Valve islands, VM10 Series

Valve slices 2 x 3/2, 5/2 and 5/3 with integral push-in fittings Ø 3 mm, 4 mm, 6 mm

Multipole or individually wired for installation flexibility

Interchangeable Fieldbus compatible modules

Compact and lightweight

Quick disconnect base (Pneumapole)

High flow from 10 mm valve width

Flexible design concept

All major Fieldbus protocols available

Technical data

Medium:
Compressed air, filtered, lubricated and non-lubricated

Operation:
Spool valve indirectly actuated

Port sizes:
Ø 3 mm, 4 mm, 6 mm Push-in fittings
Imperial versions also available

Operating pressure:
Maximum 8 bar

Flow:

Function	'C'	b'	'A'	l/min	Cv	Kv
5/2 port 1 to 2 & 4	1,77	0,48	7,10	430	0,44	0,36
5/2 ports 2 to 3 & 4 to 5	1,65	0,45	6,61	400	0,41	0,34
3/2 ports 1 to 2 & 1 to 4	1,44	0,39	5,78	350	0,36	0,29
3/2 ports 2 to 3 & 4 to 5	1,44	0,39	5,78	350	0,36	0,29
5/3 ports 1 to 2 & 4	1,44	0,39	5,78	350	0,36	0,29
5/3 ports 2 to 3 & 4 to 5	1,44	0,39	5,78	350	0,36	0,29

Degree of protection:

Individually wired	IP40
Multipole & Fieldbus	IP65

Ambient temperature:
-5°C to +50°C
Consult our Technical Service for use below +2°C.

Materials

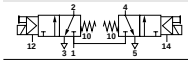
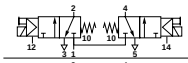
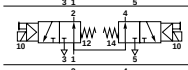
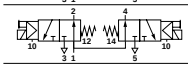
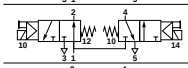
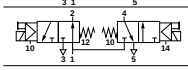
Aluminium spool with nitrile rubber seals
Body, end plates: engineered PPA co-polymer

Ordering information

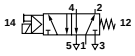
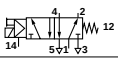
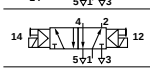
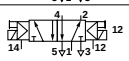
To order please use valve island configurator available at www.norgren.com
Alternatively contact Norgren for a configurator on CD or use the manual Valve Island Specification Form in the Norgren catalogue

Page

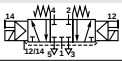
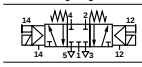
2 x 3/2 Double solenoid actuated valves

Symbol	Model	Manual override	Function 2 x 3/2	Pilot supply	Actuation	Operating pressure (bar)	Pilot pressure (bar)	kg
	VM10*A11*B213B	Turn & lock	NC	Internal	Sol/Spring	3 ... 8	–	0,054
	VM10*A11*B313B	Push only	NC	Internal	Sol/Spring	3 ... 8	–	0,054
	VM10*A22*B213B	Turn & lock	NC	External	Sol/Spring	-0,9 ... 8	3 ... 8	0,054
	VM10*A22*B313B	Push only	NC	External	Sol/Spring	-0,9 ... 8	3 ... 8	0,054
	VM10*B11*B213B	Turn & lock	NO	Internal	Sol/Spring	3 ... 8	–	0,054
	VM10*B11*B313B	Push only	NO	Internal	Sol/Spring	3 ... 8	–	0,054
	VM10*B22*B213B	Turn & lock	NO	External	Sol/Spring	-0,9 ... 8	3 ... 8	0,054
	VM10*B22*B313B	Push only	NO	External	Sol/Spring	-0,9 ... 8	3 ... 8	0,054
	VM10*C11*B213B	Turn & lock	NC/NO	Internal	Sol/Spring	3 ... 8	–	0,054
	VM10*C11*B313B	Push only	NC/NO	Internal	Sol/Spring	3 ... 8	–	0,054
	VM10*C22*B213B	Turn & lock	NC/NO	External	Sol/Spring	-0,9 ... 8	3 ... 8	0,054
	VM10*C22*B313B	Push only	NC/NO	External	Sol/Spring	-0,9 ... 8	3 ... 8	0,054

5/2 Single and double solenoid actuated valves

Symbol	Model	Manual override	Function	Pilot supply	Actuation	Operating pressure (bar)	Pilot pressure (bar)	kg
	VM10*517*B213B	Turn & lock	5/2	Internal	Sol/Spring	3 ... 8	–	0,044
	VM10*517*B313B	Push only	5/2	Internal	Sol/Spring	3 ... 8	–	0,044
	VM10*527*B213B	Turn & lock	5/2	External	Sol/Spring	-0,9 ... 8	3 ... 8	0,044
	VM10*527*B313B	Push only	5/2	External	Sol/Spring	-0,9 ... 8	3 ... 8	0,044
	VM10*511*B213B	Turn & lock	5/2	Internal	Sol/Sol	2 ... 8	–	0,054
	VM10*511*B313B	Push only	5/2	Internal	Sol/Sol	2 ... 8	–	0,054
	VM10*522*B213B	Turn & lock	5/2	External	Sol/Sol	-0,9 ... 8	2 ... 8	0,054
	VM10*522*B313B	Push only	5/2	External	Sol/Sol	-0,9 ... 8	2 ... 8	0,054

5/3 Double solenoid actuated valves

Symbol	Model	Manual override	Function	Pilot supply	Actuation	Operating pressure (bar)	Pilot pressure (bar)	kg
	VM10*611*B213B	Turn & lock	5/3 APB	Internal	Sol/Sol	3 ... 8	–	0,055
	VM10*611*B313B	Push only	5/3 APB	Internal	Sol/Sol	3 ... 8	–	0,055
	VM10*622*B213B	Turn & lock	5/3 APB	External	Sol/Sol	-0,9 ... 8	3 ... 8	0,055
	VM10*622*B313B	Push only	5/3 APB	External	Sol/Sol	-0,9 ... 8	3 ... 8	0,055

Note: For 5/3 COE please use 2 x 3/2 NC. For 5/3 COP please use 2 x 3/2 NO

APB = All Ports Blocked COE = Centre Open Exhaust COP = Centre Open Pressure

Note: * For selecting port sizes please see page 5.4.115.03

Warning

These products are intended for use in industrial compressed air systems only. Do not use these products where pressures and temperatures can exceed those listed under **'Technical Data'**.

Before using these products with fluids other than those specified, for non-industrial applications, life-support systems, or other applications not within published specifications, consult NORGREN.

Through misuse, age, or malfunction, components used in fluid power systems can fail in various modes. The system designer is warned to consider the failure modes of all component parts used in fluid power systems and to provide adequate safeguards to prevent personal injury or damage to equipment in the event of such failure.

System designers must provide a warning to end users in the system instructional manual if protection against a failure mode cannot be adequately provided.

System designers and end users are cautioned to review specific warnings found in instruction sheets packed and shipped with these products.

Options selector

VM10★★★★★B★13B

Tube size	Substitute
3 mm PIF	3
4 mm PIF	4
6 mm PIF	6
No PIF (for use with Pneumapole)*	7

Valve function	Substitute
5/2	5
5/3 APB	6
2 x 3/2 NC and 5/3 COE	A
2 x 3/2 NO and 5/3 COP	B
2 x 3/2 NC and NO	C

Manual override	Substitute
Turn to lock manual overide	2
Push only manual overide	3

Exhaust	Substitute
Standard open exhaust	A

Actuation/pilot supply	Substitute
Solenoid/solenoid internal pilot	11
Solenoid/spring internal pilot **	17
Solenoid/solenoid external pilot	22
Solenoid/spring external pilot **	27

Note: For 5/3 COE and COP use 2 x 3/2
APB = All Ports Blocked COE = Centre Open Exhaust COP = Centre Open Pressure
For valve island specification see page 17
Use our configurator under http://www.norgren.com (also available on CD)
* Requires Pneumapole sub-base
** Can only be used with 5/2 valve

Electrical details

Voltage:	24 V d.c. 0,6 W*
Surge suppression:	Flywheel diode
Indication:	Yellow LED

* 12 V d.c. also available. Please consult our Technical Service.

Solenoids

Voltage tolerance:	± 10%
Rating:	100% ED

Accessories

D Sub-connector 25 pin — IP65

V11569-E01	1 m	L1
V11569-E03	3 m	L2
V11569-E05	5 m	L3

D Sub-connector 44 pin — IP65

V11570-E01	1 m	M1
V11570-E03	3 m	M2
V11570-E05	5 m	M3

2 Pin connector — IP40

V11556-E10	1 m	K2
V11556-E03	0,3 m	K1

Valve blanking station

VM106517AQ0300	B000

Port blanking station

VM106517AQ0301	Port 1 blanked	B100
VM106517AQ0302	Ports 3 & 5 blanked	B300
VM106517AQ0303	Ports 1, 3 & 5 blanked	B500

Pressure switch

VM106517AQ0804	4 mm	7A
VM106517AQ0806	6 mm	7B

DIN Rail

V10009-C00	1 m	A17

DIN Rail fixing kit

V11900-C01	8D

Manual override set-up kit (x2)

V11574-K30	Push only	N1
V11574-K31	Turn to lock	N2

Pneumapole sub-base

For part numbers and dimensional details see page 12 & 13

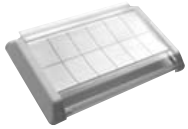
D Sub-connector 25 pin 90° Right handed

V12086-E01	1 m	L4
V12086-E03	3 m	L5
V12086-E05	5 m	L6

D Sub-connector 44 pin 90° Left handed

V12088-E01	1m	M4
V12088-E03	3m	M5
V12088-E05	5m	M6

Label cover kit



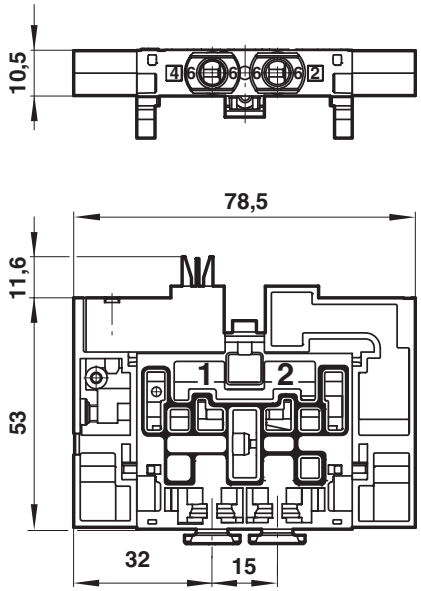
V12016-K36	4 Station	G1
V12016-K37	6 Station	G2
V12016-K38	8 Station	G3
V12016-K39	10 Station	G4
V12016-K40	12 Station	G5
V12016-K41	16 Station	G6

Labels

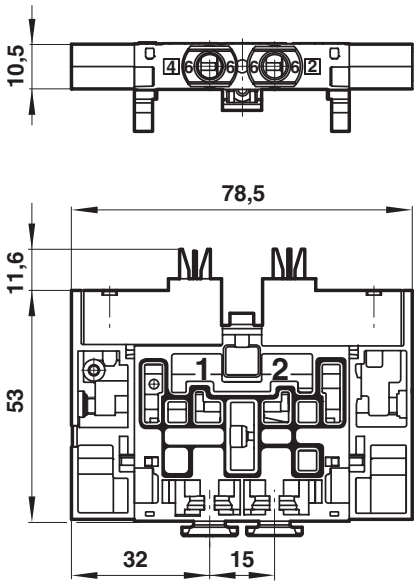
V12033-L02	Write and seal label	J1
V12034-L02	Paper label	J5

VM10 models

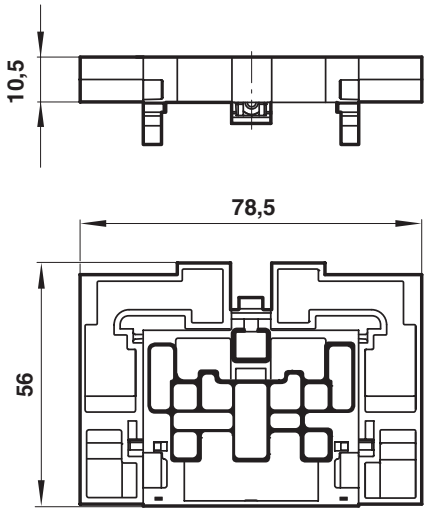
Single solenoid



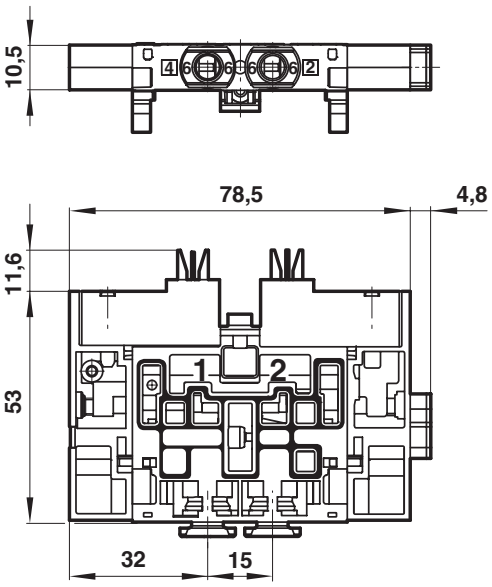
Double solenoid



Blanking plates

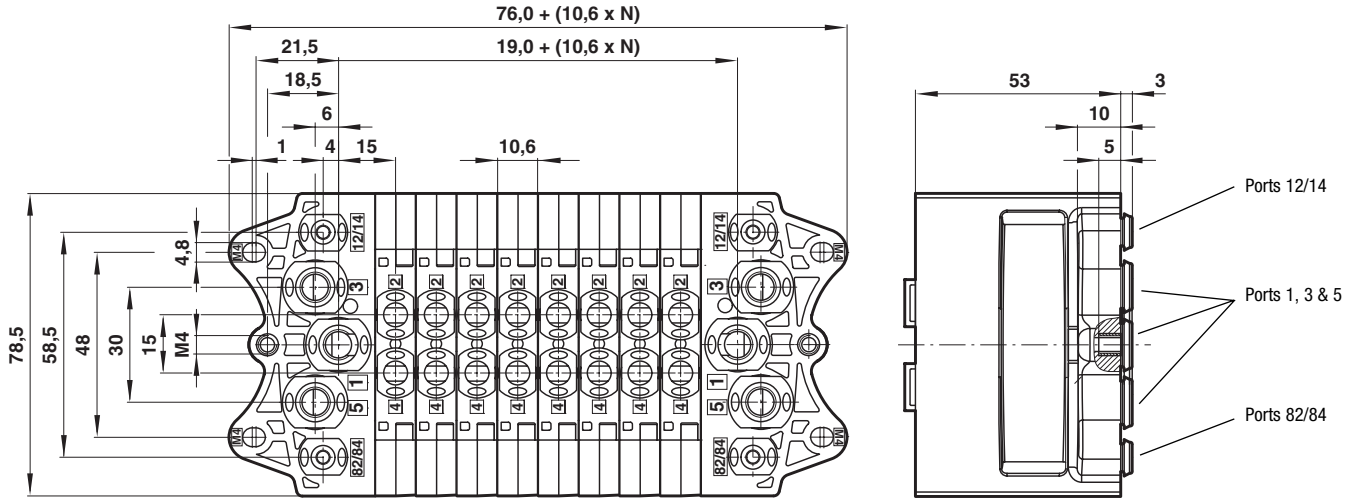


5/3 APB
Double solenoid

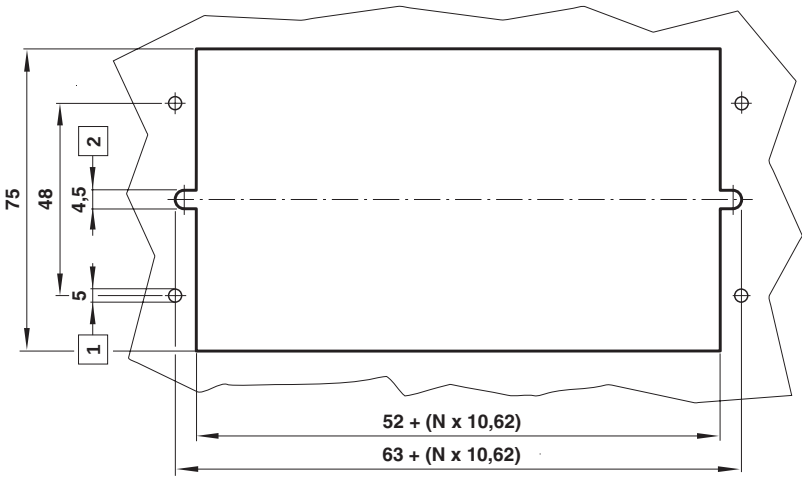


Valve blanking station	Short code	Port blanking station		Short code	kg
VM106517AQ0300	B000	VM106517AQ0301	Port 1 blanked	B100	0,028
		VM106517AQ0302	Ports 3 & 5 blanked	B300	0,028
		VM106517AQ0303	Ports 1, 3 & 5 blanked	B500	0,028

