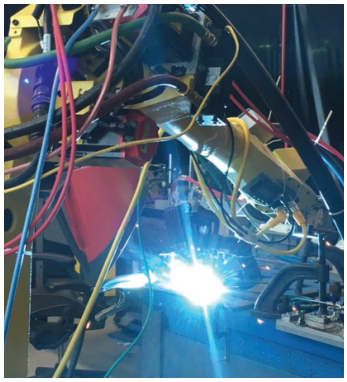
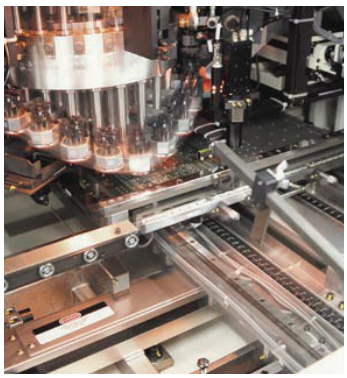
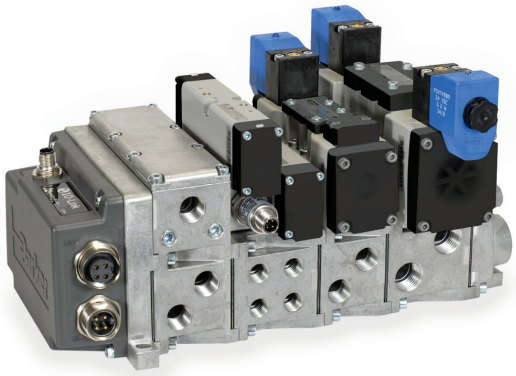
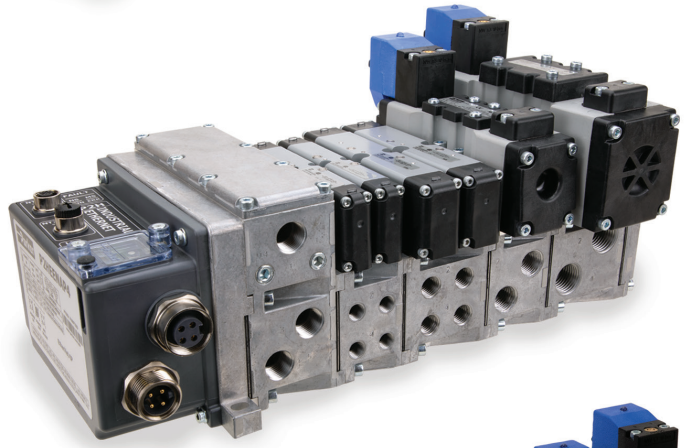
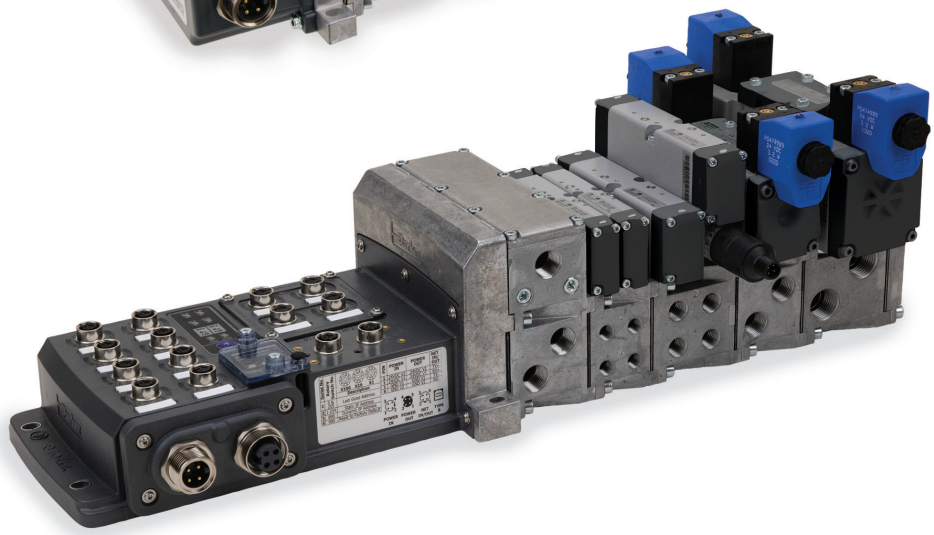






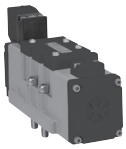




# H Series ISO Valve and Network Connectivity

PDE2589TCUK

## H Series ISO

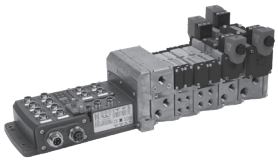



Plug-in

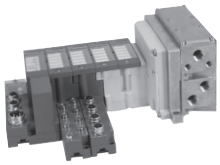

Non plug-in



## Network Connectivity

P2H Ethernet Node  PCH Network Portal

P2H IO-Link 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.

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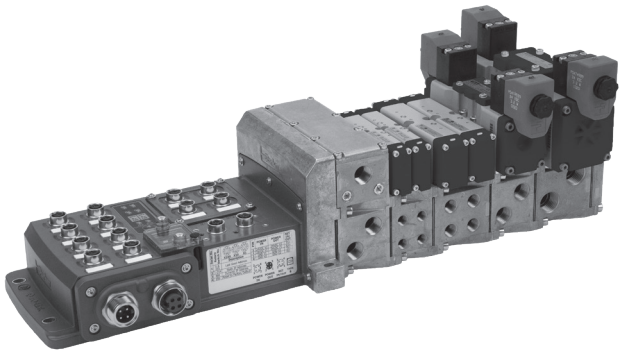
# H Series ISO

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 Qn 540 Nl/mn up to 5900 Nl/mn.
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, Qn 540 Nl/mn
  HA: 1/4 inch, Qn 1080 Nl/mn
  H1: 3/8 inch, Qn 1480 Nl/mn
  H2: 1/2 inch, Qn 2950 Nl/mn
- H Classic Manifold (not compatible with H Universal)
  H3: 3/4 inch, Qn 5900 Nl/mn
- BSPP and NPT "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 10 bar |
| Pilot pressure: | See chart |
| Temperature range: | -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: 10 bar
Minimum: see below chart

| Operator / function | Internal pilot | bar HB | bar HA | bar H1 | bar H2 | bar H3 |
|---|---|---|---|---|---|---|
| 1 | 5/2 Single Solenoid | 2.0 | 1.7 | 1.7 | 1.7 | 2.4 |
| 2 | 5/2 Double Solenoid | | | | | |
| 3 | 5/2 Single Remote Pilot ** | Vacuum | Vacuum | Vacuum | Vacuum | Vacuum |
| 4 | 5/2 Double Remote Pilot** | Vacuum | Vacuum | Vacuum | Vacuum | Vacuum |
| 5, 6, 7 | 5/3 Double Solenoid - APB, CE & PC | 2.4 | 2.4 | 2.4 | 3.4 | 3.4 |
| 8, 9, 0 | 5/3 Double Remote Pilot - APB, CE & PC | Vacuum | Vacuum | Vacuum | Vacuum | Vacuum |
| E | 5/2 Single Solenoid - Air & Spring Return | 2.0 | 2.0 | 2.4 | 3.1 | 3.1 |
| F | 5/2 Single Remote Pilot - Air & Spring Return | | | | | |
| N, P, Q | Dual 3/2 Solenoid - NC/NC, NO/NO, NC/NO | 2.0 | 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.



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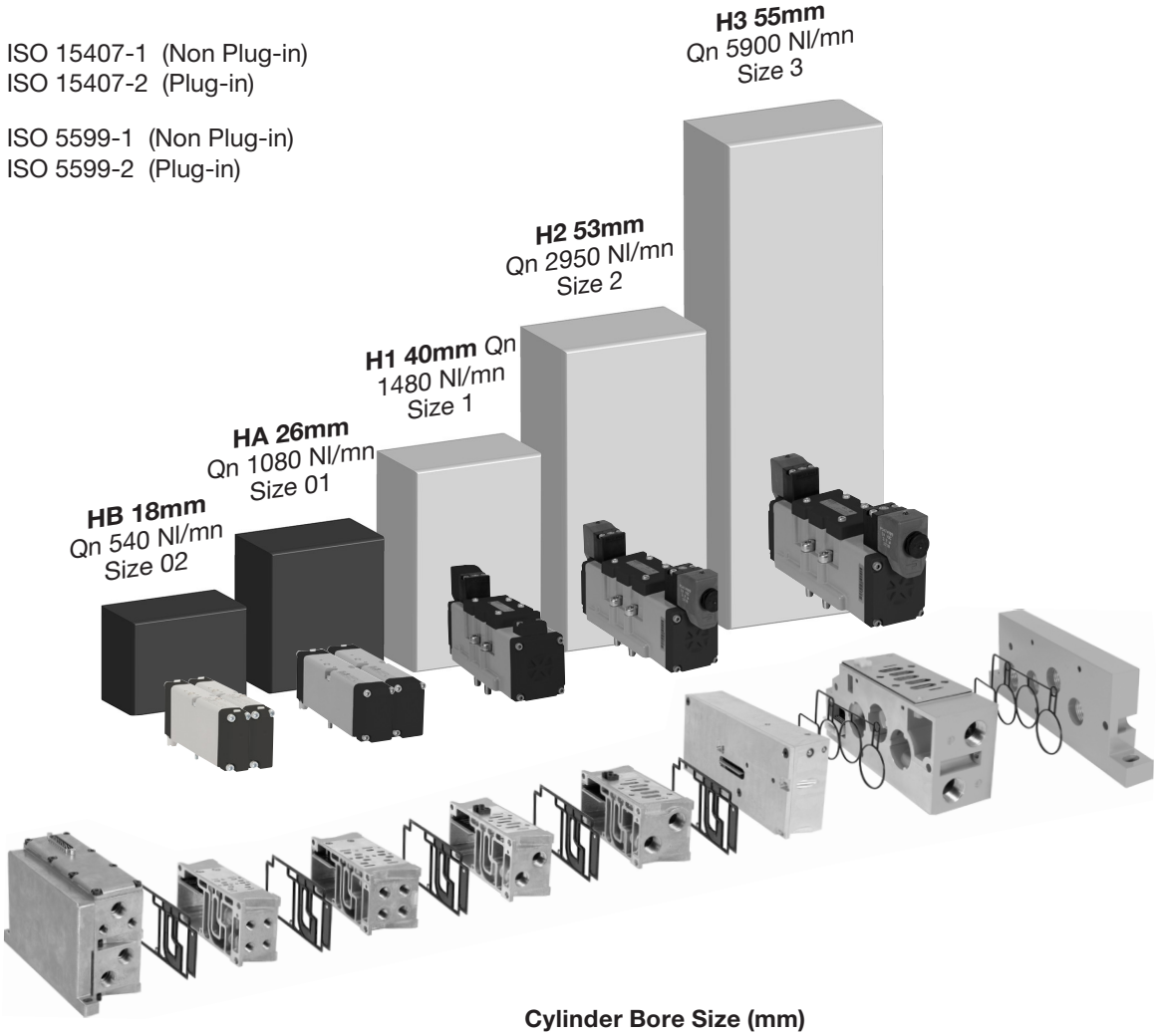
# Right Sizing

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 (mm)**

| Cylinder Speed - (mm/s) | 32 mm | 40 mm | 50 mm | 63 mm | 80 mm | 100 mm | 125 mm | 150 mm |
|---|---|---|---|---|---|---|---|---|
| 50 | 29 | 39 | 59 | 98 | 167 | 255 | 402 | 579 |
| 100 | 49 | 79 | 128 | 206 | 344 | 520 | 805 | 1168 |
| 150 | 79 | 118 | 196 | 304 | 510 | 775 | 1217 | 1747 |
| 200 | 98 | 157 | 255 | 402 | 677 | 1031 | 1610 | 2326 |
| 250 | 128 | 196 | 324 | 510 | 854 | 1296 | 2022 | 2915 |
| 300 | 157 | 245 | 393 | 609 | 1031 | 1551 | 2424 | 3494 |
| 350 | 177 | 285 | 451 | 707 | 1197 | 1816 | 2827 | 4073 |
| 400 | 206 | 324 | 520 | 805 | 1364 | 2071 | 3239 | 4662 |
| 450 | 236 | 363 | 579 | 913 | 1541 | 2326 | 3641 | 5241 |
| 500 | 255 | 402 | 648 | 1011 | 1708 | 2591 | 4044 | 5830 |
| | HB | | HA | | H1 | H2 | H3 | |





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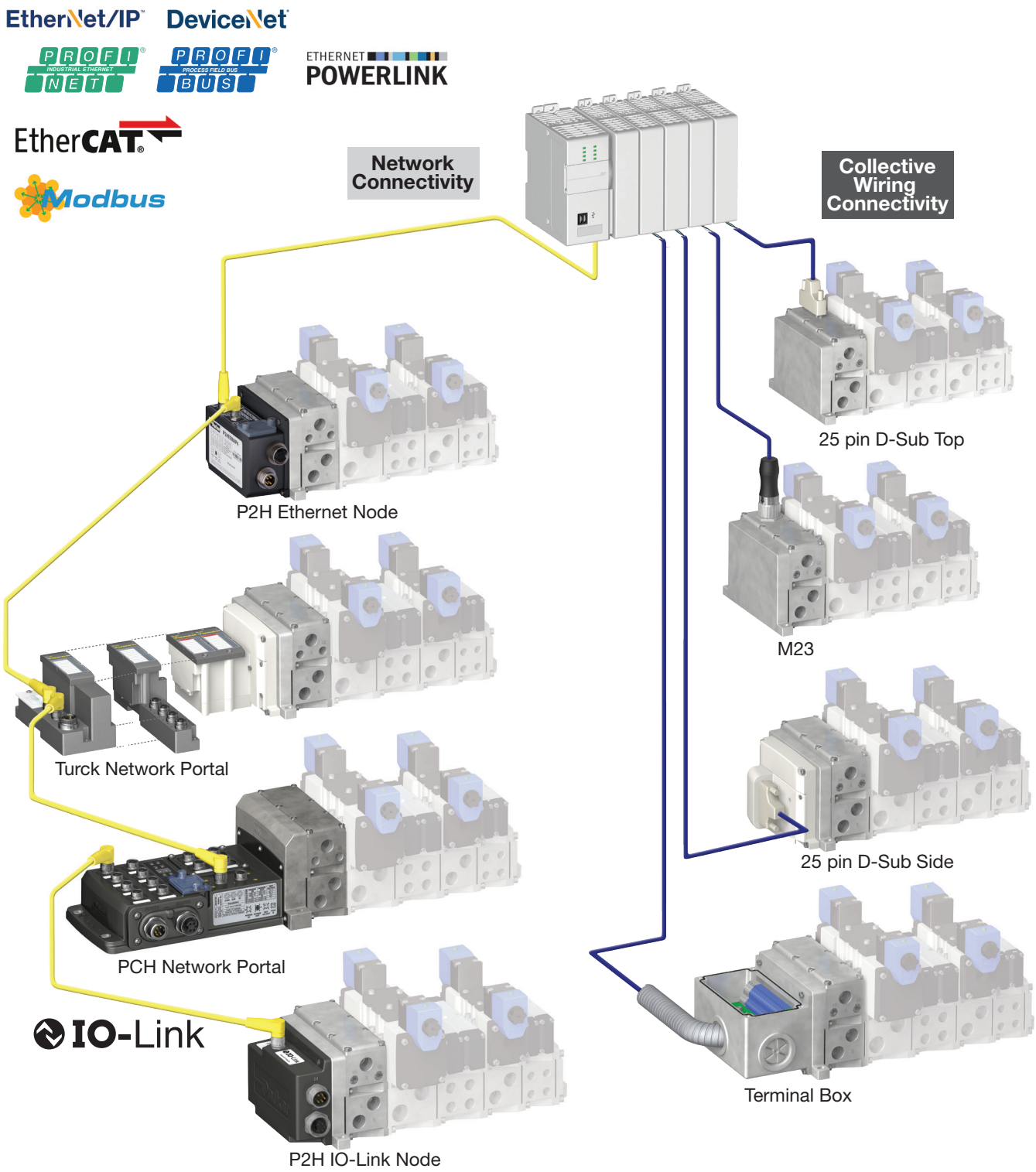
# Connectivity




Industrial Ethernet protocol offerings differ by product line



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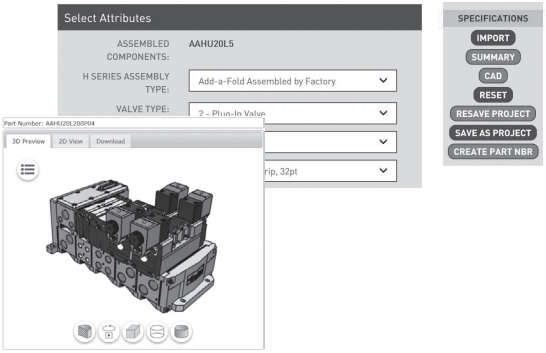
# Two easy ways to order H Universal

## 1 Online Configuration

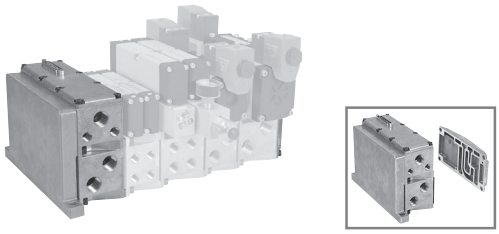
Navigate to the landing page
www.parker.com/pde/HSeriesISO
Customize your manifold assembly
Create and save a unique assembled part number
Generate a CAD model



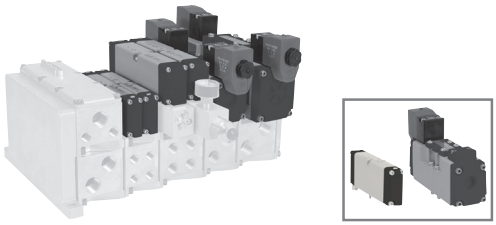

***OR***

## 2 Order Components

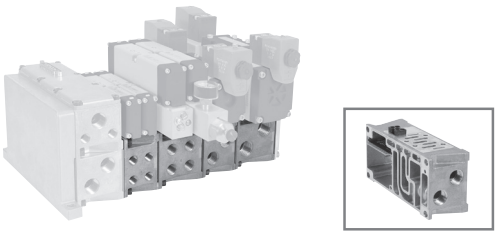
**A** **Select Endplate Kit**
Includes Left and Right Hand Endplate



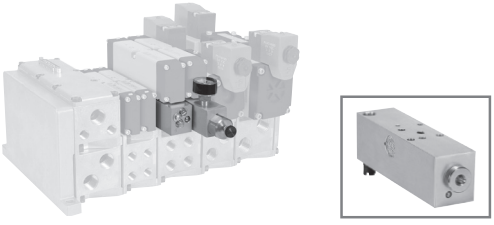
**B** **Select Valve Stations**
Valves (size HB, HA, H1 or H2)
Blanking Plate



**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





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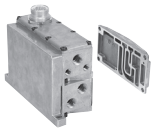
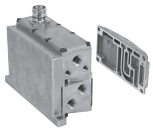
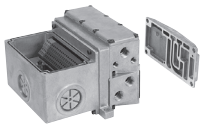
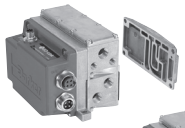
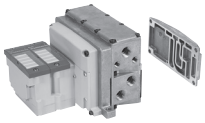
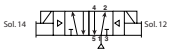
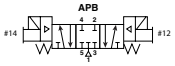
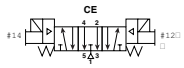
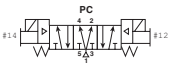
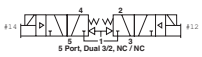
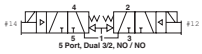
## End Plate Kits - Universal for use with HB, HA, H1 H2

| | Electrical option | BSPP port |
|---|---|---|
|  | 25-pin, D-Sub<br>Side, 24 address | **PSHU20L101P** |
|  | 25-pin, D-Sub<br>Top, 24 address | **PSHU20L201P** |
|  | 19-pin, round, Brad Harrison,<br>16 address | **PSHU20L301P** |
|  | 12-pin, M23, 8 address | **PSHU20L401P** |
| | 19-pin, M23, 16 address | **PSHU20M201P** |
|  | Terminal box, 32 address | **PSHU20L501P** |
|  Class A<br>  Class B | P2H IO Link Class B, standard version,<br>24 address | **PSHU20N201P** |
| | P2H IO Link Class B, safe version,<br>24 address | **PSHU20S201P** |
| | P2H IO Link Class A, 4-pin safe version,<br>24 address | **PSHU20S401P** |
| | P2H IO Link Class A, 5-pin safe version,<br>24 address | **PSHU20S501P** |
|  | P2H Ethernet Node, 32 addresses, EtherNet/IP™ | **PSHU20P201PE000A-P5** |
| | P2H Ethernet Node, 32 addresses, EtherCAT | **PSHU20P201PT000A-P5** |
| | P2H Ethernet Node, 32 addresses, Profinet | **PSHU20P201PN000A-P5** |
|  | PCH Network Portal, 32 addresses with 2 Module Variants, Profinet | **PSHU20P301PNAAN0-P5** |
| | PCH Network Portal, 32 addresses,with 3 Module Variants, EtherNet/IP™ | **PSHU20P301PEAAB0-P5** |
|  | Turck Network with valve driver module,<br>16 address | **PSHU20T101P** |
| | Turck Network with valve driver module,<br>32 address | **PSHU20T201P** |

**Most Popular**

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

| | Symbol | Type | Qn (Nl/mn) | Operator | Voltage | Pilot | Non-locking |
|---|---|---|---|---|---|---|---|
|  |  | 5/2 Elec. spring return | 540 | Single solenoid | 24 VDC | External* | **HBEVXLG0G9A** |
| |  | 5/2 Elec. air return | 540 | Single solenoid | 24 VDC | External* | **HB1VXLG0G9A** |
| |  | 5/2 dual Elec. | 540 | Double solenoid | 24 VDC | External* | **HB2VXLG0G9A** |
| |  | 5/3 dual Elec., all ports blocked | 0490 | Double solenoid | 24 VDC | External* | **HB5VXLG0G9A** |
|  |  | 5/3 dual Elec., center exhaust | 490 | Double solenoid | 24 VDC | External* | **HB6VXLG0G9A** |
| |  | 5/3 dual Elec., pressure center | 490 | Double solenoid | 24 VDC | External* | **HB7VXLG0G9A** |
| |  | Dual 3/2 Elec. NC/NC | 440 | Double solenoid | 24 VDC | Internal | **HBNVXBG0G9A** |
| |  | Dual 3/2 Elec. NO/NO | 440 | Double solenoid | 24 VDC | Internal | **HBPVXBG0G9A** |

* Internal/External defined from the H Universal Supply module (see page 55)

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

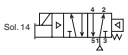
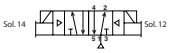
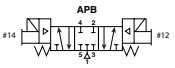
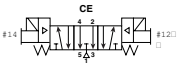
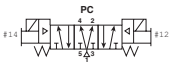
| End ported bases | Enclosure | Solenoid addresses | 1/8" BSPP |
|---|---|---|---|
|  | Circuit board | Single solenoid - 2 address | **PSHU1152J1P** |
| | Circuit board | Double solenoid - 4 addresses | **PSHU1152M1P** |

## 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** | |
| | | | Common pressure | Independent pressure |
|  | Sandwich regulator | 0,1 > 4,1 bar w/ gauge | **PS5638155P** | **PS5638255P** |
| | | 0,35 > 8,6 bar w/ gauge | **PS5638166P** | **PS5638266P** |

**Most Popular**

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

| | Symbol | Type | Qn (Nl/mn) | Operator | Voltage | Pilot | Non-locking |
|---|---|---|---|---|---|---|---|
|  |  | 5/2 Elec. spring return | 1080 | Single solenoid | 24 VDC | External* | **HAEVXLG0G9A** |
| |  | 5/2 Elec. air return | 1080 | Single solenoid | 24 VDC | External* | **HA1VXLG0G9A** |
| |  | 5/2 dual Elec. | 1080 | Double solenoid | 24 VDC | External* | **HA2VXLG0G9A** |
|  |  | 5/3 dual Elec., all ports blocked | 980 | Double solenoid | 24 VDC | External* | **HA5VXLG0G9A** |
| |  | 5/3 dual Elec., center exhaust | 980 | Double solenoid | 24 VDC | External* | **HA6VXLG0G9A** |
| |  | 5/3 dual Elec., pressure center | 980 | Double solenoid | 24 VDC | External* | **HA7VXLG0G9A** |

* Internal/External defined from the H Universal Supply module (see page 55)

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

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

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

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

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

| | Accessories | Description | | |
|---|---|---|---|---|
|  | 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** |

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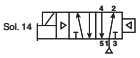
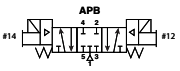
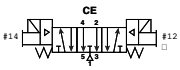
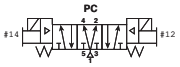
## Valve - 5599-2, Plug-in, Size 1 (H1)

| | Symbol | Type | Qn (Nl/mn) | Operator | Voltage | Pilot | Non-locking |
|---|---|---|---|---|---|---|---|
|  |  | 5/2 Elec. spring return | 1480 | Single solenoid | 24 VDC | External* | **H1EVXXG0B9D** |
| |  | 5/2 Elec. air return | 1480 | Single solenoid | 24 VDC | External* | **H11VXXG0B9D** |
|  |  | 5/2 dual Elec. | 1480 | Double solenoid | 24 VDC | External* | **H12VXXG0B9D** |
| |  | 4-way, 3-position, all ports blocked | 1180 | Double solenoid | 24 VDC | External* | **H15VXXG0B9D** |
| |  | 5/3 dual Elec., center exhaust | 1180 | Double solenoid | 24 VDC | External* | **H16VXXG0B9D** |
| |  | 5/3 dual Elec., pressure center | 1180 | Double solenoid | 24 VDC | External* | **H17VXXG0B9D** |

* Internal/External defined from the H Universal Supply module (see page 55)

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

| Side ported | Enclosure / Lead length | Solenoid addresses | 3/8" BSPP |
|---|---|---|---|
|  | Terminal strip in base | Double solenoid - 2 addresses | **PS401116CDP** |

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

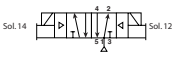
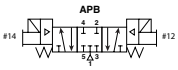
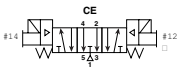
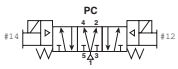
| End Ported | Enclosure | Solenoid addresses | 3/8" BSPP |
|---|---|---|---|
|  | Circuit board | Single solenoid - 1 address | **PSHU1156J1P** |
| | Circuit board | Double solenoid - 2 addresses | **PSHU1156M1P** |

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

| | Accessory | Description | | Part number |
|---|---|---|---|---|
|  | Sandwich regulator | Common pressure | 0,35 > 8,6 bar w/ gauge | **PS4038166CP** |
| | | Independent pressure | 0,35 > 8,6 bar 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 | Qn (Nl/mn) | Operator | Voltage | Pilot | Non-locking |
|---|---|---|---|---|---|---|---|
|  |  | 5/2 Elec. spring return | 2750 | Single solenoid | 24 VDC | External* | **H2EVXXG0B9D** |
| |  | 5/2 Elec. air return | 2750 | Single solenoid | 24 VDC | External* | **H21VXXG0B9D** |
| |  | 5/2 dual Elec. | 2750 | Double solenoid | 24 VDC | External* | **H22VXXG0B9D** |
|  |  | 5/3 dual Elec., all ports blocked | 2450 | Double solenoid | 24 VDC | External* | **H25VXXG0B9D** |
| |  | 5/3 dual Elec., center exhaust | 2450 | Double solenoid | 24 VDC | External* | **H26VXXG0B9D** |
| |  | 5/3 dual Elec., pressure center | 2450 | Double solenoid | 24 VDC | External* | **H27VXXG0B9D** |

* Internal/External defined from the H Universal Supply module (see page 55)

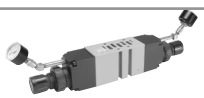
## Single Subbase - 5599-2, Plug-in, Size 2 (H2)

| Side ported base | Enclosure / Lead length | Solenoid addresses | 1/2" BSPP |
|---|---|---|---|
|  | Terminal strip in base | Double solenoid - 2 address | **PS411118CCP** |

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

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

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

| | Accessory | Description | | Part number |
|---|---|---|---|---|
|  | Sandwich regulator | Common pressure | 0,35 > 8,6 bar w/ gauge | **PS4138166CP** |
| | | Independent pressure | 0,35 > 8,6 bar 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 |

| 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 |
| 19-Pin, M23 | M2 |
| 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 |
| ------For P2H Ethernet Node and PCH Network Portal, see next pages ------ | |

* 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.

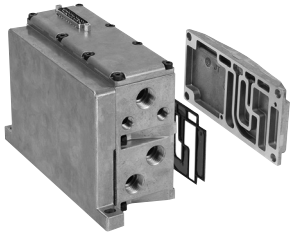
◊ Only suitable for P2M Industrial Ethernet Protocols

| 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 |
| 3* | H3 Transition plate, 1" exhaust and inlet, (electrical pass through) |
| 4* | H3 Transition plate, 1" exhaust and inlet, (expansion to 25th address) |

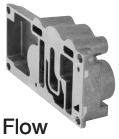
* 1, 3 & 5 manifold galery blocked at transition plate. 12 & 14 pass through.



**25-pin D-Sub (top) with low profile end plate shown Qn 3900 Nl/mn**

## Right Hand End Plate

Low Profile



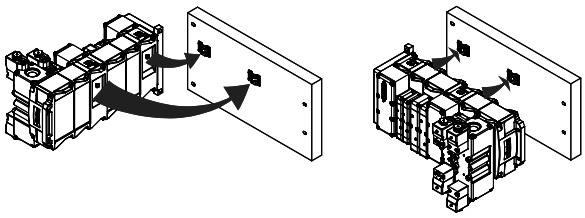
High Flow

| Description | BSPP port |
|---|---|
| Right hand end plate only, low profile, 3900 Nl/mn | **PSHU4000P** |
| Right hand end plate only, high flow 1/2" ports, 5960 Nl/mn | **PSHU4101P** |
| Right hand end plate only, high flow 3/4" ports, 8200 Nl/mn | **PSHU4201P** |

## H3 Transition Kit

| | |
|---|---|
| H3 transition, H3 right hand end plate, 1" ports, electrical pass through (includes gaskets & bolts) | **PSHU7101P** |
| H3 transition, H3 right hand end plate, 1" ports, expansion to 25th address (includes gaskets & bolts) | **PSHU7201P** |

## Installation Bracket



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

**Most Popular**



**Parker Hannifin Corporation**
Pneumatic Division - Europe
www.parker.com/pneumatics

## End Plate Kit – Universal Plug-in

The P2H EtherNet Node is ordered as an endplate kit. This includes the P2H EtherNet Node, left hand air supply module, and right hand end plate. 32 pilot solenoid addresses with two choices of power source configurations.

| PSHU20 | P2 | 0 | 0 | P | E | 000 | A | – | P4 |
|---|---|---|---|---|---|---|---|---|---|

**Valve Type**

| | |
|---|---|
| Plug-in (Internal pilot) | PSHU20 |
| Plug-in (External pilot) | PSHU2X |

**Thread Type**

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

**Network Connections**

| | |
|---|---|
| EtherNet/IP™ | E |
| EtherCAT | T |
| PROFINET | N |
| Modbus TCP | M |
| Powerlink | W |

**Power Connector**

| | |
|---|---|
| 4-pin Power IN/OUT with 1 Safe Power Capable Zone | P4 |
| 5-pin Power IN/OUT with 1 Safe Power Capable Zone | P5 |
| 5 Pin M12 L-Code IN/OUT with 1 Safe Power Capable Zone | L5 |

**Right Hand End Plate Type / Thread Size**

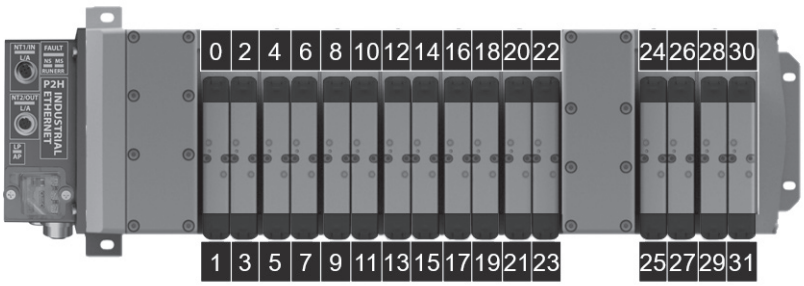
| | |
|---|---|
| Low profile (no ports) | 0 |
| 1/2 Exhaust and Inlet Port | 1 |
| 3/4 Exhaust and Inlet Port | 2 |
| H3 Transition Plate and End Plate (electrical pass through for plug-in valves only) | 3 |
| H3 Transition Plate and End Plate (expansion to 25th address for plug-in valves only) | 4 |

**Expansion Module / Power Source**

| | |
|---|---|
| Power Source for Output 25-32: AUX Power | A |
| Power Source for Output 25-32: Logic Power | L |

## Power Source Selection

The P2H Node 32DO has two available power sources for addresses 24 to 31. Addresses 24 to 31 can draw their power from Auxiliary Power Pins (Power Source Option A) or Logic Power Pins (Power Source Option L). Must use Auxiliary Inlet Module with electrical expansion to access addresses 24 to 31. Address 0 to 23 is always auxiliary power source.




Addresses 0 to 23 draw power from Auxiliary Power Pins

Addresses 24 to 31 draw power from either Auxiliary (Option A) or Logic Pins (Option L)

Most popular

## End Plate Kit – Universal Plug-in

The PCH Network Portal is ordered as an endplate kit. This includes the PCH Network Portal, left hand air supply module, and right hand end plate.

| PSHU20 | P3 | 0 | 0 | P | E | AAA | 0 | – | P4 |
|---|---|---|---|---|---|---|---|---|---|

| Valve Type | |
|---|---|
| Plug-in (Internal pilot) | PSHU20 |
| Plug-in (External pilot) | PSHU2X |

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

| Network Connections | |
|---|---|
| EtherNet/IP | E |
| EtherCAT | T |
| PROFINET | N |
| PROFINET AIDA | A |
| Modbus TCP | M |

| Power Connector * | |
|---|---|
| 4-pin Power IN/OUT with 1 Safe Power Capable Zone | P4 |
| 5-pin Power IN/OUT with 1 Safe Power Capable Zone | P5 |
| 4-pin Power IN/IN with 2 Safe Power Zones | S4 |
| 5-pin Power IN/IN with 2 Safe Power Zones | S5 |
| AIDA Power IN/OUT with 1 Safe Power Capable Zone | J1* |

* Only available with Profinet AIDA

| Right Hand End Plate Type / Thread Size | |
|---|---|
| Low profile (no ports) | 0 |
| 1/2 Exhaust and Inlet Port | 1 |
| 3/4 Exhaust and Inlet Port | 2 |
| H3 Transition Plate and End Plate (electrical pass through for plug-in valves only) | 3 |
| H3 Transition Plate and End Plate (expansion to 25th address for plug-in valves only) | 4 |

**Module Combinations**

| Module Position 1 | Module Position 2 | Module Position 3 |
|---|---|---|
| A | A | A |
| A | A | B |
| A | A | C |
| A | A | N |
| A | B | B |
| A | B | C |
| A | B | N |
| A | C | C |
| A | C | N |
| B | B | B |
| B | B | C |
| B | B | N |
| B | C | C |
| B | C | N |
| C | C | C |
| C | C | N |

For any module configurations not listed, consult factory.

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

**HB 1 VX B G 0 G9 A 8P**

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

| Options | |
|---|---|
| Blank | No Options |
| 8P | M8, PNP, Spool Sensing |
| 8N | M8, NPN, Spool Sensing |
| 2P | M12, PNP, Spool Sensing |

* Available on HA series with operator functions 1, 2, E only

| 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".

| 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 |

| Mounting | |
|---|---|
| 15407-2 Valve Less Base | VX |

| 15407-2 Enclosure / Lead Length | |
|---|---|
| 0 | Valve Less Base |

HB 18mm Valve shown

| 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 |

| Part Number | Cable Type |
|---|---|
| RKC 4.4T-2 | M12, 4 Pin Female, PVC, 2m |
| PKG 3M-4/ S90 | M8, 3 Pin Female, PUR, 4M, flying lead |

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

| 5599-2 Operator / Function | |
|---|---|
| 5/2 Elec. air return | 1 |
| 5/2 dual Elec. | 2 |
| 5/3 dual Elec., all ports blocked | 5 |
| 5/3 dual Elec., center exhaust | 6 |
| 5/3 dual Elec., pressure center | 7 |
| 5/2 Elec. spring return | E |

| 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.

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

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

**H1 Valve shown**

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

* Internal/External defined from the H Universal Supply module (see page 55)

* 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 |

## 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

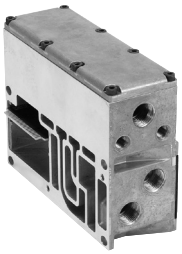
**PSHU115A T 1 P**

| 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 |

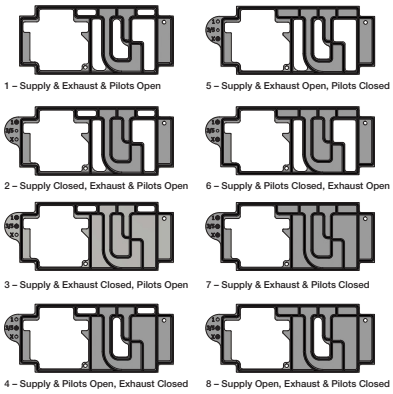


**Intermediate air supply module shown**

## Pneumatic Zoning

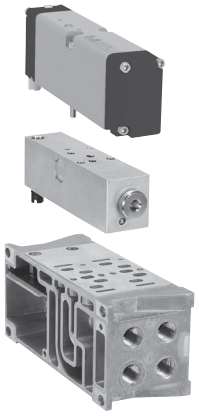
Multiple pressure zones can be created by selecting alternative gaskets between individual manifold segments or an intermediate air supply module. These zones can be designed to meet different application and safety requirements on the machine. Inserting the PXM Pilot Exhaust Module into a one of these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

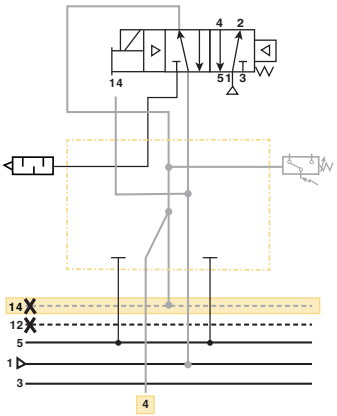
## Gasket Kit - Universal Manifold to Manifold

| | 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** |

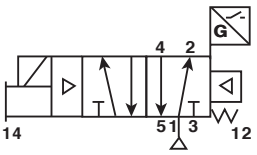
## Pilot Exhaust Module / HA Spool Sensing

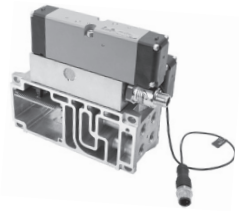
PXM Pilot Exhaust Module enables an H Series HA Single Solenoid valve to control the pilot pressure to other externally piloted H Series ISO valves in the same manifold zone. The HA valve in conjunction with the PXM will remove pilot pressure to all externally piloted valves in the manifold zone when 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).






Alternatively, the HA Single Solenoid spool sensing valve can be used in place of the standard HA Valve. The spool sensing option mounts on top of the PXM and provides the added benefit of solid-state sensing of spool position to the PLC via an M8 or M12 connection. The spool sensing can be used without the PXM module for sensing only.



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.

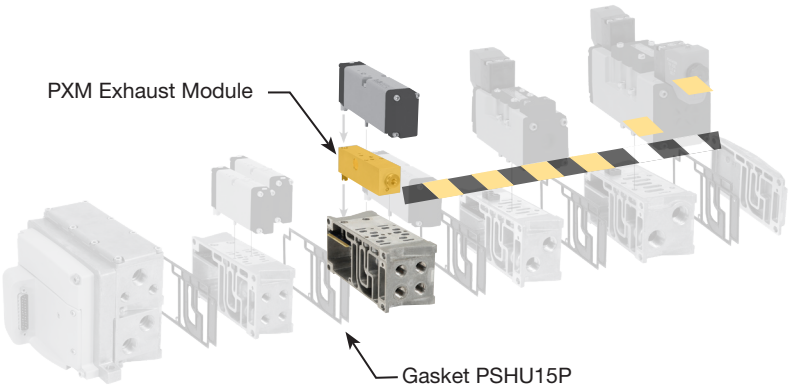
| Part Number | Sensor Type |
|---|---|
| PS55XXA0P | No sensing |
| PS55XXM0P | Mechanical pressure switch |
| PS55XXE0P | Solid state pressure switch |

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


PS55XXA0P


PS55XXM0P


PS55XXE0P



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

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

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

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

| #2 Port Regulator / Gauge* | |
|---|---|
| 5 | 0,1 > 4,1 bar w/Gauge |
| 6 | 0,35 > 8,6 bar 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 | 0,1 > 4,1 bar w/Gauge |
| 6 | 0,35 > 8,6 bar 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 Qn (Nl/mn) 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** | 196 | 196 | 402 | 334 | 226 | 186 | 275 | 265 |
| **HA** | 402 | 422 | 854 | 874 | 412 | 442 | 667 | 648 |

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


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## 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 | 0,05 > 2,0 bar w/Gauge |
| 5 | 0,1 > 4,1 bar w/Gauge |
| 6 | 0,35 > 8,6 bar 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.

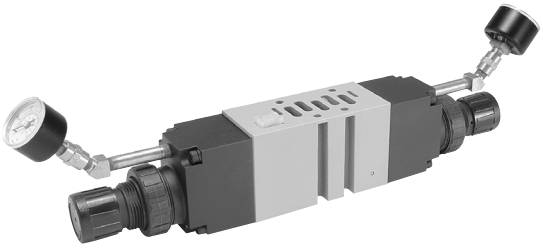
| #4 Port Regulator / Gauge* | |
|---|---|
| 0** | Line By-Pass Plate |
| 4 | 0,05 > 2,0 bar w/Gauge |
| 5 | 0,1 > 4,1 barw/Gauge |
| 6 | 0,35 > 8,6 bar w/Gauge |
| D | Remote Pilot ISO 2 & 3 only |

* 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 Qn (Nl/mn) Flow Chart*

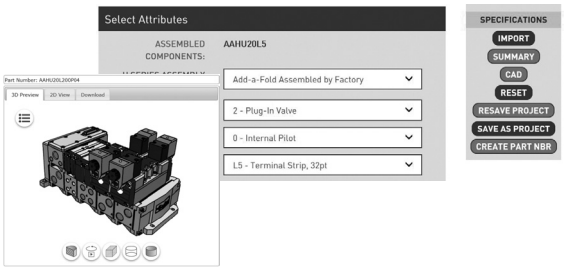
| | Common Pressure Code 166 | | | | Single Pressure 2 Code 206 | | | | Single Pressure 4 Code 260 | | | | Dual Pressure Code 266 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1-2 | 1-4 | 2-3 | 4-5 | 1-2 | 1-4 | 2-3 | 4-5* | 1-2 | 1-4 | 2-3 | 4-5* | 1-2 | 1-4 | 2-3 | 4-5* |
| **H1** | 609 | 599 | 1256 | 1158 | 716 | 942 | 942 | 913 | 334 | 687 | 923 | 962 | 510 | 471 | 844 | 864 |
| **H2** | 1443 | 1570 | 2365 | 2287 | 1678 | 1865 | 1492 | 1718 | 1708 | 1639 | 1698 | 1757 | 1580 | 1590 | 1472 | 1639 |

* Regulator Port exhaust through Base Port 3.

Note: All Qn's (Nl/mn) calculated with regulator adjusted full open.

