numatics®

G3 Fieldbus

Electronics and I/O

www.numatics.com

EMERSON
Industrial Automation

numatics

Numatics, Inc. is a leading manufacturer of pneumatic products and motion control products. Our broad spectrum of standard, custom developed products and application components, have made a significant impact on pneumatic innovation as well as pneumatic and motion control technology. Our company has an extensive history of generating innovative concepts and technological breakthroughs. Many of today's standard features in pneumatic technology were industry firsts from Numatics. We continue our innovative approach to product development by developing electric motion control solutions and enhancing our embedded Fieldbus and I/O products to continually meet and solve our customer's application requirements.

Today Numatics is proud to be a part of the Industrial Automation Division of Emerson Electric Co.
Emerson (NYSE:EMR), based in St. Louis, Missouri (USA), is a global leader in bringing technology and engineering together to provide innovative solutions for customers in industrial, commercial, and consumer markets through its network power, process management, industrial automation, climate technologies, and appliance and tools businesses. For more information, visit www.Emerson.com.

EMERSON™
Industrial Automation

Table of Contents

G3 Fieldbus Electronics and I/O

G3 Fieldbus - Electronics Made Easy!

Innovative Graphic Display is used for easy commissioning, visual status & diagnostics.

Commissioning Capabilities

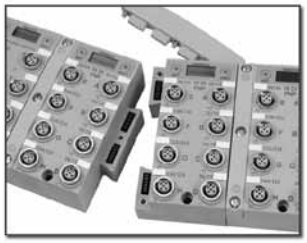
- Set network address (including IP & Subnet mask for Ethernet)
- Set baud rate
- Set auto or manual I/O sizes
- Set fault/idle output states
- Set brightness
- Set factory defaults

Visual Diagnostics

- Shorted and open load detection
- Shorted sensor/cable detection
- Low & missing power detection
- Missing module detection
- Self-test activation
- Log of network errors
- Distribution errors

Graphic Display for configuration & diagnostics


Auto Recovery Module


Highly Distributable


Easy, Robust Connections

G3 Fieldbus Communications Electronics

Why use Numatics Fieldbus communication electronics?

Modular Reality...

- No internal wiring simplifies assembly
- SPEEDCON M12 connector technology allows for fast and efficient ½ turn I/O connector attachment.
- Power connector allows output power to be removed while inputs and communication are left active.
- IP65 & IP67 protection
- Up to 1200 Input / 1200 Output capability with one communication node! (Present physical I/O combinations allows 1200 I / 544 O)
- 32 valve solenoids per manifold up to 17 manifolds per communication node!
- One node supports 16 I/O modules – Analog I/O, Digital I/O (NPN & PNP) and Specialty
- Innovative clip design allows easy module removal/replacement without dismantling manifold
- Auto Recovery Module (ARM) protects configuration information during a critical failure. Allows configuration information to be saved and reloaded to replacement module automatically.

Supported Protocols

- DeviceNet™
- DeviceNet™ w/Quick Connect
- DeviceNet™ w/DeviceLogix™
- Ethernet
- PROFIBUS®-DP
- CANopen®
- PROFINET®
- POWERLINK

CE

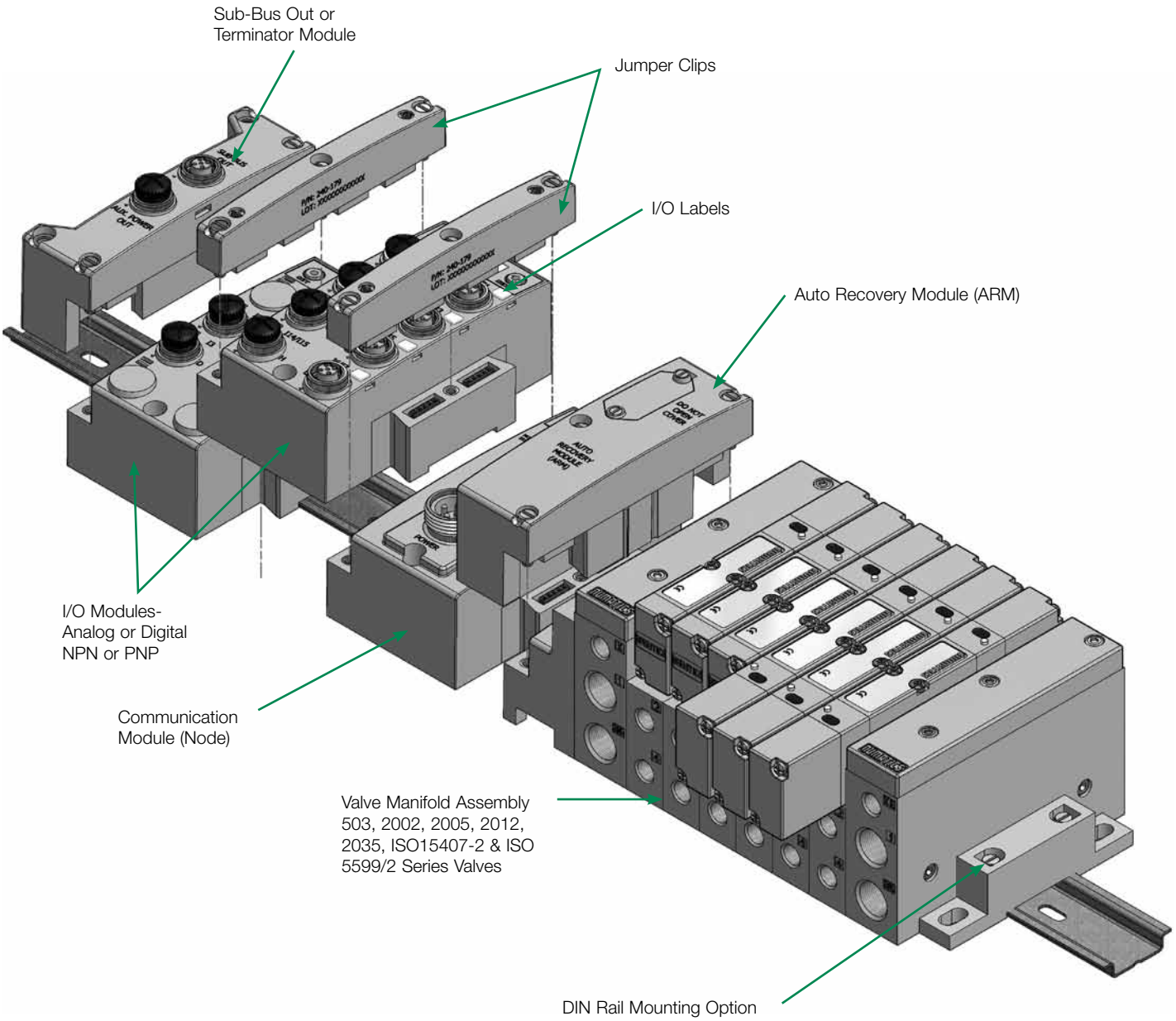
* Numatics I/O with SPEEDCON technology

- 1/2 turn for faster I/O connections
- Backwards compatible with standard M12 cables/connectors
- Meets the same IP/NEMA standards as M12/Micro cables/connectors
- Same cost as standard M12/Micro cables/connectors
- See pages 44 & 45 for cables with SPEEDCON connector technology

G3 Electronics Modularity

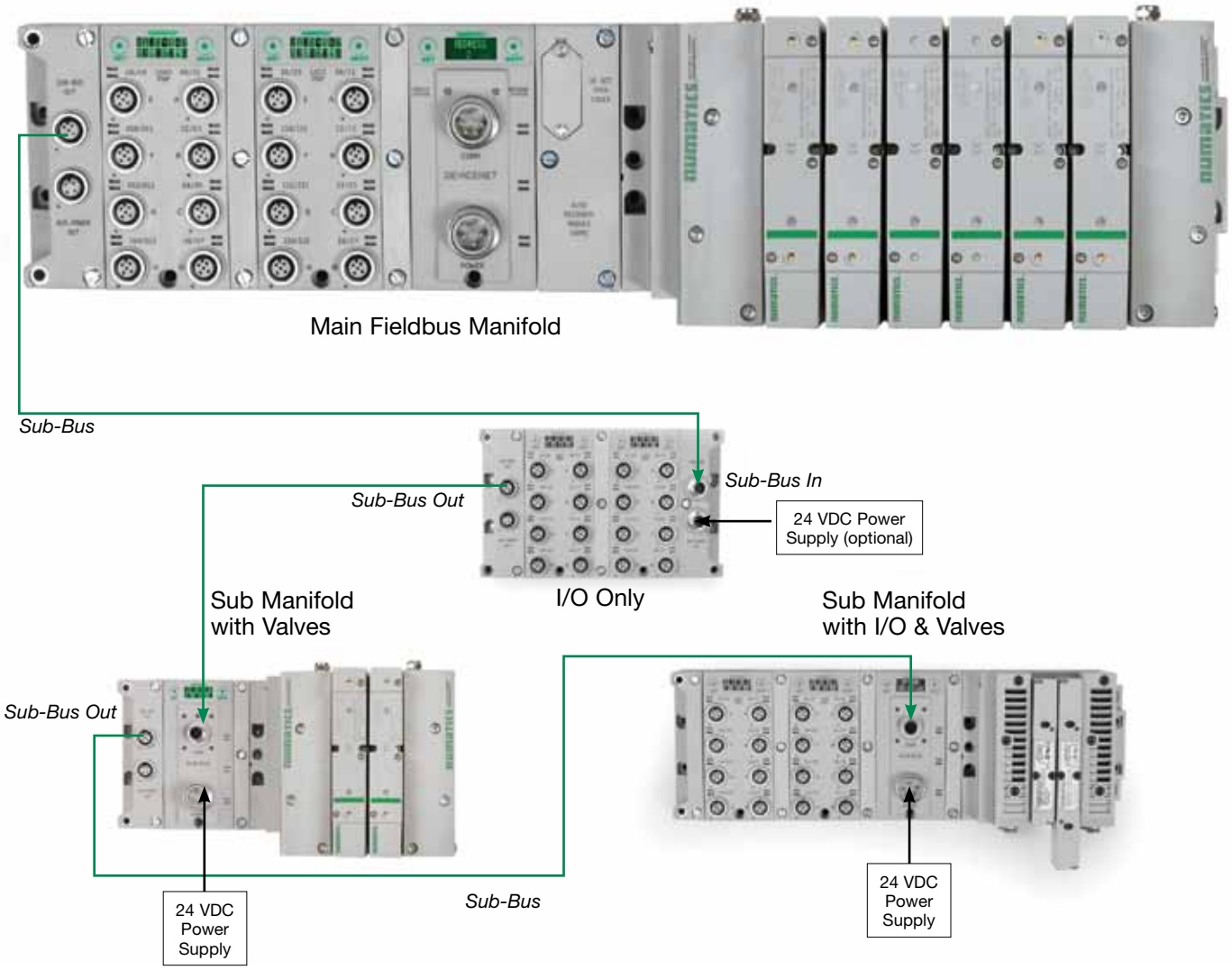
Discrete I/O

The G3 Series product line is a completely modular system. All of the G3 electronic modules plug together, via mechanical clips, allowing easy assembly and field changes. This makes the system highly distributable. Additional flexibility is incorporated because the same modules can be used in either centralized or distributed applications. The G3 electronics interfaces with the highly modular Numatics 503 Series, generation 2000 Series, ISO 5599/2 and ISO 15407-2 Series valve lines to further enhance the modularity and flexibility of the entire system.



G3 Platform Distribution Options

Easy, Cost Effective Solutions for Digital I/O and Valve Automation using G3 Electronics



- Unique distribution system allows system efficiency by allowing the same modules to be used in either centralized or distributed applications
- Distribution options include:
  Inputs OR Outputs
  Inputs AND Outputs
  Valves with Inputs AND Outputs
  Valves with Inputs OR Outputs
  Valves Only
- Maximum Sub-Bus length not to exceed 30 meters. Maximum Sub-Bus cable current not to exceed 4 amps or excessive cable voltage drops per segment. Auxiliary power connections available for currents above 4 amps. Consult factory for possible deviations.

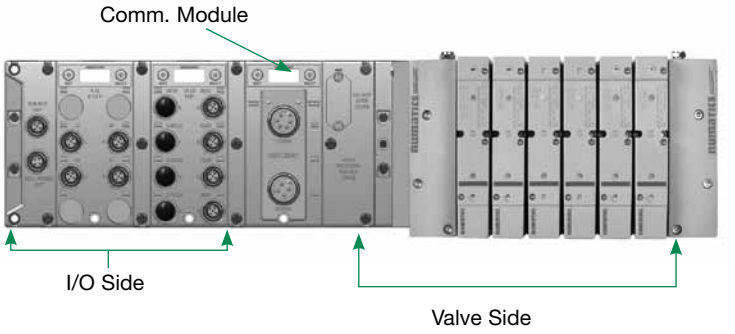
G3 Platform Distribution Options

The G3 platform is flexible to the point that there are a virtually infinite number of I/O distribution options using the few basic G3 modules. The following basic rules should be followed in the configuration of your control architecture.

Valve Side

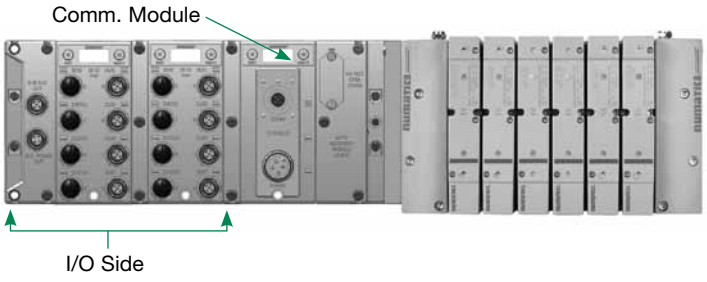
- Up to a total of 32 valve solenoids can be driven in a manifold assembly integrated into the Main Fieldbus Manifold. This can be any number of single or double solenoid valves with a total number of solenoids not to exceed 32.
- A Valve side output module is available. If a valve side output module is used, 16 outputs are allocated to the solenoids in the integral manifold and 16 are allocated to the output module in the manifold.

Typical Main Fieldbus Manifold



I/O Side Distribution

- A total of 16 modules can be integrated into the network and controlled by the main fieldbus communication module (Node)
- Modules include analog and digital I/O modules providing addressing capacity for up to 1200 Inputs / 1200 Outputs per node.
- Unique distribution system allows system efficiency by allowing the same modules to be used in either centralized or distributed applications
- Distribution options include Inputs only, Outputs only, I/O only, valves with Inputs, valves with Outputs and valves with I/O
- Configuration can include up to 16 of the following modules:
    - Digital I/O modules
    - Sub-Bus valve modules
    - Analog I/O modules



16 Modules can be supported on this side of the comm. module

DeviceNet™

DeviceNet™ is an open bus fieldbus communication system developed by Allen-Bradley based on Controller Area Network (CAN) technology. The governing body for DeviceNet™ is the Open DeviceNet™ Vendors Association (ODVA). The ODVA controls the DeviceNet™ specification and oversees product conformance testing.

Numatics' G3 nodes for DeviceNet™ have an integrated graphic display and are capable of addressing combinations of up to 1200 Outputs and 1200 Inputs.

They have been tested and approved for conformance by the ODVA.

More information about DeviceNet™ and the ODVA can be obtained from the following WEB site: www.odva.org

Description	Replacement Part Number
DeviceNet™ communications module (node)	240-180

Technical Data

Electrical Data	Voltage	Current
Node Power at Max. Brightness	24 VDC +/- 10%	0.070 Amps
BUS Power	11-25 VDC	0.025 Amps
Valves & Discrete I/O	24 VDC +/- 10%	8 Amps Maximum
Power Connector	Single key 4 pin 7/8" MINI type (male)	
Communication Connector	Single key 5 pin 7/8" MINI type (male)	
LED's	Module Status and Network Status	

Operating Data	
Temperature Range (ambient)	-10º to 115º F (-23º to +50ºC)
Humidity	95% relative humidity, non-condensing
Vibration / Shock	IEC 60068-2-27, IEC60068-2-6
Moisture Protection	IP65, IP67 (with appropriate assembly and termination)

Configuration Data	
Graphic Display	Display used for setting Node Address, Baud Rate, Fault / Idle Actions, DeviceNet™ QuickConnect and all other system settings.
ARM	(Auto Recovery Module) Optional module that contains automatic recovery of system setting in the event of total or partial system failure.
Maximum Valve-Solenoid Outputs	32
Maximum Addressable I/O Points	Various combinations of 1200 outputs and 1200 inputs

Network Data	
Supported Baud Rates	125K Baud, 250K Baud, 500K Baud, with Auto-Baud detection
Supported Connection Type	Polled, Cyclic, Change of State (COS) and combination Message Capability
Bus Connector	Single key 5 pin 7/8" MINI type (male)
Diagnostics	Power, short, open load conditions and module health are monitored
Special Features	Supports Auto-Device Replacement (ADR) and fail-safe device settings

Weight	
DeviceNet™ Communication Module	252g / 8.9 oz.

Ethernet (Ethernet/IP & Modbus TCP/IP)

Ethernet used throughout the world to network millions of PC's has now evolved into a viable industrial network. Ethernet is an open architecture high-level communication network that meets the demands of today's industrial applications requiring high-speed (10/100 Mbit/s), high-throughput and flexibility. Various application layers for this protocol including EtherNet/IP and Modbus TCP. Additionally, Ethernet technology can integrate an on-board Web server, which can make the node readily accessible to any standard Web browser for configuration, testing and even retrieval of technical documentation.

Numatics' G3 nodes for Ethernet have an integrated graphic display and are capable of addressing combinations of up to 1200 Outputs and 1200 Inputs.

The G3 Ethernet/IP nodes have been tested and approved for conformance by the ODVA.

