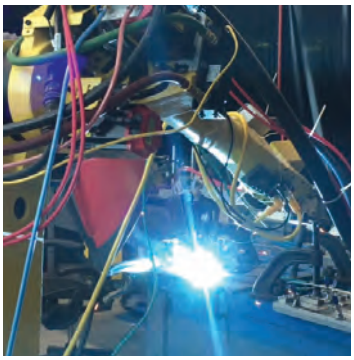
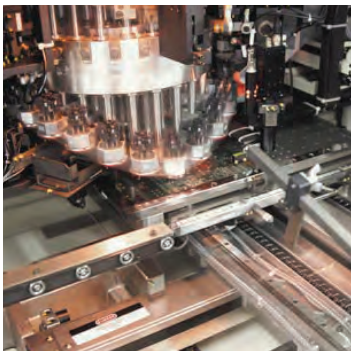
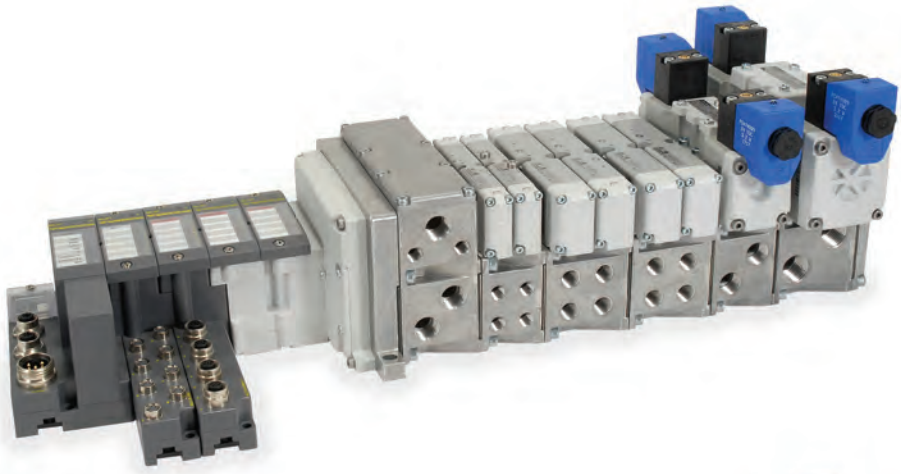






# H Series ISO Valve and Network Connectivity

Catalog 0699P (Revised 11/27/19)

Parker

## H Series ISO


Plug-in


Non plug-in

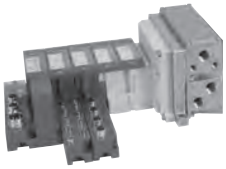


## Network Connectivity

P2M Network Node

H Series Network Portal

P2H Network Node



Turck Network Portal



## ⚠ WARNING

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application including consequences of any failure, and review the information concerning the product or system in the current product catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met.

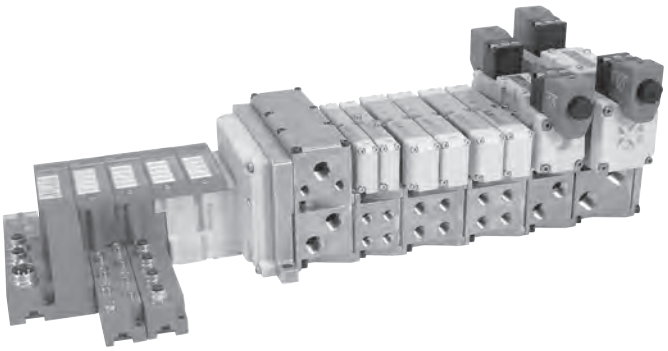
The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

## Offer of Sale

The items described in this document are hereby offered for sale by Parker Hannifin Corporation, its subsidiaries or its authorized distributors. This offer and its acceptance are governed by the provisions stated on the separate page of this document entitled “Offer of Sale”.

# H Series ISO

The H Series ISO valve conforms to international standards 15407 and 5599, providing maximum flexibility for end users. As Parker's premier manifold mount product offering, H Series ISO offers machine builders a complete offering with a wide variety of accessories and options in a valve family with flow ranges from 0.55 Cv up to 6.0 Cv. HB/HA/H1/H2 can be mounted on the same manifold. Individual wiring is available with DIN or central connectors, and collective solutions offer installation time savings with either multi-pin connectors or network solutions.



**Ports, Flow**

- H Universal Manifold
  HB: 1/8 inch, 0.55 Cv
  HA: 1/4 inch, 1.1 Cv
  H1: 3/8 inch, 1.5 Cv
  H2: 1/2 inch, 3.0 Cv
- H Classic Manifold (not compatible with H Universal)
  H3: 3/4 inch, 6.0 Cv
- NPT and BSPP "G" standard

**Solenoids**

- HB & HA: 24 VDC, 1.0 Watt, and 120 VAC, 1.0 VA
- H1, H2, & H3: 24 VDC, 3.2 Watt, 120 VAC, 4.5 VA, 24 VDC, 1.3 Watt

**Certification / approval**

- IP65 rated
- cCSAus approved voltages:
  15407-2 & 5599-2 24VDC manifolds only
  15407-2 & 5599-2 single subbase, all voltages
  15407-1 & 5599-1 manifold and single subbase, all voltages
- BSPP manifold and subbase ports meet ISO 1179 specifications

## Operating information

| | |
|---|---|
| Operating pressure: | Vacuum to 145 PSIG (Vacuum to 10 bar) |
| Pilot pressure: | See chart |
| Temperature range: | 5°F to 120°F (-15°C to 49°C) |

## Material specifications

| | |
|---|---|
| Body | Aluminum |
| End caps | PBT |
| End plates | Aluminum |
| Fasteners | Zinc plated steel |
| Manifolds | Aluminum |
| Seals | Nitrile |
| Spool | Aluminum |

## Operating Pressure

**Maximum: 145 PSIG (1000 kPa)**

**Minimum: see below chart**

| Operator / function | Internal pilot | PSIG (Min. kPa) HB | PSIG (Min. kPa) HA | PSIG (Min. kPa) H1 | PSIG (Min. kPa) H2 | PSIG (Min. kPa) H3 |
|---|---|---|---|---|---|---|
| 1 | Single solenoid - 2-position | 30 (207) | 25 (173) | 25 (173) | 25 (173) | 35 (241) |
| 2 | Double solenoid- 2-position | | | | | |
| 3 | Single remote pilot - 2-position ** | Vacuum | Vacuum | Vacuum | Vacuum | Vacuum |
| 4 | Double remote pilot - 2-position** | Vacuum | Vacuum | Vacuum | Vacuum | Vacuum |
| 5, 6, 7 | Double solenoid - 3-position APB, CE, PC | 35 (241) | 35 (241) | 35 (241) | 50 (345) | 50 (345) |
| 8, 9, 0 | Double remote pilot - 3-position** APB, CE, PC | Vacuum | Vacuum | Vacuum | Vacuum | Vacuum |
| E | Single solenoid pilot - 2-position | 30 (207) | 30 (207) | 35 (241) | 45 (310) | 45 (310) |
| | Air return / spring assist | | | | | |
| F | Single remote pilot - 2-position** | | | | | |
| | Air return / spring assist | | | | | |
| N, P, Q | Double solenoid - dual 3/2 | 30 (207) | N/A | N/A | N/A | N/A |
| | External pilot* | * | * | * | * | * |
| All | H Series | Vacuum | Vacuum | Vacuum | Vacuum | Vacuum |

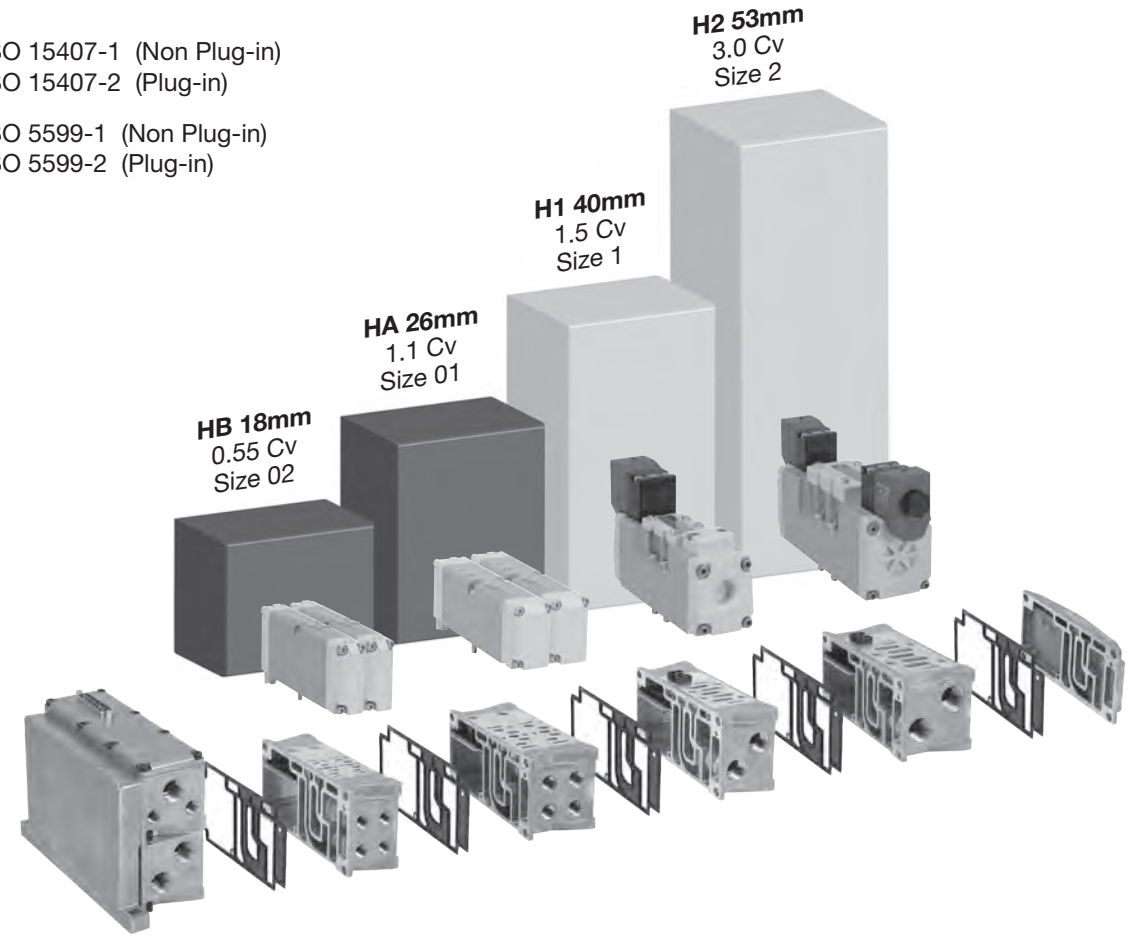
* External Pilot Pressure / Remote Pilot Supply - Must meet or exceed minimum pilot pressure for internal pilot option. Not available on Operator / Function N, P, or Q.

** Must be equal to or greater than operating pressure.

## Right Sizing

ISO 15407-1 (Non Plug-in)
ISO 15407-2 (Plug-in)

ISO 5599-1 (Non Plug-in)
ISO 5599-2 (Plug-in)




**Cylinder Bore Size - inches (mm)**

| Cylinder Speed - in/s (mm/s) | 1-1/4" (32 mm) | 1-1/2" (40 mm) | 2.00" (50 mm) | 2-1/2" (63 mm) | 3-1/4" (80 mm) | 4.00" (100 mm) | 5.00" (125 mm) | 6.00" (150 mm) |
|---|---|---|---|---|---|---|---|---|
| 1.96 (50) | 0.03 | 0.04 | 0.06 | 0.10 | 0.17 | 0.26 | 0.41 | 0.59 |
| 3.93 (100) | 0.05 | 0.08 | 0.13 | 0.21 | 0.35 | 0.53 | 0.82 | 1.19 |
| 5.90 (150) | 0.08 | 0.12 | 0.20 | 0.31 | 0.52 | 0.79 | 1.24 | 1.78 |
| 7.87 (200) | 0.10 | 0.16 | 0.26 | 0.41 | 0.69 | 1.05 | 1.64 | 2.37 |
| 9.84 (250) | 0.13 | 0.20 | 0.33 | 0.52 | 0.87 | 1.32 | 2.06 | 2.97 |
| 11.81 (300) | 0.16 | 0.25 | 0.40 | 0.62 | 1.05 | 1.58 | 2.47 | 3.56 |
| 13.77 (350) | 0.18 | 0.29 | 0.46 | 0.72 | 1.22 | 1.85 | 2.88 | 4.15 |
| 15.74 (400) | 0.21 | 0.33 | 0.53 | 0.82 | 1.39 | 2.11 | 3.30 | 4.75 |
| 17.71 (450) | 0.24 | 0.37 | 0.59 | 0.93 | 1.57 | 2.37 | 3.71 | 5.34 |
| 19.68 (500) | 0.26 | 0.41 | 0.66 | 1.03 | 1.74 | 2.64 | 4.12 | 5.94 |
| | HB | | HA | | H1 | H2 | H3 | |

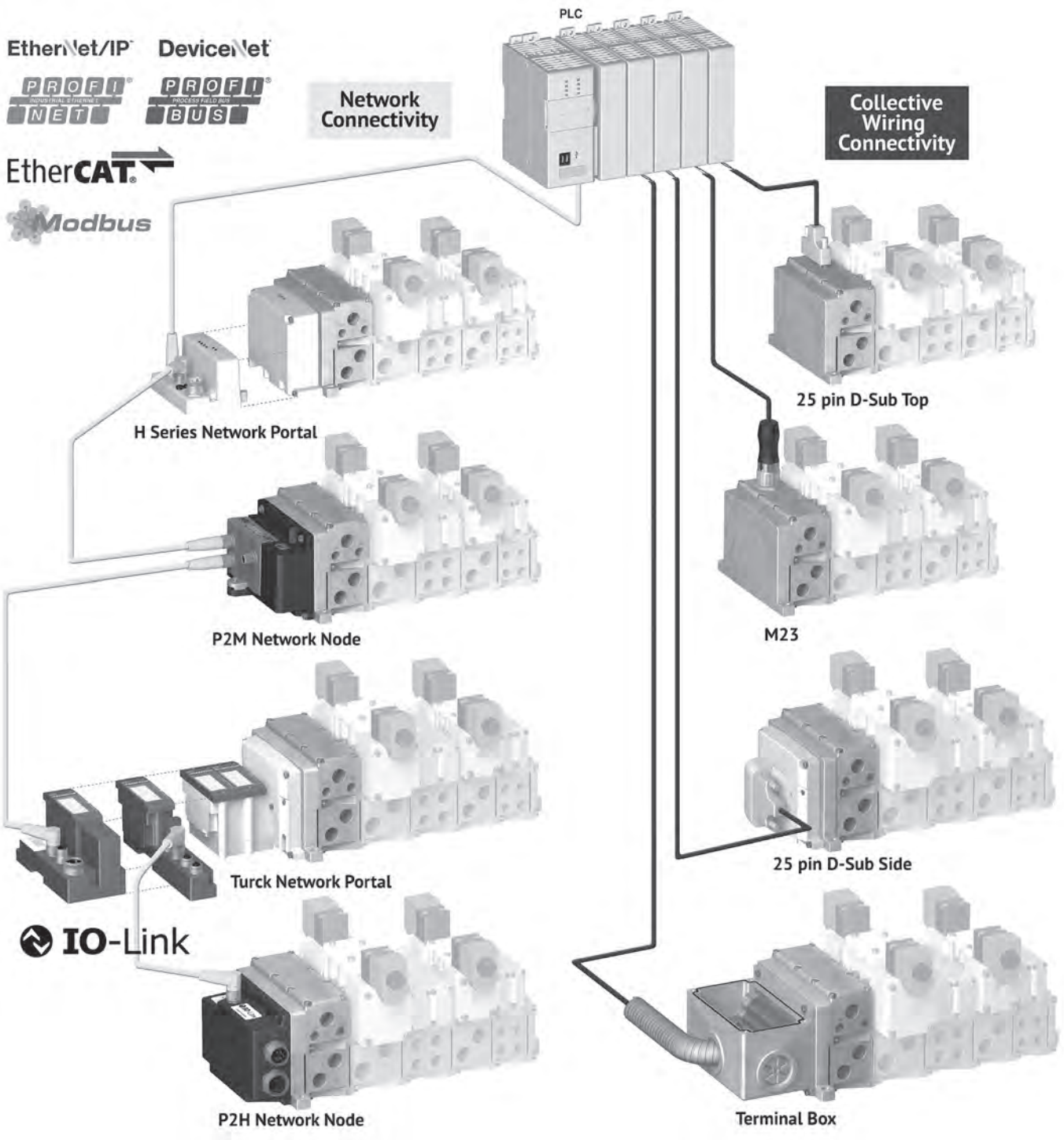




For inventory, lead times, and kit lookup, visit www.pdnplu.com

**Parker Hannifin Corporation**
Pneumatic Division
Richland, Michigan
www.parker.com/pneumatics

## Connectivity



# Two easy ways to order H Universal

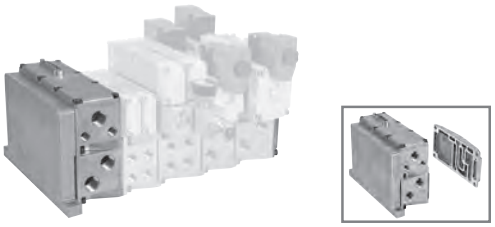
## 1 Online Configuration

Navigate to the landing page
www.parker.com/pdn/HSeriesISO
Customize your manifold assembly
Create and save a unique assembled part number
Generate a CAD model

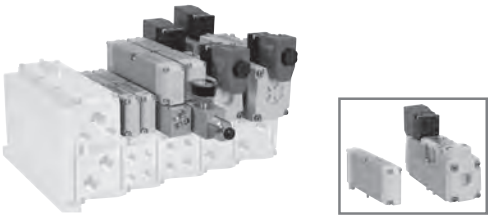

*OR*

## 2 Order Components

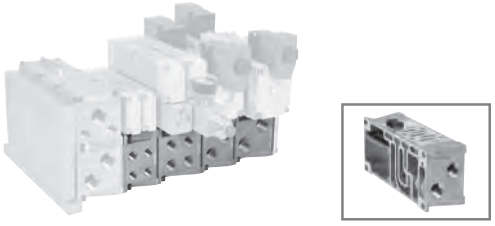
**A** **Select Endplate Kit**
Includes Left and Right Hand Endplate



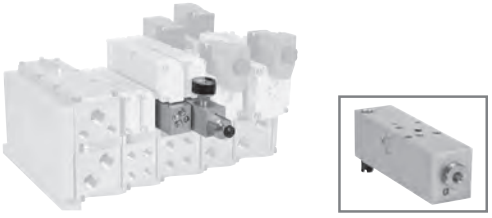
**B** **Select Valve Stations**
Valves (size HB, HA, H1 or H2)
Blanking Plate



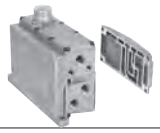
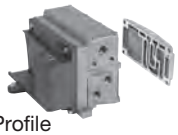
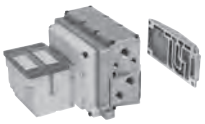
**C** **Select Valve Manifold Segments**
Manifold (size HB, HA, H1 or H2)
Air Supply Module



**D** **Select Sandwich Accessories**
Sandwich Regulators
Sandwich Flow Control
Pilot Exhaust

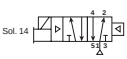
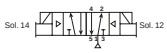
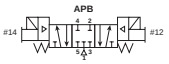
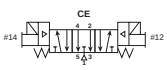
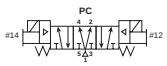
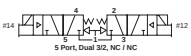
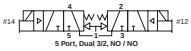


## End Plate Kits - Universal for use with HB, HA, H1 H2

| | Electrical option | NPT port | BSPP port |
|---|---|---|---|
|  | 25-pin, D-Sub<br>Side, 24 address | **PSHU20L100P** | **PSHU20L101P** |
|  | 25-pin, D-Sub<br>Top, 24 address | **PSHU20L200P** | **PSHU20L201P** |
|  | 19-pin, round, Brad Harrison,<br>16 address | **PSHU20L300P** | **PSHU20L301P** |
|  | 12-pin, M23, 8 address | **PSHU20L400P** | **PSHU20L401P** |
| | 19-pin, M23, 16 address | **PSHU20M200P** | **PSHU20M201P** |
|  | Terminal box, 32 address | **PSHU20L500P** | **PSHU20L501P** |
|  Side Mount | P2M Network Node, side mount, 24 address | **PSHU20M400P** | **PSHU20M401P** |
|  Low Profile | P2M Network Node, low profile, 24 address<br>(only suitable for P2M Industrial Ethernet Protocols) | **PSHU20M500P** | **PSHU20M501P** |
|  | H Series Network, with valve driver module,<br>32 address | **PSHU20L600P** | **PSHU20L601P** |
|  | Turck Network with valve driver module, 16 address | **PSHU20T100P** | **PSHU20T101P** |
| | Turck Network with valve driver module, 32 address | **PSHU20T200P** | **PSHU20T201P** |
|  Class A | P2H IO Link Class B, standard version, 24 address | **PSHU20N200P** | **PSHU20N201P** |
| | P2H IO Link Class B, safe version, 24 address | **PSHU20S200P** | **PSHU20S201P** |
|  Class B | P2H IO Link Class A, 4-pin safe version, 24 address | **PSHU20S400P** | **PSHU20S401P** |
| | P2H IO Link Class A, 5-pin safe version, 24 address | **PSHU20S500P** | **PSHU20S501P** |
|  Low Profile | Right hand end plate only, low profile no port | **PSHU4000P** | |
|  High Flow | Right hand end plate only, high flow 1/2" ports | **PSHU4100P** | **PSHU4101P** |
| | Right hand end plate only, high flow 3/4" ports | **PSHU4200P** | **PSHU4201P** |

Most popular.

## Valve - 15407-2, Plug-in, Size 18mm (HB)

| Symbol | Type | Cv | Operator | Voltage | Pilot | Non-locking | Locking |
|---|---|---|---|---|---|---|---|
|   | 4-way, 2-position, spring return | 0.55 | Single solenoid | 24 VDC | Internal | **HBEVXBG0G9A** | **HBEVXBH0G9A** |
| | | | | | External | **HBEVXLG0G9A** | **HBEVXLH0G9A** |
| | | | | 120 VAC | Internal | **HBEVXBG023A** | **HBEVXBH023A** |
| | | | | | External | **HBEVXLG023A** | **HBEVXLH023A** |
|  | 4-way, 2-position, air return | 0.55 | Single solenoid | 24 VDC | Internal | **HB1VXBG0G9A** | **HB1VXBH0G9A** |
| | | | | | External | **HB1VXLG0G9A** | **HB1VXLH0G9A** |
| | | | | 120 VAC | Internal | **HB1VXBG023A** | **HB1VXBH023A** |
| | | | | | External | **HB1VXLG023A** | **HB1VXLH023A** |
|  | 4-way, 2-position | 0.55 | Double solenoid | 24 VDC | Internal | **HB2VXBG0G9A** | **HB2VXBH0G9A** |
| | | | | | External | **HB2VXLG0G9A** | **HB2VXLH0G9A** |
| | | | | 120 VAC | Internal | **HB2VXBG023A** | **HB2VXBH023A** |
| | | | | | External | **HB2VXLG023A** | **HB2VXLH023A** |
|  | 4-way, 3-position, all ports blocked | 0.5 | Double solenoid | 24 VDC | Internal | **HB5VXBG0G9A** | **HB5VXBH0G9A** |
| | | | | | External | **HB5VXLG0G9A** | **HB5VXLH0G9A** |
| | | | | 120 VAC | Internal | **HB5VXBG023A** | **HB5VXBH023A** |
| | | | | | External | **HB5VXLG023A** | **HB5VXLH023A** |
|   | 4-way, 3-position, center exhaust | 0.5 | Double solenoid | 24 VDC | Internal | **HB6VXBG0G9A** | **HB6VXBH0G9A** |
| | | | | | External | **HB6VXLG0G9A** | **HB6VXLH0G9A** |
| | | | | 120 VAC | Internal | **HB6VXBG023A** | **HB6VXBH023A** |
| | | | | | External | **HB6VXLG023A** | **HB6VXLH023A** |
|  | 4-way, 3-position, pressure center | 0.5 | Double solenoid | 24 VDC | Internal | **HB7VXBG0G9A** | **HB7VXBH0G9A** |
| | | | | | External | **HB7VXLG0G9A** | **HB7VXLH0G9A** |
| | | | | 120 VAC | Internal | **HB7VXBG023A** | **HB7VXBH023A** |
| | | | | | External | **HB7VXLG023A** | **HB7VXLH023A** |
|  | 3-way, 2-position, dual valve, NC/NC | 0.45 | Double solenoid | 24 VDC | Internal | **HBNVXBG0G9A** | **HBNVXBH0G9A** |
| | | | | 120 VAC | Internal | **HBNVXBG023A** | **HBNVXBH023A** |
|  | 3-way, 2-position, dual valve, NO/NO | 0.45 | Double solenoid | 24 VDC | Internal | **HBPVXBG0G9A** | **HBPVXBH0G9A** |
| | | | | 120 VAC | Internal | **HBPVXBG023A** | **HBPVXBH023A** |

## Manifold Base - 2-Station, 15407-2, Plug-in, Size 18mm (HB)

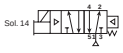
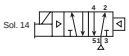
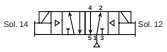
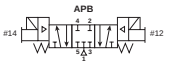
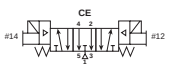
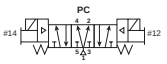
| End ported bases | Enclosure / Lead length | Solenoid addresses | 1/8" NPT | 1/8" BSPP |
|---|---|---|---|---|
|  | Circuit board | Single solenoid - 2 address | **PSHU1151J1P** | **PSHU1152J1P** |
| | Circuit board | Double solenoid - 4 addresses | **PSHU1151M1P** | **PSHU1152M1P** |

## Accessories - 15407-2, Plug-in, Size 18mm (HB)

| | Accessories | Description | | Part number |
|---|---|---|---|---|
|  | Gauge adapter kit | Includes 1/8" coupling, long nipple, and gauge | | **PS5651160P** |
|  | Blanking plate kit | | | **PS5634P** |
|  | Sandwich flow control for individual valve | | | **PS5635P** |
|  | Sandwich supply module | 1/8" NPT | | **PS561600P** |
| | | 1/8" BSPP | | **PS561601P** |
|  | Sandwich regulator | | Common pressure | Independent pressure |
| | | 2-60 PSIG w/ gauge | **PS5638155P** | **PS5638255P** |
| | | 5-125 PSIG w/ gauge | **PS5638166P** | **PS5638266P** |

Most popular.

## Valve - 15407-2, Plug-in, Size 26mm (HA)

| | Symbol | Type | Cv | Operator | Voltage | Pilot | Non-locking | Locking |
|---|---|---|---|---|---|---|---|---|
|  |  | 4-way, 2-position, spring return | 1.1 | Single solenoid | 24 VDC | Internal | **HAEVXBG0G9A** | **HAEVXBH0G9A** |
| | | | | | | External | **HAEVXLG0G9A** | **HAEVXLH0G9A** |
| | | | | | 120 VAC | Internal | **HAEVXBG023A** | **HAEVXBH023A** |
| | | | | | | External | **HAEVXLG023A** | **HAEVXLH023A** |
| |  | 4-way, 2-position, air return | 1.1 | Single solenoid | 24 VDC | Internal | **HA1VXBG0G9A** | **HA1VXBH0G9A** |
| | | | | | | External | **HA1VXLG0G9A** | **HA1VXLH0G9A** |
| | | | | | 120 VAC | Internal | **HA1VXBG023A** | **HA1VXBH023A** |
| | | | | | | External | **HA1VXLG023A** | **HA1VXLH023A** |
| |  | 4-way, 2-position | 1.1 | Double solenoid | 24 VDC | Internal | **HA2VXBG0G9A** | **HA2VXBH0G9A** |
| | | | | | | External | **HA2VXLG0G9A** | **HA2VXLH0G9A** |
| | | | | | 120 VAC | Internal | **HA2VXBG023A** | **HA2VXBH023A** |
| | | | | | | External | **HA2VXLG023A** | **HA2VXLH023A** |
|  |  | 4-way, 3-position, all ports blocked | 1.0 | Double solenoid | 24 VDC | Internal | **HA5VXBG0G9A** | **HA5VXBH0G9A** |
| | | | | | | External | **HA5VXLG0G9A** | **HA5VXLH0G9A** |
| | | | | | 120 VAC | Internal | **HA5VXBG023A** | **HA5VXBH023A** |
| | | | | | | External | **HA5VXLG023A** | **HA5VXLH023A** |
| |  | 4-way, 3-position, center exhaust | 1.0 | Double solenoid | 24 VDC | Internal | **HA6VXBG0G9A** | **HA6VXBH0G9A** |
| | | | | | | External | **HA6VXLG0G9A** | **HA6VXLH0G9A** |
| | | | | | 120 VAC | Internal | **HA6VXBG023A** | **HA6VXBH023A** |
| | | | | | | External | **HA6VXLG023A** | **HA6VXLH023A** |
| |  | 4-way, 3-position, pressure center | 1.0 | Double solenoid | 24 VDC | Internal | **HA7VXBG0G9A** | **HA7VXBH0G9A** |
| | | | | | | External | **HA7VXLG0G9A** | **HA7VXLH0G9A** |
| | | | | | 120 VAC | Internal | **HA7VXBG023A** | **HA7VXBH023A** |
| | | | | | | External | **HA7VXLG023A** | **HA7VXLH023A** |

## Single Subbase - 15407-2, Plug-in, Size 26mm (HA)

| | Enclosure / Lead length | Solenoid addresses | 1/4" NPT | 1/4" BSPP |
|---|---|---|---|---|
|  | Terminal strip in the base | Double solenoid - 2 addresses | **PS551113CP** | **PS551114CP** |

## Manifold Base - 2-Station, 15407-2, Plug-in, Size 26mm (HA)

| End ported bases | Enclosure / Lead length | Solenoid addresses | 1/4" NPT | 1/4" BSPP |
|---|---|---|---|---|
|  | Circuit board | Single solenoid - 2 address | **PSHU1153J1P** | **PSHU1154J1P** |
| | Circuit board | Double solenoid - 4 addresses | **PSHU1153M1P** | **PSHU1154M1P** |

## Accessories - 15407-2, Plug-in, Size 26mm (HA)

| | Accessories | Description | | Part number |
|---|---|---|---|---|
|  | Blanking plate kit | | | **PS5534P** |
|  | Sandwich flow control for individual valve | | | **PS5535P** |
|  | Pilot exhaust module | Pilot presure control, without sensor, 1/8" BSPP | | **PS55XXA0P** |
|  | Sandwich supply module | 1/4" NPT | | **PS552600P** |
| | | 1/4" BSPP | | **PS552601P** |
|  | Sandwich regulator | | Common pressure | Independent pressure |
| | | 2-60 PSIG w/ gauge | **PS5538155P** | **PS5538255P** |
| | | 5-125 PSIG w/ gauge | **PS5538166P** | **PS5538266P** |

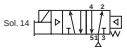
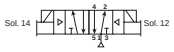
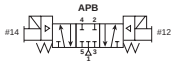
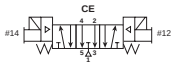
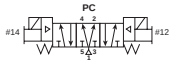
Most popular.



For inventory, lead times, and kit lookup, visit www.pdnplu.com

**Parker Hannifin Corporation**
Pneumatic Division
Richland, Michigan
www.parker.com/pneumatics

## Valve - 5599-2, Plug-in, Size 1 (H1)

| | Symbol | Type | Cv | Operator | Voltage | Pilot | Non-locking | Locking |
|---|---|---|---|---|---|---|---|---|
|  |  | 4-way, 2-position, spring return | 1.5 | Single solenoid | 24 VDC | Internal | **H1EVXBG0B9D** | **H1EVXBH0B9D** |
| | | | | | | External | **H1EVXXG0B9D** | **H1EVXXH0B9D** |
| | | | | | | Internal | **H1EVXBG023D** | **H1EVXBH023D** |
| | | | | | | External | **H1EVXXG023D** | **H1EVXXH023D** |
| |  | 4-way, 2-position, air return | 1.5 | Single solenoid | 24 VDC | Internal | **H11VXBG0B9D** | **H11VXBH0B9D** |
| | | | | | | External | **H11VXXG0B9D** | **H11VXXH0B9D** |
| | | | | | | Internal | **H11VXBG023D** | **H11VXBH023D** |
| | | | | | | External | **H11VXXG023D** | **H11VXXH023D** |
|  |  | 4-way, 2-position | 1.5 | Double solenoid | 24 VDC | Internal | **H12VXBG0B9D** | **H12VXBH0B9D** |
| | | | | | | External | **H12VXXG0B9D** | **H12VXXH0B9D** |
| | | | | | 120 VAC | Internal | **H12VXBG023D** | **H12VXBH023D** |
| | | | | | | External | **H12VXXG023D** | **H12VXXH023D** |
| |  | 4-way, 3-position, all ports blocked | 1.2 | Double solenoid | 24 VDC | Internal | **H15VXBG0B9D** | **H15VXBH0B9D** |
| | | | | | | External | **H15VXXG0B9D** | **H15VXXH0B9D** |
| | | | | | 120 VAC | Internal | **H15VXBG023D** | **H15VXBH023D** |
| | | | | | | External | **H15VXXG023D** | **H15VXXH023D** |
| |  | 4-way, 3-position, center exhaust | 1.2 | Double solenoid | 24 VDC | Internal | **H16VXBG0B9D** | **H16VXBH0B9D** |
| | | | | | | External | **H16VXXG0B9D** | **H16VXXH0B9D** |
| | | | | | 120 VAC | Internal | **H16VXBG023D** | **H16VXBH023D** |
| | | | | | | External | **H16VXXG023D** | **H16VXXH023D** |
| |  | 4-way, 3-position, pressure center | 1.2 | Double solenoid | 24 VDC | Internal | **H17VXBG0B9D** | **H17VXBH0B9D** |
| | | | | | | External | **H17VXXG0B9D** | **H17VXXH0B9D** |
| | | | | | 120 VAC | Internal | **H17VXBG023D** | **H17VXBH023D** |
| | | | | | | External | **H17VXXG023D** | **H17VXXH023D** |

## Single Subbase - 5599-2, Plug-in, Size 1 (H1)

| Side ported | Enclosure / Lead length | Solenoid addresses | 3/8" NPT | 3/8" BSPP |
|---|---|---|---|---|
|  | Terminal strip in base | Double solenoid - 2 addresses | **PS401115CDP** | **PS401116CDP** |
| | 6" flying leads | Double solenoid - 2 addresses | **PS401115ADP** | **PS401116ADP** |
| | 4-pin, M12 micro connector in base, SAE / Ford wiring | Double solenoid - 2 addresses | **PS4011158FDP** | **PS4011168FDP** |

## Manifold Base - 5599-2, Plug-in, Size 1 (H1)

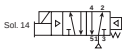
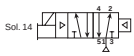
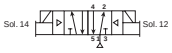
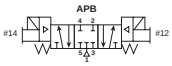
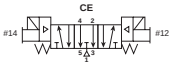
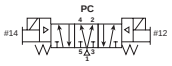
| End Ported | Enclosure / Lead length | Solenoid addresses | 3/8" NPT | 3/8" BSPP |
|---|---|---|---|---|
|  | Circuit board | Single solenoid - 1 address | **PSHU1155J1P** | **PSHU1156J1P** |
| | Circuit board | Double solenoid - 2 addresses | **PSHU1155M1P** | **PSHU1156M1P** |

## Accessories - 5599-2, Size 1 (H1)

| | Accessory | Description | | Part number |
|---|---|---|---|---|
|  | Sandwich regulator | Common pressure | 5-125 PSIG w/ gauge | **PS4038166CP** |
| | | Independent pressure | 5-125 PSIG w/ gauge | **PS4038266CP** |
|  | Blanking plate kit | | | **PS4034CP** |
|  | Sandwich flow control<br>A Sandwich Flow Control and Common Port Sandwich Regulator may be used together on a manifold or subbase. The Sandwich Flow Control MUST be located between the manifold/subbase and the Common Port Sandwich Regulator. | | | **PS4035CP** |

Most popular.

## Valve - 5599-2, Plug-in, Size 2 (H2)

| | Symbol | Type | Cv | Operator | Voltage | Pilot | Non-locking | Locking |
|---|---|---|---|---|---|---|---|---|
|  |  | 4-way, 2-position, spring return | 3.0 | Single solenoid | 24 VDC | Internal | **H2EVXBG0B9D** | **H2EVXBH0B9D** |
| | | | | | | External | **H2EVXXG0B9D** | **H2EVXXH0B9D** |
| | | | | | 120 VAC | Internal | **H2EVXBG023D** | **H2EVXBH023D** |
| | | | | | | External | **H2EVXXG023D** | **H2EVXXH023D** |
| |  | 4-way, 2-position, air return | 3.0 | Single solenoid | 24 VDC | Internal | **H21VXBG0B9D** | **H21VXBH0B9D** |
| | | | | | | External | **H21VXXG0B9D** | **H21VXXH0B9D** |
| | | | | | 120 VAC | Internal | **H21VXBG023D** | **H21VXBH023D** |
| | | | | | | External | **H21VXXG023D** | **H21VXXH023D** |
|  |  | 4-way, 2-position | 3.0 | Double solenoid | 24 VDC | Internal | **H22VXBG0B9D** | **H22VXBH0B9D** |
| | | | | | | External | **H22VXXG0B9D** | **H22VXXH0B9D** |
| | | | | | 120 VAC | Internal | **H22VXBG023D** | **H22VXBH023D** |
| | | | | | | External | **H22VXXG023D** | **H22VXXH023D** |
| |  | 4-way, 3-position, all ports blocked | 2.8 | Double solenoid | 24 VDC | Internal | **H25VXBG0B9D** | **H25VXBH0B9D** |
| | | | | | | External | **H25VXXG0B9D** | **H25VXXH0B9D** |
| | | | | | 120 VAC | Internal | **H25VXBG023D** | **H25VXBH023D** |
| | | | | | | External | **H25VXXG023D** | **H25VXXH023D** |
| |  | 4-way, 3-position, center exhaust | 2.8 | Double solenoid | 24 VDC | Internal | **H26VXBG0B9D** | **H26VXBH0B9D** |
| | | | | | | External | **H26VXXG0B9D** | **H26VXXH0B9D** |
| | | | | | 120 VAC | Internal | **H26VXBG023D** | **H26VXBH023D** |
| | | | | | | External | **H26VXXG023D** | **H26VXXH023D** |
| |  | 4-way, 3-position, pressure center | 2.8 | Double solenoid | 24 VDC | Internal | **H27VXBG0B9D** | **H27VXBH0B9D** |
| | | | | | | External | **H27VXXG0B9D** | **H27VXXH0B9D** |
| | | | | | 120 VAC | Internal | **H27VXBG023D** | **H27VXBH023D** |
| | | | | | | External | **H27VXXG023D** | **H27VXXH023D** |

## Single Subbase - 5599-2, Plug-in, Size 2 (H2)

| Side ported base | Enclosure / Lead length | Solenoid addresses | 1/2" NPT | 1/2" BSPP |
|---|---|---|---|---|
|  | Terminal strip in base | Double solenoid - 2 address | **PS411117CCP** | **PS411118CCP** |
| | 6" flying leads | Double solenoid - 2 addresses | **PS411117ACP** | **PS411118ACP** |

## Manifold Base - 5599-2, Plug-in, Size 2 (H2)

| End Ported | Enclosure / Lead length | Solenoid addresses | 1/2" NPT | 1/2" BSPP |
|---|---|---|---|---|
|  | Circuit board | Single solenoid - 1 address | **PSHU1157J1P** | **PSHU1158J1P** |
| | Circuit board | Double solenoid - 2 addresses | **PSHU1157M1P** | **PSHU1158M1P** |

## Accessories - 5599-2, Size 2 (H2)

| | Accessory | Description | | Part number |
|---|---|---|---|---|
|  | Sandwich regulator | Common pressure | 5-125 PSIG w/ gauge | **PS4138166CP** |
| | | Independent pressure | 5-125 PSIG w/ gauge | **PS4138266CP** |
|  | Blanking plate kit | | | **PS4134CP** |
|  | Sandwich flow control<br>A Sandwich Flow Control and Common Port Sandwich Regulator may be used together on a manifold or subbase. The Sandwich Flow Control MUST be located between the manifold/subbase and the Common Port Sandwich Regulator. | | | **PS4135CP** |

Most popular.

## End Plate Kit - Universal Plug-in

**PSHU20 L1 0 0 P**

| Valve Type | |
|---|---|
| **Plug-in (internal pilot)** | **PSHU20** |
| Plug-in (external pilot) | **PSHU2X** |

| Thread Type | |
|---|---|
| **0** | **NPT** |
| 1* | BSPP "G" |

* BSPP conforms to ISO 1179-1 w 228-1 threads

| Right Hand End Plate Type / Port | |
|---|---|
| **0** | **Low profile (no ports)** |
| 1 | 1/2 Exhaust and inlet port |
| 2 | 3/4 Exhaust and inlet port |

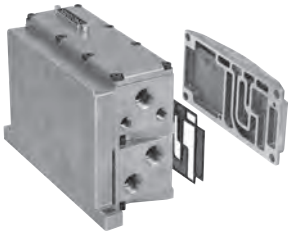
| Left Hand End Plate Type * † | |
|---|---|
| **25-Pin, D-Sub (side)** | **L1** |
| **25-Pin, D-Sub (top)** | **L2** |
| 19-Pin, Round, Brad Harrison | L3 |
| 12-Pin, M23 | L4 |
| **32-Point Terminal Strip** | **L5** |
| **H Series Network, with valve driver module ‡** | **L6** |
| 19-Pin, M23 | M2 |
| P2M Network Node Side Mount ‡ | **M4** |
| **P2M Network Node Low Profile Mount ‡ ◊** | **M5** |
| **P2H IO Link Class B, 24 Address, Standard Version** | **N2** |
| P2H IO Link Class B, 24 Address, Safe Version | S2 |
| **P2H IO Link Class A, 24 Address, 4-Pin, Safe Version** | **S4** |
| P2H IO Link Class A, 24 Address, 5-Pin, Safe Version | S5 |
| **Turck Network with valve driver module - 16 outputs ‡** | **T1** |
| **Turck Network with valve driver module - 32 outputs ‡** | **T2** |

* 120VAC is not CSA certified.

‡ Turck Network, H Series Network, and P2M Network Node communication modules must be ordered separately. See Network Connectivity section for more information.

† PSHU11P gaskets included in each end plate kit.

◊ Only suitable for P2M Industrial Ethernet Protocols



**25-pin D-Sub (top) with low profile end plate shown 3.97 Cv**

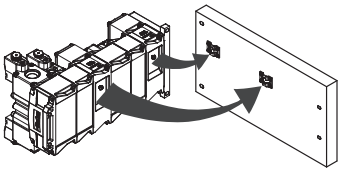
### Hi-flow - Right Hand End Plates

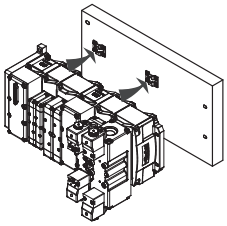
**1/2" ports 6.07 Cv**

**3/4" ports 8.35 Cv**

### Installation Bracket

| Bracket | Part number |
|---|---|
| Bracket and Bolt (Quantity 2) | **PSHU60P** |





## Valve - 15407-2 Plug-in, Size 18mm (HB) & 26mm (HA)

**HB 1 VX B G 0 G9 A**

| Basic Series 15407-2 | |
|---|---|
| ISO 15407-2 18mm | HB |
| ISO 15407-2 26mm | HA |

| 15407-2 Operator / Function | |
|---|---|
| Single solenoid, 2-position - air return | 1 |
| Double solenoid, 2-position | 2 |
| Double solenoid, 3-position - APB | 5 |
| Double solenoid, 3-position - CE | 6 |
| Double solenoid, 3-position - PC | 7 |
| Single solenoid, 2-position - air return, spring assist | E |
| Double solenoid, dual 3/2, NC/NC | N* |
| Double solenoid, dual 3/2, NO/NO | P* |
| Double solenoid, dual 3/2, 14 end NC – 12 end NO | Q* |

* Available on HB Only, must use Internal Pilot Source Option "B".

| Mounting | |
|---|---|
| 15407-2 Valve less base | VX |

| 15407-2 Pilot Source / Pilot Exhaust | |
|---|---|
| B | Internal pilot, port #1 / vented |
| L* | External pilot, port #14 / vented |

* Must be specified when using Sandwich Regulators.

| 15407-2 Overrides / Lights | |
|---|---|
| G | Non-locking, flush, push - w/ light |
| H | Locking, flush, push / turn - w/ light |

| 15407-2 Enclosure / Lead length | |
|---|---|
| 0 | Valve less base |

| 15407-2 Engineering Level | |
|---|---|
| A | Current |

| 15407-2 Voltage & Frequency | | | | |
|---|---|---|---|---|
| | AC | | DC | Light & surge suppression |
| | 60Hz | 50Hz | | |
| G9 | | | 24 | LED & suppression |
| 23 | 120 | 115 | | LED & suppression |

**HB 18mm Valve shown**

## Valve - 5599-2 Plug-in, Size H1 & H2

**H1 E VX B G 0 B9 D**

| Basic series 5599-2 | |
|---|---|
| ISO 5599-2 Size 1 | H1 |
| ISO 5599-2 Size 2 | H2 |

| 5599-2 Operator / Function | |
|---|---|
| Single solenoid, 2-position - air return | 1 |
| Double solenoid, 2-position | 2 |
| Double solenoid, 3-position - APB | 5 |
| Double solenoid, 3-position - CE | 6 |
| Double solenoid, 3-position - PC | 7 |
| Single solenoid, 2-position - air return, spring assist | E |

| 5599-2 Mounting | |
|---|---|
| 5599-2 Valve less base | VX |

| 5599-2 Pilot source / Pilot exhaust | |
|---|---|
| Internal pilot, port #1 / vented | B |
| External pilot, port #12 or #14 / vented | X* |

* Must be specified when using Sandwich Regulators.

| 5599-2 Overrides / Lights | | |
|---|---|---|
| | Voltage code | |
| B | 42, 45, 57 | Non-locking, flush, push - w/o light |
| C | 42, 45, 57 | Locking, flush, push / turn - w/o light |
| G | B9, F9, 23 | Non-locking, flush, push - w/ light |
| H | B9, 23 | Locking, flush, push / turn - w/ light |

| 5599-2 Enclosure / Lead length | |
|---|---|
| 0 | None, valve less base |

| 5599-2 Engineering Level | |
|---|---|
| D | Current |

| 5599-2 Voltage & Frequency | | | | |
|---|---|---|---|---|
| | AC | | DC | Light & surge suppression |
| | 60Hz | 50Hz | | |
| 42 | 24 | | | |
| 45 | | | 12 | |
| B9 | | | 24 | LED & suppression, 3.2 watt |
| F9 | | | 24 | LED & suppression, 1.3 watt |
| 23 | 120 | 115 | | LED & suppression |
| 57* | 240 | | | |

* Single subbase only. Not available for 5599-2 manifold mount.

**H1 Valve shown**

☐ Most popular.

## Manifold Kit - Universal Plug-in

**PSHU1153** **J** **1** **P**

| Mounting Style / Port Size | |
|---|---|
| **HB manifold with 1/8 NPT end ports** | **PSHU1151** |
| HB manifold with 1/8 BSPP end ports | PSHU1152* |
| **HA manifold with 1/4 NPT end ports** | **PSHU1153** |
| HA manifold with 1/4 BSPP end ports | PSHU1154* |
| **H1 manifold with 3/8 NPT end ports** | **PSHU1155** |
| H1 manifold with 3/8 BSPP end ports | PSHU1156* |
| **H2 manifold with 1/2 NPT end ports** | **PSHU1157** |
| H2 manifold with 1/2 BSPP end ports | PSHU1158* |

* BSPP conforms to ISO 1179-1 w 228-1 threads.

| Gasket Options | |
|---|---|
| **1** | **1,3,5 ports open and pilots open** |
| 2 | 1,3,5 ports closed and pilots open |
| 3 | 1 closed, 3,5 ports open and pilots open |
| 4 | 1 port open, 3,5 ports closed and pilots open |
| 5 | 1,3,5 ports open and pilots closed |
| 6 | 1,3,5 ports closed and pilots closed |
| 7 | 1 closed, 3,5 ports open and pilots closed |
| 8 | 1 port open, 3,5 ports closed and pilots closed |

| Circuit Board Address Configuration | |
|---|---|
| **J** | **Interconnect, Single Address** |
| **M** | **Interconnect, Double Address** |

**HA manifold shown**

## Intermediate Air Supply - Universal Plug-in

**PSHU115A** **T** **1** **P**

| Mounting Style / Port Size | |
|---|---|
| **Intermediate air supply, NPT / internal pilot** | **PSHU115A** |
| Intermediate air supply, BSPP / internal **pilot** | PSHU115B* |
| **Intermediate air supply, NPT / external pilot** | **PSHU115C** |
| Intermediate air supply, BSPP / external **pilot** | PSHU115D* |

* BSPP conforms to ISO 1179-1 w 228-1 threads.

| Gasket Options | |
|---|---|
| **1** | **1,3,5 ports open and pilots open** |
| 2 | 1,3,5 ports closed and pilots open |
| 3 | 1 closed, 3,5 ports open and pilots open |
| 4 | 1 port open, 3,5 ports closed and pilots open |
| 5 | 1,3,5 ports open and pilots closed |
| 6 | 1,3,5 ports closed and pilots closed |
| 7 | 1 closed, 3,5 ports open and pilots closed |
| 8 | 1 port open, 3,5 ports closed and pilots closed |

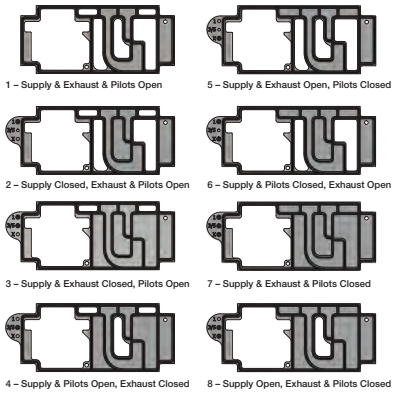
| Circuit Board Address Configuration | |
|---|---|
| **T** | **With electrical pass through** |
| **E** | **With electrical expansion to 25th address** |

**Intermediate air supply module shown**

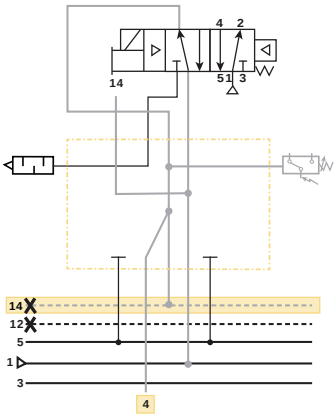
## Pneumatic Zoning

Multiple pressure zones can be created by selecting alternative gaskets between individual manifold segments or an intermediate air supply module. These zones can be designed to meet different application and safety requirements on the machine. Inserting the PXM Pilot Exhaust Module into a one of these zones allows control of pilot pressure for the entire zone.

## Gasket Kit - Universal Manifold to Manifold

| | Description | | Part number |
|---|---|---|---|
|  | Pilots opened | 1 – Supply & Exhaust & Pilots Open | **PSHU11P** |
| | | 2 – Supply Closed, Exhaust & Pilots Open | **PSHU12P** |
| | | 3 – Supply & Exhaust Closed, Pilots Open | **PSHU13P** |
| | | 4 – Supply & Pilots Open, Exhaust Closed | **PSHU14P** |
| | Pilots blocked | 5 – Supply & Exhaust Open, Pilots Closed | **PSHU15P** |
| | | 6 – Supply & Pilots Closed, Exhaust Open | **PSHU16P** |
| | | 7 – Supply & Exhaust & Pilots Closed | **PSHU17P** |
| | | 8 – Supply Open, Exhaust & Pilots Closed | **PSHU18P** |

## Pilot Exhaust Module



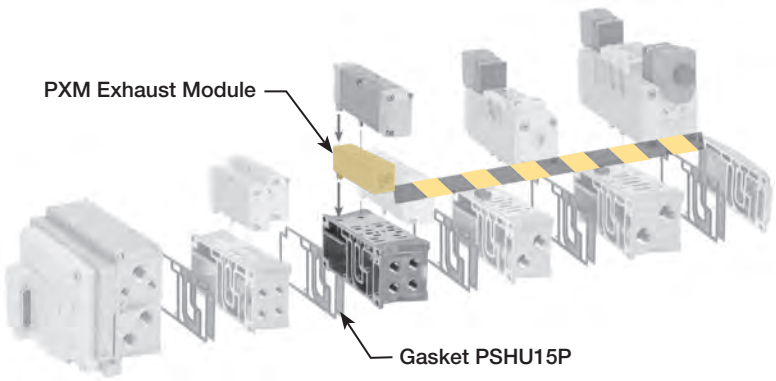

PXM Pilot Exhaust Module enables an H Series HA Single Solenoid valve to control the pilot pressure to other externally piloted H Series ISO valves in the same manifold zone. The HA valve in conjunction with the PXM will remove pilot pressure to all externally piloted valves in the manifold zone when solenoid 14 is de-energized (off). Control of all externally piloted valves in the zone is disabled for both solenoid actuation and manual override until solenoid 14 of the HA valve on the PXM is energized again (on).

**Gaskets blocking pilot pressure are required at the start of the zone the PXM is controlling.** Special zoning gaskets (shown below) are available to meet any application requirement. In the example below, main pressure and exhaust pass through to the second zone, but pilot pressure is blocked. This results in the PXM providing pilot pressure for the zone after this gasket.

| Part Number | Sensor Type |
|---|---|
| **PS55XXA0P** | No sensing |
| **PS55XXM0P** | Mechanical pressure switch |
| **PS55XXE0P** | Solid state pressure switch |

| Part Number | Cable Type |
|---|---|
| **RKC4.4T-2** | M12 cable, PVC, 2m |

PS55XXA0P PS55XXM0P PS55XXE0P



## Sandwich Regulator - 15407-2, Plug-in,

**PS5638 | 1 | 6 | 6 | P**

| Basic Series | |
|---|---|
| HB 15407-2, 18mm, Plug-in | PS5638 |
| HA 15407-2, 26mm, Plug-in | PS5538 |

| Regulator Function | |
|---|---|
| Common Pressure Regulator | 1 |
| Independent Pressure Regulator | 2 |

| #2 Port Regulator / Gauge* | |
|---|---|
| 5 | 2-60 PSIG w/Gauge |
| **6** | **5-125 PSIG w/Gauge** |

* For Common Pressure Regulator Option, Regulator Gauge callout must be the same number for both Port #4 and Port #2. (Example: 166)

| #4 Port Regulator / Gauge* | |
|---|---|
| 5 | 2-60 PSIG w/Gauge |
| **6** | **5-125 PSIG w/Gauge** |

* For Common Pressure Regulator Option, Regulator Gauge callout must be the same number for both Port #4 and Port #2. (Example: 166)

***Ordering Components***
- *Sandwich Regulator Kit configured for Internal Pilot as standard.*
- *Order valve as External Pilot.*

**HB - 18mm**
**(Independent Dual Port Regulator shown)**

**HA - 26mm**
**(Common Port Regulator shown)**

### How to Configure Sandwich Regulator / Valve Combinations

***Internal Pilot Configuration of Sandwich Regulator HA, HB***
*Pressure in Base Port 1 feeds regulator configured for Internal Pilot which feeds valve configured for External Pilot.*

| | Accessories | Description | Part number |
|---|---|---|---|
|  | Gauge adapter kit | Includes 1/8" coupling, long nipple, and gauge | **PS5651160P** |

## Sandwich Regulator Cv Flow Chart*

| | Common Pressure Code 166 | | | | Dual Pressure Code 266 | | | |
|---|---|---|---|---|---|---|---|---|
| | 1-2 | 1-4 | 2-3 | 4-5 | 1-2 | 1-4 | 2-3 | 4-5* |
| **HB** | 0.20 | 0.20 | 0.41 | 0.34 | 0.23 | 0.19 | 0.28 | 0.27 |
| **HA** | 0.41 | 0.43 | 0.87 | 0.89 | 0.42 | 0.45 | 0.68 | 0.66 |

* Regulator Port exhaust through Base Port 3.
**Note:** All Cv's calculated with regulator adjusted full open.

## Sandwich Regulator - 5599-2, Plug-in,

| PS4038 | 1 | 6 | 6 | C | P |
|---|---|---|---|---|---|

| Basic Series | |
|---|---|
| H1 5599-2, Plug-in | PS4038 |
| H2 5599-2, Plug-in | PS4138 |

| Regulator Function | |
|---|---|
| Common Pressure Regulator | 1 |
| Independent Pressure Regulator | 2 |

| #2 Port Regulator / Gauge* | |
|---|---|
| 0** | Line By-Pass Plate |
| 4 | 1-30 PSIG w/Gauge |
| 5 | 2-60 PSIG w/Gauge |
| **6** | **5-125 PSIG w/Gauge** |
| D | Remote Pilot ISO 2 & 3 only |

* For Common Pressure Regulator Option, Regulator Gauge callout must be the same number for both Port #4 and Port #2. (Example: 166)

** Pressure Line By-Pass Option can only be used with Independent Pressure Regulators.

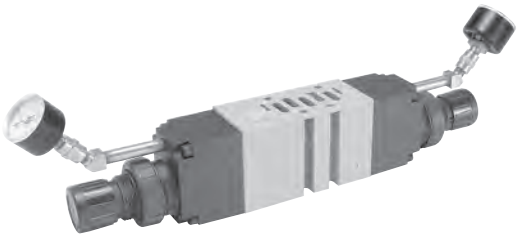
| #4 Port Regulator / Gauge* | |
|---|---|
| 0** | Line By-Pass Plate |
| 4 | 1-30 PSIG w/Gauge |
| 5 | 2-60 PSIG w/Gauge |
| **6** | **5-125 PSIG w/Gauge** |
| D | Remote Pilot ISO 2 & 3 only |

* For Common Pressure Regulator Option, Regulator Gauge callout must be the same number for both Port #4 and Port #2. (Example: 166)

** Pressure Line By-Pass Option can only be used with Independent Pressure Regulators.

***Ordering Components***
- *Sandwich Regulator Kit configured for Internal Pilot as standard.*
- *Order valve as External Pilot.*

**H1 - Size 1**
**(Independent Dual Port Regulator shown)**



**H2 - Size 2**
**(Independent Dual Port Regulator shown)**

### How to Configure Sandwich Regulator / Valve Combinations

***Internal Pilot Configuration of Sandwich Regulator H1, H2***
*Pressure in Base Port 1 feeds regulator configured for Internal Pilot which feeds valve configured for External Pilot.*

***External Pilot Configuration of Sandwich Regulator H1, H2***
*An External Pilot pressure in Port 12 or 14 of the base feeds thru the Sandwich Regulator 12 or 14 galley directly to the 12/14 pilot of the valve. This configuration takes an External Pilot from the 12 port of the base and passes it thru the regulator to feed the 12 galley of the valve.*

## Sandwich Regulator Cv Flow Chart*

| | Common Pressure Code 166 | | | | Single Pressure 2 Code 206 | | | | Single Pressure 4 Code 260 | | | | Dual Pressure Code 266 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1-2 | 1-4 | 2-3 | 4-5 | 1-2 | 1-4 | 2-3 | 4-5* | 1-2 | 1-4 | 2-3 | 4-5* | 1-2 | 1-4 | 2-3 | 4-5* |
| **H1** | 0.62 | 0.61 | 1.28 | 1.18 | 0.73 | 0.96 | 0.96 | 0.93 | 0.34 | 0.70 | 0.94 | 0.98 | 0.52 | 0.48 | 0.86 | 0.88 |
| **H2** | 1.47 | 1.60 | 2.41 | 2.33 | 1.71 | 1.90 | 1.52 | 1.75 | 1.74 | 1.67 | 1.73 | 1.79 | 1.61 | 1.62 | 1.50 | 1.67 |

* Regulator Port exhaust through Base Port 3.

**Note:** All Cv's calculated with regulator adjusted full open.

## Online Configuration

Navigate to the landing page

www.parker.com/pdn/HSeriesISO
Customize your manifold assembly
Create and save a unique assembled part number
Generate a CAD model


### Add-A-Fold - Universal Plug-in

**AA HU20 L1 0 0 P 04**

| Valve Type | |
|---|---|
| **Plug-in (internal)** | **AAHU20** |
| Plug-in (external) | AAHU2X |

| Left Hand End Plate Type * † | |
|---|---|
| **25-Pin, D-Sub (side)** | **L1** |
| **25-Pin, D-Sub (top)** | **L2** |
| 19-Pin, Round, Brad Harrison | L3 |
| 12-Pin, M23 | L4 |
| **32-Point Terminal Strip** | **L5** |
| **H Series Network, with valve driver module ‡** | **L6** |
| 19-Pin, M23 | M2 |
| P2M Network Node Side Mount ‡ | **M4** |
| **P2M Network Node Low Profile Mount ‡ ◊** | **M5** |
| **P2H IO Link Class B, 24 Address, Standard Version** | **N2** |
| P2H IO Link Class B, 24 Address, Safe Version | S2 |
| **P2H IO Link Class A, 24 Address, 4-Pin, Safe Version** | **S4** |
| P2H IO Link Class A, 24 Address, 5-Pin, Safe Version | S5 |
| **Turck Network with valve driver module - 16 outputs ‡** | **T1** |
| **Turck Network with valve driver module - 32 outputs ‡** | **T2** |

| Thread Type | |
|---|---|
| **0** | **NPT** |
| 1* | BSPP "G" |

* BSPP Conforms to ISO 1179-1 w 228-1 Threads

| Number of Segments |
|---|
| 01 |
| ↓ |
| 32 |

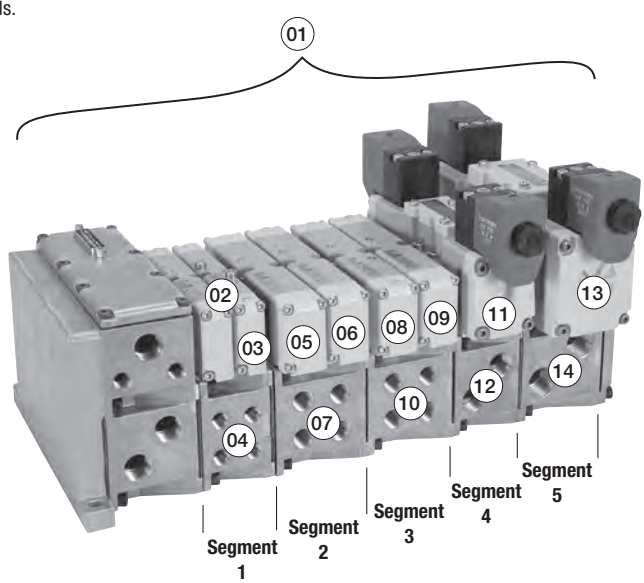
| Right Hand End Plate Type / Port | |
|---|---|
| **0** | **Low profile (no ports)** |
| 1 | 1/2 Exhaust and inlet port |
| 2 | 3/4 Exhaust and inlet port |

* 120VAC is not CSA certified. Not available with 240VAC coils.
‡ Turck Network, H Series Network, and P2M Network Node communication modules must be ordered separately. See Network Connectivity section for more information.
† PSHU11P gaskets included in each end plate kit.
◊ Only suitable for P2M Industrial Ethernet Protocols

### *Example*

Application requires a 5 segment manifold.

| Item | Part No. | Location | |
|---|---|---|---|
| 01 | AAHUL200P05 | | |
| 02 | HB2VXBG0G9A | Segment 1 | Valve station 1 |
| 03 | HB2VXBG0G9A | | Valve station 2 |
| 04 | PSHU1151M1P | | Manifold base |
| 05 | HA1VXBG0G9A | Segment 2 | Valve station 3 |
| 06 | HA2VXBG0G9A | | Valve station 4 |
| 07 | PSHU1153M1P | | Manifold base |
| 08 | HA1VXBG0G9A | Segment 3 | Valve station 5 |
| 09 | HA2VXBG0G9A | | Valve station 6 |
| 10 | PSHU1153M1P | | Manifold base |
| 11 | H12VXBG0B9A | Segment 4 | Valve station 7 |
| 12 | PSHU1155M1P | | Manifold base |
| 13 | H22VXBG0B9A | Segment 5 | Valve station 8 |
| 14 | PSHU1157M1P | | Manifold base |




**Example:**
**5 segment manifold with (2) HB, (4) HA, (1) H1, and (1) H2 valve on manifold bases with 25-pin, D-Sub end plate.**

## Subbase Kit - Plug-in

| PS55 | 1113 | C | | | P |
|---|---|---|---|---|---|

| Series | |
|---|---|
| **HA Subbase** | **PS55** |
| **H1 Subbase** | **PS40** |
| **H2 Subbase** | **PS41** |

| Mounting Style / Port Size | |
|---|---|
| **HA Series** | |
| **1/4 NPT side ports** | **1113** |
| 1/4 BSPP side ports | 1114* |
| 1/4 NPT bottom / side ports | 1123 |
| 1/4 BSPP bottom / side ports | 1124* |
| **H1 Series** | |
| **3/8 NPT side ports** | **1115** |
| 3/8 BSPP side ports | 1116* |
| **H2 Series** | |
| **1/2 NPT side ports** | **1117** |
| 1/2 BSPP side ports | 1118* |

* BSPP conforms to ISO 1179-1 w 228-1 threads.

| Engineering Level | |
|---|---|
| Blank | HA Series |
| D | H1 Series |
| C | H2 Series |

| Wiring Options | |
|---|---|
| Blank | None |
| C‡ | Chrysler |
| F‡ | SAE / Ford |
| G‡ | General Motors |

‡ Not available on HA series.

| Enclosures / Lead Length | |
|---|---|
| **Individually Wired Base*** | |
| 7†‡ | 3-Pin mini connector in base |
| 8†‡ | 4-Pin M12 micro connector in base |
| 9†‡ | 5-Pin mini connector in base |
| **A‡** | **6" Leads** |
| **C** | **Terminal block** |

* Use plate with no connection.
† Must specify valve auto wiring option "C", "F", or "G".
‡ Not available on HA series.

