

NUMATICS®

501 Series

Solenoid Pilot Actuated Valves



www.numatics.com

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



Numatics Express Shipping Program guarantees[†] product shipment in two, three or five business days. Unlike most traditional quick ship programs, the Numatics Express Shipping Program includes the most comprehensive offering in the industry. This program encompasses the range and options that you require!

Numatics is committed to offering you the highest level of customer service, quality and performance.

2DAY

Numatics Express 2Day shipping program guarantees[†] product shipment in two business days. The program includes the most popular valve, air preparation and actuator products and includes applicable switches and mounting accessories.

Numatics guarantees[†] to ship any order received before 3 pm EST for up to 10 2Day products* in two business days.

3DAY

Numatics Express shipping program offers a 3Day shipping program that guarantees[†] product shipment of a fully assembled and tested valve manifold in 3 business days. The program includes the most popular manifold configurations of the 2000 and Mark series valves:

- Sub D, Terminal Strip and Fieldbus Electronic Options
- Can be configured for DIN Rail Mounting and Muffled Exhaust
- Shipped complete and 100% tested

The 3Day Express shipping program enables you to create a 2 to 8 station manifold assembly complete with any combination of valves, regulators, and blank stations that can be configured from the valve model charts in this catalog.

Numatics guarantees[†] to ship any order received before 3 pm EST for up to 5 manifold assemblies configured from this catalog in three business days or Numatics pays the shipping cost.

5DAY

We are pleased to expand Numatics Express to include a broad range of products in a 5Day shipping program. Numatics guarantees[†] to ship up to 10 of any 5Day product** for orders received before 3 pm EST in 5 business days or Numatics pays the shipping cost.

We are committed to providing you with an unmatched level of customer service, quality, and reliability. If you cannot locate the specific product for your application or need additional product specifications, visit www.numatics.com or call 888-686-2842. Numatics Express orders cannot be canceled or adjusted once entered. Saturdays, Sundays, and Holidays are excluded.

[†]As industry requirements change, Numatics reserves the right to modify the contents of this catalog and program without notification. Updates on this program can be obtained from the Numatics website www.numatics.com or by calling 888-686-2842, or by contacting your local Numatics representative or distributor and referencing the Numatics Express program.

***Sentronic[®] Proportional Valves, CGT Compact Slides, NR Series Rodless and Air Bellows are limited to orders up to 5.**

****A Series Large Bore NFPA, ASP Series Steel Body NFPA and G Series Guide Rail Rodless are limited to orders up to 5.**

Welcome to the World of Fluid Automation...

Since 1945, Numatics has emerged as the prominent specialist in developing and manufacturing pneumatic and fluid power components for a widely diverse field of automated industry. From idea to implementation, leading engineers choose Numatics as their single source for:

- Quality Fluid Power components
- Technologically advanced design resources
- Quick response time in delivery and service from around the world



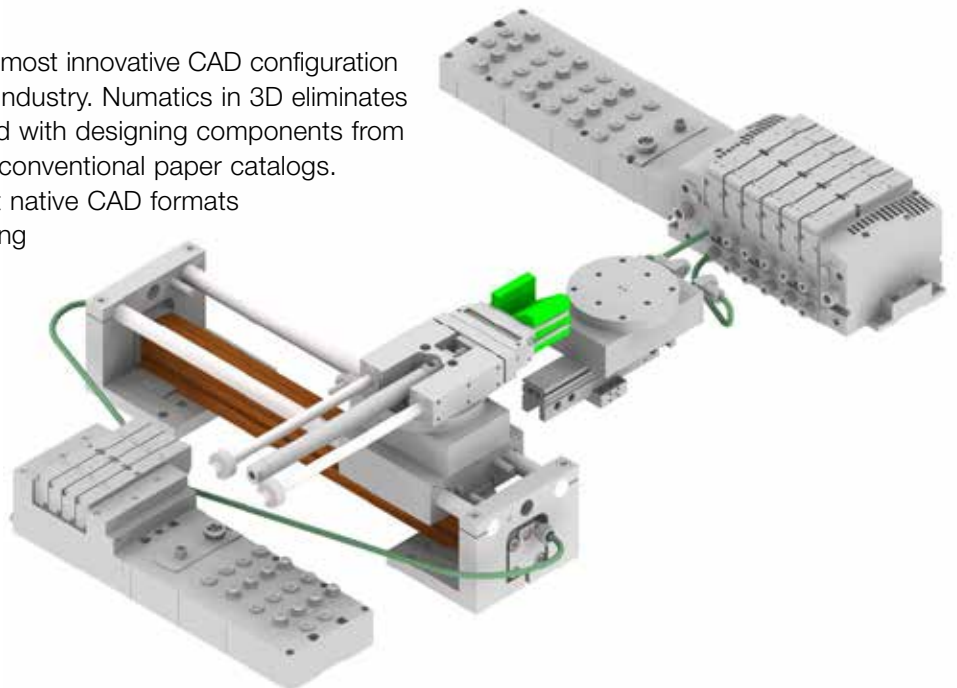
Numasizing®

Developed by Numatics, Numasizing® offers a whole new level of fluid power system optimization. Compare large amounts of component and process data against user objectives and industry benchmarks for the best possible size, pneumatic pressure, actuator stroke velocities and other part and process variable determinations.

CAD Modeling

Save critical development time with the most innovative CAD configuration program in the pneumatic component industry. Numatics in 3D eliminates the time consuming process associated with designing components from scratch based on information found in conventional paper catalogs.

The models are available in 85 different native CAD formats in 2D drawings and 3D models, including all the popular formats including Catia, I-DEAS, Pro/Engineer, SolidWorks, Unigraphics and more.



501 Series

Features and Benefits	2
Technical and Operating Data	3
How to Order	4
Valve Regulator/Plug-in Assembly	5
Sandwich Pressure Regulator Dimensions	6
Manifold Assemblies	7
Plug-In Valve Mounted	7
Sandwich Shut Off Block	8
Blank Station Plate Kit	8
Speed Control Kit	8
DIN Rail Clamp Kit	9
Blocking Disc Kit	9
End Plate Kits	9
Manifold Assembly	10
Internal/External Pilot Selection	11

Assembly Kits

How to Order	12
25 or 37 Pin Sub-D	13
1-32 Terminal Strip	14
19 Pin Round Connector	14

580 Series

Features and Benefits	18
DeviceNet™	19
Ethernet	20
Profibus DP	21
PROFINET	22
EtherCAT®	23
EtherNet/IP™ DLR	24
Dimensional Drawing - 580 Fieldbus Communication Assembly	25
How to Order - 580 Assembly Kit & 580 Electronics	26
How to Order Complete 580 Manifold Assemblies	27
Cables and Connectors	28-33

G3 Electronics

Features and Benefits	36-37
G3 Platform Distribution Options	38-39
DeviceNet™	40
Ethernet	41
PROFIBUS DP	42
PROFINET	43
CANopen®	44
DeviceLogix™	45
Ethernet POWERLINK®	46
EtherCAT® and EtherNet/IP™ DLR	47-48
I/O Modules	49-51
Sub-Bus Modules	52-53
Miscellaneous Modules & Accessories	54-55
Dimensional Drawing - G3 Fieldbus Communication Assembly	56-57
How to Order Complete G3 Manifold Assemblies	58
How to Order - G3 Assembly Kit & G3 Electronics	59-60
Cables and Connectors	61-73
Example Sub-Bus Layout and Cabling	74

501 Series – Directional Control Valve Platform

Featuring Higher Flow in a Compact Valve Package

Commissioning Capabilities

- Solenoid air pilot actuated
- Low wattage .8 wall for DC application
- DC solenoids Polarity insensitive with surge suppression
- Plug together circuit boards eliminate internal wiring
- Integral recessed gaskets
- IN Fittings to accommodate various tube sizes
- Simple conversion from internal to external pilot
- IP65 Certified



Sandwich and Manifold Accessories

- Pressure Regulators for supply pressure control at individual valve
- Speed control to control exhaust flow allows for control of actuator extend or retract speed
- Shut off block for individual valve to be isolated from pressure supply during operation and repair
- Mid Station Supply Manifold block allows for multiple pressure zones (with blocking discs) or additional air supply to a manifold



Fieldbus Electronics Compatible

- G3 Fieldbus Electronics
 - Graphic Display for easy commissioning, visual status & diagnostics
 - 32 valve solenoids per manifold
 - Easy distribution of additional manifolds through Sub-Bus communication
 - One Node supports up to 16 I/O modules
 - Available with Auto Recovery Module (ARM) which allows configuration information to be saved and reloaded to replacement module automatically
- 580 Fieldbus Electronics
 - Graphic Display for easy commissioning, visual status & diagnostics
 - 32 valve solenoids per manifold



Performance Data

Valve Data	Min.	Max.
Pilot Pressure Range	29 PSI (2 Bar)	115 PSI (8 Bar)
Valve Operating Pressure Range	28" HG Vacuum	115 PSI (8 Bar)
Ambient Temperature Range	- 10°C (- 14°F)	50 °C (122 °F)

Valve Flow Data	Proprietary	
	Cv	NL/m (6 - 5 Bar)
5/2, Double Solenoid & Single Solenoid, Spring Return	0.46	460
2X 3/2 NC-NC	0.45	450
2X 3/2 NO-NO	0.45	450
Double Solenoid, 3 pos. 4 way, Spring Centered- Open to 4 and 2 in center	0.46	460
Double Solenoid, 3 pos. 4 way, Spring Centered - Open Center	0.46	460
Double Solenoid, 3 pos. 4 way, Spring Centered - Closed Center	0.46	460

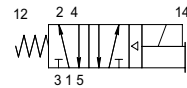


Operating Data

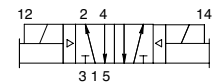
All Solenoids Are Continuous Duty Rated	24 VDC
Power (Watts)	0.8

Response Time (ms)	Rubber Seal	
	Energize	Deenergize
5/2, Single Solenoid, Spring Return	14	29
5/2, Double Solenoid	11	N/A
5/3 Spring Centered	15	20
2x3/2 NC	18	18
2 X3/2 NO	18	18

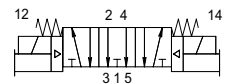
single solenoid air pilot
2 position 4-way



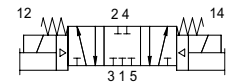
double solenoid air pilot
2 position 4-way



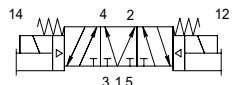
double solenoid air pilot
3 position 4-way
open center



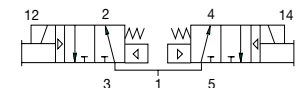
double solenoid air pilot
3 position 4-way
closed center



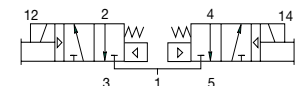
double solenoid air pilot
3 position 4-way
pressure center



double solenoid
2 position dual 3-way
"14" & "12" NO



double solenoid
2 position dual 3-way
"14" & "12" NC



How to Order

Valves

R 501 A 2 B 4 0 M A00 F1

Product Series

501 = 11 mm Valve

Revision

A = Initial Release

Actuation

2 = Rubber Packed

Valve Type

B = Solenoid Pilot with Flush Non-Locking Override

Function

- 1 = 2 Position 4-Way (5/2), Spring Return
- 4 = 2 Position 4-Way (5/2), Dual Solenoid
- 5 = 3 Position 4-Way (5/3), Open Center, Dual Pressure
- 6 = 3 Position 4-Way (5/3), Blocked Center
- 7 = 3 Position 4-Way (5/3), Open to A & B in Center
- A = Dual 3-way, A normally open - B normally open
- D = Dual 3-way, A normally closed - B normally closed
- N = Differential Air Return w/o Spring

Voltage

F1 = 24 DC

Options

- A00 = Standard (No Options)
- 11B = Flush Locking Manual Override
- 11M = Without Manual Override

Electrical

M = Plug-in, w/ Light, VDC

Port Size

0 = No Port Size

Regulators

R 501 A R S 5 1 J A00 1 0

Product Series

501 = 11 mm Valve

Revision

A = Initial Release

Product Type

R = Regulator

Regulator Type

S = Single Reg. - Pressure to Port 1

Interface

1 = Proprietary

Options

- A00 = Standard (No Options)
- 12H = Regulator Less Gauge
- 18V = Regulator with Gauge in Offset Port

Wiring Option

J = Plug-In, Receptacle Assembly

Gauge Type

1 = PSI

Pressure Range

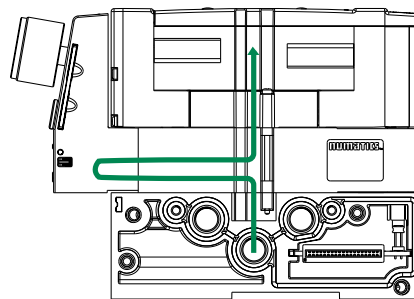
5 = 10 - 115 PSIG

Sandwich Pressure Regulators

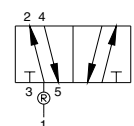
Type: RS



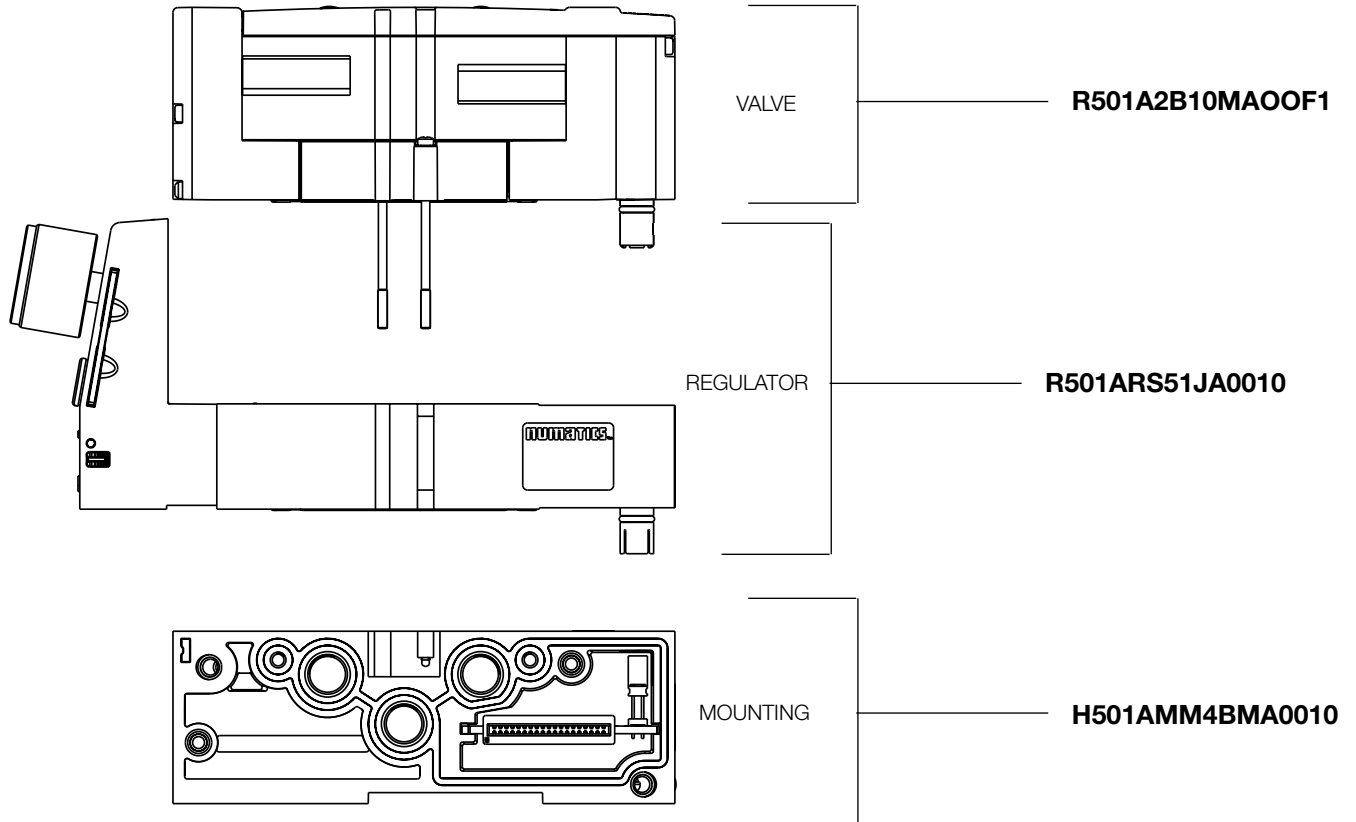
Type RS



Single pressure from a single supply



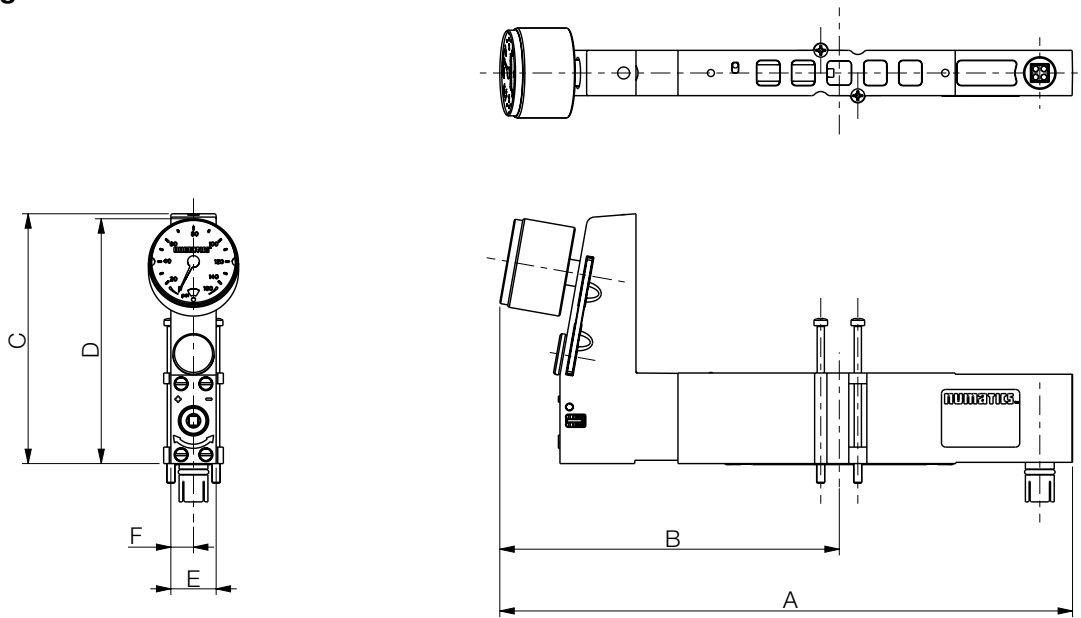
Valve Regulator / Plug-in Assembly



Sandwich Pressure Regulator

Dimensions: mm (Inches)