## Online Configuration

Navigate to the landing page
www.parker.com/pde/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 |

**Number of Segments**

| |
|---|
| 01 |
| ↓ |
| 32 |

**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 |
| 19-Pin, M23 | M2 |
| 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 |
| ------For P2H Ethernet Node and PCH Network Portal, see next pages ------ | |

**Thread Type**

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

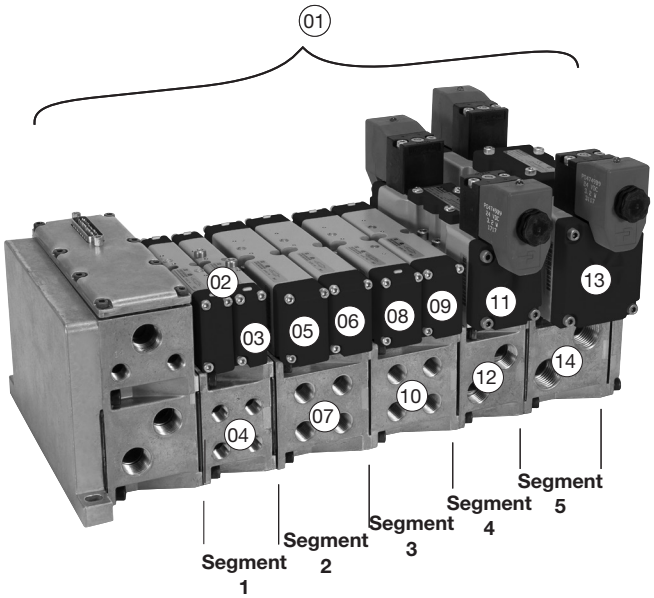
* BSPP Conforms to ISO 1179-1 w 228-1 Threads

**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 |
| 3* | H3 Transition plate, 1" exhaust and inlet, (electrical pass through) |
| 4* | H3 Transition plate, 1" exhaust and inlet, (expansion to 25th address) |

* 1, 3 & 5 manifold galley blocked at transition plate. 12 & 14 pass through.

* 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




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.

### 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 |



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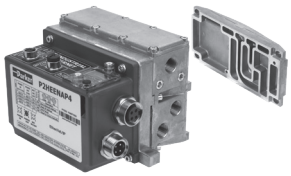
## Add-A-Fold – Universal Plug-in – P2H Ethernet Node

The P2H Industrial EtherNet node is a control unit capable of controlling up to 32 digital outputs (pilot solenoids), through the most popular Industrial Ethernet protocols. The P2H Ethernet Node is a low-cost network connection with easy integration and simple to use diagnostics all housed in a robust IP65 weld-resistant housing.



| AAHU | 20 | P2 | 0 | 0 | P | 04 | E | 000 | A | – | P4 |
|---|---|---|---|---|---|---|---|---|---|---|---|

**Valve Type**

| | |
|---|---|
| Plug-in Valves | |
| Internal pilot | 20 |
| External pilot | 2X |

**Thread Type**

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

**Number of Segments**

| |
|---|
| 0 |
| ↓ |
| 32 |

**Network Connections**

| | |
|---|---|
| EtherNet/IP™ | E |
| EtherCAT | T |
| ProfiNet | N |
| Modbus TCP | M |
| Powerlink | W |

**Power Connector**

| | |
|---|---|
| 4-pin power IN/OUT with 1 safe power capable zone | P4 |
| 5-pin power IN/OUT with 1 safe power capable zone | P5 |
| 5 Pin M12 L-Code IN/OUT with 1 Safe Power Capable Zone | L5 |

**Right Hand End Plate Type / Thread Size**

| | |
|---|---|
| Low profile (no ports) | 0 |
| 1/2 Exhaust and inlet port | 1 |
| 3/4 Exhaust and inlet port | 2 |
| H3 Transition plate and end plate (electrical pass through for plug-in valves only) | 3 |
| H3 Transition plate and end plate (expansion to 25th address for plug-in valves only) | 4 |

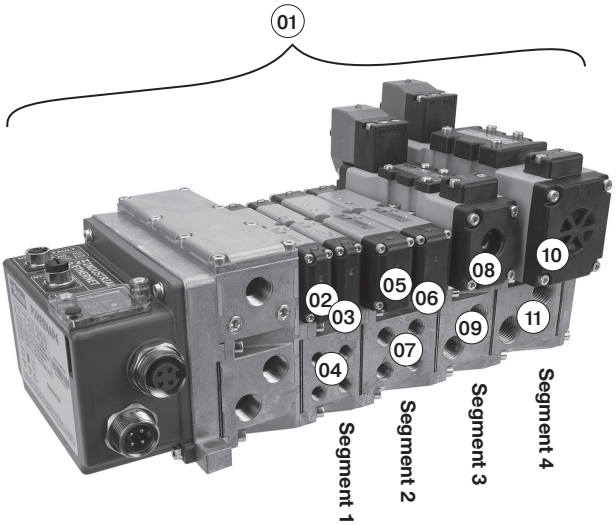
**Expansion Module / Power Source**

| | |
|---|---|
| Power Source for Output 25-32: AUX Power | A |
| Power Source for Output 25-32: Logic Power | L |

## Example

Application required a 4 segment manifold

| Item | Part No. | Location | |
|---|---|---|---|
| 01 | AAHU20P200P04E000A-P4 | | |
| 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 | H12VXBG0B9A | Segment 3 | Valve Station 5 |
| 09 | PSHU1155M1P | | Manifold Base |
| 10 | H2222VXBG0B9A | Segment 4 | Valve Station 6 |
| 11 | PSHU1157M1P | | Manifold Base |




Example:
5 segment manifold with (2) HB, (2) HA, (1) H1, and (1) H2 valve on manifold bases with P2H Ethernet Node end plate.

## Add-A-Fold – Universal Plug-in – PCH Network Portal

The PCH Network Portal redefines and revolutionizes machine I/O (Inputs and Outputs). The PCH Portal was engineered for the open protocol IO-Link A and IO-Link B devices as well as configurable inputs/outputs with true PNP/NPN circuitry switching on each port for easy machine design changes. The integrated configurability gives the user flexibility in designing I/O architecture. The PCH Network Portal is designed for general pneumatic control of industrial machinery on an Ethernet network for all types of automated industrial equipment.

| AAHU | 20 | P3 | 0 | 0 | P | 04 | E | AAA | 0 | – | P4 |
|---|---|---|---|---|---|---|---|---|---|---|---|

**Valve Type**

| Plug-in Valves | |
|---|---|
| Internal pilot | 20 |
| External pilot | 2X |

**Thread Type**

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

**Number of Segments**

| |
|---|
| 0 |
| ↓ |
| 32 |

**Network Connections**

| | |
|---|---|
| EtherNet/IP | E |
| EtherCAT | T |
| ProfiNet | N |
| Profinet AIDA | A |
| Modbus TCP | M |

**Right Hand End Plate Type / Thread Size**

| | |
|---|---|
| Low profile (no ports) | 0 |
| 1/2 Exhaust and inlet port | 1 |
| 3/4 Exhaust and inlet port | 2 |
| H3 Transition plate and end plate (electrical pass through for plug-in valves only) | 3 |
| H3 Transition plate and end plate (expansion to 25th address for plug-in valves only) | 4 |

**Module Combinations**

| Module Position 1 | Module Position 2 | Module Position 3 |
|---|---|---|
| A | A | A |
| A | A | B |
| A | A | C |
| A | A | N |
| A | B | B |
| A | B | C |
| A | B | N |
| A | C | C |
| A | C | N |
| B | B | B |
| B | B | C |
| B | B | N |
| B | C | C |
| B | C | N |
| C | C | C |
| C | C | N |

For any module configurations not listed, consult factory.

**Power Connector ***

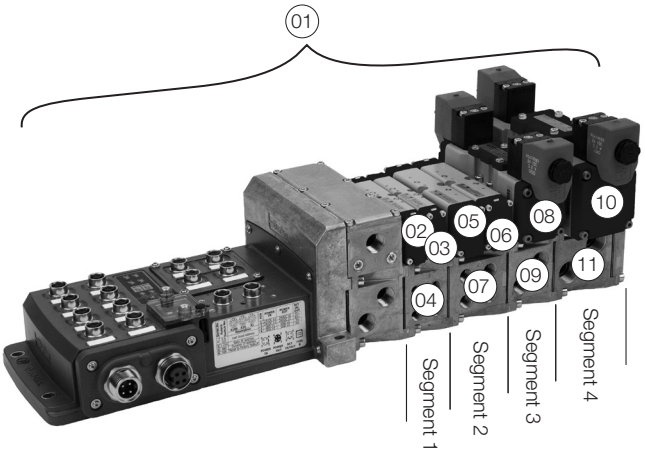
| | |
|---|---|
| 4-pin power IN/OUT with 1 safe power capable zone | P4 |
| 5-pin power IN/OUT with1 safe power capable zone | P5 |
| 4-pin power IN/IN with 2 safe power zones | S4 |
| 5-pin power IN/IN with 2 safe power zones | S5 |
| Aida power IN/OUT with 1 safe power capable zone | J1* |

* Only available with Profinet AIDA

## Example

Application required a 4 segment manifold

| Item | Part No. | Location | |
|---|---|---|---|
| 01 | AAHU20P300P04EAAA0-P4 | | |
| 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 | H12VXBG0B9A | Segment 3 | Valve Station 5 |
| 09 | PSHU1155M1P | | Manifold Base |
| 10 | H2222VXBG0B9A | Segment 4 | Valve Station 6 |
| 11 | PSHU1157M1P | | Manifold Base |




Example:
5 segment manifold with (2) HB, (2) HA, (1) H1, and (1) H2 valve on manifold bases with PCH Network Portal end plate.

## Subbase Kit - Plug-in

| PS55 | 1113 | C | | | 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* |

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

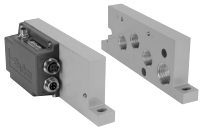
| Wiring Options | |
|---|---|
| Blank | None |
| C‡ | Chrysler |
| F‡ | SAE / Ford |
| G‡ | General Motors |

‡ 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‡ | 150 mm Leads |
| C | Terminal block |

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

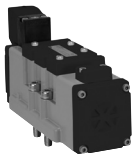
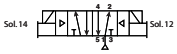
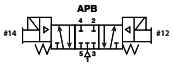
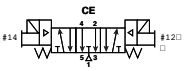
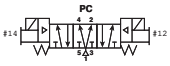
## End Plate Kit - Plug-in, 5599-2, Size 3 (H3) * Not compatible with H Universal

| Electrical option | | BSPP port |
|---|---|---|
|  | No connector - use with individually wired base | **PS4231011DP** |
|  | 25-pin, D-sub | **PS4220L21DP** |
|  | 19-pin, round, Brad Harrison | **PS4220L31DP** |
|  | 12-pin, M23 | **PS4220L41DP** |
| | 19-pin, M23 | **PS4220M21DP** |
|  | Turck Network with valve driver module - 16 address | **PS4220T11DP** |
| | Turck Network with valve driver module - 24 address | **PS4220T21DP** |
|  | P2H IO Link Class B, standard version, 24 address | **PS4220N21DP** |
| | P2H IO Link Class B, safe version, 24 address | **PS4220S21DP** |
| | P2H IO Link Class A, 4-pin safe version, 24 address | **PS4220S41DP** |
| | P2H IO Link Class A, 5-pin safe version, 24 address | **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)

| | Symbol | Type | Qn (Nl/mn) | Operator | Voltage | Pilot | Non-locking |
|---|---|---|---|---|---|---|---|
|  |  | 5/2 Elec. spring return | 5900 | Single solenoid | 24 VDC | External* | **H3EVXXG0B9D** |
| |  | 5/2 Elec. air return | 5900 | Single solenoid | 24 VDC | External* | **H31VXXG0B9D** |
| |  | 5/2 dual Elec. | 5900 | Double solenoid | 24 VDC | External* | **H32VXXG0B9D** |
|  |  | 5/3 dual Elec., all ports blocked | 4900 | Double solenoid | 24 VDC | External* | **H35VXXG0B9D** |
| |  | 5/3 dual Elec., center exhaust | 4900 | Double solenoid | 24 VDC | External* | **H36VXXG0B9D** |
| |  | 5/3 dual Elec., pressure center | 4900 | Double solenoid | 24 VDC | External* | **H37VXXG0B9D** |

* Internal/External defined from the H Universal Supply module (see page 55)

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

| Side ported base | Enclosure / Lead length | Solenoid addresses | 3/4" BSPP |
|---|---|---|---|
|  | Terminal strip in base | Double solenoid - 2 address | **PS421110CCP** |
| | 150 mm flying leads | Double solenoid - 2 addresses | **PS421110ACP** |

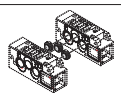
## Manifold Base - 5599-2, Plug-in, Size 3 (H3) * Not compatible with H Universal

| Bottom / End Ported Bases | Enclosure / Lead Length | Solenoid Addresses | 3/4" BSPP |
|---|---|---|---|
|  | Circuit board | Double solenoid - 2 addresses | **PS421160MCP** |
| | Terminal strip in base | Double solenoid - 2 address | **PS421160CCP** |
| | 6" flying leads | Double solenoid - 2 addresses | **PS421160ACP** |

| End Ported | Enclosure / Lead length | Solenoid addresses | 3/4" BSPP |
|---|---|---|---|
|  | Circuit board | Double solenoid - 2 addresses | **PS421150MCP** |
| | Terminal strip in base | Double solenoid - 2 address | **PS421150CCP** |
| | 150 mm flying leads | Double solenoid - 2 addresses | **PS421150ACP** |

**Most Popular**

## Accessories - 5599-2, Size 3 (H3)

| | Accessory | Description | | Part number |
|---|---|---|---|---|
|  | Sandwich regulator | Common pressure | 0,35 > 8,6 bar w/ gauge | **PS4238166CP** |
| | | Independent pressure | 0,35 > 8,6 bar 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** |

## 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 |

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

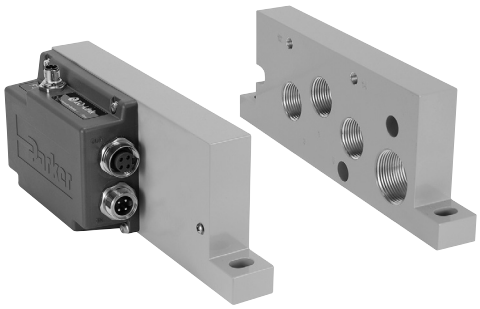
| Options † | |
|---|---|
| 25-Pin, D-Sub | 20L2* |
| 19-Pin, Round, Brad Harrison | 20L3 |
| 12-Pin, M23 | 20L4 |
| 19-Pin, M23 | 20M2 |
| P2H IO Link Class B, 24 Address, Standard Version | 20N2 |
| P2H IO Link Class B, 24 Address, Safe Version | 20S2 |
| P2H IO Link Class A, 24 Address, 4-Pin, Safe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

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

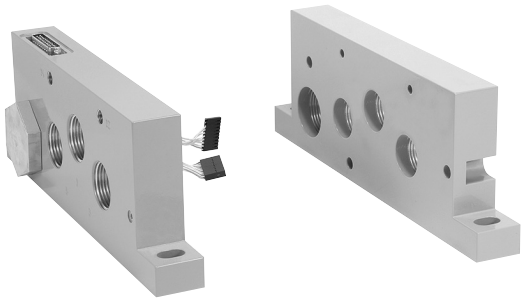
* BSPP Conforms to ISO 1179-1 w 228-1 Threads

* 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.



**H3 P2H Class A end plate shown**



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



**Parker Hannifin Corporation**
Pneumatic Division - Europe
www.parker.com/pneumatics

## Valve - Plug-in, 5599-2, Size 3

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

**Basic Series 5599-2**

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

**5599-2 Operator / Function**

| | |
|---|---|
| 5/2 Elec. air return | 1 |
| 5/2 dual Elec. | 2 |
| 5/3 dual Elec., all ports blocked | 5 |
| 5/3 dual Elec., center exhaust | 6 |
| 5/3 dual Elec., pressure center | 7 |
| 5/2 Elec. spring return | 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 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 | | | |

**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 |

**H3 Valve shown**

## Manifold / Subbase Kit - Plug-in, 5599-2, Size 3

**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 | 150 mm 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”.

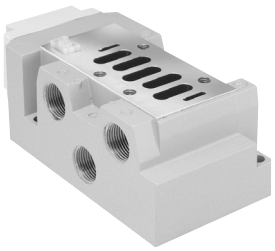
**Note:**
When using the enclosure / lead length “M” option:

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 | 0,05 > 2,0 bar w/Gauge |
| 5 | 0,1 > 4,1 bar w/Gauge |
| 6 | 0,35 > 8,6 bar 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 | 0,05 > 2,0 bar w/Gauge |
| 5 | 0,1 > 4,1 bar w/Gauge |
| 6 | 0,35 > 8,6 bar 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 Qn (Nl/mn) 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** | 2326 | 2346 | 4220 | 4387 | 2326 | 2758 | 2699 | 2954 | 2601 | 2542 | 2630 | 2689 | 2385 | 2365 | 3102 | 2984 |

* Regulator Port exhaust through Base Port 3.

**Note:** All Qn'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.)

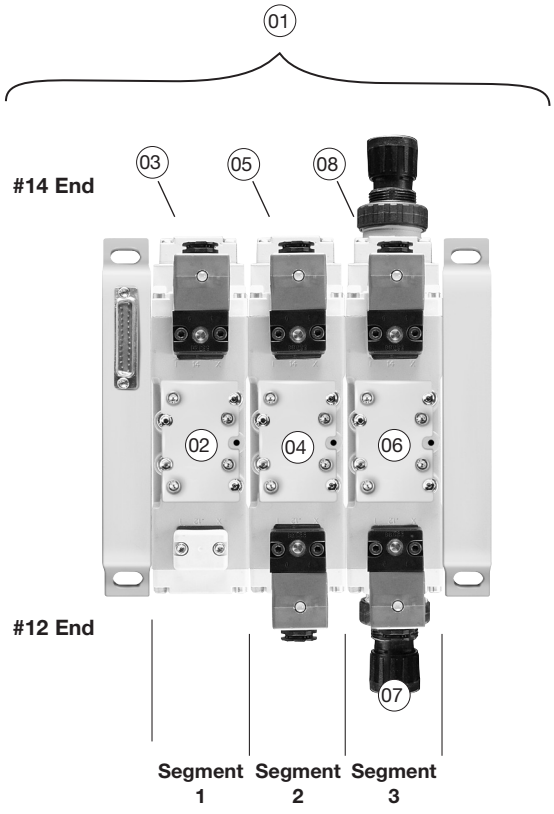
### Example

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 | Segment 3 | Valve station 3 |
| 07 | PS4238166CP | | Sandwich regulator |
| 08 | PS421159MCP | | Manifold base |

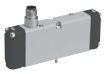
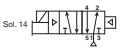
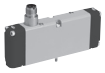
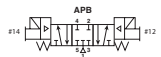
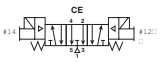
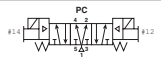
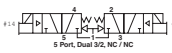
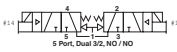
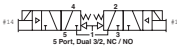
NOTE: Construct manifold assemblies from left to right while looking at the cylinder ports.

Valves must be ordered as External Pilot when using Sandwich Regulator.



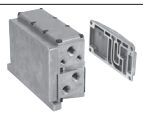

Example:
3 segment manifold with (3) H3 valves on manifold bases and regulator at segment 3.

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

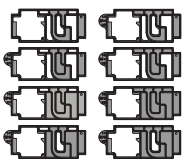
| | Symbol | Type | Qn (Nl/mn) | Operator | Voltage | Pilot | Non-locking |
|---|---|---|---|---|---|---|---|
|  |  | 5/2 Elec. spring return | 540 | Single solenoid | 24 VDC | Internal | **HBEWXBG2G9000FA** |
| | | | | | | External* | **HBEWXLG2G9000FA** |
| |  | 5/2 Elec. air return | 540 | Single solenoid | 24 VDC | Internal | **HB1WXBG2G9000FA** |
| | | | | | | External* | **HB1WXLG2G9000FA** |
|  |  | 5/2 dual Elec. | 540 | Double solenoid | 24 VDC | Internal | **HB2WXBG2G9000FA** |
| | | | | | | External* | **HB2WXLG2G9000FA** |
| |  | 5/3 dual Elec., all ports blocked | 490 | Double solenoid | 24 VDC | Internal | **HB5WXBG2G9000FA** |
| | | | | | | External* | **HB5WXLG2G9000FA** |
| |  | 5/3 dual Elec., center exhaust | 490 | Double solenoid | 24 VDC | Internal | **HB6WXBG2G9000FA** |
| | | | | | | External* | **HB6WXLG2G9000FA** |
| |  | 5/3 dual Elec., pressure center | 490 | Double solenoid | 24 VDC | Internal | **HB7WXBG2G9000FA** |
| | | | | | | External* | **HB7WXLG2G9000FA** |
| |  | Dual 3/2 Elec. NC/NC | 440 | Double solenoid | 24 VDC | Internal | **HBNWXBG2G9000FA** |
| |  | Dual 3/2 Elec. NO/NO | 440 | Double solenoid | 24 VDC | Internal | **HBPWXBG2G9000FA** |
| |  | Dual 3/2 Elec. NC/NO | 440 | Double solenoid | 24 VDC | Internal | **HBQWXBG2G9000FA** |

* Used with H Universal Manifold, "Internal / External" defined from the H Universal Supply module (see page 55)

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

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

## Accessories - 15407-1, Non-Plug-in, Size 18 mm (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" BSPP | | **PS562601P** |
| | | 1/8" NPT | | **PS562600P** |
|  | Sandwich regulator | | Common pressure | Independent pressure |
| | | 0,1 > 4,1 bar w/ gauge | **PS5637155P** | **PS5637255P** |
| | | 0,35 > 8,6 bar 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** |

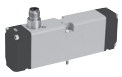
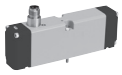
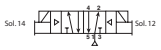
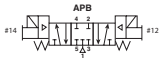
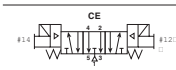
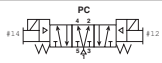
* Included with each Universal Manifolds and Supply modules

**Most Popular**



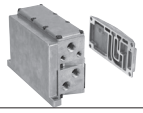
**Parker Hannifin Corporation**
Pneumatic Division - Europe
www.parker.com/pneumatics

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

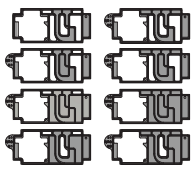
| | Symbol | Type | Qn (Nl/mn) | Operator | Voltage | Pilot | Non-locking |
|---|---|---|---|---|---|---|---|
|  |  | 5/2 Elec. spring return | 1080 | Single solenoid | 24 VDC | Internal | **HAEWXBG2G9000FA** |
| | | | | | | External* | **HAEWXLG2G9000FA** |
| |  | 5/2 Elec. air return | 1080 | Single solenoid | 24 VDC | Internal | **HA1WXBG2G9000FA** |
| | | | | | | External* | **HA1WXLG2G9000FA** |
|  |  | 5/2 dual Elec. | 1080 | Double solenoid | 24 VDC | Internal | **HA2WXBG2G9000FA** |
| | | | | | | External* | **HA2WXLG2G9000FA** |
| |  | 5/3 dual Elec., all ports blocked | 980 | Double solenoid | 24 VDC | Internal | **HA5WXBG2G9000FA** |
| | | | | | | External* | **HA5WXLG2G9000FA** |
| |  | 5/3 dual Elec., center exhaust | 980 | Double solenoid | 24 VDC | Internal | **HA6WXBG2G9000FA** |
| | | | | | | External* | **HA6WXLG2G9000FA** |
| |  | 5/3 dual Elec., pressure center | 980 | Double solenoid | 24 VDC | Internal | **HA7WXBG2G9000FA** |
| | | | | | | External* | **HA7WXLG2G9000FA** |

* Used with H Universal Manifold, "Internal / External" defined from the H Universal Supply module (see page 55)

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

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

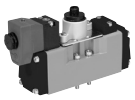
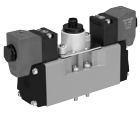
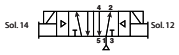
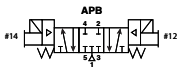
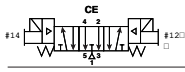
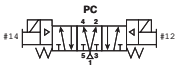
## Accessories - 15407-1, Non-Plug-in, Size 26 mm (HA)

| | Accessories | Description | | |
|---|---|---|---|---|
|  | 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 |
| | | 0,1 > 4,1 bar w/ gauge | **PS5537155P** | **PS5537255P** |
| | | 0,35 > 8,6 bar 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** |

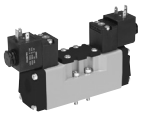
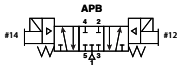
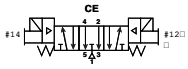
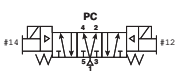
* Included with each Universal Manifolds and Supply modules

**Most Popular**

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

| | Symbol | Type | Qn (Nl/mn) | Operator | Voltage | Pilot | Non-locking |
|---|---|---|---|---|---|---|---|
| **4-Pin Central M12 Connector, 24 VDC** | | | | | | | |
|  |  | 5/2 Elec. spring return | 1480 | Single solenoid | 24 VDC | Internal | **H1EWXBG2B9000FD** |
| | | | | | | External* | **H1EWXXG2B9000FD** |
| |  | 5/2 Elec. air return | 1480 | Single solenoid | 24 VDC | Internal | **H11WXBG2B9000FD** |
| | | | | | | External* | **H11WXXG2B9000FD** |
|  |  | 5/2 dual Elec. | 1480 | Double solenoid | 24 VDC | Internal | **H12WXBG2B9000FD** |
| | | | | | | External* | **H12WXXG2B9000FD** |
| |  | 5/3 dual Elec., all ports blocked | 1180 | Double solenoid | 24 VDC | Internal | **H15WXBG2B9000FD** |
| | | | | | | External* | **H15WXXG2B9000FD** |
| |  | 5/3 dual Elec., center exhaust | 1180 | Double solenoid | 24 VDC | Internal | **H16WXBG2B9000FD** |
| | | | | | | External* | **H16WXXG2B9000FD** |
| |  | 5/3 dual Elec., pressure center | 1180 | Double solenoid | 24 VDC | Internal | **H17WXBG2B9000FD** |
| | | | | | | External* | **H17WXXG2B9000FD** |

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

| | Symbol | Type | Qn (Nl/mn) | Operator | Voltage | Pilot | Non-locking |
|---|---|---|---|---|---|---|---|
| 3-Pin DIN Connector, 24 VDC | | | | | | | |
|  |  | 5/2 Elec. spring return | 1480 | Single solenoid | 24 VDC | Internal | **H1EWXBBL49D** |
| | | | | | | External* | **H1EWXXBL49D** |
| |  | 5/2 Elec. air return | 1480 | Single solenoid | 24 VDC | Internal | **H11WXBBL49D** |
| | | | | | | External* | **H11WXXBL49D** |
|  |  | 5/2 dual Elec. | 1480 | Double solenoid | 24 VDC | Internal | **H12WXBBL49D** |
| | | | | | | External* | **H12WXXBL49D** |
| |  | 5/3 dual Elec., all ports blocked | 1180 | Double solenoid | 24 VDC | Internal | **H15WXBBL49D** |
| | | | | | | External* | **H15WXXBL49D** |
| |  | 5/3 dual Elec., center exhaust | 1180 | Double solenoid | 24 VDC | Internal | **H16WXBBL49D** |
| | | | | | | External* | **H16WXXBL49D** |
| |  | 5/3 dual Elec., pressure center | 1180 | Double solenoid | 24 VDC | Internal | **H17WXBBL49D** |
| | | | | | | External* | **H17WXXBL49D** |

* Used with H Universal Manifold, "Internal / External" defined from the H Universal Supply module (see page 55)

**Most Popular**



**Parker Hannifin Corporation**
Pneumatic Division - Europe
www.parker.com/pneumatics

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

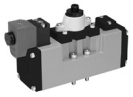
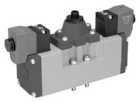
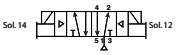
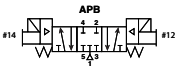
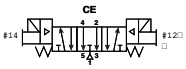
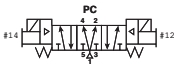
| | | Description | BSPP |
|---|---|---|---|
|  | Single subbase | Side ported, 3/8" port | **PS4011160DP** |
|  | Universal manifold base | End ported | **PSHU115601P** |
|  | Universal end plate | Non-collective wiring | **PSHU31L001P** |

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

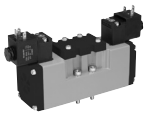
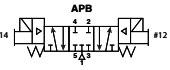
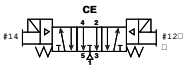
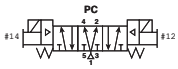
| | Accessory | Description | | Part number |
|---|---|---|---|---|
|  | Sandwich regulator | Common pressure | 0,35 > 8,6 bar w/ gauge | **PS4037166CP** |
| | | Independent pressure | 0,35 > 8,6 bar w/ gauge | **PS4037266CP** |
|  | Blanking plate kit | | | **PS4034CP** |
|  | Sandwich flow control | | | **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 | Qn (Nl/mn) | Operator | Voltage | Pilot | Non-locking |
|---|---|---|---|---|---|---|
| **4-Pin Central M12 Connector, 24 VDC** | | | | | | |
|   | 5/2 Elec. spring return | 2950 | Single solenoid | 24 VDC | Internal | **H2EWXBG2B9000FD** |
| | | | | | External* | **H2EWXXG2B9000FD** |
|  | 5/2 Elec. air return | 2950 | Single solenoid | 24 VDC | Internal | **H21WXBG2B9000FD** |
| | | | | | External* | **H21WXXG2B9000FD** |
|   | 5/2 dual Elec. | 2950 | Double solenoid | 24 VDC | Internal | **H22WXBG2B9000FD** |
| | | | | | External* | **H22WXXG2B9000FD** |
|  | 5/3 dual Elec., all ports blocked | 2750 | Double solenoid | 24 VDC | Internal | **H25WXBG2B9000FD** |
| | | | | | External* | **H25WXXG2B9000FD** |
|  | 5/3 dual Elec., center exhaust | 2750 | Double solenoid | 24 VDC | Internal | **H26WXBG2B9000FD** |
| | | | | | External* | **H26WXXG2B9000FD** |
|  | 5/3 dual Elec., pressure center | 2750 | Double solenoid | 24 VDC | Internal | **H27WXBG2B9000FD** |
| | | | | | External* | **H27WXXG2B9000FD** |

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

| Symbol | Type | Qn (Nl/mn) | Operator | Voltage | Pilot | Non-locking |
|---|---|---|---|---|---|---|
| **3-Pin DIN Connector on Coil, 24 VDC** | | | | | | |
|   | 5/2 Elec. spring return | 2950 | Single solenoid | 24 VDC | Internal | **H2EWXBBL49D** |
| | | | | | External* | **H2EWXXBL49D** |
|  | 5/2 Elec. air return | 2950 | Single solenoid | 24 VDC | Internal | **H21WXBBL49D** |
| | | | | | External* | **H21WXXBL49D** |
|   | 5/2 dual Elec. | 2950 | Double solenoid | 24 VDC | Internal | **H22WXBBL49D** |
| | | | | | External* | **H22WXXBL49D** |
|  | 5/3 dual Elec., all ports blocked | 2750 | Double solenoid | 24 VDC | Internal | **H25WXBBL49D** |
| | | | | | External* | **H25WXXBL49D** |
|  | 5/3 dual Elec., center exhaust | 2750 | Double solenoid | 24 VDC | Internal | **H26WXBBL49D** |
| | | | | | External* | **H26WXXBL49D** |
|  | 5/3 dual Elec., pressure center | 2750 | Double solenoid | 24 VDC | Internal | **H27WXBBL49D** |
| | | | | | External* | **H27WXXBL49D** |

* Used with H Universal Manifold, "Internal / External" defined from the H Universal Supply module (see page 55)

**Most Popular**

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

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

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

| | Accessory | Description | | Part number |
|---|---|---|---|---|
|  | Sandwich regulator | Common pressure | 0,35 > 8,6 bar w/ gauge | **PS4137166CP** |
| | | Independent pressure | 0,35 > 8,6 bar 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.

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## 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 |

| 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 |
| 5* | H3 Transition plate, 1" exhaust and inlet |

* 1, 3 & 5 manifold galley blocked at transition plate. 12 & 14 pass through.

## Right Hand End Plate

Low Profile

High Flow

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

## H3 Transition Kit

| | | |
|---|---|---|
| H3 transition, H3 right hand end plate, 1" ports (includes gaskets & bolts) | **PSHU7301P** | **PSHU7300P** |

## 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 | |
|---|---|
| 5/2 Elec. air return | 1 |
| 5/2 dual Elec. | 2 |
| 5/3 dual Elec., all ports blocked | 5 |
| 5/3 dual Elec., center exhaust | 6 |
| 5/3 dual Elec., pressure center | 7 |
| 5/2 Elec. spring return | E |
| Dual 3/2 Elec. NC/NC | N† |
| Dual 3/2 Elec. NO/NO | P† |
| Dual 3/2 Elec. NC/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 |

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## 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 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".

**5599-1 Operator / Function**

| | |
|---|---|
| 5/2 Elec. air return | 1 |
| 5/2 dual Elec. | 2 |
| 5/3 dual Elec., all ports blocked | 5 |
| 5/3 dual Elec., center exhaust | 6 |
| 5/3 dual Elec., pressure center | 7 |
| 5/2 Elec. spring return | 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 |

**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 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 |

**5599-1 Operator / Function**

| | |
|---|---|
| 5/2 Elec. air return | 1 |
| 5/2 dual Elec. | 2 |
| 5/3 dual Elec., all ports blocked | 5 |
| 5/3 dual Elec., center exhaust | 6 |
| 5/3 dual Elec., pressure center | 7 |
| 5/2 Elec. spring return | 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 |

**Most Popular**

## 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 |

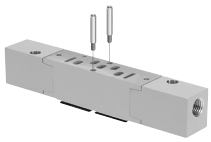
| Remote Pilot Valve | |
|---|---|
| WX000XX | Remote pilot valve |

| 15407-1 Operator / Function | |
|---|---|
| 5/2 Pneum. air return | 3 |
| 5/2 dual Pneum. | 4 |
| 5/3 dual Pneum., all ports blocked | 8 |
| 5/3 dual Pneum., center exhaust | 9 |
| 5/3 dual Pneum., pressure center | 0 |
| 5/2 Pneum. spring return | F |

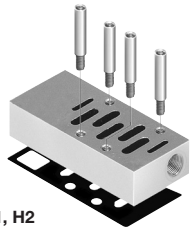
Note: For manifolds, end plates, and accessories, see 15407-1 & 5599-1 Non Plug-in valve section.

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

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



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## 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

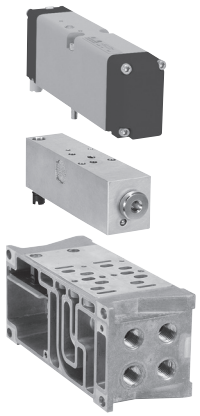
Multiple pressure zones can be created by selecting alternative gaskets between individual manifold segments or an intermediate air supply module. These zones can be designed to meet different application and safety requirements on the machine. Inserting the PXM Pilot Exhaust Module into a one of these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

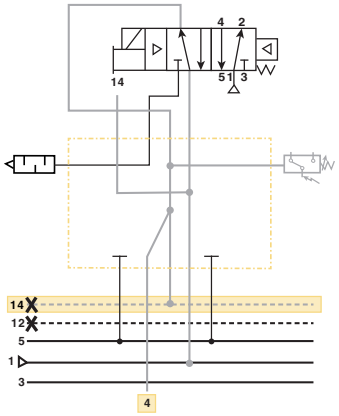
## Gasket Kit - Universal Manifold to Manifold

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

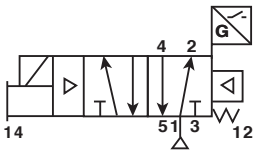
## Pilot Exhaust Module / HA Spool Sensing

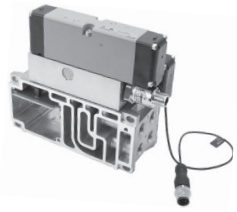
PXM Pilot Exhaust Module enables an H Series HA Single Solenoid valve to control the pilot pressure to other externally piloted H Series ISO valves in the same manifold zone. The HA valve in conjunction with the PXM will remove pilot pressure to all externally piloted valves in the manifold zone when 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).






Alternatively, the HA Single Solenoid spool sensing valve can be used in place of the standard HA Valve. The spool sensing option mounts on top of the PXM and provides the added benefit of solid-state sensing of spool position to the PLC via an M8 or M12 connection. The spool sensing can be used without the PXM module for sensing only.



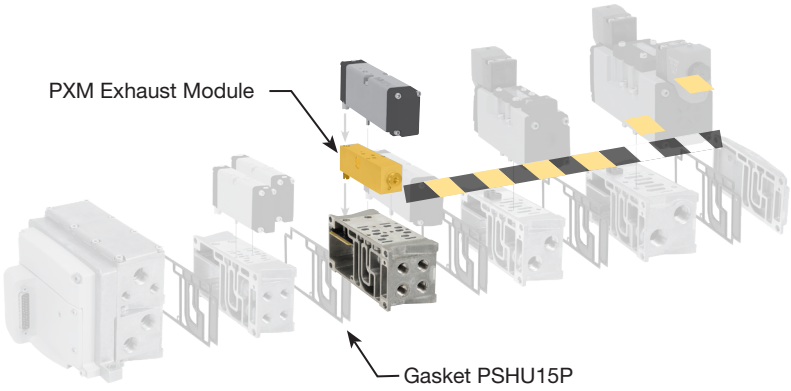



Gaskets blocking pilot pressure are required at the start of the zone the PXM is controlling. Special zoning gaskets (shown below) are available to meet any application requirement. In the example below, main pressure and exhaust pass through to the second zone, but pilot pressure is blocked. This results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



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## 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 | 0,1 > 4,1 bar w/Gauge |
| 6 | 0,35 > 8,6 bar 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 | 0,1 > 4,1 bar w/Gauge |
| 6 | 0,35 > 8,6 bar 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 Qn (Nl/mn) 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** | 196 | 196 | 402 | 334 | 226 | 186 | 275 | 265 |
| **HA** | 402 | 422 | 854 | 874 | 412 | 442 | 667 | 648 |

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

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

| 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 | 0,05 > 2,0 bar w/Gauge |
| 5 | 0,1 > 4,1 bar w/Gauge |
| 6 | 0,35 > 8,6 bar 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.

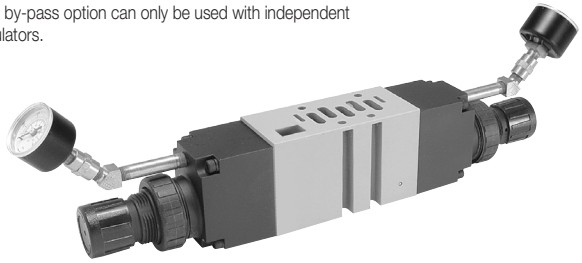
**Ordering Components**
- Sandwich regulator kit configured for internal pilot as standard.
- Order valve as external pilot.

| | #4 Port Regulator / Gauge* |
|---|---|
| 0** | Line By-Pass Plate |
| 4 | 0,05 > 2,0 bar w/Gauge |
| 5 | 0,1 > 4,1 bar w/Gauge |
| 6 | 0,35 > 8,6 bar w/Gauge |
| D | Remote Pilot ISO 2 & 3 only |

* For common pressure regulator option, regulator gauge callout mustt 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.

**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 Qn (Nl/mn) 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** | 609 | 599 | 1256 | 1158 | 716 | 942 | 942 | 913 | 334 | 687 | 923 | 962 | 510 | 471 | 844 | 864 |
| **H2** | 1443 | 1570 | 2365 | 2287 | 1678 | 1865 | 1492 | 1718 | 1708 | 1639 | 1698 | 1757 | 1580 | 1590 | 1472 | 1639 |

* Regulator Port exhaust through Base Port 3.

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



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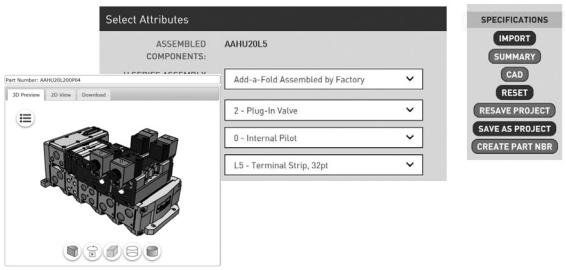
## Online Configuration

Navigate to the landing page
www.parker.com/pde/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 |
| H3 Transition plate, 1" exhaust & inlet | 5* |

* 1,3 & 5 Manifold gallery locked at transition plate.
12 & 14 pass through.

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

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

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

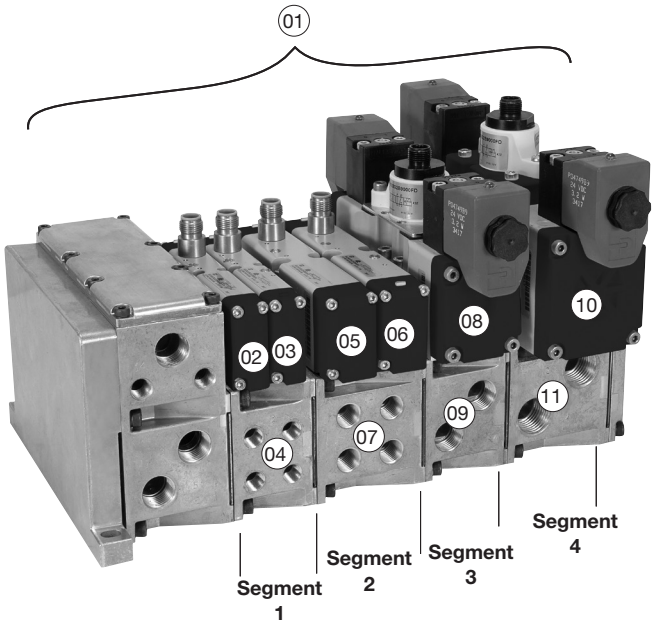
## How To Order Plug-in Add-A-Fold Assemblies

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.