**HA subbase shown**

☐ Most popular.

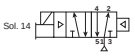
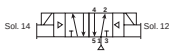
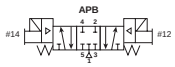
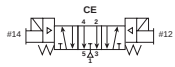
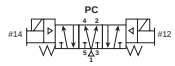
## End Plate Kit - Plug-in, 5599-2, Size 3 (H3) * Not compatible with H Universal

| Electrical option | | NPT port | BSPP port |
|---|---|---|---|
|  | No connector - use with individually wired base | **PS4231010DP** | **PS4231011DP** |
|  | 25-pin, D-sub | **PS4220L20DP** | **PS4220L21DP** |
|  | 19-pin, round, Brad Harrison | **PS4220L30DP** | **PS4220L31DP** |
|  | 12-pin, M23 | **PS4220L40DP** | **PS4220L41DP** |
| | 19-pin, M23 | **PS4220M20DP** | **PS4220M21DP** |
|  | P2M Network Node | **PS4220M40DP** | **PS4220M41DP** |
|  | H Series Network, with valve driver module | **PS4220L60DP** | **PS4220L61DP** |
|  | Turck Network with valve driver module - 16 address | **PS4220T10DP** | **PS4220T11DP** |
| | Turck Network with valve driver module - 24 address | **PS4220T20DP** | **PS4220T21DP** |
|  | P2H IO Link Class B, standard version, 24 address | **PS4220N20DP** | **PS4220N21DP** |
| | P2H IO Link Class B, safe version, 24 address | **PS4220S20DP** | **PS4220S21DP** |
| | P2H IO Link Class A, 4-pin safe version, 24 address | **PS4220S40DP** | **PS4220S41DP** |
| | P2H IO Link Class A, 5-pin safe version, 24 address | **PS4220S50DP** | **PS4220S51DP** |

Turck Network, H Series Network, and P2M Network Node communication modules must be ordered separately.
See Network Connectivity Section for more information.

**Note:**
For cable part numbers and pin out information see Network Connectivity Accessories.

## Valve - 5599-2, Plug-in, Size 3 (H3) * Not compatible with H Universal

| | Symbol | Type | Cv | Operator | Voltage | Pilot | Non-locking | Locking |
|---|---|---|---|---|---|---|---|---|
|  |  | 4-way, 2-position, spring return | 6.0 | Single solenoid | 24 VDC | Internal | **H3EVXBG0B9D** | **H3EVXBH0B9D** |
| | | | | | | External | **H3EVXXG0B9D** | **H3EVXXH0B9D** |
| | | | | | 120 VAC | Internal | **H3EVXBG023D** | **H3EVXBH023D** |
| | | | | | | External | **H3EVXXG023D** | **H3EVXXH023D** |
| |  | 4-way, 2-position, air return | 6.0 | Single solenoid | 24 VDC | Internal | **H31VXBG0B9D** | **H31VXBH0B9D** |
| | | | | | | External | **H31VXXG0B9D** | **H31VXXH0B9D** |
| | | | | | 120 VAC | Internal | **H31VXBG023D** | **H31VXBH023D** |
| | | | | | | External | **H31VXXG023D** | **H31VXXH023D** |
|  |  | 4-way, 2-position | 6.0 | Double solenoid | 24 VDC | Internal | **H32VXBG0B9D** | **H32VXBH0B9D** |
| | | | | | | External | **H32VXXG0B9D** | **H32VXXH0B9D** |
| | | | | | 120 VAC | Internal | **H32VXBG023D** | **H32VXBH023D** |
| | | | | | | External | **H32VXXG023D** | **H32VXXH023D** |
| |  | 4-way, 3-position, all ports blocked | 5.0 | Double solenoid | 24 VDC | Internal | **H35VXBG0B9D** | **H35VXBH0B9D** |
| | | | | | | External | **H35VXXG0B9D** | **H35VXXH0B9D** |
| | | | | | 120 VAC | Internal | **H35VXBG023D** | **H35VXBH023D** |
| | | | | | | External | **H35VXXG023D** | **H35VXXH023D** |
| |  | 4-way, 3-position, center exhaust | 5.0 | Double solenoid | 24 VDC | Internal | **H36VXBG0B9D** | **H36VXBH0B9D** |
| | | | | | | External | **H36VXXG0B9D** | **H36VXXH0B9D** |
| | | | | | 120 VAC | Internal | **H36VXBG023D** | **H36VXBH023D** |
| | | | | | | External | **H36VXXG023D** | **H36VXXH023D** |
| |  | 4-way, 3-position, pressure center | 5.0 | Double solenoid | 24 VDC | Internal | **H37VXBG0B9D** | **H37VXBH0B9D** |
| | | | | | | External | **H37VXXG0B9D** | **H37VXXH0B9D** |
| | | | | | 120 VAC | Internal | **H37VXBG023D** | **H37VXBH023D** |
| | | | | | | External | **H37VXXG023D** | **H37VXXH023D** |

## Subbase - Single 5599-2, Plug-in, Size 3 (H3)

| Side ported base | Enclosure / Lead length | Solenoid addresses | 3/4" NPT | 3/4" BSPP |
|---|---|---|---|---|
|  | Terminal strip in base | Double solenoid - 2 address | **PS421119CCP** | **PS421110CCP** |
| | 6" flying leads | Double solenoid - 2 addresses | **PS421119ACP** | **PS421110ACP** |

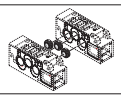
## Manifold Base - 5599-2, Plug-in, Size 3 (H3) * Not compatible with H Universal

| Bottom / End ported bases | Enclosure / Lead length | Solenoid addresses | 3/4" NPT | 3/4" BSPP |
|---|---|---|---|---|
|  | Circuit board | Double solenoid - 2 addresses | **PS421169MCP** | **PS421160MCP** |
| | Terminal strip in base | Double solenoid - 2 address | **PS421169CCP** | **PS421160CCP** |
| | 6" flying leads | Double solenoid - 2 addresses | **PS421169ACP** | **PS421160ACP** |

| End Ported | Enclosure / Lead length | Solenoid addresses | 3/4" NPT | 3/4" BSPP |
|---|---|---|---|---|
|  | Circuit board | Double solenoid - 2 addresses | **PS421159MCP** | **PS421150MCP** |
| | Terminal strip in base | Double solenoid - 2 address | **PS421159CCP** | **PS421150CCP** |
| | 6" flying leads | Double solenoid - 2 addresses | **PS421159ACP** | **PS421150ACP** |

Most popular.

## Accessories - 5599-2, Size 3 (H3) * Not compatible with H Universal

| | Accessory | Description | | Part number |
|---|---|---|---|---|
|  | Sandwich regulator | Common pressure | 5-125 PSIG w/ gauge | **PS4238166CP** |
| | | Independent pressure | 5-125 PSIG w/ gauge | **PS4238266CP** |
|  | Blanking plate kit | | | **PS4234CP** |
|  | Sandwich flow control<br>A Sandwich Flow Control and Common Port Sandwich Regulator may be used together on a manifold or subbase. The Sandwich Flow Control MUST be located between the manifold/subbase and the Common Port Sandwich Regulator. | | | **PS4235CP** |
|  | Manifold to manifold gasket kits | | | **PS4213P** |
|  | Manifold isolation kit | Main galley (1, 3, 5) | | **PS4232CP** |
|  | | Pilot galley | | **PS4033CP** |

Most popular.

## End Plate Kit - Plug-in, 5599-2, Size 3 (H3) * Not compatible with H Universal

| PS42 | 20L2 | 0 | D | P |
|---|---|---|---|---|

| Basic Series | |
|---|---|
| ISO 5599, Size 3 | PS42 |

| Options † | |
|---|---|
| **25-Pin, D-Sub** | **20L2*** |
| 19-Pin, Round, Brad Harrison | 20L3 |
| 12-Pin, M23 | 20L4 |
| 19-Pin, M23 | 20M2 |
| **P2M Network Node** | **20M4** |
| **P2H IO Link Class B, 24 Address, Standard Version** | **20N2** |
| P2H IO Link Class B, 24 Address, Safe Version | 20S2 |
| **P2H IO Link Class A, 24 Address, 4-Pin, Safe Version** | **20S4** |
| P2H IO Link Class A, 24 Address, 5-Pin, Safe Version | 20S5 |
| H Series Network, with Valve Driver Module | 20L6 |
| Turck Network with Valve Driver Module - 16 Outputs | 20T1 |
| Turck Network with Valve Driver Module - 24 Outputs | 20T2 |

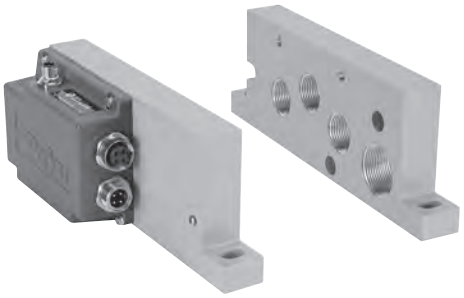
* 120VAC is Not CSA Rated.

† Manifold bases must have a circuit board.
Turck Network, H Series Network, and P2M Network Node communication modules must be ordered separately.
See Network Connectivity Section for more information.

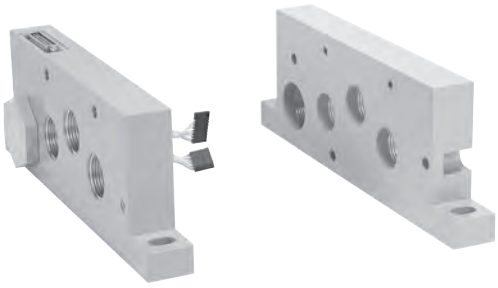
| Engineering Level | |
|---|---|
| D | Current |

| Thread Type | |
|---|---|
| 0 | NPT |
| 1* | BSPP "G" |

* BSPP Conforms to ISO 1179-1 w 228-1 Threads



**H3 P2H Class A end plate shown**



**H3 25-pin D-Sub end plate shown**

## Valve - Plug-in, 5599-2, Size 3 * Not compatible with H Universal

| H3 | E | VX | B | G | 0 | B9 | D |
|---|---|---|---|---|---|---|---|

**Basic Series 5599-2**

| | |
|---|---|
| ISO 5599-2 Size 3 | H3 |

**5599-2 Operator / Function**

| | |
|---|---|
| **Single solenoid, 2-position - air return** | **1** |
| **Double solenoid, 2-position** | **2** |
| **Double solenoid, 3-position - APB** | **5** |
| Double solenoid, 3-position - CE | 6 |
| Double solenoid, 3-position - PC | 7 |
| **Single solenoid, 2-position - air return, spring assist** | **E** |

**5599-2 Mounting**

| | |
|---|---|
| **5599-2 Valve less base** | **VX** |

**5599-2 Pilot source / Pilot exhaust**

| | |
|---|---|
| **Internal pilot, port #1 / vented** | **B** |
| External pilot, port #12 or #14 / vented | X* |

* Must be specified when using Sandwich Regulators.

**5599-2 Enclosure / Lead length**

| | |
|---|---|
| **0** | **None, valve less base** |

**5599-2 Overrides / Lights**

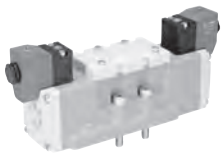
| | Voltage code | |
|---|---|---|
| B | 42, 45, 57 | Non-locking, flush, push - w/o light |
| C | 42, 45, 57 | Locking, flush, push / turn - w/o light |
| **G** | **B9, F9, 23** | **Non-locking, flush, push - w/ light** |
| H | B9, 23 | Locking, flush, push / turn - w/ light |

**5599-2 Engineering Level**

| | |
|---|---|
| **D** | **Current** |

**5599-2 Voltage & Frequency**

| | AC | | DC | Light & surge suppression |
|---|---|---|---|---|
| | 60Hz | 50Hz | | |
| 42 | 24 | | | |
| 45 | | | 12 | |
| **B9** | | | **24** | **LED & suppression, 3.2 watt** |
| **F9** | | | **24** | **LED & suppression, 1.3 watt** |
| **23** | **120** | **115** | | **LED & suppression** |
| 57 | 240 | | | |



H3 Valve shown

## Manifold / Subbase Kit - Plug-in, 5599-2, Size 3 * Not compatible with H Universal

**PS421159 M [ ] C P**

| Mounting Base Style / Port Size | |
|---|---|
| **Subbase: 3/4 NPT side port** | **PS421119** |
| Subbase: 3/4 BSPP side port | PS421110* |
| **Manifold: 3/4 NPT end port** | **PS421159** |
| Manifold: 3/4 BSPP end port | PS421150* |
| Manifold: 3/4 NPT bottom / end port | PS421169 |
| Manifold: 3/4 BSPP bottom / end port | PS421160* |

* BSPP conforms to ISO 1179-1 w 228-1 threads.

| Engineering Level | |
|---|---|
| **C** | **H3** |

| Wiring Options | |
|---|---|
| **Blank** | **None** |
| C | Chrysler |
| **F** | **SAE / Ford** |
| G | General Motors |

| Enclosures / Lead Length | |
|---|---|
| **Individually Wired Base**** | |
| 7† | 3-pin mini connector in base |
| 8† | 4-pin M12 micro connector in base |
| 9† | 5-pin mini connector in base |
| **A** | **6" Leads** |
| **C** | **Terminal block** |
| **Collective Wired Base** | |
| **M*** | **Circuit board, double address** |

* Not available with subbase kits.
** Use plate with no connection.
† Must specify valve auto wiring option "C", "F", or "G".

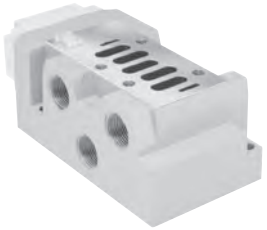
**Note:**
When using the enclosure / lead length "M" option:

12VDC - Maximum number of coils energized simultaneously is 13

24VDC - Maximum number of coils energized simultaneously is 21, B9 coil
Maximum number of coils energized simultaneously is 24, F9 coil

120VAC - Coils limited by the number of pins available in the connector
(25-pin D-Sub = 24 coils, 19-pin Brad Harrison = 16, 12-pin M23 = 8)

240VAC - Must use "A" or "C" option, lead wires or terminal blocks



### Subbase Kit

**Automotive Connectors**
Mounted in 1/2" Conduit Port
- 3-Pin - Wired for Single Solenoid
- 4-Pin / 5-Pin - Wired for Double Solenoid

### Manifold Kit

**Automotive Connectors**
Mounted in Individual Manifold Conduit Cover
- 3-Pin - Wired for Single Solenoid
- 4-Pin / 5-Pin - Wired for Double Solenoid

## Sandwich Regulator - Plug-in, 5599-2

**PS4038 | 1 | 6 | 6 | C | P**

| Basic Series | |
|---|---|
| H3 5599-2, Plug-in | PS4238 |

| Regulator Function | |
|---|---|
| Common Pressure Regulator | 1 |
| Independent Pressure Regulator | 2 |

| #2 Port Regulator / Gauge* | |
|---|---|
| 0** | Line By-Pass Plate |
| 4 | 1-30 PSIG w/Gauge |
| 5 | 2-60 PSIG w/Gauge |
| **6** | **5-125 PSIG w/Gauge** |
| D | Remote Pilot ISO 2 & 3 only |

* For Common Pressure Regulator Option, Regulator Gauge callout must be the same number for both Port #4 and Port #2. (Example: 166)

** Pressure Line By-Pass Option can only be used with Independent Pressure Regulators.

| #4 Port Regulator / Gauge* | |
|---|---|
| 0** | Line By-Pass Plate |
| 4 | 1-30 PSIG w/Gauge |
| 5 | 2-60 PSIG w/Gauge |
| **6** | **5-125 PSIG w/Gauge** |
| D | Remote Pilot ISO 2 & 3 only |

* For Common Pressure Regulator Option, Regulator Gauge callout must be the same number for both Port #4 and Port #2. (Example: 166)

** Pressure Line By-Pass Option can only be used with Independent Pressure Regulators.

***Ordering Components***
- *Sandwich Regulator Kit configured for Internal Pilot as standard.*
- *Order valve as External Pilot.*

## How to Configure Sandwich Regulator / Valve Combinations

***Internal Pilot Configuration of Sandwich Regulator H3***
*Pressure in Base Port 1 feeds regulator configured for Internal Pilot which feeds valve configured for External Pilot.*

***External Pilot Configuration of Sandwich Regulator H3***
*An External Pilot pressure in Port 12 or 14 of the base feeds thru the Sandwich Regulator 12 or 14 galley directly to the 12/14 pilot of the valve. This configuration takes an External Pilot from the 12 port of the base and passes it thru the regulator to feed the 12 galley of the valve.*

## Sandwich Regulator Cv Flow Chart*

| | Common Pressure Code 166 | | | | Single Pressure 2 Code 206 | | | | Single Pressure 4 Code 260 | | | | Dual Pressure Code 266 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1-2 | 1-4 | 2-3 | 4-5 | 1-2 | 1-4 | 2-3 | 4-5* | 1-2 | 1-4 | 2-3 | 4-5* | 1-2 | 1-4 | 2-3 | 4-5* |
| **H3** | 2.37 | 2.39 | 4.30 | 4.47 | 2.37 | 2.81 | 2.75 | 3.01 | 2.65 | 2.59 | 2.68 | 2.74 | 2.43 | 2.41 | 3.16 | 3.04 |

* Regulator Port exhaust through Base Port 3.

**Note:** All Cv's calculated with regulator adjusted full open.

## Add-A-Fold Assembly - Plug-in, 5599-2, Size 3 * Not compatible with H Universal

| AA | H3 | D | 0 | 0 | 03 |
|---|---|---|---|---|---|

**Valve Series**

| | |
|---|---|
| Right & left end plate | H3 |

**End Plate Type**

| | |
|---|---|
| **Turck Network with valve driver module - 16 address** | **A*** |
| **Turck Network with valve driver module - 32 address** | **B*** |
| **25-pin, D-sub** | **D†** |
| **19-pin, Brad Harrison** | **E†** |
| 12-pin, M23 | G† |
| 19-pin, M23 | H† |
| **P2H IO Link Class B, 24 Address, Standard Version** | **J** |
| P2H IO Link Class B, 24 Address, Safe Version | N |
| **P2H IO Link Class A, 24 Address, 4-Pin, Safe Version** | **P** |
| P2H IO Link Class A, 24 Address, 5-Pin, Safe Version | R |
| **Standard, non-collective wiring** | **S** |
| **P2M Network Node** | **T*** |
| **H Series Network, with valve driver module** | **Y*** |

* Must order communication modules separately.
† Collective wiring module included.

**Number of Segments**

| |
|---|
| 01 |
| ↓ |
| 32 |

**Thread Type**

| | |
|---|---|
| **0** | **NPT** |
| 1* | BSPP "G" |

* BSPP Conforms to ISO 1179-1 w 228-1 Threads

## How To Order Plug-in Add-A-Fold Assemblies

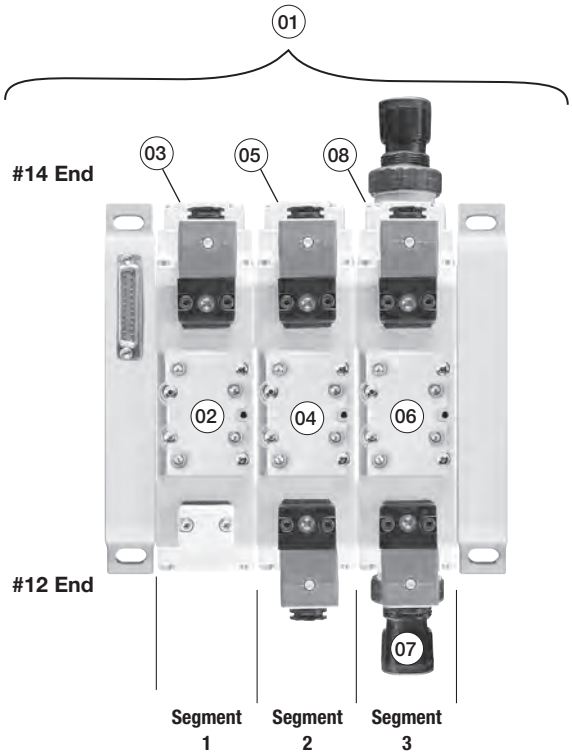
1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete valve, regulator, flow control and manifold base kit. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold. The left most segment is segment 1. (If a blank station is needed, list the blanking plate part number and the individual manifold part numbers for the required segment.)

### *Example*

Application requires a 3 segment manifold and regulator on segment 3.

| Item | Part No. | Location | |
|---|---|---|---|
| 01 | AAH3D003 | | |
| 02 | H31VXBG0B9D | Segment 1 | Valve station 1 |
| 03 | PS421159MCP | | Manifold base |
| 04 | H32VXBG0B9D | Segment 2 | Valve station 2 |
| 05 | PS421159MCP | | Manifold base |
| 06 | H32VXXG0B9D | | Valve station 3 |
| 07 | PS4238166CP | Segment 3 | Sandwich regulator |
| 08 | PS421159MCP | | Manifold base |

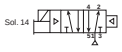
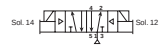
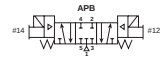
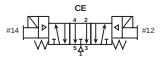
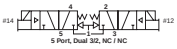
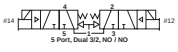
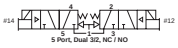
**NOTE:** Construct manifold assemblies from left to right while looking at the cylinder ports.
Valves must be ordered as External Pilot when using Sandwich Regulator.



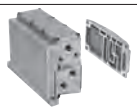

**Example:**
**3 segment manifold with (3) H3 valves on manifold bases and regulator at segment 3.**

Most popular.

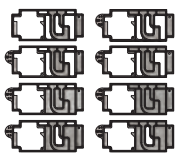
## Valve -15407-1, Non Plug-in, Size 18mm (HB)

| Symbol | Type | Cv | Operator | Voltage | Pilot | Non-locking | Locking |
|---|---|---|---|---|---|---|---|
|   | 4-way, 2-position, spring return | 0.55 | Single solenoid | 24 VDC | Internal | **HBEWXBG2G9000FA** | **HBEWXBH2G9000FA** |
| | | | | | External | **HBEWXLG2G9000FA** | **HBEWXLH2G9000FA** |
|  | 4-way, 2-position, air return | 0.55 | Single solenoid | 24 VDC | Internal | **HB1WXBG2G9000FA** | **HB1WXBH2G9000FA** |
| | | | | | External | **HB1WXLG2G9000FA** | **HB1WXLH2G9000FA** |
|  | 4-way, 2-position | 0.55 | Double solenoid | 24 VDC | Internal | **HB2WXBG2G9000FA** | **HB2WXBH2G9000FA** |
| | | | | | External | **HB2WXLG2G9000FA** | **HB2WXLH2G9000FA** |
|  | 4-way, 3-position, all ports blocked | 0.5 | Double solenoid | 24 VDC | Internal | **HB5WXBG2G9000FA** | **HB5WXBH2G9000FA** |
| | | | | | External | **HB5WXLG2G9000FA** | **HB5WXLH2G9000FA** |
|  | 4-way, 3-position, center exhaust | 0.5 | Double solenoid | 24 VDC | Internal | **HB6WXBG2G9000FA** | **HB6WXBH2G9000FA** |
| | | | | | External | **HB6WXLG2G9000FA** | **HB6WXLH2G9000FA** |
|   | 4-way, 3-position, pressure center | 0.5 | Double solenoid | 24 VDC | Internal | **HB7WXBG2G9000FA** | **HB7WXBH2G9000FA** |
| | | | | | External | **HB7WXLG2G9000FA** | **HB7WXLH2G9000FA** |
|  | 3-way, 2-position, dual valve, NC/NC | 0.45 | Double solenoid | 24 VDC | Internal | **HBNWXBG2G9000FA** | **HBNWXBH2G9000FA** |
|  | 3-way, 2-position, dual valve, NO/NO | 0.45 | Double solenoid | 24 VDC | Internal | **HBPWXBG2G9000FA** | **HBPWXBH2G9000FA** |
|  | 3-way, 2-position, dual valve, NC/NO | 0.45 | Double solenoid | 24 VDC | Internal | **HBQWXBG2G9000FA** | NA |

## Base / End Plate - 15407-1, Non Plug-in, Size 18mm (HB)

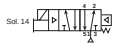
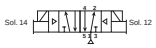
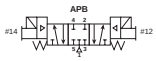
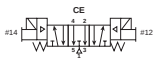
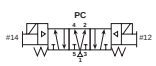
| | Description | NPT | BSPP |
|---|---|---|---|
|  Universal manifold base | 2 station, end ported | **PSHU115101P** | **PSHU115201P** |
|  Universal end plate | Non-collective wiring | **PSHU31L000P** | **PSHU31L001P** |

## Accessories - 15407-1, Non plug-in, Size 18mm (HB)

| | Accessories | Description | | Part number |
|---|---|---|---|---|
|  | Gauge adapter kit | Includes 1/8" coupling and long nipple | | **PS5651160P** |
|  | Blanking plate kit | | | **PS5634P** |
|  | Sandwich flow control | | | **PS5642P** |
|  | Sandwich supply module | 1/8" NPT | | **PS562600P** |
| | | 1/8" BSPP | | **PS562601P** |
|  | Sandwich regulator | | Common pressure | Independent pressure |
| | | 2-60 PSIG w/ gauge | **PS5637155P** | **PS5637255P** |
| | | 5-125 PSIG w/ gauge | **PS5637166P** | **PS5637266P** |
|  | Manifold to manifold gasket kits | | Pilot open | Pilot blocked |
| | | #1, 3, 5 ports open | **PSHU11P** | **PSHU15P** |
| | | Blocked #1 port | **PSHU12P** | **PSHU16P** |
| | | Blocked #1, 3, 5, ports | **PSHU13P** | **PSHU17P** |
| | | Blocked #3, 5 ports | **PSHU14P** | **PSHU18P** |

Most popular.

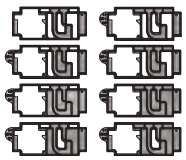
## Valve - 15407-1, Non Plug-in, Size 26mm (HA)

| | Symbol | Type | Cv | Operator | Voltage | Pilot | Non-locking | Locking |
|---|---|---|---|---|---|---|---|---|
|  |  | 4-way, 2-position, spring return | 1.1 | Single solenoid | 24 VDC | Internal | **HAEWXBG2G9000FA** | **HAEWXBH2G9000FA** |
| | | | | | | External | **HAEWXLG2G9000FA** | **HAEWXLH2G9000FA** |
| |  | 4-way, 2-position, air return | 1.1 | Single solenoid | 24 VDC | Internal | **HA1WXBG2G9000FA** | **HA1WXBH2G9000FA** |
| | | | | | | External | **HA1WXLG2G9000FA** | **HA1WXLH2G9000FA** |
|  |  | 4-way, 2-position | 1.1 | Double solenoid | 24 VDC | Internal | **HA2WXBG2G9000FA** | **HA2WXBH2G9000FA** |
| | | | | | | External | **HA2WXLG2G9000FA** | **HA2WXLH2G9000FA** |
| |  | 4-way, 3-position, all ports blocked | 1.0 | Double solenoid | 24 VDC | Internal | **HA5WXBG2G9000FA** | **HA5WXBH2G9000FA** |
| | | | | | | External | **HA5WXLG2G9000FA** | **HA5WXLH2G9000FA** |
| |  | 4-way, 3-position, center exhaust | 1.0 | Double solenoid | 24 VDC | Internal | **HA6WXBG2G9000FA** | **HA6WXBH2G9000FA** |
| | | | | | | External | **HA6WXLG2G9000FA** | **HA6WXLH2G9000FA** |
| |  | 4-way, 3-position, pressure center | 1.0 | Double solenoid | 24 VDC | Internal | **HA7WXBG2G9000FA** | **HA7WXBH2G9000FA** |
| | | | | | | External | **HA7WXLG2G9000FA** | **HA7WXLH2G9000FA** |

## Base / End Plate - 15407-1, Non Plug-in, Size 26mm (HA)

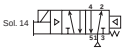
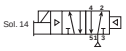
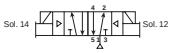
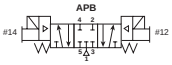
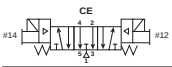
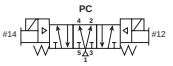
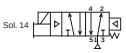
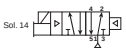
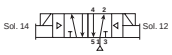
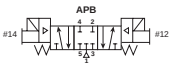
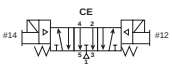
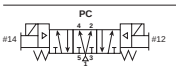
| | | Description | NPT | BSPP |
|---|---|---|---|---|
|  | Single subbase | Side ported base, 1/4" port | **PS5511130P** | **PS5511140P** |
|  | Universal manifold base | 2 station, end ported | **PSHU115301P** | **PSHU115401P** |
|  | Universal end plate | Non-collective wiring | **PSHU31L000P** | **PSHU31L001P** |

## Accessories - 15407-1, Non Plug-in, Size 26mm (HA)

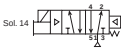
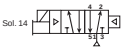
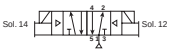
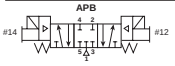
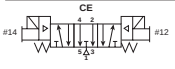
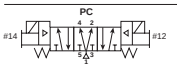
| | Accessories | Description | | Part number |
|---|---|---|---|---|
|  | Blanking plate kit | | | **PS5534P** |
|  | Sandwich flow control | | | **PS5542P** |
| | Sandwich Flow Control and Common Port Sandwich Regulator may be sandwiched together on a manifold or subbase. The Sandwich Flow Control MUST be located between the manifold/subbase and the Common Port Sandwich Regulator. | | | |
|  | Pilot exhaust module | Pilot presure control, without sensor, 1/8" BSPP | | **PS55XXA0P** |
|  | Sandwich supply module | 1/4" NPT | | **PS552600P** |
| | | 1/4" BSPP | | **PS552601P** |
|  | Sandwich regulator | | Common pressure | Independent pressure |
| | | 2-60 PSIG w/ gauge | **PS5537155P** | **PS5537255P** |
| | | 5-125 PSIG w/ gauge | **PS5537166P** | **PS5537266P** |
|  | Manifold to manifold gasket kits | | Pilot open | Pilot blocked |
| | | #1, 3, 5 ports open | **PSHU11P** | **PSHU15P** |
| | | Blocked #1 port | **PSHU12P** | **PSHU16P** |
| | | Blocked #1, 3, 5, ports | **PSHU13P** | **PSHU17P** |
| | | Blocked #3, 5 ports | **PSHU14P** | **PSHU18P** |

Most popular.

## Valve with Central Connector - 5599-1, Non Plug-in, Size 1 (H1)

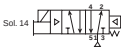
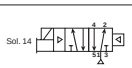
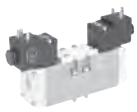
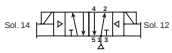
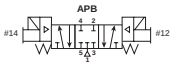
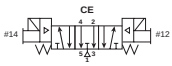
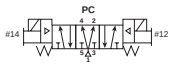
| | Symbol | Type | Cv | Operator | Voltage | Pilot | Non-locking | Locking |
|---|---|---|---|---|---|---|---|---|
| **4-Pin Central M12 Connector, 24 VDC** | | | | | | | | |
|  |  | 4-way, 2-position, spring return | 1.5 | Single solenoid | 24 VDC | Internal | **H1EWXBG2B9000FD** | **H1EWXBH2B9000FD** |
| | | | | | | External | **H1EWXXG2B9000FD** | **H1EWXXH2B9000FD** |
| |  | 4-way, 2-position, air return | 1.5 | Single solenoid | 24 VDC | Internal | **H11WXBG2B9000FD** | **H11WXBH2B9000FD** |
| | | | | | | External | **H11WXXG2B9000FD** | **H11WXXH2B9000FD** |
|  |  | 4-way, 2-position | 1.5 | Double solenoid | 24 VDC | Internal | **H12WXBG2B9000FD** | **H12WXBH2B9000FD** |
| | | | | | | External | **H12WXXG2B9000FD** | **H12WXXH2B9000FD** |
| |  | 4-way, 3-position, all ports blocked | 1.2 | Double solenoid | 24 VDC | Internal | **H15WXBG2B9000FD** | **H15WXBH2B9000FD** |
| | | | | | | External | **H15WXXG2B9000FD** | **H15WXXH2B9000FD** |
| |  | 4-way, 3-position, center exhaust | 1.2 | Double solenoid | 24 VDC | Internal | **H16WXBG2B9000FD** | **H16WXBH2B9000FD** |
| | | | | | | External | **H16WXXG2B9000FD** | **H16WXXH2B9000FD** |
| |  | 4-way, 3-position, pressure center | 1.2 | Double solenoid | 24 VDC | Internal | **H17WXBG2B9000FD** | **H17WXBH2B9000FD** |
| | | | | | | External | **H17WXXG2B9000FD** | **H17WXXH2B9000FD** |
| **5-Pin Central 7/8" Mini Connector, 120 VAC** | | | | | | | | |
|  |  | 4-way, 2-position, spring return | 1.5 | Single solenoid | 120 VAC | Internal | **H1EWXBG323000FD** | **H1EWXBH323000FD** |
| | | | | | | External | **H1EWXXG323000FD** | **H1EWXXH323000FD** |
| |  | 4-way, 2-position, air return | 1.5 | Single solenoid | 120 VAC | Internal | **H11WXBG323000FD** | **H11WXBH323000FD** |
| | | | | | | External | **H11WXXG323000FD** | **H11WXXH323000FD** |
|  |  | 4-way, 2-position | 1.5 | Double solenoid | 120 VAC | Internal | **H12WXBG323000FD** | **H12WXBH323000FD** |
| | | | | | | External | **H12WXXG323000FD** | **H12WXXH323000FD** |
| |  | 4-way, 3-position, all ports blocked | 1.2 | Double solenoid | 120 VAC | Internal | **H15WXBG323000FD** | **H15WXBH323000FD** |
| | | | | | | External | **H15WXXG323000FD** | **H15WXXH323000FD** |
| |  | 4-way, 3-position, center exhaust | 1.2 | Double solenoid | 120 VAC | Internal | **H16WXBG323000FD** | **H16WXBH323000FD** |
| | | | | | | External | **H16WXXG323000FD** | **H16WXXH323000FD** |
| |  | 4-way, 3-position, pressure center | 1.2 | Double solenoid | 120 VAC | Internal | **H17WXBG323000FD** | **H17WXBH323000FD** |
| | | | | | | External | **H17WXXG323000FD** | **H17WXXH323000FD** |

## Valve with 3-Pin DIN Connector - 5599-1, Non Plug-in, Size 1 (H1)

| | Symbol | Type | Cv | Operator | Voltage | Pilot | Non-locking | Locking |
|---|---|---|---|---|---|---|---|---|
| **3-Pin DIN Connector, 24 VDC** | | | | | | | | |
|  |  | 4-way, 2-position, spring return | 1.5 | Single solenoid | 24 VDC | Internal | **H1EWXBBL49D** | **H1EWXBCL49D** |
| | | | | | | External | **H1EWXXBL49D** | **H1EWXXCL49D** |
| |  | 4-way, 2-position, air return | 1.5 | Single solenoid | 24 VDC | Internal | **H11WXBBL49D** | **H11WXBCL49D** |
| | | | | | | External | **H11WXXBL49D** | **H11WXXCL49D** |
|  |  | 4-way, 2-position | 1.5 | Double solenoid | 24 VDC | Internal | **H12WXBBL49D** | **H12WXBCL49D** |
| | | | | | | External | **H12WXXBL49D** | **H12WXXCL49D** |
| |  | 4-way, 3-position, all ports blocked | 1.2 | Double solenoid | 24 VDC | Internal | **H15WXBBL49D** | **H15WXBCL49D** |
| | | | | | | External | **H15WXXBL49D** | **H15WXXCL49D** |
| |  | 4-way, 3-position, center exhaust | 1.2 | Double solenoid | 24 VDC | Internal | **H16WXBBL49D** | **H16WXBCL49D** |
| | | | | | | External | **H16WXXBL49D** | **H16WXXCL49D** |
| |  | 4-way, 3-position, pressure center | 1.2 | Double solenoid | 24 VDC | Internal | **H17WXBBL49D** | **H17WXBCL49D** |
| | | | | | | External | **H17WXXBL49D** | **H17WXXCL49D** |

Most popular.

## Valve with 3-Pin DIN Connector - 5599-1, Non Plug-in, Size 1 (H1) (continued)

| Symbol | Type | Cv | Operator | Voltage | Pilot | Non-locking | Locking |
|---|---|---|---|---|---|---|---|
| **3-Pin DIN Connector, 120 VAC** | | | | | | | |
|   | 4-way, 2-position, spring return | 1.5 | Single solenoid | 120 VAC | Internal | **H1EWXBBL53D** | **H1EWXBCL53D** |
| | | | | | External | **H1EWXXBL53D** | **H1EWXXCL53D** |
|  | 4-way, 2-position, air return | 1.5 | Single solenoid | 120 VAC | Internal | **H11WXBBL53D** | **H11WXBCL53D** |
| | | | | | External | **H11WXXBL53D** | **H11WXXCL53D** |
|   | 4-way, 2-position | 1.5 | Double solenoid | 120 VAC | Internal | **H12WXBBL53D** | **H12WXBCL53D** |
| | | | | | External | **H12WXXBL53D** | **H12WXXCL53D** |
|  | 4-way, 3-position, all ports blocked | 1.2 | Double solenoid | 120 VAC | Internal | **H15WXBBL53D** | **H15WXBCL53D** |
| | | | | | External | **H15WXXBL53D** | **H15WXXCL53D** |
|  | 4-way, 3-position, center exhaust | 1.2 | Double solenoid | 120 VAC | Internal | **H16WXBBL53D** | **H16WXBCL53D** |
| | | | | | External | **H16WXXBL53D** | **H16WXXCL53D** |
|  | 4-way, 3-position, pressure center | 1.2 | Double solenoid | 120 VAC | Internal | **H17WXBBL53D** | **H17WXBCL53D** |
| | | | | | External | **H17WXXBL53D** | **H17WXXCL53D** |

## Base / End Plate - 5599-1, Non Plug-in, Size 1 (H1)

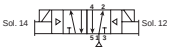
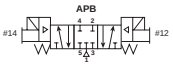
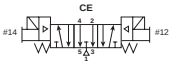
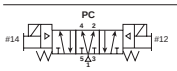
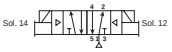
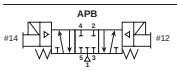
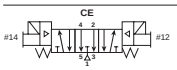
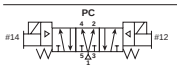
| | Description | NPT | BSPP |
|---|---|---|---|
|  Single subbase | Side ported, 3/8" port | **PS4011150DP** | **PS4011160DP** |
|  Universal manifold base | End ported | **PSHU115501P** | **PSHU115601P** |
|  Universal end plate | Non-collective wiring | **PSHU31L000P** | **PSHU31L001P** |

## Accessories - 5599-1, Non Plug-in, Size 1 (H1)

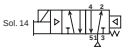
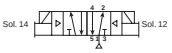
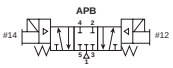
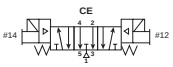
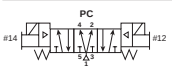
| Accessory | Description | | Part number |
|---|---|---|---|
|  Sandwich regulator | Common pressure | 5-125 PSIG w/ gauge | **PS4037166CP** |
| | Independent pressure | 5-125 PSIG w/ gauge | **PS4037266CP** |
|  Blanking plate kit | | | **PS4034CP** |
|  Sandwich flow control | | | **PS4042CP** |
| Sandwich Flow Control and Common Port Sandwich Regulator may be sandwiched together on a manifold or subbase. The Sandwich Flow Control MUST be located between the manifold/subbase and the Common Port Sandwich Regulator. | | | |

Most popular.

## Valve with Central Connector - 5599-1, Non Plug-in, Size 2 (H2)

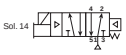
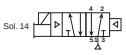
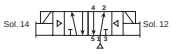
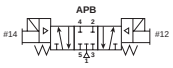
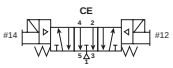
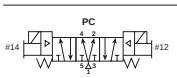
| Symbol | Type | Cv | Operator | Voltage | Pilot | Non-locking | Locking |
|---|---|---|---|---|---|---|---|
| **4-Pin Central M12 Connector, 24 VDC** | | | | | | | |
|   | 4-way, 2-position, spring return | 3.0 | Single solenoid | 24 VDC | Internal | **H2EWXBG2B9000FD** | **H2EWXBH2B9000FD** |
| | | | | | External | **H2EWXXG2B9000FD** | **H2EWXXH2B9000FD** |
|  | 4-way, 2-position, air return | 3.0 | Single solenoid | 24 VDC | Internal | **H21WXBG2B9000FD** | **H21WXBH2B9000FD** |
| | | | | | External | **H21WXXG2B9000FD** | **H21WXXH2B9000FD** |
|   | 4-way, 2-position | 3.0 | Double solenoid | 24 VDC | Internal | **H22WXBG2B9000FD** | **H22WXBH2B9000FD** |
| | | | | | External | **H22WXXG2B9000FD** | **H22WXXH2B9000FD** |
|  | 4-way, 3-position, all ports blocked | 2.8 | Double solenoid | 24 VDC | Internal | **H25WXBG2B9000FD** | **H25WXBH2B9000FD** |
| | | | | | External | **H25WXXG2B9000FD** | **H25WXXH2B9000FD** |
|  | 4-way, 3-position, center exhaust | 2.8 | Double solenoid | 24 VDC | Internal | **H26WXBG2B9000FD** | **H26WXBH2B9000FD** |
| | | | | | External | **H26WXXG2B9000FD** | **H26WXXH2B9000FD** |
|  | 4-way, 3-position, pressure center | 2.8 | Double solenoid | 24 VDC | Internal | **H27WXBG2B9000FD** | **H27WXBH2B9000FD** |
| | | | | | External | **H27WXXG2B9000FD** | **H27WXXH2B9000FD** |
| **5-Pin Central 7/8" Connector, 120 VAC** | | | | | | | |
|   | 4-way, 2-position, spring return | 3.0 | Single solenoid | 120 VAC | Internal | **H2EWXBG323000FD** | **H2EWXBH323000FD** |
| | | | | | External | **H2EWXXG323000FD** | **H2EWXXH323000FD** |
|  | 4-way, 2-position, air return | 3.0 | Single solenoid | 120 VAC | Internal | **H21WXBG323000FD** | **H21WXBH323000FD** |
| | | | | | External | **H21WXXG323000FD** | **H21WXXH323000FD** |
|   | 4-way, 2-position | 3.0 | Double solenoid | 120 VAC | Internal | **H22WXBG323000FD** | **H22WXBH323000FD** |
| | | | | | External | **H22WXXG323000FD** | **H22WXXH323000FD** |
|  | 4-way, 3-position, all ports blocked | 2.8 | Double solenoid | 120 VAC | Internal | **H25WXBG323000FD** | **H25WXBH323000FD** |
| | | | | | External | **H25WXXG323000FD** | **H25WXXH323000FD** |
|  | 4-way, 3-position, center exhaust | 2.8 | Double solenoid | 120 VAC | Internal | **H26WXBG323000FD** | **H26WXBH323000FD** |
| | | | | | External | **H26WXXG323000FD** | **H26WXXH323000FD** |
|  | 4-way, 3-position, pressure center | 2.8 | Double solenoid | 120 VAC | Internal | **H27WXBG323000FD** | **H27WXBH323000FD** |
| | | | | | External | **H27WXXG323000FD** | **H27WXXH323000FD** |

## Valve with 3-Pin DIN Connector - 5599-1, Non Plug-in, Size 2 (H2)

| Symbol | Type | Cv | Operator | Voltage | Pilot | Non-locking | Locking |
|---|---|---|---|---|---|---|---|
| **3-Pin DIN Connector on Coil, 24 VDC** | | | | | | | |
|   | 4-way, 2-position, spring return | 3.0 | Single solenoid | 24 VDC | Internal | **H2EWXBBL49D** | **H2EWXBCL49D** |
| | | | | | External | **H2EWXXBL49D** | **H2EWXXCL49D** |
|  | 4-way, 2-position, air return | 3.0 | Single solenoid | 24 VDC | Internal | **H21WXBBL49D** | **H21WXBCL49D** |
| | | | | | External | **H21WXXBL49D** | **H21WXXCL49D** |
|   | 4-way, 2-position | 3.0 | Double solenoid | 24 VDC | Internal | **H22WXBBL49D** | **H22WXBCL49D** |
| | | | | | External | **H22WXXBL49D** | **H22WXXCL49D** |
|  | 4-way, 3-position, all ports blocked | 2.8 | Double solenoid | 24 VDC | Internal | **H25WXBBL49D** | **H25WXBCL49D** |
| | | | | | External | **H25WXXBL49D** | **H25WXXCL49D** |
|  | 4-way, 3-position, center exhaust | 2.8 | Double solenoid | 24 VDC | Internal | **H26WXBBL49D** | **H26WXBCL49D** |
| | | | | | External | **H26WXXBL49D** | **H26WXXCL49D** |
|  | 4-way, 3-position, pressure center | 2.8 | Double solenoid | 24 VDC | Internal | **H27WXBBL49D** | **H27WXBCL49D** |
| | | | | | External | **H27WXXBL49D** | **H27WXXCL49D** |

Most popular.

## Valve with 3-Pin DIN Connector - 5599-1, Non Plug-in, Size 2 (H2) (continued)

| | Symbol | Type | Cv | Operator | Voltage | Pilot | Non-locking | Locking |
|---|---|---|---|---|---|---|---|---|
| **3-Pin DIN connector on coil, 120 VAC** | | | | | | | | |
|  |  | 4-way, 2-position, spring return | 3.0 | Single solenoid | 120 VAC | Internal | **H2EWXBBL53D** | **H2EWXBCL53D** |
| | | | | | | External | **H2EWXXBL53D** | **H2EWXXCL53D** |
| |  | 4-way, 2-position, air return | 3.0 | Single solenoid | 120 VAC | Internal | **H21WXBBL53D** | **H21WXBCL53D** |
| | | | | | | External | **H21WXXBL53D** | **H21WXXCL53D** |
|  |  | 4-way, 2-position | 3.0 | Double solenoid | 120 VAC | Internal | **H22WXBBL53D** | **H22WXBCL53D** |
| | | | | | | External | **H22WXXBL53D** | **H22WXXCL53D** |
| |  | 4-way, 3-position, all ports blocked | 2.8 | Double solenoid | 120 VAC | Internal | **H25WXBBL53D** | **H25WXBCL53D** |
| | | | | | | External | **H25WXXBL53D** | **H25WXXCL53D** |
| |  | 4-way, 3-position, center exhaust | 2.8 | Double solenoid | 120 VAC | Internal | **H26WXBBL53D** | **H26WXBCL53D** |
| | | | | | | External | **H26WXXBL53D** | **H26WXXCL53D** |
| |  | 4-way, 3-position, pressure center | 2.8 | Double solenoid | 120 VAC | Internal | **H27WXBBL53D** | **H27WXBCL53D** |
| | | | | | | External | **H27WXXBL53D** | **H27WXXCL53D** |

## Base / End Plate - 5599-1, Non Plug-in, Size 2 (H2)

| | | Description | 1/2" NPT | 1/2" BSPP |
|---|---|---|---|---|
|  | Single subbase | Side ported, 1/2" port | **PS4111170CP** | **PS4111180CP** |
|  | Universal manifold base | End ported | **PSHU115701P** | **PSHU115801P** |
|  | Universal end plate | Non-collective wiring | **PSHU31L000P** | **PSHU31L001P** |

## Accessories - 5599-1, Non Plug-in, Size 2 (H2)

| | Accessory | Description | | Part number |
|---|---|---|---|---|
|  | Sandwich regulator | Common pressure | 5-125 PSIG w/ gauge | **PS4137166CP** |
| | | Independent pressure | 5-125 PSIG w/ gauge | **PS4137266CP** |
|  | Blanking plate kit | | | **PS4134CP** |
|  | Sandwich flow control | | | **PS4142CP** |
| | Sandwich Flow Control and Common Port Sandwich Regulator may be sandwiched together on a manifold or subbase. The Sandwich Flow Control MUST be located between the manifold/subbase and the Common Port Sandwich Regulator. | | | |

Most popular.

## End Plate Kit - Universal Non Plug-in

Left hand end plate

**PSHU31 L0 0 0 P**

| Valve Type | |
|---|---|
| Non Plug-in (internal pilot) | PSHU31 |
| Non Plug-in (external pilot) | PSHU3X |

| Left Hand End Plate Type | |
|---|---|
| Non Plug-in | L0 |

| Right Hand End Plate Type / Port | |
|---|---|
| 0 | Low profile (no ports) |
| 1 | 1/2 Exhaust and inlet port |
| 2 | 3/4 Exhaust and inlet port |

| Thread Type | |
|---|---|
| 0 | NPT |
| 1* | BSPP "G" |

* BSPP Conforms to ISO 1179-1 w 228-1 Threads

## Right Hand End Plate

Low Profile

High Flow

| Electrical option | NPT port | BSPP port |
|---|---|---|
| Right hand end plate only, low profile | PSHU4000P | |
| Right hand end plate only, high flow 1/2" ports | PSHU4100P | PSHU4101P |
| Right hand end plate only, high flow 3/4" ports | PSHU4200P | PSHU4201P |

## Valve - Non Plug-in, 15407-1, Size 18mm (HB) & 26mm (HA)

**HB E WX B G 2 G9 000F A**

| Basic series 15407-1 | |
|---|---|
| ISO 15407-1 18mm | HB |
| ISO 15407-1 26mm | HA |

| 15407-1 Operator / Function | |
|---|---|
| Single solenoid, 2-position - air return | 1 |
| Double solenoid, 2-position | 2 |
| Double solenoid, 3-position - APB | 5 |
| Double solenoid, 3-position - CE | 6 |
| Double solenoid, 3-position - PC | 7 |
| Single solenoid, 2-position - air return, spring assist | E |
| Double solenoid, dual 3/2, NC/NC | N† |
| Double solenoid, dual 3/2, NO/NO | P† |
| Double solenoid, dual 3/2, 14 end NC – 12 end NO | Q† |

† Available on HB Only, must use Internal Pilot Source Option "B".

| 15407-1 Mounting | |
|---|---|
| Valve less base | WX |

| 15407-1 Pilot source / Pilot exhaust | |
|---|---|
| B | Internal pilot, port #1 / vented |
| L* | External pilot, port #14 / vented |

* Must be specified when using Sandwich Regulators.

| 15407-1 Overrides / Lights | |
|---|---|
| G | Non-locking, flush, push - w/ light |
| H | Locking, flush, push / turn - w/ light |

| 15407-1 Enclosure / Lead length | |
|---|---|
| 2 | 4-pin, M12 micro, straight connector |

| 15407-1 Voltage & frequency | |
|---|---|
| G9 | 24VDC LED & suppression |

| 15407-1 Central connector wiring options | |
|---|---|
| 000F | SAE / Ford, ISO 20401 |

| 15407-1 Engineering level | |
|---|---|
| A | Current |

## Valve - Non Plug-in, 5599-1, Central Connector - Size 1 & 2

| H1 | E | WX | B | G | 2B9 | 000F | D |
|---|---|---|---|---|---|---|---|

**Basic Series 5599-1**

| | |
|---|---|
| ISO 5599-1 Size 1 | H1 |
| ISO 5599-1 Size 2 | H2 |

**5599-1 Operator / Function**

| | |
|---|---|
| **Single solenoid, 2-position - air return** | **1** |
| **Double solenoid, 2-position** | **2** |
| **Double solenoid, 3-position - APB** | **5** |
| Double solenoid, 3-position - CE | 6 |
| Double solenoid, 3-position - PC | 7 |
| **Single solenoid, 2-position - air return, spring assist** | **E** |

**5599-1 Mounting**

| | |
|---|---|
| **Valve less base** | **WX** |

**5599-1 Pilot Source / Pilot Exhaust**

| | |
|---|---|
| **Internal pilot, port #1 / vented** | **B** |
| External pilot, port #12 or #14 / vented | X* |

* Must be specified when using Sandwich Regulators.

**5599-1 Overrides / Lights**

| | |
|---|---|
| **Non-locking, flush, with light** | **G** |
| Locking, flush, with light | H |

**5599 -1 Engineering Level**

| | |
|---|---|
| **D** | **Current** |

**5599-1 Central Connector Wiring Options**

| | |
|---|---|
| 000C | Chrysler |
| **000F*** | **SAE / Ford, ISO 20401** |
| 000G | General Motors |

* Complies to ISO 20401 with Enclosure Lead Length "2".

**Enclosure / Lead Length / Voltage***

| | AC | | DC | |
|---|---|---|---|---|
| | 60Hz | 50Hz | | |
| 1B9† | | | 24 | 3-pin, central mini connector, 3.2 watt |
| 1F9†+ | | | 24 | 3-pin, central mini connector, 1.3 watt |
| 123† | 120 | 115 | | 3-pin, central mini connector |
| **2B9** | | | **24** | **4-pin, central M12 micro connector, 3.2 watt** |
| **2F9+** | | | **24** | **4-pin, central M12 micro connector, 1.3 watt** |
| 3B9 | | | 24 | 5-pin, central mini connector, 3.2 watt |
| 3F9+ | | | 24 | 5-pin, central mini connector, 1.3 watt |
| 323 | 120 | 115 | | 5-pin, central mini connector |
| 619‡† | | | 24 | 2-pin, M12 micro connector on coil |

* All coils include LED & suppression
† Operator function "1" or "E"
‡ Only available with wiring option "000F"
+ Override "G" only.

## Valve - Non Plug-in, 5599-1, CNOMO - Size 1 & 2

| H1 | E | WX | B | B | L53 | D |
|---|---|---|---|---|---|---|

**Basic Series 5599-1**

| | |
|---|---|
| ISO 5599-1 Size 1 | H1 |
| ISO 5599-1 Size 2 | H2 |

**5599-1 Operator / Function**

| | |
|---|---|
| **Single solenoid, 2-position - air return** | **1** |
| **Double solenoid, 2-position** | **2** |
| **Double solenoid, 3-position - APB** | **5** |
| Double solenoid, 3-position - CE | 6 |
| Double solenoid, 3-position - PC | 7 |
| **Single solenoid, 2-position - air return, spring assist** | **E** |

**5599-1 Mounting**

| | |
|---|---|
| **Valve less base** | **WX** |

**5599-1 Pilot Source / Pilot Exhaust**

| | |
|---|---|
| **Internal pilot, port #1 / vented** | **B** |
| External pilot, port #12 or #14 / vented | X* |

* Must be specified when using Sandwich Regulators.

**5599-1 Overrides / Lights**

| | |
|---|---|
| **B** | **Non-locking, flush, push - no light** |
| C | Locking, flush, push / turn - no light |

**5599-1 Engineering Level**

| | |
|---|---|
| **D** | **Current** |

**Enclosure / Lead length / Voltage**

| | AC | | DC | |
|---|---|---|---|---|
| | 60Hz | 50Hz | | |
| L42 | 24 | | | 3-pin, 30mm DIN 43650A with CNOMO connector |
| L45 | | | 12 | 3-pin, 30mm DIN 43650A with CNOMO connector |
| **L49** | | | **24** | **3-pin, 30mm DIN 43650A with CNOMO connector** |
| **L53** | **120** | **115** | | **3-pin, 30mm DIN 43650A with CNOMO connector** |
| L57 | 240 | | | 3-pin, 30mm DIN 43650A with CNOMO connector |
| NXX | | | | Valve less coil |

☐ Most popular.



For inventory, lead times, and kit lookup, visit www.pdnplu.com

**Parker Hannifin Corporation**
Pneumatic Division
Richland, Michigan
www.parker.com/pneumatics

## Remote Pilot - Size 18mm (HB), Size 26mm (HA), Size 1 (H1) & Size 2 (H2)

**H1** **4** **WX000XX** **D**

| Basic Series | |
|---|---|
| ISO 15407-1 18mm | HB |
| ISO 15407-1 26mm | HA* |
| ISO 5599-1 Size 1 | H1* |
| ISO 5599-1 Size 2 | H2* |

* Must order remote pilot access plates for manifolds.

| Engineering Level | |
|---|---|
| A | 15407 Current |
| D | 5599 Current |

| Remote Pilot Valve | |
|---|---|
| WX000XX | Remote pilot valve |

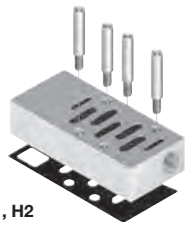
| 15407-1 Operator / Function | |
|---|---|
| Single remote pilot, 2-position - air return | 3 |
| Double remote pilot, 2-position | 4 |
| Double remote pilot, 3-position - APB | 8 |
| Double remote pilot, 3-position - CE | 9 |
| Double remote pilot, 3-position - PC | 0 |
| Single remote pilot, 2-position - air return, spring assist | F |

*Note: For manifolds, end plates, and accessories, see 15407-1 & 5599-1 Non Plug-in valve section.*

*Note: HB 18mm Valve Remote Pilot Option only available with PL02 Individual Subbase Kits.*

## Remote Pilot Access Plate Kit

HA



H1, H2

| Size | Port size | NPT | BSPP "G" |
|---|---|---|---|
| HA | 1/4" | **PS551500P** | **PS551501P** |
| H1 | 1/8" | **PS401500CP** | **PS401501CP** |
| H2 | 1/8" | **PS411500CP** | **PS411501CP** |

**Kit includes:** Pilot port access plate, gasket and mounting studs.

☐ Most popular.

## Manifold Kit - Universal Non Plug-in

**PSHU1153** **0** **1** **P**

| Mounting Style / Port Size | |
|---|---|
| **HB manifold with 1/8 NPT end ports** | **PSHU1151** |
| HB manifold with 1/8 BSPP end ports | PSHU1152* |
| **HA manifold with 1/4 NPT end ports** | **PSHU1153** |
| HA manifold with 1/4 BSPP end ports | PSHU1154* |
| **H1 manifold with 3/8 NPT end ports** | **PSHU1155** |
| H1 manifold with 3/8 BSPP end ports | PSHU1156* |
| **H2 manifold with 1/2 NPT end ports** | **PSHU1157** |
| H2 manifold with 1/2 BSPP end ports | PSHU1158* |

* BSPP conforms to ISO 1179-1 w 228-1 threads.

| | Gasket Options |
|---|---|
| **1** | **1,3,5 ports open and pilots open** |
| 2 | 1,3,5 ports closed and pilots open |
| 3 | 1 closed, 3,5 ports open and pilots closed |
| 4 | 1 port open, 3,5 ports closed and pilots open |
| 5 | 1,3,5 ports open and pilots closed |
| 6 | 1,3,5 ports closed and pilots closed |
| 7 | 1 closed, 3,5 ports open and pilots closed |
| 8 | 1 port open, 3,5 ports closed and pilots open |

| | Circuit Board Address Configuration |
|---|---|
| **0** | **No interconnect** |

**HA manifold**

## Intermediate Air Supply - Universal Non Plug-in

**PSHU115A** **0** **1** **P**

| Mounting Style / Port Size | |
|---|---|
| **Intermediate air supply, NPT / internal pilot** | **PSHU115A** |
| Intermediate air supply, BSPP / internal pilot | PSHU115B* |
| **Intermediate air supply, NPT / external pilot** | **PSHU115C** |
| Intermediate air supply, BSPP / external pilot | PSHU115D* |

* BSPP Conforms to ISO 1179-1 w 228-1 Threads.

| | Gasket Options |
|---|---|
| **1** | **1,3,5 ports open and pilots open** |
| 2 | 1,3,5 ports closed and pilots open |
| 3 | 1 closed, 3,5 ports open and pilots closed |
| 4 | 1 port open, 3,5 ports closed and pilots open |
| 5 | 1,3,5 ports open and pilots closed |
| 6 | 1,3,5 ports closed and pilots closed |
| 7 | 1 closed, 3,5 ports open and pilots closed |
| 8 | 1 port open, 3,5 ports closed and pilots open |

| | Circuit Board Address Configuration |
|---|---|
| **0** | **No electrical** |

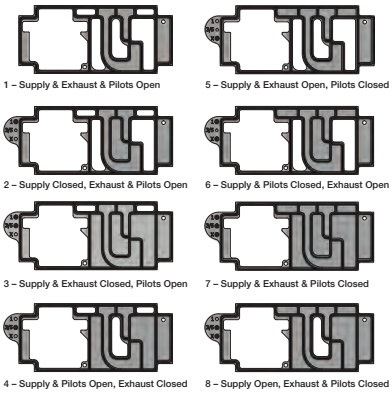
**Intermediate air supply**

☐ Most popular.

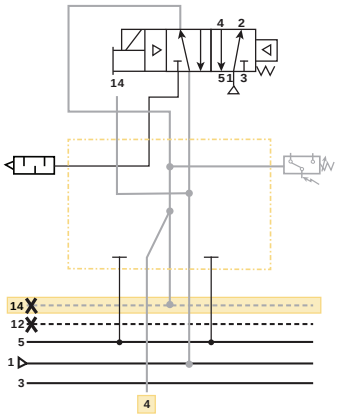
## Pneumatic Zoning

Multiple pressure zones can be created by selecting alternative gaskets between individual manifold segments or an intermediate air supply module. These zones can be designed to meet different application and safety requirements on the machine. Inserting the PXM Pilot Exhaust Module into a one of these zones allows control of pilot pressure for the entire zone.

## Gasket Kit - Universal Manifold to Manifold

| | Description | | Part number |
|---|---|---|---|
|  | Pilots opened | 1 – Supply & Exhaust & Pilots Open | **PSHU11P** |
| | | 2 – Supply Closed, Exhaust & Pilots Open | **PSHU12P** |
| | | 3 – Supply & Exhaust Closed, Pilots Open | **PSHU13P** |
| | | 4 – Supply & Pilots Open, Exhaust Closed | **PSHU14P** |
| | Pilots blocked | 5 – Supply & Exhaust Open, Pilots Closed | **PSHU15P** |
| | | 6 – Supply & Pilots Closed, Exhaust Open | **PSHU16P** |
| | | 7 – Supply & Exhaust & Pilots Closed | **PSHU17P** |
| | | 8 – Supply Open, Exhaust & Pilots Closed | **PSHU18P** |

## Pilot Exhaust Module



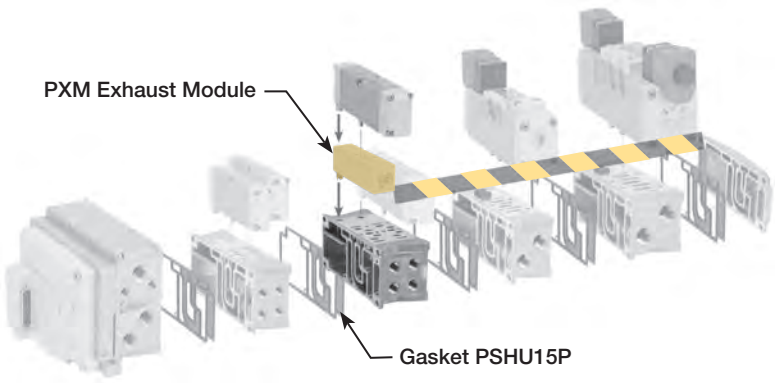

PXM Pilot Exhaust Module enables an H Series HA Single Solenoid valve to control the pilot pressure to other externally piloted H Series ISO valves in the same manifold zone. The HA valve in conjunction with the PXM will remove pilot pressure to all externally piloted valves in the manifold zone when solenoid 14 is de-energized (off). Control of all externally piloted valves in the zone is disabled for both solenoid actuation and manual override until solenoid 14 of the HA valve on the PXM is energized again (on).

**Gaskets blocking pilot pressure are required at the start of the zone the PXM is controlling.** Special zoning gaskets (shown below) are available to meet any application requirement. In the example below, main pressure and exhaust pass through to the second zone, but pilot pressure is blocked. This results in the PXM providing pilot pressure for the zone after this gasket.

| Part Number | Sensor Type |
|---|---|
| **PS55XXA0P** | No sensing |
| **PS55XXM0P** | Mechanical pressure switch |
| **PS55XXE0P** | Solid state pressure switch |

| Part Number | Cable Type |
|---|---|
| **RKC4.4T-2** | M12 cable, PVC, 2m |

PS55XXA0P PS55XXM0P PS55XXE0P



## Sandwich Regulator - Non Plug-in, 15407-1

**PS5637 | 1 | 6 | 6 | P**

| Basic Series | |
|---|---|
| HB 15407-1, 18mm, Non Plug-In | PS5637 |
| HA 15407-1, 26mm, Non Plug-In | PS5537 |

| Regulator Function | |
|---|---|
| Common Pressure Regulator | 1 |
| Independent Pressure Regulator | 2 |

| #2 Port Regulator / Gauge* | |
|---|---|
| 5 | 2-60 PSIG w/Gauge |
| **6** | **5-125 PSIG w/Gauge** |

* For Common Pressure Regulator Option, Regulator Gauge callout must be the same number for both Port #4 and Port #2. (Example: 166)

| #4 Port Regulator / Gauge* | |
|---|---|
| 5 | 2-60 PSIG w/Gauge |
| **6** | **5-125 PSIG w/Gauge** |

* For Common Pressure Regulator Option, Regulator Gauge callout must be the same number for both Port #4 and Port #2. (Example: 166)

**HB - 18mm**
**(Independent Dual Port Regulator shown)**

**HA - 26mm**
**(Common Port Regulator shown)**

***Ordering Components***
- *Manifold or Subbase Kit required.*
- *Sandwich Regulator Kit configured for Internal Pilot as standard.*
- *Order valve as External Pilot.*

### How to Configure Sandwich Regulator / Valve Combinations

***Internal Pilot Configuration of Sandwich Regulator HA, HB***
*Pressure in Base Port 1 feeds regulator configured for Internal Pilot which feeds valve configured for External Pilot.*

| | Accessories | Description | Part number |
|---|---|---|---|
|  | Gauge adapter kit | Includes 1/8" coupling, long nipple, and gauge | **PS5651160P** |

## Sandwich Regulator Cv Flow Chart*

| | Common Pressure Code 166 | | | | Dual Pressure Code 266 | | | |
|---|---|---|---|---|---|---|---|---|
| | 1-2 | 1-4 | 2-3 | 4-5 | 1-2 | 1-4 | 2-3 | 4-5* |
| **HB** | 0.20 | 0.20 | 0.41 | 0.34 | 0.23 | 0.19 | 0.28 | 0.27 |
| **HA** | 0.41 | 0.43 | 0.87 | 0.89 | 0.42 | 0.45 | 0.68 | 0.66 |

* Regulator Port exhaust through Base Port 3.
**Note:** All Cv's calculated with regulator adjusted full open.