More information about Ethernet/IP and the ODVA can be obtained from the following WEB site: www.odva.org

Description	Replacement Part Number
Ethernet/IP communications module (node)	240-181
Modbus TCP/IP communications module (node)	240-292

Technical Data

Electrical Data	Voltage	Current
Node Power at Max. Brightness	24 VDC +/- 10%	.091 Amps
Valves & Discrete I/O	24 VDC +/- 10%	8 Amps maximum
Power Connector	Single key 4 pin 7/8" MINI type (male)	
Communication Connector	D-coded 4 pin M12 type (female)	
LED's	Module Status, Network Status and Activity/Link	

Operating Data	
Temperature Range (ambient)	-10º to 115º F (-23º to +50ºC)
Humidity	95% relative humidity, non-condensing
Vibration / Shock	IEC 60068-2-27, IEC60068-2-6
Moisture Protection	IP65, IP67 (with appropriate assembly and termination)

Configuration Data	
Graphic Display	Display used for setting IP Address, Subnet mask, Fault / Idle Actions, DHCP / BootP and all other system settings.
ARM	(Auto Recovery Module) Optional module that contains automatic recovery of system setting in the event of total or partial system failure
Maximum Valve-Solenoid Outputs	32
Maximum Addressable I/O Points	Various combinations of 1200 outputs and 1200 inputs

Network Data	
Supported Baud Rates	10 Mbit / 100 Mbit
Bus Connector	D-coded 5 pin M12 type (female)
Diagnostics	Power, short, open load conditions and module health are monitored
Special Features	Integrated web server, fail-safe device settings, HTTP, FTP, and UNICAST (for EtherNet/IP)

Weight	
Ethernet Communication Module	255g / 9 oz.

PROFIBUS-DP®

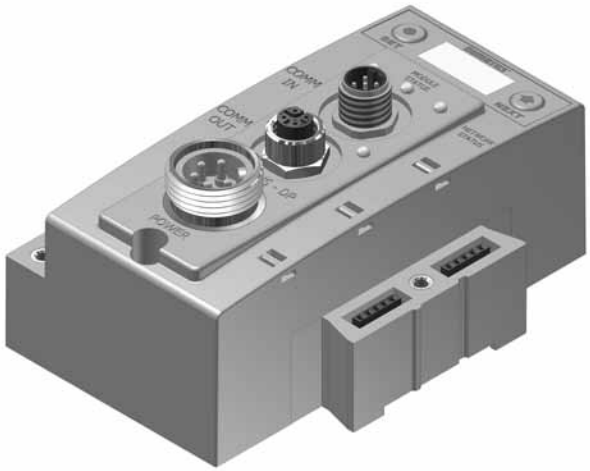
PROFIBUS-DP® is a vendor-independent, open fieldbus protocol designed for communication between automation control systems and distributed I/O at the device level.

Numatics' G3 nodes for PROFIBUS-DP® have an integrated graphic display and are capable of addressing combinations of up to 1200 Outputs and 1200 Inputs.

The G3 nodes for PROFIBUS-DP® have been designed and tested to conform to the PROFIBUS® standard EN50170. Certification has been done by the PROFIBUS® Interface Center (PIC) according to the guidelines determined by the PROFIBUS® Trade Organization (PTO). The certification process ensures interoperability for all PROFIBUS® devices.

More information regarding PROFIBUS® can be obtained from the following WEB site:

www.profibus.com



Description	Replacement Part Number
PROFIBUS-DP® communications module (node)	240-239

Technical Data

Electrical Data	Voltage	Current
Node Power at Max. Brightness	24 VDC +/- 10%	.094 Amps
Valves & Discrete I/O	24 VDC +/- 10%	8 Amps Maximum
Power Connector	Single key 5 pin 7/8" MINI type (male)	
Communication Connector	Single reverse key (B-Coded) 5 pin M12 type (1 male and 1 female)	
LED's	Module Status and Network Status	

Operating Data	
Temperature Range (ambient)	-10º to 115º F (-23º to +50ºC)
Humidity	95% relative humidity, non-condensing
Vibration / Shock	IEC 60068-2-27, IEC60068-2-6
Moisture Protection	IP65, IP67 (with appropriate assembly and termination)

Configuration Data	
Graphic Display	Display used for setting Node Address, Baud Rate, Fault / Idle Actions, and all other system settings.
ARM	(Auto Recovery Module) Optional module that contains automatic recovery of system setting in the event of total or partial system failure
Maximum Valve-Solenoid Outputs	32
Maximum Addressable I/O Points	Various combinations of 1200 outputs and 1200 inputs

Network Data	
Supported Baud Rates	125K Baud, 250K Baud, 500K Baud, with Auto-Baud detection
Bus Connector	Single key 5 pin 7/8" MINI type (male)
Diagnostics	Power, short, open load conditions and module health are monitored
Special Features	Supports Auto-Device Replacement (ADR) and fail-safe device settings

Weight	
PROFIBUS-DP® Communication Module	227g / 8 oz.

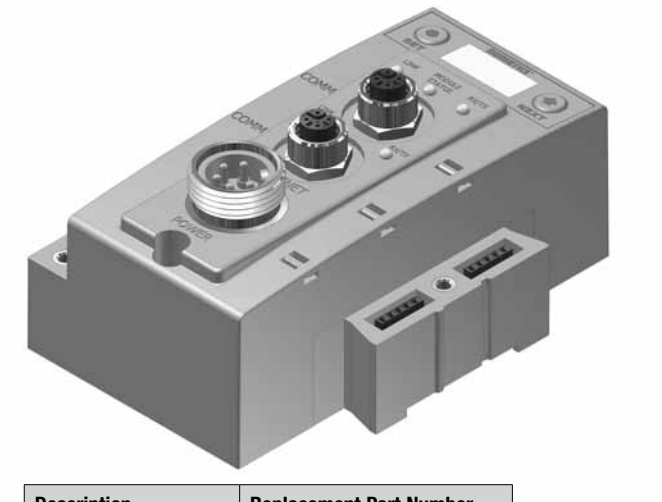
PROFINET®

PROFINET® is the innovative open standard for Industrial Ethernet, development by Siemens and the Profibus® User Organization (PNO). PROFINET® complies to IEC 61158 and IEC 61784 standards. PROFINET® products are certified by the PNO user organization, guaranteeing worldwide compatibility.

Numatics' G3 nodes for PROFINET IO (PROFINET RT) have an integrated graphic display and are capable of addressing combinations of up to 1200 Outputs and 1200 Inputs.

PROFINET® is based on Ethernet and uses TCP/IP and IT standards and complements them with specific protocols and mechanisms to achieve Real Time performance.

More information regarding PROFINET® can be obtained from the following WEB site:
www.profibus.com



Description	Replacement Part Number
PROFINET® communications module (node)	240-240

Technical Data

Electrical Data	Voltage	Current
Node Power at Max. Brightness	24 VDC +/- 10%	
Valves & Discrete I/O	24 VDC +/- 10%	8 Amps Maximum
Power Connector	Single key 5 pin 7/8" MINI type (male)	
Communication Connector	Two D-coded 4 pin M12 type (female)	
LED's	Module Status, Network Status and Activity/Link	

Operating Data	
Temperature Range (ambient)	-10° to 115° F (-23° to +50° C)
Humidity	95% relative humidity, non-condensing
Vibration / Shock	IEC 60068-2-27, IEC60068-2-6
Moisture Protection	IP65, IP67 (with appropriate assembly and termination)

Configuration Data	
Graphic Display	Display used for setting IP Address, Subnet Mask, Fault / Idle Actions, and all other system settings.
ARM	(Auto Recovery Module) Optional module that contains automatic recovery of system setting in the event of total or partial system failure.
Maximum Valve-Solenoid Outputs	32
Maximum Addressable I/O Points	Various combinations of 1200 outputs and 1200 inputs

Network Data	
Supported Baud Rates	10 Mbit / 100 Mbit
Bus Connector	Two D-coded 4 pin M12 type (2-Female)
Diagnostics	Power, short, open load conditions and module health and configuration are monitored
Special Features	Integrated web server, Integrated 2 port switch, fail-safe device settings, and FSU

Weight	
PROFINET® Communication Module	227g / 8 oz.

CANopen®

CANopen® is an open protocol based on Controller Area Network (CAN). It was designed for motion oriented machine control networks but has migrated to various industrial applications. CAN in Automation (CIA) is the international users' and manufacturers' organization that develops and supports CAN-based protocols. Numatics' G3 nodes for CANopen® have an integrated graphic display and are capable of addressing combinations of up to 1200 Outputs and 1200 Inputs.

More information regarding this organization can be found at: www.can-cia.org

Description	Replacement Part Number
CANopen® communications module (node)	240-291

Technical Data

Electrical Data	Voltage	Current
Node Power at Max. Brightness	24 VDC +/- 10%	0.070 Amps
BUS Power	11-25 VDC	0.025 Amps
Valves & Discrete I/O	24 VDC +/- 10%	8 Amps maximum
Power Connector	Single key 4 pin 7/8" MINI type (male)	
Communication Connector	Single key 5 pin 7/8" MINI type (male)	
LED's	Module Status and Network Status	

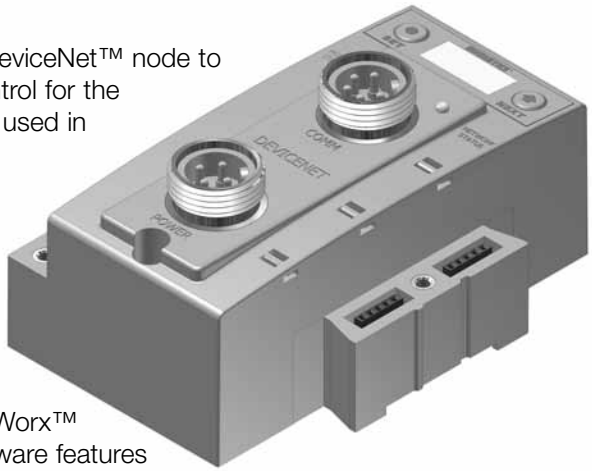
Operating Data	
Temperature Range (ambient)	-10° to 115° F (-23° to +50° C)
Humidity	95% relative humidity, non-condensing
Vibration / Shock	IEC 60068-2-27, IEC60068-2-6
Moisture Protection	IP65, IP67 (with appropriate assembly and termination)

Configuration Data	
Graphic Display	Display used for setting Node Address, Baud Rate, Fault / Idle Actions, and all other system settings.
ARM	(Auto Recovery Module) Optional module that contains automatic recovery of system setting in the event of total or partial system failure.
Maximum Valve-Solenoid Outputs	32
Maximum Addressable I/O Points	Various combinations of 1200 outputs and 1200 inputs

Network Data	
Supported Baud Rates	125K Baud, 250K Baud, 500K Baud, 1M Baud
Bus Connector	Single key 5 pin 7/8" MINI type (male)
Diagnostics	Power, short, open load conditions and module health are monitored and fail-safe device settings

Weight	
CANopen® Communication Module	252g / 8.9 oz.

DeviceLogix™



DeviceLogix™ is a Rockwell Automation technology that allows a DeviceNet™ node to be programmed to execute a sequence independently from the control for the main PLC/IPC. A DeviceLogix™ enabled DeviceNet™ node can be used in conjunction with a standard DeviceNet™ network, providing simple distributed control functionality. Additionally it can also be used in a standalone application, without a network connection or PLC/IPC, to sequence pneumatic valves and control I/O. Numatics has integrated this licensed technology into its DeviceNet™ compatible valve manifold series, which combine the functionality of a modular pneumatic valve system with integrated I/O.

Programming of the DeviceLogix™ enabled node is done using the industry standard DeviceNet™ commissioning software tool RSNetWorx™ for DeviceNet™ from Rockwell Automation. The programming software features an easily understandable graphics environment where the users can simply “drag and drop” logic function blocks (i.e. AND, NAND, OR, NOR, XOR, XNOR, RS LATCHES, COUNTERS and TIMERS) onto a page and interconnect them to develop the required sequence, or ladder logic programming can be used to develop a sequence. The programmed sequence is downloaded to the node via standard DeviceNet™ communication connection, thus multiple nodes can be programmed on the same network.

Description	Replacement Part Number
DeviceLogix™ communications module (node)	240-293

Technical Data

Electrical Data	Voltage	Current
Node Power at Max. Brightness	24 VDC +/- 10%	0.070 Amps
BUS Power	11-25 VDC	0.025 Amps
Valves & Discrete I/O	24 VDC +/- 10%	8 Amps Maximum
Power Connector	Single key 4 pin 7/8” MINI type (male)	
Communication Connector	Single key 5 pin 7/8” MINI type (male)	
LED's	Module Status and Network Status	

Operating Data	
Temperature Range (ambient)	-10º to 115º F (-23º to +50º C)
Humidity	95% relative humidity, non-condensing
Vibration / Shock	IEC 60068-2-27, IEC60068-2-6
Moisture Protection	IP65, IP67 (with appropriate assembly and termination)

Configuration Data	
Communication Module	Display used for setting Node Address, Baud Rate, Fault / Idle Actions, and all other system settings.
ARM	(Auto Recovery Module) Optional module that contains automatic recovery of system setting in the event of total or partial system failure including embedded DeviceLogix™ logic instructions.
Maximum Valve-Solenoid Outputs	32

Network Data	
Supported Baud Rates	125K Baud, 250K Baud, 500K Baud, with Auto-Baud detection
Supported Connection Type	Polled, Cyclic, Change of State (COS) and combination Message Capability
Bus Connector	Single key 5 pin 7/8” MINI type (male)
Diagnostics	Power, short, open load conditions and module health are monitored and fail-safe device settings
Special Features	Supports function block diagram and ladder logic programming

Weight	
DeviceLogix™ Communication Module	252g / 8.9 oz.

Ethernet POWERLINK®

ETHERNET POWERLINK

Ethernet POWERLINK is an open fieldbus protocol designed by B&R for communication between automation control systems and distributed I/O at the device level.

Numatics' G3 Ethernet POWERLINK nodes have an integrated graphic display and are capable of addressing combinations of up to 512 Inputs / Outputs.

The G3 Ethernet POWERLINK nodes have been designed and tested to conform to the Ethernet POWERLINK specifications available at EPSG group (Ethernet Powerlink Standardization Group).
The certification process ensures interoperability for all Ethernet POWERLINK devices and compatible with B&R systems.

More information regarding Ethernet POWERLINK can be obtained from the following WEB site.
www.ethernet-powerlink.org

Description	Replacement Part Number
POWERLINK® communications module (node)	240-309

Technical Data

Electrical Data	Voltage	Current
Node Power at Max. Brightness	24 VDC +/- 10%	
Valves & Discrete I/O	24 VDC +/- 10%	8 Amps maximum
Power Connector	Single key 5 pin 7/8" MINI type (male)	
Communication Connector	Two D-coded 4 pin M12 type (female)	
LED's	Module Status, Network Status and Activity/Link	

Operating Data	
Temperature Range (ambient)	-10° to 115° F (-23° to +50° C)
Humidity	95% relative humidity, non-condensing
Vibration / Shock	IEC 60068-2-27, IEC60068-2-6
Moisture Protection	IP65, IP67 (with appropriate assembly and termination)

Configuration Data	
Graphic Display	Display used for setting IP Address, Subnet Mask, Fault / Idle Actions, and all other system settings.
ARM	(Auto Recovery Module) Optional module that contains automatic recovery of system setting in the event of total or partial system failure.
Maximum Valve-Solenoid Outputs	32
Maximum Addressable I/O Points	Various combinations of 1200 outputs and 1200 inputs

Network Data	
Supported Baud Rates	10 Mbit / 100 Mbit
Bus Connector	Two D-coded 4 pin M12 type (2-Female)
Diagnostics	Power, short, open load conditions and module health and configuration are monitored
Special Features	Integrated web server, Integrated 2 port switch and fail-safe device settings

Weight	
POWERLINK® Communication Module	227g / 8 oz.

EtherCAT®

EtherCAT® is an open ethernet based fieldbus protocol developed by Beckhoff. EtherCAT® sets new standards for real-time performance and topology flexibility with short data update/cycle times and low communication jitter.

Numatics' G3 EtherCAT® node has an integrated graphic display for simplified commissioning and diagnostics. It is capable of addressing combinations of up to 1200 outputs and 1200 inputs.

The G3 nodes for EtherCAT® have been designed and tested to conform with EtherCAT® specifications set forth by the ETG.

More information regarding EtherCAT® can be obtained from the following web site:
www.ethercat.org

Description	Replacement Part Number
EtherCAT® communications module	240-310

Technical Data

Electrical Data	Voltage	Current
Node Power at Max. Brightness Valves and Discrete I/O	24 VDC +/- 10% 24 VDC +/- 10%	8 Amps Maximum
Power Connector	Single key 5 pin 7/8" MINI type (male)	
Communication Connector	Two D-coded 4 pin M12 type (female)	
LED's	Module Status, Network Status and Activity /Link	

Operating Data	
Temperature Range	-10º to 115º F (-23º to +50º C)
Humidity	95% relative humidity, non-condensing
Vibration / Shock	IEC 60068-2-27, IEC 60068-2-6
Moisture	IP65, IP67 (with appropriate assembly and termination)

Configuration Data	
Graphic Display	Display used for setting IP address, Subnet Mask, Fault / Idle Actions, and all other system settings.
ARM	(Auto Recovery Module) Optional module that contains automatic recovery of system settings in the event of total or partial system failure.
Maximum Valve Solenoid Outputs	32
Maximum Sub-Bus I/O Points	Various combinations of 1200 outputs and 1200 inputs

Network Data	
Supported Baud Rates	10 Mbit / 100 Mbit
Bus Connector	Two D-coded 4 pin M12 type (female)
Diagnostics	Power, short, open load conditions and module health and configuration are monitored
Special Features	Integrated web server, fail-safe device settings.

Weight	
EtherCAT® communications module	227g / 8 oz

EtherNet/IP DLR

EtherNet/IP used throughout the world to network millions of PC's has now evolved into a viable industry network. EtherNet/IP is an open architecture high-level communication network that meets the demands of today's industrial applications requiring high-speed (10/100 Mbit/s), high-throughput and flexibility. Additionally, EtherNet/IP technology can integrate an on-board Web server, which can make the node readily accessible to any standard Web browser for configuration, testing and even retrieval of technical documentation.

