injury, or death
	Electrostatic Discharge (ESD) / Electrocution Danger Alerts user to risk of potential damage to product by ESD, and/or risk of potential of injury or death via electrocution.
	Personal Protective Equipment (PPE) Always utilize the most appropriate PPE during installation and service of Signet products.
	Pressurized System Warning Sensor may be under pressure, take caution to vent system prior to installation or removal. Failure to do so may result in equipment damage and/or serious injury.
	Note / Technical Notes Highlights additional information or detailed procedure.

Specifications

General

Compatible Electrodes .... Any Signet Conductivity/ Resisitivity electrode (2818-2823, 2839-2842)
Temperature Compensation ..... PT-1000 RTD (2% per °C)
Pure Water Compensation .... Auto-switching when using 0.01 cell and raw conductivity value < 0.5 μS

EasyCal

Automatic recognition of the following conductivity values:
- 146.93 μS, 1408.8 μS, 12856 μS (@ 25 °C) (Test solutions per ASTM D1125-95)
- 10 μS, 100 μS, 200 μS, 500 μS, 1000 μS, 5000 μS, 10,000 μS, 50,000 μS, 100,000 μS (@ 25 °C)

Power
- 12 to 24 VDC (4 to 20 mA output)
- 5 VDC ±5% regulated, 3.0 mA max. for Digital (S^3L) output (Reverse polarity and short circuit protected)

Digital (S^3L) Output................ Serial ASCII, TTL level 9600 bps

Accuracy
- Conductivity .... ±2% of reading
- Temperature.......................... ±0.5 °C

Resolution
- Conductivity .... 0.1% of reading
- Temperature.......................... < 0.2 °C

Update Rate
- Single Input models .... < 600 ms
- Dual Input models................. < 1.2 s

Current Output

Field-selectable ranges. Factory set span:
- 0.01 cell (2818, 2819, 2839).. 4 to 20 mA = 0 to 100 μS
- 0.10 cell (2820, 2840) .... 4 to 20 mA = 0 to 1000 μS
- 1.0 cell (2821, 2841) .... 4 to 20 mA = 0 to 10,000 μS
- 10.0 cell (2822, 2842) .... 4 to 20 mA = 0 to 200,000 μS
- 20.0 cell (2823) .... 4 to 20 mA = 0 to 400,000 μS

Max. Loop Resistance............. 50 Ω @ 12 VDC
325 Ω @ 18 VDC
600 Ω @ 24 VDC

Accuracy.................................. ±2% of output span
Resolution................................ 7 μA
Update Rate .... <600 ms
Error Indication .... 22 mA

Available data via Digital (S^3L) Output
- Raw conductivity
- Calibrated conductivity
- Calibrated temperature-compensated conductivity
- Temp. Error Indication........... Open input and out-of-range diagnostics for temperature or internal electronic error.

Environmental

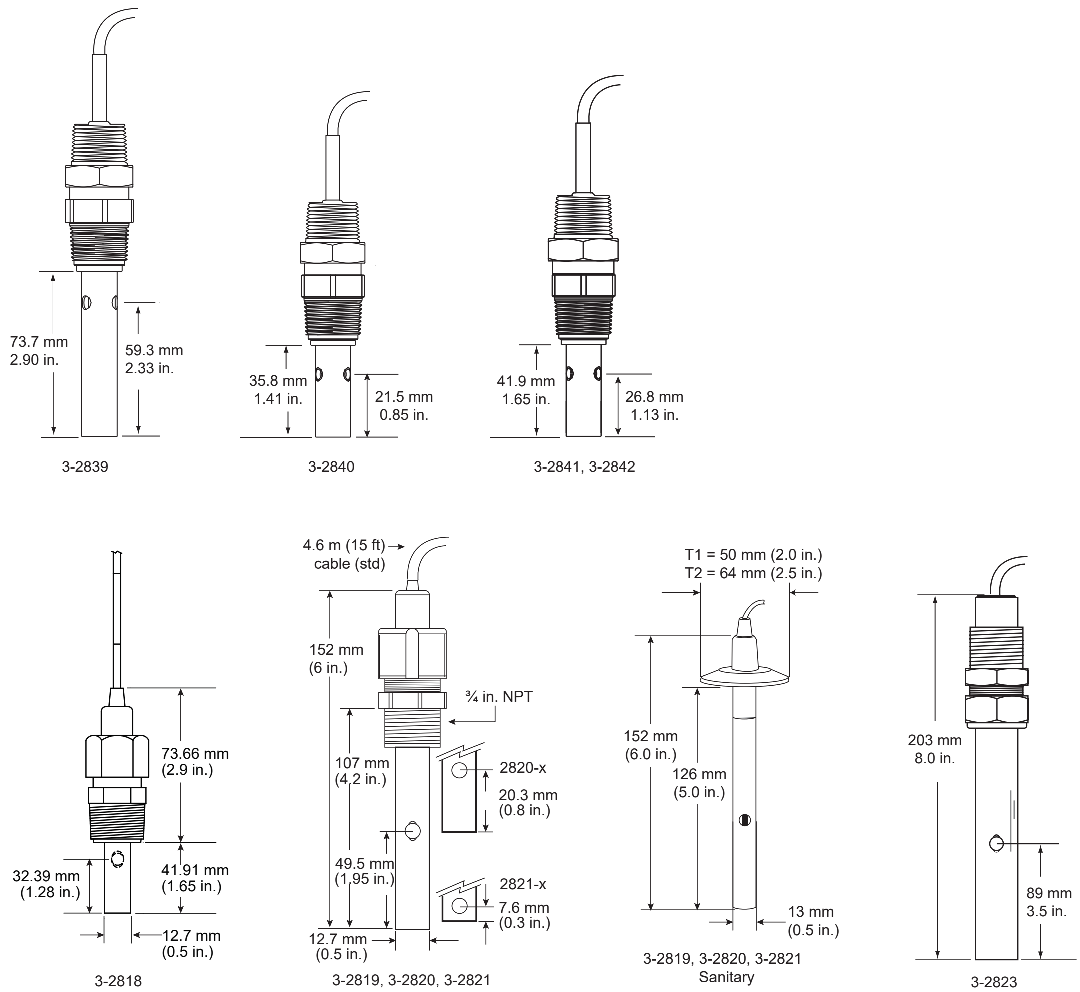
Material.................................... PBT
Enclosure Rating .... NEMA 4X/IP65
Operating Temperature............ -10 to 85 °C (14 to 185 °F)
Storage Temperature................ -20 to 85 °C (-4 to 185 °F)
Relative Humidity..................... 0 to 95%, non-condensing
Shipping Weight .... 0.75 kg (1.75 lb.)

Standards and Approvals
- CE, RoHS Compliant
- Manufactured under ISO 9001 for Quality, ISO 14001 for Environmental Management and OHSAS 18001 for Occupational Health and Safety.

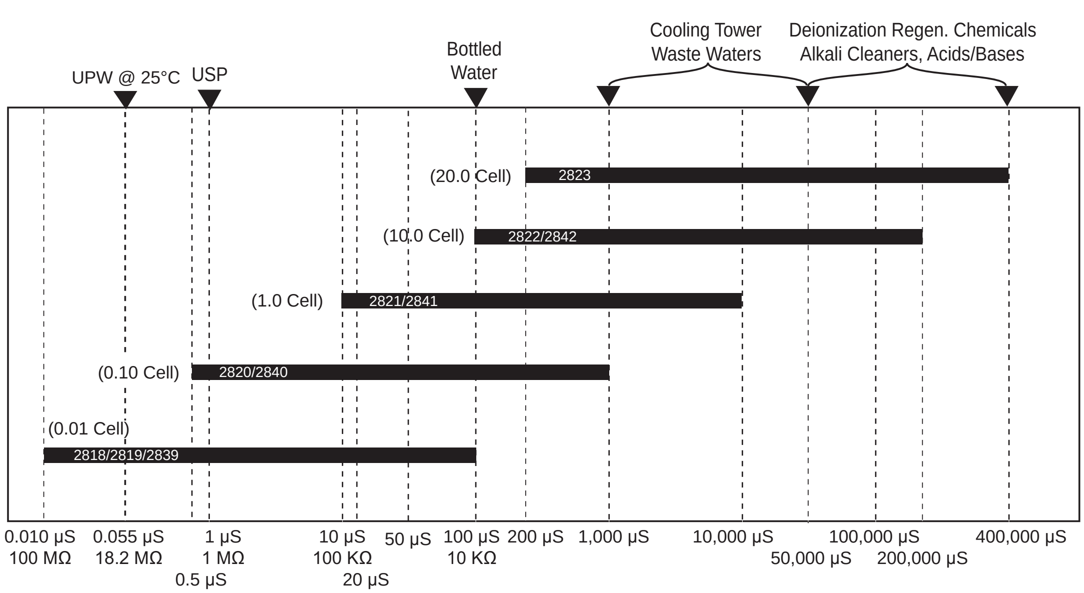
China RoHS (Go to www.gfsignet.com for details)

FC This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) This device must accept any interference received, including interference that may cause undesired operation.

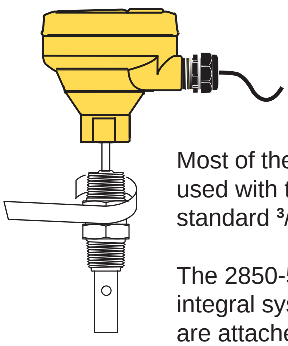
Conductivity Sensor Dimensions



Operating Range Chart

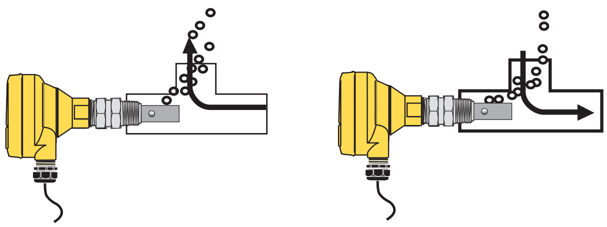


In-Line Installation

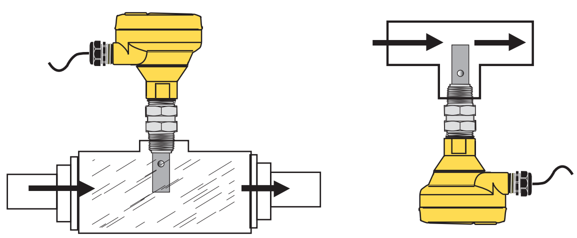


Most of the Conductivity/Resistivity electrodes used with the 2850 can be installed into standard $^3/_4$ in. (NPT or ISO 7-R$^3/_4$) fittings.

The 2850-5X models are designed for integral systems, where the electronics are attached directly to the sensor.



The preferred installation for in-line applications directs flow straight into the electrode. This configuration reduces the probability of entrapped air bubbles, and provides the best continuous sampling of the fluid content.

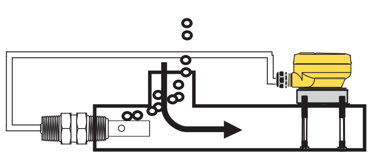


If the electrode is mounted vertically in a tee, do not recess the electrode orifices inside the tee. Mounting upside down may help prevent air entrapment.

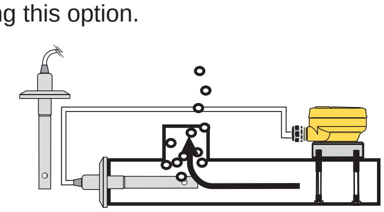
An oversized tee or flow cell may be helpful for inline installations.

At least 4 threads (ANSI B1.20.1) must be engaged to meet the pressure rating as published in the specifications.

Use the 2850-6X models for in-line installations where the electronics must be separated from the electrode.



Conductivity electrodes with sanitary flange fittings must be installed using this option.



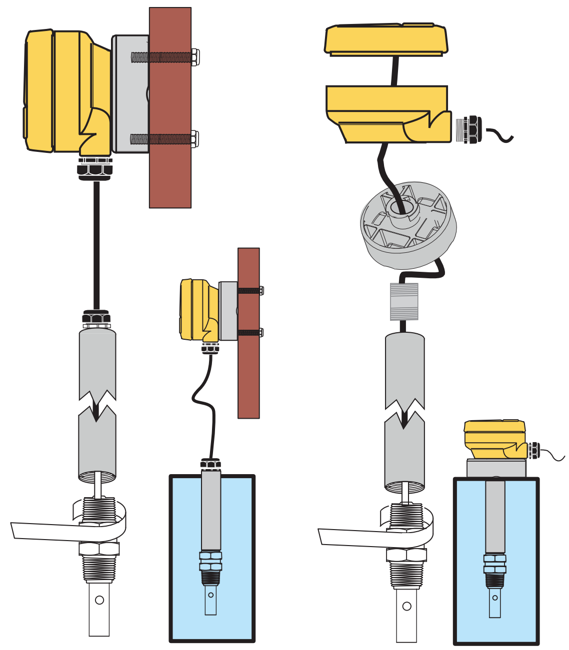
Tank Installation

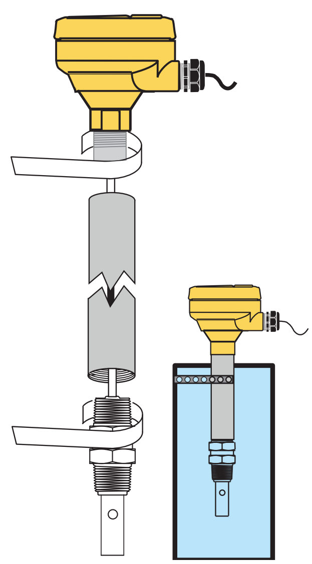
While the 2850-5X and 2850-6X electronics cannot be submerged, either model will accommodate tank installation.

Select any electrode with a 5 m (15 ft) cable. The cable may be cut to length, but it CANNOT BE EXTENDED.

The universal adapter included with 2850-6X models can be attached to the top of a tank or mounted to a surface near the tank.

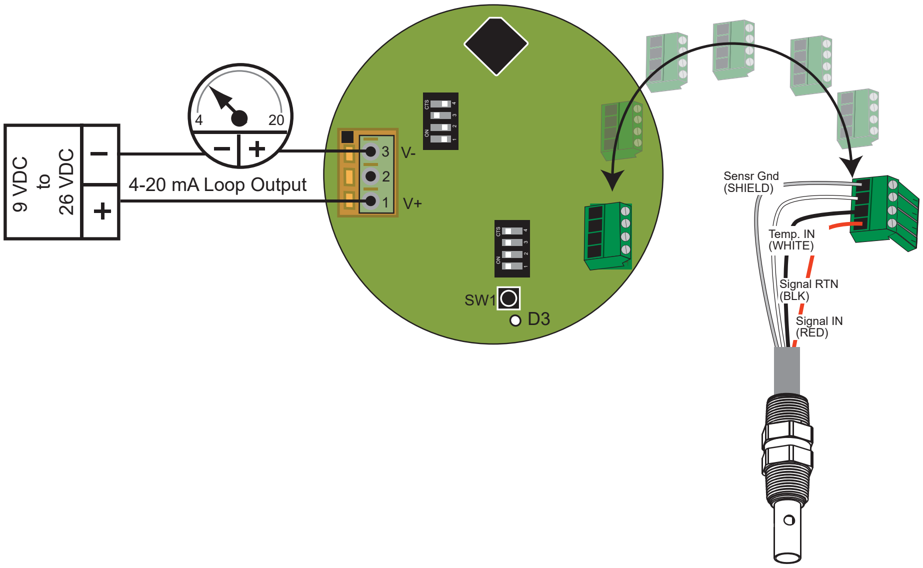
Adapt the 2850-5X models to tank installations by attaching a clamp to the conduit.





4 to 20 mA Wiring

Maximum length of 4 to 20 mA loop is 300 meters (1000 ft)



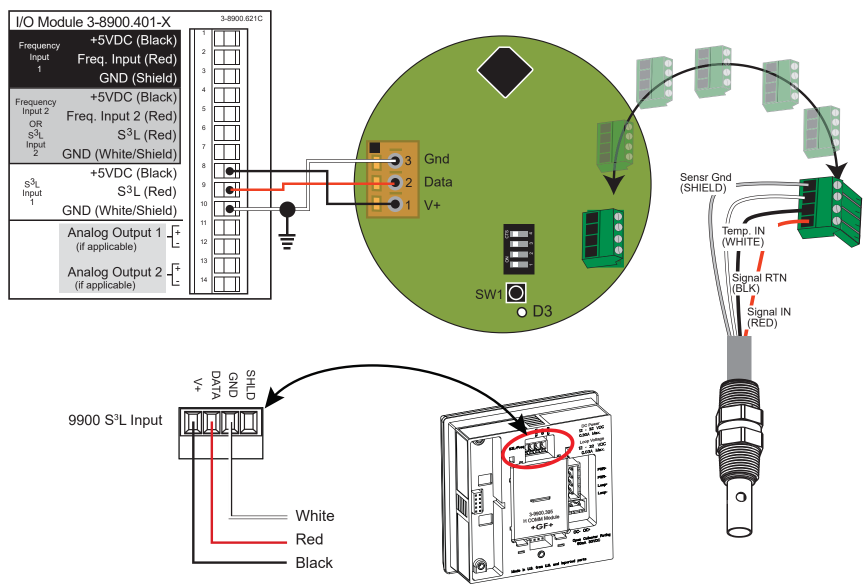
Digital (S^3L) Wiring

The Digital (S^3L) output is compatible with the Signet 8900 Multi-Parameter Controller and the Signet 9900 Transmitter.

Refer to the wiring sections of the 8900 or 9900 manual to determine cable length limitations.

IMPORTANT: Provide Earth Ground as indicated by ⏚ symbol.

Note: The 2819-2823 and 2839-2842 sensors can connect directly to the 9900 via the 9900's optional Direct Conductivity/Resistivity Module 3-9900.394 (159 001 699).

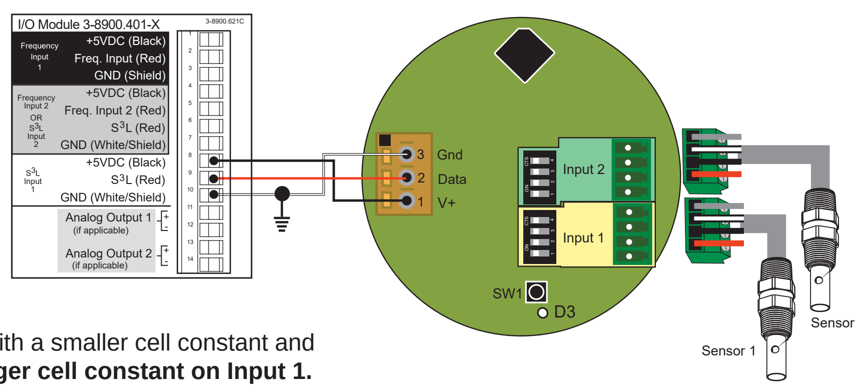


Dual Digital (S^3L) Input Wiring

Dual Input is available on Digital (S^3L) output model 3-2850-63 only, for use with the Signet 8900 Multi-Parameter Controller.

Sensors may be the same or different cell constants.

If the Dual Input model is used with a single sensor, connect the sensor to Input 1 and set all of the Input 2 switches to OFF (OPEN).



Dual Input applications usually include one sensor with a smaller cell constant and one sensor with a larger cell constant. **Place the larger cell constant on Input 1.**

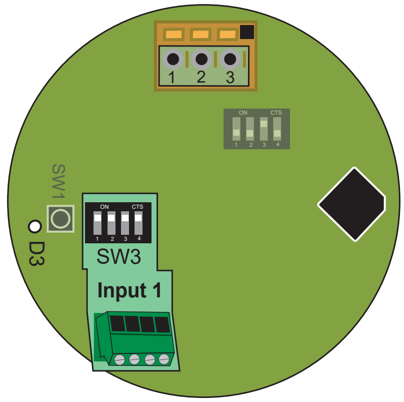
This allows periodic recalibration of the larger cell by simply turning Input 2 OFF (OPEN).

IMPORTANT: Provide Earth Ground as indicated by ⏚ symbol.

Cell Constant Selection

Single Input 2850 Electronics
(2850-51, 2850-52, 2850-61, 2850-62)

- Single input models use only SW3.
- Use SW3 #1-3 to select the cell constant for the first sensor.
- Use SW3 #4 to disable the PT1000 Temp Compensation function in the 2850 (as required for USP applications).
- Recommended:
  Make all switch settings before supplying power. Switch changes made after supplying power will take 15 to 20 seconds before becoming effective.



Integral 2850 Systems (Single Input)

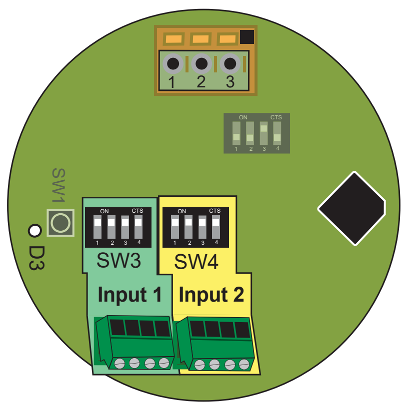
- The 2850-51-XX and 2850-52-XX are shipped from the factory with the custom cell constant and temperature offset programmed into the single-input electronics.
- SW3 will be preset to "Custom cell constant".
- No additional modifications are required.

Replacing Integral System Electrode or Electronics

- When installing a new conductivity electrode or replacing System Electronics, the SW3 switches must be configured to select the appropriate cell constant.
- See Single Input section above.
- Leaving SW3 in the custom cell constant configuration will effect accuracy.
- Use calibration standards to calibrate (see page 8).

Dual Input 3-2850-63 Electronics

- Switch banks SW3 and SW4 are used to select the cell constant of the electrodes.
- Use SW3 #1-3 to select the cell constant for the first sensor.
- Use SW3 #4 to disable the PT1000 Temp Compensation function in the 2850 (as required for USP applications).
  This disables the function for BOTH INPUTS.
- Use SW4 #1-3 to select the cell constant for the second sensor.
- Set SW4 #4 to OPEN to disable Input 2.
- Recommended:
  Make all switch settings before supplying power. Switch changes made after supplying power will take 15 to 20 seconds before becoming effective.



NOTE: Dual Input applications usually include one sensor with a smaller cell constant and one sensor with a larger cell constant. **Place the larger cell constant on Input 1.** This allows periodic recalibration of the larger cell by simply turning Input 2 OFF (OPEN).

SW3 = Cell Constant and Temperature Compensation

#1	#2	#3	#4	Cell Constant
C	C	C	O	Custom
C	O	O	O	0.01 cm^{-1}
O	C	O	O	0.1 cm^{-1}
C	C	O	O	1.0 cm^{-1}
O	O	C	O	10.0 cm^{-1}
C	O	C	O	20.0 cm^{-1}

#4: (O) Open = Temp Comp **ACTIVE**
(C) Closed = Temp Comp **INACTIVE**

SW4 = Cell Constant and Input 2

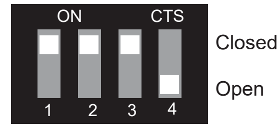
#1	#2	#3	#4	Cell Constant
C	C	C	O	Custom
C	O	O	O	0.01 cm^{-1}
O	C	O	O	0.1 cm^{-1}
C	C	O	O	1.0 cm^{-1}
O	O	C	O	10.0 cm^{-1}
C	O	C	O	20.0 cm^{-1}

#4: (O) Open = Input 2 **INACTIVE**
(C) Closed = Input 2 **ACTIVE**

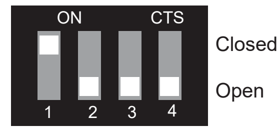
NOTE:
To work correctly with the 9900, the 2850 must be set for the custom cell constant or the actual electrode cell constant and the 9900 set for a 1.0 cell constant.

SW3 or SW4

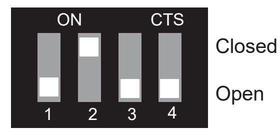
Custom Cell Constant



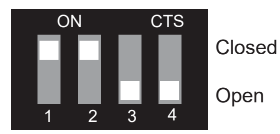
0.01/cm^{-1}



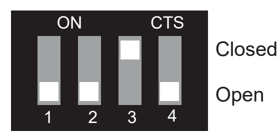
0.1/cm^{-1}



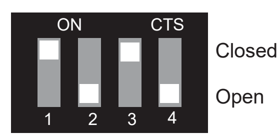
1.0/cm^{-1}



10.0/cm^{-1}

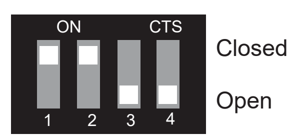


20.0/cm^{-1}

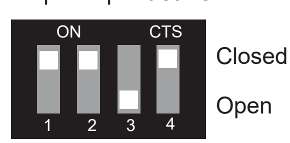


Examples

1.0 cell constant,
temp comp **Active**

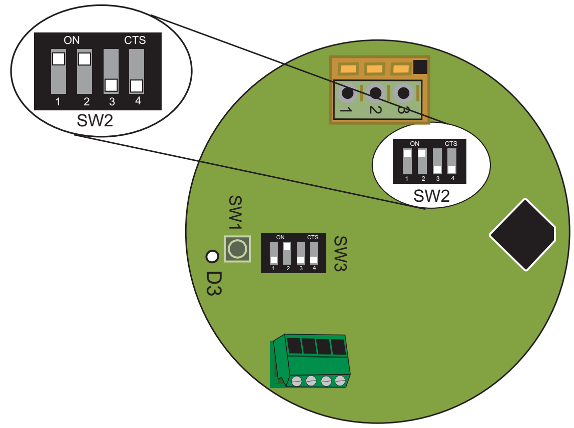


1.0 cell constant,
temp comp **Inactive**



Range Selection for 4 to 20 mA Output

- The Range selection switch bank (SW2) provides eight range selections for each cell constant.
- Each range can be inverted, making a total of 16 range options.
- Select a range from the table below and set SW2 as indicated.



Example (refer to shaded selections of chart):

- The electrode installed is the 3-2840-1V, with a 0.10 cell constant.
- The required output is 4 to 20 mA = 0 to 100 μS.
- Set SW2 switch bank to C-C-O-O.
- To invert range (4 to 20 mA = 100 to 0 μS), close switch #4.

SW2 Switch Setting				0.01 Cell	0.10 Cell	1.0 Cell	10.0 Cell	20.0 Cell
#1	#2	#3	#4	Resistivity Ranges in **BOLD**				
C	C	C	O	**10 to 20 MΩ**	0 to 2 μS	0 to 20 μS	0 to 200 μS	0 to 400 μS
C	C	C	C	**20 to 10 MΩ**	2 to 0 μS	20 to 0 μS	200 to 0 μS	400 to 0 μS
O	C	C	O	**2 to 10 MΩ**	0 to 5 μS	0 to 50 μS	0 to 500 μS	0 to 1000 μS
O	C	C	C	**10 to 2 MΩ**	5 to 0 μS	50 to 0 μS	500 to 0 μS	1 000 to 0 μS
C	O	C	O	**0 to 2 MΩ**	0 to 10 μS	0 to 100 μS	0 to 1 000 μS	0 to 2 000 μS
C	O	C	C	**2 to 0 MΩ**	10 to 0 μS	100 to 0 μS	1 000 to 0 μS	2 000 to 0 μS
O	O	C	O	0 to 1 μS	0 to 50 μS	0 to 500 μS	0 to 5 000 μS	0 to 10 000 μS
O	O	C	C	1 to 0 μS	50 to 0 μS	500 to 0 μS	5 000 to 0 μS	10 000 to 0 μS
C	C	O	O	0 to 5 μS	0 to 100 μS	0 to 1 000 μS	0 to 10 000 μS	0 to 20 000 μS
C	C	O	C	5 to 0 μS	100 to 0 μS	1 000 to 0 μS	10 000 to 0 μS	20 000 to 0 μS
O	C	O	O	0 to 10 μS	0 to 200 μS	0 to 2 000 μS	0 to 50 000 μS	0 to 100 000 μS
O	C	O	C	10 to 0 μS	200 to 0 μS	2 000 to 0 μS	50 000 to 0 μS	100 000 to 0 μS
C	O	O	O	0 to 50 μS	0 to 500 μS	0 to 5 000 μS	0 to 100 000 μS	0 to 200 000 μS
C	O	O	C	50 to 0 μS	500 to 0 μS	5 000 to 0 μS	100 000 to 0 μS	200 000 to 0 μS
O	O	O	O	0 to 100 μS	0 to 1 000 μS	0 to 10 000 μS	0 to 200 000 μS	0 to 400 000 μS
O	O	O	C	100 to 0 μS	1000 to 0 μS	10 000 to 0 μS	200 000 to 0 μS	400 000 to 0 μS

NOTE: Switch #4 inverts the loop output range

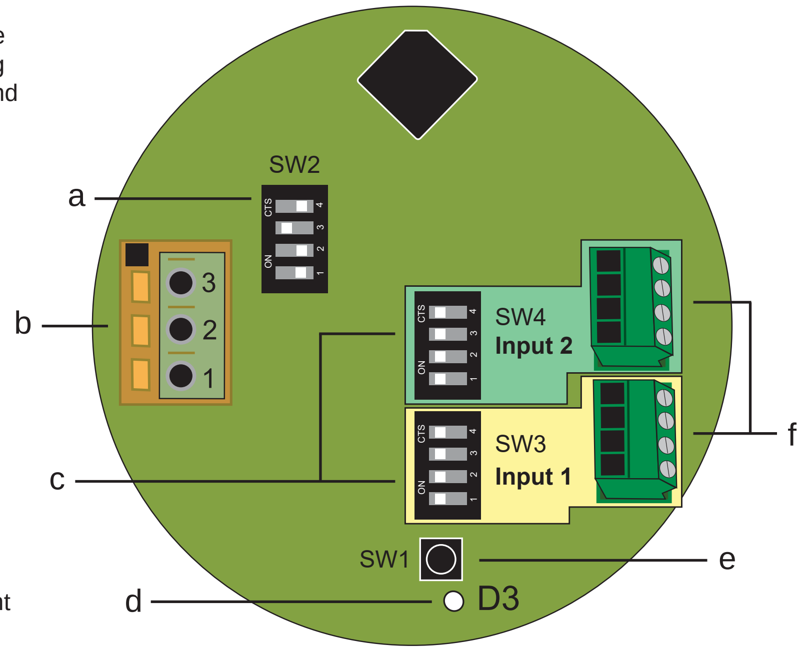
(O) Open = 4 to 20 mA
(C) Closed = 20 to 4 mA

Calibration

- All 2850 Conductivity/Resistivity Sensor Electronics are factory calibrated for maximum out-of-the-box accuracy.
- The EasyCal feature allows calibration to be performed at the sensor.

The 2839-2842 Conductivity sensors come with a certificate of calibration. This certificate provides information regarding the actual cell constant and temperature offset as tested and verified according to NIST standards. This information has been programmed into the 2850 electronics as its default factory value. If required, the sensor can be recertified by contacting the GF Signet repair department.

a. SW2: 4 to 20 mA output range selection switch bank
b. Power and Output terminal block: 4 to 20 mA or Digital (S^3L) Outputs
c. SW3 and SW4: Electrode Cell Constant selection switch banks
d. D3: LED indicator
e. SW1: EasyCal Push-button
f. Input 1 & Input 2: Conductivity Electrode connections



NOTE:
When the electrode is changed from its original factory provided electrode or the application requires a cell constant change, reset SW3 or SW4 switches (see page 6).
Then perform a wet calibration with calibration standards.

EasyCal

EasyCal is a single-point calibration system. During this procedure, if the measured value is within ±10% of any of the test values listed below, the 2850 will automatically recognize the test value and calibrate the output to that value.

NOTE: The first step (Reset) is recommended each time an electrode is replaced, but is NOT necessary upon initial installation or periodic calibration.

1. **Reset** the 2850 Sensor to factory calibration: Set all switches on SW3 (and SW4 for Dual Input) to OPEN. Apply power, wait at least 3 seconds, then press and hold SW1 until the LED (D3) comes on steady then goes off again (approx. 10 seconds). When the LED goes off, release SW1; reset is complete. Reset SW3 and SW4 to the proper settings.
2. **Place** the electrode/sensor assembly into the conductivity test solution appropriate to your operating range. Shake the electrode to dislodge any air bubbles visible on the surface of the electrode.
   - 146.93 μS, 1408.8 μS, 12856 μS (per ASTM D1125-95)
   - 10 μS, 100 μS, 200 μS, 500 μS, 1000 μS, 5000 μS, 10,000 μS, 50,000 μS, 100,000 μS.

Allow at least 2 minutes for the electrode response to stabilize.

3. **Press** and hold SW1 for approximately 8 to 10 seconds. During this time, the LED will come on steady then go back off. (If the LED blinks several times rapidly, the calibration was not successful. See the troubleshooting section).

Calibration is complete. Return the system to service.

Dual Input Calibration

Dual Input 3-2850-63 Electronics

- The 2850-63 can only be calibrated if both inputs are used, or if Input 2 is disabled.
  - To disable Input 2: Set SW4, #4 to OPEN.
- Place each sensor into a test solution that represents the operating range of that sensor. When SW1 is pressed, the 2850 will calibrate both inputs simultaneously.
- Dual Input applications usually include one sensor with a smaller cell constant and one sensor with a larger cell constant. **Place the larger cell constant on Input 1**. This allows periodic recalibration of the larger cell by simply turning Input 2 OFF (OPEN).

Maintenance

The 2850 requires no periodic maintenance.

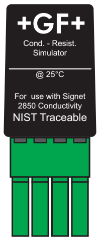
- Coatings on the electrode may cause slow response or drift.
- Clean metallic surfaces with a mild detergent and a non-abrasive brush or cotton swab.

Troubleshooting

LED and Output Condition	Possible Causes	Suggested Solutions
Current Out: **LED off, current output is 22 mA** **(S^3L) out: "Check Sensor"**	• SW3 and SW4 set to all OPEN (factory setting). • No electrode installed. • SW3 (and SW4) not set correctly. • System not ready.	• Normal for new system. • Install electrode. • Set SW3 and SW4 correctly. • Retry (recycle power).
During EasyCal, the LED blinks rapidly for 4 seconds.	• Measured value of the test solution is outside the ±10% tolerance. • The electronics or the electrode is defective.	• Use fresh test solutions and restart the calibration. • Replace the electronics or the electrode.
After completing calibration procedure, the output values are inaccurate.	• Insufficient time allowed for electrode stabilization during calibration procedure. • Test solutions are contaminated. • EasyCal performed with temp comp Inactive, then temp comp Active for measurement. (or vice versa)	• Recalibrate and wait at least 2 minutes after placing electrode in solution before pressing SW1. • Use fresh test solutions and restart the calibration.
The output of the 2850 indicates a value that is off by a factor of 10 (e.g. 10x, 100x the correct value)	• The cell constant selection on the 2850 (SW3 or SW4) does not match the actual input.	• Match the 2850 switch settings to agree with the sensor being used.

Electronic Certification

Signet offers conductivity simulators in five different values. These tools enable the user to validate the performance of the electronics independently of the electrode. This requirement is defined by ASTM D 1125-95 (Standard Test Methods for Electrical Conductivity and Resistivity of Water) which is commonly used for USP 24 applications.



3-2850.101-1	(159 001 392)	1.0 µS	±0.1%
3-2850.101-2	(159 001 393)	2.5 µS	±0.1%
3-2850.101-3	(159 001 394)	10.0 µS	±0.1%
3-2850.101-4	(159 001 395)	18.2 MΩ	±0.1%
3-2850.101-5	(159 001 396)	10.0 MΩ	±0.1%

Before using the Simulator:

Before using the simulators, disconnect all electrodes and reset the 2850 Electronics to factory calibration:

1. Set all switches on SW3 (and SW4 for Dual Input) to OPEN. Turn the power on, wait at least 3 seconds
2. Press and hold SW1 until the LED (D3) comes on steady then goes off again (approx. 10 seconds).
3. When the LED goes off, release SW1. Reset is complete.

To validate Input 1:

1. Turn the power off.
2. Set SW3 to accept a 0.01 cell constant. Leave SW4 in the all-OPEN position.
3. Install the simulator into the 2850 at the Input 1 conductivity electrode terminals.
4. Connect the 2850 output terminals to the appropriate display instrument. Turn the power on.
   - The display should indicate a conductivity value within ±2% of the simulator value.
   - If the output is x10 or x100 of the correct value, recheck step 2. The 2850 is not set to accept a 0.01 cell constant.
   - If the correct value is displayed, the electronics are calibrated to ASTM D 1125 specifications. Remove the simulator and reset SW3 to the correct cell constant before reinstalling the electrode.
   - If the correct value is not displayed, contact the factory.

To validate Input 2:

1. Turn the power off.
2. Set SW4 to accept a 0.01 cell constant.
3. Install the simulator into the 2850 at the Input 2 conductivity electrode terminals.
4. Set SW3 switches to the all-OPEN position.
5. Turn the power on and repeat step 4.

Remember to reset all switches to their correct position before resuming normal operation.

Notes

Ordering Information

Signet 2850 Conductivity/Resistivity Sensor Electronics

*All versions include EasyCal

Mfr. Part No.	Code	Description
3-2850-51	159 001 398	2850 Sensor Electronics with Digital (S^3L) Output and ¾ inch adapter
3-2850-52	159 001 399	2850 Sensor Electronics with 4 to 20 mA Output and ¾ inch adapter
3-2850-61	159 001 400	2850 Sensor Electronics with Digital (S^3L) Output and Universal adapter
3-2850-62	159 001 401	2850 Sensor Electronics with 4 to 20 mA Output and Universal adapter
3-2850-63	159 001 402	2850 Sensor Electronics with Dual Inputs, Dual Digital (S^3L) Outputs and Universal adapter (for use with 8900 only)
3-2850-51-39V	159 001 818	Integral 2850 system, Digital (S^3L) output, 0.01 cell, PVDF NPT threads
3-2850-51-40V	159 001 819	Integral 2850 system, Digital (S^3L) output, 0.1 cell, PVDF NPT threads
3-2850-51-41V	159 001 820	Integral 2850 system, Digital (S^3L) output, 1.0 cell, PVDF NPT threads
3-2850-51-42V	159 001 821	Integral 2850 system, Digital (S^3L) output, 10.0 cell, PVDF NPT threads
3-2850-51-39VD	159 001 822	Integral 2850 system, Digital (S^3L) output, 0.01 cell, PVDF ISO threads
3-2850-51-40VD	159 001 823	Integral 2850 system, Digital (S^3L) output, 0.1 cell, PVDF ISO threads
3-2850-51-41VD	159 001 824	Integral 2850 system, Digital (S^3L) output, 1.0 cell, PVDF ISO threads
3-2850-51-42VD	159 001 825	Integral 2850 system, Digital (S^3L) output, 10.0 cell, PVDF ISO threads
3-2850-52-39V	159 001 826	Integral 2850 system, 4 to 20 mA output, 0.01 cell, PVDF NPT threads
3-2850-52-40V	159 001 827	Integral 2850 system, 4 to 20 mA output, 0.1 cell, PVDF NPT threads
3-2850-52-41V	159 001 828	Integral 2850 system, 4 to 20 mA output, 1.0 cell, PVDF NPT threads
3-2850-52-42V	159 001 829	Integral 2850 system, 4 to 20 mA output, 10.0 cell, PVDF NPT threads
3-2850-52-39VD	159 001 830	Integral 2850 system, 4 to 20 mA output, 0.01 cell, PVDF ISO threads
3-2850-52-40VD	159 001 831	Integral 2850 system, 4 to 20 mA output, 0.1 cell, PVDF ISO threads
3-2850-52-41VD	159 001 832	Integral 2850 system, 4 to 20 mA output, 1.0 cell, PVDF ISO threads
3-2850-52-42VD	159 001 833	Integral 2850 system, 4 to 20 mA output, 10.0 cell, PVDF ISO threads
Parts and Accessories		
3-9000.392-1	159 000 839	Liquid-tight connector kit, 1 set, ½ in. NPT
3-9000.392-2	159 000 841	Liquid-tight connector kit, 1 set, PG 13.5
3-2850.101-1	159 001 392	Plug-in NIST-traceable recertification tool, 1.0 μS
3-2850.101-2	159 001 393	Plug-in NIST-traceable recertification tool, 2.5 μS
3-2850.101-3	159 001 394	Plug-in NIST-traceable recertification tool, 10.0 μS
3-2850.101-4	159 001 395	Plug-in NIST-traceable recertification tool, 18.2 MΩ
3-2850.101-5	159 001 396	Plug-in NIST-traceable recertification tool, 10.0 MΩ

+GF+

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For Worldwide Sales and Service, visit our website: www.gfsignet.com • Or call (in the U.S.): (800) 854-4090
For the most up-to-date information, please refer to our website at www.gfsignet.com

English

Signet 2537 Paddlewheel Flowmeter

3-2537.090 Rev. K 07/17

Operating Instructions

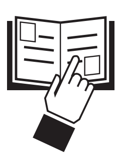
Description

The 2537 Paddlewheel Flowmeter Series offer low flow, low power and high resolution with various output options such as a Volumetric Pulse, Pulse Divider, Flow Switch, Digital (S^3L), or 4 to 20 mA. This unit can be configured on-site directly through the built-in user interface.

- The 4 to 20 mA model provides a blind current loop output.
- The Digital (S^3L) model provides a Digital (S^3L) output for use with the Signet 8900 Multi-Parameter Controller or 9900 Transmitter.
- The Multi model uses a single relay (mechanical or solid state) and has three selectable operating modes:
  - Divider Mode scales the paddlewheel frequency down to accommodate low frequency input devices.
  - Total Mode outputs one pulse per a set volume of fluid.
  - Flow Switch Mode uses a single relay for Hi or Lo alarm operation.

A small LCD enables the 2537 to be programmed without any external equipment. During normal operation the display is not visible.

Table of Contents



- English
- Deutsch
- Français
- Español
- Italiano

For earlier versions of this sensor, the Rev. C version of the 2537 manual is available at **www.gfsignet.com**, under **Resource Center**.

Select **Sensors and Instrumentation**, click **Archived Products**, select 2537, click **Instruction Manuals**.

Warranty Information

Refer to your local Georg Fischer Sales office for the most current warranty statement.

All warranty and non-warranty repairs being returned must include a fully completed Service Form and goods must be returned to your local GF Sales office or distributor. Product returned without a Service Form may not be warranty replaced or repaired.

Signet products with limited shelf-life (e.g. pH, ORP, chlorine electrodes, calibration solutions; e.g. pH buffers, turbidity standards or other solutions) are warranted out of box but not warranted against any damage, due to process or application failures (e.g. high temperature, chemical poisoning, dry-out) or mishandling (e.g. broken glass, damaged membrane, freezing and/or extreme temperatures).

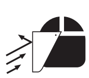
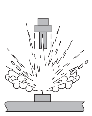
Product Registration

Thank you for purchasing the Signet line of Georg Fischer measurement products.
If you would like to register your product(s), you can now register online in one of the following ways:

- Visit our website **www.gfsignet.com.** Under **Service and Support** click on **Product Registration Form**
- If this is a pdf manual (digital copy), **click here**

Safety Information

1. Depressurize and vent system prior to installation or removal.
2. Confirm chemical compatibility before use.
3. DO NOT exceed maximum temperature or pressure specs.
4. ALWAYS wear safety goggles or faceshield during installation and/or service.
5. DO NOT alter product construction.
6. If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired
7. **This device is not approved for use or installation in hazardous locations.**

	**Caution / Warning / Danger** Indicates a potential hazard. Failure to follow all warnings may lead to equipment damage, injury, or death
	**Personal Protective Equipment (PPE)** Always utilize the most appropriate PPE during installation and service of Signet products.
	**Pressurized System Warning** Sensor may be under pressure, take caution to vent system prior to installation or removal. Failure to do so may result in equipment damage and/or serious injury.
	**Hand Tighten Only** Overtightening may permanently damage product threads and lead to failure of the retaining nut.
	**Do Not Use Tools** Use of tool(s) may damage product beyond repair and potentially void product warranty.
	**Note / Technical Notes** Highlights additional information or detailed procedure.

Chemical Compatibility

Georg Fischer Signet products are manufactured in a variety of wetted materials to suit various liquids and chemicals.

All plastic materials including typical piping types (PVC, PVDF, PP and PE) are more or less permeable to contained media, such as water or volatile substances, including some acids. This effect is not related to porosity, but purely a matter of gas diffusion through the plastic.

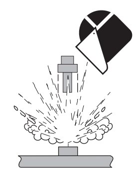
If the plastic material is compatible with the medium according to the application guidelines, the permeation will not damage the plastic itself. However, if the plastic encloses other sensitive components, as is the case with GF Signet plastic paddlewheel sensors, these may be affected or damaged by the media diffusing through the plastic body and rotor.

Failures of PVDF paddlewheel sensors when used in hot nitric acid applications have been reported. PVDF is known to allow for substantial permeation of nitric acid constituents without being damaged itself. No clear guideline can be given here, since the damaging effect to the sensor is highly dependent on temperature, pressure and concentration.

Utilizing sensors in applications with aggressive substances is possible. On special request GF Signet can provide sensors with a different internal resin encapsulation (potting) that will delay the damaging effect of acids to the sensors.

For all Special Product inquiries or to place an order, please email **signet-specialproduct@georgfischer.com.**

WARNING!



Paddlewheel Retaining Nuts:

The retaining nuts of paddlewheel sensors are not designed for prolonged contact with aggressive substances. Strong acids, caustic substances and solvents or their vapor may lead to failure of the retaining nut, ejection of the sensor and loss of the process fluid with possibly serious consequences, such as damage to equipment and serious personal injury. Retaining nuts that may have been in contact with such substances, e.g. due to leakage or spilling, must be replaced.

Paddlewheel Maintenance:

Paddlewheel flow sensors are subject to wear and may require maintenance and replacement of mechanical parts (rotors, pin, O-rings, bearings, retainers, etc.). The frequency of recommended maintenance will vary based upon application specifications, characteristics of the measured fluid, and installation details. These can include, but are not limited to: process flowrate, occurrence of water hammer, fluid corrosiveness and abrasiveness, sensor installation relevant to other equipment.

GF Signet offers individual replacement parts and rotor replacement kits, which include replacement instructions, allowing customers to perform field maintenance and reduce application down-time. Please refer to the Paddlewheel Replacement section (page 15) or contact your local GF Sales Representative with any questions.

515, 2536, 8510, 8512, 2537 Only:

To support our customers, the GF Signet Repair Department offers services to recertify the plastic paddlewheel products to factory specification. Contact your distributor or visit **www.gfsignet.com** for more information.

Specifications

General

Flow Rate Range .... 0.1 m/s to 6 m/s (0.3 ft/s to 20 ft/s)
Pipe Size Range .... DN15 to DN200 (½ in. to 8 in.)
Min. Reynolds Number 4500
Wiring Ports .... ½ in. NPT threads; liquid-tight connector accepts cables 7 mm to 10 mm OD (0.275 in. to 0.394 in.)

Materials

Case .... PBT, Yellow
Inside Cover .... Valox, Black

Wetted Materials

-P0, -P1

Sensor Body .... Glass Filled Polypropylene
O-Rings .... FKM
Pin .... Titanium
Rotor .... PVDF, Black; optional ETFE with or without carbon fiber reinforced PTFE sleeve for rotor pin

-T0

Sensor Body .... PVDF, Natural
O-Rings .... FKM
Pin .... PVDF, Natural
Rotor .... PVDF, Natural; optional ETFE with or without carbon fiber reinforced PTFE sleeve for rotor pin

Performance

Input Frequency Range .... 1 to 1000 Hz
System Response .... 100 ms update rate nominal
Paddlewheel Frequency .... 49 Hz per m/s nominal (15 Hz per ft/s nominal)
Linearity .... ±1% of maximum range @ 25 °C (77 °F)
Repeatability .... ±0.5% maximum range @ 25 °C (77 °F)

Electrical

Relay Specifications

Dry Contact SPDT .... 5 A @ 30 VDC, 5 A @ 250 VAC
Solid-State Relay .... 100 mA @ 40 VDC, 70 mA @ 33 VAC

Power Requirements

Multi:
with Dry-Contact Relay .... 24 VDC nominal ±10%, regulated, 30 mA max. current
with Solid-State Relay .... 5 to 24 VDC nominal ±10%, regulated, 30 mA max. current
Digital (S^3L) .... 5.0 VDC min. to 6.5 VDC max., 30 mA max. current (1.5 mA nominal)
4 to 20 mA .... 400 mV max. ripple voltage, 30 mA max. current
Reverse Polarity and
Short Circuit Protected .... Up to 40 V, 1 hour
Over-Voltage Protection .... > 40 VDC over 1 hour

Output

Signal Averaging .... Programmable 0 to 100 seconds
Sensitivity Response .... Programmable 0 to 9 scale

Pulse Divider/Total Pulse Output

Pulse Divider Setting .... 1.0000 to 99999
Maximum pulse rate .... 300 Hz
Maximum pulse width .... 50 ms

Flow Switch Output

Relay Modes .... Low, High
Time Delay .... 0.0 to 6400.0 seconds
Hysteresis .... Adjustable in Engineering Units

Digital (S^3L) output

Type .... Serial ASCII, TTL level 9600 bps
Maximum Cable Length .... Application dependent (See 8900 manual)

Current output (Passive 4 to 20 mA)

Loop Accuracy .... ±32 μA (@ 25 °C @ 24 VDC)
Loop Resolution .... 5 μA
Temp. Drift .... ±1 μA per °C max.
Power Supply Rejection .... ±1 uA per V
Maximum Cable Length .... 305 m (1,000 ft)
Max. Loop Resistance .... 600 Ω @ 24 VDC, 1 KΩ @ 32 VDC

Environmental Requirements

Enclosure Rating .... NEMA 4X/IP65
Storage Temperature .... -10 °C to 75 °C (14 °F to 167 °F)
Ambient Temperature .... 0 °C to 65 °C (32 °F to 150 °F)
Relative Humidity .... 0 to 90% RH, non-condensing
Altitude .... 2000 m (6,562 ft)
Pollution Degree 2

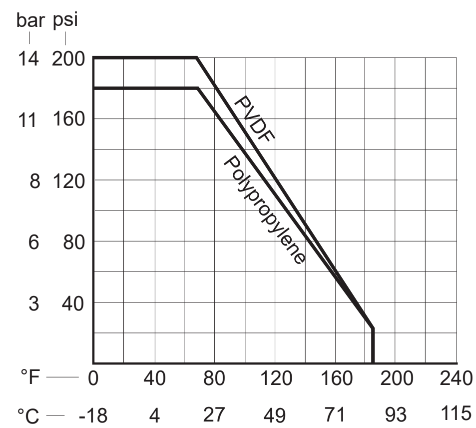
Pressure/Temperature Ratings

Polypropylene Body

- 12.5 bar (180 psi) max. @ 20 °C (68 °F)
- 1.7 bar (25 psi) max. @ 85 °C (185 °F)

PVDF Body

- 14 bar (200 psi) max. @ 20 °C (68 °F)
- 1.7 bar (25 psi) max. @ 85 °C (185 °F)



Intended Use

This product is intended for use in industrial water treatment and wastewater treatment applications where the chemical content and the fluid temperatures are consistent with the specifications listed herein.

This device is not approved for use or installation in flammable liquids.

Standards and Approvals

- CE, UL
- NSF (3-2537-xC-Px versions only)
- China RoHS (Go to www.gfsignet.com for details)
- Manufactured under ISO 9001 for Quality, ISO 14001 for Environmental Management and OHSAS 18001 for Occupational Health and Safety.

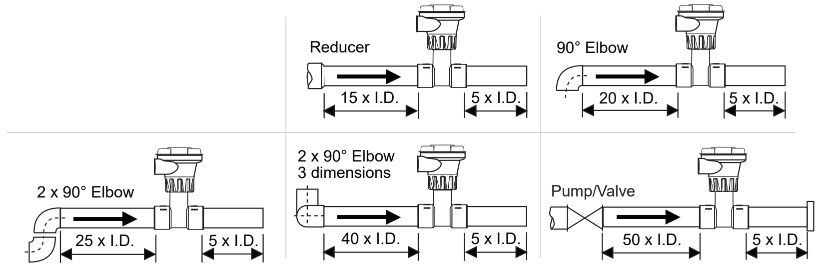
Declaration of Conformity according to FCC Part 15

This device complies with Part 15 of the FCC rules.
Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) This device must accept any interference received, including interference that may cause undesired operation.

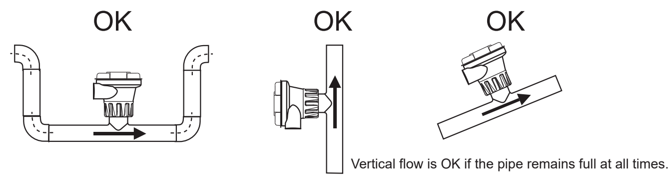
Location of Fitting

Recommended sensor upstream/downstream mounting requirements:

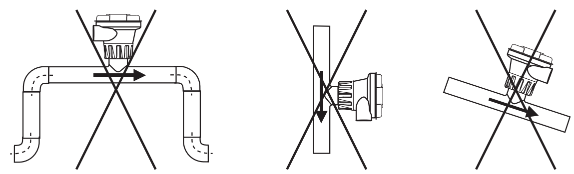
Select a location with sufficient length of straight pipe immediately upstream of the sensor.