## Sandwich Regulator - Non Plug-in, 5599-1

**PS4037 | 1 | 6 | 6 | C | P**

| Basic Series | |
|---|---|
| H1 5599-1, Non Plug-in | PS4037 |
| H2 5599-1, Non Plug-in | PS4137 |

| Regulator Function | |
|---|---|
| Common Pressure Regulator | 1 |
| Independent Pressure Regulator | 2 |

| #2 Port Regulator / Gauge* | |
|---|---|
| **0**** | **Line By-Pass Plate** |
| 4 | 1-30 PSIG w/Gauge |
| 5 | 2-60 PSIG w/Gauge |
| **6** | **5-125 PSIG w/Gauge** |
| D | Remote Pilot ISO 2 & 3 only |

* For common pressure regulator option, regulator gauge callout must be the same number for both Port #4 and Port #2. (Example: 166)

** Pressure Line by-pass option can only be used with independent pressure regulators.

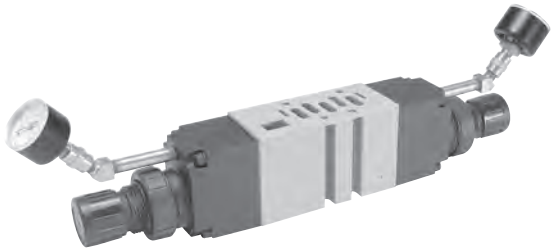
| #4 Port Regulator / Gauge* | |
|---|---|
| **0**** | **Line By-Pass Plate** |
| 4 | 1-30 PSIG w/Gauge |
| 5 | 2-60 PSIG w/Gauge |
| **6** | **5-125 PSIG w/Gauge** |
| D | Remote Pilot ISO 2 & 3 only |

* For common pressure regulator option, regulator gauge callout must be the same number for both Port #4 and Port #2. (Example: 166)

** Pressure Line by-pass option can only be used with independent pressure regulators.

***Ordering Components***
- *Sandwich regulator kit configured for internal pilot as standard.*
- *Order valve as external pilot.*

**H1 - Size 1**
**(Independent Dual Port Regulator shown)**



**H2 - Size 2**
**(Independent Dual Port Regulator shown)**

### How to Configure Sandwich Regulator / Valve Combinations

***Internal Pilot Configuration of Sandwich Regulator H1 & H2***
*Pressure in Base Port 1 feeds regulator configured for Internal Pilot which feeds valve configured for External Pilot.*

***External Pilot Configuration of Sandwich Regulator H1 & H2***
*An External Pilot pressure in Port 12 or 14 of the base feeds thru the Sandwich Regulator 12 or 14 galley directly to the 12/14 pilot of the valve. This configuration takes an External Pilot from the 12 port of the base and passes it thru the regulator to feed the 12 galley of the valve.*

## Sandwich Regulator Cv Flow Chart*

| | Common Pressure Code 166 | | | | Single Pressure 2 Code 206 | | | | Single Pressure 4 Code 260 | | | | Dual Pressure Code 266 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1-2 | 1-4 | 2-3 | 4-5 | 1-2 | 1-4 | 2-3 | 4-5* | 1-2 | 1-4 | 2-3 | 4-5* | 1-2 | 1-4 | 2-3 | 4-5* |
| **H1** | 0.62 | 0.61 | 1.28 | 1.18 | 0.73 | 0.96 | 0.96 | 0.93 | 0.34 | 0.70 | 0.94 | 0.98 | 0.52 | 0.48 | 0.86 | 0.88 |
| **H2** | 1.47 | 1.60 | 2.41 | 2.33 | 1.71 | 1.90 | 1.52 | 1.75 | 1.74 | 1.67 | 1.73 | 1.79 | 1.61 | 1.62 | 1.50 | 1.67 |

* Regulator Port exhaust through Base Port 3.

**Note:** All Cv's calculated with regulator adjusted full open.

☐ Most popular.

## Online Configuration

Navigate to the landing page
www.parker.com/pdn/HSeriesISO
Customize your manifold assembly
Create and save a unique assembled part number
Generate a CAD model


### Add-A-Fold - Universal Non Plug-in

**AAHU31 L0 0 0 P 06**

| Valve Type | |
|---|---|
| **Non plug-in (internal)** | **AAHU31** |
| Non plug-in (external) | AAHU3X |

| Left Hand End Plate Type | |
|---|---|
| **No connector, non plug-in** | **L0** |

| Right Hand End Plate Type / Port | |
|---|---|
| **Low profile (no ports)** | **0** |
| 1/2 Exhaust and inlet port | 1 |
| 3/4 Exhaust and inlet port | 2 |

| Thread Type | |
|---|---|
| **0** | **NPT** |
| 1* | BSPP "G" |

* BSPP conforms to ISO 1179-1 w 228-1 threads

| Number of Segments |
|---|
| 01 |
| ↓ |
| 32 |

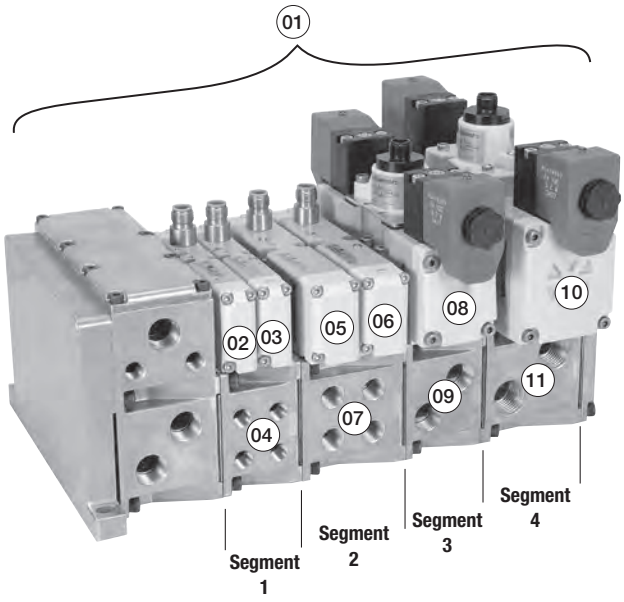
### How To Order Plug-in Add-A-Fold Assemblies

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete valve, regulator, flow control and manifold base kit. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold. The left most segment is segment 1. (If a blank station is needed, list the blanking plate part number and the individual manifold part numbers for the required segment.)

#### *Example*

Application requires a 4 segment manifold.

| Item | Part No. | Location | |
|---|---|---|---|
| 01 | AAHU31L000P04 | | |
| 02 | HB2WXBG2G9000FA | Segment 1 | Valve station 1 |
| 03 | HB2WXBG2G9000FA | | Valve station 2 |
| 04 | PSHU115101P | | Manifold base |
| 05 | HA1WXBG2G9000FA | Segment 2 | Valve station 3 |
| 06 | HA2WXBG2G9000FA | | Valve station 4 |
| 07 | PSHU115301P | | Manifold base |
| 08 | H12WXBG2B9000FD | Segment 3 | Valve station 5 |
| 09 | PSHU115501P | | Manifold base |
| 10 | H22WXBG2B9000FD | Segment 4 | Valve station 6 |
| 11 | PSHU115701P | | Manifold base |




**Example:**
**4 segment manifold with (2) HB, (2) HA, (1) H1, and (1) H2 valve on manifold bases with low profile, NPT end plate.**

Most popular.

## Subbase Kit - Non Plug-in

HA non plug-in subbase shown

**PS55 1113 0 [ ] P**

| Series | |
|---|---|
| HA Subbase | PS55 |
| H1 Subbase | PS40 |
| H2 Subbase | PS41 |

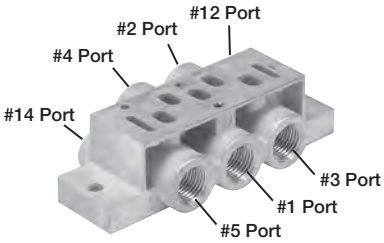
| Engineering Level | |
|---|---|
| Blank | HA Series |
| D | H1 Series |
| C | H2 Series |

| Mounting Style / Port Size | |
|---|---|
| **HA Series** | |
| **1/4 NPT side ports** | **1113** |
| 1/4 BSPP side ports | 1114* |
| 1/4 NPT bottom / side ports | 1123 |
| 1/4 BSPP bottom / side ports | 1124* |
| **H1 Series** | |
| **3/8 NPT side ports** | **1115** |
| 3/8 BSPP side ports | 1116* |
| **H2 Series** | |
| **1/2 NPT side ports** | **1117** |
| 1/2 BSPP side ports | 1118* |

| Enclosures / Lead Length | |
|---|---|
| 0 | None, No Electrical Plug |

* BSPP conforms to ISO 1179-1 w 228-1 threads.

## HB Series ISO 15407-1 Size 18mm (HB) Single Subbase



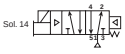
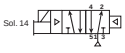
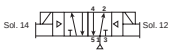
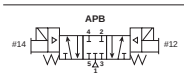
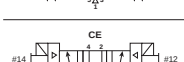
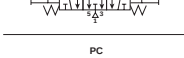
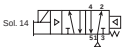
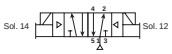
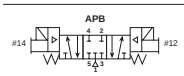
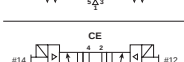

Side ported base
18mm DX02 / HB

| 1/8" NPT | 1/8" BSPP |
|---|---|
| **PL02-01-80** | **PL02-01-70** |

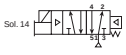
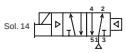
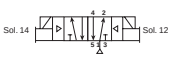
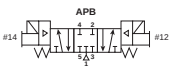
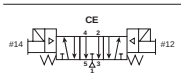
**Note:** Can be used for external, single, or double remote pilot.

Most popular.

## Valve with Central Connectors - 5599-1, Non Plug-in, Size 3 (H3) * Not compatible with H Universal

| Symbol | Type | Cv | Operator | Voltage | Pilot | Non-locking | Locking |
|---|---|---|---|---|---|---|---|
| **4-Pin Central M12 Connector, 24 VDC** | | | | | | | |
|   | 4-way, 2-position, spring return | 6.0 | Single solenoid | 24 VDC | Internal | **H3EWXBG2B9000FD** | **H3EWXBH2B9000FD** |
| | | | | | External | **H3EWXXG2B9000FD** | **H3EWXXH2B9000FD** |
|  | 4-way, 2-position, air return | 6.0 | Single solenoid | 24 VDC | Internal | **H31WXBG2B9000FD** | **H31WXBH2B9000FD** |
| | | | | | External | **H31WXXG2B9000FD** | **H31WXXH2B9000FD** |
|   | 4-way, 2-position | 6.0 | Double solenoid | 24 VDC | Internal | **H32WXBG2B9000FD** | **H32WXBH2B9000FD** |
| | | | | | External | **H32WXXG2B9000FD** | **H32WXXH2B9000FD** |
|  | 4-way, 3-position, all ports blocked | 5.0 | Double solenoid | 24 VDC | Internal | **H35WXBG2B9000FD** | **H35WXBH2B9000FD** |
| | | | | | External | **H35WXXG2B9000FD** | **H35WXXH2B9000FD** |
|  | 4-way, 3-position, center exhaust | 5.0 | Double solenoid | 24 VDC | Internal | **H36WXBG2B9000FD** | **H36WXBH2B9000FD** |
| | | | | | External | **H36WXXG2B9000FD** | **H36WXXH2B9000FD** |
|  | 4-way, 3-position, pressure center | 5.0 | Double solenoid | 24 VDC | Internal | **H37WXBG2B9000FD** | **H37WXBH2B9000FD** |
| | | | | | External | **H37WXXG2B9000FD** | **H37WXXH2B9000FD** |
| **5-Pin, Central 7/8" Mini Connector, 120 VAC** | | | | | | | |
|   | 4-way, 2-position, spring return | 6.0 | Single solenoid | 120 VAC | Internal | **H3EWXBG323000FD** | **H3EWXBH323000FD** |
| | | | | | External | **H3EWXXG323000FD** | **H3EWXXH323000FD** |
|  | 4-way, 2-position, air return | 6.0 | Single solenoid | 120 VAC | Internal | **H31WXBG323000FD** | **H31WXBH323000FD** |
| | | | | | External | **H31WXXG323000FD** | **H31WXXH323000FD** |
|   | 4-way, 2-position | 6.0 | Double solenoid | 120 VAC | Internal | **H32WXBG323000FD** | **H32WXBH323000FD** |
| | | | | | External | **H32WXXG323000FD** | **H32WXXH323000FD** |
|  | 4-way, 3-position, all ports blocked | 5.0 | Double solenoid | 120 VAC | Internal | **H35WXBG323000FD** | **H35WXBH323000FD** |
| | | | | | External | **H35WXXG323000FD** | **H35WXXH323000FD** |
|  | 4-way, 3-position, center exhaust | 5.0 | Double solenoid | 120 VAC | Internal | **H36WXBG323000FD** | **H36WXBH323000FD** |
| | | | | | External | **H36WXXG323000FD** | **H36WXXH323000FD** |
|  | 4-way, 3-position, pressure center | 5.0 | Double solenoid | 120 VAC | Internal | **H37WXBG323000FD** | **H37WXBH323000FD** |
| | | | | | External | **H37WXXG323000FD** | **H37WXXH323000FD** |

## Valve with 3-Pin DIN Connectors - 5599-1, Non Plug-in, Size 3 (H3) * Not compatible with H Universal

| Symbol | Type | Cv | Operator | Voltage | Pilot | Non-locking | Locking |
|---|---|---|---|---|---|---|---|
| **3-Pin DIN Connector on Coil, 24 VDC** | | | | | | | |
|   | 4-way, 2-position, spring return | 6.0 | Single solenoid | 24 VDC | Internal | **H3EWXBBL49D** | **H3EWXBCL49D** |
| | | | | | External | **H3EWXXBL49D** | **H3EWXXCL49D** |
|  | 4-way, 2-position, air return | 6.0 | Single solenoid | 24 VDC | Internal | **H31WXBBL49D** | **H31WXBCL49D** |
| | | | | | External | **H31WXXBL49D** | **H31WXXCL49D** |
|   | 4-way, 2-position | 6.0 | Double solenoid | 24 VDC | Internal | **H32WXBBL49D** | **H32WXBCL49D** |
| | | | | | External | **H32WXXBL49D** | **H32WXXCL49D** |
|  | 4-way, 3-position, all ports blocked | 5.0 | Double solenoid | 24 VDC | Internal | **H35WXBBL49D** | **H35WXBCL49D** |
| | | | | | External | **H35WXXBL49D** | **H35WXXCL49D** |
|  | 4-way, 3-position, center exhaust | 5.0 | Double solenoid | 24 VDC | Internal | **H36WXBBL49D** | **H36WXBCL49D** |
| | | | | | External | **H36WXXBL49D** | **H36WXXCL49D** |
|  | 4-way, 3-position, pressure center | 5.0 | Double solenoid | 24 VDC | Internal | **H37WXBBL49D** | **H37WXBCL49D** |
| | | | | | External | **H37WXXBL49D** | **H37WXXCL49D** |

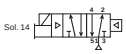
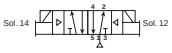
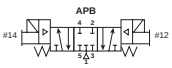
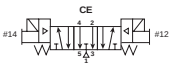
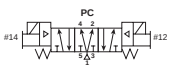
Most popular.



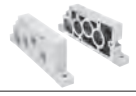
For inventory, lead times, and kit lookup, visit www.pdnplu.com

**Parker Hannifin Corporation**
Pneumatic Division
Richland, Michigan
www.parker.com/pneumatics

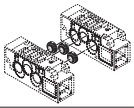
## Valve with 3-Pin DIN Connectors - 5599-1, Non Plug-in, Size 3 (H3) * Not compatible with H Universal

| | Symbol | Type | Cv | Operator | Voltage | Pilot | Non-locking | Locking |
|---|---|---|---|---|---|---|---|---|
| 3-Pin DIN Connector on Coil, 120 VDC | | | | | | | | |
|  |  | 4-way, 2-position, spring return | 6.0 | Single solenoid | 120 VAC | Internal | **H3EWXBBL53D** | **H3EWXBCL53D** |
| | | | | | | External | **H3EWXXBL53D** | **H3EWXXCL53D** |
| |  | 4-way, 2-position, air return | 6.0 | Single solenoid | 120 VAC | Internal | **H31WXBBL53D** | **H31WXBCL53D** |
| | | | | | | External | **H31WXXBL53D** | **H31WXXCL53D** |
|  |  | 4-way, 2-position | 6.0 | Double solenoid | 120 VAC | Internal | **H32WXBBL53D** | **H32WXBCL53D** |
| | | | | | | External | **H32WXXBL53D** | **H32WXXCL53D** |
| |  | 4-way, 3-position, all ports blocked | 5.0 | Double solenoid | 120 VAC | Internal | **H35WXBBL53D** | **H35WXBCL53D** |
| | | | | | | External | **H35WXXBL53D** | **H35WXXCL53D** |
| |  | 4-way, 3-position, center exhaust | 5.0 | Double solenoid | 120 VAC | Internal | **H36WXBBL53D** | **H36WXBCL53D** |
| | | | | | | External | **H36WXXBL53D** | **H36WXXCL53D** |
| |  | 4-way, 3-position, pressure center | 5.0 | Double solenoid | 120 VAC | Internal | **H37WXBBL53D** | **H37WXBCL53D** |
| | | | | | | External | **H37WXXBL53D** | **H37WXXCL53D** |

## Base / End Plate - 5599-1, Non Plug-in, Size 3 (H3) * Not compatible with H Universal

| | | Description | NPT | BSPP |
|---|---|---|---|---|
|  | Single subbase | Side ported base, 3/4" port | **PS4211190CP** | **PS4211180CP** |
|  | Manifold base | End ported bases | **PS4211590CP** | **PS4211500CP** |
| | | Bottom / end ported bases | **PS4211690CP** | **PS4211600CP** |
| | | **Note:** Manifolds include 2 pipe plugs | | |
|  | End plate | End plate - non-collective wiring | **PS4231010DP** | **PS4231011DP** |

## Accessories - 5599-1, Non Plug-in, Size 3 (H3) * Not compatible with H Universal

| | Accessory | Description | | Part number |
|---|---|---|---|---|
|  | Sandwich regulator | Common pressure | 5-125 PSIG w/ gauge | **PS4237166CP** |
| | | Independent pressure | 5-125 PSIG w/ gauge | **PS4237266CP** |
|  | Blanking plate kit | | | **PS4234CP** |
|  | Sandwich flow control | | | **PS4242CP** |
| | Sandwich Flow Control and Common Port Sandwich Regulator may be sandwiched together on a manifold or subbase. The Sandwich Flow Control MUST be located between the manifold/subbase and the Common Port Sandwich Regulator. | | | |
|  | Manifold to manifold gasket kits | | | **PS4213P** |
|  | Manifold port isolation kit | Main galley (1, 3, 5) | | **PS4232CP** |
|  | Manifold port isolation kit | Pilot galley (12, 14) | | **PS4033CP** |

Most popular.

## Valve Central Connector - Non Plug-in, 5599-1, Size 3 (H3) * Not compatible with H Universal

| H3 | E | WX | B | G | 2B9 | 000F | D |
|---|---|---|---|---|---|---|---|

**Basic Series 5599-1**

| | |
|---|---|
| ISO 5599-1 Size 3 | H3 |

**5599-1 Operator / Function**

| | |
|---|---|
| **Single solenoid, 2-position - air return** | **1** |
| **Double solenoid, 2-position** | **2** |
| **Double solenoid, 3-position - APB** | **5** |
| Double solenoid, 3-position - CE | 6 |
| Double solenoid, 3-position - PC | 7 |
| **Single solenoid, 2-position - air return, spring assist** | **E** |

**5599-1 Mounting**

| | |
|---|---|
| **Valve less base** | **WX** |

**5599-1 Pilot Source / Pilot Exhaust**

| | |
|---|---|
| **Internal pilot, port #1 / vented** | **B** |
| External pilot, port #12 or #14 / vented | X* |

* Must be specified when using Sandwich Regulators.

**5599-1 Overrides / Lights**

| | |
|---|---|
| **Non-locking, flush, with light** | **G** |
| Locking, flush, with light | H |

**5599 -1 Engineering Level**

| | |
|---|---|
| **D** | **Current** |

**5599-1 Central Connector Wiring Options**

| | |
|---|---|
| 000C | Chrysler |
| **000F*** | **SAE / Ford, ISO 20401** |
| 000G | General Motors |

* Complies to ISO 20401 with Enclosure Lead Length "2".

**Enclosure / Lead length / Voltage***

| | AC 60Hz | AC 50Hz | DC | |
|---|---|---|---|---|
| 1B9† | | | 24 | 3-pin, central mini connector, 3.2 watt |
| 1F9†+ | | | 24 | 3-pin, central mini connector, 1.3 watt |
| 123† | 120 | 115 | | 3-pin, central mini connector |
| **2B9** | | | **24** | **4-pin, central M12 connector, 3.2 watt** |
| **2F9+** | | | 24 | **4-pin, central M12 connector, 1.3 watt** |
| 3B9 | | | 24 | 5-pin, central mini connector, 3.2 watt |
| 3F9+ | | | 24 | 5-pin, central mini connector, 1.3 watt |
| 323 | 120 | 115 | | 5-pin, central mini connector |
| 619‡† | | | 24 | 2-pin, M12 connector on coil |

* All coils include LED & suppression
† Operator function "1" or "E"
‡ Only available with wiring option "000F"
+ Override "G" only.

## Valve CNOMO - Non Plug-in, 5599-1 Size 3 (H3) * Not compatible with H Universal

| H3 | E | WX | B | B | L53 | D |
|---|---|---|---|---|---|---|

**Basic Series 5599-1**

| | |
|---|---|
| ISO 5599-1 Size 3 | H3 |

**5599-1 Operator / Function**

| | |
|---|---|
| **Single solenoid, 2-position - air return** | **1** |
| **Double solenoid, 2-position** | **2** |
| **Double solenoid, 3-position - APB** | **5** |
| Double solenoid, 3-position - CE | 6 |
| Double solenoid, 3-position - PC | 7 |
| **Single solenoid, 2-position - air return, spring assist** | **E** |

**5599-1 Mounting**

| | |
|---|---|
| **Valve less base** | **WX** |

**5599-1 Pilot Source / Pilot Exhaust**

| | |
|---|---|
| **Internal pilot, port #1 / vented** | **B** |
| External pilot, port #12 or #14 / vented | X* |

* Must be specified when using Sandwich Regulators.

**5599-1 Overrides / Lights**

| | |
|---|---|
| **B** | **Non-locking, flush, push - no light** |
| C | Locking, flush, push / turn - no light |

**5599-1 Engineering Level**

| | |
|---|---|
| **D** | **Current** |

**Enclosure / Lead Length / Voltage**

| | AC 60Hz | AC 50Hz | DC | |
|---|---|---|---|---|
| L42 | 24 | | | 3-pin, 30mm DIN 43650A with CNOMO connector |
| L45 | | | 12 | 3-pin, 30mm DIN 43650A with CNOMO connector |
| **L49** | | | **24** | **3-pin, 30mm DIN 43650A with CNOMO connector** |
| **L53** | **120** | **115** | | **3-pin, 30mm DIN 43650A with CNOMO connector** |
| L57 | 240 | | | 3-pin, 30mm DIN 43650A with CNOMO connector |
| NXX | | | | Valve less coil |

Most popular.



For inventory, lead times, and kit lookup, visit www.pdnplu.com

**Parker Hannifin Corporation**
Pneumatic Division
Richland, Michigan
www.parker.com/pneumatics

## Remote Pilot - Size 3 (H3) * Not compatible with H Universal

**H3** **4** **WX000XX** **D**

| Basic Series | |
|---|---|
| ISO 5599-1 Size 3 | H3* |

* Must Order Remote Pilot Access Plates for Manifolds.

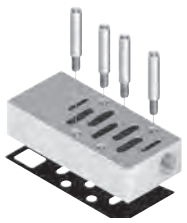
| 15407-1 Operator / Function | |
|---|---|
| **Single remote pilot, 2-position - air return** | **3** |
| **Double remote pilot, 2-position** | **4** |
| **Double remote pilot, 3-position - APB** | **8** |
| Double remote pilot, 3-position - CE | 9 |
| Double remote pilot, 3-position - PC | 0 |
| Single remote pilot, 2-position - air return, spring assist | F |

| Remote Pilot Valve | |
|---|---|
| WX000XX | Remote pilot valve |

| Engineering Level | |
|---|---|
| D | 5599 Current |

*Note: For manifolds, end plates, and accessories, see 5599-1 Non Plug-in valve section.*

## Remote Pilot Access Plate Kits * Not compatible with H Universal



| Size | Port size | NPT | BSPP "G" |
|---|---|---|---|
| H3 | 1/8" | **PS421500CP** | **PS421501CP** |

**Kit includes:** Pilot Port Access Plate, Gasket and Mounting Studs.

Most popular.

## Manifold / Subbase Kit - Non Plug-in, 5599-1, Size 3 (H3) * Not compatible with H Universal

**PS421159 0 C P**

| Mounting Base Style / Port Size | |
|---|---|
| **Subbase: 3/4 NPT side ports** | **PS421119** |
| Subbase: 3/4 BSPP side port | PS421110* |
| **Manifold: 3/4 NPT End port** | **PS421159** |
| Manifold: 3/4 BSPP end port | PS421150* |
| Manifold: 3/4 NPT bottom / end port | PS421169 |
| Manifold: 3/4 BSPP bottom / end port | PS421160* |

* BSPP conforms to ISO 1179-1 w 228-1 threads.

| Engineering Level | |
|---|---|
| C | H3 |

| Enclosures / Lead Length | |
|---|---|
| 0 | None, No Electrical Plug - 5599-1 |

H3 Subbase shown

H3 Manifold shown

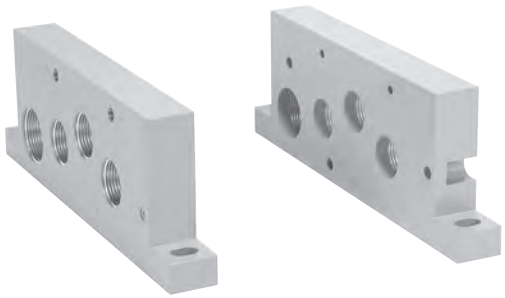
## End Plate Kit - Non plug-in, 5599-1 * Not compatible with H Universal

**PS423101 0 D P**

| Basic Series | |
|---|---|
| ISO 5599, Size 3 | PS423101 |

| Thread Type | |
|---|---|
| 0 | NPT |
| 1* | BSPP "G" |

* BSPP conforms to ISO 1179-1 w 228-1 threads.



H3 Non-Collective Wiring End Plates shown

Most popular.

## Add-A-Fold Assembly - Non Plug-in, 5599-1, Size 3 (H3) * Not compatible with H Universal

| AA | H3 | S | 0 | 0 | 03 |
|---|---|---|---|---|---|

**Valve Series**
Right & left end plate — H3

**End Plate Type**
Standard - non-collective wiring — S

**Thread Type**
0 — NPT

**Number of Segments**
01
↓
32

## How To Order Non Plug-in Add-A-Fold Assemblies

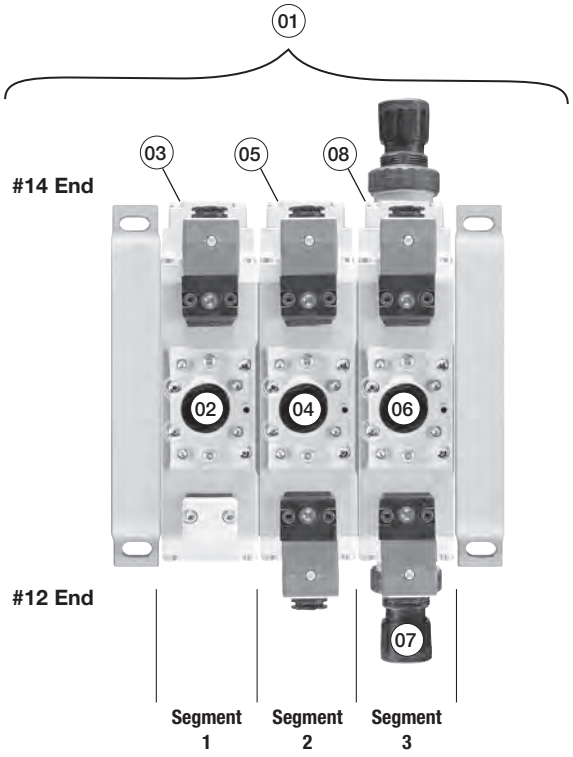
1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete valve, regulator, flow control and manifold base kit. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold. The left most segment is segment 1. (If a blank station is needed, list the blanking plate part number and the individual manifold part numbers for the required segment.)

### *Example*

Application requires a 3 segment manifold and regulator on segment 3.

| Item | Part No. | Location | |
|---|---|---|---|
| 01 | AAH3S003 | | |
| 02 | H31WXBG2B9000FD | Segment 1 | Valve station 1 |
| 03 | PS4211590CP | | Manifold base |
| 04 | H32WXBG2B9000FD | Segment 2 | Valve station 2 |
| 05 | PS4211590CP | | Manifold base |
| 06 | H32WXXG2B9000FD | | Valve station 3 |
| 07 | PS4237166CP | Segment 3 | Sandwich regulator |
| 08 | PS4211590CP | | Manifold base |

**NOTE:** Construct manifold assemblies from left to right while looking at the cylinder ports.
Valves must be ordered as External Pilot when using Sandwich Regulator.




**Example:**
**3 segment manifold with (3) H3 valves on manifold bases and regulator at segment 3.**

Most popular.

## Sandwich Regulator - Non Plug-in, 5599-1, Size 3 (H3) * Not compatible with H Universal

**PS4237 | 1 | 6 | 6 | C | P**

| Basic Series | |
|---|---|
| H3 5599-1, Non Plug-in | PS4237 |

| Regulator Function | |
|---|---|
| Common Pressure Regulator | 1 |
| Independent Pressure Regulator | 2 |

| | #2 Port Regulator / Gauge* |
|---|---|
| 0** | Line By-Pass Plate |
| 4 | 1-30 PSIG w/Gauge |
| 5 | 2-60 PSIG w/Gauge |
| 6 | 5-125 PSIG w/Gauge |
| D | Remote Pilot ISO 2 & 3 only |

* For common pressure regulator option, regulator gauge callout must be the same number for both Port #4 and Port #2. (Example: 166)

** Pressure line by-pass option can only be used with independent pressure regulators.

| | #4 Port Regulator / Gauge* |
|---|---|
| 0** | Line By-Pass Plate |
| 4 | 1-30 PSIG w/Gauge |
| 5 | 2-60 PSIG w/Gauge |
| 6 | 5-125 PSIG w/Gauge |
| D | Remote Pilot ISO 2 & 3 only |

* For common pressure regulator option, regulator gauge callout must be the same number for both Port #4 and Port #2. (Example: 166)

** Pressure line by-pass option can only be used with independent pressure regulators.

***Ordering Components***

- *Sandwich regulator kit configured for internal pilot as standard.*
- *Order valve as external pilot.*

### How to Configure Sandwich Regulator / Valve Combinations

***Internal Pilot Configuration of Sandwich Regulator H3***

*Pressure in Base Port 1 feeds regulator configured for Internal Pilot which feeds valve configured for External Pilot.*

***External Pilot Configuration of Sandwich Regulator H3***

*An External Pilot pressure in Port 12 or 14 of the base feeds thru the Sandwich Regulator 12 or 14 galley directly to the 12/14 pilot of the valve. This configuration takes an External Pilot from the 12 port of the base and passes it thru the regulator to feed the 12 galley of the valve.*

## Sandwich Regulator Cv Flow Chart*

| | Common Pressure Code 166 | | | | Single Pressure 2 Code 206 | | | | Single Pressure 4 Code 260 | | | | Dual Pressure Code 266 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1-2 | 1-4 | 2-3 | 4-5 | 1-2 | 1-4 | 2-3 | 4-5* | 1-2 | 1-4 | 2-3 | 4-5* | 1-2 | 1-4 | 2-3 | 4-5* |
| **H3** | 2.37 | 2.39 | 4.30 | 4.47 | 2.37 | 2.81 | 2.75 | 3.01 | 2.65 | 2.59 | 2.68 | 2.74 | 2.43 | 2.41 | 3.16 | 3.04 |

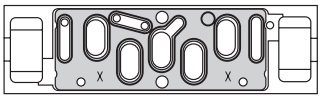
* Regulator Port exhaust through Base Port 3.

**Note:** All Cv's calculated with regulator adjusted full open.

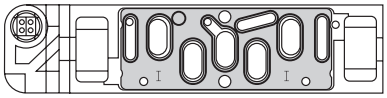
Most popular.

## ISO Pneumatic Valve Standard Definitions

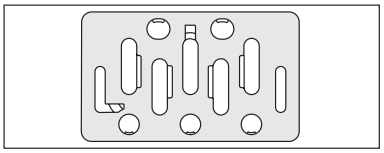
**15407-1:** Non plug-in Standards for Size 01 (26mm) & Size 02 (18mm) Wide Valves



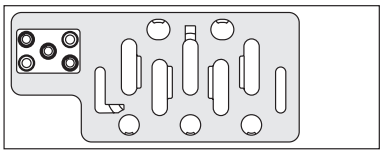
**15407-2:** Plug-in Standards for Size 01 (26mm) & Size 02 (18mm) Wide Valves



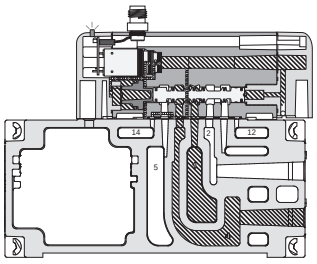
**5599-1:** Non plug-in Standards for Sizes 1, 2, 3



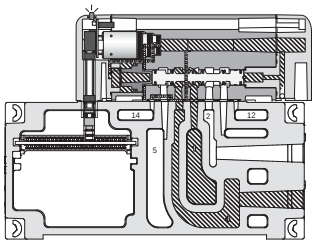
**5599-2:** Plug-in Standards for Size 1, 2, 3



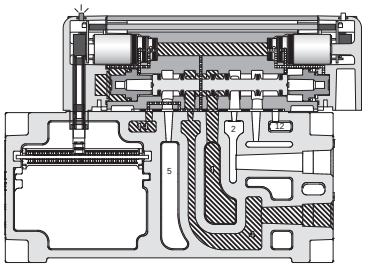
### HB / HA Series



15407-1 18mm Single Solenoid Internal Pilot Manifold Mounted



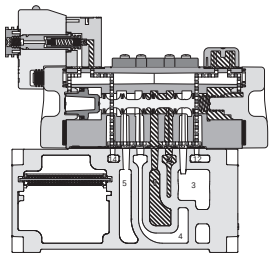
15407-2 18mm Single Solenoid Internal Pilot Manifold Mounted



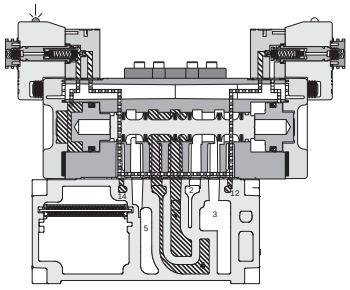
15407-2 26mm Double Solenoid External Pilot Manifold Mounted

Pressure Exhaust

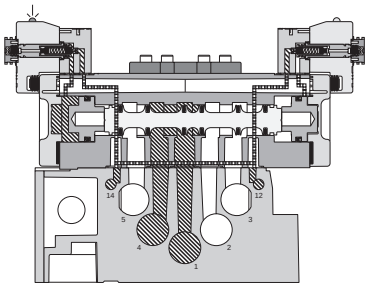
### H1, H2, H3 Series



H1 5599-2 Single Solenoid Internal Pilot Manifold Mounted



H2 5599-2 Double Solenoid External Pilot Manifold Mounted

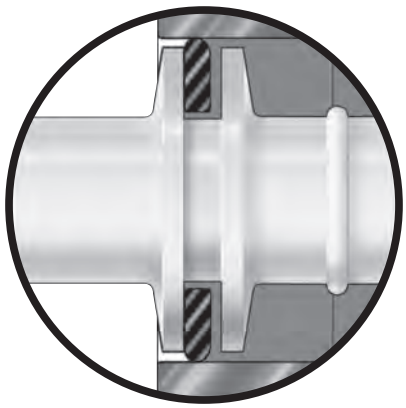


H3 5599-2 Double Solenoid External Pilot Subbase Mounted

Pressure Exhaust

# *Wear Compensation System*

- Maximum Performance
  - Low Friction
  - Fast Response
  - Lower Operating Pressures
  - Less Wear
- Long Cycle Life - Under pressure, radial expansion of the seal occurs to maintain sealing contact with the valve bore.
- Non-Lube Service - No lubrication required for continuous valve shifting.
- Bi-Directional Spool Seals - Common spool used for any pressure, including vacuum.



## Flow Rating (Cv)

| Valve size | Port size | 2-Position | 3-Position |
|---|---|---|---|
| HB | 1/8" | 0.55 Cv, C = 1.5 Nl/s x bar, b = 0.25, Qn = 390 l/min, Qmax = 648 l/min | 0.50 Cv, C = 1.4 Nl/s x bar, b = 0.25, Qn = 360 l/min, Qmax = 595 l/min |
| HA | 1/4" | 1.1 Cv, C = 3.6 Nl/s x bar, b = 0.30, Qn = 918 l/min, Qmax = 1518 l/min | 1.0 Cv, C = 3.3 Nl/s x bar, b = 0.30, Qn = 845 l/min, Qmax = 1395 l/min |
| H1 | 3/8" | 1.5 Cv, C = 5.0 Nl/s x bar, b = 0.30, Qn = 1248 l/min, Qmax = 2070 l/min | 1.2 Cv, C = 4.1 Nl/s x bar, b = 0.30, Qn = 1000 l/min, Qmax = 1660 l/min |
| H2 | 1/2" | 3.0 Cv, C = 9.7 Nl/s x bar, b = 0.35, Qn = 2520 l/min, Qmax = 4140 l/min | 2.8 Cv, C = 9.0 Nl/s x bar, b = 0.35, Qn = 2340 l/min, Qmax = 3860 l/min |
| H3 | 3/4" | 6.0 Cv, C = 18.7 Nl/s x bar, b = 0.35, Qn = 5022 l/min, Qmax = 7848 l/min | 5.0 Cv, C = 15.4 Nl/s x bar, b = 0.35, Qn = 4185 l/min, Qmax = 6545 l/min |

Cv tested per ANSI / (NFPA) T3.21.3
Flow tested According to ISO 6358.

## Response Time** (ms)

| Valve size | Port size | 0 Cu. In. Chamber Fill | 0 Cu. In. Chamber Exhaust | ## Cu. In. Chamber Fill | ## Cu. In. Chamber Exhaust |
|---|---|---|---|---|---|
| **Single Solenoid 2-Position - Air Return / Spring Assist** | | | | | |
| HB | 1/8" | 28 | 30 | 141 | 154 |
| HA | 1/4" | 24 | 26 | 77 | 124 |
| H1 | 3/8" | 28 | 39 | 124 | 198 |
| H2 | 1/2" | 38 | 76 | 149 | 295 |
| H3 | 3/4" | 56 | 70 | 163 | 235 |
| **F9, 1.3 W Coil Only Single Solenoid 2-Position - Air Return / Spring Assist** | | | | | |
| H1 | 3/8" | 55 | 84 | 188 | 270 |
| H2 | 1/2" | 91 | 146 | 245 | 349 |
| H3 | 3/4" | 126 | 127 | 256 | 328 |

## HB (12), HA (25), H1 (50), H2 (100), H3 (200)

** With 100 PSIG supply, time (ms) required to fill from 0 to 90 PSIG and Exhaust from 100 PSIG to 10 PSIG measured from the instant of energizing or de-energizing 24VDC solenoid.

Tested per ANSI / (NFPA) T3.21.8

## Left End Plate Field Conversion

End plate kits and manifold assemblies are ordered as internal or single external pilot however field conversion is possible.

### End Plate Configuration - Internal Pilot *

Insert 2 pipe plugs in locations A & B (1/8" NPT or G 1/8) as shown

Blocking off the pilot supply ports will configure the left end plate as internally piloted. Pilot pressure required to operate the H Series valves will be drawn from the supply or #1 port and no additional connections are required. Port locations C & D must be left unplugged for this option to function properly.

### End Plate Configuration - Single External Pilot *

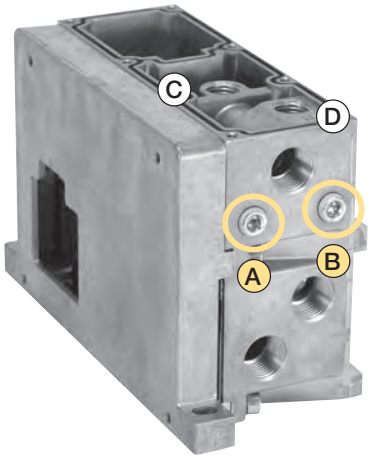
Insert 1 pipe plug into location C (1/4" NPT) as shown to configure the left end plate as single externally piloted.

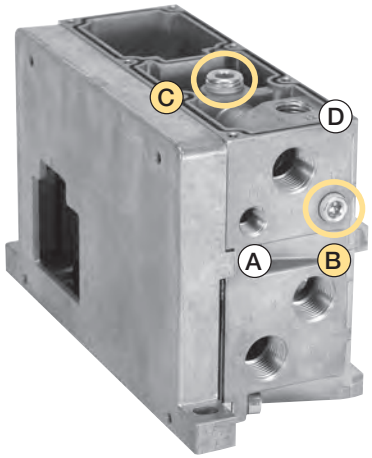
Pilot pressure required to operate the H Series valves must be supplied to the 14 port only at location A which is internally connected to the 12 pilot.

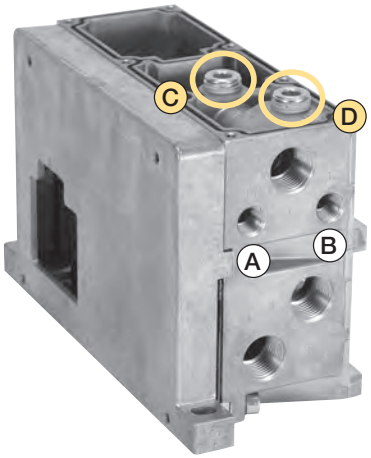
### End Plate Configuration - Double External Pilot

Insert 2 pipe plugs in locations C & D (1/4" NPT) as shown to configure the left end plate as double externally piloted.

Pilot pressure required to operate the H Series valves must be supplied separately to both ports 14 and 12 (locations A and B).



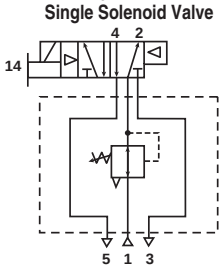

* Standard in catalog

Note: Left end plate shown with cover removed.

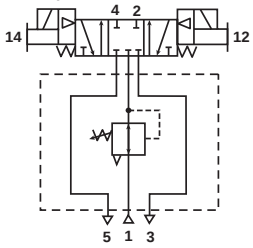
## Common Port Regulation - Plug-in, HB & HA

Provides adjustable regulated air pressure to the valve's #1 port which gives the same pressure to both the #2 and #4 port of the manifold or subbase. The regulator is always on the 14 end of the valve.

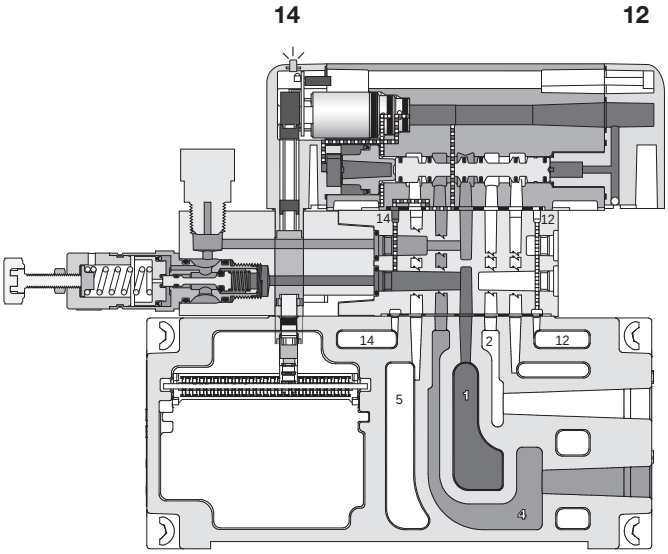
**Common Port Regulator with 4-Way, 2-Position Single Solenoid Valve**




**Common Port Regulator with 4-Way, 3-Position APB Valve**




**HB Common Port Regulator Shown - Single Solenoid, 14 Energized**

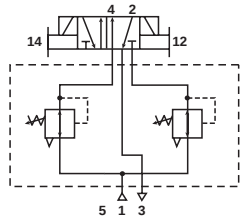



## Independent Dual Port Regulation - Plug-in, HB & HA

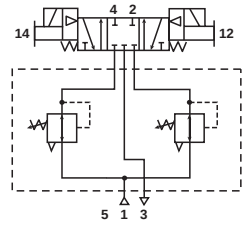
### Dual Port Regulator

Provides regulated pressure to both ports. Pressure regulation can occur out of the #2 or #4 port of the valve.

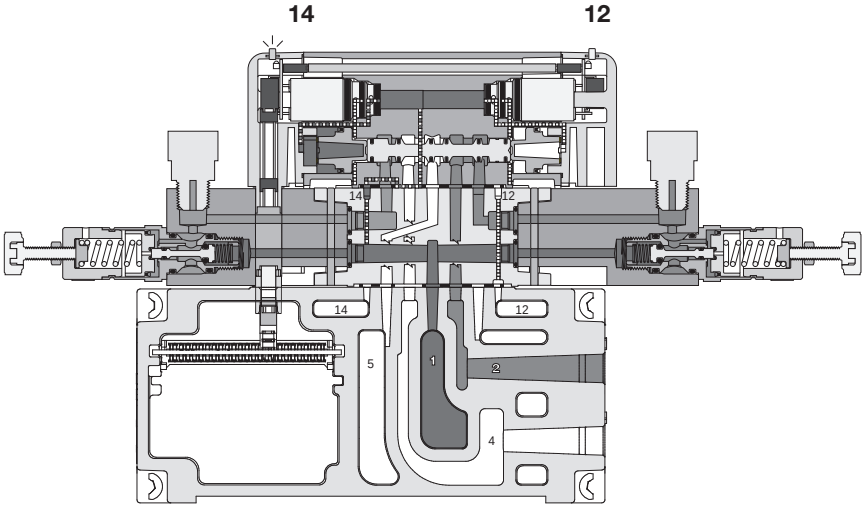
**Independent Dual Port Regulator with 4-Way, 2-Position Double Solenoid Valve**




**Independent Dual Port Regulator with 4-Way, 3-Position Double Solenoid Valve**




**HB Independent Dual Port Regulator Shown - Double Solenoid, 14 Energized**

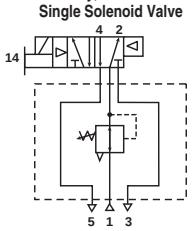



*When using an Independent Pressure Sandwich Regulator, the cylinder outlet ports are reversed. The 12 end energizes the #4 port and the 14 end energizes the #2 port. The 3-Position CE and PC functions are also reversed. (See schematics above.)*

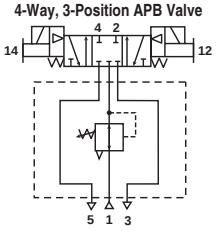
## Common Port Regulation - Non Plug-in, HB & HA

Provides adjustable regulated air pressure to the valve's #1 port which gives the same pressure to both the #2 and #4 port of the manifold or subbase. The regulator is always on the 14 end of the valve.

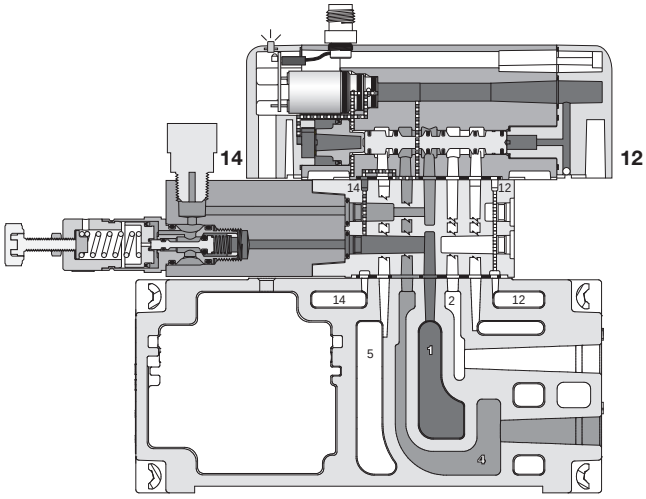
Common Port Regulator with 4-Way, 2-Position Single Solenoid Valve




Common Port Regulator with 4-Way, 3-Position APB Valve




**HB Common Port Regulator Shown - Single Solenoid, 14 Energized**

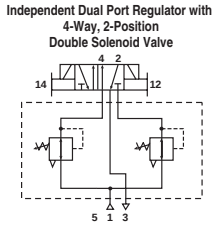



## Independent Dual Port Regulation - Non Plug-in, HB & HA

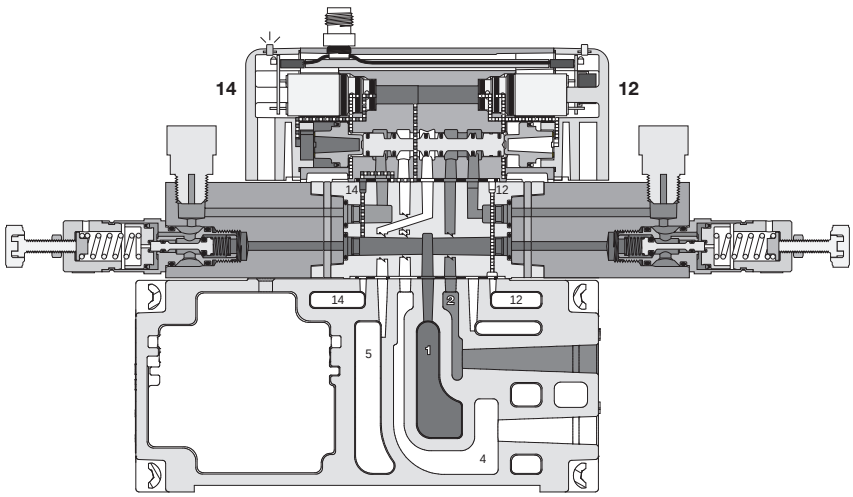
**Dual Port Regulator**

Provides regulated pressure to both ports. Pressure regulation can occur out of the #2 or #4 port of the valve.

Independent Dual Port Regulator with 4-Way, 2-Position Double Solenoid Valve




**HB Independent Dual Port Regulator Shown - Double Solenoid, 14 Energized**



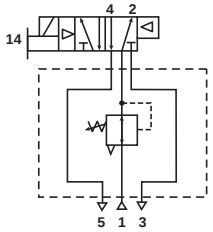

*When using an Independent Pressure Sandwich Regulator, the cylinder outlet ports are reversed. The 12 end energizes the #4 port and the 14 end energizes the #2 port. The 3-Position CE and PC functions are also reversed. (See schematics on above.)*

Most popular.

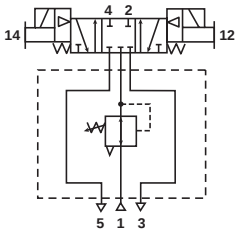
## Common Port Regulation - Plug-in, H1, H2, H3

Provides adjustable regulated air pressure to the valve's #1 port which gives the same regulated pressure to both the #2 and #4 port of the manifold or subbase. The regulator is always on the 14 end of the valve.

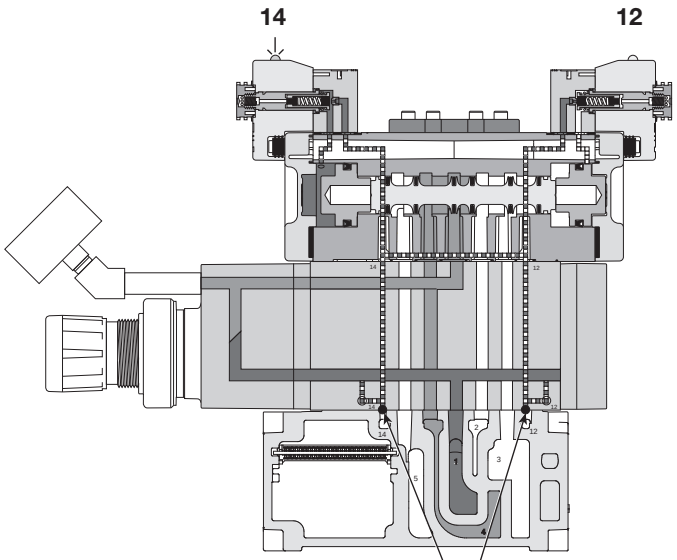
**Common Port Regulator with 4-Way, 2-Position Single Solenoid Valve**




**Common Port Regulator with 4-Way, 3-Position APB Valve**




### H2 Common Port Regulator Shown - Double Solenoid, 14 Energized, Internal Pilot



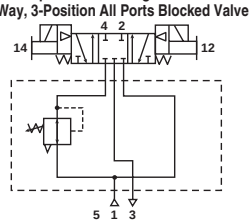

Sandwich Regulator has standard configuration of Internal Pilot with the Pilot Plug in the bottom of the I & E Pilot Holes which prevents line pressure from escaping through the manifold.

## Independent Port Regulation - Plug-in, H1, H2, H3

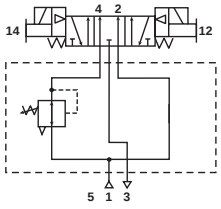
### Single Port Regulator

Provides regulated pressure to one of the ports and full line pressure to the other by use of the Line Pressure By-Pass Plate. Pressure regulation can occur out of the #4 port of the valve.

**Independent Port Regulator with 4-Way, 3-Position All Ports Blocked Valve**

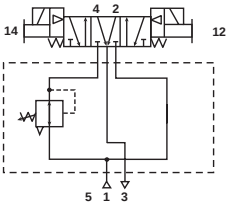



**Independent Port Regulator with 4-Way, 3-Position, Inlet to Cylinder Function**



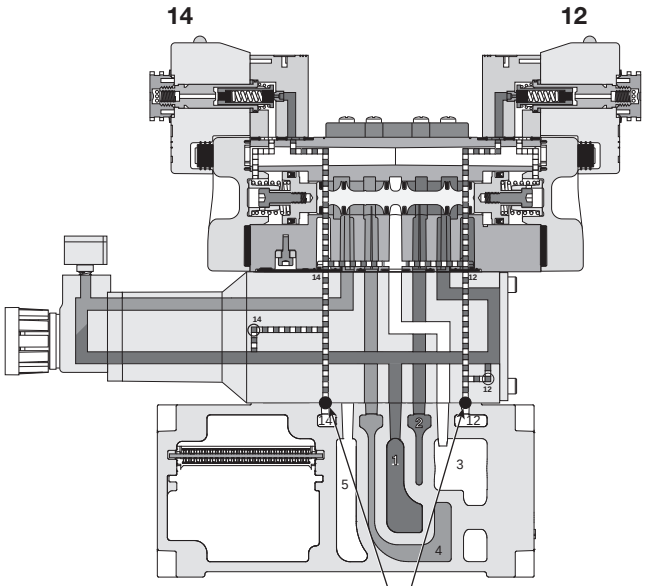

⚠ CAUTION: Requires 4-Way, 3-Position, Cylinder to Exhaust Valve

**Independent Port Regulator with 4-Way, 3-Position, Cylinder to Exhaust Function**




⚠ CAUTION: Requires 4-Way, 3-Position, Inlet to Cylinder Valve

### H1 Independent Port Regulator Shown - Double Solenoid, De-energized, Internal Pilot



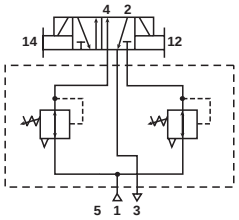

Sandwich Regulator has standard configuration of Internal Pilot with the Pilot Plug in the bottom #12 and #14 Pilot Hole which prevents line pressure from escaping through the manifold.

*When using an Independent Pressure Sandwich Regulator, the cylinder outlet ports are reversed. The 12 end energizes the #4 port and the 14 end energizes the #2 port. The 3-Position CE and PC functions are also reversed. (See schematics above.)*

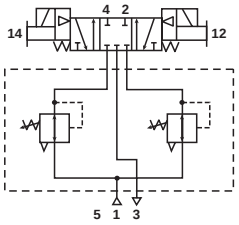
## Independent Dual Port Regulation - Plug-in, H1, H2, H3

**Dual Port Regulator**
Provides regulated pressure to both ports. Pressure regulation can occur out of the #2 or #4 port of the valve.

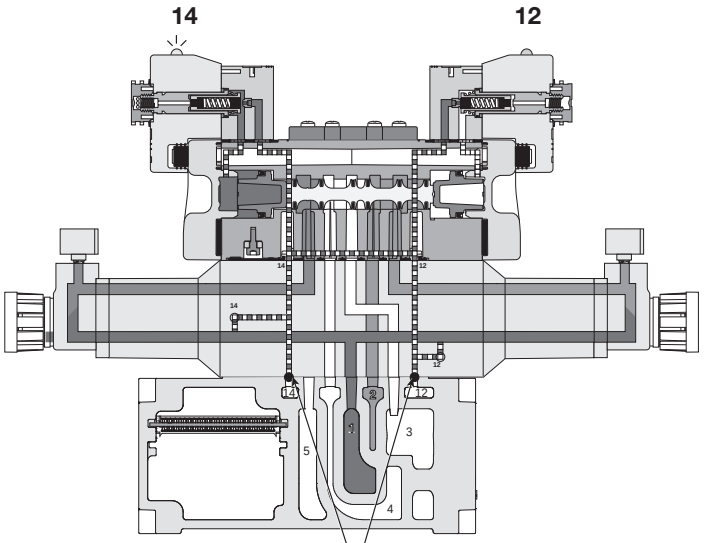
**Independent Dual Port Regulator with 4-Way, 2-Position Double Solenoid Valve**




**Independent Dual Port Regulator with 4-Way, 3-Position Double Solenoid Valve**




**H1 Independent Dual Port Regulator Shown - Double Solenoid, 14 Energized, Internal Pilot**



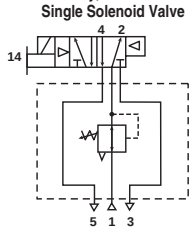

Sandwich Regulator has standard configuration of Internal Pilot with the Pilot Plug in the bottom #12 and #14 Pilot Hole which prevents line pressure from escaping through the manifold.

*When using an Independent Pressure Sandwich Regulator, the cylinder outlet ports are reversed. The 12 end energizes the #4 port and the 14 end energizes the #2 port. The 3-Position CE and PC functions are also reversed. (See schematics on above.)*

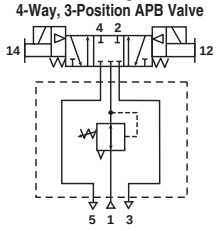
## Common Port Regulation - Non Plug-in, H1, H2, H3

Provides adjustable regulated air pressure to the valve's #1 port which gives the same regulated pressure to both the #2 and #4 port of the manifold or subbase. The regulator is always on the 14 end of the valve.

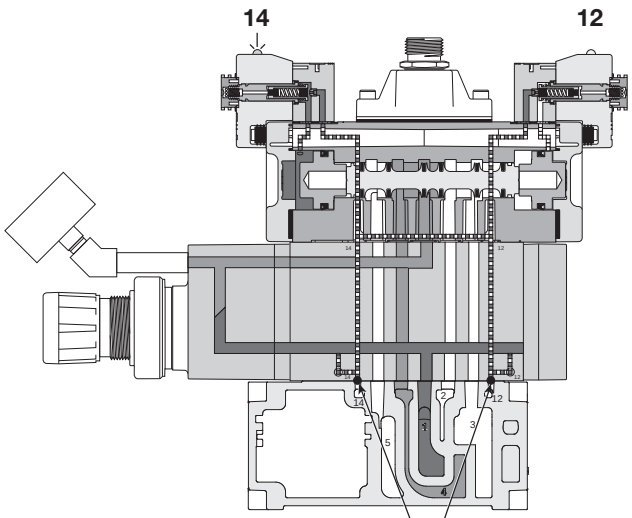
Common Port Regulator with
4-Way, 2-Position
Single Solenoid Valve




Common Port Regulator with
4-Way, 3-Position APB Valve




### H2 Common Port Regulator Shown - Double Solenoid, 14 Energized, Internal Pilot



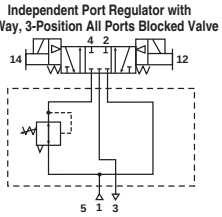

Sandwich Regulator has standard configuration of Internal Pilot with the Pilot Plug in the bottom of the I & E Pilot Holes which prevents line pressure from escaping through the manifold.

## Independent Port Regulation - Non Plug-in, H1, H2, H3

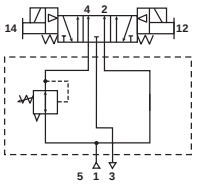
### Single Port Regulator

Provides regulated pressure to one of the ports and full line pressure to the other by use of the Line Pressure By-Pass Plate. Pressure regulation can occur out of the #4 port of the valve.

Independent Port Regulator with
4-Way, 3-Position All Ports Blocked Valve

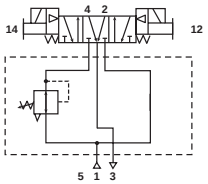



Independent Port Regulator with 4-Way,
3-Position, Inlet to Cylinder Function



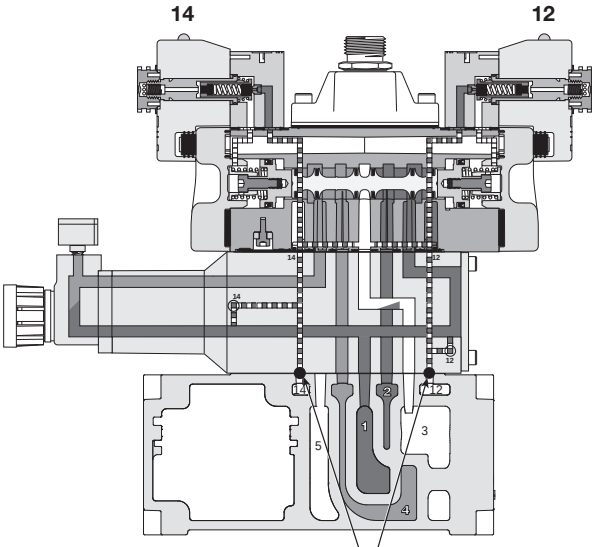

⚠CAUTION: Requires 4-Way, 3-Position, Cylinder to Exhaust Valve

Independent Port Regulator with 4-Way,
3-Position, Cylinder to Exhaust Function




⚠CAUTION: Requires 4-Way, 3-Position, Inlet to Cylinder Valve

### H1 Independent Port Regulator Shown - Double Solenoid, De-energized, Internal Pilot



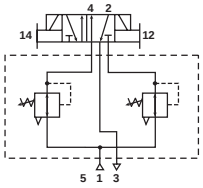

Sandwich Regulator has standard configuration of Internal Pilot with the Pilot Plug in the bottom #12 and #14 Pilot Hole which prevents line pressure from escaping through the manifold.

## Independent Dual Port Regulation - Non Plug-in, H1, H2, H3

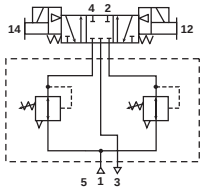
### Dual Port Regulator

Provides regulated pressure to both ports. Pressure regulation can occur out of the #2 or #4 port of the valve.

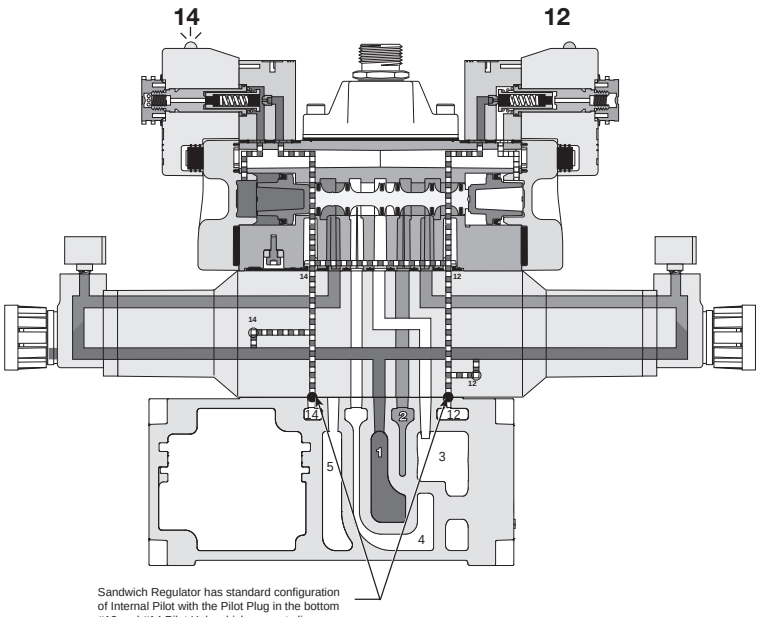
Independent Dual Port Regulator with 4-Way, 2-Position Double Solenoid Valve




Independent Dual Port Regulator with 4-Way, 3-Position Double Solenoid Valve




### H1 Independent Dual Port Regulator Shown - Double Solenoid, 14 Energized, Internal Pilot




Sandwich Regulator has standard configuration of Internal Pilot with the Pilot Plug in the bottom #12 and #14 Pilot Hole which prevents line pressure from escaping through the manifold.