Description	Replacement Part Number
EtherNet/IP DLR communications module (node)	240-325

Numatics' G3 EtherNet/IP DLR (Device Level Ring) node with integrated display, has an embedded switch which allows the unit to be used in simplified networks with linear topology configurations (daisy chain). This technology alleviates the need for an external Ethernet switch device in a single subnet configuration. Additionally, the DLR compatibility allows the node to be used in a fault tolerant "ring" network, when using appropriate EtherNet/IP DLR scanners. DLR configuration allows communication recovery from a single point failure on the network ring (e.g. failed network connection or cable).

Numatics G3 EtherNet/IP nodes are capable of addressing combinations of up to 1200 Outputs and 1200 Inputs.

The G3 EtherNet/IP nodes have been tested and approved for conformance by the ODVA

More information about EtherNet and the ODVA can be obtained from the following WEB site:
Open Device Vendors Association (ODVA) www.odva.org

Technical Data

Electrical Data	Voltage	Current
Node Power at Max. Brightness Valves and Discrete I/O	24 VDC +/- 10% 24 VDC +/- 10%	8 Amps Maximum
Power Connector	Single key 4 pin 7/8" MINI type (male)	
Communication Connector	Two D-coded 4 pin M12 type (female)	
LED's	Module Status, Network Status and Activity / Link	

Operating Data	
Temperature Range	-10° to 115° F (-23° to +50° C)
Humidity	95% relative humidity, non-condensing
Vibration / Shock	IEC 60068-2-27, IEC 60068-2-6
Moisture	IP65, IP67 (with appropriate assembly and termination)

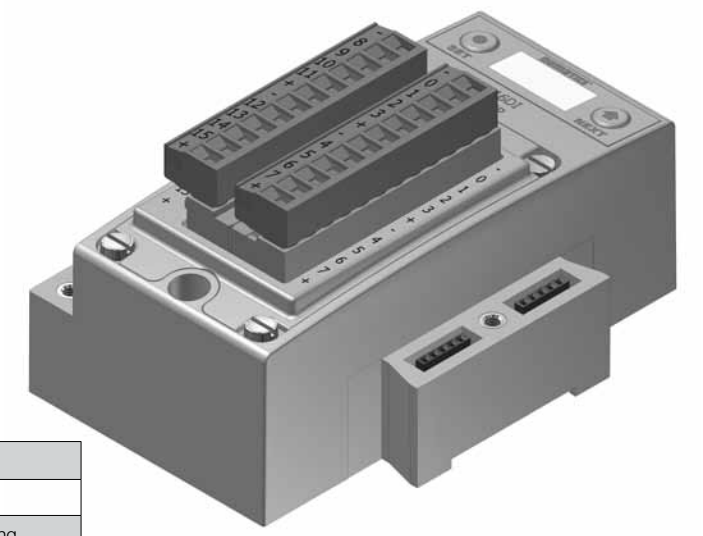
Configuration Data	
Graphic Display	Display used for setting IP address, Subnet Mask, Fault / Idle Actions, and all other system settings.
ARM	(Auto Recovery Module) Optional module that contains automatic recovery of system settings in the event of total or partial system failure.
Maximum Valve Solenoid Outputs	32
Maximum Sub-Bus I/O Points	Various combinations of 1200 outputs and 1200 inputs

Network Data	
Supported Baud Rates	10 Mbit / 100 Mbit
Bus Connector	Two D-coded 4 pin M12 type (female)
Diagnostics	Power, short, open load conditions and module health and configuration are monitored
Special Features	Embedded two port switch, Device Level Ring (DLR) compatibility, Linear network topology, Quick Connect capability, fail-safe device settings, integrated web server, HTTP, TFTP, UNICAST

Weight	
EtherCAT® communications module	227g / 8 oz

I/O Modules

Digital Inputs -Terminal Strip Modules



Description	Part Number
16 PNP Inputs	240-203
16 NPN Inputs	240-204

Technical Data

Operating Data	
Temperature Range (ambient)	-10° to 115° F (-23° to +50° C)
Humidity	95% relative humidity, non-condensing
Vibration / Shock	IEC 60068-2-27, IEC60068-2-6
Wire Range	12 to 24 AWG
Strip Length	7 mm
Tightening Torque	0.5 Nm
Moisture Protection	IP20

Spare Parts	
Replacement Terminal Strip (I/O 0-7)	140-1073
Replacement Terminal Strip (I/O 8-15)	140-1074
Keying Element for terminal strip	140-1076
Keying Element for Module	140-1077

Weight	
Input Module	292g / 10.3 oz.

Output Module -Valve Side-Single 25 Pin Sub D

Description	Part Number
16 PNP Inputs	239-1713

Technical Data

Operating Data	
Temperature Range (ambient)	-10° to 115° F (-23° to +50° C)
Humidity	95% relative humidity, non-condensing
Vibration / Shock	IEC 60068-2-27, IEC60068-2-6
Moisture Protection	IP20

Spare Parts	
Cover Gasket	140-1073
Interface Gasket	140-1074

Weight	
Valve side output module	590g / 21 oz.

I/O Modules

Digital I/O 5-pin M12 Modules

Description	Part Number
Inputs	
8 PNP Inputs	240-206
8 NPN Inputs	240-210
16 PNP Inputs	240-205
16 NPN Inputs	240-209
Outputs	
8 PNP Outputs	240-208
8 PNP High Current Outputs (Fig. A Only)	240-300
16 PNP Outputs	240-207
Inputs and Outputs	
8 PNP Inputs and 8 PNP Outputs	240-211

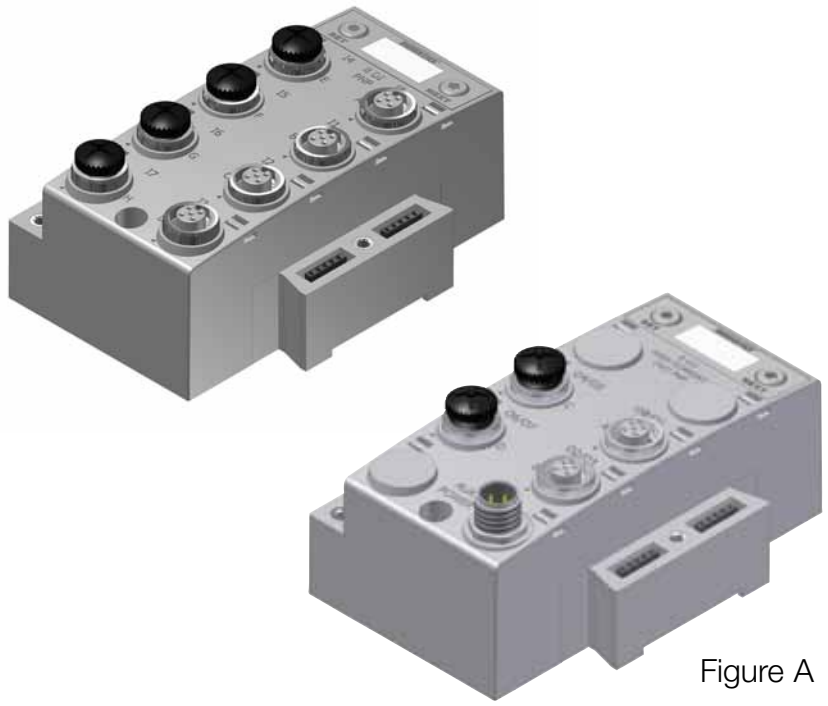


Figure A

Analog I/O with settable high and low alarms 5-pin M12 Modules

Description	Signal Type	Part Number
Inputs		
4 Analog Inputs	0-10 VDC	240-212
4 Analog Inputs	4-20 mA	240-214
Inputs and Outputs		
2 Analog Inputs & 2 Analog Outputs	0-10 VDC	240-213
2 Analog Inputs & 2 Analog Outputs	4-20 mA	240-215
2 Analog Inputs & 2 Analog Outputs High Current for Sentronic Devices	0-10 VDC	240-307

Technical Data

Operating Data	
Temperature Range (ambient)	-10° to 115° F (-23° to +50° C)
Humidity	95% relative humidity, non-condensing
Vibration / Shock	IEC 60068-2-27, IEC60068-2-6
Moisture Protection	IP65, IP67 (with appropriate assembly and termination)
Connector	Female 5-pin M12 SPEEDCON
Resolution	16 bit

Weight	
I/O Module-Analog	244g / 8.6 oz
I/O Module-Digital	274g / 9.7 oz

Dust Cover - M12 Male
230-647

G3 RTD Temperature Module

The RTD module is for use with RTD (Resistive Temperature Detectors), supporting up to four RTD devices simultaneously. The module supports various RTD types including: Pt100, Pt200, Pt500, Pt1000, Ni100 and Ni1000.

Technical Data

Electrical Data	
Voltage	24 VDC Module Supply (Via G3 System Aux. Power Connection)
Input Type	RTD (Resistive Temperature Detector), 4 per Module
Supported Sensor Type	Pt100, Pt200, Pt500, Pt1000, Ni100, Ni1000
Supported Temperature Coefficients	.00385; .00392; ….Ω/Ω/°C
Resolution	15 bits plus sign.
Data Format	Signed Integer
Calibration	Factory Calibrated Field Calibration w/ high tolerance (± .005%) 100 ohm and 350 ohm resistors.
Input Update (filter) Rate	Adjustable (5-20mS), factory default: 5ms
Accuracy	0.1% of full scale @ 25° C

Mechanical Data	
I/O Connector	M12 4 Pin Female (Accepts 5 Pin)
Mass	247g / 8.7 oz

Operating Data	
Temperature Range	-10º to 115º F (-23º to 46º C)
Humidity	95% relative humidity: non-condensing
Ingress Protection	IP65 (with appropriate assembly and terminations)

240- 317 G3 [Ex ia] NAMUR Input Module

The [Ex ia] module is for use with NAMUR certified intrinsically safe (IS) sensors.

Technical Data

Electrical Data	
Voltage	24 VDC Module Supply Sensor Supply = 8.2 VDC Nominal
Input Type NC (Normally Closed)	NAMUR Signal Current (0) ≥ 2.1 mA Signal Current (1) ≤ 1.2 mA Short Circuit Monitoring < 100 Ω Open/Broken Wire Detection < 0.05 mA
Safety Parameter Output Maximums	Uo ≤ 9.6 V Io ≤ 13 mA Po ≤ 31 mW
Diagnostics	Open (broken wire) and Short Circuit

Certification	
Module Marking (ATEX)	Ex II(1)GD [Ex ia Ga] IIC [Ex ia Da] IIIC

Mechanical Data	
I/O Connector	M12 4 Pin Female (Compatible with 5 Pin)
Mass	284g / 10.0 oz

Operating Data	
Temperature Range	-10º to 115º F (-23º to 46º C)
Humidity	95% relative humidity: non-condensing
Ingress Protection	IP65 (with appropriate assembly and terminations)

Sub-Bus Modules

Sub-Bus Valve Module

Provides Sub-Bus In and Aux. Power In connections to a distributed valve manifold

Description	Part Number	Weight
Sub-Bus Valve Module	240-241	235g / 8.3 oz

Sub-Bus Out Module

Provides Sub-Bus Out and Aux. Power Out connections for I/O distribution

Description	Part Number	Weight
Sub-Bus Out Module with DIN Rail Clips	240-244	141g / 5.0 oz
Sub-Bus Out Module	240-183	130g / 4.6 oz

Dust Cover - M12 Male
230-647

Sub-Bus In Module

Provides Sub-Bus In and Aux. Power In connections for I/O distribution

Description	Part Number	Weight
Sub-Bus In Module with DIN Rail Clips	240-246	141g / 5.0 oz
Sub-Bus In Module	240-185	130g / 4.6 oz

Dust Cover - M12 Female
230-1200

Miscellaneous Modules

Auto Recovery Module (ARM)

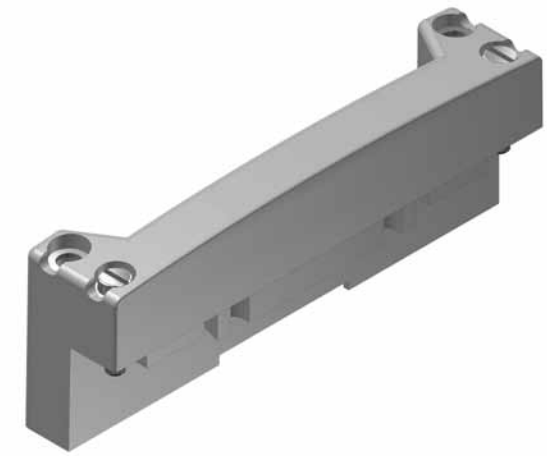
Protects configuration information during a critical failure. Allows configuration information to be saved and reloaded to replacement module automatically.

Description	Part Number	Weight
ARM Module	240-182	127g / 4.5 oz

Terminator Module

Provides termination for the sub-bus. Must be installed after the last I/O module or after the communication module if there are no I/O modules installed.

Description	Part Number	Weight
Terminator Module w/ DIN Rail Clips	240-245	102g / 3.6 oz
Terminator Module	240-184	91g/ 3.2 oz



Jumper Clip

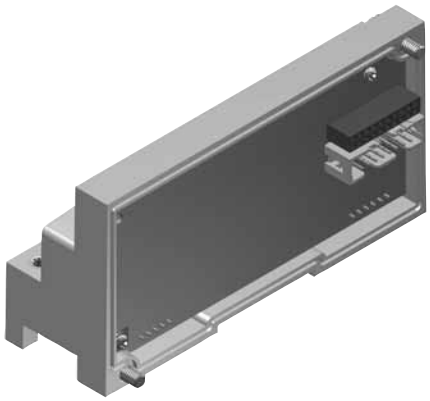
Provides electrical connections between modules

Description	Part Number	Weight
Jumper Clip	240-179	45g / 1.6 oz

Miscellaneous Modules

Valve Driver Module

Provides connections between the communication module or Sub-Bus valve module and the valve manifold



Generation 2000, ISO 5599/2 and ISO 15407-2 Series

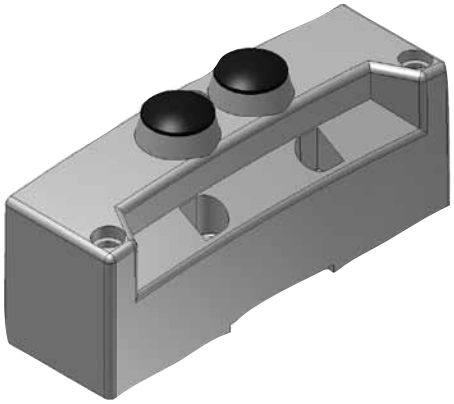
Description	Part Number	Weight
Valve Driver Module w/ DIN Rail Clips	219-858	147g / 5.2 oz
Valve Driver Module	219-828	136g / 4.8 oz

503 Series

Description	Part Number
Valve Driver Module	P599AE425188001
Valve Driver Module w/ DIN Rail Clips	P599AE425188002

Right Hand Mounting Cover

Used when a communication module is used without local valves installed



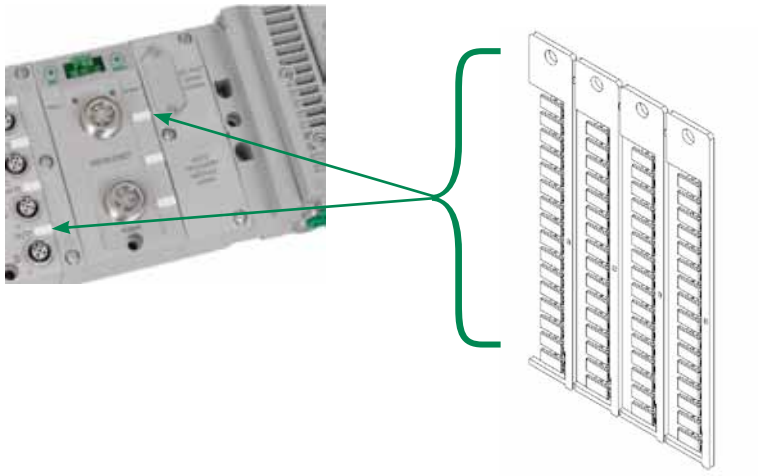
Description	Part Number	Weight
Right Hand Mounting Cover w/ DIN Rail Clips	240-290	82g / 2.9 oz.
Right Hand Mounting Cover	240-255	71g / 2.5 oz.