Locating the sensor in a trap or where the flow is upward helps to protect the sensor from exposure to air bubbles when the system is in operation.



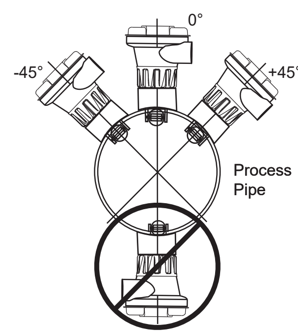
These configurations are not recommended because it is difficult to keep the pipe full.



Sensor Mounting Position

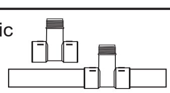
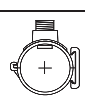
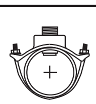
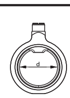
Horizontal pipe runs:
Mount sensor in the upright (0°) position for best performance. Mount at a maximum of 45° when air bubbles are present (pipe must be full).
Do not mount on the bottom of the pipe when sediments are present.

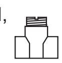
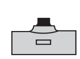
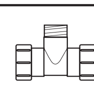
Vertical pipe runs:
Mount sensor in any orientation; however, downward flow is not recommended. Upward flow is preferred to ensure full pipe.



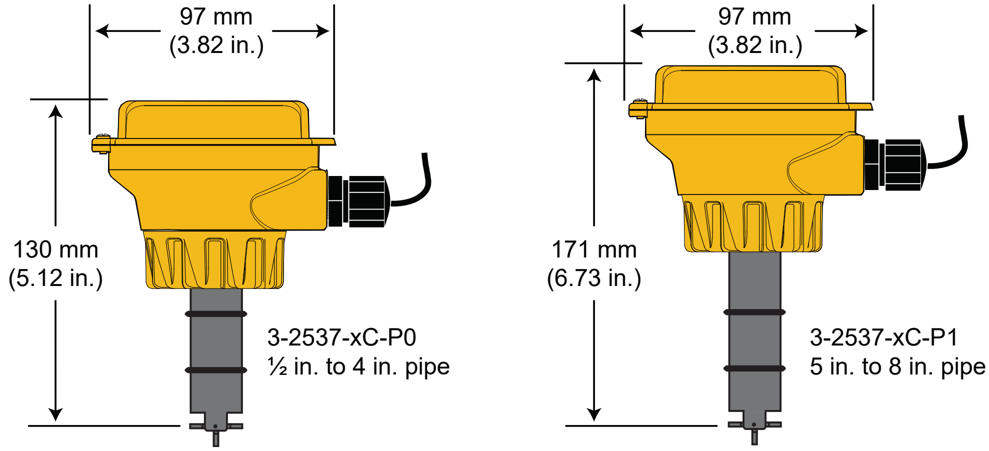
Pipe Fittings

Georg Fischer Signet offers a wide selection of installation fittings that control the position of the paddlewheel in relation to the dimensions of the pipe.

Type	Description
Plastic tees 	• 0.5 to 2 inch versions (MPVC or CPVC) • 2.5 to 4 inch versions (PVC)
PVC Glue-on Saddles 	• Available in 10 and 12 inch sizes only • Cut 2-1/2 inch hole in pipe • Weld in place using solvent cement
PVC Saddles 	• 2 to 4 inch, cut 1-7/16 inch hole in pipe • 6 to 8 inch, cut 2-1/8 inch hole in pipe
Iron Strap-on saddles 	• 2 to 4 inch, cut 1-7/16 inch hole in pipe • Over 4 inch, cut 2-1/8 inch hole in pipe • Special order 14 in. to 36 in.
Metric Wafer Fitting 	• For pipes DN65 to 200 mm • PP or PVDF

Type	Description
Iron, Carbon Steel, 316 SS Threaded tees 	• 0.5 to 2 in. versions • Mounts on threaded pipe ends
Carbon steel & stainless steel Weld-on Weldolets 	• 2 to 4 inch, cut 1-7/16 inch hole in pipe • Over 4 inch, cut 2-1/8 inch hole in pipe
Fiberglass tees  FPT	• 1.5 in. to 2 in. PVDF insert
Metric Union Fitting 	• For pipes from DN 15 to 50 mm • PP or PVDF

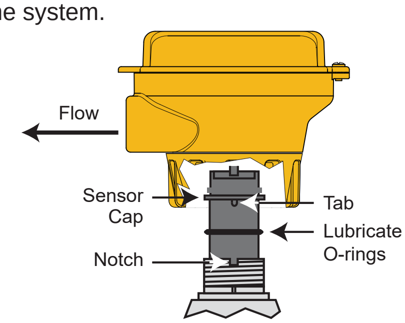
Dimensions



Installation

Plastic sensor installation tips

- Inspect the sensor O-rings for nicks and other damage that may compromise the seal.
- Lubricate O-rings with a non-petroleum based, viscous lubricant (grease) compatible with the system.
- Using an alternating/twisting motion, lower the sensor into the fitting, making sure the conduit ports on the yellow housing are pointing in the direction of flow.
- Engage one thread of the sensor cap then turn the sensor until the alignment tab is seated in the fitting notch.



HAND-TIGHTEN THE THREADED NUT ONTO THE INSTALLATION FITTING. DO NOT USE TOOLS!

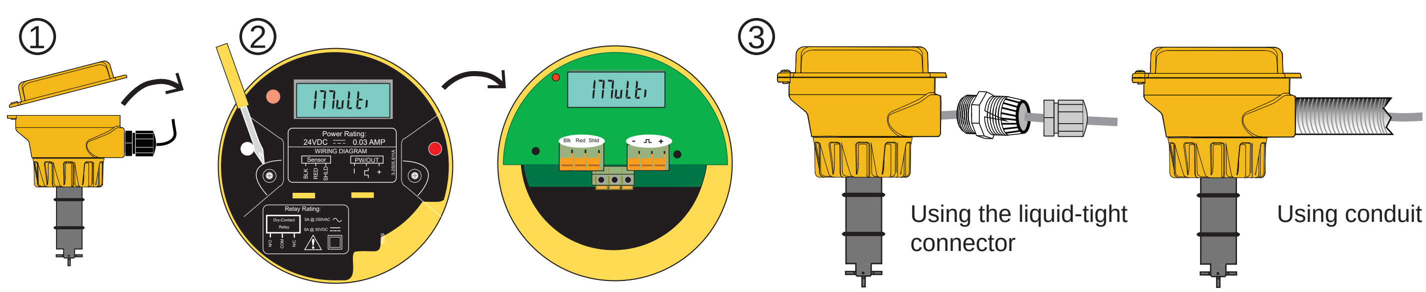
DO NOT USE THREAD SEALANT OR LUBRICANTS ON THE FITTING THREADS OR THE SENSOR CAP.

Wiring

Electrical connections to this product should be made only by qualified personnel.

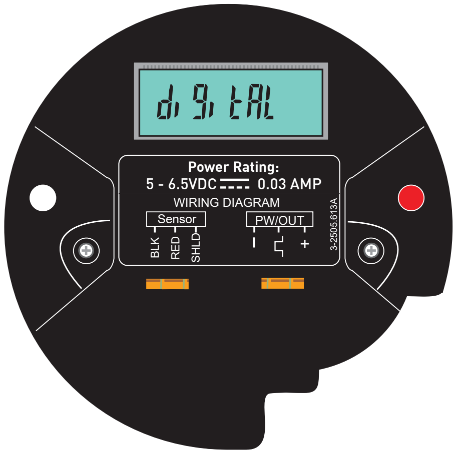
To access the wiring terminals:

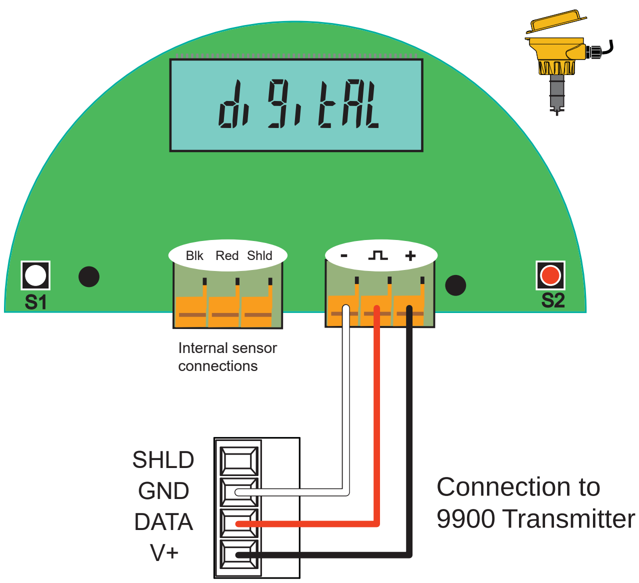
1. Turn yellow cap ¼ turn counterclockwise to remove.
2. Remove the two retaining screws and remove the black cover.
   - Route all cables through the conduit ports before connecting them to the terminals.
   - Wiring terminals are rated for 16 to 22 AWG conductors.
   - The cable must be 7 mm to 10 mm in diameter (0.275 in. to 0.394 in.) to seal properly in the liquid tight connector.
3. The conduit ports have ½ inch NPT threads. After routing the cables, seal the port with a liquid tight conduit connector (3-9000.392-1) or with conduit.
   - For conduit installations:
     - Thread conduit with ½ in. NPT threads directly into the conduit port.
     - For conduit with ISO threads, use the black thread adapter included with the connector kit.
     - To comply with NEC requirements, do not use any metal conduit in the installation.

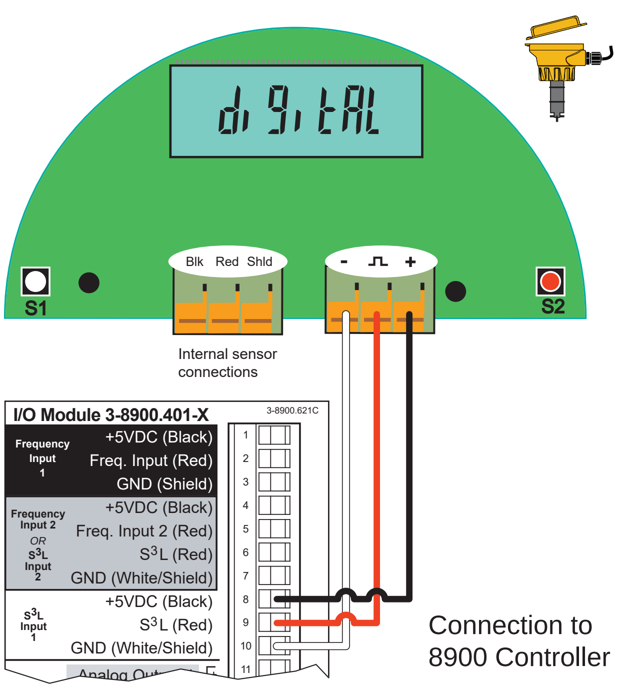


Digital (S^3L) Output Wiring

The Digital (S^3L) output is compatible with the 3-8900 Multi-Parameter Controller and the 3-9900 Transmitter.

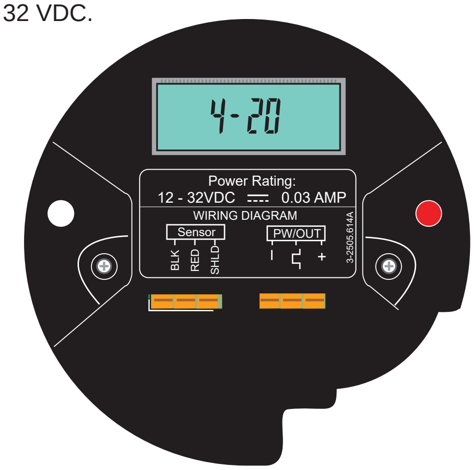


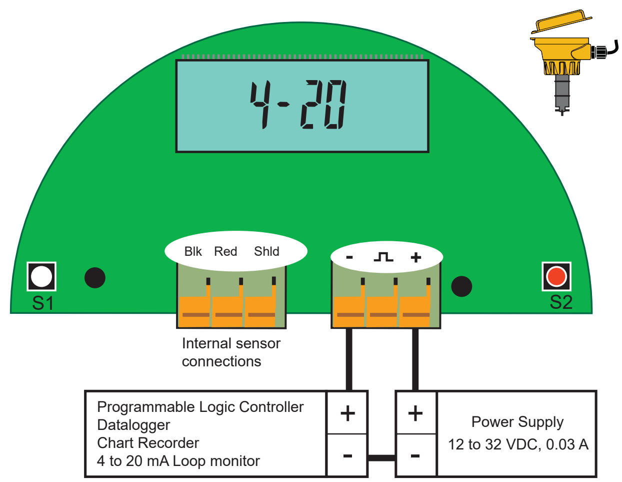




4 to 20 mA Output Wiring

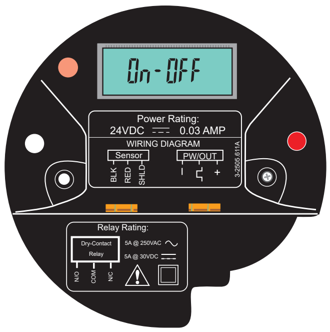
- The 4 to 20 mA output can be connected to Chart Recorders, PLCs or any device that requires a 4 to 20 mA signal.
- The 4 to 20 mA model requires an external power source of 12 to 32 VDC.

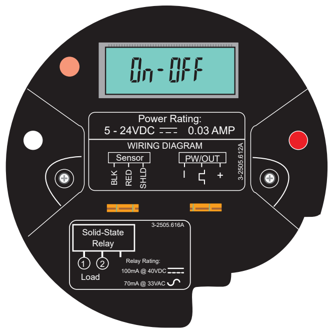




Flow Switch Output (On-Off)

- The Flow Switch mode allows a single relay that is programmable as a HIGH setpoint or LOW setpoint.
- The relay may be a dry-contact type or a solid state type:

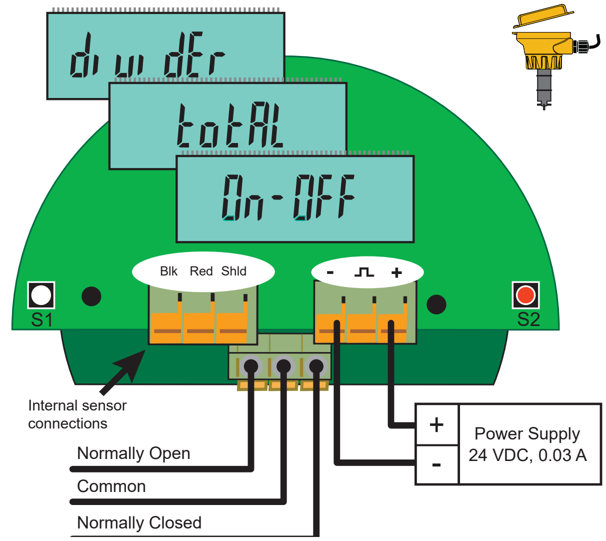




- The **Dry Contact Relay** requires an external power source of 24 VDC ± 10%.
- The **Solid State Relay** requires an external power source of 5 to 24 VDC.

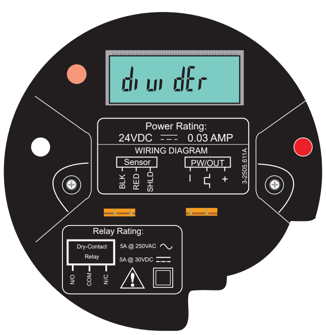
Dry Contact Relay Wiring

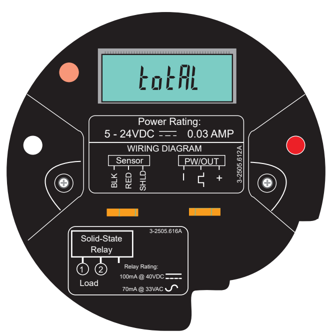
- The wiring is identical for On-OFF and Pulse modes.



Pulse Output

- The "Multi" mode allows a single relay that is programmable as a Flow Switch, Volumetric pulse output or as a simple pulse divider output.
- The relay may be a dry-contact type or a solid state type.

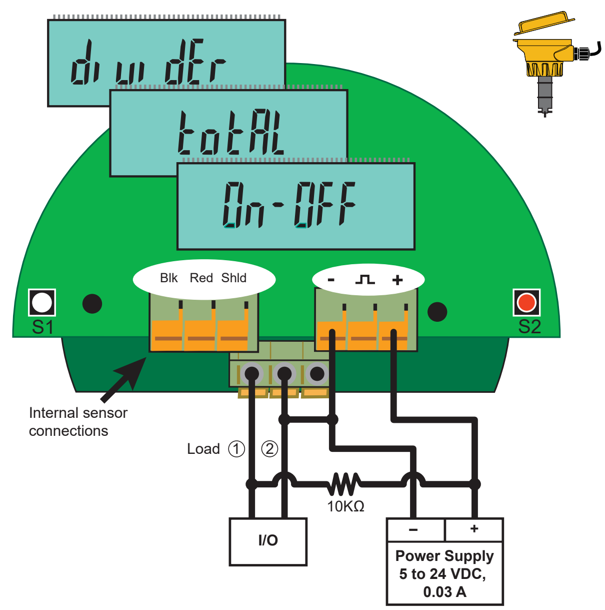




- The **Dry Contact Relay** requires an external power source of 24 VDC ± 10%.
- The **Solid State Relay** requires an external power source of 5 to 24 VDC.
- Solid State Relay requires a pull-up resistor (10K ohm recommended). Consult your instrument/ PLC manual for wiring information.

Solid State Relay Wiring

- The wiring is identical for On-OFF and Pulse modes.



Operation

The 2537 Flowmeter is available in three different models. The programming menus vary significantly from one model to another. This chart is provided inside the yellow cover to assist in navigating the menus in the 2537.

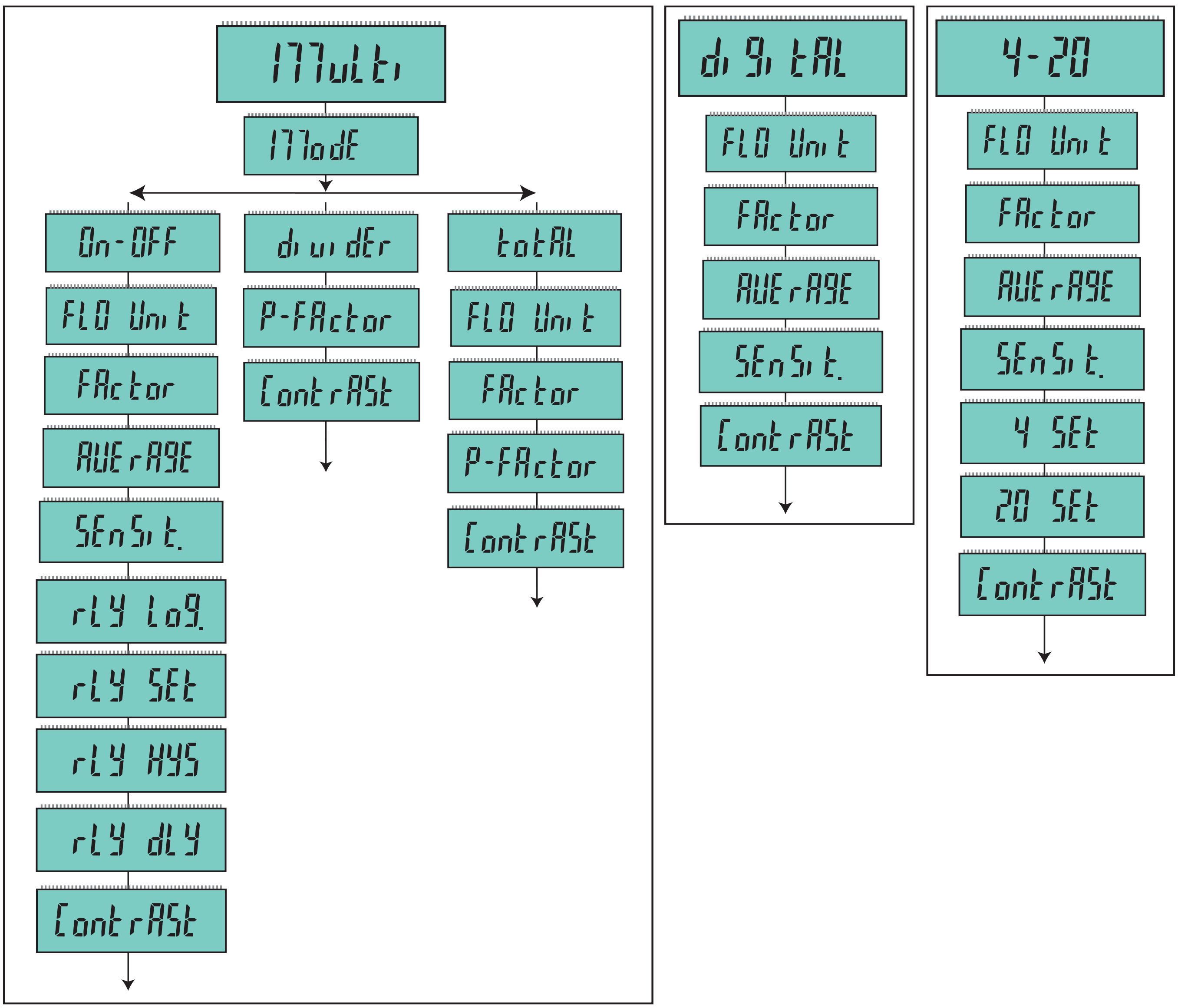
Mode	Action		
View	→ Display Flow Rate	→ Go to MENU	Go to VIEW
Menu	1X → Next Menu	1X → Display Current Value	Previous Mode
		→ Go to Edit	Previous Mode
		1X → Shift digit to right	Previous Mode
Edit	1X → Increment Value	→ Go to SAVE	Previous Mode
SAVE	1X → Toggle	1X → Store Change	N/A

Menus

3-2537-1C-XX, 3-2537-2C-XX

3-2537-5C-XX

3-2537-6C-XX



VIEW Mode Function

- All models display the model name: **Multi**, **Digital** or **4-20**.
- If the white key (S1) is held down for three seconds, the flow rate is displayed for 10 minutes before reverting back to the model name.
  - In the **Multi** Model, if the "Multi" menu item is set to "divider", then the divided pulse output will be displayed in pulses / seconds (p/s).

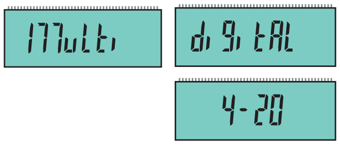
Menu Details

This table shows the definition of each menu function, the setting parameters and the page where detailed instructions can be located.

Menu Function	Definition	Setting Parameters	More Information
Flow Unit	Liters or Gallons per sec., min., hour or day	See list on page 10	page 10
K-Factor	Set PULSES per VOLUME UNIT	0.0001 to 999999	page 10
Average	Smooths out erratic flow conditions	0 to 100 seconds	page 11
Sensitivity	Overrides Average for large rate changes	0 to 9	page 11
Mode	Select the output mode	Total or Divider or On-OFF	page 12
P-Factor	As PULSE DIVIDER, divides input freq.	1.0000 to 99999	page 12
P-Factor	As PULSE TOTAL, multiplies K-Factor	1.0000 to 99999	page 12
Relay Logic	Select Hi alarm or Lo alarm mode	Hi or Lo	page 13
Relay Set	Set Relay Setpoint	0.0000 to 99999	page 13
Relay Hysteresis	Rate inside Setpoint to DEENERGIZE relay	0.0000 to 99999	page 13
Relay Delay	Time delay before relay is ENERGIZED	0000.0 to 6400.0	page 13
4 Set	Set flow RATE to be represented by 4 mA	0.0000 to 99999	page 10
20 Set	Set flow RATE to be represented by 20 mA	0.0000 to 99999	page 10
Contrast	Adjust visibility of liquid crystal display	1 to 3	page 10

Set Flow Units

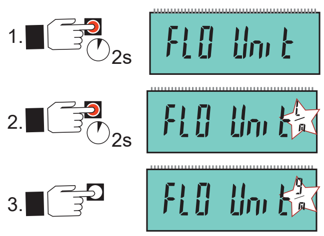
This function is available on these versions of the 2537:

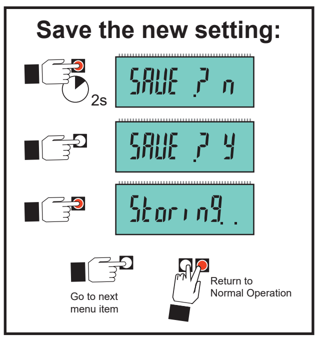


Select the volumetric units for the flow measurement:

L/s	Liters/second	g/s	Gallons/second
L/m	**Liters/minute (Factory setting)**	g/m	Gallons/minute
L/h	Liters/hour	g/h	Gallons/hour
L/d	Liters/day	g/d	Gallons/day

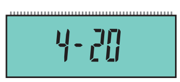
Example: Set the Flow Units to Gallons per minute:





Set 4 and Set 20

This function is available on these versions of the 2537:

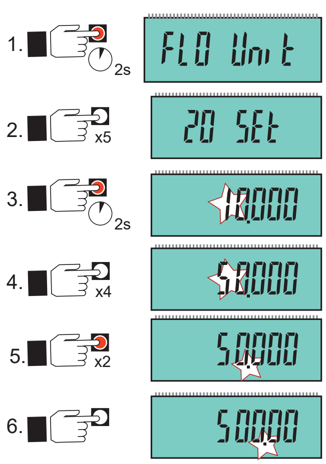


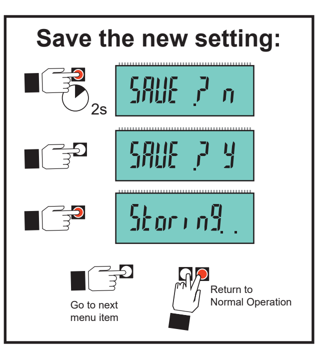
These two functions are used to span the 4 to 20 mA output signal to the required range.

The factory setting is 4 to 20 mA = 0 to 10.000

Only the 20 mA span is illustrated here.

Example: Set 20 mA = 500 GPM.

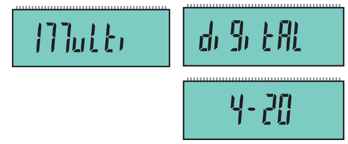




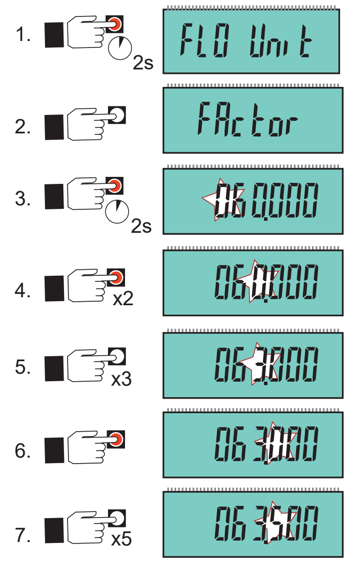
Set K-Factor

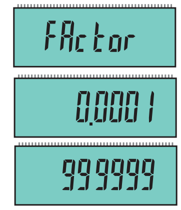
A K-Factor is the number of pulses a sensor will generate for each engineering unit of fluid that passes the sensor. The factory setting is 60.0000. Locate the K-Factor in the tables on page 14 and 15.

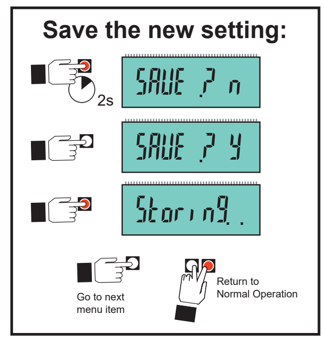
This function is available on the above versions of the 2537:



Example: Set the K-Factor to 63.5 Pulses per Gallon:

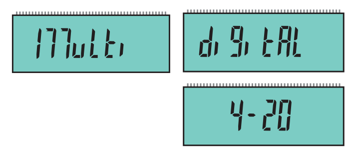




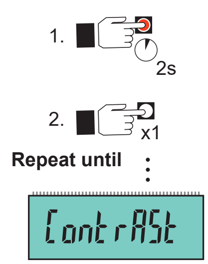


Set Contrast

This function is available on these versions of the 2537:



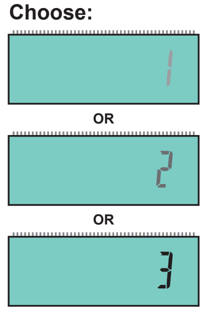
All models of the 2537 have the CONTRAST adjustment. It is always located at the end of the menu.

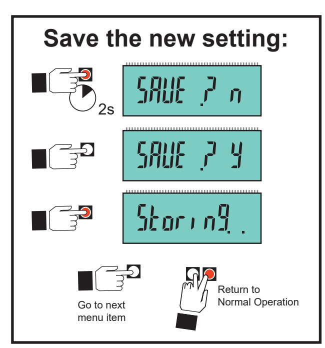


To access the adjustment, enter the menu and scroll until the Contrast display appears.

Three levels of adjustment are available. The factory setting of 3 is the highest contrast setting.

Choose:





+GF+

Averaging and Sensitivity Settings

- Because ideal flow conditions are often impossible to achieve, the flow rate is often erratic, which causes erratic readings in control features (e.g., relays, 4 to 20 mA loops, etc.) that are associated with the flow rate.
- The best solution to these problems is to correct any piping deficiency that causes the instability. This may involve longer straight runs upstream, reducing the pipe size to maintain a full pipe at all times, and other installation changes. In many situations, however, these measures are simply not possible.
- The 2537 meter provides two tools that are designed to "work around" these deficiencies. The Averaging and the Sensitivity features should be studied before making adjustments.

Averaging Time in Seconds (Factory set: 0 seconds)

- Set the time the meter will use as the averaging period. The range is from 0 (no average applied to input) to 100 (seconds of averaging applied to input).
  Use higher averaging times to smooth the display and current output where the flow in the pipe is erratic.

Quick Response Sensitivity (Factory set: 0)

- Set the relative degree of change in the flow rate required to allow the 2537 to disable the AVERAGING and jump to a new flow rate immediately. The scale is from 0 (least sensitive, averaging is never disabled.) to 9 (a very small change in flow rate will disable the averaging).

No AVERAGING, no SENSITIVITY

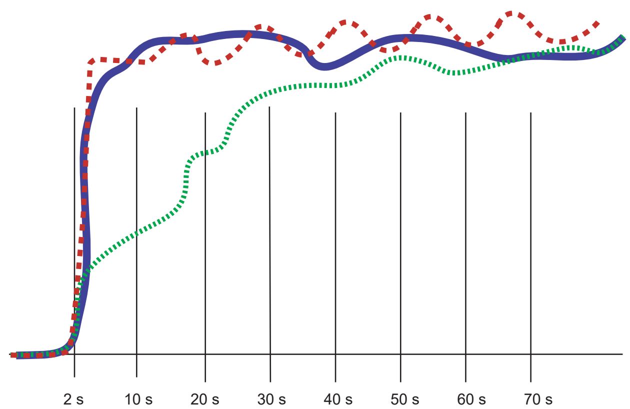
With AVERAGING set to 0 (zero) and with SENSITIVITY set to zero, the 2537 responds to every unstable shift in the flow. The dashed red line represents the actual output of the flow sensor in unstable flow conditions.

AVERAGING only

With AVERAGING set to 50 seconds and SENSITIVITY still set to zero the flow rate is stabilized, but a sharp change in flow rate is not represented for 50 seconds or longer (dotted green line).

AVERAGING and SENSITIVITY

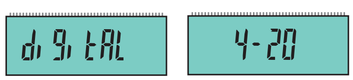
With AVERAGING at 50 seconds and SENSITIVITY set to 4 OR 5, the flow rate is stabilized, while the sudden shift in flow is reflected very quickly (solid blue line).



NOTE: The SENSITIVITY function is ineffective if the AVERAGING function is set to zero (seconds).

Set Averaging

This function is available on these versions of the 2537:

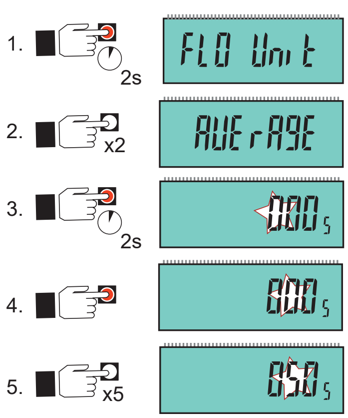


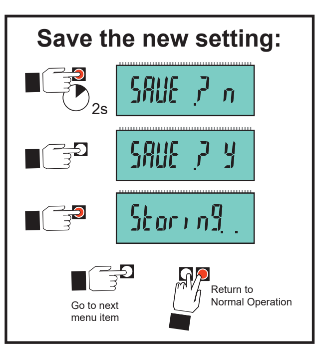
The factory setting is 0 (zero).

Minimum value

Maximum value

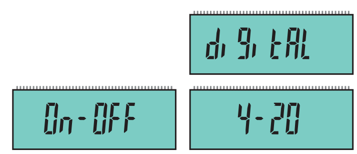
Example: Set the Averaging for 50 seconds.



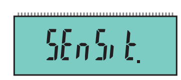


Set Sensitivity

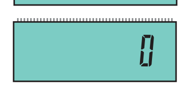
This function is available on these versions of the 2537:



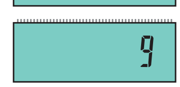
The factory setting is 0 (zero).



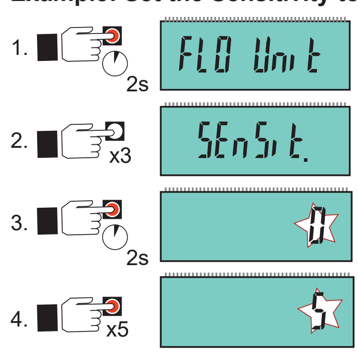
Minimum value

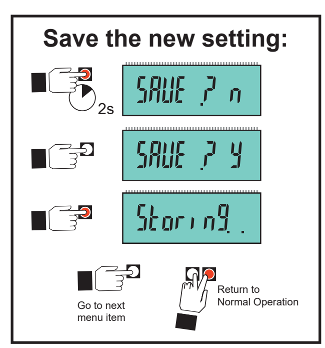


Maximum value



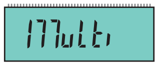
Example: Set the Sensitivity to 5.





Multi Mode

This function is available on these versions of the 2537:



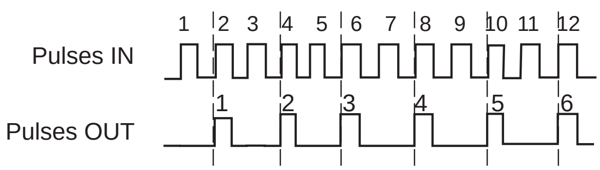
Select **DIVIDER** or **TOTAL** operation.
The factory setting is TOTAL.

PULSE DIVIDER Output = Input pulses ÷ P-Factor

DIVIDER allows you to set a scaling value (P-Factor) from 1.0000 to 99999.

Example: If the P-Factor is set for 2, then the 2537 will output one pulse for every 2 pulses received from the sensor. This selection enables the output frequency to be scaled down to match associated equipment capabilities.

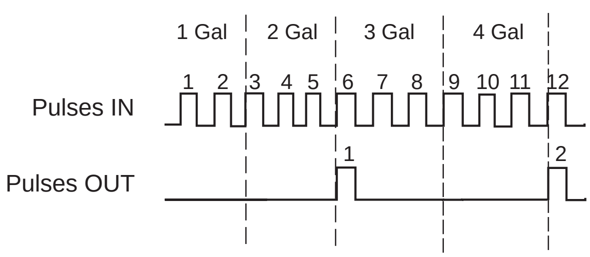
When using the PULSE DIVIDER output, associated equipment must divide the K-Factors in this manual by the P-Factor for correct calibration.

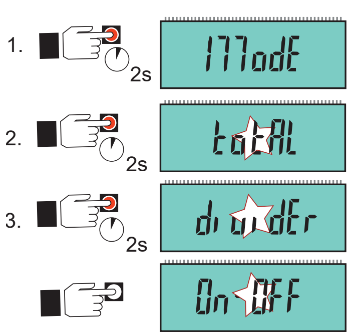


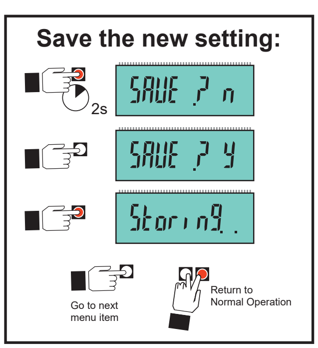
PULSE TOTAL Output = Input pulses ÷ (K-Factor × P-Factor)
TOTAL is a traditional pump pulse function. This selection will allow the entry of a K-Factor to define a volumetric unit, then set a P-Factor to define the number of volumetric units required to generate one pulse out.

Example:
Set the Total Pulse output so there is one pulse out for each 2 gallons that passes the sensor if the K-Factor is 3.0.

1. K-Factor = 3.0 (pulses in per gallon)
2. P-Factor = 2 (gallons out per pulse)

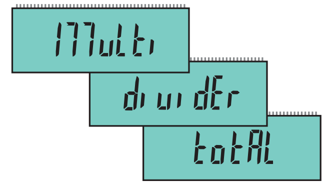




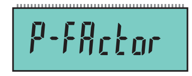


P-Factor

This function is available on the above versions of the 2537:

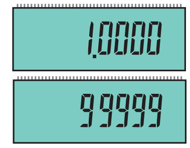


The factory setting is 1.0000



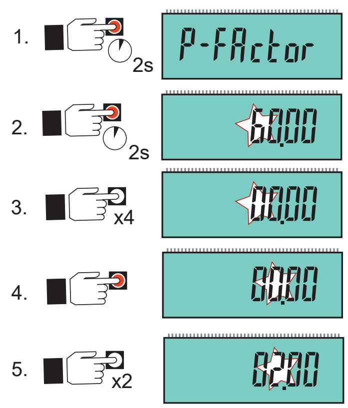
Minimum value

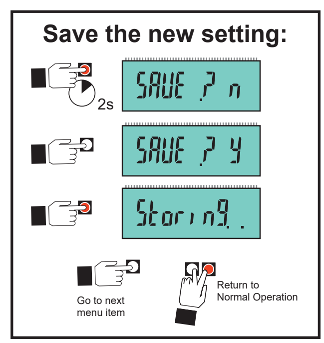
Maximum value



In PULSE DIVIDER mode the P-Factor divides:
The pulse stream from the paddlewheel sensor will be divided by the P-Factor. The resulting frequency is output through a relay.

In PULSE TOTAL mode the P-Factor multiplies:
The pulse stream from the paddlewheel sensor is divided by the K-Factor MULTIPLIED by the P-factor. The resulting frequency is output through a relay.





Set Relay Operation

The On-OFF mode has one relay (SPDT or solid-state) that can be programmed as a HIGH (Hi) alarm or a LOW (Lo) alarm.

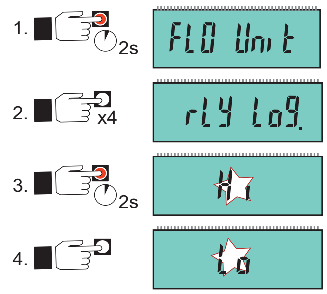
1. Select HI or LO Relay Alarm logic

A HI alarm will be activated when the flow rate rises ABOVE the setpoint.

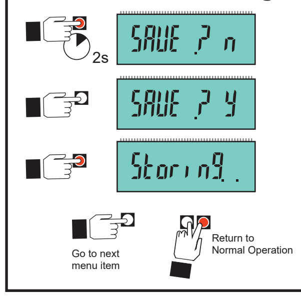
A LO alarm will be activated when the flow rate falls BELOW the setpoint.

The factory setting is Hi(gh).

Example: Change the Relay Logic to Low:



Save the new setting:



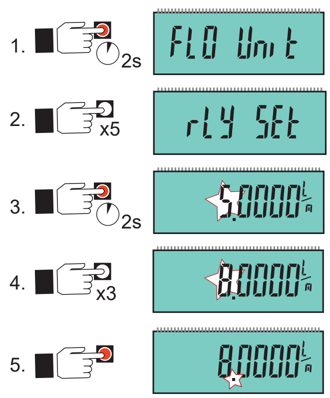
2. Program the SETPOINT.

The SETPOINT is the flow rate where the relay will be energized. The factory setting is 5.0000.

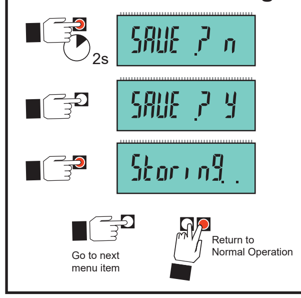
Minimum value

Maximum value

Example: Change the Setpoint to 8.0000:



Save the new setting:



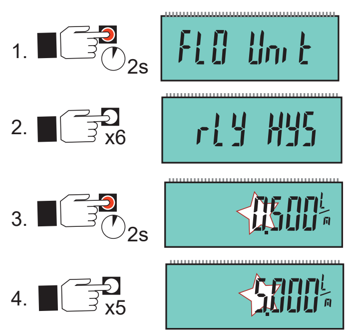
3. Program the HYSTERESIS.

Hysteresis holds a relay energized until the flow rate moves this amount past the setpoint. The factory setting is 0.5000

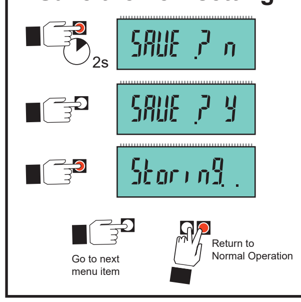
Minimum value

Maximum value

Example: Change the Hysteresis to 5.0000:



Save the new setting:



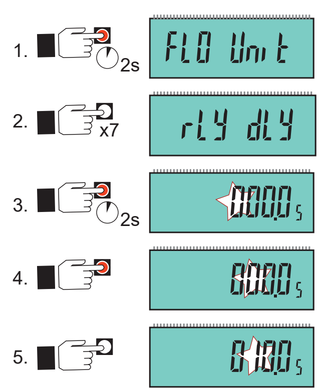
4. Program the DELAY.

When the flow rate reaches the setpoint, the 2537 will wait this long (in seconds) before triggering the alarm. The factory setting is 0000.0 seconds.

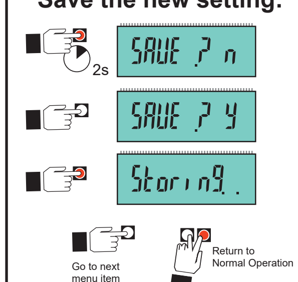
Minimum value

Maximum value

Example: Change the Delay to 10.0:



Save the new setting:

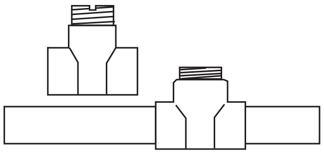


K-Factor

When using the PULSE DIVIDER mode, associated equipment must divide the K-Factors by the P-Factor.

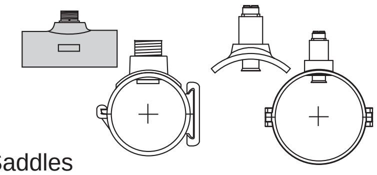
A **K-Factor** is the number of pulses a sensor will generate for each engineering unit of fluid that passes the sensor. K-Factors for water are listed below in U.S. gallons and liters.

For example, in a 1 inch SCH 80 PVC pipe, using the MPV8T010 PVC fitting, the 2537 paddlewheel generates 335.53 pulses per gallon of water passing the rotor.



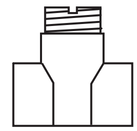
Molded Tees

PIPE SIZE (IN.)	FITTING	2537 SENSOR	
		U.S. GAL	LITERS
SCH 80 MOLDED TEES FOR SCH 80 PVC PIPE			
1/2	MPV8T005F MPV8T005 MCPV8T005F	1027.1	271.37
3/4	MPV8T007F MPV8T007 MCPV8T007F	583.19	154.08
1	MPV8T010F MPV8T010 MCPV8T010F	335.53	88.65
1-1/4	MPV8T012F MPV8T012 MCPV8T012F	178.79	47.24
1-1/2	MPV8T015F MPV8T015 MCPV8T015F	121.42	32.08
2	MPV8T020F MPV8T020 MCPV8T020F	71.44	18.87
2-1/2	PV8T025	42.994	11.359
3	PV8T030	26.652	7.0414
4	PV8T040	15.006	3.9645



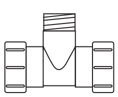
Saddles

PIPE SIZE (IN.)	FITTING	2537 SENSOR	
		U.S. GAL	LITERS
SCH 80 PVC SADDLES FOR SCH 80 PVC PIPE			
2	PV8S020	66.739	17.633
2-1/2	PV8S025	42.994	11.359
3	PV8S030	26.652	7.0414
4	PV8S040	15.006	3.9645
6	PV8S060	8.3246	2.1994
8	PV8S080	5.0164	1.3253
SCH 80 PVC SADDLE ON SCH 40 PVC PIPE			
2	PV8S020	54.700	14.452
2-1/2	PV8S025	37.159	9.8175
3	PV8S030	23.697	6.2608
4	PV8S040	13.456	3.5552
6	PV8S060	7.4594	1.9708
8	PV8S080	4.5292	1.1966



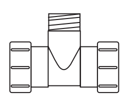
Metal Tees

PIPE SIZE (IN.)	FITTING	2537 SENSOR	
		U.S. GAL	LITERS
CARBON STEEL TEES ON SCH 40 PIPE			
1/2	CS4T005	756.00	199.74
3/4	CS4T007	438.69	115.90
1	CS4T010	286.78	75.768
1-1/4	CS4T012	121.22	32.026
1-1/2	CS4T015	91.139	24.079
2	CS4T020	54.468	14.391
STAINLESS STEEL TEES ON SCH 40 PIPE			
1/2	CR4T005	734.20	193.98
3/4	CR4T007	412.10	108.88
1	CR4T010	252.70	66.764
1-1/4	CR4T012	128.12	33.849
1-1/2	CR4T015	77.320	20.428
2	CR4T020	45.780	12.095
GALVANIZED IRON TEES ON SCH 40 PIPE			
1	IR4T010	213.01	56.277
1-1/4	IR4T012	127.75	33.751
1 1/2	IR4T015	94.401	24.941
2	IR4T020	59.420	15.699
BRONZE TEES ON SCH 40 PIPE			
1	BR4T010	213.01	56.277
1-1/4	BR4T012	127.75	33.751
1-1/2	BR4T015	94.401	24.941
2	BR4T020	59.420	15.699
COPPER TEE ON COPPER PIPE SCH K			
1/2	CUKT005	917.84	242.50
3/4	CUKT007	428.27	113.15
1	CUKT010	256.43	67.749
1-1/4	CUKT012	176.44	46.615
1-1/2	CUKT015	115.69	30.565
2	CUKT020	63.385	16.746
COPPER TEE ON COPPER PIPE SCH L			
1/2	CUKT005	858.22	226.74
3/4	CUKT007	385.74	101.91
1	CUKT010	241.64	63.841
1-1/4	CUKT012	170.90	45.152
1-1/2	CUKT015	112.03	29.598
2	CUKT020	61.74	16.310



Union Tees

PIPE SIZE	FITTING	2537 SENSOR	
		U.S. GAL	LITERS
POLYPROPYLENE TEES (DIN/ISO, BS, ANSI)			
DN15	PPMT005	952.87	251.75
DN20	PPMT007	563.10	148.77
DN25	PPMT010	291.60	77.042
DN32	PPMT012	169.22	44.709
DN40	PPMT015	103.90	27.450
DN50	PPMT020	60.789	16.060
DN65	PPMT025	41.498	10.964
DN80	PPMT030	26.786	7.0769
DN100	PPMT040	17.415	4.6011
DN125	PPMT050	10.168	2.6864
DN150	PPMT060	7.3119	1.9318
DN200	PPMT080	3.9946	1.0554

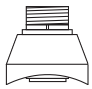


Union Tees

PIPE SIZE	FITTING	2537 SENSOR	
		U.S. GAL	LITERS
PVDF FITTINGS (DIN/ISO AND BS AND ANSI)			
DN15	SFMT005	827.26	218.56
DN20	SFMT007	489.87	129.42
DN25	SFMT010	283.55	74.915
DN32	SFMT012	158.59	41.899
DN40	SFMT015	86.980	22.980
DN50	SFMT020	50.385	13.312
PVC FITTINGS (DIN/ISO) - EUROPE ONLY			
DN15	PVMT005	972.37	256.90
DN20	PVMT007	485.69	128.32
DN25	PVMT010	297.27	78.540
DN32	PVMT012	170.25	44.980
DN40	PVMT015	103.71	27.400
DN50	PVMT020	59.500	15.720
DN65	PVMT025	34.973	9.2400
DN80	PVMT030	24.981	6.6000
DN100	PVMT040	16.275	4.3000
DN150	PVMT060	8.1756	2.1600
DN200	PVMT080	4.0878	1.0800

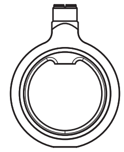
K-Factor

Weldolets and Brazolets



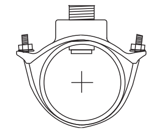
PIPE SIZE (IN.)	FITTING	2537 SENSOR	
		U.S. GAL	LITERS
STAINLESS STEEL WELDOLETS ON SCH 40 PIPE			
2-1/2	CR4W025	37.600	9.9339
3	CR4W030	24.340	6.4306
4	CR4W040	13.920	3.6777
5	CR4W050	10.860	2.8692
6	CR4W060	7.5200	1.9868
8	CR4W080	4.3400	1.1466
CARBON STEEL WELDOLETS ON SCH 40 PIPE			
2-1/2	CS4W025	37.600	9.9339
3	CS4W030	24.340	6.4306
4	CS4W040	13.920	3.6777
5	CS4W050	10.860	2.8692
6	CS4W060	7.5200	1.9868
8	CS4W080	4.3400	1.1466
COPPER/BRONZE BRAZOLETS ON SCH 40 PIPE			
2-1/2	BR4B025	37.600	9.934
3	BR4B030	24.340	6.431
4	BR4B040	13.920	3.678
5	BR4B050	10.860	2.869
6	BR4B060	7.5200	1.987
8	BR4B080	4.3400	1.147

Wafer Fittings



PIPE SIZE	FITTING	2537 SENSOR	
		U.S. GAL	LITERS
POLYPROPYLENE WAFER FITTINGS (DIN/ISO)			
DN65	PPMTE025 PPMTF025	41.498	10.964
DN80	PPMTE030 PPMTF030	26.786	7.0769
DN100	PPMTE040 PPMTF040	17.415	4.6011
DN125	PPMTE050 PPMTF050	10.168	2.6864
DN150	PPMTE060 PPMTF060	7.3119	1.9318
DN200	PPMTE080 PPMTF080	3.9946	1.0554
PVDF WAFER FITTINGS (DIN/ISO)			
DN65	SFMTF025	36.133	9.5465
DN80	SFMTF030	24.715	6.5297
DN100	SFMTF040	16.120	4.2589
DN125	SFMTF050	8.8624	2.3415
DN150	SFMTF060	6.4543	1.7052
DN200	SFMTF080	4.0720	1.0758

Iron Saddles

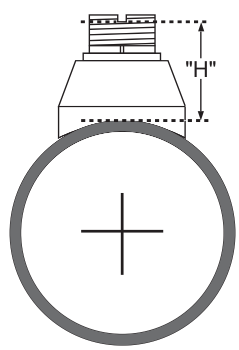


PIPE SIZE (IN.)	FITTING	2537 SENSOR	
		U.S. GAL	LITERS
SCH 80 IRON SADDLES ON SCH 80 PIPE			
2	IR8S020	64.720	17.099
2-1/2	IR8S025	42.480	11.223
3	IR8S030	26.420	6.980
4	IR8S040	14.700	3.884
5	IR8S050	12.180	3.218
6	IR8S060	8.4400	2.230
8	IR8S080	4.9000	1.295
SCH 80 IRON SADDLE ON SCH 40 PIPE			
2	IR8S020	53.640	14.172
2-1/2	IR8S025	37.600	9.934
3	IR8S030	23.220	6.135
4	IR8S040	13.260	3.503
5	IR8S050	11.040	2.917
6	IR8S060	7.2400	1.913
8	IR8S080	4.4000	1.162

H-Dimension

The plastic insert in Weldolet fittings MUST be removed during the welding process. When reinstalled, it is important that the insert be threaded to the proper height ("H" dimension).