Port connections



Panel cut-out detail



1 For mounting island from outside of panel using M4 threads in valve island end plates

2 For using through-mounting holes in valve island end plates

N = number of stations

Detailed CAD drawings available through website valve island configurator

Model	Description	B Ports 1 ,3 & 5	A Ports 12/14 & 82/84	C Ports 2 & 4	Short code	kg
VM106517AQ010Y	End plate kit - feed both ends	10 mm	6 mm	6 mm	F100	0,170
VM106517AQ0108	End plate kit - feed both ends	8 mm	4 mm	4 mm	F800	0,170
VM106517AQ011Y	End plate kit - feed left, right blocked	10 mm	6 mm	6 mm	L100	0,170
VM106517AQ0118	End plate kit - feed left, right blocked	8 mm	4 mm	4 mm	L800	0,170
VM106517AQ012Y	End plate kit - feed right, left blocked	10 mm	6 mm	6 mm	R100	0,170
VM106517AQ0128	End plate kit - feed right, left blocked	8 mm	4 mm	4 mm	R800	0,170
VM106517AQ0131	End plate kit - feed both ends	no PIF *	no PIF *	no PIF *	FP00	0,170
VM106517AQ0132	End plate kit - feed left, right blocked	no PIF *	no PIF *	no PIF *	RP00	0,170
VM106517AQ0133	End plate kit - feed right, left blocked	no PIF *	no PIF *	no PIF *	LP00	0,170

Available valve port sizes – Ø 3 mm, 4 mm and 6 mm

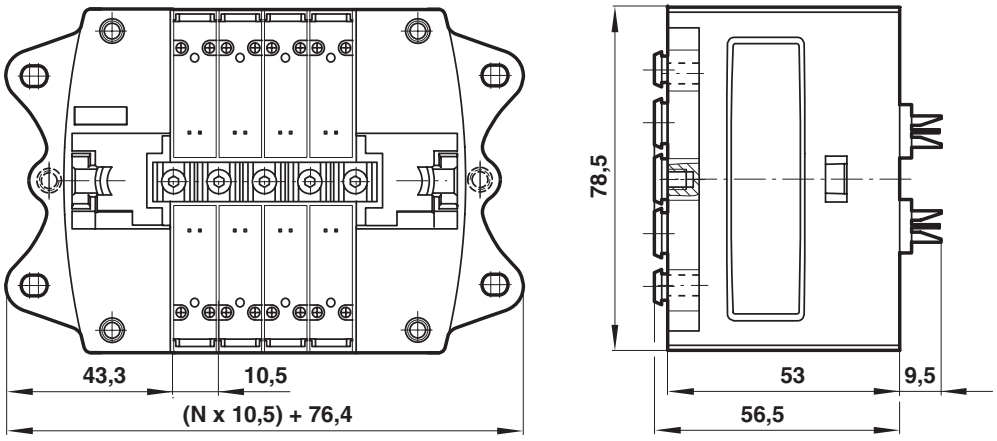
* No push in fitting for use with pneumapole sub-base

Modular assembly

Individually wired IP40

Individually wired	No. of stations	Max. no. coils	kg*
2 Pin connector	2 to 20	40	0,170

* kg + valves weight

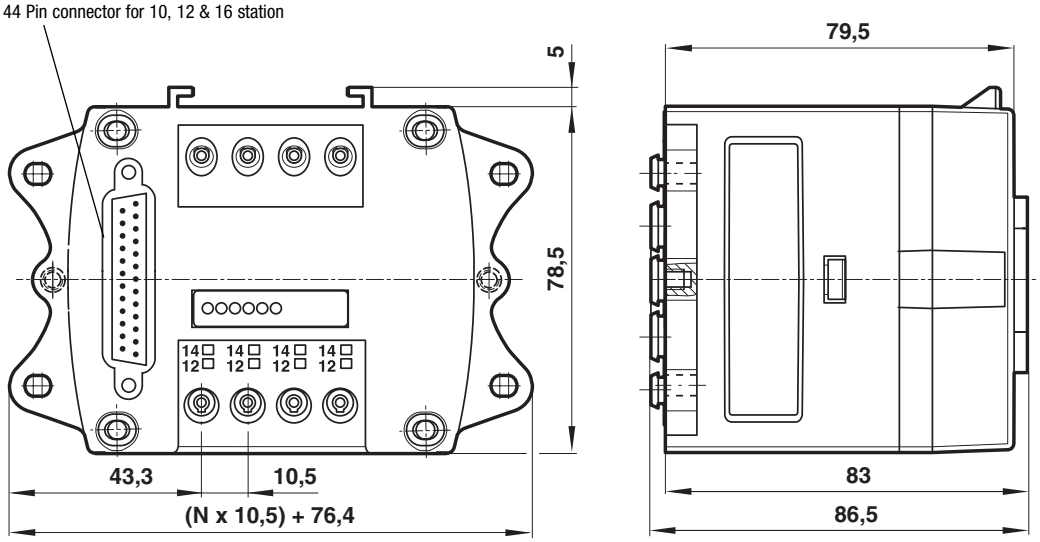


N = number of stations

Multipole IP65

Multipole	No. of stations	-ve common Model	Short code	+ve common Model	Short code	Max. no. coils	kg
25 Pin connector	4	VM106517AQ0404	2N04	VM106517RQ0404	2P04	8	0,116
25 Pin connector	6	VM106517AQ0406	2N06	VM106517RQ0406	2P06	12	0,122
25 Pin connector	8	VM106517AQ0408	2N08	VM106517RQ0408	2P08	16	0,128
25 Pin connector	10	VM106517AQ0410	2N10	VM106517RQ0410	2P10	20	0,134
25 Pin connector	12	VM106517AQ0412	2N12	VM106517RQ0412	2P12	24	0,140
44 Pin connector	10	VM106517AQ0510	4N10	VM106517RQ0510	4P10	20	0,138
44 Pin connector	12	VM106517AQ0512	4N12	VM106517RQ0512	4P12	24	0,144
44 Pin connector	16	VM106517AQ0516	4N16	VM106517RQ0516	4P16	32	0,160

25 Pin connector for 4, 6, 8, 10 & 12 station
44 Pin connector for 10, 12 & 16 station

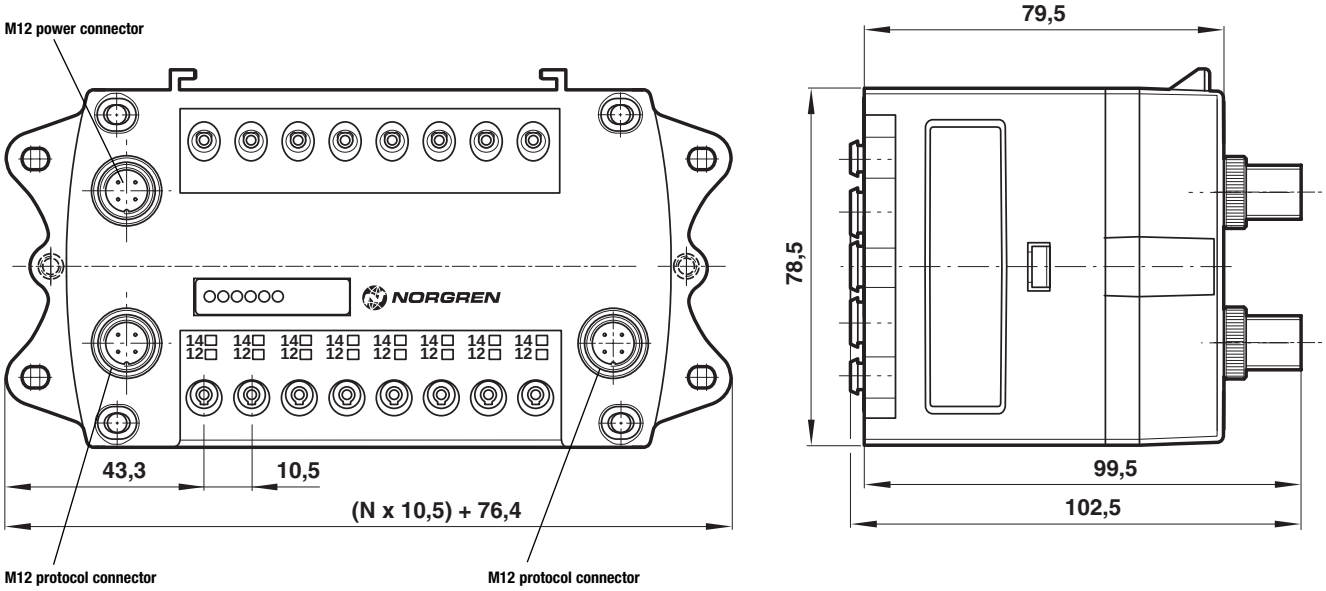


N = number of stations

Fieldbus connections (M12 connector types IP65)

Standard fieldbus	No. of stations	Model	Max. no. coils	Short code	kg
AS-interface	04*	VM10AS10A00410	4	A404	0,138
AS-interface**	08*	VM10AS10A00810	8	A808	0,144
AS-interface**	04*	VM10AS10A00820	8	A804	0,150
AS-interface**	06*	VM10AS10A00830	8	A806	0,170
DeviceNet	08	VM10DNFNB00082	16	DR08	0,138
DeviceNet	10	VM10DNFNB00102	20	DR10	0,144
DeviceNet	12	VM10DNFNB00122	24	DR12	0,150
DeviceNet	16	VM10DNFNB00162	32	DR16	0,170
CANopen	08	VM10CAFNB00082	16	CR08	0,138
CANopen	10	VM10CAFNB00102	20	CR10	0,144
CANopen	12	VM10CAFNB00122	24	CR12	0,150
CANopen	16	VM10CAFNB00162	32	CR16	0,170

* Number of stations = 04 (4 x sol/spring), 08 (8 x sol/spring), 04 (4 x sol/sol), 06 (4 x sol/spring, 2 x sol/sol).
** Use 2 x M12 protocol connectors

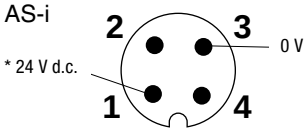


N = number of stations

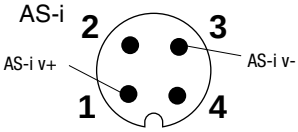
(AS-i version shown)

Connector details

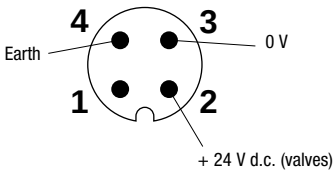
Power connection



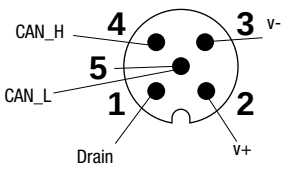
Fieldbus



DeviceNet & CANopen



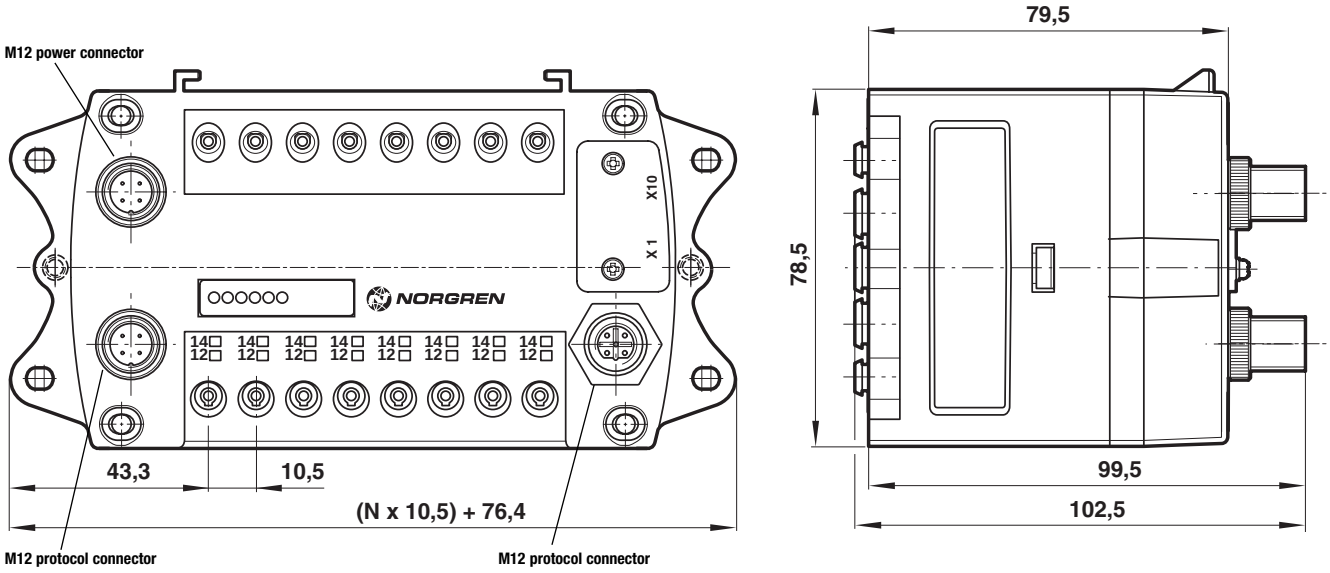
DeviceNet & CANopen



Fieldbus connections (M12 connector types IP65)

Standard Fieldbus	No. of stations	Model	Max. no. coils	Short code	kg
Profibus-DP	08	VM10DPFNB00082	16	PS08	0,138
Profibus-DP	10	VM10DPFNB00102	20	PS10	0,144
Profibus-DP	12	VM10DPFNB00122	24	PS12	0,150
Profibus-DP	16	VM10DPFNB00162	32	PS16	0,170
AB RIO	08*	–	16	–	–
AB RIO	10*	–	20	–	–
AB RIO	12*	–	24	–	–
AB RIO	16*	–	32	–	–

* For AB RIO requirements, please consult our Technical Service.