* Not for use in combination with ARM Module

Accessories

For use with Murrplastik© Type 20 Software

Labels - 122-1251

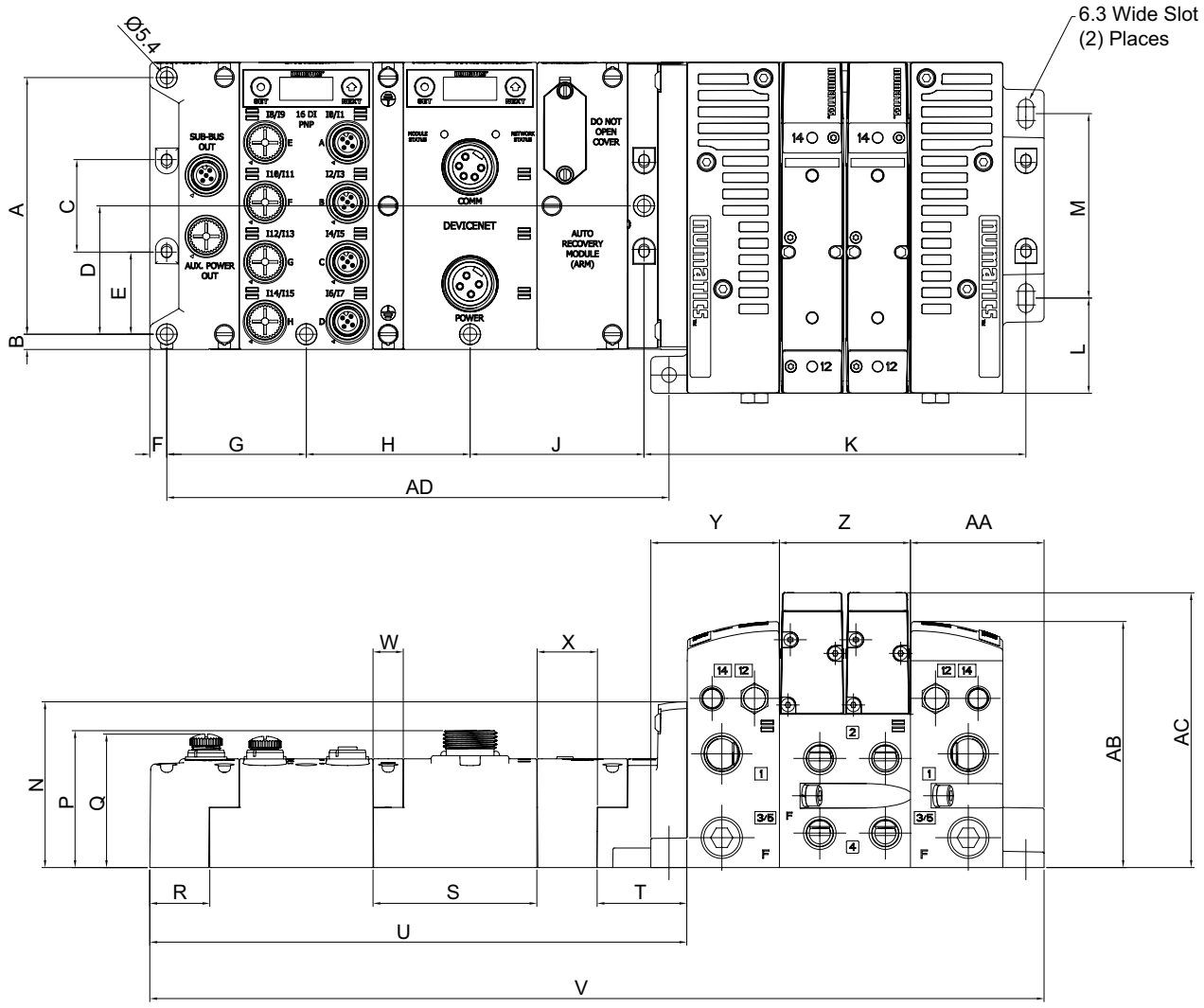


Technical Data	
Material	Polycarbonate (PC)
Color	White
Temperature Range	40° - 140° C
Label Dimensions	0.19" x 0.39"
Label - Printable Area	0.19" x 0.39"

Dimensions: mm (Inches)

Dimensional Drawing - G3 Fieldbus Manifold Assembly

503 Series Valve Manifold Assembly with G3 Electronics and Sub-Bus Output



A	B	C	D	E	F	G	H	J	K	L	M	N	P
105.5 (4.154)	6.3 (0.248)	38 (1.5)	52.8 (2.08)	33.8 (1.33)	7 (0.28)	57.5 (2.264)	67.5 (2.66)	71.7 (2.82)	–	39.1 (1.54)	75.8 (2.984)	68.1 (2.68)	56.3 (2.217)

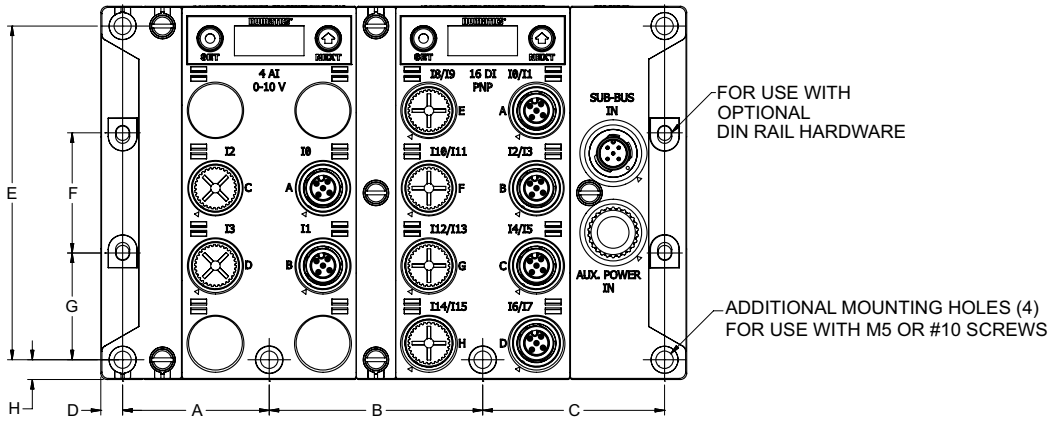
Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD
54 (2.13)	24.8 (0.98)	67.5 (2.66)	36.9 (1.45)	221.3 (8.713)	368.6 (14.51)	12.5 (0.49)	24.8 (0.976)	53 (2.087)	–	55.1 (2.17)	101.1 (3.98)	112.9 (4.445)	207 (8.2)

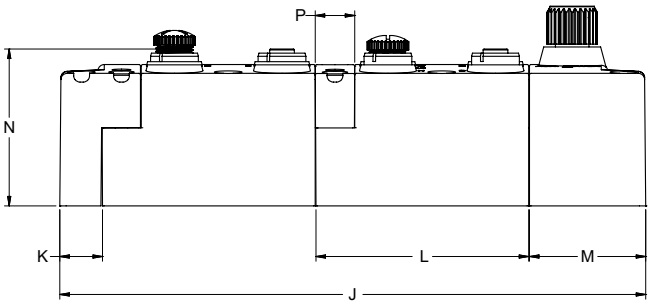
* - For valve manifold dimensions refer to Valve Series product catalogs

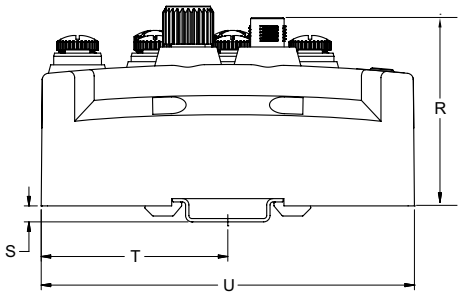
Dimensions: Inches (mm)

Dimensional Drawing - G3 Fieldbus I/O Assembly

I/O Assembly with G3 Electronics and Sub-Bus Input







VIEW SHOWN WITH OPTIONAL DIN RAIL HARDWARE AND 35mm DIN RAIL

A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U
1.82 (46.35)	2.66 (67.50)	2.26 (57.50)	0.27 (6.90)	4.15 (105.50)	1.50 (38.00)	1.33 (33.75)	0.25 (6.25)	7.29 (185.25)	0.53 (13.50)	2.65 (67.25)	1.45 (36.75)	2.13 (54.00)	0.49 (12.50)	2.46 (62.50)	0.20 (5.05)	2.32 (59.00)	4.65 (118.00)

Manifold Assembly How to Order

8 503 A V 3 B 2 0 0 V A00

Port Type
8 = NPTF[1]
G = ISO228/1-G[1]
K = Push-in Fittings

Product Series
503 = 26 mm Valve

Revision
A = Initial Release

Product Type
V = Valve Manifold Assembly

Electronics
3 = G3 Fieldbus Electronics

Number of Valve Stations

B = 2	N = 18	Z = 26
D = 4	P = 20	3 = 28
F = 6	R = 22	5 = 30
H = 8	T = 24	7 = 32
J = 10	V = 26	
L = 12	X = 28	

Options
A00 = Standard (No Options)
MUF = Muffler in End Plates
DRM = DIN Rail Mount
DWM = DIN Rail with MUF
14X = External Pilot Supply from Port # 14
D12 = (14X) External Pilot Supply from Port # 14 and (MUF) Muffler in End Plates
D14 = (14X) External Pilot Supply from Port # 14 and (DRM) DIN Rail Mount
F06 = (14X) External Pilot Supply from Port # 14, (MUF) Muffler in End Plates, and (DRM) DIN Rail Mount

End Plate Style
V = Vertical

End Plate Port Size
2 = 1/4
3 = 3/8
H = 8 mm
K = 10 mm

[1] Port Type '8' + 'G' only available in Port Size 3/8

How To Order

G3 Assembly Kit

A K 3 E D 0 0 0 0 3 L STD

Electrical / Electronic Type & Location
3 = G3 Electronics

Valve Series*
0 = N/A
6 = 2002 - 02/R2
E = 2005
G = 2012
B = 2035
W = ISO 15407-2 18 mm
X = ISO 15407-2 26 mm
Q = ISO 5599/2 Size 1
R = ISO 5599/2 Size 2
S = ISO 5599/2 Size 3

Number of Valve Stations

A = 1	I = 9	Q = 17	Y = 25
B = 2	J = 10	R = 18	Z = 26
C = 3	K = 11	S = 19	2 = 27
D = 4	L = 12	T = 20	3 = 28
E = 5	M = 13	U = 21	4 = 29
F = 6	N = 14	V = 22	5 = 30
G = 7	O = 15	W = 23	6 = 31
H = 8	P = 16	X = 24	7 = 32

Special Options
STD = Standard
DRM = DIN Rail Mounting - Not available w/2035 and ISO 5599/2
MUF = Muffler - Not available with ISO 5599/2
DW M= DIN Rail w/ Muffler - Not available w/2035 and ISO 5599/2

End Plate Port Type
L = Push-In Fitting
N = NPTF Pressure Ports (NPTF Conduit Ports if Applicable)
G = ISO 228/1-G Tap Pressure Ports (ISO 228/1-G Conduit Ports if Applicable)

End Plate Port Size
2 = 1/4
3 = 3/8
4 = 1/2
6 = 1
H = 8 mm (5/16)
K = 10 mm
X = Two or more valve groups resulting in different standard end plate port sizes.

*For manifold assembly with multiple valve series - Consult Factory

How To Order

G3 Electronics

G3 EP1 00 R 0 STD

Electronics Protocols
CO1 = CANopen
DL1 = Device Logix
DN1 = DeviceNet
EC1 = EtherCAT
ED1 = EtherNet/IP DLR
EM1 = Ethernet Modbus - TCP
EP1 = EtherNet/IP
PL1 = Ethernet POWERLINK
PT1 = PROFIBUS-DP
PN1 = PROFINET
DS2 = Sub-Bus Valve Manifold
DS3 = Sub-Bus I/O Assembly

Number of I/O Modules
00 = 0
01 = 1
02 = 2
03 = 3
04 = 4
05 = 5
06 = 6
07 = 7
08 = 8
09 = 9
10 = 10
11 = 11
12 = 12
13 = 13
14 = 14
15 = 15
16 = 16

Special Options
STD = Standard
DRM = DIN Rail Mounting
E23 = Fieldbus assembly without valves
E28 = Valve Side 25 pin Sub D NPN outpu module
E40 = Auto Recovery Module

G32 = DRM-DIN Rail Mounting
E40-Auto Recovery Module

G33 = DRM-DIN Rail Mounting
E28-Valve Side 25 pin Sub D NPN output module

G34 = E28-Valve Side 25 pin Sub D NPN output module
E40-Auto Recovery Module

G36 = E23-Fieldbus assembly without valves
DRM-DIN Rail Mounting

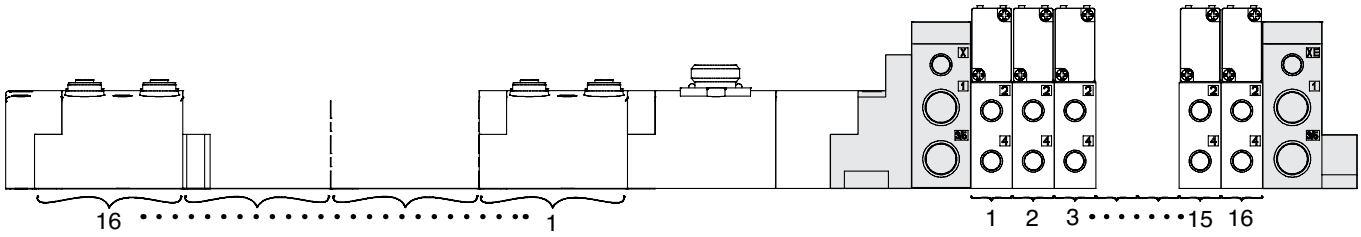
J32 = DRM-DIN Rail Mounting
E28-Valve Side 25 pin Sub D NPN output module
E40-Auto Recovery Module

Modification
0 = Initial Release

Left Mounting
D = w/ Sub-Bus Out
R = w/ Terminating Resistor

Ordering Valve Manifold Assemblies with G3 Electronics & Discrete I/O

For valve series 2002, 2005, 2012, 2035, ISO 15407-2 & ISO 5599/2 (2005 shown)



Shaded components are described by the assembly kit (AK) model number (see page 24). The communication module and number of I/O modules are described by the Electronic Interface (G3) model number designation (see page 24).

Each valve station is listed in sequential order from left to right when facing the port side of the manifold as shown.

Each discrete I/O module is listed in sequential order from RIGHT to LEFT starting from the communication module as shown.

NOTE:

1. A total of 32 solenoid outputs are available. Either 32 single solenoid valves or 16 double solenoid valves or any combination of singles and doubles not to exceed 32 outputs can be specified.

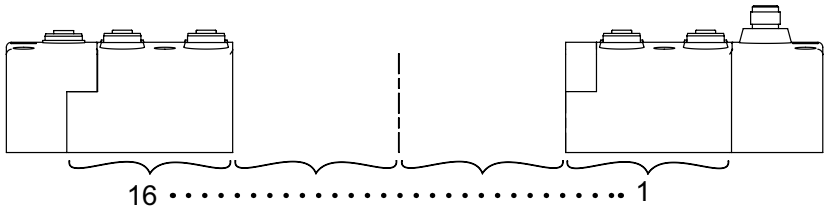
2. For manifold assemblies that exceed 16 solenoids, the assembly MUST be configured so that an even number of solenoids are utilized prior to the station using the ribbon cable feature. The 16th and the 17th solenoids cannot be on the same valve.

Example Order - 2005 Shown

Assy Kit	AK3EP00003LMUF
Station 1	052BB4Z2ML00061
Station 2	052BB4Z2ML00061
Station 3	052BB4Z2ML00061
Station 4	052BB4Z2ML00061
Station 5	052BB4Z2ML00061
Station 6	052BB4Z2ML00061
Station 7	052BB4Z2ML00061
Station 8	052BB4Z2ML00061
Station 9	052BB4R2ML00061
Station 10	052BB4Z2ML00061
Station 11	052BB4Z2ML00061
Station 12	052BB4Z2ML00061
Station 13	052BB4Z2ML00061
Station 14	052BB4Z2ML00061
Station 15	052BB4Z2ML00061
Station 16	052BB4Z2ML00061
Electronics	G3DN116R0E40
Station 1	240-205
Station 2	240-205
⋮	
Station 15	240-205
Station 16	240-205

How To Order

G3 Electronics



1. Refer to the selection table on page 24 to specify the control electronics and I/O configuration.
2. Each discrete I/O module is listed in sequential order from RIGHT to LEFT as shown.
3. A maximum of 16 I/O modules are supported by a single communication node. Analog I/O & digital I/O (NPN & PNP)

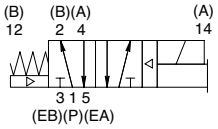
Example Order - I/O assembly

with Sub-Bus in and Sub-Bus out modules

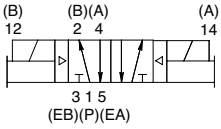
Electronics	G3DS316D0STD
Station 1	240-205
Station 2	240-205
⋮	
Station 15	240-205
Station 16	240-205

2002-R2 & 02 Series Functions

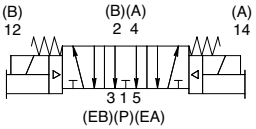
single solenoid air pilot
2 position 4-way



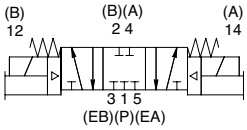
double solenoid air pilot
2 position 4-way



double solenoid air pilot
3 position 4-way
open center

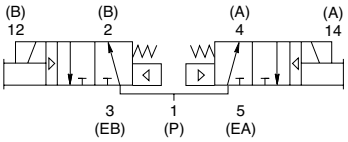


double solenoid air pilot
3 position 4-way
closed center

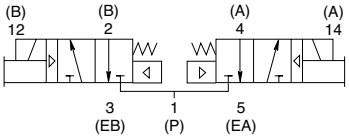


2002-R2 Series Only Functions

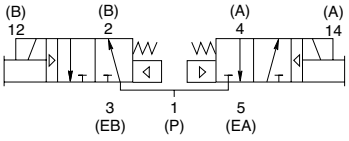
double solenoid
air pilot
dual 3-way
"12(B)" & "14(A)" NO



double solenoid
air pilot
dual 3-way
"12(B)" & "14(A)" NC



double solenoid
air pilot
2 position dual 3-way
"12(B)" NO, "14(A)" NC



5 Ported, 2 and 3 position, 4-way and dual 3-way, Packed Spool
Cv: 0.25 (4-way) 0.25 (Dual 3-way) R2 Series
Spool and Sleeve
Cv: 0.20 (4-way) 02 Series

- Solenoid air pilot actuated
- Low wattage coil
- Elimination of internal wiring
- Buna-N seals provide leakproof sealing
- Pusher piston – high spool shifting force
- Adjustable port sizes utilizing interchangeable cartridge fittings

CE

Technical Data

Valve Data	English		Metric	
	R2 Series	02 Series	R2 Series	02 Series
Cv	0.25	0.2	0.25	0.2
Flow Capacity	11.5 SCFM @ 80 PSIG upstream pressure to atmosphere	9.2 SCFM @ 80 PSIG upstream pressure to atmosphere	246 Nl/m @ 6 bar upstream pressure to 5 bar downstream	197 Nl/m @ 6 bar upstream pressure to 5 bar downstream
Operating Pressure Range	28" Hg to 100 PSIG	28" Hg to 150 PSIG	Vacuum to 7 bar	Vacuum to 10 bar
Pilot Pressure Range	35 to 100 PSIG	35 to 100 PSIG	2.5 to 7 bar	2.5 to 7 bar
Temperature Range (Ambient)	-10°F to +115°F	-10°F to +115°F	-23°C to +50°C	-23°C to +50°C