Weldolet	"H" dimension	
Part number	inches	mm
CS4W020	2.38	60.45
CS4W025	2.33	59.18
CS4W030	2.32	58.92
CS4W040	2.30	58.42
CS4W050	3.09	78.48
CS4W060	2.96	75.18
CS4W080	2.73	69.34



Weldolet	"H" dimension	
Part number	inches	mm
CR4W020	2.38	60.45
CR4W025	2.33	59.18
CR4W030	2.32	58.92
CR4W040	2.30	58.42
CR4W050	3.09	78.48
CR4W060	2.96	75.18
CR4W080	2.73	69.34

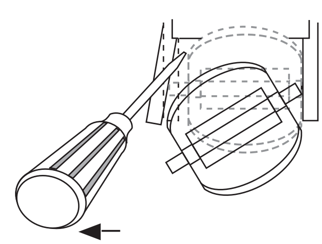
Maintenance and Cleaning

The 2537 requires very little maintenance.

- If the paddlewheel becomes fouled, it can be cleaned with mild detergents and a small brush.
- The electronics portion of the 2537 does not require maintenance or cleaning.

Rotor Replacement Procedure

1. To remove the rotor, insert a small screwdriver between the rotor and the ear of the sensor.
2. Twist the screwdriver blade to flex the ear outward enough to remove one end of the rotor and pin. DO NOT flex the ear any more than necessary! If it breaks, the sensor cannot be repaired.
3. Install the new rotor by inserting one tip of the pin into the hole, then carefully flex the opposite ear back enough to slip rotor into place.



Ordering Information

Mfr. Part No.	Code	Description
2537 system for 0.5 in. to 4 in. pipes:		
Polypropylene body, Black PVDF rotor, Titanium pin, FPM O-rings		
3-2537-1C-P0	159 001 291	Pulse/Flow Switch, DCR, -P0, Integral Mount
3-2537-2C-P0	159 001 292	Pulse/Flow Switch, SSR, -P0, Integral Mount
3-2537-5C-P0	159 001 295	Digital (S^3L), Integral Mount
3-2537-6C-P0	159 001 296	4 to 20 mA, Integral Mount
2537 system for 5 in. to 8 in. pipes:		
Polypropylene body, Black PVDF rotor, Titanium pin, FPM O-rings		
3-2537-1C-P1	159 001 303	Pulse/Flow Switch, DCR, -P1, Integral Mount
3-2537-2C-P1	159 001 304	Pulse/Flow Switch, SSR, -P1, Integral Mount
3-2537-5C-P1	159 001 307	Digital (S^3L), Integral Mount
3-2537-6C-P1	159 001 308	4 to 20 mA, Integral Mount
2537 system for 0.5 in. to 4 in. pipes:		
Natural PVDF body, Natural PVDF rotor and pin, FPM O-rings		
3-2537-1C-T0	159 001 315	Pulse/Flow Switch, DCR, -T0, Integral Mount
3-2537-2C-T0	159 001 316	Pulse/Flow Switch, SSR, -T0, Integral Mount
3-2537-5C-T0	159 001 319	Digital (S^3L), Integral Mount
3-2537-6C-T0	159 001 320	4 to 20 mA, Integral Mount

Accessories

Mfr. Part No.	Code	Description
3-2536.320-1	198 820 052	Rotor, PVDF Black
3-2536.320-2	159 000 272	Rotor, PVDF Natural
3-2536.320-3	159 000 273	Rotor, ETFE
3-2536.321	198 820 054	Rotor and Pin, PVDF Natural
3-2536.322-1	198 820 056	Sleeved Rotor, PVDF Black
3-2536.322-2	198 820 057	Sleeved Rotor, PVDF Natural
3-2536.322-3	198 820 058	Sleeved Rotor, ETFE
M1546-1	198 801 182	Rotor Pin, Titanium
M1546-2	198 801 183	Rotor Pin, Hastelloy-C
M1546-3	198 820 014	Rotor Pin, Tantalum
M1546-4	198 820 015	Rotor Pin, Stainless Steel
P51545	198 820 016	Rotor Pin, Ceramic
1220-0021	198 801 000	O-Ring, FKM
1224-0021	198 820 006	O-Ring, EPDM
1228-0021	198 820 007	O-Ring, FFKM
P31536	198 840 201	Sensor Plug, Polypro
3-8050.390-1	159 001 702	Retaining Nut Replacement Kit, NPT, Valox®
3-8050.390-3	159 310 116	Retaining Nut Replacement Kit, NPT, PP
3-8050.390-4	159 310 117	Retaining Nut Replacement Kit, NPT, PVDF
3-9000.392-1	159 000 839	Liquid tight connector kit, NPT (1 piece)
3-9000.392-2	159 000 841	Liquid tight connector kit, PG 13.5 (1 piece)
7310-1024	159 873 004	24 VDC Power Supply, 10W, 0.42 A
7310-2024	159 873 005	24 VDC Power Supply, 24W, 1.0 A
7310-4024	159 873 006	24 VDC Power Supply, 40W, 1.7 A
7310-6024	159 873 007	24 VDC Power Supply, 60W, 2.5 A
7310-7024	159 873 008	24 VDC Power Supply, 96W, 4.0 A

+GF+

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Stainless Steel Pressure Gauges

2.5" Dial, 30 to 1,500 PSI

PG SERIES

Pure Aqua's pressure gauges are constructed with stainless steel casings and are glycerin filled. The pressure gauges are graduated to indicate psi/bar and are designed to measure up to 1,500 psi/100 bar. With two different mounting styles, users are able to choose between panel mount and side mount.

Part Number	Pressure Rating (psi)	Dial Size (in)	Glycerin Filled	Mount	Clamp	Process Connection
PG-30-P-316	0-30	2.5	Yes	Back	Yes	1/4" MNPT
PG-60-P-316	0-60	2.5	Yes	Back	Yes	1/4" MNPT
PG-100-P-316	0-100	2.5	Yes	Back	Yes	1/4" MNPT
PG-150-P-316	0-150	2.5	Yes	Back	Yes	1/4" MNPT
PG-350-P-316	0-350	2.5	Yes	Back	Yes	1/4" MNPT
PG-600-P-316	0-600	2.5	Yes	Back	Yes	1/4" MNPT
PG-1500-P-316	0-1500	2.5	Yes	Back	Yes	1/4" MNPT
PG-100-S-316	0-100	2.5	Yes	Bottom	No	1/4" MNPT
PG-350-S-316	0-350	2.5	Yes	Bottom	No	1/4" MNPT
PG-1500-S-316	0-1500	2.5	Yes	Bottom	No	1/4" MNPT

Standard Features

- 304 stainless steel case liquid filled
- SS 316 wetted part
- Patented movement with polyester segment
- Pressure ranges from 0 to 1,500 psi
- Pure Aqua indication, a unique safety feature
- Individually boxed

Applications

- Reverse osmosis
- Nanofiltration
- Ultrafiltration
- Electrodeionization
- Cartridge filters
- Water softeners
- Deionizers
- Media filters

Materials of Construction

Component	Material
Casing	304 stainless steel
Wetted Parts	316 stainless steel
Liquid Filled	Glycerin
Internal Screws	Stainless steel
Scale	Dual (psi/bar)
Window	Polycarbonate
Dial	Black/blue figures on white back-ground, aluminum

To order Pure Aqua's pressure gauges (sample coding shown)
Select:

PG 100 P 316

1. Liquid filled pressure gauge, 2.5" dial size
2. Pressure range
3. 1/4" NPT connection, S for side, P for panel mount
4. SS 304 case material/SS 316 wetted part

Vertical Multistage High Pressure Pumps

GRUNDFOS **CRN**

The Grundfos CRN high pressure series provides all the benefits of the renowned Grundfos CR in a solution tailored to handle a variety of liquids from potable water to industrial liquids within a very wide temperature, flow and pressure scale.

Key Features and Benefits

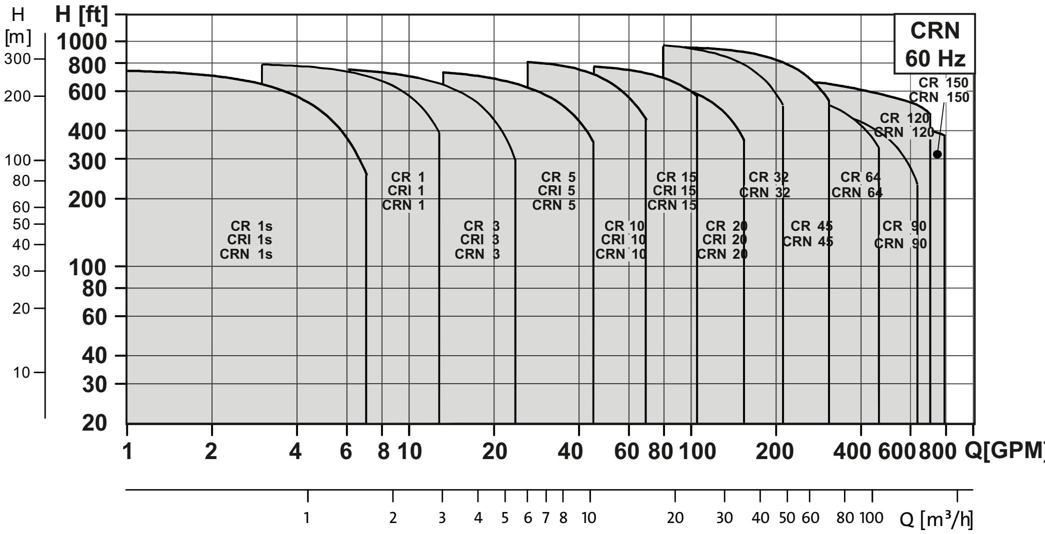
- Compact, inline design fits into small footprint
- Easy installation and operation with settings and internal connections done at factory
- Highly efficient design reduces energy consumption by up to half compared to fixed speed pumps
- Unique cartridge seal design can be replaced in minutes
- Spacer coupling allows motor to be left in place during seal replacement
- Remote control/fieldbus monitoring and data collection
- Building management system compatible
- User friendly controller interface with advanced features and functionality
- Laser welded stainless impellers promote class leading efficiency
- Optional CR Cool-Top™ allows pump to withstand liquid temperatures of up to 356°F
- Integrated sensor available
- Eleven flow sizes, with a variety of shaft seals, rubber materials and supply voltages
- MAGdrive option available for demanding industrial applications where zero-leakage is required operating range
- AISI 316 stainless steel throughout

APPLICATIONS

- Industrial process water
- Washing and cleaning
- High pressure washdown
- Boiler feed and condensate
- Ultra-filtration
- Reverse osmosis

CRN Technical Data

CRN Information	
Flow, Q:	max. 790 gpm (179.4 m³/h)
Head, H:	max. 985 ft. (300 m.)
Liquid temp:	-22°F to +248°F (-30°C to 120°C)
Working press:	max. 435 psi (30 bar)



L-CRN-SL-01 04-17

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Downers Grove, IL 60515

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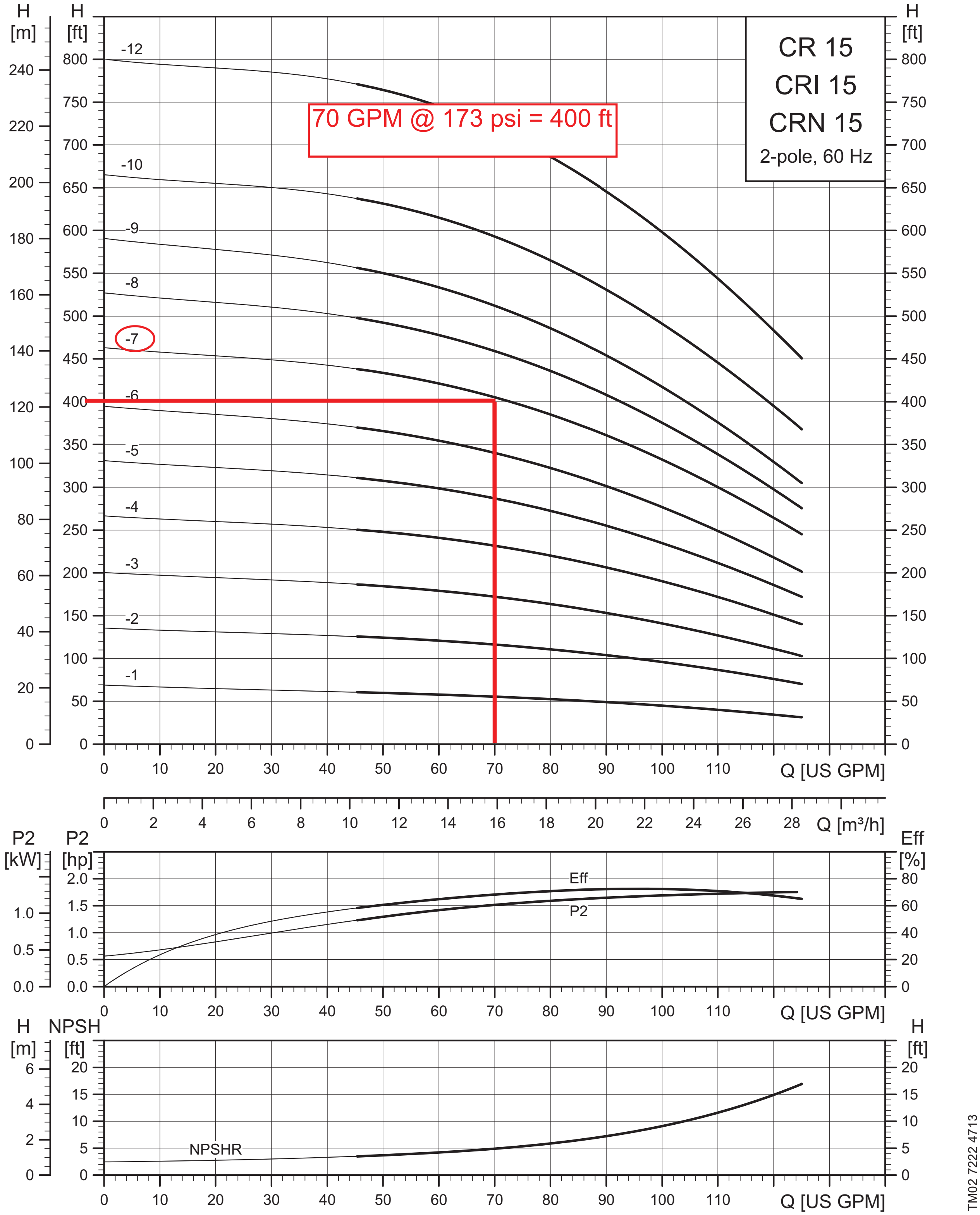
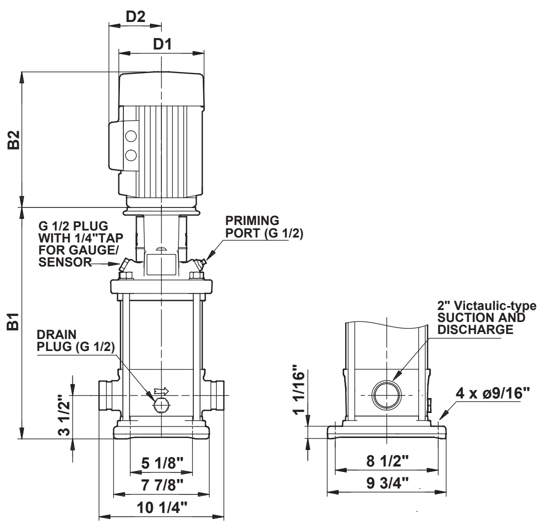
www.grundfos.ca
www.grundfos.mx

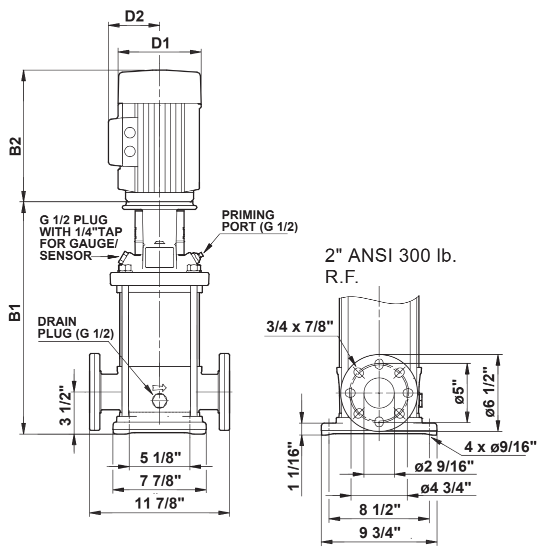
CR, CRI, CRN 15


CR 15
CRI 15
CRN 15
2-pole, 60 Hz
70 GPM @ 173 psi = 400 ft
-12
-10
-9
-8
-7
-6
-5
-4
-3
-2
-1
H [m]
H [ft]
Q [US GPM]
Q [m³/h]
P2 [kW]
P2 [hp]
Eff [%]
Eff
P2
H [m]
NPSH [ft]
NPSHR
TM02 7222 4713

CRN 15



TM03 1457 2205



TM03 1459 2205

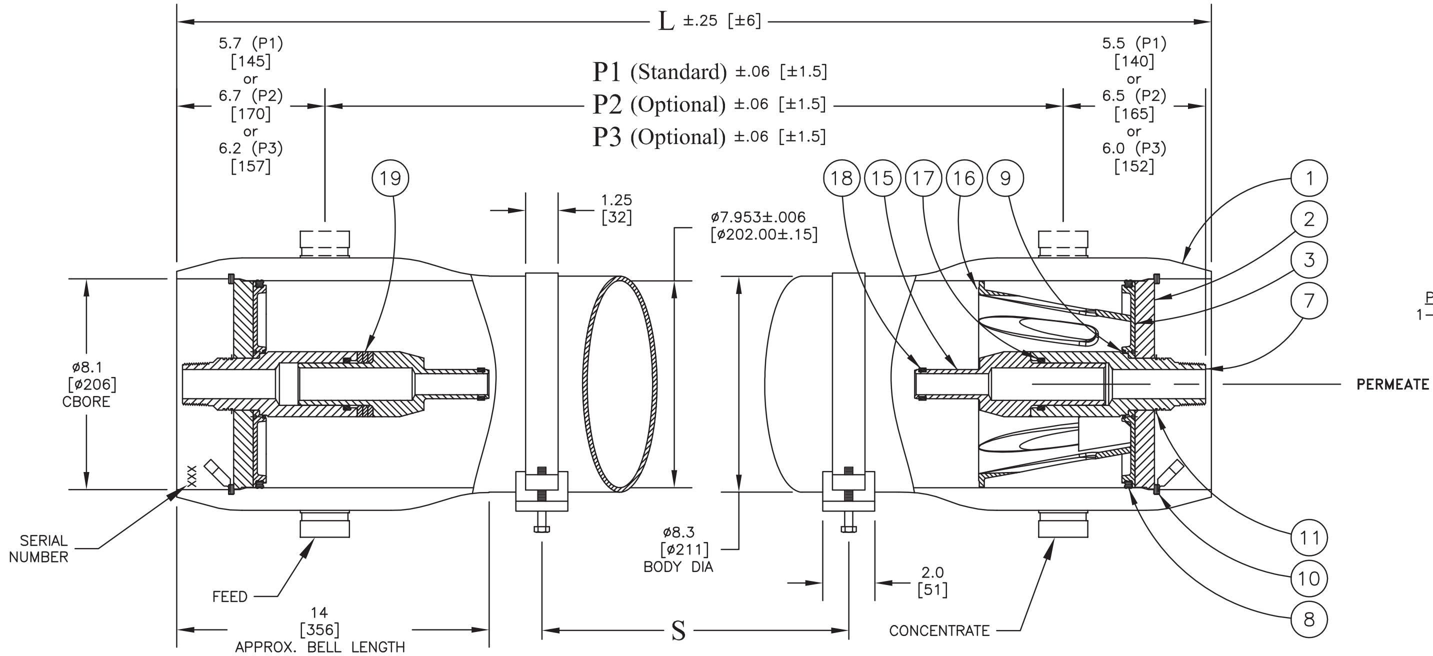
Pump type	P2 [Hp]	Ph.	PJE*	ANSI dimensions [inch (mm)]							Ship. wt. [lbs (kg)]
				B1	TEFC			ODP			
					D1	D2	B1+B2	D1	D2	B1+B2	
CRN 15-1	2	1	•	16.38 (417)	7.19 (183)	5.73 (146)	28.94 (736)	-	-	-	130 (59)
		3	•	16.38 (417)	7.01 (179)	4.33 (110)	27.6 (702)	-	-	-	121 (55)
CRN 15-2	5	1	•	17.44 (443)	10.62 (270)	7.46 (190)	32.96 (838)	-	-	-	203 (93)
		3	•	17.13 (436)	8.66 (220)	5.28 (135)	32.64 (830)	-	-	-	195 (89)
CRN 15-3	7 1/2	1	•	19.21 (488)	10.22 (260)	7.62 (194)	34.74 (883)	-	-	-	216 (98)
		3	•	19.21 (488)	8.66 (220)	5.28 (135)	34.72 (882)	-	-	-	205 (93)
CRN 15-4	7 1/2	1	•	20.98 (533)	10.22 (260)	7.62 (194)	36.51 (928)	-	-	-	218 (99)
		3	•	20.98 (533)	8.66 (220)	5.28 (135)	36.49 (927)	-	-	-	207 (94)
CRN 15-5	10	1	•	22.76 (579)	10.23 (260)	10.30 (262)	38.83 (987)	-	-	-	335 (152)
		3	•	22.76 (579)	10.24 (261)	6.26 (160)	37.49 (953)	-	-	-	214 (98)
CRN 15-6	15	3	•	27.05 (688)	12.36 (314)	8.00 (204)	45.59 (1158)	10.62 (270)	7.33 (187)	43.36 (1102)	336 (153)
CRN 15-7	15	3	•	28.82 (733)	12.36 (314)	8.00 (204)	47.36 (1203)	10.62 (270)	7.33 (187)	45.13 (1147)	369 (168)
CRN 15-8	15	3	•	30.59 (777)	12.36 (314)	8.00 (204)	49.13 (1248)	10.62 (270)	7.33 (187)	46.90 (1192)	402 (183)
CRN 15-9	20	3	•	32.36 (822)	12.36 (314)	8.00 (204)	50.90 (1293)	11.50 (293)	8.92 (227)	52.05 (1323)	410 (186)
CRN 15-10	20	3	•	34.13 (867)	12.36 (314)	8.00 (204)	52.67 (1338)	11.50 (293)	8.92 (227)	53.82 (1368)	413 (188)
CRN 15-12	25	3	•	37.05 (942)	12.36 (314)	8.00 (204)	59.44 (1510)	11.50 (293)	8.94 (228)	57.86 (1470)	413 (188)

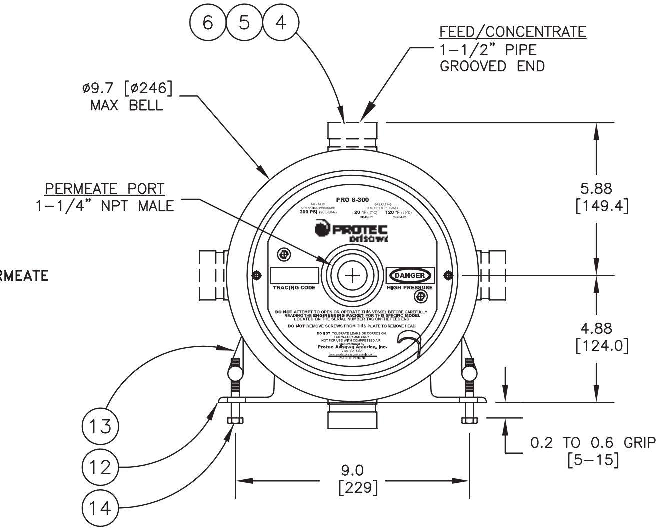
All dimensions in inches unless otherwise noted.

* PJE flanged pump B1 and B1+B2 dimension is equal to ANSI flanged pump and weight is approximately 9 lbs. less.

• Available.

Design Pressure = 300 PSI @ 120 °F Min. Design Temperature = 20 °F @ 300 PSI Hydrotest Pressure = 330 PSI	**300 PSI** SIDE PORT





NOTE: STANDARD PARTS ARE SHOWN FOR REFERENCE ONLY
CHECK ORIGINAL ORDER FOR ORDERING SPARE PARTS

Shell Length Code	L inch (mm)	P1 Standard inch (mm)	P2 Optional inch (mm)	P3 Optional inch (mm)	S Span in (mm)	Empty Weight lb (kg)
-1	58.4 [1483.36]	47 [1193.80]	45 [1143.00]	46 [1168.40]	1 @ 28 [711.20]	63 [29]
-1.5	78.4 [1991.36]	67 [1701.80]	65 [1651.00]	66 [1676.40]	1 @ 42 [1066.80]	73 [33]
-2	98.4 [2499.36]	87 [2209.80]	85 [2159.00]	86 [2184.40]	1 @ 56 [1422.40]	83 [38]
-3	138.4 [3515.36]	127 [3225.80]	125 [3175.00]	126 [3200.40]	1 @ 80 [2032.00]	103 [47]
-4	178.4 [4531.36]	167 [4241.80]	165 [4191.00]	166 [4216.40]	2 @ 64 [1625.60	123 [56]
-5	218.4 [5547.36]	207 [5257.80]	205 [5207.00]	206 [5232.40]	2 @ 78 [1981.20]	143 [65]
-6	258.4 [6563.36]	247 [6273.80]	245 [6223.00]	246 [6248.40]	2 @ 92 [2336.80]	163 [74]
-7	298.4 [7579.36]	287 [7289.80]	285 [7239.00]	286 [7264.40]	2 @ 106 [2692.40]	183 [83]
-7.5	318.4 [8087.36]	307 [7797.80]	305 [7747.00]	306 [7772.40]	2 @ 114 [2895.60]	193 [88]
-8	338.4 [8595.36]	327 [8305.80]	325 [8255.00]	326 [8280.40]	2 @ 120 [3048.00]	203 [92]

ITEM	QTY	P/N	DESCRIPTION	MATERIAL
1	1	4080019	Shell	Filament Wound, Epoxy FRP
2	2	4080028	Bearing Plate	6061-T6 Aluminum, SB-221, Anodized
3	2	4080177-3	Sealing Plate	Noryl GFN2
4	2	4080250	Feed/Concentrate Port, 1-1/2", "D"	Stainless Steel, 316, SA-312
5	4	6121187	Retaining Ring, F/C Port, 1-1/2", "D"	Stainless Steel, 316, SA-479
6	2	6184604-N	O-Ring Seal, F/C Port, 1-1/2", "D"	Ethylene Propylene
7	2	4080309	Permeate Port	Noryl GFN2
8	2	6100442MK	Head Seal	Ethylene Propylene
9	2	6110229-N	Permeate Port Seal	Ethylene Propylene
10	2	4080320	Retaining Ring w/ Finger Pull	Stainless Steel, 316, SA-479
11	2	6121200	Retaining Ring, Permeate Port	Stainless Steel, 316
12	2*	4080173	Support Saddle	Thermoplastic Rubber
13	2	4080137	Strap Assembly	Stainless Steel, 316L
14	4	6150001	Strap Screw	Stainless Steel, 18-8
15	2	A/R	Adapter	Thermoplastic
16	1	4080165-1	Thrust Cone	PVC Thermoplastic
17	2	6110326-N	Adapter Seal	Ethylene Propylene
18	A/R	A/R	PWT Seal	Ethylene Propylene
19	3	4080062-4	Shim, Adapter	Noryl GFN2

*3 each with shell lengths -4 and longer.

NOTES:

DIMENSIONS IN INCHES (MM APPROX.)

FOR REFERENCE ONLY, NOT FOR CONSTRUCTION UNLESS CERTIFIED

SHIMMING OF THE SADDLES MAY BE REQUIRED

CENTER VESSEL ON 2 OR 3 SUPPORTS AT SPAN(S) "S".

INCORRECT MANIFOLDING WILL CAUSE SEVERE LOCAL STRESS AROUND PORT AND MAY RESULT IN LEAKS AND PREMATURE FAILURE. TAKE EVERY PRECAUTION LISTED IN THE ENGINEERING PACKET OR USERS MANUAL.

INTERNAL PERMEATE PRESSURE MUST NOT EXCEED 125 PSI.

ASME SECTION X, 2013
RP CODE STAMP OPTIONAL

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

PROTEC arisawa
Vista, California, U.S.A.
www.protec-arisawa.com

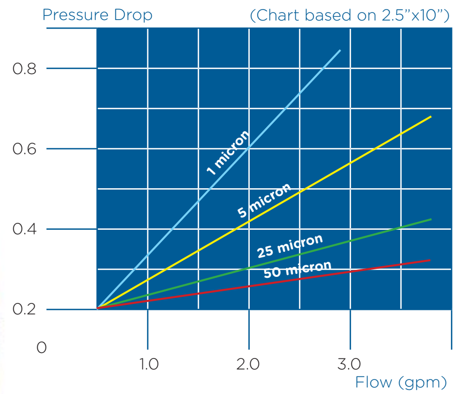
PRO 8-300-SP

APPROVED AP 11/30/00				
CHECKED AP 11/30/00				
DRAWN AP 11/30/00	ECO 20002	REVISED 3/31/14	DRAWING 101002	REV V

Cartridge Filters

Spun Polypropylene Sediment Filter Cartridges

Pure Aqua's spun polypropylene sediment filters are constructed of multi-layers for superior depth filtration. The graded density construction captures particles throughout the entire cross section of the cartridge and reduces surface binding. The cartridges combine quality and cost effectiveness to provide excellent filtration value. Available in a variety of micron ratings and sizes. Pure Aqua's spun polypropylene sediment filters meet NSF standards.



Applications

- Reverse osmosis pre-filtration
- Food & beverage industry
- Potable water
- Electronics
- Residential
- Fine chemicals
- Plating
- Metal finishing
- Car wash

2.5" Diameter

Part Number	Micron	Length	Case qty
PA-101	1	9-7/8"	50
PA-201	1	20"	25
PA-301	1	30"	25
PA-401	1	40"	25
PA-105	5	9-7/8"	50
PA-205	5	20"	25
PA-305	5	30"	25
PA-405	5	40"	25
PA-1025	25	9-7/8"	50
PA-2025	25	20"	25
PA-1050	50	9-7/8"	50

Features & Benefits

- Multi-layers graded density
- Excellent chemical resistance
- Low cost
- High dirt holding capacity
- Wide range of micron ratings
- Wide range of sizes

Specifications

Material	Polypropylene	
Length	9-7/8" - 40"	
Maximum temperature	60°C / 140°F	
Micron rating (nominal)	1 - 50	
Maximum flow rate	2 - 28 gpm (2.5" diameter)	10 - 30 gpm (4.5" diameter)
Cartridge packaging	Shrink wrapped	

4.5" Diameter

Part Number	Micron	Length	Case qty
PA-101-B	1	9-7/8"	24
PA-201-B	1	20"	12
PA-105-B	5	9-7/8"	24
PA-205-B	5	20"	12
PA-1025-B	25	9-7/8"	24
PA-2025-B	25	20"	12

Multi-Cartridges Stainless Steel Filter Housings

Capacity: 6 to 3,000 GPM

SSC SERIES

Pure Aqua offers a variety of filter housings sizes and styles in rugged stainless steel that assures maximum durability. SSC housings are ideal for most industrial/commercial applications. SSC housings easily accept PA cartridges. With our wide range of models, options, and filter cartridges, these units can meet most requirements, including filtration of particulates, chlorine taste, odor and for inhibition of scale and corrosion.

Standard Features

- 3"-10" flanged, 2" MNPT or 3/4" - 1" FNPT connections
- Removable cartridge posts for easy cleaning
- 304 stainless steel housings
- 1/2" NPT drains connection for SSC-4 or larger
- Filtration for: silt, taste, odor or sediment
- Air vent port for use before start-up or draining
- Accepts complete range of filter cartridges
- Operating pressure: 150 psi (10.3 bars) maximum
- Operating temperature: 40°-300°F (4°-149° C)

Applications

- Pre-filtration for reverse osmosis systems
- Pre-filtration for ion exchange and UV units
- Commercial buildings
- Food service
- Car washes
- Agriculture
- Hospitals
- Bottled water
- Process water

Available Options

- Duplex systems
- 316 stainless steel housings
- Differential pressure switch & gauge
- Inlet/outlet sample valves
- Inlet/outlet pressure gauges
- Skid mounted pre-plumbed and wired
- Drain valves
- Vent valve
- Sediment cartridges
- Activated carbon cartridges
- Electro-polished housings
- Isolation valves

3" Flanged Connection

2" MNPT Connection

Multi-Cartridges Stainless Steel Filter Housings

Capacity: 6 to 3,000 GPM

SSC SERIES

SSC-I Series (Industrial)

Model #	Cartridges Requirement	Pipe Size (Flange)	Max. Flow Rate (GPM)	Drain Size (NPT)	Dimensions (W"xH")	Shipping Weight (lbs)
SSC-24	(6) of 40"	3"	144	1/2"	14.5x57	86
SSC-28	(7) of 40"	3"	168	1/2"	14.5x57	66
SSC-36	(9) of 40"	3"	216	1/2"	16.5x60	92
SSC-48	(12) of 40"	4"	288	1/2"	20.5x60	100
SSC-66	(22) of 30"	4"	396	1/2"	20.5x53	165
SSC-88	(22) of 40"	6"	528	1/2"	22.5x63	175
SSC-108	(27) of 40"	6"	660	1/2"	24.5x60	205
SSC-144	(36) of 40"	6"	720	1/2"	31.5x83.5	225
SSC-168	(42) of 40"	6"	1,008	1/2"	31.5x83.5	250
SSC-220	(55) of 40"	8"	1,320	1/2"	31.5x83.5	275
SSC-244	(61) of 40"	8"	1,464	1/2"	31.5x83.5	300
SSC-292	(73) of 40"	8"	1,752	1/2"	38x83.5	310
SSC-390	(98) of 40"	10"	2,340	1/2"	38x83.5	325
SSC-480	(120) of 40"	10"	2,880	1/2"	40x83.5	335
SSC-600	(150) of 40"	10"	3,000	1/2"	44x83.5	345

SSC-C Series (Commercial)

Model #	Cartridges Requirement	Pipe Size (MNPT)	Max. Flow Rate (GPM)	Drain Size (NPT)	Dimensions (W"xH")	Shipping Weight (lbs)
SSC-4	(4) of 10"	2"	24	1/2"	10.5x21	25
SSC-5	(5) of 10"	2"	30	1/2"	10.5x21	27
SSC-8	(4) of 20"	2"	48	1/2"	10.5x28	31
SSC-10	(5) of 20"	2"	60	1/2"	10.5x31.5	33
SSC-12	(4) of 30"	2"	72	1/2"	10.5x41	38
SSC-14	(7) of 20"	2"	84	1/2"	14x31.5	44
SSC-15	(5) of 30"	2"	90	1/2"	10.5x41	38
SSC-16	(4) of 40"	2"	96	1/2"	10.5x51.5	45
SSC-20	(5) of 40"	2"	120	1/2"	10.5x51.5	45
SSC-21	(7) of 30"	2"	126	1/2"	14.5x41.5	55

SSC-R Series (Residential)

Model #	Cartridges Requirement	Pipe Size (FNPT)	Max. Flow Rate (GPM)	Drain Size	Dimensions (W"xH")	Shipping Weight (lbs)
SSC-1	(1) of 10"	3/4"-1"	6	1/4"	3.5x14	6
SSC-2	(1) of 20"	3/4"-1"	12	1/4"	3.5x24	8
SSC-3	(1) of 30"	3/4"-1"	18	1/4"	3.5x33	11

Pure Aqua also supplies: Custom Engineered Solutions, Multimedia Pretreatment, Activated Carbon Pretreatment, Chemical Dosing Systems, Ultraviolet (UV) Sterilizers and Ozonation Systems.

Electrically Actuated Ball Valve
Type 127

General

- **Size**: ⅜"-2"
- **Material**: PVC, CPVC, ABS
- **Seat**: PTFE
- **Seals**: EPDM or FPM
- **End Connection**: Solvent cement socket, threaded, flanged
- **Actuator Housing**: Glass-filled PP
- **Voltage**: 100-230VAC
- **Protection Class**: IP67
- **Mounting**: Stainless steel threaded inserts
- **Manual Override**: Integrated
- **Position Feedback**: Open/close, bistable relay
- **Optical Position Indicator**: Integrated, LED enforced

Key Valve Certifications

- **NSF 61**: PVC and CPVC
- **FDA CFR 21 177.2600**: EPDM and FPM
- **FDA CFR 21 177.1550**: PTFE
- **ABS**: All materials

Sample Speciation

The Type 127 Ball Valve shall be used in open/close applications. The actuator shall be a Type EA15 with integrated adjustable heating element and open/close position feedback via two bistable relays. The ball valve shall be true union and utilize a floating ball design. A 7-segment display shall communicate specific fault status. The ball shall be fully molded and full port with two way blocking capability. The stem shall be blowout proof, utilizing a double o-ring seal and a predetermined break point opposite the media side of the stem seals. The seat carrier shall be adjustable and reverse threaded. The valve nut threads shall be of buttress type. Ball seats shall have an elastomeric backing o-ring and all elastomeric seals shall be of like material. ANSI flanged versions shall meet ANSI B16.5 150lb standards. All valves shall be tested in accordance to ISO9393 and designed to ISO16135 standards. All valves shall be manufactured under ISO9001 for Quality and ISO14001 for Environmental Management. Following assembly, every valve shall be tested and certified bubble tight exceeding Class VI standards

Material Specification

PVC valves shall meet ASTM D1784 cell classification 12454 standards. CPVC valves shall meet ASTM D1784 cell classification 23447-B standards. ABS valves shall meet ASTM D3965 cell classification 42222 standards. Valves of all materials shall be RoHS compliant.

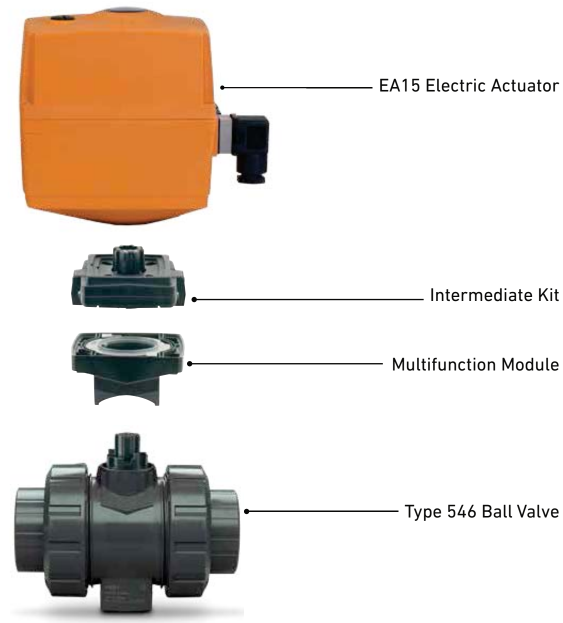
Optional Features

- **Fail Safe Return**: Battery back-up, internal or external
- **Manual Loading Station**: Local control box
- **Vented Ball**: For sodium hypochlorite use
- **Voltage**: 24VAC/DC

Key Actuator Certifications

- **CE 2006/42/EC, Annex II B:** EA15
- **CE 2004/108/CE**: EA15
- **CE 2006/95/CE**: EA15
- **UL 61010-1**: EA15
- **CSA C22.2 N0. 61010-1**: EA15

Components



Actuator Technical Data

	EA 15
Cycle Time	5s/90°
Cycles at 70°F	150,000
Housing Material	Glass-filled PP
Position Indicator	Optical, integrated LED for visual communication of position and actuator status
Emergency Manual Override	Integrated
Rated Voltage	100–230VAC, 50/60 Hz
Rated Voltage Tolerance	+/- 15%
Nominal Output	35VA
Calculated Current Draw	0.3A @ 100VAC 0.13A @ 230VAC
Duty Cycle	40%
Position Feedback	Bi-stable, 250V, 2A
Protection Class	IP67 per EN 60529 UL/CSA: For interior use NEMA 4X
Overload Protection	Resetting (1)
Overvoltage Category	Category II according to DIN EN 61010-1
Power Connection	Connector plug 3 P+ E per DIN EN 175301-03
Pollution Grade	Grade 2 according to DIN EN 61010-1
Maximum Elevation	6561 feet
Ambient Temperature	14°F to 122°F (2)
Allowable Humidity	90% relative humidity, non condensing

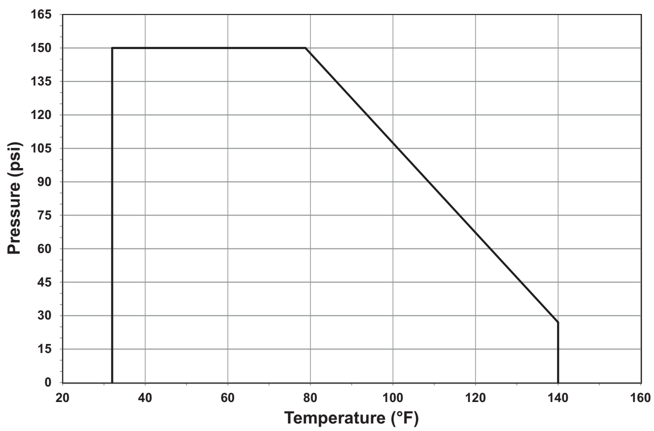
(1) Overload protection of the motor is dimensioned so that the motor and the power supply board are protected. As soon as the load is within the torque range, the actuator will begin operating again.
(2) At temperatures below 14°F and if there is condensation, the heating element should be activated.

Technical Data

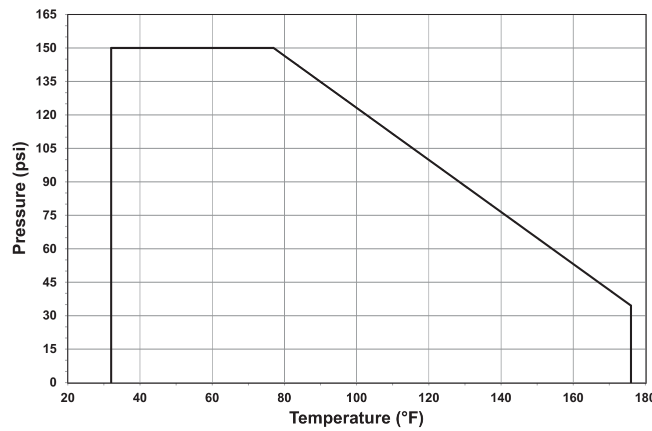
Pressure Temperature Curves

The following graphs are based on a 25 year lifetime water or similar media application

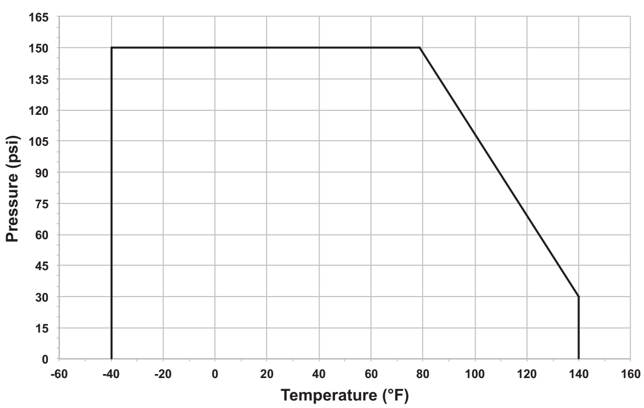
PVC



CPVC



ABS



Pressure-Temperature

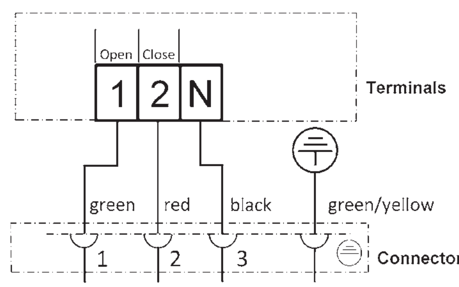
Material	Temperature Range (°F)	Max Pressure (psi)
PVC	32 to 140	150
CPVC	32 to 176	150
ABS	-40 to 140	150

Vacuum Service

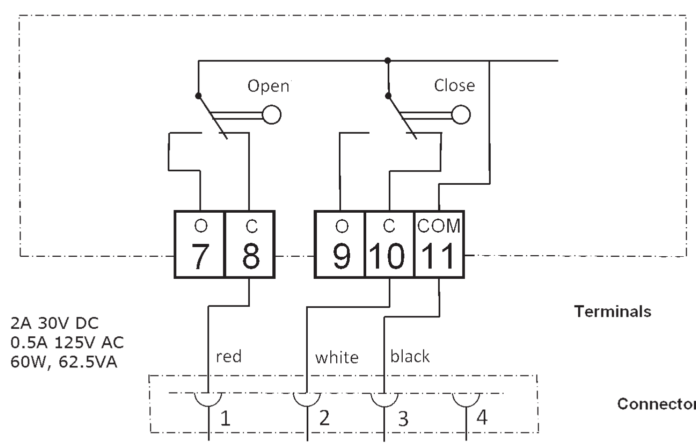
The Type 127 is rated for full vacuum service. Maximum differential pressure of 15psi at 122°F.

Wiring

Control



Feedback



Flow

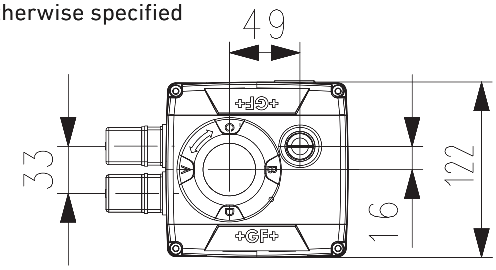
The following information is based on water applications at 68° F

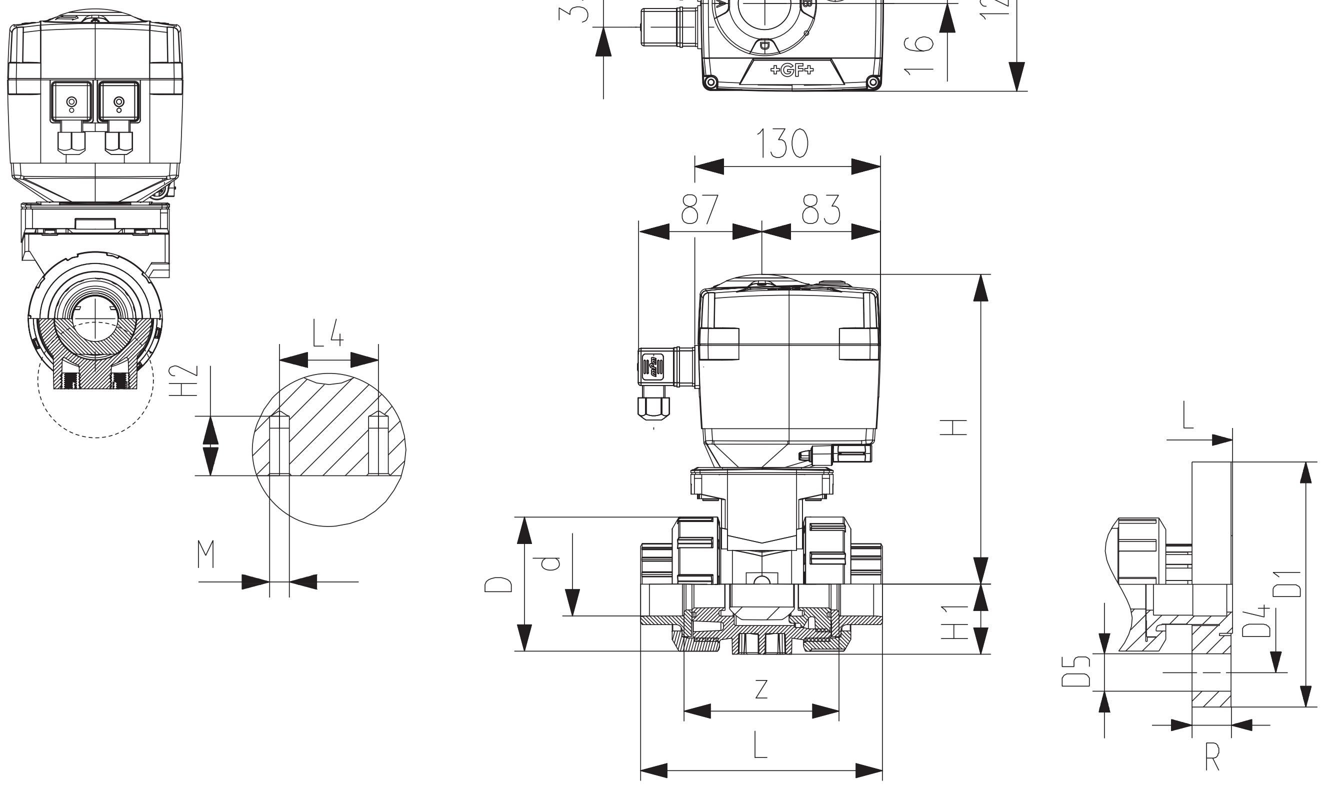
Cv Value

Size (inch)	d (mm)	Cv (gal/min)
⅜	16	5
½	20	13
¾	25	25
1	32	49
1¼	40	70
1½	50	112
2	63	217

Dimensions

The following tables are shown in millimeters unless otherwise specified





All Materials

Size (inch)	d (mm)	D	H	H1	H2	L4	M
⅜	16	50	201	27	12	25	M6
½	20	50	201	27	12	25	M6
¾	25	58	210	30	12	25	M6
1	32	68	210	36	12	25	M6
1¼	40	84	221	44	16	45	M8
1½	50	97	221	51	16	45	M8
2	63	124	243	64	16	45	M8

PVC/CPVC

Size (inch)	IPS Socket		Threaded NPT		ANSI Flanged				
	L	z	L	z	L	D1 (inch)	D4 (inch)	D5 (inch)	R (inch)
⅜	105	67	98	69	-	-	-	-	-
½	105	61	98	65	149	3.5	2.38	0.63	0.57
¾	121	70	111	74	165	3.88	2.75	0.63	0.58
1	133	76	127	82	184	4.25	3.13	0.63	0.66
1¼	154	90	147	98	206	4.63	3.5	0.63	0.69
1½	164	94	157	110	221	5	3.88	0.63	0.76
2	183	107	183	135	251	6	4.75	0.75	0.82

ABS

	Metric Socket	
d (mm)	L	z
16	92	64
20	95	64
25	110	72
32	123	79
40	146	94
50	157	95
63	183	107

June 2017

KTW ACS FDA NSF WRAS APPROVED PRODUCT DVGW

NSF-51
NSF-61

ISO 9001
ISO 14001

DMfit®

DMT
www.dmfit.com

DMfit®

PUSH-IN TUBE FITTINGS

US FDA approved materials :
DMfit® fittings are produced using FDA approved materials.

NSF51
NSF61

ANSI/NSF-51, 61, WRAS, ACS, KTW DVGW - W270 Certifications :
DMfit® fittings are suitable for contact with foodstuffs & drinking water.

ISO 9001
ISO 14001

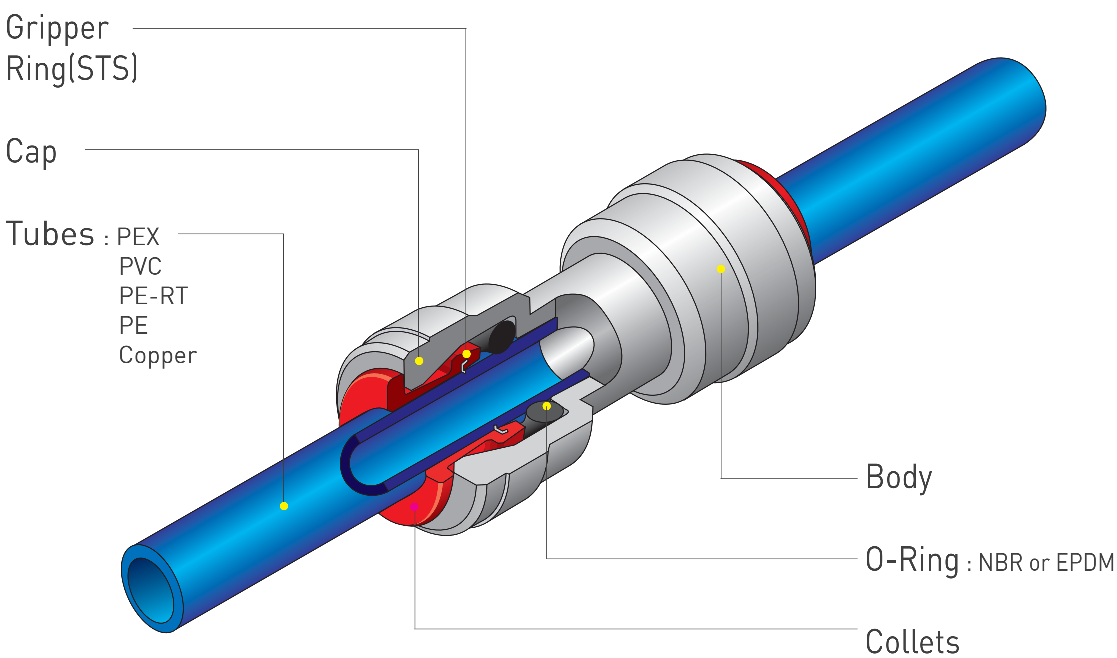
ISO 9001/ISO14001 Certifications :
DMfit® fittings are produced under a registered ISO 9001 / ISO 14001 quality system.