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## 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 |

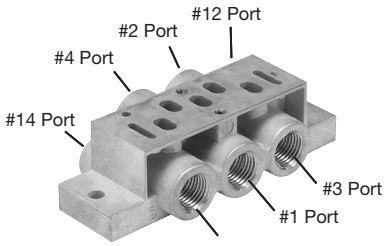
| Mounting Style / Port Size | |
|---|---|
| HA Series | |
| 1/4 NPT side ports | 1113 |
| 1/4 BSPP side ports | 1114* |
| 1/4 NPT bottom / side ports | 1123 |
| 1/4 BSPP bottom / side ports | 1124* |
| H1 Series | |
| 3/8 NPT side ports | 1115 |
| 3/8 BSPP side ports | 1116* |
| H2 Series | |
| 1/2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

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

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

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

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




Side ported base
18 mm DX02 / HB

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

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



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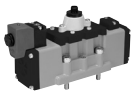
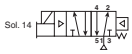
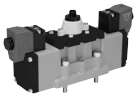
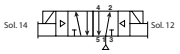
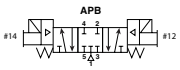
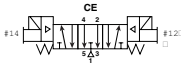
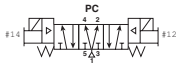
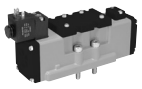
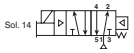
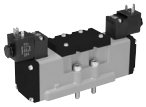
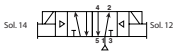
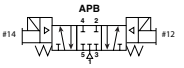
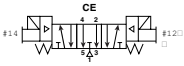
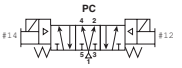
## Valve with Central Connectors - 5599-1, Non Plug-in, Size 3 (H3)

| | Symbol | Type | Qn (Nl/mn) | Operator | Voltage | Pilot | Non-locking |
|---|---|---|---|---|---|---|---|
| 4-Pin Central M12 Connector, 24 VDC | | | | | | | |
|  |  | 5/2 Elec. spring return | 5900 | Single solenoid | 24 VDC | Internal | **H3EWXBG2B9000FD** |
| | | | | | | External* | **H3EWXXG2B9000FD** |
| |  | 5/2 Elec. air return | 5900 | Single solenoid | 24 VDC | Internal | **H31WXBG2B9000FD** |
| | | | | | | External* | **H31WXXG2B9000FD** |
|  |  | 5/2 dual Elec. | 5900 | Double solenoid | 24 VDC | Internal | **H32WXBG2B9000FD** |
| | | | | | | External* | **H32WXXG2B9000FD** |
| |  | 5/3 dual Elec., all ports blocked | 4900 | Double solenoid | 24 VDC | Internal | **H35WXBG2B9000FD** |
| | | | | | | External* | **H35WXXG2B9000FD** |
| |  | 5/3 dual Elec., center exhaust | 4900 | Double solenoid | 24 VDC | Internal | **H36WXBG2B9000FD** |
| | | | | | | External* | **H36WXXG2B9000FD** |
| |  | 5/3 dual Elec., pressure center | 4900 | Double solenoid | 24 VDC | Internal | **H37WXBG2B9000FD** |
| | | | | | | External* | **H37WXXG2B9000FD** |

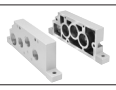
## Valve with 3-Pin DIN Connectors - 5599-1, Non Plug-in, Size 3 (H3)

| | Symbol | Type | Qn (Nl/mn) | Operator | Voltage | Pilot | Non-locking |
|---|---|---|---|---|---|---|---|
| 3-Pin DIN Connector on Coil, 24 VDC | | | | | | | |
|  |  | 5/2 Elec. spring return | 5900 | Single solenoid | 24 VDC | Internal | **H3EWXBBL49D** |
| | | | | | | External* | **H3EWXXBL49D** |
| |  | 5/2 Elec. air return | 5900 | Single solenoid | 24 VDC | Internal | **H31WXBBL49D** |
| | | | | | | External* | **H31WXXBL49D** |
|  |  | 5/2 dual Elec. | 5900 | Double solenoid | 24 VDC | Internal | **H32WXBBL49D** |
| | | | | | | External* | **H32WXXBL49D** |
| |  | 5/3 dual Elec., all ports blocked | 4900 | Double solenoid | 24 VDC | Internal | **H35WXBBL49D** |
| | | | | | | External* | **H35WXXBL49D** |
| |  | 5/3 dual Elec., center exhaust | 4900 | Double solenoid | 24 VDC | Internal | **H36WXBBL49D** |
| | | | | | | External* | **H36WXXBL49D** |
| |  | 5/3 dual Elec., pressure center | 4900 | Double solenoid | 24 VDC | Internal | **H37WXBBL49D** |
| | | | | | | External* | **H37WXXBL49D** |

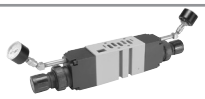
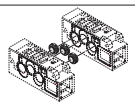
* Used with H Universal Manifold, "Internal / External" defined from the H Universal Supply module (see page 55)

**Most Popular**

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

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

## Accessories - 5599-1, Non Plug-in, Size 3 (H3)

| | Accessory | Description | | Part number |
|---|---|---|---|---|
|  | Sandwich regulator | Common pressure | 0,35 > 8,6 bar w/ gauge | **PS4237166CP** |
| | | Independent pressure | 0,35 > 8,6 bar 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)

**H3 E WX B G 2B9 000F D**

**Basic Series 5599-1**

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

**5599 -1 Engineering Level**

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

**5599-1 Operator / Function**

| | |
|---|---|
| 5/2 Elec. air return | 1 |
| 5/2 dual Elec. | 2 |
| 5/3 dual Elec., all ports blocked | 5 |
| 5/3 dual Elec., center exhaust | 6 |
| 5/3 dual Elec., pressure center | 7 |
| 5/2 Elec. spring return | E |

**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".

**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 |

**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 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)

**H3 E WX B B L53 D**

**Basic Series 5599-1**

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

**5599-1 Engineering Level**

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

**5599-1 Operator / Function**

| | |
|---|---|
| 5/2 Elec. air return | 1 |
| 5/2 dual Elec. | 2 |
| 5/3 dual Elec., all ports blocked | 5 |
| 5/3 dual Elec., center exhaust | 6 |
| 5/3 dual Elec., pressure center | 7 |
| 5/2 Elec. spring return | E |

**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 |

**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 |

**Most Popular**



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## Remote Pilot - Size 3 (H3)

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

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

* Must Order Remote Pilot Access Plates for Manifolds.

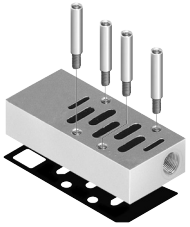
| Engineering Level | |
|---|---|
| D | 5599 Current |

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

| 15407-1 Operator / Function | |
|---|---|
| 5/2 Pneum. air return | 3 |
| 5/2 dual Pneum. | 4 |
| 5/3 dual Pneum., all ports blocked | 8 |
| 5/3 dual Pneum., center exhaust | 9 |
| 5/3 dual Pneum., pressure center | 0 |
| 5/2 Pneum. spring return | F |

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

## Remote Pilot Access Plate Kits



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

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



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## Manifold / Subbase Kit - Non Plug-in, 5599-1, Size 3 (H3)

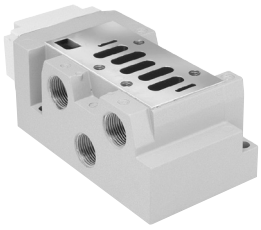
**PS421159 | 0 | C | P**

| 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**

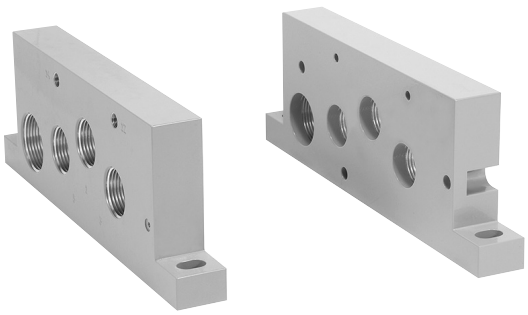
## End Plate Kit - Non-Plug-in, 5599-1 * Not compatible with H Universal

**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

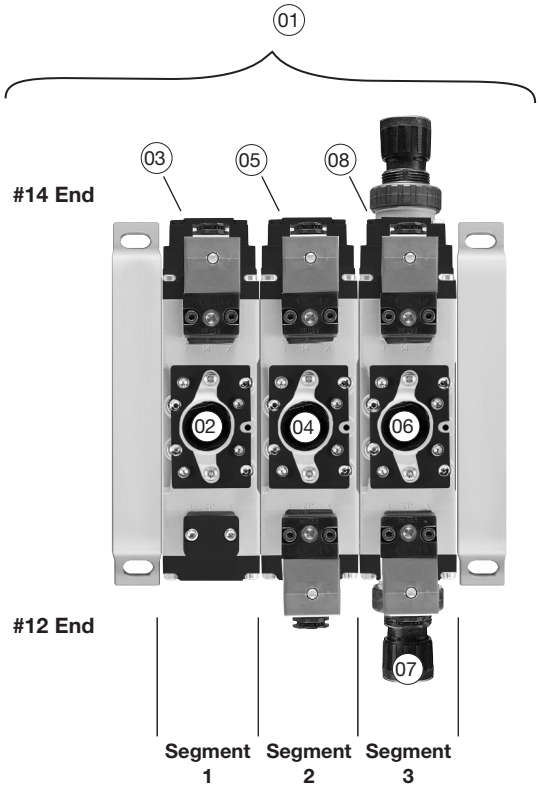
1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete valve, regulator, flow control and manifold base kit. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold. The left most segment is segment 1. (If a blank station 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 | Segment 3 | Valve station 3 |
| 07 | PS4237166CP | | 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.



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## Sandwich Regulator - Non Plug-in, 5599-1, Size 3 (H3)

**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 | 0,05 > 2,0 bar w/Gauge |
| 5 | 0,1 > 4,1 bar w/Gauge |
| 6 | 0,35 > 8,6 bar 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 | 0,05 > 2,0 bar w/Gauge |
| 5 | 0,1 > 4,1 bar w/Gauge |
| 6 | 0,35 > 8,6 bar 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 Qn (Nl/mn) 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** | 2326 | 2346 | 4220 | 4387 | 2326 | 2758 | 2699 | 2954 | 2601 | 2542 | 2630 | 2689 | 2385 | 2365 | 3102 | 2984 |

* Regulator Port exhaust through Base Port 3.

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



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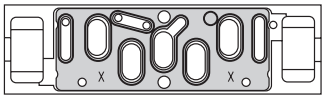
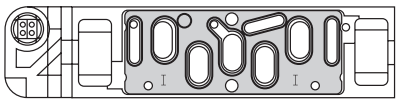
## ISO Pneumatic Valve Standard Definitions

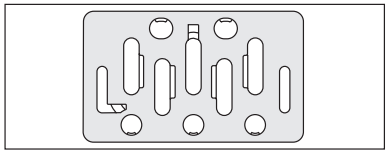
**15407-1:** Non-Plug-in Standards for Size 01 (26mm) & Size 02 (18mm) Wide Valves



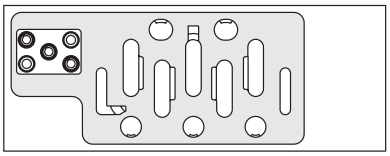
**15407-2:** Plug-in Standards for Size 01 (26mm) & Size 02 (18mm) Wide Valves



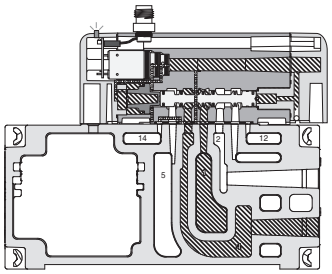
**5599-1:** Non-Plug-in Standards for Sizes 1, 2, 3



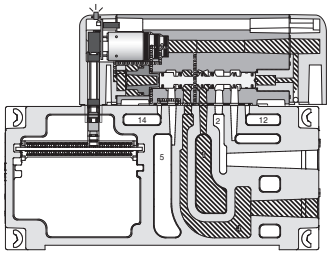
**5599-2:** Plug-in Standards for Size 1, 2, 3



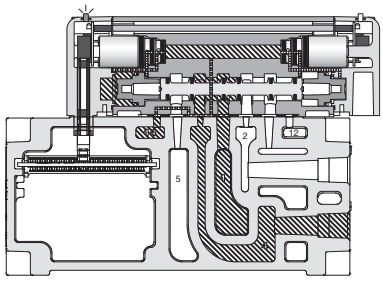
### HB / HA Series



15407-1 18mm Single Solenoid Internal Pilot Manifold Mounted



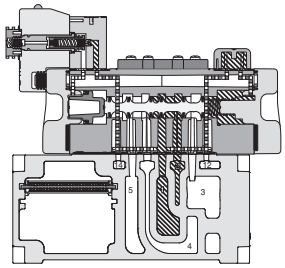
15407-2 18mm Single Solenoid Internal Pilot Manifold Mounted



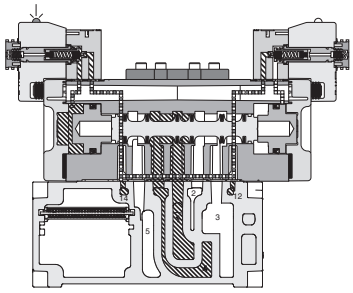
15407-2 26mm Double Solenoid External Pilot Manifold Mounted

Pressure Exhaust

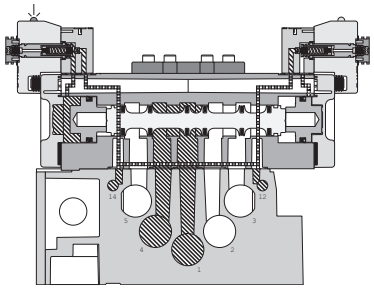
### H1, H2, H3 Series



H1 5599-2 Single Solenoid Internal Pilot Manifold Mounted



H2 5599-2 Double Solenoid External Pilot Manifold Mounted

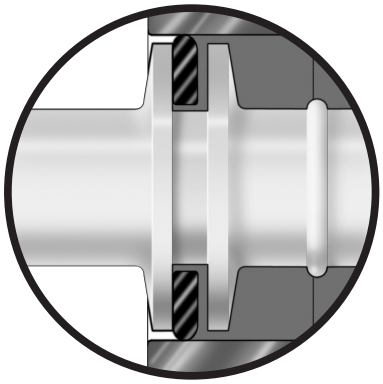


H3 5599-2 Double Solenoid External Pilot Subbase Mounted

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 (Qn)

| Valve size | Port size | 2-Position | 3-Position |
|---|---|---|---|
| HB | 1/8" | Qn = 540 Nl/mn<br>Qmax = 920 Nl/mn | Qn = 490 Nl/mn<br>Qmax = 830 Nl/mn |
| HA | 1/4" | Qn = 1080 Nl/mn<br>Qmax = 1835 Nl/mn | Qn = 980 Nl/mn<br>Qmax = 1670 Nl/mn |
| H1 | 3/8" | Qn = 1480 Nl/mn<br>Qmax = 2500 Nl/mn | Qn = 1180 Nl/mn<br>Qmax = 2000 Nl/mn |
| H2 | 1/2" | Qn = 2950 Nl/mn<br>Qmax = 4140 l/min | Qn = 2750 Nl/mn<br>Qmax = 4670 Nl/mn |
| H3 | 3/4" | Qn = 5900 Nl/mn<br>Qmax = 10000 Nl/mn | Qn = 4910 Nl/mn<br>Qmax = 8340 Nl/mn |

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<br>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 6,9 bar supply, time (ms) required to fill from 0 to 6,2 bar and Exhaust from 6,9 bar to 0,7 bar 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 *

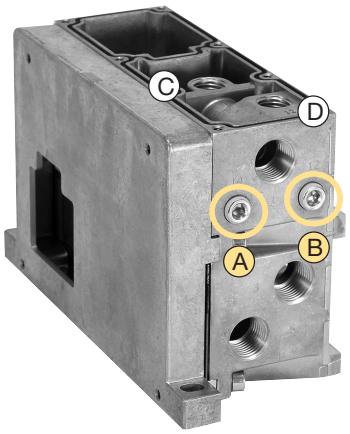
Insert 1 pipe plug into location C (1/4" NPT) as shown to configure the left end plate as single externally piloted.

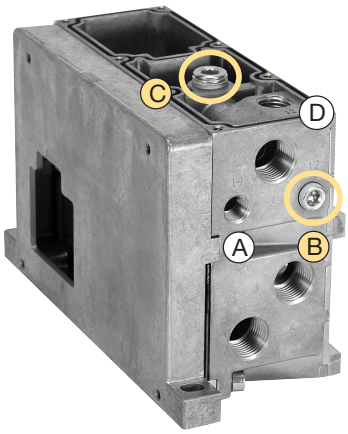
Pilot pressure required to operate the H Series valves must be supplied to the 14 port only at location A which is internally connected to the 12 pilot.

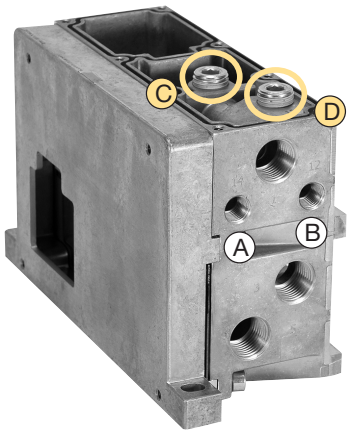
### End Plate Configuration - Double External Pilot

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).



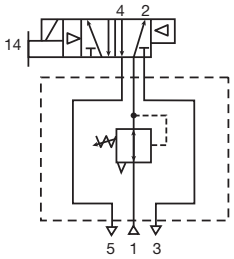




* Standard in catalog
Note: Left end plate shown with cover removed.

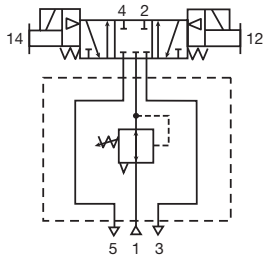
## Common Port Regulation - Plug-in, HB & HA

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.

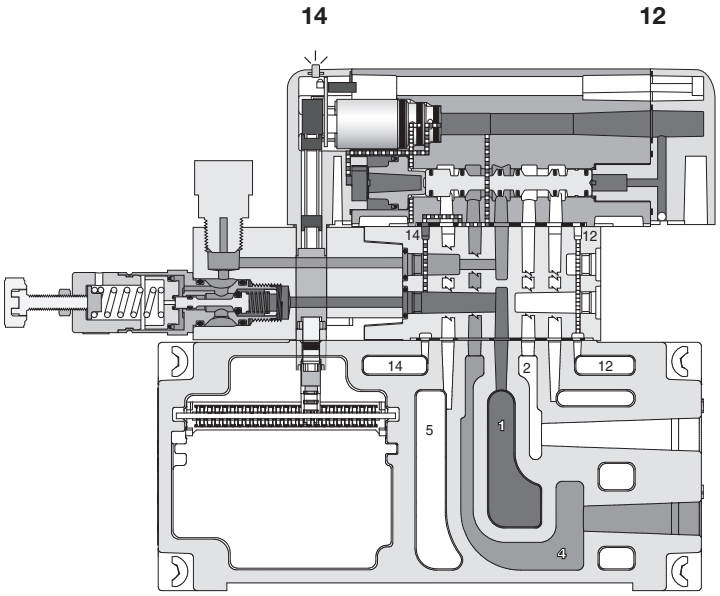
Common Port Regulator with
4-Way, 2-Position
Single Solenoid Valve




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




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

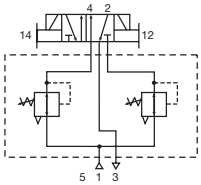



## Independent Dual Port Regulation - Plug-in, HB & HA

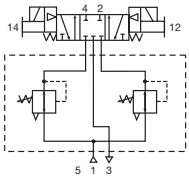
### Dual Port Regulator

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

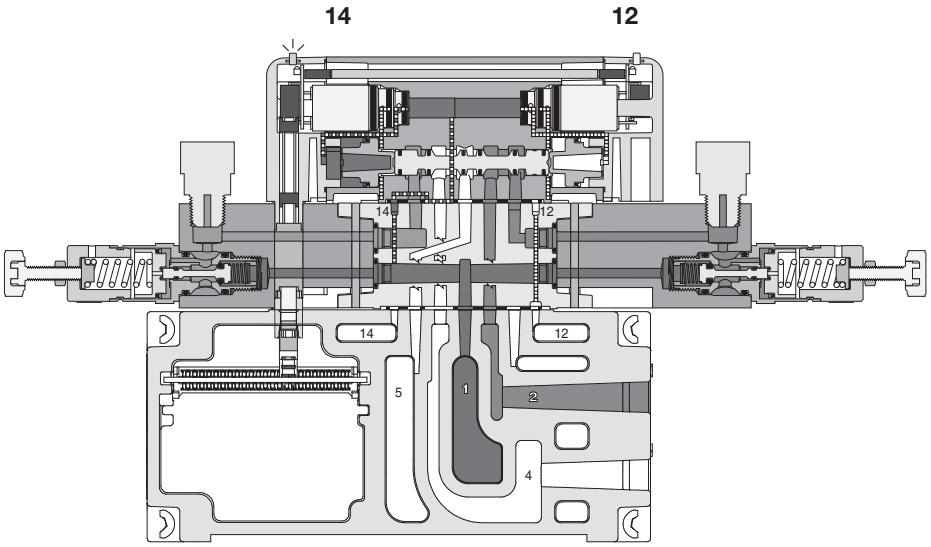
Independent Dual Port Regulator with
4-Way, 2-Position
Double Solenoid Valve




Régulateur à double orifice indépendant
avec distributeur 5/3 centre fermé




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

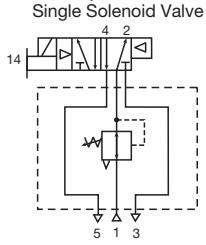



When using an Independent Pressure Sandwich Regulator, the cylinder outlet ports are reversed. The 12 end energizes the #4 port and the 14 end energizes the #2 port. The 3-Position CE and PC functions are also reversed. (See schematics above.)

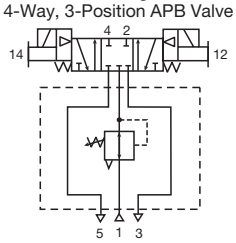
## Common Port Regulation - Non Plug-in, HB & HA

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.

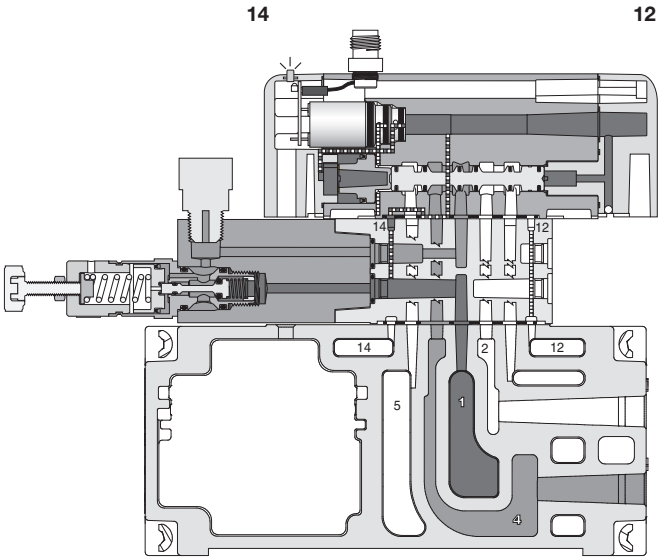
Common Port Regulator with
4-Way, 2-Position
Single Solenoid Valve




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




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

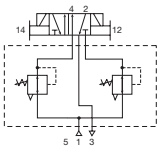



## Independent Dual Port Regulation - Non Plug-in, HB & HA

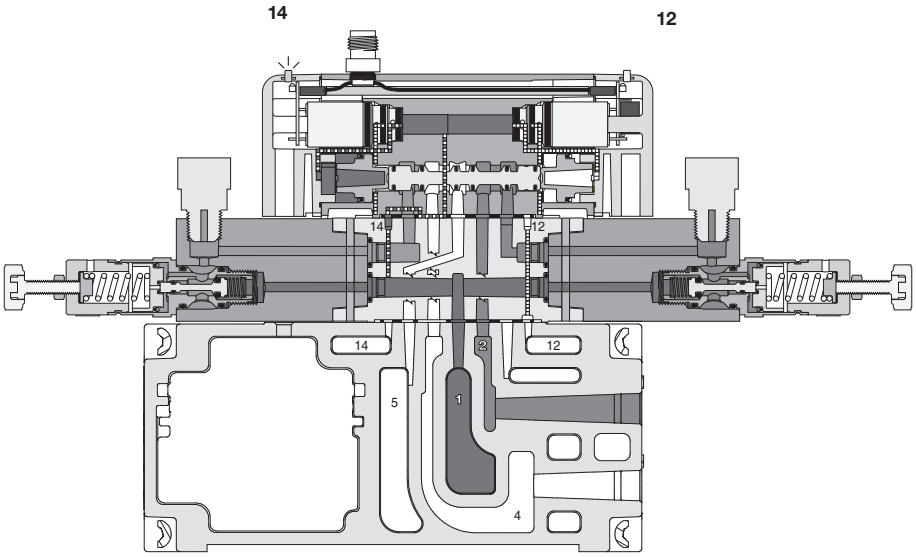
**Dual Port Regulator**

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**

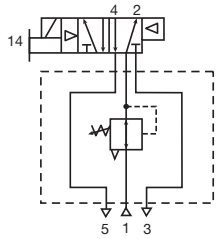



When using an Independent Pressure Sandwich Regulator, the cylinder outlet ports are reversed. The 12 end energizes the #4 port and the 14 end energizes the #2 port. The 3-Position CE and PC functions are also reversed. (See schematics on above.)

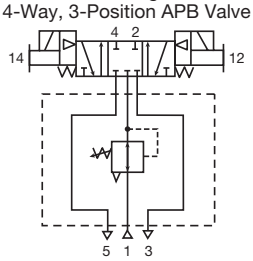
## Common Port Regulation - Plug-in, H1, H2, H3

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.

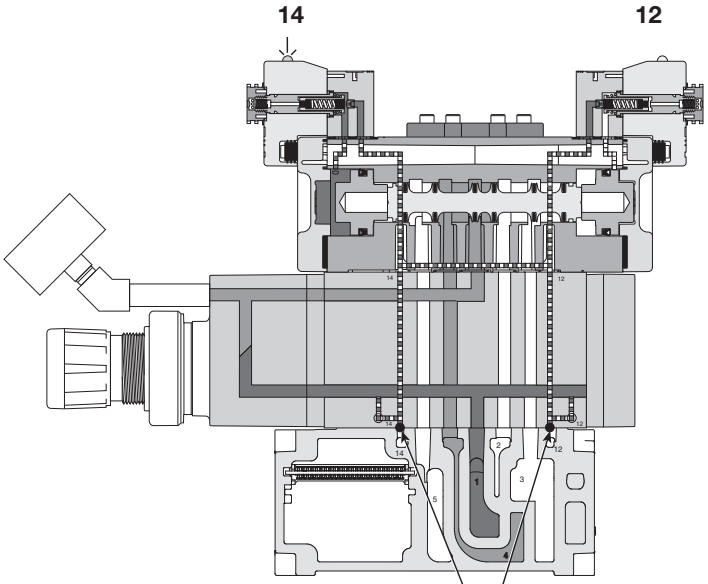
Common Port Regulator with
4-Way, 2-Position
Single Solenoid Valve




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




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

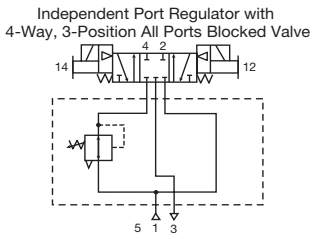



Sandwich Regulator has standard configuration of Internal Pilot with the Pilot Plug in the bottom of the I & E Pilot Holes which prevents line pressure from escaping through the manifold.

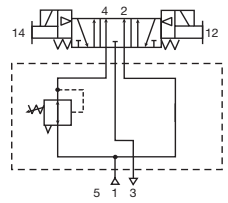
## Independent Port Regulation - Plug-in, H1, H2, H3

**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

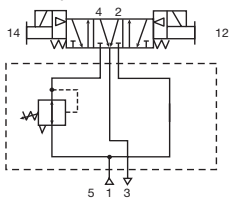



Independent Port Regulator with 4-Way,
3-Position, Inlet to Cylinder Function



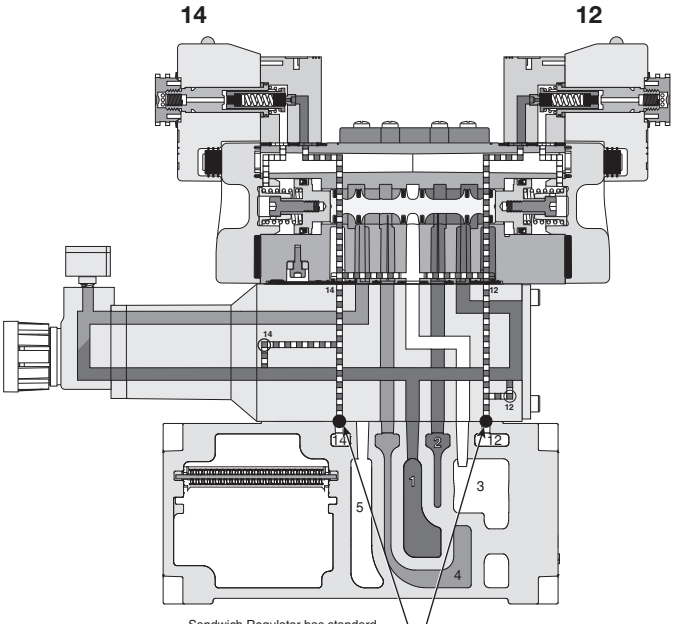

⚠CAUTION: Requires 4-Way, 3-Position, Cylinder to Exhaust Valve

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.

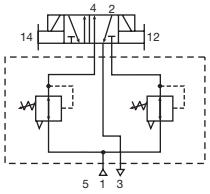
When using an Independent Pressure Sandwich Regulator, the cylinder outlet ports are reversed. The 12 end energizes the #4 port and the 14 end energizes the #2 port. The 3-Position CE and PC functions are also reversed. (See schematics above.)

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

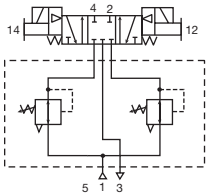
### Dual Port Regulator

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

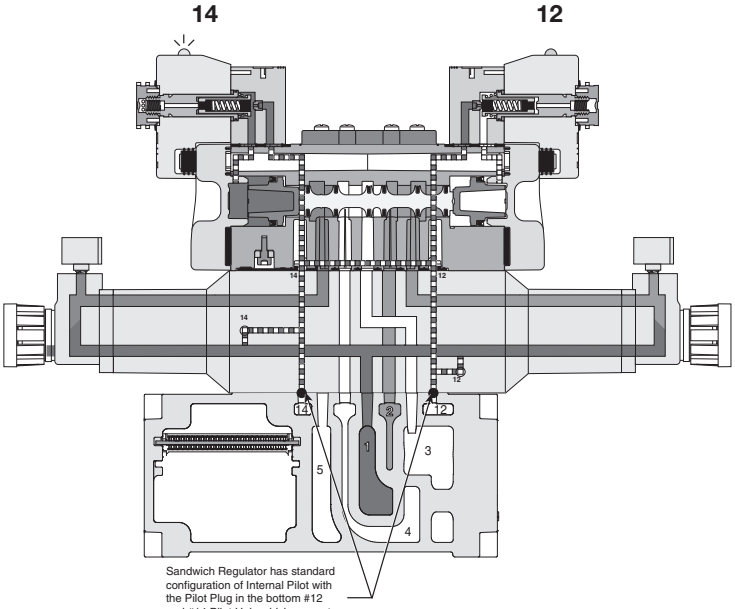
Independent Dual Port Regulator with
4-Way, 2-Position
Double Solenoid Valve




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




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



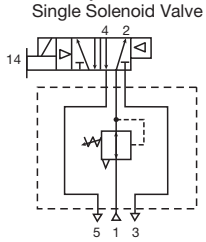

Sandwich Regulator has standard configuration of Internal Pilot with the Pilot Plug in the bottom #12 and #14 Pilot Hole which prevents line pressure from escaping through the manifold.

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.)

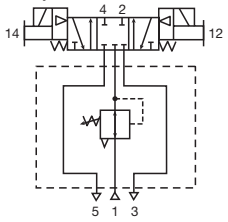
## Common Port Regulation - Non Plug-in, H1, H2, H3

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.

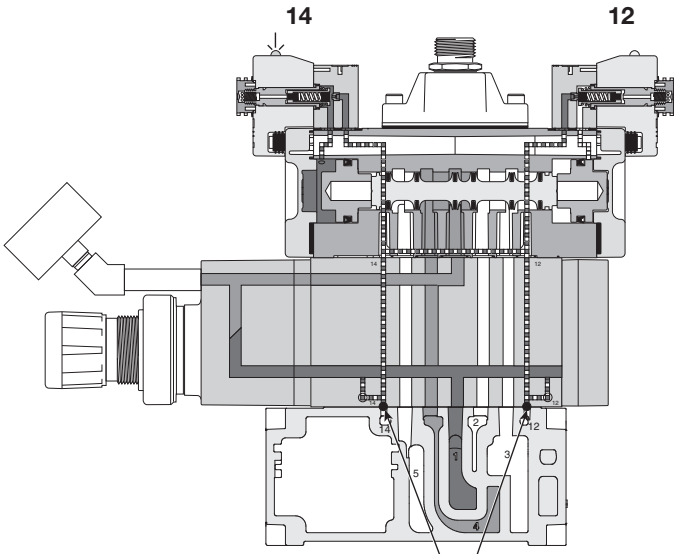
Common Port Regulator with
4-Way, 2-Position
Single Solenoid Valve




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




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

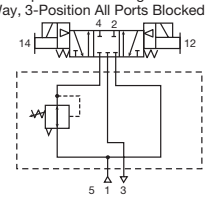



Sandwich Regulator has standard configuration of Internal Pilot with the Pilot Plug in the bottom of the I & E Pilot Holes which prevents line pressure from escaping through the manifold.

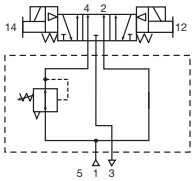
## Independent Port Regulation - Non Plug-in, H1, H2, H3

**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

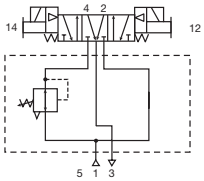



Independent Port Regulator with 4-Way,
3-Position, Inlet to Cylinder Function



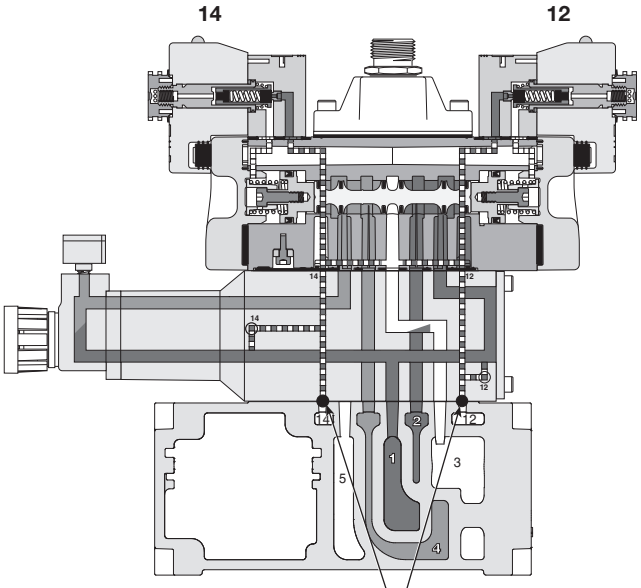

⚠CAUTION: Requires 4-Way, 3-Position, Cylinder to Exhaust Valve

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



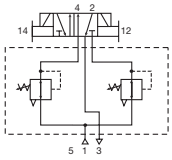

Sandwich Regulator has standard configuration of Internal Pilot with the Pilot Plug in the bottom #12 and #14 Pilot Hole which prevents line pressure from escaping through the manifold.

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

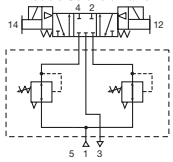
### Dual Port Regulator

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

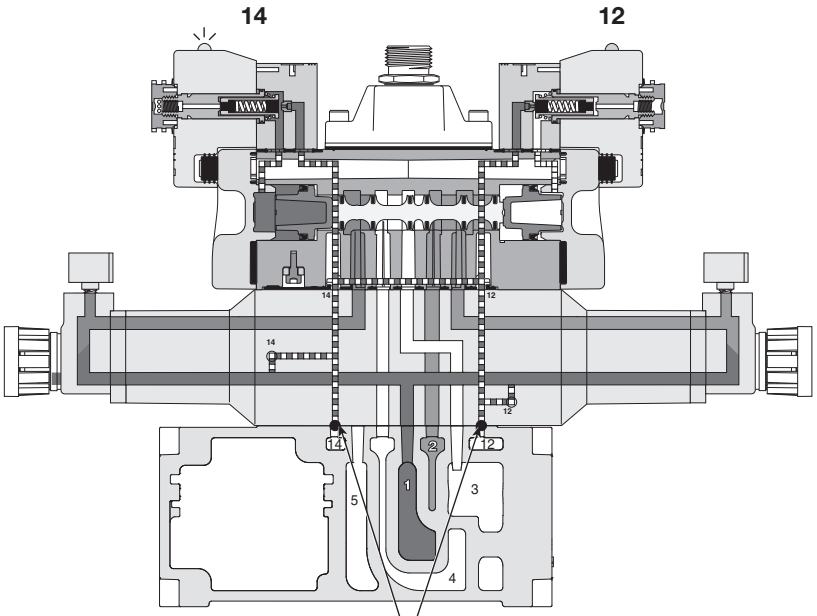
Independent Dual Port Regulator with 4-Way, 2-Position Double Solenoid Valve




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

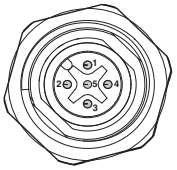
| | HB | HA | H1 | H2 | H3 |
|---|---|---|---|---|---|
| **MOV (24VDC)** | 20.4 | 20.4 | 20.4 | 20.4 | 20.4 |
| **MOV (120VAC)** | 102* | 102* | 102 | 102 | 102 |

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

## P2H IO-Link

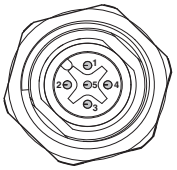
### Class B, M12 pin

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

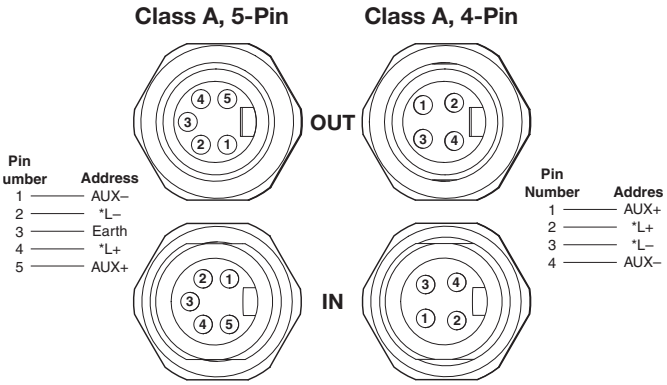


### Class A, M12 pin

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



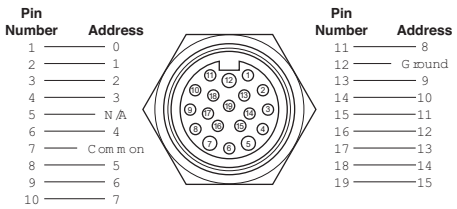
### Class A, Power IN / OUT 7/8 pin




* 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

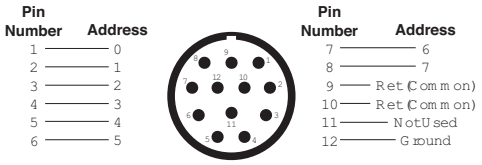
Common Pin "7" is rated for 8 amps. Cable common wire must be greater than total amperage of solenoids on Add-A-Fold assembly.

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

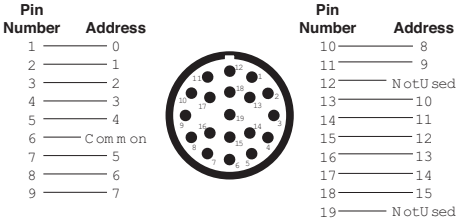
NEMA 4 rated with properly assembled NEMA 4 rated cable.

## M23, Round Connector

### Male 12-pin connector, face view

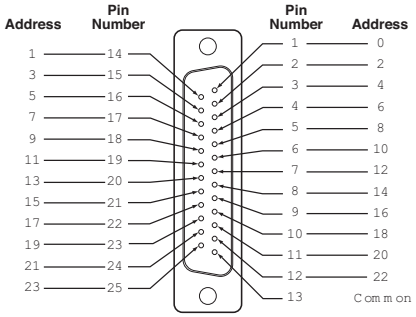



### Male 19-pin connector, view into end plate

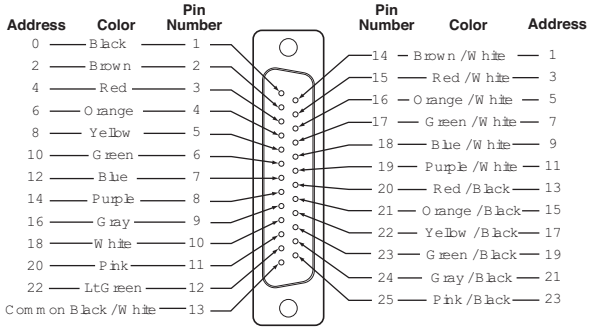



## 25-Pin, D-Sub Connector

### 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** |



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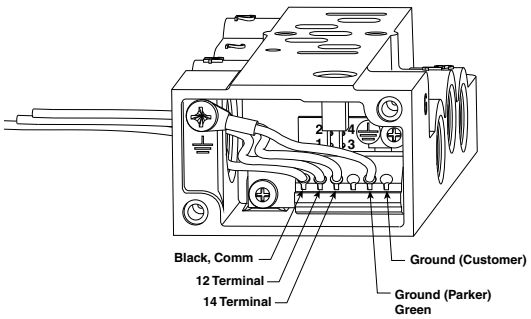
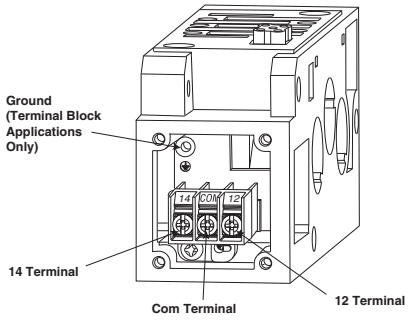
## Subbase Wiring



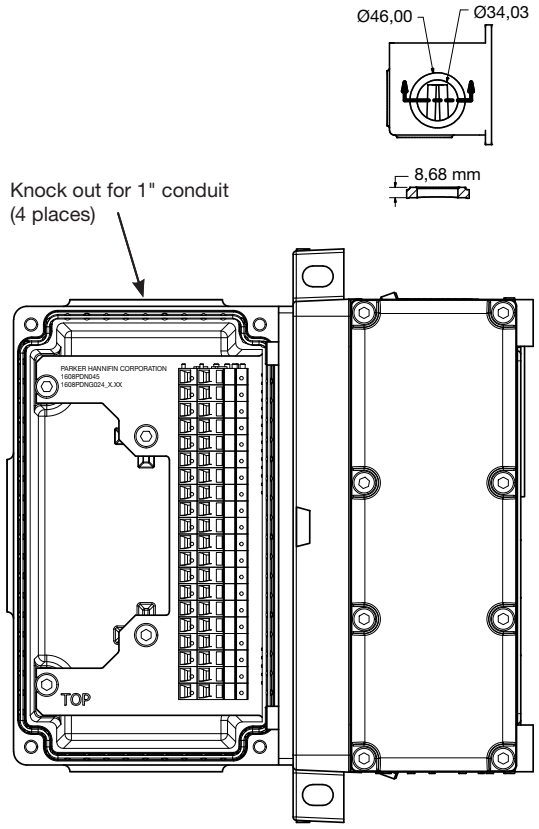

All commons internally
connected on terminal strip

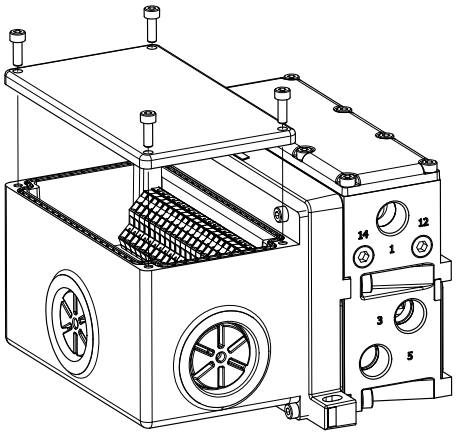
| **Connections** | 14 Solenoid | 12 Solenoid |
|---|---|---|
| Valves with Wires | Black Wires | Red Wires |
| Valves with Terminal Block (Will accept 18 to 24 Gauge Wires) | 14 and Com Terminals | 12 and Com Terminals |

## Manifold Wiring - Size 3

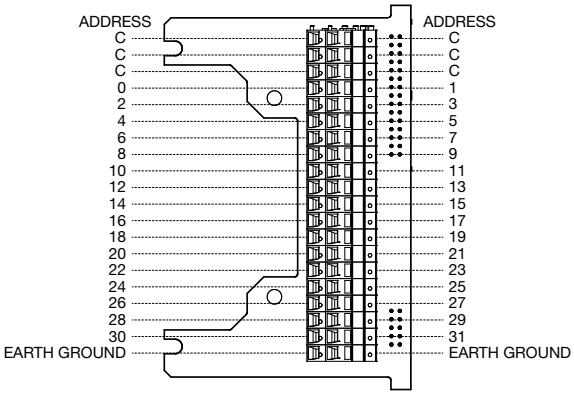



## Terminal Box Wiring (H Universal)



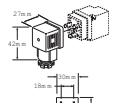
SCHEMATIC



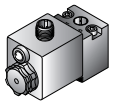

All commons internally
connected on terminal strip

## Electrical Connectors - Size 1, 2 & 3

### 5599-1 CNOMO

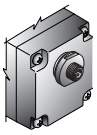


30mm 3-Pin ISO 4400
(DIN 43650A)

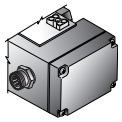


2-Pin M12 Euro

### 5599-2

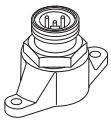


Manifold Auto Connector
(H3 Only)

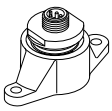


Subbase Auto Connector

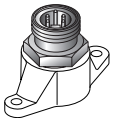
### 5599-1 AUTO



3-Pin Mini

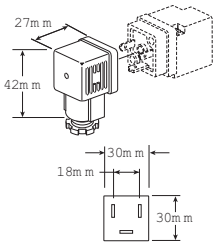


4-Pin Micro



5-Pin Mini

## 30 mm 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.

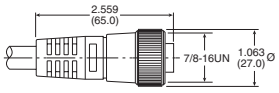
**Note:** Max ø6.5 mm cable size required for connector w/o 6' (2m) cord. IP65 rated when properly installed.