Operating Data

All Solenoids are Continuous Duty Rated	24 VDC
Power (Watts)	0.5
Holding Current (Amps)	0.02

Response Time in Seconds	Energize		De-Energize	
	R2 Series	02 Series	R2 Series	02 Series
2-Position, Single, Spring Return	0.017	0.014	0.013	0.20
2-Position, Double, Detented	0.010	0.010	N/A	N/A
3-Position, Spring Centered	0.009	0.009	0.022	0.057
Dual 3-way	0.018	N/A	0.010	N/A

How To Order

Valves

R2 1 BB A Z4 M K 000 61

Series Identifier
02 = Spool/Sleeve with Body to Base Plug
R2 = Rubber Packed Spool With Body to Base Plug

Port Size
1 = 1/8
2 = 1/4
D = 5/32 (4mm) (Port type "K" only)
F = 6mm (Port type "K" only)

Valve Type
BW = Solenoid Pilot w/ Flush Non-Locking Manual Override & Differential Air Return
BB = Double Solenoid Pilot w/Flush Non-Locking Manual Override
00 = Blank Station

Function
4 = 2 Position, 4-Way
5 = 3 Position, 4-Way, Open Center, Dual Pressure
6 = 3 Position, 4-Way, Closed Center
A = Dual 3-Way, A Normally Open - B Normally Open
C = Dual 3-Way, A Normally Closed - B Normally Open
D = Dual 3-Way, A Normally Closed - B Normally Closed
P = Blank Station Plate

Mounting
Z3 = Manifold Block, Side Ports Only, Single Solenoid Output
Z4 = Manifold Block, Side Ports Only, Double Solenoid Output

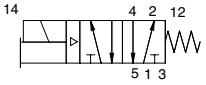
Wiring Option
M = Plug-In DC w/Light
0 = Blank Station

Port Type
K = Push-in Fitting
H = Barbed Fitting

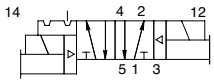
Options
11B = Flush Locking Override
14A = External Pilot Supply
000 = No Option

Voltage
61 = 24 VDC
00 = Use w/ Blank Station Plate

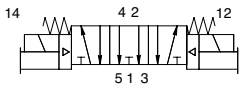
single solenoid air pilot
2 position 4-way



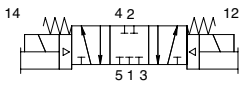
double solenoid air pilot
2 position 4-way



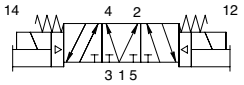
double solenoid air pilot
3 position 4-way
open center



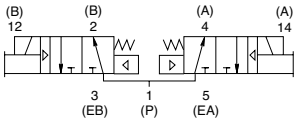
double solenoid air pilot
3 position 4-way
closed center



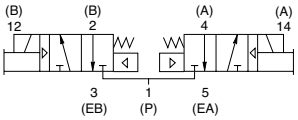
double solenoid air pilot
3 position 4-way
pressure center



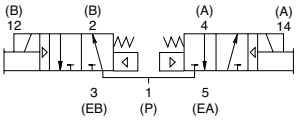
double solenoid
2 position dual 3-way
“14(A)” & “12(B)” NO



double solenoid
2 position dual 3-way
“14(A)” & “12(B)” NC



doub le solenoi d
2 position dual 3-way
“14(A) ” NC , “12(B) ” NO



5 Ported, 2 and 3 position, 4-way, Spool & Sleeve
Cv: 0.56
Dual 3-Way Pack Spool Cv:0.56

- Solenoid air pilot actuated
- Low wattage coil
- DC solenoids polarity insensitive with spike suppression
- Plug together circuit boards eliminate internal wiring
- Integral recessed gaskets
- Interchangeable Push-in fittings to accommodate various tube sizes
- Simple conversion from internal to external pilot supply
- NEMA 4/IP65

Technical Data

Valve Data	English	Metric
Cv	0.56	0.56
Flow Capacity	26 SCFM @ 80 PSIG upstream pressure to atmosphere	552 Nl/m @ 6 bar upstream to 5 bar downstream
Operating Pressure Range	28" Hg Vacuum to 150 PSIG	Vacuum to 10 bar
Operating Pressure Range – 3 Way	22" Hg Vacuum to 100 PSIG	Vacuum to 7 bar
Pilot Pressure Range	26 to 120 PSIG	1.8 to 8.2 bar
Pilot Pressure Range – 3 Way	26 to 100 PSIG	1.8 to 7 bar
Pilot Pressure Vacuum	50 to 100 PSIG	3.5 to 7 bar
Temperature Range (Ambient)	-10˚F to +115˚F	-23˚C to +50˚C

Operating Data

All Solenoids are Continuous Duty Rated	24 VDC
Power (Watts)	1.35
Holding Current (Amps)	0.056

Response Time in Seconds	Energize	De-Energize
2-Position, Single, Spring Return	0.014	0.016
2-Position, Double, Detented	0.013	N/A
3-Position, Spring Centered	0.014	0.016
Dual 3-way	0.014	0.016

How to Order

Valves

051 BB 4 Z6 M N 000 61

Valve Series & Port Size
051 = 1/8 (Threaded only)
052 = 1/4 (Push-in only)
05F = 6mm
05H = 8mm

Valve Type
BA = Single Solenoid Pilot, (Spring Return) w/flush Non-Locking Override
BB = Double Solenoid Pilot w/Flush non-locking Override
00 = Blank Station

Function
4 = 2 Position, 4-way
5 = 3 Position, 4-way Open Center
6 = 3 Position, 4-way Closed Center
7 = 3 Position, 4 way Pressure Center
A = Dual 3-way, A Normally Open - B Normally Open
B = Dual 3-way, Vacuum Service, A Normally Open - B Normally Open
D = Dual 3-way, A Normally Closed - B Normally Closed
E = Dual 3-way, Vacuum Service, A Normally Closed - B Normally Closed
P = Blank Station Plate

Mounting
Z1 = Manifold Block w/Side and Bottom Ports, Single Solenoid Internal Circuit Board
Z2 = Manifold Block w/Side and Bottom Ports, Double Solenoid Internal Circuit Board
Z5 = Z1 w/Speed Control
Z6 = Z2 w/Speed Control
R1 = Z1 w/ Ribbon Cable Connector
R2 = Z2 w/ Ribbon Cable Connector
R5 = Z5 w/ Ribbon Cable Connector
R6 = Z6 w/ Ribbon Cable Connector

Wiring Option
M = Plug-In DC w/Light
0 = Blank Station

Port Type
L = Push-In Fitting
N = NPTF (1/8 only)
G = G Tap (1/8 only)

Options
000 = No Option
11B = Flush Locking Override
11M = No Override

Voltage
61 = 24 VDC
00 = Use w/ Blank Station Plate

Regulators

051 RS 1 Z1 J K 000 00

Valve Series & Port Size
051 = 1/8
052 = 1/4 (Push-in only)
05F = 6mm
05H = 8mm
*Use for regulator unit only (Mounting = 00)

Regulator Type
RS = Single Pressure to Port 1 (P)
RD = Dual Pressure to Ports 3 (EB) & 5 (EA)
RE = Dual Pressure to Ports 4 (4) & 2 (B)
RT = 2 Pressure Selector
*For metric gauge replace R with E in 4th Digit.

Pressure Range
1 = 10-130 PSIG (0.7-9 bar)
3 = 3-30 PSIG (0.2-2 bar)
4 = 5-60 PSIG (0.5-4 bar)

Mounting
R1 = Z1 W/ Ribbon Cable Connector
R2 = Z2 W/ Ribbon Cable Connector
R5 = Z5 W/ Ribbon Cable Connector
R6 = Z6 W/ Ribbon Cable Connector
Z0 = Manifold Block w/Side and Bottom Ports, Transfer Board, Used w/RE Regulators RE only (no Z-board)
Z1 = Manifold Block w/Side and Bottom Ports, Single Solenoid Internal Circuit Board
Z2 = Manifold Block w/Side and Bottom Ports, Double Solenoid Internal Circuit Board
Z5 = Z1 W/Speed Control
Z6 = Z2 W/Speed Control

Wiring Option
J = Plug-In Receptacle Ass'y

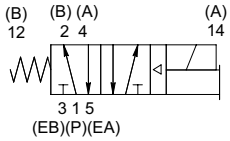
Port Type
K = Push-In
P = NPTF (1/8 only)
Q = G Tap (1/8 only)

Options
000 = No Option
12H = Less Gauge
16N = Jumper on 14 (A) End
16P = Jumper on 12 (B) End
16W = Top Facing Gauge
61Y = Extended Gauge
63D = 16W + 61Y Extended Top Facing Gauge
See Note Below

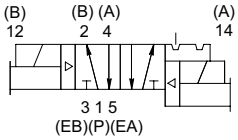
NOTE: Regulator gauges must be offset on alternating stations to prevent interference (see photo)

* Odd numbered stations will use either standard (no option) or top facing ("16W" option) gauges.
* Even numbered stations will use either extended standard ("61Y" opton) or extended top facing ("63D" option) gauges.

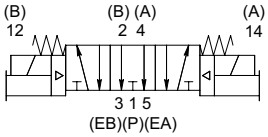
single solenoid air pilot
2 position 4-way



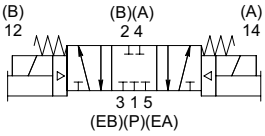
double solenoid air pilot
2 position 4-way



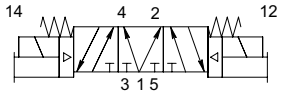
double solenoid air pilot
3 position 4-way
open center



double solenoid air pilot
3 position 4-way
closed center



double solenoid air pilot
3 position 4-way
pressure center



5 Ported, 2 and 3 position, 4-way, Spool & Sleeve
Cv: 1.2

- Solenoid air pilot actuated
- Low wattage coil
- DC solenoids polarity insensitive with spike suppression
- Plug together circuit boards eliminate internal wiring
- Integral recessed gaskets
- Interchangeable push-in fittings to accommodate various tube sizes
- Simple conversion from internal to external pilot
- NEMA 4/IP65

Technical Data

Valve Data	English	Metric
Cv	1.20	1.20
Flow Capacity	56 SCFM @ 80 PSIG upstream pressure to atmosphere	1180 Nl/m @ 6 bar upstream to 5 bar downstream
Operating Pressure Range	28" Hg Vacuum to 150 PSIG	Vacuum to 10 bar
Pilot Pressure Range	26 to 120 PSIG	1.8 to 8.2 bar
Temperature Range (Ambient)	-10°F to + 115°F	-23°C to +50° C

Operating Data

All Solenoids are Continuous Duty Rated	24 VDC
Power (Watts)	2.5
Holding Current (Amps)	0.10

Response Time in Seconds	Energize	De-Energize
2-Position, Single, Spring Return	0.010	0.020
2-Position, Double, Detented	0.010	N/A
3-Position, Spring Centered	0.010	0.020

How to Order

Valves

122 BB 4 Z6 M L 000 61

Valve Series & Port Size
122 = 1/4
123 = 3/8
12H = 8mm
12K = 10mm

Valve Type
BA = Single Solenoid Pilot, (Spring Return) w/Flush Non-Locking Override
BB = Double Solenoid Pilot w/Flush Non-Locking Override
00 = Blank Station

Function
4 = 2 Position, 4-way
5 = 3 Position, 4-way Open Center
6 = 3 Position, 4-way Closed Center
7 = 3 Position, 4-way Pressure Center
P = Blank Station Plate

Mounting
Z1 = Manifold Block w/Side and Bottom Ports, Single Solenoid Internal Circuit Board
Z2 = Manifold Block w/Side and Bottom Ports Double Solenoid Internal Circuit Board
Z5 = Z1 w/Speed Control
Z6 = Z2 w/Speed Control
R1 = Z1 w/ Ribbon Cable Connector
R2 = Z2 w/ Ribbon Cable Connector
R5 = Z5 w/ Ribbon Cable Connector
R6 = Z6 w/ Ribbon Cable Connector

Voltage
61 = 24 VDC
00 = Use w/ Blank Station Plate

Special Options
000 = No Option
11B = Flush Locking Override
11M = No Override

Port Type
L = Push-in Fitting
N = NPTF
G = G Tap

Wiring Option
M = Plug-in DC w/Light
0 = Blank Station

Regulators

122 RS 3 Z1 J L 000 00

Valve Series & Port Size
122 = 1/4
123 = 3/8
12H = 8mm
12K = 10mm

Regulator Type
RS = Single Pressure to Port 1 (P)
RD = Dual Pressure to Ports 3 (EB) & 5 (EA)
RC = Dual Pressure w/Non-relieving Checks
RQ = Dual Pressure w/Relieving Checks
RE = Dual Pressure to Ports 4 (A) & 2 (B)
RT = 2 Pressure Selector
*For metric gauge, replace R with E in 4th digit.

Pressure Range
1 = 10-130 PSIG (0.7-9 bar)
3 = 3-30 PSIG (0.2-2 bar)
4 = 5-60 PSIG (0.5 - 4 bar)

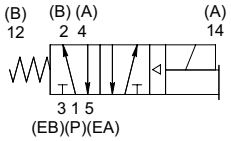
Mounting
R1 = Z1 w/Ribbon Cable Connector
R2 = Z2 w/Ribbon Cable Connector
R5 = Z5 w/Ribbon Cable Connector
R6 = Z6 w/Ribbon Cable Connector
Z0 = Manifold Block w/Side and Bottom Ports, Transfer Board, Used w/RE Regulators RE only (no Z-board)
Z1 = Manifold Block w/Side and Bottom Ports, Single Solenoid Internal Circuit Board
Z2 = Manifold Block w/Side and Bottom Ports, Double Solenoid Internal Circuit Board
Z5 = Z1 w/Speed Control
Z6 = Z2 w/Speed Control

Wiring Option
J = Plug-In Receptacle Ass'y
O = Non-Plug-In (Type RE only)

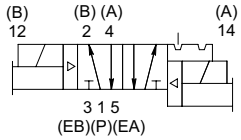
Port Type
L = Push-In
N = NPTF
G = G Tap

Special Options
000 = No Option
12H = Less gauge
16N = Jumper on 14 (A) End
16P = Jumper on 12 (B) End
16W = Top Facing Gauge

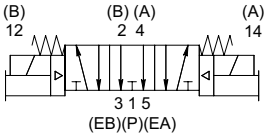
single solenoid air pilot
2 position 4-way



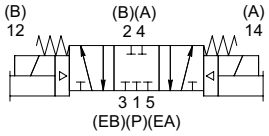
double solenoid air pilot
2 position 4-way



double solenoid air pilot
3 position 4-way
open center



double solenoid air pilot
3 position 4-way
closed center



5 Ported, 2 and 3 position, 4-way, Spool & Sleeve
Cv: 3.5

- Solenoid air pilot actuated
- Low wattage coil
- DC solenoids polarity insensitive with spike suppression
- Plug together circuit boards eliminate internal wiring
- Integral recessed gaskets
- Simple conversion from internal to external pilot supply
- Designed to meet NEMA4/IP65
- Manifold connection allows disassembly at any station

Technical Data

Valve Data	English	Metric
Cv	3.5*	3.5*
Flow Capacity	161 SCFM @ 80 PSIG upstream pressure to atmosphere	3500 Nl/m @ 6 bar upstream pressure to 5 bar atmosphere
Operating Pressure Range	28" Hg Vacuum to 145 PSIG	Vacuum to 10 bar
Pilot Pressure Range	26.1 to 120 PSIG	1.8 to 8.2 bar
Temperature Range (Ambient)	-10°F to + 115°F	-23°C to +50° C

Operating Data

All Solenoids are Continuous Duty Rated	24 VDC
Power (Watts)	2.5
Holding Current (Amps)	0.10

Response Time in Seconds**	Energize	De-Energize
2-Position, Single, Spring Return	0.021	0.067
2-Position, Double, Detented	0.017	N/A
3-Position, Spring Centered	0.021	0.072

* Valve on 1/2 NPTF Sub-Plate
** Per ISO 12238 Standard

How to Order

Valves

353 BB 4 Z6 M N 000 61

Valve Series & Port Size
353 = 3/8
354 = 1/2

Valve Type
BA = Single Solenoid Pilot, (Spring Return) w/Flush Non-Locking Override
BB = Double Solenoid Pilot w/Flush Non-Locking Override
00 = Blank Station

Function
4 = 2 Position, 4-way
5 = 3 Position, 4-way Open Center
6 = 3 Position, 4-way Closed Center
P = Blank Station Plate

Mounting
Z1 = Manifold Block w/Side and Bottom Ports, Single Solenoid Internal Circuit Board
Z2 = Manifold Block w/Side and Bottom Ports Double Solenoid Internal Circuit Board
Z5 = Z1 w/Speed Control
Z6 = Z2 w/Speed Control
R1 = Z1 w/ Ribbon Cable Connector
R2 = Z2 w/ Ribbon Cable Connector
R5 = Z5 w/ Ribbon Cable Connector
R6 = Z6 w/ Ribbon Cable Connector

Wiring Option
M = Plug-in DC w/Light
0 = Blank Station

Port Type
N = NPTF
G = G Tap

Special Options
000 = No Option
11B = Flush Locking Override
11M = No Override

Volrage
61 = 24 VDC
00 = Use w/ Blank Station Plate

Regulators

353 RS 3 Z1 J N 000 00

Valve Series & Port Size
353 = 3/8
354 = 1/2

Regulator Type
RS = Single Pressure to Port 1 (P)
RD = Dual Pressure to Ports 3 (EB) & 5 (EA)
RC = Dual Pressure w/Non-relieving Checks
RQ = Dual Pressure w/Relieving Checks
RE = Dual Pressure to Ports 4 (A) & 2 (B)
RT = 2 Pressure Selector

Note: For metric gauge, replace R with E in 4th digit.