Single Regulator



A	B	C	D	E	F
139.1 (5.476)	82.5 (3.248)	60.7 (2.390)	59.5 (2.342)	11 (0.433)	5.5 (0.216)

How to Order

Manifold Assemblies

K 501 A M S4 2 M A00 1 0

Port Type

H = Metric Thread
K = Push-In Fittings

Product Series

501 = 11 mm Valve

Revision

A = Initial Release

Product Type

M = Manifold Sub Base
Z = Mid Station Supply*

Mounting

S4 = Manifold Sub Base, 4 Stations, Side Ports, Single Z-Board
M4 = Manifold Sub Base, 4 Stations, Side Ports, Double Z-Board

Interface

1 = Proprietary

Options

A00 = Standard (No Options)

Wiring Option

M = Plug-In, Receptacle Assembly

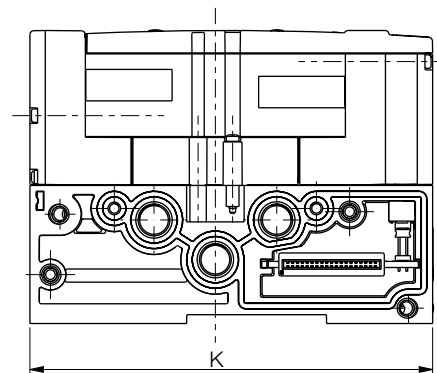
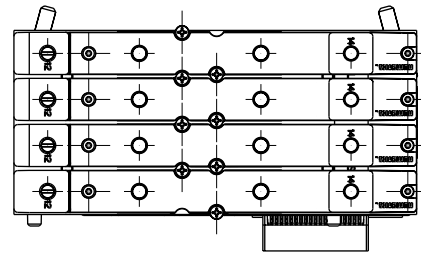
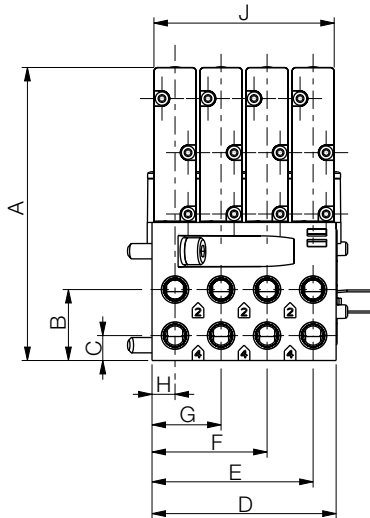
Port Size

B = M7 (Threaded only)
D = 4 mm (5/32) (Push-In Fittings only)
F = 6 mm (Push-In Fittings only)
2 = 1/4 (Push-In Fittings only)

*Available with M4 mounting only

Dimensions: mm (Inches)

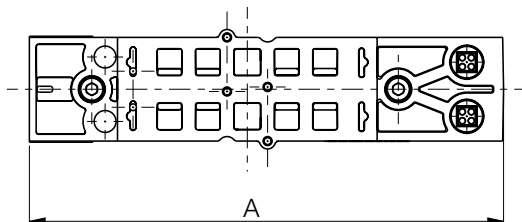
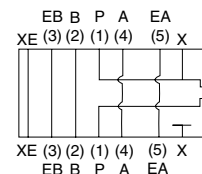
Plug In Valve Mounted



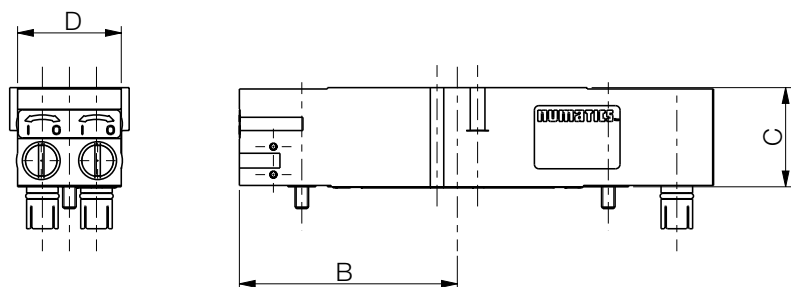
A	B	C	D	E	F	G	H	J	K
76.4	18.5	6.5	48	42	30	18	6	47	105
(3.008)	(0.728)	(0.256)	(1.890)	(1.653)	(1.181)	(0.709)	(0.236)	(1.850)	(4.134)

Sandwich Shut Off Block

- Used to shut off pressure when mounted below valve.
- Allows easy maintenance without the need to shut off pressure to the entire manifold.



Part Number	Description
R501AY428501001	Proprietary Sandwich Shut Off Kit

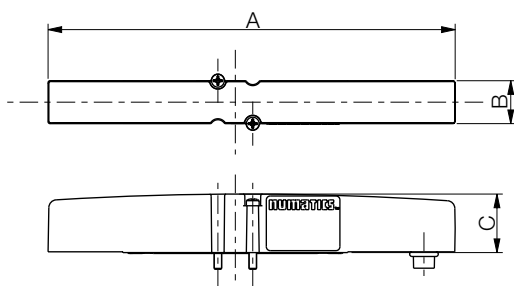


Dimensions: mm (Inches)

A	B	C	D
105.2 (4.142)	48.4 (1.905)	22 (0.866)	23 (0.905)

Blank Station Plate Kit

P501AB429685001

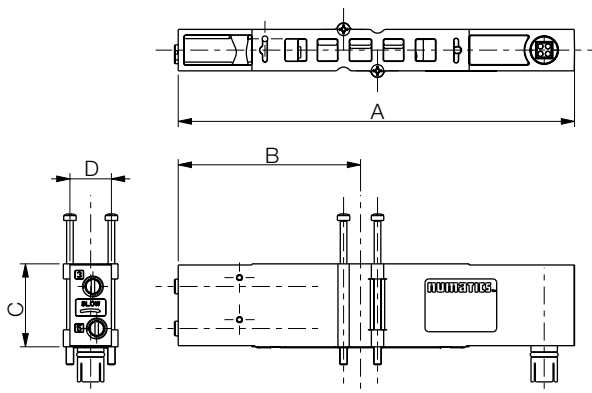


- Used to block off a manifold station for future use.

Dimensions: mm (Inches)

A	B	C
105.1 (4.138)	11 (0.433)	15 (0.591)

Speed Control Kit



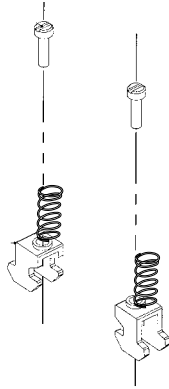
Part Number	Description
R501AS428500001	Sandwich Speed Control

Dimensions: mm (Inches)

A	B	C	D
105.1 (4.137)	48.4 (1.905)	22 (0.866)	11 (0.433)

DIN Rail Clamp Kit

239-980



Blocking Disc Kits

(Includes tag to label ports blocked)

Ports	Part
1	P501AD431915001
3	P501AD431915002
5	P501AD431915003
1 + 3	P501AD431915004
1 + 5	P501AD431915005
3 + 5	P501AD431915006
1, 3, 5	P501AD431915007

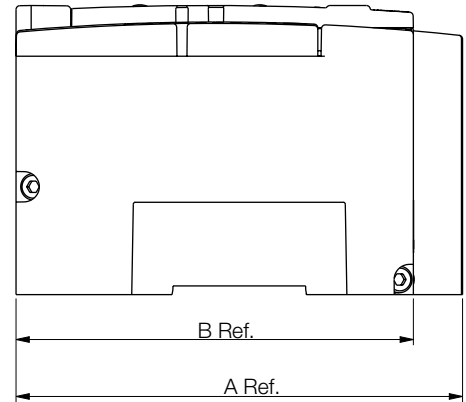
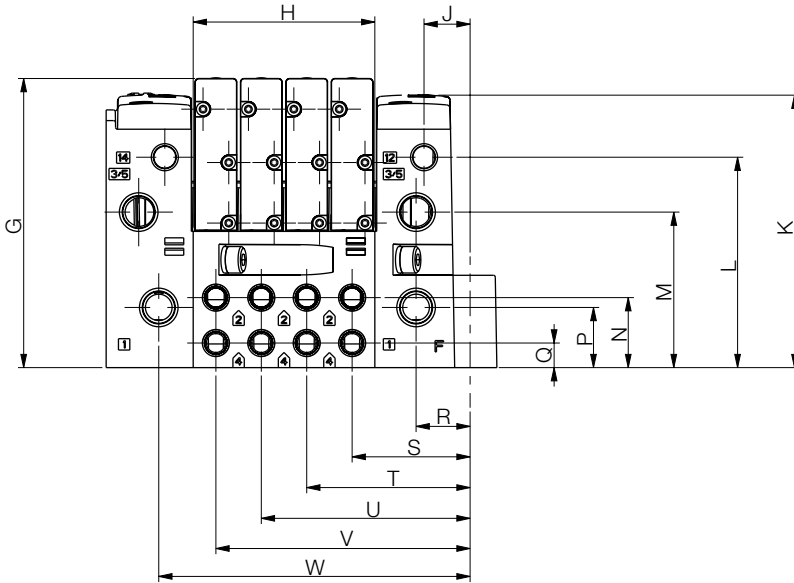
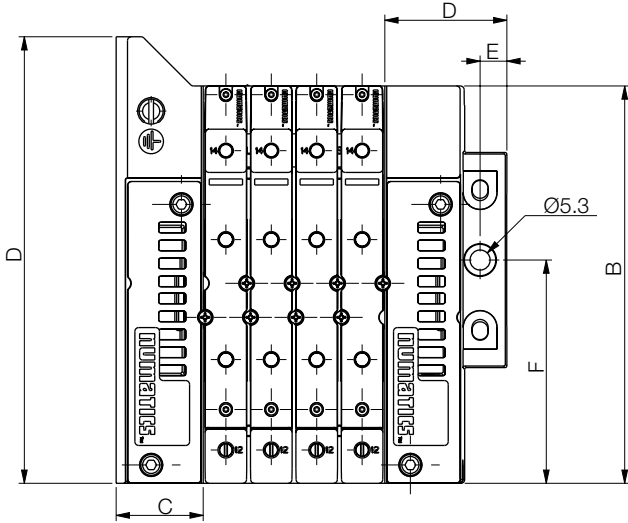
End Plate Kit - Threaded



Port Type	NPTF			G			Push In			Push In		
	Port	1	3/5	X,XE	1	3/5	X,XE	1	3/5	X,XE	1	3/5
Port Size	1/8	1/8	M7	1/8	1/8	M7	5/16	5/16	1/4	8 mm	8 mm	6 mm
w/o Muffler, w/o DIN	8501AK429465001			G501AK429465009			K501AK429465003			K501AK429465011		
w/o Muffler, w/DIN	8501AK429465002			G501AK429465010			K501AK429465004			K501AK429465012		
w/Muffler, w/o DIN	8501AK429465005			G501AK429465013			K501AK429465007			K501AK429465015		
w/Muffler, w/DIN	8501AK429465006			G501AK429465014			K501AK429465008			K501AK429465016		

Manifold Assembly

Dimensions: mm (Inches)



A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W
118	105	23	32.3	7.1	59	76.4	48	12.2	72	55.6	41.1	18.5	15.9	6.5	14.3	31.2	43.2	55.2	67.2	82.3
(4.65)	(4.13)	(0.90)	(1.27)	(0.28)	(2.32)	(3.01)	(1.89)	(0.48)	(2.83)	(2.19)	(1.62)	(0.73)	(0.63)	(0.26)	(0.56)	(1.23)	(1.70)	(2.17)	(2.65)	(3.24)

Internal Pilot



External Pilot



Manifold Assembly How to Order

K 501 A V 3 D 2 0 0 V A00

Port Type

- 8 = NPTF
- G = ISO228/1-G
- K = Push-In Fittings

Product Series

- 501 = 11 mm Valve

Revision

- A = Initial Release

Product Type

- V = Valve Manifold Assembly

Electronics

- 3 = G3 Fieldbus (See page 33.)
- 8 = 580 Fieldbus (See page 15.)
- J = 25 Pin Sub-D Connector
- M = 37 Pin Sub-D Connector
- Q = 19 Pin Round Connector
- T = Terminal Strip 1-32

Number of Valve Stations

- D = 4 T = 20
- H = 8 X = 24
- L = 12 3 = 28
- P = 16 7 = 32

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

Second Valve Series

- 0 = No Second Valve Series

Second Valve Series Port Size

- 0 = No Second Valve Series

End Plate Port Size - Supply and Exhaust

- 1 = 1/8 (NPTF and G Thread Only)
- 2 = 1/4 (Push In Fittings Only)
- H = 8mm (5/16) (Push in Fittings Only)

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

Maximum Solenoid Outputs

Terminal Strip	25 Pin Sub-D	37 Pin Sub-D	19 Pin Round	G3 Fieldbus	580 Fieldbus
32	22	32	16	32	32

*NOTE: Maximum number of valve stations is determined by:

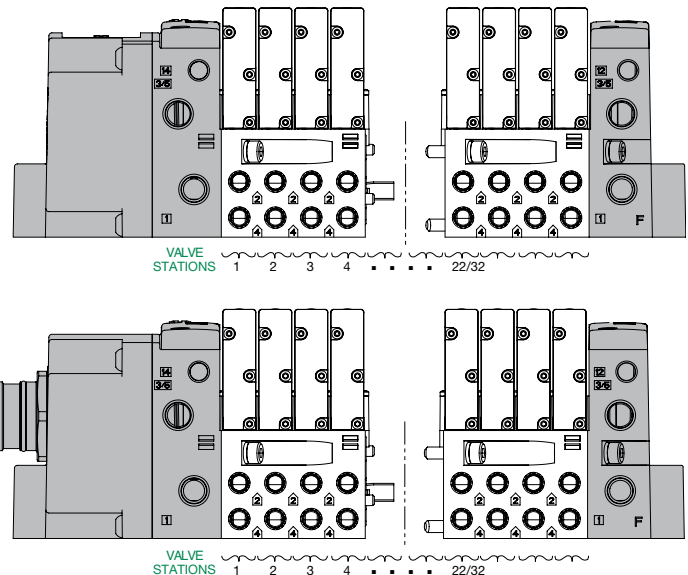
- The electrical connection type.
- The valve type - single solenoid valves up to the maximum solenoid outputs allowed by the electrical connection type (see chart above) or a combination of single and/or double solenoid valves not to exceed the maximum number of solenoid outputs allowed.
- Combination of all stations cannot exceed 32 solenoids.

25 or 37 Pin Sub-D, Terminal Strip and 19 Pin Round Connector

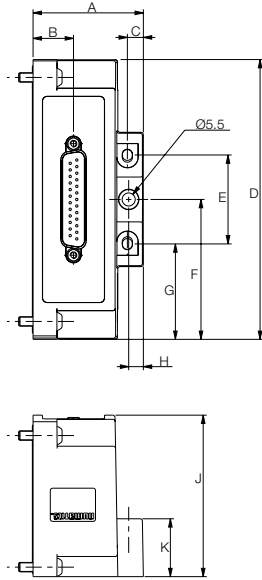
- Shaded components described by Assembly Kit model number designation.
- Each valve manifold station is listed in sequential order from left to right when facing the port side of the manifold as indicated.