Engineering data:

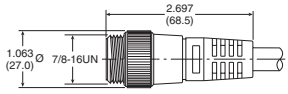
Conductors: 2 poles plus ground; cable range (connector only): 8 to 10mm (0.31 To 0.39 Inch); contact spacing: 18mm

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

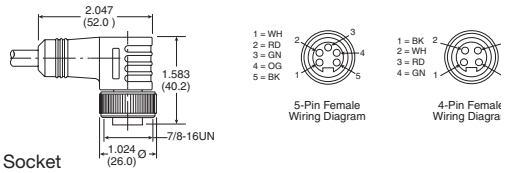
RKM Female Socket




RSM Male Pins



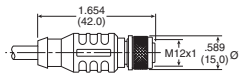

WKM Female Socket



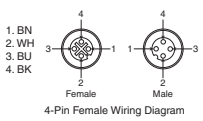

| Description | Part number |
|---|---|
| 4-pin female to flying lead cable, 5 meters, TPE | **RKM 46-5M/S1587** |
| 5-pin female to flying lead cable, 5 meters, TPE | **RKM 56-5M/S1587** |
| 4-pin male to female cable, TPE | **RSM RKM 46-x/S1587** |
| 5-pin male to female cable, TPE | **RSM RKM 56-x/S1587**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




4-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



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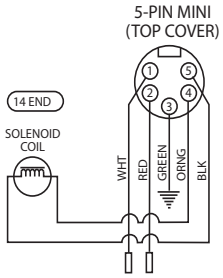
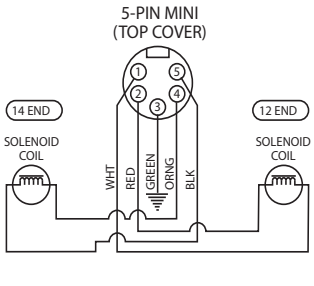
# Automotive Connection – Wiring Options

## 'C' Chrysler Connection

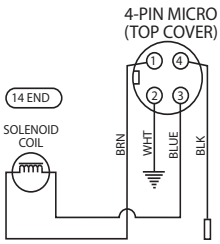
**5-Pin Male / Single Solenoid**
(Encl. Option 3, Auto Option C)



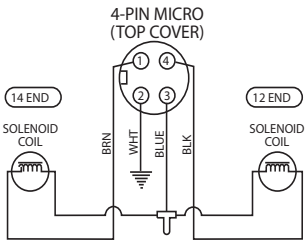

**5-Pin Male / Double Solenoid**
(Encl. Option 3, Auto Option C)




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

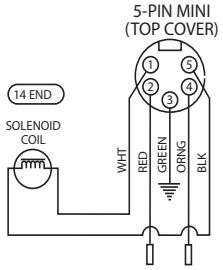



**4-Pin Male / Double Solenoid**
(Encl. Option 2, Auto Option C)

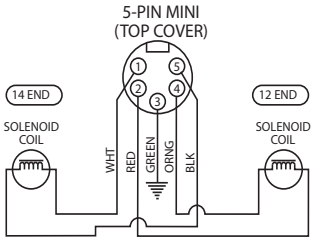



## 'F' SAE / Ford Wiring

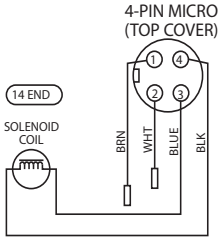
**5-Pin Male / Single Solenoid**
(Encl. Option 3, Auto Option F)



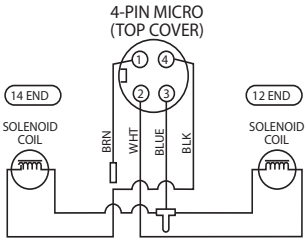

**5-Pin Male / Double Solenoid**
(Encl. Option 3, Auto Option F)




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

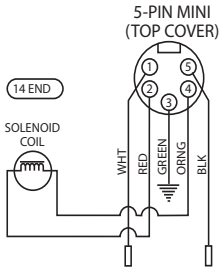



**ISO 20401**
**4-Pin Male / Double Solenoid**
(Encl. Option 2, Auto Option F)

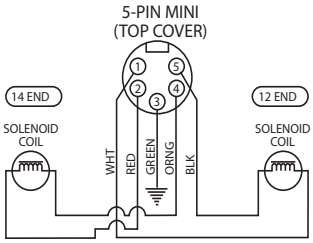



## 'G' GM Wiring

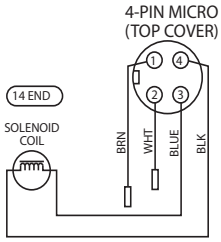
**5-Pin Male / Single Solenoid**
(Encl. Option 3, Auto Option G)



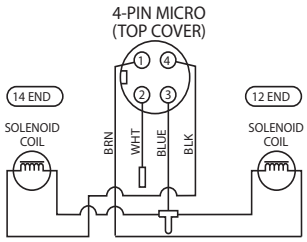

**5-Pin Male / Double Solenoid**
(Encl. Option 3, Auto Option G)




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

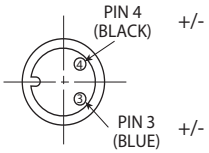



**4-Pin Male / Double Solenoid**
(Encl. Option 2, Auto Option G)

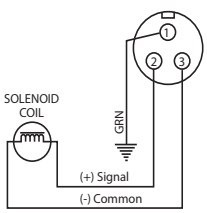



## CNOMO Connection - Wiring Options

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




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



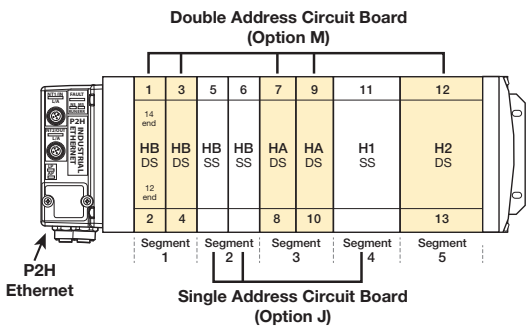
## Maximum Number of Solenoids
**(Maximum energized simultaneously)**

| | 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 |

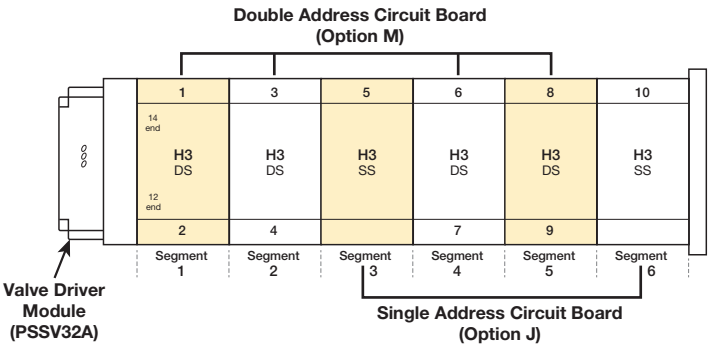
* Not CSA certified for 25-pin, D-sub option.
† Use Type A IO-Link module for 24 outputs simultaneously.
§ P2M Industrial Ethernet limited to 2A, use F9 coil for more than simultaneous solenoids.

## I/O Addressing Examples

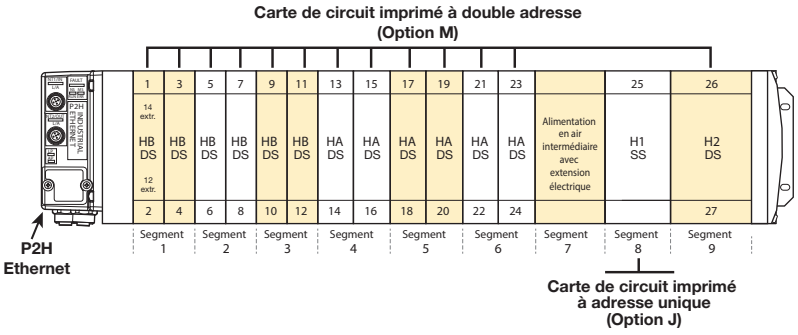
HB, HA, H1, H2 - Five Segment Manifold Example




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** | — |

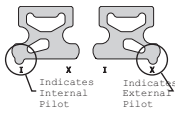
Quantity 1

## 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 shown | HB | **PS5605P** |
|   | HA | **PS5505P** |
|   | H1, H2 & H3 | **PS4007P** |

Quantity 10

## Regulator Kits

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



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## 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 4,1 bar | **PS4051060BP** |
| | 0 to 11 bar | **PS4051160BP** |
| 1-1/2" Face Air - Large* | | |
| | 0 to 4,1 bar | **PS4053060BP** |
| | 0 to 11 bar | **PS4053160BP** |
| 1-1/2" Face Liquid* | | |
| | 0 to 11 bar | **PS4052160BP** |

* Includes brass pipe fitting extensions
Quantity 1

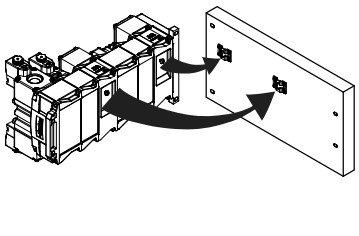
## Pilot By-Pass Plate

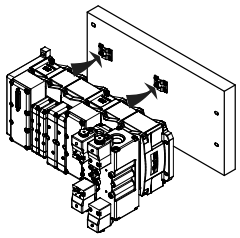
| Valve size | Part number |
|---|---|
| H1, H2, H3 | **PS4051CP** |

Quantity 10

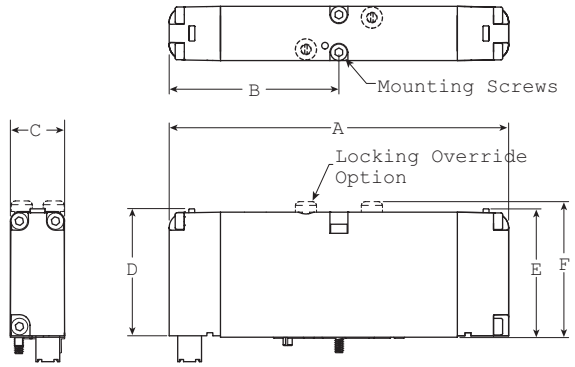
## Installation Bracket

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





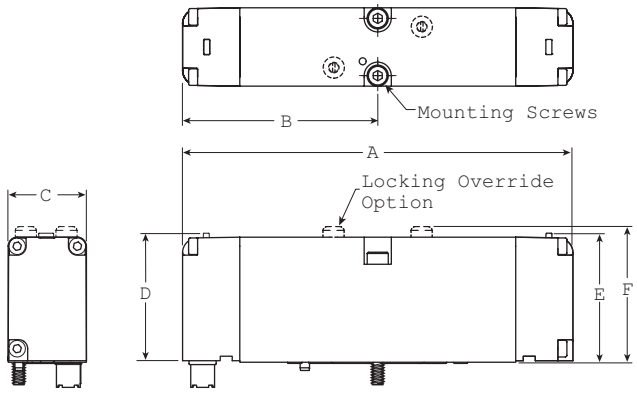
## H Series ISO 15407-2, Plug-in, Size 18 mm (HB)




**18 mm Dimensions [mm]**

| A | B | C | D |
|---|---|---|---|
| 113 | 56 | 18 | 50 |
| E | F | | |
| 43 | 45 | | |

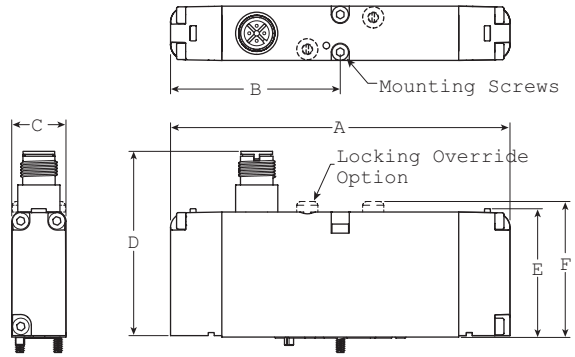
## H Series ISO 15407-2, Plug-in, Size 26 mm (HA)




**26 mm Dimensions [mm]**

| A | B | C | D |
|---|---|---|---|
| 130 | 65 | 26 | 50 |
| E | F | | |
| 43 | 45 | | |

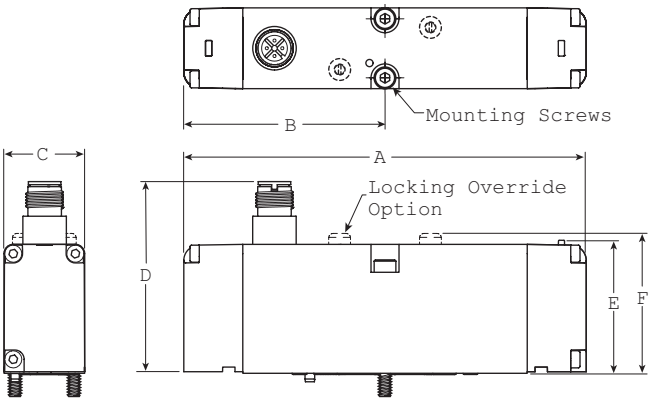
## H Series ISO 15407-1, Non Plug-in, Size 18 mm (HB)




**18 mm Dimensions [mm]**

| A | B | C | D |
|---|---|---|---|
| 113 | 56 | 18 | 61 |
| E | F | | |
| 43 | 45 | | |

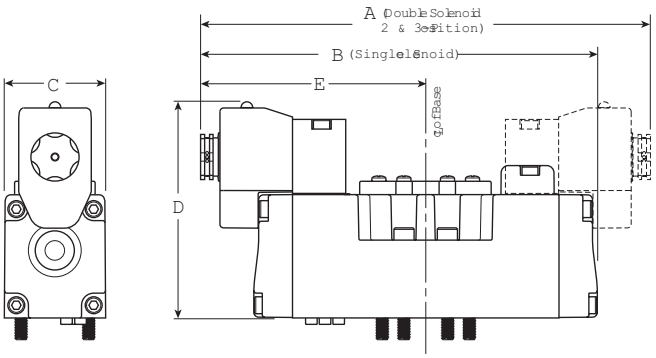
## H Series ISO 15407-1, Non Plug-in, Size 26 mm (HA)



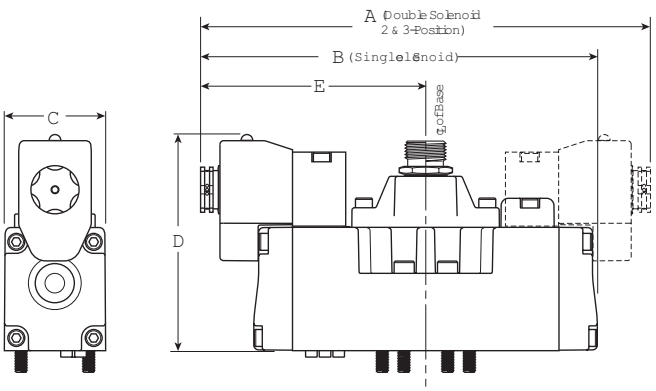

**26 mm Dimensions [mm]**

| A | B | C | D |
|---|---|---|---|
| 130 | 65 | 26 | 61 |
| E | F | | |
| 43 | 45 | | |

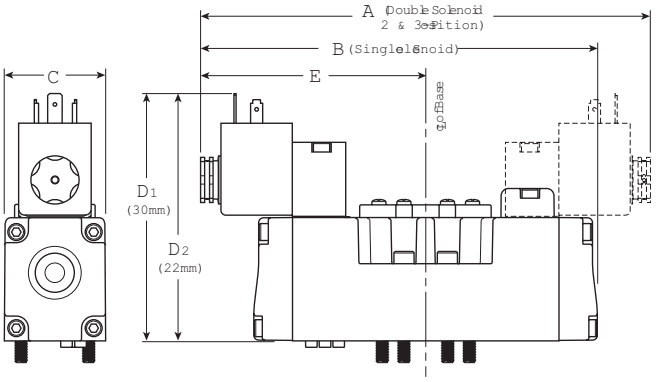
## H Series ISO 5599-2



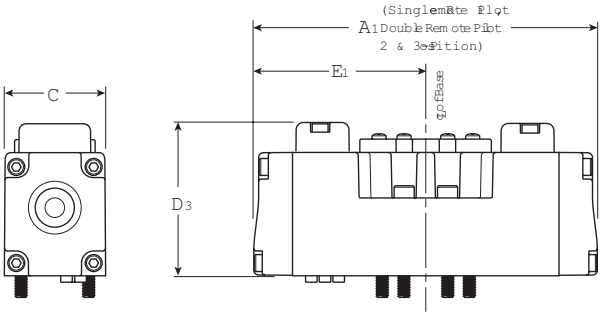

## H Series ISO 5599-1 Auto




## H Series ISO 5599-1 CNOMO




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




**H1 Valves Shown**

### H1 Dimensions [mm]

| A | A1 | B | C |
|---|---|---|---|
| 186 | 142 | 164 | 42 |
| **D** | **D1** | **D2** | **D3** |
| 90 | 109 | 109 | 63.5 |
| **D4** | **E** | **E1** | |
| 63 | 93 | 71 | |

### H2 Dimensions [mm]

| A | A1 | B | C |
|---|---|---|---|
| 212 | 168 | 190 | 55 |
| **D** | **D1** | **D2** | **D3** |
| 103 | 122 | 116 | 76 |
| **E** | **E1** | | |
| 106 | 84 | | |

### H3 Dimensions [mm]

| A | A1 | B | C |
|---|---|---|---|
| 246 | 177 | 220 | 55 |
| **D** | **D1** | **D2** | **D3** |
| 103 | 122 | 116 | 76 |
| **E** | **E1** | | |
| 121 | 89 | | |



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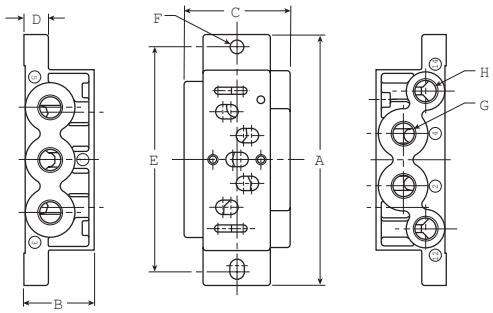
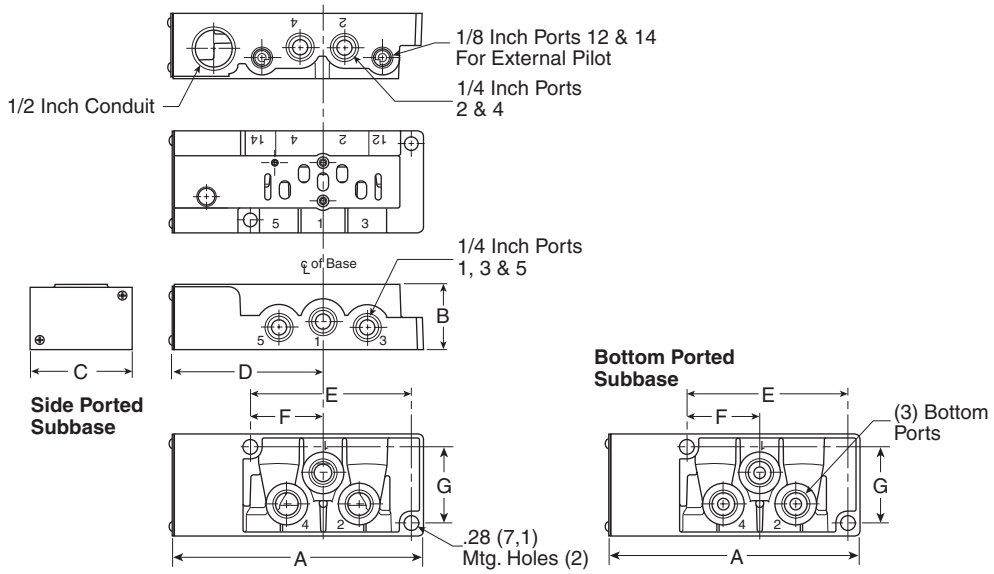
## HB Series ISO 15407-1, Size 18 mm (HB) Single Subbase




**HB Dimensions (PL02) [mm]**

| A | B | C | D |
|---|---|---|---|
| 80 | 22 | 27 | 8 |
| **E** | **F** | **G** | **H** |
| 70 | Ø 5,5 | 1/8 | M5 |

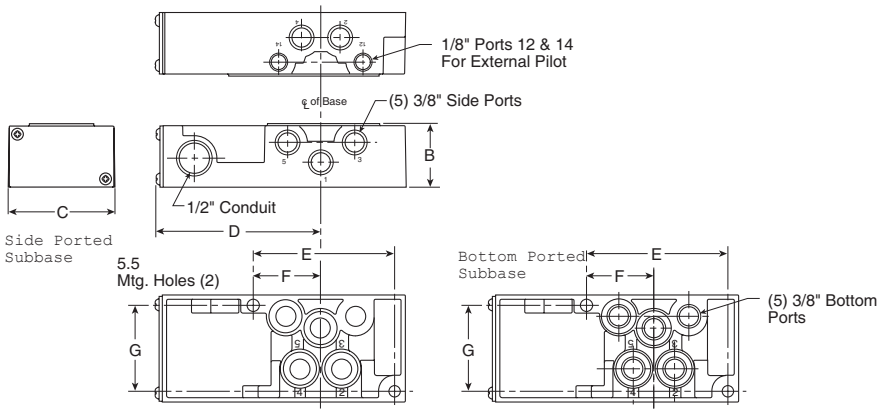
## H Series ISO 15407-2 & 15407-1 Size 26 mm (HA), Plug-in Subbases




**HA Dimensions [mm]**

| A | B | C | D |
|---|---|---|---|
| 124 | 32,5 | 50,8 | 74 |
| **E** | **F** | **G** | |
| 36,2 | 80,2 | 37,9 | |

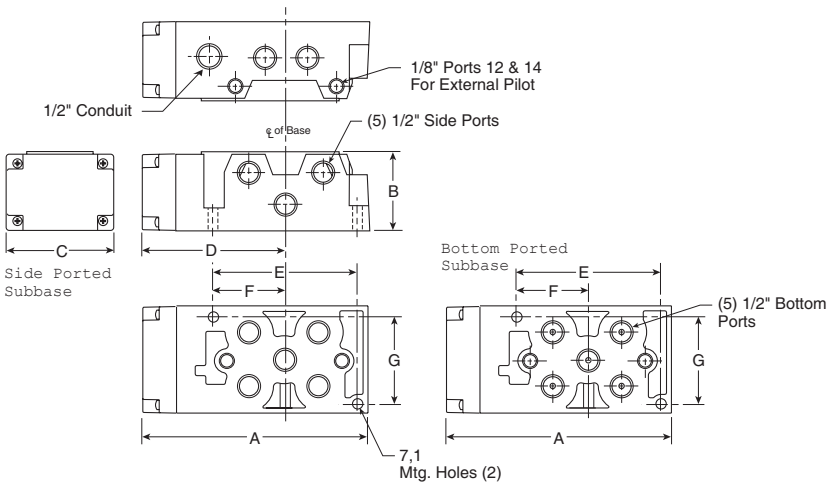
## H Series ISO 5599-1 Size H1, PS4011 Subbase




**PS4011 Subbase Dimensions [mm]**

| A | B | C | D |
|---|---|---|---|
| 148 | 38 | 64 | 98 |
| **E** | **F** | **G** | |
| 84 | 40 | 51 | |

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




**PS4111 Subbase Dimensions [mm]**

| A | B | C | D |
|---|---|---|---|
| 170 | 59 | 80 | 108 |
| **E** | **F** | **G** | |
| 107 | 52 | 65 | |



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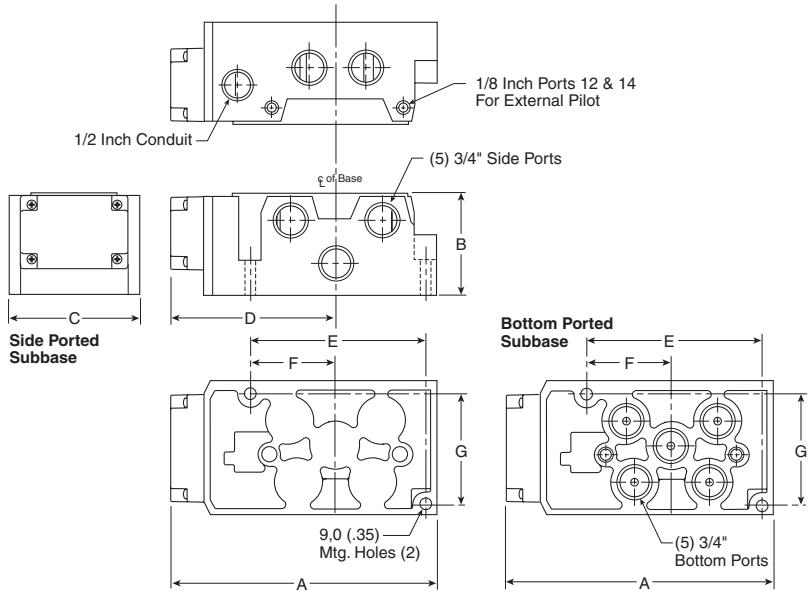
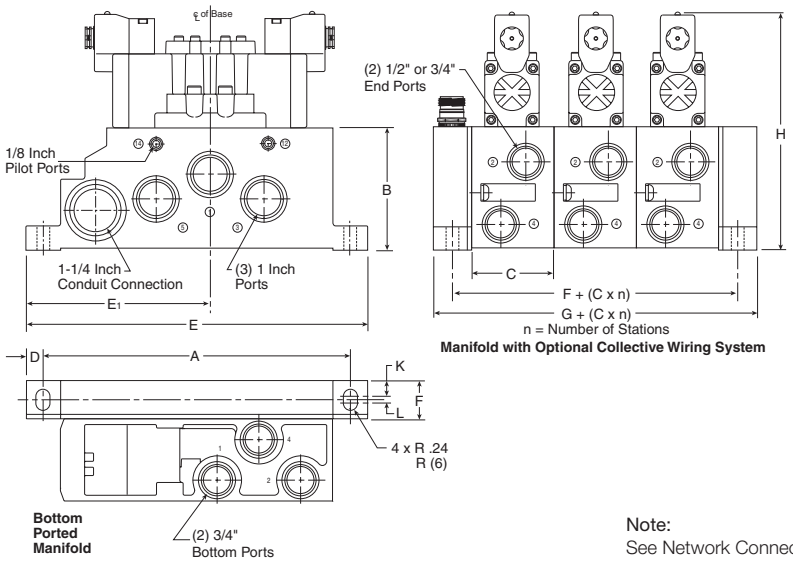
## H Series ISO 5599-1 Size H3, PS4211 Subbase




**PS4211 Subbase Dimensions [mm]**

| A | B | C | D |
|---|---|---|---|
| 201 | 75 | 99 | 125 |
| **E** | **F** | **G** | |
| 131 | 64 | 82 | |

## H Series ISO 5599 Size H3, PS4211 Manifold



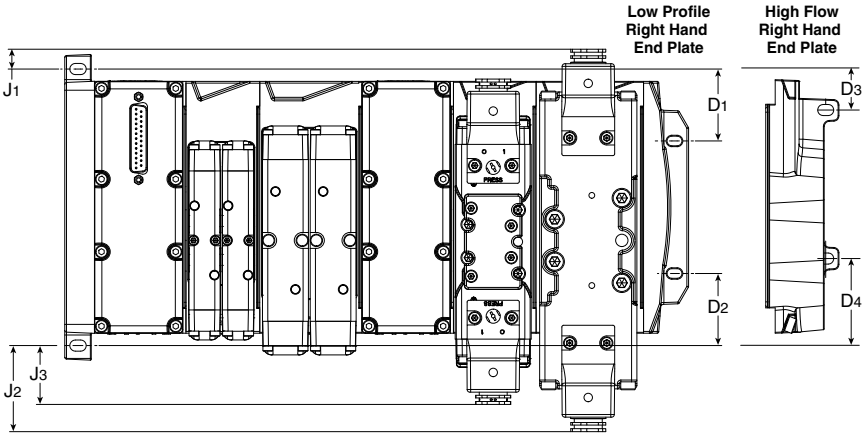

**PS4211 Manifold Dimensions [mm]**

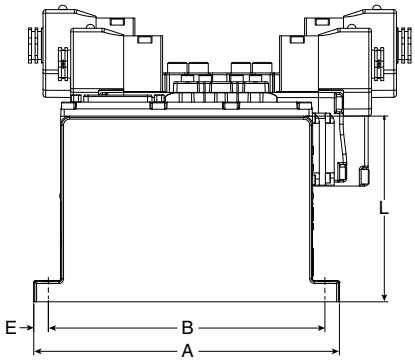
| A | B | C | D | E |
|---|---|---|---|---|
| 265 | 105 | 71 | 15 | 295 |
| **E1** | **F** | **G** | **H** | |
| 159 | 33 | 63 | 208 | |
| **K** | **L** | | | |
| 13,5 | 6 | | | |

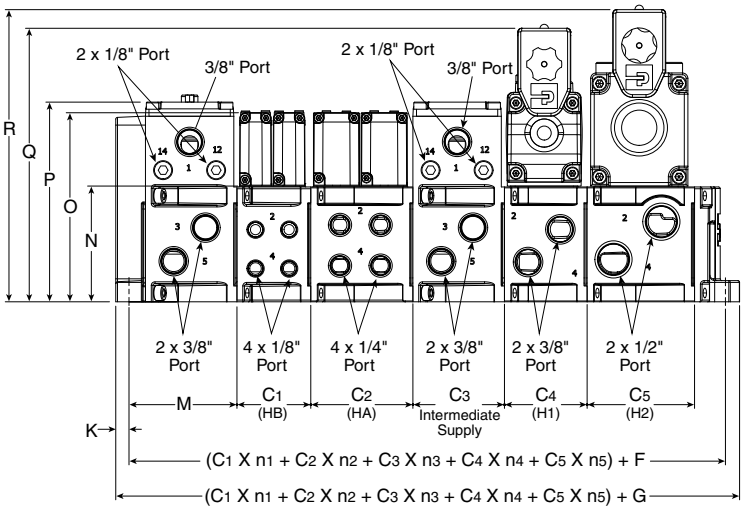
Note:
See Network Connectivity Section for the dimensions of manifolds utilizing the H Series Network, Turck Network, or P2M Network Node end plate type.

## H Series ISO Universal Manifold

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




### Dimensions [mm]

| A | B | $C_1$ | $C_2$ | $C_3$ | $C_4$ |
|---|---|---|---|---|---|
| 172.95 | 156.5 | 41.79 | 57.79 | 51.79 | 46.79 |
| $C_5$ | $D_1$ | $D_2$ | $D_3$ | $D_4$ | E |
| 60.79 | 40.71 | 40.71 | 24.3 | 48.8 | 8.00 |
| F | G | $J_1$ | $J_2$ | $J_3$ | K |
| 78.58 | 111.58 | 11.2 | 48.7 | 33.3 | 7.5 |
| L | M | N | O | P | Q |
| 105.08 | 61.08 | 48.7 | 107 | 113 | 154.77 |
| R | | | | | |
| 165.32 | | | | | |



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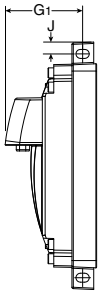
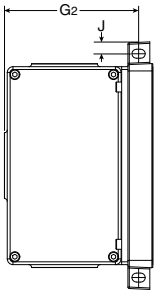
## H Series ISO Universal Manifold with H3 Transition

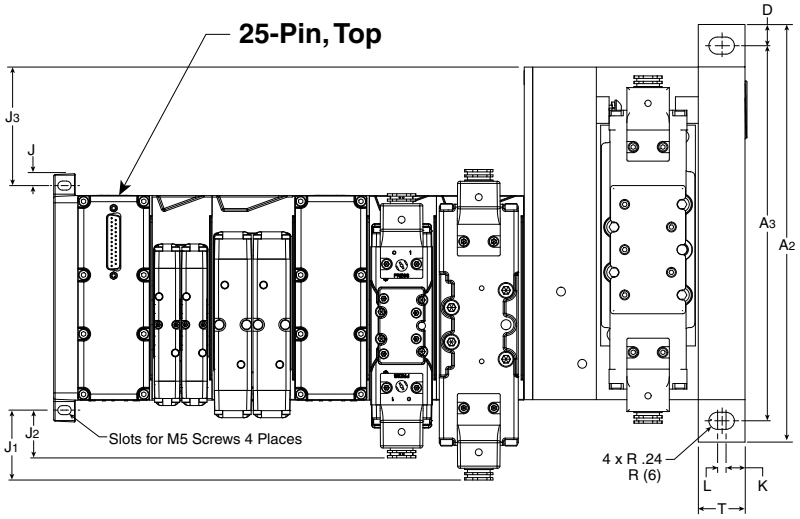
Network Connectivity dimensions (P2H, Turck, H Net, and P2M) are located at the end of the Network Connectivity Section.

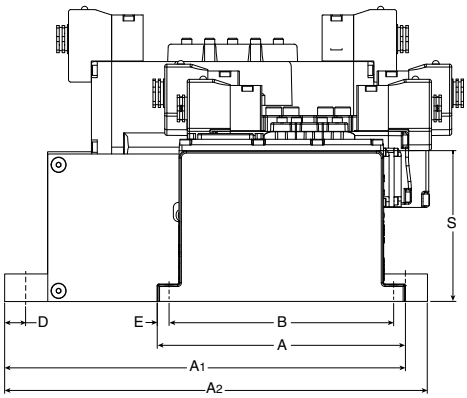


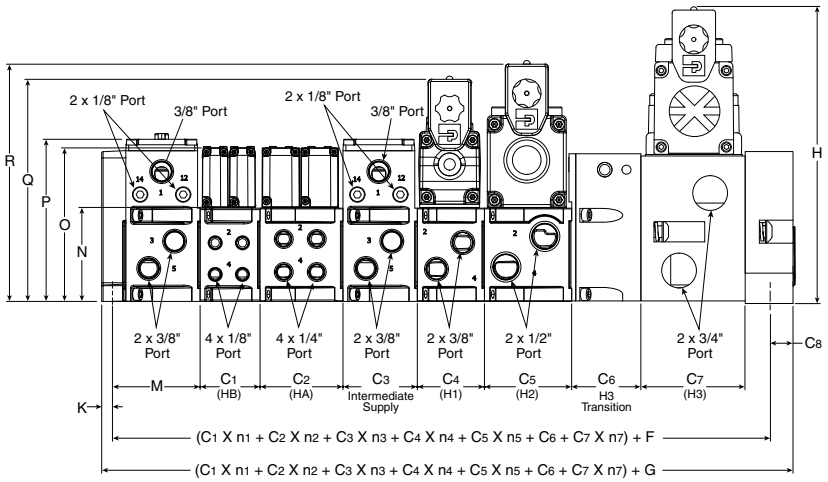

**25-Pin, Side Profile**




**Terminal Block Profile**




| A | A1 | A2 | A3 | B | C1 | C2 | C3 | C4 | C5 | C6 | C7 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 172.95 | 313.43 | 365.3 | 265 | 156.5 | 41.79 | 57.79 | 51.79 | 46.79 | 60.79 | 51.0 | 71.0 |
| C8 | D | E | F | G | G1 | G2 | H | J | J1 | J2 | J3 |
| 16.5 | 15.0 | 8.0 | 77.58 | 101.6 | 54.0 | 93.8 | 208 | 8.3 | 48.7 | 33.3 | 88.25 |
| K | L | M | N | O | P | Q | R | S | T | | |
| 7.5 | 6.0 | 61.08 | 48.7 | 107 | 113 | 154.77 | 165.32 | 105.08 | 33.0 | | |



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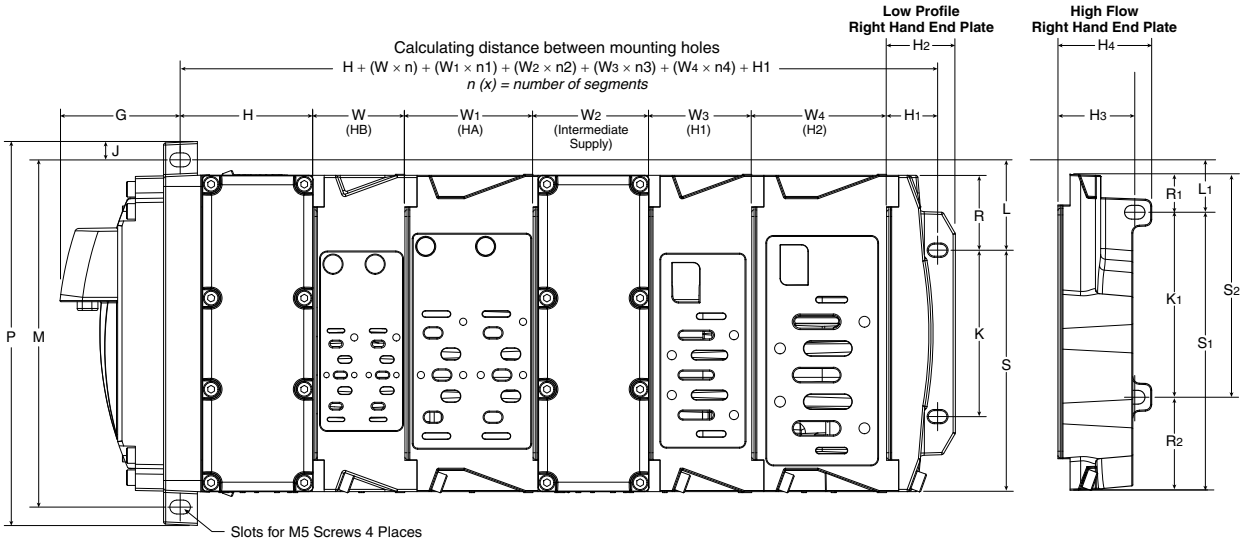
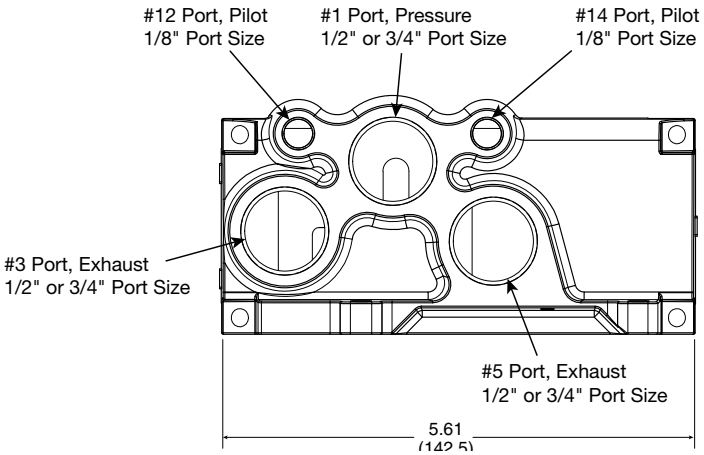
## 25-Pin Side with H Series ISO Valves



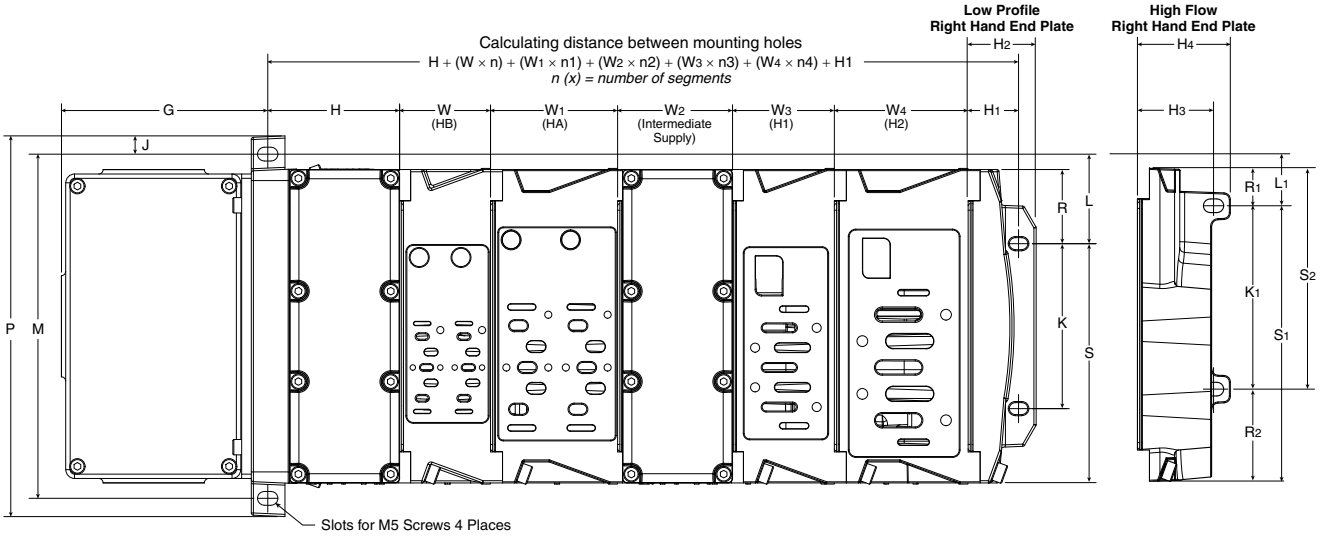

## Hi-Flow Right Hand End Plate

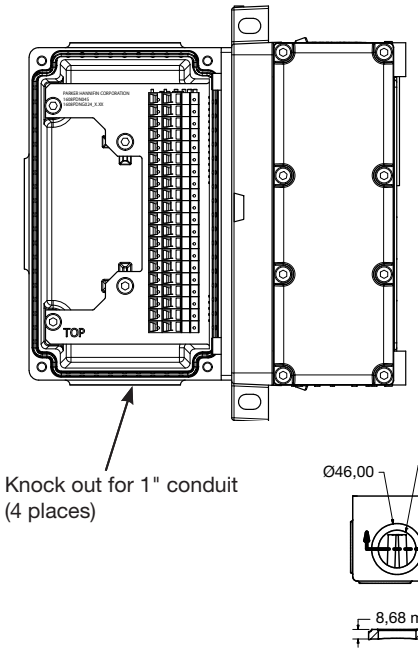



**Hi-Flow Right Hand End Plate**

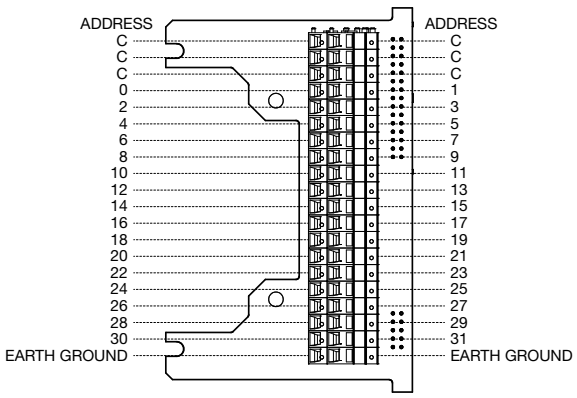
| | |
|---|---|
| **PSHU41** | 1/2" port size |
| **PSHU42** | 3/4" port size |