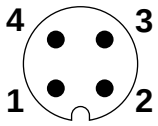


N = number of stations

Connector details

Power connection

Male

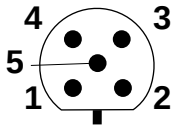


Looking into node connector

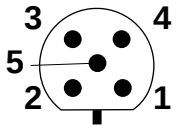
Pin no.	Function	Tolerance	Max. current
1	24 VB Logic circuit supply	±30%	300 mA
2	24 VA Valves	±10%	1,5 A
3	0 V	–	1.53 A
4	Earth	–	–

Profibus-DP

Male
Communication in

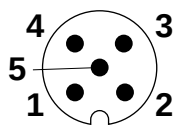


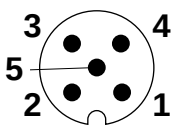
Female
Communication out



Pin no.	Function
1	5 VI Opto isolator
2	A-line (green)
3	0 VI Opto isolated
4	B-line (red)
5	Shield
Threaded joint	Shield

AB-RIO (Bus)

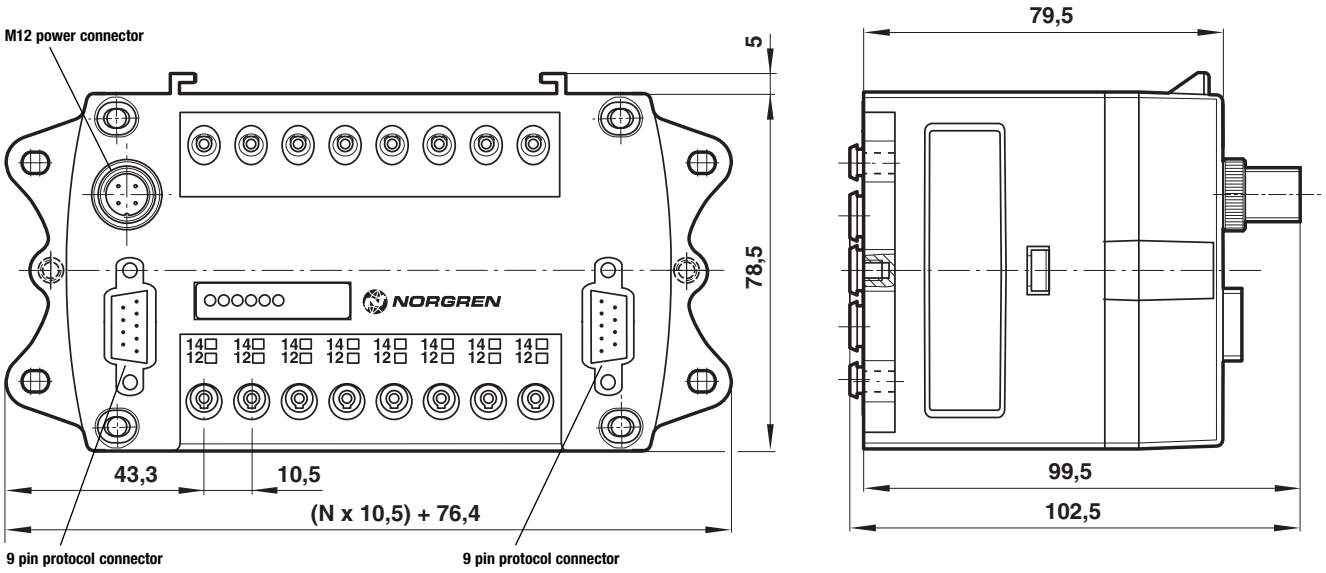




Pin no.	Function
1	RIO 1
2	–
3	RIO 2
4	–
5	RIO SH

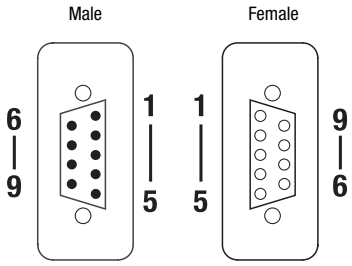
Fieldbus connections - (9 pin D-type connector IP65)

Standard fieldbus - available protocols	No. of stations	Model	Max. no. coils	Short code	kg
Interbus-S	8	VM10IBFNB00080	16	S008	0,138
Interbus-S	10	VM10IBFNB00100	20	S010	0,144
Interbus-S	12	VM10IBFNB00120	24	S012	0,150
Interbus-S	16	VM10IBFNB00160	32	S016	0,170



N = number of stations

Connector details



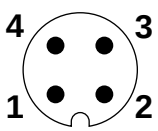
Looking into node connector

Outgoing Remote Bus D-Sub Connector (Female)		Incoming Remote Bus D-Sub Connector (Male)	
Pin Number	Signal	Pin Number	Signal
1	DO	1	DO
2	DI	2	DI
3	0VI	3	0VI
4	*	4	*
5	+5VI**	5	*
6	/DO	6	/DO
7	/DI	7	/DI
8	*	8	*
9	RBST**	9	–

* Do not connect to pins 4 or 8
** If used, the outgoing bus connector should have pins 5 and 9 connected together to indicate the presence of a device on the outgoing bus.

Power connection

Male

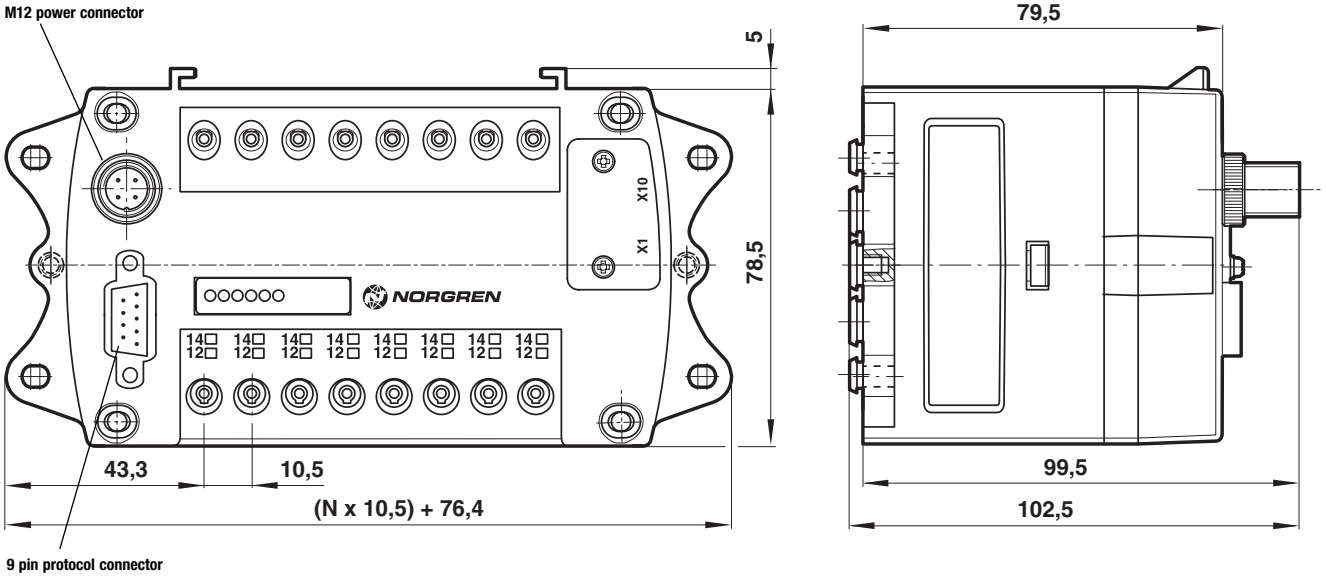


Looking into node connector

Pin no.	Function	Tolerance	Max. current
1	24 VB Logic circuit supply	±30%	300 mA
2	24 VA Valves	±10%	1,5 A
3	0 V	–	1.53 A
4	Earth	–	–

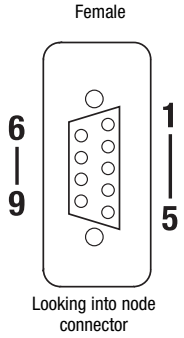
Fieldbus connections - (9 pin D-type connector IP40)

Standard fieldbus	No. of stations	Model	Max. no. coils	Short code	kg
Profibus-DP	8	VM10DPFNB00083	16	PR08	0,138
Profibus-DP	10	VM10DPFNB00103	20	PR10	0,144
Profibus-DP	12	VM10DPFNB00123	24	PR12	0,150
Profibus-DP	16	VM10DPFNB00163	32	PR16	0,170



N = number of stations

Connector details

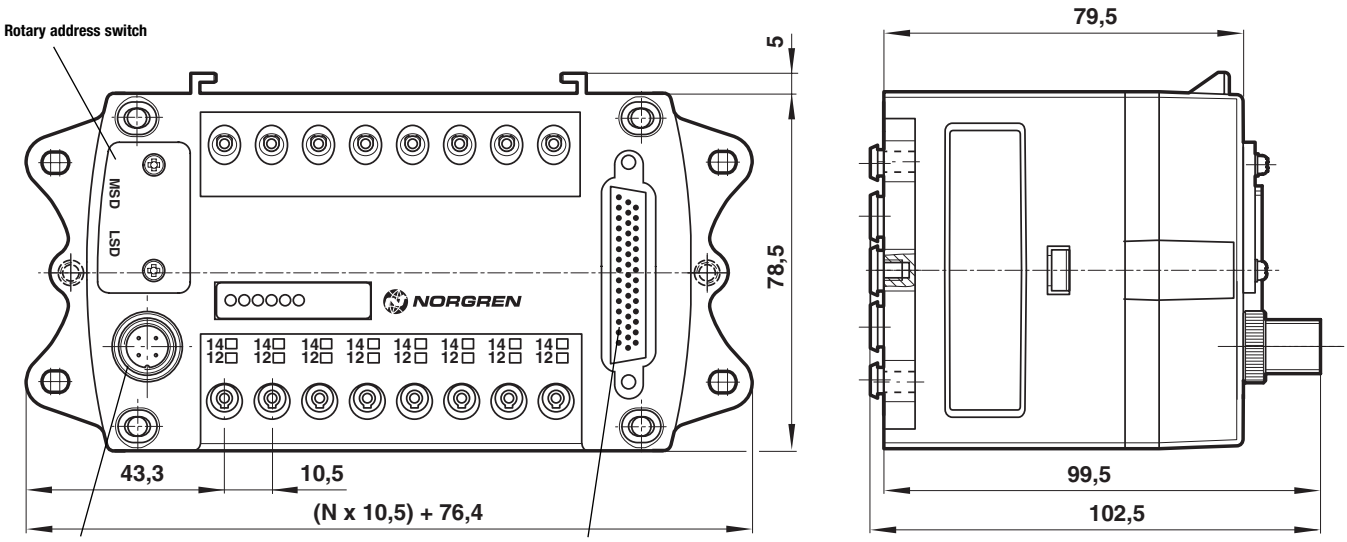


Pin Number	Function
1	Shield
2	N/C
3	B-line (Red) RxD / TxD-P
4	CNTR-P (RTS)
5	DGND (OVI) opto Isolated
6	VP (5VI) opto Isolated
7	N/C
8	A-line (Green) RxD / TxD-N
9	CNTR-N (direction control)

Fieldbus connections with interlocks IP65

Standard fieldbus	No. of stations	Model	Max. no. coils	Short code	kg
DeviceNet	8	VM10DNFNB00083	16	DK08	0,138
DeviceNet	10	VM10DNFNB00103	20	DK10	0,144
DeviceNet	12	VM10DNFNB00123	24	DK12	0,150
DeviceNet	16	VM10DNFNB00163	32	DK16	0,170

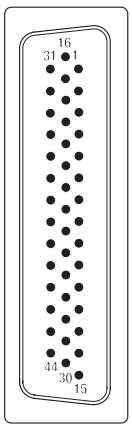
DeviceNet



N = number of stations

Connector details

44 way 'D' interlocked power connections

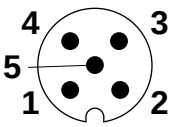


Looking into node connector

Valve/Sol	8	10	12	16	Valve/Sol	8	10	12	16
1-a	16	20	24	32	1-b	15	19	23	31
2-a	14	18	22	30	2-b	13	17	21	29
3-a	12	16	20	28	3-b	11	15	19	27
4-a	10	14	18	26	4-b	9	13	17	25
5-a	8	12	16	24	5-b	7	11	15	23
6-a	6	10	14	22	6-b	5	9	13	21
7-a	4	8	12	20	7-b	3	7	11	19
8-a	2	6	10	18	8-b	1	5	9	17
9-a	N/A	4	8	16	9-b	N/A	3	7	15
10-a	N/A	2	6	14	10-b	N/A	1	5	13
11-a	N/A	N/A	4	12	11-b	N/A	N/A	3	11
12-a	N/A	N/A	2	10	12-b	N/A	N/A	1	9
13-a	N/A	N/A	N/A	8	13-b	N/A	N/A	N/A	7
14-a	N/A	N/A	N/A	6	14-b	N/A	N/A	N/A	5
15-a	N/A	N/A	N/A	4	15-b	N/A	N/A	N/A	3
16-a	N/A	N/A	N/A	2	16-b	N/A	N/A	N/A	1
Common	44	44	44	44	Common	44	44	44	44

Fieldbus

DeviceNet & CANopen

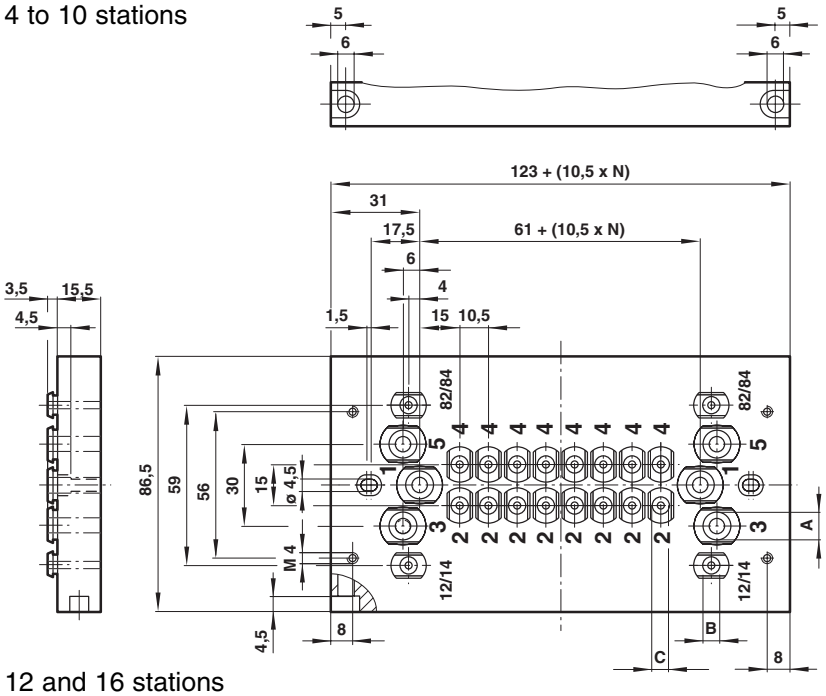


Pin no.	Function
1	Drain
2	V+
3	V-
4	CAN_H
5	CAN_L

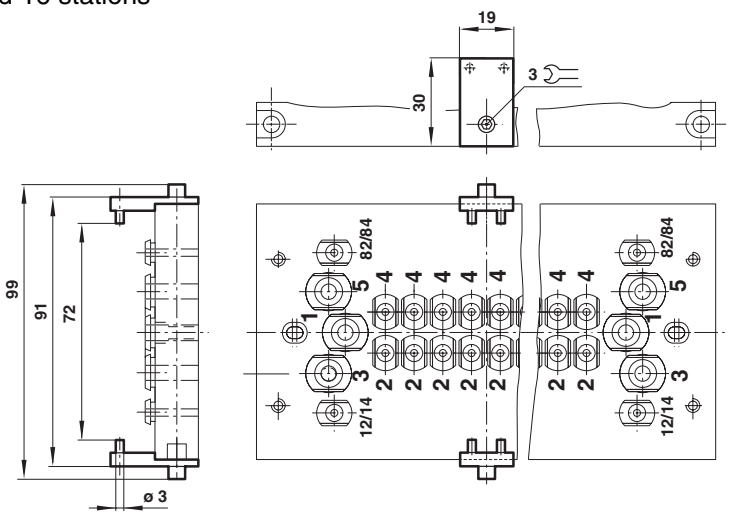
Pneumapole sub-base – bottom ported

Model	Description	A Ports 1, 3 & 5	B Ports 12/14 & 82/84	C Ports 2 & 4	Exhaust type	Short code
VM106517AQ6604	4 station Pneumapole	10 mm	6 mm	6 mm	Standard	6B04
VM106517AQ6606	6 station Pneumapole	10 mm	6 mm	6 mm	Standard	6B06
VM106517AQ6608	8 station Pneumapole	10 mm	6 mm	6 mm	Standard	6B08
VM106517AQ6610	10 station Pneumapole	10 mm	6 mm	6 mm	Standard	6B10
VM106517AQ6612	12 station Pneumapole	10 mm	6 mm	6 mm	Standard	6B12
VM106517AQ6616	16 station Pneumapole	10 mm	6 mm	6 mm	Standard	6B16