Pressure Range
1 = 10-130 PSIG (0.7-9 bar)
3 = 3-30 PSIG (0.2-2 bar)
4 = 5-60 PSIG (0.5 - 4 bar)

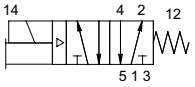
Mounting
Z1 = Manifold Block w/Side and Bottom Ports, Single Solenoid Internal Circuit Board
Z2 = Manifold Block w/Side and Bottom Ports, Double Solenoid Internal Circuit Board
Z5 = Z1 w/Speed Control
Z6 = Z2 w/Speed Control
R1 = Z1 w/Ribbon Cable Connector
R2 = Z2 w/Ribbon Cable Connector
R5 = Z5 w/Ribbon Cable Connector
R6 = Z6 w/Ribbon Cable Connector

Wiring Option
J = Plug-In Receptacle Assembly
O = Non-Plug-In (Type RE only)

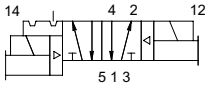
Port Type
N = NPTF
G = G Tap

Special Options
000 = No Option
12H = Less gauge
16N = Jumper on 14 (A) End
16P = Jumper on 12 (B) End
16W = Top Facing Gauge
000 = No Option

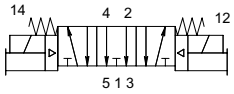
single solenoid air pilot
2 position 4-way



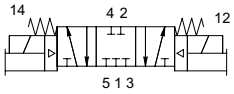
double solenoid air pilot
2 position 4-way



double solenoid air pilot 3 position
4-way open center



double solenoid air pilot 3 position
4-way closed center



5 Ported, 2 and 3 position, 4-way, Spool & Sleeve
Cv: 0.56

- Solenoid air pilot actuated
- Low wattage coil
- DC solenoids polarity insensitive with spike suppression
- Plug together circuit boards eliminate internal wiring
- Integral recessed gaskets
- Interchangeable push-in fittings to accommodate various tube sizes
- Simple conversion from internal to external pilot
- NEMA 4/IP65

CE

Technical Data - 18mm

Valve Data	English	Metric
Cv	0.56	0.56
Flow Capacity	26 SCFM @ 80 PSIG upstream pressure to atmosphere	552 Nl/m @ 6 bar upstream to 5 bar downstream
Operating Pressure Range	28" Hg Vacuum to 150 PSIG	Vacuum to 10 bar
Pilot Pressure Range	26 to 120 PSIG	1.8 to 8.2 bar
Temperature Range (Ambient)	-10°F to + 115°F	-23°C to +50° C

Operating Data

All Solenoids are Continuous Duty Rated	24 VDC
Power (Watts)	1.35
Holding Current (Amps)	0.056

Response Time in Seconds**	Energize	De-Energize
2-Position, Single, Spring Return	0.014	0.016
2-Position, Double, Detented	0.013	N/A
3-Position, Spring Centered	0.014	0.016

How to Order 15407-2 18 mm

Valves

I51 BB 4 Z6 M N 000 61

Valve Series & Port Size
I51 = 1/8 (Threaded only)
I52 = 1/4 (Push-in only)
I5F = 6mm
I5H = 8mm

Valve Type
BA = Single Solenoid Pilot, (Spring Return) w/flush Non-Locking Override
BB = Double Solenoid Pilot w/Flush Non-Locking Override
00 = Blank Station

Function
4 = 2 position, 4-way
5 = 3 position, 4-way open center
6 = 3 position, 4-way closed center
P = Blank Station Plate

Mounting
Z1 = Manifold Block w/Side and Bottom Ports, Single Solenoid Internal Circuit Board
Z2 = Manifold Block w/Side and Bottom Ports, Double Solenoid Internal Circuit Board
Z5 = Z1 w/Speed Control
Z6 = Z2 w/Speed Control
R1 = Z1 w/Ribbon Cable Connector
R2 = Z2 w/Ribbon Cable Connector
R5 = Z5 w/Speed Control
R6 = Z6 w/Speed Control

Wiring Option
M = Plug-in DC w/Light
0 = Blank Station

Port Type
L = Push-in Fitting
N = NPTF (1/8 only) or Valve Unit only
G = G Tap (1/8 only) ISO 228/I-G

Options
11B = Flush Locking Overrride
11M = No Override
000 = No Option

Voltage
61 = 24 VDC
00 = Use w/ Blank Station Plate

Regulators

I51 RS 1 Z1 J K 000 00

Valve Series & Port Size
I51 = 1/8
I52 = 1/4 (Push-in only)
I5F = 6mm
I5H = 8mm

Regulator Type
RS = Single Pressure to Port 1 (P)
RD = Dual Pressure to Ports 3 (EB) & 5 (EA)
RT = 2 Pressure Selector
RE = Dual Pressure to Ports 4 (A) & 2 (B)

Pressure Range
1 = 10-130 PSIG (0.7-9 bar)
3 = 3-30 PSIG (0.2-2 bar)
4 = 5-60 PSIG (0.5-4 bar)

Mounting
Z1 = Manifold Block w/Side and Bottom Ports, Single Solenoid Internal Circuit Board
Z2 = Manifold Block w/Side and Bottom Ports, Double Solenoid Internal Circuit Board
Z5 = Z1 w/Speed Control
Z6 = Z2 w/Speed Control
R1 = Z1 w/Ribbon Cable Connector
R2 = Z2 w/Ribbon Cable Connector
R5 = Z5 w/Speed Control
R6 = Z6 w/Speed Control

Wiring Option
J = Plug-in Receptacle Ass'y

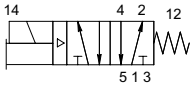
Port Type
L = Push-in
N = NPTF (1/8 only)
G = G Tap (1/8 only) ISO 228/I-G

Special Options
000 = No Option
12H = Less Gauge
16N = Jumper on 14 (A) End
16P = Jumper on 12 (B) End
16W = Top Facing Gauge
61Y = Extended Gauge
63D = 16W + 61Y Extended Top Facing Gauge
(See Note Below)

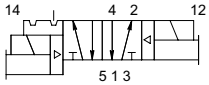
NOTE:

* Regulator gauges must be offset on alternating stations to prevent interference (see photo)
* Odd numbered stations will use either standard (no option) or top facing ("16W" option) gauges.
* Even numbered stations will use either extended standard ("61Y" opton) or extended top facing ("63D" option) gauges.

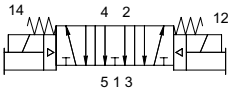
single solenoid air pilot
2 position 4-way



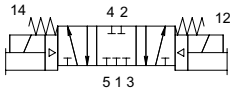
double solenoid air pilot
2 position 4-way



double solenoid air pilot 3 position
4-way open center



double solenoid air pilot 3 position
4-way closed center



5 Ported, 2 and 3 position, 4-way, Spool & Sleeve
Cv: 1.2

- Solenoid air pilot actuated
- Low wattage coil
- DC solenoids polarity insensitive with spike suppression
- Plug together circuit boards eliminate internal wiring
- Integral recessed gaskets
- Interchangeable push-in fittings to accommodate various tube sizes
- Simple conversion from internal to external pilot
- Modular plug-together Fieldbus electronics
- NEMA 4/IP65

CE

Technical Data - 26mm

Valve Data	English	Metric
Cv	1.20	1.20
Flow Capacity	56 SCFM @ 80 PSIG upstream pressure to atmosphere	1180 Nl/m @ 6 bar upstream to 5 bar downstream
Operating Pressure Range	28" Hg Vacuum to 150 PSIG	Vacuum to 10 bar
Pilot Pressure Range	26 to 120 PSIG	1.8 to 8.2 bar
Temperature Range (Ambient)	-10°F to + 115°F	-23°C to +50° C

Operating Data

All Solenoids are Continuous Duty Rated	24 VDC
Power (Watts)	2.5
Holding Current (Amps)	0.10

Response Time in Seconds**	Energize	De-Energize
2-Position, Single, Spring Return	0.010	0.020
2-Position, Double, Detented	0.010	N/A
3-Position, Spring Centered	0.010	0.020

How to Order 15407-2 26 mm

Valves

I62 BB 4 Z6 M L 000 61

Valve Series and Port Size
I62 = 1/4
I63 = 3/8
I6H = 8mm
I6K = 10mm

Valve Type
BA = Single Solenoid Pilot, (Spring Return) w/Flush Non-Locking Override
BB = Double Solenoid Pilot w/Flush Non-Locking Override
00 = Blank Station

Function
4 = 2 Position, 4-Way
5 = 3 Position, 4-Way Open Center
6 = 3 Position, 4-Way Closed Center
P = Blank Station Plate

Mounting
Z1 = Manifold Block w/Side and Bottom Ports, Single Solenoid Internal Circuit Board
Z2 = Manifold Block w/Side and Bottom Ports, Double Solenoid Internal Circuit Board
Z5 = Z1 w/Speed Control
Z6 = Z2 w/Speed Control
R1 = Z1 w/Ribbon Cable Connector
R2 = Z2 w/Ribbon Cable Connector
R5 = Z5 w/Speed Control
R6 = Z6 w/Speed Control

Wiring Option
M = Plug-in DC w/Light
0 = Blank Station

Port Type
L = Push-in Fitting
N = NPTF
G = G tap ISO 228/I-G

Options
000 = No Option
11B = Flush Locking Override
11M = No Override

Voltage
61 = 24 VDC
00 = Use w/ Blank Station Plate

Regulators

I62 RS 3 Z1 J L 000 00

Valve Series & Port Size
I62 = 1/4
I63 = 3/8
I6H = 8mm
I6K = 10mm

Regulator Type
RS = Single Pressure to Port 1 (P)
RD = Dual Pressure to Ports 3 (EB) & 5 (EA)
RC = Dual Pressure w/Non-Relieving Checks
RQ = Dual Pressure w//Relieving Checks
RE = Dual Pressure to Ports 4 (A) & 2 (B)
RT = 2 Pressure Selector

Pressure Range
1 = 10-130 PSIG (0.7-9 bar)
3 = 3-30 PSIG (0.2-2 bar)
4 = 5-60 PSIG (0.5 - 4 bar)

Mounting
Z0 = Manifold Block w/Side and Bottom Ports, Transfer Board w/ISO 15407-2 Interface, Used w/RE Regulators RE only (no Z-board)
Z1 = Manifold Block w/Side and Bottom Ports, Single Solenoid Internal Circuit Board
Z2 = Manifold Block w/Side and Bottom Ports, Double Solenoid Internal Circuit Board
Z5 = Z1 w/Speed Control
Z6 = Z2 w/Speed Control
R1 = Z1 w/Ribbon Cable Connector
R2 = Z2 w/Ribbon Cable Connector
R5 = Z5 w/Speed Control
R6 = Z6 w/Speed Control

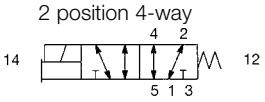
Wiring Option
J = Plug-in Receptacle Ass'y
O = Non-Plug-in (Type RE only)

Port Type
L = Push-in
N = NPTF
G = G Tap ISO 228/I-G

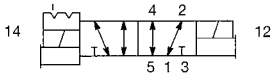
Options
000 = No Option
12H = Less Gauge
16N = Jumper on 14 (A) End
16P = Jumper on 12 (B) End
16W = Top Facing Gauge

Direct Solenoid Actuated

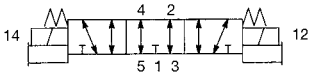
single solenoid
2 position 4-way



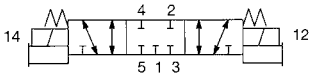
double solenoid
2 position 4-way



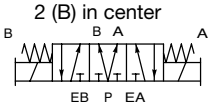
double solenoid
3 position 4-way
open center



double solenoid
3 position 4-way
closed center

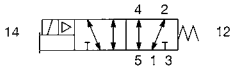


double solenoid
3 Position 4-Way (5/3),
open to 4 (A) and
2 (B) in center

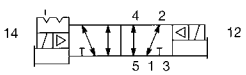


Solenoid Pilot Actuated

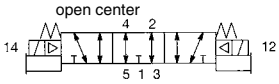
single solenoid
2 position 4-way



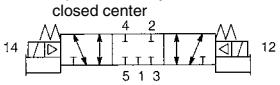
double solenoid
2 position 4-way



double solenoid
3 position 4-way
open center

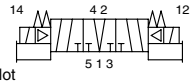


double solenoid
3 position 4-way
closed center

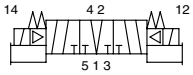


double solenoid
3 Position 4-Way (5/3),
open to 4 (A) and
2 (B) in center

double solenoid pilot
3 Position 4-Way (5/3),
open to 4 (A) and
2 (B) in center



double solenoid pilot
3 Position 4-Way (5/3),
open to 4 (A) and
2 (B) in center



5 Ported, 4-way, 2 and 3 position, Spool & Sleeve,

Cv: 1.2 to 5.3

- Direct and Solenoid Pilot Actuated
- Complies with ISO Standard 5599/2- Sizes 1, 2 & 3
- NEMA 4/IP 65

Technical Data

Valve Data		Direct Acting		Solenoid Pilot Actuated	
		English	Metric	English	Metric
Cv	Size 1 Size 2 Size 3	1.2 2 NA	1.2 2 NA	1.3 2.9 5.3	1.3 2.9 5.3
Flow Capacity	Size 1 Size 2 Size 3	55.5 SCFM 101.7 SCFM NA	1181 Nl/m 2168 Nl/m NA	60.1 SCFM 134.0 SCFM 245.0 SCFM	1280 Nl/m 2857 Nl/m 5222 Nl/m
Main valve operating pressure range - All sizes		80 PSIG upstream pressure to atmosphere	6 bar upstream to 5 bar downstream	80 PSIG upstream pressure to atmosphere	6 bar upstream to 5 bar downstream
Pilot pressure range - All sizes		28" Hg to 232 PSIG	Vacuum to 16 bar	15 to 125 PSIG	1 to 8.6 bar
Temperature Range (Ambient) - All sizes		-10°F to +115°F	-23°C to +50°C	-10°F to +115°F	-23°C to +50°C

Operating Data - All solenoids continuous duty rated

All Solenoids are Continuous Duty Rated	24 VDC Direct Acting		24 VDC Solenoid Pilot	
	Sizes 1 & 2	Size 3	Size 1 & 2	Size 3
Power (Watts) - All Sizes	6.0	NA	4.0	4.0
Holding Current (Amps)	.25	NA	0.016	0.016
In-Rush Current (Amps) - All Sizes	NA	NA	NA	NA

Response Time in Seconds	Direct Acting				Solenoid Pilot Actuated					
	Energize (Sec)		De-Energize (Sec)		Energize (Sec)			De-Energize (Sec)		
	Sizes 1 & 2	Size 3	Sizes 1 & 2	Size 3	Size 1	Size 2	Size 3	Size 1	Size 2	Size 3
2-Position, Single, Spring Return	0.038	NA	0.012	NA	0.013	0.013	0.020	0.036	0.060	0.066
2-Position, Double, Detented	0.012	NA	NA	NA	0.013	0.013	0.020	NA	NA	NA
3-Position, Spring Centered	0.038	NA	NA	NA	0.013	0.013	0.020	0.036	0.060	0.066

How to Order

Valves

I24 BA 4 Z1 M P 000 61

Valve Series and Port Size
I12 = ISO 5599/2 Size 1 1/4
I13 = ISO 5599/2 Size 1 3/8
I23 = ISO 5599/2 Size 2 3/8
I24 = ISO 5599/2 Size 2 1/2
I34* = ISO 5599/2 Size 3 1/2
I35* = ISO 5599/2 Size 3 3/4

First letter = "14" Actuator
Second letter = "12 " Actuator
BA = Solenoid Pilot w/Spring Return
BB = Double Solenoid
BW = Solenoid Pilot w/Differential Air Return
SA = Direct Solenoid w/Spring Return
SS = Double Direct Solenoid
00 = Blank Station

Function
4 = 2 Position, 4-Way
5 = 3 Position, 4-Way Open Center
6 = 3 Position, 4-Way Closed Center
7 = 3 Position 4-Way (5/3), Open to 4 (A) and 2(B) in Center
P = Blank Station Plate

Mounting
Z1 = Manifold Block w/Side and Bottom Ports, Single Solenoid Internal Circuit Board
Z2 = Manifold Block w/Side and Bottom Ports, Double Solenoid Internal Circuit Board
Z5 = Z1 w/Speed Control
Z6 = Z2 w/Speed Control
R1 = Z1 w/Ribbon Cable Connector
R2 = Z2 w/Ribbon Cable Connector
R5 = Z5 w/Ribbon Cable Connector
R6 = Z6 w/Ribbon Cable Connector

Wiring Option
M = Plug-in DC w/Light
0 = Blank Station

Port Type
0 = NPTF (Direct Solenoid Valves)
G = G Tap (Direct Solenoid Valves) (conforms to ISO standards 1179-1 and 228-1)
P = NPTF (Solenoid Pilot Valves)
Q = G Tap (Solenoid Pilot Valves) (conforms to ISO standards 1179-1 and 228-1)

Options
000 = No Option
11B = Flush Locking Manual Override
11Z = Extended Locking Manual Override (Direct Acting Only)
12A = FKM Seals on Sleeve Assembly
12B = Lubricant Free Assembly
14C = Internal Pilot Supply from Port 3 (Solenoid Pilot Only)
14D = Internal Pilot Supply from Pot 5 (Solenoid Pilot Only)
14X = External Pilot Supply

Voltage
61 = 24 VDC
00 = Use w/Blank Station Plate

Note: Standard for all ISO 5599/2 Solenoid Pilot Valve Series is internal pilot supply from port #1.
*Not available in direct operated SA and SS Series