## Terminal Block with H Series ISO Valves



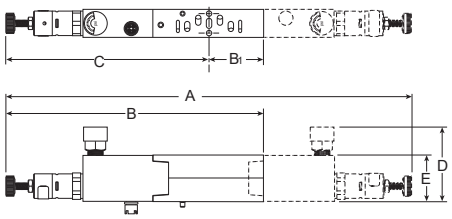




SCHEMATIC




All commons internally
connected on terminal strip

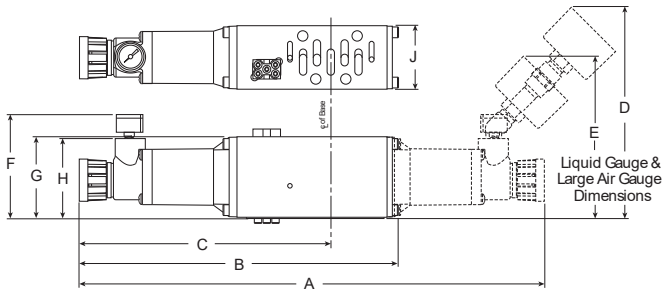
## H Series ISO 15407, HB / HA Sandwich Regulator




**HB / HA Series Sandwich Regulator, Dimensions [mm]**

| | | | | | | |
|---|---|---|---|---|---|---|
| HB (PS5637) | A 261 | B 156 | B1 26 | C 130 | D 66 | E 30 |
| HA (PS5537) | A 254 | B 163 | B1 36 | C 127 | D 69 | E 30 |

## H Series ISO 5599, Size H1 Sandwich Regulator

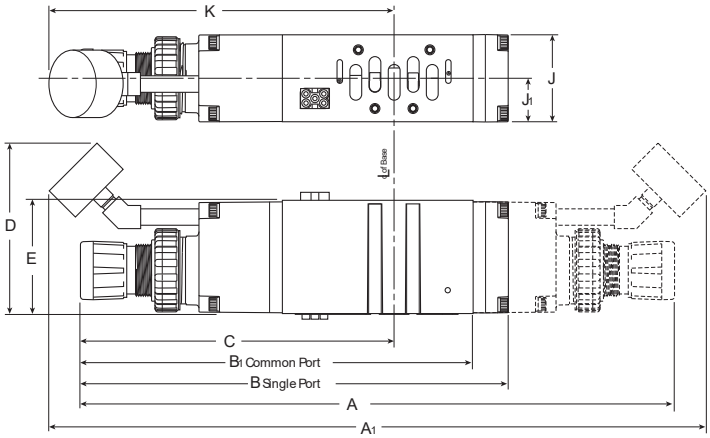



**H1 Series Sandwich Regulator, Dimensions [mm]**

| | | | | | | |
|---|---|---|---|---|---|---|
| H1 (PS4037) (PS4038) | A 301 | B 207 | C 163 | D 138 | E 108 | F 72 |
| | G 53 | H 52 | J 41 | | | |

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

**H2 Sandwich Regulator shown**

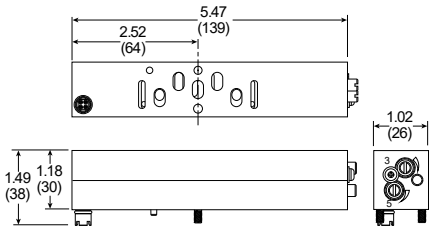



**H2 & H3 Series Sandwich Regulator, Dimensions [mm]**

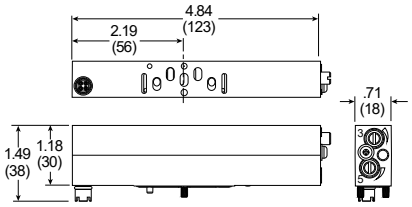
| | | | | | | |
|---|---|---|---|---|---|---|
| H2 (PS4137) (PS4138) | A 372 | A1 411 | B 268 | B1 250 | C 196 | D 107 |
| | E 71 | J 55 | J1 27 | K 216 | | |
| H3 (PS4237) (PS4238) | A 398 | A1 436 | B 293 | B1 271 | C 213 | D 107 |
| | E 75 | J 64 | J1 32 | K 231 | | |

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

### HA Flow Control

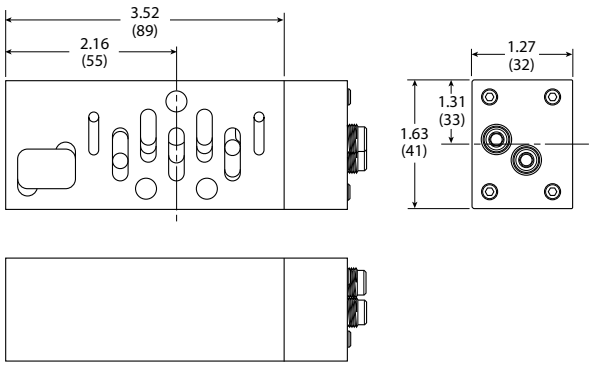



### HB Flow Control

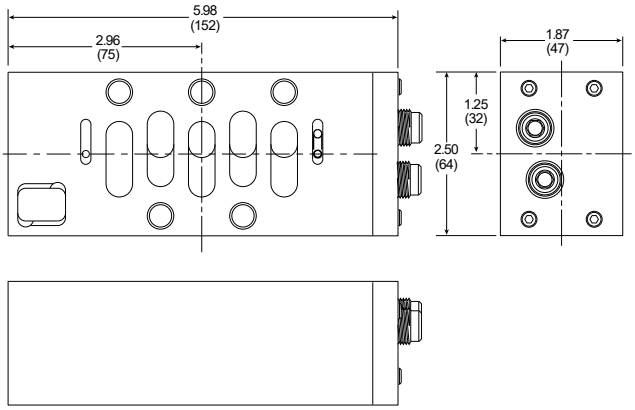



## H Series ISO 5599, Size H1, H2 & H3, Flow Control

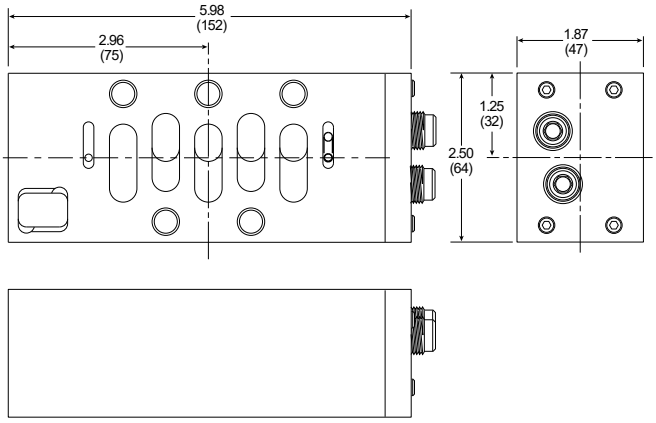
### H1 Flow Control




### H2 Flow Control




### H3 Flow Control



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# Network Connectivity

## Offering

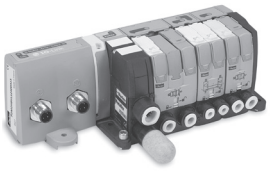
| Valve series | P2M | P2H IO-Link | P2H Ethernet | PCH | Turck BL67 |
|---|---|---|---|---|---|
| Moduflex | X | | | | |
| H Series Micro | X | | | | X |
| H Series ISO | | X | X | X | X |

| Protocol | P2M | P2H IO-Link | P2H Ethernet | PCH | Turck BL67 |
|---|---|---|---|---|---|
| IO-Link | X | X | | | |
| DeviceNet | | | | | X |
| EtherNet/IP | X | | X | X | X |
| PROFIBUS-DP | | | | | X |
| PROFINET | X | | X | X | X |
| Modbus/TCP | X | | X | X | X |
| EtherCAT | X | | X | X | |
| PowerLink | X | | X | | |
| CANopen | | | | | X |

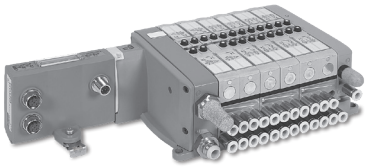
| Options | P2M | P2H IO-Link | P2H Ethernet | PCH | Turck BL67 |
|---|---|---|---|---|---|
| Digital inputs / outputs | | | | X | X |
| Analog inputs / outputs | | | | | X |
| Class A IO-Link master module | | | | X | X |
| Class B IO-Link master module | | | | X | |
| 24 Solenoid control | X* | X | | | X |
| 32 Solenoid control | | | X | X | X |
| Short circuit protection on inputs | | | | X | X |
| Current sensing outputs | | | | X | X |
| Bus expansion | | | | | |
| DeviceNet subnet | | | | | X |
| Programmable comm modules | | | | | X |
| Power over DeviceNet / CANopen | | | | | X |
| Rockwell preferred connectivity | | | | | |
| CANopen expansion | | | | | X |

* Only the first 19 solenoid outputs when used with Moduflex Valve Series

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

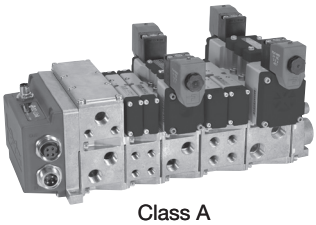


Moduflex

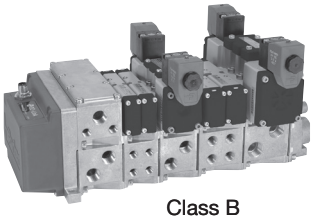


H Micro

### P2H Network Node: IO-Link (shown on H Series ISO)

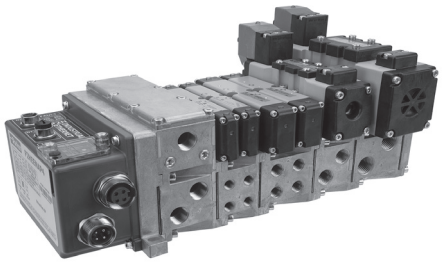


Class A

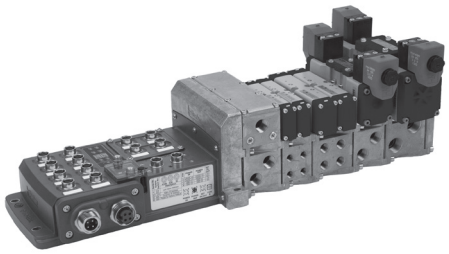


Class B

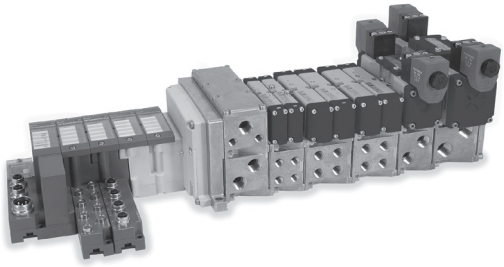
### P2H Network Node: Industrial Ethernet (shown on H Series ISO)



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



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





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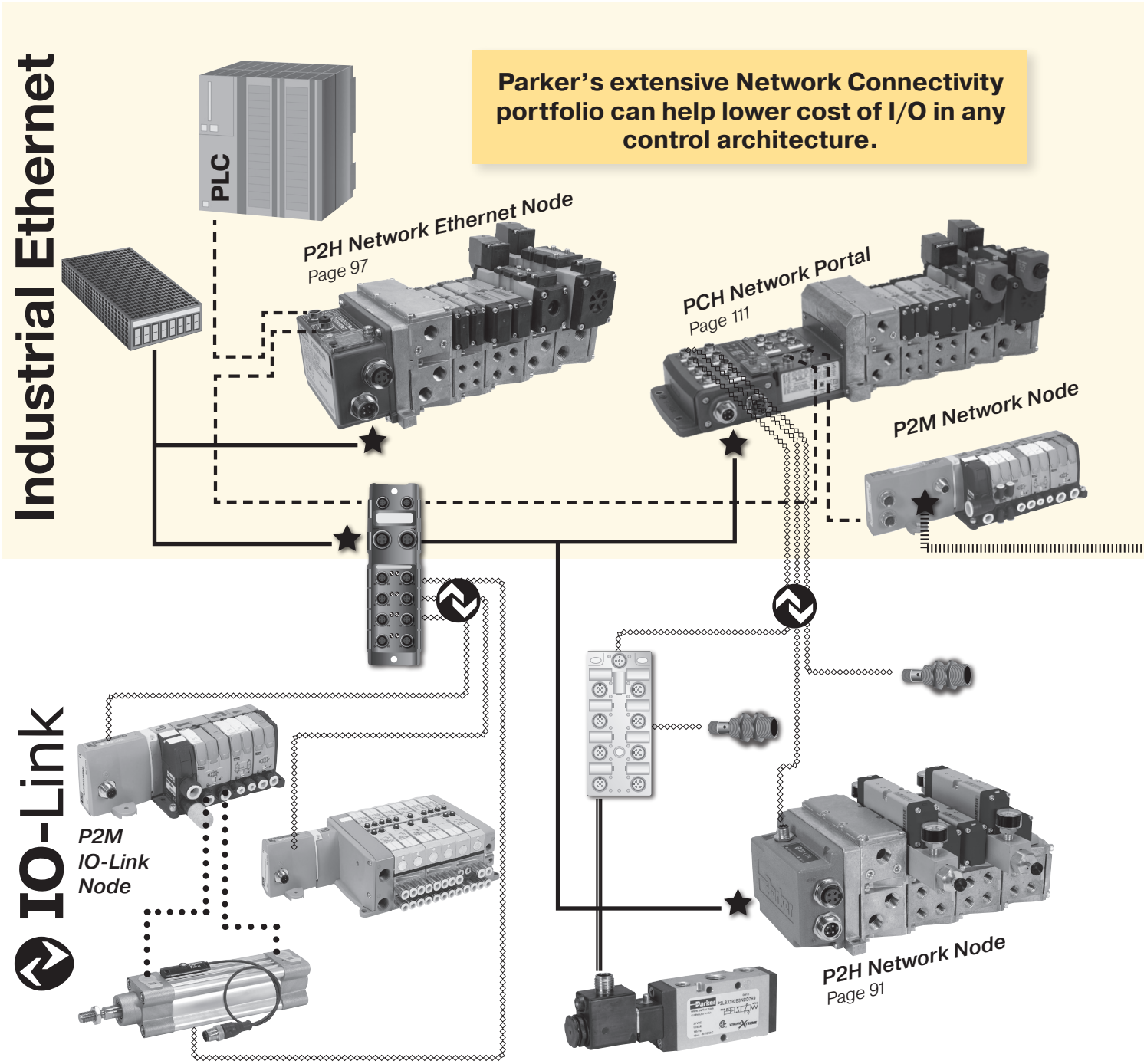



**Parker's extensive Network Connectivity portfolio can help lower cost of I/O in any control architecture.**

### Network to Remote IO-Link Master

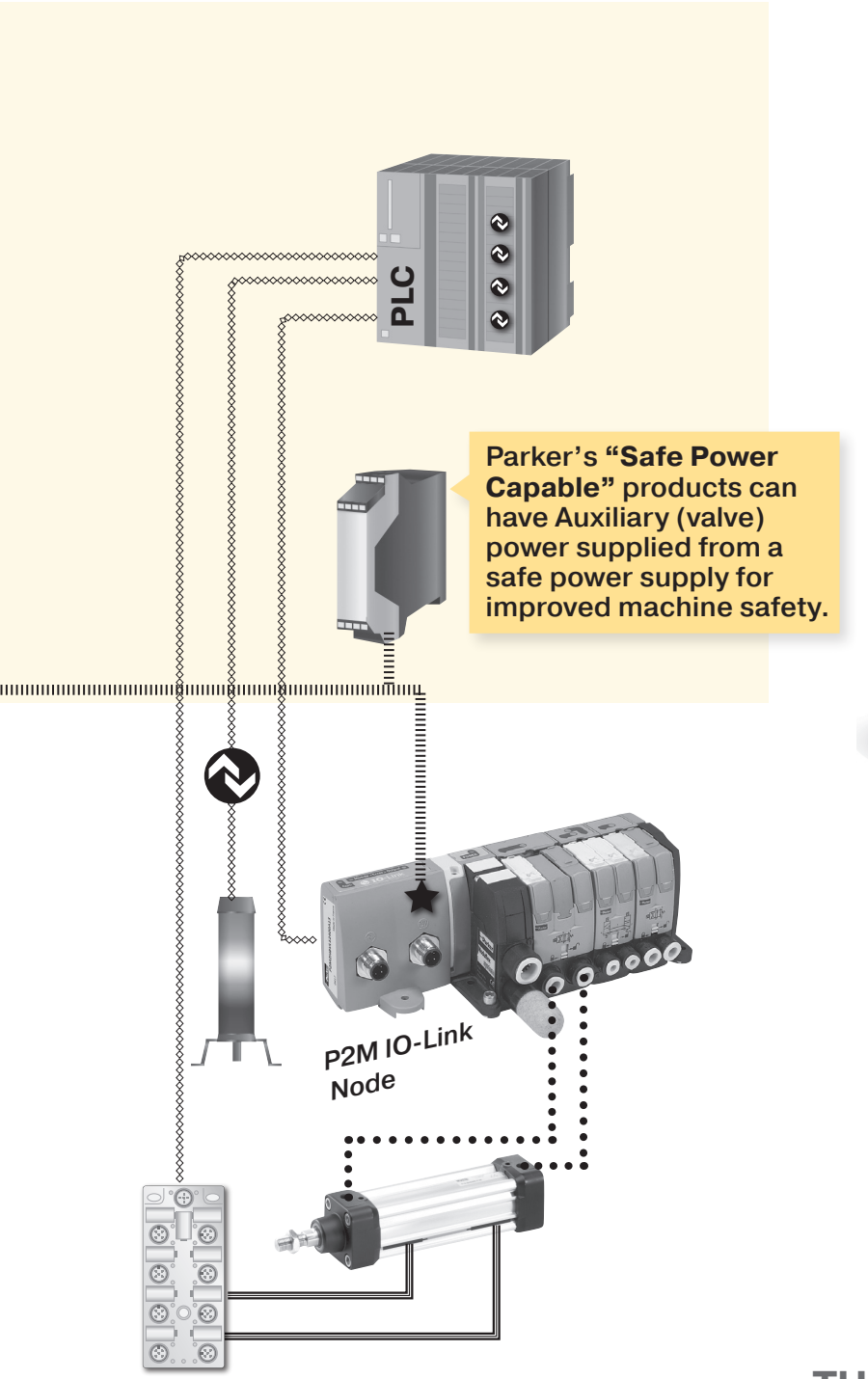
Reduce cabinet size by using a de-centralized "on-machine" IO-Link Master

* 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/pde/CPS and www.parker.com/pde/P2M_IOL

### Node Expansion Using IO-Link

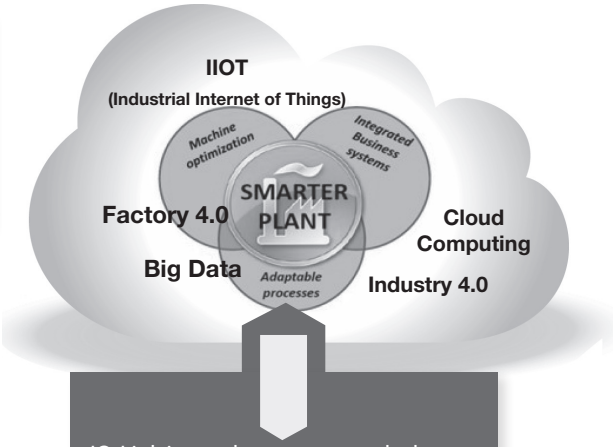
Reduce node count by adding an IO-Link Master module onto Turck Network manifold

* 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/pde/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

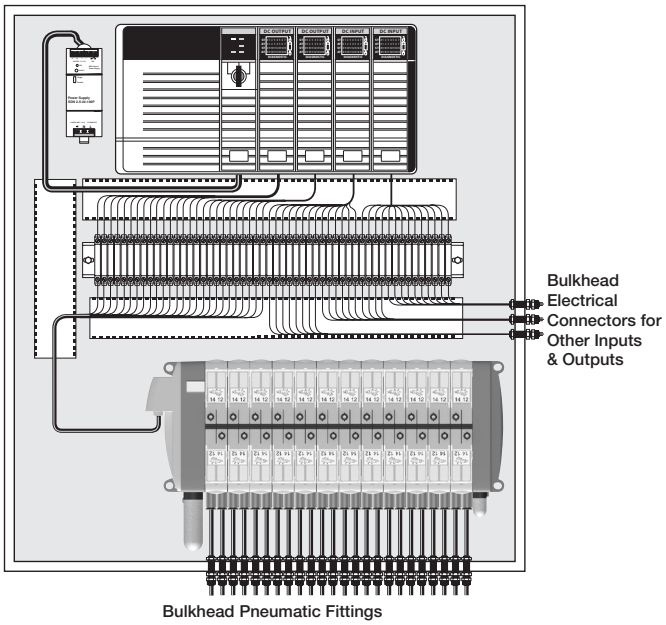
### De-centralized Application

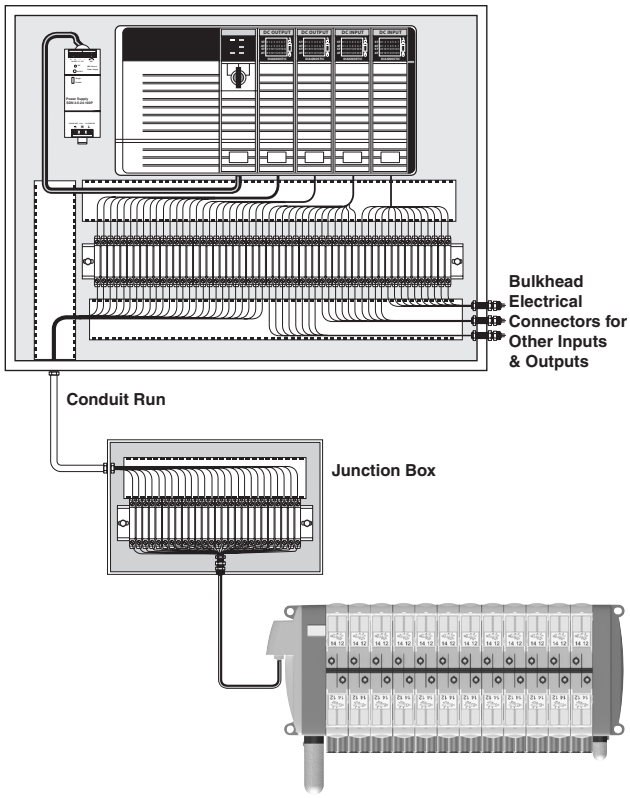
**Valves Outside Control Cabinet**

- 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



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## 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 with Universal manifold

### 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

### De-centralized Application

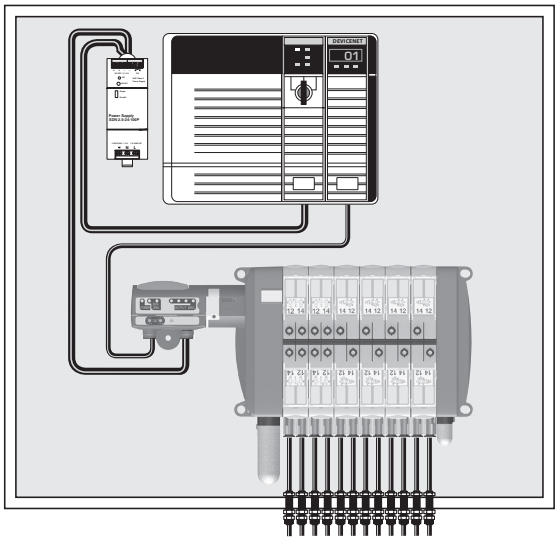
**H Series Micro Outside Control Cabinet**

- 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

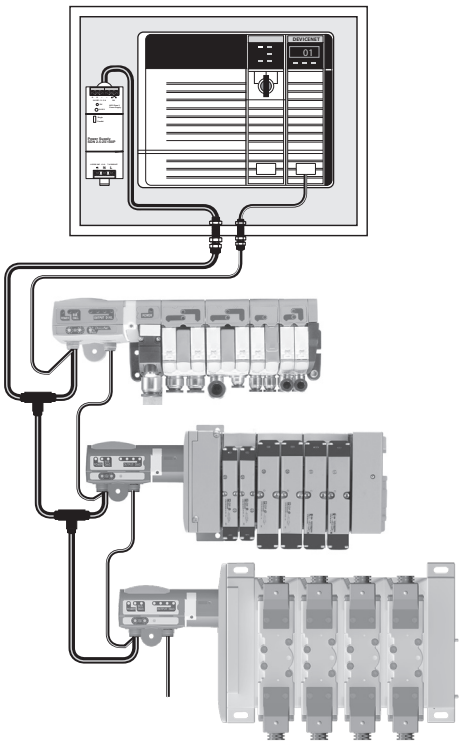
**Advantages**

- 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

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



Bulkhead Pneumatic Fittings



## 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

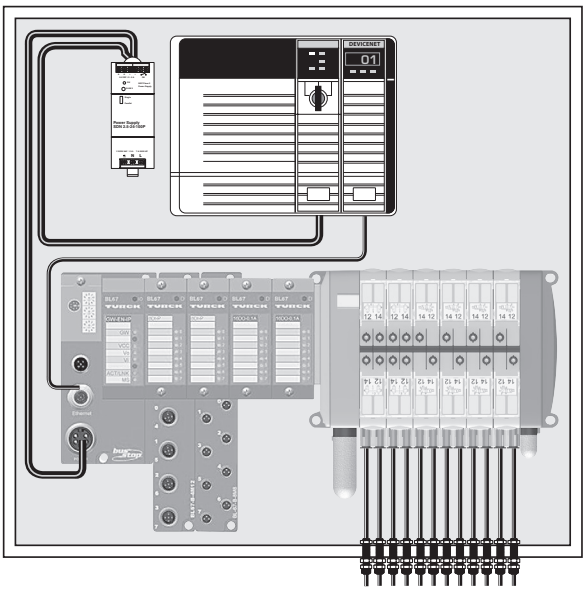
- Valves located near application - ready for machine mounting
- IP65 rating suitable for dusty and wet environments

### Advantages

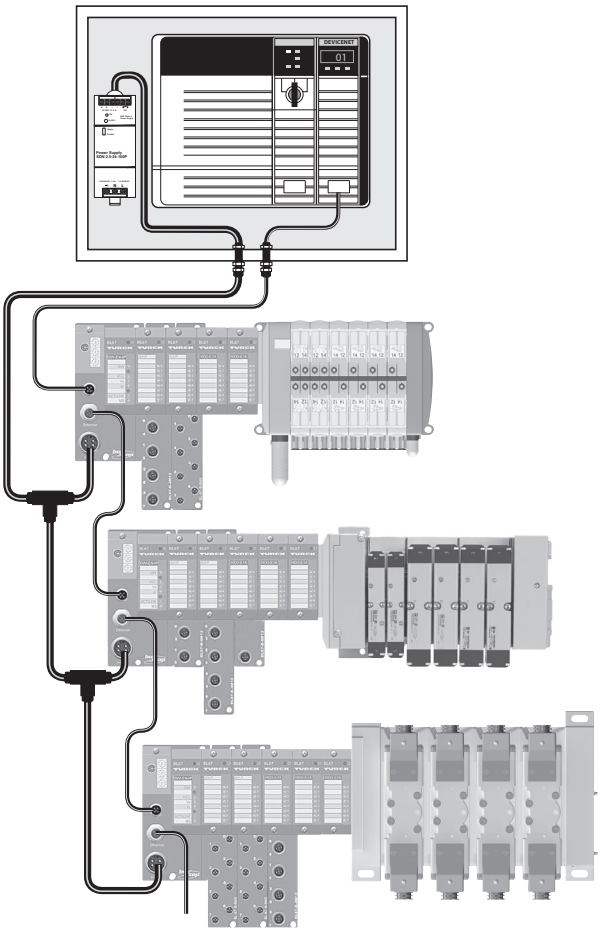
- Smallest control cabinet
- Reduces tubing length and improves response time
- Eliminates pneumatic bulk fittings on control cabinet

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

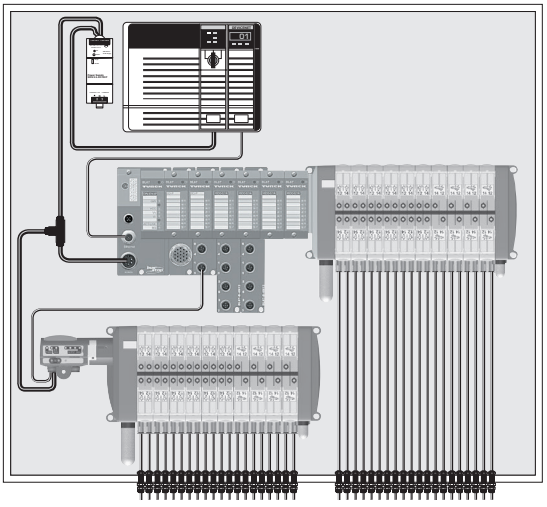
- Valves located near machine control
- Applications with caustic wash down, hazardous areas, or extreme temperatures

### Advantages

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

EtherNet/IP™ PROFINET Modbus/TCP™

DeviceNet™ PROFIBUS CANopen



Bulkhead Pneumatic Fittings

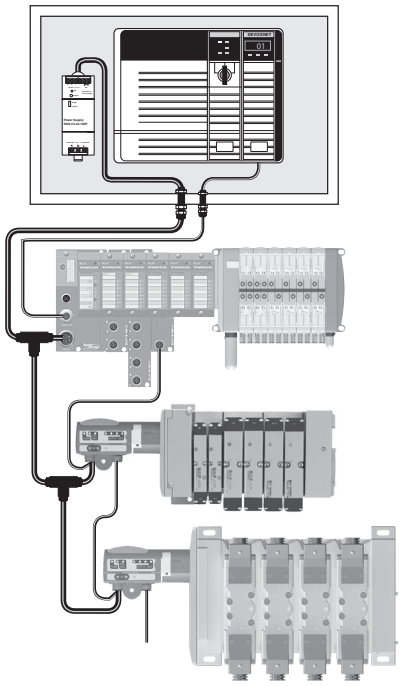
## De-centralized Application

### 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

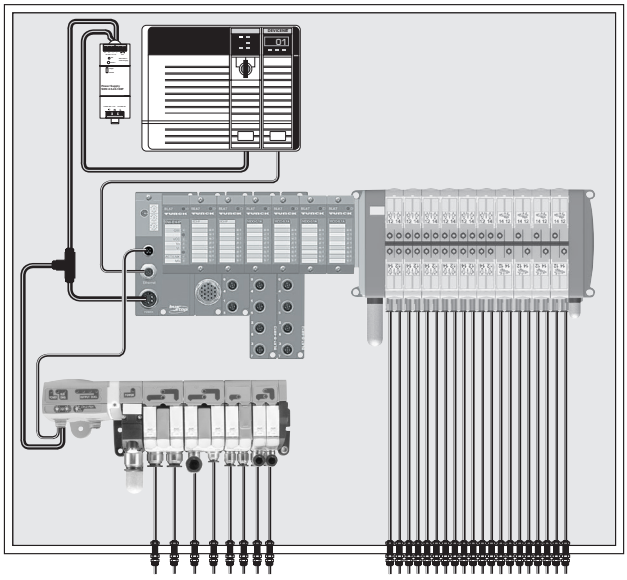
## Centralized Application

### 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

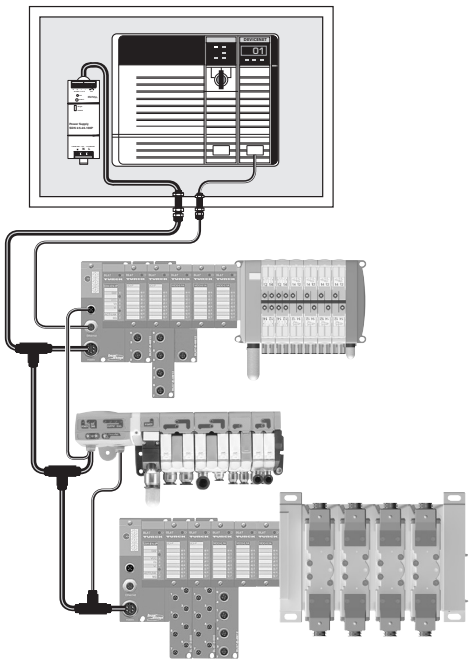
## De-centralized Application

### 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

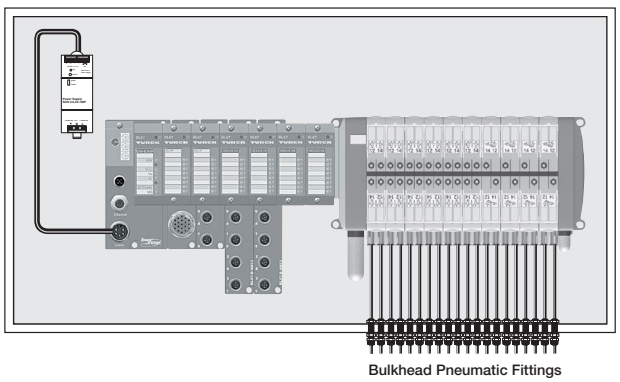
## Centralized Application Valves

### 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

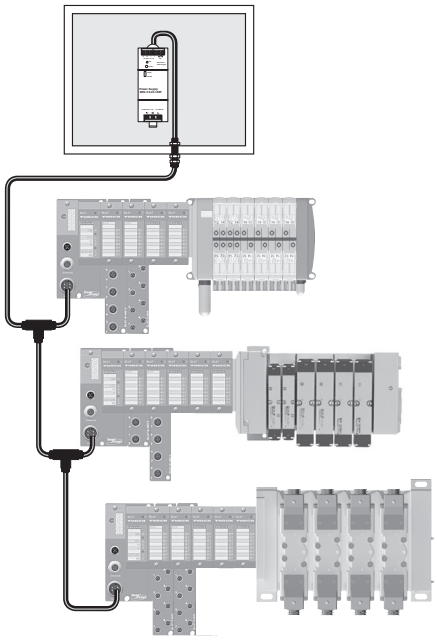
## De-centralized Application

### 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



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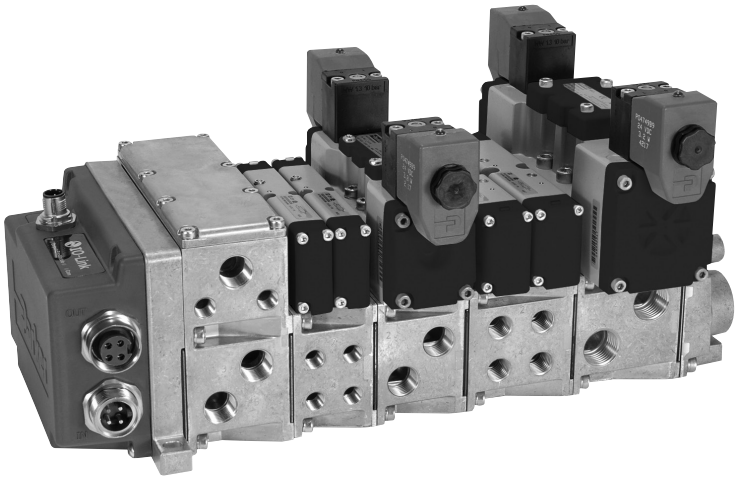
## P2H IO-Link Node 24DO

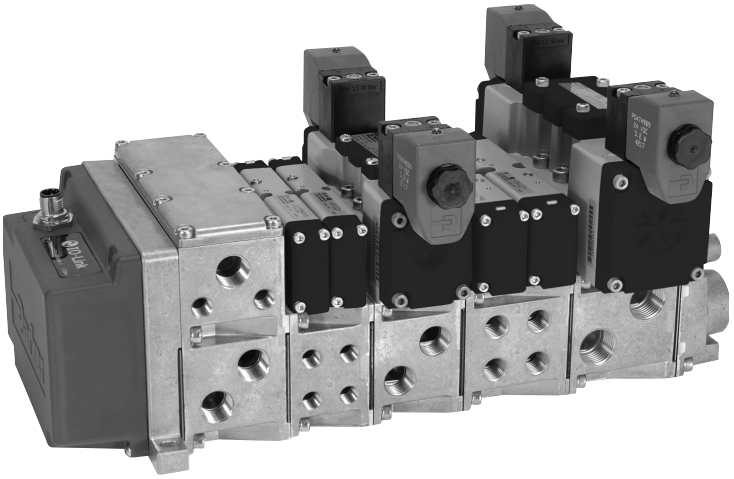
The P2H Network Node is available with IO-Link connectivity for the industries first connection of ISO valves (5599 & 15407) to the low cost IO-Link network.

### 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 Qn 490 Nl/mn to 2950 Nl/mn
- 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



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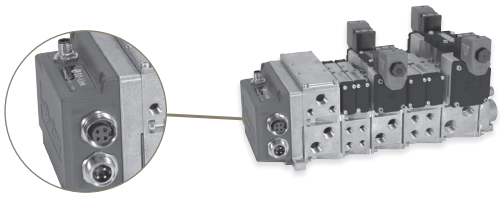
## Overview - P2H IO-Link Node 24DO

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.

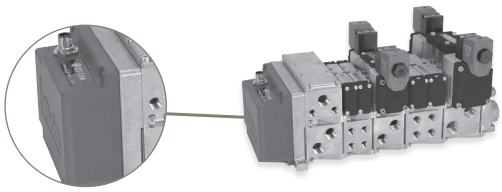
## Connection Types and Power:

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.

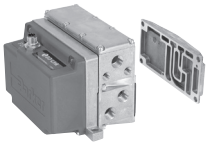
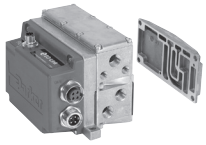
Class B Node



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

| | IO-Link class / type | Current | HB, HA, H1, H2 Valves NPT port | HB, HA, H1, H2 Valves BSPP port | H3 Valves NPT port | H3 Valves BSPP port |
|---|---|---|---|---|---|---|
|  Class B | 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** |
|  Class A | 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/pde/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 | |



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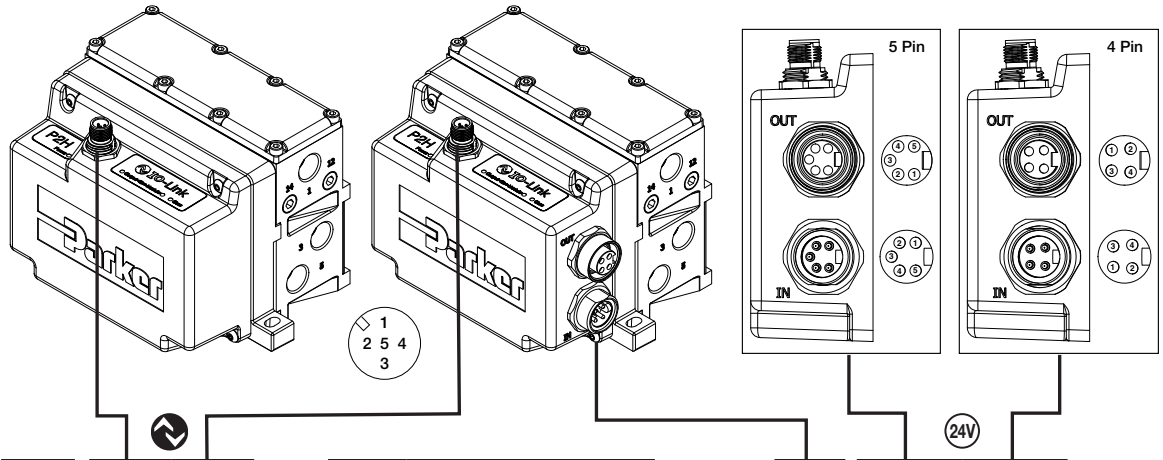
## P2H IO-Link Node 24DO – Connections and LED Diagnostics




| 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 | 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

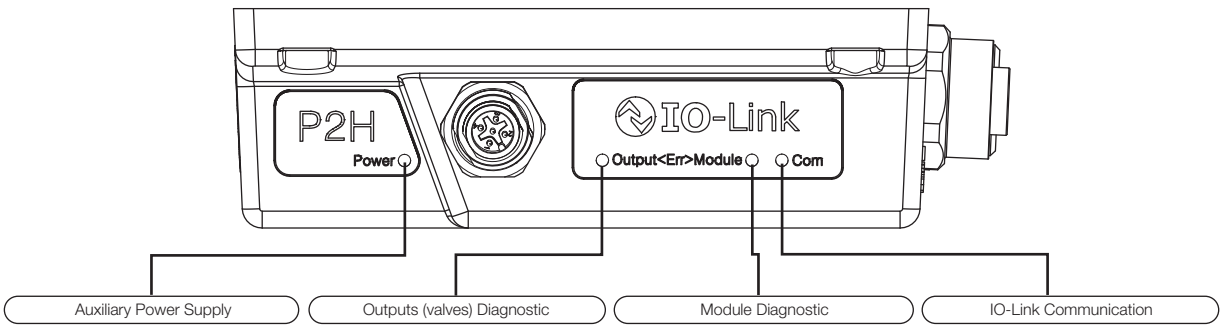
| LED Status | Description | Solving |
|---|---|---|
| OFF ○ | Standard mode (No error active) | N/A |
| ON ● | Any outputs driver error (auxiliary power error, overload, short circuit, over temperature, …) | If auxiliary power OK (see Power LED status), check error messages and related troubleshooting |

**<Err>Module** ○ Red LED

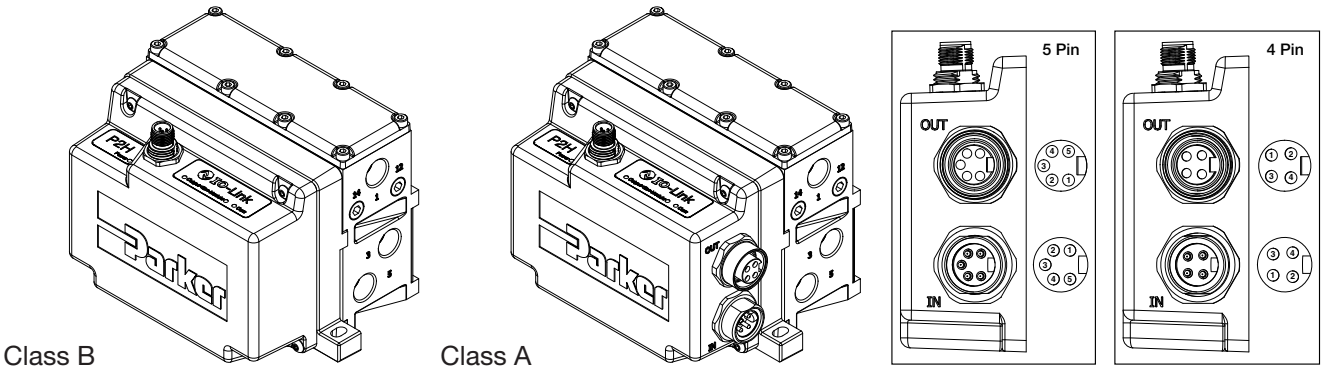
| LED Status | Description | Solving |
|---|---|---|
| OFF ○ | Standard mode (No error active) | N/A |
| ON ● | 24 VDC auxiliary power missing or any active malfunction | Check Auxiliary power supply. If auxiliary power supply OK, module must be replaced |

○ **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 |



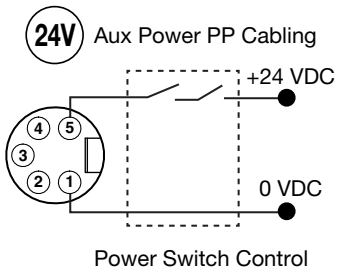
## P2H IO-Link Node 24DO – Connections and LED Diagnostics

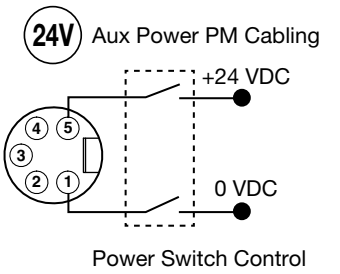



## P2H IO-Link 24DO Node connection to SAFE Power PP / PM mode for valve control

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.