*When using an Independent Pressure Sandwich Regulator, the cylinder outlet ports are reversed. The 12 end energizes the #4 port and the 14 end energizes the #2 port. The 3-Position CE and PC functions are also reversed. (See schematics on above.)*

## Minimum Operating Voltage

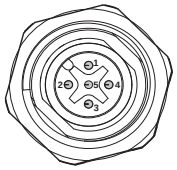
| | HB | HA | H1 | H2 | H3 |
|---|---|---|---|---|---|
| **MOV (24VDC)** | 20.4 | 20.4 | 20.4 | 20.4 | 20.4 |
| **MOV (120VAC)** | 102* | 102* | 102 | 102 | 102 |

* 120VAC coils have a dropout voltage of 10VAC when used with solid state relays. A pull-down resister may be necessary.

## P2H IO-Link

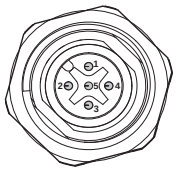
### Class B, M12 pin

| Pin Number | Address |
|---|---|
| 1 | L+ |
| 2 | AUX+ |
| 3 | L– |
| 4 | C/Q |
| 5 | AUX– |

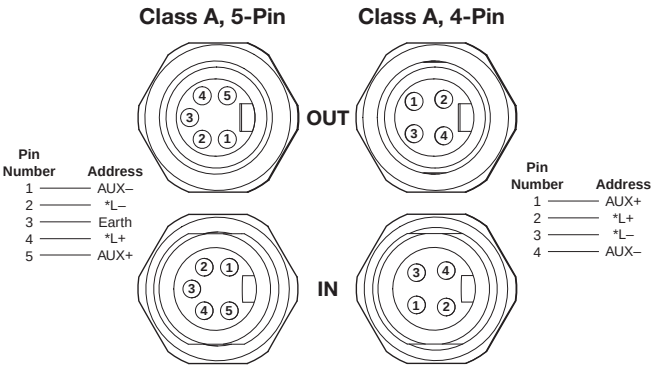


### Class A, M12 pin

| Pin Number | Address |
|---|---|
| 1 | L+ |
| 2 | |
| 3 | L– |
| 4 | C/Q |
| 5 | |



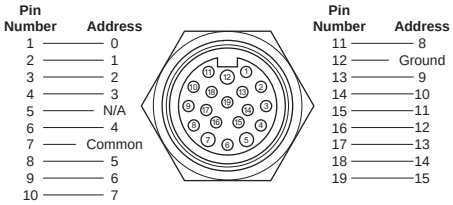
### Class A, Power IN / OUT 7/8 pin




* 7/8" logic power has no connection to internal P2H unit but does carryover to OUT 7/8" connector (for jumper logic power only). Logic power for P2H unit will be supplied from M12 (pin 1 & 3).

## 19-Pin Connector, Round Brad Harrison

### Male, face view




### 19-Pin Round Cable Specifications

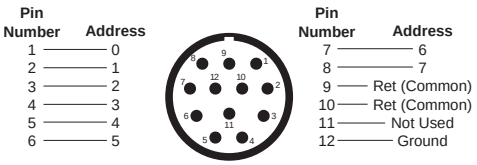
Common Pin "7" is rated for 8 amps. Cable common wire must be greater than total amperage of solenoids on Add-A-Fold assembly.

***Example:*** 8 segment manifold, 16 solenoids, 120VAC - 16 x .039 amps = .63 total amp rating.

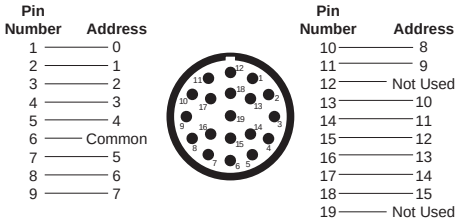
NEMA 4 rated with properly assembled NEMA 4 rated cable.

## M23, Round Connector

### Male 12-pin connector, face view

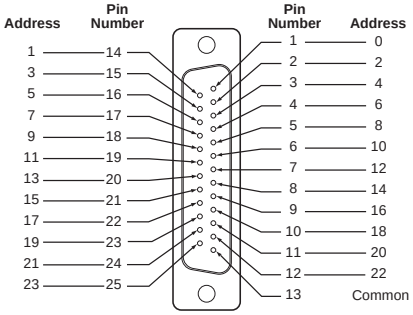



### Male 19-pin connector, view into end plate

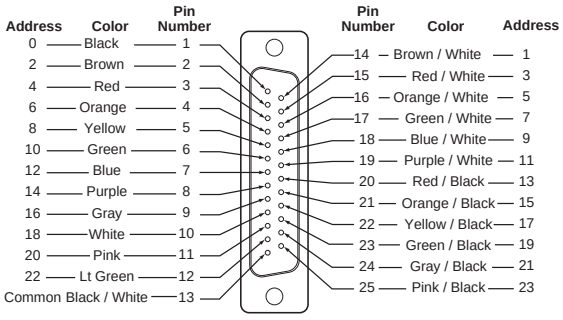



## 25-Pin, D-Sub Connector

### Male, view into end plate connector

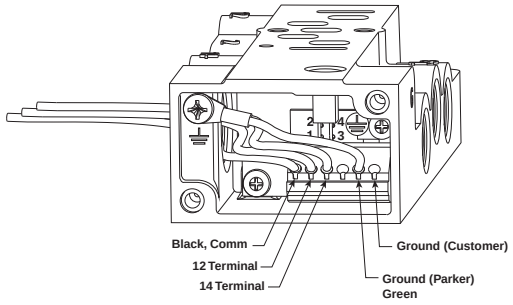



### Female, view into cable connector




| | Description | Length | Part number |
|---|---|---|---|
|  | 25-pin, D-sub cable, IP20 | 3 Meters | **P8LMH25M3A** |
| | 25-pin, D-sub cable, IP20 | 9 Meters | **SCD259D** |
| | 25-pin, D-sub cable, IP65 | 3 Meters | **SCD253W** |
| | 25-pin, D-sub cable, IP65 | 9 Meters | **SCD259WE** |

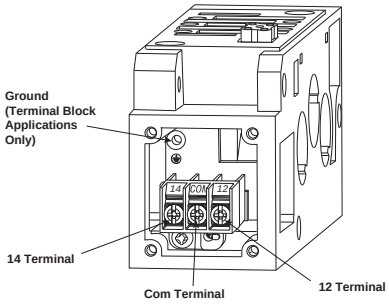
## Subbase Wiring



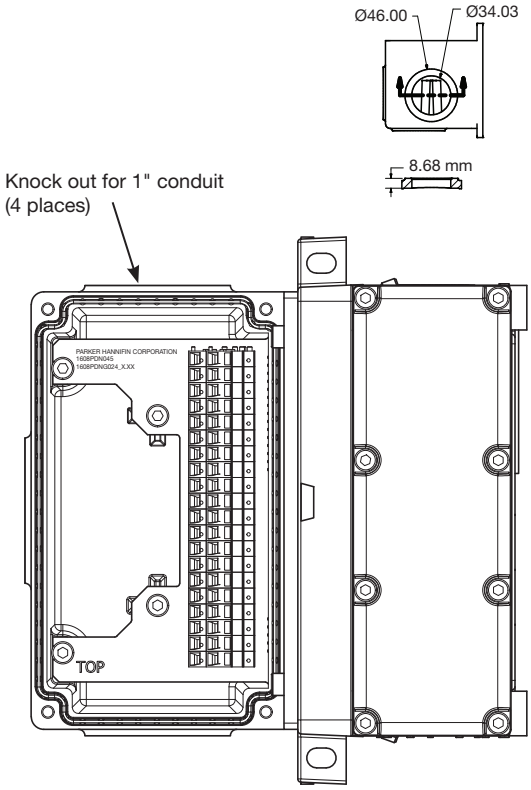

All commons internally
connected on terminal strip

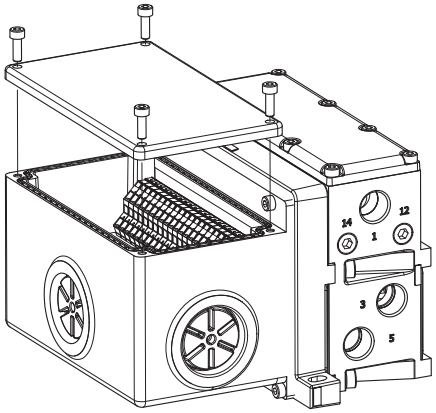
| Connections | 14 Solenoid | 12 Solenoid |
|---|---|---|
| Valves with Wires | Black Wires | Red Wires |
| Valves with Terminal Block (Will accept 18 to 24 Gauge Wires) | 14 and Com Terminals | 12 and Com Terminals |

## Manifold Wiring - Size 3

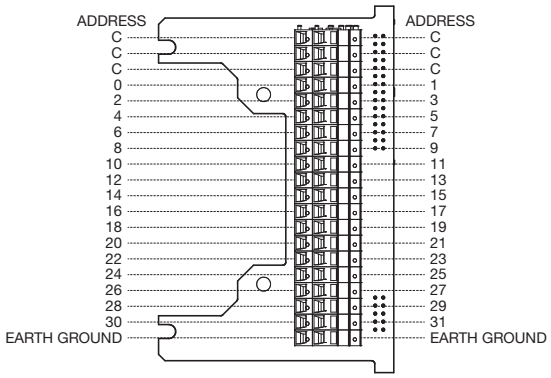



## Terminal Box Wiring (H Universal)



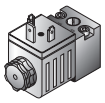
SCHEMATIC



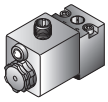

All commons internally
connected on terminal strip

## Electrical Connectors - Size 1, 2 & 3

### 5599-1 CNOMO

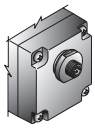


30mm 3-Pin ISO 4400
(DIN 43650A)

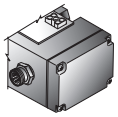


2-Pin M12 Euro

### 5599-2

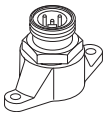


Manifold Auto Connector
(H3 Only)

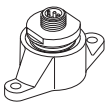


Subbase Auto Connector

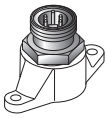
### 5599-1 AUTO



3-Pin Mini

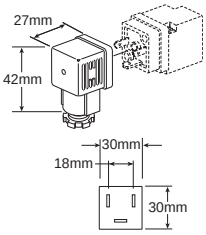


4-Pin Micro



5-Pin Mini

## 30mm Square 3-Pin – ISO 4400, DIN 43650A (Use with Enclosure "A")




| Description | Connector with 6' (2m) cord | Connector |
|---|---|---|
| Unlighted | **PS2028JCP** | **PS2028BP** |
| Light – 6-48V. 50/60Hz. 6-48VDC | **PS2032J79CP*** | **PS203279BP** |
| Light – 120V/60Hz | **PS2032J83CP*** | **PS203283BP** |

* LED with surge suppression.

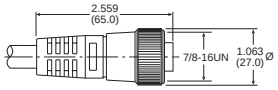
**Note:** Max ø6.5mm cable size required for connector w/o 6' (2m) cord. IP65 rated when properly installed.

**Engineering data:**

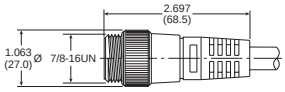
Conductors: 2 poles plus ground; cable range (connector only): 8 to 10mm (0.31 To 0.39 Inch); contact spacing: 18mm

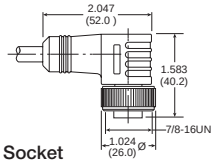
## 7/8" Mini Power Cables - use with 5-pin mini connector

RKM Female Socket

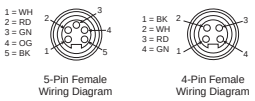



RSM Male Pins



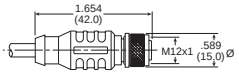

WKM Female Socket



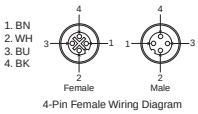

| Description | Part number |
|---|---|
| 4-pin female to flying lead cable, 5 meters, TPE | **RKM 46-5M/S1587** |
| 5-pin female to flying lead cable, 5 meters, TPE | **RKM 56-5M/S1587** |
| 4-pin male to female cable, TPE | **RSM RKM 46-x/S1587** |
| 5-pin male to female cable, TPE | **RSM RKM 56-x/S1587** |
| 4-pin right angle female to flying lead cable, 5 meters,TPE | **WKM 46-5M/S1587** |
| 5-pin right angle female to flying lead cable, TPE | **WKM 56-5M/S1587** |

Where x = 2, 4, 5, 6, 8, 10 meter standard lengths

## M12 A-code Cables - use with 4-pin micro, 2-pin micro




RKC Female Sockets



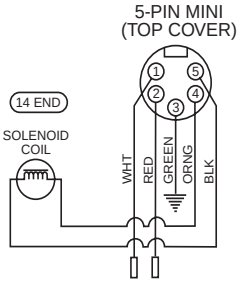

| Description | Part number |
|---|---|
| 4-pin female to flying lead cable, PVC | **RKC 4.4T-1** |
| 4-pin male to flying lead cable, PVC | **RSC 4.4T-*** |
| 4-pin male to female cable, PVC | **RKC 4.4T-*-RSC 4.4T** |
| 5-pin female to flying lead cable, TPE | **RKC 4.5T-*/S1587** |
| 5-pin male to flying lead cable, TPE | **RSC 4.5T-4/S1587** |
| 5-pin male to female cable, TPE | **RKC 4.5T-*-RSC 4.5T/S1587** |

Where * = 1, 2, 3, 4 meter standard lengths

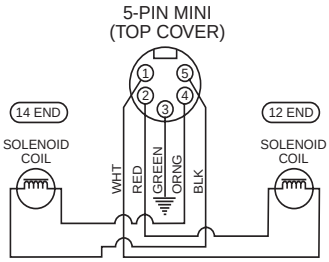
# Automotive Connection – Wiring Options

## 'C' Chrysler Connection

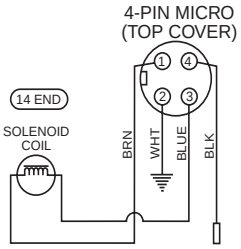
**5-Pin Male / Single Solenoid**
(Encl. Option 3, Auto Option C)



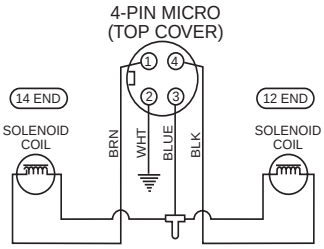

**5-Pin Male / Double Solenoid**
(Encl. Option 3, Auto Option C)




**4-Pin Male / Single Solenoid**
(Encl. Option 2, Auto Option C)

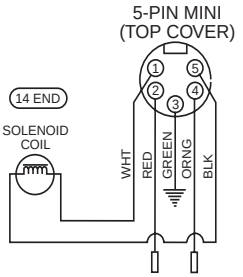



**4-Pin Male / Double Solenoid**
(Encl. Option 2, Auto Option C)

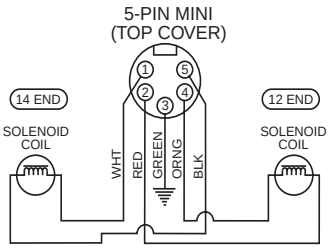



## 'F' SAE / Ford Wiring

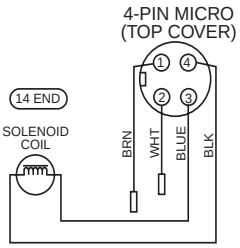
**5-Pin Male / Single Solenoid**
(Encl. Option 3, Auto Option F)



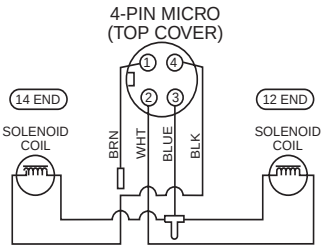

**5-Pin Male / Double Solenoid**
(Encl. Option 3, Auto Option F)




**ISO 20401**
**4-Pin Male / Single Solenoid**
(Encl. Option 2, Auto Option F)

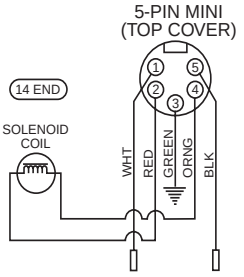



**ISO 20401**
**4-Pin Male / Double Solenoid**
(Encl. Option 2, Auto Option F)

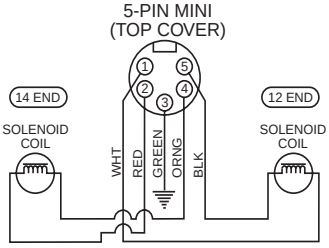



## 'G' GM Wiring

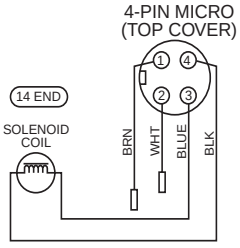
**5-Pin Male / Single Solenoid**
(Encl. Option 3, Auto Option G)



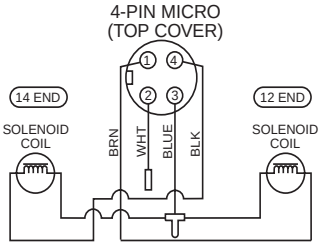

**5-Pin Male / Double Solenoid**
(Encl. Option 3, Auto Option G)




**4-Pin Male / Single Solenoid**
(Encl. Option 2, Auto Option G)

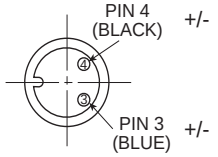



**4-Pin Male / Double Solenoid**
(Encl. Option 2, Auto Option G)

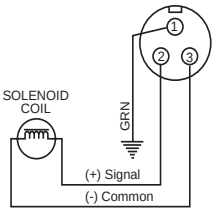



## CNOMO Connection - Wiring Options

**2-Pin Male / Single Solenoid**
(Encl. Option 6, Auto Option F)




**3-Pin Male / Single Solenoid**
(Encl. Option 1, Auto Options C, F & G)






For inventory, lead times, and kit lookup, visit www.pdnplu.com

**Parker Hannifin Corporation**
Pneumatic Division
Richland, Michigan
www.parker.com/pneumatics

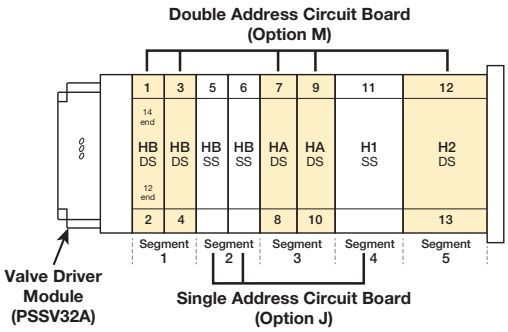
## Maximum Number of Solenoids
**(Maximum energized simultaneously)**

| | Voltage code | 25-pin D-sub | 19-pin Brad Harrison | 12-Pin M23 | 19-pin M23 | P2M Network Node | P2H Network Node | H Series Network Portal | Turck Network Portal 16 Outputs | Turck Network Portal 32 Outputs |
|---|---|---|---|---|---|---|---|---|---|---|
| **HA & HB** | | | | | | | | | | |
| 24VDC | G9 (1.0 watt) | 24 (24) | 16 (16) | 8 (8) | 16 (16) | 24 (24) | 24 (24) | 32 (32) | 16 (16) | 32 (32) |
| 120VAC* | 23 (1.0 VA) | 24 (24) | 16 (16) | 8 (8) | 16 (16) | N/A | N/A | N/A | N/A | N/A |
| **H1, H2** | | | | | | | | | | |
| 12VDC | 45 (2.4 watt) | 24 (13) | 16 (13) | 8 (8) | 16 (13) | N/A | N/A | N/A | N/A | N/A |
| 24VAC* | 42 (4.0 VA) | 24 (24) | 16 (16) | 8 (8) | 16 (16) | N/A | N/A | N/A | N/A | N/A |
| 24VDC | B9 (3.2 watt) | 24 (24) | 16 (16) | 8 (8) | 16 (16) | 24 (24) †§ | 24 (24) † | 32 (32) | 16 (16) | 32 (32) |
| 24VDC | F9 (1.3 watt) | 24 (24) | 16 (16) | 8 (8) | 16 (16) | 24 (24) | 24 (24) † | 32 (32) | 16 (16) | 32 (32) |
| 120VAC* | 23 (4.5 VA) | 24 (24) | 16 (16) | 8 (8) | 16 (16) | N/A | N/A | N/A | N/A | N/A |
| **H3 Only** | | | | | | | | | | |
| 12VDC | 45 (2.4 watt) | 24 (13) | 16 (13) | 8 (8) | 16 (13) | N/A | N/A | N/A | N/A | N/A |
| 24VAC* | 42 (4.0 VA) | 24 (24) | 16 (16) | 8 (8) | 16 (16) | N/A | N/A | N/A | N/A | N/A |
| 24VDC | B9 (3.2 watt) | 24 (20) | 16 (16) | 8 (8) | 16 (16) | 24 (24) †§ | 24 (24) † | 24 (21) | 16 (16) | 24 (21) |
| 24VDC | F9 (1.3 watt) | 24 (24) | 16 (16) | 8 (8) | 16 (16) | 24 (24) | 24 (24) † | 24 (24) | 16 (16) | 24 (24) |
| 120VAC* | 23 (4.5 VA) | 24 (24) | 16 (16) | 8 (8) | 16 (16) | N/A | N/A | N/A | N/A | N/A |

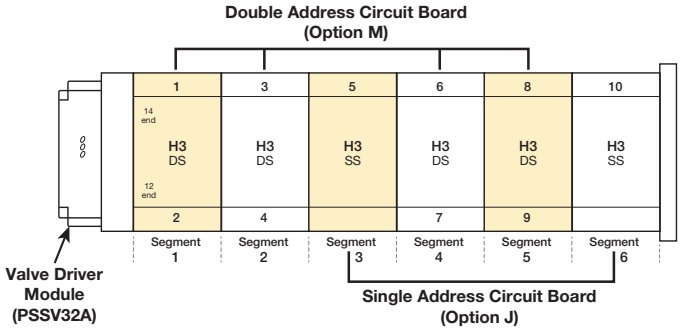
* Not CSA certified for 25-pin, D-sub option.
† Use Type A IO-Link module for 24 outputs simultaneously.
§ P2M Industrial Ethernet limited to 2A, use F9 coil for more than simultaneous solenoids.

## I/O Addressing Examples

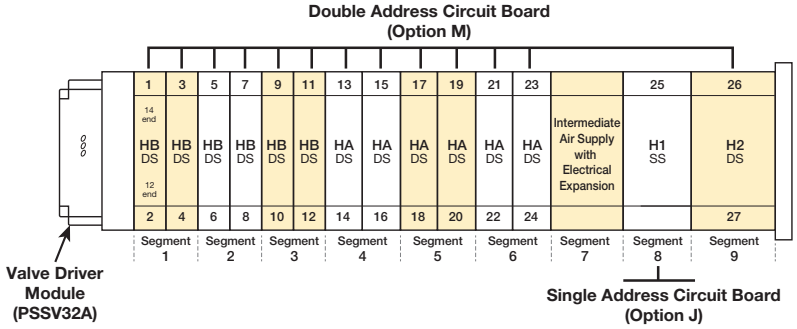
### HB, HA, H1, H2 - Five Segment Manifold Example




### H3 Example - Six Segment Manifold Example




### HB, HA, H1, H2 - Nine Segment Manifold with Intermediate Supply Example




**Notes:** SS = Single Solenoid Valve
DS = Double Solenoid Valve
First output address is the #14 end of the valve closest to the valve driver module.

Intermediate Module with Electrical Expansion to 25th address required for manifolds with greater than 24 solenoid addresses.

## 5599-2 & 5599-1 AUTO Solenoid Kits

| Valve size | Voltage code | Coil kit number |
|---|---|---|
| H1, H2 & H3 | 42 (24VAC) | **PS404142P** |
| | 45 (12VDC) | **PS404145P** |
| | B9 (24VDC), 3.2 watt | **PS4041B9P** |
| | F9 (24VDC), 1.3 watt | **PS4041F9P** |
| | 23 (120VAC) | **PS404123P** |
| | 57 (240VAC) | **PS404157P** |

Quantity 1

## Pilot Operator - CNOMO

| Valve size | | Kit number |
|---|---|---|
| H1, H2 & H3 | Locking | **PS4052CP** |
| | Non-locking | **PS4053CP** |
| | Non-locking † | **PS4054CP** |

† F9 (1.3 watt) coil option only.

## Manifold Hardware Kits – PS Series

| Valve size | Kit number |
|---|---|
| HB, HA, H1, H2 * | **PSHU10P** |
| H3 ** | **PS4212P** |

* Quantity 20
** Quantity 12

## Valve Bolt Kits

| Valve size | Kit number |
|---|---|
| HB | **PS5687P** |
| HA | **PS5587P** |
| H1 | **PS4087DP** |
| H2 | **PS4187DP** |
| H3 | **PS4287DP** |

Quantity 12

## Valve to Base Gasket Kits

| Valve size | Standard | Remote pilot | Dual pressure #3 | Dual pressure #5 |
|---|---|---|---|---|
| HB | **PS5605P*** | — | — | — |
| HA | **PS5505P*** | — | — | — |
| H1 | **PS4005DP** | **PS4006DP** | **PS40D3DP** | — |
| H2 | **PS4105DP** | **PS4106DP** | **PS41D3DP** | **PS41D5DP** |
| H3 | **PS4205DP** | **PS4206DP** | **PS42D3DP** | **PS42D5DP** |

Quantity 1
* Quantity 10

## 5599-1 CNOMO Solenoid Kits

| Voltage code | 3-pin, 30mm 'L' coil kit | 2-pin, M12 Euro '6' coil kit |
|---|---|---|
| 19 | — | **PS2828619P** |
| 42 | **P2FCA442** | — |
| 45 | **P2FCA445** | — |
| 49 | **P2FCA449** | — |
| 53 | **P2FCA453** | — |
| 57 | **P2FCA457** | — |

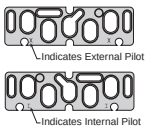
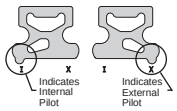
Quantity 1

## Body Service Kits

| Valve size | 2-position | 3-position | | |
|---|---|---|---|---|
| | | APB | CE | PC |
| HB | **PS5601P** | **PS5602P** | **PS5603P** | **PS5604P** |
| HA | **PS5501P** | **PS5502P** | **PS5503P** | **PS5504P** |
| H1 | **PS4001CP** | **PS4002CP** | **PS4003CP** | **PS4004CP** |
| H2 | **PS4101CP** | **PS4102CP** | **PS4103CP** | **PS4104CP** |
| H3 | **PS4201CP** | **PS4202CP** | **PS4203CP** | **PS4204CP** |

HB / HA Kit Includes: Spool assembly with seals.
H1, H2, H3 Kit Includes: Spool assembly with seals, all piston seals, return spring, pilot selector gasket, coil to end cap gasket.
Quantity 1

## Pilot Select Gasket Kits

| | Valve size | Part number |
|---|---|---|
|   | HB | **PS5605P** |
| | HA | **PS5505P** |
|   | H1, H2 & H3 | **PS4007P** |

Quantity 10

## Regulator Kits

| Valve size | Part number |
|---|---|
| H1 | **PS4039P** |
| H2, H3 | **PS4139P** |

## Regulator & Flow Control Mounting Studs

| Valve type | Type | Part number |
|---|---|---|
| HB | Flow Control & Regulator | **PS5636P** |
| HA | Flow Control & Regulator | **PS5536P** |
| H1 | Flow Control | **PS4036P** |
| | Regulator | **PS4040P** |
| H2 | Flow Control | **PS4136P** |
| | Regulator | **PS4140P** |
| H3 | Flow Control | **PS4236P** |
| | Regulator | **PS4240P** |

Quantity 12

## Regulator Gauge Kits – Size H1, H2 & H3

| Gauge type | Part number |
|---|---|
| **1" Face Air - Standard** | |
| 0 to 60 PSIG | **PS4051060BP** |
| 0 to 160 PSIG | **PS4051160BP** |
| **1-1/2" Face Air - Large*** | |
| 0 to 60 PSIG | **PS4053060BP** |
| 0 to 160 PSIG | **PS4053160BP** |
| **1-1/2" Face Liquid*** | |
| 0 to 160 PSIG | **PS4052160BP** |

*** Includes brass pipe fitting extensions**
**Quantity 1**

## Regulator Spring Range Kits – Size H1, H2 & H3

| Spring range | Valve size | Part number |
|---|---|---|
| 0 to 30 PSIG | H1 | **PS4050030P** |
| | H2, H3 | **PS4150030BP** |
| 2 to 60 PSIG | H1 | **PS4050060P** |
| | H2, H3 | **PS4150060BP** |
| 5 to 125 PSIG | H1 | **PS4050125P** |
| | H2, H3 | **PS4150125BP** |

**Quantity 1**

## Regulator Conversion Kits – Size H1, H2 & H3

| Valve size | Description | Part number |
|---|---|---|
| H1 | Manual Bonnet Assembly (w/o Spring) | **PS4045BP** |
| | Air Pilot Bonnet Assembly | **PS4047BP** |
| | Independent By-Pass Plate | **PS4048BP** |
| H2, H3 | Manual Bonnet Assembly (w/o Spring) | **PS4145BP** |
| | Air Pilot Bonnet Assembly | **PS4147BP** |
| | Independent By-Pass Plate | **PS4148BP** |

**Quantity 1**

## Pilot By-Pass Plate

| Valve size | Part number |
|---|---|
| H1, H2, H3 | **PS4051CP** |

Quantity 10

## Valve Driver Module

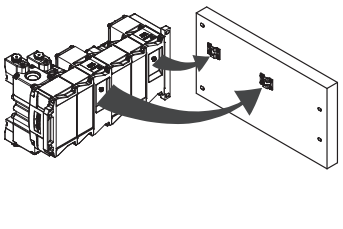
| | Driver Module | Part number |
|---|---|---|
|  | 32 Point Module – HB, HA, H1, H2, H3 | **PSSV32A*†** |

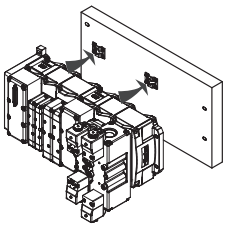
**PSSV32A**

* Reference Document E100P for Installation Instructions. See www.pdnplu.com

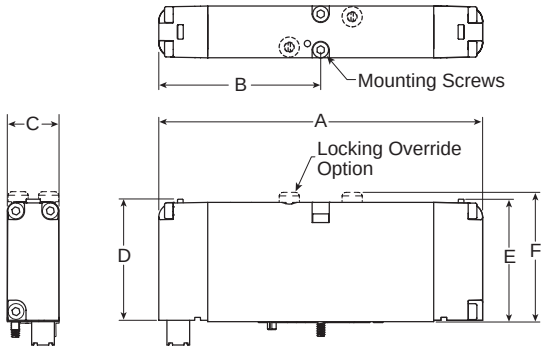
## Installation Bracket

| | Bracket | Part number |
|---|---|---|
|  | Bracket and Bolt (Quantity 2) | **PSHU60P** |





## H Series ISO 15407-2, Plug-in, Size 18mm (HB)



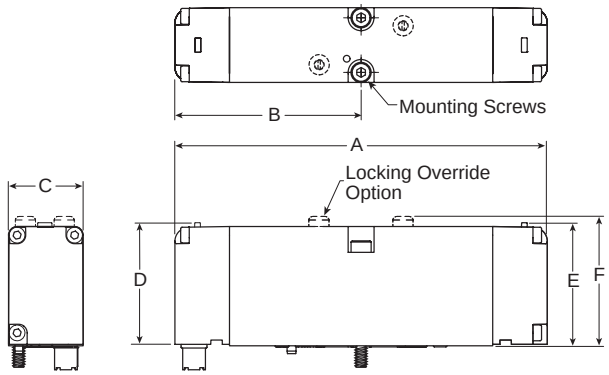

**18mm Dimensions**

| A | B | C | D |
|---|---|---|---|
| 4.43 (113) | 2.22 (56) | .72 (18) | 1.98 (50) |

| E | F |
|---|---|
| 1.68 (43) | 1.77 (45) |

Inches (mm)

## H Series ISO 15407-2, Plug-in, Size 26mm (HA)



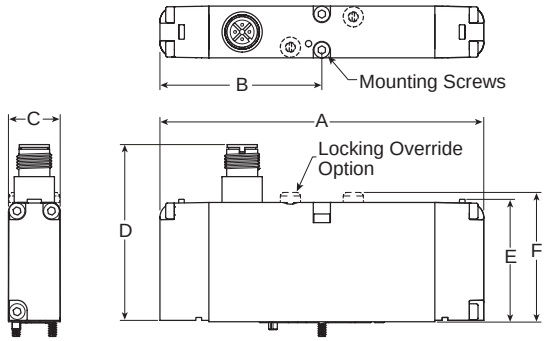

**26mm Dimensions**

| A | B | C | D |
|---|---|---|---|
| 5.10 (130) | 2.55 (65) | 1.02 (26) | 1.98 (50) |

| E | F |
|---|---|
| 1.68 (43) | 1.77 (45) |

Inches (mm)

## H Series ISO 15407-1, Non Plug-in, Size 18mm (HB)



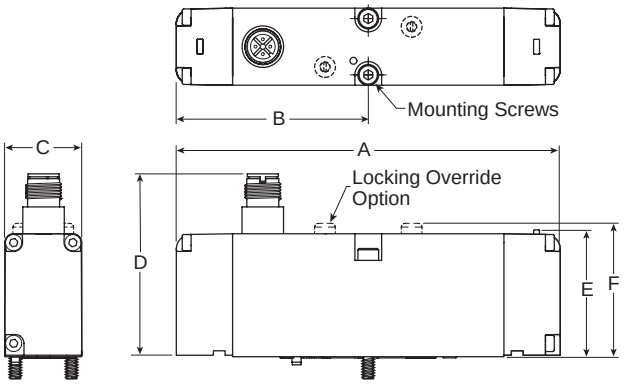

**18mm Dimensions**

| A | B | C | D |
|---|---|---|---|
| 4.43 (113) | 2.22 (56) | .72 (18) | 2.40 (61) |

| E | F |
|---|---|
| 1.68 (43) | 1.77 (45) |

Inches (mm)

## H Series ISO 15407-1, Non Plug-in, Size 26mm (HA)



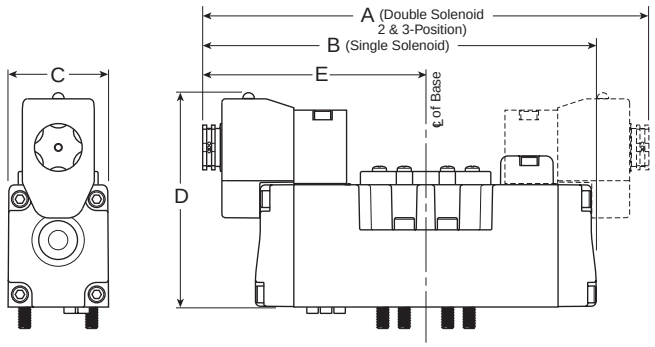

**26mm Dimensions**

| A | B | C | D |
|---|---|---|---|
| 5.10 (130) | 2.55 (65) | 1.02 (26) | 2.40 (61) |

| E | F |
|---|---|
| 1.68 (43) | 1.77 (45) |

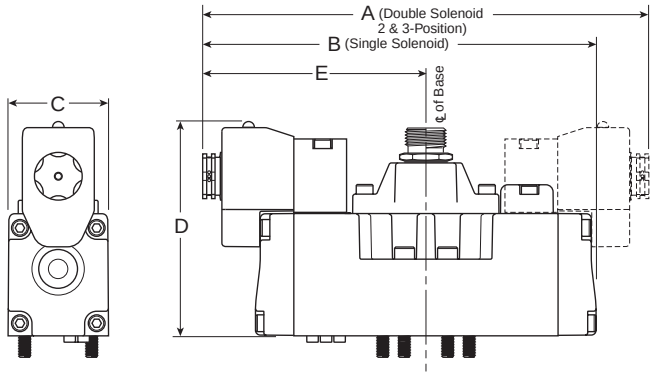
Inches (mm)

## H Series ISO 5599-2

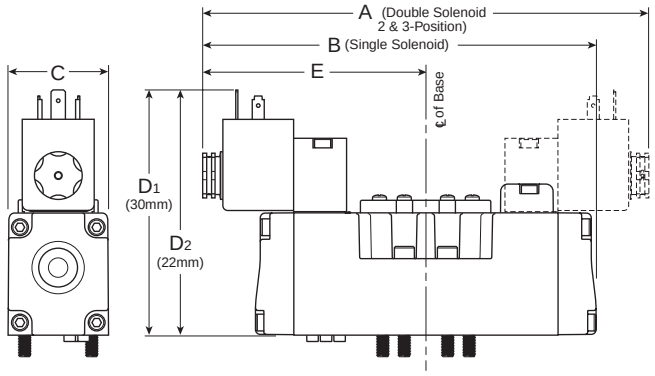



**H1 Valves Shown**

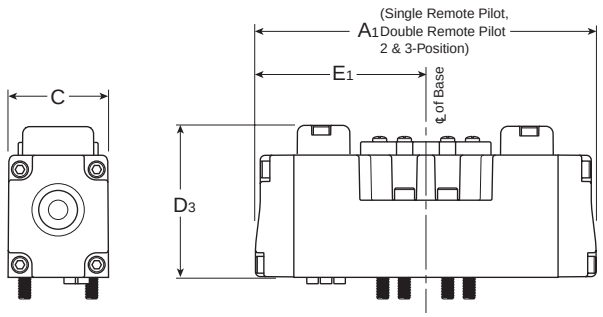
## H Series ISO 5599-1 Auto




## H Series ISO 5599-1 CNOMO




## H Series ISO 5599-2 / 5599-1 Remote Pilot




### H1 Dimensions

| A | A1 | B | C |
|---|---|---|---|
| 7.32 (186) | 5.59 (142) | 6.46 (164) | 1.65 (42) |
| **D** | **D1** | **D2** | **D3** |
| 3.54 (90) | 4.29 (109) | 4.29 (109) | 2.50 (63.5) |
| **D4** | **E** | **E1** | |
| 2.48 (63) | 3.66 (93) | 2.80 (71) | |

Inches (mm)

### H2 Dimensions

| A | A1 | B | C |
|---|---|---|---|
| 8.35 (212) | 6.62 (168) | 7.48 (190) | 2.17 (55) |
| **D** | **D1** | **D2** | **D3** |
| 4.05 (103) | 4.80 (122) | 4.57 (116) | 2.99 (76) |
| **E** | **E1** | | |
| 4.17 (106) | 3.31 (84) | | |

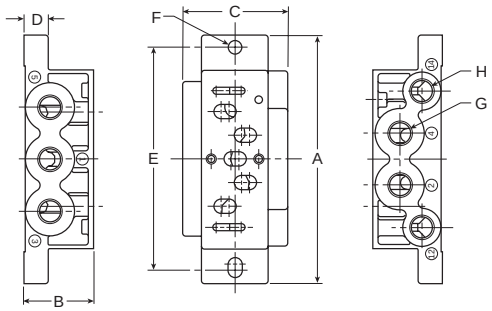
Inches (mm)

### H3 Dimensions

| A | A1 | B | C |
|---|---|---|---|
| 9.68 (246) | 6.98 (177) | 8.68 (220) | 2.17 (55) |
| **D** | **D1** | **D2** | **D3** |
| 4.05 (103) | 4.80 (122) | 4.57 (116) | 2.99 (76) |
| **E** | **E1** | | |
| 4.74 (121) | 3.49 (89) | | |

Inches (mm)

## HB Series ISO 15407-1, Size 18mm (HB) Single Subbase

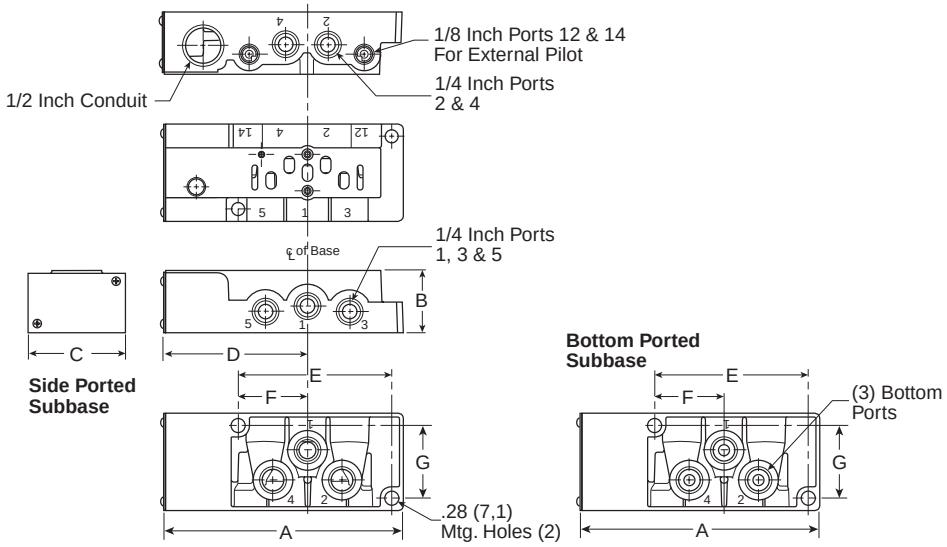



**HB Dimensions (PL02)**

| A | B | C | D |
|---|---|---|---|
| 3.15 (80) | .87 (22) | 1.06 (27) | .31 (8) |
| **E** | **F** | **G** | **H** |
| 2.76 (70) | .216 Dia. (Ø 5.5) | 1/8 | M5 |

Inches (mm)

## H Series ISO 15407-2 & 15407-1 Size 26mm (HA), Plug-in Subbases

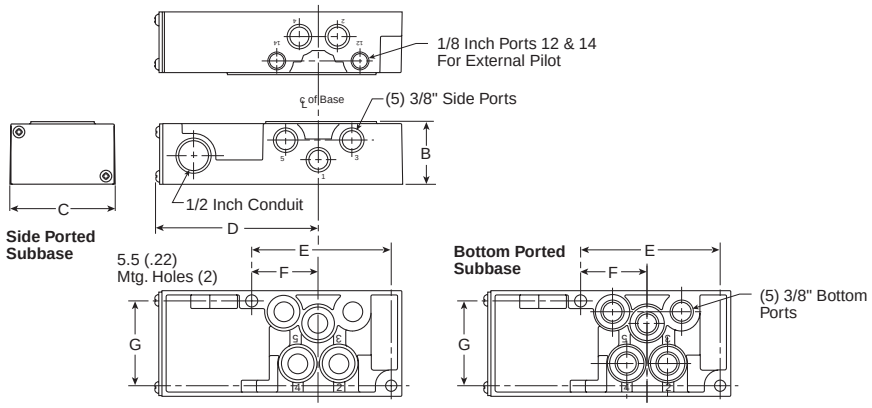



**HA Dimensions**

| A | B | C | D |
|---|---|---|---|
| 4.88 (124) | 1.28 (32.5) | 2.00 (50.8) | 2.91 (74) |
| **E** | **F** | **G** | |
| 1.43 (36.2) | 3.16 (80.2) | 1.49 (37.9) | |

Inches (mm)

## H Series ISO 5599-1 Size H1, PS4011 Subbase



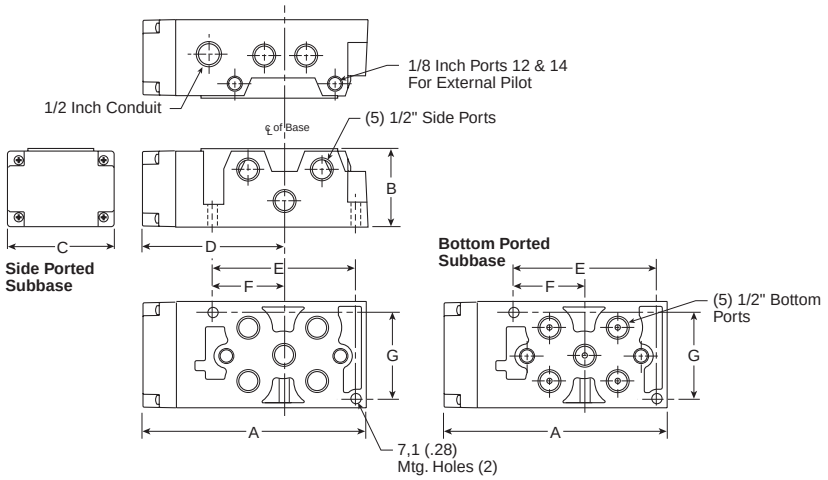

**PS4011 Subbase Dimensions**

| A | B | C | D |
|---|---|---|---|
| 5.83 (148) | 1.48 (38) | 2.50 (64) | 3.86 (98) |

| E | F | G |
|---|---|---|
| 3.29 (84) | 1.57 (40) | 2.00 (51) |

Inches (mm)

## H Series ISO 5599-1 Size H2, PS4111 Subbase



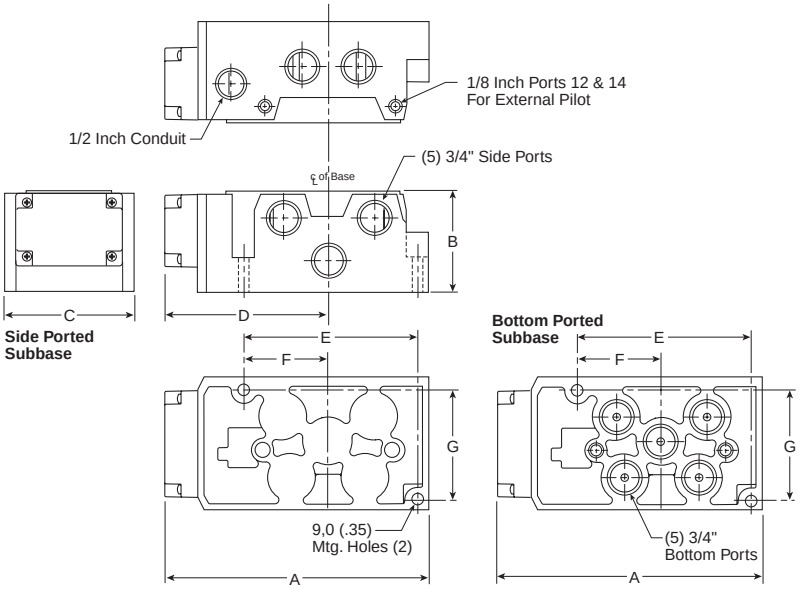

**PS4111 Subbase Dimensions**

| A | B | C | D |
|---|---|---|---|
| 6.69 (170) | 2.33 (59) | 3.15 (80) | 4.25 (108) |

| E | F | G |
|---|---|---|
| 4.21 (107) | 2.07 (52) | 2.56 (65) |

Inches (mm)

## H Series ISO 5599-1 Size H3, PS4211 Subbase



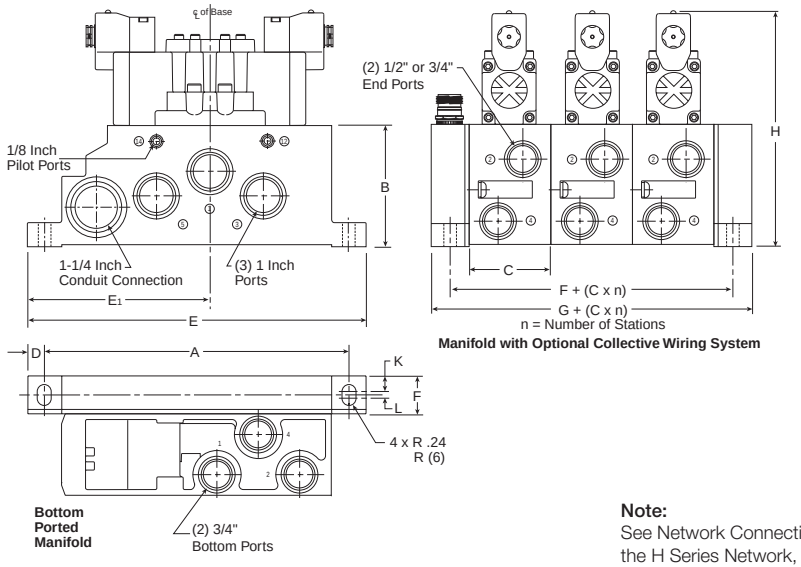

### PS4211 Subbase Dimensions

| A | B | C | D |
|---|---|---|---|
| 7.90 (201) | 2.96 (75) | 3.90 (99) | 4.92 (125) |

| E | F | G |
|---|---|---|
| 5.14 (131) | 2.50 (64) | 3.24 (82) |

Inches (mm)

## H Series ISO 5599 Size H3, PS4211 Manifold




### PS4211 Manifold Dimensions

| A | B | C | D | E |
|---|---|---|---|---|
| 10.41 (265) | 4.13 (105) | 2.80 (71) | .59 (15) | 11.61 (295) |

| E1 | F | G | H |
|---|---|---|---|
| 6.26 (159) | 1.30 (33) | 2.60 (63) | 8.19 (208) |

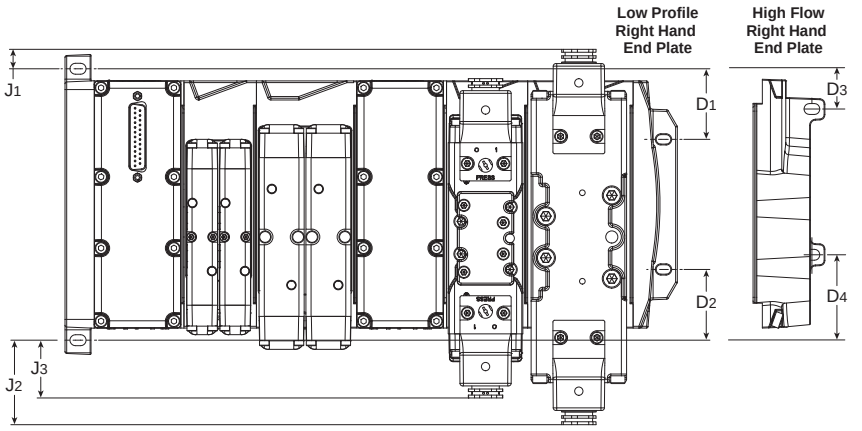
| K | L |
|---|---|
| .53 (13.5) | .24 (6) |

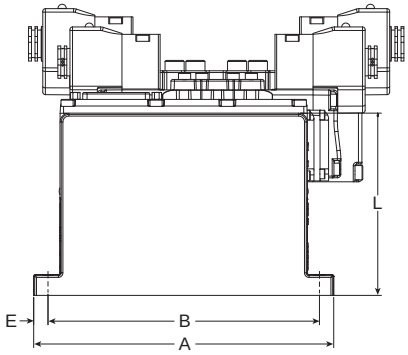
Inches (mm)

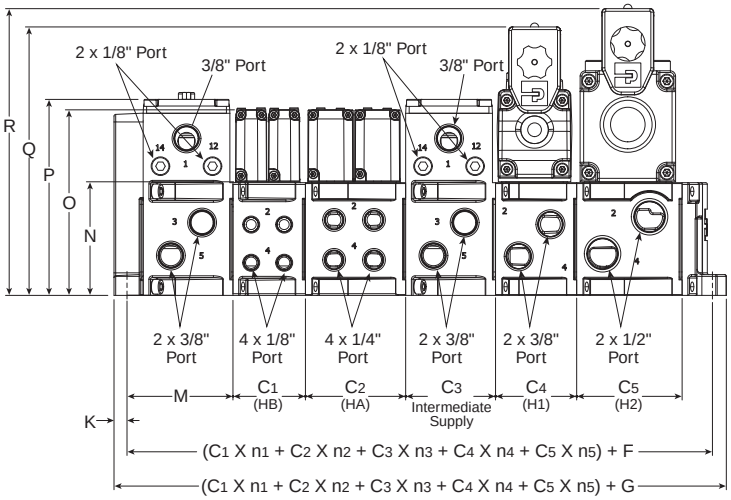
**Note:**
See Network Connectivity Section for the dimensions of manifolds utilizing the H Series Network, Turck Network, or P2M Network Node end plate type.

## H Series ISO Universal Manifold

Network Connectivity dimensions (P2H, Turck, H Net, and P2M) are located at the end of the Network Connectivity Section.



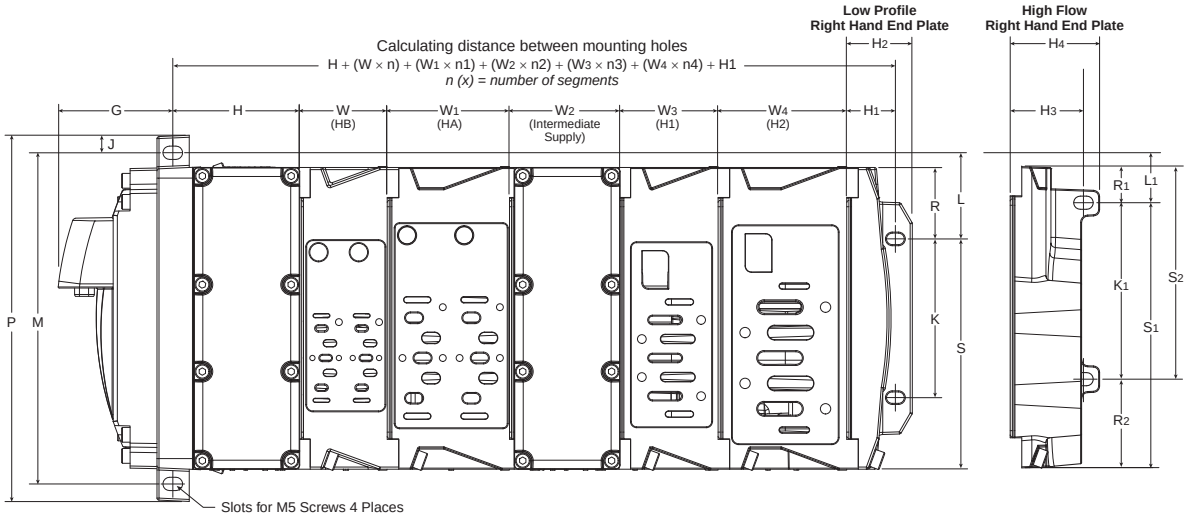




| A | B | C1 | C2 | C3 | C4 |
|---|---|---|---|---|---|
| 6.81 (172.95) | 6.16 (156.5) | 1.65 (41.79) | 2.28 (57.79) | 2.04 (51.79) | 1.84 (46.79) |
| **C5** | **D1** | **D2** | **D3** | **D4** | **F** |
| 2.39 (60.79) | 1.60 (40.71) | 1.60 (40.71) | 0.96 (24.3) | 1.92 (48.8) | 3.09 (78.58) |
| **G** | **J1** | **J2** | **J3** | **K** | **L** |
| 4.39 (111.58) | 0.44 (11.2) | 1.92 (48.7) | 1.31 (33.3) | 0.30 (7.5) | 4.14 (105.08) |
| **M** | **N** | **O** | **P** | **Q** | **R** |
| 2.40 (61.08) | 1.92 (48.7) | 4.21 (107) | 4.45 (113) | 6.09 (154.77) | 6.51 (165.32) |

Inches (mm)

## 25-Pin Side with H Series ISO Valves



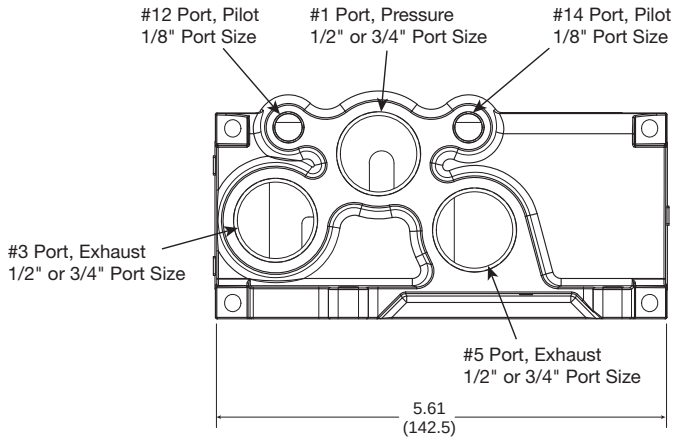

**n (x)** = number of segments

| G | H | H1 | H2 | H3 | H4 | J | K | K1 | L | L1 | M |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.13 (54.0) | 2.36 (60.0) | 0.90 (23.0) | 1.22 (31.0) | 1.36 (34.6) | 1.66 (42.3) | 0.33 (8.3) | 2.95 (75.0) | 3.28 (83.4) | 1.60 (40.7) | 0.96 (24.3) | 6.16 (156.5) |

| P | S | S1 | S2 | R | R1 | R2 | W | W1 | W2 | W3 | W4 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 6.81 (173.1) | 4.28 (108.8) | 4.93 (125.2) | 3.96 (100.7) | 1.33 (33.7) | 0.68 (17.3) | 1.6 (41.8) | 1.63 (41.3) | 2.28 (57.8) | 2.06 (52.3) | 1.82 (46.3) | 2.39 (60.8) |

Inches (mm)

## Hi-Flow Right Hand End Plate




### Hi-Flow Right Hand End Plate

| | |
|---|---|
| **PSHU41** | 1/2" port size |
| **PSHU42** | 3/4" port size |

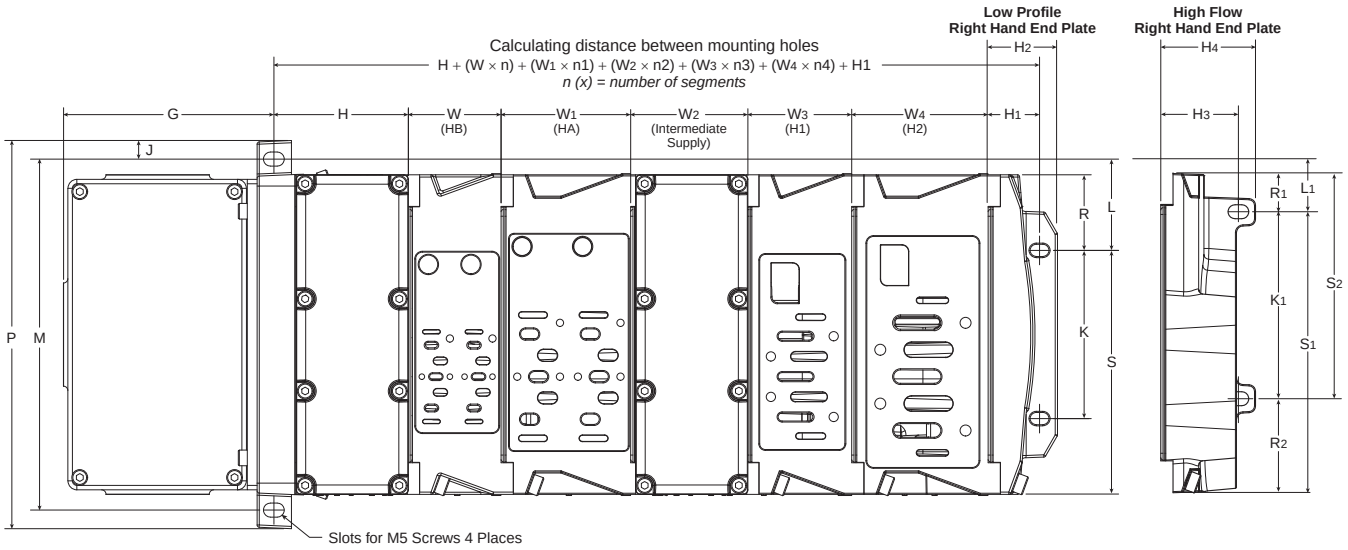
Inches (mm)





**Parker Hannifin Corporation**
Pneumatic Division
Richland, Michigan
www.parker.com/pneumatics

## Terminal Block with H Series ISO Valves

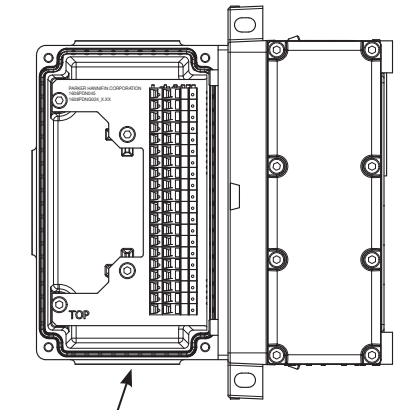



**n (x)** = number of segments

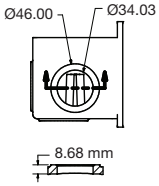
| G | H | H1 | H2 | H3 | H4 | J | K | K1 | L | L1 | M |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.69 (93.8) | 2.36 (60.0) | 0.90 (23.0) | 1.22 (31.0) | 1.36 (34.6) | 1.66 (42.3) | 0.33 (8.3) | 2.95 (75.0) | 3.28 (83.4) | 1.60 (40.7) | 0.96 (24.3) | 6.16 (156.5) |

| P | S | S1 | S2 | R | R1 | R2 | W | W1 | W2 | W3 | W4 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 6.81 (173.1) | 4.28 (108.8) | 4.93 (125.2) | 3.96 (100.7) | 1.33 (33.7) | 0.68 (17.3) | 1.65 (41.8) | 1.63 (41.3) | 2.28 (57.8) | 2.06 (52.3) | 1.82 (46.3) | 2.39 (60.8) |

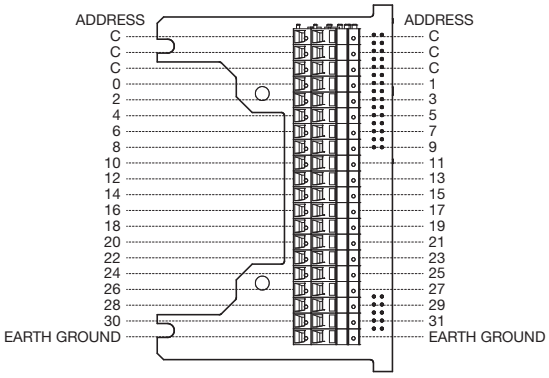
Inches (mm)




Knock out for 1" conduit
(4 places)

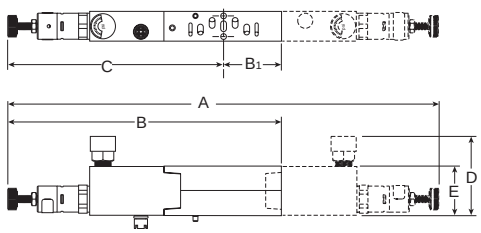



SCHEMATIC




All commons internally
connected on terminal strip

## H Series ISO 15407, HB / HA Sandwich Regulator

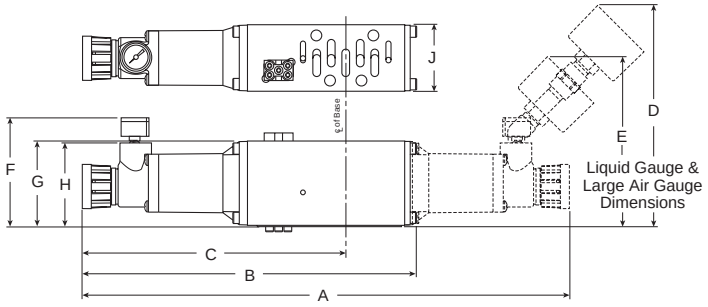



### HB / HA Series Sandwich Regulator, Dimensions

| | | | | | | |
|---|---|---|---|---|---|---|
| **HB (PS5637)** | **A** 10.28 (261) | **B** 6.14 (156) | **B1** 1.02 (26) | **C** 5.13 (130) | **D** 2.60 (66) | **E** 1.18 (30) |
| **HA (PS5537)** | **A** 10.00 (254) | **B** 6.42 (163) | **B1** 1.42 (36) | **C** 5.00 (127) | **D** 2.72 (69) | **E** 1.18 (30) |

Inches (mm)

## H Series ISO 5599, Size H1 Sandwich Regulator



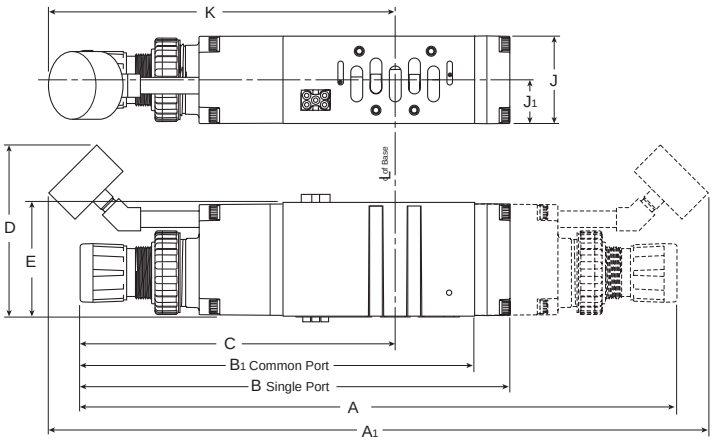

### H1 Series Sandwich Regulator, Dimensions

| | | | | | | |
|---|---|---|---|---|---|---|
| **H1 (PS4037) (PS4038)** | **A** 11.84 (301) | **B** 8.13 (207) | **C** 6.40 (163) | **D** 5.45 (138) | **E** 4.25 (108) | **F** 2.85 (72) |
| | **G** 2.09 (53) | **H** 2.05 (52) | **J** 1.63 (41) | | | |

Inches (mm)

## H Series ISO 5599, Size H2 & H3 Sandwich Regulator

**H2 Sandwich Regulator shown**



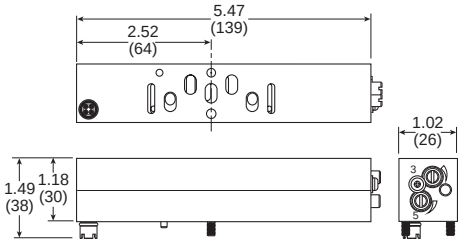

### H2 & H3 Series Sandwich Regulator, Dimensions

| | | | | | | |
|---|---|---|---|---|---|---|
| **H2 (PS4137) (PS4138)** | **A** 14.65 (372) | **A1** 16.18 (411) | **B** 10.56 (268) | **B1** 9.84 (250) | **C** 7.71 (196) | **D** 4.20 (107) |
| | **E** 2.80 (71) | **J** 2.15 (55) | **J1** 1.07 (27) | **K** 8.50 (216) | | |
| **H3 (PS4237) (PS4238)** | **A** 15.67 (398) | **A1** 17.15 (436) | **B** 11.53 (293) | **B1** 10.67 (271) | **C** 8.37 (213) | **D** 4.20 (107) |
| | **E** 2.93 (75) | **J** 2.50 (64) | **J1** 1.25 (32) | **K** 9.10 (231) | | |

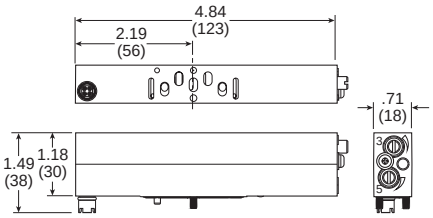
Inches (mm)

## H Series ISO 15407, Size 18mm (HB) & 26mm (HA), Flow Control

### HA Flow Control

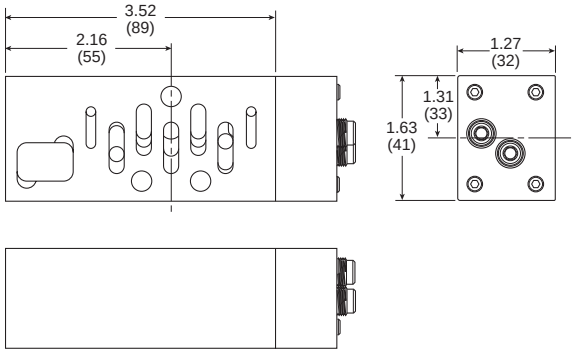



### HB Flow Control

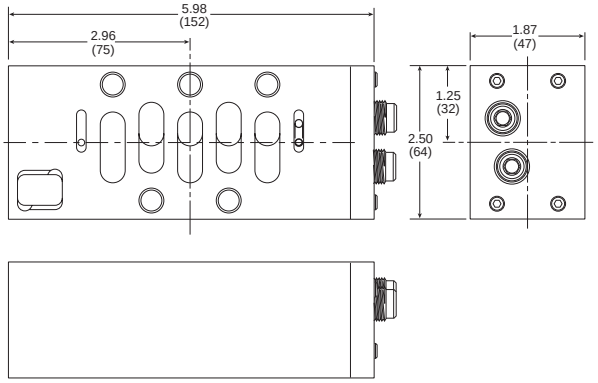



## H Series ISO 5599, Size H1, H2 & H3, Flow Control

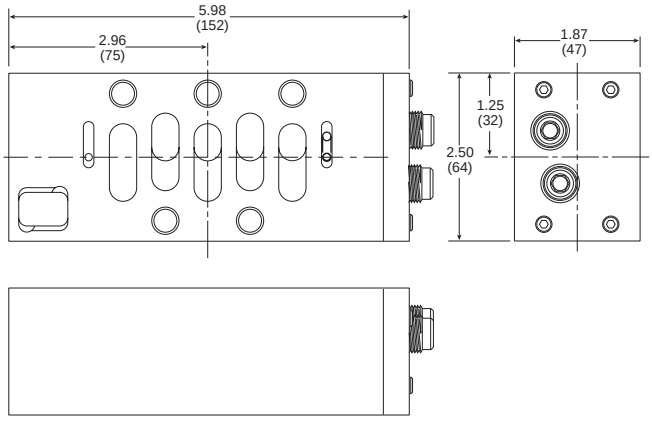
### H1 Flow Control




### H2 Flow Control




### H3 Flow Control



# Network Connectivity

## Offering

| Valve series | P2M | P2H | H Series | Turck |
|---|---|---|---|---|
| Moduflex | X | | | |
| H Series Micro | X | | X | X |
| H Series ISO | X | X | X | X |

| Protocol | P2M | P2H | H Series | Turck |
|---|---|---|---|---|
| IO-Link | X | X | | |
| DeviceNet | X | | | X |
| EtherNet/IP | X | | X | X |
| PROFIBUS-DP | X | | X | X |
| PROFINET | X | | | X |
| Modbus/TCP | X | | | X |
| EtherCAT | X | | | |
| PowerLink | X | | | |
| AS-i | X | | | |
| CANopen | X | | | X |
| InterBus-S | X | | | |

| Options | P2M | P2H | H Series | Turck |
|---|---|---|---|---|
| Digital inputs / outputs* | X | | X | X |
| Analog inputs / outputs | | | X | X |
| Class A IO-Link master module | | | | X |
| 24 Solenoid control** | X | X | | X |
| 32 Solenoid control | | | X | X |
| Short circuit protection on inputs | | | | X |
| Current sensing outputs | | | | X |
| Bus expansion | | | X | |
| DeviceNet subnet | | | | X |
| Programmable comm modules | | | | X |
| Power over DeviceNet / CANopen | | | | X |
| Rockwell preferred connectivity | | | X | |
| CANopen expansion | | | | X |

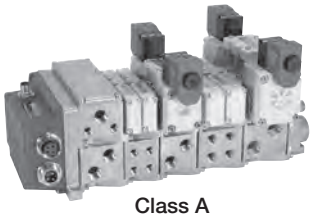
* P2M AS-i modules are available with 6 or 8 inputs and 6 or 8 solenoid outputs.
** P2M DeviceNet, PROFIBUS, AS-I, CANopen, and InterBus-S only 16 solenoids.