Example Order - 501 Shown

- 25 Pin Sub-D K501AVJHG00VA00
- Valve Station #1 R501A2B10MA00F1
- Valve Station #2 R501A2B10MA00F1
- Valve Station #3 R501A2B10MA00F1
- Valve Station #4 R501A2B10MA00F1
- Mounting #1 K501AMS42MA0010
- Valve Station #5 R501A2B40MA00F1
- Valve Station #6 R501A2B40MA00F1
- Valve Station #7 R501A2B40MA00F1
- Valve Station #8 R501A2B40MA00F1
- Mounting #2 K501AMM42MA0010
- Assembled

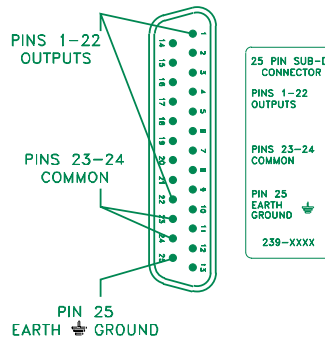


25 Pin Sub-D Connector Kit



Dimensions: mm (Inches)

A	B	C	D	E	F	G	H	J	K
46.4	17	6.7	118	37.5	59	40.2	40.2	68.1	24.4
(1.827)	(0.669)	(0.26)	(4.65)	(1.48)	(2.32)	(1.58)	(1.58)	(2.68)	(0.96)



25 Pin Sub-D Connector Housing Kits

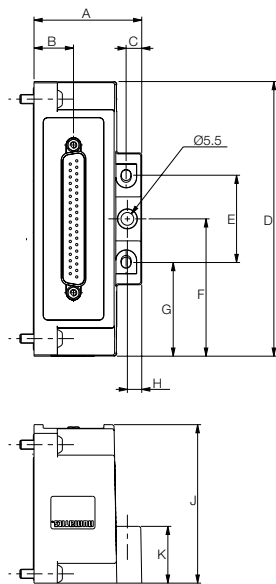
P599AE428441001	25 PIN SUB-D ASSEMBLY WITHOUT DIN RAIL
P599AE428441002	25 PIN SUB-D ASSEMBLY WITH DIN RAIL

NOTE: External fusing or output protection recommended.

25 Pin Sub-D Female Cable 22 AWG – Unshielded, Standard

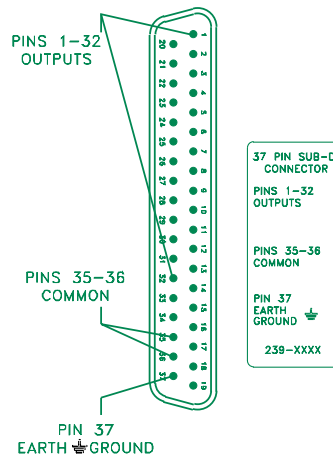
Part Number	Length
SC2502MCX00000000	2 Meters
SC2505MCX00000000	5 Meters
SC2510MCX00000000	10 Meters
NDB25F22U02MSB4	2 Meters
NDB25F22U05MSB4	5 Meters
NDB25F22U10MSB4	10 Meters

37 Pin Sub-D Connector Kit



Dimensions: mm (Inches)

A	B	C	D	E	F	G	H	J	K
46.4	17	6.7	118	37.5	59	40.2	40.2	68.1	24.4
(1.827)	(0.669)	(0.26)	(4.65)	(1.48)	(2.32)	(1.58)	(1.58)	(2.68)	(0.96)



37 Pin Sub-D Connector Housing Kits

P599AE428442001	37 PIN SUB-D ASSEMBLY WITHOUT DIN RAIL
P599AE428442002	37 PIN SUB-D ASSEMBLY WITH DIN RAIL

NOTE: External fusing or output protection recommended.

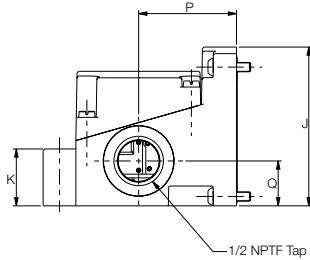
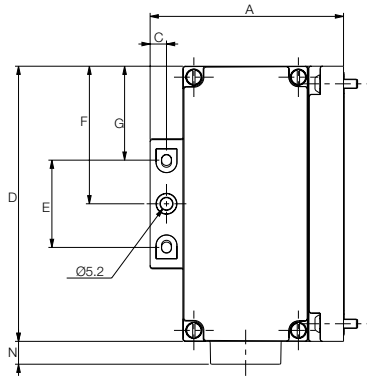
37 Pin Sub-D Female Cable 22 AWG – Unshielded, Standard

Part Number	Length
SC3702MCX00000000	2 Meters
SC3705MCX00000000	5 Meters
SC3710MCX00000000	10 Meters

37 Pin Sub-D Female Cable 22 AWG – Unshielded IP65

NDB37F22U02MSB4	2 Meters
NDB37F22U05MSB4	5 Meters
NDB37F22U10MSB4	10 Meters

1-32 Terminal Strip Kit



Dimensions: mm (Inches)

A	C	D	E	F	G	J	K	N	P	Q
82.7	7	118	37.5	59	40.2	68.1	24.4	9.8	41.9	19.3
(3.256)	(0.28)	(4.65)	(1.48)	(2.32)	(1.583)	(2.68)	(0.96)	(0.39)	(1.65)	(0.76)

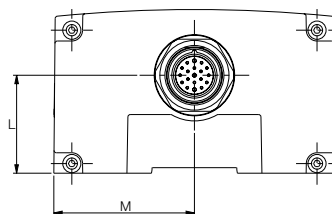
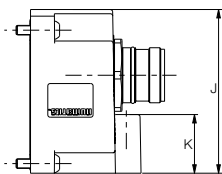
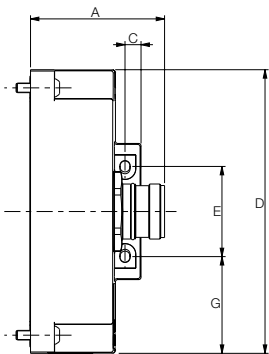
TERMINAL STRIP
TERMINALS 1-32 OUTPUTS
TERMINAL COM COMMON
TERMINAL GND EARTH GROUND
18 AWG WIRE MAXIMUM

1 - 32 Terminal Strip Housing Kits

P599AE428444001	TERMINAL STRIP ASSEMBLY WITHOUT DIN RAIL
P599AE428444002	TERMINAL STRIP ASSEMBLY WITH DIN RAIL

NOTE: External fusing or output protection recommended.
NOTE: Min. Wire AWG 26
Max. Wire AWG 18

19 Pin Round Connector Kit



Dimensions: mm (Inches)

A	C	D	E	G	J	K	L	M
56.3	6.7	118	37.5	40.2	68.1	24.4	40.8	59
(2.217)	(0.26)	(4.65)	(1.48)	(1.583)	(2.68)	(0.96)	(1.61)	(2.323)

19 Pin Round Connector Housing Kits

P599AE428436001	19 PIN ASSEMBLY WITHOUT DIN RAIL
P599AE428436002	19 PIN ASSEMBLY WITH DIN RAIL

NOTE: External fusing or output protection recommended.

19 PIN CONNECTOR

PIN 1= COIL 15 PIN 11= COIL 13
PIN 2= COIL 11 PIN 12= P.E.
PIN 3= COIL 7 PIN 13= COIL 12
PIN 4= COIL 4 PIN 14= COIL 8
PIN 5= COIL 3 PIN 15= COIL 1
PIN 6= COMMON PIN 16= COIL 5
PIN 7= COIL 2 PIN 17= COIL 9
PIN 8= COIL 6 PIN 18= COIL 16
PIN 9= COIL 10 PIN 19= N.C.
PIN 10= COIL 14

19 Pin M23 Female Cable

Part Number	Length
CC1905MI00000000	5 Meters
CC1910MI00000000	10 Meters

NUMATICS®

580 Series

Fieldbus Electronics



Table of Contents

Features and Benefits	16
DeviceNet™	17
Ethernet	18
Profibus DP	19
PROFINET	20
EtherCAT®	21
EtherNet/IP™ DLR	22
Dimensional Drawing - 580 Fieldbus Communication Assembly	23
How to Order - 580 Assembly Kit & 580 Electronics	24
How to Order Complete 580 Manifold Assemblies	25
Cables and Connectors	26-31

580 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 brightness
- Set factory defaults

Visual Diagnostics

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



Graphic Display for configuration & diagnostics

580 Fieldbus Communications Electronics

Why use Numatics Fieldbus communication electronics?

Modular Reality...

- No internal wiring simplifies assembly
- Power connector allows output power to be removed while inputs and communication are left active.
- IP65 protection
- 32 valve solenoids per manifold

Supported Protocols

- DeviceNet™
- Ethernet/IP
- PROFIBUS DP
- PROFINET
- EtherCAT®
- EtherNet/IP™ DLR



DeviceNet™ is a trademark of ODVA.
ControlNet is a trademark of ControlNet International, Ltd.
PROFIBUS and PROFINET are registered trademarks of Profibus International.
EtherCAT is a registered trademark of Beckhoff Automation GmbH.

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' 580 nodes for DeviceNet™ have an integrated graphic display.

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

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



Description	Replacement Part Number
DeviceNet™ communications module (node)	P580AEDN1010A00

Technical Data

Electrical Data	Voltage	Current
Node Power	24 VDC +/- 10%	0.050 Amps
BUS Power	11-25 VDC	0.050 Amps
Valves	24 VDC +/- 10%	4 Amps Maximum
Power Connector	A-Coded 4 Pin M12 (Male)	
Communication Connector	A-Coded 5 Pin M12 (Male)	
LEDs	Module Status and Network Status	

Operating Data	
Temperature Range (ambient)	-10° to 115° F (-23° to +46°C)
Humidity	95% relative humidity, non-condensing
Vibration / Shock	IEC 60068-2-27, IEC60068-2-6
Moisture Protection	IP65 Certified

Configuration Data	
Graphic Display	Display used for setting Node Address, Baud Rate, Fault / Idle Actions, and all other system settings.
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	A-Coded 5 pin M12 (male)
Diagnostics	Power, short, open load conditions are monitored
Special Features	Supports Auto-Device Replacement (ADR) and fail-safe device settings

Weight	
DeviceNet™ Communication Module	336g/10.8 oz.

Ethernet/IP™

Ethernet used throughout the world to network millions of PCs 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. 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' 580 nodes for Ethernet have an integrated graphic display.

The 580 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 website: www.odva.org.



Description	Replacement Part Number
Ethernet/IP™ communications module (node)	P580AEEP1010A00

Technical Data

Electrical Data	Voltage	Current
Node Power	24 VDC +/- 10%	0.070 Amps
Valves	24 VDC +/- 10%	4 Amps maximum
Power Connector	A-Coded 4 pin M12 (male)	
Communication Connector	D-coded 4 pin M12 (female)	
LEDs	Module Status, Network Status and Activity/Link	

Operating Data	
Temperature Range (ambient)	-10° to 115° F (-23° to +46°C)
Humidity	95% relative humidity, non-condensing
Vibration / Shock	IEC 60068-2-27, IEC60068-2-6
Moisture Protection	IP65 Certified

Configuration Data	
Graphic Display	Display used for setting IP Address, Subnet mask, Fault / Idle Actions, DHCP / BootP and all other system settings.
Maximum Valve-Solenoid Outputs	32

Network Data	
Supported Baud Rates	10 Mbit / 100 Mbit
Bus Connector	D-coded 4 pin M12 (female)
Diagnostics	Power, short, open load conditions
Special Features	Integrated web server, fail-safe device settings, HTTP, FTP, and UNICAST (for EtherNet/IP)

Weight	
Ethernet Communication Module	336 g/10.8 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' 580 nodes for PROFIBUS DP have an integrated graphic display.

The 580 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 website: www.profibus.com.



Description	Replacement Part Number
PROFIBUS DP communications module (node)	P580AEPT1010A00

Technical Data

Electrical Data	Voltage	Current
Node Power	24 VDC +/- 10%	0.080 Amps
Valves	24 VDC +/- 10%	4 Amps Maximum
Power Connector	A-Coded 5 pin M12 (male)	
Communication Connector	Single reverse key (B-Coded) 5 pin M12 (1 male and 1 female)	
LEDs	Module Status and Network Status	

Operating Data	
Temperature Range (ambient)	-10° to 115° F (-23° to +46°C)
Humidity	95% relative humidity, non-condensing
Vibration / Shock	IEC 60068-2-27, IEC60068-2-6
Moisture Protection	IP65 Certified

Configuration Data	
Graphic Display	Display used for setting Node Address, Fault / Idle Actions, and all other system settings.
Maximum Valve-Solenoid Outputs	32

Network Data	
Supported Baud Rates	Auto-Baud (From 9.6k to 12M Baud)
Bus Connector	Single reverse key (B-coded) 5 pin M12 (1 male and 1 female)
Diagnostics	Power, short, open load conditions and module health are monitored

Weight	
PROFIBUS DP Communication Module	342 g/11.0 oz.

PROFINET

PROFINET is the innovative open standard for Industrial Ethernet, developed 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' 580 nodes for PROFINET IO (PROFINET RT) have an integrated graphic display.

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 website: www.profibus.com.



Description	Replacement Part Number
PROFINET communications module (node)	P580AEPN1010A00

Technical Data

Electrical Data	Voltage	Current
Node Power	24 VDC +/- 10%	0.110 Amps
Valves	24 VDC +/- 10%	4 Amps Maximum
Power Connector	A-Coded 5 pin M12 (male)	
Communication Connector	Two D-coded 4 pin M12 (female)	
LEDs	System Fault, Bus Fault, and Activity/Link	

Operating Data	
Temperature Range (ambient)	-10° to 115° F (-23° to +46° C)
Humidity	95% relative humidity, non-condensing
Vibration / Shock	IEC 60068-2-27, IEC60068-2-6
Moisture Protection	IP65 Certified

Configuration Data	
Graphic Display	Display used for setting IP Address, Subnet Mask, Fault / Idle Actions, and all other system settings.
Maximum Valve-Solenoid Outputs	32

Network Data	
Supported Baud Rates	10 Mbit / 100 Mbit
Bus Connector	Two D-coded 4 pin M12 (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

Weight	
PROFINET Communication Module	342 g/11.0 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' 580 EtherCAT® node has an integrated graphic display for simplified commissioning and diagnostics.

The 580 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 website: www.ethercat.org.



Description	Replacement Part Number
EtherCAT® communications module	P580AEEC1010A00

Technical Data

Electrical Data	Voltage	Current
Node Power	24 VDC +/- 10%	0.110 Amps
Valves	24 VDC +/- 10%	4 Amps Maximum
Power Connector	A-Coded 5 pin M12 (male)	
Communication Connector	Two D-coded 4 pin M12 (female)	
LEDs	Error, Run	
Operating Data		
Temperature Range	-10° to 115° F (-23° to +46° C)	
Humidity	95% relative humidity, non-condensing	
Vibration / Shock	IEC 60068-2-27, IEC 60068-2-6	
Moisture	IP65 Certified	
Configuration Data		
Graphic Display	Display used for Subnet Mask, Fault / Idle Actions, and all other system settings.	
Maximum Valve Solenoid Outputs	32	
Network Data		
Supported Baud Rates	10 Mbit / 100 Mbit	
Bus Connector	Two D-coded 4 pin M12 (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	342 g/11.0 oz.	

EtherNet/IP™ DLR

EtherNet/IP™ DLR used throughout the world to network millions of PCs 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.

Numatics' 580 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).

The 580 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 website: Open Device Vendors Association (ODVA) www.odva.org.