Since our creation in 1987, we have taken a leading position in the plastic extruded casing industry because of our quality-first mindset, integrity and technical leadership.

Now, we have made a second bold leap - into the fittings business. The goal is to be a global leader, providing the best net value in fittings products to the entire range of fluid handling industries.

CONTENTS

PUSH-IN TUBE FITTINGS



Material Standards

Material Options	Fittings Color	O-ring
A - acetal	Gray, Black, White	NBR / EPDM
P - polypropylene	White	
B - brass	brass, or chromed	

Outer Diameter Tolerance Limit of Tubing Used with Fittings

Size		Tolerance
Small Size	5/32″, 4mm	±0.004″(±0.1mm)
	3/16″, 5mm	
	1/4″, 6mm	
	5/16″, 8mm	
	3/8″, 10mm	
	1/2″, 12mm	
Large Size	5/8″, 15(16)mm	
	7/8″, 18(22)mm	
	28mm	

※ For use at higher temperatures or pressures, please contact your DMfit representative for assistance.

Fitting Working Pressure and Temperature

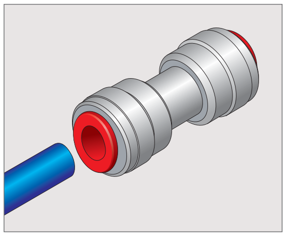
SIZE / Temperature	Small Size						Large Size				
	5/32″	3/16″	1/4″	5/16″	3/8″	1/2″	5/8″		7/8″		28mm
	4mm	5mm	6mm	8mm	10mm	12mm	15mm	16mm	18mm	22mm	
1℃ (34℉)	16bar (230PSI)				11bar (170PSI)		11bar (170PSI)				
20℃ (68℉)	16bar (230PSI)				11bar (170PSI)		11bar (170PSI)				
65℃ (150℉)	10bar (150PSI)				7bar (100PSI)		7bar (100PSI)				

Maximum Permissible Torque

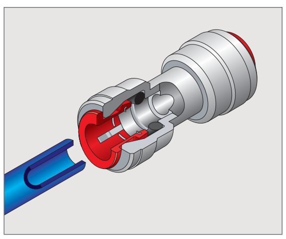
Torque / Thread			1/8″, 1/4″		3/8″, 1/2″		3/4″
Plastic	Maximum Torque	(Nm)	1.5		3.0		4.0
Steel	Maximum Torque	(Nm)	7.0~9.0	12.0~14.0	22.0~24.0	28.0~30.0	40.0

※ The above values are average maximum applied torque.
Actual results may vary.

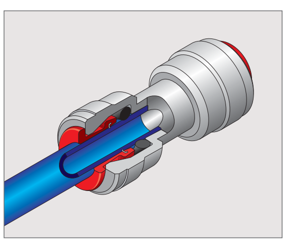
Installing DMfit Fittings



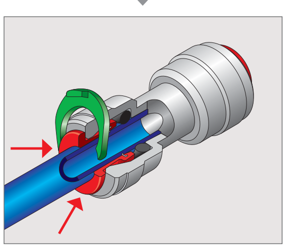
- Cut the part of the tube to be inserted into the fitting to plane the end.
- Make sure to use a clean tube without any foreign material or cracks.



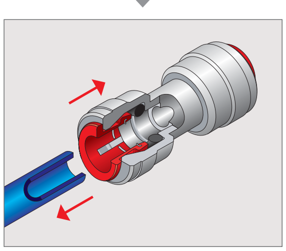
- When inserting the tube, remove any obstructions before fully inserting the tube. Make sure the tube is fully inserted.
- Inserting the tube into the fitting only takes moderate force. The tube or fitting should not be scratched or damaged in the process, as this is the main cause for water leaks later on.



- To make sure that the fitting is properly connected to the tube, pull it once.
  After pulling, insert a spanner under the collet and push the tube into the fitting once more for a complete insertion.



- When no play is desired for the fitting and tube, use our company's LC to eliminate the play of the fitting.



- Make sure to completely eliminate pressure before disassembling the fitting.
- When disassembling the tube, push the clip in direction of the main assembly and then pull the tube out for easy disassembling.
- Fittings and tubes can be reused.

Terms and Conditions

Please read, understand, and follow all instructions, precautions, and warnings prior to using Dmfit® products on pressurized systems. Failure to follow all instructions, precautions, and warnings may result in bodily harm or property damage.

⚠ Warnings and Precautions

① Fittings are not recommended for use with liquids other than water and food or beverage products. Where fittings may be used with other chemicals contact DMT for advice.

② Do not disassemble or modify the individual product, as this may cause a product malfunction, leak, or failture and voids the product warranty.

③ Do not over-stress the fitting by rotation, twist, bending, shock, fatigue, or other excess force, This may damage the fitting and cause malfuction, leak, or failure and voids the product warranty,

④ Do not use the product where ambient temperature or fluid temperature may exceed 65℃(150℉) in domestic environment Food & Drink, inderstrial Pneumatic. This may damage the fitting and cause malfuction, leak, or failure.

⑤ Do not use pipe dope or other liquid thread sealers. Use only Teflon tape to seal threaded connections.

⑥ If your plumbed line is used as an electrical ground, you must use a jumper wire to provide continuity across plastic fittings and tubing.

⑦ Never press collets toward the body unless attempting to separate tubing from a fitting in an unpressurized line. The use of the DMfit® Locking Clip is advised to restrict inadvertent disassembly of connections.

⑧ DMT reserves the right to modify the product from time-to-time as required for quality improvement and per market requirements. Actual product may differ from pictures shown.

⑨ Connecting DMfit® products to tubing or connecting elements other than DMfit® products is not warranted for performance. Always perform any checks and testing necessary to verify acceptable function.

⑩ Before making any tube connection, verify that the end of the tube has been cut squarely and there are no scratches on the tube O.D within 30mm of the end.

⑪ When making a tube connection, occasionally a gripping of the tube may occur just as the tube begins to pass through the o-ring, although the seal is not yet made. In this case, push the tube deeply once more to complete assembly of the connection. Failure to completely seat the tube into the fitting may cause a leak.

⑫ When using metallic tubing, de-burr the tube ends to avoid potential cutting or other damage to the o-ring.

⑬ After assembling a tube connection, tug with moderate force to check for proper gripping of the tube.

⑭ Before disassembling tube connections, always verify that pressure has been removed from the system.

⑮ When disassembling tube connections, always press the collet evenly toward the body and then pull the tube. If a locking clip is used, remove the locking clip before attempting to separate a tube connection.

⑯ When tightening threaded fittings, use care not to over-torque the fitting as this may damage the fitting and cause a leak or other failure.

⑰ TS(Tube Support) supports to soft tube and tube at 65℃(150℉) of ambient and fluid temperature.

⑱ Our threaded fittings should be complied with our specification. (ref. page4)

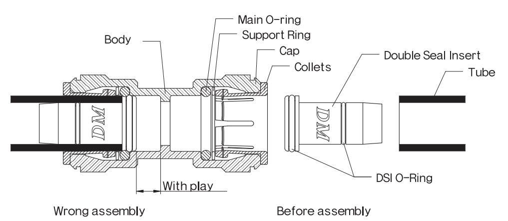
⑲ All *DMfit*®, Push-fit fittings and tubings carry a period of 2 years limited warranty from the date of original shipment from DMT or its Authorized Reseller.

Material Characteristics

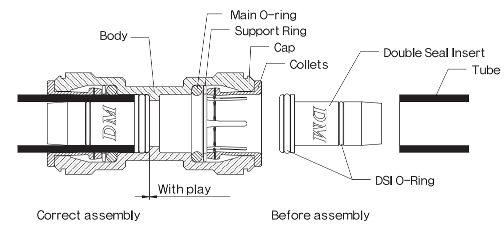
- **Acetal** : Also known as POM. Highly durable and resistant to fatigue and creep. It has high resistance to a wide range of organic & inorganic chemicals and detergents. Not recommended for use with strong acids or repeated exposure to strong oxidizers.
- **Polypropylene** : Has excellent chemical resistance, cold endurance, and high tolerance to oxidizers.

PUSH-IN TUBE FITTINGS

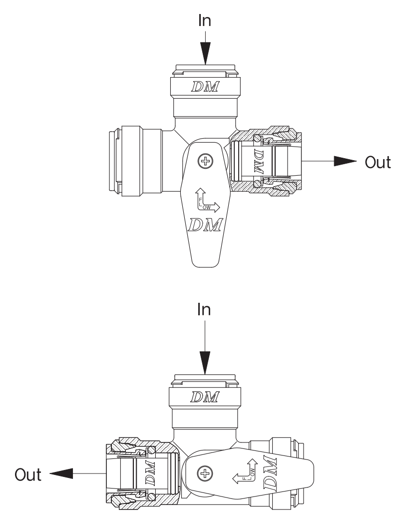
Poor DSI assembly



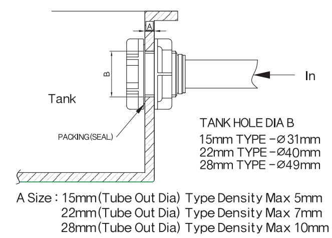
Good DSI assembly



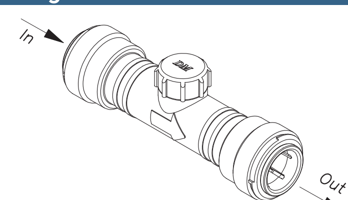
Three way valve to control direction of water flow.



Example of tank connector assembly



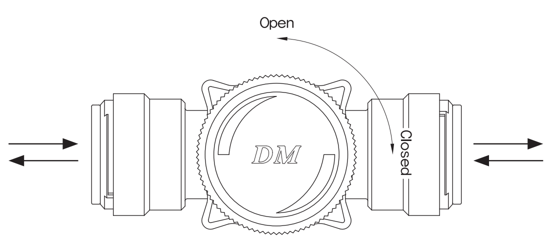
Checking force of a double check valve



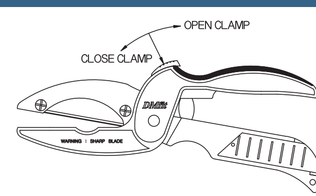
※ **Notice for use of double-check valve**

- In case of reverse pressure, the valve will withstand temporary pressure spikes of up to 10bar.

Hand valve connector



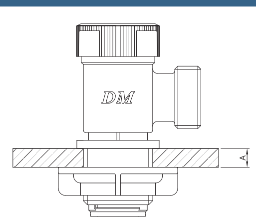
Hose cutter



※ **Notice for using the hose cutter**

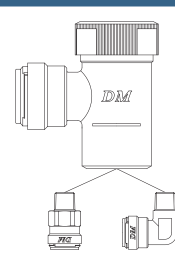
1. Be careful when using the cutter, as the blade is very sharp.
2. When the cutter is not in use, put it in "lock" position.

Example of Hand Wash Machine assembly



A Size : 5/8" Type Density Max 8mm

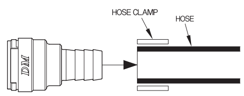
Example of Hand Valve Female Adapter assembly



※ **Application Examples**

1. Select the location to install the kit as required.
2. Pipe installation with screw clamps.

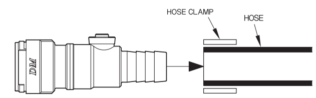
Usage and Features I



※ **Application Examples**

1. Use connected with a hose.
2. Fix the hose clamp to make sure the connector does not disengage from the hose.
3. When connecting braided hoses, use a pressed metal connector on the connecting end.

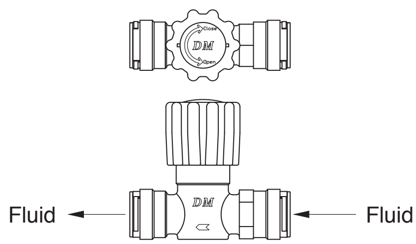
Usage and Features II



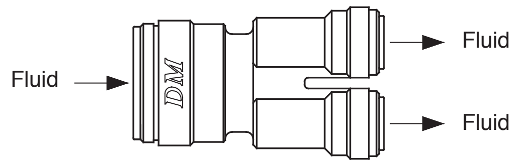
※ **Application Examples**

1. Use connected with a hose.
2. Fix the hose clamp to make sure the connector does not disengage from the hose.
3. When connecting braided hoses, use a pressed metal connector on the connecting end.
4. Water flow can be blocked with the stop valve.

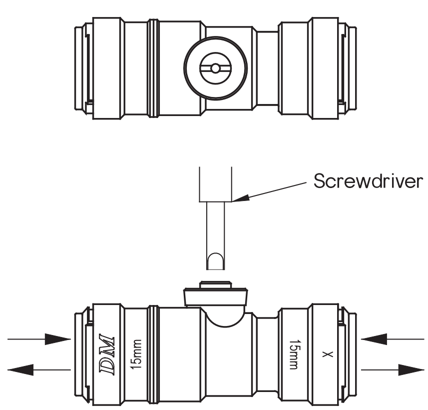
THC-Throttle Hand Valve Connector



FWC-Four Way Connector

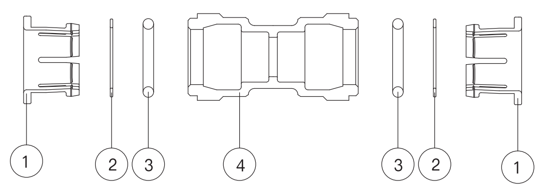


HSV-Hand Stop Valve



DMfit Fitting Standard Anatomy

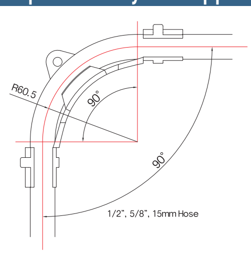
● All diagrams are based on the UC0808 product.



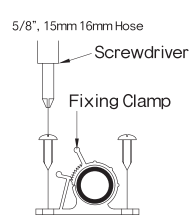
No.	Part Name	Material	Q'ty	Remark
1	Collets	Acetal	2	
2	Support Ring	Acetal	2	
3	O-ring	NBR/EPDM	2	
4	Body	Acetal	1	

■ Exceptional, Small sizes don't have Sup-Ring in the body.

Flow Bend Clamp Assembly and Application Features

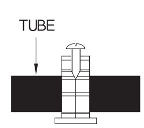


How to Connect the Locking Tube Locking



※ **Application Examples**

1. Use connected with a hose.
2. Fix the hose using the fixing clamp. Use screw to attach the product to a wall.



ACETAL FITTINGS (GRAY / INCH)

■ Suitable for

- **Water & foods use** : *DMfit®* products are manufactured from safe, non-toxic materials meeting the requirements of the US FDA, WRAS, ANSI/NSF-51, 61, ACS, KTW and DVGW-W270 Our products are widely used in water purification, food/beverage and pneumatic systems.
- **Function & Quality** : *DMfit®* provides quick and convenient assembly - saving time & expense. Our ISO9001, 14001 registered quality system ensures our customers a superior level of product quality. Defects are easily detectable and maintenance is easy with its easy dismantling for access.
- **Collet Design** : Our unique oval collet design is superior and more practical, and is an improvement welcomed by our world-wide customers in all industries.
- **Applications** : Beyond water and food use, fittings can be used with air, gases, vacuum, & liquids. And all connections can be assembled & disassembled repeatedly. A broad of sizes covers a broad scope of applications.
- **Color** : Gray Acetal Copolymer

Part Numbering System

A MC 04 04 F - W

Tube O.D.(Stem O.D.)	01=5/32", 03=3/16", 04=1/4", 05=5/16", 06=3/8", 07=1/2", 08=5/8", 10=7/8"
Fitting Type	
Material	• Acetal copolymer : A • Polypropylene : P
• Tube O.D. • Stem O.D. • Power O.D. • Thread Size	• NPTF, BSP(P), BSPT, Thread Size : 02=1/8", 04=1/4", 06=3/8", 07=1/2", 08=5/8", 09=3/4", 11=1" • UN, UNF, UNS(major diameter-threads per inch)
Type(FA series)	• F : Flat type, C : Cone type, V : V-type
Body color	• Gray : G(STD), White : W

MC - Male Connector

NPTF Thread

PART NO.	Tube O.D.	NPTF Thread	Qty / Box
AMC 0102	5/32	1/8	500
AMC 0104	5/32	1/4	500
AMC 0302	3/16	1/8	500
AMC 0402	1/4	1/8	400
AMC 0404	1/4	1/4	350
AMC 0406	1/4	3/8	300
AMC 0407	1/4	1/2	150
AMC 0502	5/16	1/8	400
AMC 0504	5/16	1/4	400
AMC 0506	5/16	3/8	350
AMC 0602	3/8	1/8	300
AMC 0604	3/8	1/4	300
AMC 0606	3/8	3/8	250
AMC 0607	3/8	1/2	200
AMC 0706	1/2	3/8	200
AMC 0707	1/2	1/2	150

MCB - Male Connector

BSP(P) Thread

PART NO.	Tube O.D.	BSP(P) Thread	Qty / Box
AMCB 0102	5/32	1/8	500
AMCB 0104	5/32	1/4	500
AMCB 0302	3/16	1/8	500
AMCB 0304	3/16	1/4	400
AMCB 0402	1/4	1/8	400
AMCB 0404	1/4	1/4	400
AMCB 0502	5/16	1/8	400
AMCB 0504	5/16	1/4	400
AMCB 0506	5/16	3/8	250
AMCB 0602	3/8	1/8	300
AMCB 0604	3/8	1/4	250
AMCB 0606	3/8	3/8	250
AMCB 0607	3/8	1/2	200
AMCB 0706	1/2	3/8	200
AMCB 0707	1/2	1/2	150

MCBB - Male Connector Big o-ring

BSP(P) Thread

PART NO.	Tube O.D.	BSP(P) Thread	Qty / Box
AMCBB 0602	3/8	1/8	300
AMCBB 0604	3/8	1/4	300

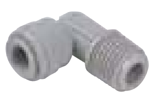
MCW - Male Connector

BSW Thread

PART NO.	Tube O.D.	BSW Thread	Qty / Box
AMCW 04 9/16	1/4	9/16	400
AMCW 0507	5/16	1/2	250
AMCW 05 9/16	5/16	9/16	250
AMCW 0607	3/8	1/2	200
AMCW 06 9/16	3/8	9/16	200

ME - Male Elbow

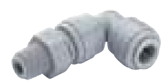
NPTF Thread



PART NO.	Tube O.D.	NPTF Thread	Qty / Box
AME 0302	3/16	1/8	500
AME 0402	1/4	1/8	500
AME 0404	1/4	1/4	350
AME 0406	1/4	3/8	300
AME 0504	5/16	1/4	300
AME 0506	5/16	3/8	250
AME 0604	3/8	1/4	250
AME 0606	3/8	3/8	250
AME 0706	1/2	3/8	200
AME 0707	1/2	1/2	150

MES - Male Elbow Swivel

NPTF Thread



PART NO.	Tube O.D.	NPTF Thread	Qty / Box
AMES 0102	5/32	1/8	500
AMES 0104	5/32	1/4	400
AMES 0302	3/16	1/8	500
AMES 0402	1/4	1/8	300
AMES 0404	1/4	1/4	250
AMES 0502	5/16	1/8	200
AMES 0504	5/16	1/4	200
AMES 0506	5/16	3/8	200
AMES 0604	3/8	1/4	150
AMES 0606	3/8	3/8	100
AMES 0706	1/2	3/8	100
AMES 0707	1/2	1/2	100

MCBT - Male Connector

BSPT(PT) Thread

PART NO.	Tube O.D.	BSPT(PT) Thread	Qty / Box
AMCBT 0102	5/32	1/8	500
AMCBT 0104	5/32	1/4	500
AMCBT 0302	3/16	1/8	500
AMCBT 0304	3/16	1/4	500
AMCBT 0402	1/4	1/8	500
AMCBT 0404	1/4	1/4	400
AMCBT 0406	1/4	3/8	300
AMCBT 0407	1/4	1/2	200
AMCBT 0502	5/16	1/8	400
AMCBT 0504	5/16	1/4	400
AMCBT 0506	5/16	3/8	350
AMCBT 0602	3/8	1/8	300
AMCBT 0604	3/8	1/4	300
AMCBT 0606	3/8	3/8	300
AMCBT 0607	3/8	1/2	200
AMCBT 0706	1/2	3/8	200
AMCBT 0707	1/2	1/2	150

SAB - Stem Adapter

BSP(P) Thread

PART NO.	Stem O.D.	BSP(P) Thread	Qty / Box
ASAB 0604	3/8	1/4	400
ASAB 0606	3/8	3/8	250
ASAB 0607	3/8	1/2	200
ASAB 0707	1/2	1/2	150

EU - Elbow Union

PART NO.	Tube O.D	Tube O.D.	Qty / Box
AEU 0101	5/32	5/32	700
AEU 0303	3/16	3/16	700
AEU 0404	1/4	1/4	350
AEU 0501	5/16	5/32	400
AEU 0503	5/16	3/16	400
AEU 0504	5/16	1/4	300
AEU 0505	5/16	5/16	300
AEU 0603	3/8	3/16	200
AEU 0604	3/8	1/4	200
AEU 0605	3/8	5/16	200
AEU 0606	3/8	3/8	200
AEU 0704	1/2	1/4	150
AEU 0705	1/2	5/16	150
AEU 0706	1/2	3/8	150
AEU 0707	1/2	1/2	150

MCF - Male Connector

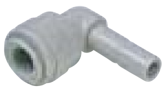
MFL Thread

PART NO.	Tube O.D.	MFL Thread	Qty / Box
AMCF 0505	5/16	5/16	300
AMCF 0604	3/8	1/4	300
AMCF 0507N	5/16	1/2	300
AMCF 0607N	3/8	1/2	300

- MFL Thread
  MFL 1/4 Corresponds to a 7/16 - 20 UNF
  MFL 5/16 Corresponds to a 1/2 - 20 UNF
  MFL 3/8 Corresponds to a 5/8 - 18 UNF
  MFL 1/2 Corresponds to a 3/4 - 16 UNF

ACETAL FITTINGS (GRAY / INCH)

TEU - Tube Elbow Union



PART NO.	Tube O.D.	Stem O.D.	Qty / Box
ATEU 0101	5/32	5/32	800
ATEU 0303	3/16	3/16	600
ATEU 0306	3/16	3/8	500
ATEU 0404	1/4	1/4	500
ATEU 0406	1/4	3/8	400
ATEU 0505	5/16	5/16	350
ATEU 0506	5/16	3/8	350
ATEU 0606	3/8	3/8	250
ATEU 0607	3/8	1/2	200
ATEU 0707	1/2	1/2	150

FAU - Female Adapter

UNS Thread (Cone Type)

PART NO.	Tube O.D.	UNS Thread	Qty / Box
AFAU 04 7/16C	1/4	7/16 - 24	400
AFAU 05 7/16C	5/16	7/16 - 24	350
AFAU 06 7/16C	3/8	7/16 - 24	300

FA - Female Adapter

NPTF Thread

PART NO.	Tube O.D.	NPTF Thread	Qty / Box
AFA 0402	1/4	1/8	400
AFA 0404	1/4	1/4	400
AFA 0502	5/16	1/8	300
AFA 0504	5/16	1/4	300
AFA 0602	3/8	1/8	300
AFA 0604	3/8	1/4	300

FAB - Female Adapter

BSP(P) Thread (Flat Type)

PART NO.	Tube O.D.	BSP(P) Thread	Qty / Box
AFAB 0508F	5/16	5/8	150
AFAB 0507F	5/16	1/2	250
AFAB 0607F	3/8	1/2	200
AFAB 0608F	3/8	5/8	150
AFAB 0706F	1/2	3/8	200
AFAB 0707F	1/2	1/2	150
AFAB 0708F	1/2	5/8	150

FAUN - Female Adapter

UN Thread (V - Type)

PART NO.	Tube O.D.	UN Thread	Qty / Box
AFAUN 05 1/2V	5/16	1/2 - 16	350
AFAUN 06 1/2V	3/8	1/2 - 16	200
AFAUN 07 1/2V	1/2	1/2 - 16	150

FAB - Female Adapter

BSP(P) Thread (Cone Type)

PART NO.	Tube O.D.	BSP(P) Thread	Qty / Box
AFAB 0406C	1/4	3/8	200
AFAB 0407C	1/4	1/2	200
AFAB 0506C	5/16	3/8	200
AFAB 0507C	5/16	1/2	200
AFAB 0606C	3/8	3/8	200
AFAB 0607C	3/8	1/2	200
AFAB 0608C	3/8	5/8	150
AFAB 0708C	1/2	5/8	150

FAUF - Female Adapter

UNF Thread (Cone Type)

PART NO.	Tube O.D.	UNF Thread	Qty / Box
AFAUF 04 7/16C	1/4	7/16 - 20	400
AFAUF 05 7/16C	5/16	7/16 - 20	300
AFAUF 06 7/16C	3/8	7/16 - 20	300

FAUF - Female Adapter

UNF Thread (V - Type)

PART NO.	Tube O.D.	UNF Thread	Qty / Box
AFAUF 04 7/16V	1/4	7/16 - 20	400
AFAUF 05 7/16V	5/16	7/16 - 20	300
AFAUF 06 7/16V	3/8	7/16 - 20	300
AFAUF 06 5/8V	3/8	5/8 - 18	300

- 7/16 UNF Corresponds to a 1/4 MFL
- 5/8 UNF Corresponds to a 3/8 MFL

SA - Stem Adapter

NPTF Thread

PART NO.	Stem O.D.	NPTF Thread	Qty / Box
ASA 0102	5/32	1/8	800
ASA 0104	5/32	1/4	500
ASA 0302	3/16	1/8	800
ASA 0402	1/4	1/8	500
ASA 0404	1/4	1/4	500
ASA 0502	5/16	1/8	500
ASA 0504	5/16	1/4	400
ASA 0506	5/16	3/8	300
ASA 0604	3/8	1/4	300
ASA 0606	3/8	3/8	300
ASA 0706	1/2	3/8	250
ASA 0707	1/2	1/2	150

SABT - Stem Adapter

BSPT(PT) Thread

PART NO.	Stem O.D.	BSPT(PT) Thread	Qty / Box
ASABT 0302	3/16	1/8	800
ASABT 0504	5/16	1/4	400
ASABT 0506	5/16	3/8	300
ASABT 0604	3/8	1/4	400
ASABT 0606	3/8	3/8	300
ASABT 0707	1/2	1/2	150

SAW - Stem Adapter

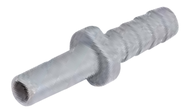
BSW Thread

PART NO.	Stem O.D.	BSW Thread	Qty / Box
ASAW 05 9/16	5/16	9/16	150
ASAW 0 6 0 7	3/8	1/2	150
ASAW 06 9/16	3/8	9/16	150

RD - ReDucer

PART NO.	Tube O.D.	Stem O.D.	Qty / Box
ARD 0104	5/32	1/4	800
ARD 0305	3/16	5/16	700
ARD 0306	3/16	3/8	600
ARD 0405	1/4	5/16	700
ARD 0406	1/4	3/8	500
ARD 0506	5/16	3/8	400
ARD 0507	5/16	1/2	300
ARD 0607	3/8	1/2	300

TBC - Tube Barb Connector

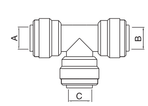


PART NO.	Stem O.D.	Tube I.D.	Qty / Box
ATBC 0403	1/4	3/16	1000
ATBC 0404	1/4	1/4	1000
ATBC 0405	1/4	5/16	800
ATBC 0503	5/16	3/16	800
ATBC 0504	5/16	1/4	800
ATBC 0505	5/16	5/16	700
ATBC 0506	5/16	3/8	700
ATBC 0604	3/8	1/4	500
ATBC 0605	3/8	5/16	500
ATBC 0606	3/8	3/8	400
ATBC 0607	3/8	1/2	300
ATBC 0706	1/2	3/8	300
ATBC 0707	1/2	1/2	300

TEB - Tube Elbow Barb connector

PART NO.	Stem O.D.	Tube I.D.	Qty / Box
ATEB 0404	1/4	1/4	800
ATEB 0405	1/4	5/16	800
ATEB 0504	5/16	1/4	700
ATEB 0505	5/16	5/16	600
ATEB 0604	3/8	1/4	600
ATEB 0605	3/8	5/16	600
ATEB 0606	3/8	3/8	550

TU - Tee Union



PART NO.	Tube O.D. (A)	Tube O.D. (B)	Tube O.D. (C)	Qty / Box
ATU 010101	5/32	5/32	5/32	350
ATU 030303	3/16	3/16	3/16	350
ATU 040404	1/4	1/4	1/4	300
ATU 040405	1/4	1/4	5/16	250
ATU 050505	5/16	5/16	5/16	200
ATU 060604	3/8	3/8	1/4	150
ATU 060606	3/8	3/8	3/8	150
ATU 070706	1/2	1/2	3/8	100
ATU 070707	1/2	1/2	1/2	100

MTS - Male Tee Swivel

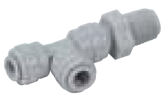
NPTF Thread

PART NO.	Tube O.D.	NPTF Thread	Qty / Box
AMTS 0102	5/32	1/8	500
AMTS 0104	5/32	1/4	400
AMTS 0302	3/16	1/8	300
AMTS 0402	1/4	1/8	250
AMTS 0404	1/4	1/4	200
AMTS 0502	5/16	1/8	200
AMTS 0504	5/16	1/4	180
AMTS 0506	5/16	3/8	150
AMTS 0604	3/8	1/4	130
AMTS 0606	3/8	3/8	100
AMTS 0706	1/2	3/8	70
AMTS 0707	1/2	1/2	70

ACETAL FITTINGS (GRAY / INCH)

MRS - Male Run Swivel

NPTF Thread



PART NO.	Tube O.D.	NPTF Thread	Qty / Box
AMRS 0102	5/32	1/8	500
AMRS 0104	5/32	1/4	400
AMRS 0302	3/16	1/8	300
AMRS 0402	1/4	1/8	300
AMRS 0404	1/4	1/4	200
AMRS 0502	5/16	1/8	200
AMRS 0504	5/16	1/4	200
AMRS 0506	5/16	3/8	150
AMRS 0604	3/8	1/4	130
AMRS 0606	3/8	3/8	100
AMRS 0706	1/2	3/8	80
AMRS 0707	1/2	1/2	80

OC - Offset Connector

PART NO.	Tube O.D.	Tube O.D.	Qty / Box
AOC 0604	3/8	1/4	300
AOC 0705	1/2	5/16	200

UC - Union Connector

PART NO.	Tube O.D.	Tube O.D.	Qty / Box
AUC 0101	5/32	5/32	500
AUC 0303	3/16	3/16	500
AUC 0401	1/4	5/32	500
AUC 0403	1/4	3/16	400
AUC 0404	1/4	1/4	350
AUC 0501	5/16	5/32	400
AUC 0503	5/16	3/16	400
AUC 0504	5/16	1/4	300
AUC 0505	5/16	5/16	300
AUC 0601	3/8	5/32	300
AUC 0603	3/8	3/16	300
AUC 0604	3/8	1/4	250
AUC 0605	3/8	5/16	250
AUC 0606	3/8	3/8	250
AUC 0705	1/2	5/16	200
AUC 0706	1/2	3/8	200
AUC 0707	1/2	1/2	150
AUC 067.5	3/8	7.5 mm	250

TWD - Two Way Divider

PART NO.	Tube in	Tube out	Qty / Box
ATWD 0101	5/32	5/32	400
ATWD 0404	1/4	1/4	300
ATWD 0505	5/16	5/16	200
ATWD 0605	3/8	5/16	150
ATWD 0606	3/8	3/8	150
ATWD 0607	3/8	1/2	100
ATWD 0707	1/2	1/2	100

THWD - THree Way Divider

PART NO.	Tube O.D.	Tube O.D.	Qty / Box
ATHWD 0604	3/8	1/4	150
ATHWD 0606	3/8	3/8	50
ATHWD 0706	1/2	3/8	50

PL - PLug

PART NO.	Stem O.D.	Qty / Box
APL 01	5/32	1000
APL 03	3/16	1000
APL 04	1/4	1000
APL 05	5/16	700
APL 06	3/8	500
APL 07	1/2	400

UB - U Bend

PART NO.	Tube O.D.	Tube O.D.	Qty / Box
AUB 0404	1/4	1/4	300
AUB 0505	5/16	5/16	250
AUB 0606	3/8	3/8	150
AUB 0707	1/2	1/2	100

DEU - Dispensing Elbow Union

PART NO.	Tube O.D.	Stem O.D.	Qty / Box
ADEU 0606	3/8	3/8	250

TES - Tube End Stop

PART NO.	Tube O.D.	Qty / Box
ATES 04	1/4	700
ATES 05	5/16	600
ATES 06	3/8	300
ATES 07	1/2	300

DST - Dispensing Stem

PART NO.	Stem O.D.	Stem O.D.	Qty / Box
ADST 0606	3/8	3/8	400

BU - Bulkhead Union

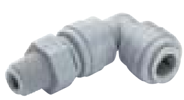
PART NO.	Tube O.D.	Tube O.D.	Thread Size	Qty / Box
ABU 0101	5/32	5/32	M16XP1	300
ABU 0303	3/16	3/16	M16XP1	300
ABU 0404	1/4	1/4	M16XP1	250
ABU 0406	1/4	3/8	M20XP1.5	200
ABU 0505	5/16	5/16	M20XP1.5	150
ABU 0604	3/8	1/4	M20XP1.5	150
ABU 0606	3/8	3/8	M20XP1.5	150
ABU 0707	1/2	1/2	M27XP1.5	70

CR - CRoss

PART NO.	Tube O.D.	Qty / Box
ACR 0101	5/32	300
ACR 0404	1/4	250
ACR 0505	5/16	200
ACR 0606	3/8	100
ACR 0707	1/2	80

MESBT - Male Elbow Swivel

BSPT(PT) Thread



PART NO.	Tube O.D.	BSPT(PT) Thread	Qty / Box
AMESBT 0104	5/32	1/4	400
AMESBT 0302	3/16	1/8	400
AMESBT 0306	3/16	3/8	300
AMESBT 0406	1/4	3/8	200
AMESBT 0407	1/4	1/2	200
AMESBT 0504	5/16	1/4	200
AMESBT 0506	5/16	3/8	200
AMESBT 0507	5/16	1/2	150
AMESBT 0604	3/8	1/4	150
AMESBT 0606	3/8	3/8	150
AMESBT 0707	1/2	1/2	100

FAB - Female Adapter

BSP(P) Thread

PART NO.	Tube O.D.	BSP(P) Thread	Qty / Box
AFAB 0409F-1	1/4	3/4	200
AFAB 0609F-1	3/8	3/4	200
AFAB 0709F-1	1/2	3/4	150

FAN - Female Adapter

NH Thread

PART NO.	Tube O.D.	NH Thread	Qty / Box
AFAN 0409F	1/4	3/4	100
AFAN 0509F	5/16	3/4	100
AFAN 0609F	3/8	3/4	100
AFAN 0809F	5/8	3/4	50

FAB - Female Adapter

BSP(P) Thread

PART NO.	Tube O.D.	BSP(P) Thread	Qty / Box
AFAB 0407F	1/4	1/2	100
AFAB 0409F	1/4	3/4	100
AFAB 0509F	5/16	3/4	100
AFAB 0609F	3/8	3/4	100
AFAB 0809F	5/8	3/4	50

BFU - Both Female Union

BSP(P) Thread

PART NO.	BSP(P) Thread	BSP(P) Thread	Qty / Box
ABFU 0409	1/4	3/4	150

STU - Stackable Tee Union

PART NO.	Tube O.D.	Tube O.D.	Stem O.D.	Qty / Box
ASTU 040404	1/4	1/4	1/4	300
ASTU 060606	3/8	3/8	3/8	150
ASTU 070707	1/2	1/2	1/2	100

MTUR - Male Tee Union

NPTF Thread

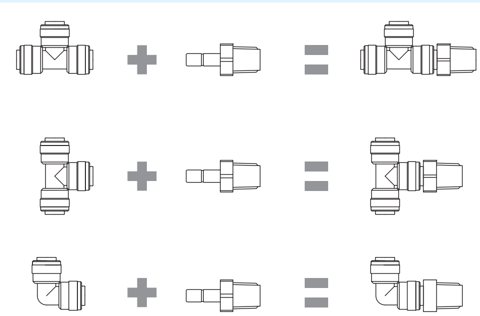
PART NO.	Tube O.D.	Tube O.D.	NPTF Thread	Qty / Box
AMTUR 040404	1/4	1/4	1/4	300
AMTUR 060606	3/8	3/8	3/8	150

BTU - Branch Tee Union

PART NO.	Tube O.D.	Tube O.D.	Stem O.D.	Qty / Box
ABTU 040404	1/4	1/4	1/4	300
ABTU 060606	3/8	3/8	3/8	150
ABTU 070707	1/2	1/2	1/2	100

Adaptability

- For maximum flexibility, fittings may be combined to provide wider functions.
- Unlike some competitors' products, separation and reuse is easy.



ACETAL FITTINGS (WHITE / INCH)

Suitable for

- **Water & foods use** : *DMfit*® products are manufactured from safe, non-toxic materials meeting the requirements othe of the US FDA, WRAS, ANSI/NSF-51, 61, ACS, KTW and DVGW-W270. Our products are widely used in water purification, food/beverage and pneumatic systems.
- **Function & Quality** : *DMfit*® provides quick and convenient assembly - saving time & expense. Our ISO9001, 14001 registered quality system ensures our customers a superior level of product quality. Defects are easily detectable and maintenance is easy with its easy dismantling for access.
- **Collet Design** : Our unique oval collet design is superior and more practical, and is an improvement welcomed by our world-wide customers in all industries.
- **Applications** : Beyond water and food use, fittings can be used with air, gases, vacuum, & liquids. And all connections can be assembled & disassembled repeatedly. A broad of sizes covers a broad scope of applications.
- **Color** : White Acetal Copolymer

MC - Male Connector

NPTF Thread

PART NO.	Tube O.D.	NPTF Thread	Qty / Box
AMC 0102W	5/32	1/8	500
AMC 0104W	5/32	1/4	500
AMC 0302W	3/16	1/8	500
AMC 0402W	1/4	1/8	400
AMC 0404W	1/4	1/4	350
AMC 0406W	1/4	3/8	300
AMC 0407W	1/4	1/2	150
AMC 0502W	5/16	1/8	400
AMC 0504W	5/16	1/4	400
AMC 0506W	5/16	3/8	350
AMC 0602W	3/8	1/8	300
AMC 0604W	3/8	1/4	300
AMC 0606W	3/8	3/8	250
AMC 0607W	3/8	1/2	200
AMC 0706W	1/2	3/8	200
AMC 0707W	1/2	1/2	150
AMC 0806W	5/8	3/8	80
AMC 0807W	5/8	1/2	80
AMC 1009W	7/8	3/4	40
AMC 1011W	7/8	1	40

ME - Male Elbow

NPTF Thread

PART NO.	Tube O.D.	NPTF Thread	Qty / Box
AME 0302W	3/16	1/8	500
AME 0402W	1/4	1/8	500
AME 0404W	1/4	1/4	350
AME 0406W	1/4	3/8	300
AME 0504W	5/16	1/4	300
AME 0506W	5/16	3/8	300
AME 0604W	3/8	1/4	250
AME 0606W	3/8	3/8	250
AME 0706W	1/2	3/8	200
AME 0707W	1/2	1/2	150
AME 0806W	5/8	3/8	80
AME 0807W	5/8	1/2	40

MCB - Male Connector

BSP(P) Thread

PART NO.	Tube O.D.	BSP(P) Thread	Qty / Box
AMCB 0807W	5/8	1/2	100
AMCB 0809W	5/8	3/4	100
AMCB 1009W	7/8	3/4	50

MCB - Male Connector

BSP(P) Thread

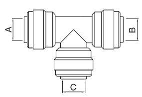
New

PART NO.	Tube O.D.	BSP(P) Thread	Qty / Box
AMCB 0409S	1/4	3/4	100
AMCB 0609S	3/8	3/4	100

EU - Elbow Union

PART NO.	Tube O.D.	Tube O.D.	Qty / Box
AEU 0101W	5/32	5/32	700
AEU 0303W	3/16	3/16	700
AEU 0404W	1/4	1/4	350
AEU 0501W	5/16	5/32	500
AEU 0503W	5/16	3/16	400
AEU 0504W	5/16	1/4	300
AEU 0505W	5/16	5/16	300
AEU 0603W	3/8	3/16	200
AEU 0604W	3/8	1/4	200
AEU 0605W	3/8	5/16	200
AEU 0606W	3/8	3/8	200
AEU 0704W	1/2	1/4	150
AEU 0705W	1/2	5/16	150
AEU 0706W	1/2	3/8	150
AEU 0707W	1/2	1/2	150
AEU 0808W	5/8	5/8	100
AEU 1008W	7/8	5/8	50
AEU 1010W	7/8	7/8	50

TU - Tee Union



PART NO.	Tube O.D. (A)	Tube O.D. (B)	Tube O.D. (C)	Qty / Box
ATU 010101W	5/32	5/32	5/32	350
ATU 030303W	3/16	3/16	3/16	350
ATU 040404W	1/4	1/4	1/4	300
ATU 050505W	5/16	5/16	5/16	200
ATU 060604W	3/8	3/8	1/4	150
ATU 060606W	3/8	3/8	3/8	150
ATU 070706W	1/2	1/2	3/8	100
ATU 070707W	1/2	1/2	1/2	100
ATU 080804W	5/8	5/8	1/4	50
ATU 080807W	5/8	5/8	1/2	50
ATU 080808W	5/8	5/8	5/8	40
ATU 080810W	5/8	5/8	7/8	40
ATU 100810W	7/8	5/8	7/8	30
ATU 101008W	7/8	7/8	5/8	30
ATU 100808W	7/8	5/8	5/8	40
ATU 101010W	7/8	7/8	7/8	30

TTU - Tube Tee Union connector

PART NO.	Tube O.D.	Tube O.D.	Stem O.D.	Qty / Box
ATTU 080808W	5/8	5/8	5/8	50

FAB - Female Adapter

BSP(P) Thread (Cone Type)

PART NO.	Tube O.D.	BSP(P) Thread	Qty / Box
AFAB 0406CW	1/4	3/8	250
AFAB 0407CW	1/4	1/2	200
AFAB 0506CW	5/16	3/8	200
AFAB 0507CW	5/16	1/2	200
AFAB 0606CW	3/8	3/8	200
AFAB 0607CW	3/8	1/2	200
AFAB 0608CW	3/8	5/8	150
AFAB 0708CW	1/2	5/8	150

FA - Female Adapter

NPTF Thread

PART NO.	Tube O.D.	NPTF Thread	Qty / Box
AFA 0402W	1/4	1/8	400
AFA 0404W	1/4	1/4	400
AFA 0502W	5/16	1/8	300
AFA 0504W	5/16	1/4	300
AFA 0602W	3/8	1/8	300
AFA 0604W	3/8	1/4	300
AFA 0807W	5/8	1/2	100
AFA 0809W	5/8	3/4	100
AFA 1009W	7/8	3/4	50
AFA 1011W	7/8	1	40

FAB - Female Adapter

BSP(P) Thread (Flat Type)

PART NO.	Tube O.D.	BSP(P) Thread	Qty / Box
AFAB 0508FW	5/16	5/8	250
AFAB 0607FW	3/8	1/2	200
AFAB 0608FW	3/8	5/8	150
AFAB 0706FW	1/2	3/8	200
AFAB 0707FW	1/2	1/2	150
AFAB 0708FW	1/2	5/8	150
AFAB 0809FW	5/8	3/4	100

FAUF - Female Adapter

UNF Thread (Cone Type)

PART NO.	Tube O.D.	UNF Thread	Qty / Box
AFAUF 04 7/16CW	1/4	7/16 - 20	400
AFAUF 05 7/16CW	5/16	7/16 - 20	350
AFAUF 06 7/16CW	3/8	7/16 - 20	300

FAU - Female Adapter

UNS Thread (Cone Type)

PART NO.	Tube O.D.	UNS Thread	Qty / Box
AFAU 04 7/16CW	1/4	7/16 - 24	400
AFAU 05 7/16CW	5/16	7/16 - 24	350
AFAU 06 7/16CW	3/8	7/16 - 24	300

FAUF - Female Adapter

UNF Thread (V - Type)

PART NO.	Tube O.D.	UNF Thread	Qty / Box
AFAUF 04 7/16VW	1/4	7/16 - 20	400
AFAUF 05 7/16VW	5/16	7/16 - 20	300
AFAUF 06 7/16VW	3/8	7/16 - 20	300
AFAUF 06 5/8VW	3/8	5/8 - 18	350

- 7/16 UNF Corresponds to a 1/4 MFL
- 5/8 UNF Corresponds to a 3/8 MFL

FAUN - Female Adapter

UN Thread (V - Type)

PART NO.	Tube O.D.	UN Thread	Qty / Box
AFAUN 05 1/2VW	5/16	1/2 - 16	350
AFAUN 06 1/2VW	3/8	1/2 - 16	200
AFAUN 07 1/2VW	1/2	1/2 - 16	150

ACETAL FITTINGS (WHITE / INCH)

HA - Hub Adapter

NPSH Thread

PART NO.	Tube O.D.	NPSH Thread	Qty / Box
AHA 1011W	7/8	1	400

SA - Stem Adapter

NPTF Thread

PART NO.	Stem O.D.	NPTF Thread	Qty / Box
ASA 0102W	5/32	1/8	800
ASA 0104W	5/32	1/4	500
ASA 0302W	3/16	1/8	800
ASA 0402W	1/4	1/8	500
ASA 0404W	1/4	1/4	500
ASA 0502W	5/16	1/8	500
ASA 0504W	5/16	1/4	400
ASA 0506W	5/16	3/8	300
ASA 0604W	3/8	1/4	300
ASA 0606W	3/8	3/8	300
ASA 0706W	1/2	3/8	250
ASA 0707W	1/2	1/2	150

SABT - Stem Adapter

BSPT(PT) Thread

PART NO.	Stem O.D.	BSPT(PT) Thread	Qty / Box
ASABT 0302W	3/16	1/8	800
ASABT 0504W	5/16	1/4	400
ASABT 0506W	5/16	3/8	300
ASABT 0604W	3/8	1/4	400
ASABT 0606W	3/8	3/8	300
ASABT 0707W	1/2	1/2	150

THWD - THree Way Divider

PART NO.	Tube O.D.	Tube O.D.	Qty / Box
ATHWD 0604W	3/8	1/4	150
ATHWD 0706W	1/2	3/8	50

TEU - Tube Elbow Union

PART NO.	Tube O.D.	Stem O.D.	Qty / Box
ATEU 0101W	5/32	5/32	800
ATEU 0303W	3/16	3/16	600
ATEU 0306W	3/16	3/8	500
ATEU 0404W	1/4	1/4	500
ATEU 0406W	1/4	3/8	400
ATEU 0505W	5/16	5/16	350
ATEU 0506W	5/16	3/8	350
ATEU 0606W	3/8	3/8	250
ATEU 0607W	3/8	1/2	200
ATEU 0707W	1/2	1/2	150
ATEU 0808W	5/8	5/8	50
ATEU 1010W	7/8	7/8	50

DA - Drain Adapter

NPSH Thread

PART NO.	Tube O.D.	NPSH Thread	Qty / Box
ADA 0809W	5/8	3/4	50

BU - Bulkhead Union

PART NO.	Tube O.D.	Tube O.D.	Thread Size	Qty / Box
ABU 0101W	5/32	5/32	M16XP1	300
ABU 0303W	3/16	3/16	M16XP1	300
ABU 0404W	1/4	1/4	M16XP1	250
ABU 0406W	1/4	3/8	M20XP1.5	200
ABU 0505W	5/16	5/16	M20XP1.5	150
ABU 0604W	3/8	1/4	M20XP1.5	150
ABU 0606W	3/8	3/8	M20XP1.5	150
ABU 0707W	1/2	1/2	M27XP1.5	70

CR - CRoss

PART NO.	Tube O.D.	Qty / Box
ACR 0101W	5/32	300
ACR 0404W	1/4	250
ACR 0505W	5/16	200
ACR 0606W	3/8	100
ACR 0707W	1/2	80

UC - Union Connector

PART NO.	Tube O.D.	Tube O.D.	Qty / Box
AUC 0101W	5/32	5/32	500
AUC 0303W	3/16	3/16	500
AUC 0404W	1/4	1/4	350
AUC 0501W	5/16	5/32	400
AUC 0503W	5/16	3/16	400
AUC 0504W	5/16	1/4	300
AUC 0505W	5/16	5/16	300
AUC 0603W	3/8	3/16	300
AUC 0604W	3/8	1/4	250
AUC 0605W	3/8	5/16	250
AUC 0606W	3/8	3/8	250
AUC 0705W	1/2	5/16	200
AUC 0706W	1/2	3/8	200
AUC 0707W	1/2	1/2	150
AUC 067.5W	3/8	7.5 (mm)	250
AUC 0807W	5/8	1/2	100
AUC 0808W	5/8	5/8	100
AUC 1008W	7/8	5/8	50
AUC 1010W	7/8	7/8	50

TES - Tube End Stop

PART NO.	Tube O.D.	Qty / Box
ATES 04W	1/4	800
ATES 05W	5/16	600
ATES 06W	3/8	300
ATES 07W	1/2	300
ATES 08W	5/8	100
ATES 10W	7/8	50

SUC - Swivel Union Connector

BSP(P) Thread

PART NO.	Tube O.D.	BSP(P) Thread	Qty / Box
ASUC 0807W	5/8	1/2	50
ASUC 0809W	5/8	3/4	50
ASUC 1009W	7/8	3/4	40

TWD - Two Way Divider

PART NO.	Tube in	Tube out	Qty / Box
ATWD 0101W	5/32	5/32	400
ATWD 0404W	1/4	1/4	300
ATWD 0505W	5/16	5/16	200
ATWD 0605W	3/8	5/16	150
ATWD 0606W	3/8	3/8	150
ATWD 0607W	3/8	1/2	100
ATWD 0707W	1/2	1/2	100

UB - U Bend

PART NO.	Tube O.D.	Tube O.D.	Qty / Box
AUB 0404W	1/4	1/4	350
AUB 0505W	5/16	5/16	250
AUB 0606W	3/8	3/8	150
AUB 0707W	1/2	1/2	100
AUB 0808W	5/8	5/8	60
AUB 1010W	7/8	7/8	40

SVA - Stop Valve Adapter

UNEF Thread

PART NO.	Tube O.D.	UNEF Thread	Qty / Box
ASVA 04 9/16W	1/4	9/16-24	200
ASVA 06 9/16W	3/8	9/16-24	150

- For an undercounter filter systems

PL - PLug

PART NO.	Stem O.D.	Qty / Box
APL 01W	5/32	1000
APL 03W	3/16	1000
APL 04W	1/4	1000
APL 05W	5/16	700
APL 06W	3/8	500
APL 07W	1/2	400
APL 08W	5/8	200
APL 10W	7/8	100

SEU - Swivel Elbow Union

BSP(P) Thread

PART NO.	Tube O.D.	BSP(P) Thread	Qty / Box
ASEU 0807W	5/8	1/2	50
ASEU 0809W	5/8	3/4	50

KFA - Kitchen Faucet Adapter

NPSM Thread

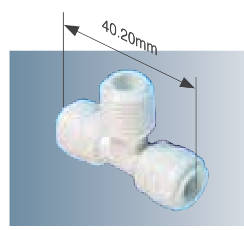
PART NO.	Tube O.D.	NPSM Thread	Qty / Box
AKFA 0407W	1/4	1/2-14	100
AKFA 0607W	3/8	1/2-14	100

- For installing undercounter filters & RO systems

MTU - Male Tee Union

NPTF Thread

PART NO.	Tube O.D.	NPTF Thread	Qty / Box
AMTU 0404W	1/4	1/4	300



BBC - BarB Connector

PART NO.	Tube O.D.	Tube I.D.	Qty / Box
ABBC 0807W	5/8	1/2	100
ABBC 1007W	7/8	1/2	50
ABBC 1009W	7/8	3/4	40

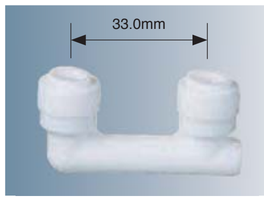
RD - ReDucer

PART NO.	Tube O.D.	Stem O.D.	Qty / Box
ARD 0104W	5/32	1/4	800
ARD 0305W	3/16	5/16	700
ARD 0306W	3/16	3/8	600
ARD 0405W	1/4	5/16	700
ARD 0406W	1/4	3/8	500
ARD 0408W	1/4	5/8	300
ARD 0506W	5/16	3/8	400
ARD 0507W	5/16	1/2	300
ARD 0607W	3/8	1/2	300

ACETAL FITTINGS (WHITE / INCH)

FC - Filter Connector

PART NO.	Tube O.D.	Tube O.D.	Qty / Box
AFC 0404W	1/4	1/4	300



EL - EnLarger

PART NO.	Tube O.D.	Stem O.D.	Qty / Box
AEL 0605	3/8	5/16	400
AEL 0706	1/2	3/8	300