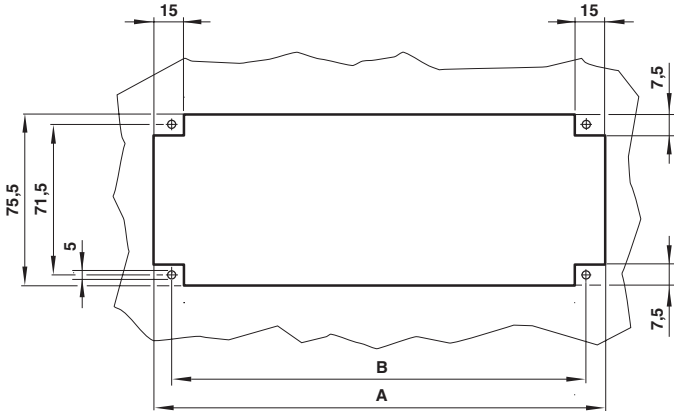
4 to 10 stations



12 and 16 stations

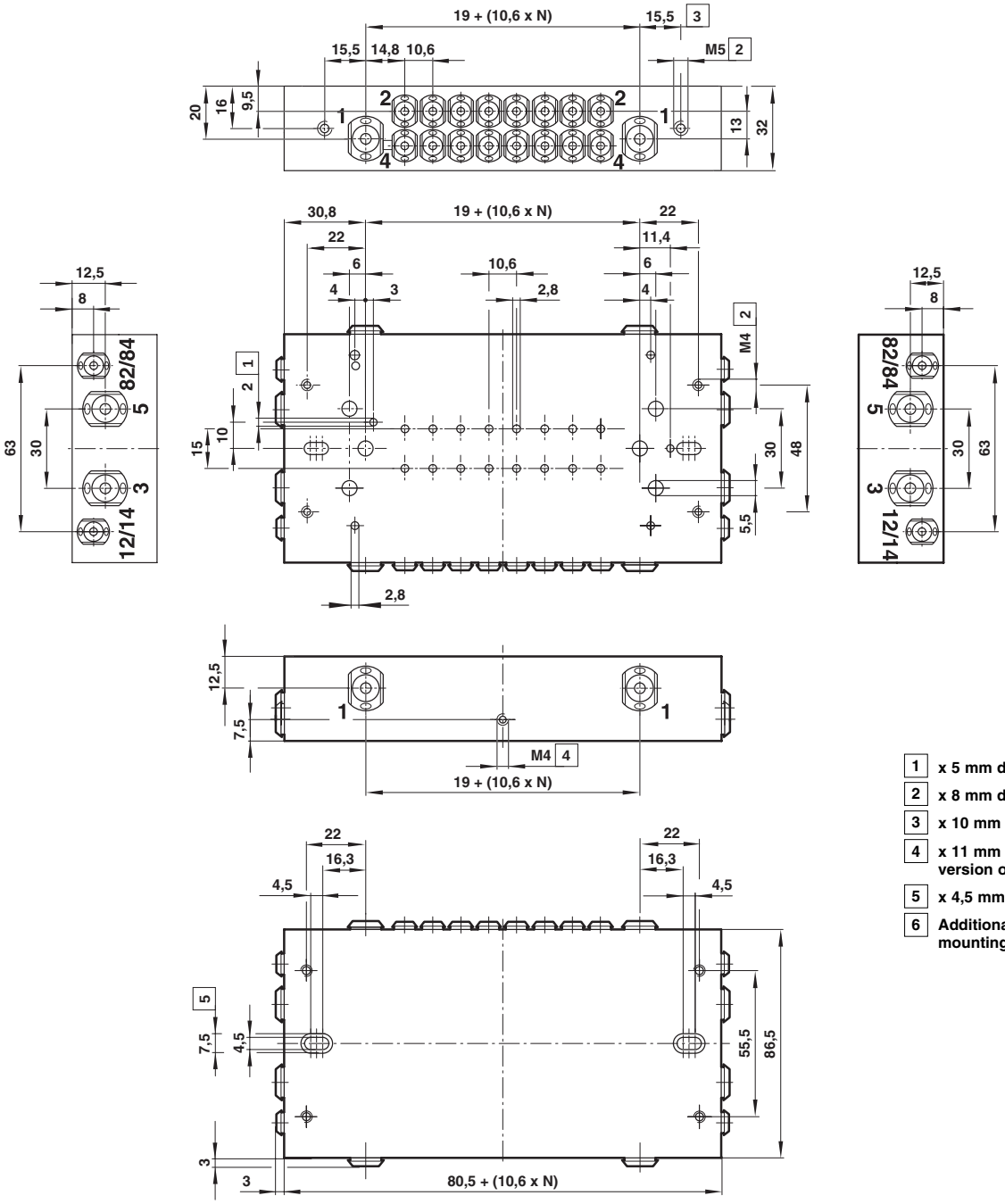


Panel cut-out detail



Pneumapole sub-base – side ported

Model	Description	A Ports 1, 3 & 5	B Ports 12/14 & 82/84	C Ports 2 & 4	Exhaust type	Short code
VM106517AQ6S04	4 station Pneumapole	10 mm	6 mm	6 mm	Standard	6S04
VM106517AQ6S06	6 station Pneumapole	10 mm	6 mm	6 mm	Standard	6S06
VM106517AQ6S08	8 station Pneumapole	10 mm	6 mm	6 mm	Standard	6S08
VM106517AQ6S10	10 station Pneumapole	10 mm	6 mm	6 mm	Standard	6S10



1 x 5 mm deep (chamfer 1x45°)

2 x 8 mm deep

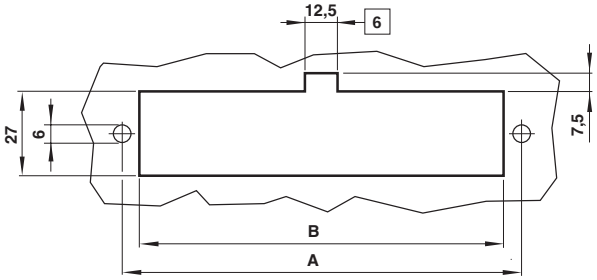
3 x 10 mm deep

4 x 11 mm deep (12 & 16 station version only)

5 x 4,5 mm deep

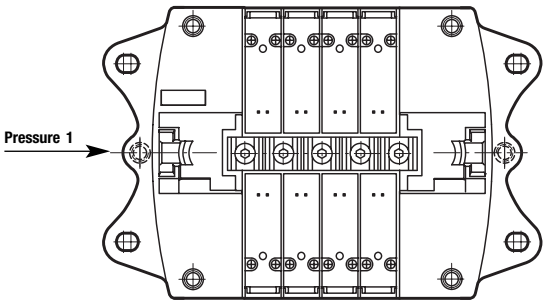
6 Additional cut-out required when rear mounting 12 &16 station versions

Panel cut-out detail

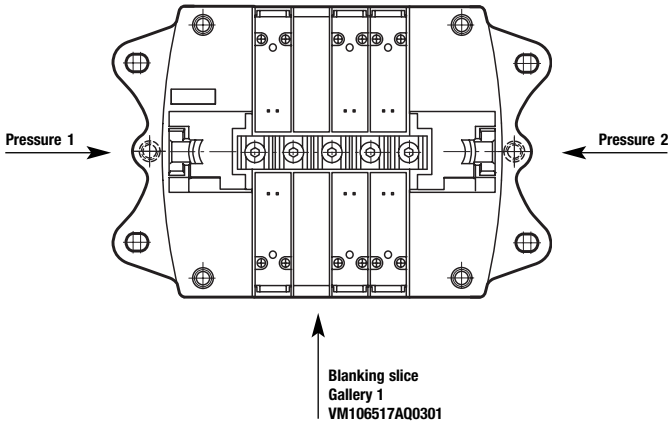


Multi-pressure options

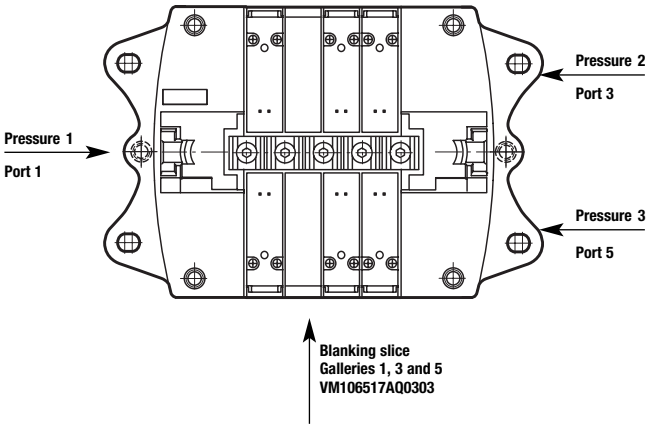
Single pressure



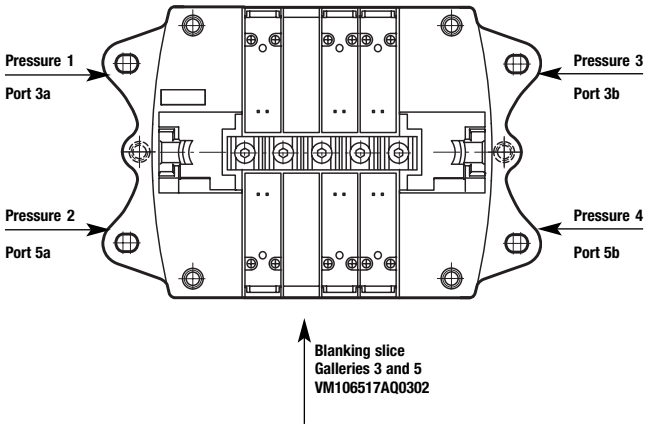
Dual pressure



Three pressure

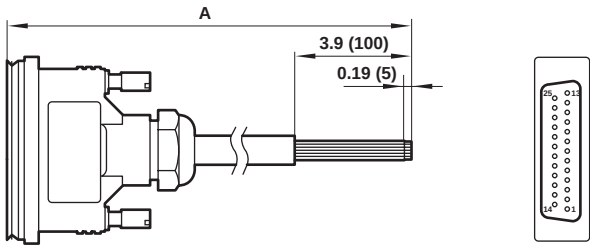


Four pressure



3 & 4 pressure systems can only be achieved using externally piloted 2 x 3/2 valves

25 pin D sub-connector (IP65)



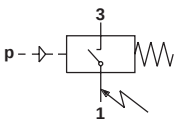
Model	A	Short code	kg
V11569-E01	1 m	**L1**	0,276
V11569-E03	3 m	**L2**	0,676
V11569-E05	5 m	**L3**	1,076

Pin no.	Wire colour	Socket	Pilot	Station
1	White	Solenoid 1–a	14	1
2	Brown	Solenoid 2–a	14	2
3	Green	Solenoid 3–a	14	3
4	Yellow	Solenoid 4–a	14	4
5	Grey	Solenoid 5–a	14	5
6	Pink	Solenoid 6–a	14	6
7	Blue	Solenoid 7–a	14	7
8	Red	Solenoid 8–a	14	8
9	Black	Solenoid 9–a	14	9
10	Violet	Solenoid 10–a	14	10
11	Grey/Pink	Solenoid 11–a	14	11
12	Red/Blue	Solenoid 12–a	14	12
13	White/Green	Common-Ve		–
14	Brown/Green	Solenoid 1–b	12	1
15	White/Yellow	Solenoid 2–b	12	2
16	Yellow/Brown	Solenoid 3–b	12	3
17	White/Grey	Solenoid 4–b	12	4
18	Grey/Brown	Solenoid 5–b	12	5
19	White/Pink	Solenoid 6–b	12	6
20	Pink/Brown	Solenoid 7–b	12	7
21	White/Blue	Solenoid 8–b	12	8
22	Brown/Blue	Solenoid 9–b	12	9
23	White/Red	Solenoid 10–b	12	10
24	Brown/Red	Solenoid 11–b	12	11
25	White/Black	Solenoid 12–b	12	12

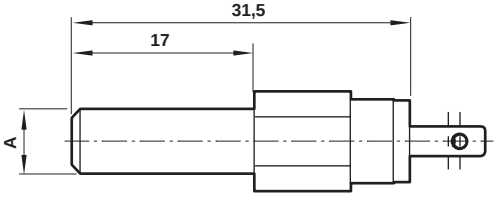
Note: Conforms to DIN 47100

Pressure switch

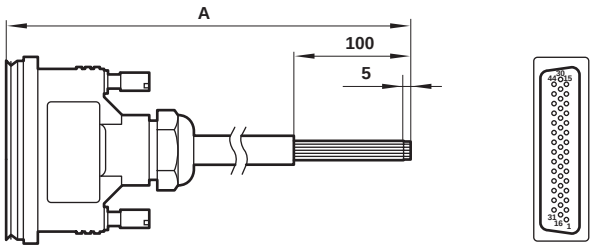
Model	A	Short code	kg
VM106517AQ0804	4	7A	0,004
VM106517AQ0806	6	7B	0,004



AMP E–terminals 2,8 x 0,8
Degree of protection: IP 00
Non adjustable
Pressure range: 0 to 10 bar
Switching point rising pressure: 3,0 to 5,0
Switch point falling pressure: 2,5 to 3,7 bar



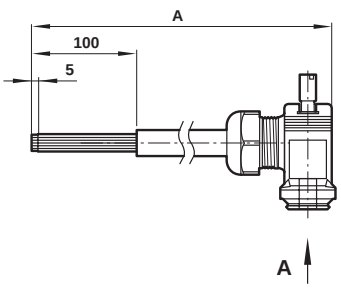
44 pin D Sub-connector (IP65)

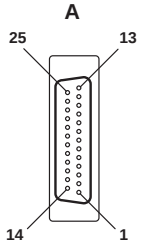


Model	A	Short code	kg
V11570-E01	1 m	**M1**	0,280
V11570-E03	3 m	**M2**	0,680
V11570-E05	5 m	**M3**	1,080

Pin no.	Wire colour	Socket	Pilot	Station
1	White	Solenoid 1–a	14	1
2	Brown	Solenoid 2–a	14	2
3	Green	Solenoid 3–a	14	3
4	Yellow	Solenoid 4–a	14	4
5	Grey	Solenoid 5–a	14	5
6	Pink	Solenoid 6–a	14	6
7	Blue	Solenoid 7–a	14	7
8	Red	Solenoid 8–a	14	8
9	Black	Solenoid 9–a	14	9
10	Violet	Solenoid 10–a	14	10
11	Grey/Pink	Solenoid 11–a	14	11
12	Red/Blue	Solenoid 12–a	14	12
13	White/Green	Solenoid 13–a	14	13
14	Brown/Green	Solenoid 14–a	14	14
15	White/Yellow	Solenoid 15–a	14	15
16	Yellow/Brown	Solenoid 1–b	12	1
17	White/Grey	Solenoid 2–b	12	2
18	Grey/Brown	Solenoid 3–b	12	3
19	White/Pink	Solenoid 4–b	12	4
20	Pink/Brown	Solenoid 5–b	12	5
21	White/Blue	Solenoid 6–b	12	6
22	Brown/Blue	Solenoid 7–b	12	7
23	White/Red	Solenoid 8–b	12	8
24	Brown/Red	Solenoid 9–b	12	9
25	White/Black	Solenoid 10–b	12	10
26	Brown/Black	Solenoid 11–b	12	11
27	Grey/Green	Solenoid 12–b	12	12
28	Yellow/Grey	Solenoid 13–b	12	13
29	Pink/Green	Solenoid 14–b	12	14
30	Yellow/Pink	Solenoid 15–b	12	15
31	Green/Blue	Solenoid 16–a	14	16
32	Yellow/Blue	Solenoid 16–b	12	16
33	-	NOT USED	-	-
34	-	NOT USED	-	-
35	-	NOT USED	-	-
36	-	NOT USED	-	-
37	-	NOT USED	-	-
38	-	NOT USED	-	-
39	-	NOT USED	-	-
40	-	NOT USED	-	-
41	-	NOT USED	-	-
42	-	NOT USED	-	-
43	-	NOT USED	-	-
44	Red/Black Yellow/Black	Common -Ve	-	-