Description	Replacement Part Number
EtherNet™/IP DLR communications module (node)	P580AEED1010A00



Technical Data

Electrical Data	Voltage	Current
Node Power	24 VDC +/- 10%	0.110 Amps
Valves	24 VDC +/- 10%	4 Amps Maximum
Power Connector	A-Coded 4 pin M12 (male)	
Communication Connector	Two D-coded 4 pin M12 (female)	
LEDs	Module Status, Network Status and Activity / Link	

Operating Data	
Temperature Range	-10° to 115° F (-23° to +46 C)
Humidity	95% relative humidity, non-condensing
Vibration / Shock	IEC 60068-2-27, IEC 60068-2-6
Moisture	IP65 Certified

Configuration Data	
Graphic Display	Display used for setting IP address, Subnet Mask, Fault / Idle Actions, and all other system settings.
Maximum Valve Solenoid Outputs	32

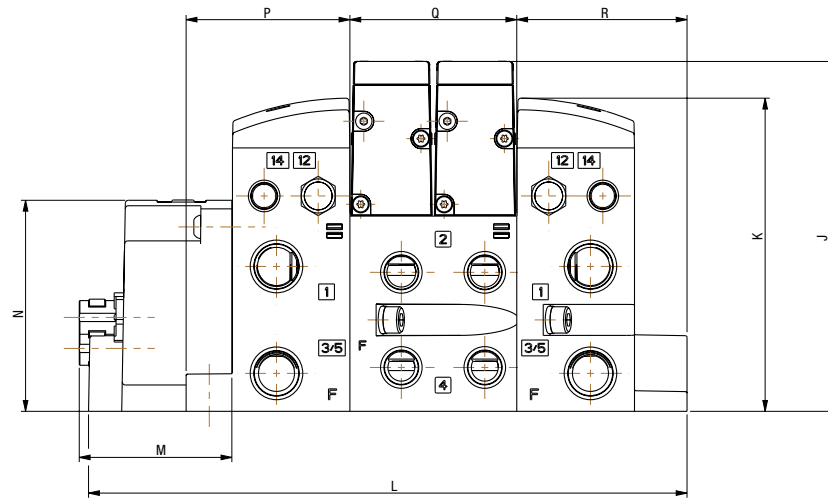
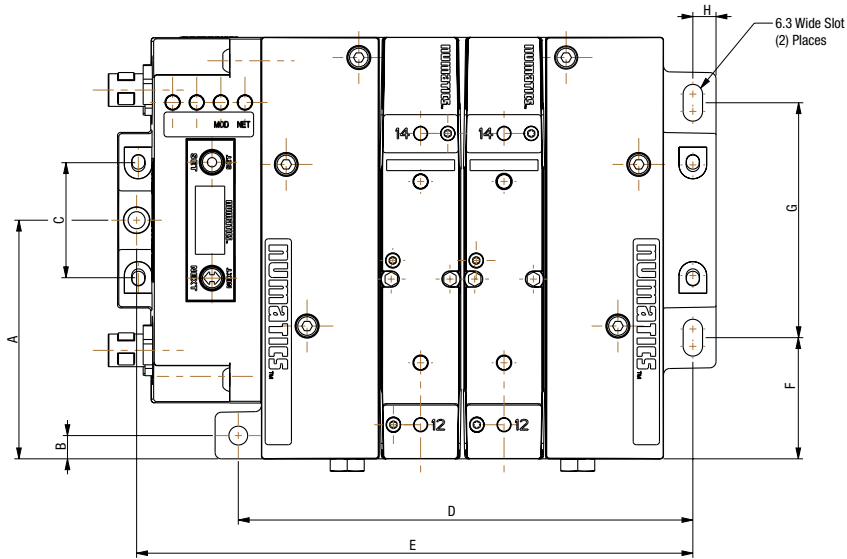
Network Data	
Supported Baud Rates	10 Mbit / 100 Mbit
Bus Connector	Two D-coded 4 pin M12 (female)
Diagnostics	Power, short, open load conditions and module health and configuration are monitored
Special Features	Embedded two port switch, Device Level Ring (DLR) compatibility, Linear network topology,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

Weight	
EtherCAT® communications module	342 g/11.0 oz.

Dimensions: mm (Inches)

Dimensional Drawing - 580 Fieldbus Manifold Assembly

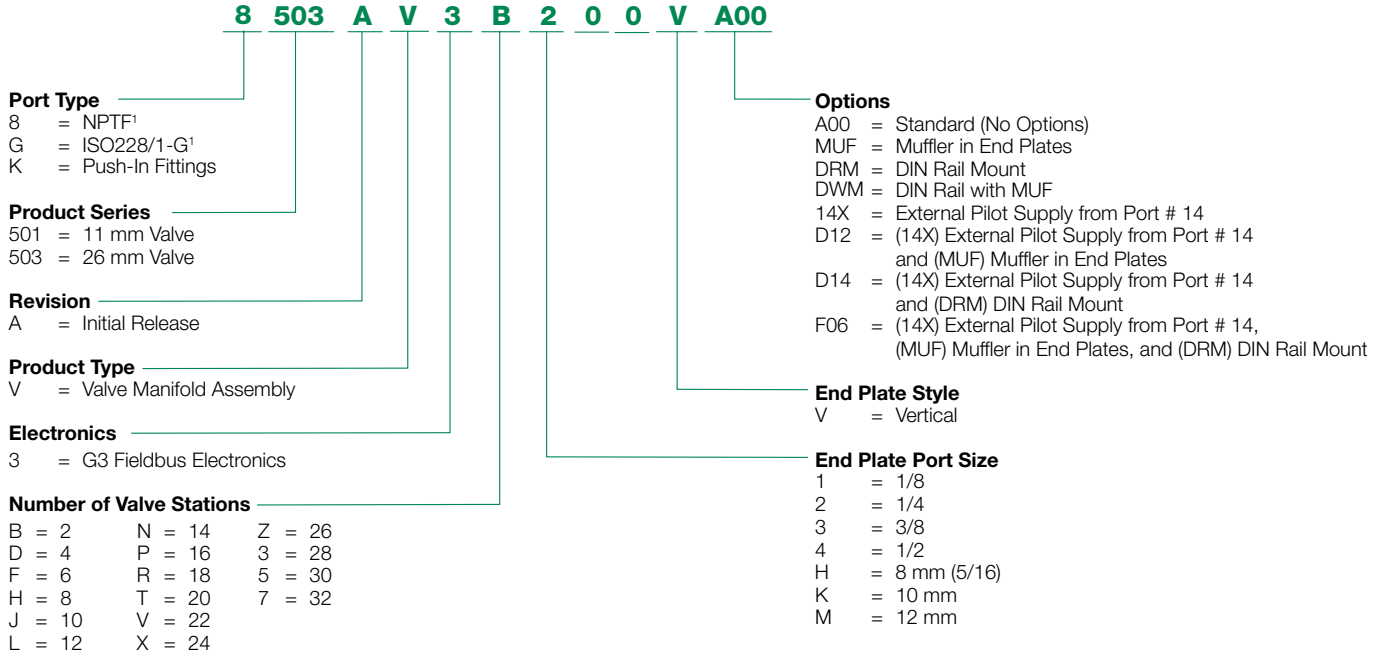
503 Series Valve Manifold Assembly with 580 Electronics



A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R
77	7.5	38	147.1	180	39.1	75.8	7.5	113	101	194	49.4	68.1	53	54	55.1
(3.032)	(0.295)	(1.5)	(5.79)	(7.087)	(1.539)	(2.984)	(0.295)	(4.449)	(3.976)	(7.638)	(1.945)	(2.681)	(2.087)	(2.13)	(2.169)

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

Manifold Assembly How to Order



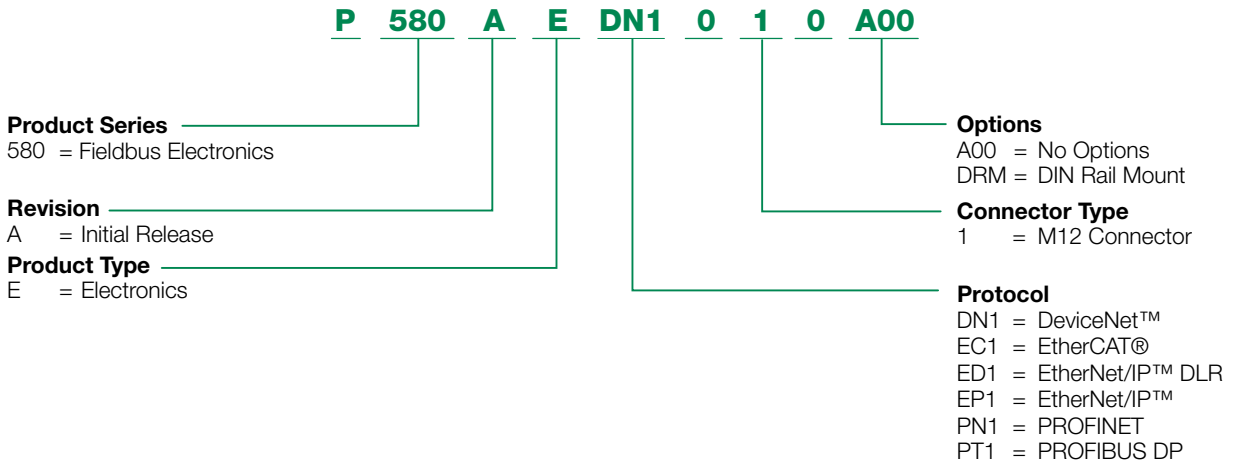
¹Port Type '8' + 'G' only available in Port Size 3/8

²Horizontal end plates only available with Electronics option 'O' - No Electronics

*NOTE: 501 Valve Series Available with 4, 8, 12, 16, 20, 24, 28 and 32 Stations Only

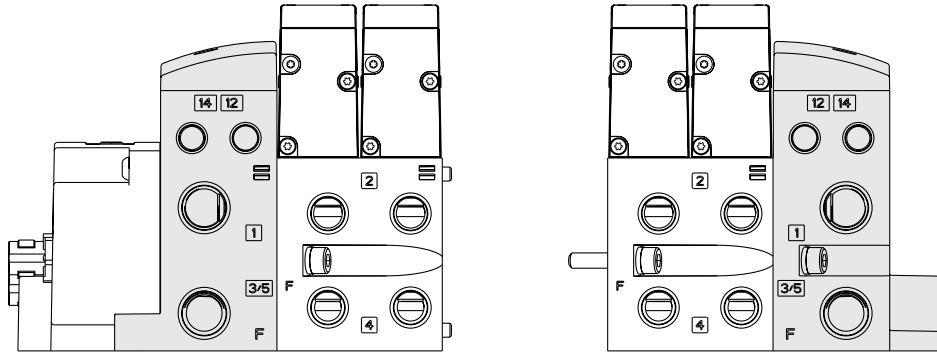
How To Order

580 Electronics



Ordering Valve Manifold Assemblies with 580 Electronics

For valve series



Shaded components are described by the manifold assembly number (see page 10). The communication module is described by the Electronic Interface model number designation (see page 10).

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

Example Order - 503 Shown

Assembly Kit	8503AV8H100VMUF
Valve Station #1	R503A2B40MA00F1
Valve Station #2	R503A2B40MA00F1
Mounting # 1	8503AMM22MA0010
Valve Station #3	R503A2B40MA00F1
Valve Station #4	R503A2B40MA00F1
Mounting # 2	8503AMM22MA0010
Valve Station #5	R503A2B40MA00F1
Valve Station #6	R503A2B40MA00F1
Mounting #3	8503AMM22MA0010
Valve Station #7	R503A2B40MA00F1
Valve Station #8	R503A2B40MA00F1
Mounting #4	8503AMM22MA0010
Electronics Assembled	P580AEDN1010A00

M12 A-Coded Cables



M12 Straight 4 Pin Female Single Ended Cable, Euro Color Code

TC0405MAE0000000 – 5 Meter

TC0410MAE0000000 – 10 Meter



M12 Straight 5 Pin Female Single Ended Cable, Euro Color Code

TC0505MAE0000000 – 5 Meter

TC0510MAE0000000 – 10 Meter

M12 90° 4 Pin Female Single Ended Cable, Euro Color Code

TD0405MAE0000000 – 5 Meter

TD0410MAE0000000 – 10 Meter

M12 90° 5 Pin Female Single Ended Cable, Euro Color Code

TD0505MAE0000000 – 5 Meter

TD0510MAE0000000 – 10 Meter

M12 A-Coded Field Wireable Connectors



M12 Straight 4 Pin Female Field Wireable Connector

TC04F10000000000 – PG 7 Cable Gland

TC04F20000000000 – PG 9 Cable Gland

M12 Straight 5 Pin Female Field Wireable Connector

TC05F10000000000 – PG 7 Cable Gland

TC05F20000000000 – PG 9 Cable Gland



M12 90° 4 Pin Female Field Wireable Connector

TD04F10000000000 – PG 7 Cable Gland

TD04F20000000000 – PG 9 Cable Gland

M 12 90° 5 Pin Female Field Wireable Connector

TD05F10000000000 – PG 7 Cable Gland

TD05F20000000000 – PG 9 Cable Gland

Technical Data	Cable	Field Wireable	Pin Out / Color Code
Molded Body / Insert	PVC / Polyamide	Polyamide	
Coupling Nut	Nickel Copper Alloy		
Cable Jacket Material	PVC	NA	
Cable O.D.	7.4mm	NA	
Voltage Rating	125 V Max. @ 105° C		
Current Rating	4.0 Amps		
Degree of Protection	IP65 (mated)		
Operating Temperature	-25° C - 85° C		
Conductor Gauge	18 AWG	NA	
Bend Radius	74mm	NA	
Maximum Wire AWG	NA	18 AWG	
Wire Connection	NA	Screw Terminal	
PG 7 Range	NA	4-6 mm	
PG 9 Range	NA	6-8 mm	

Female View

M12 A-Coded Cables



M12 Straight 5 Pin Female Single Ended Cable - Shielded

- TA0505MGD0000000 – 5 Meter – MALE
- TA0510MGD0000000 – 10 Meter – MALE
- TC0505MGD0000000 – 5 Meter - FEMALE
- TC0510MGD0000000 – 10 Meter - FEMALE



M12 90° 5 Pin Male & Female Single Ended Cable - Shielded

- TB0505MGD0000000 – 5 Meter – MALE
- TB0510MGD0000000 – 10 Meter – MALE
- TD0505MGD0000000 – 5 Meter - FEMALE
- TD0510MGD0000000 – 10 Meter - FEMALE



3 Way M12 "T"

- TC0500000TT05000 – 12mm

Terminating Resistor - Male

- TA05TR0000000000 – 12mm

M12 A-Coded Field Wireable Connectors



M12 90° 5 Pin Male & Female Field Wireable Connector – Spring Cage

- TB05F2000000071V – PG 9 Cable Gland – Spring Cage Male
- TD05F2000000071V – PG 9 Cable Gland – Spring Cage Female



M12 Straight 5 Pin Male & Female Field Wireable Connector – Spring Cage

- TA05F2000000071V – PG 9 Cable Gland – Spring Cage Male
- TC05F2000000071V – PG 9 Cable Gland – Spring Cage Female

Technical Data	Cable	M12 Field Wireable	"T"	Pin Out / Color Code
Molded Body / Insert	PVC / Polyamide	Nickel Plated Zinc / TPU	TPU / TPU GF	<p>Female View</p> <p>Pin 1=Shield Pin 2= V+ Pin 3= V- Pin 4= CAN_H Pin 5= CAN_L</p>
Coupling Nut	Nickel Plated Brass	Nickel Plated Brass	Nickel Plated Zinc	
Cable Jacket Material	PVC	NA	NA	
Cable O.D.	7 mm	4.0 to 8 mm	NA	
Voltage Rating	300 Volts	60 Volts	60 Volts	
Current Rating	4.0 Amps	4.0 Amps	4.0 Amps	
Degree of Protection	IP65 (mated)	IP 65 (mated)	IP 65 (mated)	
Operating Temperature	-40° C - 80° C	-40° C - 85° C	-25° C - 90° C	
Conductor Gauge	24 AWG (power & data)	26-20 AWG	NA	
Minimum Bend Radius	74 mm	NA	NA	
Wire Connection	NA	Spring Cage	NA	

M12 D-Coded Cables



M12 Straight 4 Pin Male D-Coded Single Ended Cable

QA0405MK00000000 – 5 Meter
QA0410MK00000000 – 10 Meter

M12 Straight 4 Pin Male D-Coded to Male RJ45 Cable

QA0405MK0VA04000 – 5 Meter
QA0410MK0VA04000 – 10 Meter

M12 90° 4 Pin Male D-Coded Single Ended Cable

QB0405MK00000000 – 5 Meter
QB0410MK00000000 – 10 Meter

M12 Straight 4 Pin Male D-Coded Double Ended Cable

QA0405MK0QA04000 – 5 Meter
QA0410MK0QA04000 – 10 Meter

M12 Straight 4 Pin Male D-Coded to RJ45 Female Socket Converter

QA04D2MK0VC04000 – 0.2 Meter

M12 D-Coded Field Wireable Connectors



M12 90° 4 Pin Male D-Coded Field Wireable Connector w/IDC

QB04F2000000071N – PG 9 Cable Gland – IDC

M12 Straight 4 Pin Male D-Coded Field Wireable Connector w/IDC

QA04F2000000071N – PG 9 Cable Gland – IDC

Technical Data	Cable	M12 Field Wireable	Pin Out / Color Code
Molded Body / Insert	PUR / Polyamide	Nickel Plated Zinc / PA 66	<p>Male View</p>
Coupling Nut	Nickel Plated Brass	Nickel Plated Brass	
Cable Jacket Material	PUR	NA	
Cable O.D.	5.6 mm	4.0 to 8 mm	
Voltage Rating (Nominal)	300 Volts	60 Volts	
Current Rating	2.0 Amps	1.75 Amps	
Degree of Protection	IP65 (mated)	IP 65 (mated)	
Operating Temperature	-40° C - 75° C	-40° C - 85° C	
Conductor Gauge	24 AWG	IDC 26-22 AWG	
Bend Radius	61mm	NA	
Wire Connection	NA	IDC	