BFU - Both Female Union

BSP(P) Thread

PART NO.	BSP(P) Thread	BSP(P) Thread	Qty / Box
ABFU 0409	1/4	3/4	150

FAN - Female Adapter

NH Thread

PART NO.	Tube O.D.	NH Thread	Qty / Box
AFAN 0409F	1/4	3/4	100
AFAN 0509F	5/16	3/4	100
AFAN 0609F	3/8	3/4	100
AFAN 0809F	5/8	3/4	50

PART NO.	Tube O.D. (mm)	NH Thread	Qty / Box
AFAN 0609FM	6	3/4	100
AFAN 0809FM	8	3/4	100
AFAN 1009FM	10	3/4	100

FAB - Female Adapter

BSP(P) Thread

PART NO.	Tube O.D.	BSP(P) Thread	Qty / Box
AFAB 0407F	1/4	1/2	100
AFAB 0409F	1/4	3/4	100
AFAB 0509F	5/16	3/4	100
AFAB 0609F	3/8	3/4	100
AFAB 0809F	5/8	3/4	50

PART NO.	Tube O.D. (mm)	BSP(P) Thread	Qty / Box
AFAB 0609FM	6	3/4	100
AFAB 0809FM	8	3/4	100
AFAB 1009FM	10	3/4	100

FAB - Female Adapter

BSP(P) Thread

PART NO.	Tube O.D.	BSP(P) Thread	Qty / Box
AFAB 0409FW-1	1/4	3/4	150
AFAB 0609FW-1	3/8	3/4	100
AFAB 0709FW-1	1/2	3/4	100

STU - Stackable Tee Union

PART NO.	Tube O.D.	Tube O.D.	Stem O.D.	Qty / Box
ASTU 040404	1/4	1/4	1/4	300
ASTU 060606	3/8	3/8	3/8	150
ASTU 070707	1/2	1/2	1/2	100

MTUR - Male Tee Union

NPTF Thread

PART NO.	Tube O.D.	Tube O.D.	NPTF Thread	Qty / Box
AMTUR 040404	1/4	1/4	1/4	300
AMTUR 060606	3/8	3/8	3/8	150

BTU - Branch Tee Union

PART NO.	Tube O.D.	Tube O.D.	Stem O.D.	Qty / Box
ABTU 040404	1/4	1/4	1/4	300
ABTU 060606	3/8	3/8	3/8	150
ABTU 070707	1/2	1/2	1/2	100

BMC - Brass Male Connector

BSP(P) Thread

PART NO.	Tube O.D.	Metric Thread	Qty / Box
BMC 04M10	1/4	M10	500
BMC 06M10	3/8	M10	500

PART NO.	Tube O.D. (mm)	BSP(P) Thread	Qty / Box
BMCB 1004M	10	1/4	500

1. Chrome plating is by special request.
2. Manufactured after receipt of order.

BFAUF - Brass Female Adapter

UNF Thread

PART NO.	Tube O.D.	UNF Thread	Qty / Box
BFAUF 04 7/16V	1/4	7/16-20	400
BFAUF 06 7/16V	3/8	7/16-20	300
BFAUF 06 5/8V	3/8	5/8-18	250

- 7/16 UNF corresponds to a 1/4 MFL
- 5/8 UNF corresponds to a 3/8 MFL

1. Chrome plating is by special request.
2. Manufactured after receipt of order.

ACETAL FITTINGS (BLACK / METRIC)

Suitable for

- **Water & foods use :** *DMfit®* products are manufactured from safe, non-toxic materials meeting the requirements of the US FDA, WRAS, ANSI/NSF-51, 61, ACS, KTW and DVGW-W270 Our products are widely used in water purification, food/beverage and pneumatic systems.
- **Function & Quality :** *DMfit®* provides quick and convenient assembly - saving time & expense. Our ISO9001, 14001 registered quality system ensures our customers a superior level of product quality. Defects are easily detectable and maintenance is easy with its easy dismantling for access.
- **Collet Design :** Our unique oval collet design is superior and more practical, and is an improvement welcomed by our world-wide customers in all industries.
- **Applications :** Beyond water and food use, fittings can be used with air, gases, vacuum, & liquids. And all connections can be assembled & disassembled repeatedly. A broad of sizes covers a broad scope of applications.
- **Color :** Black Acetal Copolymer

Part Numbering System

A MC 04 04 F M - B

Tube O.D.(Stem O.D.)	04=4mm, 05=5mm, 06=6mm, 08=8mm, 10=10mm, 12=12mm, 15=15mm, 16=16mm, 18=18mm, 22=22mm, 28=28mm
Fitting Type	
Materials	• Acetal copolymer : A
• Tube O.D. • Stem O.D. • Power O.D. • Thread Size	• NPTF, BSP(P), BSPT, PT Thread No. : 02=1/8", 04=1/4", 06=3/8", 07=1/2, 08=5/8", 09=3/4", 11=1" • UN, UNF, UNS(major diameter-threads per inch)
Type(FA series)	• F : Flat type, C : Cone type, V : V-type
Metric size	
Body color	• Black : B

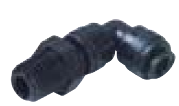
ME - Male Elbow

BSPT(PT) Thread

PART NO.	Tube O.D. (mm)	BSPT(PT) Thread	Qty / Box
AME 0602M	6	1/8	500
AME 0604M	6	1/4	400
AME 0606M	6	3/8	400
AME 0804M	8	1/4	300
AME 0806M	8	3/8	300
AME 1004M	10	1/4	250
AME 1006M	10	3/8	250
AME 1206M	12	3/8	200
AME 1207M	12	1/2	150
AME 1506M	15	3/8	100
AME 1507M	15	1/2	100
AME 1606M	16	3/8	100
AME 1607M	16	1/2	100

MES - Male Elbow Swivel

BSPT(PT) Thread



PART NO.	Tube O.D. (mm)	BSPT(PT) Thread	Qty / Box
AMES 0402M	4	1/8	500
AMES 0404M	4	1/4	400
AMES 0502M	5	1/8	500
AMES 0602M	6	1/8	300
AMES0604M	6	1/4	300
AMES 0802M	8	1/8	200
AMES 0804M	8	1/4	200
AMES 0806M	8	3/8	200
AMES 1004M	10	1/4	150
AMES 1006M	10	3/8	150
AMES 1206M	12	3/8	100
AMES 1207M	12	1/2	100

ACETAL FITTINGS (BLACK / METRIC)

MC - Male Connector

BSPT(PT) Thread

PART NO.	Tube O.D. (mm)	BSPT(PT) Thread	Qty / Box
AMC 0402M	4	1/8	500
AMC 0404M	4	1/4	500
AMC 0502M	5	1/8	500
AMC 0504M	5	1/4	500
AMC 0602M	6	1/8	400
AMC 0604M	6	1/4	500
AMC 0606M	6	3/8	300
AMC 0607M	6	1/2	250
AMC 0802M	8	1/8	400
AMC 0804M	8	1/4	400
AMC 0806M	8	3/8	350
AMC 1002M	10	1/8	300
AMC 1004M	10	1/4	300
AMC 1006M	10	3/8	300
AMC 1007M	10	1/2	200
AMC 1206M	12	3/8	200
AMC 1207M	12	1/2	200
AMC 1506M	15	3/8	100
AMC 1507M	15	1/2	100
AMC 1606M	16	3/8	100
AMC 1607M	16	1/2	100
AMC 1807M	18	1/2	80
AMC 2209M	22	3/4	80
AMC 2211M	22	1	40

EU - Elbow Union

PART NO.	Tube O.D. (mm)	Tube O.D. (mm)	Qty / Box
AEU 0404M	4	4	700
AEU 0505M	5	5	700
AEU 0606M	6	6	400
AEU 0804M	8	4	500
AEU 0805M	8	5	400
AEU 0806M	8	6	300
AEU 0808M	8	8	300
AEU 1005M	10	5	300
AEU 1006M	10	6	300
AEU 1008M	10	8	200
AEU 1010M	10	10	200
AEU 1206M	12	6	200
AEU 1208M	12	8	200
AEU 1210M	12	10	150
AEU 1212M	12	12	150
AEU 1515M	15	15	80
AEU 1616M	16	16	80
AEU 1818M	18	18	60
AEU 2215M	22	15	50
AEU 2216M	22	16	50
AEU 2222M	22	22	40
AEU 2828M	28	28	20

MCB - Male Connector

BSP(P) Thread

PART NO.	Tube O.D. (mm)	BSP(P) Thread	Qty / Box
AMCB 0402M	4	1/8	500
AMCB 0404M	4	1/4	400
AMCB 0502M	5	1/8	400
AMCB 0504M	5	1/4	400
AMCB 0602M	6	1/8	400
AMCB 0604M	6	1/4	400
AMCB 0802M	8	1/8	400
AMCB 0804M	8	1/4	400
AMCB 0806M	8	3/8	250
AMCB 0807M	8	1/2	200
AMCB 1004M	10	1/4	300
AMCB 1006M	10	3/8	250
AMCB 1007M	10	1/2	200
AMCB 1206M	12	3/8	200
AMCB 1207M	12	1/2	150
AMCB 1507M	15	1/2	150
AMCB 1509M	15	3/4	100
AMCB 1607M	16	1/2	150
AMCB 1609M	16	3/4	100
AMCB 2209M	22	3/4	80

TEU - Tube Elbow Union

PART NO.	Tube O.D. (mm)	Stem O.D. (mm)	Qty / Box
ATEU 0404M	4	4	500
ATEU 0505M	5	5	500
ATEU 0606M	6	6	500
ATEU 0610M	6	10	400
ATEU 0806M	8	6	400
ATEU 0808M	8	8	350
ATEU 0810M	8	10	350
ATEU 1010M	10	10	250
ATEU 1212M	12	12	150
ATEU 1515M	15	15	100
ATEU 2222M	22	22	40

PART NO.	Tube O.D. (mm)	Stem O.D.	Qty / Box
ATEU 16M08	16	5/8	100

MESB - Male Elbow Swivel

BSP(P) Thread

PART NO.	Tube O.D. (mm)	BSP(P) Thread	Qty / Box
AMESB 0402M	4	1/8	350
AMESB 0404M	4	1/4	350
AMESB 0502M	5	1/8	300
AMESB 0504M	5	1/4	300
AMESB 0602M	6	1/8	250
AMESB 0604M	6	1/4	250
AMESB 0802M	8	1/8	200
AMESB 0804M	8	1/4	200
AMESB 0806M	8	3/8	150
AMESB 1004M	10	1/4	140
AMESB 1006M	10	3/8	140
AMESB 1007M	10	1/2	100
AMESB 1206M	12	3/8	90
AMESB 1207M	12	1/2	80

RD - ReDucer

PART NO.	Tube O.D. (mm)	Stem O.D. (mm)	Qty / Box
ARD 0405M	4	5	800
ARD 0406M	4	6	700
ARD 0408M	4	8	700
ARD 0506M	5	6	700
ARD 0508M	5	8	700
ARD 0608M	6	8	600
ARD 0610M	6	10	500
ARD 0810M	8	10	400
ARD 0812M	8	12	300
ARD 1012M	10	12	300
ARD 1015M	10	15	250
ARD 1215M	12	15	200
ARD 1518M	15	18	150
ARD 1522M	15	22	100
ARD 1618M	16	18	100
ARD 1622M	16	22	100
ARD 1822M	18	22	80
ARD 2228M	22	28	50

PART NO.	Tube O.D.	Stem O.D.	Qty / Box
ARD 0615M	3/8	15mm	250
ARD 1512M	15	12mm	150

FA - Female Adapter

BSPT(PT) Thread

PART NO.	Tube O.D. (mm)	BSPT(PT) Thread	Qty / Box
AFA 0602M	6	1/8	500
AFA 0604M	6	1/4	400
AFA 0802M	8	1/8	300
AFA 0804M	8	1/4	300
AFA 1002M	10	1/8	300
AFA 1004M	10	1/4	300
AFA 1507M	15	1/2	100
AFA 1509M	15	3/4	100
AFA 1607M	16	1/2	100
AFA 1609M	16	3/4	100
AFA 2209M	22	3/4	50
AFA 2211M	22	1	40

FAB - Female Adapter

BSP(P) Thread

PART NO.	Tube O.D. (mm)	BSP(P) Thread	Qty / Box
AFAB 1507M	15	1/2	100
AFAB 1509M	15	3/4	100
AFAB 1607M	16	1/2	100
AFAB 1609M	16	3/4	100
AFAB 2209M	22	3/4	40

FAUN - Female Adapter

UN Thread (V - Type)

PART NO.	Tube O.D. (mm)	UN Thread	Qty / Box
AFAUN 08 1/2VM	8	1/2 - 16	350
AFAUN 10 1/2VM	10	1/2 - 16	200
AFAUN 12 1/2VM	12	1/2 - 16	200

EL - EnLarger

PART NO.	Tube O.D. (mm)	Stem O.D. (mm)	Qty / Box
AEL1510M	15	10	150
AEL 1512M	15	12	150
AEL1610M	16	10	150
AEL 1612M	16	12	150
AEL 2215M	22	15	60
AEL 2822M	28	22	50

PART NO.	Tube O.D. (mm)	Stem O.D.	Qty / Box
AEL 15M07	15	1/2	150
AEL 16M07	16	1/2	150
AEL 18M07	18	1/2	150

FAU - Female Adapter

UNS Thread (Cone Type)

PART NO.	Tube O.D. (mm)	UNS Thread	Qty / Box
AFAU 06 7/16CM	6	7/16 - 24	400
AFAU 08 7/16CM	8	7/16 - 24	350
AFAU 10 7/16CM	10	7/16 - 24	300

FAB - Female Adapter

BSP(P) Thread (Cone Type)

PART NO.	Tube O.D. (mm)	BSP(P) Thread	Qty / Box
AFAB 0606CM	6	3/8	200
AFAB 0607CM	6	1/2	200
AFAB 0806CM	8	3/8	150
AFAB 0807CM	8	1/2	200
AFAB 1006CM	10	3/8	200
AFAB 1007CM	10	1/2	200
AFAB 1008CM	10	5/8	150
AFAB1206CM	12	3/8	150
AFAB 1208CM	12	5/8	150

FAUF - Female Adapter

UNF Thread (Cone Type)

PART NO.	Tube O.D. (mm)	UNF Thread	Qty / Box
AFAUF 06 7/16CM	6	7/16 - 20	400
AFAUF 08 7/16CM	8	7/16 - 20	300
AFAUF 10 7/16CM	10	7/16 - 20	300

ACETAL FITTINGS (BLACK / METRIC)

FAB - Female Adapter

BSP(P) Thread (Flat Type)

PART NO.	Tube O.D. (mm)	BSP(P) Thread	Qty / Box
AFAB 0804FM	8	1/4	200
AFAB 0808FM	8	5/8	200
AFAB 1004FM	10	1/4	200
AFAB 1007FM	10	1/2	150
AFAB 1008FM	10	5/8	150
AFAB 1206FM	12	3/8	150
AFAB 1207FM	12	1/2	150
AFAB 1208FM	12	5/8	150

FAB - Female Adapter

BSP(P) Thread

PART NO.	Tube O.D. (mm)	BSP(P) Thread	Qty / Box
AFAB 0609FM-1	6	3/4	150
AFAB 1009FM-1	10	3/4	100
AFAB 1209FM-1	12	3/4	100

FAUF - Female Adapter

UNF Thread (V - Type)

PART NO.	Tube O.D. (mm)	UNF Thread	Qty / Box
AFAUF 06 7/16VM	6	7/16 - 20	400
AFAUF 08 7/16VM	8	7/16 - 20	300
AFAUF 10 7/16VM	10	7/16 - 20	300
AFAUF 10 5/8VM	10	5/8 - 18	350

HA - Hub Adapter

NPSH Thread

PART NO.	Tube O.D. (mm)	NPSH Thread	Qty / Box
AHA 2211M	22	1	40

MRSB - Male Run Swivel

BSP(P) Thread

PART NO.	Tube O.D. (mm)	BSP(P) Thread	Qty / Box
AMRSB 0402M	4	1/8	300
AMRSB 0404M	4	1/4	300
AMRSB 0502M	5	1/8	250
AMRSB 0504M	5	1/4	250
AMRSB 0602M	6	1/8	200
AMRSB 0604M	6	1/4	200
AMRSB 0802M	8	1/8	150
AMRSB 0804M	8	1/4	150
AMRSB 0806M	8	3/8	150
AMRSB 1004M	10	1/4	130
AMRSB 1006M	10	3/8	100
AMRSB 1007M	10	1/2	100
AMRSB 1206M	12	3/8	80
AMRSB 1207M	12	1/2	80

MRS - Male Run Swivel

BSPT(PT) Thread

PART NO.	Tube O.D. (mm)	BSPT(PT) Thread	Qty / Box
AMRS 0402M	4	1/8	500
AMRS 0404M	4	1/4	400
AMRS 0502M	5	1/8	300
AMRS 0504M	5	1/4	300
AMRS 0602M	6	1/8	250
AMRS 0802M	8	1/8	200
AMRS 0804M	8	1/4	200
AMRS 0806M	8	3/8	150
AMRS 1004M	10	1/4	130
AMRS 1006M	10	3/8	100
AMRS 1007M	10	1/2	100
AMRS 1206M	12	3/8	80
AMRS 1207M	12	1/2	80

MTSB - Male Tee Swivel

BSP(P) Thread

PART NO.	Tube O.D. (mm)	BSP(P) Thread	Qty / Box
AMTSB 0402M	4	1/8	450
AMTSB 0404M	4	1/4	350
AMTSB 0502M	5	1/8	300
AMTSB 0504M	5	1/4	250
AMTSB 0602M	6	1/8	250
AMTSB 0604M	6	1/4	200
AMTSB 0802M	8	1/8	200
AMTSB 0804M	8	1/4	150
AMTSB 0806M	8	3/8	150
AMTSB 1004M	10	1/4	130
AMTSB 1006M	10	3/8	100
AMTSB 1007M	10	1/2	100
AMTSB 1206M	12	3/8	80
AMTSB 1207M	12	1/2	80

MTS - Male Tee Swivel

BSPT(PT) Thread

PART NO.	Tube O.D. (mm)	BSPT(PT) Thread	Qty / Box
AMTS 0402M	4	1/8	500
AMTS 0404M	4	1/4	400
AMTS 0502M	5	1/8	300
AMTS 0504M	5	1/4	250
AMTS 0602M	6	1/8	250
AMTS 0802M	8	1/8	200
AMTS 0804M	8	1/4	180
AMTS 0806M	8	3/8	150
AMTS 1004M	10	1/4	130
AMTS 1006M	10	3/8	100
AMTS 1007M	10	1/2	100
AMTS 1206M	12	3/8	70
AMTS 1207M	12	1/2	70

OC - Offset Connector

PART NO.	Tube O.D. (mm)	Tube O.D. (mm)	Qty / Box
AOC 1006M	10	6	200
AOC 1208M	12	8	200

CR - CRoss

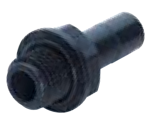
PART NO.	Tube O.D.(mm)	Qty / Box
ACR 0404M	4	300
ACR 0606M	6	250
ACR 0808M	8	200
ACR 1010M	10	120
ACR 1212M	12	80

THWD - THree Way Divider

PART NO.	Tube O.D. (mm)	Tube O.D. (mm)	Qty / Box
ATHWD 1006M	10	6	150
ATHWD 1210M	12	10	50

SAB - Stem Adapter

BSP(P) Thread



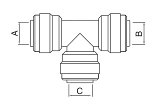
PART NO.	Stem O.D. (mm)	BSP(P) Thread	Qty / Box
ASAB 0402M	4	1/8	900
ASAB 0404M	4	1/4	600
ASAB 0502M	5	1/8	600
ASAB 0504M	5	1/4	500
ASAB 0602M	6	1/8	500
ASAB 0604M	6	1/4	400
ASAB 0802M	8	1/8	500
ASAB 0804M	8	1/4	400
ASAB 0806M	8	3/8	250
ASAB 1004M	10	1/4	250
ASAB 1006M	10	3/8	250
ASAB 1007M	10	1/2	150
ASAB 1206M	12	3/8	150
ASAB 1207M	12	1/2	150
ASAB 1506M	15	3/8	150
ASAB 1507M	15	1/2	150
ASAB 1807M	18	1/2	100
ASAB 2207M	22	1/2	80
ASAB 2209M	22	3/4	80

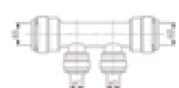
SA - Stem Adapter

BSPT(PT) Thread

PART NO.	Stem O.D. (mm)	BSPT(PT) Thread	Qty / Box
ASA 0402M	4	1/8	800
ASA 0404M	4	1/4	500
ASA 0502M	5	1/8	800
ASA 0504M	5	1/4	500
ASA 0602M	6	1/8	500
ASA 0604M	6	1/4	500
ASA 0802M	8	1/8	500
ASA 0804M	8	1/4	400
ASA 0806M	8	3/8	300
ASA 1004M	10	1/4	400
ASA 1006M	10	3/8	300
ASA 1007M	10	1/2	250
ASA 1206M	12	3/8	250
ASA 1207M	12	1/2	150

TU - Tee Union





PART NO.	Tube O.D. (A) (mm)	Tube O.D. (B) (mm)	Tube O.D. (C) (mm)	Qty / Box
ATU 040404M	4	4	4	300
ATU 050505M	5	5	5	350
ATU 060606M	6	6	6	300
ATU 080808M	8	8	8	200
ATU 101006M	10	10	6	150
ATU 101010M	10	10	10	150
ATU 121210M	12	12	10	100
ATU 121212M	12	12	12	100
ATU 121012M	12	10	12	100
ATU 151010M	15	10	10	50
ATU 151510M	15	15	10	50
ATU 151512M	15	15	12	50
ATU 151515M	15	15	15	50
ATU 151522M	15	15	22	40
ATU 161616M	16	16	16	40
ATU 161622M	16	16	22	40
ATU 181815M	18	18	15	30
ATU 181816M	18	18	16	30
ATU 181818M	18	18	18	30
ATU 221515M	22	15	22	20
ATU 221522M	22	15	22	20
ATU 222210M	22	22	10	20
ATU 222215M	22	22	15	20
ATU 221616M	22	16	16	20
ATU 222216M	22	22	16	20
ATU 222222M	22	22	22	20
ATU 282815M	28	28	15	10
ATU 282828M	28	28	28	10

PART NO.	Tube O.D. (A)	Tube O.D. (B)	Tube O.D. (C)	Qty / Box
ATU 15M0606	15mm	3/8	3/8	50
ATU 1515M06	15mm	15mm	3/8	50
ATU 1616M07	16mm	16mm	1/2	20
ATU 18M0606	18mm	3/8	3/8	20

PART NO.	Tube O.D. (A)	Tube O.D. (B)	Tube O.D. (C)	Tube O.D. (C)	Qty / Box
ATU 1515M0606	15mm	15mm	3/8	3/8	20

BU - Bulkhead Union

PART NO.	Tube O.D. (mm)	Tube O.D. (mm)	Thread Size	Qty / Box
ABU 0404M	4	4	M16XP1	300
ABU 0505M	5	5	M16XP1	300
ABU 0606M	6	6	M16XP1	250
ABU 0610M	6	10	M20XP1.5	200
ABU 0808M	8	8	M20XP1.5	200
ABU 1006M	10	6	M20XP1.5	150
ABU 1010M	10	10	M20XP1.5	150
ABU 1212M	12	12	M27XP1.5	70

UB - U Bend

PART NO.	Tube O.D (mm)	Tube O.D (mm)	Qty / Box
AUB 0606M	6	6	350
AUB 0808M	8	8	250
AUB 1010M	10	10	150
AUB 1212M	12	12	100
AUB 1515M	15	15	60
AUB 1616M	16	16	60
AUB 2222M	22	22	30

ACETAL FITTINGS (BLACK / METRIC)

TWD - Two Way Divider

PART NO.	Tube in (mm)	Tube out (mm)	Qty / Box
ATWD 0404M	4	4	400
ATWD 0606M	6	6	300
ATWD 0808M	8	8	200
ATWD 1008M	10	8	150
ATWD 1010M	10	10	150
ATWD 1012M	10	12	100
ATWD 1212M	12	12	100
ATWD 1515M	15	15	100

UC - Union Connector

PART NO.	Tube in (mm)	Tube out (mm)	Qty / Box
AUC 0404M	4	4	500
AUC 0505M	5	5	500
AUC 0604M	6	4	500
AUC 0605M	6	5	400
AUC 0606M	6	6	350
AUC 0804M	8	4	400
AUC 0805M	8	5	300
AUC 0806M	8	6	300
AUC 0808M	8	8	300
AUC 1004M	10	4	300
AUC 1005M	10	5	300
AUC 1006M	10	6	250
AUC 1008M	10	8	250
AUC 1010M	10	10	250
AUC 1208M	12	8	200
AUC 1210M	12	10	150
AUC 1212M	12	12	150
AUC 1510M	15	10	100
AUC 1512M	15	12	100
AUC 1515M	15	15	100
AUC 1612M	16	12	100
AUC 1615M	16	15	100
AUC 1616M	16	16	100
AUC 1818M	18	18	60
AUC 2215M	22	15	50
AUC 2216M	22	16	50
AUC 2222M	22	22	50
AUC 2828M	28	28	40

PART NO.	Tube O.D. (mm)	Tube O.D.	Qty / Box
AUC 15M04	15	1/4	100
AUC 15M07	15	1/2	100
AUC 12M06	12	3/8	100

New

SUC - Swivel Union Connector

BSP(P) Thread

PART NO.	Tube O.D. (mm)	BSP(P) Thread	Qty / Box
ASUC 1507M	15	1/2	80
ASUC 1509M	15	3/4	50
ASUC 1607M	16	1/2	80
ASUC 1609M	16	3/4	50
ASUC 2209M	22	3/4	40

SEU - Swivel Elbow Union

BSP(P) Thread

PART NO.	Tube O.D. (mm)	BSP(P) Thread	Qty / Box
ASEU 1507M	15	1/2	50
ASEU 1509M	15	3/4	50
ASEU 1607M	16	1/2	50
ASEU 1609M	16	3/4	50

TES - Tube End Stop

PART NO.	Tube O.D. (mm)	Qty / Box
ATES 06M	6	800
ATES 08M	8	600
ATES 10M	10	300
ATES 12M	12	200
ATES 15M	15	100
ATES 16M	16	100
ATES 18M	18	50
ATES 22M	22	50

PL - PLug

PART NO.	Stem O.D. (mm)	Qty / Box
APL 04M	4	1000
APL 05M	5	1000
APL 06M	6	1000
APL 08M	8	700
APL 10M	10	500
APL 12M	12	400
APL 15M	15	250
APL 18M	18	250
APL 22M	22	100

TBC - Tube Barb Connector

PART NO.	Stem O.D. (mm)	Tube I.D. (mm)	Qty / Box
ATBC 0604M	6	4	1000
ATBC 0606M	6	6	800
ATBC 0806M	8	6	700
ATBC 1008M	10	8	500
ATBC 1010M	10	10	500
ATBC 1210M	12	10	300

PART NO.	Stem O.D. (mm)	Tube O.D.	Qty / Box
ATBC 15M06	15	3/8	300
ATBC 15M07	15	1/2	300

SSA - Stem to Stem Adapter

PART NO.	Stem O.D. (mm)	Stem O.D.	Qty / Box
ASSA 15M06	15	3/8	200

BBC - BarB Connetor

PART NO.	Tube O.D. (mm)	Tube I.D.	Qty / Box
ABBC 1507M	15	1/2	150
ABBC 1607M	16	1/2	150
ABBC 2207M	22	1/2	80
ABBC 2209M	22	3/4	80

PART NO.	Tube O.D. (mm)	Tube I.D. (mm)	Qty / Box
ABBC 1210M	12	10	200
ABBC 1510M	15	10	150
ABBC 1610M	16	10	150

PART NO.	Tube O.D. (mm)	Tube I.D. (mm)	Qty / Box
ABBC 15M09	15	9	150
ABBC 15M10	15	10	150
ABBC 15M13	15	13	150

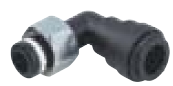
DA - Drain Adapter

NPSH Thread

PART NO.	Tube O.D. (mm)	NPSH Thread	Qty / Box
ADA 1509M	15	3/4	50
ADA 1609M	16	3/4	50

EFCB - Elbow Female Connector

BSP(P) Thread



PART NO.	Tube O.D. (mm)	BSP(P) Thread	Qty / Box
AEFCB 1507M	15	1/2	50

TC - Tank Connector

PART NO.	Tube O.D. (mm)	Thread Size	Qty / Box
ATC 15M	15	M30XP3.5	30
ATC 22M	22	M39XP3.5	20
ATC 28M	28	M39XP2.0	10

FWC - Four Way Connetor

PART NO.	Tube O.D. (mm)	Tube O.D. (mm)	Qty / Box
AFWC 2210M	22	10	50

SFCB - Staight Female Connetor

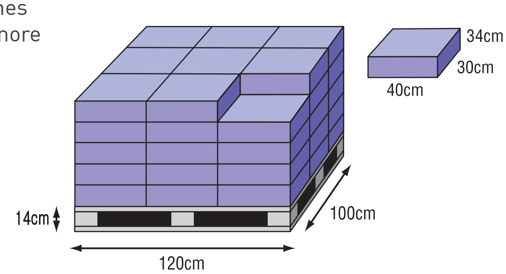
BSP(P) Thread

PART NO.	Tube O.D. (mm)	BSP(P) Thread	Qty / Box
ASFCB 1507M	15	1/2	50
ASFCB 1509M	15	3/4	50
ASFCB 2209M	22	3/4	40

Special design

- The unique oval-shaped collet is easier to grip, facilitating connecting and disconnecting.
- The rounded stainless teeth minimize scratches on the tube, allowing more frequent re-use.

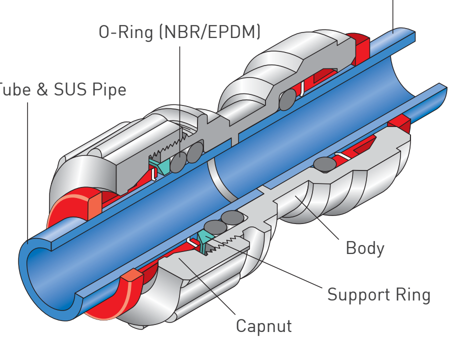
PACKAGING - PALLET AND BOX SIZES



ACETAL POWER FITTINGS (GRAY-INCH / BLACK-METRIC)

for use with Stainless Steel Pipe

Structure



Features

- This is the special products using for stainless steel, or other plated pipes.
- When you fasten 'cap nut',interaction between Support Ring and Collet can grab more completely the pipe, and seal O-Ring in the fitting.
- Two O-Rings give more sealing effectiveness in the high temperature.
- It prevents a breakaway of pipe from fastening 'cap nut' with using hands tools.

PSEU - Power Elbow Union (Single)

PART NO.	Tube O.D.	Power O.D.	Qty / Box
APSEU 0505	5/16	5/16	250
APSEU 0506	5/16	3/8	250
APSEU 0604	3/8	1/4	300
APSEU 0605	3/8	5/16	200
APSEU 0606	3/8	3/8	200

PBEU - Power Elbow Union (Both)

PART NO.	Power O.D.	Power O.D.	Qty / Box
APBEU 0505	5/16	5/16	250
APBEU 0605	3/8	5/16	250
APBEU 0606	3/8	3/8	200

PBUC - Power Union Connector (Both)

PART NO.	Power O.D.	Power O.D.	Qty / Box
APBUC 0505	5/16	5/16	250
APBUC 0606	3/8	3/8	250

PSUC - Power Union Connector (Single)

PART NO.	Tube O.D.	Power O.D.	Qty / Box
APSUC 0505	5/16	5/16	300
APSUC 0506	5/16	3/8	250
APSUC 0604	3/8	1/4	250
APSUC 0605	3/8	5/16	200
APSUC 0606	3/8	3/8	200

PMCW - Power Male Connector

BSW Thread

PART NO.	Power O.D.	BSW Thread	Qty / Box
APMCW 05 9/16	5/16	9/16-24	350
APMCW 06 9/16	3/8	9/16-24	300

PMCBT - Power Male Connector

BSPT(PT) Thread

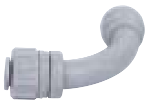
PART NO.	Power O.D.	BSPT(PT) Thread	Qty / Box
APMCBT 0504	5/16	1/4	400

PSP - Power SPanner (Nylon)

PART NO.	Tube O.D.
NPSP	5/16, 3/8

● Available in metalic spanner

PSFBU - Power Flow Bend Union (Single)



PART NO.	Power O.D.	Tube O.D.	Qty / Box
APSFBU 0505	5/16	5/16	

PMCF - Power Male Connector

MFL Thread

PART NO.	Power O.D.	MFL Thread	Qty / Box
APMCF 0504	5/16	1/4	400
APMCF 0506	5/16	3/8	250

- 7/16-20 UNF corresponds to a 1/4 MFL
- 5/8-18 UNF corresponds to a 3/8 MFL

PBBC - Power BarB Connector

PART NO.	Power O.D.	Tube I.D.	Qty / Box
APBBC 0404	1/4	1/4	400
APBBC 0504	5/16	1/4	400
APBBC 0604	3/8	1/4	250

PMCBT - Power Male Connector

BSPT(PT) Thread

PART NO.	Power O.D. (mm)	BSPT(PT) Thread	Qty / Box
APMCBT 0804M	8	1/4	400

PSEU - Power Elbow Union (Single)

PART NO.	Tube O.D. (mm)	Power O.D. (mm)	Qty / Box
APSEU 0808M	8	8	250
APSEU 0810M	8	10	250
APSEU 1006M	10	6	300
APSEU 1008M	10	8	250
APSEU 1010M	10	10	250

PBEU - Power Elbow Union (Both)

PART NO.	Power O.D. (mm)	Power O.D. (mm)	Qty / Box
APBEU 0808M	8	8	250
APBEU 1008M	10	8	250
APBEU 1010M	10	10	250

PSUC - Power Union Connector (Single)

PART NO.	Tube O.D. (mm)	Power O.D. (mm)	Qty / Box
APSUC 0808M	8	8	300
APSUC 0810M	8	10	250
APSUC 1006M	10	6	250
APSUC 1008M	10	8	250
APSUC 1010M	10	10	250

PBUC - Power Union Connector (Both)

PART NO.	Power O.D. (mm)	Power O.D. (mm)	Qty / Box
APBUC 0808M	8	8	250
APBUC 1010M	10	10	250

PMCW - Power Male Connector

BSW Thread

PART NO.	Power O.D. (mm)	BSW Thread	Qty / Box
APMCW 08 9/16M	8	9/16-24	400
APMCW 10 9/16M	10	9/16-24	350

PMCF - Power Male Connector

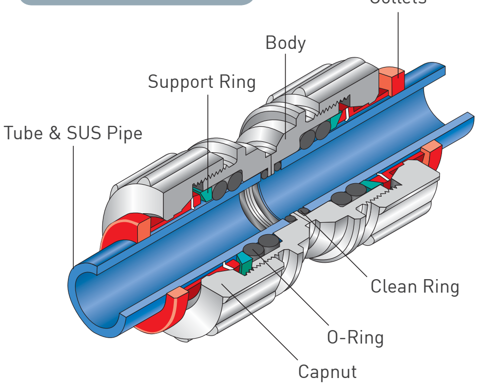
MFL Thread

PART NO.	Power O.D. (mm)	MFL Thread	Qty / Box
APMCF 0804M	8	1/4	40
APMCF 0806M	8	3/8	350

- 7/16-20 UNF corresponds to a 1/4 MFL
- 5/8-18 UNF corresponds to a 3/8 MFL

CLEAN FITTINGS (GRAY / INCH)

Structure



■ Features

- Designed to no gap between pipe and clean ring, there is no movement of the pipe.
- This funtion prevents the containment, and provides to use the clean environments.
- Clean fittings are conducted the same function as power fittings and with EPDM O-rings.

CIMCBT - Clean fitting Male Connector

BSPT(PT)Thread

PART NO.	Power O.D.	BSPT(PT) Thread	Qty / Box
ACIMCBT 0504	5/16	1/4	400

CIBEU - Clean fitting Elbow Union (Both)

PART NO.	Power O.D.	Power O.D.	Qty / Box
ACIBEU 0505	5/16	5/16	250
ACIBEU 0605	3/8	5/16	250
ACIBEU 0606	3/8	3/8	250

CIBUC - Clean fitting Union Connector (Both)

PART NO.	Power O.D.	Power O.D.	Qty / Box
ACIBUC 0505	5/16	5/16	250
ACIBUC 0606	3/8	3/8	250

CIMCW - Clean fitting Male Connector

BSW Thread

PART NO.	Power O.D.	BSW Thread	Qty / Box
ACIMCW 05 9/16	5/16	9/16-24	400
ACIMCW 06 9/16	3/8	9/16-24	350

CIMCF - Clean fitting Male Connector

MFL Thread

PART NO.	Power O.D.	MFL Thread	Qty / Box
ACIMCF 0504	5/16	1/4	400
ACIMCF 0506	5/16	3/8	350

- 7/16-20 UNF corresponds to a 1/4 MFL
- 5/8-18 UNF correspords to a 3/8 MFL

POLYPROPYLENE FITTINGS (WHITE / INCH)

■ Suitable for

- **Water & foods use** : *DMfit®* products are manufactured from safe, non-toxic materials meeting the requirements of FDA, ANSI/NSF-51, 61. Our products are widely used in water purification, food/beverage.
- **Function & Quality** : *DMfit®* provides quick and convenient assembly - saving time & expense. Our ISO9001, 14001 registered quality system ensures our customers a superior level of product quality. Defects are easily detectable and maintenance is easy with its easy dismantling for access.
- **Collet Design** : Our unique oval collet design is superior and more practical, and is an improvement welcomed by our world-wide customers in all industries.
- **Applications** : Beyond water and food use, fittings can be used with air, gases, vacuum, & liquids. And all connections can be assembled & disassembled repeatedly. A broad of sizes covers a broad scope o f applications.
- **Color** : White Polypropylene with food grade EPDM O-rings.

Working Pressure and Temperature

Pressure	10bar	4bar
Temperature	1℃(35°F) ~ 20℃(70°F)	65℃(150°F)

MC - Male Connector

NPTF Thread

PART NO.	Tube O.D.	NPTF Thread	Qty / Box
PMC 0402W	1/4	1/8	400
PMC 0404W	1/4	1/4	350
PMC 0406W	1/4	3/8	300
PMC 0407W	1/4	1/2	150
PMC 0502W	5/16	1/8	400
PMC 0504W	5/16	1/4	400
PMC 0506W	5/16	3/8	350
PMC 0602W	3/8	1/8	300
PMC 0604W	3/8	1/4	300
PMC 0606W	3/8	3/8	250
PMC 0607W	3/8	1/2	200
PMC 0706W	1/2	3/8	200
PMC 0707W	1/2	1/2	150
PMC 0807W	5/8	1/2	80
PMC 1009W	7/8	3/4	40

MCB - Male Connector

BSP(P) Thread

PART NO.	Tube O.D.	BSP(P) Thread	Qty / Box
PMCB 0807W	5/8	1/2	100
PMCB 0809W	5/8	3/4	100
PMCB 1009W	7/8	3/4	50

ME - Male Elbow

NPTF Thread

PART NO.	Tube O.D.	NPTF Thread	Qty / Box
PME 0402W	1/4	1/8	500
PME 0404W	1/4	1/4	350
PME 0406W	1/4	3/8	300
PME 0504W	5/16	1/4	300
PME 0506W	5/16	3/8	300
PME 0604W	3/8	1/4	250
PME 0606W	3/8	3/8	250
PME 0706W	1/2	3/8	200
PME 0707W	1/2	1/2	150

EU - Elbow Union

PART NO.	Tube O.D.	Tube O.D.	Qty / Box
PEU 0404W	1/4	1/4	350
PEU 0504W	5/16	1/4	300
PEU 0505W	5/16	5/16	300
PEU 0604W	3/8	1/4	200
PEU 0605W	3/8	5/16	200
PEU 0606W	3/8	3/8	200
PEU 0704W	1/2	1/4	150
PEU 0705W	1/2	5/16	150
PEU 0706W	1/2	3/8	150
PEU 0707W	1/2	1/2	150
PEU 1008W	7/8	5/8	50

POLYPROPYLENE FITTINGS (WHITE / INCH)

TU - Tee Union

PART NO.	Tube O.D. (A)	Tube O.D. (B)	Tube O.D. (C)	Qty / Box
PTU 010101W	5/32	5/32	5/32	350
PTU 030303W	3/16	3/16	3/16	350
PTU 040404W	1/4	1/4	1/4	300
PTU 050505W	5/16	5/16	5/16	200
PTU 060604W	3/8	3/8	1/4	150
PTU 060606W	3/8	3/8	3/8	150
PTU 070706W	1/2	1/2	3/8	100
PTU 070707W	1/2	1/2	1/2	100
PTU 080804W	5/8	5/8	1/4	50
PTU 080807W	5/8	5/8	1/2	50
PTU 080808W	5/8	5/8	5/8	40
PTU 080810W	5/8	5/8	7/8	40
PTU 100810W	7/8	5/8	7/8	30
PTU 101008W	7/8	7/8	5/8	30
PTU 100808W	7/8	5/8	5/8	40
PTU 101010W	7/8	7/8	7/8	30

TTU - Tube Tee Union connector

PART NO.	Tube O.D.	Tube O.D.	Stem O.D.	Qty / Box
PTTU 080808W	5/8	5/8	5/8	50

FAB - Female Adapter

BSP(P) Thread (Cone Type)

PART NO.	Tube O.D.	BSP(P) Thread	Qty / Box
PFAB 0406CW	1/4	3/8	250
PFAB 0407CW	1/4	1/2	200
PFAB 0506CW	5/16	3/8	200
PFAB 0507CW	5/16	1/2	200
PFAB 0606CW	3/8	3/8	200
PFAB 0607CW	3/8	1/2	200
PFAB 0608CW	3/8	5/8	150
PFAB 0708CW	1/2	5/8	150

FA - Female Adapter

NPTF Thread

PART NO.	Tube O.D.	NPTF Thread	Qty / Box
PFA 0402W	1/4	1/8	400
PFA 0404W	1/4	1/4	400
PFA 0502W	5/16	1/8	300
PFA 0504W	5/16	1/4	300
PFA 0602W	3/8	1/8	300
PFA 0604W	3/8	1/4	300
PFA 0807W	5/8	1/2	100
PFA 0809W	5/8	3/4	100
PFA 1009W	7/8	3/4	50
PFA 1011W	7/8	1	40

FAB - Female Adapter

BSP(P) Thread (Flat Type)

PART NO.	Tube O.D.	BSP(P) Thread	Qty / Box
PFAB 0508FW	5/16	5/8	250
PFAB 0607FW	3/8	1/2	200
PFAB 0608FW	3/8	5/8	150
PFAB 0706FW	1/2	3/8	200
PFAB 0707FW	1/2	1/2	150
PFAB 0708FW	1/2	5/8	150

FAUF - Female Adapter

UNF Thread (Cone Type)

PART NO.	Tube O.D.	UNF Thread	Qty / Box
PFAUF 04 7/16CW	1/4	7/16 - 20	400
PFAUF 05 7/16CW	5/16	7/16 - 20	350
PFAUF 06 7/16CW	3/8	7/16 - 20	300

FAU - Female Adapter

UNS Thread (Cone Type)

PART NO.	Tube O.D.	UNS Thread	Qty / Box
PFAU 04 7/16CW	1/4	7/16 - 24	400
PFAU 05 7/16CW	5/16	7/16 - 24	350
PFAU 06 7/16CW	3/8	7/16 - 24	300

FAUF - Female Adapter

UNF Thread (V - Type)

PART NO.	Tube O.D.	UNF Thread	Qty / Box
PFAUF 04 7/16VW	1/4	7/16 - 20	400
PFAUF 05 7/16VW	5/16	7/16 - 20	300
PFAUF 06 7/16VW	3/8	7/16 - 20	300
PFAUF 06 5/8VW	3/8	5/8 - 18	350

- 7/16 UNF Corresponds to a 1/4 MFL
- 5/8 UNF Corresponds to a 3/8 MFL

FAUN - Female Adapter

UN Thread (V - Type)

PART NO.	Tube O.D.	UN Thread	Qty / Box
PFAUN 05 1/2VW	5/16	1/2 - 16	350
PFAUN 06 1/2VW	3/8	1/2 - 16	200
PFAUN 07 1/2VW	1/2	1/2 - 16	150

HA - Hub Adapter

NPSH Thread

PART NO.	Tube O.D.	NPSH Thread	Qty / Box
PHA 1011W	7/8	1	400

DA - Drain Adapter

NPSH Thread

PART NO.	Tube O.D.	NPSH Thread	Qty / Box
PDA 0809W	5/8	3/4	50

SA - Stem Adapter

NPTF Thread

PART NO.	Stem O.D.	NPTF Thread	Qty / Box
PSA 0102W	5/32	1/8	800
PSA 0104W	5/32	1/4	500
PSA 0302W	3/16	1/8	800
PSA 0402W	1/4	1/8	500
PSA 0404W	1/4	1/4	500
PSA 0502W	5/16	1/8	500
PSA 0504W	5/16	1/4	400
PSA 0506W	5/16	3/8	300
PSA 0604W	3/8	1/4	300
PSA 0606W	3/8	3/8	300
PSA 0706W	1/2	3/8	250
PSA 0707W	1/2	1/2	150

BU - Bulkhead Union

PART NO.	Tube O.D.	Tube O.D.	Thread Size	Qty / Box
PBU 0101W	5/32	5/32	M16XP1	300
PBU 0303W	3/16	3/16	M16XP1	300
PBU 0404W	1/4	1/4	M16XP1	250
PBU 0406W	1/4	3/8	M20XP1.5	200
PBU 0505W	5/16	5/16	M20XP1.5	150
PBU 0604W	3/8	1/4	M20XP1.5	150
PBU 0606W	3/8	3/8	M20XP1.5	150
PBU 0707W	1/2	1/2	M27XP1.5	70

SABT - Stem Adapter

BSPT(PT) Thread

PART NO.	Stem O.D.	BSPT(PT) Thread	Qty / Box
PSABT 0302W	3/16	1/8	800
PSABT 0504W	5/16	1/4	400
PSABT 0506W	5/16	3/8	300
PSABT 0604W	3/8	1/4	400
PSABT 0606W	3/8	3/8	300
PSABT 0707W	1/2	1/2	150

CR - CRoss

PART NO.	Tube O.D.	Qty / Box
PCR 0101W	5/32	300
PCR 0404W	1/4	250
PCR 0505W	5/16	200
PCR 0606W	3/8	100
PCR 0707W	1/2	80

THWD - THree Way Divider

PART NO.	Tube O.D.	Tube O.D.	Qty / Box
PTHWD 0604W	3/8	1/4	150
PTHWD 0706W	1/2	3/8	50

UC - Union Connector

PART NO.	Tube O.D.	Tube O.D.	Qty / Box
PUC 0101W	5/32	5/32	500
PUC 0303W	3/16	3/16	500
PUC 0404W	1/4	1/4	350
PUC 0501W	5/16	5/32	400
PUC 0503W	5/16	3/16	400
PUC 0504W	5/16	1/4	300
PUC 0505W	5/16	5/16	300
PUC 0603W	3/8	3/16	300
PUC 0604W	3/8	1/4	250
PUC 0605W	3/8	5/16	250
PUC 0606W	3/8	3/8	250
PUC 0705W	1/2	5/16	200
PUC 0706W	1/2	3/8	200
PUC 0707W	1/2	1/2	150
PUC 067.5W	3/8	7.5 (mm)	250
PUC 0807W	5/8	1/2	100
PUC 0808W	5/8	5/8	100
PUC 1008W	7/8	5/8	50
PUC 1010W	7/8	7/8	50

TEU - Tube Elbow Union

PART NO.	Tube O.D.	Stem O.D.	Qty / Box
PTEU 0101W	5/32	5/32	800
PTEU 0303W	3/16	3/16	600
PTEU 0306W	3/16	3/8	500
PTEU 0404W	1/4	1/4	500
PTEU 0406W	1/4	3/8	400
PTEU 0505W	5/16	5/16	350
PTEU 0506W	5/16	3/8	350
PTEU 0606W	3/8	3/8	250
PTEU 0607W	3/8	1/2	200
PTEU 0707W	1/2	1/2	150
PTEU 0808W	5/8	5/8	50
PTEU 1010W	7/8	7/8	50

POLYPROPYLENE FITTINGS (WHITE / INCH)

TES - Tube End Stop

PART NO.	Tube O.D.	Qty / Box
PTES 04W	1/4	800
PTES 05W	5/16	600
PTES 06W	3/8	300
PTES 07W	1/2	300
PTES 08W	5/8	100
PTES 10W	7/8	50

SUC - Swivel Union Connector

BSP(P) Thread

PART NO.	Tube O.D.	BSP(P) Thread	Qty / Box
PSUC 0807W	5/8	1/2	50
PSUC 0809W	5/8	3/4	50
PSUC 1009W	7/8	3/4	40

TWD - Two Way Divider

PART NO.	Tube in	Tube out	Qty / Box
PTWD 0101W	5/32	5/32	400
PTWD 0404W	1/4	1/4	300
PTWD 0505W	5/16	5/16	200
PTWD 0605W	3/8	5/16	150
PTWD 0606W	3/8	3/8	150
PTWD 0607W	3/8	1/2	100
PTWD 0707W	1/2	1/2	100

UB - U Bend

PART NO.	Tube O.D.	Tube O.D.	Qty / Box
PUB 0404W	1/4	1/4	350
PUB 0505W	5/16	5/16	250
PUB 0606W	3/8	3/8	150
PUB 0707W	1/2	1/2	100
PUB 0808W	5/8	5/8	60
PUB 1010W	7/8	7/8	40

SVA - Stop Valve Adapter

UNEF Thread

PART NO.	Tube O.D.	UNEF Thread	Qty / Box
PSVA 04 9/16W	1/4	9/16-24	200
PSVA 06 9/16W	3/8	9/16-24	150

- For an undercounter filter systems

PL - PLug

PART NO.	Stem O.D.	Qty / Box
PPL 01W	5/32	1000
PPL 03W	3/16	1000
PPL 04W	1/4	1000
PPL 05W	5/16	700
PPL 06W	3/8	500
PPL 07W	1/2	400
PPL 08W	5/8	200
PPL 10W	7/8	100

SEU - Swivel Elbow Union

BSP(P) Thread

PART NO.	Tube O.D.	BSP(P) Thread	Qty / Box
PSEU 0807W	5/8	1/2	50
PSEU 0809W	5/8	3/4	50

KFA - Kitchen Faucet Adapter

NPSM Thread

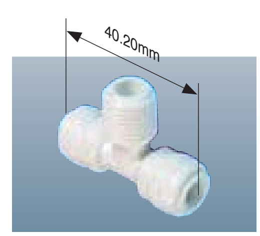
PART NO.	Tube O.D.	NPSM Thread	Qty / Box
PKFA 0407W	1/4	1/2-14	100
PKFA 0607W	3/8	1/2-14	100

- For installing undercounter filters & RO systems

MTU - Male Tee Union

NPTF Thread

PART NO.	Tube O.D.	NPTF Thread	Qty / Box
PMTU 0404W	1/4	1/4	300



RD - ReDucer

PART NO.	Tube O.D.	Stem O.D.	Qty / Box
PRD 0405W	1/4	5/16	700
PRD 0406W	1/4	3/8	500
PRD 0408W	1/4	5/8	300
PRD 0506W	5/16	3/8	400
PRD 0507W	5/16	1/2	300
PRD 0607W	3/8	1/2	300

TBC - Tube Barb Connector

PART NO.	Stem O.D.	Tube I.D.	Qty / Box
PTBC 0404	1/4	1/4	1000
PTBC 0405	1/4	5/16	800
PTBC 0504	5/16	1/4	800
PTBC 0505	5/16	5/16	700
PTBC 0506	5/16	3/8	700
PTBC 0604	3/8	1/4	500
PTBC 0605	3/8	5/16	500
PTBC 0606	3/8	3/8	400
PTBC 0607	3/8	1/2	300
PTBC 0706	1/2	3/8	300
PTBC 0707	1/2	1/2	300

STOP & FAUCET ADAPTOR VALVES

Lead Free

AV range of Stop & Faucet Valve Adaptor valves and Slip Tee Valves are manufactured in white Polypropylene, reinforced plastic with EPDM O-rings which provides value- added advantages in the installation of water supply line mainly.

AV range of Stop & Faucet Valve Adaptors and Slip Tee Valves are designed for use in drinking water systems, Refrigerators, Ice-Makers, Humidifiers and Water filtration applications, etc.,. Our valves offer greater efficiency than any traditional valves.
AV valves have been approved in NSF/ANSI 61 & 372.
AV range is 1/4" Turn valves.