Regulators

I24 RS 1 Z1 J P 000 00

Valve Series and Port Size
I12 = ISO 5599/2 Size 1 1/4"
I13 = ISO 5599/2 Size 1 3/8"
I23 = ISO 5599/2 Size 2 3/8"
I24 = ISO 5599/2 Size 2 1/2"
I34 = ISO 5599/2 Size 3 1/2"
I35 = ISO 5599/2 Size 3 3/4"

Regulator Type
RS = Single Pressure to Port #1 (P)
RD* = Dual Pressure to Ports 3 (EB) & 5 (EA)
RC* = Dual Pressure w/Non-relieving Checks Air Return (Sizes 2 & 3 Only)
RQ* = Dual Pressure w/Relieving Checks
RE = Dual Pressure, External Outlet

*Solenoid pilot valves used with RC, RD & RQ regulators must have the pilot supply from other than internally from ports #1 (P)

Pressure Range
1 = 10 - 130 PSIG (0.7 - 9 bar)
3 = 3 - 30 PSIG (0.2 - 2 bar)
4 = 5 - 60 PSIG (0.3 - 4.1 bar)
6 = 20 - 250 PSIG (1.4 - 17 bar)

Mounting
Z0 = Manifold Block w/Side and Bottom Ports Transfer Board, Used w/RE Regulator
Z1 = Manifold Block w/Side and Bottom Ports, Single Solenoid Internal Circuit Board
Z2 = Manifold Block w/Side and Bottom Ports, Double Solenoid Internal Circuit Board
Z5 = Z1 w/Speed Control
Z6 = Z2 w/Speed Control
R1 = Z1 w/Ribbon Cable Connector
R2 = Z2 w/Ribbon Cable Connector
R5 = Z5 w/Ribbon Cable Connector
R6 = Z6 w/Ribbon Cable Connector

Wiring Option
J = Plug-In Recepticle
O = Non Plug-In Type RE Only

Port Type
P = NPTF
Q = G Tap

Options
000 = No Optionn
16N = Jumper on 14 (A) End
16P = Jumper on 12 (B) End

7/8" MINI Cables

4 Pin Cables for DeviceNet, DeviceLogix, Ethernet, Modbus TCP, CANopen, and Sub-Bus

7/8" MINI Straight 4 Pin Female Single Ended Cable, Euro Color Code
MC0405MAC0000000 – 5 Meter
MC0410MAC0000000 – 10 Meter

7/8" MINI 90° 4 Pin Female Single Ended Cable, Euro Color Code
MD0405MAC0000000 – 5 Meter
MD0410MAC0000000 – 10 Meter

5 Pin Cables for PROFIBUS DP, PROFINET and POWERLINK

7/8" MINI Straight 5 Pin Female Single Ended Cable, Euro Color Code
MC0505MAG0000000 – 5 Meter
MC0510MAG0000000 – 10 Meter

7/8" MINI 90° 5 Pin Female Single Ended Cable, Euro Color Code
MD0505MAG0000000 – 5 Meter
MD0510MAG0000000 – 10 Meter

7/8" MINI Field Wireable Connectors

4 Pin Connectors for DeviceNet, DeviceLogix, Ethernet, Modbus TCP, CANopen, and Sub-Bus

7/8" MINI Straight 4 Pin Female Field Wireable Connector
MC04F90000000000 –Cable Gland – One size fits all

7/8" MINI 90° 4 Pin Female Field Wireable Connector
MD04F20000000000 – PG 9 Cable Gland

5 Pin Connectors for PROFIBUS DP, PROFINET and POWERLINK

7/8" MINI Straight 5 Pin Female Field Wireable Connector
MC05F90000000000 – Cable Gland – One size fits all

7/8" MINI 90° 5 Pin Female Field Wireable Connector
MD05F20000000000 – PG 9 Cable Gland

M12 to 7/8" MINI Cable

4 Pin Cable for Sub-Bus Power

M12 Straight 4 Pin Male to 7/8" MINI 4 Pin Female Extension
TA0401MA0MC0471T – 1 Meter
TA0405MA0MC0471T – 5 Meter
TA0410MA0MC0471T – 10 Meter

M12 Cables

4 Pin Cables for Sub-Bus Power

M12 Straight 4 Pin Female Single Ended Cable, Euro Color Code
TC0405MAE0000000 – 5 Meter
TC0410MAE0000000 – 10 Meter

M12 90° 4 Pin Female Single Ended Cable, Euro Color Code
TD0405MAE0000000 – 5 Meter
TD0410MAE0000000 – 10 Meter

M12 Straight 4 Pin Male to Female Cable Extension
TC0401MAETA04000 – 1 Meter
TC0405MAETA04000 – 5 Meter
TC0410MAETA04000 – 10 Meter

M12 Field Wireable Connectors

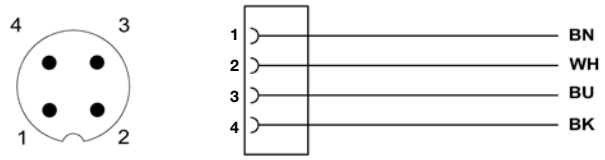
4 Pin Connectors for Sub-Bus Power

M12 Straight 4 Pin Female Field Wireable Connector
TC04F10000000000 – PG 7 Cable Gland
TC04F20000000000 – PG 9 Cable Gland

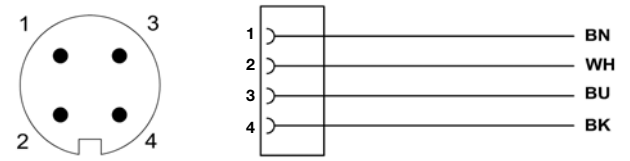
M12 90° 4 Pin Female Field Wireable Connector
TD04F10000000000 – PG 7 Cable Gland
TD04F20000000000 – PG 9 Cable Gland

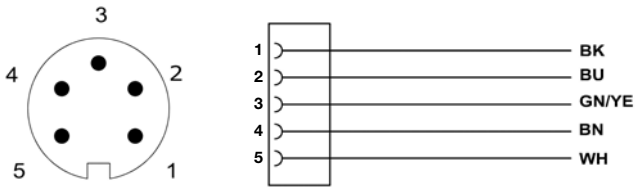
Pin Out and Technical Data

M12 Cable - Pin Out / Euro Color Code (Male View)



7/8" MINI Cable - Pin Out / Euro Color Code (Male View)





Technical Data	M12	7/8" MINI
Molded Body / Insert	Cable = PVC Field Wireable = Polyamide	Cable = PVC Field Wireable = Polyamide or PBT
Coupling Nut	Nickel Copper Alloy	Black Anodized Aluminum
Cable Jacket Material	PVC	PVC
Cable O.D.	7.4mm	7.4mm (4 Pin & 5 Pin)
Voltage Rating (Nominal)	250 V Max. @ 105° C	250 V Max. @ 105° C
Current Rating	Cables = 4.0 Amps Field Wireable = 4.0 Amps	Cables = 5.5 Amps Field Wireable = 8.0 Amps
Degree of Protection	IP67 (mated)	IP67 (mated)
Operating Temperature	-25° C - 85° C	-40° C - 85° C
Conductor Gauge	Cable = 18 AWG	Cable = 18 AWG
Bend Radius	Cable = 74mm	Cable = 74mm (4 Pin & 5 Pin)
Maximum Wire AWG	Field Wireable = 18 AWG	Field Wireable = 16 AWG
Wire Connection	Field Wireable = Screw Terminal	Field Wireable = Screw Terminal
PG 7 Range	4-6 mm	N/A
PG 9 Range	6-8 mm	5-13 mm – One size fits all
PG 13.5 Range	N/A	5-13 mm – One size fits all

7/8" MINI Drop Cables

7/8" MINI Straight 5 Pin Female Single Ended Cable - Shielded
MC0505MGD0000000 – 5 Meter
MC0510MGD0000000 – 10 Meter

M12 Drop Cables

M12 Straight 5 Pin Female Single Ended Cable - Shielded
TC0505MGD0000000 – 5 Meter
TC0510MGD0000000 – 10 Meter

7/8" MINI 3 Way "T"

3 Way 7/8" MINI "T"
MC0500000MT05000

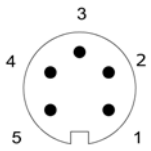
Terminating Resistors "TR"

7/8" MINI & M12 Straight 5 Pin Male Terminators
TA05TR0000000000 – M12 Male
MA05TR0000000000 – MINI Male

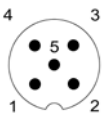
7/8" MINI Field Wireable Connectors

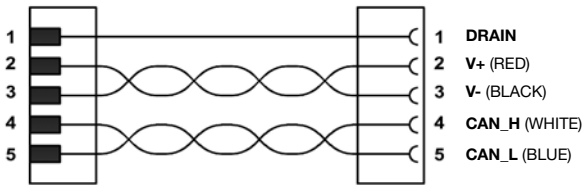
7/8" MINI Straight 5 Pin Field Wireable Connectors
MC05F90000000000 - Female - Cable Gland - One size fits all
MA05F90000000000 - Male - Cable Gland - One size fits all

MINI Cable - Pin Out / Color Code (Male View)



M12 Cable - Pin Out / Color Code (Male View)





Technical Data	Cable	T & TR	Field Wireable
Molded Body / Insert	PVC	PVC	Body = Glass Filled Polyamide
Coupling Nut	Nickel Plated Brass or Anodized Aluminum	Clear Anodized Aluminum	Black Anodized Aluminum
Cable Jacket Material	PVC	N/A	N/A
Cable O.D.	MINI = 8mm M12 = 8mm	N/A	5-13mm – One size fits all
Voltage Rating (Nominal)	150 Volts	T =300 Volts	600 Volts
Current Rating	MINI =4.0 Amps MR = 3.0 Amps	T = 8.0 Amps TR = NA	8.0 Amps
Degree of Protection	IP65 (mated)	IP65 (mated)	IP65 (mated)
Operating Temperature	-40° C - 80° C	-40° C - 105° C	-40° C - 90° C
Conductor Gauge	22 AWG Power 24 AWG Signal	N/A	16-22 AWG
Bend Radius	Cable = 72mm	N/A	N/A
Wire Connection	NA	N/A	Screw Terminal







M12 D-Coded Cables

M12 Straight 4 Pin Male D-Coded Single Ended Cable
QA0405MR00000000 – 5 Meter
QA0410MR00000000 – 10 Meter

M12 Straight 4 Pin Male D-Coded Double Ended Cable
QA0405MR0QA04000 – 5 Meter
QA0410MR0QA04000 – 10 Meter

M12 Straight 4 Pin Male D-Coded to Male RJ45 Cable
QA0405MR0VA04000 – 5 Meter
QA0410MR0VA04000 – 10 Meter

M12 Straight 4 Pin Male D-Coded to RJ45 Female Socket Convertor
QA04D2MK0VC04000 – 0.2 Meter

M12 D-Coded Field Attachable CONNECTORS

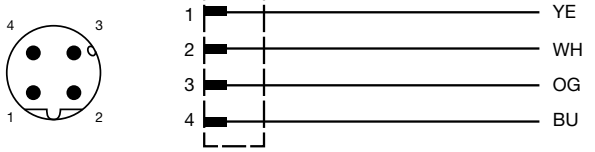
M12 Straight 4 Pin Male D-Coded Field Wireable Connector
QA04F20000000000 – PG 9 Cable Gland – Screw Terminal

M12 Straight 4 Pin Male D-Coded Field Wireable Connector W/IDC
QA04F200R000071N – PG 9 Cable Gland - IDC

RJ45 Field Attachable CONNECTOR

RJ45 Field Wireable Connector with IDC
VA08F200R000071N – PG 9 Cable Gland

M12 D-Coded Cable - Pin Out / Color Code (Male View)



Technical Data	Cable	RJ45 Field Attachable	M12 Field Attachable
Molded Body / Insert	TPU	Housing = PA Carrier = PC	Body = Nickel Plated Zinc Insert = PA 66
Coupling Nut	Nickel Plated Zinc	N/A	Nickel Plated Brass
Cable Jacket Material	PVC	N/A	N/A
Cable O.D.	6.5 to 7.4 mm	Accepts 4.5 to 8.0 mm	Accepts 6.0 to 8 mm
Voltage Rating (Nominal)	250 Volts	N/A	60 Volts
Current Rating	4.0 Amps	1.75 Amps	Screw 4.0 Amps IDC 1.75 Amps
Degree of Protection	IP65 (mated), RJ45 – IP20	IP20	IP 65 (mated)
Operating Temperature	-25° C - 60° C	-10° C - 60° C	-40° C - 85° C
Conductor Gauge	22 & 24 AWG	22 AWG Solid/Stranded	Screw 24-18 AWG IDC 26-22 AWG
Bend Radius Minimum	19.5mm (fixed) 45.5mm (Flexible)	N/A	N/A
Wire Connection	NA	IDC	Screw Terminal, IDC

M12 D-Coded Cables

M12 Straight 4 Pin Male D-Coded Double Ended Cable
QA0405MS0QA04000 – 5 Meter
QA0410MS0QA04000 – 10 Meter

M12 Straight 4 Pin Male D-Coded to Male RJ45 Cable
QA0405MS0VA04000 – 5 Meter
QA0410MS0VA04000 – 10 Meter

M12 Straight 4 Pin Male D-Coded to RJ45 Female Socket Convertor
QA04D2MK0VC04000 – 0.2 Meter

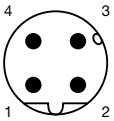
M12 D-Coded Field Attachable CONNECTORS

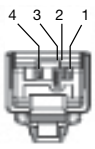
M12 Straight 4 Pin Male D-Coded Field Wireable Connector
QA04F20000000000 – PG 9 Cable Gland – Screw Terminal

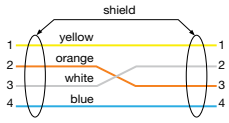
M12 Straight 4 Pin Male D-Coded Field Wireable Connector W/IDC
QA04F200R000071N – PG 9 Cable Gland - IDC

RJ45 Field Attachable CONNECTOR

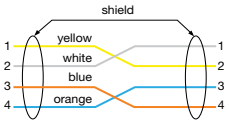
RJ45 Field Wireable Connector with IDC
VA08F200R000071N – PG 9 Cable Gland







RJ45 to M12



M12 to M12

M12 D-Coded Cable & RJ45
Pin Out / Color Code (Male View)

Technical Data	Cable	RJ45 Field Attachable	M12 Field Attachable
Molded Body / Insert	N/A	Housing = PA Carrier = PC	Body = Nickel Plated Zinc Insert = PA 66
Coupling Nut	Nickel Plated Zinc or Brass	N/A	Nickel Plated Brass
Cable Jacket Material	PUR	N/A	N/A
Cable O.D.	6.5 mm	Accepts 4.5 to 8.0 mm	Accepts 6.0 to 8 mm
Voltage Rating (Nominal)	N/A	N/A	60 Volts
Current Rating	N/A	1.75 Amps	Screw 4.0 Amps IDC 1.75 Amps
Degree of Protection	IP65 (mated), RJ45 – IP20	IP20	IP 65 (mated)
Operating Temperature	-25° C - 60° C	-10° C - 60° C	-40° C - 85° C
Conductor Gauge	22 AWG	22 AWG Solid/Stranded	Screw 24-18 AWG IDC 26-22 AWG
Bend Radius Minimum	45.5mm	N/A	N/A
Wire Connection	N/A	IDC	Screw Terminal, IDC

M12 D-Coded Cables

M12 Straight 4 Pin Male D-Coded Single Ended Cable - Shielded
QA0405MK00000000 – 5 Meter
QA0410MK00000000 – 10 Meter

M12 Straight 4 Pin Male D-Coded to Male RJ45 Cable - Shielded
QA0405MK0VA04000 – 5 Meter
QA0410MK0VA04000 – 10 Meter

M12 Straight 4 Pin Male D-Coded to RJ45 Female Socket Convertor - Shielded
QA04D2MK0VC04000 – 0.2 Meter

M12 D-Coded Field Wireable Connectors

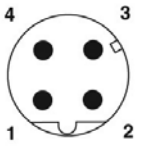
M12 Straight 4 Pin Male D-Coded Field Wireable Connector
QA04F20000000000 – PG 9 Cable Gland – Screw Terminal

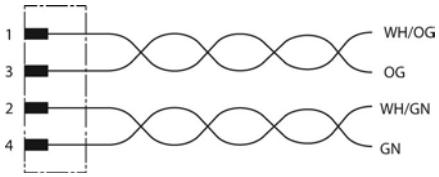
M12 Straight 4 Pin Male D-Coded Field Wireable Connector w/IDC
QA04F2000000071N – PG 9 Cable Gland - IDC

RJ45 Field Wireable Connector

RJ45 Field Wireable Connector with IDC
VA08F2000000071N – PG 9 Cable Gland

M12 D-Coded Cable - Pin Out / Color Code (Male View)





Technical Data	Cable	RJ45 Field Wireable	Field Wireable
Molded Body / Insert	TPU, PA, PA66	Housing = PA Carrier = PC	Body = Nickel Plated Zinc Insert = PA 66
Coupling Nut	Nickel Plated Zinc or Brass	N/A	Nickel Plated Brass
Cable Jacket Material	PUR or PVC	N/A	N/A
Cable O.D.	6.7 or 8.0 mm	4.5 to 8.0 mm	6.0 to 8.0 mm
Voltage Rating (Nominal)	42 Volts	N/A	60 Volts
Current Rating	1.5 Amps	1.75 Amps	Screw 4.0 Amps IDC 1.75 Amps
Degree of Protection	IP65 (mated)	IP20 (mated)	IP65 (mated)
Operating Temperature	-20° C - 60° C	-20° C - 70° C	-40° C - 85° C
Conductor Gauge	26 or 24 AWG	26-22 AWG Solid/Stranded	Screw 24-18 AWG IDC 26-22 AWG
Bend Radius	40mm	N/A	N/A
Wire Connection	NA	IDC	IDC, Screw Terminal

M12 Reverse Key B-Coded Cables

M12 Straight 5 Pin Male Reverse Key Single Ended Cable - Shielded
RA0505MHP0000000 – 5 Meter
RA0510MHP0000000 – 10 Meter