M12 D-Coded Cables



M12 Straight 4 Pin Male D-Coded Single Ended Cable

QA0405MR00000000 – 5 Meter

QA0410MR00000000 – 10 Meter

M12 90° 4 Pin Male D-Coded Single Ended Cable

QB0405MR00000000 – 5 Meter

QB0410MR00000000 – 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 Wireable Connectors



M12 90° 4 Pin Male D-Coded Field Wireable Connector w/IDC

QB04F200R000071N – PG 9 Cable Gland – IDC

M12 Straight 4 Pin Male D-Coded Field Wireable Connector w/IDC

QA04F200R000071N – PG 9 Cable Gland – IDC

Technical Data	Cable	M12 Field Wireable	Pin Out / Color Code
Molded Body / Insert	PUR / PUR or PE	Nickel Plated Zinc / PA 66	<p>Male View</p> <p>1 ——— YE 2 ——— WH 3 ——— OG 4 ——— BU</p>
Coupling Nut	Nickel Plated Zinc and Brass	Nickel Plated Brass	
Cable Jacket Material	PVC	NA	
Cable O.D.	6.5mm / 7.4mm	4.0 to 8.0 mm	
Voltage Rating (Nominal)	42 Volts	60 Volts	
Current Rating	1.5 Amps	1.75 Amps	
Degree of Protection	IP65 (mated)	IP 65 (mated)	
Operating Temperature	-25° C - 60°	-40° C - 85° C	
Conductor Gauge	24 & 22 AWG	26-22 AWG	
Bend Radius	19.5 mm	NA	
Wire Connection	NA	IDC	

M12 B-Coded (Reverse Key) Cables



M12 Straight 5 Pin Male & Female Single Ended Cables

- RA0505MHP0000000 – 5 Meter – MALE
- RA0510MHP0000000 – 10 Meter – MALE
- RC0505MHP0000000 – 5 Meter – FEMALE
- RC0510MHP0000000 – 10 Meter – FEMALE

M12 Straight 5 Pin Male – to – Female Double Ended Cables

- RC0505MHPRA05000 – 5 Meter
- RC0510MHPRA05000 – 10 Meter

M12 90° 5 Pin Male & Female Single Ended Cable

- RB0505MHP0000000 – 5 Meter – MALE
- RB0510MHP0000000 – 10 Meter – MALE
- RD0505MHP0000000 – 5 Meter – FEMALE
- RD0510MHP0000000 – 10 Meter – FEMALE

M12 B-Coded (Reverse Key) Field Wireable Connectors



M12 90° 5 Pin Male & Female Field Wireable Connectors, w/IDC

- RB05F200P000071V – PG9 Cable Gland – IDC MALE
- RD05F200P000071V – PG9 Cable Gland – IDC FEMALE

M12 Straight 5 Pin Male & Female Field Wireable Connectors

- RA05F200P0000000 – PG7 Cable Gland – MALE
- RC05F200P0000000 – PG7 Cable Gland – FEMALE

M12 Straight 5 Pin Terminating Resistor

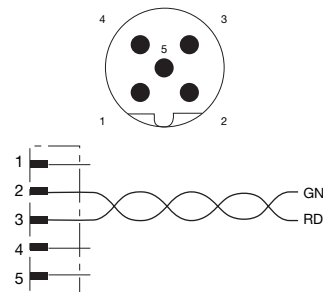
- RA05TR0000000000 – MALE

M12 Bus "T"

- RA050000PRT05000

Technical Data	Cable	Field Wireable	"T"	Pin Out / Color Code
Molded Body	PUR	Nickel Plated Zinc / Brass	Aluminum	
Insert	Polyamide	TPU/PVC	Nylon	
Coupling Nut	Nickel Plated Brass	Nickel Plated Brass / Stainless Steel	Nickel Plated Brass	
Cable Jacket Material	PVC	NA	NA	
Cable O.D.	8.5 mm	4.0 to 8.0 mm / 3.0 to 6.5 mm	NA	
Voltage Rating	300 Volts	60 Volts	250 Volts	
Current Rating	4.0 Amps	4.0 Amps	4.0 Amps	
Degree of Protection	IP65 (mated)	IP 65 (mated)	IP 65 (mated)	
Operating Temperature	-40° C - 80° C	-40° C - 85° C	-40° C - 80° C	
Conductor Gauge	22 AWG	26-20 AWG / 24-18 AWG	NA	
Minimum Bend Radius	74 mm	NA	NA	
Wire Connection	NA	IDC / Screw Terminal	NA	

Male View



M12 D-Coded Cables



M12 Straight 4 Pin Male D-Coded Single Ended Cable

QA0405MT00000000 – 5 Meter

QA0410MT00000000 – 10 Meter

M12 90° 4 Pin Male D-Coded Single Ended Cable

QB0405MT00000000 – 5 Meter

QB0410MT00000000 – 10 Meter

M12 Straight 4 Pin Male D-Coded Double Ended Cable

QA0405MT0QA04000 – 5 Meter

QA0410MT0QA04000 – 10 Meter

M12 Straight 4 Pin Male D-Coded to Male RJ45 Cable

QA0405MT0VA04000 – 5 Meter

QA0410MT0VA04000 – 10 Meter

M12 Straight 4 Pin Male D-Coded to RJ45 Female Socket Converter

QA04D2MK0VC04000 – 0.2 Meter

M12 D-Coded Field Wireable Connectors



M12 90° 4 Pin Male D-Coded Field Wireable Connector w/IDC

QB04F200R000071N – PG 9 Cable Gland – IDC

M12 Straight 4 Pin Male D-Coded Field Wireable Connector w/IDC

QA04F200R000071N – PG 9 Cable Gland – IDC

Technical Data	Cable	M12 Field Wireable	Pin Out / Color Code
Molded Body / Insert	PVC / PE	Nickel Plated Zinc / PA 66	<p>Male View</p>
Coupling Nut	Nickel Plated Zinc	Nickel Plated Brass	
Cable Jacket Material	PUR	NA	
Cable O.D.	6.5 mm	4.0 to 8.0 mm	
Voltage Rating (Nominal)	300 Volts	60 Volts	
Current Rating	2.0 Amps	1.75 Amps	
Degree of Protection	IP65 (mated)	IP 65 (mated)	
Operating Temperature	-5° C - 50° C	-40° C - 85° C	
Conductor Gauge	22 AWG	26-22 AWG	
Bend Radius	46 mm	NA	
Wire Connection	NA	IDC	

NUMATICS®

G3 Fieldbus

Electronics and I/O

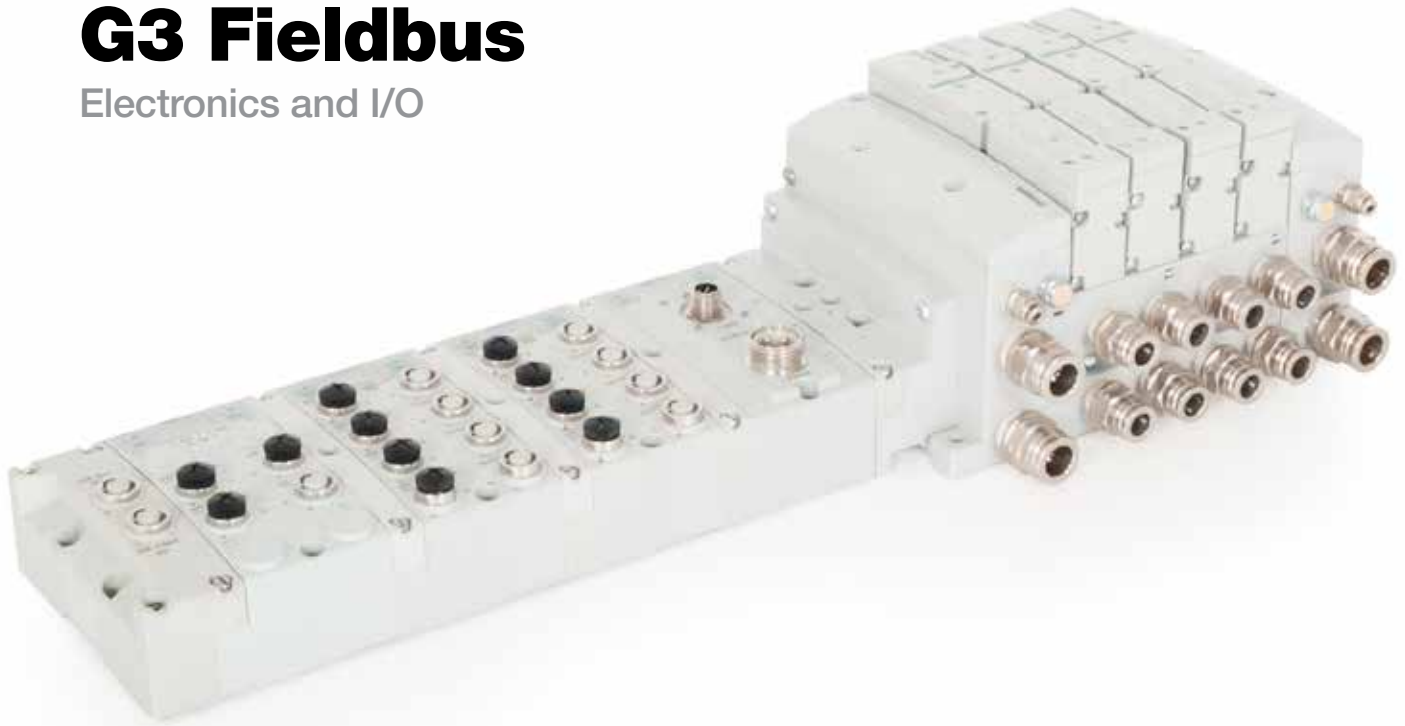


Table of Contents

Section 1

Features and Benefits	34-35
G3 Platform Distribution Options	36-37
DeviceNet™	38
Ethernet	39
PROFIBUS DP	40
PROFINET	41
CANopen®	42
DeviceLogix™	43
Ethernet POWERLINK®	44
EtherCAT® and EtherNet/IP™ DLR	45-46
I/O Modules	47-49
Sub-Bus Modules	51
Miscellaneous Modules & Accessories	52-53
Dimensional Drawing - G3 Fieldbus Communication Assembly	54-55

Section 2 - How to Configure & Order G3 Electronics

How to Order Complete G3 Manifold Assemblies	56
How to Order - G3 Assembly Kit & G3 Electronics	57-58
Cables and Connectors	59-71
Example Sub-Bus Layout and Cabling	72

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

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.



Highly Distributable



Easy, Robust Connections

Supported Protocols

- DeviceNet™
- DeviceNet™ w/QuickConnect™
- DeviceNet™ w/DeviceLogix™
- Ethernet
- PROFIBUS DP
- CANopen®
- PROFINET
- Ethernet POWERLINK®
- EtherCat®
- EtherNet/IP DLR with Quick Connect



*** 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 68 & 69 for cables with SPEEDCON® connector technology.

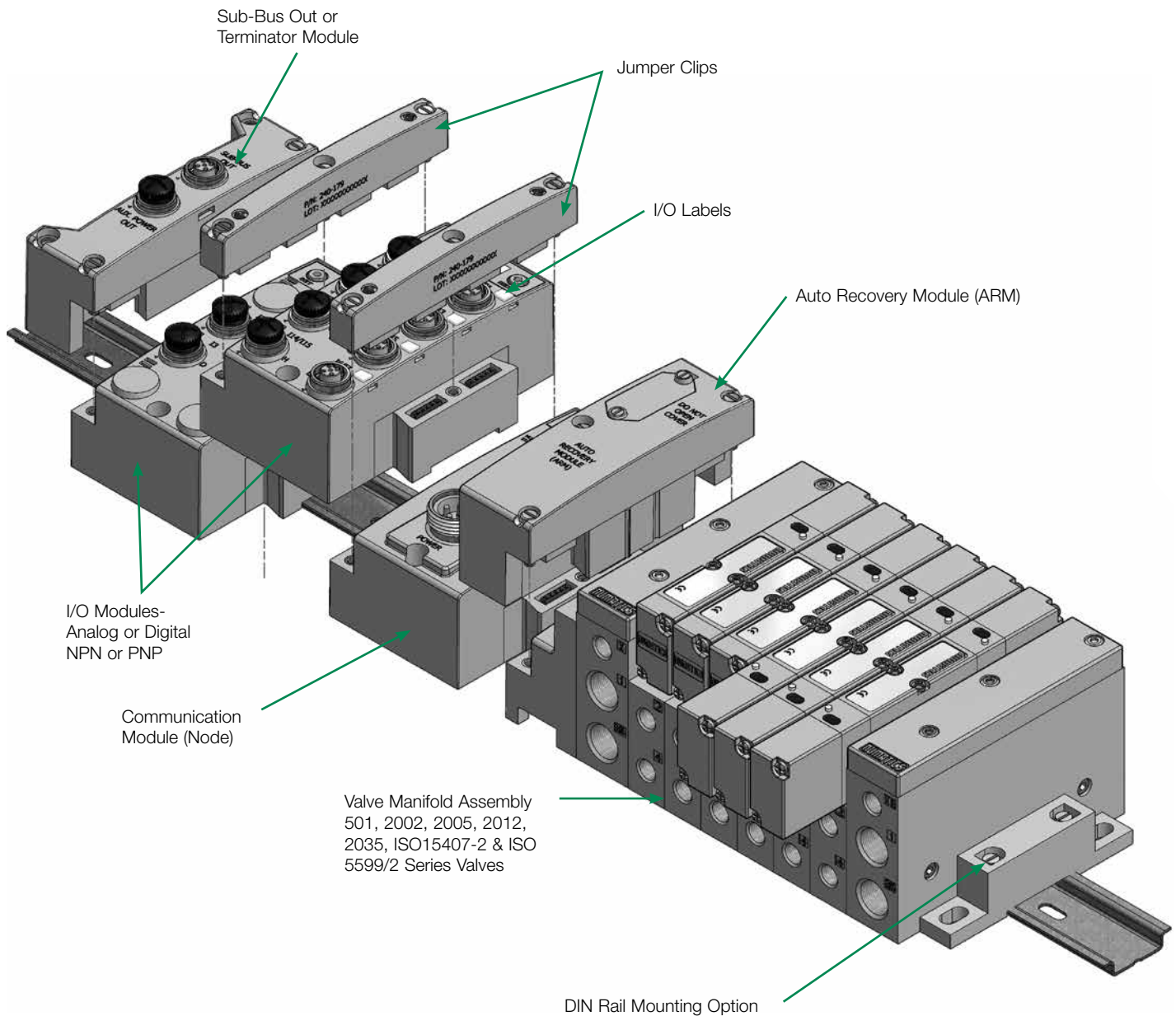


CANopen® is a registered Community trademark of CAN in Automation e.V. DeviceNet™ and QuickConnect™ are trademarks of ODVA. DeviceLogix™ is a trademark of Rockwell Automation, Inc. Ethernet POWERLINK® is a registered trademark of Bernecker + Rainer Industrie – Elektronik Ges.m.b.H. PROFIBUS-DP and PROFINET are trademarks of Profibus Nutzerorganisation e.V.