Working Pressure and Temperature

Pressure	12bar	6bar
Temperature	20℃(70°F)	65℃(150°F)

STOP VALVE ADAPTOR _ Hand Tighten

PART NO	TUBE OD	THREAD	Qty / Box
AVA6753CP	1/4"	3/8" x 3/8" Compression	70
AVA6713CP	3/8"	3/8" x 3/8" Compression	70
AVA6753CPB	1/4"	3/8" x 3/8" BSPP	70
AVA6713CPB	3/8"	3/8" x 3/8" BSPP	70

STOP VALVE ADAPTOR _ Brass Shaft

PART NO	TUBE OD	THREAD	Qty / Box
AVA6753BCP	1/4"	3/8" x 3/8" Compression	70
AVA6713BCP	3/8"	3/8" x 3/8" Compression	70
AVA6753BB	1/4"	3/8" x 3/8" BSPP	70
AVA6713BB	3/8"	3/8" x 3/8" BSPP	70

* Conversion adaptor can be threaded to 1/2" x 1/2" NPS/BSPP or 3/8" x 3/8" Compression/BSPP

How to Connect

① Shut off your existing Stop valve and disconnect the riser from the valve.
② Connect our Stop valve to the water valve.
③ Connect the riser to our valve.
④ Ensure the Perfect Connection Every Time. Open valves and check for leaks.

FAUCET VALVE ADAPTOR _ Hand Tighten

PART NO	TUBE OD	THREAD	Qty / Box
AVA6754	1/4"	1/2" x 1/2" NPS	50
AVA6714	3/8"	1/2" x 1/2" NPS	50
AVA6754BP	1/4"	1/2" x 1/2" BSPP	50
AVA6714BP	3/8"	1/2" x 1/2" BSPP	50

SLIP TEE VALVE

Easy connection with your existing water line – Slip connection
Designed to be suitable for Copper, PEX and CPVC pipe.

5" Long

PART NO	TUBE OD	TUBE OD BRANCH	Qty / Box
AVT67665S	5/8" x 5/8"	1/4"	25
AVT67661S	5/8" x 5/8"	3/8"	25
AVT67445S	7/8" x 7/8"	1/4"	25
AVT67665SM	15mm x 15mm	1/4"	25
AVT67661SM	15mm x 15mm	3/8"	25
AVT67445SM	22mm x 22mm	1/4"	25

Angle Check Valve

PART NO	TUBE OD	THREAD	Qty / Box
CVA54B	1/4"	1/2" x 1/2" NPS	50
CVA14B	3/8"	1/2" x 1/2" NPS	50
CVA53BB	1/4"	3/8" x 3/8" BSPP	50
CVA13BB	3/8"	3/8" x 3/8" BSPP	50
CVA54BBP	1/4"	1/2" x 1/2" BSPP	50
CVA14BBP	3/8"	1/2" x 1/2" BSPP	50

ICE Maker / Water Supply Kit

PART NO	BAG / QTY	Qty / Box
DIK-T (Clear)	1	20
DIK-W (White)	1	20
DIK-B (Blue)	1	20

Contains : (1) 25ft 1/4" PE-RT Tubing, (1) 1/4" Stop Valve, (1) 1/4" Female Adaptor

VALVES (WHITE / INCH)

Control Valves

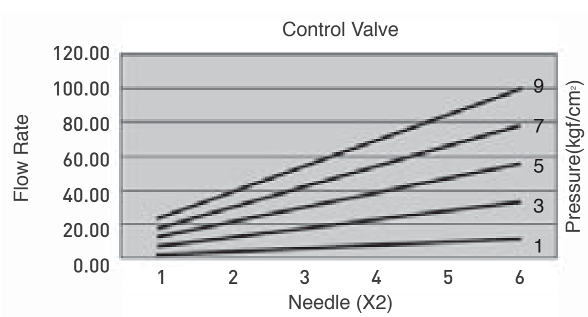
■ Features

- Highly durable and fatigue resistant.
- Can be used with a variety of chemicals & gases. However, when using other than water or air, please refer to the Chemical Compatability Tables, or consult our representative.
- Do not apply excessive vibration, torque, shock, or other strong loads on the fittings. The valve body may be damaged or collects may be dislocated.
- **Color** : Inch Size - White Acetal Copolymer
  Metric Size - Black Acetal Copolymer

Working Pressure and Temperature

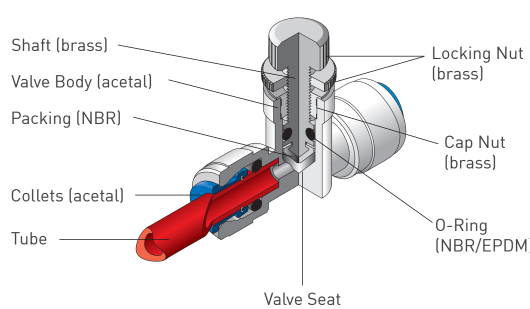
Pressure	10bar	4bar
Temperature	1℃(35°F)～20℃(70°F)	65℃(150°F)

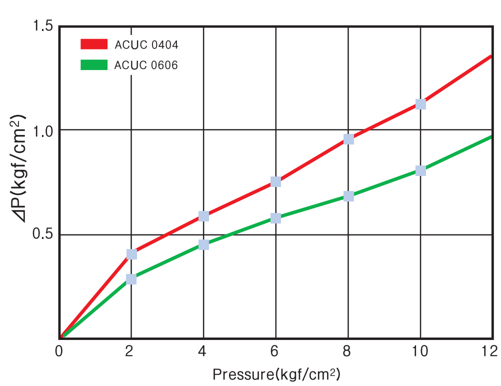
Flow Rate Per Rotation of Valve Stem



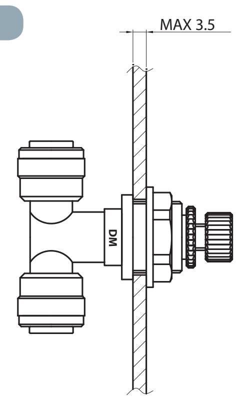
※ Above data may vary depending on the time and temperature variations.

Structure





Assembly



CUC - Control valve Union Connector

PART NO.	Tube O.D.	Tube O.D.	Qty / Box
ACUC 0404	1/4	1/4	250
ACUC 0606	3/8	3/8	150
PART NO.	**Tube O.D. (mm)**	**Tube O.D. (mm)**	**Qty / Box**
ACUC 0606M	6	6	200
ACUC 1010M	10	10	150

CFA - Control valve Female Adapter

PART NO.	Tube O.D.	NPTF Thread	Qty / Box
ACFA 0404	1/4	1/4	250
ACFA 0606	3/8	3/8	150
PART NO.	**Tube O.D. (mm)**	**BSPT(PT) Thread**	**Qty / Box**
ACFA 0604M	6	1/4	200
ACFA 1006M	10	3/8	150

CEU - Control valve Elbow Union

PART NO.	Tube O.D.	Tube O.D.	Qty / Box
ACEU 0404	1/4	1/4	250
ACEU 0606	3/8	3/8	150
PART NO.	**Tube O.D. (mm)**	**Tube O.D. (mm)**	**Qty / Box**
ACEU 0606M	6	6	250
ACEU 1010M	10	10	150

CMC - Control valve Male Connector

PART NO.	Tube O.D.	NPTF Thread	Qty / Box
ACMC 0404	1/4	1/4	250
ACMC 0606	3/8	3/8	150
PART NO.	**Tube O.D. (mm)**	**BSPT(PT) Thread**	**Qty / Box**
ACMC 0604M	6	1/4	250
ACMC 1006M	10	3/8	150

BCUC-Bulkhead Control valve union Connector

PART NO.	Tube O.D.	Tube O.D.	Qty / Box
ABCUC 0404	1/4	1/4	200
ABCUC 0606	3/8	3/8	120
PART NO.	**Tube O.D. (mm)**	**Tube O.D. (mm)**	**Qty / Box**
ABCUC 0606M	6	6	150
ABCUC 1010M	10	10	120

BCFA-Bulkhead Control valve Female Adapter

PART NO.	Tube O.D.	Tube O.D.	Qty / Box
ABCFA 0404	1/4	1/4	200
ABCFA 0606	3/8	3/8	120
PART NO.	**Tube O.D. (mm)**	**Tube O.D. (mm)**	**Qty / Box**
ABCFA 0604M	6	1/4	150
ABCFA 1010M	10	3/8	120

BCEU-Bulkhead Control valve Elbow Union

PART NO.	Tube O.D.	Tube O.D.	Qty / Box
ABCEU 0404	1/4	1/4	200
ABCEU 0606	3/8	3/8	120
PART NO.	**Tube O.D. (mm)**	**Tube O.D. (mm)**	**Qty / Box**
ABCEU 0606M	6	6	150
ABCEU 1010M	10	10	120

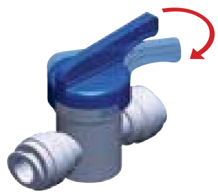
BCMC-Bulkhead Control valve Male Connector

PART NO.	Tube O.D.	Tube O.D.	Qty / Box
ABCMC 0404	1/4	1/4	200
ABCMC 0606	3/8	3/8	120
PART NO.	**Tube O.D. (mm)**	**Tube O.D. (mm)**	**Qty / Box**
ABCMC 0604M	6	1/4	150
ABCMC 1010M	10	3/8	120

VALVES (WHITE / INCH)

Hand Valves

■ Features



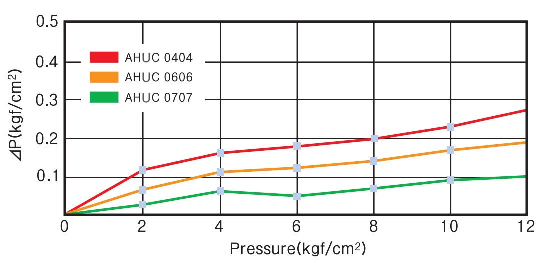
• Can be used with a variety of chemicals & gases. However, when using other than water or air, please refer to the Chemical Compatibility Tables or consult our representative.

• Do not apply excessive vibration, torque, shock, or other strong loads on the fittings. The valve body may be damaged, or the collets may be dislocated.

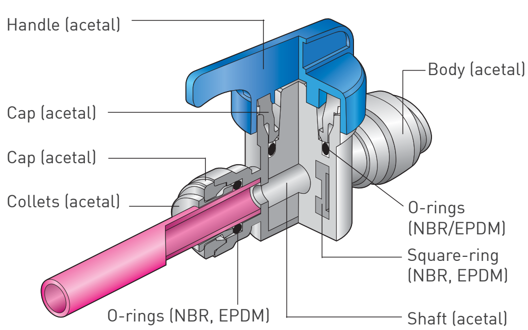
• Easy quarter-turn operation for opening and closing.
• Partial flow control is possible (high, medium, low).
• Ruggedly designed for durability.
• Color : Inch Size - White, Metric Size - Black
• Max. Handle Torque : 2 N/m

Working Pressure and Temperature

	Temperature	Pressure
Air	-20℃	10bar
Air / Liquid	1℃	10bar
	20℃	10bar
	65℃	7bar



Structure



HMC - Hand valve Male Connector

PART NO.	Tube O.D.	NPTF Thread	Qty / Box
AHMC 0404	1/4	1/4	150
AHMC 0606	3/8	3/8	100
AHMC 0707	1/2	1/2	70

HUC - Hand valve Union Connector

Fitting Size	PART NO.	Tube O.D.	Tube O.D.	Qty / Box
Small Size	AHUC 0404	1/4	1/4	150
	AHUC 0505	5/16	5/16	100
	AHUC 0606	3/8	3/8	100
	AHUC 0707	1/2	1/2	70
Large Size	AHUC 0806	5/8	3/8	50
	AHUC 0807	5/8	1/2	50
	AHUC 0808	5/8	5/8	40
	AHUC 1010	7/8	7/8	20

HFA - Hand valve Female Adapter

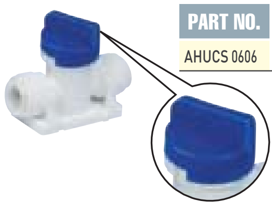
Fitting Size	PART NO.	Tube O.D.	NPTF Thread	Qty / Box
Small Size	AHFA 0404	1/4	1/4	100
	AHFA 0604	3/8	1/4	100
	AHFA 0606	3/8	3/8	100
	AHFA 0607	3/8	1/2	80
	AHFA 0706	1/2	3/8	70
	AHFA 0707	1/2	1/2	70
Large Size	AHFA 0806	5/8	3/8	40
	AHFA 0807	5/8	1/2	50

HFAUC - Hand valve Female Adapter Union Connector

PART NO.	Tube O.D.	NPTF Thread	Qty / Box
AHFAUC 0607	3/8	1/2	100
PART NO.	**Tube O.D. (mm)**	**BSPT(PT) Thread**	**Qty / Box**
AHFAUC 1007M	10	1/2	100

Hand Valves

HUCS - Hand valve Union Connector (Short handle)



PART NO.	Tube O.D.	Tube O.D.	Qty / Box
AHUCS 0606	3/8	3/8	100

※ Order siges with short handle are available by customers demand.

HWM - Hand Washing Machine valve

PART NO.	Tube O.D.	BSPT(PT) Thread	Thread Size	Qty / Box
AHWM 0809	5/8	3/4	M3.0XP3.5	20

MCLP - Mounting Clip

PART NO.	Size	Qty / Box
AMCLP06	3/8	200

TWV - Three Way Valve

PART NO.	Tube O.D.	Tube O.D.	Tube O.D.	Qty / Box
ATWV 080808	5/8	5/8	5/8	20

HVEU - Hand Valve Elbow Union connector

PART NO.	Tube O.D.	Tube O.D.	Qty / Box
AHVEU 0608	3/8	5/8	50

HBC - Hand Barb Connector

PART NO.	Tube O.D.	Tube I.D.	Qty / Box
AHBC 0807	5/8	1/2	100
AHBC 1007	7/8	1/2	60
AHBC 1009	7/8	3/4	60

VALVES (BLACK / METRIC)

Hand Valves

HMC - Hand valve Male Connector

PART NO.	Tube O.D. (mm)	BSPT(PT) Thread	Qty / Box
AHMC 0604M	6	1/4	150
AHMC 1006M	10	3/8	100
AHMC 1207M	12	1/2	70

HVMCB - Hand Valve Male Connector

BSP(P) Thread

PART NO.	Tube O.D.(mm)	BSP(P) Thread	Qty / Box
AHVMCB 1509M	15	3/4	30

HUC - Hand valve Union Connector

Fitting Size	PART NO.	Tube O.D. (mm)	Tube O.D. (mm)	Qty / Box
Small Size	AHUC 0606M	6	6	150
	AHUC 0808M	8	8	100
	AHUC 1010M	10	10	100
	AHUC 1212M	12	12	70
Large Size	AHUC 1510M	15	10	50
	AHUC 1512M	15	12	50
	AHUC 1515M	15	15	40
	AHUC 1610M	16	10	50
	AHUC 1616M	16	16	40
	AHUC 2222M	22	22	20

Fitting Size	PART NO.	Tube O.D. (mm)	Tube O.D.	Qty / Box
Large Size	AHUC 16M06	15	3/8	40
	AHUC 16M07	15	1/2	40
	AHUC 16M08	15	5/8	50

HFA - Hand valve Female Adapter

Fitting Size	PART NO.	Tube O.D. (mm)	BSPT(PT) Thread	Qty / Box
Small Size	AHFA 0604M	6	1/4	150
	AHFA 1006M	10	3/8	100
	AHFA 1007M	10	1/2	100
	AHFA 1206M	12	3/8	70
	AHFA 1207M	12	1/2	70
Large Size	AHFA 1506M	15	3/8	40
	AHFA 1507M	15	1/2	40
	AHFA 1606M	16	3/8	40
	AHFA 1607M	16	1/2	40

TWV - Three Way Valve

PART NO.	Tube O.D. (mm)	Tube O.D. (mm)	Tube O.D. (mm)	Qty / Box
ATWV 121212M	12	12	12	20

PART NO.	Tube O.D. (mm)	Tube O.D. (mm)	Tube O.D. (mm)	Qty / Box
ATWV 161616M	16	16	16	20

HBC - Hand Barb Connector

PART NO.	Tube O.D. (mm)	Tube I.D.	Qty / Box
AHBC 1507M	15	1/2	100
AHBC 2107M	21	1/2	60
AHBC 2109M	21	3/4	50
AHBC 2207M	22	1/2	60
AHBC 2209M	22	3/4	50

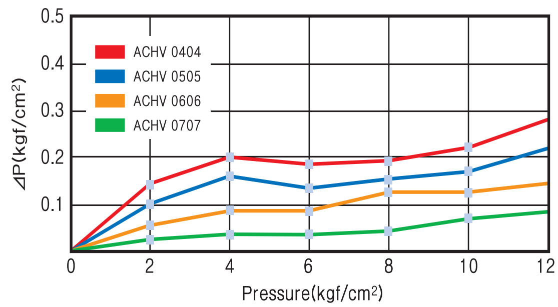
HSV - Hand Stop Valve connector

PART NO.	Tube O.D.(mm)	Tube O.D.(mm)	Qty / Box
AHSV 1515M	15	15	80
AHSV 2115M	21	15	60
AHSV 2215M	22	15	60

THC - Throttle Hand valve Connector

PART NO.	Tube O.D.(mm)	Tube O.D.(mm)	Qty / Box
ATHC 1515M	15	15	20
ATHC 2222M	22	22	10

Check Valves



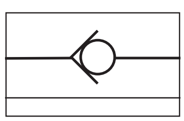
■ Features

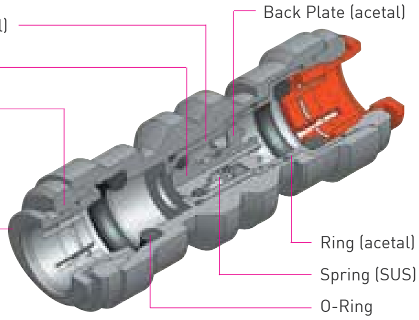
- Can be used with a variety of chemicals and gases. However, when using other than water or air, please refer to Chemical Compatability Tables, or consult our representative.
- Do not apply excessive vibration, shock, torque, or other strong loads on the fittings. The valve body may be damaged or the collets may be dislocated.
- Superior function in a compact size.
- Color : Inch Size - White Acetal Copolymer
  Metric Size - Black Acetal Copolymer

Working Pressure and Temperature

Pressure	10bar	5bar
Temperature	1℃(35°F)～20℃(70°F)	65℃(150°F)

Check Valve Sign





CHV - Check Valve

PART NO.	Outlet Tube O.D.	Inlet Tube O.D.	Qty / Box
ACHV 0404	1/4	1/4	300
ACHV 0405	1/4	5/16	250
ACHV 0505	5/16	5/16	250
ACHV 0606	3/8	3/8	200
ACHV 0707	1/2	1/2	150

PART NO.	Outlet Tube O.D.(mm)	Inlet Tube O.D.(mm)	Qty / Box
ACHV 0606M	6	6	250
ACHV 0808M	8	8	200
ACHV 1010M	10	10	200
ACHV 1212M	12	12	150

DCHV - Double Check Valve

PART NO.	Tube O.D.	Tube O.D.	Qty / Box
ADCHV 0404	1/4	1/4	200

DCHV - Double Check Valve

PART NO.	Tube O.D. (mm)	Tube O.D. (mm)	Qty / Box
ADCHV 1515M	15	15	50

MCHV - Mini Check Valve

NPTF Thread

PART NO.	Tube O.D.	NPTF Thread	Qty / Box
AMCHV 0402W	1/4	1/8	500

● 1kgf/cm2 - 980cc/min

VALVES (GRAY / INCH)

Stop Valves

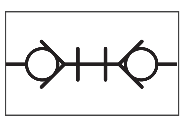
Features

- As a one touch fitting, it is often used where tubing facility is frequently changed.
- Stop fitting allows flow in both directions from the Check Valve in instances when they are connected with Tube. By disconnection the middle of valve, stopping the fluid in both sides, it maintains the faculties and the safe.
- Flows in both directions by connection.
- Stops flow in both directions by separation where pulling to the open position.
- Easy to assemble with the nut.

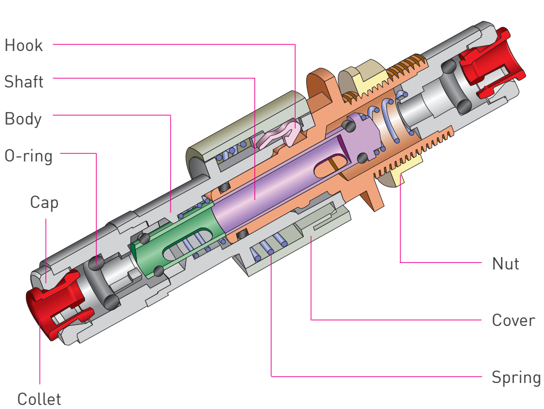
Working Pressure and Temperature

Pressure	10bar	5bar
Temperature	1℃(35°F)～20℃(70°F)	65℃(150°F)

Stop Valve Sign



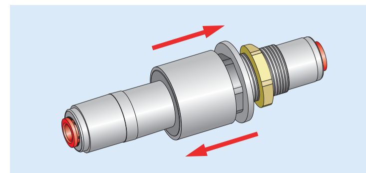
Structure



Flowing

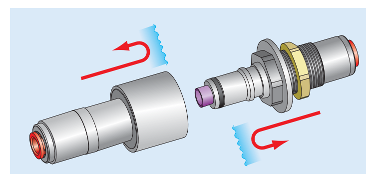
Connector

- Flows in both directions by connection.



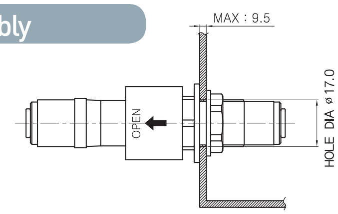
Disconnector

- Stop flows in both directions by with separation where pulling to the open position.



Assembly

- Just keep the direction marked on Body.



STVUC-STop Valve Union Connector

PART NO.	Tube O.D.	Tube O.D.	Qty / Box
ASTVUC 0404	1/4	1/4	5

STVBU-STop Valve Bulkhead Union

PART NO.	Tube O.D.	Tube O.D.	Thread Size	Qty / Box
ASTVBU 0404	1/4	1/4	M16XP1	5

STVBUE-STop Valve Bulkhead Union Elbow

PART NO.	Tube O.D.	Tube O.D.	Thread Size	Qty / Box
ASTVBUE 0404	1/4	1/4	M16XP1	5

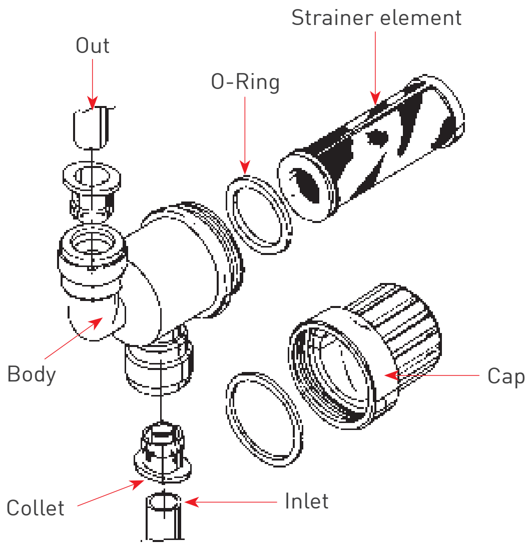
BSTMC-STop Valve Male Connector

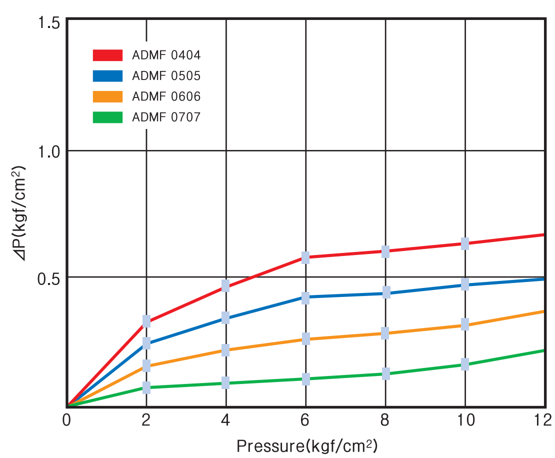
- Various sizes are available by the request of customers.
- Please contact the local representative office for more information.

FILTER STRAINERS

■ Features

- A rugged and durable filter strainer, available in 100 mesh (standard) with optional 150 or 200 mesh replaceable elements.
- *DMfit®* Compatible with DMfit tube and fittings, as well as standard-sized tubing from a variety of other manufacturers.
- Color options: gray, white, or black.
- The detachable CAP and BODY allow for easy servicing and cleaning.
- Can be used with a variety of chemicals and gases. However, when using with other than water or air, please refer to the Chemical Compatability Tables or consult our representative.
- Do not apply excessive vibration, torque, shock or other strong loads to the filter. The filter body may be damaged or collets may be dislocated.





Working Pressure and Temperature

Parameter \ Size	1/4"	5/16"	3/8"	1/2"
	6mm	8mm	10mm	12mm
Pressure	170psi			
Temperature	Air -20℃(-4°F)~65℃(150°F) Liquid			

※Maximum pressure values are based on use at room temperature.

※Consult your DMT representative when using at continuous elevated temperature and pressure

Filter Materials and Mesh Size

Screen Mesh	Standard	Special Order
	100 Mesh	150 Mesh
Material	SUS	

※Standard models are provided with100 mesh screen elements.

※Other meshes is available by special order.

Inch Size (Standard-100Mesh)

PART NO.	INLET	OUTLET	Qty / Box
ADMF 0404	1/4	1/4	50
ADMF 0505	5/16	5/16	50
ADMF 0606	3/8	3/8	50
ADMF 0707	1/2	1/2	40

Metric Size (Standard-100Mesh)

PART NO.	INLET (mm)	OUTLET (mm)	Qty / Box
ADMF 0606M	6	6	50
ADMF 0808M	8	8	50
ADMF 1010M	10	10	50
ADMF 1212M	12	12	40

BRASS FITTINGS

Suitable for

- With our one touch fittings for the hydraulic tube, it is possible to connect, disconnect and repair tubes quickly, more conveniently and safely.
- Since we have various sizes and functions the fittings can be applied to all tubes with wide scope of application.
- Our oval collets are specifically designed to conveniently remove tubes, but still provide a strong connection.
- The body was manufactured to have a hexagonal on the middle section to make more tightening as it can.
- Color : Body - Brass and Cr-plated
  Collets - White

Working Pressure and Temperature

Pressure	12bar	6bar
Temperature	1℃(35°F)～20℃(70°F)	65℃(150°F)

BUN - Brass UNion

PART NO.	Tube O.D.	Tube O.D.	Qty / Box
BUN 0808	5/8	5/8	
BUN 1010	7/8	7/8	
PART NO.	**Tube O.D. (mm)**	**Tube O.D. (mm)**	**Qty / Box**
BUN 1515M	15	15	
BUN 1616M	16	16	
BUN 1818M	18	18	
BUN 2222M	22	22	

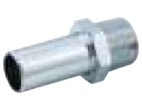
BFA - Brass Female Adapter

BSPT(PT) Thread

PART NO.	Tube O.D.	BSPT(PT) Thread	Qty / Box
BFA 0807	5/8	1/2	
BFA 1009	7/8	3/4	
BFA 1011	7/8	1	
PART NO.	**Tube O.D. (mm)**	**BSPT(PT) Thread**	**Qty / Box**
BFA 1507M	15	1/2	
BFA 1607M	16	1/2	
BFA 2209M	22	3/4	
BFA 2211M	22	1	

BMSAB - Brass Male Stem Adapter

BSP(P) Thread



PART NO.	Stem O.D. (mm)	BSP(P) Thread	Qty / Box
BMISAB 1507M	15	1/2	
BMISAB 2209M	22	3/4	
BMSAB 1507M	15	1/2	
BMSAB 2209M	22	3/4	
BMSAB 2811M	28	1	
BFSAB 1507M	15	1/2	
BFSAB 2209M	22	3/4	
BMSAT 1507M	15	1/2	
BMSAT 2209M	22	3/4	
BMSAT 2811M	28	1	

BFAB - Brass Female Adapter

BSP(P) Thread

PART NO.	Tube O.D.	BSP(P) Thread	Qty / Box
BFAB 0807	5/8	1/2	
BFAB 1009	7/8	3/4	
BFAB 1011	7/8	1	
PART NO.	**Tube O.D. (mm)**	**BSP(P) Thread**	**Qty / Box**
BFAB 1507M	15	1/2	
BFAB 1607M	16	1/2	
BFAB 2209M	22	3/4	
BFAB 2211M	22	1	

BMCB - Brass Male Connector

BSP(P) Thread

PART NO.	Stem O.D. (mm)	BSP(P) Thread	Qty / Box
BMCB 1007M	10	1/2	
BMCB 1207M	12	1/2	
BMCB 1509M	15	3/4	
BMCB 2209M	22	3/4	
BMCB 2211M	22	1	
BMCB 2811M	28	1	
BMCT 1207M	12	1/2	
BMCT 1507M	15	1/2	
BMCT 2209M	22	3/4	
BMCT 2811M	28	1	

BDC - Brass Drain Cock

PART NO.	Stem O.D. (mm)	Tube I.D. (mm)	Qty / Box
BDC 15M	15	13.8	

BFEB - Brass Flange Elbow

BSP(P) Thread

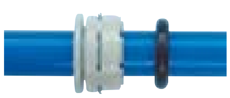
PART NO.	Tube O.D. (mm)	BSP(P) Thread	Qty / Box
BFEB 1507M	15	1/2	
BFEB 2209M	22	3/4	

CARTRIDGES

Half cartridges

- Half-cartridges are available in Acetal, Brass and Stainless Steel.
- They provide to simplify your application's size and shapes.
- In addintion,they give you more cost effectiveness comparing to Fittings.
- Easy installation, Shorten time to assemble.
- Two O-rings make more completed sealing(Refer to Cavity Dimension).

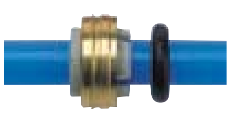
AC - Acetal Cartridge



Inch size	PART NO.	Tube O.D.	Qty / Box
ACETAL CARTRIDGE O-RING NBR (NBR/EPDM)	ACU 01	5/32	2000
	ACU 03	3/16	2000
	ACP 04	1/4	1000
	ACP 05	5/16	1000
	ACP 06	3/8	700
	ACP 07	1/2	500

Metric size	PART NO.	Tube O.D. (mm)	Qty / Box
ACETAL CARTRIDGE O-RING NBR (NBR/EPDM)	ACU 04M	4	2000
	ACU 05M	5	2000
	ACP 06M	6	1000
	ACP 08M	8	1000
	ACP 10M	10	700
	ACP 12M	12	500

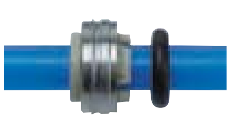
BC - Brass Cartridge



Inch size	PART NO.	Tube O.D.	Qty / Box
BRASS CARTRIDGE O-RING NBR (NBR/EPDM)	BC 01	5/32	2000
	BC 03	3/16	2000
	BC 04	1/4	1000
	BC 05	5/16	1000
	BC 06	3/8	700
	BC 07	1/2	500

Metric size	PART NO.	Tube O.D. (mm)	Qty / Box
BRASS CARTRIDGE O-RING NBR (NBR/EPDM)	BC 04M	4	2000
	BC 05M	5	1000
	BC 06M	6	1000
	BC 08M	8	1000
	BC 10M	10	700
	BC 12M	12	500
	BC 15M	15	500
	BC 22M	22	300

SC - Stainless Steel Cartridge

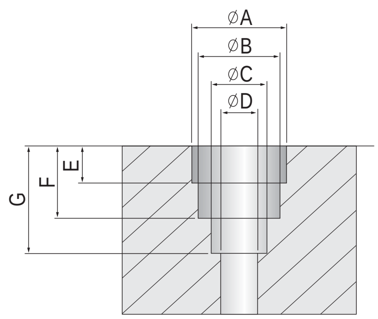


Inch size	PART NO.	Tube O.D.	Qty / Box
STAINLESS STEEL CARTRIDGE O-RING NBR (NBR/EPDM)	SC 01	5/32	2000
	SC 03	3/16	2000
	SC 04	1/4	1000
	SC 05	5/16	1000
	SC 06	3/8	700
	SC 07	1/2	500

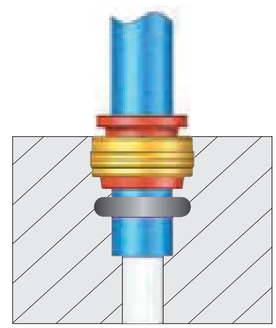
Metric size	PART NO.	Tube O.D. (mm)	Qty / Box
STAINLESS STEEL CARTRIDGE O-RING NBR (NBR/EPDM)	SC 04M	4	2000
	SC 05M	5	1000
	SC 06M	6	1000
	SC 08M	8	1000
	SC 10M	10	700
	SC 12M	12	500
	SC 15M	15	500
	SC 22M	22	300

CARTRIDGES

Cavity Dimension



Assembly



Inch Sizes

(Unit: inch)

Size (Inch)	ΦA±0.002"	ΦB±0.002"	ΦC±0.002"	ΦD±0.002"	ΦE±0.01"/-0	ΦF1±0.006"	ΦF2±0.006"	ΦG1±0.006"	ΦG2±0.006"
5/32	0.490	0.317	0.161	0.098	0.181	0.370	0.462	0.502	0.594
3/16	0.470	0.344	0.197	0.126	0.181	0.370	0.462	0.502	0.594
1/4	0.528	0.421	0.257	0.169	0.181	0.373	0.477	0.545	0.653
5/16	0.542	0.465	0.323	0.217	0.213	0.413	0.508	0.615	0.709
3/8	0.630	0.563	0.382	0.250	0.268	0.472	0.574	0.719	0.822
1/2	0.775	0.661	0.508	0.374	0.303	0.525	0.629	0.827	0.945

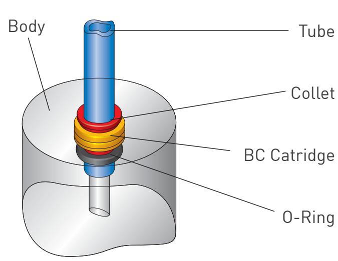
Metric Sizes

(Unit: mm)

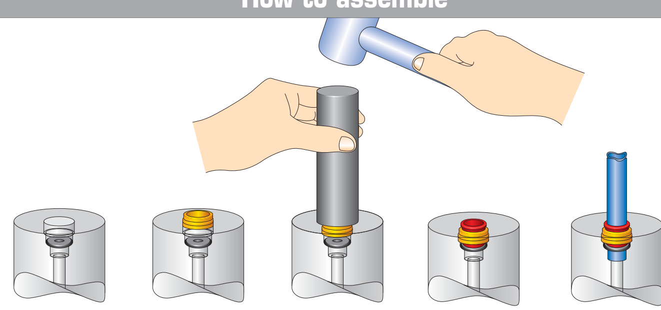
Size (mm)	ΦA±0.05	ΦB±0.05	ΦC±0.05	ΦD±0.05	ΦE±0.25/-0	ΦF1±0.15	ΦF2±0.15	ΦG1±0.15	ΦG2±0.15
4	12.44	8.05	4.20	2.50	4.59	9.39	11.73	12.75	15.08
5	11.93	8.73	5.20	3.50	4.59	9.39	11.73	12.75	15.08
6	13.41	10.69	6.20	4.00	4.59	9.47	12.22	13.84	16.59
8	13.76	11.81	8.20	6.00	5.41	10.50	12.90	15.63	18.00
10	16.00	14.30	10.20	7.00	6.80	11.98	14.28	18.27	20.87
12	19.68	16.78	12.20	9.00	7.69	13.33	16.27	21.00	24.00
15	22.90	20.20	15.20	12.00	9.00	17.20	20.00	26.30	26.30
22	31.05	27.60	22.20	19.20	10.90	21.10	24.30	31.30	31.30

※ Double O-rings half cartridges : Colums F2 and G2

Structure



How to assemble



- Caution
- Tap softly with special tool standing for inserting cartridge into the Cavity. (Use the tool with flat base if you don't have any special tool for an insert cartridges)
- Please check up the breakaway a cartridge from the Cavity with pulling gently the tube inserted.

FULL CARTRIDGES

■ Features

DM full cartridges are designed to provide a saving cost and effective way to connect tubes perfectly into metalic products.

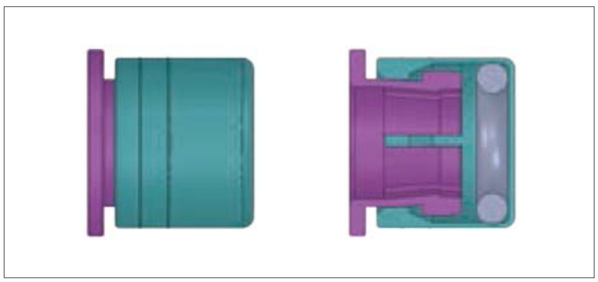
The cartridge is supplied with EPDM/NBR O-ring and collet.

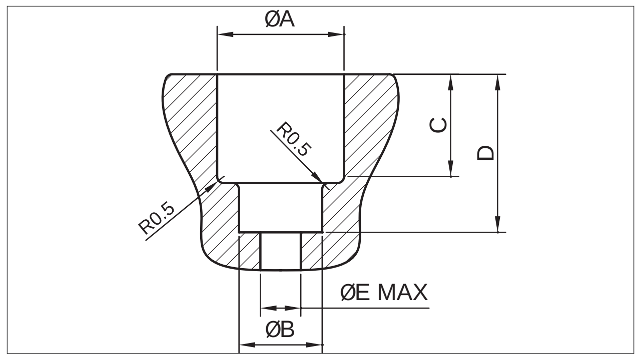
The cartridge are good for compressed air applications.

Please do check if your application is required an additional bonding on.

Please do refer to our plastic cartridges shown on pages 45 to 46 of this catalogue if you need to install connections into plastic products.

■ Cavity Dimensions





Metric Sizes

PART NO.	Size(mm)	øA±0.05	øB±0.05	øC±0.25	D±0.15	øE MAX
FC04M	04	9.12	4.20	9.30	12.65	2.75
FC05M	05	9.82	5.20	9.90	13.25	3.50
FC06M	06	11.78	6.20	11.30	15.67	4.00
FC08M	08	12.88	8.20	11.05	16.18	6.00
FC10M	10	15.38	10.20	12.40	18.69	7.00
FC12M	12	17.88	12.20	13.80	21.47	9.00

※ All dimensions in Metric.

DRAIN SADDLE ADAPTOR

New

■ Features

DMFIT products are manufactured from safe, non-toxic materials metting the requirements of the FDA, and DVGW-W270, KTW. Drain saddle are designed for use in the drainage line between traps and sinks with drinking water systems, Refrigerators, Ice- Makers, Humidifiers and Water filtration applications. The design provides quick and convenient assemly without other tooling - saving time & expense. It is suitable for use in cold water applications.

Material : White Acetal Copolymer , EPDM

DSA-Drain Saddle Adaptor

PART NO.	Tube O.D	PIPE O.D	QTY/BOX
ADSA40	1/4	40Ø	25
ADSA50	1/4	50Ø	25

ACCESSORIES

TS - Tube Support

PART NO.	Tube O.D.	Tube I.D.	Qty / Box
ATS 04	1/4	0.170	3,500
ATS 05	5/16	0.216	3,000
ATS 06	3/8	1/4	1,500
ATS 07	1/2	0.350	800
ATS 08	5/8	0.476	600
ATS 10	7/8	0.669	500

- The tube support is recommended for use with soft or very thin walled tubing.

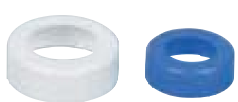
PART NO.	Tube O.D. (mm)	Tube I.D. (mm)	Qty / Box
ATS 06M	6	4	3,500
ATS 08M	8	6	3,000
ATS 10M	10	7	1,600
ATS 12M	12	9	800
ATS 15M	15	11.4	600
ATS 16M	16	12	600
ATS 18M	18	14	400
ATS 22M	22	17.6	500
ATS 28M	28	23	300

DSI - Double Seal Insert

PART NO.	Tube O.D.	Tube I.D.	Qty / Box
ADSI 06	3/8	1/4	2,000
ADSI 07	1/2	0.332	1,000
ADSI 08	5/8	0.472	800
ADSI 10	7/8	0.669	600

PART NO.	Tube O.D. (mm)	Tube I.D. (mm)	Qty / Box
ADSI 08M	8	6	3,000
ADSI 10M	10	7	2,000
ADSI 12M	12	9	1,000
ADSI 15M	15	11.5	600
ADSI 16M	16	12	800
ADSI 18M	18	14	600
ADSI 22M	22	17.5	600
ADSI 28M	28	23	400

COV - Collet COVer

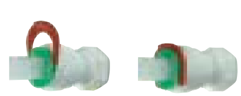


PART NO.	Tube O.D.	Qty / Box
ACOV 04	1/4	700
ACOV 05	5/16	600
ACOV 06	3/8	600
ACOV 07	1/2	500
ACOV 08	5/8	500
ACOV 10	7/8	300

PART NO.	Tube O.D. (mm)	Qty / Box
ACOV 06M	6	700
ACOV 08M	8	600
ACOV 10M	10	600
ACOV 12M	12	500
ACOV 15M	15	500
ACOV 16M	16	500
ACOV 18M	18	400
ACOV 22M	22	300
ACOV 28M	28	200

LC - Locking Clip

PART NO.	Tube O.D.	Qty / Box
ALC 03	3/16	12,000
ALC 04	1/4	10,000
ALC 05	5/16	8,000
ALC 06	3/8	7,000
ALC 07	1/2	5,000
ALC 08	5/8	2,500
ALC 10	7/8	2,000



PART NO.	Tube O.D. (mm)	Qty / Box
ALC 05M	5	12,000
ALC 06M	6	10,000
ALC 08M	8	8,000
ALC 10M	10	7,000
ALC 12M	12	5,000
ALC 15M	15	4,000
ALC 16M	16	4,000
ALC 18M	18	3,000
ALC 22M	22	2,000
ALC 28M	28	2,000

FBC - Flow Bend Clip

PART NO.	Tube O.D.	Qty / Box
AFBC 04	1/4	400
AFBC 05	5/16	300
AFBC 06	3/8	200
AFBC 07	1/2	150

PART NO.	Tube O.D. (mm)	Qty / Box
AFBC 06M	6	400
AFBC 08M	8	300
AFBC 10M	10	200
AFBC 12M	12	150

PART NO.	Tube O.D.	Qty / Box
NFBC 08	1/2(12mm) to 5/8(15mm)	100

- FBC 08 is made from Nylon 66.
- Provides a simple method for smooth 90 degree tube bend without twist.
- Can be built into the equipment or walls with screws.

SP - SPanner

PART NO.	Tube O.D.
ASP	3/16, 1/4, 5/16, 3/8, 1/2

HTC - Hand Tube Cutter (Nylon)

PART NO.	Tube O.D. (Minimum)	Tube O.D. (Inch) (Maximum)
NHTC 08	5/32(4mm)	5/8 (16mm)

PSP - Power SPanner (Nylon)

PART NO.	Tube O.D.
NPSP	5/16, 3/8

- Available in metalic spanner

TC - Tube Cutter

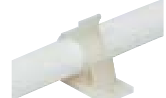
PART NO.	Tube O.D.	Qty / Box
TC	MAX. DIA 1/2" or 13mm	40

- *DMfit®* Tube Cutter with quality blade is suitable for cutting plastic tubing sizes up to 13mm.

Hook

PART NO.	Size (mm)	Qty / Box
AHOOK	19.5	

TLC - Tube Locking Clamp (Nylon)



PART NO.	Tube O.D.	Qty / Box
NTLC 08	5/8(16mm)	200

RA - Release Aid

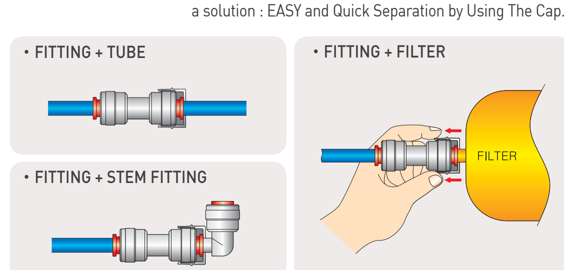
PART NO.	Tube O.D.	Qty / Box
ARA 06	3/8	700
ARA 07	1/2	700
ARA 08	5/8	600
ARA 10	7/8	500

PART NO.	Tube O.D. (mm)	Qty / Box
ARA 10M	10	700
ARA 12M	12	700
ARA 12M	12	600
ARA 15M	15	600
ARA 16M	16	600
ARA 18M	18	500
ARA 22M	22	500
ARA 28M	28	500

EFCAP - Easy Fitting CAP

PART NO.	Tube O.D.	Qty / Box
AEFCAP 04	1/4	1000

- Fittings need to be separated from the Tank and The Filter, Especially under the pressure It can offer a solution : EASY and Quick Separation by Using The Cap.



LLDPE TUBES

DMfit® tubing is produced from an advanced grade of LLDPE. Its greatest advantage is superior environmental stress cracking resistance (ESCR), greatly exceeding that of ordinary polyethylene tubing as measured by ASTM D-1693 (IGEPAL) tests. Environmental stresses that can shorten the service life of tubing include chemical exposure, aging connections with barb-type fittings, or high vibration loads with connections to compression fittings. Our tubing is compliant to ANSI/NSF-51, 61, WRAS and FDA requirements for food contact applications. Our tubing is available in multiple coding colors, and offers the user :

- Dimensional stability
- Uniformity and long-term strength
- Higher burst pressure
- Greater tensile strength
- Wide range of available colors.
- Suitable for use with *DMfit*® products and those of other manufacturers.

Working Pressure and Temperature

Parameter \ Size	5/32"	3/16"	1/4"	5/16"	3/8"	1/2"
	4mm	5mm	6mm	8mm	10mm	12mm
Pressure	230 psi			170 psi		
Tube Tolerances	-0.1mm / +0.1mm					
Temperature	Air -20℃(-4℉) ~ 65℃(150℉) Liquid					

※ Pressure values are based on PE tube used at room temperature.
※ Consult our representative when using at continuous elevated temperature and pressure.

Order Information

DPE 04 (M) - B - 0500

- 0500 → Reel Length
- B → Color: Blue
- (M) → "M", if metric size
- 04 → O.D. of tube

Colors Available

Suffix	Color	LLDPE													PE-RT	
		5/32"	3/16"	1/4"	5/16"	3/8"	1/2"	4mm	5mm	6mm	8mm	10mm	12mm	15mm	1/4"	5/16"
B	Blue	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Y	Yellow	○	○	○	○	○	○	○	○	○	○	○	○	○		
W	White	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
N	Natural	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
BK	Black	○	○	○	○	○	○	○	○	○	○	○	○	○		
R	Red	○	○	○	○	○	○	○	○	○	○	○	○	○		
GR	Gray	○	○	○	○	○	○	○	○	○	○	○	○	○		
G	Green	○	○	○	○	○	○	○	○	○	○	○	○	○		

TC - Tube Cutter

- *DMfit*® Tube Cutter with quality blade is suitable for cutting plastic tubing sizes up to 13mm.

Inch Size

Part No.	Material	O.D.In.	I.D. In.	Wall	Reel Length (Meter)
DPE 01	LLDPE	5/32"	0.094	0.031	500
DPE 03	LLDPE	3/16"	0.125	0.031	400
DPE 04	LLDPE	1/4"	0.17	0.04	300
DPE-RT 04	PE-RT	1/4"	0.17	0.04	300
DPE 05	LLDPE	5/16"	0.216	0.048	200
DPE-RT 05	PE-RT	5/16"	0.216	0.048	200
DPE 06	LLDPE	3/8"	1/4"	0.062	150
DPE 07	LLDPE	1/2"	3/8"	0.062	100

Metric Size

Part No	Material	O.D.In.	I.D. In.	Wall	Reel Length (Meter)
DPE 04M	LLDPE	4	2.5	0.75	500
DPE 05M	LLDPE	5	3.5	0.75	400
DPE 06M	LLDPE	6	4	1	300
DPE 08M	LLDPE	8	6	1	200
DPE 10M	LLDPE	10	7	1.5	150
DPE 12M	LLDPE	12	9	1.5	100
DPE 12M	LLDPE	12	9	1.5	100
DPE 15M	LLDPE	15	11.5	1.75	70

CHEMICAL COMPATIBILITY TABLES

DMfit® has excellent resistance to exposure to organic compounds, industrial chemicals, and gases.

■ Resistance of chemical characteristics for plastic resins & elastomers.

Description (%, ℃)	Brass	SUS	Resin		Rubber	
			Acetal	PP	NBR	EPDM
Caustic soda(10%, 20℃)	△	△	◎	○	○	◎
Gasoline	○	○	◎	△	◎	×
Formic acid(25%, 20℃)	×	△	×	◎	○	◎
Air	◎	◎	◎	◎	◎	◎
Mineral oil	○	○	◎	○	◎	×
Grease	○	◎	◎	△	◎	×
Sodium silicate	○	-	◎	◎	◎	◎
Glycerin	○	◎	◎	◎	◎	◎
Ozone	○	○	△	△	○	◎
Animal oil(Lard oil)	○	-	◎	○	◎	○
Kerosene	◎	◎	◎	◎	◎	×
Methane	○	-	◎	◎	◎	×
Methyl alcohol(Methanol)	◎	△	○	○	◎	◎
Water(24℃)	○	○	◎	◎	◎	◎
Water(100℃)	×	○	△	△	-	-
Sea water	△	○	◎	◎	-	-
Bunker oil	△	-	-	○	◎	-
Benzene(Benzol)	×	△	○	△	×	×
Butane	◎	◎	◎	◎	◎	×
Fluorine	×	×	×	×	-	△
Boric acid	○	○	○	◎	◎	◎
Carbon tetrachloride	△	△	○	△	△	×
Oxygen	◎	◎	○	○	○	◎
Petroleum	-	-	○	×	◎	×
Soda ash(Sodium carbonate)	○	△	◎	◎	◎	◎
Calcium hydroxide	△	△	◎	○	◎	◎
Hydrogen	△	◎	◎	◎	◎	◎
Mercury	×	-	-	◎	◎	◎
Steam(150℃)	○	-	△	×	×	◎
Sodium cyanide	×	-			◎	◎
Vegetable oil	-	-	○	○	◎	◎
Silicone greases	-	-	◎	△	◎	◎
Silicone oil	-	-	◎	△	◎	◎
Acetone	◎	△	○	△	×	◎
Sulfurous acid gas	-	-	△	○	○	○
Ammonia	△	◎	○	○	◎	◎
Liquiefied petroleum gas(LPG)	◎	◎	◎	○	◎	×
Ethyl alcohol(Ethanol)	◎	○	◎	○	◎	◎

Description (%, ℃)	Brass	SUS	Resin		Rubber	
			Acetal	PP	NBR	EPDM
Lye solution	-	-	◎	○	○	◎
Hydrochloric acid(10%, 20℃)	×	×	○	◎	-	-
Hydrochloric acid(20%, 20℃)	×	×	△	○	-	-
Hydrochloric acid(20%, 80℃)	×	×	×	×	×	△
Hydrochloric acid(38%, 20℃)	×	×	△	○	○	◎
Ammonium chloride	×	△	○	◎	◎	◎
Calcium chloride	○	△	◎	◎	◎	◎
Naphtha	△	○	◎	△	△	×
Olive oil	△	◎	○	◎	◎	○
Sulfur	×	○	◎	◎	×	◎
Sodium phosphate	×	△	○	◎	◎	◎
Ammonium phosphate	△	△	○	◎	◎	◎
Ammonium nitric	×	○	○	◎	◎	◎
Nitrogen	○	◎	◎	◎	◎	◎
Natural gas	◎	◎	◎	○	◎	×
Acetic acid(10%, 20℃)	-	-	-	-	-	-
Acetic acid(50%, 20℃)	-	-	-	-	-	-
Acetic acid(50%, 70℃)	-	-	-	-	-	-
Acetic acid(100%, 20℃)	-	-	-	-	-	-
Ketones	○	○	○	◎	-	○
Cresol	○	△	△	○	△	×
Chromic acid(2%, 70℃)	×	×	×	△	-	-
Chromic acid(10%, 70℃)	×	×	×	×	-	-
Chromic acid(25%, 70℃)	×	×	×	×	-	-
Chromic acid(2%, 50℃)	×	×	△	△	×	○
Soybean oil	△	○	◎	○	◎	△
Toluene	◎	◎	○	△	×	×
Glucose	◎	◎	◎	◎	◎	◎
Propane	◎	◎	◎	◎	◎	×
Castor oil	○	○	○	◎	◎	○
Sulfuric acid(10%, 20℃)	×	×	○	○	×	○
Sulfuric acid(10%, 70℃)	×	×	×	△	-	-
Sulfuric acid(30%, 20℃)	×	×	△	○	-	-
Sulfuric acid(30%, 70℃)	×	×	×	△	-	-
Sulfuric acid(98%, 20℃)	×	×	×	×	-	-
Aluminium sulfate	×	○	○	◎	◎	◎
Potassium sulfate	○	△	○	◎	◎	◎
Hydrogen sulfide	△	△	○	◎	×	◎

※ ◎ : Very acceptable ○ : Acceptable △ : Slightly Unacceptable × : Unacceptable - : No data

■ Resistance of chemical characteristics for Tube.