### P2M Network Nodes (shown on H Micro & Moduflex)

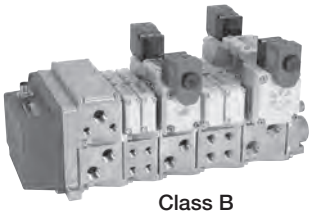
Moduflex

H Micro

### P2H Network Nodes (shown on H Series ISO)

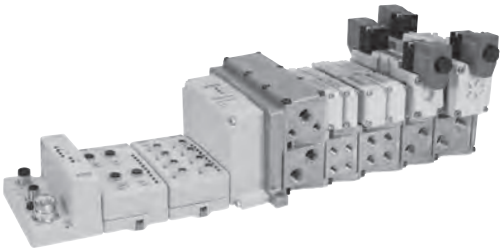


Class A

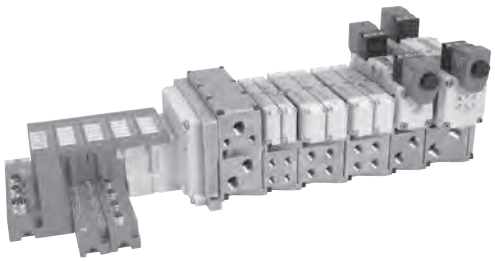


Class B

### H Series Network Portal (shown on H Series ISO)

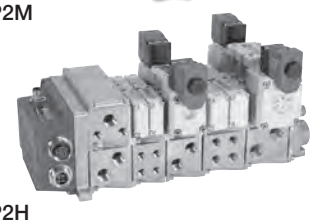


### Turck Network Portal (shown on H Series ISO)



## P2M & P2H Network Nodes: Network diagnostics made simple!

P2M



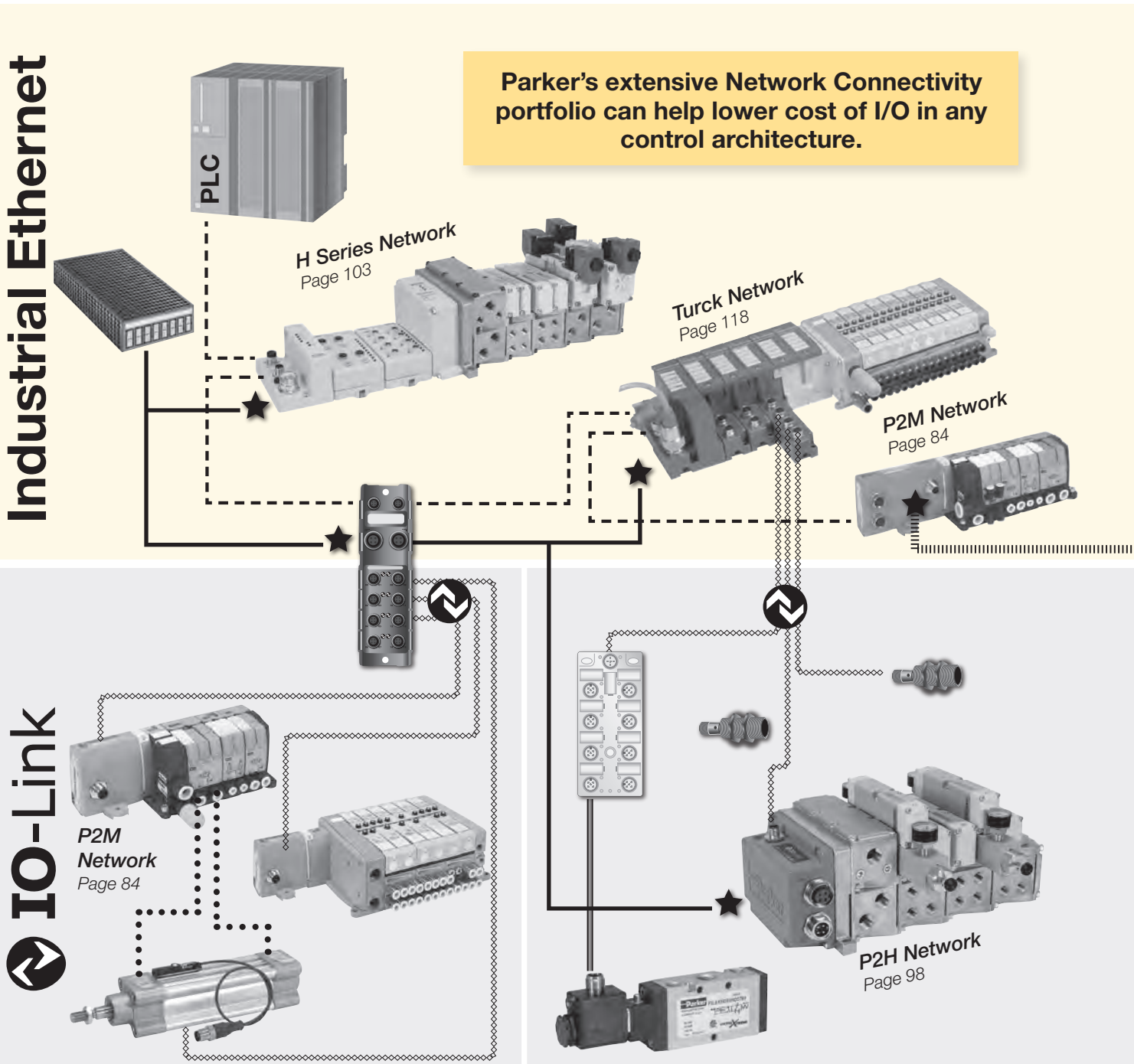
P2H

Standard on any IO-Link or Industrial Ethernet protocol

- Useful diagnostic flags in process (cyclic) data for easy access
  - Voltage warnings
  - Internal communication error & more
- Detailed diagnostic information in parameter (acyclic) data
  - Cycle count for each solenoid

Add on Instructions / Function Blocks are also available!

**Parker's extensive Network Connectivity portfolio can help lower cost of I/O in any control architecture.**




### Network to Remote IO-Link Master

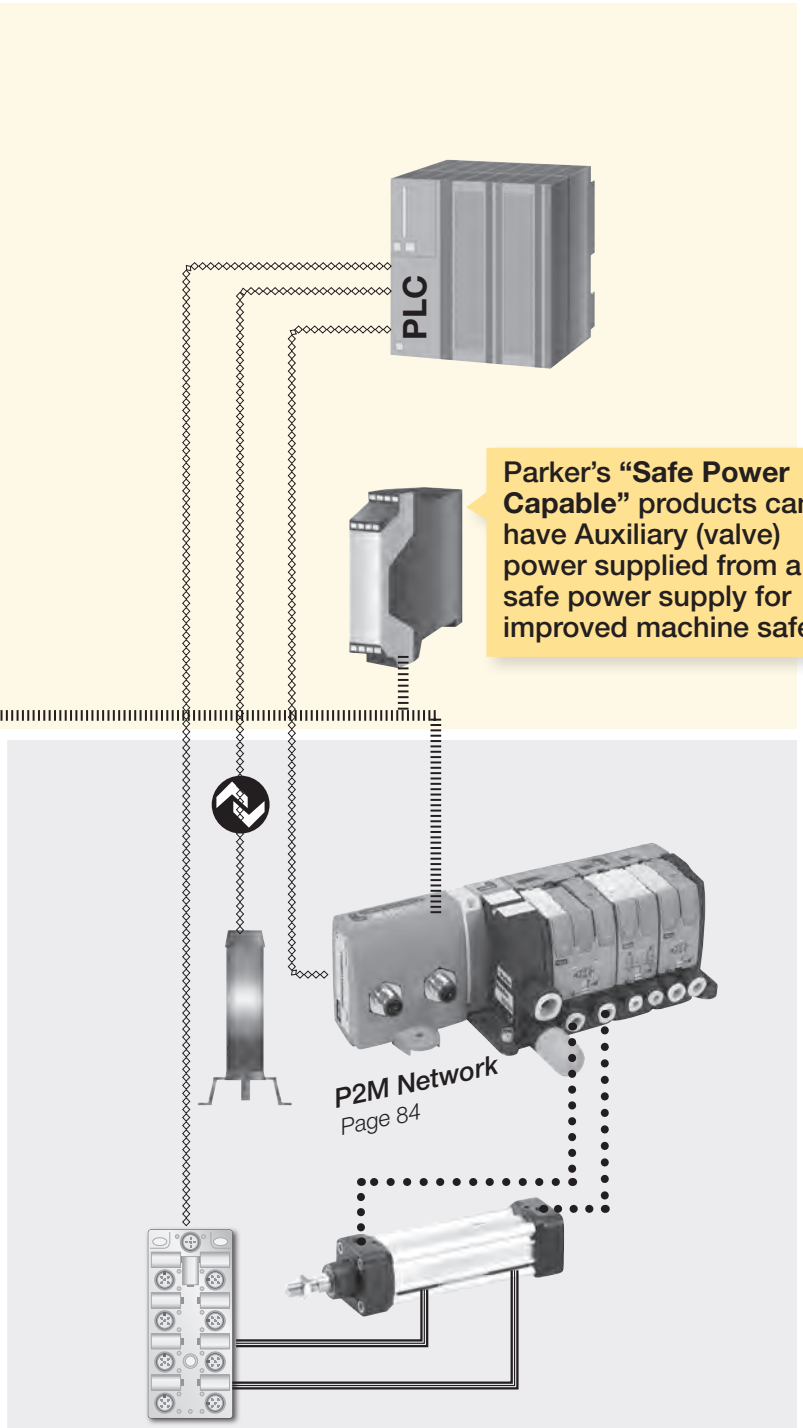
Reduce cabinet size by using a de-centralized "on-machine" IO-Link Master

* Control all local I/O with IO-Link Masters
  - Discrete I/O
  - "Smart" I/O
  - P2M IO-Link Class B & CPS pictured see www.parker.com/pdn/CPS and www.parker.com/pdn/P2M_IOL

### Node Expansion Using IO-Link

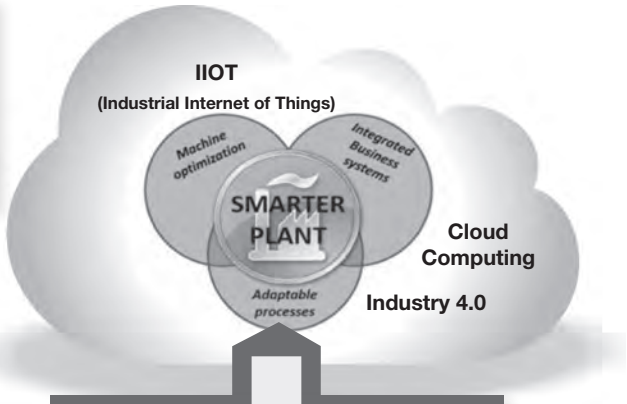
Reduce node count by adding an IO-Link Master module onto Turck Network manifold

* 20m max length for I/O-Link cables
* Control all "smart I/O" on 1 node
* Reduce cost of secondary valve manifold
  - P2H IO-Link Class A pictured see www.parker.com/pdn/P2H_IOL




Parker's **"Safe Power Capable"** products can have Auxiliary (valve) power supplied from a safe power supply for improved machine safety.

- - - - Industrial Network
◇◇◇◇◇◇◇ IO-Link
═══ Discrete Wired Input / Output
——★ 24 VDC Power
||||||||★ 24 VDC SAFE Power
• • • • • • Pneumatic




**IO-Link** is another step towards the smarter plant by lowering the cost for gathering component level prognostics and diagnostics.

Out of Tolerance Warnings
* Voltage
* Temperature

Error Descriptors
* Solenoid short circuit
* IO-Link communication error cycle count for each valve

**Non-Network I/O Control Using IO-Link**
Use PLC with integrated IO-Link Master for machines with smaller I/O counts

* 20m max length for I/O-Link cables
* Control all local I/O with IO-Link
  - Discrete I/O
  - "Smart" I/O
  - P2M IO-Link Class A pictured

**THIS IS EASIER**
Faster installation than discrete wiring
Standard IP67 M12 cable

**THIS IS SAVINGS**
Fewer network nodes
Easy expandability

**THIS IS VALUE**
Easy access diagnostics
Prognostics to prevent downtime

## System Overview - Discrete Wiring

- Up to 24 solenoids per manifold
- Discretely wired solenoids - optimized for PLCs with onboard inputs and outputs
- 25-Pin D-Sub, 19-Pin Brad Harrison or M23, or 12-Pin M23 connectors available

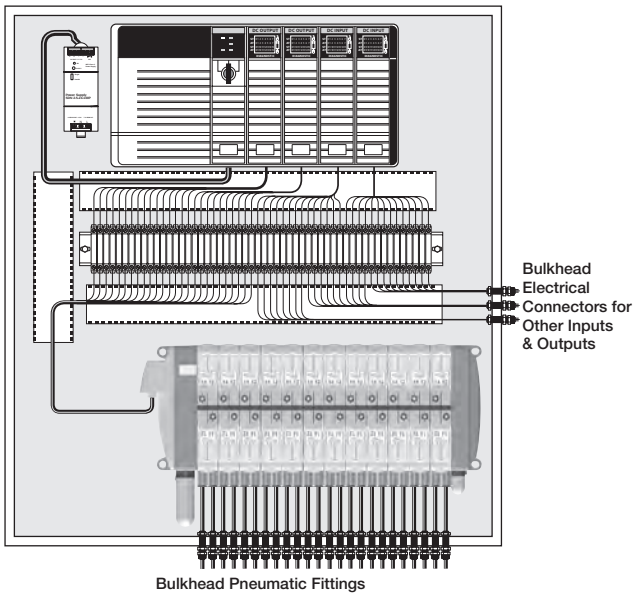
### Centralized Application

**Valves Inside Control Cabinet**

- Valves located near machine control
- Applications with caustic wash down, hazardous areas, or extreme temperatures

**Disadvantages**

- Difficult to troubleshoot
- Difficult to maintain
- Expensive bulkhead fittings
- Long wiring time in cabinet



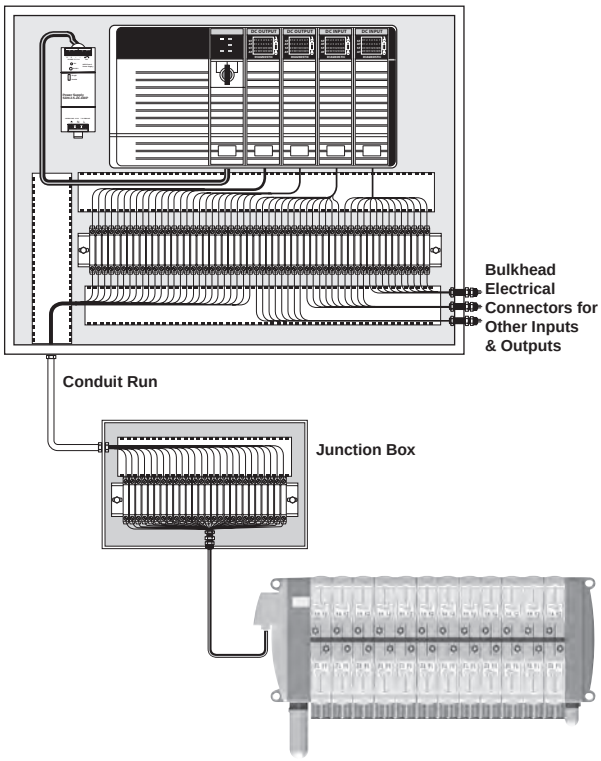

### De-centralized Application

**Valves Outside Control Cabinet**

- Valves located near application - ready for machine mounting
- IP65 rating suitable for dusty and wet environments

**Disadvantages**

- Difficult to troubleshoot
- Difficult to maintain
- Long wiring time in cabinet
- Long wiring time in junction box



## System Overview - P2M Network Node

- Up to 24 solenoids per manifold
- Optimized for PLCs with network capability
- Routinely used on medium sized machines
- Connectivity to Moduflex, H Series Micro and H Series ISO valves

### Centralized Application

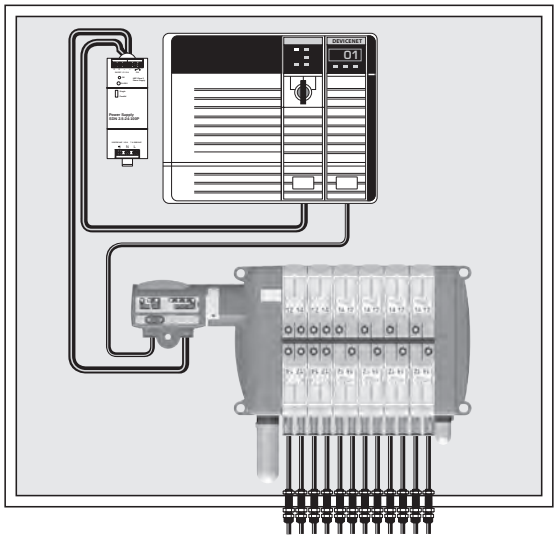
**Valves Inside Control Cabinet**

- Valves located near machine control
- Applications with caustic wash down, hazardous areas, or extreme temperatures
- Additional inputs and outputs are not directly attached to valve manifold

**Advantages**

- Highest degree of environmental protection
- One location for all control devices
- Small size requires minimal cabinet space
- Eliminates terminal strips and wire ways for valves
- Greatly reduces wiring time
- Eliminates junction boxes for valves
- Eliminates conduit runs for valves

IO-Link
ETHERNET POWERLINK
PROFINET INDUSTRIAL ETHERNET
EtherNet/IP
EtherCAT
Modbus
CC-Link IE



Bulkhead Pneumatic Fittings

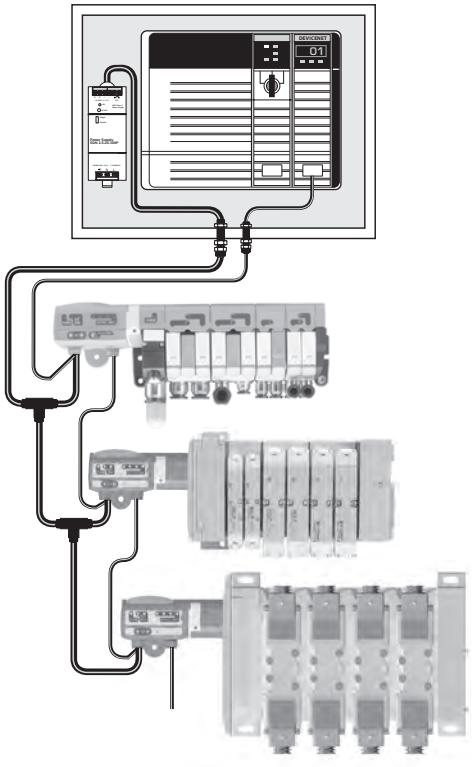
### De-centralized Application

**H Series Micro Outside Control Cabinet**

- Valves located near application - ready for machine mounting
- IP65 rating suitable for dusty and wet environments
- Additional inputs and outputs are not directly attached to valve manifold

**Advantages**

- Smallest control cabinet
- Reduces tubing length and improves pneumatic response time
- Eliminates pneumatic bulk fittings on control cabinet
- Many network nodes can be attached to the network with little incremental cost – valve manifolds, inputs, outputs and other devices
- Eliminates terminal strips and wire ways for valves
- Greatly reduces wiring time
- Eliminates junction boxes for valves
- Eliminates conduit runs for valves



## System Overview - H Series Network Portal

- Up to 32 solenoids per manifold
- With H Series Micro bus extension functionality, 4 manifolds with up to 32 solenoids each can be connected on the same node
- Add inputs and outputs to the H Series Network Portal
- Optimized for PLC's with network capability
- Connectivity to H Series Micro and H Series ISO valves

### Centralized Application

**Valves Inside Control Cabinet**

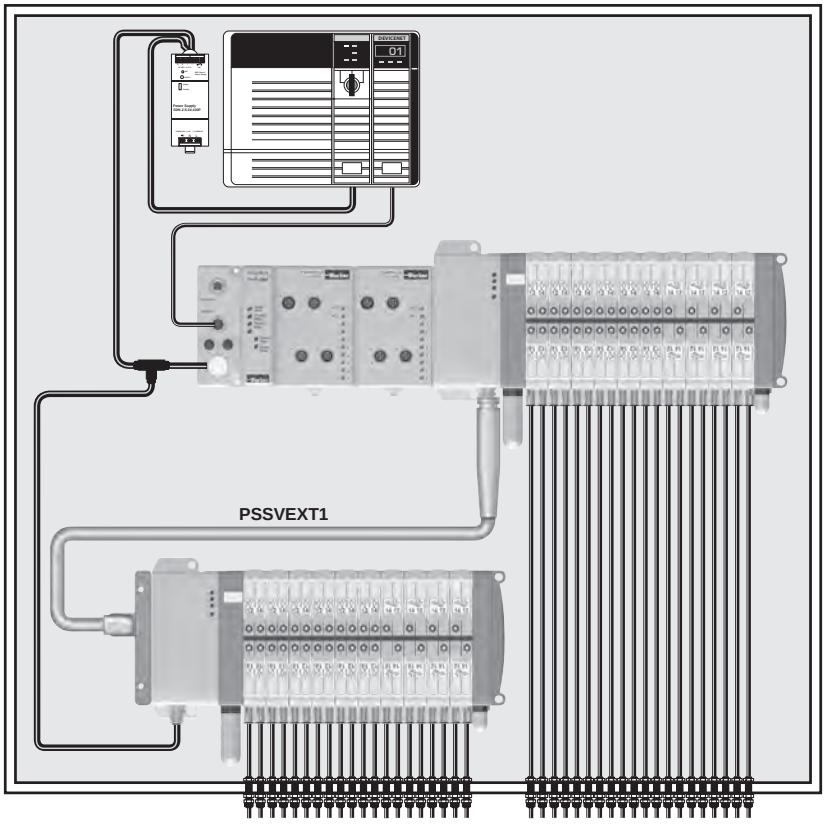
- H Series Network Portal with inputs and outputs
- Valves located near machine control
- Applications with caustic wash down, hazardous areas, or extreme temperatures
- Additional inputs and outputs are directly attached to valve manifold

EtherNet/IP™

PROFIBUS PROCESS FIELD BUS

**Advantages**

- Handle all I/O from one node
- Eliminate PLC input / output cards
- Up to 128 solenoids per node with bus extension cables
- Up to 256 inputs and 256 outputs per H Series Network node
- Analog inputs / outputs available
- Highest degree of environmental protection
- One location for all control devices
- Eliminates terminal strips and wire ways
- Greatly reduces wiring time




Bulkhead Pneumatic Fittings

## System Overview - H Series Network Portal

- Up to 32 solenoids per manifold
- With H Series Micro bus extension functionality, 4 manifolds with up to 32 solenoids each can be connected on the same node
- Add inputs and outputs to the H Series Network
- Optimized for PLC's with network capability
- Connectivity to H Series Micro and H Series ISO valves

### De-centralized Application

**Valves Outside Control Cabinet**

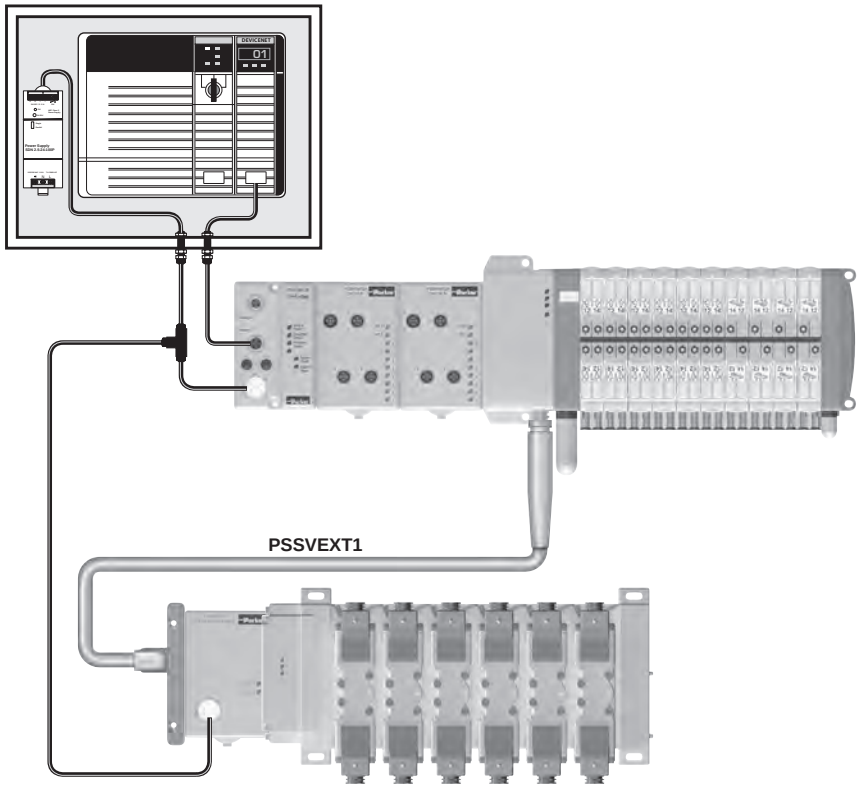
- H Series Network Portal with inputs and outputs
- Valves located near application - ready for machine mounting
- IP65 rating suitable for dusty and wet environments
- Additional inputs and outputs are directly attached to valve manifold

EtherNet/IP™

PROFIBUS PROCESS FIELD BUS

**Advantages**

- Handle all I/O from one node
- Eliminate PLC input / output cards
- Up to 128 solenoids per node with bus extension cables
- Up to 256 inputs and 256 outputs
- Analog Inputs / outputs available
- Smallest control cabinet
- Reduces tubing length and improves pneumatic response time
- Eliminates pneumatic bulk fittings on control cabinet
- Many network nodes can be attached to the network with little incremental cost – valve manifolds, inputs, outputs and other devices.
- Eliminates terminal strips and wire ways
- Greatly reduces wiring time
- Eliminates junction boxes for all inputs and outputs
- Eliminates conduit runs for all inputs and outputs



## System Overview - Turck Network Portal

### General Product Features

- Turck Network Portal with up to 256 inputs / outputs and 32 solenoids per manifold
- Digital inputs / outputs, analog inputs / outputs, serial interface, counter modules, and RFID modules available
- Connectivity to H Series Micro and H Series ISO valve series

### Advantages

- Handle all I/O from one node; eliminate PLC input / output cards
- Optimized for PLC's with network capability
- Eliminates junction boxes, terminal strips, and conduit runs for all inputs and outputs, greatly reducing wiring time

## Centralized Application

### Valves Inside Control Cabinet

- Valves located near machine control
- Applications with caustic wash down, hazardous areas, or extreme temperatures

### Advantages

- Highest degree of environmental protection
- One location for all control devices
- Small size requires minimal cabinet space

## De-centralized Application

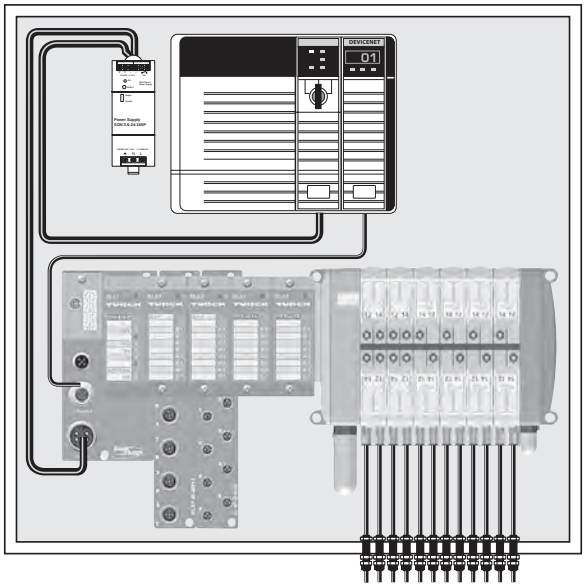
### Valves Outside Control Cabinet

- Valves located near application - ready for machine mounting
- IP65 rating suitable for dusty and wet environments

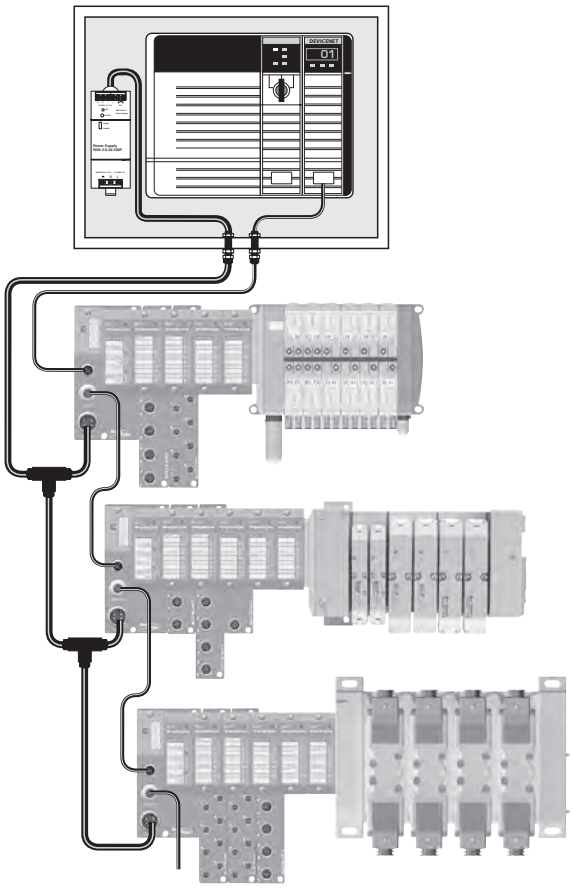
### Advantages

- Smallest control cabinet
- Reduces tubing length and improves response time
- Eliminates pneumatic bulk fittings on control cabinet

EtherNet/IP™ PROFINET Modbus/TCP™ DeviceNet PROFIBUS CANopen



Bulkhead Pneumatic Fittings



## System Overview - Turck Network Portal with CANopen Expansion

### General Product Features

- Turck Network Portal with up to 256 inputs / outputs and 32 solenoids per manifold
- Digital inputs / outputs, analog inputs / outputs, serial interface, counter modules, and RFID modules available
- Connectivity to H Series Micro and H Series ISO valves

### CANopen Expansion Features

- Using a CANopen interface module, a CANopen subnet is created within the Turck Network Portal, controlling an additional 64 inputs, outputs, or solenoids
- The CANopen subnet is independent of the main network, and is not visible to the master PLC
- Additional P2M CANopen modules can be attached to the CANopen subnet to provide a connection for 16 solenoids each
- Other 3rd party CANopen devices can also be used on this network, within the 64 bit CANopen expansion limit

### System Advantages

- Handle all I/O from one node; eliminate PLC input / output cards
- Optimized for PLC's with network capability
- Several CANopen nodes can be attached to the network – valve manifolds, inputs, outputs or other devices
- CANopen expansion allows additional devices to be attached to the system without a CANopen scanner card
- Eliminates junction boxes, terminal strips, and conduit runs for all inputs and outputs, greatly reducing wiring time

## Centralized Application

### Valves Inside Control Cabinet

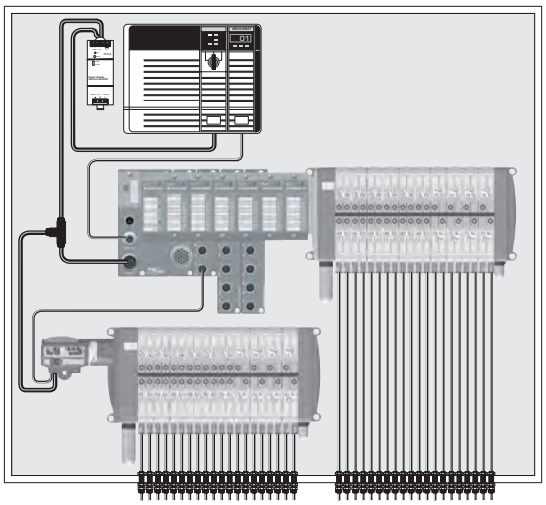
- Valves located near machine control
- Applications with caustic wash down, hazardous areas, or extreme temperatures

### Advantages

- Highest degree of environmental protection
- One location for all control devices
- Small size requires minimal cabinet space

EtherNet/IP™ PROFINET® INDUSTRIAL ETHERNET Modbus/TCP™

DeviceNet™ PROFIBUS® PROCESS FIELD BUS CANopen®



Bulkhead Pneumatic Fittings

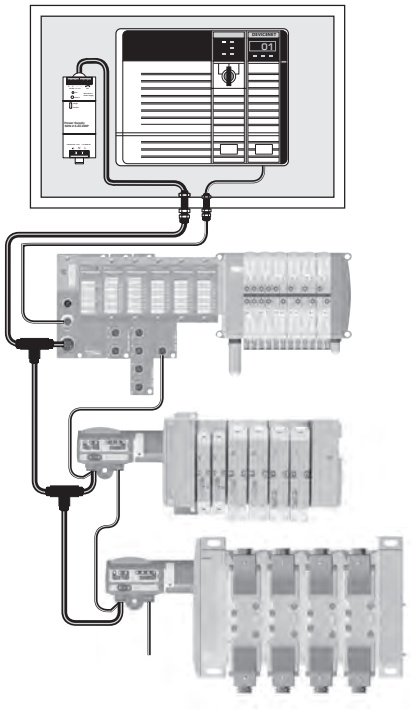
## De-centralized Application

### Valves Outside Control Cabinet

- Valves located near application - ready for machine mounting
- IP65 rating suitable for dusty and wet environments

### Advantages

- Smallest control cabinet
- Reduces tubing length and improves response time
- Eliminates pneumatic bulk fittings on control cabinet



## System Overview - Turck Network Portal with BL Remote DeviceNet Subnet

### General Product Features

- Turck Network Portal with up to 256 inputs / outputs and 32 solenoids per manifold
- Digital inputs / outputs, analog inputs / outputs, serial interface, counter modules, and RFID modules available
- Connectivity to H Series Micro and H Series ISO valves

### BL Remote DeviceNet Subnet Features

- With BL remote DeviceNet subnet functionality, each communication module has its own DeviceNet master which provides a connection for 63 DeviceNet nodes with additional inputs, outputs, and solenoid control
- BL remote DeviceNet subnet is independent of the main network, and is not visible to the master PLC
- P2M DeviceNet modules can be attached to the subnet to provide a connection for 16 solenoids each
- Turck DeviceNet modules can be attached to the subnet to provide a connection for 16 or 32 solenoids each and inputs and outputs up to the 256 input and output limitation

### System Advantages

- Handle all I/O from one node; eliminate PLC input / output cards
- Optimized for PLC's with network capability
- Many DeviceNet nodes can be attached to the network – valve manifolds, inputs, outputs or other devices
- Eliminates junction boxes, terminal strips, and conduit runs for all inputs and outputs, greatly reducing wiring time

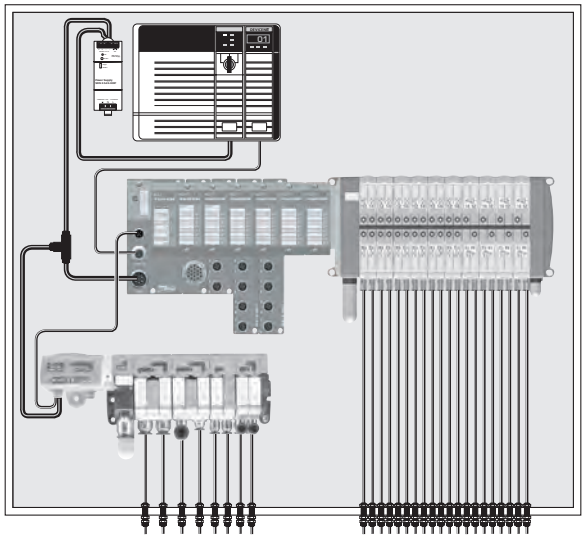
## Centralized Application

### Valves Inside Control Cabinet

- Valves located near machine control
- Applications with caustic wash down, hazardous areas or extreme temperatures

### Advantages

- Highest degree of environmental protection
- One location for all control devices
- Small size requires minimal cabinet space



Bulkhead Pneumatic Fittings

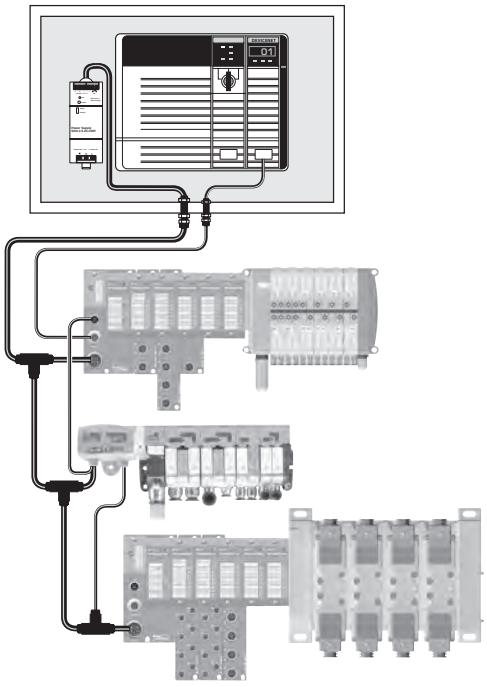
## De-centralized Application

### Valves Outside Control Cabinet

- Valves located near application - ready for machine mounting
- IP65 rating suitable for dusty and wet environments

### Advantages

- Smallest control cabinet
- Reduces tubing length and improves response time
- Eliminates pneumatic bulk fittings on control cabinet



## System Overview - Turck Network Portal with Stand Alone Control

### General Product Features

- Turck Network Portal with up to 256 inputs / outputs and 32 solenoids per manifold
- Digital inputs / outputs, analog inputs / outputs, serial interface, counter modules, and RFID modules available
- Connectivity to H Series Micro and H Series ISO valves

### Stand Alone Control Features

- Communication modules equipped with standalone control – programmed according to IEC61131-3 with CoDeSys
- 512KB program memory with 32 bit RISC processor
- Run 1000 instructions in less than 1 ms
- Optimized for PLC's with network capability or standalone controllers that need to interface with other devices

### System Advantages

- Handle all I/O and control with one system; eliminate the PLC when used as the main controller for smaller machines
- Reduces programming and bandwidth requirements on large machines with a master PLC controller by handling local I/O and interfacing with the PLC over the network
- Eliminates junction boxes, terminal strips, and conduit runs for all inputs and outputs, greatly reducing wiring time

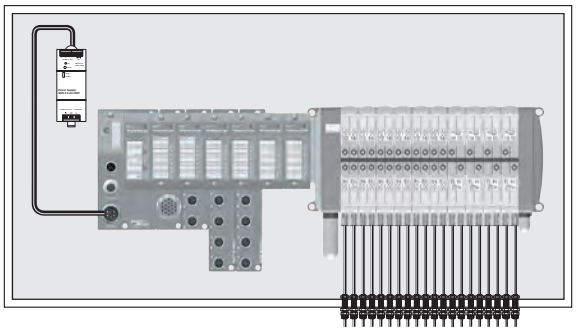
## Centralized Application Valves

### Inside Control Cabinet

- Valves attached to the machine control
- Applications with caustic wash down, hazardous areas, or extreme temperatures

### Advantages

- Highest degree of environmental protection
- One location for all control devices



Bulkhead Pneumatic Fittings

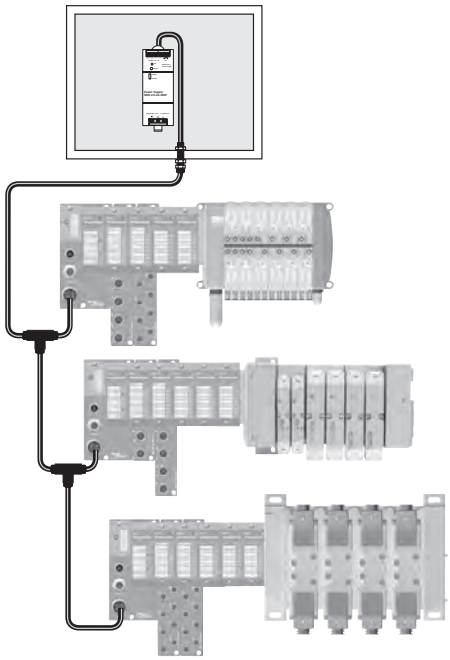
## De-centralized Application

### Valves Outside Control Cabinet

- Valves and machine control located near application - ready for machine mounting
- IP65 rating suitable for dusty and wet environments

### Advantages

- No control cabinet needed when used as the main controller
- Reduces tubing length and improves response time
- Eliminates pneumatic bulk fittings on control cabinet

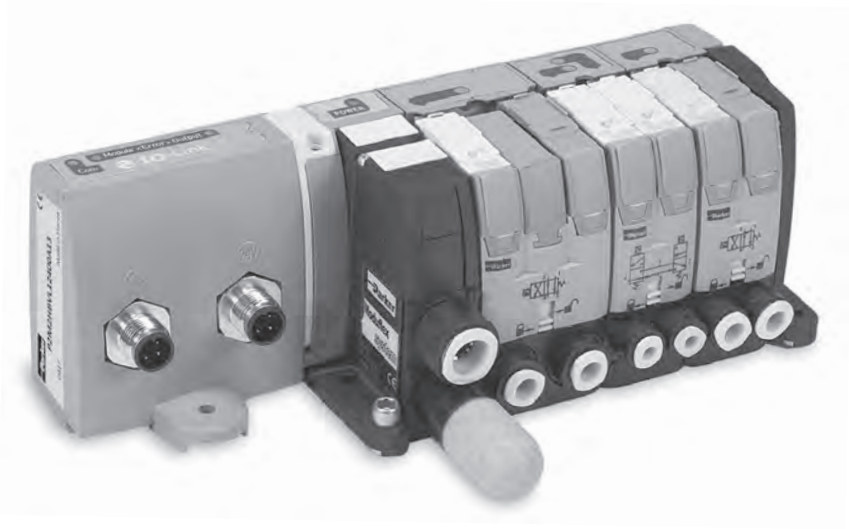


## P2M Network Nodes

P2M module attaches directly to the Moduflex valve series as well as the P2M endplates of the H Series Micro and H Series ISO valve products. The P2M node offers a compact and low cost network solution.

**Features**

- Small, compact product design
- IO-Link Class A & Class B nodes
- Broad protocol offering
- Channel-level diagnostics (LED and Electronic)
- Horizontal and vertical mounting without derating
- 5g vibration
- Quick-disconnects for I/O and network connectivity
- Built-in panel grounding
- CE certification



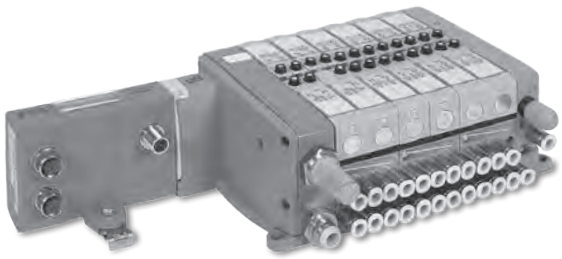
## P2M Network Nodes

P2M communication module attaches directly to the end plate. It offers a compact and low cost network solution.

### Features

- Small, compact product design
- IO-Link Class A & Class B nodes
- Broad protocol offering
- Built-in panel grounding
- CE certification

**P2M2HBVL12400A13**
(Class A IO-Link)



**P2M2HBVE12400**
(EtherNet/IP)

| Industrial Ethernet Protocol | Maximum Addresses † | Part number |
|---|---|---|
| EtherNet/IP *(Safe Power Capable)* | 24 † | **P2M2HBVE12400** |
| PROFINET *(Safe Power Capable)* | 24 † | **P2M2HBVN12400** |
| EtherCAT *(Safe Power Capable)* | 24 † | **P2M2HBVT12400** |
| Modbus/TCP *(Safe Power Capable)* | 24 † | **P2M2HBVM12400** |
| PowerLink *(Safe Power Capable)* | 24 † | **P2M2HBVW12400** |
| CC-Link IE *(Safe Power Capable)* | 24 † | **P2M2HBVK12400** |

| | IO-Link class | IO-Link | Aux. power | Aux. power pinout | Maximum addresses † | Part number | |
|---|---|---|---|---|---|---|---|
| | | | | | | Standard | Safe power capable * |
|  | Class A | 3 Pins | 3 Pins | 1 & 3 | 24 † | **P2M2HBVL12400A13** | **P2M2HBVL12400A13-SPC** |
| | | 3 Pins | 3 Pins | 4 & 3 | 24 † | **P2M2HBVL12400A43** | **P2M2HBVL12400A43-SPC** |
| | | 3 Pins | 5 Pins | 4 & 2 | 24 † | **P2M2HBVL12400A42** | **P2M2HBVL12400A42-SPC** |
|  | Class B | 5 Pins | | 2 & 5 | 24 † | **P2M2HBVL12400B25** | **P2M2HBVL12400B25-SPC** |

* Safe Power Capable (-SPC) version is suitable for connection to an OSSD (test pulsed) SAFE output source.

† If using with Moduflex valves, maximum solenoid addresses limit is 19.

Further details: www.parker.com/pdn/P2M_IOL

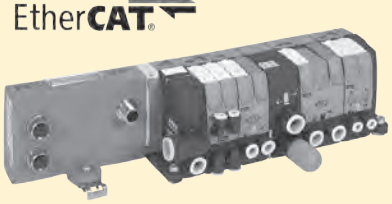
Most popular.

## P2M Industrial Ethernet Node

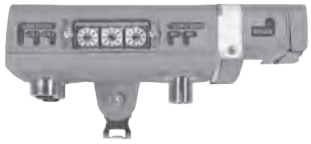
The P2M Industrial Ethernet 24 DO node allows a very simple and cost efficient connection to the most popular Industrial Ethernet networks.

Designed with isolated auxiliary power, it can easily be adapted to all power supply architectures and follow any required machine directives as Safe Power Capable.

EtherNet/IP™ ETHERNET POWERLINK PROFINET INDUSTRIAL ETHERNET EtherCAT® Modbus CC-Link IE



## Simple Product Set-Up



The P2M Industrial Ethernet Node offers IP addressing through 3 rotary switches located on the top side.

The 3 rotary switches also allow for Factory Reset, IP address storage, and DHCP addressing.

If supported by the protocol used, the IP address can be modified through the embedded web page.

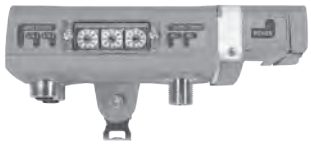
For an application requiring a regular disconnection / reconnection of communication & power, PROFINET and EtherNet/IP protocols allow respectively a Fast Start-Up (FSU) and Quick Connect mode. This mode can be enabled or disabled.

## Topology / Integrated Ethernet Switch

The P2M Industrial Ethernet 24 DO Node offers 2 Ethernet ports allowing a line topology without external switch. The Ring topology can also be supported (enable/disable) for PROFINET, EtherNet/IP and Modbus TCP/IP.

The integrated Ethernet switch supports Class C services allowing use in an isochronous real time (IRT) structure.

## Easy Diagnostics – Local LEDs, Process (cyclic) data, Parameter (acyclic) data



The P2M Industrial Ethernet 24 DO Node offers local diagnostics through 7 LED's located on the visible top side, showing:

- Logic status
- Ethernet activity on both ports
- Standard status due to protocol
- Output error / Auxiliary power

This local information as well as configuration and predictive maintenance diagnostics (Power monitoring, Solenoid cycle counting, etc) are available via both Process Data (cyclic) and Parameter Data (acyclic) via the PLC through the network and also easily viewable from the embedded web page.

When the PLC is NOT in control, the web page allows the user to force ON/OFF the solenoids state. This function has password protection.

## Safe Power Capable

Auxiliary power of P2M Industrial Ethernet 24 DO Node can be supplied from a safe output device following machinery directives. This includes:

- Output Signal Switch Device (OSSD) test pulse compatible
- Galvanic isolation between 0 VDC Logic and Auxiliary power
- PP or PM cabling modes

For more details, refer to the user manuals located at www.parker.com/pdn/P2M_IE

## P2M Industrial Ethernet Connections & Configuration

### Ethernet ports and Auxiliary power connection

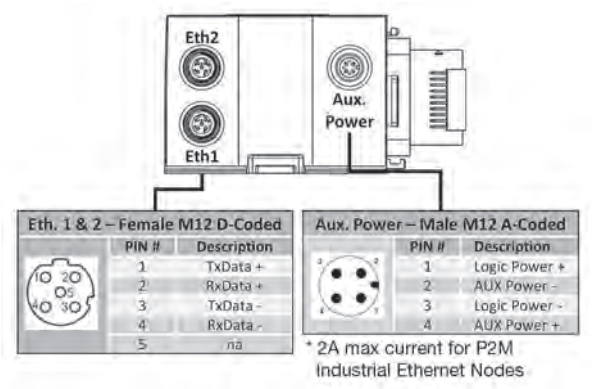
Ethernet ports: 2 x Standard Female M12 D-Coded – 5 pins
Auxiliary Power: Standard Male M12 A-Coded – 4 pins

### Configuration file

The configuration files (.EDS, .GDS, etc) can be download from the product web page.

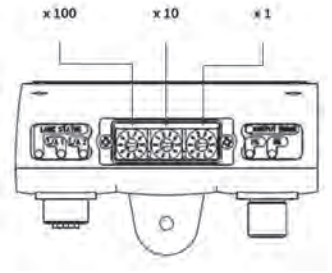
### Add on Instructions & Function Blocks

Add on Instructions & Function Blocks to assist in the configuration and programming of the P2M Node are available on the product web page – www.parker.com/pdn/P2M_IE




### IP Address Setting

Can be done via Rotary Switches, DHCP, Web page, Ipconfig Tool or TCP/IP Interface Object, depending on protocol:




| Description | EtherNet/IP Profinet IO Modbus TCP/IP | Ethernet PowerLink | EtherCAT | CC-Link IE |
|---|---|---|---|---|
| IP-Address setting stored into the NV-memory of the P2M node | 000 | 000 | N/A | 000 |
| IP-Address setting determined by the 3 rotary switches:<br>• IP Address: 192.168.1.**xxx**<br>• Subnet Mask: 255.255.255.0<br>• Default Gateway for 001: 192.168.1.**2**<br>• Default Gateway for 002 - 254: 192.168.1.**1** | 001 – 254 | 001 – 239 | N/A | 001 – 120 |
| The device will obtains its address via DHCP | 888 | N/A | N/A | N/A |
| Reset to factory status | 999 | 999 | 999 | 999 |
| Invalid, the module will not start | All others | All others | All others | All others |

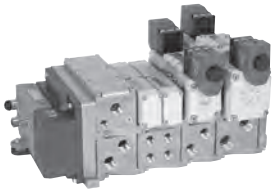
## P2M Industrial Ethernet Valve Control

All P2M Industrial Ethernet Modules can easily connect to and control pneumatic valves sizes ranging from 0.18 Cv to 6.0 Cv utilizing the Moduflex, H Micro, or H ISO valve series including the new H ISO Universal manifold which can mix ISO sizes 15407 (sizes 02 & 01) and 5599 (sizes 1 & 2) without transition plates.

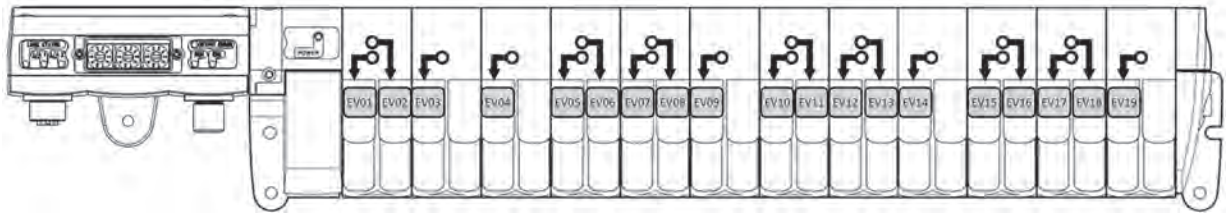
P2M on Moduflex

P2M on H Series Micro

P2M on H Series ISO Universal



## P2M Industrial Ethernet Node Output (Solenoid) data mapping - shown on Moduflex valve series




| | 7 . . . . . 3 | 2 . . . . . 0 |
|---|---|---|
| Byte 0 | EV08 . . . . . | . . EV01 |
| Byte 1 | EV16 . . . . . | . . EV09 |
| Byte 2* | EV24 . . . . . EV20 | EV19 . . . . . EV17 |

* Byte 2 / Bits 3 to 7 are only available when connected to H Series Micro or H Series ISO valve manifolds. The Moduflex valve series is limited to 19.

### Process (Cyclic) Diagnostic through network via ADI #9 – "Module Error Input"

Easy to access diagnostic data transmitted to the PLC as Application Device Instance (ADI) #9

- Voltage warning, short circuit condition, module error, etc
- For more details refer to user manual on product web page – www.parker.com/pdn/P2M_IE

| ADI | Instance name | Data type | Access |
|---|---|---|---|
| #9 | Module error input | Unit 16 | Read |

| | |
|---|---|
| Byte 0 | Diag 7 . . . . . Diag 0 |
| Byte 1 | Reserved |





**Parker Hannifin Corporation**
Pneumatic Division
Richland, Michigan
www.parker.com/pneumatics

## "V" Series Valve Island
## P2M head module for IO-Link

Electrical Module for 24 outputs
(The last 5 outputs of this 24 DO module can not be used with Moduflex Valve)

IO-Link

**M12 A coded Connector connection**


| Description | IO-Link class | IO-Link | Aux. power | Aux. power pinout | Weight (g) | Part number Standard | Part number Safe power capable |
|---|---|---|---|---|---|---|---|
| P2M IO-Link communication module | Class A | 3 Pin's | 3 Pin's | 1 & 3 | 160 | **P2M2HBVL12400A13** | **P2M2HBVL12400A13-SPC** |
| | | 3 Pin's | 3 Pin's | 4 & 3 | 160 | **P2M2HBVL12400A43** | **P2M2HBVL12400A43-SPC** |
| | | 3 Pin's | 5 Pin's | 4 & 2 | 160 | **P2M2HBVL12400A42** | **P2M2HBVL12400A42-SPC** |
| | Class B | 5 Pin's | | 2 & 5 | 140 | **P2M2HBVL12400B25** | **P2M2HBVL12400B25-SPC** |
| Power & communication cable | | | | | | **RKC 4.5T-*-RSC 4.5T/S1587** | |

IODD file can be downloaded from IODD Finder or the Moduflex web site:
https://ioddfinder.io-link.com or www.parker.com/pdn/io-link

Where * = 1, 2, 3, 4, 5, 10, 20 meter standard lengths

## P2M Class A Module with Independent Auxiliary Power Supply

The P2M **IO-Link** Class A module can handle a Moduflex valve manifold having up to 19 solenoid outputs, or H Series Micro / ISO up to 24 solenoid outputs.

Thanks to its 2 x M12 A coded male connectors, the P2M node can be connected to any IO-Link Class A master and separately receive its auxiliary power supply for valves from an independent source.

The P2M **IO-Link** Class A module exists in 3 versions with the auxiliary power M12 connector pin out adapted to any sourcing through a standard M12 cable:

- P2M2HBVL12400A13 version: 24VDC / 0VDC on pins 1 & 3 – Standard version
- P2M2HBVL12400A43 version: 24VDC / 0VDC on pins 4 & 3 – Compatible with Siemens wiring
- P2M2HBVL12400A42 version: 24VDC / 0VDC on pins 4 & 2 – Compatible with Rockwell wiring and Turck wiring

## P2M Class B module

The P2M **IO-Link** Class B module can handle a Moduflex valve manifold having up to 19 solenoid outputs, or H Series Micro / ISO up to 24 solenoid outputs.

Thanks to its single M12 A coded male connectors, P2M node can be connected to any IO-Link Class B master receiving its auxiliary power supply for valves on pins 2 & 5 from the only cable simplifying the connection.

- P2M2HBVL12400B25 version: 24VDC / 0VDC on pins 2 & 5

### Diagnostic

The P2M **IO-Link** module offers a local diagnostic through 4 LED's located on the visible top side, showing:

- IO-Link com status
- Module error
- Output error
- Auxiliary power

Additional useful diagnostic information can be read by the PLC through the network simplifying diagnostic and allowing predictive maintenance (all details in the user manual).

### Auxiliary power for safe supply

The P2M **IO-Link** module is compatible with a SAFE power source for valve control.

For more details, refer to next page.

Most popular.

## IO-Link Module Connection and Diagnostic Functions

### IO-Link Module Connection

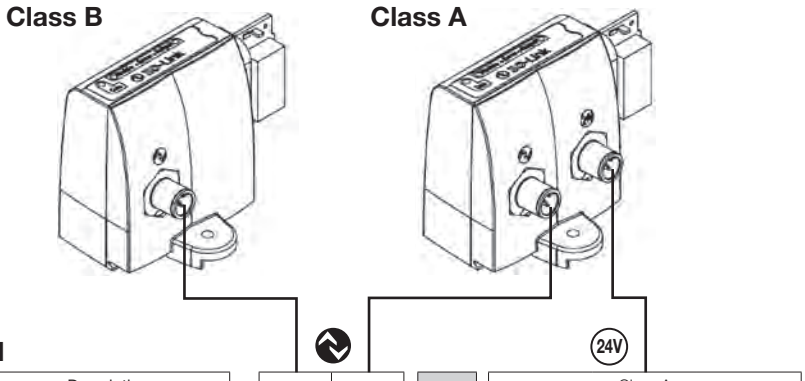
Standard male M12 – type A

Usage of standard manufactured cables available from your usual electrical supplier is recommended.

Note: Auxiliary power for solenoids can be wired allowing the user to turn outputs off while the communications remains on.

### Configuration

IODD file can be downloaded from IODD Finder or the P2M web site:
https://ioddfinder.io-link.com
www.parker.com/pdn/P2M_IOL




**Legend**

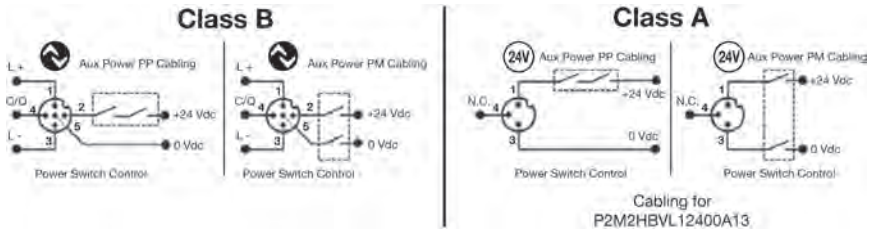
| Symbol | Description |
|---|---|
| L+ | IO-Link power supply "+" |
| L- | IO-Link power supply "-" |
| C/Q | IO-Link communication |
| Aux + | Auxiliary power supply 24 VDC |
| Aux - | Auxiliary power supply 0 VDC |

| Class B 5 pin's P2M...B.. | Class A 3 pin's P2M...A.. | M12 pin's | Class A 3 pin's P2M...A13 | Class A 3 pin's P2M...A43 | Class A 5 pin's P2M...A42 |
|---|---|---|---|---|---|
| L+ | L+ | 1 | Aux + | Not used | Not used |
| Aux + | - | 2 | - | - | Aux - |
| L- | L- | 3 | Aux - | Aux - | Not used |
| C/Q | C/Q | 4 | n.c. | Aux + | Aux + |
| Aux - | - | 5 | - | - | Not used |

### Auxiliary Power Supply Compatibility

The P2M IO-Link Node can be powered from a 24VDC auxiliary source in PP or PM mode as grounds are isolated.

The P2M Safe Power Capable (-SPC) versions can be connected from a SAFE OSSD test pulsed power source.