D Sub-connector 25 pin 90° Right handed



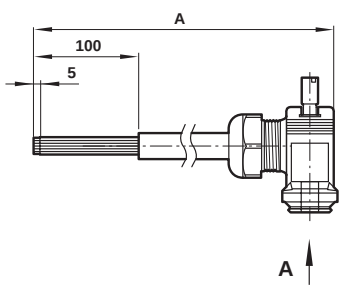


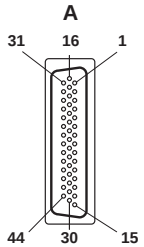
Model	A	Short code	kg
V12086-E01	1 m	L4	0,275
V12086-E03	3 m	L5	0,675
V12086-E05	5 m	L6	1,075

Pin no.	Wire colour	Socket	Pilot	Station
1	White	Solenoid 1–a	14	1
2	Brown	Solenoid 2–a	14	2
3	Green	Solenoid 3–a	14	3
4	Yellow	Solenoid 4–a	14	4
5	Grey	Solenoid 5–a	14	5
6	Pink	Solenoid 6–a	14	6
7	Blue	Solenoid 7–a	14	7
8	Red	Solenoid 8–a	14	8
9	Black	Solenoid 9–a	14	9
10	Violet	Solenoid 10–a	14	10
11	Grey/Pink	Solenoid 11–a	14	11
12	Red/Blue	Solenoid 12–a	14	12
13	White/Green	Common-Ve		–
14	Brown/Green	Solenoid 1–b	12	1
15	White/Yellow	Solenoid 2–b	12	2
16	Yellow/Brown	Solenoid 3–b	12	3
17	White/Grey	Solenoid 4–b	12	4
18	Grey/Brown	Solenoid 5–b	12	5
19	White/Pink	Solenoid 6–b	12	6
20	Pink/Brown	Solenoid 7–b	12	7
21	White/Blue	Solenoid 8–b	12	8
22	Brown/Blue	Solenoid 9–b	12	9
23	White/Red	Solenoid 10–b	12	10
24	Brown/Red	Solenoid 11–b	12	11
25	White/Black	Solenoid 12–b	12	12

Note: Conforms to DIN 47100

D Sub-connector 44 pin 90° Left handed

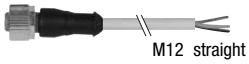
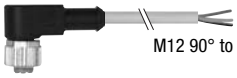
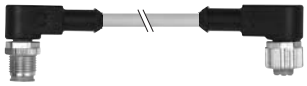




Model	A	Short code	kg
V12088-E01	1m	M4	0,280
V12088-E03	3m	M5	0,680
V12088-E05	5m	M6	1,080

Pin no.	Wire colour	Socket	Pilot	Station
1	White	Solenoid 1–a	14	1
2	Brown	Solenoid 2–a	14	2
3	Green	Solenoid 3–a	14	3
4	Yellow	Solenoid 4–a	14	4
5	Grey	Solenoid 5–a	14	5
6	Pink	Solenoid 6–a	14	6
7	Blue	Solenoid 7–a	14	7
8	Red	Solenoid 8–a	14	8
9	Black	Solenoid 9–a	14	9
10	Violet	Solenoid 10–a	14	10
11	Grey/Pink	Solenoid 11–a	14	11
12	Red/Blue	Solenoid 12–a	14	12
13	White/Green	Solenoid 13–a	14	13
14	Brown/Green	Solenoid 14–a	14	14
15	White/Yellow	Solenoid 15–a	14	15
16	Yellow/Brown	Solenoid 1–b	12	1
17	White/Grey	Solenoid 2–b	12	2
18	Grey/Brown	Solenoid 3–b	12	3
19	White/Pink	Solenoid 4–b	12	4
20	Pink/Brown	Solenoid 5–b	12	5
21	White/Blue	Solenoid 6–b	12	6
22	Brown/Blue	Solenoid 7–b	12	7
23	White/Red	Solenoid 8–b	12	8
24	Brown/Red	Solenoid 9–b	12	9
25	White/Black	Solenoid 10–b	12	10
26	Brown/Black	Solenoid 11–b	12	11
27	Grey/Green	Solenoid 12–b	12	12
28	Yellow/Grey	Solenoid 13–b	12	13
29	Pink/Green	Solenoid 14–b	12	14
30	Yellow/Pink	Solenoid 15–b	12	15
31	Green/Blue	Solenoid 16–a	14	16
32	Yellow/Blue	Solenoid 16–b	12	16
33	-	NOT USED	-	-
34	-	NOT USED	-	-
35	-	NOT USED	-	-
36	-	NOT USED	-	-
37	-	NOT USED	-	-
38	-	NOT USED	-	-
39	-	NOT USED	-	-
40	-	NOT USED	-	-
41	-	NOT USED	-	-
42	-	NOT USED	-	-
43	-	NOT USED	-	-
44	Red/Black Yellow/Black	Common -Ve	-	-

Fieldbus accessories

Symbol	Description	Connection	Cable length	Model	Short code
Fieldbus power connector					
	DeviceNet (4 pin, female) CANopen (4 pin, female) AB RIO (4 pin, female) Profibus-DP (4 pin, female) Interbus-S (4 pin, female)	M12	Wireable	V11588-E01	R1
Fieldbus power cables					
	M12 straight to open end	M12	1 m 2,5 m 5 m	FD676U84S74003 FD676U84S74006 FD676U84S7400B	C1 C2 C3
	M12 90° to open end	M12	1 m 2,5 m 5 m	FD676U84A74003 FD676U84A74006 FD676U84A7400B	C4 C5 C6
Interlock power connector					
	DeviceNet or CANopen (44 pin, female)	D-Sub	1 m 3 m 5 m	V11570-E01 V11570-E03 V11570-E05	M1 M2 M3
Communication cable and connector					
	Profibus straight	M12	0,3 m 1 m 2 m	FD677UP3SG3S11 FD677UP3SG3S13 FD677UP3SG3S15	A1 A2 A3
	DeviceNet/CANopen straight	M12	0,3 m 1 m 2 m	FD678UD5SH5S11 FD678UD5SH5S13 FD678UD5SH5S15	B1 B2 B3
	Profibus 90°	M12	0,3 m 1 m 2 m	FD677UP3AG3A11 FD677UP3AG3A13 FD677UP3AG3A15	A4 A5 A6
	DeviceNet/CANopen 90°	M12	0,3 m 1 m 2 m	FD678UD5AH5A11 FD678UD5AH5A13 FD678UD5AH5A15	B4 B5 B6
	DeviceNet (5 pin, female) CANopen (5 pin, female) AB RIO (5 pin, female)	M12	Wireable	V11589-E01	R2
	Profibus-DP, reverse keyway (5 pin, male)	M12	Wireable	V11590-E01	R3
	Profibus-DP, reverse keyway (5 pin female)	M12	Wireable	V11591-E01	R4
	Profibus-DP connector (9 pin, male with terminating resistor)	D-Sub IP40	Wireable	V11654-E01	R0
	Profibus - DP terminating resistor	M12	–	V11592-E01	R6
	AS-interface power or communications (4 pin)	M12	Wireable	VE1ASCN1-M1200	R5
	Interbus-S (9 pin)	D-Sub	1 m 3 m 5 m	VE2FBC9P-9S010 VE2FBC9P-9S030 VE2FBC9P-9S050	F21 F22 F23
	Interbus-S (9 pin, male)	D-Sub	Wireable	VE2FBC9P-00000	F24
	Interbus-S (9 pin, female)	D-Sub	Wireable	VE2FBC9S-00000	F25
	Interbus-S terminating connector (9 pin male)	D-Sub	–	V11340-E03	R9

Short codes for valve island specification

Model	Description	Manual override	Short code
VM103A11AB213B	2 x 3/2 - 2 x NC - Internal feed valve 3 mm PIF	Turn & lock	NA3T
VM103A11AB313B	2 x 3/2 - 2 x NC - Internal feed valve 3 mm PIF	Push only	NA3U
VM104A11AB213B	2 x 3/2 - 2 x NC - Internal feed valve 4 mm PIF	Turn & lock	NA4T
VM104A11AB313B	2 x 3/2 - 2 x NC - Internal feed valve 4 mm PIF	Push only	NA4U
VM106A11AB213B	2 x 3/2 - 2 x NC - Internal feed valve 6 mm PIF	Turn & lock	NA6T
VM106A11AB313B	2 x 3/2 - 2 x NC - Internal feed valve 6 mm PIF	Push only	NA6U
VM107A11AB213B	2 x 3/2 - 2 x NC - Internal feed valve no PIF	Turn & lock	NAZT
VM107A11AB313B	2 x 3/2 - 2 x NC - Internal feed valve no PIF	Push only	NAZU
VM103A22AB213B	2 x 3/2 - 2 x NC - External feed valve 3 mm PIF	Turn & lock	ND3T
VM103A22AB313B	2 x 3/2 - 2 x NC - External feed valve 3 mm PIF	Push only	ND3U
VM104A22AB213B	2 x 3/2 - 2 x NC - External feed valve 4 mm PIF	Turn & lock	ND4T
VM104A22AB313B	2 x 3/2 - 2 x NC - External feed valve 4 mm PIF	Push only	ND4U
VM106A22AB213B	2 x 3/2 - 2 x NC - External feed valve 6 mm PIF	Turn & lock	ND6T
VM106A22AB313B	2 x 3/2 - 2 x NC - External feed valve 6 mm PIF	Push only	ND6U
VM107A22AB213B	2 x 3/2 - 2 x NC - External feed valve no PIF	Turn & lock	NDZT
VM107A22AB313B	2 x 3/2 - 2 x NC - External feed valve no PIF	Push only	NDZU
VM103B11AB213B	2 x 3/2 - 2 x NO - Internal feed valve 3 mm PIF	Turn & lock	NB3T
VM103B11AB313B	2 x 3/2 - 2 x NO - Internal feed valve 3 mm PIF	Push only	NB3U
VM104B11AB213B	2 x 3/2 - 2 x NO - Internal feed valve 4 mm PIF	Turn & lock	NB4T
VM104B11AB313B	2 x 3/2 - 2 x NO - Internal feed valve 4 mm PIF	Push only	NB4U
VM106B11AB213B	2 x 3/2 - 2 x NO - Internal feed valve 6 mm PIF	Turn & lock	NB6T
VM106B11AB313B	2 x 3/2 - 2 x NO - Internal feed valve 6 mm PIF	Push only	NB6U
VM107B11AB213B	2 x 3/2 - 2 x NO - Internal feed valve no PIF	Turn & lock	NBZT
VM107B11AB313B	2 x 3/2 - 2 x NO - Internal feed valve no PIF	Push only	NBZU
VM103B22AB213B	2 x 3/2 - 2 x NO - External feed valve 3 mm PIF	Turn & lock	NE3T
VM103B22AB313B	2 x 3/2 - 2 x NO - External feed valve 3 mm PIF	Push only	NE3U
VM104B22AB213B	2 x 3/2 - 2 x NO - External feed valve 4 mm PIF	Turn & lock	NE4T
VM104B22AB313B	2 x 3/2 - 2 x NO - External feed valve 4 mm PIF	Push only	NE4U
VM106B22AB213B	2 x 3/2 - 2 x NO - External feed valve 6 mm PIF	Turn & lock	NE6T
VM106B22AB313B	2 x 3/2 - 2 x NO - External feed valve 6 mm PIF	Push only	NE6U
VM107B22AB213B	2 x 3/2 - 2 x NO - External feed valve no PIF	Turn & lock	NEZT
VM107B22AB313B	2 x 3/2 - 2 x NO - External feed valve no PIF	Push only	NEZU
VM103C11AB213B	2 x 3/2 - 1 x NC + 1 x NO - Internal feed valve 3 mm PIF	Turn & lock	NC3T
VM103C11AB313B	2 x 3/2 - 1 x NC + 1 x NO - Internal feed valve 3 mm PIF	Push only	NC3U
VM104C11AB213B	2 x 3/2 - 1 x NC + 1 x NO - Internal feed valve 4 mm PIF	Turn & lock	NC4T
VM104C11AB313B	2 x 3/2 - 1 x NC + 1 x NO - Internal feed valve 4 mm PIF	Push only	NC4U
VM106C11AB213B	2 x 3/2 - 1 x NC + 1 x NO - Internal feed valve 6 mm PIF	Turn & lock	NC6T
VM106C11AB313B	2 x 3/2 - 1 x NC + 1 x NO - Internal feed valve 6 mm PIF	Push only	NC6U
VM107C11AB213B	2 x 3/2 - 1 x NC + 1 x NO - Internal feed valve no PIF	Turn & lock	NCZT
VM107C11AB313B	2 x 3/2 - 1 x NC + 1 x NO - Internal feed valve no PIF	Push only	NCZU
VM103C22AB213B	2 x 3/2 - 1 x NC + 1 x NO - External feed valve 3 mm PIF	Turn & lock	NF3T
VM103C22AB313B	2 x 3/2 - 1 x NC + 1 x NO - External feed valve 3 mm PIF	Push only	NF3U
VM104C22AB213B	2 x 3/2 - 1 x NC + 1 x NO - External feed valve 4 mm PIF	Turn & lock	NF4T
VM104C22AB313B	2 x 3/2 - 1 x NC + 1 x NO - External feed valve 4 mm PIF	Push only	NF4U
VM106C22AB213B	2 x 3/2 - 1 x NC + 1 x NO - External feed valve 6 mm PIF	Turn & lock	NF6T
VM106C22AB313B	2 x 3/2 - 1 x NC + 1 x NO - External feed valve 6 mm PIF	Push only	NF6U
VM107C22AB213B	2 x 3/2 - 1 x NC + 1 x NO - External feed valve no PIF	Turn & lock	NFZT
VM107C22AB313B	2 x 3/2 - 1 x NC + 1 x NO - External feed valve no PIF	Push only	NFZU
VM103517AB213B	5/2 Solenoid Spring - Internal feed valve 3mm PIF	Turn & lock	NG3T
VM103517AB313B	5/2 Solenoid Spring - Internal feed valve 3mm PIF	Push only	NG3U
VM104517AB213B	5/2 Solenoid Spring - Internal feed valve 4mm PIF	Turn & lock	NG4T
VM104517AB313B	5/2 Solenoid Spring - Internal feed valve 4mm PIF	Push only	NG4U
VM106517AB213B	5/2 Solenoid Spring - Internal feed valve 6mm PIF	Turn & lock	NG6T
VM106517AB313B	5/2 Solenoid Spring - Internal feed valve 6mm PIF	Push only	NG6U
VM107517AB213B	5/2 Solenoid Spring - Internal feed valve No PIF	Turn & lock	NGZT
VM107517AB313B	5/2 Solenoid Spring - Internal feed valve No PIF	Push only	NGZU
VM103527AB213B	5/2 Solenoid Spring - External feed valve 3mm PIF	Turn & lock	NH3T
VM103527AB313B	5/2 Solenoid Spring - External feed valve 3mm PIF	Push only	NH3U
VM104527AB213B	5/2 Solenoid Spring - External feed valve 4mm PIF	Turn & lock	NH4T
VM104527AB313B	5/2 Solenoid Spring - External feed valve 4mm PIF	Push only	NH4U
VM106527AB213B	5/2 Solenoid Spring - External feed valve 6mm PIF	Turn & lock	NH6T
VM106527AB313B	5/2 Solenoid Spring - External feed valve 6mm PIF	Push only	NH6U
VM107527AB213B	5/2 Solenoid Spring - External feed valve No PIF	Turn & lock	NHZT
VM107527AB313B	5/2 Solenoid Spring - External feed valve No PIF	Push only	NHZU