G3 Electronics Modularity

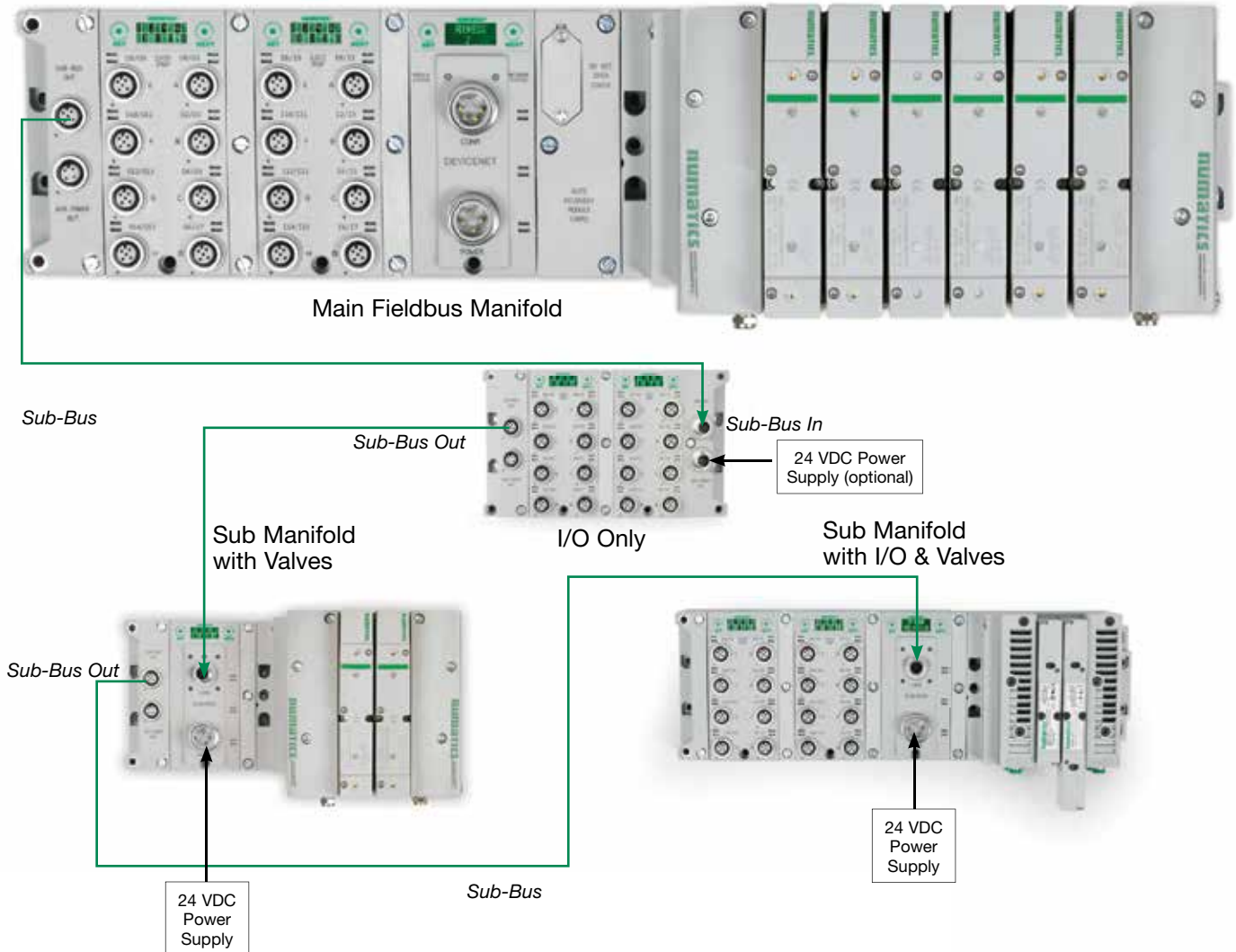
Discrete I/O

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 501 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



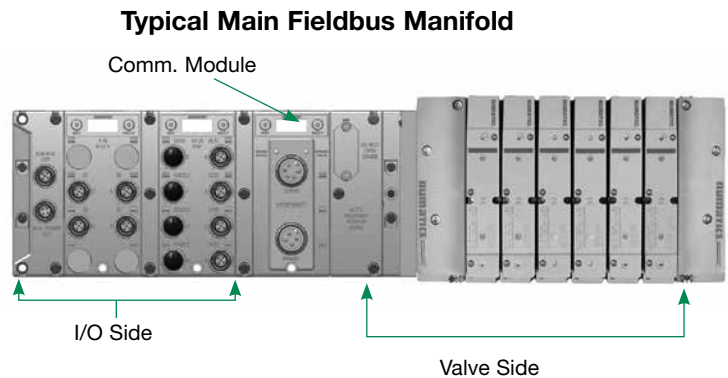
- Unique distribution system allows system efficiency by allowing the same modules to be used in either centralized or distributed applications.
- Distribution options include:
 - Inputs OR Outputs
 - Inputs AND Outputs
 - Valves with Inputs AND Outputs
 - Valves with Inputs OR Outputs
 - Valves Only
- 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.

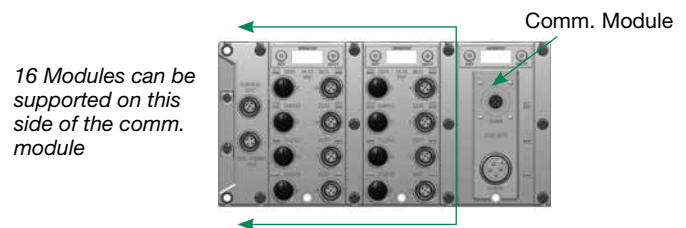
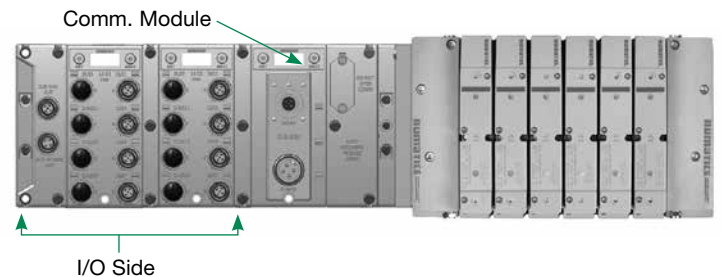
Valve Side

- 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.



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



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 website: 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)	
LEDs	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, DeviceNet™ w/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 PCs 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 include 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 website: 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)	
LEDs	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, 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 website: 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)	
LEDs	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, 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, developed 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 website: 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)	
LEDs	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)	
LEDs	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)

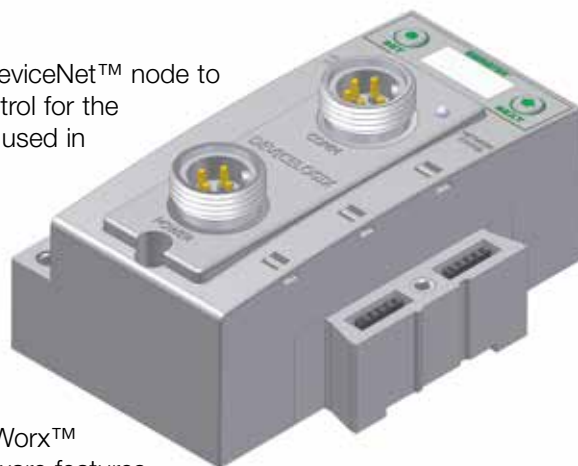
Configuration Data	
Graphic Display	Display used for setting Node Address, Baud Rate, Fault / Idle Actions, and all other system settings.
ARM	(Auto Recovery Module) Optional module that contains automatic recovery of system setting in the event of total or partial system failure.
Maximum Valve-Solenoid 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)	
LEDs	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	
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® 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 website:
www.ethernet-powerlink.org.

ETHERNET
POWERLINK®



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)	
LEDs	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 website: 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%	8 Amps Maximum
Power Connector	Single key 5 pin 7/8" MINI type (male)	
Communication Connector	Two D-coded 4 pin M12 type (female)	
LEDs	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	Integrated web server, fail-safe device settings

Weight	
EtherCAT® communications module	227g / 8 oz.

EtherNet/IP™ DLR

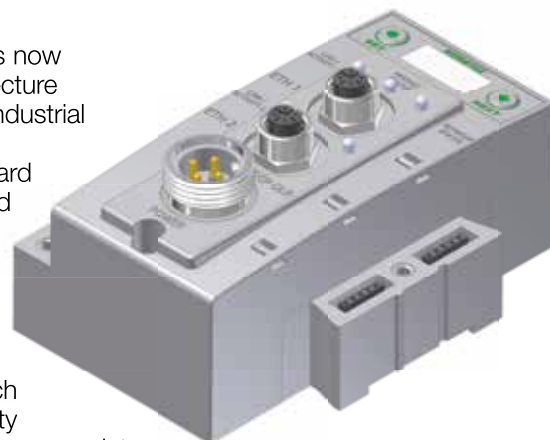
EtherNet/IP™ used throughout the world to network millions of PCs has now evolved into a viable industry network. EtherNet/IP™ is an open architecture high-level communication network that meets the demands of today's industrial applications requiring high-speed (10/100 Mbit/s), high-throughput and flexibility. 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.

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 website:

Open Device Vendors Association (ODVA) www.odva.org



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

Technical Data

Electrical Data	Voltage	Current
Node Power at Max. Brightness Valves and Discrete I/O	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)	
LEDs	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, QuickConnect™ 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

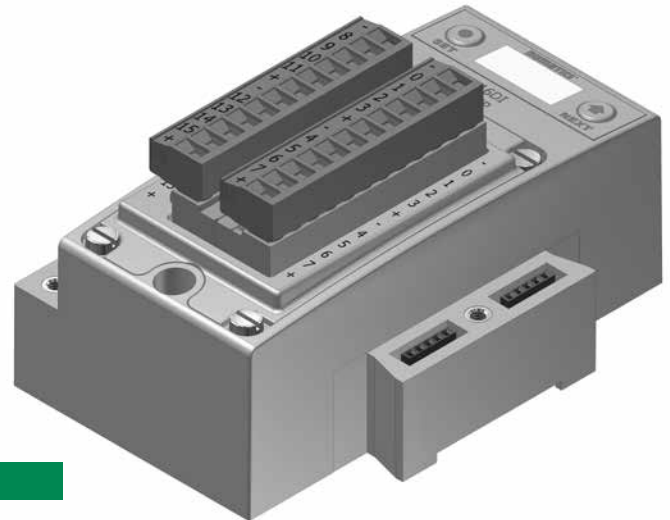
Description	Part Number
16 PNP Inputs	240-203
16 NPN Inputs	240-204
8 PNP Inputs	240-316
16 PNP outputs	240-330

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
Ingress 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-25 Pin Sub D

Description	Part Number
16 NPN Outputs	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
Ingress 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 Fig A. Only	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
Ingress Protection	IP65, IP67 (with appropriate assembly and termination)
Connector	M12 4 Pin Female, Speedcon (Compatible with 5 Pin)
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 240-311

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. Speedcon (Compatible with 5 Pin)
Mass	247g / 8.7 oz.

Operating Data

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

240- 320 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	NAMUR
NC (Normally Closed)	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)	 II(1)GD [Ex ia Ga] IIC [Ex ia Da] IIIC
-----------------------	---

Mechanical Data

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

Operating Data

Temperature Range Ambient	-10° to 115° F (-23° to 46° 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 w/ IO	240-241	235g / 8.3 oz.
Sub-Bus Valve Module w/ IO with DIN Rail Clips	P580AEDS4010DRM	347 / 11.2 oz.
Sub-Bus Valve Module w/o IO	P580AEDS4010A00	336g / 10.8 oz.
Sub-Bus Valve Module w/o IO, with DIN Rail Clips	P580AEDS4010DRM	347g / 11.2 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.
Sub-Bus Out Module for Intrinsically Safe	240-318	



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.
Sub-Bus In Module for Intrinsically Safe	240-318	



Dust Cover - M12 Female
230-1200



240-326 G3 4 Branch SUB-BUS HUB Module

The G3 HUB module allows for branch distribution from the I/O side of the G3 System and can be integrated into the existing G3 Series Sub-Bus configuration. Auto Addressing allows for trouble free set up and configuration. Input, Output, as well as Valve manifolds can be attached to the available four Branches on a HUB module. Each G3 System can support up to two HUB modules, allowing for maximum flexibility. The HUB module is transparent to the I/O side of the G3 and does not reserve one of the potential sixteen positions.

As with all other G3 I/O modules, standard G3 display and ARM functionality (storing of all parameters) is supported.



Technical Data

Electrical Data

Voltage	24 VDC Module Supply
No. of HUB Branches	4 Per HUB Module, 2 HUB Modules per G3 System (A HUB module cannot be connected to the branch of another HUB module)
HUB Branch Length	30 Meters Per Branch
Addressing	Auto Addressing on Power Up (Branch I/O reserve capability)
Display / Diagnostics	Onboard LCD Multi Function Display
G3 System Integration	Integrated into existing G3 I/O Side
Topology	Star, Tree and Hybrid

Mechanical Data

Branch Connector	M12 5 Pin Female
Mass	255 g / 9.0 oz.

Operating Data

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

Miscellaneous Modules

Auto Recovery Module (ARM)

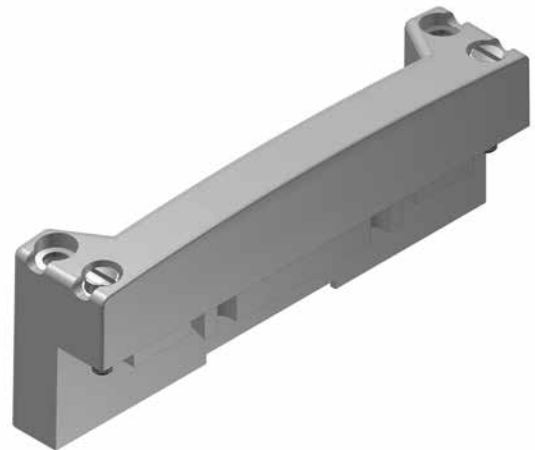
Protects configuration information during a critical failure. Allows configuration information to be saved and reloaded to replacement module automatically.



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.
Jumper Clip for Intrinsically Safe	240-317	



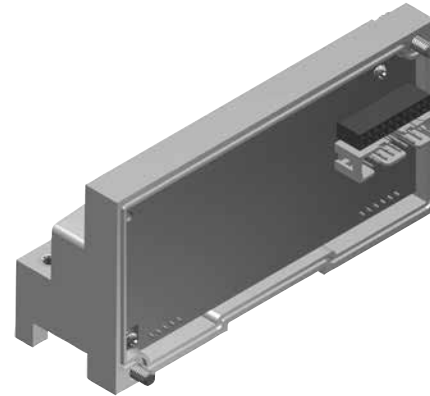
Miscellaneous Modules

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.



501 and 503 Series Valves

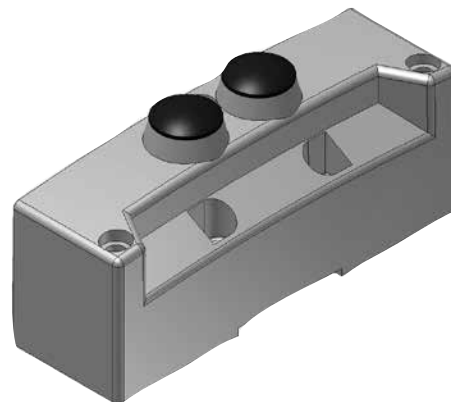
Description	Part Number
Valve Driver Module	P599AE425188001
Valve Driver Module w/ DIN Rail Clips	P599AE425188002

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

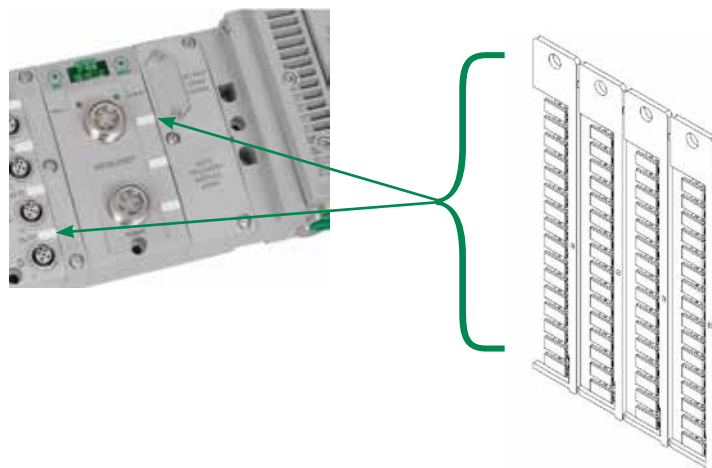


Accessories

For use with Murrplastik® Type 20 Software

Labels - 122-1251

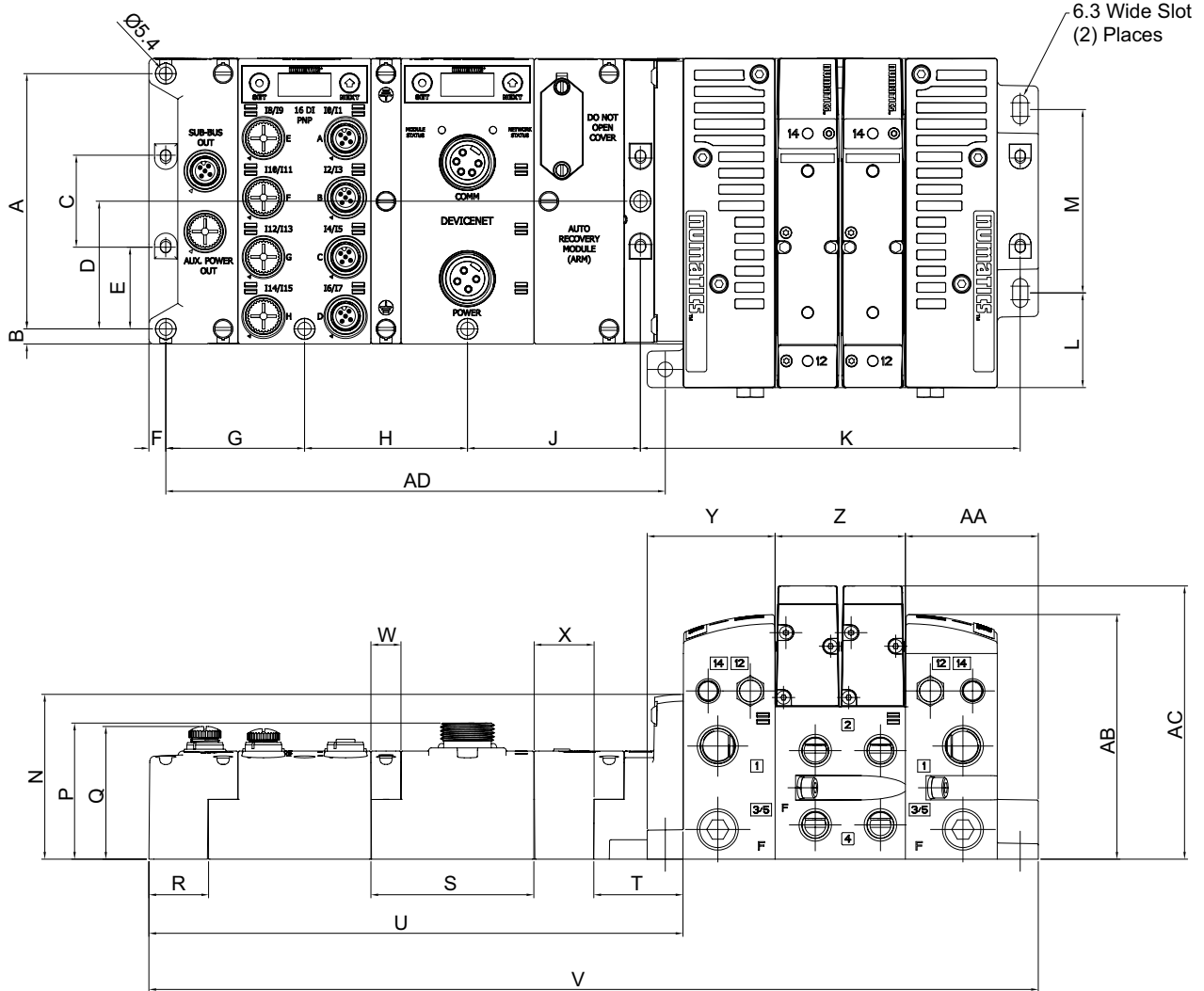
Technical Data	
Material	Polycarbonate (PC)
Color	White
Temperature Range	40° - 140° C
Label Dimensions	0.19" x 0.39"
Label - Printable Area	0.19" x 0.39"