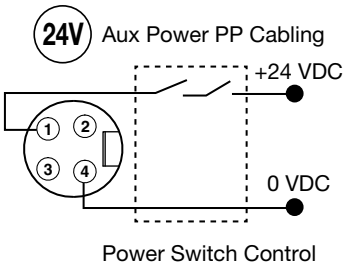
### Class A – 5 Pin

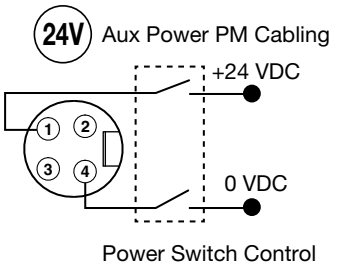



| Pin Number | Address |
|---|---|
| 1 | AUX– |
| 2 | *L– |
| 3 | Earth |
| 4 | *L+ |
| 5 | AUX+ |

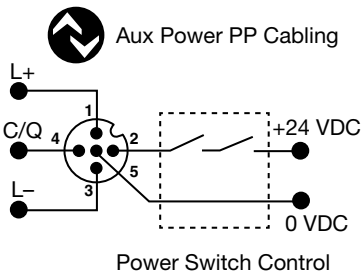
### Class A – 4 Pin

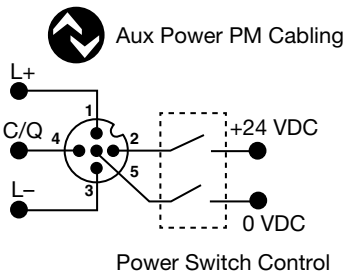



| Pin Number | Address |
|---|---|
| 1 | AUX+ |
| 2 | *L+ |
| 3 | *L– |
| 4 | AUX– |

### 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 IO-Link Node 24DO – 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)

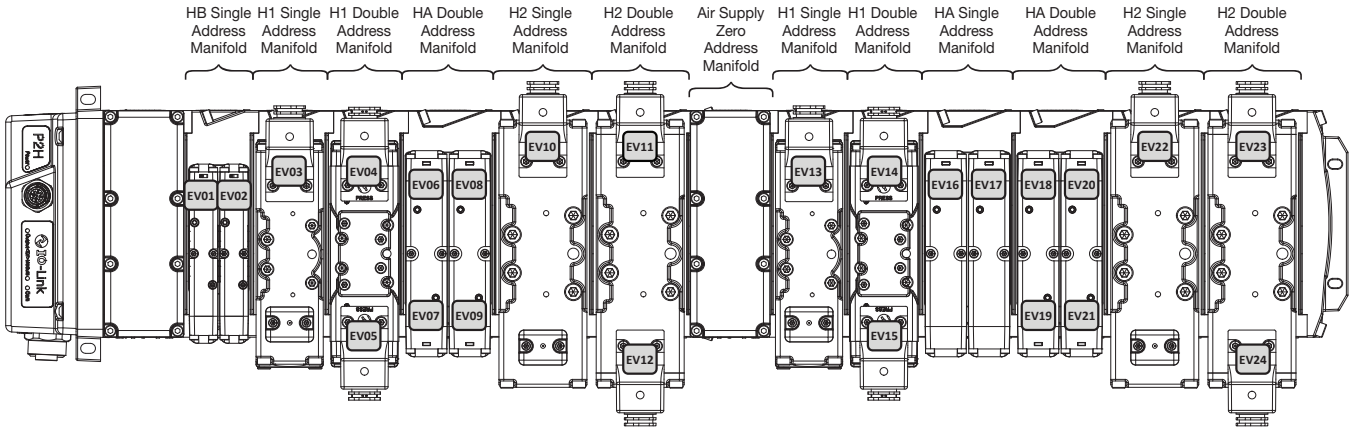
| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|
| EV8 | EV7 | EV6 | EV5 | EV4 | EV3 | EV2 | EV1 |

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 |




PLC Process outputs data mapping

| | 7 . . . . . 0 |
|---|---|
| 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/pde/P2H_IOL

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www.parker.com/pneumatics

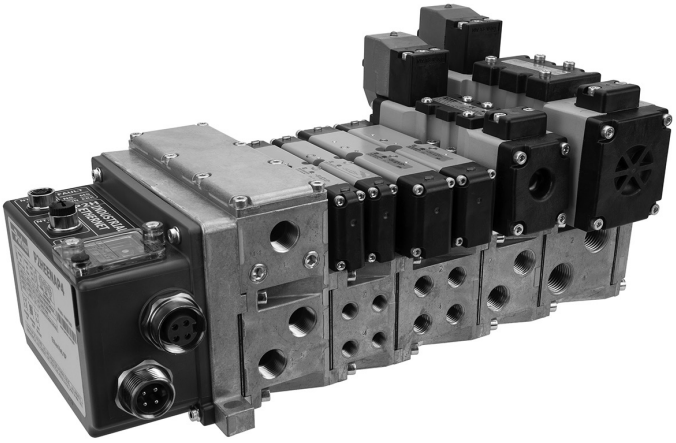
## P2H Ethernet Node 32 DO

The P2H Ethernet Node has been designed to be connected to a many popular Ethernet Networks. It can be used with Parker's H-Universal ISO 15407-2 (size 02 & 01) and 5599-2 (sizes 1, 2 & 3) valve series. It can control up to 32 pilot solenoid addresses with different power configuration options available and provides local visual and remote diagnostics through the Network. Designed for industrial environments, the P2H Ethernet Node is constructed of PBT material, which is glass-filled and offers weld splatter resistance, UV stability and has significant flame-retardant properties making it suitable for the durability required in industrial applications with high heat and welding applications.

### Features

**Industrial Ethernet Protocols:**

- Profinet
- EtherNet/IP
- EtherCAT
- Modbus TCP
- Powerlink



**Power Options:**

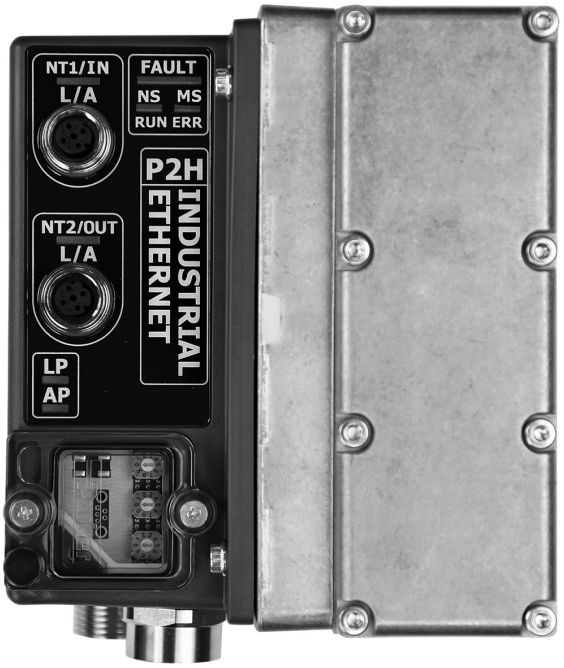
- Power IN/OUT Connection
- 7/8 4 pin
- 7/8 5 pin
- L- Code M12 5 pin
- Safe Power Capable
- OSSD Compatible

**Environment:**

- IP65
- Weld Spatter Resistant
- Weld Noise Immune

**Diagnostics:**

- PLC
- Web Interface
- Network Specific LED's



## P2H Ethernet Node 32 DO - Overview

Designed to integrate directly with all H Series ISO valve sizes, the P2H Ethernet Network Node provides a compact, robust and cost-efficient solution for industrial ethernet connectivity to a PLC or other controls device that supports industrial ethernet protocols. The P2H Ethernet 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 Ethernet Network Node is suitable for use on a valve manifold with up to 32 solenoid outputs. P2H Ethernet Node connects to a network with two standard M12 D-coded connections. These two connections function as a switch to enable the network to be connected to another network device.

Power connectors are available in three styles:

- 7/8 4-pin
- 7/8 5-pin
- M12 L-Code 5-pin

The power connectors are arranged in an IN/OUT design, and this allows the flexibility to connect power to another down stream device, instead of running two separate cables from a power supply. Each power connector can supply up to 12 A of current on both Logic and Auxiliary power pins. All power connections support (OSSD) test pulsing if the P2H Ethernet Node is connected to a safety rated output device that uses test pulses to detect faults in a safety system.


| PSHU20 | P2 | 0 | 0 | P | E | 000 | A | – | P4 |
|---|---|---|---|---|---|---|---|---|---|

**Valve Type**

| | |
|---|---|
| Plug-in (Internal pilot) | PSHU20 |
| Plug-in (External pilot) | PSHU2X |

**Thread Type**

| | |
|---|---|
| NPT | 0 |
| BSPP “G” | 1 |

**Network Connections**

| | |
|---|---|
| EtherNet/IP™ | E |
| EtherCAT | T |
| PROFINET | N |
| Modbus TCP | M |
| Powerlink | W |

**Power Connector**

| | |
|---|---|
| 7/8 4-pin Power IN/OUT with 1 Safe Power Capable Zone | P4 |
| 7/8 5-pin Power IN/OUT with 1 Safe Power Capable Zone | P5 |
| M12 L-Code 5-pin IN/OUT with 1 Safe Power Capable Zone | L5 |

**Right Hand End Plate Type / Thread Size**

| | |
|---|---|
| Low profile (no ports) | 0 |
| 1/2 Exhaust and Inlet Port | 1 |
| 3/4 Exhaust and Inlet Port | 2 |
| H3 Transition Plate and End Plate (electrical pass through for plug-in valves only) | 3 |
| H3 Transition Plate and End Plate (expansion to 25th address for plug-in valves only) | 4 |

**Expansion Module / Power Source**

| | |
|---|---|
| Power Source for Output 25-32: AUX Power | A |
| Power Source for Output 25-32: Logic Power | L |

## P2H Ethernet Node 32 DO - Expansion Module

Note: An optional intermediate air supply module must be installed to the manifold for expansion from 25 – 32 solenoids, 24 to 31 addresses.

**PSHU115A** **E** **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* |

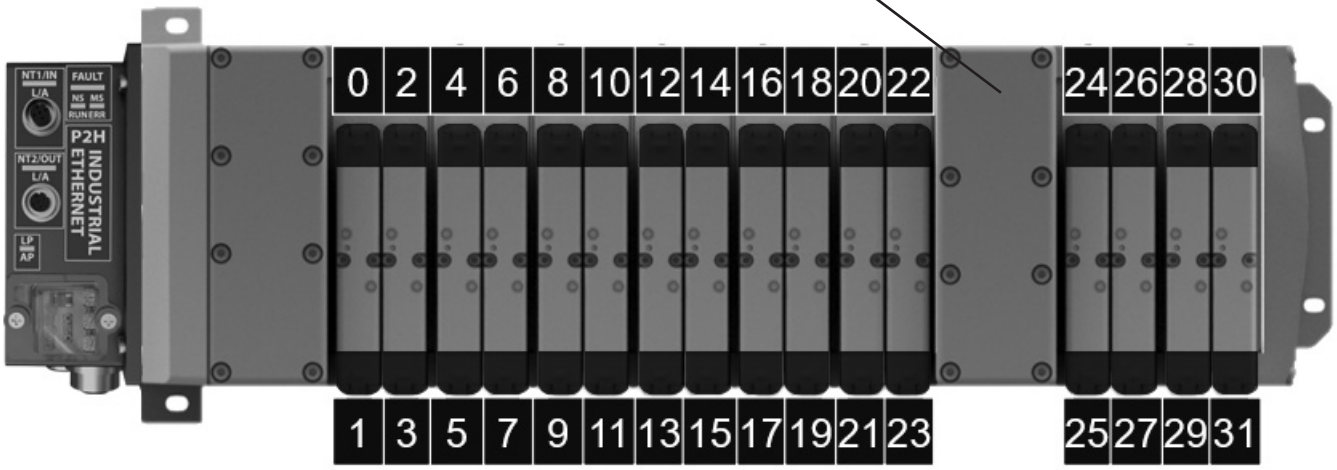
* BSPP conforms to ISO 1179-1 w 228-1 threads.

| | 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 | |
|---|---|
| E | With Electrical Expansion To 24th Address |

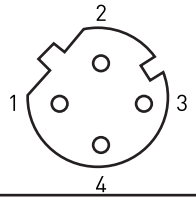
Intermediate air supply module shown

Address Numbers

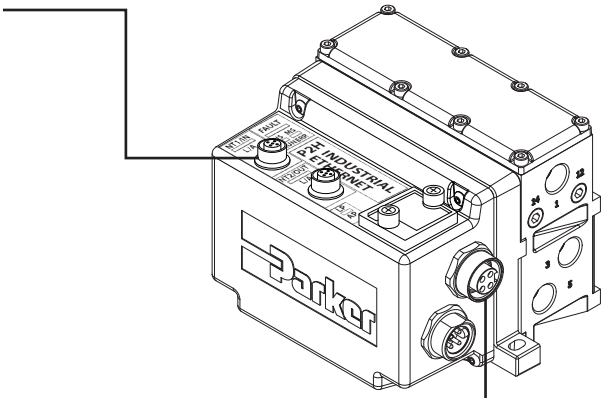


## P2H Ethernet Node 32 DO - Network Interface

The P2H Node 32DO allows connection to an industrial Ethernet Network via two M-12 D-Coded connectors (NT1 and NT2). An embedded switch allows for daisy-chaining ethernet communications. The connectors pin assignments are as follows:

| M12, D-coded, Female | Pin No. | Function |
|---|---|---|
|  | 1 | Tx+ |
| | 2 | Rx+ |
| | 3 | Tx- |
| | 4 | Rx- |






7/8 Power Connections
Options P4, P5, L5

## Industrial Ethernet Options

| XXXXXX | P2 | X | X | P | **E** | 000 | 0 | - | XX |
|---|---|---|---|---|---|---|---|---|---|

| Network Connections | |
|---|---|
| EtherNet/IP™ | E |
| EtherCAT | T |
| PROFINET | N |
| Modbus TCP | M |
| Powerlink | W |



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## P2H Ethernet Node 32 DO - Power Options

- The P2H Ethernet Network Node has 3 available power connectors
- There are two power schemes that can be achieved detailed below
- H ISO Universal manifold valves draw power from the AUX power pins of the power connector

**Consumption @ 24 VDC**

| | |
|---|---|
| AUX power max consumption | 12A |
| Logic power max consumption | 12A |

Left over power that is not used by the P2H Ethernet Node can be passed on to other devices in the system through the power OUT connector

| XXXXXX | P2 | X | X | P | X | 000 | 0 | - | **P4** |
|---|---|---|---|---|---|---|---|---|---|

| Power Connector * | |
|---|---|
| 7/8 4-pin power in/out with 1 safe power capable zone | P4 |
| 7/8 5-pin power in/out with 1 safe power capable zone | P5 |
| M12 L-Code 5-Pin in/out with 1 Safe Power Capable zone | L5 |

## Power Connection Layout

The following three types of power connectors are available based on the end user's requirement. Current considerations should be used in the power connection selection process. Each power connection type can support a maximum of 12 A of current on each channel (VAUX and VLOG). When daisy chaining power is used, care must be taken in knowing the downstream current draw in order not to overload the maximum current rating of the pins.

**TOP CONNECTOR**

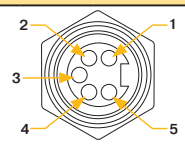
**P4 - 7/8", 4-pin**

**Power OUT**


| Pin | Function | Description |
|---|---|---|
| 1 | + 24 V | V2 (VAUX) |
| 2 | + 24 V | V1 (VLOG) |
| 3 | 0 V | GND V1 (VLOG) |
| 4 | 0 V | GND V2 (VAUX) |

**P5 - 7/8", 5-pin**

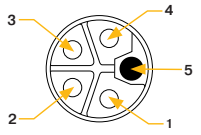
**Power OUT**




| Pin | Function | Description |
|---|---|---|
| 1 | 0 V | GND V2 (VAUX) |
| 2 | 0 V | GND V1 (VLOG) |
| 3 | PE | Protective Earth |
| 4 | + 24 V | V1 (VLOG) |
| 5 | + 24 V | V2 (VAUX) |

**L5 - L-Coded, M12**

**Power OUT**



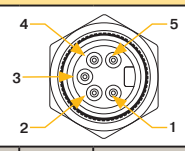

| Pin | Function | Description |
|---|---|---|
| 1 | + 24 V | V1 (VLOG) |
| 2 | 0 V | GND V2 (VAUX) |
| 3 | 0 V | GND V1 (VLOG) |
| 4 | + 24 V | V2 (VAUX) |
| 5 | PE | Protective Earth |

**BOTTOM CONNECTOR**

**Power IN**

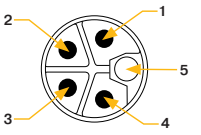

| Pin | Function | Description |
|---|---|---|
| 1 | + 24 V | V2 (VAUX) |
| 2 | + 24 V | V1 (VLOG) |
| 3 | 0 V | GND V1 (VLOG) |
| 4 | 0 V | GND V2 (VAUX) |

**Power IN**




| Pin | Function | Description |
|---|---|---|
| 1 | 0 V | GND V2 (VAUX) |
| 2 | 0 V | GND V1 (VLOG) |
| 3 | PE | Protective Earth |
| 4 | + 24 V | V1 (VLOG) |
| 5 | + 24 V | V2 (VAUX) |

**Power IN**

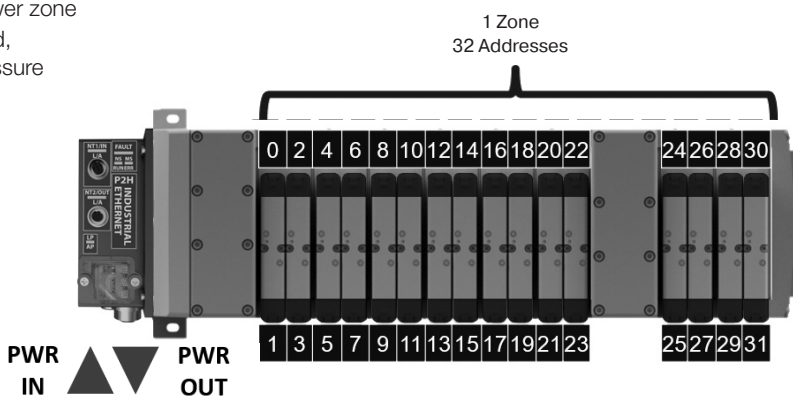



| Pin | Function | Description |
|---|---|---|
| 1 | + 24 V | V1 (VLOG) |
| 2 | 0 V | GND V2 (VAUX) |
| 3 | 0 V | GND V1 (VLOG) |
| 4 | + 24 V | V2 (VAUX) |
| 5 | PE | Protective Earth |

*PE – Protective Earth

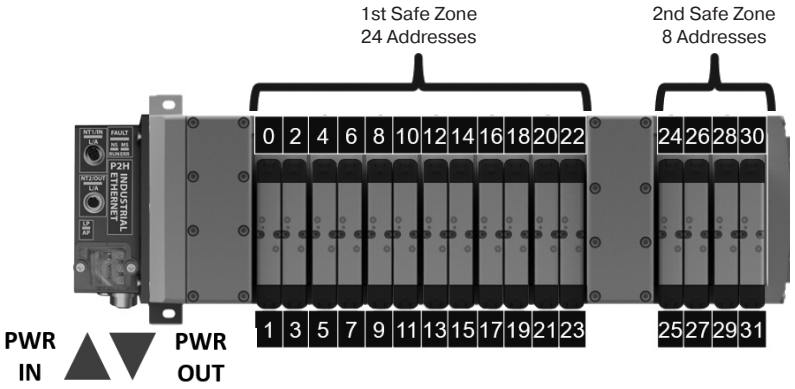
## P2H Ethernet Node 32 DO - Power Scheme 1 Option "A"

- All 32 addresses are controlled in the same power zone
- Safety zoning is possible for valve solenoids and, with the H ISO Universal valves, pneumatic pressure
- Power zone is safe power capable




## Power Scheme 2 Option "L"

- The 1st 24 addresses are supplied by auxiliary voltage power. The last 8 addresses are supplied by the logic voltage power.
- Each zone has an isolated safe ground pin so each can be powered by a SAFE 24 VDC auxiliary source in PP or PM mode. NOTE: You can treat each zone as a separate power zone/safe zone. Be aware that the last 8 addresses will be supplied by logic power. If power is shut down to this zone the P2H Ethernet module loses power and communication. This may cause extra time to reconnect to the network when power is restored.




## Industrial Ethernet Options

| XXXXXX | P2 | X | X | P | X | 000 | A | - | XX |
|---|---|---|---|---|---|---|---|---|---|

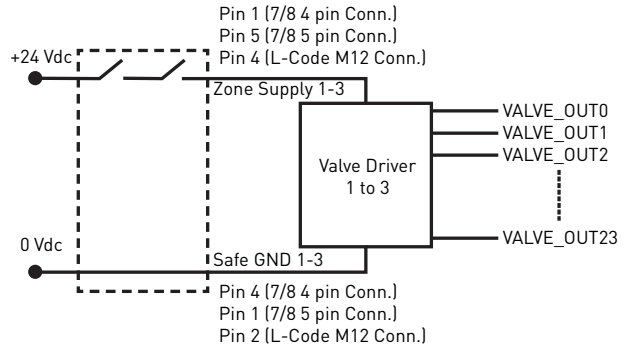
| Expansion Module / Power Source | |
|---|---|
| Power Source for Output 25-32: AUX Power | A |
| Power Source for Output 25-32: Logic Power | L |

## P2H Ethernet Node 32 DO - Safe Power Connectivity

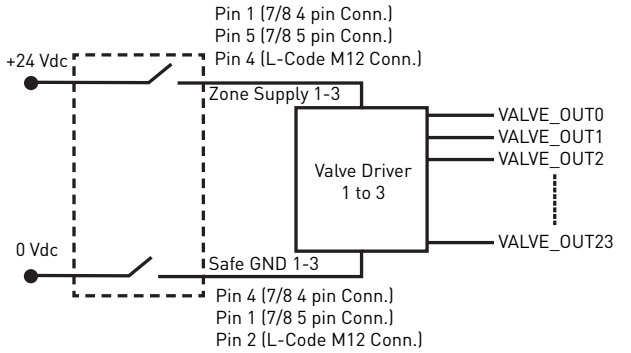
### P2H Ethernet Node connection to SAFE Power PP / PM mode for valve control

The P2H Ethernet Node 32DO Auxiliary Power for valves can be supplied from an OSSD (Output Signal Switching Device) 24 VDC safe output power source in PP (plus plus) or PM (plus minus) configurations. The connection diagram below represents power option “A”. For power option “L” valve driver number 4 power would be supplied from the logic pins of the connection selected (please reference the power pinout diagram).

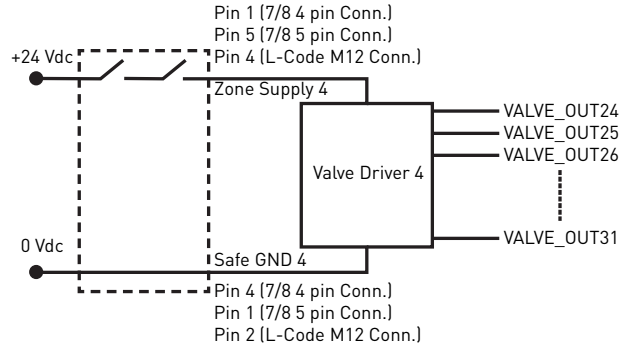
**SAFE 24Vdc auxiliary source in PP mode for Zone 1 to 3 (Valve output 0 to 23)**




**SAFE 24Vdc auxiliary source in PM mode for Zone 1 to 3 (Valve output 0 to 23)**

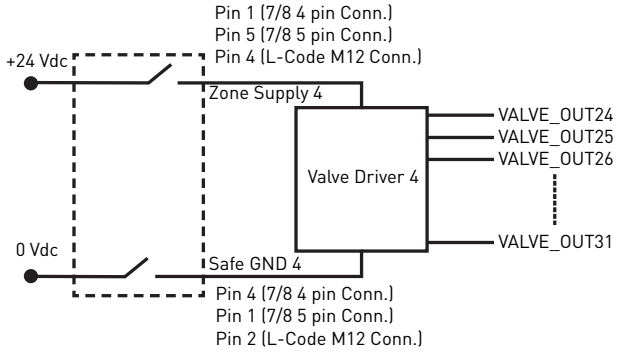



**SAFE 24Vdc auxiliary source in PP mode for Zone 4 (Valve output 24 to 31) ***




*If power option “L” is selected these outputs are supplied by logic power. This diagram does not apply.

**SAFE 24Vdc auxiliary source in PM mode for Zone 4 (Valve output 24 to 31) ***




*If power option “L” is selected these outputs are supplied by logic power. This diagram does not apply.

Note: Please check max. power available from the source. Refer to the “Auxiliary power consumption calculation” section.
* 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 Ethernet Node 32 DO - Auxiliary Power Consumption Calculation

The P2H Node 32DO auxiliary power consumption calculation depends on the combination of the valves selected and the number of coils used. The table below can be used for power consumption calculation by valve type and the number of each type used. Take note that there are two types of coils for sizes 1,2,3. An energy efficient coil and standard coil.

| Valve Range | Number of Pilots Simultaneously powered | Power | Total |
|---|---|---|---|
| H ISO - 15407-2 - Sizes 02 & 01 | _____ | x 40 mA | = _____ mA |
| H ISO - 5599-2 - Sizes 1, 2 & 3 (Energy Efficiency Coils) * | _____ | x 54 mA | = _____ mA |
| H ISO - 5599-2 - Sizes 1, 2 & 3 (Standard Coils) ** | _____ | x 133 mA | = _____ mA |
| | | Total : | _____ mA |

* F9 Valve Voltage Code

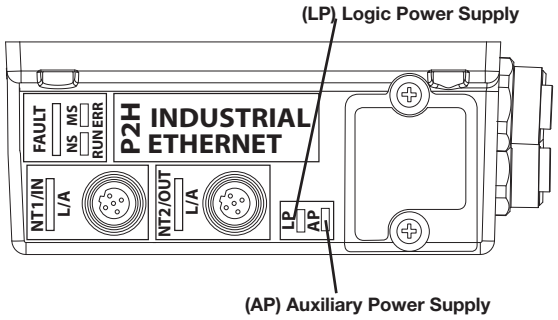
** B9 Valve Voltage Code

## Power Supply Diagnostics

### Power Supply Diagnostics through LED

The P2H Node 32DO monitors the logic and auxiliary power supply voltages and manages two levels of diagnostics: warning and error range. Status is indicated via LEDs located on the device. The range limits can be modified through parameter data.

To restore default value (factory setting), refer to "Factory Reset Section" in the manual.




**LED function details:**

- "Logic power" or "Aux power" error is active from 9.6 to 19.4 VDC or above 28.5 VDC
- When "Logic power error" or "Aux power error" is active, LED is solid red

| LP and AP (Green / Yellow) LEDs | | |
|---|---|---|
| LED Status | Description | Troubleshooting |
| OFF | Logic and/or Aux lines not powered | Check power supply (see Power Supply section for pin assignments) |
| ON (Green) | Voltage in normal range | N/A |
| ON (Red) | Voltage in error range (too low or too high) | Check power supply (see Power Supply section for pin assignments) |
| Blinking (Red) | Voltage in warning range (out of normal range, not in error range) | Check power supply (see Power Supply section for pin assignments) |
| Blinking (Yellow) | Invalid rotary switch setting | Check rotary switch setting |
| Blinking (Red / Yellow) | Firmware version error or Completed "Reset to Factory" procedure | If switches setting different from "999" and no "Reset to Factory" performed via webpage, then contact technical support |

### Power Supply Diagnostics through Network and Process Data Mapping

Diagnostics are available in Process Input data (byte 0) to indicate whether Logic and Auxiliary voltages are within range. There is a warning range (normal operation with fault indication) and an error range (module enters Failsafe state).

The default warning range is set as 20.4 VDC < power supply < 26.4 VDC. These limits can be modified via acyclic data, objects #11 and #12. The error range is set as 19.4 VDC < power supply < 28.5 VDC. These limits cannot be modified.

The voltage measured by the module, both Logic and Auxiliary, can be accessed via acyclic data, in Object #4. The displayed value is in mV.

## P2H Ethernet Node 32 DO - Process Data mapping - Inputs

The following tables describes the input mapping for P2H Ethernet Node. The byte mapping order varies by protocol please reference the manual for specific byte order arrangement.

### Channel Error – Input Mapping

| | Input Bits | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Byte # | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Description |
| 1 | EV07 | EV06 | EV05 | EV04 | EV03 | EV02 | EV01 | EV00 | Valve Error Data<br>EVxx = Output on Valve range is 0 to 31 |
| 2 | EV15 | EV14 | EV13 | EV12 | EV11 | EV10 | EV9 | EV08 | |
| 3 | EV23 | EV22 | EV21 | EV20 | EV19 | EV18 | EV17 | EV16 | |
| 4 | EV31 | EV30 | EV29 | EV28 | EV27 | EV26 | EV25 | EV24 | |

### Module Info Flags - Input Mapping

| Module Info Flags | | | |
|---|---|---|---|
| Byte # | Output Bits | Error Name | Error Description |
| 1 | 0 | Heartbeat not toggling AUX 1 | Heartbeat is currently not toggling |
| | 1 | Heartbeat not toggling AUX 2 | |
| | 2 | SPI COM Error AUX 1 | Error in SPI Communication between AUX and Logic. Outputs are switched off |
| | 3 | SPI COM Error AUX 2 | |
| | 4 | SPI COM Lost AUX 1 | Communication not possible. Outputs are switched off |
| | 5 | SPI COM Lost AUX 2 | |
| | 6 | Output Interconnect Error | Short circuit between outputs detected. Affected outputs switched off. |
| | 7 | SPI NP40 Error | Error in communication between Logic and Comm |
| 2 | 0 | NP40 Version Error | Comm Module Version error. Outputs are switched off |
| | 1-7 | Reserved | These bits will be always set as 0 |

### Module Error Input – Input Mapping

| Module Error Input | | | |
|---|---|---|---|
| Byte # | Output Bits | Error Name | Error Description |
| 1 | 0 | AUX Voltage Warning | Set if Auxiliary Voltage in warning range. Module keeps normal operation |
| | 1 | AUX Voltage Error | Auxiliary Voltage in Error range. Outputs are switched OFF |
| | 2 | Logic Voltage Warning | Set if Logic voltage is out of range for warning. |
| | 3 | Logic Voltage Error | Set if Logic voltage is out of range for error. Outputs are switched OFF |
| | 4 | Temperature Warning | Set if a temperature increase above warning levels is detected by the output drivers |
| | 5 | Output Driver Channel Error | Set if a major fault is detected at the output stage – solenoid short circuit. Outputs are switched OFF |
| | 6 | Module Error | Set if an internal communication error is active |
| | 7 | Auxiliary Power Not Available | Auxiliary Power is off |
| 2 | 0 - 7 | Reserved | These bits will be always set as 0 |

## P2H Ethernet Node 32 DO - Process Data mapping - Outputs

The following tables describes the input mapping for P2H Ethernet Node. The byte mapping order varies by protocol please reference the manual for specific byte order arrangement.

### System Command – Output Mapping

| System Command Module | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Byte # | Output Bits | | | | | | | | Description |
| | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | |
| 1 | System Command Value | | | | | | | | One Byte that accepts the system command value see table below for values |

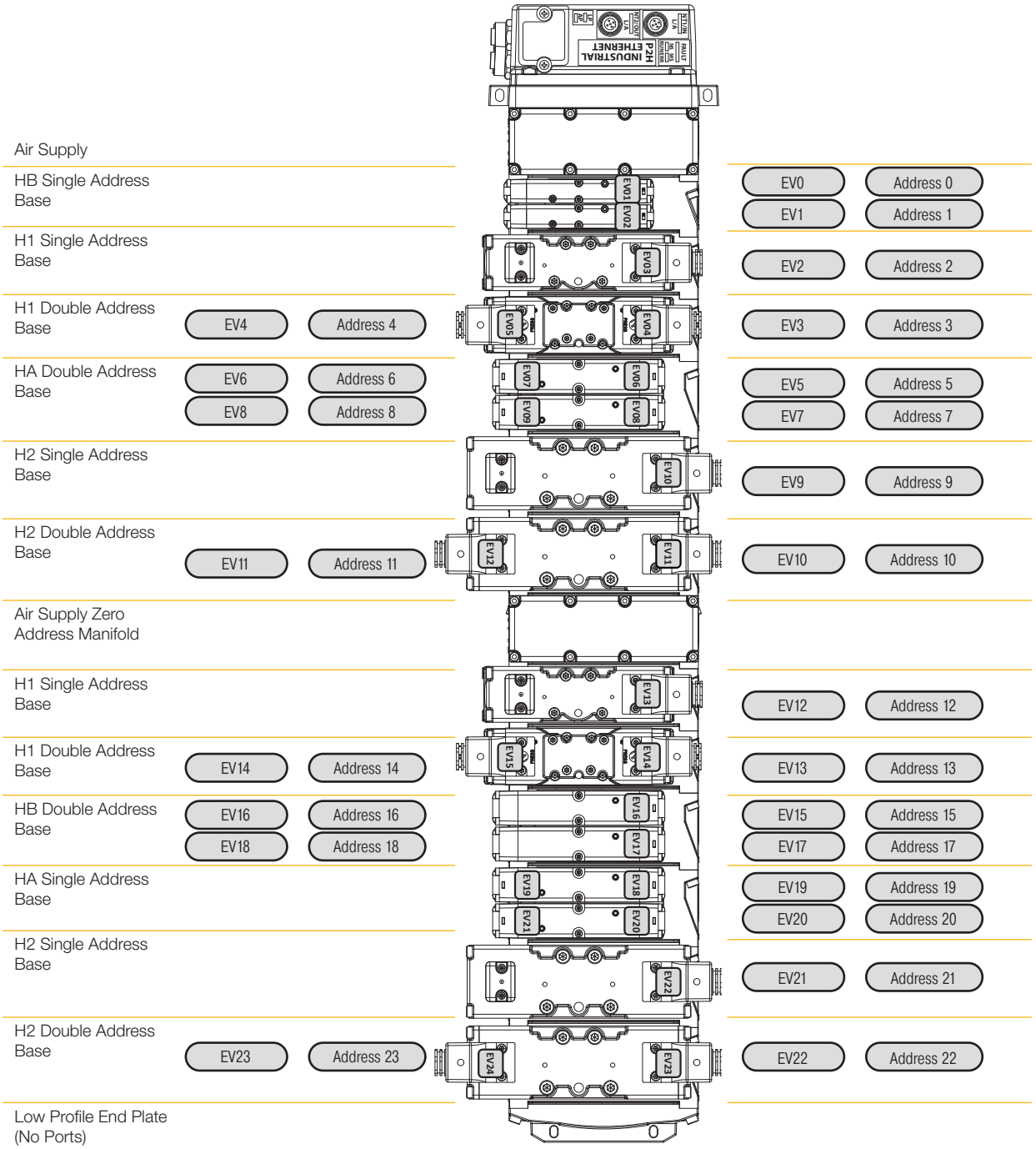
| Command Value | Command Name | Description |
|---|---|---|
| 0X02 | Store Switching Cycle Counters | When this command is executed, the current values of the switching cycle counters are stored into EEPROM. This command is intended to be used before powering off the device. |
| 0X03 | Store Diagnostic Log | When this command is executed, the diagnostic log is stored to the EEPROM. |
| 0X04 | Delete Diagnostic Log | Removes all diagnostic log entries in EEPROM (required by webpage). |

### Solenoids – Output Mapping

| Solenoid Module | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Byte # | Output Bits | | | | | | | | Description |
| | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | |
| 1 | EV07 | EV06 | EV05 | EV04 | EV03 | EV02 | EV01 | EV00 | Valve Output Data<br>EVxx -> Output on Valve range is 0 to 31 |
| 2 | EV15 | EV14 | EV13 | EV12 | EV11 | EV10 | EV9 | EV08 | |
| 3 | EV23 | EV22 | EV21 | EV20 | EV19 | EV18 | EV17 | EV16 | |
| 4 | EV31 | EV30 | EV29 | EV28 | EV27 | EV26 | EV25 | EV24 | |

## P2H Ethernet Node 32 DO - Solenoid Addressing

- The P2H Ethernet Network Node can support up to 32 addresses as shown
- Addresses 24-31 can be accessed using an Intermediate Air Supply with Electric Expansion
- Each address is one solenoid



## P2H Ethernet Node 32 DO - Technical Data

### Mechanical Data

| | |
|---|---|
| Housing Material | Housing /Enclosure: PBT with 33% GF and UL94-V0<br>Base Cover (plate): Aluminium 380 |
| Enclosure rating | IP 65 (only when plugged-in and threaded-in) |
| Power Connectors | 7/8" 4 pin or 7/8" 5 pin or L-Coded M12 5-pin male and female pin connector |
| Dimensions (L x B x H in mm) | 226.6mm x 130.7mm x 55mm |
| Mounting type | Screw Mount |
| Ground strap attachment | M5 |
| Weight | Approx. 1.3 kg |

### Operating Conditions

| | |
|---|---|
| Operating Temperature | 0°C to 50°C |
| Storage Temperature | -25°C to 70°C |
| CE as per | IEC 61000-6-2 (Industrial Immunity) |
| | IEC 61000-6-4 (Industrial Emission) |
| Shock/Vibrations | IEC 60068-2-27:2008 |
| | IEC 60068-2-6:2007 |
| Electrostatic Discharge | IEC 61000-4-2 |
| Electrical Fast Transient/ Burst | IEC 61000-4-4 |
| Surge Immunity | IEC 61000-4-5 |

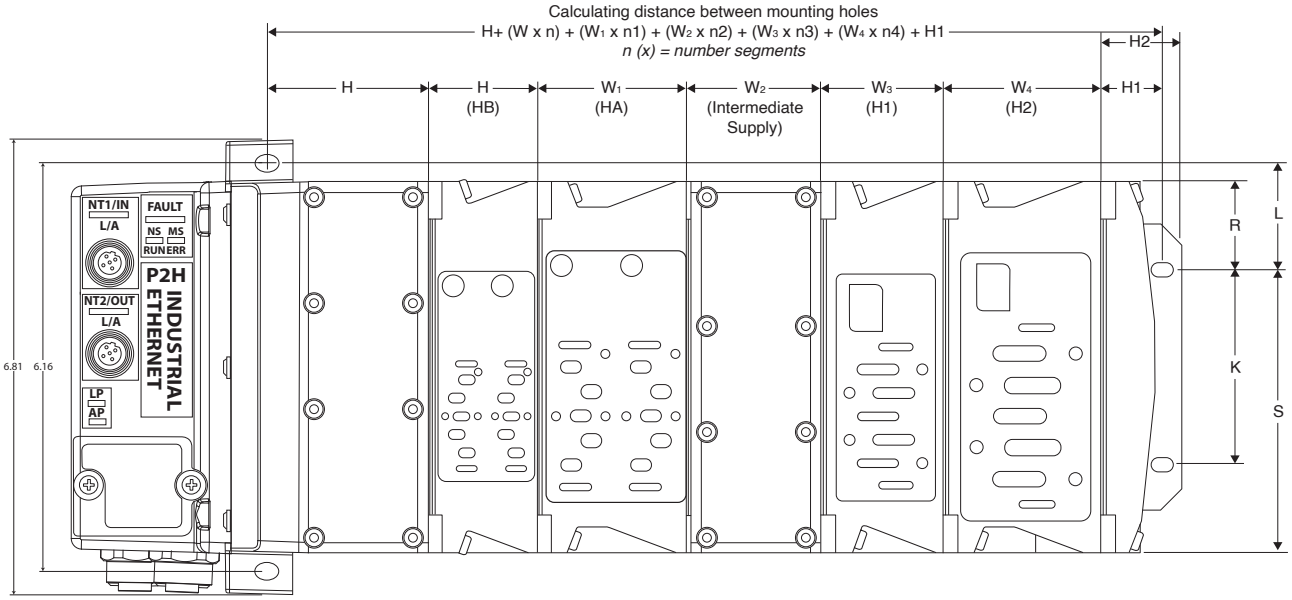
### Electrical Data

| | |
|---|---|
| Supply Voltage | 24VDC (-15% to +20%) |
| Logic current at 24 V (V1) | Max Current 8A –<br>Actual usage depends on configuration |
| Auxiliary current at 24 V (V2) | Max Current 12A –<br>Actual usage depends on configuration |

### Valve Configuration

| | |
|---|---|
| Compatible Valves | H Universal ISO Valves |

## P2H Ethernet Node 32 DO - H Series ISO Valves

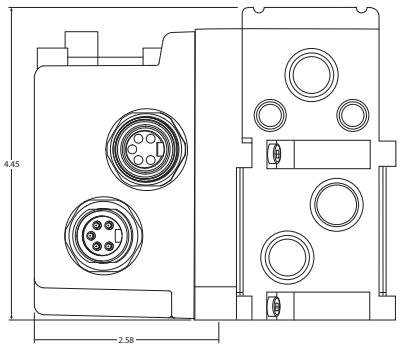



n (x) = number segments

| A | B | C | D | E | F | G | H | H1 | H2 | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.42 (112.3) | 2.64 (67.1) | 2.46 (62.5) | 1.17 (29.7) | .55 (14) | 9.32 (236.7) | 1.51 (38.4) | 2.36 (59.9) | .9 (22.9) | 1.22 (31) | 1.55 (39.4) | 2.95 (74.9) | 1.6 (40.6) |

| M | O | P | Q | R | S | T | W | W1 | W2 | W3 | W4 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 8.91 (226.3) | 5.61 (142.5) | 6.86 (174.2) | 6.18 (157) | 1.33 (33.8) | 4.28 (108.7) | 7.14 (181.4) | 1.63 (41.4) | 2.28 (57.9) | 2.03 (51.6) | 1.82 (46.2) | 2.39 (60.7) |

Inches (mm)



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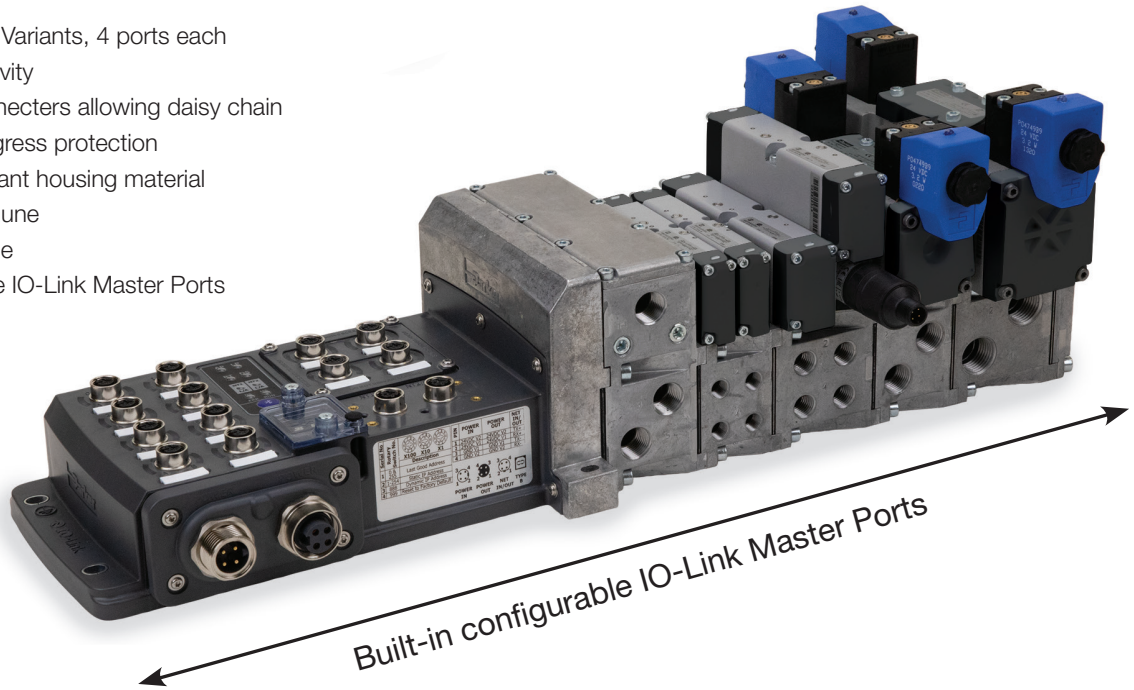
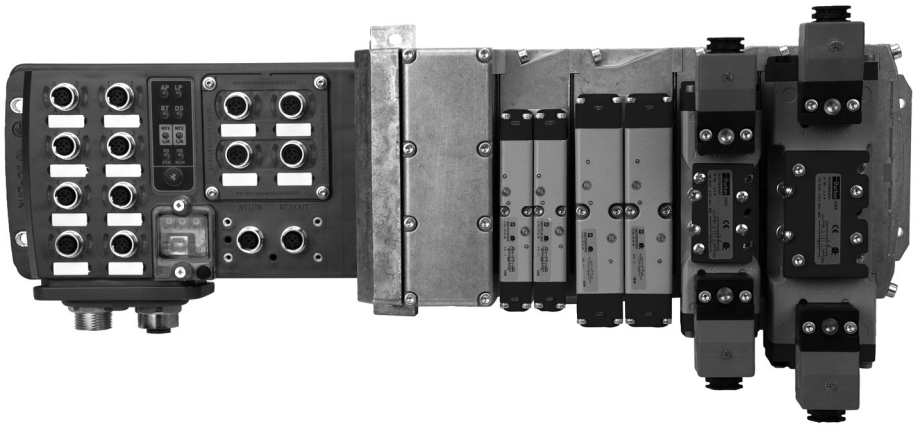
## PCH Network Portal

**Features**

- Industrial Ethernet Communication
- Truly Configurable I/O
- Feature Rich Webserver
- Built-In Technician
- 3 Available Module Variants, 4 ports each
- Bluetooth Connectivity
- Flexible power connecters allowing daisy chain
- Certified to IP65 ingress protection
- Weld splatter resistant housing material
- Welding Noise Immune
- Safe Power Capable
- Built-in configurable IO-Link Master Ports




The PCH Network Portal redefines and revolutionizes decentralized machine I/O's architecture. The PCH Network Portal was engineered to support industrial ethernet protocols and the open protocol IO-Link with configurable inputs/outputs with true PNP/NPN circuitry switching on each port for easy machine design changes. This integrated configurability gives the user flexibility in designing custom I/O architecture on the fly.