Short codes for valve island specification

Model	Description	Manual override	Short code
VM103511AB213B	5/2 Solenoid Solenoid - Internal feed valve 3 mm PIF	Turn & lock	NJ3T
VM103511AB313B	5/2 Solenoid Solenoid - Internal feed valve 3 mm PIF	Push only	NJ3U
VM104511AB213B	5/2 Solenoid Solenoid - Internal feed valve 4 mm PIF	Turn & lock	NJ4T
VM104511AB313B	5/2 Solenoid Solenoid - Internal feed valve 4 mm PIF	Push only	NJ4U
VM106511AB213B	5/2 Solenoid Solenoid - Internal feed valve 6 mm PIF	Turn & lock	NJ6T
VM106511AB313B	5/2 Solenoid Solenoid - Internal feed valve 6 mm PIF	Push only	NJ6U
VM107511AB213B	5/2 Solenoid Solenoid - Internal feed valve No PIF	Turn & lock	NJZT
VM107511AB313B	5/2 Solenoid Solenoid - Internal feed valve No PIF	Push only	NJZU
VM103522AB213B	5/2 Solenoid Solenoid - External feed valve 3 mm PIF	Turn & lock	NK3T
VM103522AB313B	5/2 Solenoid Solenoid - External feed valve 3 mm PIF	Push only	NK3U
VM104522AB213B	5/2 Solenoid Solenoid - External feed valve 4 mm PIF	Turn & lock	NK4T
VM104522AB313B	5/2 Solenoid Solenoid - External feed valve 4 mm PIF	Push only	NK4U
VM106522AB213B	5/2 Solenoid Solenoid - External feed valve 6 mm PIF	Turn & lock	NK6T
VM106522AB313B	5/2 Solenoid Solenoid - External feed valve 6 mm PIF	Push only	NK6U
VM107522AB213B	5/2 Solenoid Solenoid - External feed valve No PIF	Turn & lock	NKZT
VM107522AB313B	5/2 Solenoid Solenoid - External feed valve No PIF	Push only	NKZU
VM103611AB213B	5/3 APB Solenoid Solenoid - Internal feed valve 3 mm PIF	Turn & lock	NL3T
VM103611AB313B	5/3 APB Solenoid Solenoid - Internal feed valve 3 mm PIF	Push only	NL3U
VM104611AB213B	5/3 APB Solenoid Solenoid - Internal feed valve 4 mm PIF	Turn & lock	NL4T
VM104611AB313B	5/3 APB Solenoid Solenoid - Internal feed valve 4 mm PIF	Push only	NL4U
VM106611AB213B	5/3 APB Solenoid Solenoid - Internal feed valve 6 mm PIF	Turn & lock	NL6T
VM106611AB313B	5/3 APB Solenoid Solenoid - Internal feed valve 6 mm PIF	Push only	NL6U
VM107611AB213B	5/3 APB Solenoid Solenoid - Internal feed valve No PIF	Turn & lock	NLZT
VM107611AB313B	5/3 APB Solenoid Solenoid - Internal feed valve No PIF	Push only	NLZU
VM103622AB213B	5/3 APB Solenoid Solenoid - External feed valve 3 mm PIF	Turn & lock	NM3T
VM103622AB313B	5/3 APB Solenoid Solenoid - External feed valve 3 mm PIF	Push only	NM3U
VM104622AB213B	5/3 APB Solenoid Solenoid - External feed valve 4 mm PIF	Turn & lock	NM4T
VM104622AB313B	5/3 APB Solenoid Solenoid - External feed valve 4 mm PIF	Push only	NM4U
VM106622AB213B	5/3 APB Solenoid Solenoid - External feed valve 6 mm PIF	Turn & lock	NM6T
VM106622AB313B	5/3 APB Solenoid Solenoid - External feed valve 6 mm PIF	Push only	NM6U
VM107622AB213B	5/3 APB Solenoid Solenoid - External feed valve No PIF	Turn & lock	NMZT
VM107622AB313B	5/3 APB Solenoid Solenoid - External feed valve No PIF	Push only	NMZU

End plates

Model	Description		Short code
VM106517AQ010Y	End plate kit - feed both ends	10 mm	F100
VM106517AQ0108	End plate kit - feed both ends	8 mm	F800
VM106517AQ011Y	End plate kit - feed left, right blocked	10 mm	L100
VM106517AQ0118	End plate kit - feed left, right blocked	8 mm	L800
VM106517AQ012Y	End plate kit - feed right, left blocked	10 mm	R100
VM106517AQ0128	End plate kit - feed right, left blocked	8 mm	R800
VM106517AQ0131	End plate kit - feed both ends	no PIF	FP00
VM106517AQ0132	End plate kit - feed left, right blocked	no PIF	RP00
VM106517AQ0133	End plate kit - feed right, left blocked	no PIF	LP00

Valve island specification

Valve island specification form VIP/ .....

Company name . . . . . Contact name . . . . .

Address . . . . . Tel no . . . . .

. . . . . Fax no . . . . .

. . . . . E-mail . . . . .

Using the short order codes provided complete the build model below.

One valve island per sheet only

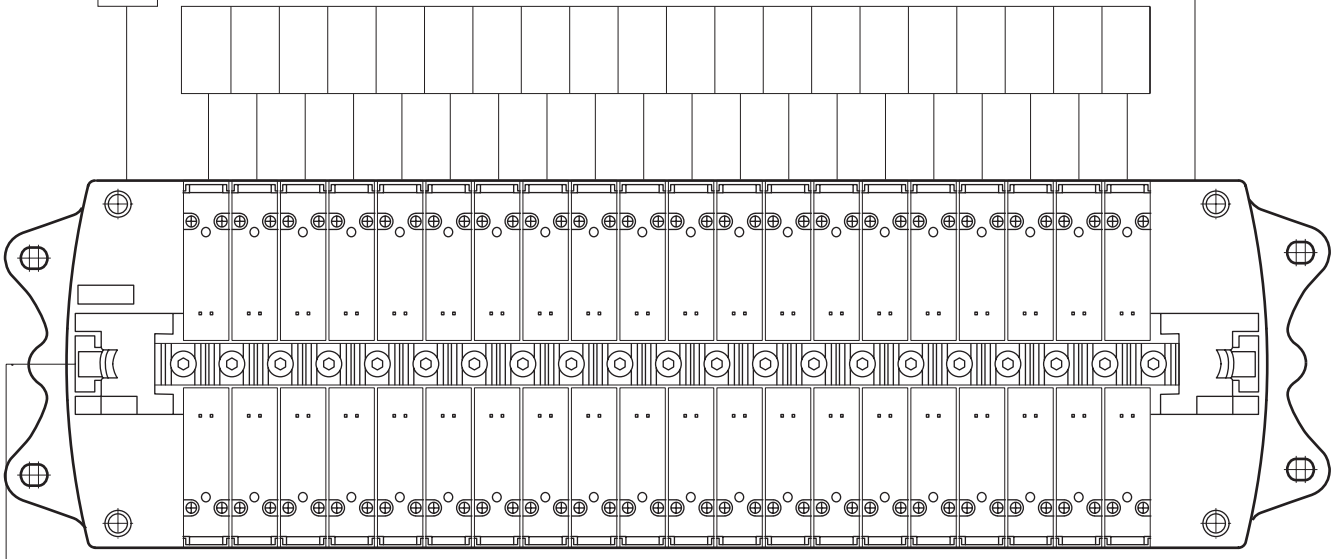
Unit ID No. . . . . . Norgren to specify

No. of units required ☐

Valve range:VM10

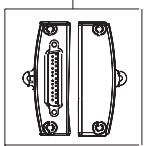
End plate code ☐

Valve codes

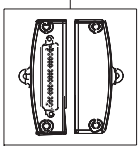


Connection options - select one only

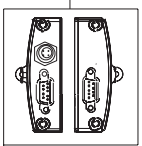
Individually wired 2 to 20 stations ☐



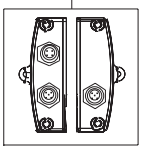
25 pin IP65 D-sub connector 4, 6, 8, 10 & 12 stations ☐



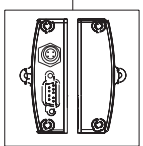
44 pin IP65 D-sub connector 10, 12 & 16 stations ☐



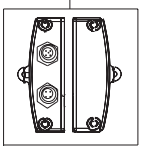
Interbus-S 8, 10, 12 & 16 stations ☐



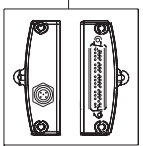
Profibus – DP 8, 10, 12 & 16 stations M12 (IP65) ☐



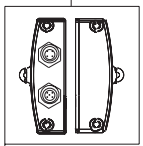
Profibus – DP 9 pin (IP40) ☐



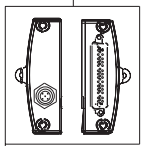
DeviceNet 8, 10, 12 & 16 stations ☐



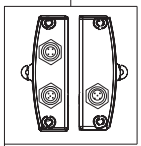
DeviceNet with interlocks 8, 10, 12 & 16 stations ☐



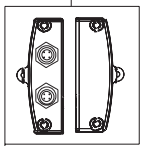
CANopen 8, 10, 12 & 16 stations ☐



CANopen with interlocks 8, 10, 12 & 16 stations ☐



AB RIO 8, 10, 12 & 16 stations ☐



AS interface 4, 6 & 8 stations ☐

Accessories

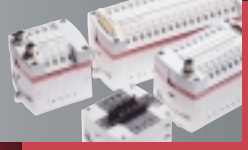
Short code	Qty per island

Power supply options Select one only

Standard: 24 V d.c. negative common (Multipole & Fieldbus) ☐

Multipole 24 V d.c. positive common ☐

NORGREN



Product Documentation

VM10 Fieldbus

Issue 3
November 2002

Contents

1. System overview

VM10 is a modular pneumatic valve island incorporating 10.5 mm wide valves with Integrated multipole or Fieldbus interface.

The system comprises a bank of pneumatic valves which are fitted with endplates to provide pneumatic connections to line and exhaust.

A top enclosure provides connections to multipole or Fieldbus versions together with LED indication of valve operation and position. Manual overrides are also provided on the top cover as are label points.

Each valve has push-in-fitting connectors integrated into the lower face with connections to ports 2 and 4 (or 2 x 2 for double 3/2 valves).

DIN rail mounting clips can be fitted to the rear face of the valve island to allow mounting with free access to pneumatic ports. Panel mounting is also possible using the M4 inserts provided in the base.

The valve islands can be configured to incorporate any combination of 5/2 sol/sol, 5/2 sol/spring , 2 x 3/2 NC and NO or 5/3 COP , COE or APB valves.

Multi-pressure operation is also possible.

Versions available are:

Multipole 25 way connector	4 , 6 , 8 , 10 & 12 stations.
Multipole 44 way connector	10 , 12 & 16 stations.
Fieldbus	8 , 10 , 12 & 16 stations.
AS-interface	4, 6, & 8 stations.
Norgren Bus	4, 6, 8, 10,12 & 16 stations

The VM10 valve islands when fully assembled have an IP65 protection rating.

Specifications

BSEN 50081-1 : 1992 and BSEN 61000-6-2 : 1999

2. Compliance

All Profibus-DP components are compliant with the Profibus-DP specification IEC61158 type 3 and IEC61158.

All Interbus-S components are compliant with the Interbus-S specification DIN 19258.

All DeviceNet components are compliant with the DeviceNet specification Vol. 2.0 A-15

All CANopen components are compliant with the CANopen communication profile CiA DS-301 V4.01.

All AS-interface components are compliant with the AS-interface specification IEC 62026/6 and EN 50295

All Norgren electronic products are tested to the vibration standard BSEN60068-2-6. All electronic components are compliant with the EMC Directive 89/336/EEC, test references: BSEN50081-1:1992 and BSEN61000-6-2:1999.

3. Power and EMC precautions

All Norgren VM10 products are designed to be used with a Safety Extra Low Voltage Supply so that a protective earth is not required. A Safety Extra Low Voltage supply is designed so that the primary and secondary supplies are isolated by typically 3KV. This means that an earth connection for safety reasons is not required because the supply voltage is restricted to a maximum of 42.2 volts even under fault conditions.

The Earth, however, must be connected. It is not a protective earth, but is required to provide EMC shielding.

Electrostatic precautions must be taken whilst handling component parts of the valve island. This means that whilst assembling or reconfiguring a valve island the assembler must be connected to earth by means of a special electrostatic earth strap.

Once the valve island is fully assembled it is protected from electrostatic discharge.

Power must be removed from the system while assembling and dis-assembling the component parts or connecting Fieldbus or power cables.

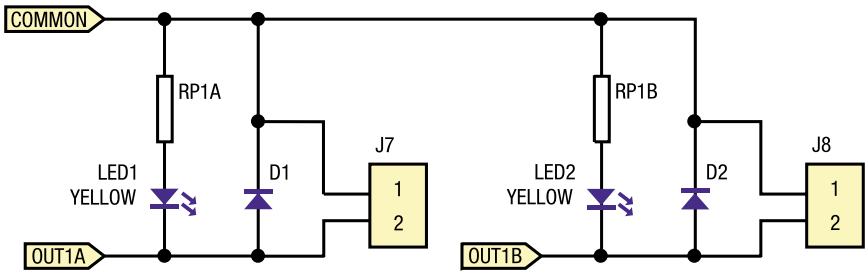
4. Multipole operation

Multipole versions of VM10 are intended for direct connection to a control system output device.

The VM10 multipole valve island is provided with a "D" connector with individual pins for solenoid operation and supply common.

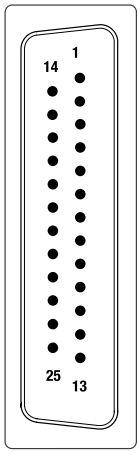
Common positive and negative versions are available.

Outputs are polarity protected and incorporate LED indicators and diode noise suppression.

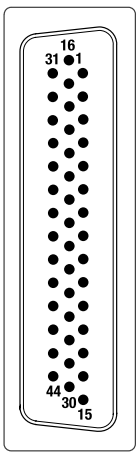


Station number	Valve/Sol	Signal Pins 25	44	12 Valve/Sol	Signal Pins 25	44
1	14	1	1	12	14	16
2	14	2	2	12	15	17
3	14	3	3	12	16	18
4	14	4	4	12	17	19
5	14	5	5	12	18	20
6	14	6	6	12	19	21
7	14	7	7	12	20	22
8	14	8	8	12	21	23
9	14	9	9	12	22	24
10	14	10	10	12	23	25
11	14	11	11	12	24	26
12	14	12	12	12	25	27
13	14	N/C	13	12	N/C	28
14	14	N/C	14	12	N/C	29
15	14	N/C	15	12	N/C	30
16	14	N/C	31	12	N/C	32
				Common	13	44

Looking into node connector
25 Pin connector - Male



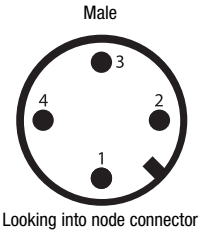
Looking into node connector
44 Pin connector - Male



5. Valve power connection

An M12 four pin connector provides the user with an IP65 rated connection point for both the valve and logic circuit power supply.

Pin No:	Function	Tolerance	Maximum Current
1	24 VB Logic Circuit Supply	+/-30%	300mA
2	24 VA Valves	+/-10%	1.5A
3	0 Volts	-	1.53A
4	Earth	-	-



Looking into node connector

Two 24 Volt power input lines allow power to the solenoids within the valve island to be isolated in case of emergency, whilst still leaving the logic circuits of the valve island active thus still maintaining communication with the host controller.

Both DeviceNet and CANopen VM10 Nodes do not use pin 1 of the M12 power connector this is due to the power for the logic circuit being drawn from the network connection.

6. Basic Fieldbus operation

The following Fieldbus versions of VM10 are available.

Profibus-DP

DeviceNet

Interbus-S

AS-interface

CANopen

AB RIO

Norgren FBII serial wireway

The VM10 top enclosure incorporates the Fieldbus interface together with appropriate connectors and indicator LEDs. Each solenoid has its own associated yellow LED within the Valve Island.