Name of chemical	Polyethylene	Remarks
Air	◎	
Alcohol	◎	
Ammonia gas	◎	
Ammonia liquid	○	high temperature △
Beer	◎	
Benzene	△	
Bromine liquid	×	
Carbon dioxide gas	○	
Caustic soda	○	
Diesel fuel	△	
Ethyl alcohol	○	high temperature △
Fluor gas, dry	×	
Fuel Oil	△	

Name of chemicals	Polyethylene	Remarks
Hexane	△	
Hydrogen gas	◎	
Lighting gas	△	
Mercury	◎	
Methanol (Methyl Alcohol)	◎	
Milk	◎	
Molasses	◎	
Nickel salts	◎	
Oils, essential	△	
Propane gas	△	
Spindle Oil	△	
Water, high-purity	◎	

※ : Very acceptable, ○: Acceptable, △: Slightly unacceptable, ×: Very unacceptable
※ Differences in data can exist due to extended duration and elevated temperature (Standard data reflects use at ambient temperature.)
※ Consult our representative when using unsuitable liquids.

GLOBAL SALES

DMT

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John Guest®

Drinks Dispense And Pure Water

Super Speedfit Fittings, Valves and Tubing

INTRODUCING

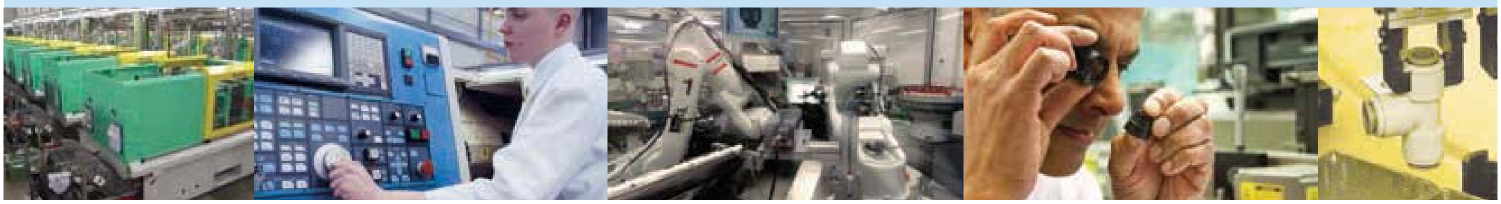
POLARCLEAN®

TUBE IN TUBE TECHNOLOGY

September 2017

John Guest®

The John Guest Group has a long established reputation as a world leading manufacturer of push-fit fittings, tube and other fluid control products. A reputation built on producing consistently high quality products with an ongoing commitment to value engineering and product development.



Quality Manufacture

MADE IN BRITAIN

A commitment to quality is at the heart of the John Guest philosophy.

The strictest control is maintained by virtue of the fact that design and manufacture is carried out in modern purpose built manufacturing centres in West London and at Maidenhead in Berkshire.

Maintaining control over the whole process from initial tool design and tool making through to final assembly and testing ensuring that only products of the highest quality are produced.

The company believe it is this commitment to quality that has led to it receiving prestigious awards from many of the world's leading testing and approvals organisations.

John Guest is a preferred supplier to many international companies.

John Guest offer the widest range of push-fit fittings, tube and other fluid control products for drinks dispense and pure water applications.

The world's first food quality push in fitting, the John Guest range is now over 800 items strong and provides the quickest and most effective of installations. Pushing the tube into the fitting is all that is needed to produce an instant but permanent leakproof connection.

The fittings are just as easy to disconnect and re use without the need for replacement parts.

NSF standard 51 listed products in this catalogue are produced in FDA compliant materials making them especially suitable for potable liquids. Almost all products are also supported by a John Guest declaration of compliance with European Regulation (EC) no. 1935/2004. Selected items can also be used for inert gases such as CO_2.

FAST INSTALLATION TIME 'RIGHT FIRST TIME EVERY TIME'

SUITABLE FOR SOFT METAL OR PLASTIC TUBES

NO TOOLS NEEDED

QUICK DISCONNECTION

RE-USABLE

SUPERIOR FLOW CHARACTERISTICS

Accepted by almost all the world's beer and beverage producers and by the manufacturers of drinks dispense equipment, John Guest products have quality and performance approvals from leading esting and acceptance authorities.

NSF 51
NSF 61

FM01977

John Guest®

Contents

Metric Size Fittings

Valves, LLDPE Tube and Accessories

How Super Speedfit Works

To make a connection, the tube is simply pushed in by hand; the unique patented John Guest collet locking system then holds the tube firmly in place without deforming it or restricting flow.

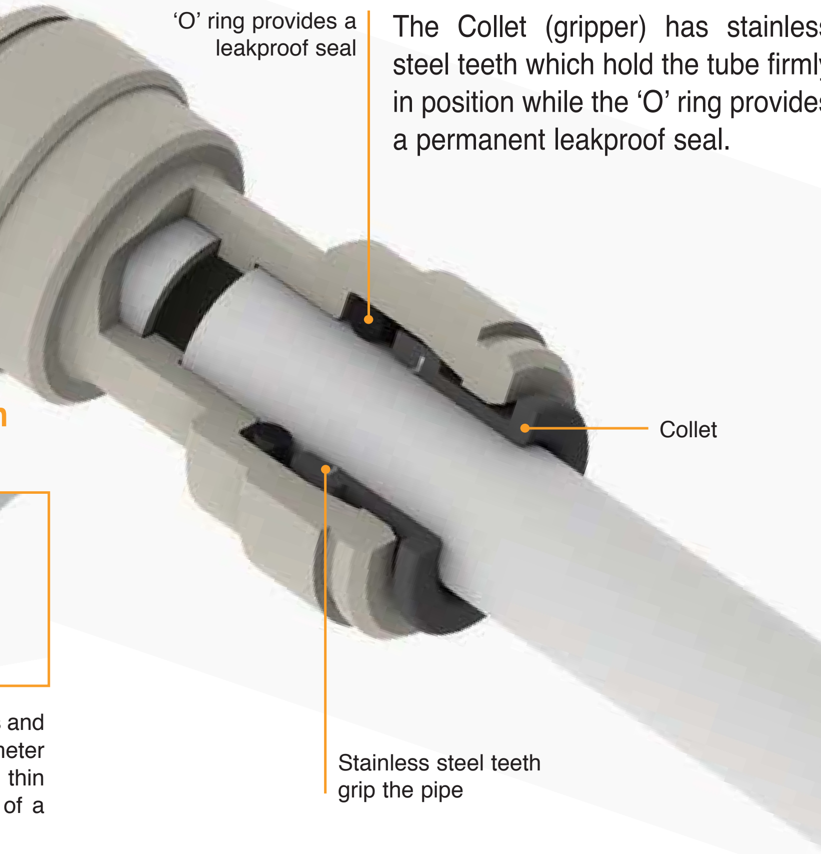
Materials of construction

Super Speedfit fittings are made up of three components:

Bodies are produced in an acetal copolymer or polypropylene.
'O' rings are Nitrile rubber or EPDM.
Collets are produced in acetal copolymer or polypropylene with stainless steel teeth.

Grips before it seals

The Collet (gripper) has stainless steel teeth which hold the tube firmly in position while the 'O' ring provides a permanent leakproof seal.



How to make a connection

Cut the tube square

Cut the tube square and remove burrs and sharp edges. Ensure the outside diameter is free of score marks. For soft or thin walled tube we recommend the use of a tube insert.

Push up to tube stop

Push the tube into the fitting, to the tube stop.

Pull to check secure

Pull on the tube to check it is secure. Test the system before use.

To disconnect

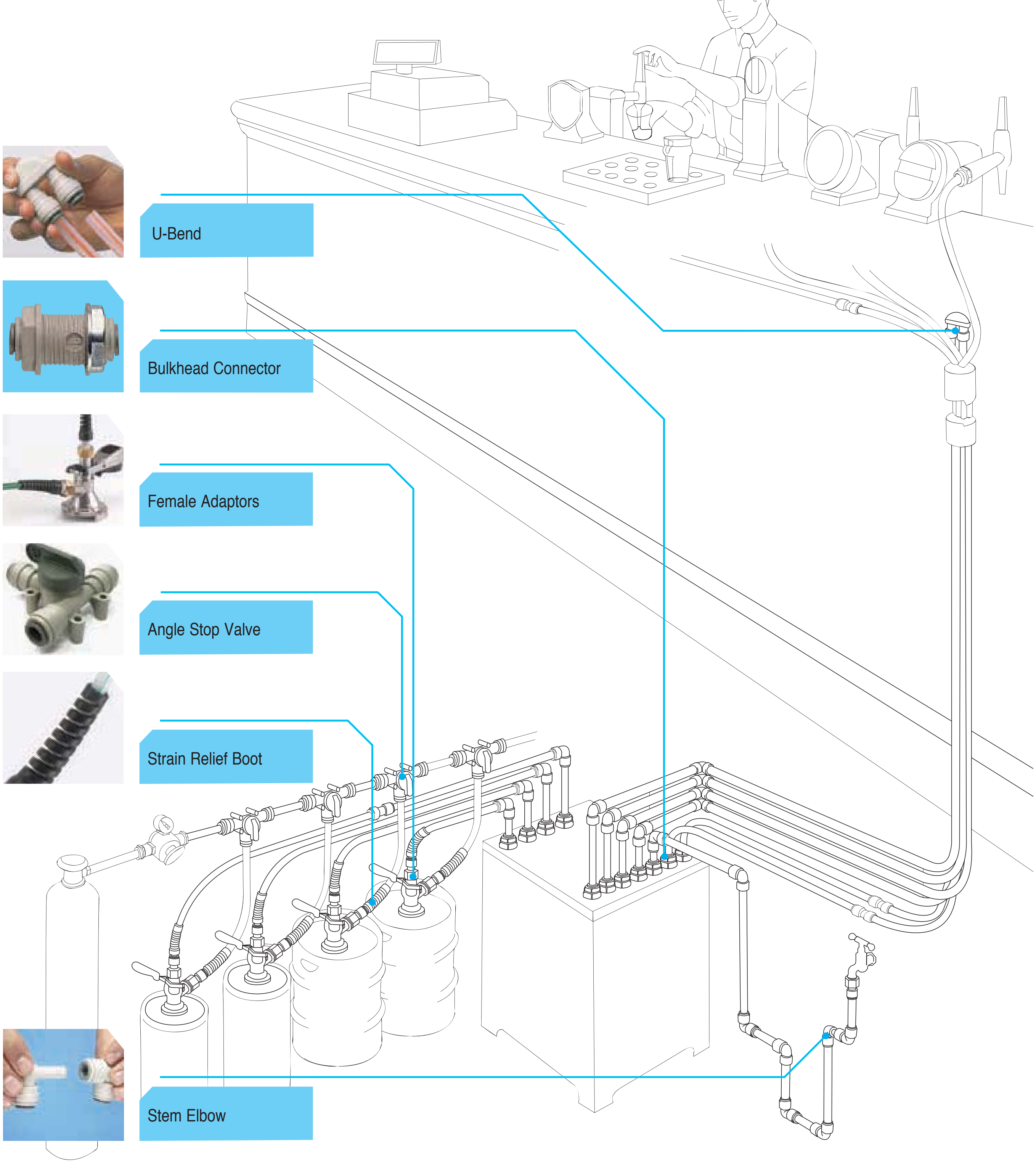
Push in collet and remove tube

To disconnect, ensure the system is depressurized, push the collet square against the fitting. With the collet held in this position the tube can be removed.

Typical Bar Installation

Super Speedfit push-in fittings have been designed for a wide range of industrial applications. They provide a fast and secure way of connecting tubes and offer considerable advantages over conventional fittings.

Complex tubing systems can be assembled more rapidly than with traditional methods and because Super Speedfit fittings are easy to disconnect, fault finding and maintenance become a much easier operation.



JG John Guest®

Grey Acetal Fittings

PI fittings offered in sizes 5/32” to 5/8” are manufactured in grey acetal copolymer, making them especially suitable for applications involving foodstuffs and potable liquids. They are however equally suitable for air and inert gases and can be used on N_2/CO_2 (installed in accordance with The British Beer and Pub Association Code of Practice) mixed gas dispense lines and in pneumatic applications and vacuum.

Technical information shown on page 36.

for liquids & inert gases

STRAIGHT ADAPTOR BSPT Thread

PART NO.	TUBE OD		THREAD BSPT
PM010401S	5/32	x	1/8
PM010402S	5/32	x	1/4
PI010601S	3/16	x	1/8
PI010602S	3/16	x	1/4
PI010801S	1/4	x	1/8
PI010802S	1/4	x	1/4
PM010801S	5/16	x	1/8
PM010802S	5/16	x	1/4
PM010803S	5/16	x	3/8
PI011202S	3/8	x	1/4
PI011203S	3/8	x	3/8
PI011603S	1/2	x	3/8
PI011604S	1/2	x	1/2

STRAIGHT ADAPTOR BSP Thread

PART NO.	TUBE OD		THREAD BSP
NCPI011211S	3/8	x	1/8
NCPI011212S	3/8	x	1/4

3/8” x 1/4” has special large seal for use with chamfered face ports.

No thread seal on 3/8” x 1/8”.

STRAIGHT ADAPTOR British Nipple Type

PART NO.	TUBE OD		THREAD BSW
PI0106E5S	3/16	x	1/2 - 24
PI0108E5S	1/4	x	1/2 - 24
PM0108E5S	5/16	x	1/2 - 24
PM0108E6S	5/16	x	9/16 - 24
PI0112E5S	3/8	x	1/2 - 24
PI0112E6S	3/8	x	9/16 - 24

STRAIGHT ADAPTOR NPTF Thread

PART NO.	TUBE OD		THREAD NPTF
PM010421S	5/32	x	1/8
PM010422S	5/32	x	1/4
PI010621S	3/16	x	1/8
PI010821S	1/4	x	1/8
PI010822S	1/4	x	1/4
PI010823S	1/4	x	3/8
PM010821S	5/16	x	1/8
PM010822S	5/16	x	1/4
PM010823S	5/16	x	3/8
PI011221S	3/8	x	1/8
PI011222S	3/8	x	1/4
PI011223S	3/8	x	3/8
PI011224S	3/8	x	1/2
PI011623S	1/2	x	3/8
PI011624S	1/2	x	1/2
PI012026S	5/8	x	3/4

STRAIGHT ADAPTOR BSP Thread

PART NO.	TUBE OD		THREAD BSP
PI010812S	1/4	x	1/4
PI011212S	3/8	x	1/4
PI011213S	3/8	x	3/8
PI011613S	1/2	x	3/8

For use with spot face ports.

STRAIGHT ADAPTOR MFL Thread

PART NO.	TUBE OD		THREAD MFL
PI0108F4S	1/4	x	1/4
PI0112F4S	3/8	x	1/4
PI0112F5S	3/8	x	5/16
PI0112F6S	3/8	x	3/8
PI0112F8S	3/8	x	1/2
PI0116F8S	1/2	x	1/2
PM0108C5S	5/16	x	1/2 - 16 UN
PI0112C5S	3/8	x	1/2 - 16 UN

OUTLET ADAPTOR
Parallel Thread

PART NO.	TUBE OD		THREAD BSP
NC128/I12	3/8	x	1/4

EQUAL ELBOW

PART NO.	TUBE OD	
PM0304S	5/32	
PI0306S	3/16	
PI0308S	1/4	
PM0308S	5/16	
PI0312S	3/8	
PI0316S	1/2	
PI0308S-B	1/4	Blue Collet

RIGID ELBOW
NPTF Thread

PART NO.	TUBE OD		THREAD NPTF
PI480821S	1/4	x	1/8
PI480822S	1/4	x	1/4
PI480823S	1/4	x	3/8
PI481022S	5/16	x	1/4
PI481023S	5/16	x	3/8
PI481222S	3/8	x	1/4
PI481223S	3/8	x	3/8
PI482024S	5/8	x	1/2

EQUAL STRAIGHT CONNECTOR

PART NO.	TUBE OD
PM0404S	5/32
PI0406S	3/16
PI0408S	1/4
PM0408S	5/16
PI0412S	3/8
PI0416S	1/2

REDUCING ELBOW

PART NO.	TUBE OD		TUBE OD
PM210804S	5/16	-	5/32
PI211006S	5/16	-	3/16
PI211008S	5/16	-	1/4
PI211206S	3/8	-	3/16
PI211208S	3/8	-	1/4
PI211210S	3/8	-	5/16
PI211610S	1/2	-	5/16
PI211612S	1/2	-	3/8

EQUAL TEE

PART NO.	TUBE OD
PM0204S	5/32
PI0206S	3/16
PI0208S	1/4
PM0208S	5/16
PI0212S	3/8
PI0216S	1/2

REDUCING TEE

PART NO.	TUBE OD ENDS		TUBE OD BRANCH
PI301208S	3/8	-	1/4
PI301612S	1/2	-	3/8

REDUCING STRAIGHT CONNECTOR

PART NO.	TUBE OD		TUBE OD
PI200806S	1/4	-	3/16
PM200804S	5/16	-	5/32
PI201006S	5/16	-	3/16
PI201008S	5/16	-	1/4
PI201206S	3/8	-	3/16
PI201208S	3/8	-	1/4
PI201210S	3/8	-	5/16
PI201608S	1/2	-	1/4
PI201610S	1/2	-	5/16
PI201612S	1/2	-	3/8

STEM ELBOW

PART NO.	STEM OD		TUBE OD
PM220404S	5/32	-	5/32
PI220606S	3/16	-	3/16
PI220808S	1/4	-	1/4
PM220808S	5/16	-	5/16
PI221206S	3/8	-	3/16
PI221208S	3/8	-	1/4
PI221210S	3/8	-	5/16
PI221212S	3/8	-	3/8
PI221616S	1/2	-	1/2

Accessories for PI Fittings are shown on page 33.

John Guest®

Adaptability

SWIVEL ELBOW BSPT Thread

PART NO.	TUBE OD		THREAD BSPT
PI090601S	3/16	x	1/8
PI090801S	1/4	x	1/8
PI090802S	1/4	x	1/4
PM090801S	5/16	x	1/8
PM090802S	5/16	x	1/4
PM090803S	5/16	x	3/8
PI091202S	3/8	x	1/4
PI091203S	3/8	x	3/8
PI091603S	1/2	x	3/8
PI091604S	1/2	x	1/2

SWIVEL BRANCH TEE BSPT Thread

PART NO.	TUBE OD		THREAD BSPT
PI100601S	3/16	x	1/8
PI100801S	1/4	x	1/8
PI100802S	1/4	x	1/4
PM100801S	5/16	x	1/8
PM100802S	5/16	x	1/4
PM100803S	5/16	x	3/8
PI101202S	3/8	x	1/4
PI101203S	3/8	x	3/8
PI101603S	1/2	x	3/8
PI101604S	1/2	x	1/2

SWIVEL MALE RUN TEE BSPT Thread

PART NO.	TUBE OD		THREAD BSPT
PI110601S	3/16	x	1/8
PI110801S	1/4	x	1/8
PI110802S	1/4	x	1/4
PM110801S	5/16	x	1/8
PM110802S	5/16	x	1/4
PM110803S	5/16	x	3/8
PI111202S	3/8	x	1/4
PI111203S	3/8	x	3/8
PI111603S	1/2	x	3/8
PI111604S	1/2	x	1/2

SWIVEL ELBOW NPTF Thread

PART NO.	TUBE OD		THREAD NPTF
PM090421S	5/32	x	1/8
PM090422S	5/32	x	1/4
PI090621S	3/16	x	1/8
PI090821S	1/4	x	1/8
PI090822S	1/4	x	1/4
PM090821S	5/16	x	1/8
PM090822S	5/16	x	1/4
PM090823S	5/16	x	3/8
PI091222S	3/8	x	1/4
PI091223S	3/8	x	3/8
PI091623S	1/2	x	3/8
PI091624S	1/2	x	1/2

SWIVEL BRANCH TEE NPTF Thread

PART NO.	TUBE OD		THREAD NPTF
PM100421S	5/32	x	1/8
PM100422S	5/32	x	1/4
PI100621S	3/16	x	1/8
PI100821S	1/4	x	1/8
PI100822S	1/4	x	1/4
PM100821S	5/16	x	1/8
PM100822S	5/16	x	1/4
PM100823S	5/16	x	3/8
PI101222S	3/8	x	1/4
PI101223S	3/8	x	3/8
PI101623S	1/2	x	3/8
PI101624S	1/2	x	1/2

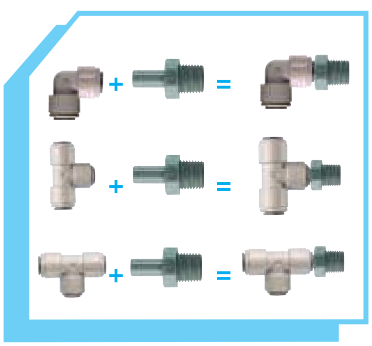
SWIVEL MALE RUN TEE NPTF Thread

PART NO.	TUBE OD		THREAD NPTF
PM110421S	5/32	x	1/8*
PM110422S	5/32	x	1/4*
PI110621S	3/16	x	1/8
PI110821S	1/4	x	1/8
PI110822S	1/4	x	1/4
PM110821S	5/16	x	1/8*
PM110822S	5/16	x	1/4
PM110823S	5/16	x	3/8*
PI111222S	3/8	x	1/4
PI111223S	3/8	x	3/8
PI111623S	1/2	x	3/8*
PI111624S	1/2	x	1/2*

* Obtained by using an Equal Tee shown on page 3 and a Stem Adaptor, shown on page 11.

John Guest Adaptability

Standard ***Super Speedfit*** products can be coupled together to form integral new fittings.



STRAIN RELIEF BOOT

PART NO.	SIZE
NC2447	3/8"
NC2448	1/2"

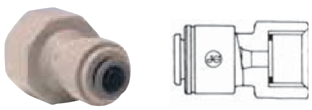
To suit most 3/8" or 1/2" fittings.

The Strain Relief Boot has been developed to reduce the potential strain on the tubing. The Boot limits the bend radius of the tube, preventing it from kinking.

Female Adaptors

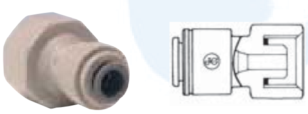
4 Tube Sizes
5 Thread Forms
10 Thread Sizes

FEMALE ADAPTOR BSP Thread - Flat End



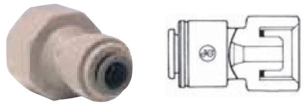
PART NO.	TUBE OD		THREAD BSP
PI451014FS	5/16	x	1/2
PI451015FS	5/16	x	5/8
PI451213S	3/8	x	3/8
PI451214FS	3/8	x	1/2
PI451215FS	3/8	x	5/8
PI451613S	1/2	x	3/8
PI451615FS	1/2	x	5/8

FEMALE ADAPTOR BSP Thread - Cone End



PART NO.	TUBE OD		THREAD BSP
PI451014CS	5/16	x	1/2
PI451015CS	5/16	x	5/8
PI451214CS	3/8	x	1/2
PI451215CS	3/8	x	5/8
PI451614CS	1/2	x	1/2
PI451615CS	1/2	x	5/8
PI451616CS	1/2	x	3/4

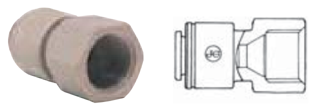
FEMALE ADAPTOR BSP Thread - Small Cone End



PART NO	TUBE OD		THREAD BSP
NCPI451214CS	3/8	x	1/2

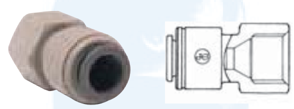
Typically used on beer outlet/gas inlet of keg couplers. Cone supports 'Top Hat' type Duck Bill Valve.

FEMALE ADAPTOR British Whitworth Thread



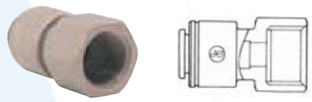
PART NO.	TUBE OD		THREAD BSW
PM4508E5S	5/16	x	1/2 - 24
PI4512E6S	3/8	x	9/16 - 24

FEMALE ADAPTOR UNS Thread



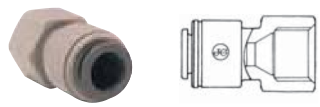
PART NO.	TUBE OD		THREAD UNS
PM4508C5S	5/16	x	1/2 - 16
PI4512C5S	3/8	x	1/2 - 16
PI4516C5S	1/2	x	1/2 - 16

FEMALE ADAPTOR NPTF Thread



PART NO.	TUBE OD		THREAD NPTF
PI450822S	1/4	x	1/4
PI451222S	3/8	x	1/4

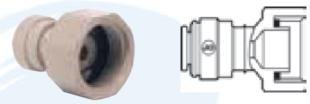
FEMALE ADAPTOR FFL Thread



PART NO.	TUBE OD		THREAD FFL
PM4508F4S	5/16	x	1/4
PI4512F4S	3/8	x	1/4
PI4512F6S	3/8	x	3/8

1/4 (FFL) corresponds to a 7/16 UNF
3/8 (FFL) corresponds to a 5/8 UNF

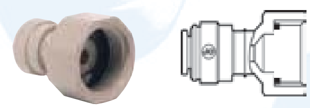
TAP ADAPTOR BSP Thread



PART NO.	TUBE OD		THREAD BSP
CI320814S	1/4	x	1/2
CI320816S	1/4	x	3/4
CI321214S	3/8	x	1/2
CI321216S	3/8	x	3/4

Not suitable for air

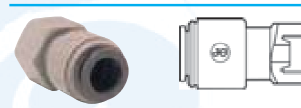
TAP ADAPTOR BSP Thread - Flat End



PART NO.	TUBE OD		THREAD BSP
CI320816FS	1/4	x	3/4
CI321216FS	3/8	x	3/4

Not suitable for air

TAP ADAPTOR UNS Thread



PART NO.	TUBE OD		THREAD UNS
CI3208U7S	1/4	x	7/16 - 24
CI3210U7S	5/16	x	7/16 - 24
CI3212U7S	3/8	x	7/16 - 24

Not suitable for air

KEG BEER OUTLET ADAPTOR

PART NO.	TUBE OD		THREAD BSP
PI561214CS	3/8	x	1/2

KEG GAS INLET ADAPTOR

PART NO.	TUBE OD		THREAD BSP
PI561214CS-NRV	3/8	x	1/2

John Guest®

THREE WAY DIVIDER

PART NO.	TUBE OD INLET		TUBE OD OUTLET
PI491612S	1/2	-	3/8
PI491616S	1/2	-	1/2

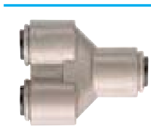
THREE WAY DIVIDER

PART NO.	TUBE OD INLET		TUBE OD OUTLET
PI491212S-R	3/8”	-	3/8”

TWO-WAY DIVIDER

PART NO.	TUBE OD
PI2308S	1/4
PM2308S	5/16
PI2312S	3/8
PI2316S	1/2

UNEQUAL TWO-WAY DIVIDER



PART NO.	TUBE OD INLET		TUBE OD OUTLET
PI241210S	3/8	-	5/16

BULKHEAD CONNECTOR

PART NO.	TUBE OD
PM1204S	5/32
PI1206S	3/16
PI1208S	1/4
PM1208S	5/16
PI1212S	3/8
PI1216S	1/2

REDUCING BULKHEAD CONNECTOR

PART NO.	TUBE OD		TUBE OD
PI121208S	3/8	-	1/4
NC2429	1/4”	-	6mm

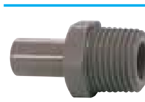
STEM ADAPTOR BSPT Thread

PART NO.	STEM OD		THREAD BSPT
PI050601S	3/16	x	1/8
PI050801S	1/4	x	1/8
PI050802S	1/4	x	1/4
PM050801S	5/16	x	1/8
PM050802S	5/16	x	1/4
PM050803S	5/16	x	3/8
PI051202S	3/8	x	1/4
PI051203S	3/8	x	3/8
PI051603S	1/2	x	3/8
PI051604S	1/2	x	1/2

STEM ADAPTOR BSP Thread

PART NO.	STEM OD		THREAD BSP
PM050812S	5/16	x	1/4
PI051212S	3/8	x	1/4
PI051213S	3/8	x	3/8

STEM ADAPTOR NPTF Thread

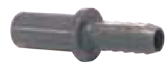


PART NO.	STEM OD		THREAD NPTF
PM050421S	5/32	x	1/8
PM050422S	5/32	x	1/4
PI050621S	3/16	x	1/8
PI050821S	1/4	x	1/8
PI050822S	1/4	x	1/4
PI050823S	1/4	x	3/8
PM050821S	5/16	x	1/8
PM050822S	5/16	x	1/4
PM050823S	5/16	x	3/8
PI051222S	3/8	x	1/4
PI051223S	3/8	x	3/8
PI051623S	1/2	x	3/8
PI051624S	1/2	x	1/2

STEM ADAPTOR British Nipple Type

PART NO.	STEM OD		THREAD BSW
PM0508E6S	5/16	x	9/16 - 24
PI0512E5S	3/8	x	1/2 - 24
PI0512E6S	3/8	x	9/16 - 24

TUBE TO HOSE STEM

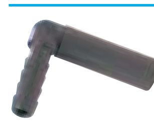


PART NO.	STEM OD		HOSE ID
PI250806S	1/4	-	3/16
PI250808S	1/4	-	1/4
PI250810S	1/4	-	5/16
PI251006S	5/16	-	3/16
PI251008S	5/16	-	1/4
PM250808S	5/16	-	5/16
PI251012S	5/16	-	3/8
PI251208S	3/8	-	1/4
PI251210S	3/8	-	5/16
PI251212S	3/8	-	3/8
PI251216S	3/8	-	1/2
PI251612S	1/2	-	3/8
PI251616S	1/2	-	1/2

TUBE TO HOSE STEM Long Version

PART NO.	STEM OD		HOSE ID
PI251012SL	5/16	-	3/8
PI251212SL	3/8	-	3/8

TUBE TO HOSE ELBOW



PART NO.	STEM OD		HOSE ID
PI290808S	1/4	-	1/4
PI290810S	1/4	-	5/16
PI291008S	5/16	-	1/4
PM290808S	5/16	-	5/16
PI291208S	3/8	-	1/4
PI291210S	3/8	-	5/16

Adaptors to convert to Metric sizes are shown on page 19.

ENLARGER

PART NO.	TUBE OD		STEM OD
PI131012S	3/8	-	5/16
PI131216S	1/2	-	3/8

REDUCER

PART NO.	STEM OD		TUBE OD
PI060605S	3/16	-	5/32
PI061006S	5/16	-	3/16
PI061008S	5/16	-	1/4
PI061206S	3/8	-	3/16
PI061208S	3/8	-	1/4
PI061210S	3/8	-	5/16
PI061610S	1/2	-	5/16
PI061612S	1/2	-	3/8

CROSS

PART NO.	TUBE OD
PI4712S	3/8

DISPENSING VALVE ELBOW

PART NO.	TUBE OD
NC356-02	3/8

DISPENSING VALVE STEM

PART NO.	STEM OD
NC730-02	3/8

OFFSET CONNECTOR

PART NO.	TUBE OD		TUBE OD
NC641	1/2	-	5/16

U-BEND

PART NO.	TUBE OD
PIUB12S	3/8
PIUB16S	1/2

PLUG

PART NO.	STEM OD
PM0804S	5/32
PI0806S	3/16
PI0808S	1/4
PM0808S	5/16
PI0812S	3/8
PI0816S	1/2

END STOP

PART NO.	TUBE OD
PI4608S	1/4
PI4612S	3/8

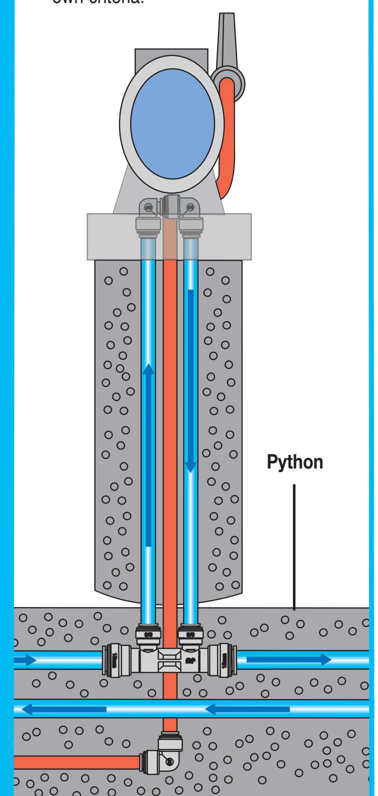
COOLING MANIFOLD

PART NO.	TUBE SIZE ENDS	TUBE SIZE BRANCHES
NC2183	15mm	3/8”

Intended for use on a 15mm Water Recirculation System.

A 4mm restriction between the two 15mm ports directs a proportion of recirculation water around a 3/8” looped spur.

Performance characteristics are dependent on a number of variables so it is recommended that suitability is assessed against the customer’s own criteria.



Accessories for PI Fittings are shown on page 33.

John Guest®

POLARCLEAN®

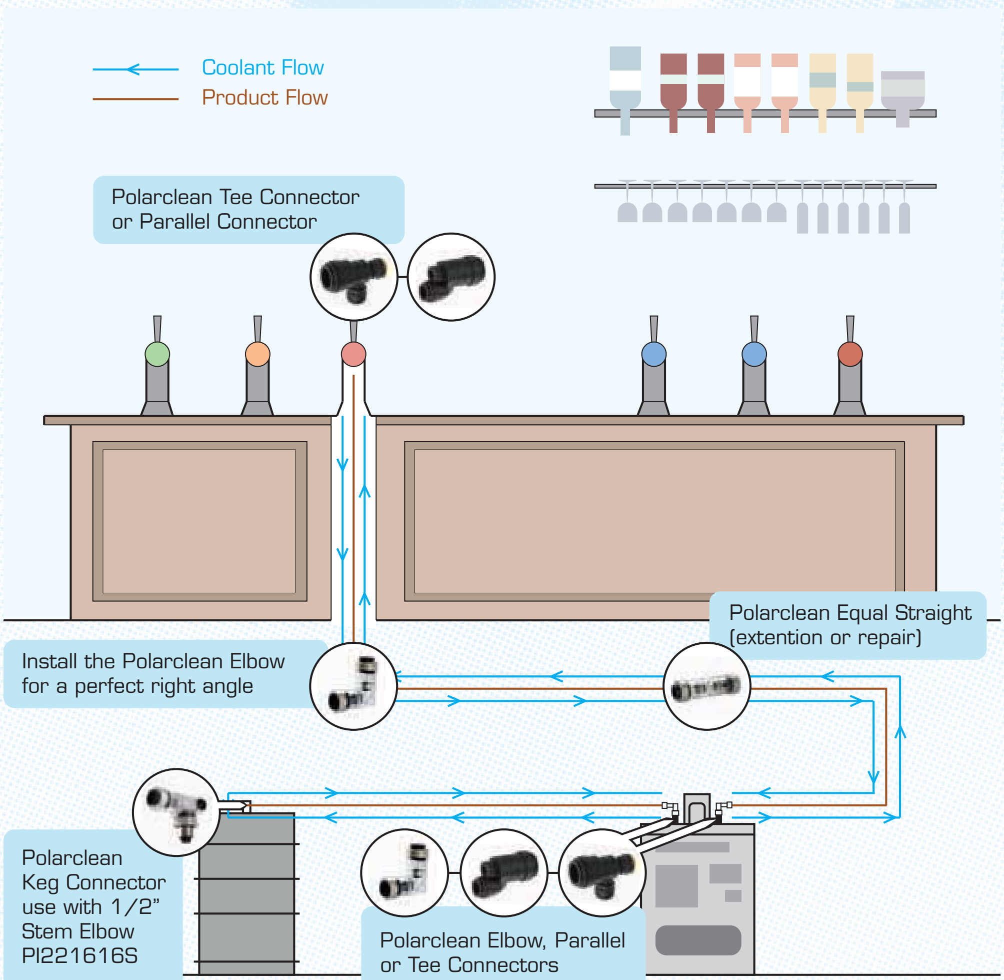
NEW

TUBE IN TUBE TECHNOLOGY

The John Guest range of tube-in-tube technology has recently been extended to further satisfy the requirements of a draught beer dispense system, from beer barrel to tap. A tube-in-tube system can help maintain critical temperature conditioning of beer or beverage in the pipeline by enabling each product tube to be fully enveloped by recirculating coolant, usually either water or a water glycol blend, over the entire pipeline length. Subject to system configuration, this may offer significant benefits to the retail outlet, brand owner and consumer when compared to a traditional draught dispense system or packaged product restriction.

System Benefits

- *Consistent temperature at pour - to brand specification / customer satisfaction*
- *Extra cold temperature capability without necessity of a coldroom or secondary cooling device & associated running / maintenance costs & space utilisation*
- *Microbiological activity is reduced at low temperature & product quality is less prone to microbial related complaints e.g. 'off flavours', beer fobbing, subject to an appropriate cleaning regime. Less waste means more revenue per barrel*
- *Genuine draught dispense where not previously a viable option*

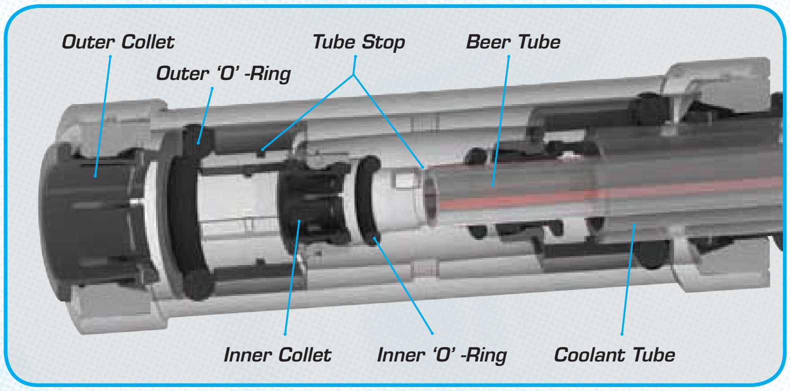


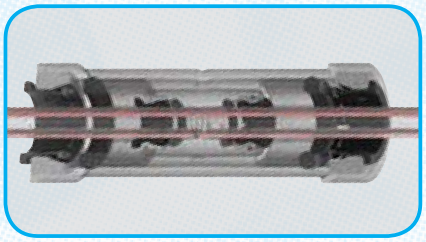
Polarclean Working Pressures and Temperatures

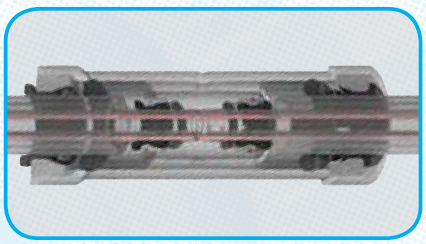
Water	5 Bar at 30ºC Max
Minimum Temperature	-5ºC* [internal fluids must not be permitted to freeze]

** At sub zero temperatures material strength reduces. Extra care should be taken to avoid abusive handling & impact at lower temperatures.*

TO MAKE A POLARCLEAN CONNECTION



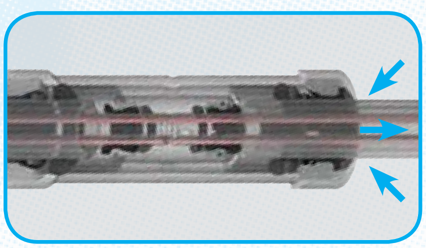


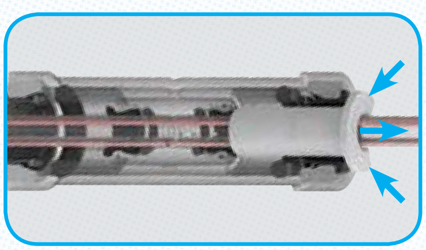


For transparent connectors:

1. Push beer tube up to tube stop. Visually confirm correct tube positioning and pull to check connection is secure.
2. Push the coolant tube up to the tube stop. Visually confirm correct tube positioning and pull to check connection is secure.
3. Connect beer supply and check for leakages.
4. Connect coolant supply and check for leakages.

TO DISCONNECT A POLARCLEAN CONNECTION





For transparent connectors:

1. Ensure both beer and coolant lines are depressurised. Push and hold the outer collet square against the face of the fitting whilst withdrawing the coolant tube.
2. Fit the Coaxial Collet Release Tool (NC2654) over the beer tube and slide into the Coaxial Connector until square against the inner collet. Depress the inner collet whilst withdrawing beer tube.
3. Remove Release Tool.

NOTE: For non-transparent coaxial connectors the beer tube passes through the connector without interuption.

POLARCLEAN RANGE

NOTE: *ALL 'OUTER' COAXIAL COOLANT TUBES ARE 18MM DIAMETER.*

EQUAL STRAIGHT CONNECTOR

PART NO.	INNER TUBE OD
NC2617	3/8

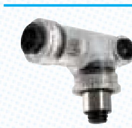
EQUAL ELBOW CONNECTOR

PART NO.	INNER TUBE OD
NC2618	3/8

REDUCING ELBOW CONNECTOR

PART NO.	INNER TUBE OD		INNER TUBE OD (RED COLLET)
NC2635	3/8	x	8

KEG CONNECTOR



Typically used with PI221616S at side inlet.

PART NO.	INNER TUBE OD	SIDE INLET TUBE OD	KEG COUPLER BSP THREAD
NC2648	3/8	1/2	1/2
NEW NC2782	3/8	1/2	5/8

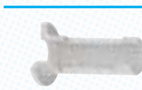
TEE CONNECTOR

PART NO.	INNER TUBE OD		BRANCH TUBE OD
NC909	3/8	x	3/8

PARALLEL CONNECTOR

PART NO.	INNER TUBE OD		BRANCH TUBE OD
NC2546	3/8	x	1/2

INTERNAL COLLET RELEASE TOOL



PART NO.
NC2654

BARBED COOLER SPIGOT

PART NO.
NC2742 18MM

John Guest®

White Acetal Fittings

CI inch size fittings are manufactured in white acetal. With a food grade EPDM 'O' ring, they have been developed for the water industry but are equally suitable for other potable liquids. They are also recommended for intermittent hot water applications.

Selected items are available with red or blue collets.

The CI Range is NOT suitable for compressed air and vacuum applications. For these situations we recommend the PI Range on pages 07 - 12.

Working Pressures and Temperatures

Water 10 BAR at 20˚C
7 BAR at 65˚C intermittent hot water

Other technical information is shown on page 36.

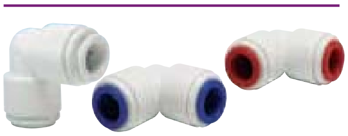
EQUAL STRAIGHT CONNECTOR

PART NO.	TUBE OD
CI0408W	1/4
CI0412W	3/8

STRAIGHT ADAPTOR NPTF Thread

PART NO.	TUBE OD		THREAD NPTF
CI010821W	1/4	x	1/8
CI010822W	1/4	x	1/4
CI010823W	1/4	x	3/8
CI011222W	3/8	x	1/4

EQUAL ELBOW

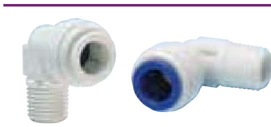


PART NO.	TUBE OD	
CI0308W	1/4	
CI0312W	3/8	
CI0308WB	1/4	Blue Collet
CI0312WB	3/8	Blue Collet
CI0312WR	3/8	Red Collet

STEM ELBOW

PART NO.	STEM OD		TUBE OD	
CI220808W	1/4	-	1/4	
CI221208W	3/8	-	1/4	
CI221212W	3/8	-	3/8	
CI220808WB	1/4	-	1/4	Blue Collet
CI221212WB	3/8	-	3/8	Blue Collet
CI220808WR	1/4	-	1/4	Red Collet
CI221212WR	3/8	-	3/8	Red Collet

RIGID ELBOW NPTF Thread



PART NO.	TUBE OD		THREAD NPTF	
CI480821W	1/4	x	1/8	
CI480822W	1/4	x	1/4	
CI480823W	1/4	x	3/8	
CI481222W	3/8	x	1/4	
CI480821WB	1/4	x	1/8	Blue Collet

EQUAL TEE

PART NO.	TUBE OD	
CI0208W	1/4	
CI0212W	3/8	
CI0208WB	1/4	Blue Collet

STEM TEE

PART NO.	TUBE OD		TUBE OD		TUBE OD
CI580808W	1/4	-	1/4	-	1/4

BRANCH STEM TEE

PART NO.	TUBE OD		TUBE OD		TUBE OD
CI530808W	1/4	-	1/4	-	1/4

BULKHEAD CONNECTOR

PART NO.	TUBE OD
CI1208W	1/4

FEMALE CONNECTOR BSP Thread

PART NO.	TUBE OD		THREAD BSP
CI450814FW	1/4	x	1/2

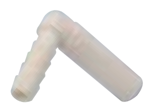
for pure water and potable liquids

pure water & potable liquids

FEMALE ADAPTOR
NPTF Thread

PART NO.	TUBE OD		THREAD NPTF
CI451222W	3/8	x	1/4

TUBE TO HOSE ELBOW

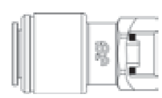


PART NO.	STEM OD		HOSE ID
CI291208W	3/8	-	1/4

STEM ADAPTOR
NPTF Thread

PART NO.	STEM OD		THREAD NPTF
CI050821W	1/4	x	1/8
CI050822W	1/4	x	1/4
CI051222W	3/8	x	1/4
CI051223W	3/8	x	3/8

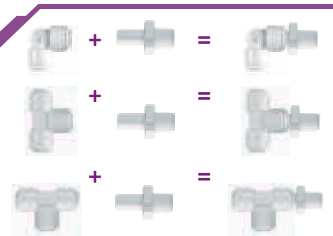
TAP ADAPTOR



PART NO.	TUBE OD		THREAD UNS
CI3212U7FW	3/8	x	7/16

John Guest Adaptability

Standard ***Super Speedfit*** products can be coupled together to form integral new fittings.



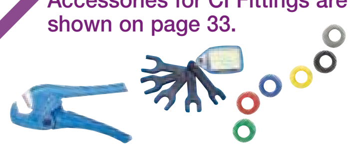
REDUCER

PART NO.	STEM OD		TUBE OD
CI061208W	3/8	-	1/4

BARB CONNECTOR
Superseal X Barb

PART NO.	SUPERSEAL OD		TUBE ID
CI270808W	1/4	-	1/4

Accessories for CI Fittings are shown on page 33.



John Guest®

Polypropylene Fittings

The PP Range of inch size push-in fittings is produced in white polypropylene and fitted with EPDM seals.

Polypropylene has the advantage of being more chemically resistant than acetal.

Working Pressures and Temperatures

Water	10 Bar at 20˚C
	4 Bar at 60˚C
Minimum Temperature	1˚C

Other technical information is shown on page 36.

STRAIGHT ADAPTOR NPTF Thread

PART NO.	TUBE OD		THREAD NPTF
PP010821W	1/4	-	1/8
PP010822W	1/4	-	1/4
PP010823W	1/4	-	3/8
PP010824W	1/4	-	1/2
PP011222W	3/8	-	1/4
PP011223W	3/8	-	3/8
PP011224W	3/8	-	1/2
PP011623W	1/2	-	3/8
PP011624W	1/2	-	1/2

EQUAL STRAIGHT CONNECTOR

PART NO.	TUBE OD
PP0408W	1/4
PPM0408W	5/16
PP0412W	3/8
PP0416W	1/2

REDUCING STRAIGHT CONNECTOR

PART NO.	TUBE OD		TUBE OD
PP201208W	3/8	-	1/4
PP201612W	1/2	-	3/8

EQUAL TEE

PART NO.	TUBE OD	
PP0208W	1/4	
PPM0208W	5/16	
PP0212W	3/8	
PP0216W	1/2	
PP0208W-B	1/4	Blue Collet

REDUCING TEE

PART NO.	TUBE OD END	TUBE OD END	TUBE OD BRANCH
PP30080812W	1/4	1/4	3/8
PP30120812W	3/8	1/4	3/8
PP30121208W	3/8	3/8	1/4
PP301612W	1/2	1/2	3/8

STEM TEE

PART NO.	TUBE OD END	TUBE OD END	TUBE OD BRANCH
PP531212W	3/8	3/8	3/8

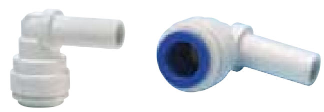
EQUAL ELBOW

PART NO.	TUBE OD	
PP0308W	1/4	
PPM0308W	5/16	
PP0312W	3/8	
PP0316W	1/2	
PP0308W-B	1/4	Blue Collet

REDUCING ELBOW

PART NO.	TUBE OD		TUBE OD
PP211008W	5/16	-	1/4
PP211208W	3/8	-	1/4
PP211612W	1/2	-	3/8

STEM ELBOW



PART NO.	STEM OD		TUBE OD	
PP220808W	1/4	-	1/4	
PPM220808W	5/16	-	5/16	
PP221208W	3/8	-	1/4	
PP221212W	3/8	-	3/8	
PP221616W	1/2	-	1/2	
PP221212W-B	3/8	-	3/8	Blue Collet

RIGID ELBOW NPTF Thread

PART NO.	TUBE OD		THREAD NPTF
PP480821W	1/4	x	1/8
PP480822W	1/4	x	1/4
PP480823W	1/4	x	3/8
PP481222W	3/8	x	1/4
PP481223W	3/8	x	3/8
PP481623W	1/2	x	3/8

BULKHEAD CONNECTOR

PART NO.	TUBE OD
PP1208W	1/4
PP1212W	3/8
PP1216W	1/2

Inch size -

white polypropylene

for pure water *and a wide range of applications*

REDUCING BULKHEAD CONNECTOR

PART NO.	TUBE OD		TUBE OD
PP121208W	3/8	-	1/4

FEMALE ADAPTOR

NPTF Thread

PART NO.	TUBE OD		THREAD NPTF
PP450821W	1/4	x	1/8
PP450822W	1/4	x	1/4
PP451222W	3/8	x	1/4
PP451223W	3/8	x	3/8

TAP ADAPTOR

UNS Thread

PART NO.	TUBE OD		THREAD UNS
PP3208U7W	1/4	x	7/16 - 24
PP3212U7W	3/8	x	7/16 - 24

STEM ADAPTOR

NPTF Thread

PART NO.	STEM OD		THREAD NPTF
PP050821W	1/4	x	1/8
PP050822W	1/4	x	1/4
PP051222W	3/8	x	1/4
PP051223W	3/8	x	3/8
PP051623W	1/2	x	3/8
PP051624W	1/2	x	1/2

REDUCER

PART NO.	STEM OD		TUBE OD
PP061208W	3/8	-	1/4
PP061210W	3/8	-	5/16
PP061612W	1/2	-	3/8
PP062008W	5/8	-	1/4
PP062012W	5/8	-	3/8
PP062016W	5/8	-	1/2

THREE WAY DIVIDER

PART NO.	TUBE OD INLET		TUBE OD OUTLET
PP491208W*	3/8	-	1/4

PLUG

PART NO.	STEM OD
PP0808W	1/4
PPM0808W	5/16
PP0812W	3/8
PP0816W	1/2

TUBE TO HOSE STEM

PART NO.	STEM OD		HOSE ID
PP251212W	3/8	-	3/8
PP251216W	3/8	-	1/2
PP251612W	1/2	-	3/8
PP251616W	1/2	-	1/2

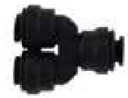
UNEQUAL DIVIDER

PART NO.	TUBE OD	TUBE OD
PP241208W	1/4	3/8

DIVIDER

PART NO.	TUBE OD
PP2312W	3/8

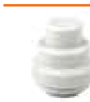
TWO WAY DIVIDER



Push-fit fitting with improved UV resistance and suitable for a wide variety of applications.

PART NO.	TUBE OD
PP2308E	1/4

END STOP



PART NO.	TUBE OD
PP4608W	1/4

John Guest®

Superseal Fittings

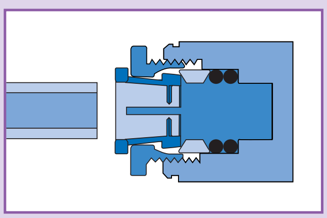
For use with Stainless Steel

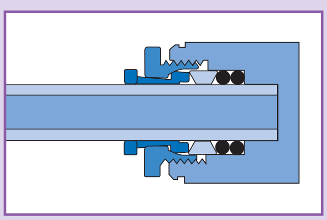
Superseal is a special fitting designed to provide extra grip on hard steel, stainless steel and other polished metal tubing.

The Superseal design features a collet with integrally moulded stainless steel teeth similar to the standard Super Speedfit design, but incorporating an additional hand-operated nut and wedge shaped plastic washer to apply extra pressure to the collet and the double 'O' ring seals. This ensures that the collet teeth bite thoroughly into the tube to provide grip while at the same time, compressing the 'O' rings to further enhance sealing.