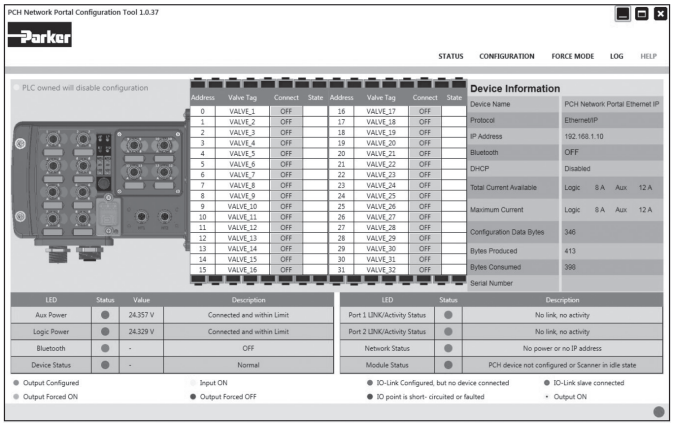
EtherNet/IP™ PROFINET INDUSTRIAL ETHERNET EtherCAT® Modbus TCP/IP

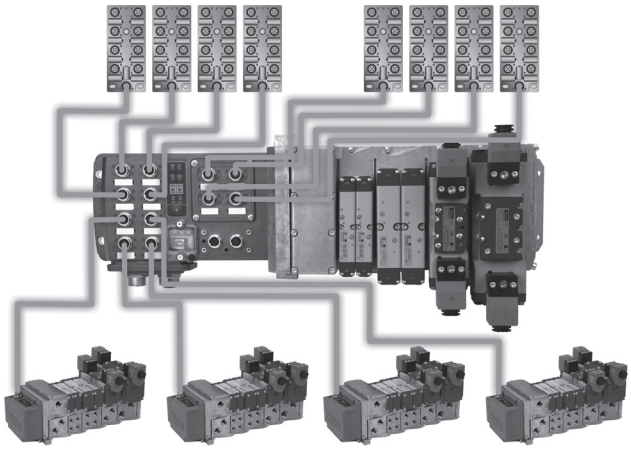
The PCH Network Portal can be assembled to Parker's H ISO Universal Manifold Platform, giving you access to a wid variety of low ranges all on one manifold.

### Intuitive Interfaces

Modern factories recognize that plant floor architecture is an important structural part of machine design that can make a real difference in managing costs for future changes, integrations and expansions. The PCH Network Portal design team lived in this environment, therefore intuitive interfaces and complete modularity was the heart of PCH Network Portal design concepts.

As with all Cyber Physical Systems (CPS), intuitive interfaces are the backbone of simplicity in application. The PCH Network Portal offers several means of intuitive and embedded interfaces to shorten commission time.



IO-Link

### Value Redefined

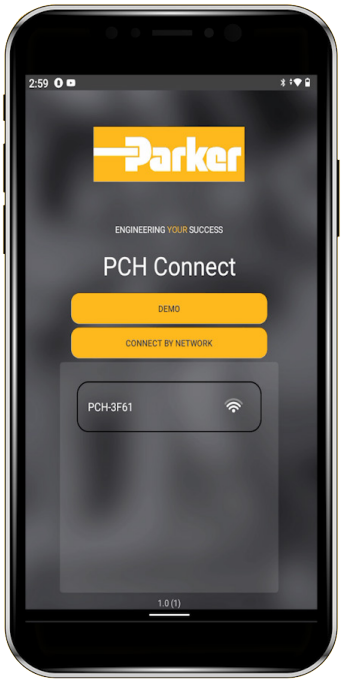
The PCH Network Portal minimizes machine costs by redefining the traditional process of connectivity within a single footprint that provides multiple configurations. The flexibility of configurable I/O combined with built-in IO-Link master ports revolutionizes machine design and can save thousands of dollars at the design phrase which typically accounts for 30-40% of overall costs. Changes can be made to the system with easy software reconfiguration of ports eliminating the need for additional hardware or time consuming programming.

### Can't access the PLC? No Problem!

With meticulously designed embedded configuration tools, the PCH Network Portal can serve as your **virtual technician** to make problems easy to troubleshoot. A laptop, tablet or phone can access usable prognostic/diagnostic data and time stamped event logs to make accessing data and commissioning your machine simple. Once you've finished your configuration, the device's configuration profile can be downloaded and easily uploaded to other PCH Network Portals on your machine.

Configure via:

- Bluetooth App via phone or tablet
- Bluetooth connection via PC
- Integrated Webpage via ethernet connection
- Stand-a-lone "PCH Portal Configuration Tool" software via USB-B




Safety Foot Note:
Bluetooth application cannot turn on outputs if a PLC where present and in control. The application cannot override the PLC at any time.



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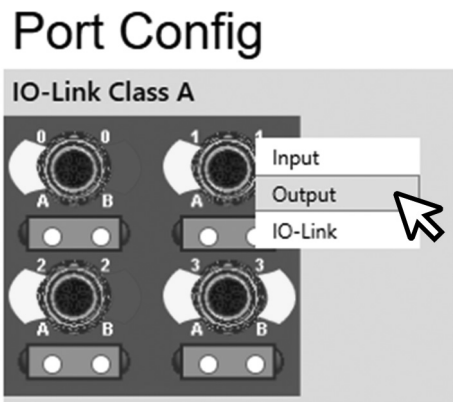
### Truly Configurable I/O

Configurable I/O means last minute design changes are now simple. Each PCH Network Portal is offered with three selectable modules that make up twelve configurable ports. All modules can be configured IO-Link A, IO-Link B or dual configurable I/O ports with true PNP/NPN circuitry switching on each port providing easy point and click changes on individual pins to customize a setup. Last minute design changes to the machine require minimal effort and no additional software or hardware. The ability to customize the machine design is no longer limited by the product.



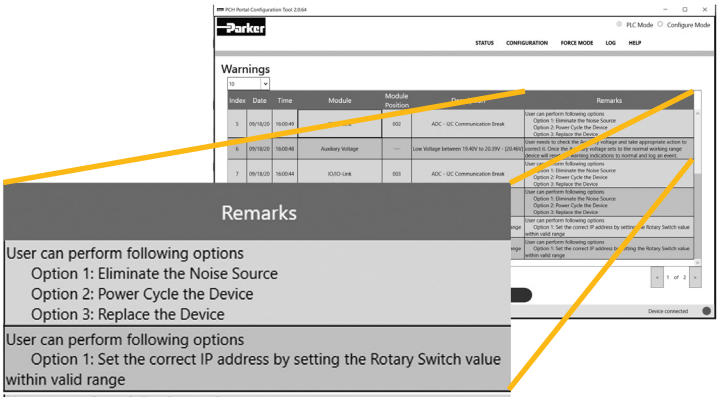


### Tools Designed for Productivity

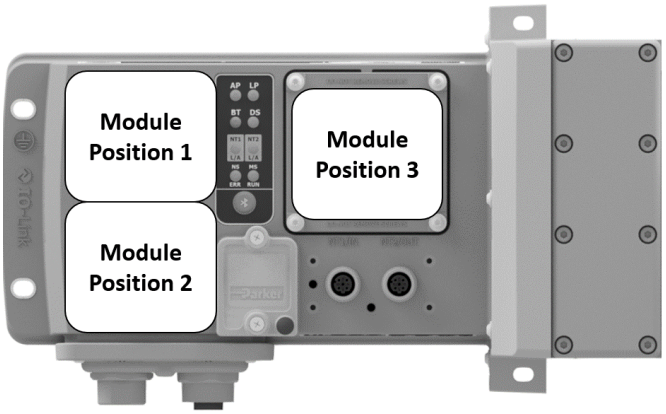
When a line stops and needs a reset you are often left wondering why. The root cause can seem a mystery and often stems back to over voltage or other power issues caused by the plant floor. Working with the PCH Network Portal is like having your own built-in technician. Rolling 40 errors, warnings and events are time and date stamped allowing you to spend time on what matters - running the facility. Let PCH Network Portal give you the detail so time can be better utilized elsewhere.

### Built-In Technician

When using the 'PCH Portal Configuration Tool' your built-in technician comes to life with easy to follow screens for readouts, adjustments, and settings. Configuring the PCH Network Portal to the network is easy. Fast and storable configurations combined with embedded smart diagnostic and prognostic tools like built-in debounce times and up/down counters translate to quick change-over and short downtime. Further problems are easy to spot with the rolling 40 error, warnings, and events log which are time stamped. No more guessing at what went wrong in plant. Commissioning and troubleshooting a tool can even be done remotely from outside the work cell via the device's secure and lockable Bluetooth connectivity.

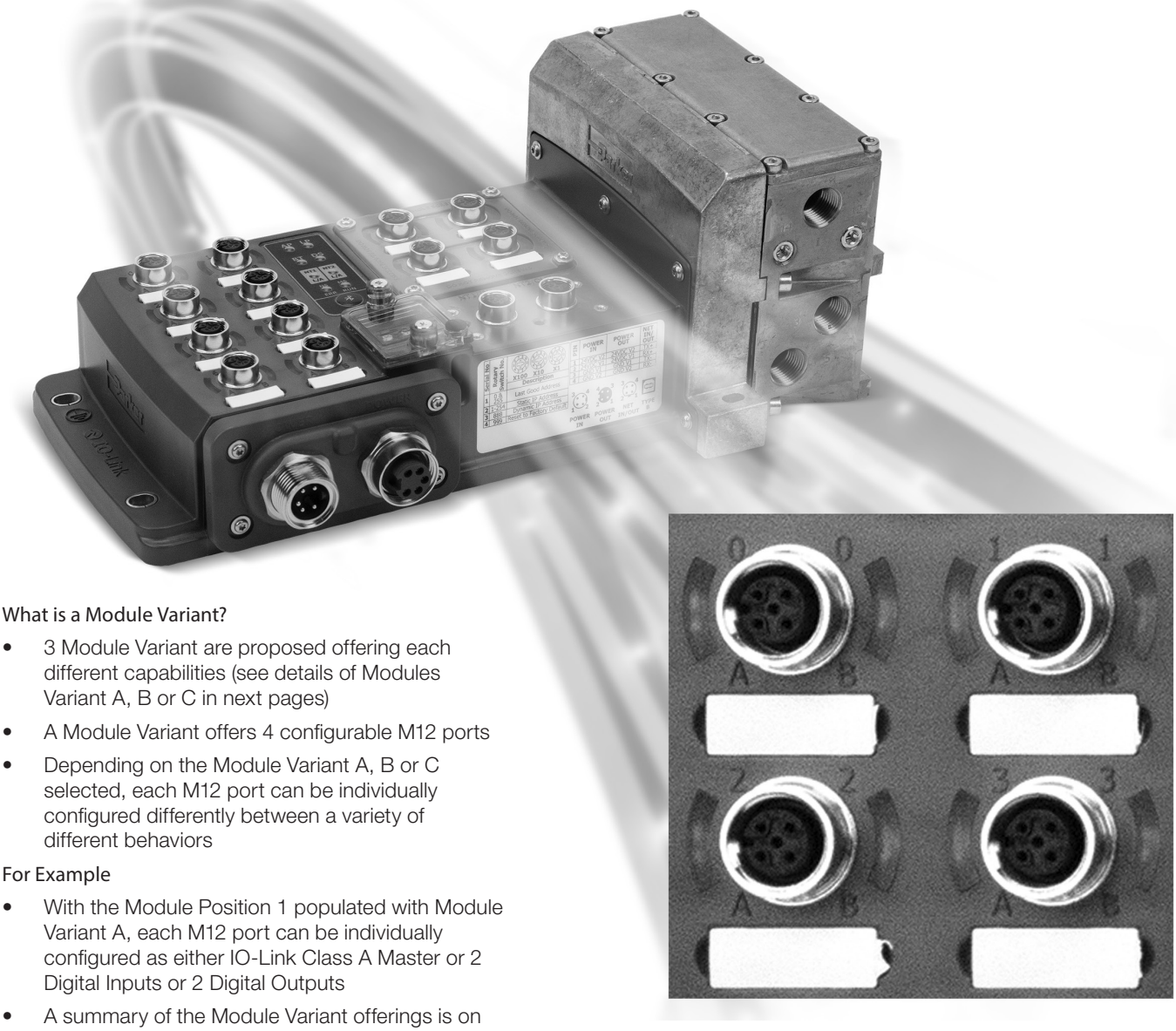


## Value Redefined




What are Module Positions?

- The PCH Network Portal is split into 3 Module Positions
- Each Module Position can accept different Module Variants to meet the application needs
- Populating a Module Position with an I/O Module Variant gives the PCH Network Portal 4 configurable M12 ports



What is a Module Variant?

- 3 Module Variant are proposed offering each different capabilities (see details of Modules Variant A, B or C in next pages)
- A Module Variant offers 4 configurable M12 ports
- Depending on the Module Variant A, B or C selected, each M12 port can be individually configured differently between a variety of different behaviors

For Example

- With the Module Position 1 populated with Module Variant A, each M12 port can be individually configured as either IO-Link Class A Master or 2 Digital Inputs or 2 Digital Outputs
- A summary of the Module Variant offerings is on page 118



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## PCH Network Portal

Module Variants

Module
A

What is a Module Variant?

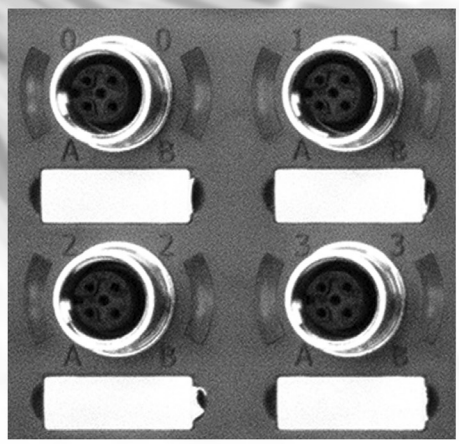
- The PCH Network Portal has 3 available Module Positions. Each module position can be populated with three different Module Variants
- Each Module Position can accept all module variants

Port Behavior

- Each port Is capable of the following behavior listed below
- Through software, the user can click and change how the port behaves on the fly
- The A Module Variant gives the user access to IO-Link Class A Master ports

Possible Port Behavior

| | |
|---|---|
| IO-Link, Class A Master or<br>2 x Digital Inputs or<br>2 x Digital Outputs* | IO-Link, Class A Master or<br>2 x Digital Inputs or<br>2 x Digital Outputs* |
| IO-Link, Class A Master or<br>2 x Digital Inputs or<br>2 x Digital Outputs* | IO-Link, Class A Master or<br>2 x Digital Inputs or<br>2 x Digital Outputs* |

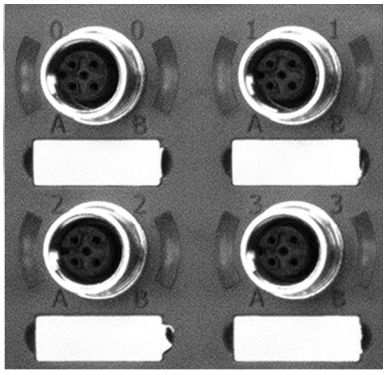


*Digital Output draws current from logic power

Port Behavior

- Each port's behavior can differ from one another
- For example, the user can select the behavior listed below through software (shown below)

| | |
|---|---|
| IO-Link, Class A Master or<br>**2 x Digital Inputs**<br>2 x Digital Outputs | **IO-Link, Class A Master**<br>2 x Digital Inputs or<br>2 x Digital Outputs |
| IO-Link, Class A Master or<br>2 x Digital Inputs or<br>**2 x Digital Outputs** | IO-Link, Class A Master or<br>2 x Digital Inputs or<br>**2 x Digital Outputs** |





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## PCH Network Portal

Module Variants

Module
B

### What is a Module Variant?

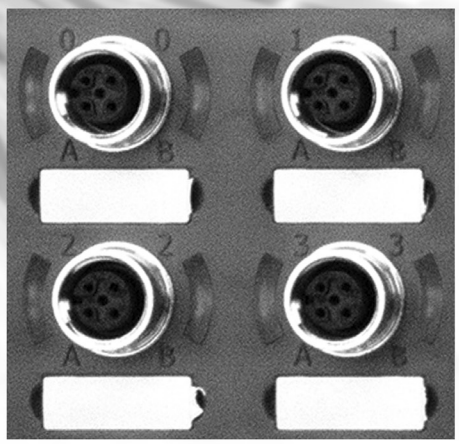
- The PCH Network Portal has 3 available Module Positions. Each module position can be populated with three different Module Variants
- Each Module Position can accept all module variants

### Port Behavior

- Each port Is capable of the following behavior listed below
- Through software, the user can click and change how the port behaves on the fly
- The B Module Variant gives the user access to IO-Link Class B Master ports

Possible Port Behavior

| | |
|---|---|
| IO-Link, Class B Master or<br>1 x Digital Input or<br>1 x Digital Output* | IO-Link, Class B Master or<br>1 x Digital Input or<br>1 x Digital Output* |
| IO-Link, Class B Master or<br>1 x Digital Input or<br>1 x Digital Output* | IO-Link, Class B Master or<br>1 x Digital Input or<br>1 x Digital Output* |

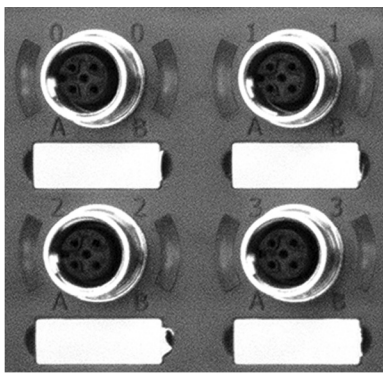


*Digital Output draws current from logic power

Port Behavior

- Each port's behavior can differ from one another
- For example, the user can select the behavior listed below through software (shown below)

| | |
|---|---|
| IO-Link, Class B Master or<br>**1 x Digital Input**<br>1 x Digital Output | **IO-Link, Class B Master**<br>1 x Digital Input or<br>1 x Digital Output |
| IO-Link, Class B Master or<br>1 x Digital Input or<br>**1 x Digital Output** | IO-Link, Class B Master or<br>1 x Digital Input or<br>**1 x Digital Output** |



## PCH Network Portal

Module Variants

Module
C

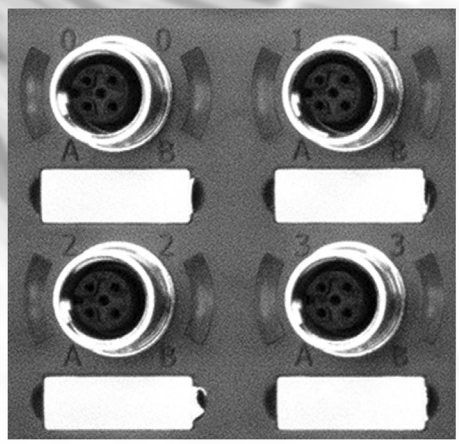
What is a Module Variant?

- The PCH Network Portal has 3 available Module Positions. Each module position can be populated with three different Module Variants
- Each Module Position can accept all module variants

Port Behavior

- Each port Is capable of the following behavior listed below
- Through software, the user can click and change how the port behaves on the fly
- The C Module Variant gives the user access to IO-Link Class B Master ports and fixed high current outputs

Possible Port Behavior

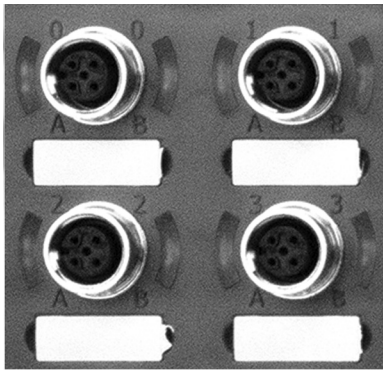
| | | |
|---|---|---|
| 2 x Digital Outputs, 500 mA each, Fixed ¥ |  | 2 x Digital Outputs, 500 mA each, Fixed ¥ |
| IO-Link, Class B Master or | | IO-Link, Class B Master or |
| 1 x Digital Input or | | 1 x Digital Input or |
| 1 x Digital Output* | | 1 x Digital Output* |

¥ Digital Outputs draw current from auxiliary power

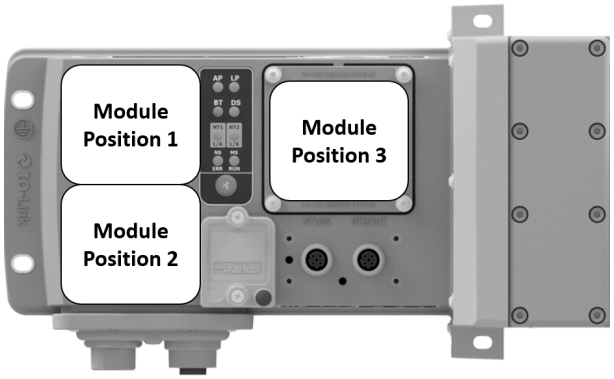
* Digital Output draws current from logic power

Port Behavior

- Each port's behavior can differ from one another
- For example, the user can select the behavior listed below through software (shown below)

| | | |
|---|---|---|
| **2 x Digital Outputs, 500 mA each, Fixed** |  | **2 x Digital Outputs, 500 mA each, Fixed** |
| IO-Link, Class B Master or | | **IO-Link, Class B Master** |
| 1 x Digital Input or | | 1 x Digital Input or |
| **1 x Digital Output** | | 1 x Digital Output |

## I/O Module Combinations




- The PCH Network Portal gives true port flexibility
- The PCH Network Portal can be ordered with 3 available module variants
- Each module variant has 4, M12 Ports
- Each module variants can be chosen in any module position
- Each port is individually software configurable
- A blanking plate is available for Module Position 3
- **Important:** Once Module Variants are selected on the PCH Network Portal, they cannot be changed in the field

**Before** it comes through your door
Select which Module Variant you want in each Module Position

**After** it comes through your door
Truly Configurable I/O - Select port behavior from listed options

## Module Variants

### Module A

- IO-Link, Class A Master **OR**
- 2 Inputs, PNP/NPN **OR**
- 2 Outputs, 250 mA ea

- IO-Link, Class A Master **OR**
- 2 Inputs, PNP/NPN **OR**
- 2 Outputs, 250 mA ea

- IO-Link, Class A Master **OR**
- 2 Inputs, PNP/NPN **OR**
- 2 Outputs, 250 mA ea

- IO-Link, Class A Master **OR**
- 2 Inputs, PNP/NPN **OR**
- 2 Outputs, 250 mA ea

### Module B

- IO-Link, Class B Master **OR**
- 1 Input, PNP/NPN **OR**
- 1 Output, 250 mA ea

- IO-Link, Class B Master **OR**
- 1 Input, PNP/NPN **OR**
- 1 Output, 250 mA ea

- IO-Link, Class B Master **OR**
- 1 Input, PNP/NPN **OR**
- 1 Output, 250 mA ea

- IO-Link, Class B Master **OR**
- 1 Input, PNP/NPN **OR**
- 1 Output, 250 mA ea

### Module C

- 2 Outputs, 500 mA ea

- 2 Outputs, 500 mA ea

- IO-Link, Class B Master **OR**
- 1 Input, PNP/NPN **OR**
- 1 Output, 250 mA ea

- IO-Link, Class B Master **OR**
- 1 Input, PNP/NPN **OR**
- 1 Output, 250 mA ea

### Module N

Blank Cover, No Ports, Only available in Position 3



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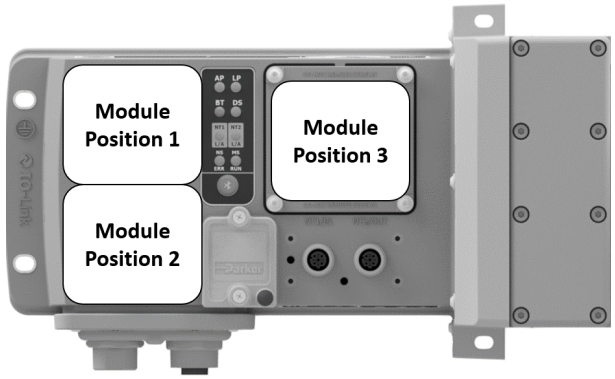
## I/O Module Combinations




- Below are 16 standard module combinations
- For simplicity, similar combinations of modules are consolidated into one combination

For Example:


## Example Model Structure

| XX | XX | P3 | XX | P | XX | **XXX** | 0 - | P4 |
|---|---|---|---|---|---|---|---|---|

Below are the standard module configurations

Refer to page 14 for full product Module Structure.

| Order Code | Module Position 1 | Module Position 2 | Module Position 3 |
|---|---|---|---|
| AAA | A | A | A |
| AAB | A | A | B |
| AAC | A | A | C |
| AAN | A | A | N |
| ABB | A | B | B |
| ABC | A | B | C |
| ABN | A | B | N |
| ACC | A | C | C |
| ACN | A | C | N |
| BBB | B | B | B |
| BBC | B | B | C |
| BBN | B | B | N |
| BCC | B | C | C |
| BCN | B | C | N |
| CCC | C | C | C |
| CCN | C | C | N |

For any module configurations not listed, consult factory.

## Power Options

- The PCH Network Portal has 4 available power connectors
- There are two power schemes that can be achieved detailed below
- Any I/O ports using AUX power and any attached H ISO Universal manifold valves draw power from the AUX power pins of the power connector

### Consumption @ 24 VDC

| | |
|---|---|
| AUX power max consumption | 12A |
| Logic power max consumption | 8A |
| Total possible passthrough for AUX line and Logic | 20A |

Any power left over can be passed on to other devices on the network

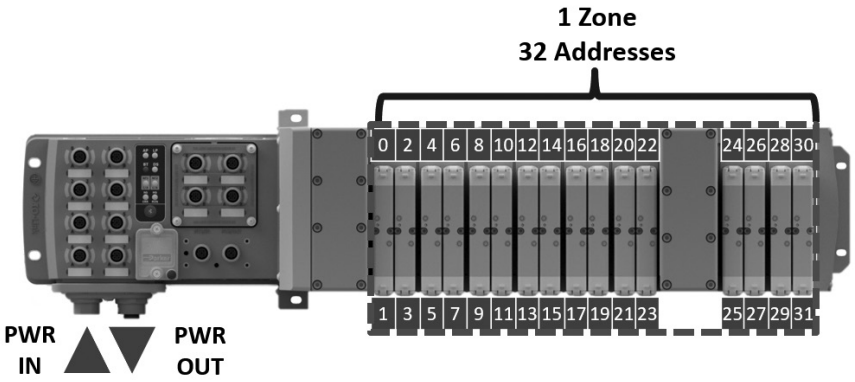
| XX | XX | P3 | XX | P | XX | AAA | 0 - | **P4** |
|---|---|---|---|---|---|---|---|---|

| Power Connector * | |
|---|---|
| 4-pin power in/out with 1 safe power capable zone | P4 |
| 5-pin power in/out with 1 safe power capable zone | P5 |
| 4-pin power in/out with 2 safe power zones | S4 |
| 5-pin power in/out with 2 safe power zones | S5 |
| AIDA power in/out with 1 safe power capable zone | J1* |

* Only available with Profinet AIDA

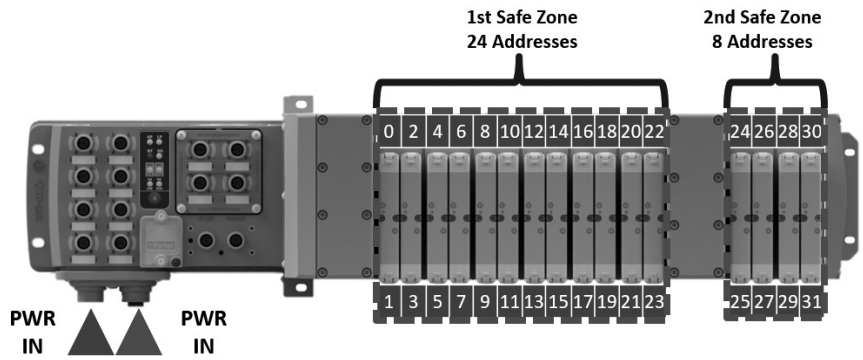
## Power Scheme 1

- All 32 addresses are controlled in the same power zone
- Safety zoning is possible for valve solenoids and, with the H ISO Universal valves, pneumatic pres
- Power zone is safe power capable
- Available in 4 or 5-pin 7/8" power connectors




## Power Scheme 2

- The power connector separates the valve power
- Each zone has an isolated safe ground pin so each can be powered by a SAFE 24 VDC auxiliary source in PP or PM mode
- Available in 4 or 5 pin 7/8" power connectors



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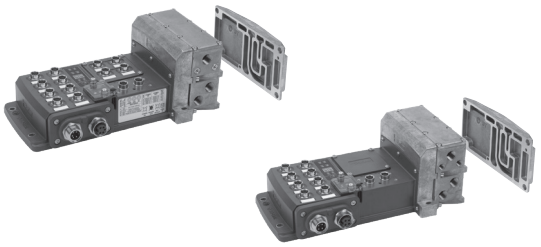
www.parker.com/pneumatics

## End Plate Kit – Universal Plug-in

The PCH Network Portal is ordered as an endplate kit. This includes the PCH Network Portal, left hand air supply module, and right hand end plate.



| PSHU20 | P3 | 0 | 0 | P | E | AAA | 0 | – | P4 |
|---|---|---|---|---|---|---|---|---|---|

| Valve Type | |
|---|---|
| Plug-in (Internal pilot) | PSHU20 |
| Plug-in (External pilot) | PSHU2X |

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

| Network Connections | |
|---|---|
| EtherNet/IP | E |
| EtherCAT | T |
| PROFINET | N |
| PROFINET AIDA | A |
| Modbus TCP | M |

| Power Connector * | |
|---|---|
| 4-pin power IN/OUT with 1 safe power capable zone | P4 |
| 5-pin power IN/OUT with 1 safe power capable zone | P5 |
| 4-pin power IN/IN with 2 safe power zones | S4 |
| 5-pin power IN/IN with 2 safe power zones | S5 |
| AIDA power IN/OUT with 1 safe power capable zone | J1* |

* Only available with Profinet AIDA

| Right Hand End Plate Type / Thread Size | |
|---|---|
| Low profile (no ports) | 0 |
| 1/2 Exhaust and inlet port | 1 |
| 3/4 Exhaust and inlet port | 2 |
| H3 Transition plate and end plate (electrical pass through for plug-in valves only) | 3 |
| H3 Transition plate and end plate (expansion to 25th address for plug-in valves only) | 4 |

**Module Combinations**

| Module Position 1 | Module Position 2 | Module Position 3 |
|---|---|---|
| A | A | A |
| A | A | B |
| A | A | C |
| A | A | N |
| A | B | B |
| A | B | C |
| A | B | N |
| A | C | C |
| A | C | N |
| B | B | B |
| B | B | C |
| B | B | N |
| B | C | C |
| B | C | N |
| C | C | C |
| C | C | N |

For any module configurations not listed, consult factory.

## Mechanical Data

| | |
|---|---|
| Housing Material | Housing /Enclosure: PBT with 33% GF and UL94-V0 Base Cover (plate): Aluminum 380 |
| Enclosure rating | IP 65 (only when plugged-in and threaded-in) |
| Power Connectors | 7/8" 4 or 5 pin male and female pin connector |
| Input ports/ Output ports | M12, A-coded (12 x female) |
| Dimensions (L x B x H in mm) | 226.6mm x 130.7mm x 55mm |
| Mounting type | Screw Mount |
| Ground strap attachment | M5 |
| Weight | Approx. 1.3 kg |

## Operating Conditions

| | |
|---|---|
| Operating Temperature | 0°C to 50°C |
| Storage Temperature | -25°C to 70°C |
| CE as per | IEC 61000-6-2 (Industrial Immunity) |
| | IEC 61000-6-4 (Industrial Emission) |
| Shock/Vibrations | IEC 60068-2-27:2008 |
| | IEC 60068-2-6:2007 |
| Electrostatic Discharge | IEC 61000-4-2 |
| Electrical Fast Transient/ Burst | IEC 61000-4-4 |
| Surge Immunity | IEC 61000-4-5 |

## Electrical Data

| | |
|---|---|
| Supply Voltage | 24VDC (-15% to +20%) |
| Logic current at 24 V (V1) | Max Current 8A – Actual usage depends on configuration |
| Auxiliary current at 24 V (V2) | Max Current 12A – Actual usage depends on configuration |

## Valve Configuration

| | |
|---|---|
| Compatible Valves | H Universal ISO Valves |
| Available addresses | 24 addresses, 32 addresses with H Universal Extension Slice |

## I/O Port Pin Outs

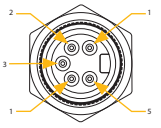
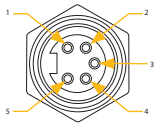
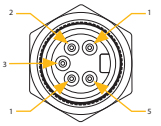
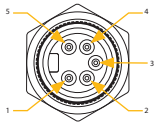
- The PCH Network Portal uses threaded M12 Ports for I/O Connections
- All configurable ports are configurable through software at any time

| Module Variant | Connector | Pin No. | Function |
|---|---|---|---|
| A<br>*Applies to ports 1-4 of this module |  | 1 | +24V, 500mA VLOG (V1) |
| | | 2 | Input (PNP or NPN) / Output +24V, 250 mA (V1) |
| | | 3 | GND (V1) |
| | | 4 | IO-Link/Input (PNP or NPN) / Output +24V, 250mA (V1) |
| | | 5 | Not Connected |
| B<br>*Applies to ports 1-4 of this module |  | 1 | +24V, 250mA VLOG (V1) |
| | | 2 | +24V, 1.2A VAUX (V2) |
| | | 3 | GND (V1) |
| | | 4 | IO-Link/Input (PNP or NPN) / Output +24V, 250mA (V1) |
| | | 5 | GND (V2) |
| C<br>*Applies to ports 1-2 of this module |  | 1 | Not Connected |
| | | 2 | Output +24VAUX (V2), 500mA |
| | | 3 | GND (V2) |
| | | 4 | Output +24VAUX (V2), 500mA |
| | | 5 | Not Connected |
| C<br>*Applies to ports 3-4 of this module |  | 1 | +24V, 250mA VLOG (V1) |
| | | 2 | +24V, 1.2A VAUX (V2) |
| | | 3 | GND (V1) |
| | | 4 | IO-Link/Input (PNP or NPN) / Output +24V, 250mA (V1) |
| | | 5 | GND (V2) |

## Power Conector Pin Outs

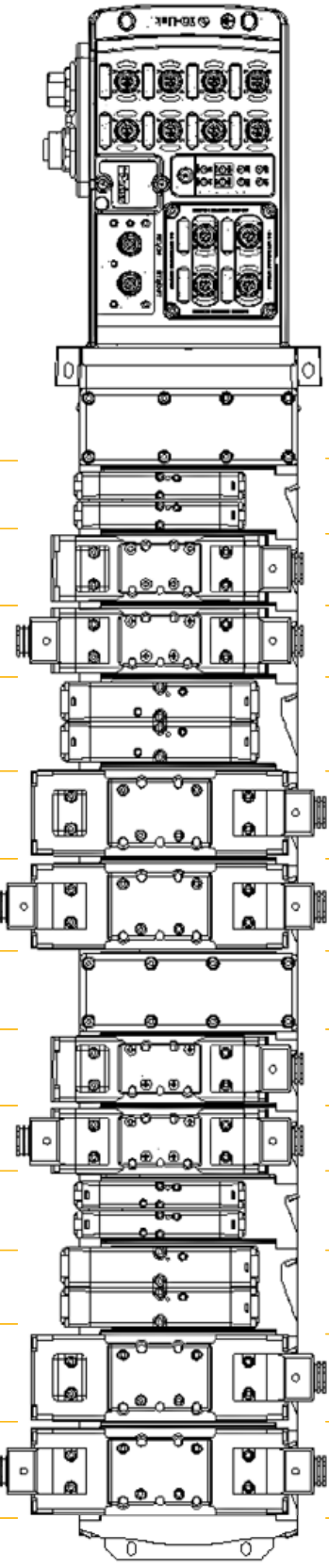
- The PCH Network Portal uses 7/8” ports for its left IN and right OUT (P4 & P5) or IN (S4 or S5) power connectors
- Any power configuration below can be ordered

*For AIDA power connector, consult factory

| | Left Power Connector: Power IN | | | | Right Power Connector:<br>P4 & P5 - Power OUT - 1 Valve Safe Zone<br>S4 & S5 - Power IN - 2 Valve Safe Zones | | | |
|---|---|---|---|---|---|---|---|---|
| | Connector | Pin No. | Function | Description | Connector | Pin No. | Function | Description |
| P4 |  | 1 | +24V | V2 (VAUX), 12A |  | 1 | +24V | V2 (VAUX), 3.8A |
| | | 2 | +24V | V1 (VLOG), 8A | | 2 | +24V | V1 (VLOG), 1.28A |
| | | 3 | 0V | GND V1 (VLOG) | | 3 | 0V | GND V1 (VLOG) |
| | | 4 | 0V | GND V2 (VAUX) | | 4 | 0V | GND V2 (VAUX) |
| P5 |  | 1 | 0V | GND V2 (VAUX) |  | 1 | 0V | GND V2 (AUX) |
| | | 2 | 0V | GND V1 (VLOG) | | 2 | 0V | GND V1 (VLOG) |
| | | 3 | Protective Earth | Protective Earth | | 3 | Protective Earth | Protective Earth |
| | | 4 | +24V | V1 (VLOG), 8A | | 4 | +24V | V1 (VLOG) |
| | | 5 | +24V | V2 (VAUX), 12A | | 5 | +24V | V2 (VAUX) |
| S4 |  | 1 | +24V | V2 (VAUX), 12A |  | 1 | +24V | V3 (VAUX) 3.8A |
| | | 2 | +24V | V1 (VLOG), 8A | | 2 | +24V | V4 (VAUX) 1,2 A |
| | | 3 | 0V | GND V1 (VLOG) | | 3 | 0V | Safe GND V3 (VAUX) |
| | | 4 | 0V | GND V2 (VAUX) | | 4 | 0V | Safe GND V4 (VAUX) |
| S5 |  | 1 | 0V | GND V2 (VAUX) |  | 1 | +24V | V3 (VAUX) 3.8A |
| | | 2 | 0V | GND V1 (VLOG) | | 2 | +24V | V4 (VAUX) 1,2 A |
| | | 3 | Protective Earth | Protective Earth | | 3 | Protective Earth | Protective Earth |
| | | 4 | +24V | V1 (VLOG), 8A | | 4 | 0V | Safe GND V3 (VAUX) |
| | | 5 | +24V | V2 (VAUX), 12A | | 5 | 0V | Safe GND V4 (VAUX) |

## Solenoid Addressing

- The PCH Network Portal can used the following H ISO Universal Valves:
  - ISO 15407-2 – sizes 02 & 01
  - ISO 5599-2 – sizes 1, 2 & 3
- The PCH Network Portal can support up to 32 addresses as shown
- The data map and PCH Tool refers to each address with a Valve_X designator. Each Valve_X designator is as shown.
- Addresses 25-31 can be accessed using an Intermediate Air Supply with Electric Expansion
- Each address is one solenoid



| | | | | |
|---|---|---|---|---|
| Air Supply | | | | |
| HB Single Address Manifold | | | EV0 | Address 0 |
| | | | EV1 | Address 1 |
| H1 Single Address Manifold | | | EV2 | Address 2 |
| H1 Double Address Manifold | EV4 | Address 4 | EV3 | Address 3 |
| HA Double Address Manifold | EV6 | Address 6 | EV5 | Address 5 |
| | EV8 | Address 8 | EV7 | Address 7 |
| H2 Single Address Manifold | | | EV9 | Address 9 |
| H2 Double Address Manifold | EV11 | Address 11 | EV10 | Address 10 |
| Air Supply Zero Address Manifold | | | | |
| H1 Single Address Manifold | | | EV12 | Address 12 |
| H1 Double Address Manifold | EV14 | Address 14 | EV13 | Address 13 |
| HB Double Address Manifold | EV16 | Address 16 | EV15 | Address 15 |
| | EV18 | Address 18 | EV17 | Address 17 |
| HA Single Address Manifold | | | EV19 | Address 19 |
| | | | EV20 | Address 20 |
| H2 Single Address Manifold | | | EV21 | Address 21 |
| H2 Double Address Manifold | EV23 | Address 23 | EV22 | Address 22 |
| Low Profile End Plate (No Ports) | | | | |



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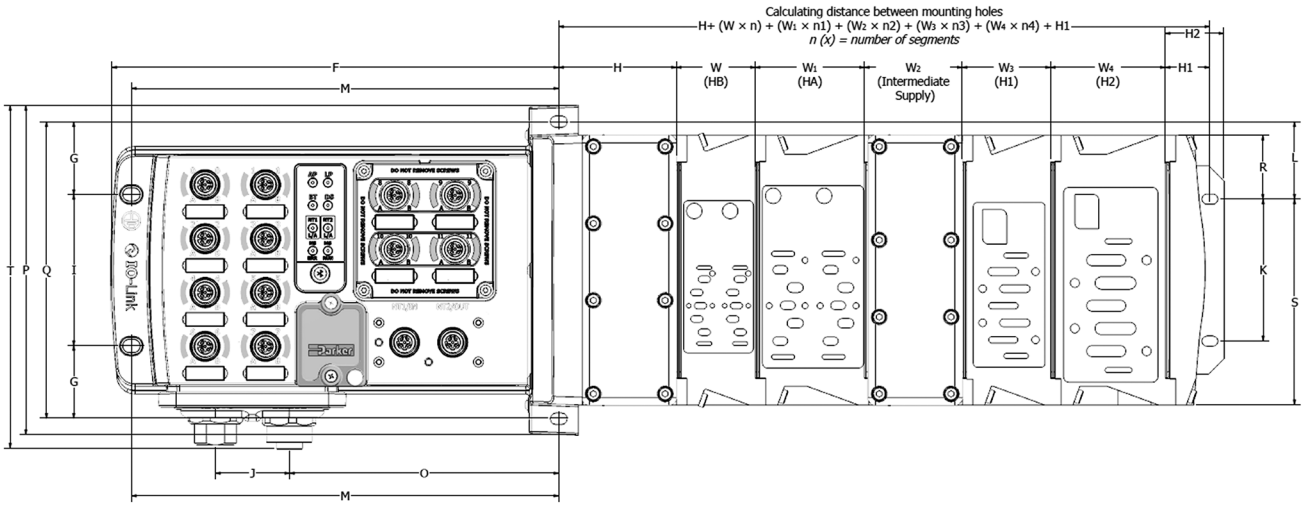
## PCH Network Portal with H Series ISO Valves

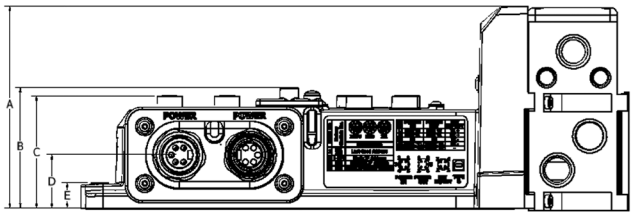



n (x) = number of segments

| A | B | C | D | E | F | G | H | $H_1$ | $H_2$ | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.42 (112.3) | 2.64 (67.1) | 2.46 (62.5) | 1.17 (29.7) | .55 (14) | 9.32 (236.7) | 1.51 (38.4) | 2.36 (59.9) | .9 (22.9) | 1.22 (31) | 1.55 (39.4) | 2.95 (74.9) | 1.6 (40.6) |

| M | O | P | Q | R | S | T | W | $W_1$ | $W_2$ | $W_3$ | $W_4$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 8.91 (226.3) | 5.61 (142.5) | 6.86 (174.2) | 6.18 (157) | 1.33 (33.8) | 4.28 (108.7) | 7.14 (181.4) | 1.63 (41.4) | 2.28 (57.9) | 2.03 (51.6) | 1.82 (46.2) | 2.39 (60.7) |

Inches (mm)



## Product Support

- The PCH Network Portal Product Landing page can be accessed at the following:

www.parker.com/pdn/PCHPortal

- The PCH Network Portal support material can be accessed at the following:

www.parker.com/pdn/networkconnectivity

- The PCH Connect - Bluetooth Application

GET IT ON Google Play

Available on the App Store

### User Manuals

- The PCH Network Portal User Manuals can be accessed at the following website. Click on QR code for hyperlink.