Each valve is mapped onto the controller outputs directly or by the use of electronic data files supplied with the VM10 valve island.

7. Profibus-DP specification

Norgren Profibus-DP Fieldbus systems conform to IEC 61158 type 3 and IEC61158.

Communication System: 2 wire RS485 hardware communication protocol Transmission Speed: 9.6 Kbits/s to 12 Mbits/s. Automatic detection.

Maximum Nodes Per Network: 126

Total Number Of I/O Per Network: 32256

Bus Topology: Line

Wiring specification

The bus line is specified in EN 50170 as line type A. It can be used as shown in thefollowing table. The table gives the bus parameters and line lengths of A and B for comparison, however it is recommended that only type A lines are used due to their expanded length.

Line parameters:

Parameter	Line A	Line B (avoid if possible)
Impedance In Ohms	135 to 165	100 to 130
Capacitance per unit length (pF/m)	< 30	< 60
Loop resistance (ohms/km)	110	---
Core Diameter (mm)	0.64	>0.53
Core cross section (mm2)	>0.34	>0.22

Line Lengths:

Transmission Rate (kbit/sec)	9.6	19.2	93.75	187.5	500	1500	12000
Line A	1200	1200	1200	1000	400	200	100
Line B	1200	1200	1200	600	200	-	-

Calculating Possible Line Lengths:

The maximum admissible distance between two bus stations in each PROFIBUS network can be calculated as follows:

(NO_REP + 1) * Segment length

NO_REP= The maximum number of repeaters connected in series (depends on repeater type).

Example: The repeater manufacturer's specifications allow nine repeaters to be connected in series.

The maximum distance between two bus stations at a data transfer rate of 1500 kbit/s is then as follows:

(9 + 1) * 200 m = 2000 m

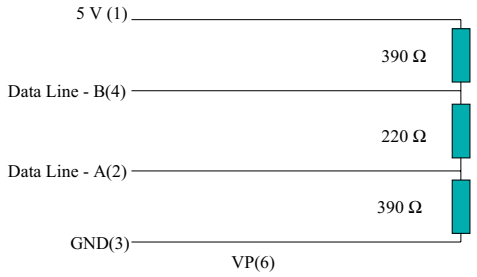
Cable Suppliers:

Name	Supplier	Part number
Unitonic-Bus L2	Lapp	2170221T
Unitonic-Bus	Lapp	217022T
L2 Bus Cable	Siemens	6XV1830-0AH10

Wiring termination

The active bus termination using a resistor combination avoids signal reflections during data transfer and ensures a defined zero-signal voltage on the data lines when none of the stations on the bus are active. Active termination must be provided at the beginning and end of each RS485 bus segment.

If the bus termination is missing, this can cause errors during data transfer. Problems can also arise if too many bus terminators are fitted since each bus terminator also represents an electrical load and reduces the signal levels and thus the signal-to-noise ratio. Too many or missing bus terminators can also cause intermittent data transfer errors, particularly if the bus segment is operated close to the specified limits for maximum numbers of stations, maximum bus segment length and maximum data transfer rate.



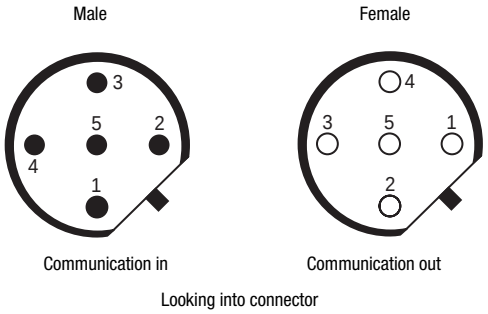
Line termination of wire A in acc. With EN 50 170

The power required by the active bus termination is usually obtained through the bus connector from stations connected to the bus. Alternative measures must be taken if there is no guarantee that the power required by the bus termination is permanently provided while the bus is operating. For example, in a particular installation the station providing the power to the bus termination may need to be repeatedly switched off or removed from the bus for operational reasons. In such cases, the bus termination should use an external power supply or a repeater should be used for bus termination instead.

Connections to the Norgren Profibus Node

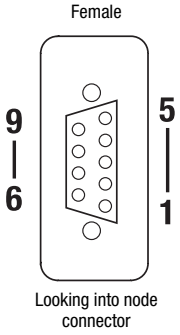
M12 connector version

Pin Number	Function
1	5VI Opto Isolated
2	A-Line (Green)
3	0VI Opto Isolated
4	B-Line (Red)
5	Shield
Threaded Joint	Shield



D'type connector version

Pin Number	Function
1	Shield
2	N/C
3	B-line (Red) RxD / TxD-P
4	CNTR-P (RTS)
5	DGND (0VI) opto Isolated
6	VP (5VI) opto Isolated
7	N/C
8	A (Green) RxD / TxD-N
9	CNTR-N (direction control)



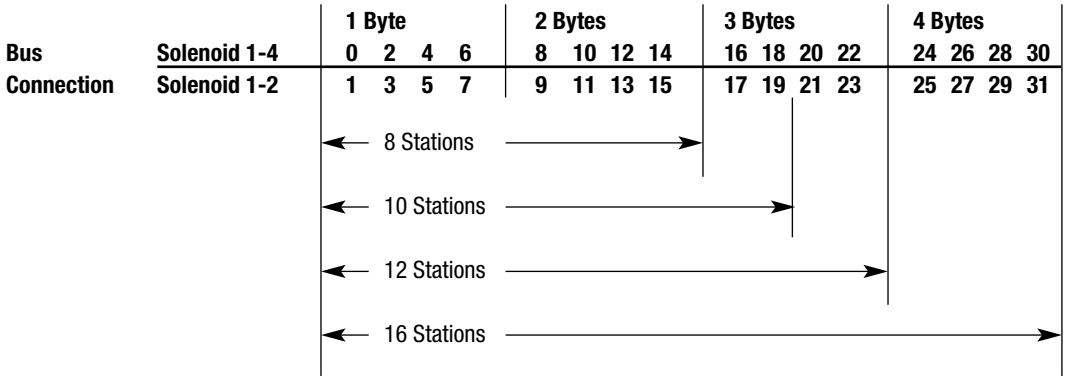
Address and Baud rate setting

The Norgren Profibus-DP VM10 valve island address can be set within the range 0 to 126 using a master controller with the capacity to change slave addresses or with a hand-held or PC based configuration device.

The VM10 valve island is connected to the master and the default address changed to the address required .

The baud rate can be 9.6, 19.2, 45.45, 93.75, 187.5, 500, 1500 or 12,000 kbits/sec and is detected automatically.

Address of each valve output



Default node address – 125

Indicators

24V (Green) – This LED will only be energised when 24 volts is applied to the valve power terminal of the power supply connector.

5V (Green) – This LED will only be energised when a 24 volt supply is applied to the electronic supply terminal of the power supply connector, indicating that the logic circuit of the module is powered.

Status (Green) – This LED indicates the operating status of the device.

Data Exchange (Green) – This LED indicates the status of the network traffic, indicating when network packages are received.

5VI (Green) – This LED indicates the power status of the opto-isolated side of the Profibus phyical layer.

Indicator Status During Powering Up and Commissioning

Condition	24V	5V	Data Exchange	5VI	Status
Power Up	On	On	Off	On	Flickering
Changing of Address During Commissioning	On	On	Off	On	On
Device In a Stopped State	On	On	Off	On	Flickering
Device In an Operation state	On	On	On	On	On

Commissioning

Due to the increasing number of compatible master controllers it would be impractical to create detailed instructions for commissioning the Norgren node on a particular master. All Norgren Profibus products are conformance tested to the latest specification by an independent authorized test site and are fully certified by the Profibus International Group. Because of this we feel that the help guide and manual supplied with the users chosen PLC should be used during the commissioning stages of each Norgren node.

GSD File

A GSD file is used to identify a PROFIBUS-DP/PA device. (Master or Slave). It contains data making it possible to have manufacturer independent configuration tools. Typical information in a GSD file is Vendor information, Baudrates supported, Timing information, Options/features supported and Available i/o signals. A GSD file must be available for every DP/PA slave. This is installed into the PLC configuration software loaded into the products catalogue, in the additional field devices section.

Other Related Documents

Profibus Group: Profibus-DP/FMS Installation Guideline Order Number 2.112

Related Web Sites

www.profibus.com	Profibus Worldwide Organisation
www.profibus.co.uk	Profibus Europe Organisation
www.ad.siemens.de	Siemens Automation and Drive

DeviceNet

8. DeviceNet Specification

Norgren DeviceNet systems conform to DeviceNet Volume 1 Release 2 and the Pneumatic Valve Device Profile.

Communication System: 2 wire CAN hardware communication protocol

Number Of Nodes Per Network: 64

Bus Topology: Line with drops.

Line Parameters

Wiring specification

Parameter	Thick Cable	Thin Cable
Impedance In Ohms	120 +/- 10%	120 +/- 10%
Capacitance per unit length (pF/f)	12	12
Jacket Marking	Vendor Name & Part #.	Vendor Name & Part #.
Core Diameter (mm)	#18 Copper 19 Strands	#24 Copper 19 Strands
Outside Diameter	0.410 - 0.490 inches round	0.240 - 0.280 inches round

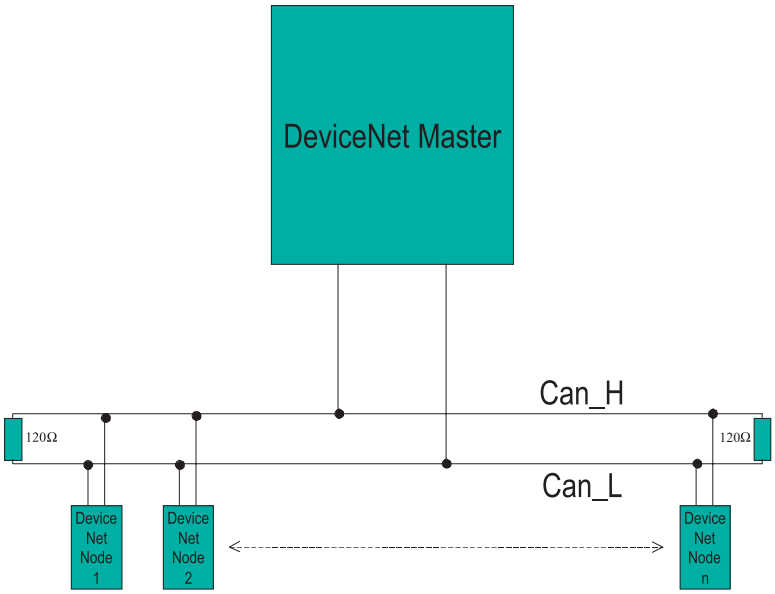
Suppliers:

Belden Trunk Cable	Type 3082A, 3083A	Supplier	Belden
Belden Drop Cable	Type 3084A, 3085A	Supplier	Belden
Trunk & Accessories		Supplier	Molex
Trunk & Accessories		Supplier	Brad Harrison

Line Lengths:

Baud Rate (in kB)	Trunk Cable Length (max.)
125	500m
250	250m
500	100m

Wiring termination

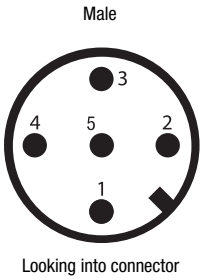


Cable termination is required at both extreme ends of the trunk cable. This can be done simply with a 120Ω resistor between the communication lines or by using purpose designed terminators that fit onto the tee-adapter

Connector details

M12 connector

Pin Number	Function
1	Drain
2	V+
3	V-
4	CAN_H
5	CAN_L



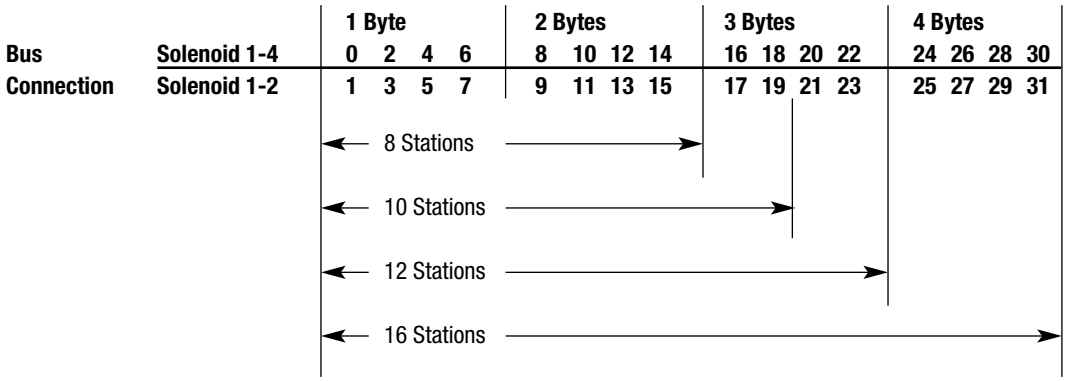
Looking into connector

Address and baud rate setting

The Norgren VM10 DeviceNet valve island address can be set within the range 0 to 63 using configuration software such as Rockwell RSNetworx and suitable hardware for connection to the DeviceNet bus or by the use of a separate master simulator with the capacity to change address.The VM10 valve island is connected to the bus and the default address changed to the address required .

125 , 250 & 500 Kb/sec baud rates are supported by the VM10 DeviceNet valve island and are detected automatically.

Address of each valve output



Default node address – 63

Indicators

24V (Green) – This LED will only be energised when 24 volts is applied to the valve power terminal of the power supply connector.

5V (Green) – This LED will only be energised when the Network power is connected to the Network connector, indicating that the logic circuit of the module is powered.

Module Status (Red/Green) – This LED indicates the device and whether it is operational or working correctly

Network Status (Red/Green) – This LED indicates the status of the CAN communication link.

Indicator Status During Powering Up and Commissioning

Condition	24V	5V	Module Status	Network Status
Power Up	On	On	Single Flash	Single Flash Green/Red
Auto Baud Rate Detection Active	On	On	Green	Off
Changing of Address During Commissioning	On	On	Green	Green
Device In a Pre-operation State	On	On	Green	Flashing Green
Device In an Operation state	On	On	Green	Green
Connection Time Out	On	On	Green	Flashing Red
Failed Communication	On	On	Green	Red
Un-recoverable Fault	On	On	Red	Dependant

Commissioning

The electronic data sheet (EDS) library is a collection of EDS files that can be registered with RSNetWorx for Allen Bradley PLC's and Compbus/D configurator for Omron PLC's.

The EDS files, which are provided by Norgren and other manufacturers, contain configuration and identification information for the devices. RSNetWorx for DeviceNet software can access only those devices that have been registered. You must use the EDS Wizard within RS Networx for registering EDS files for unknown devices, or if you have updated EDS files to install. To install a new EDS file to your PLC please refer to the PLC manufacturers instruction manual or online help.

Although you receive a large number of electronic data sheet (EDS) files with the configuration software for DeviceNet, there may be a time when you need to acquire other manufactures EDS files from the ODVA www.odva.org (Open DeviceNet Vendor's Association) web site.

DeviceNet node commissioning tool (RS Networx Only)

The DeviceNet node commissioning tool lets you commission, that is, set the node address and the data rate parameters of, devices that are either connected to a DeviceNet network, or via a point-to-point connection.

Commissioning devices on a DeviceNet network

Before you can add any node to a live DeviceNet network, it must be commissioned. This means that a node address and a data rate must be programmed into the device. All Norgren VM10 nodes are preset with a node address, which is usually set to 63, unless other wise stated by the user in the valve island configurator. baud. These default preset values will need to be changed to meet your application needs. Once a device has been commissioned and attached to a network, you can use the RSNetWorx for DeviceNet node commissioning tool to edit the node address that was set previously. Some devices do not permit software setting of the node address or data rate. Refer to the device documentation for specific information.