### IO-Link Module Diagnostic Functions

The P2M IO-Link module offers additional useful module status information:

- Solenoid overload or short circuit
- Auxiliary voltage out of tolerance
- Cycle counter for each solenoid
- Module temperature

For more information on product technical information and module diagnostic functionalities, please refer to the user manual available from the product web page:

www.parker.com/pdn/P2M_IOL

**COM. Green LED**

| LED Status | Description | Solving |
|---|---|---|
| OFF | IO-Link L+ / L- not powered | Check connection |
| ON | IOL L+ / L- powered IO mode | Set IO-Link mode in IO-Link master |
| Blinking | IO-Link communication active | NA |

**Module — Error Red LED**

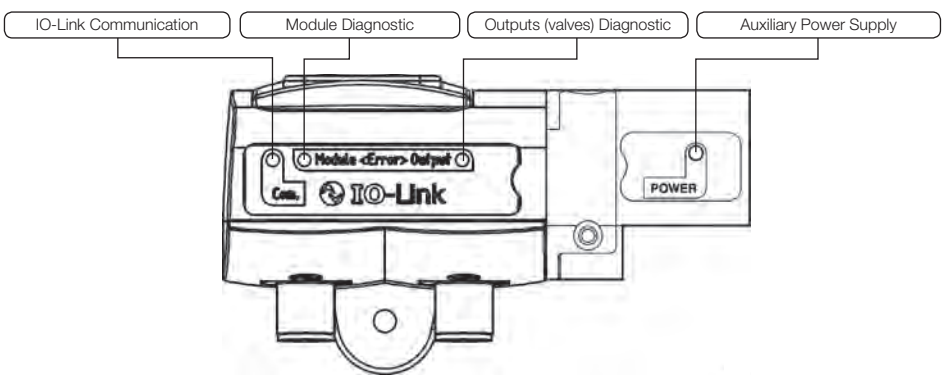
| LED Status | Description | Solving |
|---|---|---|
| OFF | Standard mode | NA |
| ON | 24 VDC AUX power missing or any active malfunction | Check power supply or change module |

**Error — Output Red LED**

| LED Status | Description | Solving |
|---|---|---|
| OFF | Standard mode | NA |
| ON | Any driver error (overload, over temperature, etc.) | Fix solenoid issue then acknowledge error |

**POWER Green LED**

| LED Status | Description | Solving |
|---|---|---|
| OFF | AUX power failure | Check Auxiliary Power Supply |
| ON | Standard | NA |
| Blinking | Aux Power is out of range, alarm level | Check Auxiliary Power Supply |



## Input Data

**One byte of diagnostic input data is transferred from P2M IO-Link to the IO-Link Master.**

**Process input data**

| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|
| Output driver SPI error | Output driver channel error | Polyfuse tripped | Temperature warning | SPI error | AUX voltage error | AUX voltage warning | Acknowledge Required |

## Output Data

**Three bytes of process data are received by P2M IO-Link from the IO-Link Master for control of solenoids.**

**Process output data (Byte 0)**

| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|
| EV8 | EV7 | EV6 | EV5 | EV4 | EV3 | EV2 | EV1 |

**Process output data (Byte 1)**

| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|
| EV16 | EV15 | EV14 | EV13 | EV12 | EV11 | EV10 | EV9 |

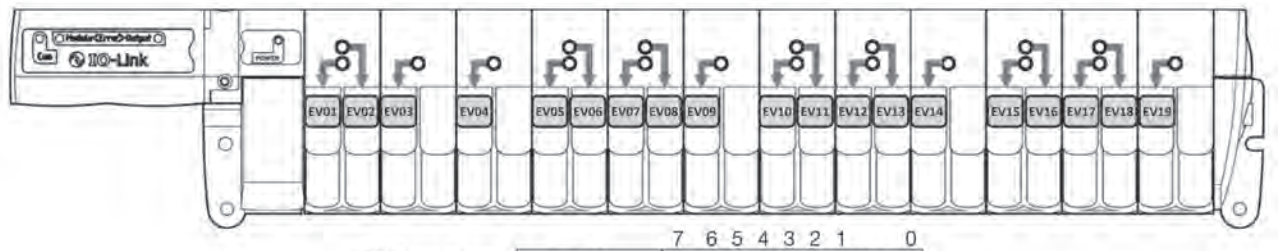
**Process output data (Byte 2)**

| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|
| EV24 | EV23 | EV22 | EV21 | EV20 | EV19 | EV18 | EV17 |

## Solenoid Pilots Addressing and Process Mapping

### P2M IO-Link node addressing used with Moduflex Valve System

The P2M IO-Link node, when used with Moduflex Valve System can handle up to 19 pilot solenoid valves. Addressing will be done as shown below.




| PLC mapping Process output | 7 6 5 4 3 2 1 0 | |
|---|---|---|
| | Byte 0 | EV08 ..... EV01 |
| | Byte 1 | EV16 ..... EV09 |
| | Byte 2 | EV24 ..... EV17 |

## P2M IO-Link Module Electrical Specifications

| | |
|---|---|
| IO-Link power supply | According to IO-Link standard V1.1.2 |
| Speed communication | Com 2 – 38 kBd |
| Auxiliary power supply | 20.4 VDC to 26.4 VDC |
| Current limit per channel | 150 mA |
| Max current limit | 4 A |
| Polarity inversion | YES |
| Short circuit protection | YES |
| Operating temperature | 0°C to 55°C |
| Storage temperature | -25°C to 70°C |
| Shock according to IEC | 60068-2-27:2008 |
| Vibration according to IEC | 60068-2-6:2007 |
| EMC according to IEC | 61000-4-2 up to -4-6 |

## Network Diagnostic Through Process Mapping:

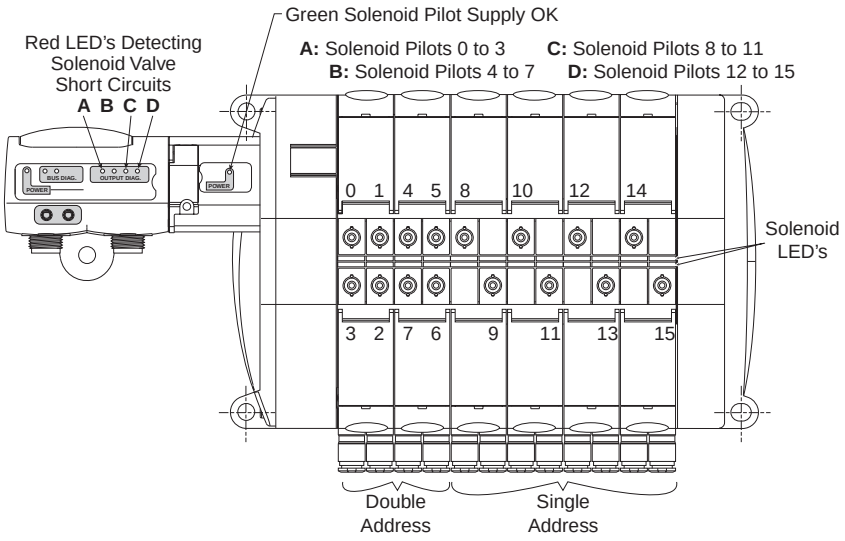
The P2M IO-Link module offers diagnostic data transmitted to the PLC through the master:

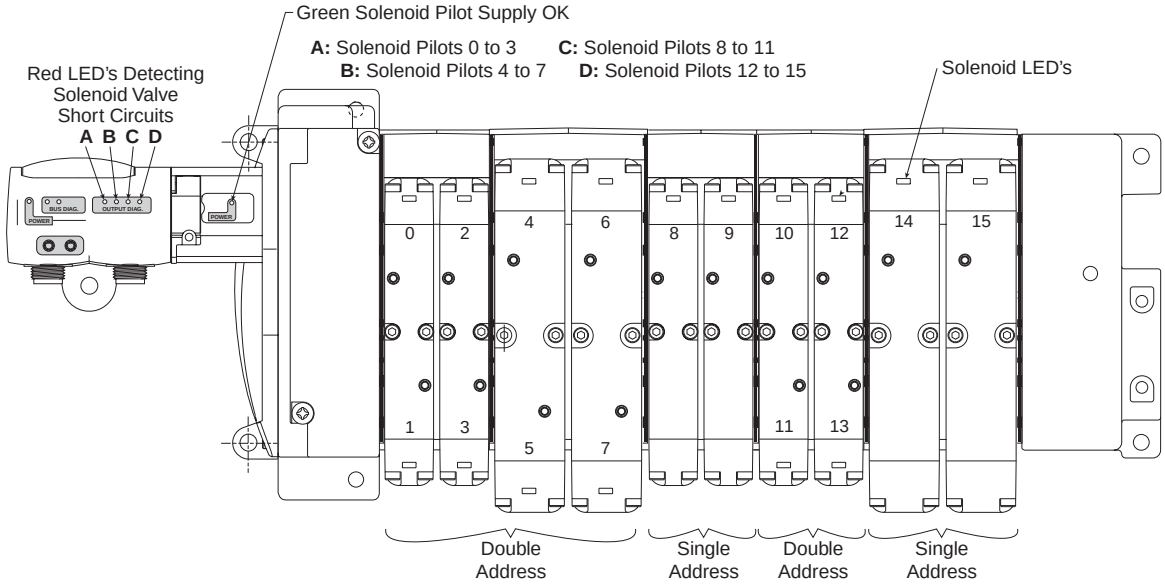
| PLC mapping Process input | 7 6 5 4 3 2 1 0 | |
|---|---|---|
| | Byte 0 | Diag 7 . . . . . Diag 0 |

| Diag bit | Error message | Detail |
|---|---|---|
| Diag 0..... | Fail-safe status ..... | Acknowledgement required |
| Diag 1..... | Auxiliary voltage warning..... | Check auxiliary power |
| Diag 2..... | Auxiliary voltage failure..... | Check auxiliary power |
| Diag 3..... | Module failure ..... | Module HS. must be replaced |
| Diag 4..... | Module over-temperature | |
| Diag 5..... | Module over-load | |
| Diag 6..... | Pilot solenoid(s) short circuit..... | Solenoid must be replaced |
| Diag 7..... | Outputs stage failure | |

For further details, refer to the user manual: can be downloaded from www.parker.com/pdn/P2M_IOL

## Solenoid Pilot Diagnostic Common to All P2M Nodes




Inside the communication module, solenoid valve control is protected against short-circuits with the following visual indication provided:

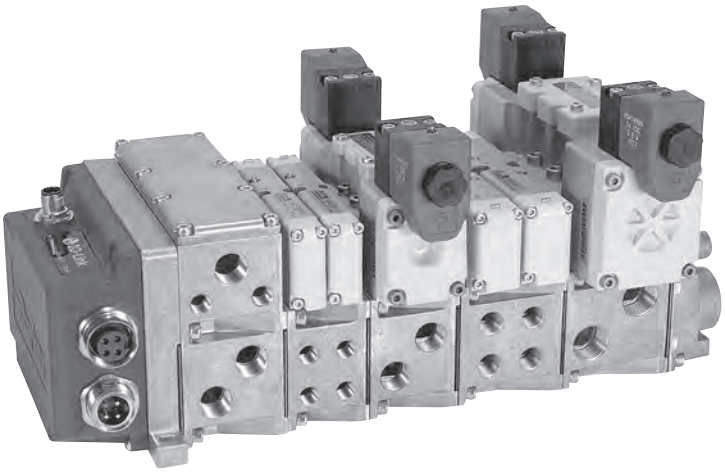
- The red LEDs with code, shown above, detect solenoid valve short-circuits
- Supply is OK when the solenoid pilot power supply indicator is green

## P2H Network Node

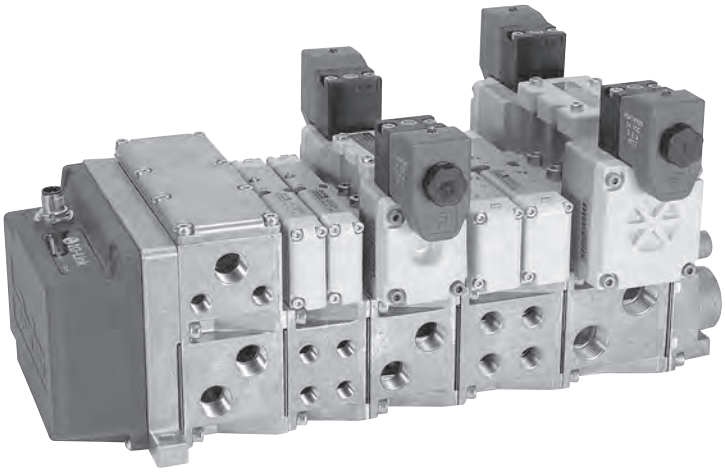
The P2H Network Node is available with IO-Link connectivity for the industries first connection of ISO valves (5599 & 15407) to the low cost IO-Link network.

### Features

- Compact, robust product design
- Weld splatter resistant housing material
- Simple connection to IO-Link Class A or Class B masters
- Industries first power in & out capability for Class A version
- Industries first 7/8" power connectors on Class A version
- IO-Link connection to new H Series ISO Universal Manifold, capable of mixing valve sizes from 0.5 Cv – 3 Cv
- Safe Power Capable for supplying valve power from a safety device (ie. safe relay)
- Diagnostics made SIMPLE! Useful diagnostic flags in process (cyclic) data for easy access and use for preventative maintenance
- Certified to IP65 ingress protection
- CE certification



Class A Node



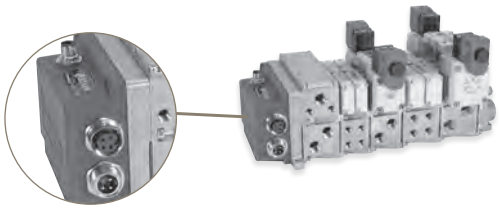
Class B Node

## Overview - P2H Network Node

Designed to integrate directly with all H Series ISO valve sizes, the P2H IO-Link Network Node provides a compact, robust and cost efficient solution for IO-Link capability. The P2H IO-Link network node is offered as an end plate kit on the H Series valve for five sizes (HB, HA, H1, H2 and H3). The P2H node is suitable for use on a valve manifold with up to 24 solenoid outputs.

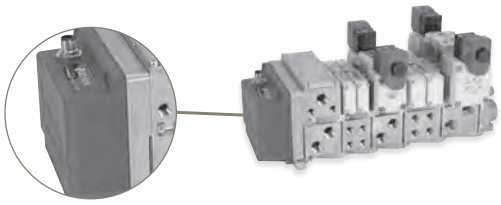
## Connection Types and Power:

**Class A Node**



The Class A node has (1) 3 pin M12 connector for communication and logic power from any class A IO-Link master, and (2) 7/8" connectors for auxiliary valve power IN and OUT.

**Class B Node**



The Class B node has (1) 5 pin M12 connector to connect IO-Link for communication to a Class B IO-Link master, logic power and auxiliary power for the valve solenoids (up to the limit of the Class B node output*).

*It is recommended to use the Class A node with auxiliary power if the Class B master cannot provide enough power.

### Left and Right Hand End Plate

Class B

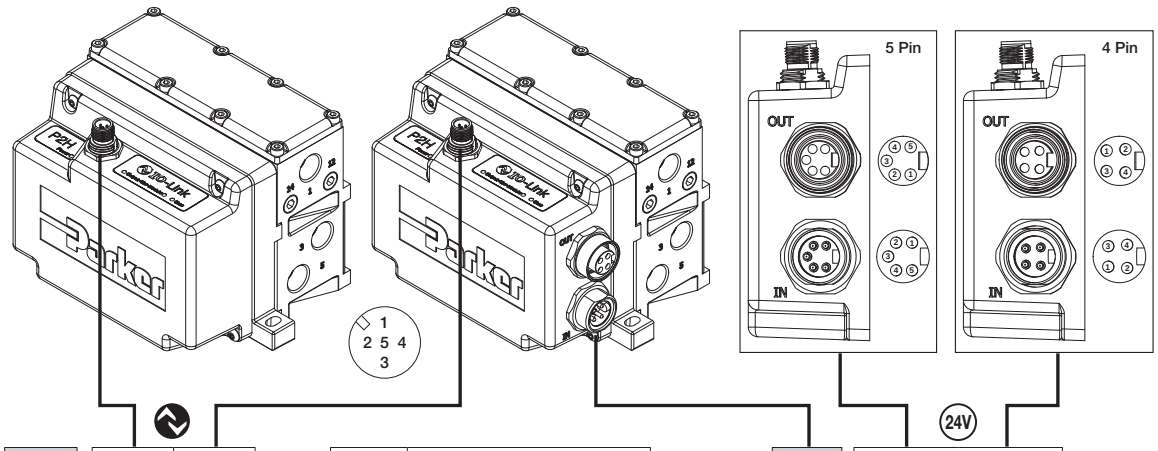
Class A

| IO-Link class / type | Current | HB, HA, H1, H2 Valves | | H3 Valves | |
|---|---|---|---|---|---|
| | | NPT port | BSPP port | NPT port | BSPP port |
| P2H IO-Link Class B, standard version, 24 address | 3.2A max | **PSHU20N200P** | **PSHU20N201P** | **PS4220N20DP** | **PS4220N21DP** |
| P2H IO-Link Class B, Safe Power Capable, 24 address | 2.0A max | **PSHU20S200P** | **PSHU20S201P** | **PS4220S20DP** | **PS4220S21DP** |
| P2H IO-Link Class A, 4-pin Safe Power Capable, 24 address | 3.2A max | **PSHU20S400P** | **PSHU20S401P** | **PS4220S40DP** | **PS4220S41DP** |
| P2H IO-Link Class A, 5-pin Safe Power Capable, 24 address | 3.2A max | **PSHU20S500P** | **PSHU20S501P** | **PS4220S50DP** | **PS4220S51DP** |

www.parker.com/pdn/P2H_IOL

| Description | | Standard version | - Safe power capable versions |
|---|---|---|---|
| IO-Link power supply | | According to IO-Link standard V1.1.2 | |
| Speed communication | | Com 2 – 38 kBd | |
| Auxiliary power supply | voltage | 20,4 VDC to 26,4 VDC | |
| | OSSD compatibility | No | Yes |
| Short circuit protection | | Yes | |
| Operating temperature | | 0°C to +55°C | |
| Shock | | According to IEC 60068-2-27:2008 | |
| Vibration | | According to IEC 60068-2-6:2007 | |
| EMC | | According to EN 55011 & EN 61000-4-2 to -4-6 | |
| Ingress protection | | Certified to IP65 | |

## P2H Network Node – Connections and LED Diagnostics




| M12 pin's | Class B 5 pin's P2HLB.. | Class A 5 pin's P2HLA.. |
|---|---|---|
| 1 | L+ | L+ |
| 2 | Aux + | - |
| 3 | L- | L- |
| 4 | C/Q | C/Q |
| 5 | Aux - | - |

| Symbol | Description |
|---|---|
| L+ | IO-Link power supply 24 VDC |
| L- | IO-Link power supply 0 VDC |
| C/Q | IO-Link communication |
| Aux + | Auxiliary power supply 24 VDC |
| Aux - | Auxiliary power supply 0 VDC |

| 7/8 pin's | Class A 5 pin's P2HLA24P5 | Class A 4 pin's P2HLA24P4 |
|---|---|---|
| 1 | Aux - | Aux + |
| 2 | *L - | *L + |
| 3 | Earth | *L - |
| 4 | *L + | Aux - |
| 5 | Aux + | - |

Note:
*7/8" logic power has no connection to internal P2H unit but does carryover to OUT 7/8" connector (for jumper logic power only). Logic power for P2H unit will be supplied from M12 (pin 1 & 3)

### Local diagnostic through LED:

The P2H IO-Link Node offers a local diagnostic through 4 LED's status with interpretation described in the table below:

**Power ○ Green LED**

| LED Status | Description | Solving |
|---|---|---|
| OFF ○ | Auxiliary power failure < 18V or > 28,5V | Check auxiliary power supply |
| ON ● | Standard mode (auxiliary power within normal range 20,4V* to 26.4V*) | N/A |
| Blinking ✸ | Auxiliary power out of range (warning level*) | Check auxiliary power supply, check/reset adjusted values |

**○ Output<Err> Red LED**

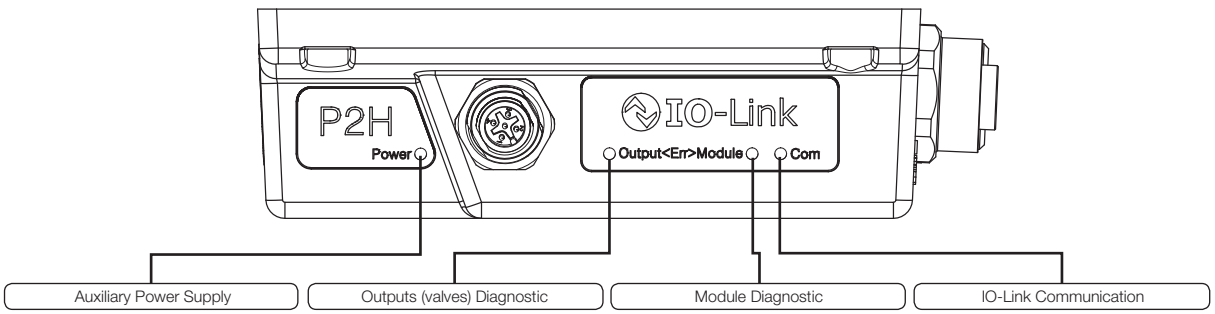
| LED Status | Description | Solving |
|---|---|---|
| OFF ○ | Standard mode (No error active) | N/A |
| ON ● | Any outputs driver error (auxiliary power error, overload, short circuit, over temperature, …) | If auxiliary power OK (see Power LED status), check error messages and related troubleshooting |

**<Err>Module ○ Red LED**

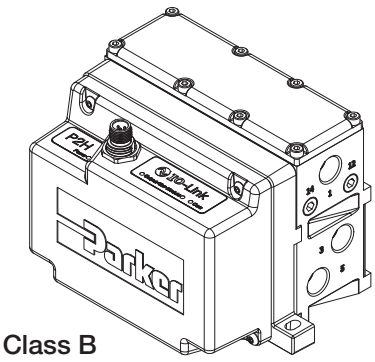
| LED Status | Description | Solving |
|---|---|---|
| OFF ○ | Standard mode (No error active) | N/A |
| ON ● | 24 VDC auxiliary power missing or any active malfunction | Check Auxiliary power supply. If auxiliary power supply OK, module must be replaced |

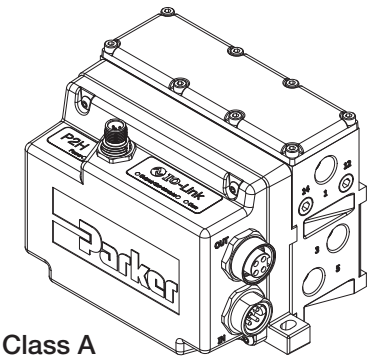
**○ Com Green LED**

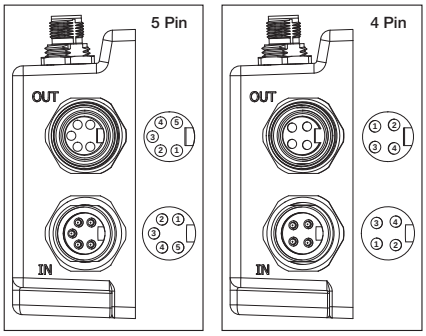
| LED Status | Description | Solving |
|---|---|---|
| OFF ○ | IO-Link L+ / L- line not powered | Check IO-Link power supply from IO-Link Master (pin's 1 & 3) |
| ON ● | IO-Link L+ / L- line powered<br>IO-Link master port set as SIO mode | Set IO-Link master channel in IO-Link mode |
| Blinking ✸ | IO-Link communication active | N/A |



## P2H Network Node – Connections and LED Diagnostics



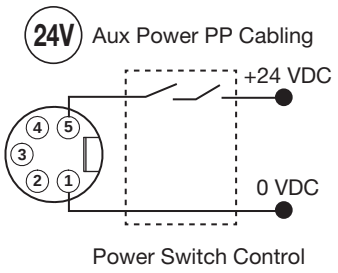



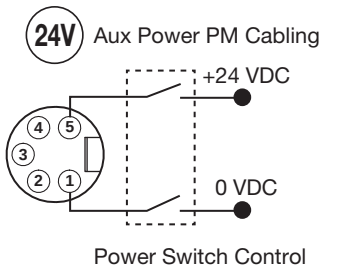

SAFETY

### P2H IO-Link 24DO Node connection to SAFE Power PP / PM mode for valve control

The P2H IO-Link 24DO node can be powered from a SAFE 24 VDC auxiliary source in PP or PM mode as grounds are isolated. Auxiliary power for solenoids can be wired allowing the functionality to turn outputs OFF while communications remain active.

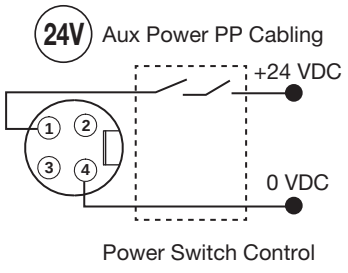
## Class A – 5 Pin

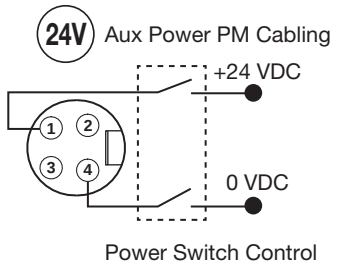



| Pin Number | Address |
|---|---|
| 1 | AUX– |
| 2 | *L– |
| 3 | Earth |
| 4 | *L+ |
| 5 | AUX+ |

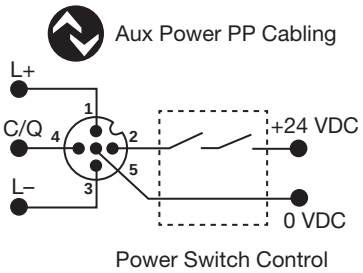
## Class A – 4 Pin

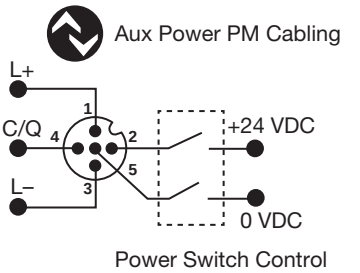



| Pin Number | Address |
|---|---|
| 1 | AUX+ |
| 2 | *L+ |
| 3 | *L– |
| 4 | AUX– |

## Class B




| Pin Number | Address |
|---|---|
| 1 | L+ |
| 2 | AUX+ |
| 3 | L– |
| 4 | C/Q |
| 5 | AUX– |

* 7/8" logic power has no connection to internal P2H unit but does carryover to OUT 7/8" connector (for jumper logic power only). Logic power for P2H unit will be supplied from M12 (pin 1 & 3).

## P2H Network Node – Input / Output Data Mapping

### Input Data

**One byte of diagnostic input data is transferred from Moduflex to the IO-Link Master.**

**Process Input Data**

| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|
| Output driver SPI error | Output driver channel error | Polyfuse tripped | Temperature warning | SPI error | Aux voltage error | Aux voltage warning | Acknowledge required |

| Diag bit | Error Message | Detail |
|---|---|---|
| Diag 0 | Fail-safe status | Acknowledgment required |
| Diag 1 | Auxiliary voltage warning | Auxiliary voltage out of range, check auxiliary power line |
| Diag 2 | Auxiliary voltage failure | Auxiliary voltage out of order, check auxiliary power source |
| Diag 3 | Module failure | Switch OFF / ON auxiliary power, if error message persists, replace the module |
| Diag 4 | Module over-temperature | Switch OFF / ON auxiliary power, if error message persists, replace the module |
| Diag 5 | Module over-load | Check overall pilot solenoid valves, if error message persists, replace the module |
| Diag 6 | Pilot solenoid(s) short circuit | Check faulty pilot solenoid valve(s), replace if necessary |
| Diag 7 | Outputs stage not available | Auxiliary power is OFF |

### Output Data

**Three bytes of process data are received by Moduflex from the IO-Link Master for control of solenoids.**

**Process Output Data (Byte 0)**

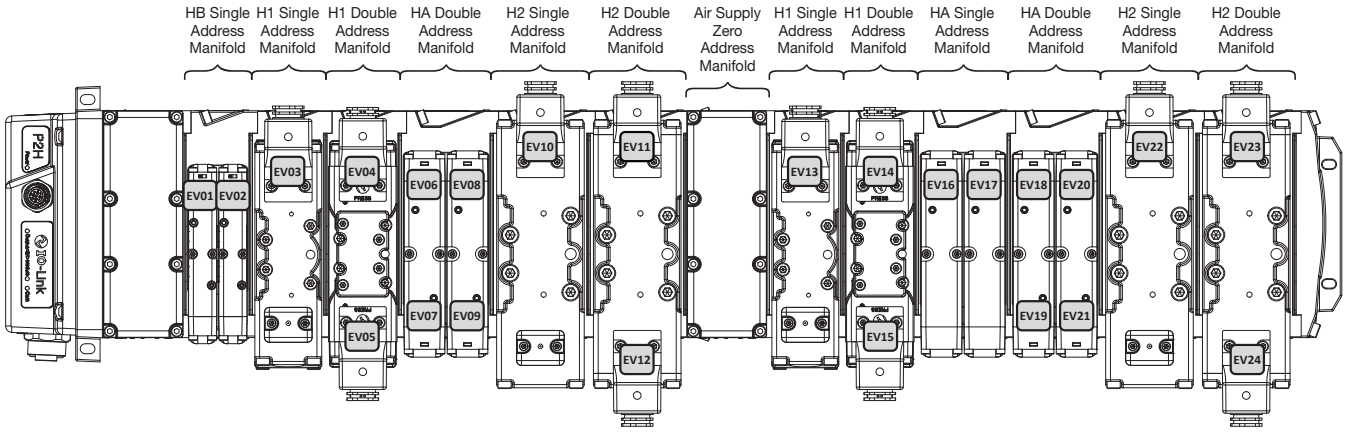
| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|
| EV8 | EV7 | EV6 | EV5 | EV4 | EV3 | EV2 | EV1 |

**Process Output Data (Byte 1)**

| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|
| EV16 | EV15 | EV14 | EV13 | EV12 | EV11 | EV10 | EV9 |

**Process Output Data (Byte 2)**

| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|
| EV24 | EV23 | EV22 | EV21 | EV20 | EV19 | EV18 | EV17 |




7 . . . . . 0

PLC Process outputs data mapping

| | |
|---|---|
| Byte 0 | EV08 ..... EV01 |
| Byte 1 | EV16 ..... EV09 |
| Byte 2 | EV24 ..... EV17 |

## Configuration IODD File

IODD file can be downloaded from IODD Finder or the P2H IO-Link web site:

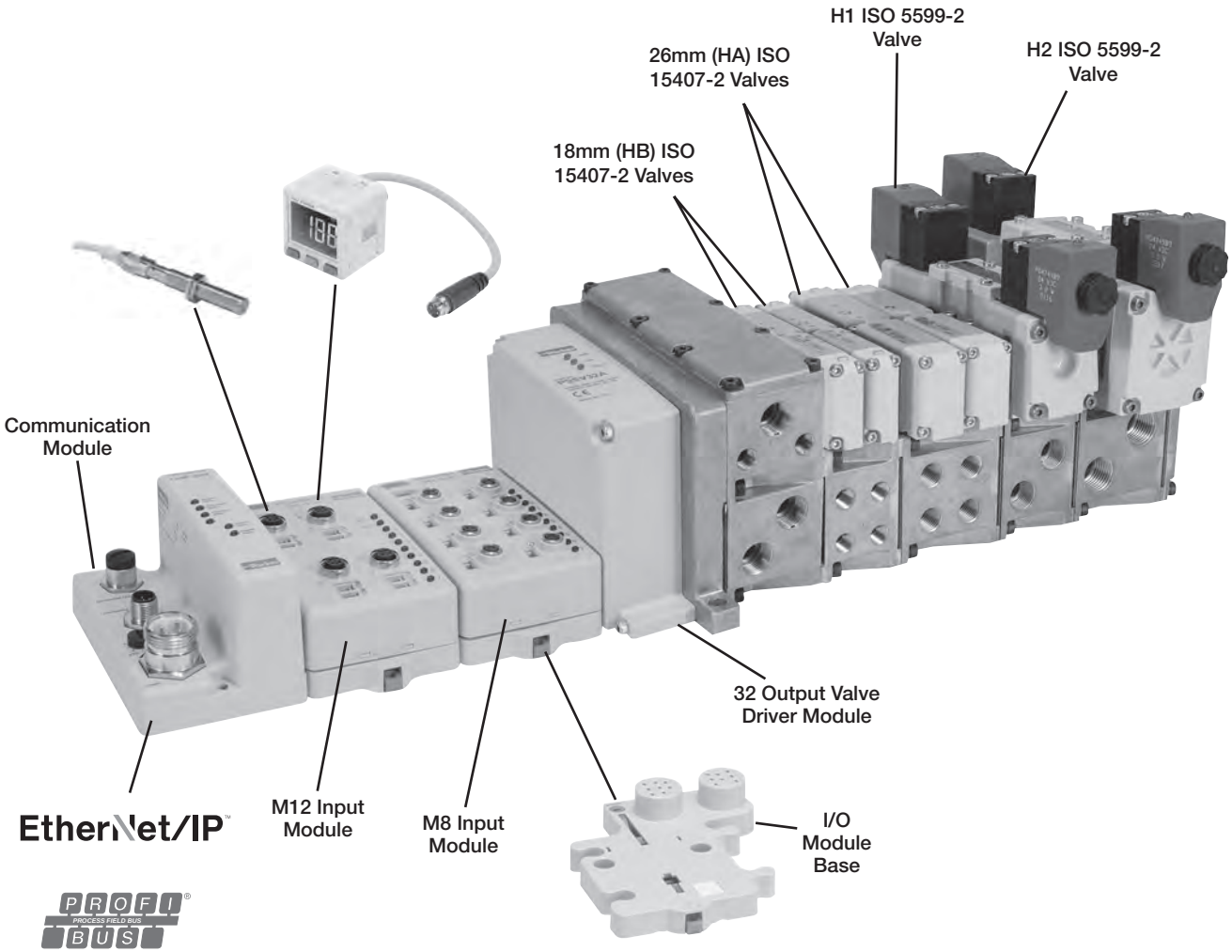
- https://ioddfinder.io-link.com
- www.parker.com/pdn/P2H_IOL

## H Series ISO & H Series Network Portal

- A complete network communication offering for all H Series ISO and H Series Micro valves
- CSA, cCSAus and CE certifications (as marked)

## I/O Configuration

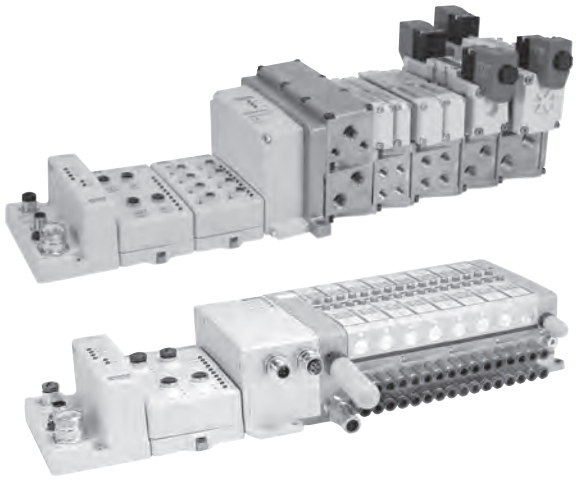
- De-centralized H Series Network Portal
- M23, 12-Pin or 19-Pin output extension to an H Series ISO valve manifold
- Separate input clusters using a bus extender cable
- Separate output and input power using a power extension module
- I/O density per module = 8 or 16



## The H Series Network Portal

**H Series Network Portal has four major components:**

- Valve driver module provide control for 32 solenoids on a manifold, with bus extension providing connectivity to 3 more manifolds
- I/O modules provide the field interface, system-interface circuitry, and bases for mounting
- Communication modules provide the network-interface circuitry
- Power distribution module provide 5 additional power inputs to the H Series Network Portal



## Features

- Highly modular design (4pt – 16pt modularity)
- Broad application coverage
- Channel-level diagnostics (LED)
- Channel-level alarm and annunciation (electronic)
- Channel-level open-wire detection with electronic feedback
- Parameter-level explicit messaging
- Horizontal and vertical mounting without derating
- 5g vibration
- Electronic and mechanical keying
- Robust backplane design
- Quick-disconnects for I/O and network connectivity
- Built-in panel grounding
- Color-coded module labels
- UL, cUL, and CE certifications (as marked)
- Highly reliable structural integrity
- Optical isolation between field and system circuits

## Communications Module

| | Protocol | Part number |
|---|---|---|
|  PSSCENA | EtherNet/IP | **PSSCENA** |
| | PROFIBUS-DP | **PSSCPBA** |

All modules are IP67 certified.

Reference the following documents for installation instructions.
DeviceNet - E101P, PSS-UM001A; ControlNet - E103P
EtherNet/IP - E104P; PROFIBUS-DP - E102P

## Digital Inputs

| | I/O modules | Voltage | Part number |
|---|---|---|---|
|  PSSN16M12A | 16 digital inputs M12, 5-pin used with PNP sourcing input device | 10 to 28.8VDC | **PSSN16M12A** |
| | 8 digital inputs M12, 5-pin used with PNP sourcing input device | 10 to 28.8VDC | **PSSN8M12A** |
|  PSSN8M8A | 8 digital inputs M8, 3-pin used with PNP sourcing input device | 10 to 28.8VDC | **PSSN8M8A** |

Reference E106P document for installation instructions.

☐ Most popular.

## Digital Outputs

| | I/O modules | Voltage | Part number |
|---|---|---|---|
|  | 16 digital outputs M12, 5-pin used with PNP sourcing outputs* | 10 to 28.8VDC | **PSST16M12A** |
| | 8 digital outputs M12, 5-pin used with PNP sourcing outputs* | 10 to 28.8VDC | **PSST8M12A** |
| PSST16M12A | 4 digital output, high watt relay M12, 5-pin used with PNP sourcing outputs (2 Amp) § | 24VDC | **PSSTR4M12A** |
|  | 8 digital outputs M23, 12-pin used with PNP sourcing outputs* | 10 to 28.8VDC | **PSST8M23A** |
| PSST8M12A | | | |

All modules are IP67 certified.
Reference the following documents for installation instructions.
+ E107P
§ E109P
See www.pdnplu.com

## Analog Inputs

| | I/O modules | Voltage | Part number |
|---|---|---|---|
|  | 2 Analog inputs voltage M12, 5-pin ‡ | -10 to 10VDC or 0 to 10VDC | **PSSNAVM12A** |
| | 2 Analog inputs current M12, 5-pin ‡ | 4 to 20mA or 0 to 20mA | **PSSNACM12A** |
| PSSNACM12A | | | |

All modules are IP67 certified,
‡ Reference E110P document for installation instructions.
See www.pdnplu.com

## Terminating Base Module

| | Base module | Part number |
|---|---|---|
|  | Termination base for stand alone units | **PSSTERM** |

Used as the last terminating module for a stand alone H Series network assembly.

## Power Extender Module

| | Extender module | Part number |
|---|---|---|
|  | 24VDC field power module | **PSSSE24A** |

A Power Extender Module must be used on every 14th module in H Series Network assembly.
Reference document E105P and PSS-SG001 for configuration instructions.
See www.pdnplu.com

Most popular.

## Bus Extender Cable

| | Description | Voltage | Part number |
|---|---|---|---|
|  | 1 meter cable* | 24VDC | **1738-EXT1** |
| | 3 meter cable* | 24VDC | **1738-EXT3** |

* Requires a PSSSE24 Power Extender Module.
IP67 certified.
Reference E117P document for installation instructions.
See www.pdnplu.com

## H Series Micro Bus Extender Cable

| | Description | Voltage | Part number |
|---|---|---|---|
|  | 1 meter cable* | 24VDC | **PSSVEXT1** |

* IP67 certified.

## Replacement Base Module

| | Description | Part number |
|---|---|---|
|  | Base module | **PSSBASE** |

Most popular.

## Using Bus Extender Cables

### Example #1:

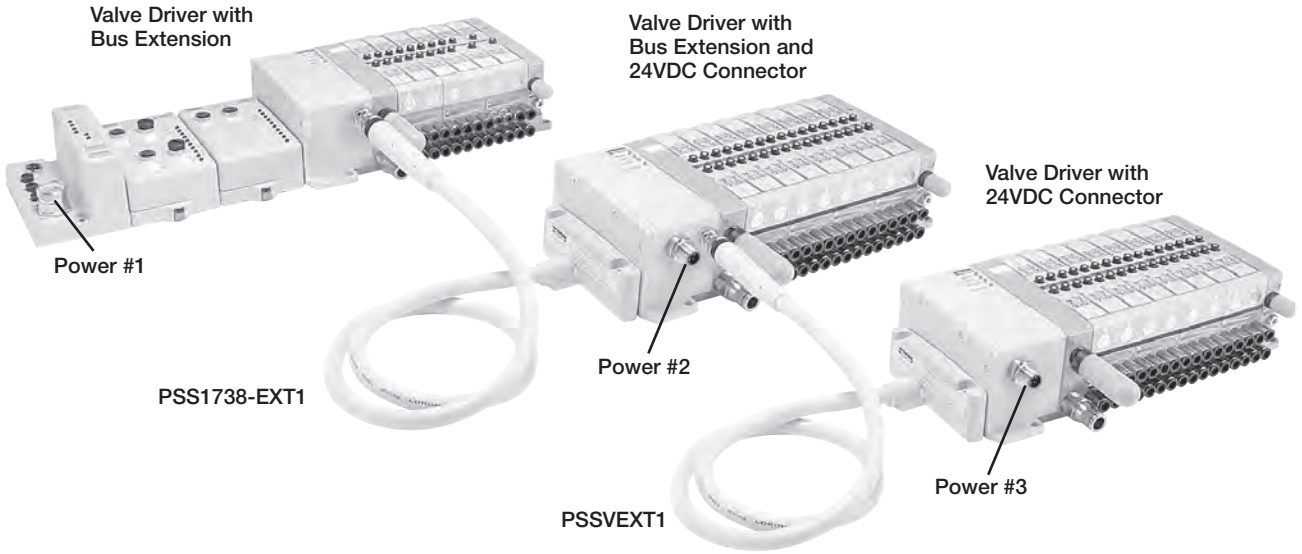
### H Series Micro with Standard Bus Extender Cable

- Separate the communication module and a portion of the I/O from other I/O and the valve manifold
- Commonly used when overall length is restricted
- PSSSE24A is needed on the extension. No 24VDC connector needed on the H Series Network end plate
- Can be used with H Series ISO and H Series Micro valves


### Example #2:

### H Series Micro with Bus Extension on Valve Driver Module – No additional I/O at the Extension

- Add up to three additional valve manifolds without adding another communication module
- No PSSSE24A is needed on the extension when the valve driver module with 24VDC connector is used
- Commonly used when many valves are required
- Bus expansion only available with H Series Micro valves

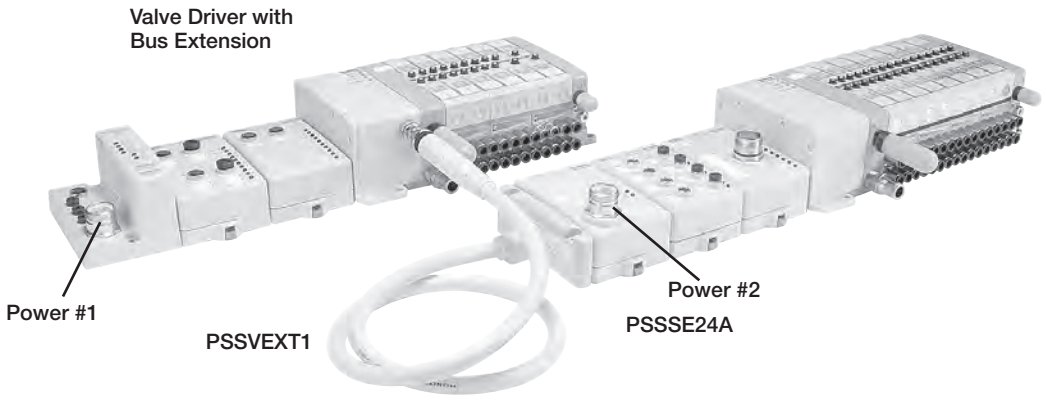


## Using Bus Extender Cables (continued)

### Example #3:

**H Series Micro with Bus Extension on Valve Driver – With I/O at Extension**

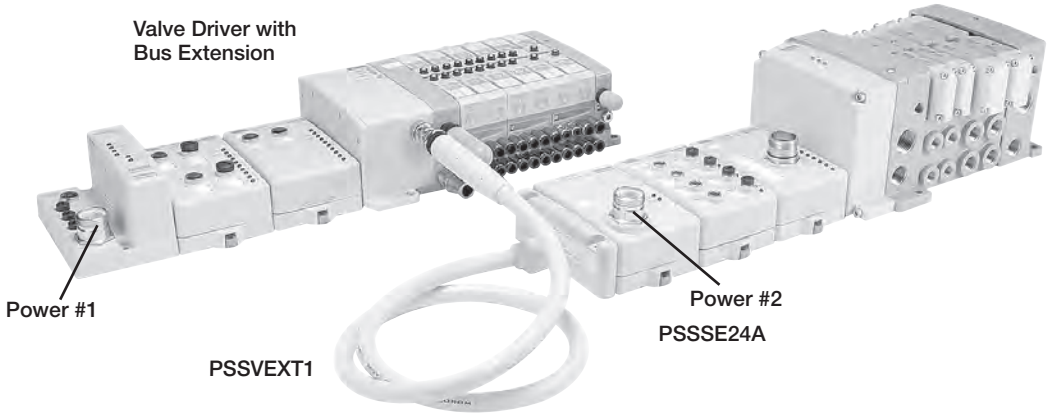
- Add up to three additional valve manifolds without adding another communication module
- PSSSE24A is needed on the extension. No 24VDC connector needed on the H Series Network end plate
- Commonly used when many valves are required, and each location requires additional I/O
- Bus expansion only available with H Series Micro




### Example #4:

**H Series Micro with Bus Extension on Valve Driver Module – With I/O at the Extension and Larger H Series ISO Valve Manifold**

- Add up to two additional H Series Micro valve manifolds and one H Series ISO valve manifold without adding another communication module
- PSSSE24A is needed on the extension
- H Series ISO valve manifold must be the last manifold on the extension
- Commonly used when many valves are required, and each location requires additional I/O
- Bus expansion only available with H Series Micro, H Series ISO manifold must be the last manifold in the system



## Digital I/O Modules

Choose digital I/O modules when you need:

- **Input Modules.** An input module responds to an input signal in the following manner:
  - Input filtering limits the effect of voltage transients caused by contact bounce and/or electrical noise. If not filtered, voltage transients could produce false data. All input modules use input filtering.
  - Optical isolation shields logic circuits from possible damage due to electrical transients.
  - Logic circuits process the signal.
  - An input LED turns on or off indicating the status of the corresponding input device.
- **Output Modules.** An output module controls the output signal in the following manner:
  - Logic circuits determine the output status.
  - An output LED indicates the status of the output signal.
  - Optical isolation separates module logic and bus circuits from field power.
  - The output driver turns the corresponding output on or off.
- **Surge Suppression.** Most output modules have built-in surge suppression to reduce the effects of high-voltage transients. However, we recommend that you use an additional suppression device if an output is being used to control inductive devices, such as:
  - Relays
  - Motor starters
  - Solenoids
  - Motors

  Additional suppression is especially important if your inductive device is in series with, or parallel to, hard contacts such as:
  - Push buttons
  - Selector switches

The digital I/O modules support:

- A wide variety of voltage interface capabilities
- Isolated and non-isolated module types
- Point-level output fault states
- Choice of direct-connect or rack-optimized communications
- Field-side diagnostics on select modules

Connector types are indicated by the catalog number. For example, the PSSN16M12A has an M12 connector.

### Digital DC Input Modules

| | PSSN8M8A<br>PSSN8M12A | PSSN16M12A |
|---|---|---|
| Number of inputs | 8 PNP sourcing | 16 PNP sourcing |
| Key switch position | 1 | |
| Voltage, on-state input, nom. | 24VDC | |
| Voltage, on-state input, min. | 10VDC | |
| Voltage, on-state input, max. | 28.8VDC | |
| Input delay time, ON to OFF | 0.5 ms hardware + (0…65 ms selectable)* | |
| Current, on-state input, min. | 2 mA | |
| Current, on-state input, max. | 5 mA | |
| Current, off-state input, max. | 1.5 mA | |
| Bus power current (mA) | 75 | |
| Power dissipation, max. | 1.0 W @ 28.8VDC | |

* Input ON-to-OFF delay time is the time from a valid input signal to recognition by the module.

### Digital DC Output Modules

| | PSST8M12A<br>PSST8M23A | PSST16M12A |
|---|---|---|
| Number of outputs | 8 PNP sourcing | 16 PNP sourcing |
| Keyswitch position | 1 | |
| Voltage, on-state output, nom. | 24VDC | |
| Voltage, on-state output, min. | 10VDC | |
| Voltage, on-state output, max. | 28.8VDC | |
| Output current rating, max. | 3.0 A per module, 1.0 A per channel | |
| Bus power current (mA) | 75 | |
| Power dissipation, max. | 1.2 W @ 28.8VDC | |

### Relay Output Module

| | PSSTR4M12A |
|---|---|
| Number of outputs | 4 Form A (N.O.) relays, isolated |
| Key switch position | 7 |
| Output delay time, ON to OFF, max. | 26 ms* |
| Contact resistance, initial | 30 mΩ |
| Current leakage, Off-state output, max. | 1.2 mA and bleed resistor thru snubber circuit @ 240V ac |
| Output current rating, max | 8.0 A per module, 2.0 A per channel |
| Bus power current (mA) | 90 |
| Power dissipation, max. | 0.5 W |

*Time from valid output off signal to relay de-energization by module.

## Analog I/O Modules

The H Series Network Portal analog modules support: on-board, channel-level data alarming (four set-points per channel); scaling to engineering units; channel-level diagnostics (electronic bits and LEDs); and integer format.

Choose analog input modules when you need:

- **Individually configurable channels** to use the module(s) with a variety of sensors.
- **On-board scaling** to eliminate the need to scale the data in the controller. Controller processing time and power are preserved for more important tasks, such as I/O control, communications, or other user-driven functions.
- **On-line configuration.** Modules can be configured in the RUN mode using the programming software or the control program. This allows you to change configuration while the system is operating. For example, the input filter for a particular channel could be changed, or a channel could be disabled based on a batch condition. To use this feature, the controller and network interface must also support this feature.
- **Over- and under-range detections and indications.** This eliminates the need to test values in the control program, saving valuable processing power of the controller. In addition, since alarms are handled by the module, the response is faster and only a single bit per channel is monitored to determine if an error condition has occurred.
- **Ability to individually enable and disable channels.** Disabling unused channels improves module performance.
- **Selectable input filters** This lets you select the filter frequencies for each channel that best meets the performance needs of your application based on environmental limitations. Lower filter settings provide greater noise rejection and resolution. Higher filter settings provide faster performance. Note: The analog modules provide four input filter selections.
- **Selectable response to broken input sensor.** This feature provides feedback to the controller that a field device is not connected or operating properly. This lets you specify corrective action based on the bit or channel condition.
- **High accuracy.** The modules share a high accuracy rating of ±0.1% of full-scale accuracy at 25°C.

### Analog Input Modules

| | PSSNACM12A | PSSNAVM12A |
|---|---|---|
| Number of inputs | 2 | 2 |
| Key switch position | 3 | 3 |
| Input signal range | 4…20 mA<br>0…20 mA | -10 to 10VDC<br>0 to 10VDC |
| Input resolution, bits | 16 bits - over 21 mA<br>0.32 µA/cnt | 15 bits plus sign<br>320 µV/cnt in unipolar or bipolar mode |
| Absolute accuracy, current input | 0.1% full scale @ 25°C*† | — |
| Absolute accuracy, voltage input | — | 0.1% full scale @ 25°C*† |
| Input step response, per channel | 70 ms @ notch = 60 Hz (default)<br>80 ms @ notch = 50 Hz<br>16 ms @ notch = 250 Hz<br>8 ms @ notch = 500 Hz | 70 ms @ notch = 60 Hz (default)<br>80 ms @ notch = 50 Hz<br>16 ms @ notch = 250 Hz<br>8 ms @ notch = 500 Hz |
| Input conversion type | Delta Sigma | Delta Sigma |
| Bus power current (mA) | 75 | 75 |
| Power dissipation, max. | 0.6 W @ 28.8VDC | 0.6 W @ 28.8VDC |

* Includes offset, gain, non-linearity and repeatability error terms.

† Analog input modules support these configurable parameters and diagnostics: open-wire with LED and electronic reporting; four-alarm and annunciation set-points; calibration mode and electronic reporting; under- and over-range and electronic reporting; channel signal range and update rate and on-board scaling; filter-type; channel update rate.

## Valve Driver Modules

The PSSV32A and PSSVM32A valve driver modules provide an interface between the H Series Network Portal and the valve assembly. These modules will always be the last on the H Series Network serial bus, and control 32 digital outputs at 24VDC. Depending on the valve selection, a valve driver module can control up to 32 single solenoid valves or 16 double solenoid valves.

PSSV32A is used with H Series ISO valves and PSSVM32A is used with H Series Micro valves.

### Specifications

| | PSSV32A and PSSVM32A |
|---|---|
| Outputs per module | 32, PNP sourcing |
| Voltage drop, on-state output, maximum | 0.2VDC |
| Voltage, off-state output, maximum | 28.8VDC |
| Voltage, on-state output,<br>maximum<br>minimum<br>nominal | <br>28.8VDC<br>10VDC<br>24VDC |
| Output current rating | 200 mA per channel, not to exceed 6.0 A per module |
| Output surge current, maximum | 0.5 A for 10 ms, repeatable every 3 seconds |
| Current leakage, off-state output, Maximum | 0.1 mA |
| Current, on-state output minimum | 200 mA per channel |
| Output delay time OFF to ON, Maximum[1] | 0.1 ms |
| Output delay time, ON to OFF, Maximum[1] | 0.1 ms |
| External DC power supply voltage range | 10 to 28.8VDC |
| External DC power supply voltage nominal | 24VDC |

1. OFF to ON or ON to OFF delay is time from a valid output “on” or “off” signal to output energization or de-energization.

## Select the Appropriate Power Supply

| Part number | Power supply input voltage, nom. | Operating voltage range | Maximum continuous current draw | Power supply inrush current, max. | Input overvoltage protection | Power supply interruption protection |
|---|---|---|---|---|---|---|
| **PSSCENA** | 24VDC | 10...28.8VDC | 10 A | 6 A for 10 ms | Reverse polarity protected | Output voltage will stay within specifications when input drops out for max. load. |
| **PSSCPBA** | | | | | | |
| **PSSSE24A** | | | | | | |

## Power Extender Module

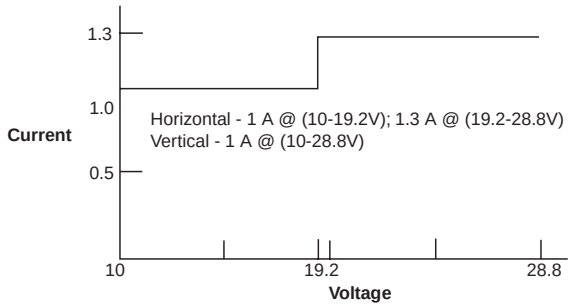
The PSSSE24A expansion power unit passes 24VDC field power to the I/O modules to the right of it. This unit extends the backplane bus power and creates a new field voltage partition segment for driving field devices for up to 13 I/O modules. The expansion power unit separates field power from I/O modules to the left of the unit, effectively providing functional and logical partitioning for:

- Separating field power between input and output modules
- Separating field power to the analog and digital modules
- Grouping modules to perform a specific task or function

You can use multiple expansion power units with any of the communication adapters to assemble a full system. If you are using the PSSCENA adapter, you may use a PSSSE24A expansion power unit to add additional modules. For example, if you had a 36 module system with a PSSCENA adapter, you would have at least two or more PSSSE24A expansion power units to provide more bus power current for modules to the right of the supply.

- 1.3A of additional bus power
- Starts new voltage distribution
- Partitioning for E-Stop wiring

### PSSSE24A Current Derating for Mounting



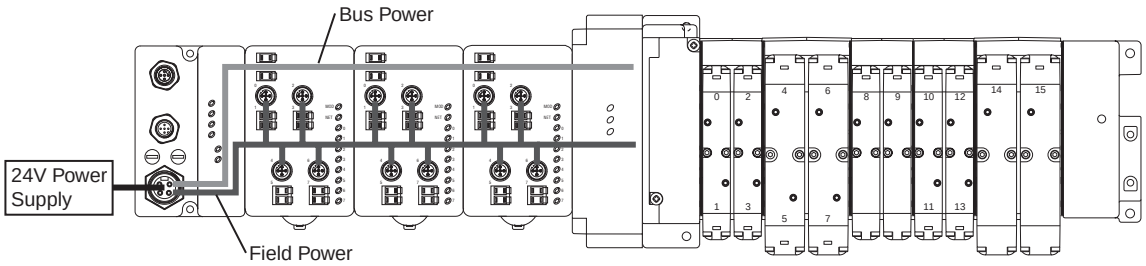

## Power Distribution General Specifications

| | PSSSE24A |
|---|---|
| Power supply requirements | **Note:** In order to comply with CE low voltage directives (LVD), you must use a safety extra low voltage (SELV) or a protected extra low voltage (PELV) power supply to power this adapter |
| Field side power requirements | 24VDC (+20% = 28.8VDC max.) @ 400 mA |
| Inrush current, max. | 6 A for 10 ms |
| Input overvoltage protection | Reverse polarity protected |
| Power supply interruption protection | Output voltage will stay within specifications when input drops out for 10 ms at 10V with max. load |
| Power supply input voltage, nom. | 24VDC |
| Operating voltage range | 10…28.8VDC |
| Power consumption, max. | 9.8 W @ 28.8VDC |
| Power dissipation, max. | 3.0 W @ 28.8VDC |
| Thermal dissipation, max. | 10.0 BTU/hr @ 28.8VDC |
| Isolation voltage | 1250V rms |
| Bus power supply current, max. | 1.5 A |
| Field power supply current, max. | 10 A |

## Power Distribution Options for H Series ISO

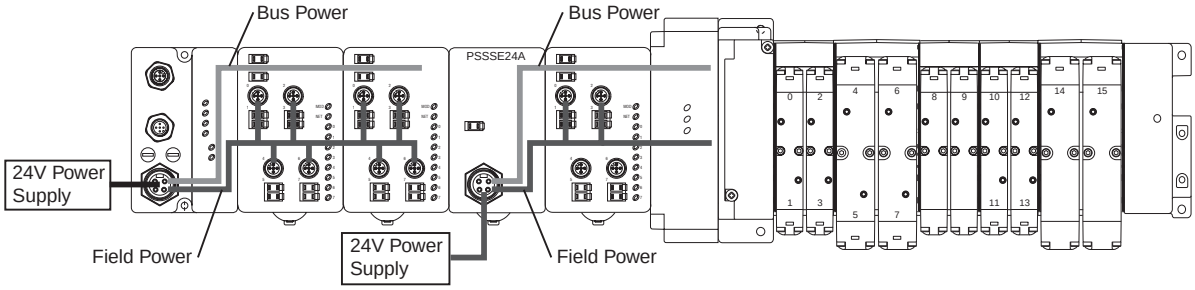
### H Series Network Communication and I/O Modules

An auxiliary 24VDC power supply from the communication module provides power to the backplane bus power and I/O module field power. You can connect up to 13 I/O modules with a maximum of 10A field power, using the auxiliary power.




### H Series Network Portal with 24VDC Expansion Power Unit (PSSSE24A)

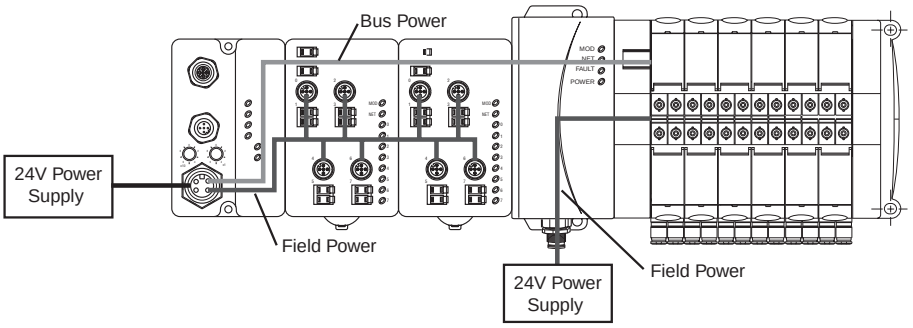
The auxiliary power from the communication module supports up to 13 I/O modules with a maximum of 10A field power. The 24VDC power extender module (PSSSE24A) extends the backplane bus power and I/O Module field power to support up to 13 more I/O modules. Connect additional power extender modules to expand the I/O assembly up to the maximum of 63 I/O modules. This secondary 24VDC connector on the PSSSE24A can be wired into an emergency stop circuit.



## Additional Power Distribution Options for H Series Micro

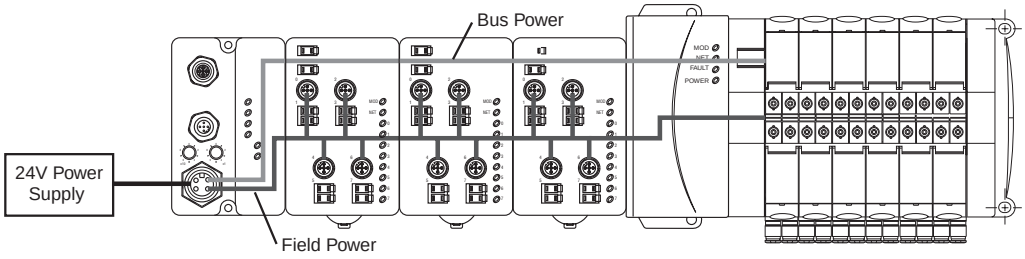
### H Series Network Communication Module and Valve Driver Module with 24VDC Connector

The 24VDC power supply from the communication adaptor provides power to the backplane bus power and I/O module field power for up to 13 modules and an adapter with a maximum of 10A field power. In this configuration, backplane bus power and I/O module field power are supplied to the input and output modules. The communication module only supplies backplane bus power to the valve driver module, as the H Series Micro with 24VDC connector separates the field power from the rest of the network. This secondary 24VDC connector on the valve driver module supplies field power to the valves, and can be wired into an emergency stop circuit.




### H Series Network Communication and I/O Modules

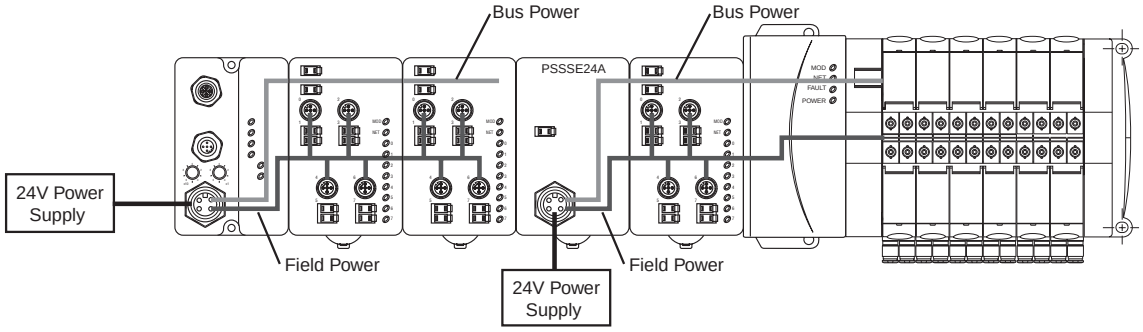
The 24VDC power supply from the communication module provides power to the backplane bus power and I/O module field power. You can connect up to 13 modules and an adapter with a maximum of 10A field power, using this power source.




### H Series Network Communication and I/O Modules

The 24VDC power supply from the communication module provides power to the backplane bus power and I/O module field power. You can connect up to 13 modules and an adapter with a maximum of 10A field power, using this power source.

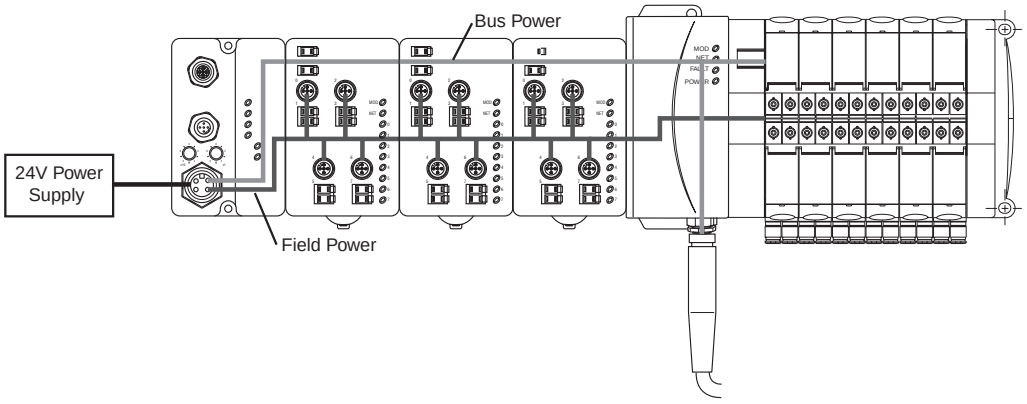
The 24VDC power extender module (PSSSE24A) extends the backplane bus power and I/O module field power to support up to 13 more modules. Connect additional power extender modules to expand the assembly up to the maximum of 63 I/O modules. The valve driver module is the last module on the system, and will draw bus power and field power from the PSSSE24A to the left of it. This secondary 24VDC connector on the PSSSE24A can be wired into an emergency stop circuit.