M12 Straight 5 Pin Female Reverse Key Single Ended Cable - Shielded
RC0505MHP0000000 – 5 Meter
RC0510MHP0000000 – 10 Meter

M12 Straight 5 Pin MALE TO FEMALE Reverse Key EXTENSION CABLE
RC0505MHPRC05000 – 5 Meter
RC0510MHPRC05000 – 10 Meter

M12 Reverse Key B-Coded Field Wireable Connectors

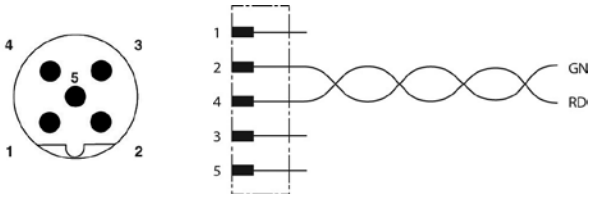
M12 Straight 5 Pin Male Reverse Key Field Wireable Connector
RA05F200P0000000 – PG 9 Cable Gland

M12 Straight 5 Pin Female Reverse Key Field Wireable Connector
RC05F200P0000000 – PG 9 Cable Gland

M12 Reverse Key B-Coded Terminating Resistor

M12 Straight 5 Pin Male Reverse Key Terminating Resistor
RA05TR0000000000 - Male

M12 Reverse Key B-Coded Cable Pin Out / Color Code (Male View)



Technical Data	Cable	TR	Field Wireable
Molded Body / Insert	TPU	TR = TPU	Body = Nickel Plated Zinc Insert = PA 66
Coupling Nut	Nickel Plated Zinc	Nickel Plated Zinc or Brass	Nickel Plated Brass
Cable Jacket Material	PUR	N/A	N/A
Cable O.D.	7.4 mm	N/A	8.5 mm Max.
Voltage Rating (Nominal)	250 volts	60 Volts	60 Volts
Current Rating	4.0 Amps	4.0 Amps	4.0 Amps
Degree of Protection	IP65 (mated)	IP65 (mated)	IP 65 (mated)
Operating Temperature	-20° C - 80° C	-20° C - 80° C	-40° C - 85° C
Conductor Gauge	24 AWG	N/A	18 AWG Maximum
Bend Radius	Cable = 78mm	N/A	N/A
Wire Connection	N/A	N/A	Screw Terminal

I/O Cables with SPEEDCON Connector Technology

M12 Straight 4 Pin Male Single Ended Cable, Euro Color Code
TA04E5MIE000071P – 1.5 Meter
TA0403MIE000071P – 3 Meter
TA0405MIE000071P – 5 Meter

M12 90° 4 Pin Male Single Ended Cable, Euro Color Code
TB04E5MIE000071P – 1.5 Meter
TB0403MIE000071P – 3 Meter
TB0405MIE000071P – 5 Meter

M12 Straight 4 Pin Male to Female Cable Extension
TC04E5MIETA0471P – 1.5 Meter
TC0403MIETA0471P – 3 Meter

M12 Straight 3 Pin Male to M8 3 Pin Straight Female Extension
TC03E5MIEPA0371P – 1.5 Meter
TC0303MIEPA0371P – 3 Meter

I/O Connectors

M12 Straight 4 Pin Male Field Wireable Connector, IDC Connection
TA04F2000000081E – PG 9 Cable Gland w/ SPEEDCON connector technology

M12 Straight 4 Pin Male Field Wireable Connector, Screw Terminal
TA04F10000000000 – PG 7 Cable Gland
TA04F20000000000 – PG 9 Cable Gland

M12 90° 4 Pin Male Field Wireable Connector, Screw Terminal
TB04F10000000000 – PG 7 Cable Gland
TB04F20000000000 – PG 9 Cable Gland

I/O Splitters

M12 to M12 “Y” Splitter, 21mm Spacing
TA0500000JC05000

M12 to M8 “Y” Splitter
TA0400000KC03000

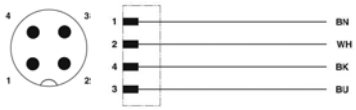
M12 Cable Splitter, 2 Straight M12 Female Connectors
TA04D3MIEJC04000 – 0.3 Meter
TA04E5MIEJC04000 – 1.5 Meter
TA0403MIEJC04000 – 3.0 Meter

M12 Cable Splitter, 2 Straight M8 Female Connectors
TA04D3MIEKC03000 – 0.3 Meter
TA04E5MIEKC03000 – 1.5 Meter
TA0403MIEKC03000 – 3.0 Meter

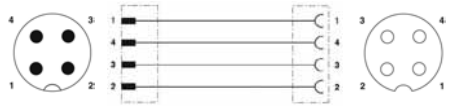
Wire Stripper Tool
140-1097

I/O Cable Connector Pin Out Diagrams

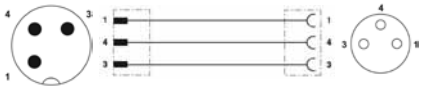
M12 Cable - Pin Out / Color Code
TA04XXMIE0000000, TB04XXMIE0000000
(Male View)



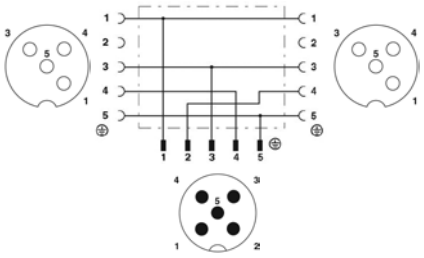
M12 Cable - Pin Out / Color Code
TC03XXMIEPA0371P
(Male to Female View)



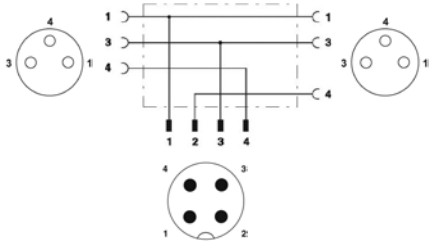
M12 Cable - Pin Out / Color Code
TC03XXMIEPA0371P
(Male to Female View)



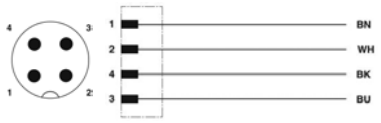
M12 to M12 "Y" Splitter - Pin Out
TA0500000JC05000
(Male to Female View)



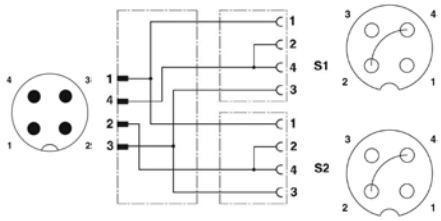
M12 to M8 "Y" Splitter - Pin Out
TA0400000KC03000
(Male to Female View)



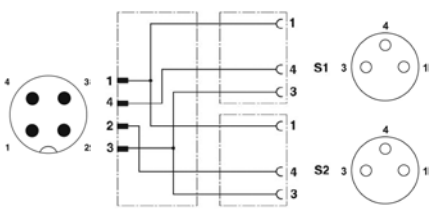
M12 Field Wireable (IDC) - Pin Out
TA04F2000000081E (SPEEDCON)
(Male View)



M12 to M12 Cable Splitter - Pin Out
TA04XXMIEJC04000
(Male to Female View)



M12 to M8 Cable Splitter - Pin Out
TA04XXMIEKC03000
(Male to Female View)



Note:
XX denotes allowable length
See pages 44 and 45.

Cable and Connector Technical Data

Technical Data	M12 Cables	M12/M8 Cables	M12 Connectors
Molded Body / Insert	TPU	TPU	Polyamide (or) PA 66
Coupling Nut	Nickel Plated Zinc	Nickel Plated Zinc	Nickel Plated Zinc
Cable Jacket Material	PUR	PUR	NA
Cable O.D.	4.70 mm	4.70 mm	PG7 4.0 to 6.0 mm PG9 4.0 to 8.0 mm
Voltage Rating	250 Volts	60 Volts	50 Volts
Current Rating (Cond.)	4.0 Amps	3.0 Amps	4.0 Amps
Degree of Protection	IP65 (mated)	IP65 (mated)	IP67 (mated)
Operating Temperature	-25° C to 80° C (fixed instl.)	-25° C to 80° C (fixed instl.)	-25° C to 80° C
Conductor Gauge	22 AWG	22 AWG	22 AWG Min. 18 AWG Max.
Bend Radius	47 mm	47 mm	NA

Technical Data	I/O "Y" Splitter	I/O Cable Splitter
Molded Body / Insert	TPU	TPU
Coupling Nut	Nickel Plated Zinc	Nickel Plated Zinc
Cable Jacket Material	NA	PUR
Cable O.D.	NA	4.40 mm
Voltage Rating	60 Volts	60 Volts
Current Rating (Cond.)	3.0 Amps	3.0 Amps
Degree of Protection	IP67 (mated)	IP67 (mated)
Operating Temperature	-25° C to 90° C	-25° C to 80° C
Conductor Gauge	NA	22 AWG or 24 AWG
Bend Radius	NA	44 mm

Technical Data	Wire Stripper
Use with	PVC Insulation
Stripping Range	28 AWG to 10 AWG
Cutting Range (Flexible)	10 AWG
Cutting Range (Rigid)	12 AWG

Sub-Bus Cables

M12 Straight 5 Pin Male to Female Sub-Bus Cable - Shielded
TA0501MGDTC0571P – 1 Meter
TA0505MGDTC0571P – 5 Meter
TA0510MGDTC0571P – 10 Meter

M12 Straight 5 Pin Female FIELD WIREABLE CONNECTOR, SPRING CAGE
TC05F2000000071V – PG9 Cable Gland

M12 Straight 5 Pin Male FIELD WIREABLE CONNECTOR, SPRING CAGE
TA05F2000000071V – PG9 Cable Gland

M12 90º 5 Pin Female FIELD WIREABLE CONNECTOR, SPRING CAGE
TD05F2000000071V – PG9 Cable Gland

M12 90º 5 Pin male FIELD WIREABLE CONNECTOR, SPRING CAGE
TB05F2000000071V – PG9 Cable Gland

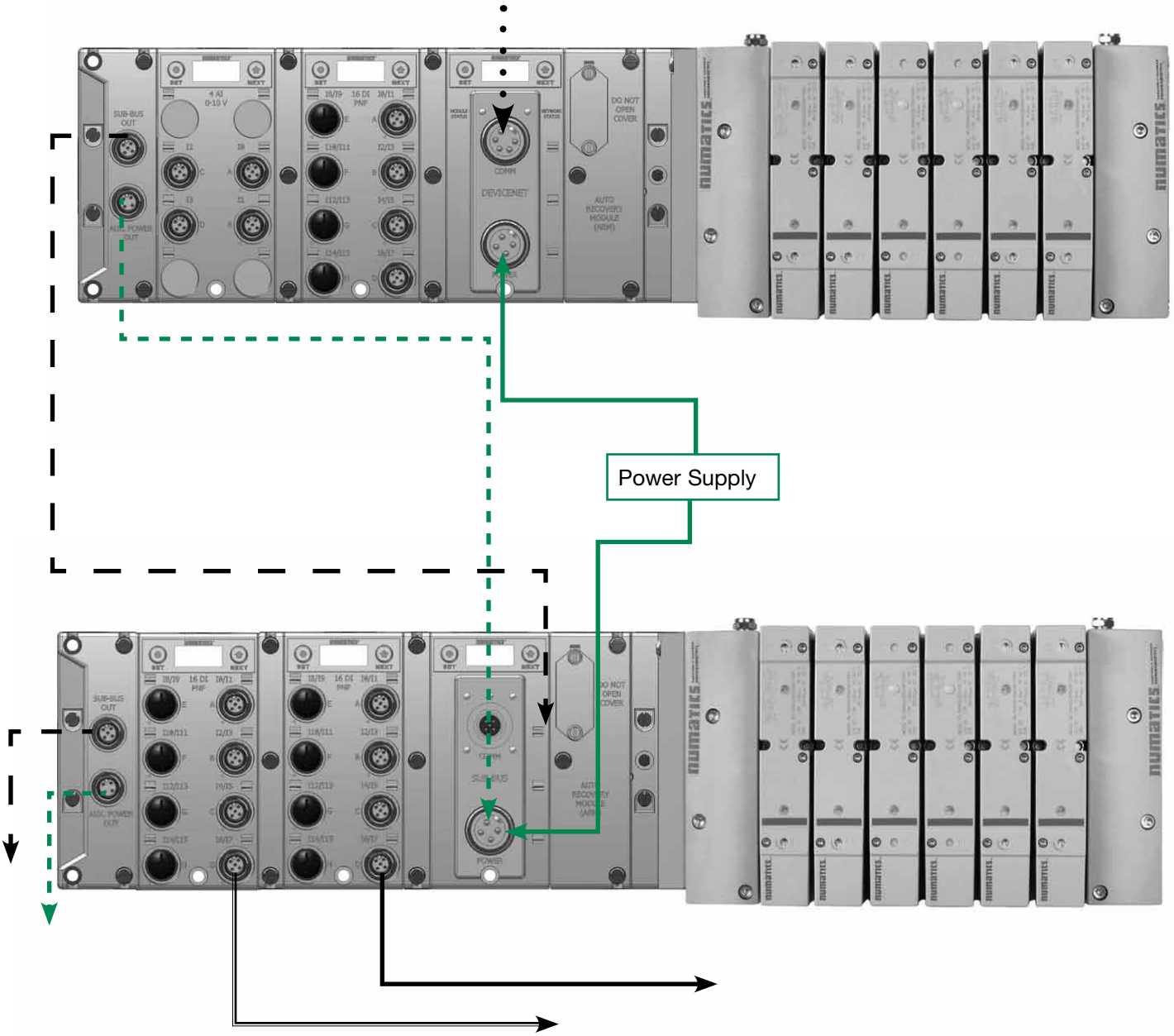
Bulk Sub-Bus Cable	*NOTE
000550MGD0005000 – 50 Meter Length	
0005A0MGD0005000 – 100 Meter Length	

* Note:
Length of field wired cables should not exceed the maximum length of 30 meters for total sub-bus communications link. See appropriate technical manual for sub-bus length requirements. The cable assemblies and Bulk cable are the only approved cables for the G3 Sub-Bus link. See technical document TDG3SBWD1-0EN for proper installation and wiring of field wireable connectors.

Technical Data

Technical Data	Cable	Connectors	Bulk Cable
Molded Body / Insert	TPU	Zinc - Nickel Plated	N/A
Coupling Nut	Zinc - Nickel Plated	Brass - Nickel Plated	N/A
Cable Jacket Material	PUR	N/A	Gray RAL 7001
Cable O.D.	6.70 mm	N/A	6.70 mm
Voltage Rating (Nominal)	60 Volts	60 Volts	60 Volts
Current Rating	4.0 Amps	4.0 Amps	4.0 Amps
Degree of Protection	IP65 (mated)	IP65 (mated)	IP65 (terminated)
Operating Temperature	-40° C - 80° C	-40° C - 80° C	-20° C - 75° C
Conductor Gauge	24 AWG Signal 22 AWG Power	26-20 AWG	24 AWG Signal 22 AWG Power
Bend Radius	67 mm	N/A	67 mm
No. of Bending Cycles	5 Million	N/A	5 Million

Example Sub-Bus Layout and Cabling (DeviceNet™ / CANopen® Network)



Cable	Description	Example Cable Part #	Page
	Power Cable	MC0405MAC0000000	354
	DeviceNet™/CANopen Communication Cable	MC0505MGD0000000	357
	Sub-Bus Cable	TA0501MGDTC0571P	365
	Alternate Sub-Bus Power Option	TA0401MA0MC04000	355
	I/O Field Wireable Connector	TA04F2000000081E	362
	I/O Connector with Molded Cable	TA0405MIE000071P	362

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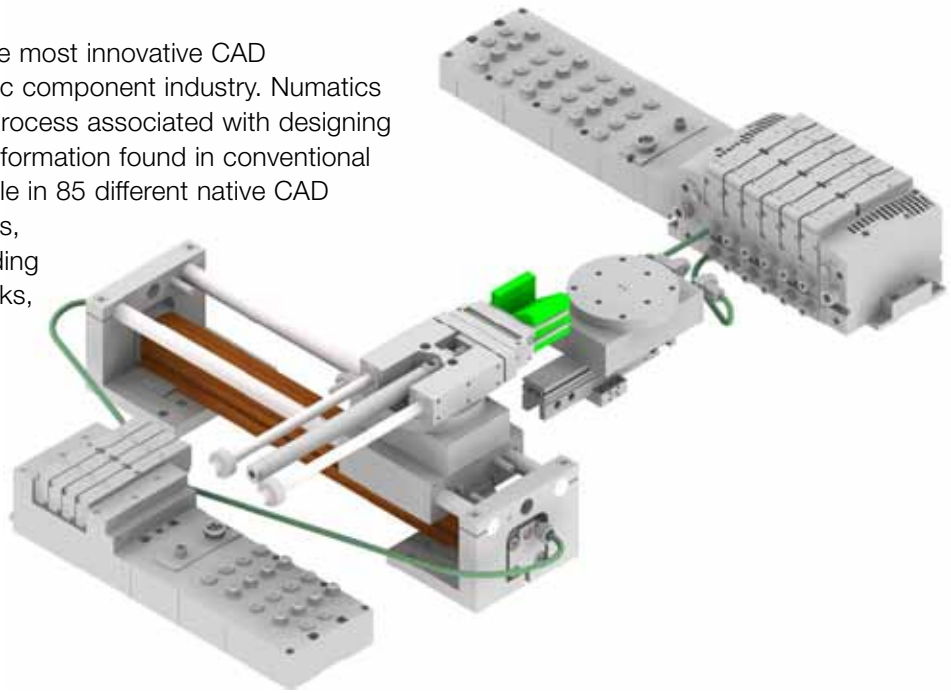

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LT-G3Catalog 2.5 Rev 05/13
10M-IPC-12/11