EtherNet/IP™ EtherNet/IP™ User Manual

Profinet User Manual

EtherCAT EtherCAT User Manual

Modbus User Manual

For more information on IO-link

IO-Link www.io-link.com

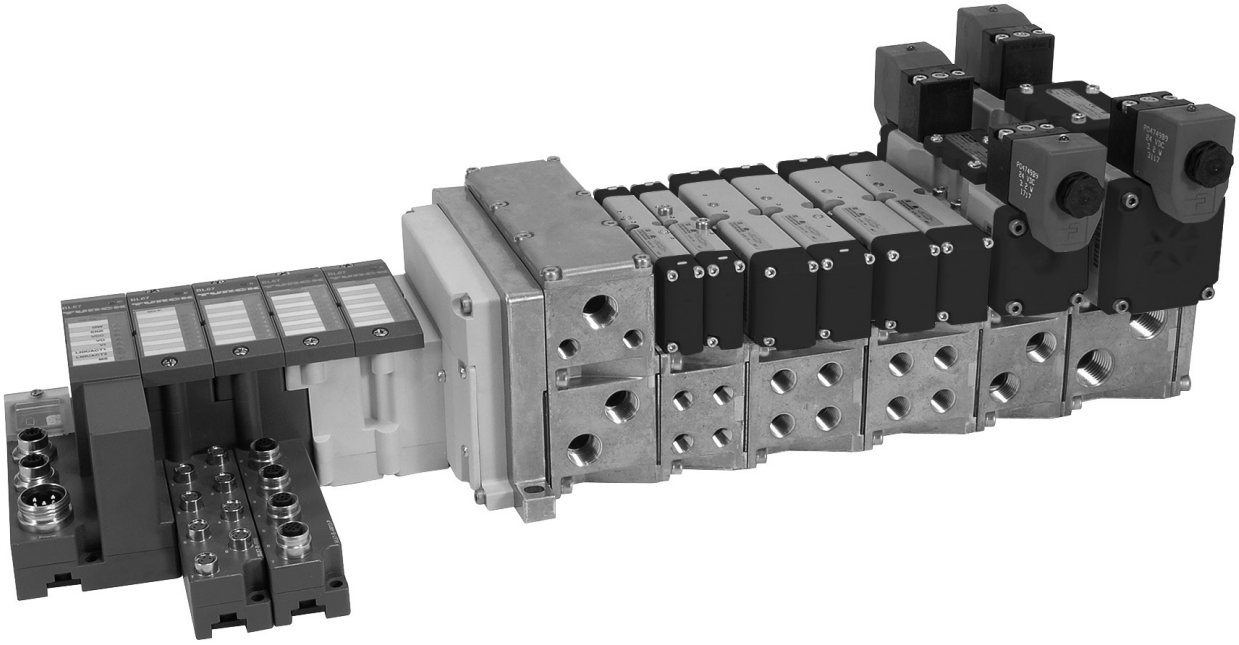
## The Turck Network Portal

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



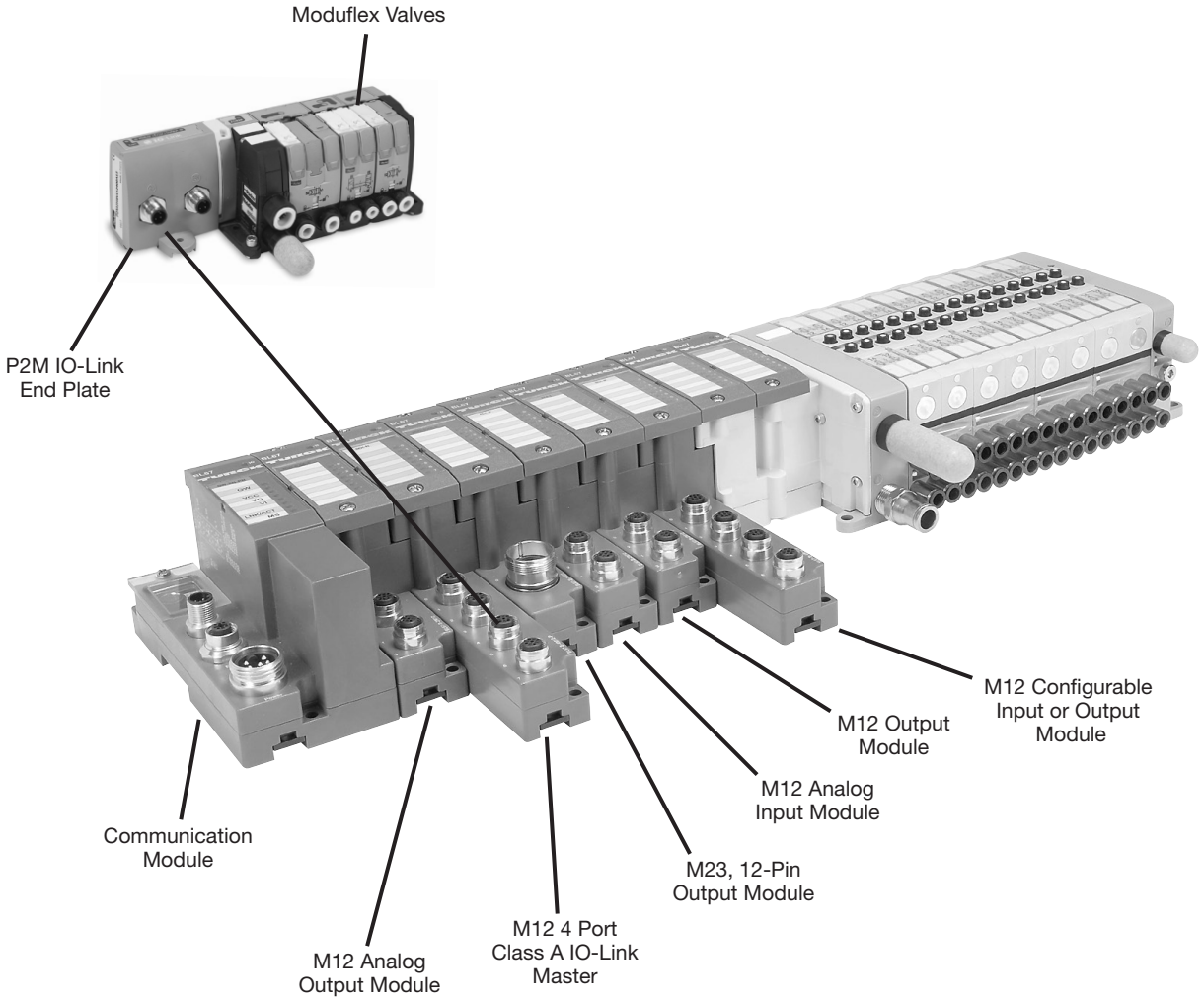
## Turck Network Portal

- 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.**

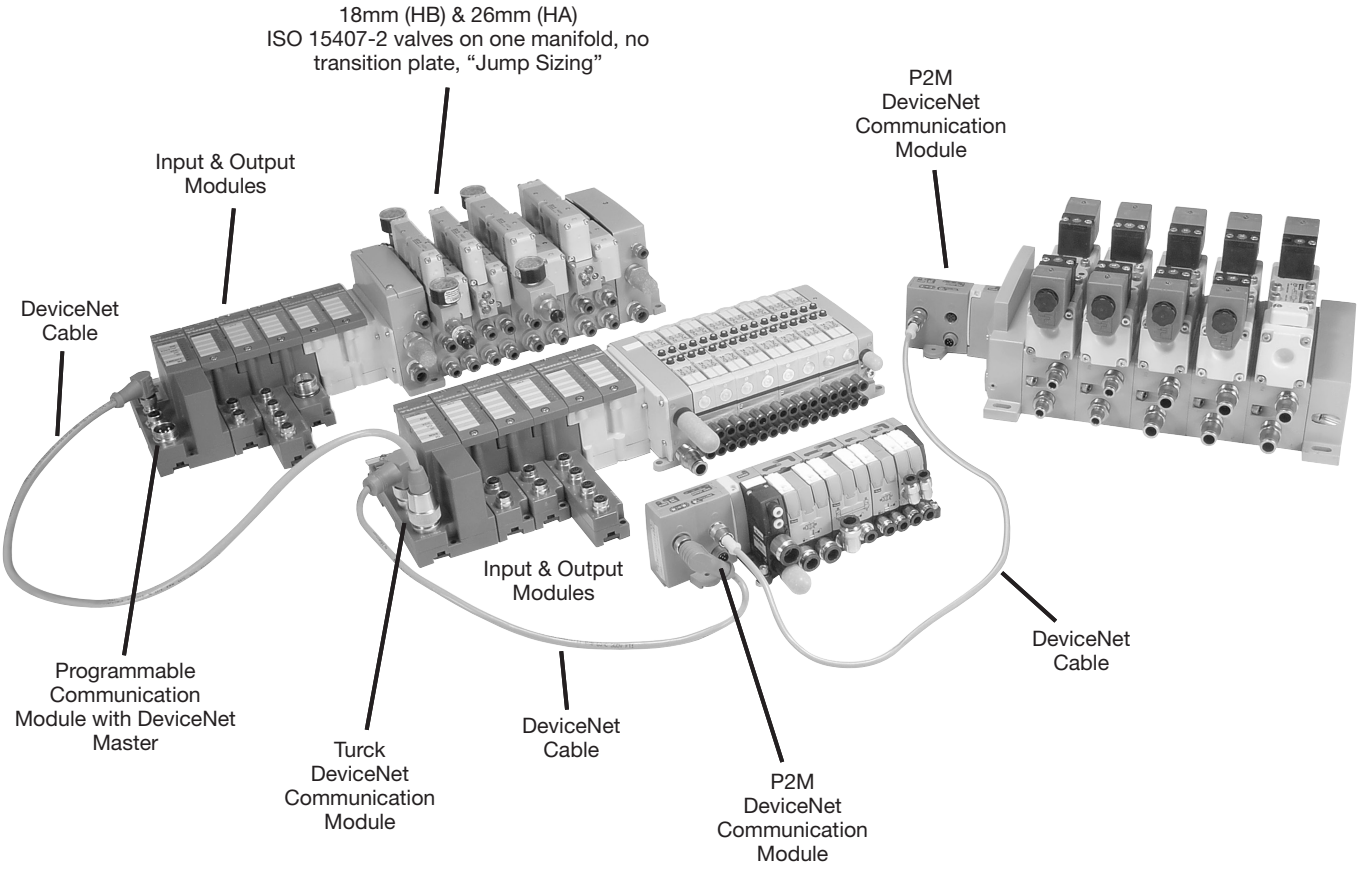
## Turck Network Portal

- A complete network communication offering for all H Series ISO and H Series Micro valves.
- CSA, cCSAus and CE certifications (as marked).

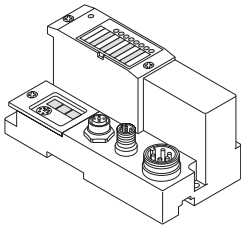
## I/O Configuration

- 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

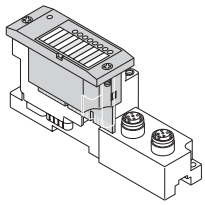


BL67 communication modules are the heart of a BL67 station. They are designed to connect the modular nodes to the higher level network (PROFIBUS-DP, DeviceNet, CANopen, Ethernet).

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.

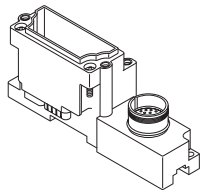
## Electronic Module



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.

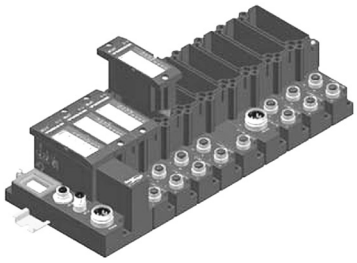
The base modules serve for connection of the field devices an are available with different connection types (M8, M12, M23 and 7/8).

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 |

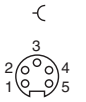
## BL67-GW-DN

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)

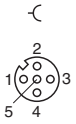
Turck Network Portal with up to 256 inputs, outputs, and 32 solenoids per H Series Micro or H Series ISO manifold. Digital inputs / outputs, analog inputs / outputs, serial interface, and counter modules are available. DeviceNet communication speeds selectable between 120, 250, 500 kbps, and CANopen 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 = $V_o$

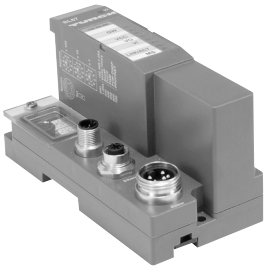
Turck Network Portal with up to 256 inputs, outputs, and 32 solenoids per H Series Micro or H Series ISO manifold. Digital inputs / outputs, analog inputs / outputs, serial interface, and counter modules are available. PROFIBUS communication speeds are selectable between 9.6 kbps up to 12 Mbps, and addressing can be selected via rotary switches or set through software.

## BL67-GW-EN

Modbus/TCP, EtherNet/IP, and PROFINET

## BL67-GW-EN-PN

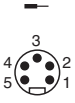
PROFINET Communication Module



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

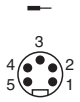
DeviceNet OUT


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 = $V_o$

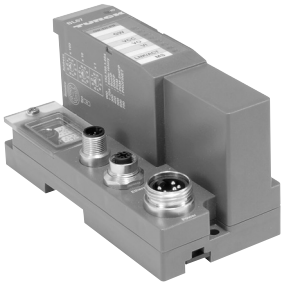
With BL Remote DeviceNet subnet functionality, each communication module has its own DeviceNet master which provides a connection for 63 DeviceNet nodes with additional inputs, outputs, and solenoid control. BL Remote DeviceNet subnet is independent of the main network, and is not visible to the master 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



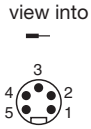
DeviceNet OUT


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

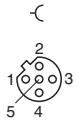
Modbus/TCP Programmable Communication Module

## BL67-PG-EN-IP

EtherNet/IP Programmable Communication Module

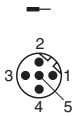
Profibus Wiring

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

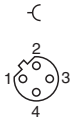
M12 B-code bus in Wiring,
view into female connector




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** |

## 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** |



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## 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** |

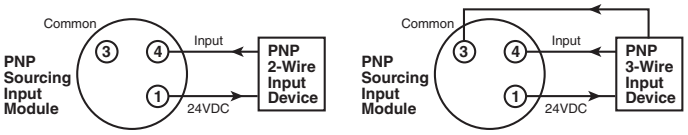
| | Base module | Part number |
|---|---|---|
|  | 1 x M12, 8 pole, female, A-code | **BL67-B-1M12-8** |
|  | 1 x M23, 12 pole, female | **BL67-B-1M23** |

## 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.

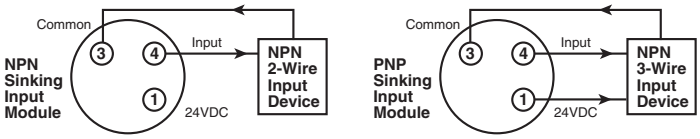



## Digital NPN Input Modules

| 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.

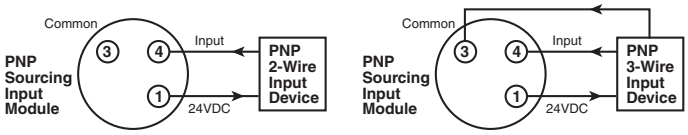


## Digital PNP Output Modules

| 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.

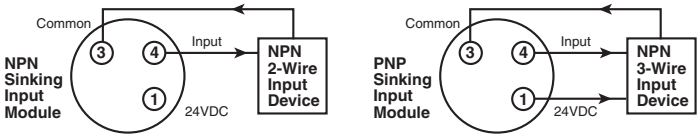



## Digital NPN Output Modules

| 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 |

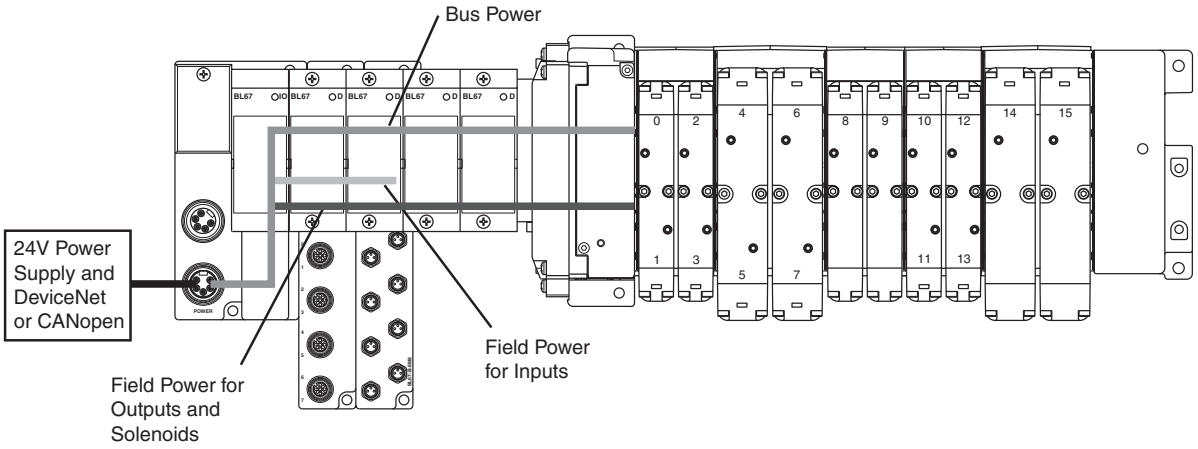
## CANopen Expansion Module

| 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

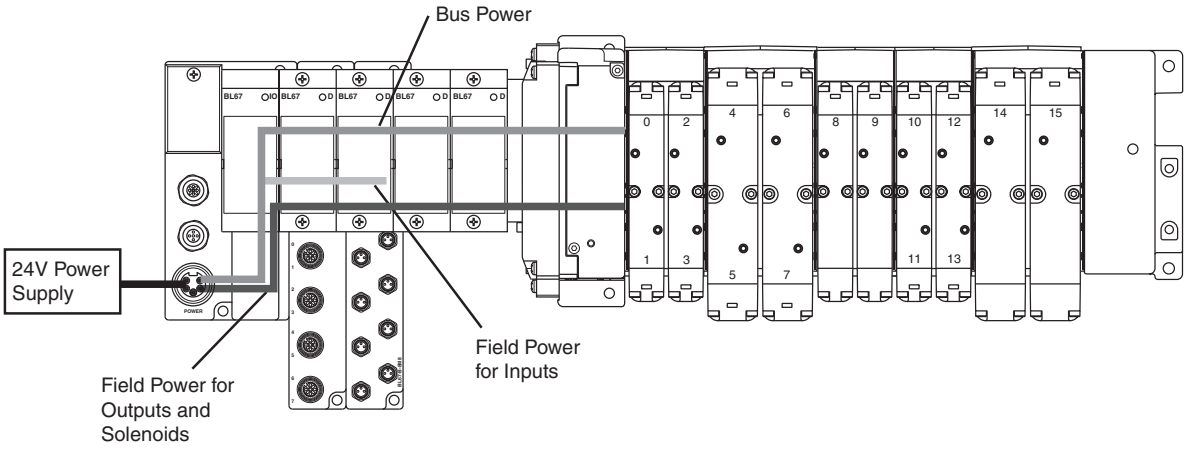
### Turck Communication and I/O Modules - DeviceNet and CANopen, Power Over Network

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

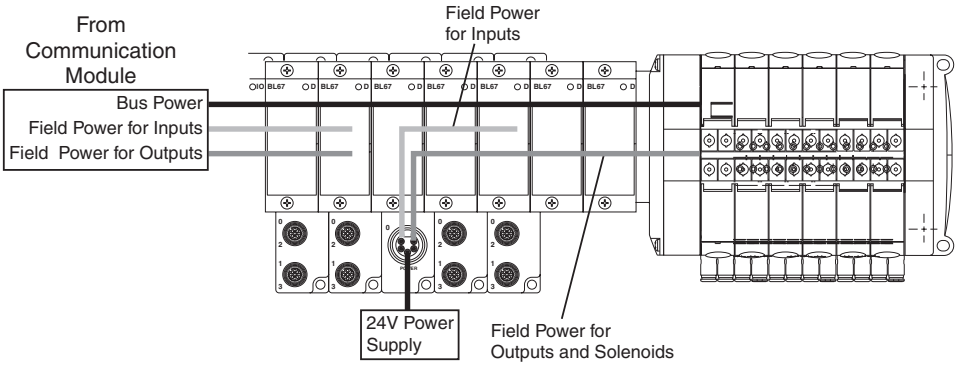
An auxiliary 24VDC power supply from the communication module provides power across two separate circuits. The first circuit provides 1.5A bus power and 4A field power for inputs. The second circuit provides 10A field power for outputs which can be wired to an e-stop circuit to kill all outputs.



## Power Distribution Options for Turck Network Portal (continued)

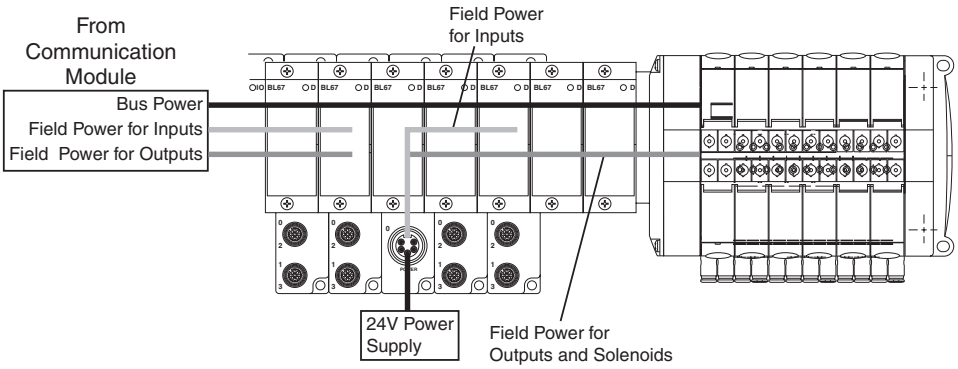
### 24VDC Power Extender Module (BL67-PF-24VDC) with Base Module BL67-B-1RSM

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.



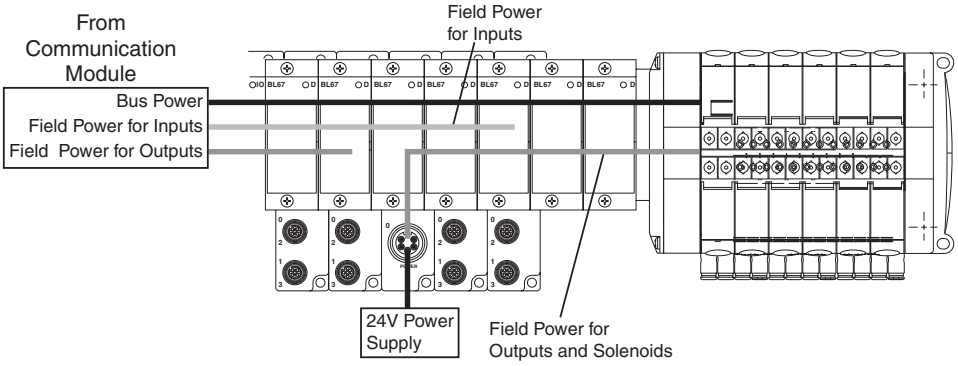

### 24VDC Power Extender Module (BL67-PF-24VDC) with Base Module BL67-B-1RSM-4

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.

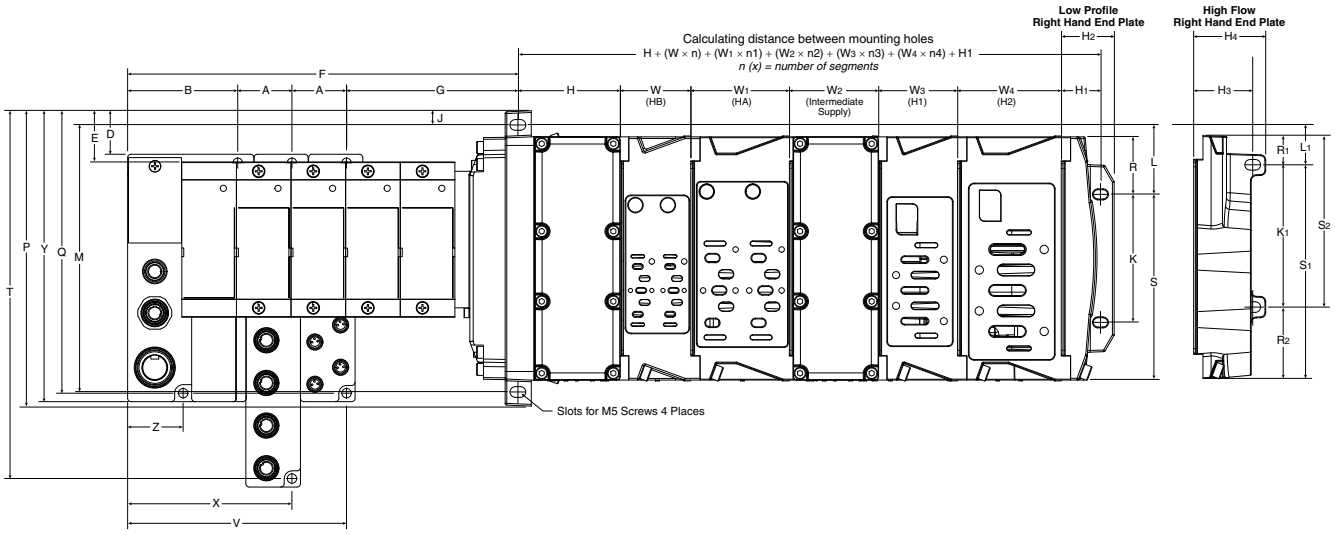



### 24VDC Power Extender Module (BL67-PF-24VDC) with Base Module BL67-B-1RSM-VO

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.



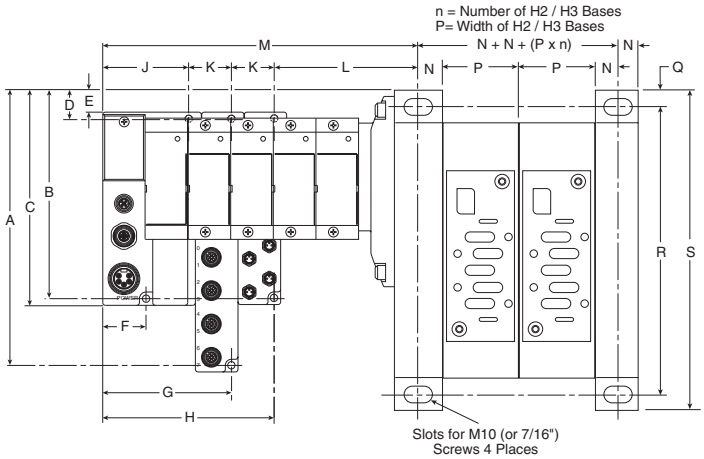
## Turck with H Series ISO Valves




n (x) = number of segments

| A | B | D | E | F | G | H | H1 | H2 | H3 | H4 | J |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 32,0 | 64,5 | 25,4 | 29,9 | 228,4 | 100,1 | 60,0 | 23,0 | 31,0 | 34,6 | 42,3 | 8,3 |
| **K** | **K1** | **L** | **L1** | **M** | **P** | **Q** | **R** | **R1** | **R2** | **S** | **S1** |
| 75,0 | 83,4 | 40,7 | 24,3 | 156,5 | 173,1 | 165,4 | 33,7 | 17,3 | 41,8 | 108,8 | 125,2 |
| **S2** | **T** | **V** | **W** | **W1** | **W2** | **W3** | **W4** | **X** | **Y** | **Z** | |
| 100,7 | 215,4 | 128,3 | 41,3 | 57,8 | 52,3 | 46,3 | 60,8 | 96,3 | 170,4 | 32,5 | |

### H3 Manifold Assembly

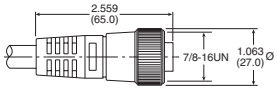



| A | B | C | D | E | F | G | H | J | K | L | M | N | P | Q | R | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 218,9 | 168,9 | 173,9 | 33,9 | 28,9 | 32,5 | 96,5 | 128,5 | 64,5 | 32 | 110 | See note 1 | 16,5 | 71 | 15 | 265 | 295 |

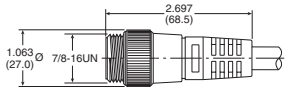
Note 1: M =J+L+$n_2$xK, where $n_2$ = Number of Turck input / output modules

## 7/8" Mini Power Cables - P2H Network Node, H Series Network Portal, Turck Network Portal

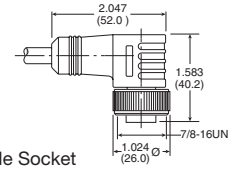
RKM Female Socket

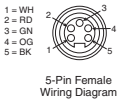



RSM Male Pins

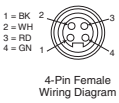



WKM Female Socket




5-Pin Female
Wiring Diagram

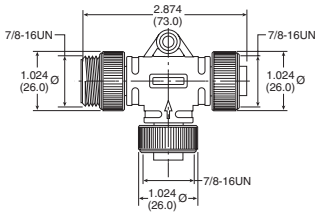


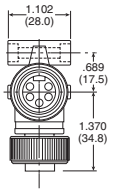

4-Pin Female
Wiring Diagram

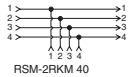
| Description | Part number |
|---|---|
| 4-pin female to flying lead cable, 5 meters, TPE | **RKM 46-5M/S1587** |
| 5-pin female to flying lead cable, 5 meters, TPE | **RKM 56-5M/S1587** |
| 4-pin male to female cable, TPE | **RSM RKM 46-x/S1587** |
| 5-pin male to female cable, TPE | **RSM RKM 56-x/S1587**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

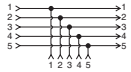
## Power Tee - P2H Network Node, H Series Network Portal, Turck Network Portal




RSM-2RKM 40

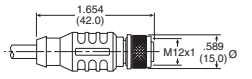


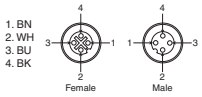

RSM-2RKM 50

| 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

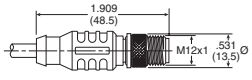
RKC Female Sockets

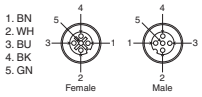



4-Pin Female Wiring Diagram

RSC Male Pins



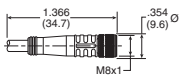



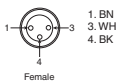

5 -Pin Female Wiring Diagram

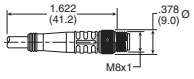
| Description | Part number |
|---|---|
| 4-pin female to flying lead cable, PVC | **RKC 4.4T-1** |
| 4-pin male to flying lead cable, PVC | **RSC 4.4T-*** |
| 4-pin male to female cable, PVC | **RKC 4.4T-*-RSC 4.4T** |
| 5-pin female to flying lead cable, TPE | **RKC 4.5T-*/S1587** |
| 5-pin male to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

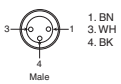
Where * = 1, 2, 3, 4 meter standard lengths

## M8 Cables - H Series IO-Link Network Portal, Turck IO-Link Network Portal



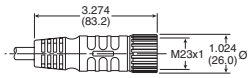



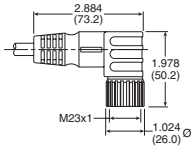




| Description | Part number |
|---|---|
| 3-pin female to flying lead cable, PUR | **PKG 3M-4/S90** |
| 3-pin male to flying lead cable, PUR | **PSG 3M-*/S90** |
| 3-pin male to female cable, PUR | **PKG 3M-*-PSG 3M/S90** |

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

## M23 Cables

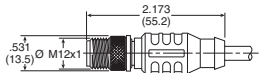


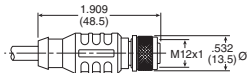

| Description | Part number |
|---|---|
| 12-pin, double ended female thread with male pins and female socket, PUR. Pinout optimized for H Series Network Portal. | **CSCM CKCM 12-11-x/S90** |
| 19-pin, double ended female thread with male pins and female socket, PUR. Pinout optimized for H Series Network 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** |

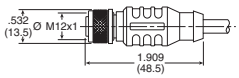
Where x = 2, 4, 5, 6, 8, 10 meter standard lengths

## PROFIBUS Terminating Resistor - P2M Network Node, Turck Network Portal

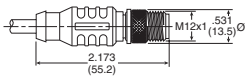

Male Pins

| Description | Part number |
|---|---|
| M12 male pin terminating resistor | **P8BPA00MB** |

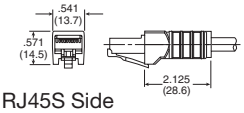
## Ethernet Cables - P2M Network Node, H Series Network Portal, Turck Network Portal




RKSD Side, Female Sockets




RSSD Side, Male Pins




RJ45S Side

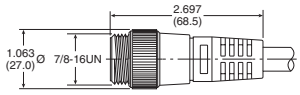
| Description | Part number |
|---|---|
| M12 female to M12 male, PUR | **RSSD RKSD 443-xM** |
| RJ45 to M12 male, PUR | **RSSD RJ45S 443-2M** |

Where x = 2, 5, 10, 15, 20, 30 meter standard lengths

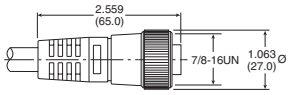
## 25-pin, D-Sub Cable (Female)

| 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** |

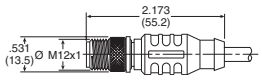
## DeviceNet and CANopen Cables - P2M Network Node, H Series Network Portal, Turck Network Portal



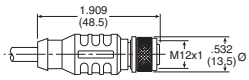

RSM Side, 7/8 Mini with Male Pins




RKM Side, 7/8 Mini with Male Pins




RSC Side, Male Pins

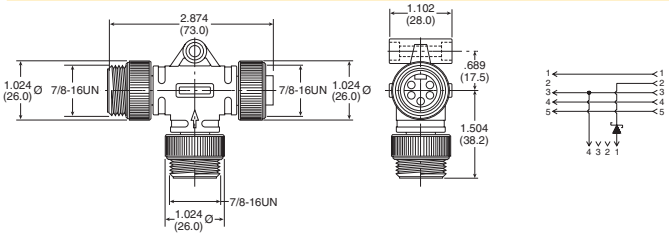



RKC Side, Female Sockets

| 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

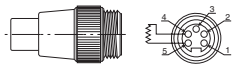
## Bus Power Tee - P2M Network Node, H Series Network Portal, Turck Network Portal




| Description | Part number |
|---|---|
| Bus power tee | **RSM RKM 57 WSM 40 PST** |

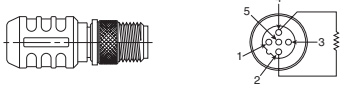
For systems not equipped with Power over network, combines separate network and power feeds into the communication module. Includes reverse current protection

## DeviceNet & CANopen Terminating Resistor - P2M Network Node, H Series Network Portal, Turck Network Portal




RSM 57-TR2

Male Pins



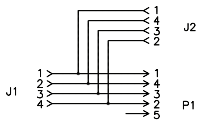

P8BPA00MB

Male Pins

| Description | Part number |
|---|---|
| 7/8" Mini Male Pin Terminating Resistor | **RSM 57-TR2** |
| M12 Male Pin Terminating Resistor | **P8BPA00MA** |

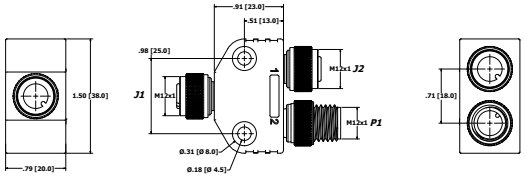
## M12 Power Splitter - PCH Network Portal, Turck Network Portal, P2M IO-Link, P2H IO-Link


**Female Pins (J1 and J2)**





**Male Pins (P1)**



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# 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 access ing the Parker website 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.

| | |
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| Buyer: | means any customer receiving a Quote for Products. |
| Goods: | means any tangible part, system or component to be supplied by Seller. |
| Products: | means the Goods, Services and/or Software as described in a Quote. |
| 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 provided by Seller. |
| Software: | means any software related to the Goods, whether embedded or separately downloaded. |
| Terms: | means the terms and conditions of this Offer of Sale. |

**2. Terms.** All sales of Products by Seller are expressly conditioned upon, and will be governed by the acceptance of, these Terms. These Terms are incorporated into any Quote provided by Seller to Buyer. Buyer's order for any Products whether communicated to Seller verbally, in writing, by electronic data 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 or conditions 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 the Quote are offered for sale at the prices indicated in the Quote. Unless otherwise specifically stated in the 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 2020). All sales are contingent upon credit approval and full 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, and 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 carrier at Seller's facility. Unless otherwise agreed prior to shipment and for domestic delivery locations only, Seller will select and arrange, at Buyer's sole expense, the carrier and means of delivery. When Seller selects and arranges the carrier and means of delivery, freight and insurance costs for shipment to the designated delivery location will be prepaid by Seller and added as a separate line item to the invoice. Buyer shall be responsible for any additional shipping charges incurred by Seller due to Buyer's acts or omissions. Buyer shall not return or repackage any Products without the prior written authorization from Seller, and any return shall be at the sole cost and expense of Buyer.

**5. Warranty.** The warranty for 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 date of completion of the Services; 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: **EXEMPTION CLAUSE; DISCLAIMER OF WARRANTY, CONDITIONS, REPRESENTATIONS: THIS WARRANTY IS THE SOLE AND ENTIRE WARRANTY, CONDITION, AND REPRESENTATION, PERTAINING TO PRODUCTS. SELLER DISCLAIMS ALL OTHER WARRANTIES, CONDITIONS, AND REPRESENTATIONS, WHETHER STATUTORY, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THOSE RELATING TO 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. 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 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 INCLUDING ANY LOSS OF REVENUE OR PROFITS, 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. Confidential Information.** Buyer acknowledges and agrees that any technical, commercial, or other confidential information of Seller, including, without limitation, pricing, technical drawings or prints and/or part lists, which has been or will be disclosed, delivered or made available, whether directly or indirectly, to Buyer ("Confidential Information"), has been and will be received in confidence and will remain the property of Seller. Buyer further agrees that it will not use Seller's Confidential Information for any purpose other than for the benefit of Seller.

**9. Loss to Buyer's Property.** Any tools, patterns, materials, equipment or information furnished by Buyer or which are or become Buyer's property ("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 Buyer's Property. Furthermore, Seller shall not be responsible for any loss or damage to Buyer's Property while it is in Seller's possession or control.

**10. Special Tooling.** "Special Tooling" includes but is not limited to tools, jigs, fixtures and associated manufacturing equipment acquired or necessary to manufacture Goods. Seller may impose a tooling charge 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 the Special Tooling, even if such Special Tooling has been specially converted or adapted for manufacture of Goods for Buyer 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 owned by Seller in its sole discretion at any time.

**11. Security Interest.** To secure payment of all sums due from Buyer, 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 Seller's security interest.

**12. User Responsibility.** 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. Buyer must analyze all aspects of the application and follow applicable industry standards, specifications, and any technical information provided with the Quote or the Products, such as Seller's instructions, guides and specifications. If Seller provides options of or for Products based upon data or specifications provided by Buyer, 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 Buyer is not the end-user of the Products, Buyer will ensure such end-user complies with this paragraph.

**13. Use of Products, Indemnity by Buyer.** Buyer shall comply with all instructions, guides and specifications provided by Seller with the Quote or the Products. **Unauthorized Uses**. If Buyer uses or resells the Products in any way prohibited by 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. Further, 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, arising out of or in connection with: (a) improper selection, design, specification, application, or any misuse of Products; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller's use of patterns, tools, equipment, plans, drawings, designs, 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, tampering with or repackaging the Products; 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.

**14. Cancellations and Changes.** Buyer may not cancel or modify, including but not limited to movement of delivery dates for the Products, 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 and any additional expense. Seller, at any time, may change features, specifications, designs and availability of Products.

**15. Limitation on Assignment.** Buyer may not assign its rights or obligations without the prior written consent of Seller.

**16. Force Majeure.** Seller is not liable for delay or failure to perform any of its obligations by reason of events or circumstances beyond its reasonable control. Such circumstances include without limitation: accidents, labor disputes or stoppages, government acts or orders, acts of nature, pandemics, epidemics, other widespread illness, or public health emergency, delays or failures in delivery from carriers or suppliers, shortages of materials, war (whether declared or not) or the serious threat of same, riots, rebellions, acts of terrorism, fire or any reason whether similar to the foregoing or otherwise. Seller will resume performance as soon as practicable after the event of force majeure has been removed. All delivery dates affected by force majeure shall be tolled for the duration of such force majeure and rescheduled for mutually agreed dates as soon as practicable after the force majeure condition ceases to exist. Force majeure shall not include financial distress, insolvency, bankruptcy, or other similar conditions affecting one of the parties, affiliates and/or sub-contractors.

**17. Waiver and Severability.** Failure to enforce any provision of these Terms will not invalidate that provision; nor will any such failure prejudice either party's right to enforce that provision in the future. Invalidation of any provision of these Terms shall not invalidate any other provision herein and, the remaining provisions will remain in full force and effect.

**18. 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) becomes or is deemed insolvent, (c) appoints or has appointed a trustee, receiver or custodian for all or any part of Buyer's property, (d) files a petition for relief in bankruptcy on its own behalf, or one is filed against Buyer by a third party, (e) makes an assignment for the benefit of creditors; or (f) dissolves its business or liquidates all or a majority of its assets.

**19. 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.

**20. 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 Seller to 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 claims of infringement of Intellectual Property Rights.

**21. 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.

**22. 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 and purchase. 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.

**23. 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 Products from Seller in a manner or for a purpose that violates Export Laws or would cause Seller to be in violation of Export Laws. Buyer agrees to promptly and reliably provide Seller all requested information or documents, including end-user statements and other written assurances, concerning Buyer's ongoing compliance with Export Laws.

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PDE2589TCUK - V4 04/2023