## Power Distribution Options for H Series Micro (Continued)

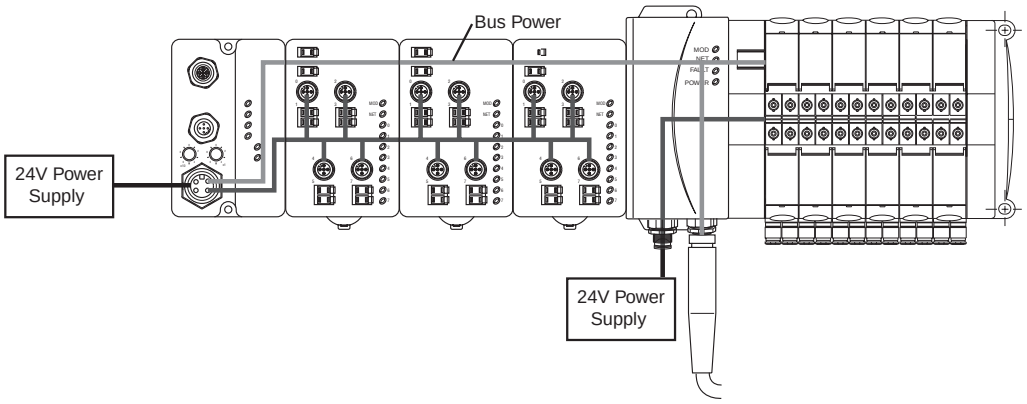
### H Series Network Communication Module with Bus Extension Connector and I/O Modules

The 24VDC power supply from the communication module provides power to the backplane bus power and I/O module field power. You can connect up to 13 modules and an adapter with a maximum of 10A field power, using this power source. The H Series Micro with bus extension connector carries backplane bus power and communication down to another H Series network assembly through the PSSVEXT1 cable. If additional H Series Network input and output modules or H Series ISO valve manifold is used on this extension, a PSSSE24A power extender module is required to provide field power. If the extension is attached directly to an H Series Micro manifold, field power can be supplied directly by using the 24VDC connector option.




### H Series Network Communication Module with 24VDC and Bus Extension Connectors and I/O Modules

The 24VDC power supply from the communication module provides power to the backplane bus power and I/O module field power. In this configuration, bus power and field power are supplied to the input and output modules. The communication module only supplies bus power to the valve driver module, as the 24VDC connector separates the field power from the rest of the network. This secondary 24VDC connector on the valve driver module supplies field power to the valves, and can be wired into an emergency stop circuit. The bus extension connector carries bus power and communication down to another H Series Network assembly through the PSSVEXT1 cable. If additional H Series Network input and output modules or H Series ISO valve manifold is used on this extension, a PSSSE24A power extender module is required to provide field power. If the extension is attached directly to an H Series Micro manifold with 24VDC connector, field power can be supplied directly by using the 24VDC connector option.



## Placing H Series Network Modules

### Maximum Size Layout

| Part number | Bus power supply | Maximum I/O modules with 24VDC backplane current at 75 mA each | Maximum I/O modules with expansion power supplies |
|---|---|---|---|
| PSSCENA on EtherNet/IP | 1000 | Up to 13 | 63 |
| PSSCPBA on PROFIBUS | | | |
| PSSSE24A Expansion Power | Horizontal mounting: 1A @ 10...19.2V input; 1.3A @ 19.2...28.8V input<br>Vertical mounting: 1A @ 10...28.8V input | | |

### Power Supply Distance Rating

Modules are placed to the right of the power supply. Each H Series Network module can be placed in any of the slots to the right of the power supply until the usable backplane current of that supply has been exhausted. A communication module provides 1 A current to the PointBus. The power extend module, PSSSE24A, provides up to 1.3 A and I/O modules require from 75 mA (typical for the digital and analog I/O modules) up to 90 mA or more.

### Current Requirements

| Part number | PointBus current requirements |
|---|---|
| **PSSN8xxx** | 75 mA |
| **PSSP8xxx** | |
| **PSST8xxx** | |
| **PSSN16xxx** | |
| **PSST16xxx** | |
| **PSSTR4MRA** | 90 mA |
| **PSSNACM12A** | 75 mA |
| **PSSNAVM12A** | |
| **PSSV32A** | |
| **PSSVM32A** | |

## Related Documentation

Additional user documentation presents information according to the tasks performed and the programming environment used. Refer to the table below for information on H Series Network Portal products.

### H Series Network Portal Related Publications*

| | Part number | Description | Instruction sheet* |
|---|---|---|---|
| General information | — | Industrial automation wiring and grounding guidelines | E115P |
| | | Safety guidelines for the application, installation and maintenance of solid state control | E116P |
| Communication interfaces | **PSSCENA** | H Series EtherNet/IP 10/100 Mbps adapter module | E104P, installation instructions |
| | **PSSCPBA** | H Series PROFIBUS adapter module | E102P, installation instructions |
| Valve driver module | **PSSV32A, PSSVM32A** | 32 Point valve driver module | E100P |
| DC I/O | **PSSN16M12A** | 24VDC 16 sink input w/8 M12 connectors, 2 points per connector | E106P |
| | **PSSN8M8A** | 24VDC 8 sink input w/8 M8 connectors | |
| | **PSSN8M12A** | 24VDC 8 sink input w/4 M12 connectors, 2 points per connector | |
| | **PSST16M12A** | 24VDC 16 source output w/8 M12 | E107P |
| | **PSST8M12A** | 24VDC 8 source output w/4 M12 | |
| | **PSST8M23A** | 24VDC 8 source output w/8 M8 | |
| Analog | **PSSNACM12A** | 24VDC analog current input w/ 2 M12 connectors | E110P |
| | **PSSNAVM12A** | 24VDC 2 analog voltage input w/ 2 M12 connectors | |
| Power unit | **PSSSE24A** | 24VDC expansion power supply | E105P |
| Relay output | **PSSTR4M12A** | 4 from A isolated (normally open) electromechanical relays | E109P |

* Publications are electronic versions only. To make copies of these publications, go to: www.pdnplu.com

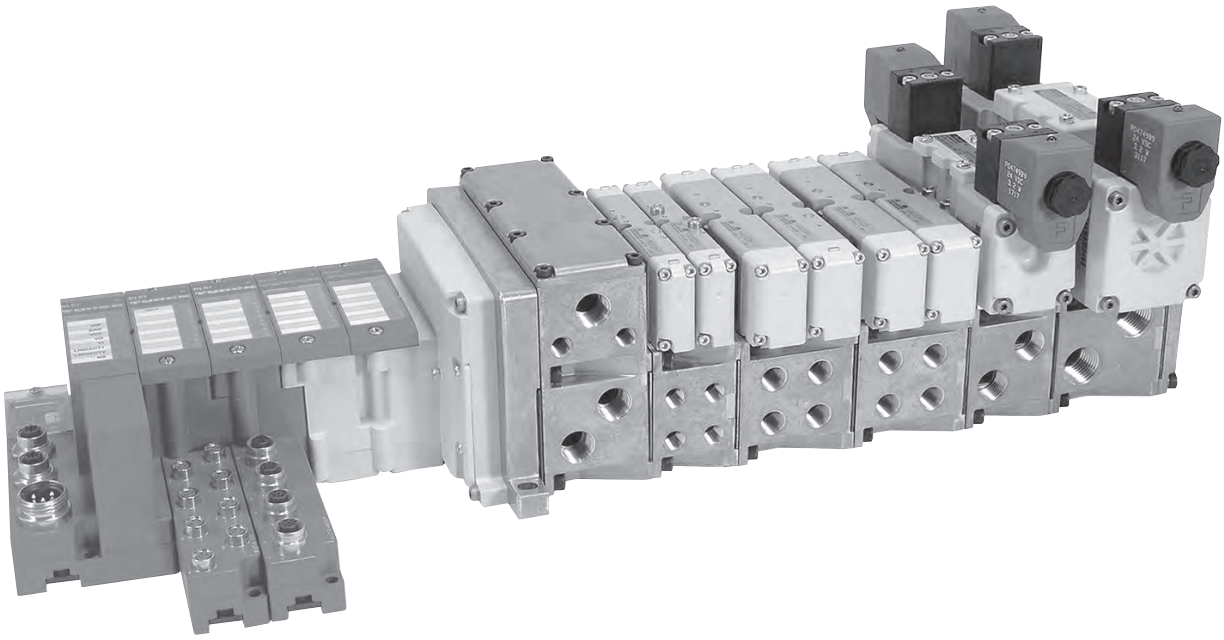
## The Turck Network Portal

Turck Network Portal has four major components:

- **Valve Driver Module** provide control for either 16 or 32 solenoids on a manifold
- **I/O Modules** provide the field interface and system-interface circuitry
- **Communication Modules** provide the network-interface circuitry
- **Power Distribution Module** provide 5 additional power inputs to the Turck system

## Turck Features

- Highly modular design (4pt – 16pt modularity)
- Broad application coverage
- Expandable 4 port Class A IO-Link master
- Channel-level diagnostics (LED and electronic)
- Channel-level alarm and annunciation (electronic)
- Channel-level open-wire detection with electronic feedback
- Channel-level short-circuit detection with electronic feedback
- Horizontal and vertical mounting without derating
- 5g vibration
- Electronic and mechanical keying
- Robust backplane design
- Quick-disconnects for I/O and network connectivity
- Built-in panel grounding
- Color-coded module labels
- UL, cCSAus, and CE certifications (as marked)
- Highly reliable structural integrity
- Optical isolation between field and system circuits



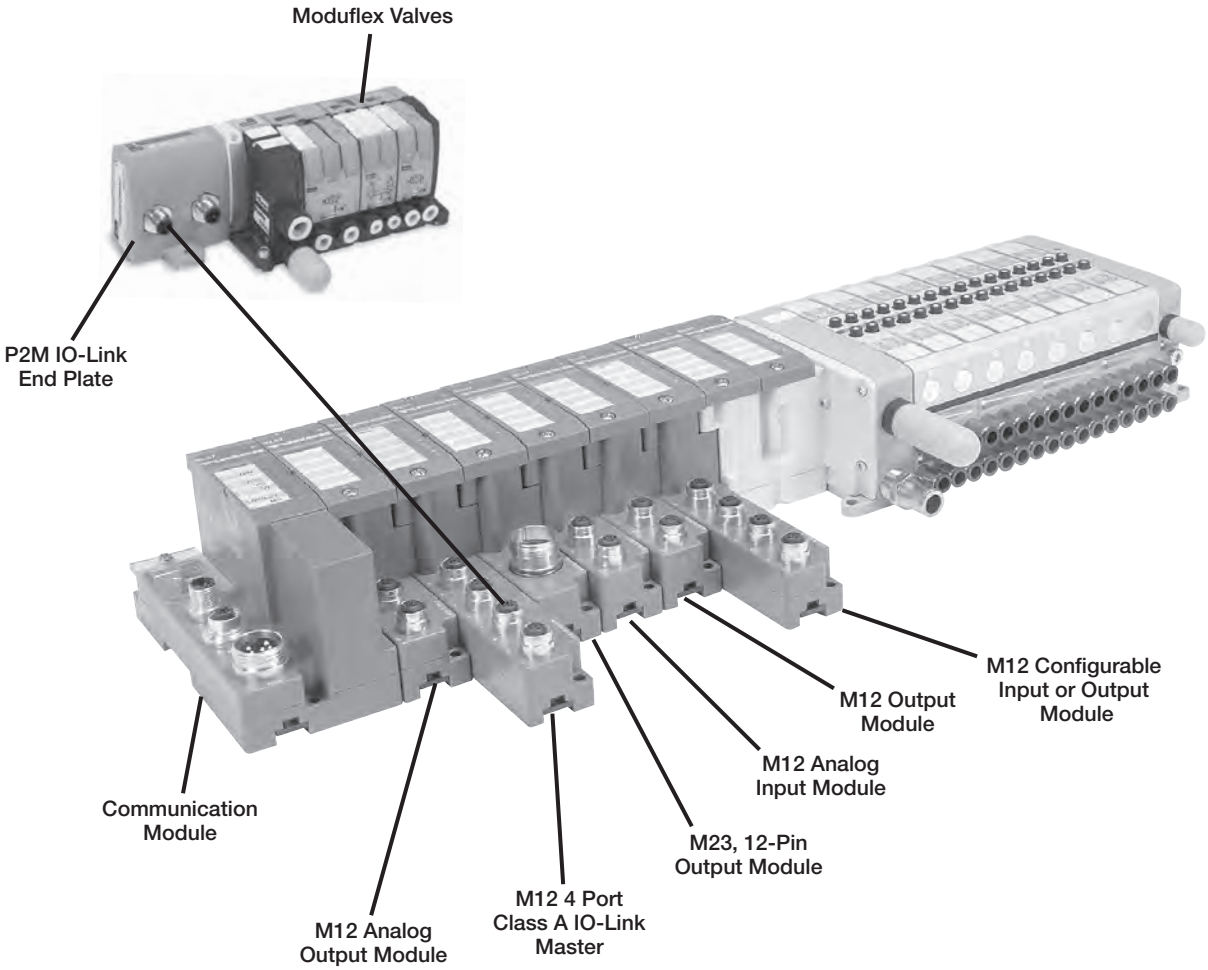
## Turck Network Portal

- A complete network communication offering for all H Series ISO and H Series Micro valves
- CSA, cULus and CE certifications (as marked)

## I/O Configuration

- Centralized Turck Network Portal
- Pneumatics and I/O are in close proximity with one another
- M23, 12-Pin or 19-Pin output extension to an additional H Series valve manifold
- I/O density per module = 4, 8 or 16

EtherNet/IP™ DeviceNet™ PROFIBUS PROFINET Modbus/TCP™ CANopen




**Configure / Program any module with RS232, or directly through Ethernet for any module with an Ethernet physical layer.**

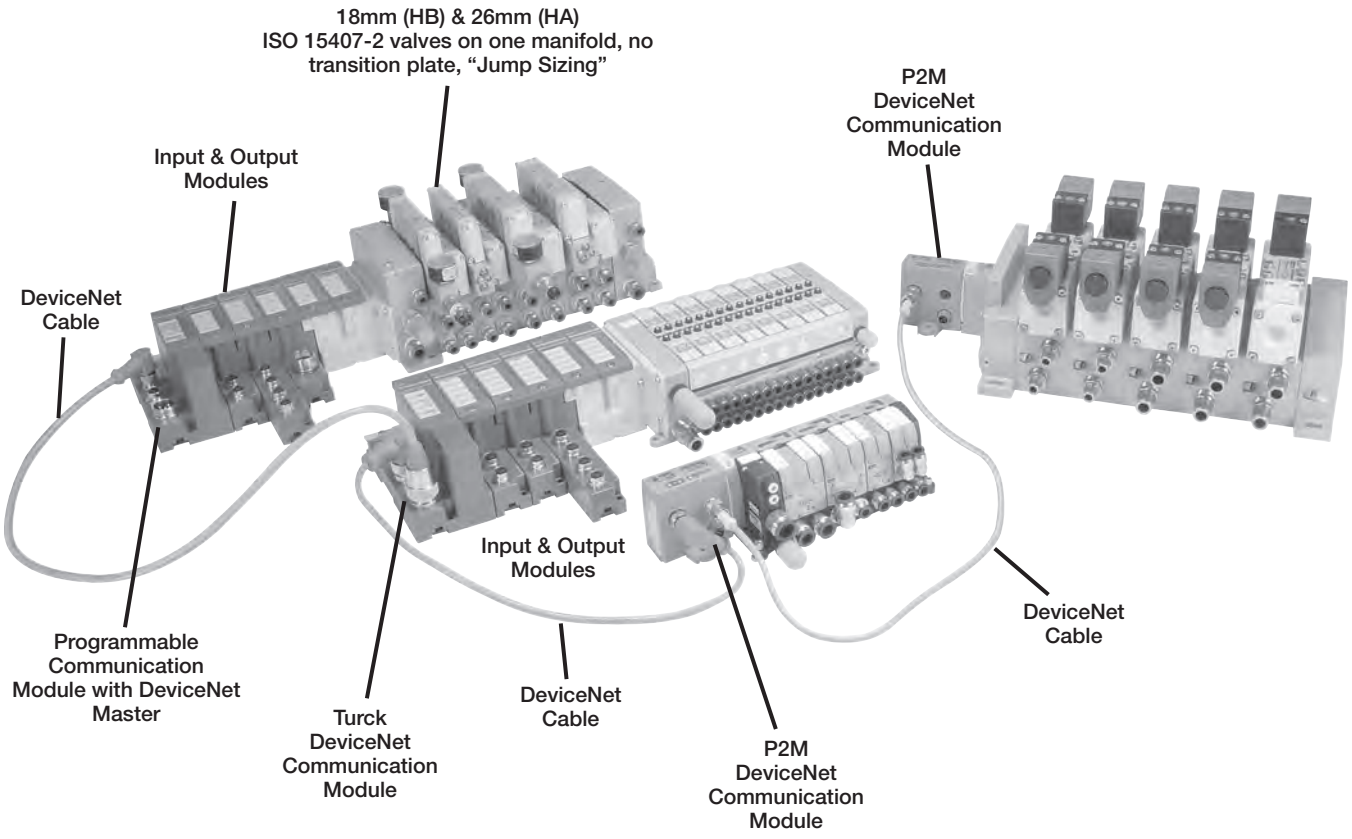
## Turck Network Portal

- A complete network communication offering for all H Series ISO and H Series Micro valves.
- CSA, cCSAus and CE certifications (as marked).

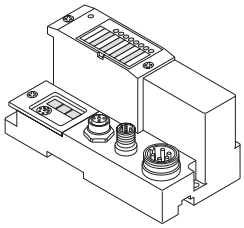
## I/O Configuration

- Complete control of all I/O and valves with stand alone control
- Additional I/O and valves connected over DeviceNet with BL Remote Subnet
- BL Remote connection to P2M and Turck DeviceNet equipped communication modules
- I/O density per module = 4, 8 or 16

EtherNet/IP™ DeviceNet PROFIBUS PROFINET Modbus/TCP™ CANopen



## Communications Module

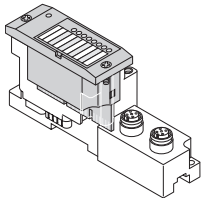


BL67 communication modules are the heart of a BL67 station. They are designed to connect the modular nodes to the higher level network (PROFIBUS-DP, DeviceNet, CANopen, Ethernet).

All BL67 electronic modules communicate over the internal module bus with the communication modules. The communication module structures the data and sends them clustered via network nodes to the higher control system.

This way all I/O modules can be configured independently of the system.

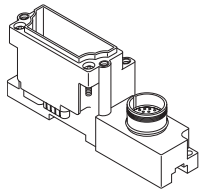
## Electronic Module



BL67 electronic modules are inserted into the passive base modules from above and then simply affixed with two screws. Maintenance is extremely simplified due to the separation of connection level and module electronics.

Moreover, flexibility is enhanced because the base modules provide different types of connectors. Voltage supply for the electronic modules is either provided via the communication modules or a Power Extender module. Power Extender modules can be used to create galvanically isolated potential groups.

## Base Module



BL67 base modules are aligned one by one to the right of the communication module and are tightened each with two screws, either with the communication modules or with the previous module. A DIN rail is not required. This way a compact and stable unit is created which can be mounted directly on the machine.

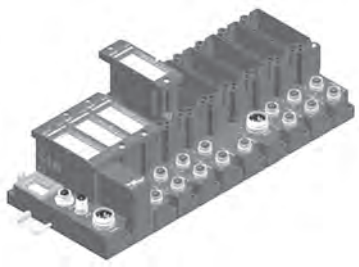
The base modules serve for connection of the field devices an are available with different connection types (M8, M12, M23 and 7/8).

A BL67 system can be extended to a total length of 1 m, comprising of a communication module for PROFIBUS-DP, DeviceNet / CANopen or Ethernet and a maximum of 32 modules.

System supply: The power supply for the BL67 system is either derived separately for Profibus-DP and Ethernet communication modules or directly from the DeviceNet / CANopen cable for the DeviceNet / CANopen communication module.

Power Extender modules can be inserted anywhere in the BL67 station. They provide isolated field voltage for the I/O modules mounted to their right.

Thus Power Extender modules can also be used to create different potential groups.



## Maximum System Extension

| | | PROFIBUS | | DeviceNet | | CANopen | | ModbusTCP | | EtherNet/IP | | PROFINET | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Number of | | Number of | | Number of | | Number of | | Number of | | Number of | |
| Module type | | chan. | mod. | chan. | mod. | chan. | mod. | chan. | mod. | chan. | mod. | chan. | mod. |
| Digital inputs | 4 DI | 128 | 32 | 128 | 32 | 128 | 32 | 128 | 32 | 128 | 32 | 128 | 32 |
| | 8 DI | 256 | 32 | 256 | 32 | 256 | 32 | 256 | 32 | 256 | 32 | 256 | 32 |
| Digital outputs | 4 DO | 128 | 32 | 128 | 32 | 128 | 32 | 128 | 32 | 128 | 32 | 128 | 32 |
| | 8 DO | 256 | 32 | 256 | 32 | 256 | 32 | 256 | 32 | 256 | 32 | 256 | 32 |
| | 16 DO | 512 | 32 | 512 | 32 | 512 | 32 | 512 | 32 | 512 | 32 | 512 | 32 |
| Analog inputs | 2AI | 64 | 32 | 64 | 32 | 64 | 32 | 64 | 32 | 64 | 32 | 64 | 32 |
| | 4AI | 112 | 28 | 124 | 31 | 124 | 31 | 128 | 32 | 128 | 32 | 128 | 32 |
| | 2 AI-PT | 56 | 28 | 64 | 32 | 64 | 32 | 64 | 32 | 64 | 32 | 64 | 32 |
| | 2 AI-TC | 64 | 32 | 64 | 32 | 64 | 32 | 64 | 32 | 64 | 32 | 64 | 32 |
| Analog outputs | 2 AO-I | 38 | 19 | 64 | 32 | 64 | 32 | 64 | 32 | 64 | 32 | 64 | 32 |
| | 2 AO-V | 38 | 19 | 50 | 25 | 50 | 25 | 50 | 25 | 50 | 25 | 50 | 25 |

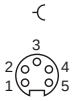
## BL67-GW-DN

DeviceNet Communication Module with Power Over the Network

**7/8 Mini bus in wiring, view into male connector**


1 = Shield
2 = RD (V +)
3 = BK (V -)
4 = WH (CAN H)
5 = BU (CAN L)

**7/8 Mini bus out wiring, view into female connector**



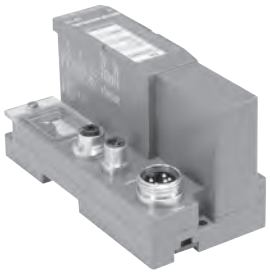

1 = Shield
2 = RD (V +)
3 = BK (V -)
4 = WH (CAN H)
5 = BU (CAN L)

Turck Network Portal with up to 256 inputs, outputs, and 32 solenoids per H Series Micro or H Series ISO manifold. Digital inputs / outputs, analog inputs / outputs, serial interface, and counter modules are available. DeviceNet communication speeds selectable between 120, 250, 500 kbps, and CANopen communication speeds are selectable between 10 kbps up to 1 Mbps. Addressing for either module can be selected via rotary switches or set through software.

With the Power over the Network feature, it is only necessary to connect one cable to the communication module. For networks requiring additional power, a Bus Power Tee can be installed to combine separate network and power feeds into the communication module. See the Cables and Cordsets section for additional information.

## BL67-GW-CO

CANopen Communication Module



**M12 A-code bus out Wiring, view into female connector**


1 = Shield
2 = RD (V +)
3 = BK (V -)
4 = WH (CAN H)
5 = BU (CAN L)

**M12 A-code bus In Wiring, view into male connector**


1 = Shield
2 = RD (V +)
3 = BK (V -)
4 = WH (CAN H)
5 = BU (CAN L)

**7/8 Mini Power in wiring, view into male connector**


1 = GND
2 = GND
3 = PE
4 = $V_i$
5 = $V_o$

Turck Network Portal with up to 256 inputs, outputs, and 32 solenoids per H Series Micro or H Series ISO manifold. Digital inputs / outputs, analog inputs / outputs, serial interface, and counter modules are available. CANopen communication speeds are selectable between 10 kbps up to 1 Mbps, and addressing can be selected via rotary switches or set through software.

## BL67-GW-DPV1

PROFIBUS Communication Module

**M12 B-code bus out Wiring, view into female connector**


1 = 5 VDC
2 = GN (Bus A)
3 = GND
4 = RD (Bus B)
5 = Shield

**M12 B-code bus In Wiring, view into male connector**


1 = n.c.
2 = GN (Bus A)
3 = n.c.
4 = RD (Bus B)
5 = Shield

**7/8 Mini Power in wiring, view into male connector**


1 = GND
2 = GND
3 = PE
4 = $V_i$
5 = $V_o$

Turck Network Portal with up to 256 inputs, outputs, and 32 solenoids per H Series Micro or H Series ISO manifold. Digital inputs / outputs, analog inputs / outputs, serial interface, and counter modules are available. PROFIBUS communication speeds are selectable between 9.6 kbps up to 12 Mbps, and addressing can be selected via rotary switches or set through software.

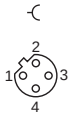
## BL67-GW-EN

Modbus/TCP, EtherNet/IP, and PROFINET

## BL67-GW-EN-PN

PROFINET Communication Module

**M12 D-code Ethernet in Wiring, view into female connector**




1 = YE (TX+)
2 = WH (RX+)
3 = OG (TX-)
4 = BU (RX-)

**7/8 Mini Power in wiring, view into male connector**


1 = GND
2 = GND
3 = PE
4 = $V_i$
5 = $V_o$

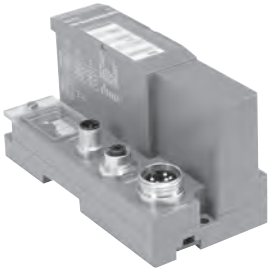
Turck Network Portal with up to 256 inputs, outputs, and 32 solenoids per H Series Micro or H Series ISO manifold. Digital inputs / outputs, analog inputs / outputs, serial interface, and counter modules are available. Communication speeds of 10/100 Mbps, and addressing can be selected via rotary switches, BOOTP, DHCP, or through software.

## BL67-GW-EN-DN

Modbus/TCP Communication Module with DeviceNet Subnet

## BL67-GW-EN-IP-DN

EtherNet/IP Communication Module with DeviceNet Subnet



**DeviceNet OUT**


1 = Shield
2 = RD (V +)
3 = BK (V -)
4 = WH (CAN H)
5 = BU (CAN L)

**M12 D-code Ethernet in Wiring, view into female connector**


1 = YE (TX+)
2 = WH (RX+)
3 = OG (TX-)
4 = BU (RX-)

**7/8 Mini Power in wiring, view into male connector**


1 = GND
2 = GND
3 = PE
4 = $V_i$
5 = $V_o$

With BL Remote DeviceNet subnet functionality, each communication module has its own DeviceNet master which provides a connection for 63 DeviceNet nodes with additional inputs, outputs, and solenoid control. BL Remote DeviceNet subnet is independent of the main network, and is not visible to the master PLC.

## BL67-PG-EN-DN

Modbus/TCP Programmable Communication Module with DeviceNet Subnet

## BL67-PG-EN-IP-DN

EtherNet/IP Programmable Communication Module with DeviceNet Subnet

**DeviceNet OUT**


1 = Shield
2 = RD (V +)
3 = BK (V -)
4 = WH (CAN H)
5 = BU (CAN L)

**M12 D-code Ethernet in Wiring, view into female connector**


1 = YE (TX+)
2 = WH (RX+)
3 = OG (TX-)
4 = BU (RX-)

**7/8 Mini Power in wiring, view into male connector**


1 = GND
2 = GND
3 = PE
4 = $V_i$
5 = $V_o$

Communication modules are equipped with a built in standalone controller which is programmed according to IEC61131-3 with CoDeSys. Each module has 512KB Program memory with 32 bit RISC processor, and can run 1000 instructions in less than 1 ms. These network equipped modules are optimized to interface with PLC's with network capability or act as standalone controllers that need to interface with other network equipped devices.

With BL Remote DeviceNet subnet functionality, each communication module has its own DeviceNet master which provides a connection for 63 DeviceNet nodes with additional inputs, outputs, and solenoid control. BL Remote DeviceNet subnet is independent of the main network, and is not visible to the master PLC.

## BL67-PG-DP

PROFIBUS Programmable Communication Module

## BL67-PG-EN

Modbus/TCP Programmable Communication Module

## BL67-PG-EN-IP

EtherNet/IP Programmable Communication Module

**Profibus Wiring**

**M12 B-code bus out Wiring, view into female connector**


1 = 5 VDC
2 = GN (Bus A)
3 = GND
4 = RD (Bus B)
5 = Shield

**M12 B-code bus in Wiring, view into female connector**


1 = n.c.
2 = GN (Bus A)
3 = n.c.
4 = RD (Bus B)
5 = Shield

**Ethernet Wiring**

**M12 D-code Ethernet in Wiring, view into female connector**


1 = YE (TX+)
2 = WH (RX+)
3 = OG (TX-)
4 = BU (RX-)

**7/8 Mini Power in wiring, view into male connector Common to modules**


1 = GND
2 = GND
3 = PE
4 = $V_i$
5 = $V_o$

Communication modules are equipped with a built in standalone controller which is programmed according to IEC61131-3 with CoDeSys. Each module has 512KB Program memory with 32 bit RISC processor, and can run 1000 instructions in less than 1 ms. These network equipped modules are optimized to interface with PLC's with network capability or act as standalone controllers that need to interface with other network equipped devices.

| | Base Modules | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | BL67-B-4M8 | BL67-B-8M8 | BL67-B-1M12 | BL67-B-1M12-8 | BL67-B-2M12 | BL67-B-2M12-P | BL67-B-4M12 | BL67-B-4M12-P | BL67-B-1M23 | BL67-B-1M23-19 | BL67-B-1RSM | BL67-B-1RSM-4 | BL67-1RSM-VO |
| **Power Extender Modules** | | | | | | | | | | | | | |
| BL67-PF-24VDC | | | | | | | | | | | ✔ | ✔ | ✔ |
| **Digital Input Modules** | | | | | | | | | | | | | |
| BL67-4DI-P | ✔ | | | | ✔ | ✔ | ✔ | | ✔ | | | | |
| BL67-8DI-P | | ✔ | | | | | ✔ | ✔ | ✔ | | | | |
| BL67-4DI-PD | ✔ | | | | ✔ | ✔ | ✔ | | ✔ | | | | |
| BL67-8DI-PD | | ✔ | | | | | ✔ | ✔ | ✔ | | | | |
| BL67-4DI-N | ✔ | | | | ✔ | ✔ | ✔ | | ✔ | | | | |
| BL67-8DI-N | | ✔ | | | | | ✔ | ✔ | ✔ | | | | |
| **Digital Output Modules** | | | | | | | | | | | | | |
| BL67-4DO-0.5A-P | ✔ | | | | ✔ | ✔ | ✔ | | ✔ | | | | |
| BL67-4DO-2A-P | ✔ | | | | ✔ | ✔ | ✔ | | ✔ | | | | |
| BL67-8DO-0.5A-P | | ✔ | | | | | ✔ | ✔ | ✔ | | | | |
| BL67-16DO-0.1A-P | | | | | | | | | | ✔ | | | |
| BL67-4DO-2A-N | ✔ | | | | ✔ | ✔ | ✔ | | ✔ | | | | |
| BL67-8DO-0.5A-N | | ✔ | | | | | ✔ | ✔ | ✔ | | | | |
| **Relay Output Modules** | | | | | | | | | | | | | |
| BL67-8DO-R-NO | | | | | | | | ✔ | | | | | |
| **Digital Input / Output Modules** | | | | | | | | | | | | | |
| BL67-4DI4DO-PD | | ✔ | | | | | ✔ | ✔ | ✔ | | | | |
| **Configurable Digital Input / Output Modules** | | | | | | | | | | | | | |
| BL67-8XSG-PD | | ✔ | | | | | ✔ | ✔ | ✔ | | | | |
| **Analog Input Modules** | | | | | | | | | | | | | |
| BL67-2AI-I | | | | | ✔ | | | | | | | | |
| BL67-2AI-V | | | | | ✔ | | | | | | | | |
| BL67-4AI-V/I | | | | | | | ✔ | | | | | | |
| BL67-2AI-PT | | | | | ✔ | | | | | | | | |
| BL67-2AI-TC | | | | | ✔ | | | | | | | | |
| **Analog Output Modules** | | | | | | | | | | | | | |
| BL67-2AO-I | | | | | ✔ | | | | | | | | |
| BL67-2AO-V | | | | | ✔ | | | | | | | | |
| **Technology Modules** | | | | | | | | | | | | | |
| BL67-1RS232 | | | ✔ | ✔ | | | | | ✔ | | | | |
| BL67-1RS485/422 | | | ✔ | ✔ | | | | | ✔ | | | | |
| BL67-1SSI | | | | ✔ | | | | | ✔ | | | | |
| BL67-1CNT/ENC | | | | ✔ | | | | | ✔ | | | | |
| BL67-1CVI | | | ✔ | | | | | | | | | | |
| **BL *Ident*® RFID Modules** | | | | | | | | | | | | | |
| BL67-2RFID-A | | | | | ✔ | | | | | | | | |
| BL67-2RFID-S | | | | | ✔ | | | | | | | | |

## System Supply via the Module Bus

The number of BL67 modules that can be powered by the communication module, depends on the nominal current draw of all the modules in the system. The total bus power current consumption of the installed BL67 modules may not exceed 1.5 A. The total field power current for inputs may not exceed 4 A, and the total field power for outputs may not exceed 8 A for DeviceNet and CANopen with power over the network, or 10A for all other communication modules.

When using the software PACTware, the menu item <Station - Verify> will automatically generate an error message if the system supply via the module bus is not reliably ensured.

## Nominal Current Consumption

The following table shows the nominal current consumption of the various BL67 modules:

| Modules | Bus power current (mA) | Field power for inputs[1)] (mA) | Field power for outputs (mA) |
|---|---|---|---|
| PROFIBUS-DP communication module | 0 | | 150 |
| DeviceNet communication module | 0 | | 150 |
| CANopen communication module | 0 | | 150 |
| Ethernet communication module | 0 | | 150 |
| Valve driver with 16 outputs | 30 | | < 109 mA (plus load current) |
| Valve driver with 32 outputs | 60 | | < 218 mA (plus load current) |
| BL67-PF-24VDC | 30 | | 9 |
| BL67-4DI-P | 30 | < 49 mA | |
| BL67-4DI-N | 30 | < 10 mA | |
| BL67-4DI-PD | 30 | < 109 mA | |
| BL67-8DI-P | 30 | < 49 mA | |
| BL67-8DI-N | 30 | < 10 mA | |
| BL67-8-DI-PD | 30 | < 109 mA | |
| BL67-4DO-0.5A-P | 30 | | < 109 mA (plus load current) |
| BL67-4DO-2A-P | 30 | | < 109 mA (plus load current) |
| BL67-4DO-2A-N | 30 | | < 109 mA (plus load current) |
| BL67-8DO-0.5A-P | 30 | | < 109 mA (plus load current) |
| BL67-8DO-0.5A-N | 30 | | < 109 mA (plus load current) |
| BL67-16DO-0.1A-P | 30 | | < 109 mA (plus load current) |
| BL67-4DI4DO-PD | 30 | | < 109 mA (plus load current) |
| BL67-8XSG-PD | 30 | | < 109 mA (plus load current) |
| BL67-8DO-R-NO | 30 | | < 109 mA (plus load current) |
| BL67-2AI-V | 35 | < 22 mA | |
| BL67-2AI-I | 35 | < 22 mA | |
| BL67-4AI-I/V | 35 | < 22 mA | |
| BL67-2AI-TC | 35 | < 40 mA | |
| BL67-2AI-PT | 45 | < 58 mA | |
| BL67-2AO-I | 40 | | < 62 mA |
| BL67-2AO-V | 60 | | < 67 mA |
| BL67-1RS232 | 140 | < 90 mA | |
| BL67-1RS485/422 | 60 | < 42 mA | |
| BL67-1SSI | 50 | < 39 mA | |
| BL67-1CNT/ENC | 30 | < 109 mA | |
| BL67-1CVI | 30 | < 109 mA | |

1) Is limited to 4A by means of the integrated short-circuit protection.

## Digital Input Modules

| | I/O modules | Voltage | Part number |
|---|---|---|---|
|  | 8 PNP input module | 7 to 30 VDC | **BL67-8DI-P** |
| | 8 PNP input module, with diagnostics | 7 to 30 VDC | **BL67-8DI-PD** |
| | 8 NPN input module | 24 VDC | **BL67-8DI-N** |

| | Base module | Part number |
|---|---|---|
|  | 8 x M8, 3 pole, female | **BL67-B-8M8** |
|  | 4 x M12, 5 pole, female, A-code | **BL67-B-4M12** |
|  | 4 x M12, 5 pole, female, A-code | **BL67-B-4M12-P** |
|  | 1 x M23, 12 pole, female | **BL67-B-1M23** |

| I/O modules | Voltage | Part number |
|---|---|---|
| 4 PNP input module | 7 to 30 VDC | **BL67-4DI-P** |
| 4 PNP input module, with diagnostics | 7 to 30 VDC | **BL67-4DI-PD** |
| 4 NPN input module | 24 VDC | **BL67-4DI-N** |

| | Base module | Part number |
|---|---|---|
|  | 4 x M8, 3 pole, female | **BL67-B-4M8** |
|  | 2 x M12, 5 pole, female, A-code | **BL67-B-2M12** |
|  | 2 x M12, 5 pole, female, A-code | **BL67-B-2M12-P** |
|  | 4 x M12, 5 pole, female, A-code | **BL67-B-4M12** |
|  | 1 x M23, 12 pole, female | **BL67-B-1M23** |

## Digital Output Modules

| | I/O modules | Output current | Part number |
|---|---|---|---|
|  | 8 PNP output module | 0.5 amps per channel | **BL67-8DO-0.5A-P** |
| | 8 NPN output module | 0.5 amps per channel | **BL67-8DO-0.5A-N** |

| | Base module | Part number |
|---|---|---|
|  | 8 x M8, 3 pole, female | **BL67-B-8M8** |
|  | 4 x M12, 5 pole, female, A-code | **BL67-B-4M12** |
|  | 4 x M12, 5 pole, female, A-code | **BL67-B-4M12-P** |
|  | 1 x M23, 12 pole, female | **BL67-B-1M23** |

| I/O modules | Output Current | Part number |
|---|---|---|
| 4 PNP output module | 0.5 amps per channel | **BL67-4DO-0.5A-P** |
| 4 PNP output module | 2 amps per channel | **BL67-4DO-2A-P** |
| 4 PNP output module | 4 amps per channel | **BL67-4DO-4A-P** |
| 4 NPN output module | 2 amps per channel | **BL67-4DO-2A-N** |

| | Base module | Part number |
|---|---|---|
|  | 4 x M8, 3 pole, female | **BL67-B-4M8** |
|  | 2 x M12, 5 pole, female, A-code | **BL67-B-2M12** |
|  | 2 x M12, 5 pole, female, A-code | **BL67-B-2M12-P** |
|  | 4 x M12, 5 pole, female, A-code | **BL67-B-4M12** |
|  | 1 x M23, 12 pole, female | **BL67-B-1M23** |

Most popular.

## Digital Output Modules

| I/O modules | Output current | Part number |
|---|---|---|
| 16 PNP output module | 0.14 amps per channel | **BL67-16DO-0.1A-P** |

| | Base module | Part number |
|---|---|---|
|  | 1 x M23, 19 pole, female | **BL67-B-1M23-19** |

## Relay Output Modules

| I/O modules | Output current | Part number |
|---|---|---|
| 8 normally open relays | 0.14 amps per channel | **BL67-8DO-R-NO** |

| | Base module | Part number |
|---|---|---|
|  | 4 x M12, 5 pole, female, A-code | **BL67-B-4M12-P** |

## Analog Input Modules

| I/O modules | Input type | Part number |
|---|---|---|
| 4 configurable current or voltage analog input module | 4 to 20 mA or 0 to 20 mA -10 to +10 VDC or 0 to +10 VDC | **BL67-4AI-V/I** |

| | Base module | Part number |
|---|---|---|
|  | 4 x M12, 5 pole, female, A-code | **BL67-B-4M12** |

| I/O modules | Input type | Part number |
|---|---|---|
| 2 current analog input module | 4 to 20 mA or 0 to 20 mA | **BL67-2AI-I** |
| 2 voltage analog input module | -10 to +10 VDC or 0 to +10 VDC | **BL67-2AI-V** |
| 2 temperature analog input module | PT100, PT200, PT500, PT1000, Ni100, Ni1000 | **BL67-2AI-PT** |
| 2 temperature analog input module | Type B, E, J, K, N R, S, T | **BL67-2AI-TC** |

| | Base module | Part number |
|---|---|---|
|  | 2 x M12, 5 pole, female, A-code | **BL67-B-2M12** |

## Combination Input / Output Modules

| I/O modules | Input voltage & output current | Part number |
|---|---|---|
| 4 PNP output 4 PNP input module, with diagnostics | 7 to 30 VDC 0.5 Amps | **BL67-4DI4DO-PD** |
| 8 PNP configurable input or output module, with diagnostics | 7 to 30 VDC 0.5 Amps | **BL67-8XSG-PD** |

| | Base module | Part number |
|---|---|---|
|  | 8 x M8, 3 pole, female | **BL67-B-8M8** |
|  | 4 x M12, 5 pole, female, A-code | **BL67-B-4M12** |
|  | 4 x M12, 5 pole, female, A-code | **BL67-B-4M12P** |

## Analog Output Modules

| I/O modules | Input type | Part number |
|---|---|---|
| 4 voltage analog output module | -10 to +10 VDC or 0 to +10 VDC | **BL67-4AO-V** |

| | Base module | Part number |
|---|---|---|
|  | 4 x M12, 5 pole, female, A-code | **BL67-B-4M12** |

| I/O modules | Input type | Part number |
|---|---|---|
| 2 current analog output module | 4 to 20 mA or 0 to 20 mA | **BL67-2AO-I** |
| 2 voltage analog output module | -10 to +10 VDC or 0 to +10 VDC | **BL67-2AO-V** |

| | Base module | Part number |
|---|---|---|
|  | 2 x M12, 5 pole, female, A-code | **BL67-B-2M12** |

Most popular.

## Combination Analog Input / Output Modules

| I/O modules | Output current | Part number |
|---|---|---|
| 4 configurable input and 4 configurable output current or voltage analog module | 4 to 20 mA or 0 to 20 mA -10 to +10 VDC or 0 to +10 VDC | **BL67-4AI4AO-V/I** |

| | Base module | Part number |
|---|---|---|
|  | 8 x M8, 3 pole, female | **BL67-B-8M8** |
|  | 4 x M12, 5 pole, female, A-code | **BL67-B-4M12** |

## CANopen Subnet Module

| Extender module | Capacity | Part number |
|---|---|---|
| 1 CANopen connection | 64 bits of inputs or outputs | **BL67-1CVI** |

| | Base module | Part number |
|---|---|---|
|  | 1 x M12, 5 pole, female, A-code | **BL67-B-1M12** |

## IO-Link Class A Master

| Extender module | Part number |
|---|---|
| 4 master channels | **BL67-4IOL** |

| | Base module | Part number |
|---|---|---|
|  | 4 x M12, 5 pole, female, A-code | **BL67-B-4M12** |

## Power Extender Module

| Extender module | Current capacity | Part number |
|---|---|---|
| 24 VDC field power module | 10 amps input | **BL67-PF-24VDC** |

| | Base module | Part number |
|---|---|---|
|  | 5 pole mini connector to supply bus power and field power | **BL67-B-1RSM** |
|  | 5 pole mini connector to field power only | **BL67-B-1RSM-VO** |
|  | 4 pole mini connector to supply bus power and field power | **BL67-B-1RSM-4** |

| I/O modules | Output current | Part number |
|---|---|---|
| 2 configurable input and 2 configurable output current or voltage analog module | 4 to 20 mA or 0 to 20 mA -10 to +10 VDC or 0 to +10 VDC | **BL67-2AI2AO-V/I** |

| | Base module | Part number |
|---|---|---|
|  | 8 x M8, 3 pole, female | **BL67-B-8M8** |

## Serial Interface Module

| Extender module | Capacity | Part number |
|---|---|---|
| 1 RS232 serial interface | 300 to 115200 bps | **BL67-1RS232** |
| 1 RS485 or 422 serial interface | 300 to 115200 bps | **BL67-1RS485/422** |

| | Base module | Part number |
|---|---|---|
|  | 1 x M12, 5 pole, female, A-code | **BL67-B-1M12** |
|  | 1 x M12, 8 pole, female, A-code | **BL67-B-1M12-8** |
|  | 1 x M23, 12 pole, female | **BL67-B-1M23** |

## SSI and Counting Modules

| Extender module | Capacity | Part number |
|---|---|---|
| 1 SSI sensor interface | 65 kbps up to 1 Mbps | **BL67-1SSI** |
| 1 counter interface | Up to 250 kHz | **BL67-1CNT/ENC** |

| | Base module | Part number |
|---|---|---|
|  | 1 x M12, 8 pole, female, A-code | **BL67-B-1M12-8** |
|  | 1 x M23, 12 pole, female | **BL67-B-1M23** |

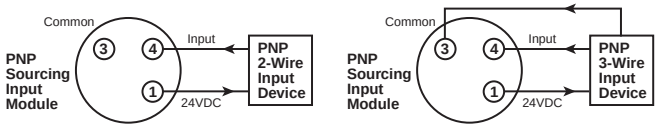
Most popular.

## Digital PNP Input Modules

| DC Input Module | BL67-4DI-P | BL67-8DI-P | BL67-4DI-PD | BL67-8DI-PD |
|---|---|---|---|---|
| Number of inputs | 4 | 8 | 4 | 8 |
| Sensor requirement | PNP Sourcing | | PNP Sourcing | |
| Voltage, on-state input, nom. | 24 VDC | | 24 VDC | |
| Field power for inputs current consumption | 49 mA | | 109 mA | |
| Bus power current consumption | 30 mA | | 30 mA | |
| Low level signal voltage | <4.5 V | | <4.5 V | |
| High level signal voltage | 7…30V | | 7…30V | |
| Low level signal current | <1.5 mA | | <1.5 mA | |
| High level signal current | 2.1…3.7 mA | | 2.1…3.7 mA | |
| Type of diagnostics | Group Diagnostics | | Channel Diagnostics | |
| Short circuit protection | Group Protection | | Channel Protection | |
| Input delay | 0.25 ms | | 0.25; 2.5 ms | |

### PNP (Sourcing)

PNP input modules provide sourcing capabilities. When the input field device is passing, current flows from the input device into the Turck input module.

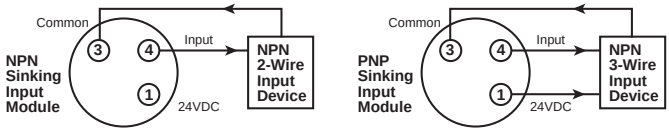



## Digital NPN Input Modules

| Digital DC Input Module | BL67-4DI-N | BL67-8DI-N |
|---|---|---|
| Number of inputs | 4 | 8 |
| Sensor requirement | NPN Sinking | NPN Sinking |
| Voltage, on-state input, nom. | 24 VDC | 24 VDC |
| Field power for inputs current consumption | 10 mA | 10 mA |
| Bus power current consumption | 30 mA | 30 mA |
| Low level signal voltage | >7 V | >7 V |
| High level signal voltage | <5 V | <5 V |
| Low level signal current | <2.5 mA | <1.2 mA |
| High level signal current | >3 mA | >1.5 mA |
| Type of diagnostics | Group Diagnostics | Group Diagnostics |
| Short circuit protection | Group Protection | Group Protection |
| Input delay | 0.25 ms | 0.25 ms |

### NPN (Sinking)

NPN input modules provide sinking capabilities. When the input field device is passing, current out of the Turck input module into the field input device.

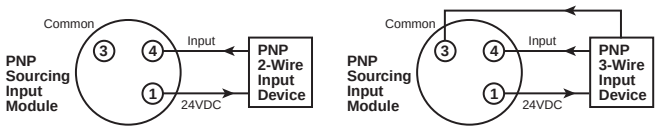


## Digital PNP Output Modules

| Digital DC Output Module | BL67-4DO-0.5A-P | BL67-8DO-0.5A-P | BL67-4DO-2A-P | BL67-16DO-0.1A-P |
|---|---|---|---|---|
| Number of outputs | 4 | 8 | 4 | 16 |
| Sensor requirement | PNP Sourcing | PNP Sourcing | PNP Sourcing | PNP Sourcing |
| Output voltage | 24 VDC | 24 VDC | 24 VDC | 24 VDC |
| Field power for outputs current consumption | 109 mA (Plus load current) | 109 mA (Plus load current) | 109 mA (Plus load current) | 109 mA (Plus load current) |
| Bus power current consumption | 30 mA | 30 mA | 30 mA | 30 mA |
| Output current per channel | 0.5 A | 0.5 A | 2.0A | 0.1 A |
| Output delay | 3 ms | 3 ms | 3 ms | 3 ms |
| Load type | Resistive, Inductive, Lamp Load | Resistive, Inductive, Lamp Load | Resistive, Inductive, Lamp Load | Resistive, Inductive |
| Load resistance, resistive | >48 Ohm | >48 Ohm | >12 Ohm | >250 Ohm |
| Load resistance, inductive | <1.2 H | <1.2 H | <1.2 H | <1.2 H |
| Lamp load | < 3W | < 3W | < 10W | < 10W |
| Switching frequency, resistive | <200 Hz | <200 Hz | <200 Hz | <200 Hz |
| Switching frequency, inductive | < 2 Hz | < 2 Hz | < 2 Hz | < 2 Hz |
| Switching frequency, lamp load | < 20 Hz | < 20 Hz | < 20 Hz | < 20 Hz |
| Short-circuit protection | Group Protection | Group Protection | Group Protection | Group Protection |
| Diagnostic bits | 4 | 8 | 4 | 16 |

### PNP (Sourcing)

PNP input modules provide sourcing capabilities. When the input field device is passing, current flows from the input device into the Turck input module.

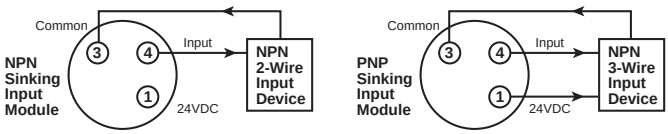



## Digital NPN Output Modules

| Digital DC Output Module | BL67-8DO-0.5A-N | BL67-4DO-2A-N |
|---|---|---|
| Number of outputs | 8 | 4 |
| Sensor requirement | NPN Sinking | NPN Sinking |
| Output voltage | 24 VDC | 24 VDC |
| Field power for outputs current consumption | 109 mA (Plus load current) | 109 mA (Plus load current) |
| Bus power current consumption | 30 mA | 30 mA |
| Output current per channel | 0.5 A | 2.0 A |
| Output delay | 3 ms | 3 ms |
| Load type | Resistive, Inductive, Lamp Load | Resistive, Inductive, Lamp Load |
| Load resistance, resistive | >48 Ohm | >48 Ohm |
| Load resistance, inductive | <1.2 H | <1.2 H |
| Lamp load | < 3W | < 3W |
| Switching frequency, resistive | <200 Hz | <200 Hz |
| Switching frequency, inductive | < 2 Hz | < 2 Hz |
| Switching frequency, lamp load | < 20 Hz | < 20 Hz |
| Short-circuit protection | Group Protection | Group Protection |
| Diagnostic bits | 4 | 8 |

### NPN (Sinking)

NPN input modules provide sinking capabilities. When the input field device is passing, current out of the Turck input module into the field input device.



## Relay Output Modules

| Relay Output Module | BL67-8DO-R-NO |
|---|---|
| Number of outputs | 8 |
| Output type | Relay |
| Output voltage | 24 VDC |
| Field power for outputs current consumption | 109 mA (Plus load current) |
| Bus power current consumption | 30 mA |
| Output current per channel | 100 mA |
| Output delay | 3 ms |
| Load type | Resistive, TTL logic |
| Switching resistor | <31 Ohm |
| Switching frequency, resistive | <200 Hz |
| Short-circuit protection | None |

## Combination Digital Modules

| Combination Input and Output Modules | BL67-4DI4DO-PD | BL-67-8XSG-PD |
|---|---|---|
| Number of outputs | 4 | Configurable 0 to 8 |
| Number of inputs | 4 | Configurable 0 to 8 |
| Total channels | 8 | 8 |
| Sensor requirement | PNP Sourcing | PNP Sourcing |
| Voltage, on-state input, nom. | 24 VDC | 24 VDC |
| Output voltage | 24 VDC | 24 VDC |
| Field power for outputs current consumption | 109 mA | 109 mA |
| Bus power current consumption | 30 mA | 30 mA |
| Input low level signal voltage | <4.5 V | <4.5 V |
| Input high level signal voltage | 7…30V | 7…30V |
| Input low level signal current | <1.5 mA | <1.5 mA |
| Input high level signal current | 2.1…3.7 mA | 2.1…3.7 mA |
| Input delay | 0.25; 2.5 ms | 0.25; 2.5 ms |
| Output current per channel | 0.5 A | 0.5 A |
| Output delay | 3 ms | 3 ms |
| Load type | Resistive, Inductive, Lamp Load | Resistive, Inductive, Lamp Load |
| Load resistance, resistive | >48 Ohm | >48 Ohm |
| Load resistance, inductive | <1.2 H | <1.2 H |
| Lamp load | < 3W | < 3W |
| Switching frequency, resistive | <200 Hz | <200 Hz |
| Switching frequency, inductive | < 2 Hz | < 2 Hz |
| Switching frequency, lamp load | < 20 Hz | < 20 Hz |
| Short-circuit protection | Channel Protection | Channel Protection |
| Diagnostic bits | 8 | 12 |

## Analog Input Modules

| Analog Input Module | BL67-2AI-I | BL67-2AI-V | BL67-4AI-V/I |
|---|---|---|---|
| Number of inputs | 2 | 2 | 4 |
| Nominal voltage | 24 VDC | 24 VDC | 24 VDC |
| Field power for inputs current consumption | 22 mA | 22 mA | 22 mA |
| Bus power current consumption | 35 mA | 35 mA | 35 mA |
| Analog input type | 0/4…20mA | -10/0…+10 VDC | 0/4…20mA or<br>-10/0…+10 VDC |
| Input resistance | <0.125 kOhm | <98.5 kOhm | <0.125 kOhm or<br><98.5 kOhm |
| Maximum limiting frequency | 50 Hz | | 20 Hz |
| Fault limit @ 23 degree C | <0.2% | | <0.3% |
| Repeatability | 0.05% | 0.05% | 0.05% |
| Temperature coefficient<br>(ppm/degree C of full scale) | <300 | <150 | <300 |
| Resolution | 16 Bit | 16 Bit | 16 Bit |
| Measuring principle | Sigma Delta | Sigma Delta | Sigma Delta |
| Measured value display | 16 bit signed integer,<br>12 bit full range left justified | 16 bit signed integer,<br>12 bit full range left justified | 16 Bit signed integer,<br>12 bit full range left justified |
| Diagnostic bits | 16 | | 32 |

## Temperature Inputs

| Analog Input Module | BL67-2AI-PT | BL67-2AI-TC |
|---|---|---|
| Number of inputs | 2 | 2 |
| Nominal voltage | 24 VDC | 24 VDC |
| Field power for inputs current consumption | 58 mA | 40 mA |
| Bus power current consumption | 45 mA | 35 mA |
| Temperature input type | PT100, PT200, PT500, PT1000,<br>Ni100, Ni1000 | B, E, J, K, N, R, S, T |
| Voltage resolution | n/a | +/- 50mV; <2uV |
| Fault limit @ 23 degree C | <0.2% | <0.2% |
| Repeatability | 0.05% | 0.05% |
| Temperature coefficient<br>(ppm/degree c of full scale) | <300 | <300 |
| Resolution | 16 Bit | 16 Bit |
| Measured value display | 16 bit signed integer,<br>12 bit full range left justified | 16 bit signed integer,<br>12 bit full range left justified |
| Diagnostic bits | 16 | 16 |

## Analog Input Modules

| Analog Input Module | BL67-2AO-I | BL67-2AO-V |
|---|---|---|
| Number of inputs | 2 | 2 |
| Nominal voltage | 24 VDC | 24 VDC |
| Field power for outputs current consumption | 62 mA | 67 mA |
| Bus power current consumption | 40 mA | 60 mA |
| Analog output type | 0/4…20mA | -10/0…+10 VDC |
| Output current per channel | n/a | 250 mA |
| Load resistance, resistive | <0.45 kOhm | > 1kOhm |
| Load resistance, inductive | <1 mH | n/a |
| Load resistance, capacitive | n/a | > 1 uF |
| Transmission frequency | <200 Hz | <100 Hz |
| Fault limit @ 23 degree C | <0.2% | <0.2% |
| Repeatability | 0.05% | 0.05% |
| Temperature coefficient (ppm/degree c of full scale) | <150 | <300 |
| Resolution | 16 bit | 16 bit |
| Measured value display | 16 bit signed integer,<br>12 bit full range left justified | 16 bit signed integer,<br>12 bit full range left justified |

## Combination Analog Modules

| Analog Combination Module | BL67-4AI4AO-V/I | BL67-2AI2AO-V/I |
|---|---|---|
| Number of analog inputs | 4 | 2 |
| Number of analog outputs | 4 | 2 |
| Nominal voltage | 24 VDC | 24 VDC |
| Field power for outputs current consumption | 67 mA | 67 mA |
| Bus power current consumption | 60 mA | 60 mA |
| Analog input type | 0/4…20mA or -10/0…+10 VDC | 0/4…20mA or -10/0…+10 VDC |
| Input resistance | 0.065 or 225 kOhm | 0.065 or 225 kOhm |
| Maximum limiting frequency | 20 Hz | 20 Hz |
| Fault limit @ 23 degree c | <0.3% | <0.3% |
| Repeatability | 0.05% | 0.05% |
| Temperature coefficient (ppm/degree c of full scale) | <300 | <300 |
| Resolution | 16 bit | 16 bit |
| Measuring principle | Sigma Delta | Sigma Delta |
| Measured value display | 16 bit signed integer,<br>12 bit full range left justified | 16 bit signed integer,<br>12 bit full range left justified |
| Analog output type | -10/0…+10 VDC | -10/0…+10 VDC |
| Output current per channel | 250 mA | 250 mA |
| Load resistance, resistive | >1 kOhm | >1 kOhm |
| Load resistance, capacitive | <1 uF | <1 uF |
| Transmission frequency | <100 Hz | <100 Hz |
| Fault limit @ 23 degree C | <0.3% | <0.3% |
| Repeatability | 0.05% | 0.05% |
| Temperature coefficient (ppm/degree c of full scale) | <300 | <300 |
| Resolution | 16 bit | 16 bit |
| Measured value display | 16 bit signed integer,<br>12 bit full range left justified | 16 bit signed integer,<br>12 bit full range left justified |
| Diagnostic bits | 8 | 4 |

## Power Extender Module

| Power Extender Module | BL67-PF-24VDC |
|---|---|
| Nominal voltage | 24 VDC |
| Field power for outputs current consumption | 9 mA |
| Bus power current consumption | 30 mA |
| Supply for field power for inputs current | 4.0 A |
| Supply for field power for outputs current | 10 A |
| Diagnostic bits | 3 |

## RS232 Interface

| RS232 Interface | BL67-1RS232 |
|---|---|
| Number of channels | 1 |
| Field power for inputs current consumption | 90 mA |
| Bus power current consumption | 140 mA |
| Transmission level active (u rs1) | -15 to -3 VDC |
| Transmission level inactive (urso) | 3 to 15 VDC |
| Common-mode range (ugl) | -7 to 12 VDC |
| Transmission signals | RxD, TxD, RTS, CTS |
| Data buffer received | 128 Byte |
| Send data buffer | 64 Byte |
| Connection type | Full Duplex |
| Transmission rate | 300 to 115200 bps |
| Parameter | Transmission Rate, Diagnostics, Data Bits, Stop Bits, XON - Character, XOFF - Character, Parity, Flow Control |
| Cable length | 15 m |
| Diagnostic bits | 8 |

## RS485 / 422 Interface

| RS485/422 Interface | BL67-1RS485/422 |
|---|---|
| Number of channels | 1 |
| Field power for inputs current consumption | 42 mA |
| Bus power current consumption | 60 mA |
| Transmission signals | RxD, TxD |
| Connection type | 2 Wire Half Duplex or 4 Wire Full Duplex |
| Transmission rate | 300 to 115200 bps |
| Parameter | RS485/422, Transmission Rate, Diagnostics, Data Bits, Stop Bits, XON - Character, XOFF - Character, Parity, Flow Control |
| Cable length | 1000 m |
| Line impedance | 120 Ohm |
| Bus termination | External |
| Diagnostic bits | 8 |

## SSI Sensor Interface

| SSI Sensor Interface | BL67-1SSI |
|---|---|
| Number of channels | 1 |
| Field power for inputs current consumption | 39 mA |
| Bus power current consumption | 50 mA |
| Transmission signals | CL, D |
| Connection type | 4 Wire Full Duplex (Clock Output/Signal Input) |
| Transmission rate | 62.5 kbps up to 1 Mbps |
| Parameter | Transmission Rate, Diagnostics, Data Format (Binary / GRAY coded), Data Fram Bits (1-32), Number of Invalid Bits (LSB: 0-15, MSB 0-7) |
| Cable length | 30 m |
| Diagnostic bits | 8 |

## Counting Module

| Counting Module | BL67-1CNT/ENC |
|---|---|
| Number of channels | 1 |
| Field power for inputs current consumption | 109 mA |
| Bus power current consumption | 30 mA |
| Input type | PNP |
| Output type | PNP |
| Output current per channel | 0.5 A |
| Output delay | 2 ms |
| Load type | Resistive |
| Frequency measurement | Up to 250 kHz |
| Speed measurement | Factor Configurable |
| Period duration measurement | 2 usec |
| Upper count limit | 0x80000000 up to 0xFFFFFFFF |
| Lower count limit | 0x80000000 up to 0xFFFFFFFF |
| Short circuit protection | Channel Protection |

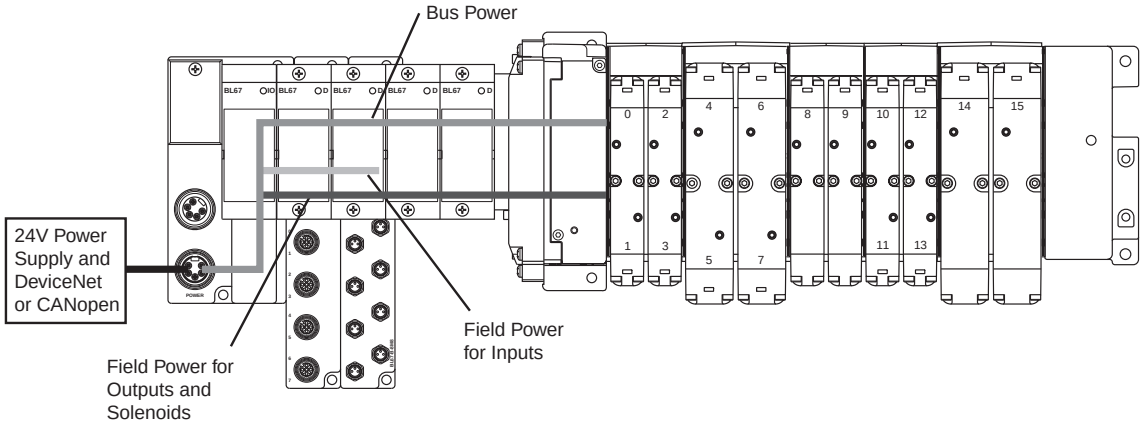
## CANopen Expansion Module

| CANopen Expansion Module | BL67-1CVI |
|---|---|
| Number of channels | 1 |
| Field power for inputs current consumption | 109 mA |
| Bus power current consumption | 30 mA |
| Transmission signals | CAN High, CAN Low |
| Connection type | CANopen |
| Transmission speed | 10 kbps up to 1 Mbps |
| Parameter | Transmission Rate, Diagnostics, Bus Termination, Range of I/O Data |
| Bus termination | Internal |
| Diagnostic bits | 48 |
| Max number of CANopen nodes | 8 |
| Max processing data per module | 8 Byte |
| Max data per node | 4 Byte |

## Power Distribution Options for Turck Network Portal

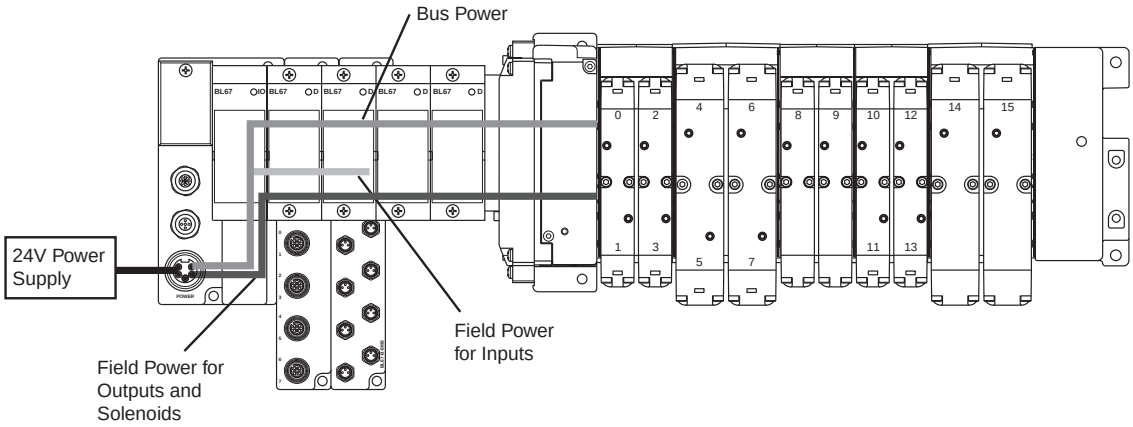
### Turck Communication and I/O Modules - DeviceNet and CANopen, Power Over Network

The 24VDC power supply pins from the DeviceNet or CANopen network connection on the communication module provides a single power circuit. This circuit provides 1.5A bus power, 4A field power for inputs and 8A field power for outputs.