Dimensions: mm (Inches)

Dimensional Drawing - G3 Fieldbus Manifold Assembly

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



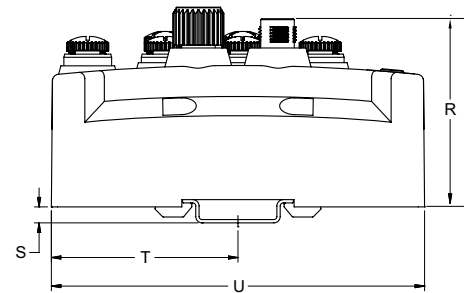
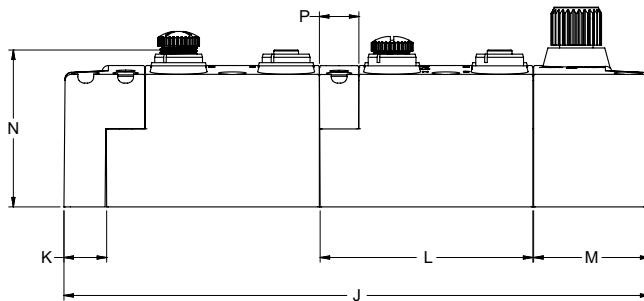
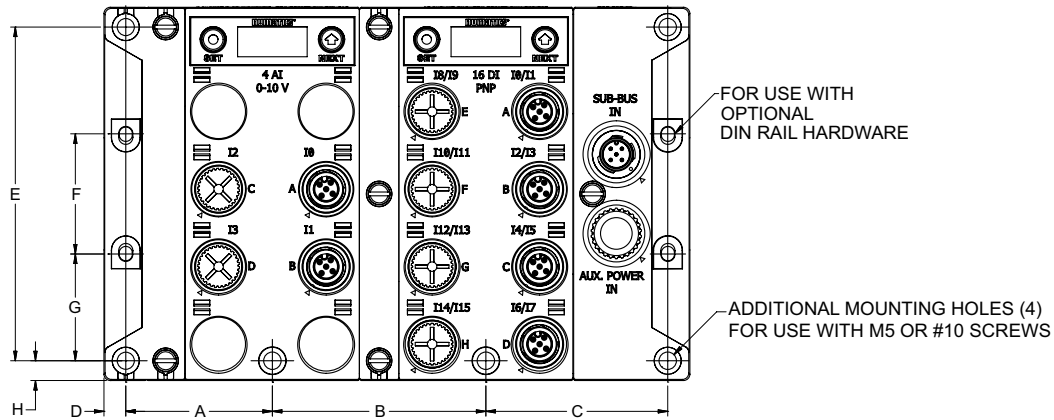
A	B	C	D	E	F	G	H	J	K	L	M	N	P
105.5 (4.154)	6.3 (0.248)	38 (1.5)	52.8 (2.08)	33.8 (1.33)	7 (0.28)	57.5 (2.264)	67.5 (2.66)	71.7 (2.82)	-	39.1 (1.54)	75.8 (2.984)	68.1 (2.68)	56.3 (2.217)
Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD
54 (2.13)	24.8 (0.98)	67.5 (2.66)	36.9 (1.45)	221.3 (8.713)	368.6 (14.51)	12.5 (0.49)	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	2.66	2.26	0.27	4.15	1.50	1.33	0.25	7.29	0.53	2.65	1.45	2.13	0.49	2.46	0.20	2.32	4.65
(46.35)	(67.50)	(57.50)	(6.90)	(105.50)	(38.00)	(33.75)	(6.25)	(185.25)	(13.50)	(67.25)	(36.75)	(54.00)	(12.50)	(62.50)	(5.05)	(59.00)	(118.00)

Manifold Assembly How to Order

K 501 A V 3 D 2 0 0 V A00

Port Type

- 8 = NPTF¹
- G = ISO228/1-G¹
- K = Push-In Fittings

Product Series

- 501 = 11 mm Valve
- 503 = 26 mm Valve

Revision

- A = Initial Release

Product Type

- V = Valve Manifold Assembly

Electronics

- 3 = G3 Fieldbus Electronics
- 8 = 580 Fieldbus Electronics

Number of Valve Stations

- B = 2 R = 18
- D = 4 T = 20
- F = 6 V = 22
- H = 8 X = 24
- J = 10 Z = 26
- L = 12 3 = 28
- N = 14 5 = 30
- P = 16 7 = 32

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

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

Second Valve Series

- 0 = No Second Valve Series

Second Valve Series Port Size

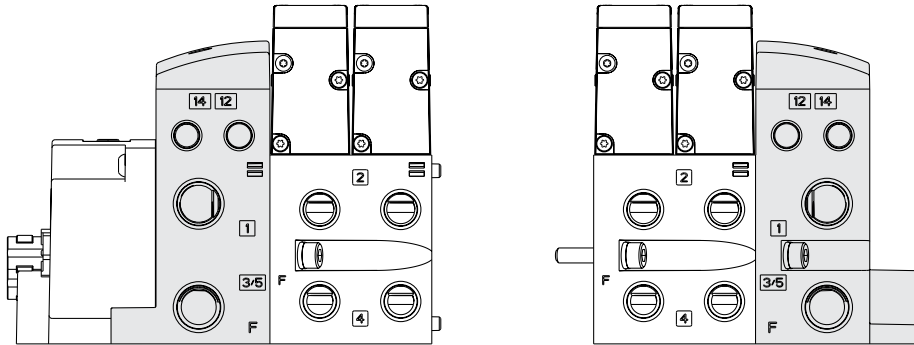
- 0 = No Second Valve Series

Port Size

- 1 = 1/8
- 2 = 1/4
- 3 = 3/8
- 4 = 1/2
- H = 8 mm (5/16 mm)
- K = 10 mm
- M = 12 mm

NOTE: 501 Valve Series Available with 4, 8, 12, 16, 20, 24, 28 and 32 Stations Only

How to Order: Sub Bus Valve Manifold without I/O or Additional Distribution



Example Order - 503 Shown

Assembly Kit	8503AV8H100VMUF
Valve Station #1	R503A2B40MA00F1
Valve Station #2	R503A2B40MA00F1
Mounting # 1	8503AMM22MA0010
Valve Station #3	R503A2B40MA00F1
Valve Station #4	R503A2B40MA00F1
Mounting # 2	8503AMM22MA0010
Valve Station #5	R503A2B40MA00F1
Valve Station #6	R503A2B40MA00F1
Mounting #3	8503AMM22MA0010
Valve Station #7	R503A2B40MA00F1
Valve Station #8	R503A2B40MA00F1
Mounting #4	8503AMM22MA0010
Electronics	P580AEDS4010A00
Assembled	

Shaded components are described by the manifold assembly number (see page 10). The communication module is described by the Electronic Interface model number designation (see page 10).

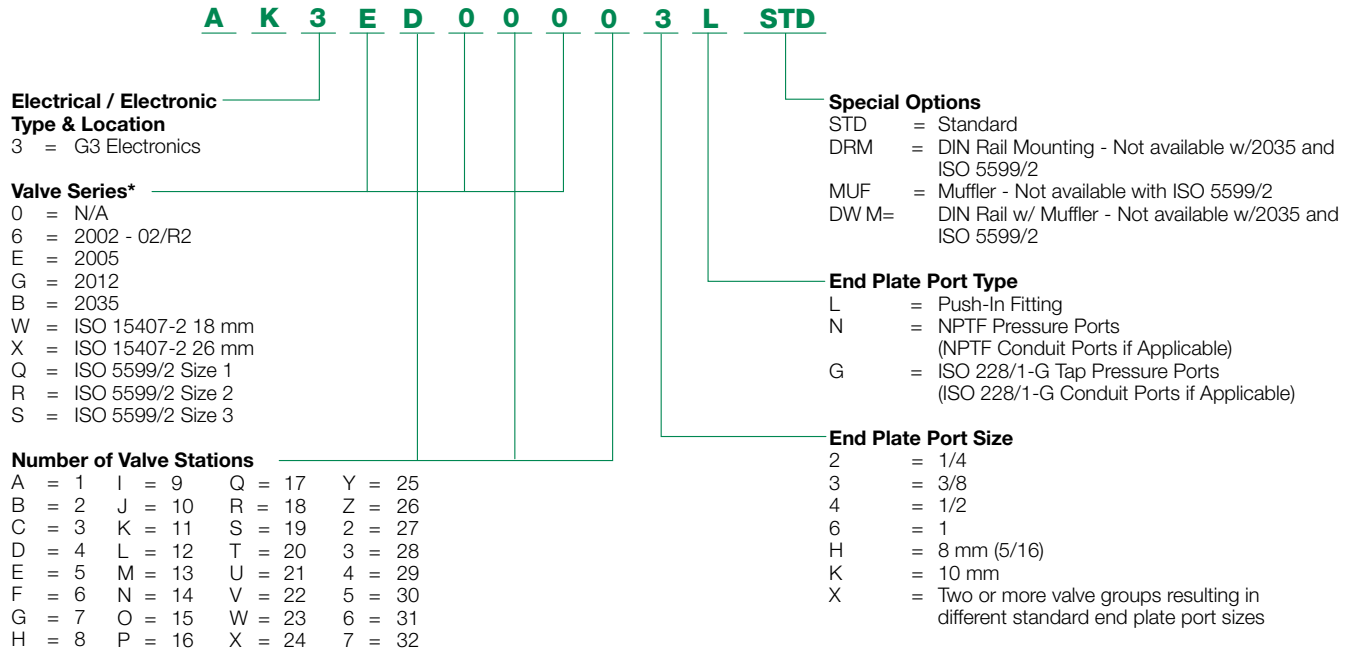
Each valve station is listed in sequential order from left to right when facing the port side of the manifold as shown.

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.

How To Order

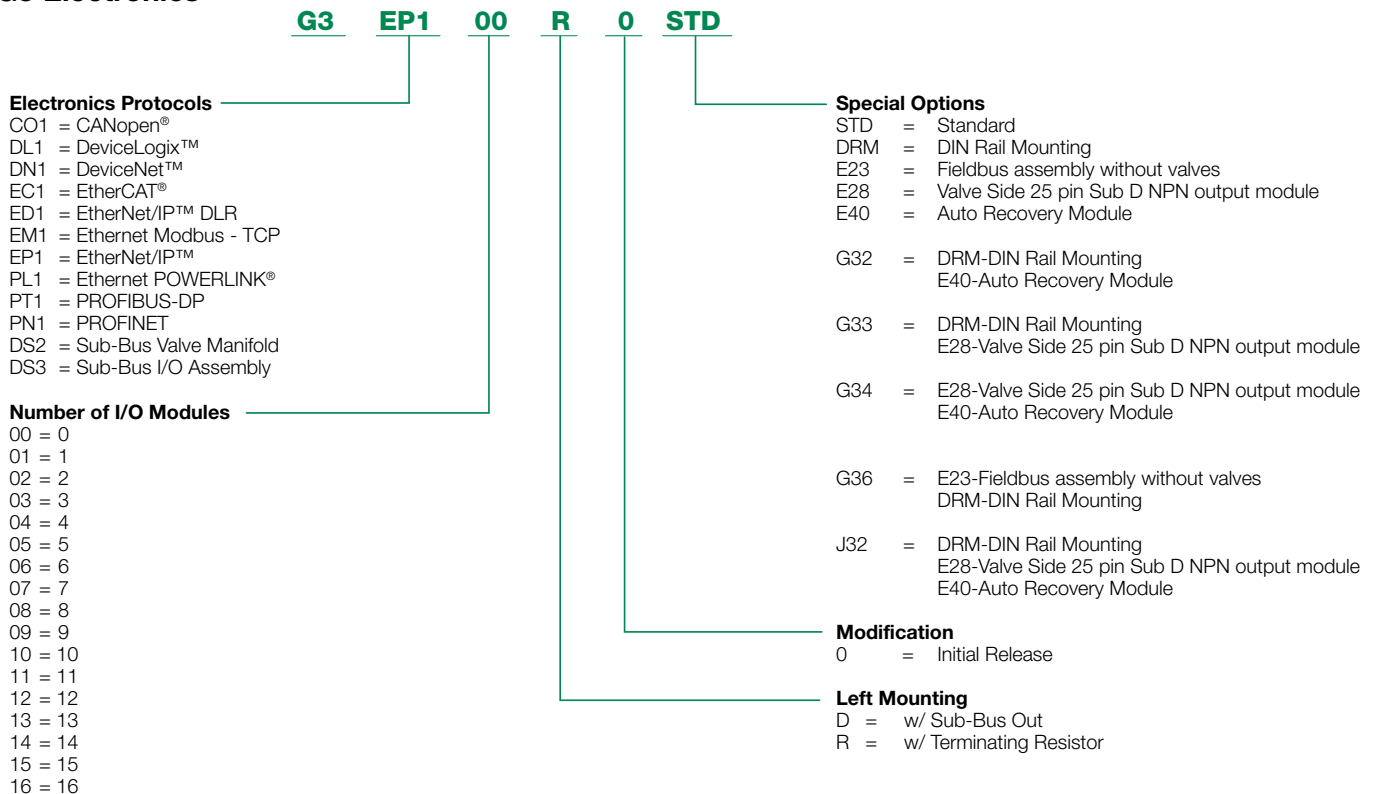
G3 Assembly Kit



*For manifold assembly with multiple valve series - consult factory.

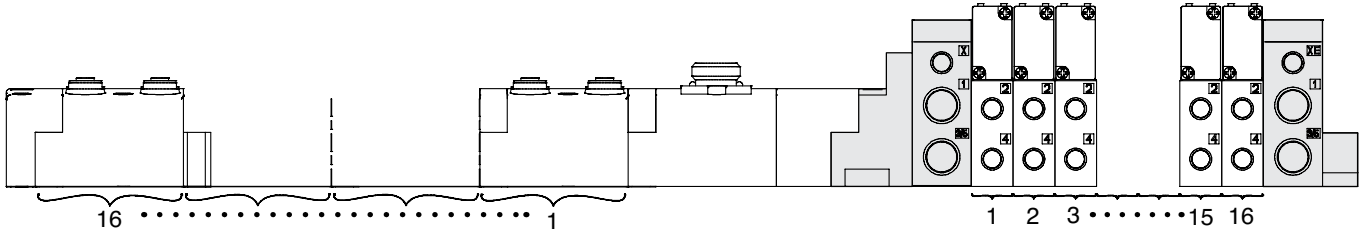
How To Order

G3 Electronics



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 56). The communication module and number of I/O modules are described by the Electronic Interface (G3) model number designation (see page 56).