Like other John Guest fittings Superseal is suitable for potable liquids and other food quality applications.

Technical information shown on page 36.





STRAIGHT ADAPTOR
BSPT Thread

PART NO.	SUPERSEAL OD		THREAD BSPT
SM010802S	5/16	x	1/4

STRAIGHT ADAPTOR
BSP Thread

PART NO.	SUPERSEAL OD		THREAD BSP
SM010812S	5/16	x	1/4

STRAIGHT ADAPTOR
MFL Thread

PART NO.	SUPERSEAL OD		THREAD MFL
SM0108F4S	5/16	x	1/4

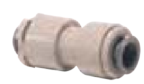
STRAIGHT ADAPTOR
Whitworth Thread

PART NO.	SUPERSEAL OD		THREAD BSW
SI0112E6S	3/8	x	9/16-24

STRAIGHT CONNECTOR
Superseal X Superseal

PART NO.	SUPERSEAL OD
SM410808E	5/16

STRAIGHT CONNECTOR
Superseal X Speedfit



PART NO.	SUPERSEAL OD		SPEEDFIT OD
SM040808S	5/16	-	5/16
SI041012S	5/16	-	3/8
SI041016S	5/16	-	1/2
SI041210S	3/8	-	5/16
SI041212S	3/8	-	3/8
SI041216S	3/8	-	1/2

METRIC SIZE
STRAIGHT CONNECTOR
SUPERSEAL X SPEEDFIT

PART NO.	SUPERSEAL OD		SPEEDFIT OD
SM040608E	6mm	-	8mm

for use with

stainless steel tube

ELBOW
Superseal X Superseal

PART NO.	SUPERSEAL OD		SUPERSEAL OD
SM400808S	5/16	-	5/16
SI401210S	3/8	-	5/16
SI401212S	3/8	-	3/8

BARB CONNECTOR

PART NO.	SUPERSEAL OD		TUBE ID
SI270808S	1/4	-	1/4
SI271008S	5/16	-	1/4
SI271208S	3/8	-	1/4

ELBOW
Superseal X Speedfit

PART NO.	SUPERSEAL OD		SPEEDFIT OD
SI030812S	1/4	-	3/8
SM030808S	5/16	-	5/16
SI031012S	5/16	-	3/8
SI031210S	3/8	-	5/16
SI031212S	3/8	-	3/8

STRAIGHT CONNECTOR

PART NO.	SUPERSEAL OD		SPEEDFIT OD
NC2301	1/2"	-	15mm

FLOW BEND CONNECTOR
Superseal X Speedfit

PART NO.	SUPERSEAL OD		SPEEDFIT OD
SM420808S	5/16	-	5/16
SI421012S	5/16	-	3/8
SI421210S	3/8	-	5/16
SI421212S	3/8	-	3/8

BULKHEAD CONNECTOR
Superseal X Speedfit

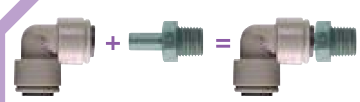
PART NO.	SUPERSEAL OD		SPEEDFIT OD
SM120808S	5/16	-	5/16

SUPERSEAL SPANNER

PART NO.
SPAN1

John Guest Adaptability

Standard ***Super Speedfit*** products can be coupled together to form integral new fittings.



Accessories for Superseal Fittings are shown on page 33.

John Guest®

Brass Fittings *for* beverage dispense *applications*

Designed for use in coffee brewing equipment, dispensing and vending machine applications. The fittings are manufactured in brass with a polypropylene collet and a food grade EPDM 'O' ring.

Working Pressures and Temperatures

Water	10 Bar at 20˚C
	4 Bar at 60˚C
Minimum Temperature	1˚C

Other technical information is shown on page 36.

BRASS FEMALE CONNECTOR
FFL Thread

PART NO.	TUBE OD		THREAD FFL
MI4508F4S	1/4	x	1/4
MI4512F4S	3/8	x	1/4
MI4512F6S	3/8	x	3/8

1/4 (FFL) corresponds to a 7/16 UNF
3/8 (FFL) corresponds to a 5/8 UNF

BRASS FEMALE CONNECTOR
GH Thread

PART NO.	TUBE OD		THREAD GH
NC2098	1/4	x	3/4

A stem elbow shown on page 08 will provide a neat 90º installation. The tube can be orientated in any direction.

BRASS POLYPROPYLENE FEMALE CONNECTOR
BSPP Thread

PART NO.	TUBE OD		THREAD BSPP
NC2145	1/4	x	3/4
NC2249	3/8	x	3/4

Metric to Imperial Adaptors

STRAIGHT CONNECTOR

PART NO.	TUBE OD		TUBE OD
NC462	15mm	-	1/2"

STEM TO TUBE ADAPTOR

PART NO.	STEM OD		TUBE OD
NC2164	15mm	-	3/8"
NC2173	1/2"	-	15mm

ADAPTOR TEE

PART NO.	TUBE OD END	TUBE OD BRANCH
NC869	15mm	3/8"

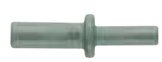
STRAIGHT CONNECTOR

PART NO.	SUPERSEAL OD		SPEEDFIT OD
NC2301	1/2"	-	15mm

STEM TO HOSE CONNECTOR

PART NO.	STEM OD		HOSE ID
NC932	15mm	-	1/2"

STEM TO STEM ADAPTOR



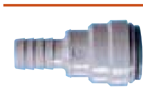
PART NO.	STEM OD		STEM OD
NC478	15mm	-	3/8"

UNEQUAL STRAIGHT CONNECTOR

NEW

PART NO.	TUBE OD		TUBE OD
NC2511	15mm	-	3/8"

TUBE TO HOSE CONNECTOR



PART NO.	TUBE OD		HOSE ID
NC448	15mm	-	1/2"

CM Fittings *for drinks and other potable liquids*

CM range of metric size fittings are manufactured in acetal. With a food grade EPDM 'O' ring, they have been developed for the water industry but are equally suitable for other potable liquids. They are also recommended for intermittent hot water applications.

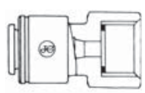
The CM Range is NOT suitable for compressed air and vacuum applications. For these situations we recommend the PI Range on pages 7 - 12 and the PM Range on Pages 23 - 26.

Working Pressures and Temperatures

Water 10 BAR at 20ºC
7 BAR at 65ºC intermittent hot water

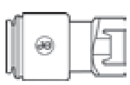
Other technical information is shown on page 36.

FEMALE ADAPTOR BSP Thread

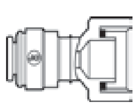
PART NO.	TUBE OD		THREAD BSP
CM451213FS	12	x	3/8
CM451214FS	12	x	1/2
CM451513FS	15	x	3/8

TAP ADAPTOR UNS Thread

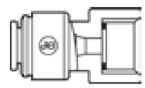
PART NO.	TUBE OD		THREAD UNS
CM3210U7E	10	x	7/16 - 24

TAP ADAPTOR BSP Thread

PART NO.	TUBE OD		THREAD BSP
CM320616E	6	x	3/4
CM320816E	8	x	3/4
CM321014E	10	x	1/2
CM321216E	12	x	3/4

TAP ADAPTOR Flat End BSP Thread

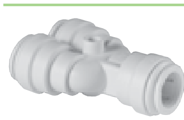



PART NO.	TUBE OD		THREAD BSP
CM320816FE	8	x	3/4

END STOP

PART NO.	TUBE OD
CM4612W	12

TWO WAY DIVIDER



PART NO.	TUBE OD
CM2315W	15

STRAIGHT ADAPTOR

PART NO.	TUBE OD		THREAD BSP
CM011514S	15	x	1/2

John Guest®

Black Acetal Fittings

The PM Range of metric size fittings is manufactured in black acetal copolymer with food grade nitrile ‘O’ rings. Being especially produced for foodstuff and potable liquids, they are equally suitable for air and inert gases and can therefore be used on N_2/CO_2 (installed in accordance with the Brewers and Licensed Retailers Association code of practice) mixed gas dispense lines and pneumatic applications and vacuum.

Technical Information shown on page 36.

STRAIGHT ADAPTOR
BSP Thread

PART NO.	TUBE OD		THREAD BSP
PM010411E	4	x	1/8
PM010412E	4	x	1/4
PM010511E	5	x	1/8
PM010512E	5	x	1/4
PM010611E	6	x	1/8
PM010612E	6	x	1/4
PM010811E	8	x	1/8
PM010812E	8	x	1/4
PM010813E	8	x	3/8
PM011012E	10	x	1/4
PM011013E	10	x	3/8
PM011014E	10	x	1/2
PM011213E	12	x	3/8
PM011214E	12	x	1/2
PM011513E**	15	x	3/8
PM011514E	15	x	1/2
PM011516E *	15	x	3/4
PM011814E	18	x	1/2
PM012216E	22	x	3/4

* No thread seal
** New

STRAIGHT ADAPTOR
BSPT Thread

PART NO.	TUBE OD		THREAD BSPT
PM010401E	4	x	1/8
PM010402E	4	x	1/4
PM010501E	5	x	1/8
PM010502E	5	x	1/4
PM010601E	6	x	1/8
PM010602E	6	x	1/4
PM010801E	8	x	1/8
PM010802E	8	x	1/4
PM010803E	8	x	3/8
PM011002E	10	x	1/4
PM011003E	10	x	3/8
PM011004E	10	x	1/2
PM011203E	12	x	3/8
PM011204E	12	x	1/2

PART NO.	TUBE OD		THREAD NPTF
PM010622E	6	x	1/4

EQUAL STRAIGHT CONNECTOR

PART NO.	TUBE OD
PM0404E	4
PM0405E	5
PM0406E	6
PM0408E	8
PM0410E	10
PM0412E	12
PM0415E	15
PM0418E	18
PM0422E	22

REDUCING STRAIGHT CONNECTOR

PART NO.	TUBE OD		TUBE OD
PM200604E	6	-	4
PM200804E	8	-	4
PM200806E	8	-	6
PM201004E	10	-	4
PM201006E	10	-	6
PM201008E	10	-	8
PM201208E	12	-	8
PM201210E	12	-	10

EQUAL ELBOW

PART NO.	TUBE OD
PM0304E	4
PM0305E	5
PM0306E	6
PM0308E	8
PM0310E	10
PM0312E	12
PM0315E	15
PM0318E	18
PM0322E	22

REDUCING ELBOW CONNECTOR

PART NO.	TUBE OD		TUBE OD
PM210604E	6	-	4
PM210804E	8	-	4
PM210806E	8	-	6
PM211004E	10	-	4
PM211006E	10	-	6
PM211008E	10	-	8
PM211208E	12	-	8
PM211210E	12	-	10

STEM ELBOW

PART NO.	TUBE OD		STEM OD
PM220404E	4	-	4
PM220505E	5	-	5
PM220606E	6	-	6
PM220808E	8	-	8
PM221010E	10	-	10
PM221212E	12	-	12
PM221515E	15	-	15
PM221818E	18	-	18
PM222222E	22	-	22

RIGID ELBOW

PART NO.	TUBE OD		THREAD NPTF
PM480621E	6	x	1/8
PM480622E	6	x	1/4
PM480623E	6	x	3/8

for liquids & *inert gases*

SWIVEL ELBOW
BSP Thread

PART NO.	STEM OD		THREAD BSP
PM090411E	4	x	1/8
PM090412E	4	x	1/4
PM090511E	5	x	1/8
PM090512E	5	x	1/4
PM090611E	6	x	1/8
PM090612E	6	x	1/4
PM090811E	8	x	1/8
PM090812E	8	x	1/4
PM090813E	8	x	3/8
PM091012E	10	x	1/4
PM091013E	10	x	3/8
PM091014E	10	x	1/2
PM091213E	12	x	3/8
PM091214E	12	x	1/2

SWIVEL ELBOW
BSPT Thread

PART NO.	TUBE OD		THREAD BSPT
PM090401E	4	x	1/8
PM090402E	4	x	1/4
PM090501E	5	x	1/8
PM090502E	5	x	1/4
PM090601E	6	x	1/8
PM090602E	6	x	1/4
PM090801E	8	x	1/8
PM090802E	8	x	1/4
PM090803E	8	x	3/8
PM091002E	10	x	1/4
PM091003E	10	x	3/8
PM091004E	10	x	1/2
PM091203E	12	x	3/8
PM091204E	12	x	1/2

EQUAL TEE

PART NO.	TUBE OD
PM0204E	4
PM0205E	5
PM0206E	6
PM0208E	8
PM0210E	10
PM0212E	12
PM0215E	15
PM0218E	18
PM0222E	22

REDUCING TEE

PART NO.	TUBE OD ENDS		TUBE OD BRANCH
PM3006AE	4	-	6
PM3018AE	18	-	15
PM3022AE	22	-	15

SWIVEL TEE
Centre Leg BSP Thread

PART NO.	TUBE OD		THREAD BSP
PM100411E	4	x	1/8
PM100412E	4	x	1/4
PM100511E	5	x	1/8
PM100512E	5	x	1/4
PM100611E	6	x	1/8
PM100612E	6	x	1/4
PM100811E	8	x	1/8
PM100812E	8	x	1/4
PM100813E	8	x	3/8
PM101012E	10	x	1/4
PM101013E	10	x	3/8
PM101014E	10	x	1/2
PM101213E	12	x	3/8
PM101214E	12	x	1/2

SWIVEL TEE
Centre Leg BSPT Thread

PART NO.	TUBE OD		THREAD BSPT
PM100401E	4	x	1/8
PM100402E	4	x	1/4
PM100501E	5	x	1/8
PM100502E	5	x	1/4
PM100601E	6	x	1/8
PM100602E	6	x	1/4
PM100801E	8	x	1/8
PM100802E	8	x	1/4
PM100803E	8	x	3/8
PM101002E	10	x	1/4
PM101003E	10	x	3/8
PM101004E	10	x	1/2
PM101203E	12	x	3/8
PM101204E	12	x	1/2

SWIVEL MALE RUN TEE
BSP Thread

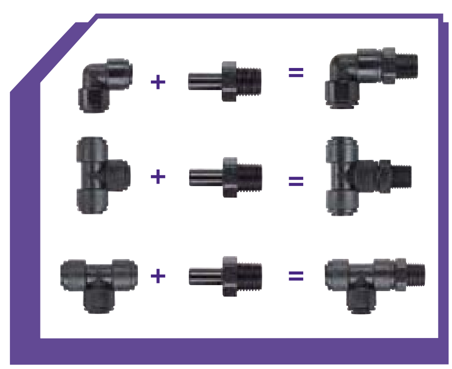
PART NO.	TUBE OD		THREAD BSP
PM110411E	4	x	1/8
PM110412E	4	x	1/4
PM110511E	5	x	1/8
PM110512E	5	x	1/4
PM110611E	6	x	1/8
PM110612E	6	x	1/4
PM110811E	8	x	1/8
PM110812E	8	x	1/4
PM110813E	8	x	3/8
PM111012E	10	x	1/4
PM111013E	10	x	3/8
PM111014E	10	x	1/2
PM111213E	12	x	3/8
PM111214E	12	x	1/2

SWIVEL MALE RUN TEE
BSPT Thread

PART NO.	TUBE OD		THREAD BSPT
PM110401E	4	x	1/8
PM110402E	4	x	1/4
PM110501E	5	x	1/8
PM110502E	5	x	1/4
PM110601E	6	x	1/8
PM110602E	6	x	1/4
PM110801E	8	x	1/8
PM110802E	8	x	1/4
PM110803E	8	x	3/8
PM111002E	10	x	1/4
PM111003E	10	x	3/8
PM111004E	10	x	1/2
PM111203E	12	x	3/8
PM111204E	12	x	1/2

John Guest Adaptability

Standard ***Super Speedfit*** products can be coupled together to form integral new fittings.



John Guest®

BULKHEAD CONNECTOR

PART NO.	TUBE OD
PM1204E	4
PM1205E	5
PM1206E	6
PM1208E	8
PM1210E	10
PM1212E	12

For 1/4" x 6mm size
see page 11

REDUCER

PART NO.	STEM OD		TUBE OD
PM060504E	5	-	4
PM060604E	6	-	4
PM060605E	6	-	5
PM060804E	8	-	4
PM060805E	8	-	5
PM060806E	8	-	6
PM061006E	10	-	6
PM061008E	10	-	8
PM061208E	12	-	8
PM061210E	12	-	10
PM061510E	15	-	10
PM061512E	15	-	12
PM061815E	18	-	15
PM062215E	22	-	15
PM062218E	22	-	18

ENLARGER

PART NO.	TUBE OD		STEM OD
PM130405E	5	x	4

STEM ADAPTOR

BSP Thread

PART NO.	STEM OD		THREAD BSP
PM050411E	4	x	1/8
PM050412E	4	x	1/4
PM050511E	5	x	1/8
PM050512E	5	x	1/4
PM050611E	6	x	1/8
PM050612E	6	x	1/4
PM050811E	8	x	1/8
PM050812E	8	x	1/4
PM050813E	8	x	3/8
PM051012E	10	x	1/4
PM051013E	10	x	3/8
PM051014E	10	x	1/2
PM051213E	12	x	3/8
PM051214E	12	x	1/2
PM051513E	15	x	3/8
PM051514E	15	x	1/2
PM051814E	18	x	1/2
PM052214E	22	x	1/2
PM052216E	22	x	3/4

STEM ADAPTOR

BSPT Thread

PART NO.	STEM OD		THREAD BSPT
PM050401E	4	x	1/8
PM050402E	4	x	1/4
PM050501E	5	x	1/8
PM050502E	5	x	1/4
PM050601E	6	x	1/8
PM050602E	6	x	1/4
PM050801E	8	x	1/8
PM050802E	8	x	1/4
PM050803E	8	x	3/8
PM051002E	10	x	1/4
PM051003E	10	x	3/8
PM051004E	10	x	1/2
PM051203E	12	x	3/8
PM051204E	12	x	1/2

TWO-WAY DIVIDER

PART NO.	TUBE OD
PM2304E	4
PM2308E	8
PM2310E	10

TWO-WAY DIVIDER

PART NO.	TUBE OD
PM2315E	15

For the new BDA Approved Twin Recirc.
Python for coolant water feed and return

PLUG

PART NO.	STEM OD
PM0804R	4
PM0805R	5
PM0806R	6
PM0808R	8
PM0810R	10
PM0812R	12
PM0815E	15
PM0818E	18
PM0822E	22

4mm - 12mm sizes in red
15mm - 22mm sizes in black
8mm size also available in
black Part No. PM0808E

TUBE TO HOSE STEM

PART NO.	STEM OD		HOSE ID
PM250604E	6	-	4
PM250806E	8	-	6
PM251008E	10	-	8

OFFSET CONNECTOR

PART NO.	TUBE OD		TUBE OD
NC657	12	-	8

END STOP

PART NO.	TUBE OD
PM4612E	12
PM4615E	15
PM4622E	22

U-BEND

PART NO.	TUBE OD
PMUB15E	15

FEMALE ADAPTOR

PART NO.	TUBE OD		THREAD
PM450411E*	4	x	1/8 BSP
PM450611E	6	x	1/8 BSP
PM450612E*	6	x	1/4 BSP
PM450812E	8	x	1/4 BSP
PM450813E	8	x	3/8 BSP
PM451015FE*	10	x	5/8 BSP
PM451215FE	12	x	5/8 BSP

* With thread seal.
Other sizes no seal.

Accessories for PM Fittings
are shown on page 33.

John Guest®

White Polypropylene Fittings

The PPM Range of metric size push-fit fittings are produced in white polypropylene and fitted with EPDM seals.

Polypropylene has the advantage of being more chemically resistant than acetal.

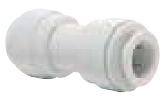
Working Pressures and Temperatures

Water 10 BAR at 20˚C
4 BAR at 60˚C intermittent hot water

Minimum Temperature 1˚C

Other technical information is shown on page 36.

EQUAL STRAIGHT CONNECTOR

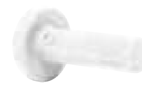


PART NO.	TUBE OD
PPM0408W	8
PPM0412W	12

STEM ELBOW

PART NO.	STEM OD		TUBE OD
PPM220808W	8	-	8
PPM221212W	12	-	12

PLUG



PART NO.	STEM OD
PPM0808W	8

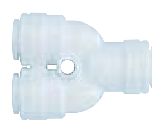
REDUCING STRAIGHT CONNECTOR

PART NO.	TUBE OD		TUBE OD
PPM201512W	15	-	12

EQUAL TEE

PART NO.	TUBE OD
PPM0208W	8
PPM0212W	12

DIVIDER



PART NO.	TUBE OD
PPM2312W	12

EQUAL ELBOW

PART NO.	TUBE OD
PPM0308W	8
PPM0312W	12

REDUCER

PART NO.	STEM OD		TUBE OD
PPM061512W	15	-	12

Adaptors to convert to Metric sizes are shown on page 19.

Acetal Angle Stop Valves

John Guest Angle Stop Valves are manufactured in Acetal with EPDM ‘O’ rings. They incorporate a single check valve and a 1/4 turn chromium plated ball valve.

The valves are for use with potable water. For use with other potable liquids please refer to our Customer Services Department for guidance.

The valves are not to be used with compressed air, explosive gases, petroleum spirit and other fuels or for heating systems.

Working Pressures and Temperatures

Water	12 Bar at 20ºC
	6 Bar at 65ºC

ACETAL ANGLE STOP VALVE •

PART NO.	TUBE OD	TUBE OD BRANCH
ASV3	15mm	1/4”
ASV4	15mm	3/8”

PART NO.	THREAD BSP	THREAD BSP	TUBE OD BRANCH
ASV7	3/8	3/8	3/8
ASV8	1/2	1/2	3/8
ASV9	3/8	3/8	1/4
ASV10	1/2	1/2	1/4

Acetal Elbow Stop Valves

The Elbow Stop Valve has an Acetal body and is fitted with EPDM seals and a brass nut.

Suitable for applications in the Drinks Dispense and Pure Water Industries.

The Valves should not be used with compressed air, explosive gases, petroleum spirits and other fuels or for heating systems.

Working Pressures and Temperatures

Water	10 Bar at 23ºC
	7 Bar at 65ºC

ACETAL ELBOW STOP VALVE •

PART NO.	TUBE OD	THREAD BSP
PISVBTC1214	3/8	1/2

1/4 Turn Valves. These valves have been designed to allow temporary servicing of downstream equipment and must only be used in the fully open or fully closed position.

DO NOT USE THESE VALVES:

- In a partially open position to control flow.
- To provide a permanent termination.
- Without tubing assembled or plugged (or threaded connections sealed).
- As a tap or “faucet”.

1/4 Turn Valves are indicated by this marker ‘•’

John Guest

Polypropylene Shut-Off Valve

The PP Range of shut-off valves are produced in polypropylene and fitted with EPDM seals. Polypropylene has the advantage of being more chemically resistant than acetal.

The valves are for use with potable water. For use with other potable liquids please refer to our Customer Services Department for guidance.

The valves are not to be used with compressed air, explosive gases, petroleum spirits and other fuels or for heating systems.

Working Pressures and Temperatures

Water	10 Bar at	20°C
	4 Bar at	60°C
Minimum Temperature		1°C

For advice on the use of 1/4 turn valves see Technical Specification on page 36.

White polypropylene for Potable Water

SPEEDFIT TO SPEEDFIT •

PART NO.	TUBE OD
PPSV040808W	1/4
PPSV041212W	3/8
PPMSV040606W	6mm
PPMSV040808W	8mm
PPMSV041010W	10mm
PPMSV041212W	12mm

8mm also available with mounting clip supplied unassembled **PPMSV04KIT**

SPEEDFIT TO FEMALE • NPTF

PART NO.	TUBE OD	THREAD NPTF
PPSV500822W	1/4	1/4
PPSV501222W	3/8	1/4

1/4 Turn Valves. These valves have been designed to allow temporary servicing of downstream equipment and must only be used in the fully open or fully closed position.

DO NOT USE THESE VALVES:

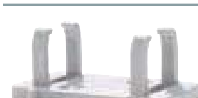
- In a partially open position to control flow.
- To provide a permanent termination.
- Without tubing assembled or plugged (or threaded connections sealed).
- As a tap or "faucet".

1/4 Turn Valves are indicated by this marker '•'

SPEEDFIT TO MALE • NPTF

PART NO.	TUBE OD	THREAD NPTF
PPSV010822W	1/4	1/4
PPSV011223W	3/8	3/8

MOUNTING CLIP



PART NO.	
SVMC-06	For 6mm and 1/4"
SVMC-10	For 10mm and 3/8"

The mounting clip is designed to give a very firm grip. A twisting action is needed to remove the valve. The clip can be used with either shut off valve. When used with the short handle version, valves can be banked together.

Accessories are shown on page 33.

Acetal Shut-Off Valve

John Guest acetal shut-off valves have a brand new full bore mechanism and are especially designed for the Brewing and Soft Drinks Industries and for potable water.

They are also suitable for air and inert gases such as N_2/CO_2.

The range includes valves with short and long handles to operate a 1/4 turn on off action.

Some valves are available with or without mounting clip. Others have integral mounting bosses.

Working Temperatures & Pressures

Air	-20ºC	10 bar
Air / Potable Liquids	+1ºC	10 bar
	+23ºC	10 bar
	+65ºC	7 bar

Can also be used with N^2/CO^2 to a maximum temperature of 50°C. When being used with N^2/CO^2, the valve should be installed in accordance with The British Beer and Pub Association Code of Practice.

For cleaning and sanitising and for advice on the use of 1/4 turn valves see Technical Specification on page 36.

Grey acetal for liquids & inert gases

SHUT OFF VALVE ● Short Handle

PART NO.	TUBE OD
PISV0412CS	**3/8**

SHUT OFF VALVE ● Short Handle with Mounting Clip

PART NO.	TUBE OD
PISV04KIT-SH	**3/8**

supplied unassembled

SHUT OFF VALVE ● Long Handle

PART NO.	TUBE OD
PISV0412S	**3/8**
PISV0416S	**1/2**

SHUT OFF VALVE ● LONG HANDLE WITH MOUNTING CLIP

PART NO.	TUBE OD
PISV04KIT	**3/8**

supplied unassembled

ANGLE STOP VALVE ●

PART NO.	TUBE OD
NC2555	**3/8**

The John Guest 3/8" Angle Stop Valve features double 'O' rings in each of the Speedfit ports and has been developed for a wide range of applications including foodstuffs, potable liquids and air.

1/4 Turn Valves. These valves have been designed to allow temporary servicing of downstream equipment and must only be used in the fully open or fully closed position.

DO NOT USE THESE VALVES:

- In a partially open position to control flow.
- To provide a permanent termination.
- Without tubing assembled or plugged (or threaded connections sealed).
- As a tap or "faucet".

1/4 Turn Valves are indicated by this marker '●'

John Guest®

Check Valves & Service Valves

Single Check Valves

Produced at the request of leading companies in the Drinks Dispense Industry, the Super Speedfit acetal Single Check Valve ensures protection against reversal of flow.

The low headloss design and fast installation time makes the valve the ideal selection. The valve is designed for use with liquids, it is not suitable for air and vacuum applications.

Working Pressures and Temperatures

10 Bar at 20˚C
7 Bar at 65˚C intermittent hot water
Minimum Temperature 1˚C
Typical 'crack open' pressure 0.02 Bar

Technical information other than working pressures and temperatures shown on page 36.

SINGLE CHECK VALVE

PART NO.	TUBE OD
1/4SCV	1/4"
5/16SCV	5/16"
3/8SCV	3/8"

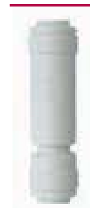
For use with liquids only.

SINGLE CHECK VALVE

PART NO.	TUBE OD
6SCV	6mm
10SCV	10mm
12SCV	12mm

For use with liquids only.

SINGLE CHECK VALVE

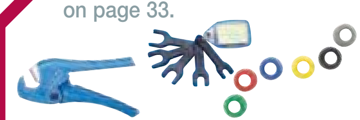


PART NO.	TUBE OD
NC2718	1/4

WRAS approved materials only, fittings approval not possible due to higher crack-open pressure (5psi). For use with liquids only.

- **Valves with low fixed cracking pressure (i.e 10cm water column), that have not been activated for some time may take several seconds to re-seal.**
- **It is the responsibility of the end user to verify that the product is suitable for his specific application.**
- **It is also recommended that the non-return valve is regularly checked and maintained.**

Accessories are shown on page 33.



NSF
NSF51
NSF61

WRAS APPROVED PRODUCT

Double Check Valve

Double Check Valves ensure the prevention of contamination arising from back syphonage, back flow and cross connection.

A spring loaded internal check valve is sited either side of the test cock and an arrow identifies the direction of flow. The low headloss design and fast installation time makes this unit the ideal selection. The valve can be mounted in any position.

The valve can also be used for domestic hot and cold water supplies.

Working Pressures and Temperatures

10 Bar at 20ºC
7 Bar at 65ºC intermittent hot water

Technical information other than working pressures and temperatures shown on page 36.

Service Valves

Speedfit Service Valves are ideally suited to provide a temporary shut-off facility in a drinks dispense situation.

The valve consists of a ball mechanism operated by means of a screwdriver slot

Push in connections make for a fast installation time, especially in confined spaces.

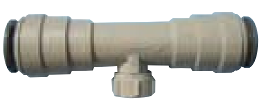
The valves can also be used for domestic hot and cold water supplies.

Working Pressures and Temperatures

10 Bar at 20ºC
7 Bar at 65ºC intermittent hot water

Technical information other than working pressures and temperatures shown on page 36.

DOUBLE CHECK VALVE



PART NO.	TUBE OD
15DCV	15mm

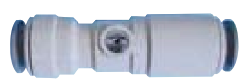
For use with liquids only.

DOUBLE CHECK SERVICE VALVE ●

PART NO.	TUBE OD
15DCSV	15mm

For use with liquids only.

SERVICE VALVE ●



PART NO.	TUBE OD
15SV	15mm

For use with liquids only.

SERVICE VALVE ●

PART NO.	TUBE OD
1/2ISV	1/2”

For use with liquids only.

1/4 Turn Valves. These valves have been designed to allow temporary servicing of downstream equipment and must only be used in the fully open or fully closed position.

DO NOT USE THESE VALVES:

- In a partially open position to control flow.
- To provide a permanent termination.
- Without tubing assembled or plugged (or threaded connections sealed).
- As a tap or “faucet”.

1/4 Turn Valves are indicated by this marker ‘●’

John Guest®

10
8 Col
Strong

LLDPE Tubing

The John Guest PE Range of plastic tubing is produced in Linear Low Density Polyethylene for cold and intermittent hot water applications.

Our tubing provides the benefits of a wide range of temperature and pressure suitability, broad chemical compatibility and is made from non contaminating materials. Common applications being water purification, water conditioners, ice makers and misting systems. LLDPE is more robust than traditional low or medium density polyethylene and is recommended for use with cold and intermittent hot water.

Our tubing is made from FDA approved materials and is NSF International certified.

John Guest Polyethylene tubing is designed for use with John Guest Super Speedfit Push-fit fittings, John Guest Shut-Off Valves and virtually all standard tubing connectors.

Sizes Available

PART NO.	OD	ID LENGTH	COIL RADII	MINI BEND	TUBE COLOUR SUFFIX
PE-08-BI-0500F-	1/4”(0.250”)	0.170”	500 FT	1.00”	N B R E W G Y O * *
PE-08-BI-1000F-	1/4”(0.250”)	0.170”	1000FT	1.00”	N B R E W - Y O * *
PE-10-CI-0500F-	5/16”(0.312”)	0.187”	500 FT	1.13”	N B R E W G Y O * *
PE-12-EI-0500F-	3/8”(0.375”)	0.250”	500 FT	1.25”	N B R E W G Y O *
PE-16-GI-0250F-	1/2”(0.500”)	0.375”	250 FT	2.50”	N B R E W G Y O *
PE-04025-0100M-	4mm	2.5mm	100m	25mm	N B R E W G Y O * *
PE-0604-0100M-	6mm	4mm	100m	25mm	N B R E W G Y O * *
PE-0806-0100M-	8mm	6mm	100m	30mm	N B R E W G Y O * *
PE-1007-100M-	10mm	7mm	100m	32mm	N B R E W G Y O *
PE-1209-100M-	12mm	9mm	100m	63mm	N B R E W G Y O *
PE-15115-0100M-	15mm	11.5mm	100m	100mm	- B R E - G - -

The suffix letter denotes tube colour as shown below ie PE-08-BI-0500F-N (denotes natural). Colour suffix in black text are generally in stock and available in minimum order quantities of 2 coils. Suffix in red text are non standard and are subject to minimum order quantities unless in stock and will incur a longer lead-time.

* denotes products shown in red have a minimum order quantity of 50 coils.
** denotes products which are shown in red have a minimum order quantity of 100 coils.

Tube Tolerances

1/4” to 1/2”	+0.001/-0.004”
4mm	+0.05/-0.07mm
6mm to 12mm	+0.05/-0.10mm
15mm	+0.10/-0.10mm

Standard Colours Available

SUFFIX

N	B	E	R	W
NATURAL	BLUE	BLACK	RED	WHITE




Other special colours available on request:-

Orange (O)
Green (G)
Yellow (Y)

15mm size only available in Blue, Red, Black and Green.

8mm size only available in Natural, Blue, Black, Red and White.
For other colours we suggest you use 5/16”.
Black tubing is UV stabilized.

Working Temperatures and Pressures - LLDPE

TUBE OD		TUBE ID	
1/4"	x	0.170"	230 psi @70ºF 16 bar @20ºC
5/16"	x	0.187"	
3/8"	x	0.25"	120 psi @150ºF 8 bar @ 65ºC
4mm	x	2.5mm	
6mm	x	4mm	
10mm	x	7mm	
1/2"	x	0.375"	150 psi @70ºF 10 bar @20ºC
8mm	x	6mm	
12mm	x	9mm	90 psi @150ºF 6 bar @65ºC
15mm	x	11.5mm	

1 Bar = 14.5 psi (approx.)

Maximum Working Temperature 150ºF at pressures shown in chart above.

For temperatures above 150ºF customers should refer to our Technical Help Desk.

The above maximum temperatures and pressures do not take chlorine content into account. This could reduce service life.

Please note maximum pressure rating for a 'system' depends on the lowest rated component, eg. most John Guest fittings have a different rating from the tube ratings shown above.

Burst Pressures are approximately 3 times the maximum working pressure.

Pneumatics Applications

John Guest LLDPE tube is suitable for pneumatic applications providing pressure is maximum 10 bar @ 20ºC (150psi @ 70ºF). At elevated temperatures(50ºC+) mineral oil will degrade LLDPE tube and, therefore, LLDPE tube used in pneumatic circuits should be periodically checked and replaced if necessary.

Tube Inserts

If the tube is used in a warm water system a tube insert is necessary.

Exposure to Ultraviolet Light

Only black tube should be installed in areas exposed to any light if biofilm growth is considered an issue. In this case other colours must be protected from exposure to light. Black tube is also UV stabilised and can be installed where exposed to direct sunlight (UV).

Chemical Resistance

For use of LLDPE with chemicals or potentially aggressive liquids, please refer to our Technical Service Department.

NOTE: When using cleaning agents or other potentially aggressive liquids, please ensure compatibility with tubing and fittings. LLDPE is not recommended for mineral oils, gases and fuels or high pressure compressed air / pneumatic systems.

Potable Water Applications

John Guest LLDPE tubing is suitable for potable cold water applications with a maximum chlorine content of 4 parts per million (4 ppm). Heating water above 70ºF (20ºC) and or pressures above the maximum will significantly reduce service life. Direct exposure to sunlight will also significantly reduce its useful service. As part of good practice tubing should be inspected regurlarly. If there is any evidence of damage, hardening or cracking it should be replaced immediately.

John Guest®

Accessories

COLLET COVERS

The slip-on Collet Cover shown in the illustration prevents accidental removal or tampering with tubing. Tubing can be inserted with the Collet Cover already attached to the fittings or the cover can slide into position afterwards. The cover is easily removed when required and comes in a variety of colours for colour coding.

Colours available - Suffix indicates colours

E = Black Y = Yellow B = Blue
R = Red S = Grey G = Green

INCH SIZE

PART NO.	TUBE OD
PM1904S	5/32
PI1906S	3/16
PI1908S	1/4
PM1908S	5/16
PI1912S	3/8
PI1916S	1/2

Please indicate by suffix, colour required or grey will be supplied.

METRIC SIZE

PART NO.	TUBE OD
PM1904E	4
PM1905E	5
PM1906E	6
PM1908E	8
PM1910E	10
PM1912E	12
PM1915E	15
PM1918E	18
PM1922E	22

15mm to 22mm sizes available in black as standard, white red or blue

Please indicate by suffix, colour required or black will be supplied.

FLOW BEND CLIP

PART NO.	TUBE OD
PM2608S	8mm/5/16
PM2610S	10mm/3/8
PM2612S	12mm/1/2

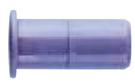
Designed to support tube and eliminate kinking.

TUBE INSERT

PART NO.	TUBE OD	TUBE ID
TSI250S	3/8	1/4
TSI312S	3/8	5/16
TSI375S	1/2	3/8

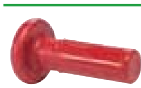
PART NO.	TUBE OD	TUBE ID
TSM1209S	12mm -	9mm

TUBE INSERT



PART NO.	TUBE OD	TUBE ID
TSM10N	10	7
TSM1209S	12	9
TSM15N	15	11.5

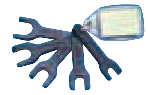
PLUG



PART NO.	STEM OD
PM0804R	4
PM0805R	5
PM0806R	6
PM0808R	8
PM0810R	10
PM0812R	12
PM0815E	15
PM0818E	18
PM0822E	22

4mm - 12mm sizes in red.
15mm - 22mm sizes in black.
8mm size also available in black Part No. PM0808E.

COLLET LOCKING TOOL



PART NO.	SIZE
ICLT/2	3/16 to 1/2

TUBE CUTTER

PART NO.	PART NO.
TS NIP	BLADES

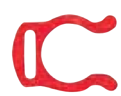
Suitable for up to 12mm tube.

PIPE CUTTER

PART NO.
JG-TS

Suitable for up to 22mm tube.

LOCKING CLIP



PART NO.	TUBE OD
INCH SIZE	
PIC1808R	1/4
PMC1808R	5/16
PIC1812R	3/8
PIC1816R	1/2
METRIC SIZE	
PMC1815R	15mm

Secures the collet in its position to prevent an accidental disconnection of the tube.

Technical Specification

Working Pressure and Temperature Range

Super Speedfit fittings are suitable for the following pressures and temperatures.

Temp.	Pressure	
	5/32" - 5/16" 4mm - 8mm	3/8" -1/2" 10mm - 22mm
Air		
- 20ºC	16 Bar	10 Bar
Potable Liquids and Air		
+1ºC	16 Bar	10 Bar
+20ºC	16 Bar	10 Bar
+65ºC	10 Bar	7 Bar

Also suitable for vacuum

Depending on the tube used, under certain conditions fittings may be used at higher pressures and temperatures. Please refer to our Customer Services Department for guidance. Note 1 Bar = 14.5 PSIG.

Tube Types

Plastic Tube - Polyethylene, nylon and polyurethane conforming to the tolerances shown below. For soft tubing or thin wall tube we recommend the use of tube inserts.

Braided Tube - Use of Tube to Hose Stems listed on pages 11, 16, 18, 21 and 26 is essential when using tube. Use of clamps to retain braided tube on barbs is recommended.

Metal Tube (soft) - Brass, copper or mild steel conforming to the tolerances below.

Metal Tube (hard) - We do not recommend Super Speedfit fittings for hard metal or chromium plated tubes.

For stainless steel and other polished metal tubes we recommend the use of Superseal fittings. These are shown on page 9 of this brochure.
It is essential that outside diameters be free from score marks and that the tube be deburred before inserting the fitting.

Tube Tolerances

Super Speedfit fittings are offered for tubes with outside diameters to the following tolerances.

Size (inches)	5/32 - 3/16	1/4 - 1/2
Tolerance (inches)	+0.001 / -0.003	+0.001 / -0.004
Size (mm)	4mm - 5mm	6mm - 22mm
Tolerance (mm)	+0.05 / -0.07	+0.05 / -0.10

Installation and System Testing

Fittings and tube should be kept clean and undamaged before use.
All tube and fittings installations must be pressure tested after installation to ensure system integrity before handing over to the final user. See also "How to make a connection".

1/4 Turn Valves

These valves have been designed to allow temporary servicing of downstream equipment and must only be used in the fully open or fully closed position. **DO NOT USE THESE VALVES:** In a partially open position to control flow; to provide a permanent termination; without tubing assembled or plugged (or threaded connections sealed, or as a tap or "faucet".

Chemicals

For use with chemicals or other potentially aggressive liquids, please refer to our Customer Services Department. In general, use only water or oil based paint. DO NOT ALLOW CONTACT WITH Cellulose based paint, paint thinners or strippers, solder flux or aggressive cleaners (see Cleaners and Sanitising). Keep away from ozone generators such as electric motors, mercury vapour lamps and high voltage electrical equipment.
Super Speedfit fittings are not recommended for use with explosive gases, petroleum spirits, and other fuels or for central heating systems.

Collet Covers

Are available as additional security against removal of the tube or to provide a simple means of colour coding. The cover is offered in a range of six colours. Please see page 26 of this brochure.

Food Quality

NSF standard 51 listed fittings in this brochure are produced in Food and Drug Administration (FDA) compliant materials and are therefore recommended for food quality applications. The majority of fitting in this catalogue are also supported by a John Guest declaration of compliance to European Regulation (EC) no.1935/2004

Maximum Torque Values for Plastic Threads BSP, BSPT & NPT.

Plastic threads are not generally as strong as brass threads. Customers and end users should be aware of this when choosing products for their applications. Overtightening of plastic threads will cause undue stress and eventual cracking and leakage. The maximum torque figures for BSP and BSPT threads used on John Guest fittings in mating threads conforming to the relevant BS or International thread standards are shown below.

	Threads		
	1/8 - 1/4	3/8 - 1/2	3/4
Max. Torque	1.5Nm	3.0Nm	4.0Nm

John Guest recommend OEM customers to consider replacing threaded ports with the more modern Cartridge Systems.
It is recommended that all installations are checked prior to use to determine that a seal has been made.

Maintenance and Replacement Intervals

John Guest products generally require little maintenance but as a minimum we recommend routine visual inspection. Frequency of visual inspection will depend on severity of application and risk of failure. If after visual inspection John Guest products appear damaged, cracked, charred, discoloured, heat distorted or corroded they should be replaced. Any product that is or appears to be leaking should be replaced.
Product life is affected by the severity of the application, the hostility of the working environment and contact with aggressive chemicals or liquids. It is therefore important that specific replacement intervals be considered by specifiers/users/customers based on previous service life or when failure could result in unacceptable downtime, damage or injury risk.

Cleaners and Sanitising of Fittings

The external surfaces of John Guest products must not come into contact with oxidising or acidic cleaners and sanitising agents, for example (but not limited to) those below pH 4, high in sodium hypochlorite level (bleach) or containing hydrogen peroxide. Our plastic material suppliers recommend ECOLAB Oasis 133 as a suitable cleaner for the external surfaces of products manufactured by John Guest.
Several different methods exist for sanitising the internal surfaces of fluid systems, including sodium hypochlorite, hydrogen peroxide, chlorine dioxide or ozone. It is entirely the responsibility of the end user to determine if the chosen method is suitable for use with John Guest products over the planned working life of the system. However, to avoid unnecessary early failure, John Guest requires that the disinfection solution must be immediately flushed out at all draw off points with fresh, wholesome water at the end of the disinfection period. **The solution must not be left in the system**. Disinfection solutions must only come into contact with the internal (fluid carrying) surfaces of the system. If any other surfaces of a fitting come into contact with disinfection solution **the whole fitting must be replaced immediately.** Polypropylene fittings offer greater resistance to aggressive chemicals than Acetal fittings but do not have the same mechanical properties. John Guest polypropylene fittings are generally designated by the part number prefix PP or PPM.

Side Loads

John Guest products are not designed to be used whilst under side load as this may adversely affect their ability to function long-term. Always ensure tubes have good alignment with the fitting. They must also not be subjected to any form of impact or other damage, such as being hit or dropped, even accidently. If fittings have damaged or suffered an impact, they should be replaced immediately. John Guest warranty does not cover loss caused by any form of damage.

Warranty

Whilst we give a warranty against defects in manufacture or materials, it is the responsibility of the specifier to ensure that fittings and related products are suitable for their application. The installation must be carried out correctly in accordance with our recommendations, complying with recognised codes of practice and relevant national standards, and be properly maintained. Please refer to our terms and conditions of sale.

John Guest®

Notes

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NOT JUST A BRAND
JG
EST. 1961
WE ARE THE STANDARD

Product Selection and Installation

John Guest fittings and related products are specifically designed and manufactured by John Guest to the Technical Specifications set out in the John Guest Product Catalogues. All John Guest fittings and related products should be selected, installed, used and maintained in accordance with these Technical Specifications. It is the customer's / user's responsibility to ensure that John Guest fittings and related products are suitable for their intended applications, and are properly installed and maintained and are used in accordance with the Technical Specifications. It is also the customer's / user's responsibility to provide it's customers with any relevant technical information about John Guest products it supplies them.

The company has a policy of continuous research and development and reserves the right to amend without notice the specification and design of all products illustrated in this catalogue. John Guest reserve the right to change the colour and shape of products. Photographs are for illustration purposes only.

Subject to our Terms and Conditions of Sale available on request.

Z2105/87/0917

Schedule 80 Product Overview

PVC Performance Engineered & Tested

SPEARS® Schedule 80 PVC product designs combine years of proven experience with computer generated stress analysis to yield the optimum physical structure and performance for each fitting. Material reinforcement is uniformly placed in stress concentration areas for substantially improved pressure handling capability. Resulting products are subjected to numerous verification tests to assure obtaining the very best PVC fittings available.

1/4" Through 14" Availability

Spears® comprehensive line of PVC injection molded fittings and extruded pipe offers a variety of configurations in sizes 1/4" through 14". Schedule 80 fittings are manufactured to ASTM D 2467 and pipe is produced to ASTM D 1785. Spears® exclusive CL150 Flanges are produced in sizes 1/2" - 18" with ANSI B16.5 bolt patterns, plus numerous Unions, Saddles, Transition and Specialty fittings in a variety of sizes.

Exceptional Chemical & Corrosion Resistance

Unlike metal, PVC fittings and pipe never rust, scale, or pit, and will provide many years of maintenance-free service and extended system life.

High Temperature Ratings

PVC thermoplastic can handle fluids at service temperatures up to 140°F (60°C), allowing a wide range of process applications, including corrosive fluids.

Lower Installation Costs

Substantially lower material costs than steel alloys or lined steel, combined with lighter weight and ease of installation, can reduce installation costs by as much as 60% over conventional metal systems.

Higher Flow Capacity

Smooth interior walls result in lower pressure loss and higher volume than conventional metal fittings.

Additional Fabricated Configurations through 36"

Extra large, hard-to-find, and custom configurations are fabricated from NSF® Certified pipe. Fittings are engineered and tested to provide full pressure handling capabilities according to Spears® specifications.

Advanced Design Specialty Fittings

Spears® wide range of innovative, improved products include numerous metal-to-plastic transition fittings and unions with Spears® patented special reinforced (SR) plastic threads.

PVC Valves

SPEARS® PVC Valve products are available for total system compatibility and uniformity.

PVC Sample Engineering Specifications

All PVC Schedule 80 pipe and fittings shall be produced by Spears® Manufacturing Company from PVC Type I, cell classification 12454, conforming to ASTM Standard D 1784. All PVC injection molded Schedule 80 fittings and extruded pipe shall be Certified for potable water service by NSF International. All Schedule 80 fittings shall be manufactured in strict compliance to ASTM D 2467 and Schedule 80 pipe shall be manufactured in strict compliance to ASTM D 1785. All fabricated fittings shall be produced in accordance with Spears® General Specifications for Fabricated Fittings. All PVC flanges shall be designed and manufactured to meet CL150 bolt pattern per ANSI Standard B16.5 and rated for a maximum internal pressure of 150 psi, non-shock at 73°F.

Schedule 80 Product Overview

The information contained in this publication is based on current information and Product design at the time of publication and is subject to change without notification. Our ongoing commitment to product improvement may result in some variation. No representations, guarantees or warranties of any kind are made as to its accuracy, suitability for particular applications or results to be obtained therefrom. For verification of technical data or additional information not contained herein, please contact Spears® Technical Services Department [West Coast: (818) 364-1611 — East Coast: (678) 985-1263].

General Information

Recommendations For Installers And Users

Plastic piping systems should be **ENGINEERED, INSTALLED** and **OPERATED** in accordance with **ESTABLISHED DESIGN AND ENGINEERING STANDARDS AND PROCEDURES** for plastic piping systems. Suitability for the intended service application should be determined by the installer and/or user prior to installation of a plastic piping system. **PRIOR TO ASSEMBLY, all piping system components should be inspected for damage or irregularities. Mating components should be checked to assure that tolerances and engagements are compatible. Do not use any components that appear irregular or do not fit properly. Contact the appropriate manufacturer of the component product in question to determine usability. Consult all applicable codes and regulations for compliance prior to installation.**

Solvent Weld Connections — Use quality solvent cements and primers formulated for the intended service application, pipe size and type of joint. While the pipe and fitting materials may be compatible with the intended medium, the solvent cement may not be. Consult the manufacturers for suitability of use. Read and follow the cement and primer manufacturers' applications and cure time instructions thoroughly. Be sure to use the correct size applicator.

Threaded Connections — Use a quality grade thread sealant. **WARNING: SOME PIPE JOINT COMPOUNDS OR PTFE PASTES MAY CONTAIN SUBSTANCES THAT COULD CAUSE STRESS CRACKING TO PLASTIC.** Spears® Manufacturing company recommends the use of Spears® **BLUE 75™** Thread Sealant which has been tested for compatibility with Spears® products. Please follow the sealant manufacturers' application/installation instructions. Choice of an appropriate thread sealant other than those listed above is at the discretion of the installer. 1 to 2 turns beyond **FINGER TIGHT** is generally all that is required to make a sound plastic threaded connection. Unnecessary **OVERTIGHTENING** will cause **DAMAGE TO BOTH PIPE AND FITTING.**

Standards and Specifications

Molded Schedule 80 PVC products are manufactured to ASTM D 2467 for use with pipe manufactured to ASTM D 1785. Certain products carry reduced pressure handling capability and have maximum internal pressure ratings at 73°F noted.

Fabricated Schedule 80 PVC pressure fittings (part numbers ending with **"F"**) are manufactured to Spears® specifications for use with pipe manufactured to ASTM D 1785. General Specifications for Standard Fabricated Fittings for additional information.

All specified Schedule 80 PVC products are manufactured from materials certified by NSF® for use in potable water service.

"Lead Free" low lead certification – unless otherwise specified, all Spears® Schedule 80 fittings specified here-in are certified by NSF International to ANSI/NSF® Standard 61, Annex G and is in compliance with California's Health & Safety Code Section 116825 (commonly known as AB1953) and Vermont Act 193. Weighted average lead content <=0.25%. Spears® PVC Pipe, Fittings and Valves have always been lead-free and Certified by NSF International for use in potable water systems. Spears® offers a wide range of lead-free specialty fittings and transition adapters for plumbing applications. However, certain brass threaded adapter fittings for applications that are not intended to convey water for human consumption through drinking or cooking are still produced and available.

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Note: The overall system dimensions and GA drawings will be provided once the P&ID and submittal are approved and engineering is completed. Some components are subject to change. If any changes are required, Pure Aqua will notify Village Safe Water of these changes. Pure Aqua makes no claims, warranties or guarantees regarding system performance, filtration efficiency, and product water quality. Client approval is required within 14 days to proceed with the project. If 14 days have passed without client approval, then Pure Aqua may revise any pricing before proceeding with the project. After client approval further changes are subject to additional penalties/charges. This document constitutes the entire, final and exclusive agreement in regards to this specific project (Pure Aqua, Inc. Sales order number 5-8672) between Pure Aqua and The State of Alaska / City of Thorne Bay (Consultant representing the client) and supersedes any and all previous oral, written, or electronic agreements, understandings, documents or emails. Any specifications or options not listed in this document will not be supplied and are outside the scope of this agreement. The system is designed to Pure Aqua's standards and is not NSF or UL listed. Pure Aqua makes no claim or guarantee that the system meets NSF or any other standards. NSF components are supplied where applicable. It is the obligation of Village Safe Water & City of Thorne Bay to determine if any components meet installation requirements and the requirement of the State of Alaska. NSF data sheets are supplied from the respective manufacturers for various components as is. Payment terms apply as per contract and include penalties for late payment. If your shipment is delayed, lost, weathered or damaged in transit, Pure Aqua is not responsible for any liability for any loss, damage, consequence or expense. By signing this submittal, The State of Alaska / City of Thorne Bay and the consultant agree to the specifications above and Pure Aqua's disclaimer.

Client Signature: x____________________________________ Date: ____________