### Turck Communication and I/O Modules - EtherNet/IP, Modbus/TCP, PROFINET, PROFIBUS, and CANopen

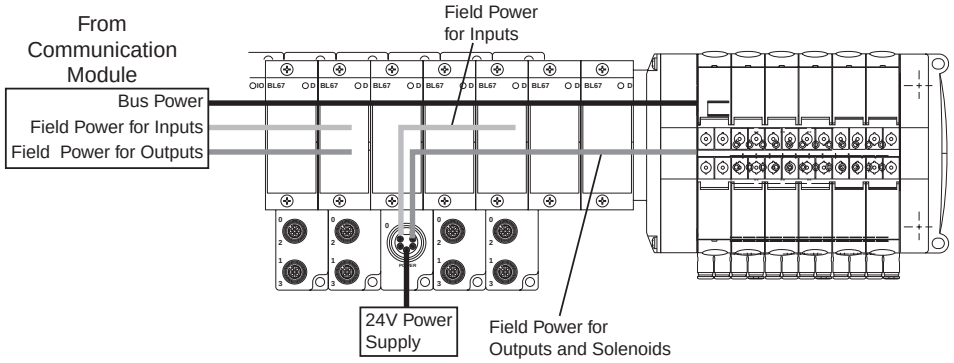
An auxiliary 24VDC power supply from the communication module provides power across two separate circuits. The first circuit provides 1.5A bus power and 4A field power for inputs. The second circuit provides 10A field power for outputs which can be wired to an e-stop circuit to kill all outputs.



## Power Distribution Options for Turck Network Portal (continued)

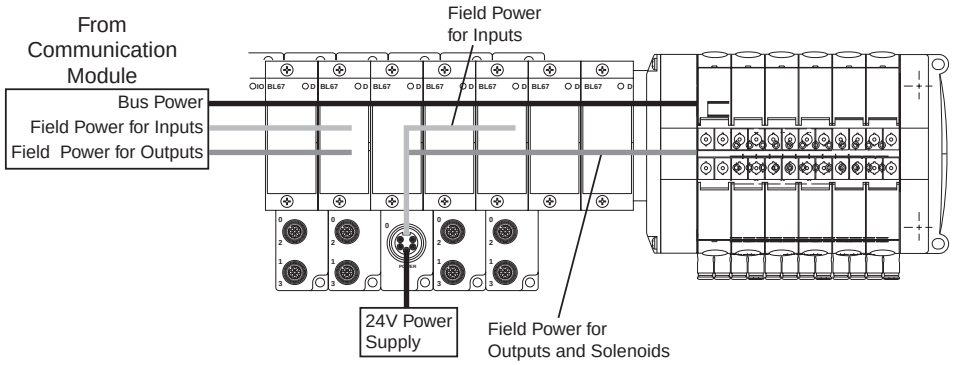
### 24VDC Power Extender Module (BL67-PF-24VDC) with Base Module BL67-B-1RSM

This configuration creates an auxiliary 24VDC power supply and provides power across two separate circuits, regardless of the communication module used. The first circuit provides 4A field power for inputs. The second circuit provides 10A field power for outputs which can be wired to an e-stop circuit to kill all outputs and solenoids to the right of the module. The 1.5A bus power is uninterrupted, and is still supplied from the communication module.



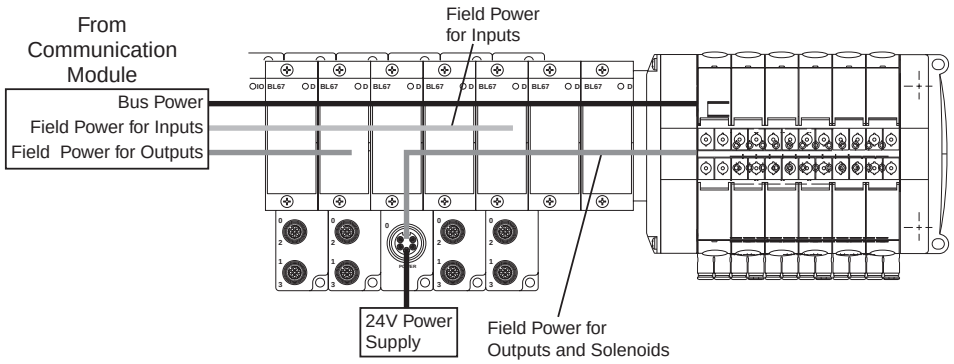

### 24VDC Power Extender Module (BL67-PF-24VDC) with Base Module BL67-B-1RSM-4

This configuration creates an auxiliary 24VDC power supply and provides power across one circuit, regardless of the communication module used. This circuit provides 4A field power for inputs and 10A field power for outputs. The 1.5A bus power is uninterrupted, and is still supplied from the communication module.




### 24VDC Power Extender Module (BL67-PF-24VDC) with Base Module BL67-B-1RSM-VO

This configuration creates an auxiliary 24VDC power supply and provides power across one circuit, regardless of the communication module used. This circuit provides 10A field power for outputs which can be wired to an e-stop circuit to kill all outputs and solenoids to the right of the module. The 1.5A bus power and 4A field power for inputs are uninterrupted, and are still supplied from the communication module.



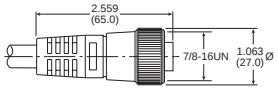



For inventory, lead times, and kit lookup, visit www.pdnplu.com

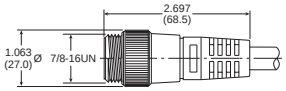
**Parker Hannifin Corporation**
Pneumatic Division
Richland, Michigan
www.parker.com/pneumatics

## 7/8" Mini Power Cables - P2H Network Node, H Series Network Portal, Turck Network Portal

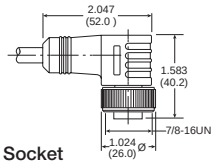
RKM Female Socket

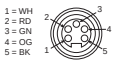



RSM Male Pins

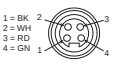



WKM Female Socket




5-Pin Female Wiring Diagram

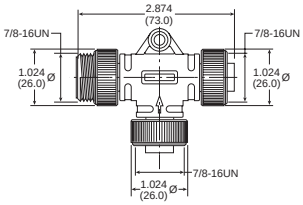


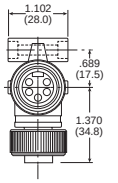

4-Pin Female Wiring Diagram

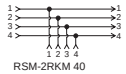
| Description | Part number |
|---|---|
| 4-pin female to flying lead cable, 5 meters, TPE | **RKM 46-5M/S1587** |
| 5-pin female to flying lead cable, 5 meters, TPE | **RKM 56-5M/S1587** |
| 4-pin male to female cable, TPE | **RSM RKM 46-x/S1587** |
| 5-pin male to female cable, TPE | **RSM RKM 56-x/S1587** |
| 4-pin right angle female to flying lead cable, 5 meters,TPE | **WKM 46-5M/S1587** |
| 5-pin right angle female to flying lead cable, TPE | **WKM 56-5M/S1587** |

Where x = 2, 4, 5, 6, 8, 10 meter standard lengths

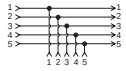
## Power Tee - P2H Network Node, H Series Network Portal, Turck Network Portal




RSM-2RKM 40

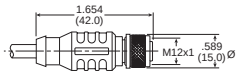


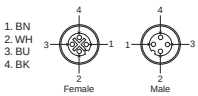

RSM-2RKM 50

| Description | Part number |
|---|---|
| 4-pin Male to 2 female sockets | **RSM-2RKM 40** |
| 5-pin Male to 2 female sockets | **RSM-2RKM 50** |

## M12 A-code Cables - P2M IO-Link, P2H IO-Link, H Series IO-Link Network Portal, Turck IO-Link Network Portal

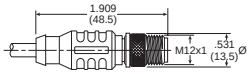
RKC Female Sockets

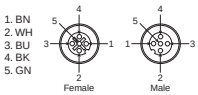



4-Pin Female Wiring Diagram

RSC Male Pins



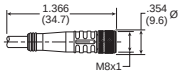



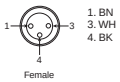

5 -Pin Female Wiring Diagram

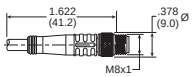
| Description | Part number |
|---|---|
| 4-pin female to flying lead cable, PVC | **RKC 4.4T-1** |
| 4-pin male to flying lead cable, PVC | **RSC 4.4T-*** |
| 4-pin male to female cable, PVC | **RKC 4.4T-*-RSC 4.4T** |
| 5-pin female to flying lead cable, TPE | **RKC 4.5T-*/S1587** |
| 5-pin male to flying lead cable, TPE | **RSC 4.5T-4/S1587** |
| 5-pin male to female cable, TPE | **RKC 4.5T-*-RSC 4.5T/S1587** |

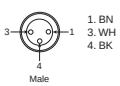
Where * = 1, 2, 3, 4 meter standard lengths

## M8 Cables - H Series IO-Link Network Portal, Turck IO-Link Network Portal



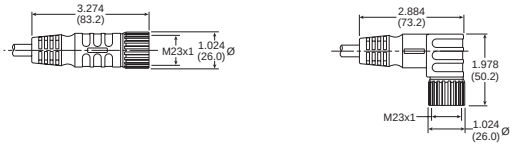




| Description | Part number |
|---|---|
| 3-pin female to flying lead cable, PUR | **PKG 3M-4/S90** |
| 3-pin male to flying lead cable, PUR | **PSG 3M-*/S90** |
| 3-pin male to female cable, PUR | **PKG 3M-*-PSG 3M/S90** |

Where * = 1, 2, 3, 4 meter standard lengths

Most popular.

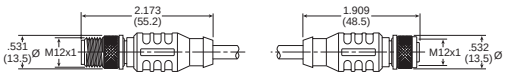
## M23 Cables




| Description | Part number |
|---|---|
| 12-pin, double ended female thread with male pins and female socket, PUR. Pinout optimized for H Series Network Portal. | **CSCM CKCM 12-11-x/S90** |
| 19-pin, double ended female thread with male pins and female socket, PUR. Pinout optimized for H Series Network Portal. | **CSM CKM 19-19-x/S90** |
| 19-pin, 90° double ended female thread with male pins and female socket, PUR. Pinout optimized for Turck Network Portal. | **CSWM CKWM 19-19-x/CS12852** |

Where x = 1, 2, 3, 4 meter standard lengths

## PROFIBUS Cables - P2M Network Node, Turck Network Portal




RSSW Side, Male Pins

RKSW Side, Female Sockets

| Description | Part number |
|---|---|
| M12 male to M12 female, PUR | **RSSW RKSW 455-xM** |

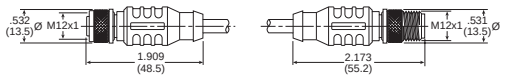
Where x = 2, 4, 5, 6, 8, 10 meter standard lengths

## PROFIBUS Terminating Resistor - P2M Network Node, Turck Network Portal


Male Pins

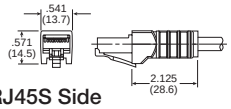
| Description | Part number |
|---|---|
| M12 male pin terminating resistor | **P8BPA00MB** |

## Ethernet Cables - P2M Network Node, H Series Network Portal, Turck Network Portal




RKSD Side, Female Sockets

RSSD Side, Male Pins




RJ45S Side

| Description | Part number |
|---|---|
| M12 female to M12 male, PUR | **RSSD RKSD 443-xM** |
| RJ45 to M12 male, PUR | **RSSD RJ45S 443-2M** |

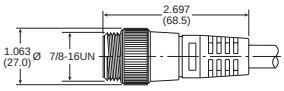
Where x = 2, 5, 10, 15, 20, 30 meter standard lengths

## 25-pin, D-Sub Cable (Female)

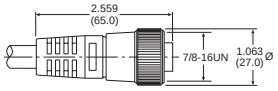
| Description | Length | Part number |
|---|---|---|
| 25-pin, D-sub cable, IP20 | 3 meters | **P8LMH25M3A** |
| 25-pin, D-sub cable, IP20 | 9 meters | **SCD259D** |
| 25-pin, D-sub cable, IP65 | 3 meters | **SCD253W** |
| 25-pin, D-sub cable, IP65 | 9 meters | **SCD259WE** |

Most popular.

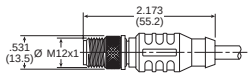
## DeviceNet and CANopen Cables - P2M Network Node, H Series Network Portal, Turck Network Portal



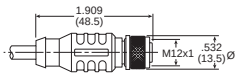

RSM Side, 7/8 Mini with Male Pins




RKM Side, 7/8 Mini with Male Pins




RSC Side, Male Pins

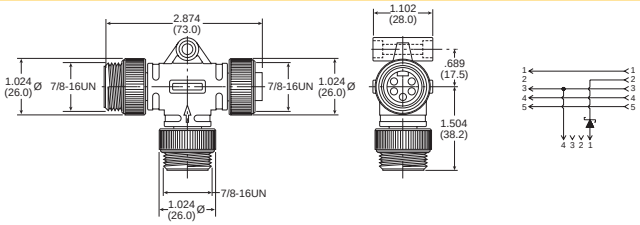



RKC Side, Female Sockets

| Description | Part number |
|---|---|
| 7/8" mini male to 7/8" mini female, PUR | **RSM RKM 5711-xM** |
| 7/8" mini male to M12 female, PUR | **RSM RKC 5711-xM** |
| M12 male to M12 female, PUR | **RSC RKC 5711-xM** |
| M12 male to 7/8" mini female, PUR | **RSC RKM 5711-xM** |

Where x = 2, 4, 5, 6, 8, 10 meter standard lengths

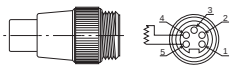
## Bus Power Tee - P2M Network Node, H Series Network Portal, Turck Network Portal




| Description | Part number |
|---|---|
| Bus power tee | **RSM RKM 57 WSM 40 PST** |

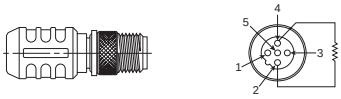
For systems not equipped with Power over network, combines separate network and power feeds into the communication module. Includes reverse current protection

## DeviceNet & CANopen Terminating Resistor - P2M Network Node, H Series Network Portal, Turck Network Portal



RSM 57-TR2

Male Pins



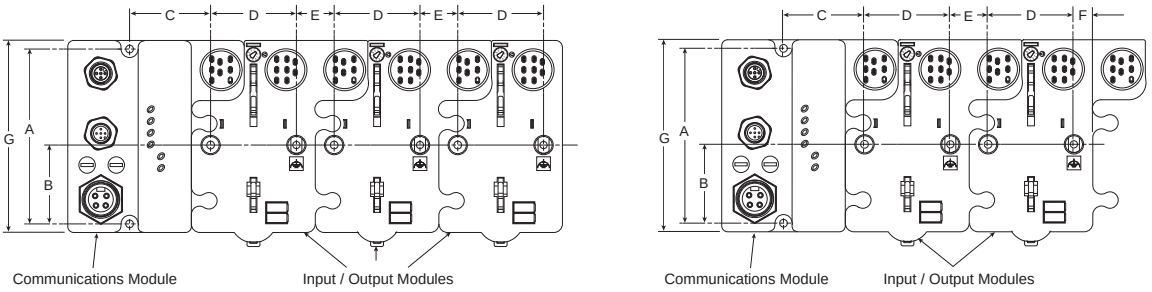
P8BPA00MB

Male Pins

| Description | Part number |
|---|---|
| 7/8" Mini Male Pin Terminating Resistor | **RSM 57-TR2** |
| M12 Male Pin Terminating Resistor | **P8BPA00MA** |

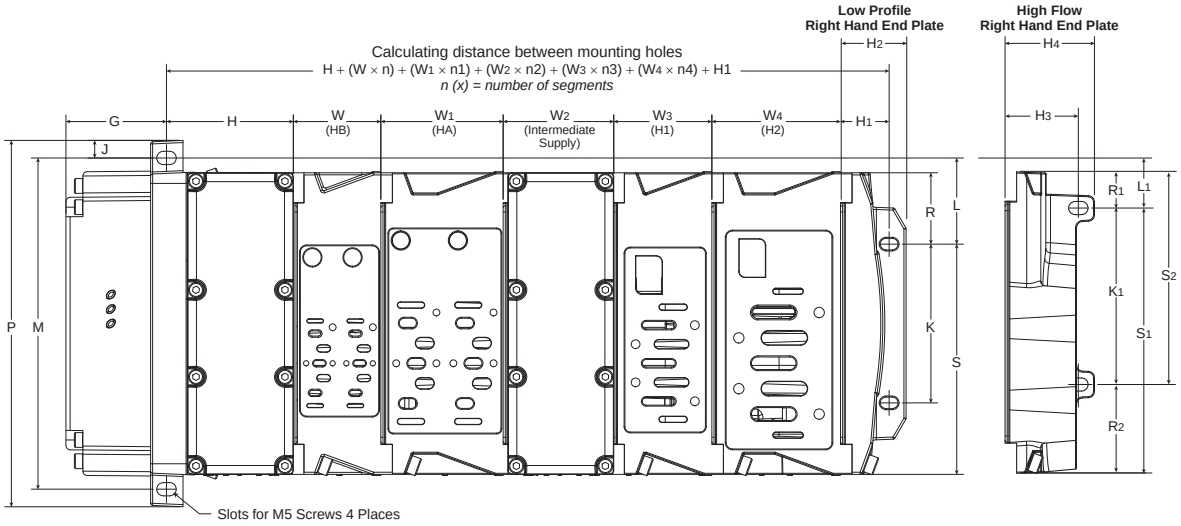
Most popular.

## H Series Network with H Series ISO Valves




| A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|
| 4.00 | 1.80 | 1.90 | 2.00 | .87 | .43 | 4.41 |
| (102) | (46) | (48) | (50) | (22) | (11) | (112) |

Inches (mm)



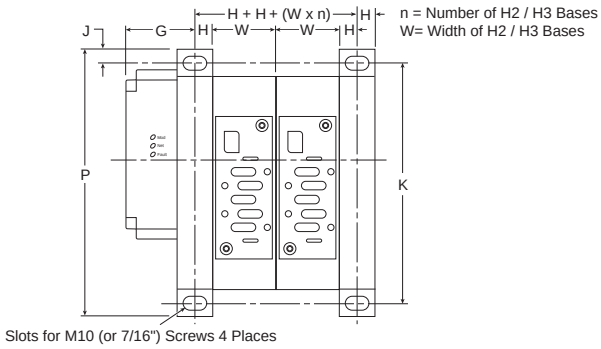

**n (x)** = number of segments

| G | H | $H_1$ | $H_2$ | $H_3$ | $H_4$ | J | K | $K_1$ | L | $L_1$ | M |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.87 | 2.36 | 0.90 | 1.22 | 1.36 | 1.66 | 0.33 | 2.95 | 3.28 | 1.60 | 0.96 | 6.16 |
| (47.5) | (60.0) | (23.0) | (31.0) | (34.6) | (42.3) | (8.3) | (75.0) | (83.4) | (40.7) | (24.3) | (156.5) |

| P | S | $S_1$ | $S_2$ | R | $R_1$ | $R_2$ | W | $W_1$ | $W_2$ | $W_3$ | $W_4$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 6.81 | 4.28 | 4.93 | 3.96 | 1.33 | 0.68 | 1.65 | 1.63 | 2.28 | 2.06 | 1.82 | 2.39 |
| (173.1) | (108.8) | (125.2) | (100.7) | (33.7) | (17.3) | (41.8) | (41.3) | (57.8) | (52.3) | (46.3) | (60.8) |

Inches (mm)

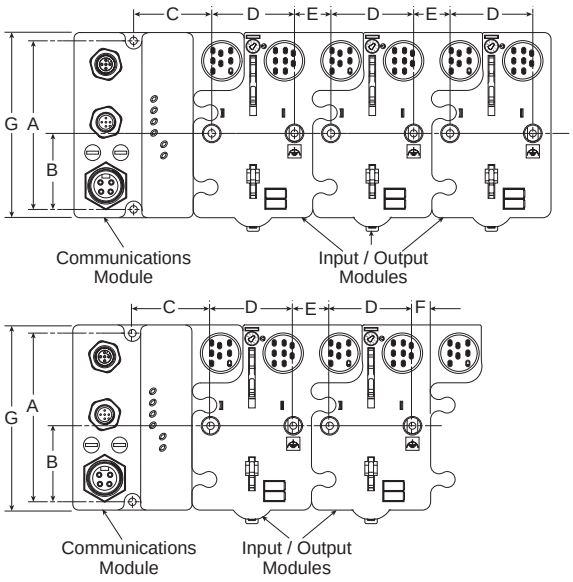
### H3 Manifold Assembly




| G | H | J | K | P | W |
|---|---|---|---|---|---|
| 2.34 | .65 | .59 | 10.43 | 11.61 | 2.80 |
| (59.5) | (16.5) | (15) | (265) | (295) | (71) |

Inches (mm)

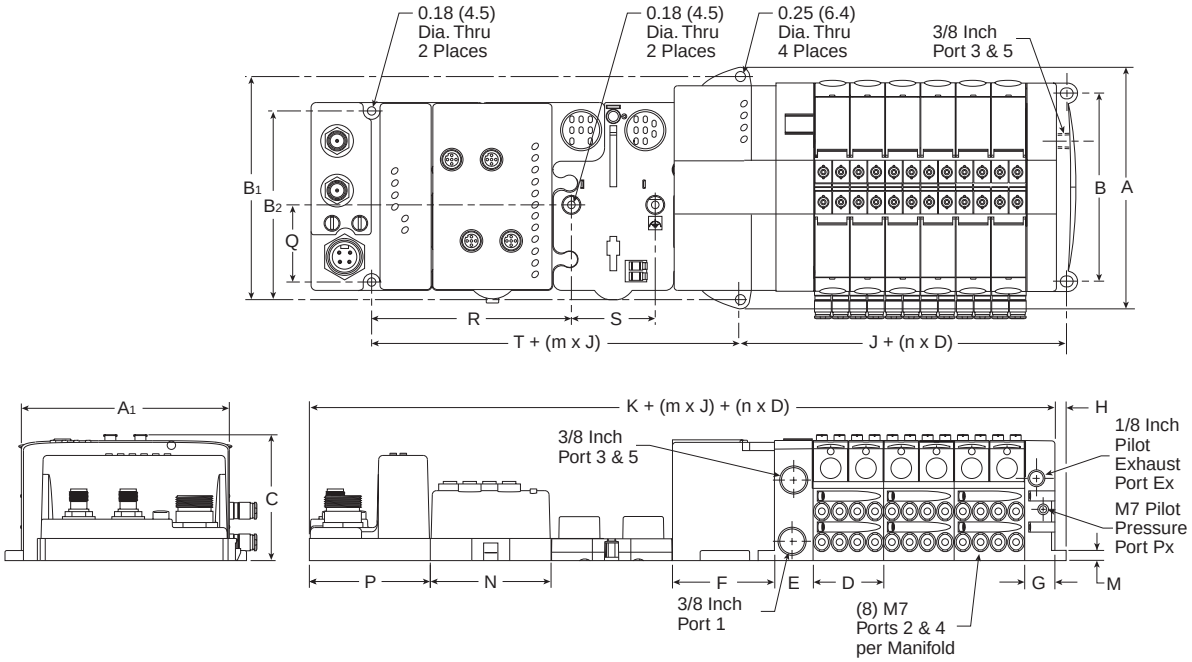
## H Series Network with H Series Micro Valves




| A | B | C | D |
|---|---|---|---|
| 4.00 (102) | 1.80 (46) | 1.90 (48) | 2.00 (50) |

| E | F | G |
|---|---|---|
| .87 (22) | .43 (11) | 4.41 (112) |

Inches (mm)



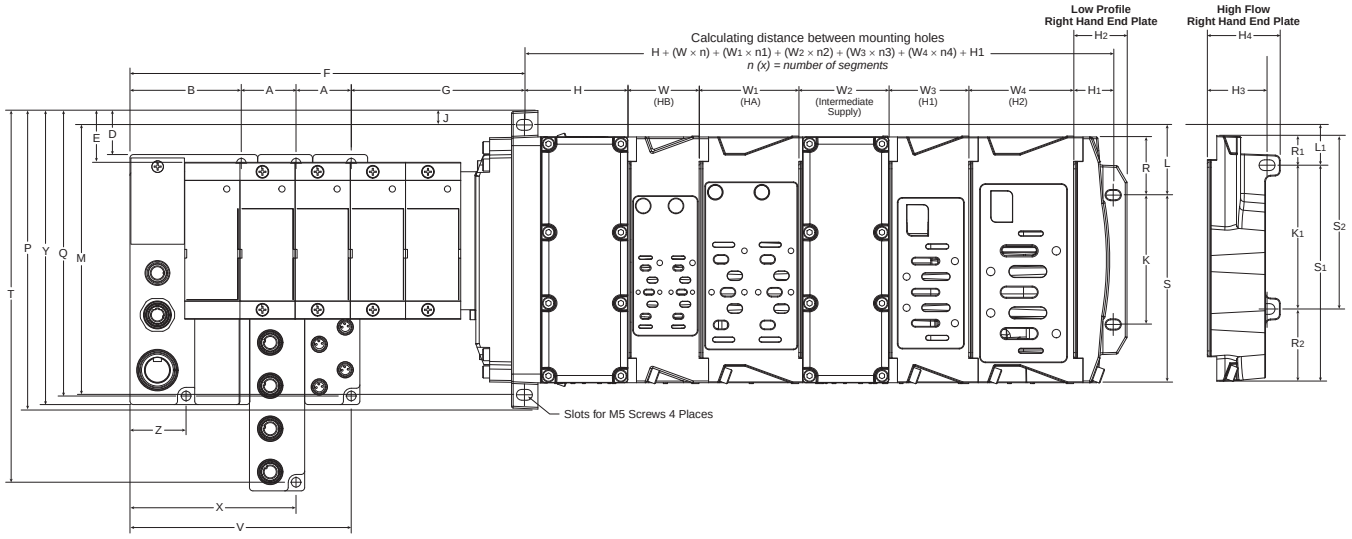

| A | A1 | B | B1 | B2 | C | D | E | F | G |
|---|---|---|---|---|---|---|---|---|---|
| 5.67 (144.0) | 4.88 (124.0) | 4.41 (112.0) | 5.24 (133.0) | 4.02 (102.0) | 2.95 (75.0) | 1.65 (42.0) | 0.91 (23.0) | 2.40 (61.0) | 0.71 (18.0) |

| H | J | K | M | N | P | Q | R | S | T |
|---|---|---|---|---|---|---|---|---|---|
| 0.49 (12.5) | 2.72 (69.0) | 7.32 (186.0) | 0.24 (6.1) | 2.83 (72.0) | 2.83 (72.0) | 1.81 (46.0) | 4.72 (120.0) | 2.01 (51.0) | 2.01 (51.0) |

Inches (mm)

n = Number of Manifolds
m = Number of Modules

## Turck with H Series ISO Valves




**n (x)** = number of segments

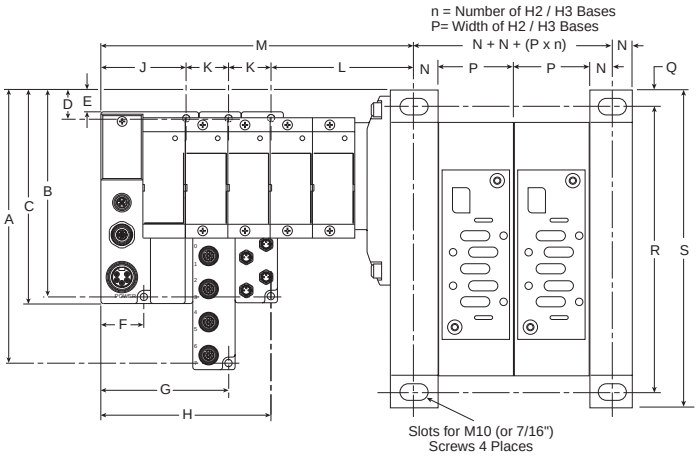
| A | B | D | E | F | G | H | H1 | H2 | H3 | H4 | J |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.26 (32.0) | 2.54 (64.5) | 1.00 (25.4) | 1.18 (29.9) | 8.99 (228.4) | 3.94 (100.1) | 2.36 (60.0) | 0.90 (23.0) | 1.22 (31.0) | 1.36 (34.6) | 1.66 (42.3) | 0.33 (8.3) |

| K | K1 | L | L1 | M | P | Q | R | R1 | R2 | S | S1 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.95 (75.0) | 3.28 (83.4) | 1.60 (40.7) | 0.96 (24.3) | 6.16 (156.5) | 6.81 (173.1) | 6.51 (165.4) | 1.33 (33.7) | 0.68 (17.3) | 1.65 (41.8) | 4.28 (108.8) | 4.93 (125.2) |

| S2 | T | V | W | W1 | W2 | W3 | W4 | X | Y | Z |
|---|---|---|---|---|---|---|---|---|---|---|
| 3.96 (100.7) | 8.48 (215.4) | 5.05 (128.3) | 1.63 (41.3) | 2.28 (57.8) | 2.06 (52.3) | 1.82 (46.3) | 2.39 (60.8) | 3.79 (96.3) | 6.71 (170.4) | 1.28 (32.5) |

Inches (mm)

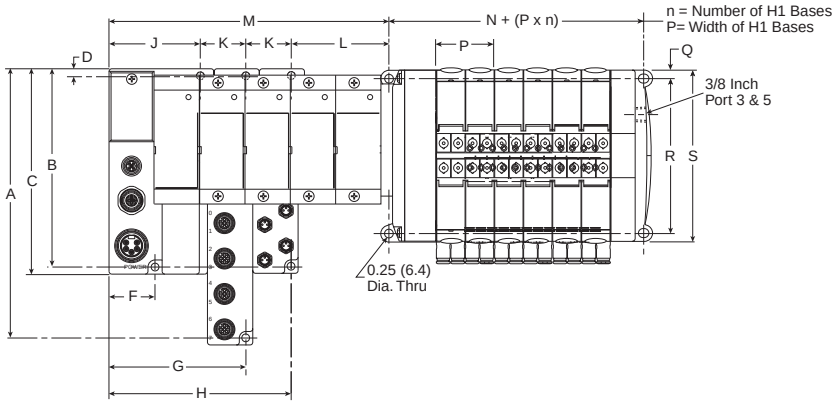
### H3 Manifold Assembly




| A | B | C | D | E | F | G | H | J | K | L | M | N | P | Q | R | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8.62 (218.9) | 6.65 (168.9) | 6.85 (173.9) | 1.33 (33.9) | 1.14 (28.9) | 1.28 (32.5) | 3.79 (96.5) | 5.06 (128.5) | 2.53 (64.5) | 1.26 (32) | 4.34 (110) | See note 1 | .65 (16.5) | 2.80 (71) | .59 (15) | 10.43 (265) | 11.61 (295) |

Note 1: M =J+L+$n_2$xK, where $n_2$ = Number of Turck input / output modules
Inches (mm)

## Turck with H Series Micro Valves

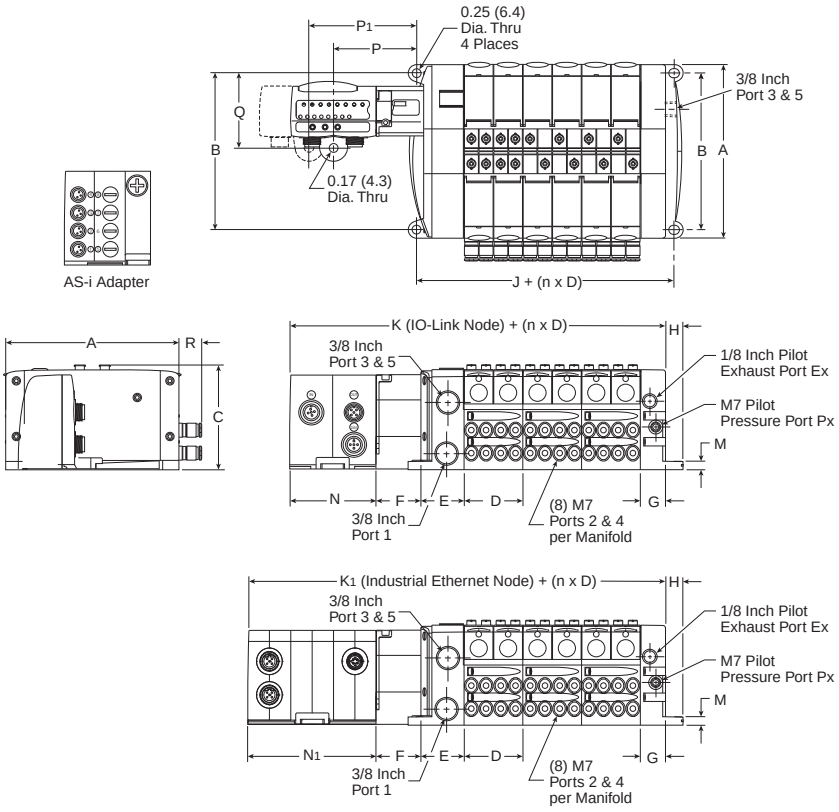



n = number of segments

| A | B | C | D | F | G | H | J | K | L | M | N | P | Q | R | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7.48 | 5.51 | 5.71 | 0.20 | 1.28 | 3.79 | 5.06 | 2.53 | 1.26 | 2.54 | See | 2.28 | 1.65 | .19 | 4.41 | 4.88 |
| (190) | (140) | (145) | (5) | (32.5) | (96.5) | (128.5) | (64.5) | (32) | (64) | note 1 | (58) | (42) | (4.9) | (112) | (124) |

Note 1: M =J+L+$n_2$xK, where $n_2$ = Number of Turck input / output modules
Inches (mm)

## P2M Adapter, Side Ported

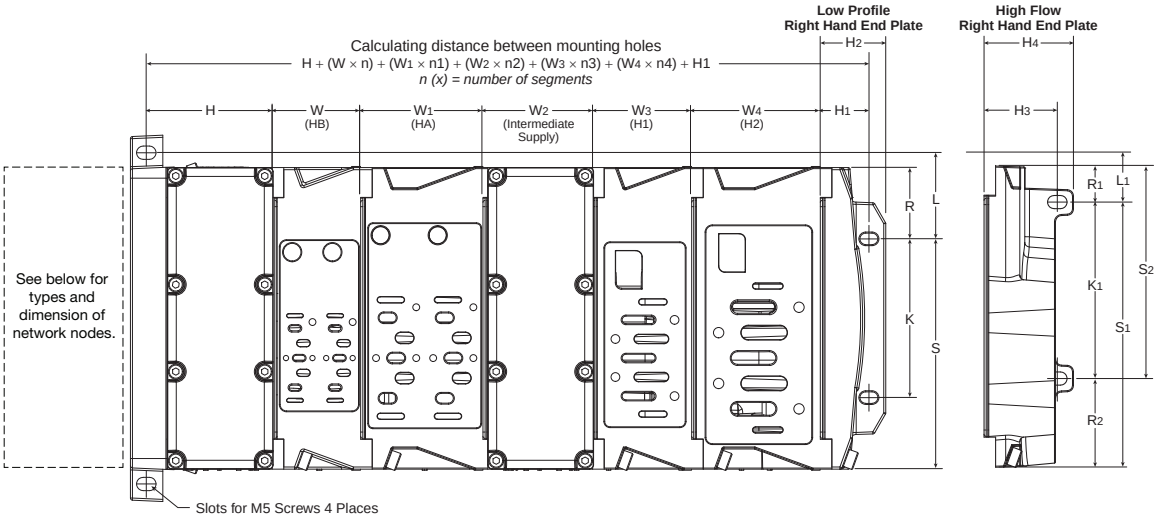



n = number of segments

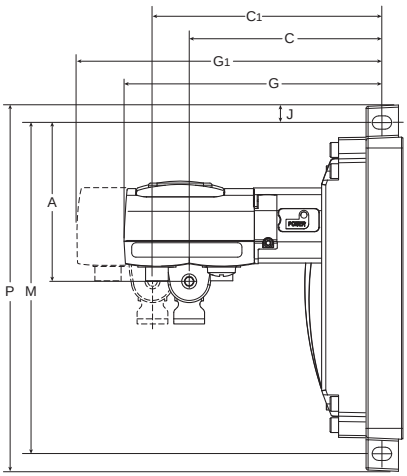
| A | B | C | D | E | F | G | H | J | K | $K_1$ | M | N | $N_1$ | P | $P_1$ | Q | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.88 | 4.41 | 2.95 | 1.65 | 1.22 | 1.28 | 0.71 | 0.49 | 2.28 | 6.10 | 6.87 | 0.24 | 2.40 | 3.71 | 2.36 | 2.94 | 2.07 | 0.56 |
| (124.0) | (112.0) | (75.0) | (42.0) | (31.0) | (32.5) | (18.0) | (12.5) | (58.0) | (155.0) | (174.5) | (6.1) | (61.0) | (94.3) | (60.0) | (74.7) | (52.5) | (14.3) |

Inches (mm)

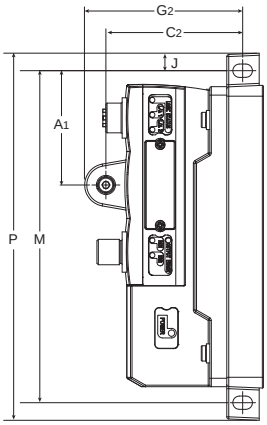
## H Series ISO Valve Manifold



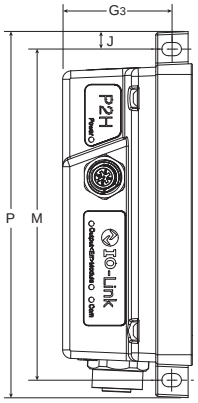

## Network Nodes




**P2M Side Mount**




**P2M Low Profile**




**P2H**

G .....P2M IO-Link
G1 .....P2M Industrial Ethernet Protocol

| A | A1 | C | C1 | C2 | G | G1 | G2 | G3 | H | H1 | H2 | H3 | H4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.97 (75.5) | 2.12 (53.9) | 3.57 (90.8) | 4.32 (109.8) | 2.54 (64.5) | 4.79 (121.6) | 6.19 (157.2) | 2.93 (74.5) | 2.03 (51.5) | 2.36 (60.0) | 0.90 (23.0) | 1.22 (31.0) | 1.36 (34.6) | 1.66 (42.3) |

| J | K | K1 | L | L1 | M | P | S | S1 | S2 | R | R1 | R2 | W |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.33 (8.3) | 2.95 (75.0) | 3.28 (83.4) | 1.60 (40.7) | 0.96 (24.3) | 6.16 (156.5) | 6.81 (173.1) | 4.28 (108.8) | 4.93 (125.2) | 3.96 (100.7) | 1.33 (33.7) | 0.68 (17.3) | 1.65 (41.8) | 1.63 (41.3) |

| W1 | W2 | W3 | W4 |
|---|---|---|---|
| 2.28 (57.8) | 2.06 (52.3) | 1.82 (46.3) | 2.39 (60.8) |

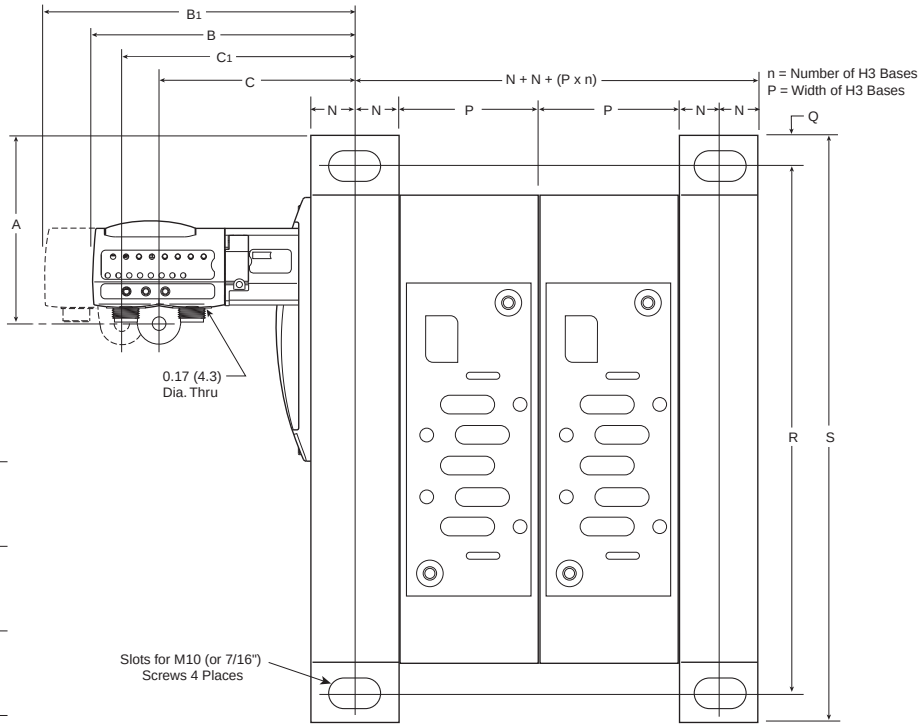
Inches (mm)



For inventory, lead times, and kit lookup, visit www.pdnplu.com

**Parker Hannifin Corporation**
Pneumatic Division
Richland, Michigan
www.parker.com/pneumatics

## P2M with H3 Series ISO Valves

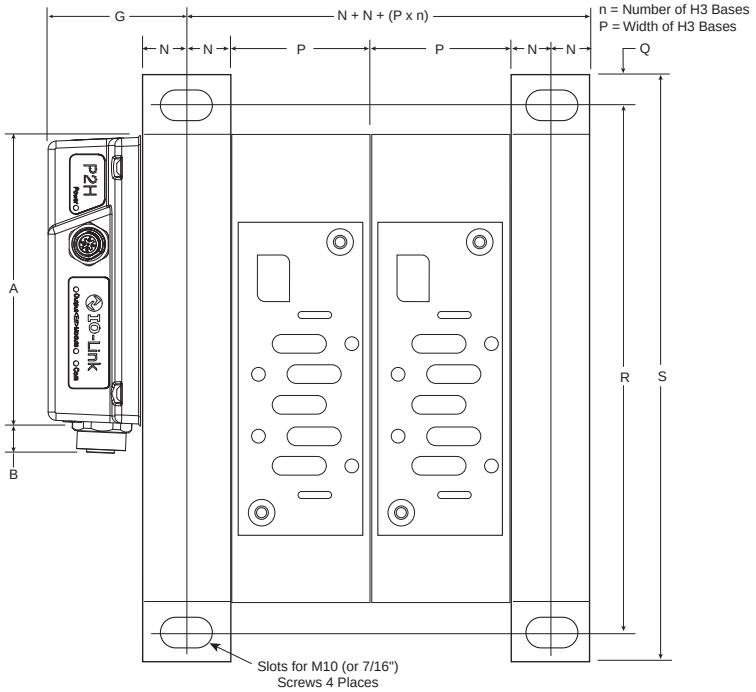



B .....P2M IO-Link
B1 .....P2M Industrial Ethernet Protocol

| A | B | B1 | C |
|---|---|---|---|
| 3.31 (84.2) | 6.40 (161.5) | 6.04 (153.3) | 5.19 (131.8) |
| **C1** | **N** | **P** | **Q** |
| 4.31 (109.5) | .65 (16.5) | 2.80 (71) | .59 (15) |
| **R** | **S** | | |
| 10.43 (265) | 11.61 (295) | | |

Inches (mm)

## P2H with H3 Series ISO Valves




**n (x)** = number of segments

| A | B | G | N |
|---|---|---|---|
| 5.51 (140) | 0.49 (12.5) | 3.01 (76.5) | 0.65 (16.5) |
| **P** | **Q** | **R** | **S** |
| 2.80 (71) | 0.59 (15) | 10.43 (265) | 11.61 (295) |

Inches (mm)

For inventory, lead times, and kit lookup, visit www.pdnplu.com

**Parker Hannifin Corporation**
Pneumatic Division
Richland, Michigan
www.parker.com/pneumatics

# Safety Guide For Selecting And Using Pneumatic Division Products And Related Accessories

**⚠ WARNING:**

**FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF PNEUMATIC DIVISION PRODUCTS, ASSEMBLIES OR RELATED ITEMS ("PRODUCTS") CAN CAUSE DEATH, PERSONAL INJURY, AND PROPERTY DAMAGE. POSSIBLE CONSEQUENCES OF FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THESE PRODUCTS INCLUDE BUT ARE NOT LIMITED TO:**

- Unintended or mistimed cycling or motion of machine members or failure to cycle
- Work pieces or component parts being thrown off at high speeds.
- Failure of a device to function properly for example, failure to clamp or unclamp an associated item or device.
- Explosion
- Suddenly moving or falling objects.
- Release of toxic or otherwise injurious liquids or gasses.

Before selecting or using any of these Products, it is important that you read and follow the instructions below.

**1. GENERAL INSTRUCTIONS**

**1.1. Scope:** This safety guide is designed to cover general guidelines on the installation, use, and maintenance of Pneumatic Division Valves, FRLs (Filters, Pressure Regulators, and Lubricators), Vacuum products and related accessory components.

**1.2. Fail-Safe:** Valves, FRLs, Vacuum products and their related components can and do fail without warning for many reasons. Design all systems and equipment in a fail-safe mode, so that failure of associated valves, FRLs or Vacuum products will not endanger persons or property.

**1.3 Relevant International Standards:** For a good guide to the application of a broad spectrum of pneumatic fluid power devices see: ISO 4414:1998, Pneumatic Fluid Power – General Rules Relating to Systems. See www.iso.org for ordering information.

**1.4. Distribution:** Provide a copy of this safety guide to each person that is responsible for selection, installation, or use of Valves, FRLs or Vacuum products. Do not select, or use Parker valves, FRLs or vacuum products without thoroughly reading and understanding this safety guide as well as the specific Parker publications for the products considered or selected.

**1.5. User Responsibility:** Due to the wide variety of operating conditions and applications for valves, FRLs, and vacuum products Parker and its distributors do not represent or warrant that any particular valve, FRL or vacuum product is suitable for any specific end use system. This safety guide does not analyze all technical parameters that must be considered in selecting a product. The user, through its own analysis and testing, is solely responsible for:

- Making the final selection of the appropriate valve, FRL, Vacuum component, or accessory.
- Assuring that all user's performance, endurance, maintenance, safety, and warning requirements are met and that the application presents no health or safety hazards.
- Complying with all existing warning labels and / or providing all appropriate health and safety warnings on the equipment on which the valves, FRLs or Vacuum products are used; and,
- Assuring compliance with all applicable government and industry standards.

**1.6. Safety Devices:** Safety devices should not be removed, or defeated.

**1.7. Warning Labels:** Warning labels should not be removed, painted over or otherwise obscured.

**1.8. Additional Questions:** Call the appropriate Parker technical service department if you have any questions or require any additional information. See the Parker publication for the product being considered or used, or call 1-800-CPARKER, or go to www.parker.com, for telephone numbers of the appropriate technical service department.

**2. PRODUCT SELECTION INSTRUCTIONS**

**2.1. Flow Rate:** The flow rate requirements of a system are frequently the primary consideration when designing any pneumatic system. System components need to be able to provide adequate flow and pressure for the desired application.

**2.2. Pressure Rating:** Never exceed the rated pressure of a product. Consult product labeling, Pneumatic Division catalogs or the instruction sheets supplied for maximum pressure ratings.

**2.3. Temperature Rating:** Never exceed the temperature rating of a product. Excessive heat can shorten the life expectancy of a product and result in complete product failure.

**2.4. Environment:** Many environmental conditions can affect the integrity and suitability of a product for a given application. Pneumatic Division products are designed for use in general purpose industrial applications. If these products are to be used in unusual circumstances such as direct sunlight and/or corrosive or caustic environments, such use can shorten the useful life and lead to premature failure of a product.

**2.5. Lubrication and Compressor Carryover:** Some modern synthetic oils can and will attack nitrile seals. If there is any possibility of synthetic oils or greases migrating into the pneumatic components check for compatibility with the seal materials used. Consult the factory or product literature for materials of construction.

**2.6. Polycarbonate Bowls and Sight Glasses:** To avoid potential polycarbonate bowl failures:

- Do not locate polycarbonate bowls or sight glasses in areas where they could be subject to direct sunlight, impact blow, or temperatures outside of the rated range.
- Do not expose or clean polycarbonate bowls with detergents, chlorinated hydro-carbons, keytones, esters or certain alcohols.
- Do not use polycarbonate bowls or sight glasses in air systems where compressors are lubricated with fire resistant fluids such as phosphate ester and di-ester lubricants.

**2.7. Chemical Compatibility:** For more information on plastic component chemical compatibility see Pneumatic Division technical bulletins Tec-3, Tec-4, and Tec-5

**2.8. Product Rupture:** Product rupture can cause death, serious personal injury, and property damage.
- Do not connect pressure regulators or other Pneumatic Division products to bottled gas cylinders.
- Do not exceed the maximum primary pressure rating of any pressure regulator or any system component.
- Consult product labeling or product literature for pressure rating limitations.

**3. PRODUCT ASSEMBLY AND INSTALLATION INSTRUCTIONS**

**3.1. Component Inspection:** Prior to assembly or installation a careful examination of the valves, FRLs or vacuum products must be performed. All components must be checked for correct style, size, and catalog number. DO NOT use any component that displays any signs of nonconformance.

**3.2. Installation Instructions:** Parker published Installation Instructions must be followed for installation of Parker valves, FRLs and vacuum components. These instructions are provided with every Parker valve or FRL sold, or by calling 1-800-CPARKER, or at www.parker.com.

**3.3. Air Supply:** The air supply or control medium supplied to Valves, FRLs and Vacuum components must be moisture-free if ambient temperature can drop below freezing

**4. VALVE AND FRL MAINTENANCE AND REPLACEMENT INSTRUCTIONS**

**4.1. Maintenance:** Even with proper selection and installation, valve, FRL and vacuum products service life may be significantly reduced without a continuing maintenance program. The severity of the application, risk potential from a component failure, and experience with any known failures in the application or in similar applications should determine the frequency of inspections and the servicing or replacement of Pneumatic Division products so that products are replaced before any failure occurs. A maintenance program must be established and followed by the user and, at minimum, must include instructions 4.2 through 4.9.

**4.2. Installation and Service Instructions:** Before attempting to service or replace any worn or damaged parts consult the appropriate Service Bulletin for the valve or FRL in question for the appropriate practices to service the unit in question. These Service and Installation Instructions are provided with every Parker valve and FRL sold, or are available by calling 1-800-CPARKER, or by accessing the Parker web site at www.parker.com.

**4.3. Lockout / Tagout Procedures:** Be sure to follow all required lockout and tagout procedures when servicing equipment. For more information see: OSHA Standard – 29 CFR, Part 1910.147, Appendix A, The Control of Hazardous Energy – (Lockout / Tagout)

**4.4. Visual Inspection:** Any of the following conditions requires immediate system shut down and replacement of worn or damaged components:
- Air leakage: Look and listen to see if there are any signs of visual damage to any of the components in the system. Leakage is an indication of worn or damaged components.
- Damaged or degraded components: Look to see if there are any visible signs of wear or component degradation.
- Kinked, crushed, or damaged hoses. Kinked hoses can result in restricted air flow and lead to unpredictable system behavior.
- Any observed improper system or component function: Immediately shut down the system and correct malfunction.
- Excessive dirt build-up: Dirt and clutter can mask potentially hazardous situations.

**Caution: Leak detection solutions should be rinsed off after use.**

**4.5. Routine Maintenance Issues:**
- Remove excessive dirt, grime and clutter from work areas.
- Make sure all required guards and shields are in place.

**4.6. Functional Test:** Before initiating automatic operation, operate the system manually to make sure all required functions operate properly and safely.

**4.7. Service or Replacement Intervals:** It is the user's responsibility to establish appropriate service intervals. Valves, FRLs and vacuum products contain components that age, harden, wear, and otherwise deteriorate over time. Environmental conditions can significantly accelerate this process. Valves, FRLs and vacuum components need to be serviced or replaced on routine intervals. Service intervals need to be established based on:
- Previous performance experiences.
- Government and / or industrial standards.
- When failures could result in unacceptable down time, equipment damage or personal injury risk.

**4.8. Servicing or Replacing of any Worn or Damaged Parts:** To avoid unpredictable system behavior that can cause death, personal injury and property damage:
- Follow all government, state and local safety and servicing practices prior to service including but not limited to all OSHA Lockout Tagout procedures (OSHA Standard – 29 CFR, Part 1910.147, Appendix A, The Control of Hazardous Energy – Lockout / Tagout).
- Disconnect electrical supply (when necessary) before installation, servicing, or conversion.
- Disconnect air supply and depressurize all air lines connected to system and Pneumatic Division products before installation, service, or conversion.
- Installation, servicing, and / or conversion of these products must be performed by knowledgeable personnel who understand how pneumatic products are to be applied.
- After installation, servicing, or conversions air and electrical supplies (when necessary) should be connected and the product tested for proper function and leakage. If audible leakage is present, or if the product does not operate properly, do not put product or system into use.
- Warnings and specifications on the product should not be covered or painted over. If masking is not possible, contact your local representative for replacement labels.

**4.9. Putting Serviced System Back into Operation:** Follow the guidelines above and all relevant Installation and Maintenance Instructions supplied with the valve FRL or vacuum component to insure proper function of the system.

**PARKER-HANNIFIN CORPORATION**
**OFFER OF SALE**

**1. Definitions**. As used herein, the following terms have the meanings indicated.

| | |
|---|---|
| Buyer: | means any customer receiving a Quote for Products from Seller. |
| Goods: | means any tangible part, system or component to be supplied by the Seller. |
| Products: | means the Goods, Services and/or Software as described in a Quote provided by the Seller. |
| Quote: | means the offer or proposal made by Seller to Buyer for the supply of Products. |
| Seller: | means Parker-Hannifin Corporation, including all divisions and businesses thereof. |
| Services: | means any services to be supplied by the Seller. |
| Software: | means any software related to the Products, whether embedded or separately downloaded. |
| Terms: | means the terms and conditions of this Offer of Sale or any newer version of the same as published by Seller electronically at www.parker.com/saleterms. |

**2. Terms.** All sales of Products by Seller are contingent upon, and will be governed by, these Terms and, these Terms are incorporated into any Quote provided by Seller to any Buyer. Buyer's order for any Products whether communicated to Seller verbally, in writing, by electronic date interface or other electronic commerce, shall constitute acceptance of these Terms. Seller objects to any contrary or additional terms or conditions of Buyer. Reference in Seller's order acknowledgement to Buyer's purchase order or purchase order number shall in no way constitute an acceptance of any of Buyer's terms of purchase. No modification to these Terms will be binding on Seller unless agreed to in writing and signed by an authorized representative of Seller.

**3. Price; Payment.** The Products set forth in Seller's Quote are offered for sale at the prices indicated in Seller's Quote. Unless otherwise specifically stated in Seller's Quote, prices are valid for thirty (30) days and do not include any sales, use, or other taxes or duties. Seller reserves the right to modify prices at any time to adjust for any raw material price fluctuations. Unless otherwise specified by Seller, all prices are F.C.A. Seller's facility (INCOTERMS 2010). All sales are contingent upon credit approval and payment for all purchases is due thirty (30) days from the date of invoice (or such date as may be specified in the Quote). Unpaid invoices beyond the specified payment date incur interest at the rate of 1.5% per month or the maximum allowable rate under applicable law.

**4. Shipment; Delivery; Title and Risk of Loss.** All delivery dates are approximate. Seller is not responsible for damages resulting from any delay. Regardless of the manner of shipment, delivery occurs and title and risk of loss or damage pass to Buyer, upon placement of the Products with the shipment carrier at Seller's facility. Unless otherwise agreed, Seller may exercise its judgment in choosing the carrier and means of delivery. No deferment of shipment at Buyers' request beyond the respective indicated shipping date will be made except on terms that will indemnify, defend and hold Seller harmless against all loss and additional expense. Buyer shall be responsible for any additional shipping charges incurred by Seller due to Buyer's acts or omissions.

**5. Warranty.** The warranty related to the Products is as follows: (i) Goods are warranted against defects in material or workmanship for a period of twelve (12) months from the date of delivery or 2,000 hours of use, whichever occurs first; (ii) Services shall be performed in accordance with generally accepted practices and using the degree of care and skill that is ordinarily exercised and customary in the field to which the Services pertain and are warranted for a period of six (6) months from the completion of the Services by Seller; and (iii) Software is only warranted to perform in accordance with applicable specifications provided by Seller to Buyer for ninety (90) days from the date of delivery or, when downloaded by a Buyer or end-user, from the date of the initial download. All prices are based upon the exclusive limited warranty stated above, and upon the following disclaimer:

**DISCLAIMER OF WARRANTY: THIS WARRANTY IS THE SOLE AND ENTIRE WARRANTY PERTAINING TO PRODUCTS. SELLER DISCLAIMS ALL OTHER WARRANTIES, EXPRESS AND IMPLIED, INCLUDING DESIGN, NONINFRINGEMENT, MERCHANTABILITY, AND FITNESS FOR A PARTICULAR PURPOSE. SELLER DOES NOT WARRANT THAT THE SOFTWARE IS ERROR-FREE OR FAULT-TOLERANT, OR THAT BUYER'S USE THEREOF WILL BE SECURE OR UNINTERRUPTED. BUYER AGREES AND ACKNOWLEDGES THAT UNLESS OTHERWISE AUTHORIZED IN WRITING BY SELLER THE SOFTWARE SHALL NOT BE USED IN CONNECTION WITH HAZARDOUS OR HIGH RISK ACTIVITIES OR ENVIRONMENTS. EXCEPT AS EXPRESSLY STATED HEREIN, ALL PRODUCTS ARE PROVIDED "AS IS".**

**6. Claims; Commencement of Actions.** Buyer shall promptly inspect all Products upon receipt. No claims for shortages will be allowed unless reported to the Seller within ten (10) days of delivery. Buyer shall notify Seller of any alleged breach of warranty within thirty (30) days after the date the non-conformance is or should have been discovered by Buyer. Any claim or action against Seller based upon breach of contract or any other theory, including tort, negligence, or otherwise must be commenced within twelve (12) months from the date of the alleged breach or other alleged event, without regard to the date of discovery.

**7. LIMITATION OF LIABILITY.** IN THE EVENT OF A BREACH OF WARRANTY, SELLER WILL, AT ITS OPTION, REPAIR OR REPLACE THE NON-CONFORMING PRODUCT, RE-PERFORM THE SERVICES, OR REFUND THE PURCHASE PRICE PAID WITHIN A REASONABLE PERIOD OF TIME. **IN NO EVENT IS SELLER LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR AS THE RESULT OF, THE SALE, DELIVERY, NON-DELIVERY, SERVICING, NON-COMPLETION OF SERVICES, USE, LOSS OF USE OF, OR INABILITY TO USE THE PRODUCTS OR ANY PART THEREOF, LOSS OF DATA, IDENTITY, PRIVACY, OR CONFIDENTIALITY, OR FOR ANY CHARGES OR EXPENSES OF ANY NATURE INCURRED WITHOUT SELLER'S WRITTEN CONSENT, WHETHER BASED IN CONTRACT, TORT OR OTHER LEGAL THEORY. IN NO EVENT SHALL SELLER'S LIABILITY UNDER ANY CLAIM MADE BY BUYER EXCEED THE PURCHASE PRICE PAID FOR THE PRODUCTS.**

**8. Loss to Buyer's Property.** Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer or any other items which are or become Buyer's property, will be considered obsolete and may be destroyed by Seller after two (2) consecutive years have elapsed without Buyer ordering the Products manufactured using such property. Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.

**9. Special Tooling.** Special Tooling includes but is not limited to tooling, jigs, fixtures and associated manufacturing equipment acquired or necessary to manufacture Products. A tooling charge may be imposed for any Special Tooling. Such Special Tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in Special Tooling belonging to Seller that is utilized in the manufacture of the Products, even if such Special Tooling has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller has the right to alter, discard or otherwise dispose of any Special Tooling or other property in its sole discretion at any time.

**10. Security Interest.** To secure payment of all sums due, Seller retains a security interest in all Products delivered to Buyer and, Buyer's acceptance of these Terms is deemed to be a Security Agreement under the Uniform Commercial Code. Buyer authorizes Seller as its attorney to execute and file on Buyer's behalf all documents Seller deems necessary to perfect its security interest.

**11. User Responsibility.** The Buyer through its own analysis and testing, is solely responsible for making the final selection of the Products and assuring that all performance, endurance, maintenance, safety and warning requirements of the application of the Products are met. The Buyer must analyze all aspects of the application and follow applicable industry standards, specifications, and other technical information provided with the Product. If Seller provides Product options based upon data or specifications provided by the Buyer, the Buyer is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the Products. In the event the Buyer is not the end-user, Buyer will ensure such end-user complies with this paragraph.

**12. Use of Products, Indemnity by Buyer.** Buyer shall comply with all instructions, guides and specifications provided by Seller with the Products. **Unauthorized Uses**. If Buyer uses or resells the Products for any uses prohibited in Seller's instructions, guides or specifications, or Buyer otherwise fails to comply with Seller's instructions, guides and specifications, Buyer acknowledges that any such use, resale, or non-compliance is at Buyer's sole risk. Buyer shall indemnify, defend, and hold Seller harmless from any losses, claims, liabilities, damages, lawsuits, judgments and costs (including attorney fees and defense costs), whether for personal injury, property damage, intellectual property infringement or any other claim, brought by or incurred by Buyer, Buyer's employees, or any other person, arising out of: (a) improper selection, application, design, specification or other misuse of Products provided by Seller; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller's use of patterns, tooling, equipment, plans, drawings, designs or specifications or other information or things furnished by Buyer; (d) damage to the Products from an external cause, repair or attempted repair by anyone other than Seller, failure to follow instructions, guides and specifications provided by Seller, use with goods not provided by Seller, or opening, modifying, deconstructing or tampering with the Products for any reason; or (e) Buyer's failure to comply with these Terms. Seller shall not indemnify Buyer under any circumstance except as otherwise provided in these Terms.

**13. Cancellations and Changes.** Buyer may not cancel or modify any order for any reason, except with Seller's written consent and upon terms that will indemnify, defend and hold Seller harmless against all direct, incidental and consequential loss or damage. Seller, at any time, may change Product features, specifications, designs and availability.

**14. Limitation on Assignment.** Buyer may not assign its rights or obligations without the prior written consent of Seller.

**15. Force Majeure**. Seller does not assume the risk and is not liable for delay or failure to perform any of Seller's obligations by reason of events or circumstances beyond its reasonable control ("Events of Force Majeure"). Events of Force Majeure shall include without limitation: accidents, strikes or labor disputes, acts of any government or government agency, acts of nature, delays or failures in delivery from carriers or suppliers, shortages of materials, or any other cause beyond Seller's reasonable control.

**16. Waiver and Severability.** Failure to enforce any provision of these Terms will not invalidate that provision; nor will any such failure prejudice Seller's right to enforce that provision in the future. Invalidation of any provision of these Terms by legislation or other rule of law shall not invalidate any other provision herein and, the remaining provisions will remain in full force and effect.

**17. Termination.** Seller may terminate any agreement governed by or arising from these Terms for any reason and at any time by giving Buyer thirty (30) days prior written notice. Seller may immediately terminate, in writing, if Buyer: (a) breaches any provision of these Terms (b) appoints a trustee, receiver or custodian for all or any part of Buyer's property (c) files a petition for relief in bankruptcy on its own behalf, or one if filed by a third party (d) makes an assignment for the benefit of creditors; or (e) dissolves its business or liquidates all or a majority of its assets.

**18. Ownership of Software.** Seller retains ownership of all Software supplied to Buyer hereunder. In no event shall Buyer obtain any greater right in and to the Software than a right in the nature of a license limited to the use thereof and subject to compliance with any other terms provided with the Software.

**19. Indemnity for Infringement of Intellectual Property Rights.** Seller is not liable for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights ("Intellectual Property Rights") except as provided in this Section. Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on a third party claim that one or more of the Products sold hereunder infringes the Intellectual Property Rights of a third party in the country of delivery of the Products by the Seller to the Buyer. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of any such claim, and Seller having sole control over the defense of the claim including all negotiations for settlement or compromise. If one or more Products sold hereunder is subject to such a claim, Seller may, at its sole expense and option, procure for Buyer the right to continue using the Products, replace or modify the Products so as to render them non-infringing, or offer to accept return of the Products and refund the purchase price less a reasonable allowance for depreciation. Seller has no obligation or liability for any claim of infringement: (i) arising from information provided by Buyer; or (ii) directed to any Products provided hereunder for which the designs are specified in whole or part by Buyer; or (iii) resulting from the modification, combination or use in a system of any Products provided hereunder. The foregoing provisions of this Section constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for such claims of infringement of Intellectual Property Rights.

**20. Governing Law.** These Terms and the sale and delivery of all Products are deemed to have taken place in, and shall be governed and construed in accordance with, the laws of the State of Ohio, as applicable to contracts executed and wholly performed therein and without regard to conflicts of laws principles. Buyer irrevocably agrees and consents to the exclusive jurisdiction and venue of the courts of Cuyahoga County, Ohio with respect to any dispute, controversy or claim arising out of or relating to the sale and delivery of the Products.

**21. Entire Agreement.** These Terms, along with the terms set forth in the main body of any Quote, forms the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of sale. In the event of a conflict between any term set forth in the main body of a Quote and these Terms, the terms set forth in the main body of the Quote shall prevail. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter shall have no effect. These Terms may not be modified unless in writing and signed by an authorized representative of Seller.

**22. Compliance with Laws**. Buyer agrees to comply with all applicable laws, regulations, and industry and professional standards, including those of the United States of America, and the country or countries in which Buyer may operate, including without limitation the U.S. Foreign Corrupt Practices Act ("FCPA"), the U.S. Anti-Kickback Act ("Anti-Kickback Act"), U.S. and E.U. export control and sanctions laws ("Export Laws"), the U.S. Food Drug and Cosmetic Act ("FDCA"), and the rules and regulations promulgated by the U.S. Food and Drug Administration ("FDA"), each as currently amended. Buyer agrees to indemnify, defend, and hold harmless Seller from the consequences of any violation of such laws, regulations and standards by Buyer, its employees or agents. Buyer acknowledges that it is familiar with all applicable provisions of the FCPA, the Anti-Kickback Act, Export Laws, the FDCA and the FDA and certifies that Buyer will adhere to the requirements thereof and not take any action that would make Seller violate such requirements. Buyer represents and agrees that Buyer will not make any payment or give anything of value, directly or indirectly, to any governmental official, foreign political party or official thereof, candidate for foreign political office, or commercial entity or person, for any improper purpose, including the purpose of influencing such person to purchase Products or otherwise benefit the business of Seller. Buyer further represents and agrees that it will not receive, use, service, transfer or ship any Product from Seller in a manner or for a purpose that violates Export Laws or would cause Seller to be in violation of Export Laws.

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