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:

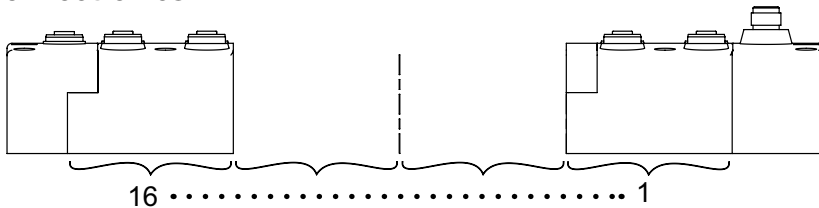
1. A total of 32 solenoid outputs are available. Either 32 single solenoid valves or 16 double solenoid valves or any combination of singles and doubles not to exceed 32 outputs can be specified.
2. For manifold assemblies that exceed 16 solenoids, the assembly **MUST** be configured so that an even 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

Assembly 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 56 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

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

MC0405MAC00000000 – 5 Meter

MC0410MAC00000000 – 10 Meter



7/8" MINI 90° 4 Pin Female Single Ended Cable, Euro Color Code

MD0405MAC00000000 – 5 Meter

MD0410MAC00000000 – 10 Meter



5 Pin Cables for PROFIBUS DP, PROFINET, POWERLINK®, and EtherCAT®

7/8" MINI Straight 5 Pin Female Single Ended Cable, Euro Color Code

MC0505MAG00000000 – 5 Meter

MC0510MAG00000000 – 10 Meter



7/8" MINI 90° 5 Pin Female Single Ended Cable, Euro Color Code

MD0505MAG00000000 – 5 Meter

MD0510MAG00000000 – 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®, and EtherCAT®

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

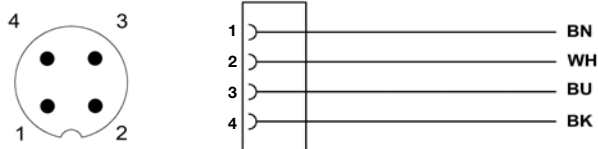


M12 90° 4 Pin Female Field Wireable Connector

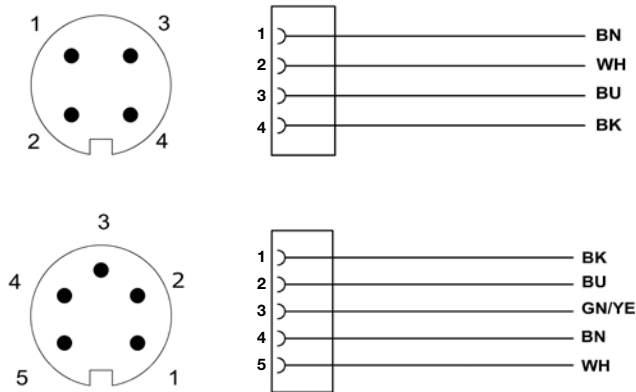
- TD04F10000000000 – PG 7 Cable Gland
- TD04F20000000000 – PG 9 Cable Gland

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/Die Cast Zinc
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



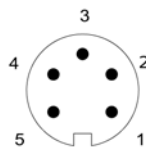
7/8" MINI Field Wireable Connectors

7/8" MINI Straight 5 Pin Field Wireable Connectors

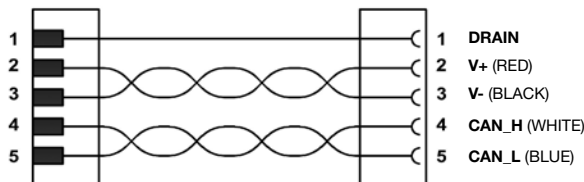
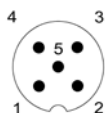
MC05F90000000000 - Female - Cable Gland - One size fits all

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 Converter

QA04D2MK0VC04000 – 0.2 Meter



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

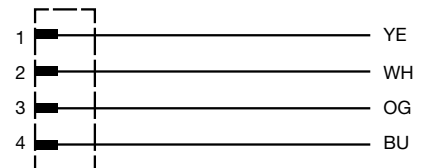
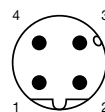


RJ45 Field Attachable CONNECTOR

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

- QA0405MSQQA04000 – 5 Meter
- QA0410MSQQA04000 – 10 Meter

M12 Straight 4 Pin Male D-Coded to Male RJ45 Cable

- QA0405MSOVA04000 – 5 Meter
- QA0410MSOVA04000 – 10 Meter

M12 Straight 4 Pin Male D-Coded to RJ45 Female Socket Converter

- 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

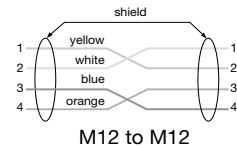
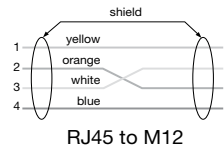
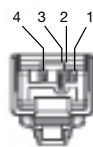
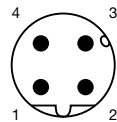
- QA04F200R000071N – PG 9 Cable Gland - IDC

RJ45 Field Attachable CONNECTOR

RJ45 Field Wireable Connector with IDC

- VA08F200R000071N – PG 9 Cable Gland

M12 D-Coded Cable & 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 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

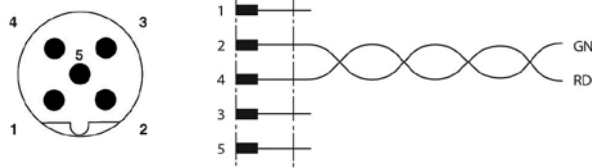
RC05F200P0000000 – PG 9 Cable Gland

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



M12 D-Coded Cables

M12 Straight 4 Pin Male D-Coded Single Ended Cable

- QA0405MT00000000 – 5 Meter
- QA0410MT00000000 – 10 Meter



M12 Straight 4 Pin Male D-Coded Double Ended Cable

- QA0405MT0QA04000 – 5 Meter
- QA0410MT0QA04000 – 10 Meter



M12 Straight 4 Pin Male D-Coded to Male RJ45 Cable

- QA0405MT0VA04000 – 5 Meter
- QA0410MT0VA04000 – 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

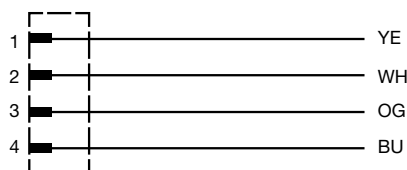
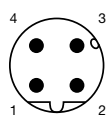


RJ45 Field Attachable Connector

RJ45 Field Wireable Connector with IDC

- VA08F200R000071N – PG 9 Cable Gland (1658435)

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



Technical Data	Cable	RJ45 Field Wireable	M12 Field Attachable
Molded Body / Insert	TPU / PE	Housing = PA Carrier = PC	Nickel Plated Zinc / PA 66
Coupling Nut	Nickel Plated Zinc	NA	Nickel Plated Brass
Cable Jacket Material	PVC	NA	NA
Cable O.D.	6.5 mm	Accepts 4.5 to 8.0 mm	Accepts 4.0 to 8 mm
Voltage Rating (Nominal)	250 Volts	NA	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	-40° C - 70° 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)	NA	NA
Wire Connection	NA	IDC	Screw Terminal / IDC



M12 D-Coded Cables

M12 Straight 4 Pin Male D-Coded Single Ended Cable

QA0405MK00000000 – 5 Meter

QA0410MK00000000 – 10 Meter

M12 Straight 4 Pin Male D-Coded Double Ended Cable

QA0405MK0QA04000 – 5 Meter

QA0410MK0QA04000 – 10 Meter

M12 Straight 4 Pin Male D-Coded to Male RJ45 Cable

QA0405MK0VA04000 – 5 Meter

QA0410MK0VA04000 – 10 Meter

M12 Straight 4 Pin Male D-Coded to RJ45 Female Socket Converter

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

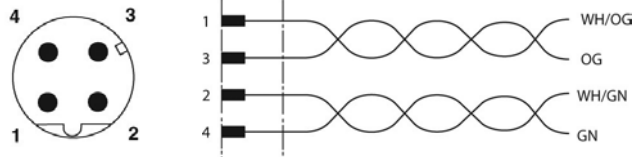
QA04F20000000000 – PG 9 Cable Gland – Screw Terminal

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	M12 Field Attachable
Molded Body / Insert	TPU, PA, PA66	Housing = PA Carrier = PC	Body = Nickel Plated Zinc Insert = PA 66
Coupling Nut	Nickel Plated Zinc or Brass	NA	Nickel Plated Brass
Cable Jacket Material	PUR or PVC	NA	NA
Cable O.D.	0.67 to 8.0 mm	4.5 to 8.0 mm	6.0 to 8.0 mm
Voltage Rating (Nominal)	42 Volts	NA	60 Volts
Current Rating	1.5 Amps	1.75 Amps	Screw 4.0 Amps IDC 1.75 Amps
Degree of Protection	IP65 (mated)	IP20	IP 65 (mated)
Operating Temperature	-20° C - 60° C	-20° C - 70° C	-40° C - 85° C
Conductor Gauge	26 & 24 AWG	26-22 AWG Solid/Stranded	Screw 24-18 AWG IDC 26-22 AWG
Bend Radius	40mm	NA	NA
Wire Connection	NA	IDC	IDC, 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)



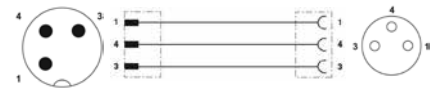
M12 Cable - Pin Out / Color Code

TC03XXMIEPA0371P
(Male to Female View)



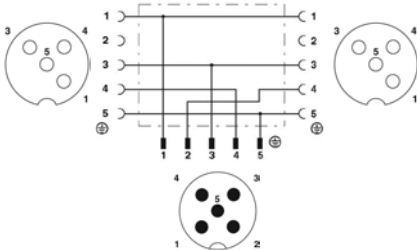
M12 Cable - Pin Out / Color Code

TC03XXMIEPA0371P
(Male to Female View)



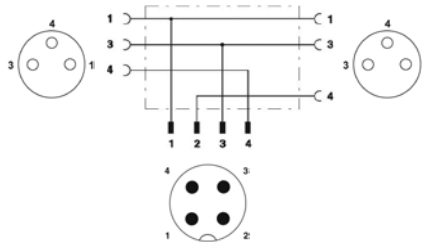
M12 to M12 "Y" Splitter - Pin Out

TA0500000JC05000
(Male to Female View)



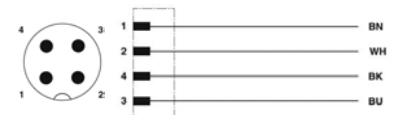
M12 to M8 "Y" Splitter - Pin Out

TA0400000KC03000
(Male to Female View)



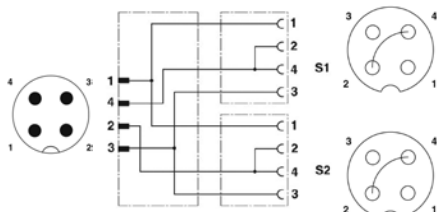
M12 Field Wireable (IDC) - Pin Out

TA04F2000000081E (SPEEDCON®)
(Male View)



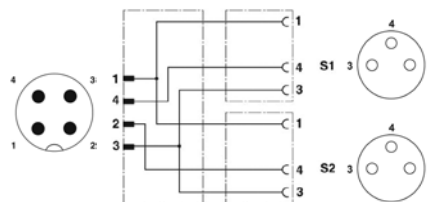
M12 to M12 Cable Splitter - Pin Out

TA04XXMIEJC04000
(Male to Female View)



M12 to M8 Cable Splitter - Pin Out

TA04XXMIEKC03000
(Male to Female View)



Note:
XX denotes allowable length.
See pages 70 & 71.

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

TC05F200000071V – PG9 Cable Gland



M12 Straight 5 Pin Male FIELD WIREABLE CONNECTOR, SPRING CAGE

TA05F200000071V – PG9 Cable Gland



M12 90° 5 Pin Female FIELD WIREABLE CONNECTOR, SPRING CAGE

TD05F200000071V – PG9 Cable Gland



M12 90° 5 Pin male FIELD WIREABLE CONNECTOR, SPRING CAGE

TB05F200000071V – PG9 Cable Gland



Bulk Sub-Bus Cable

***NOTE**

000550MGD0005000 – 50 Meter Length

0005A0MGD0005000 – 100 Meter Length

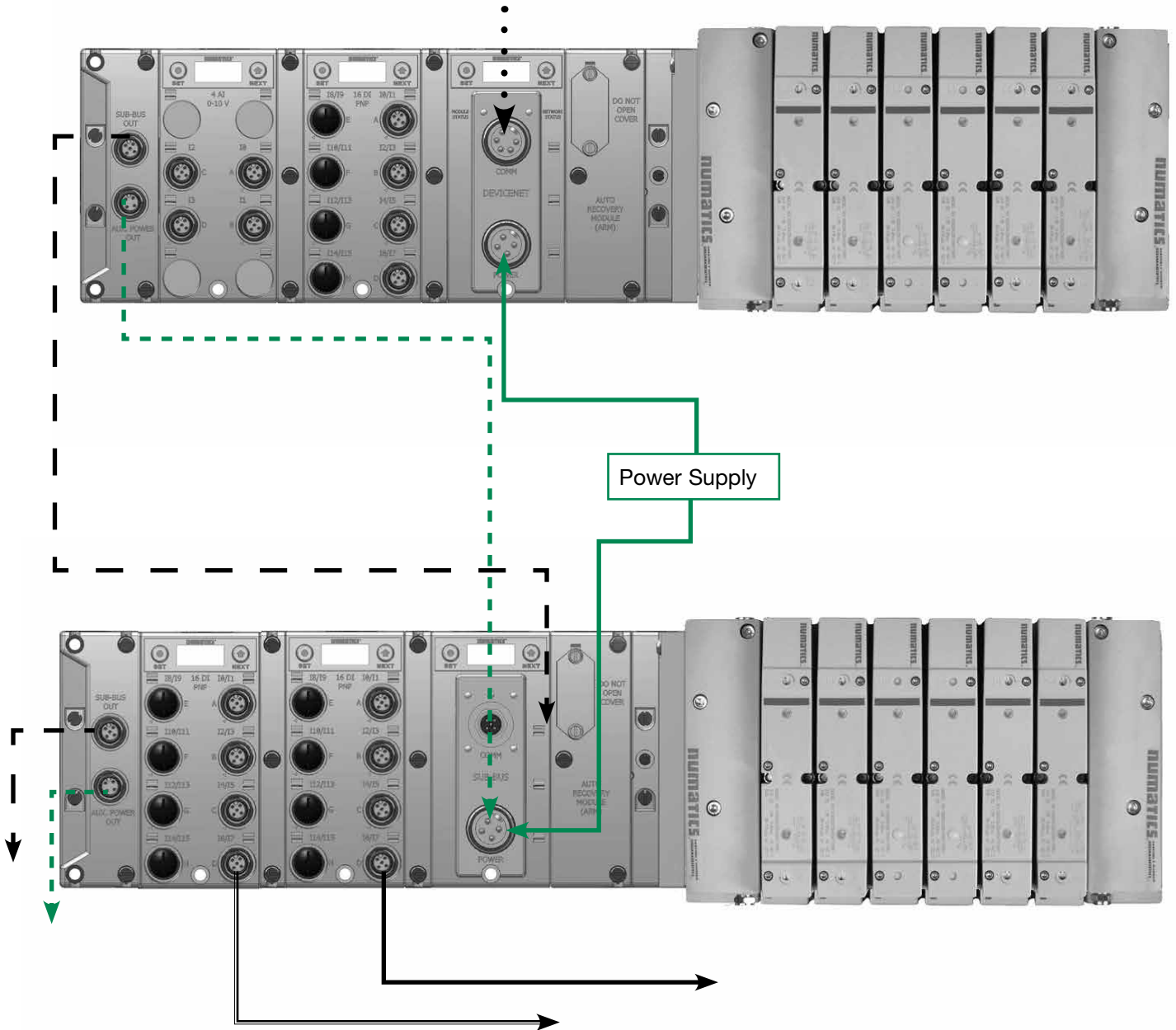
*** Note:**

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	42
	DeviceNet™/CANopen® Communication Cable	MC0505MGD0000000	45
	Sub-Bus Cable	TA0501MGDTC0571P	53
	Alternate Sub-Bus Power Option	TA0401MA0MC04000	43
	I/O Field Wireable Connector	TA04F2000000081E	50
	I/O Connector with Molded Cable	TA0405MIE000071P	50



World Class Supplier of Pneumatic Components



World Headquarters

USA Numatics, Incorporated

46280 Dylan Drive
Novi, Michigan 48377

P: 248-596-3200
F: 248-596-3201

Canada Numatics, Ltd

P: 519-758-2700
F: 519-758-5540

México - Ascomatica SA de CV

P: 52 55 58 09 56 40 (DF y Area metropolitana)
P: 01 800 000 2726 (Interior de la República)
F: 52 55 58 09 56 60

Brazil Ascoval Ind.e Comercio Ltda

P: (55) 11-4208-1700
F: (55) 11-4195-3970