For example, if two of the devices on your network are a photoelectric sensor and a hand controller and you accidentally change the node address of the hand controller to be the same as that of the photoelectric sensor, then the hand controller will no longer have a unique address, which means that it will not be able to communicate on the network. If you cannot access a device, because you have used its node address for another device, you will have to remove it from the network, recommission it, then reinstall it on the network.

Other Related Documents

Rockwell Automation:	RS Networx; Getting Results
Allen-Bradley:	DeviceNet Cable System Planning and Installation Manual
Allen-Bradley:	SLC 500 Addressing Reference Manual

Related Web Sites

www.odva.org	Open DeviceNet Vendors Association
www.rockwellautomation.com	Rockwell Automation
www.ab.com	Allen-Bradley

CANopen

9. CANopen Specification

Norgren CANopen systems conform to CANopen communication profile CiA DS-301 V4.0

Communication System: 2 wire CAN hardware communication protocol Number of Nodes per Network: Master + 63 slaves

Bus Topology: Line with drops.

CANopen Wiring Specification

Line Parameters:

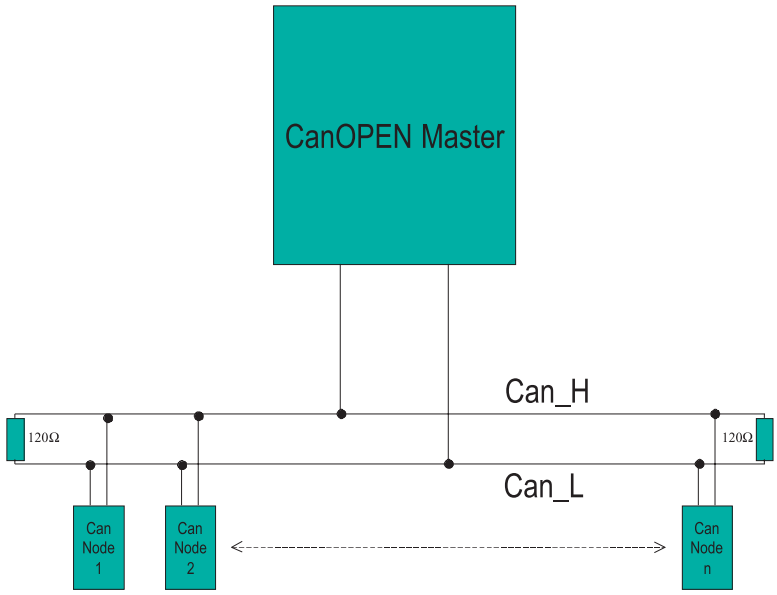
Parameter	Thick Cable	Thin Cable
Impedance In Ohms	120 +/- 10%	120 +/- 10%
Capacitance per unit length (pF/f)	12	12
Jacket Marking	Vendor Name & Part #.	Vendor Name & Part #.
Core Diameter (mm)	#18 Copper 19 Strands	#24 Copper 19 Strands
Outside Diameter	0.410 - 0.490 inches round	0.240 - 0.280 inches round

Suppliers

Belden Trunk Cable	Type 3082A, 3083A	Supplier	Belden
Belden Drop Cable	Type 3084A, 3085A	Supplier	Belden
Trunk & Accessories		Supplier	Molex
Trunk & Accessories		Supplier	Brad Harrison

Line Lengths

Baud Rate (in kB)	Trunk Cable Length (max.)
10	5000m
20	2500m
50	1000m
125	500m
250	250m
500	100m
800	50m
1000	25m



Line Termination In Accordance With ISO 11898

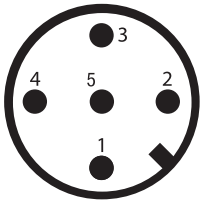
Cable termination is required at both extreme ends of the trunk cable. This can be done simply with a 120Ω resistor between the communication lines or by using purpose designed terminators that fit onto the tee-adapters.

CanOPEN Connections

M12 connector

Pin Number	Function
1	Drain
2	V+
3	V-
4	CAN_H
5	CAN_L

Male



Looking into node connector

Address and baud rate setting

Changing the address of the node:

Using a CANopen configuration tool connected to the network the address of each node maybe changed by the following method:

Send an SDO Telegram command to the node at SDO index 2100h containing the new node address, valid range 1-127. View example of SDO message below

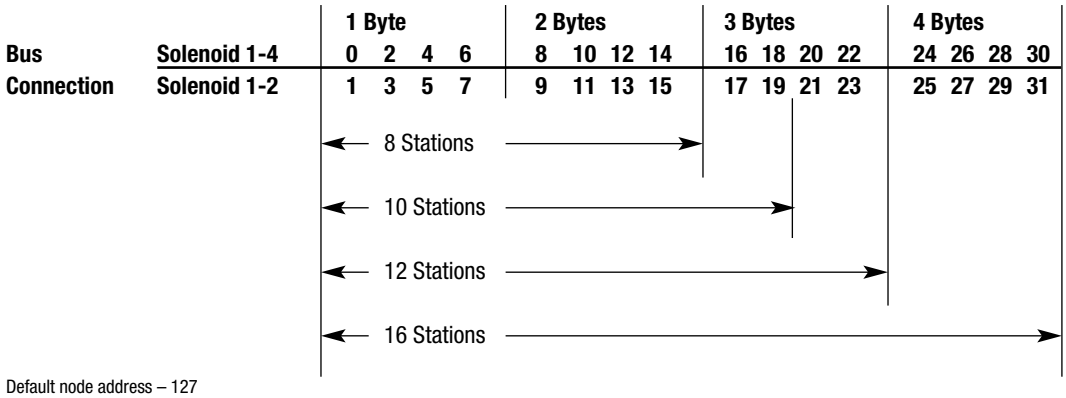
Description	SDO Index	Sub Index	Value
EEPROM Node Address	2100h	0	1-127

The Norgren CANopen node also supports the layer setting service (LSS). The following configuration services are avalible

Service	COB-ID	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
Switch Mode Global	2021h	CS=04	Mode			Reserved			
Configure Node ID	2021h	CS=17	Address			Reserved			
Configure Bit Timing	2021h	CS=19	Table Selector	Table Index			Reserved		
Activate Bit Timing	2021h	CS=21	Switch Delay				Reserved		
Store Configuration	2021h	CS=23			Reserved				

The following baud rates are supported by the VM10 CANopen node 10, 20, 50, 125, 250, 500, 800, 1000 kbits/sec and are detected automatically.

Address of each valve output



Default node address – 127

Indicators

24V (Green) – This LED will only be energised when 24 volts is applied to the valve power terminal of the power supply connector.

5V (Green) – This LED will only be energised when the Network power is connected to the Network connector, indicating that the logic circuit of the module is powered.

Error LED (Red) – This LED indicates the status of the CAN physical and indicates errors due to missing CAN messages (SYNC,GUARD or HEARTBEAT).

Run LED (Red/Green) – This LED indicates the status of the CANopen network state machine.

Indicator Status During Powering Up and Commissioning

Condition	24V	5V	Error LED	Run LED
Power Up	On	On	Single Flash	Single Flash Green / Red
Auto Baud Rate Detection Active	On	On	Flickering	Flickering Green
Changing of Address During Commissioning	On	On	Flickering	Flickering Green
Device In a Pre-operation State	On	On	Off	Blinking Green
Device In a Stopped State	On	On	Off	Single Flash Green
Device In an Operation state	On	On	Off	On Green

Indicator Status During CAN message Errors

Condition	24V	5V	Error LED	Run LED
Too Many Error Frames Received	On	On	Single Flash	Dependent on Device State
Heatbeat Event Has Occurred	On	On	Double Flash	Dependent on Device State
A Sync Message Has Not Been Received	On	On	Triple Flash	Dependent on Device State
Bus Off	On	On	On	Dependent on Device State

Commissioning

Due to the increasing number of compatible CANopen master controllers it would be impractical to create detailed instructions for commissioning the Norgren node on a particular master. All Norgren CANopen products are conformance tested to the latest specification by an independent authorised test site and are fully certified by the CIA. Because of this, the help guide and manual supplied with the users chosen PLC should be used during the commissioning stages of each Norgren node.

Other Related Documents

CIA:	CIA DS 301-V4.01	CANopen Application Layer and Communication Layer
CIA:	CIA DR 303-V1.1	CANopen Cabling and Connector Pin Assignment
CIA:	CIA DR 305-V1.0	CANopen Layer Setting Services and Protocol (LSS)

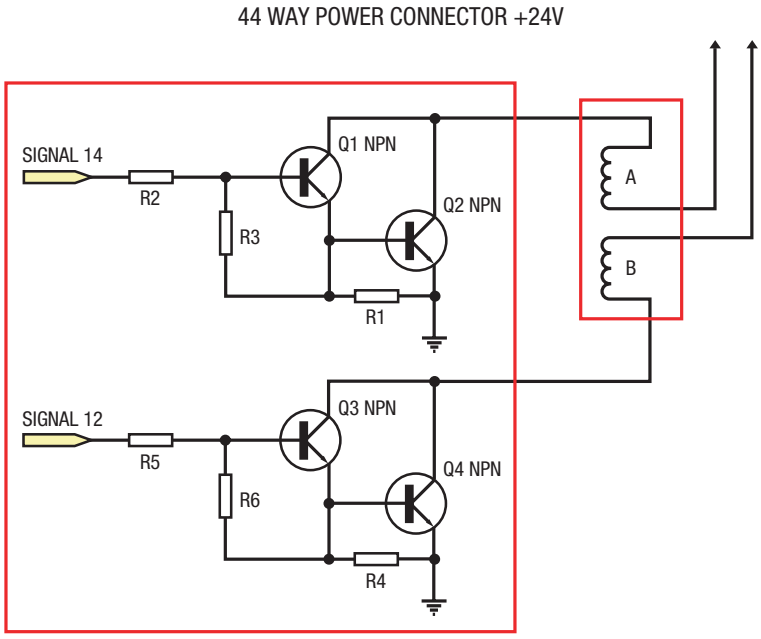
Related Web Sites

www.can-cia.org/canopen/	CAN In Automation

10. Interlock version

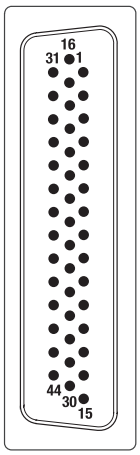
Some fieldbus versions of VM10 valve islands can be provided with an "Interlock" connector which is used to supply power for each valve coil from an external source.

This can be connected through a series of external switches to ensure that a valve coil can only energise if the interlock path is complete. This can be used to provide interlocking for safety gates etc.



Valve/Sol	8	10	12	16	Valve/Sol	8	10	12	16
14	16	20	24	32	12	15	19	23	31
14	14	18	22	30	12	13	17	21	29
14	12	16	20	28	12	11	15	19	27
14	10	14	18	26	12	9	13	17	25
14	8	12	16	24	12	7	11	15	23
14	6	10	14	22	12	5	9	13	21
14	4	8	12	20	12	3	7	11	19
14	2	6	10	18	12	1	5	9	17
14	N/C	4	8	16	12	N/C	3	7	15
14	N/C	2	6	14	12	N/C	1	5	13
14	N/C	N/C	4	12	12	N/C	N/C	3	11
14	N/C	N/C	2	10	12	N/C	N/C	1	9
14	N/C	N/C	N/C	8	12	N/C	N/C	N/C	7
14	N/C	N/C	N/C	6	12	N/C	N/C	N/C	5
14	N/C	N/C	N/C	4	12	N/C	N/C	N/C	3
14	N/C	N/C	N/C	2	12	N/C	N/C	N/C	1
Common	44	44	44	44	Common	44	44	44	44

N.B. To maintain EMC compatibility it is advisable that a screened cable is used when the cable length is in excess of 1 metre.



Looking into node connector
44 Pin connector - Male

11. Interbus-S specification

Norgren Interbus-S Fieldbus systems conform to DIN19258

Communication System: 4 wire RS422 hardware communication protocol

Number Of Nodes per Network: Master + 512 Nodes Including Remote Slaves

Total Number Of I/O Per Network: 4096

Bus Topology: Ring

Note: Norgren Interbus-S VM10 valve islands are intended for connection to the Interbus-S Remote Bus system and if connected to Local bus may cause damage to the internal circuitry For Installation Remote Bus applications please contact Norgren Technical.

Wiring specification

Line Parameters:

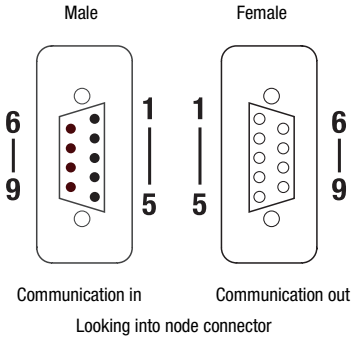
Parameter	Lutze(manufacturer)
Impedance In Ohms	158
Outer Jacket	PVC
Core Diameter (mm)	3*2*0.25
Outside Diameter (mm)	8.6

Line Lengths:

Transmission Rate In kbit/sec	500
Main Line Between Nodes	400M
Maximum Length	13Km

Connectors

Outgoing Remote Bus D-Sub Connector (Female)		Incoming Remote Bus D-Sub Connector (Male)	
Pin Number	**Signal**	**Pin Number**	**Signal**
1	DO	1	DO
2	DI	2	DI
3	0VI	3	0VI
4	*	4	*
5	+5VI**	5	*
6	/DO	6	/DO
7	/DI	7	/DI
8	*	8	*
9	RBST**	9	-



* Do not connect to pins 4 or 8

** If used, the outgoing bus connector should have pins 5 and 9 connected together to indicate the presence of a device on the outgoing bus.

Addressing and baud rate

The address of the valve island outputs are determined during configuration. The baud rate is fixed at 500 kbaud.

Address of each valve output

Bus	Solenoid 1-4	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30
Connection	**Solenoid 1-2**	1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31

8 Stations
10 Stations
12 Stations
16 Stations

Indicators

24V (Green) – This LED will only be energised when 24 volts is applied to the valve power terminal of the power supply connector.

5V (Green) – This LED will only be energised when a 24 volt supply is applied to the electronic supply terminal of the power connector, indicating that the logic circuit of the module is powered.

UL (Green) – This LED will only be energised when the Network power is connected to the Network connector, indicating that the logic circuit of the module is powered.

RC (Green) – This LED will only be energised when a cable connection is made to the incoming connector of the device.

BA (Green) – This LED will only be energised when communication is established on the network from the master.

RD (Yellow) – This LED will only be energised when no connection is made to the device, or the master is in an offline state.

Indicator Status During Powering Up and Commissioning

Condition	24V	5V	UL	RC	BA	RD
Power Up	On	On	On	Off	Off	On
No Operationing State (Master Offline)	On	On	On	On	Off	On
Establishing Communication With Master	On	On	On	Flickering	On	Off
Device In an Operation state	On	On	On	On	On	Off

I.D and length codes

VM10 Valve island only offer output connections and each size of Interbus node are configured to the fewest possible appropiate number of outputs and stores the corresponding ID code.

Possible VM10 Interbus 'S' I.D. Codes

Number Of Stations	Connection Size	ID Code
8	16	0101h
10	24	010Bh*
12	24	010Bh*
16	32	0102h

* The host controller boards support the data width only as of firmware version 3.2 and PC AT boards of driver version 2.0.

Commissioning

Due to the increasing number of compatible Interbus 'S' master controllers it would be impossible to create detailed instructions for commissioning the Norgren node on a particular master. All Norgren Interbus products are conformance tested to the latest specification by an independent authorised test site and are fully certified by the Interbus Club. Because of this, the help guide and manual supplied with the users chosen PLC should be used during the commissioning stages of each Norgren node.

Other Related Documents

Interbus Club: Interbus Basics

Related Web Sites

www.interbusclub.com Interbus Club Organisation

12. AB RIO specification

Norgren RIO systems conform to the Allen-Bradley (RIO) link specification. Communication System: 2-wire RIO protocol

Number of Nodes per Network: Master + 32 slaves

Bus Topology: Line.

Line parameters

Proprietary screened twisted pair cable.

Wiring specification

Belden 9463.

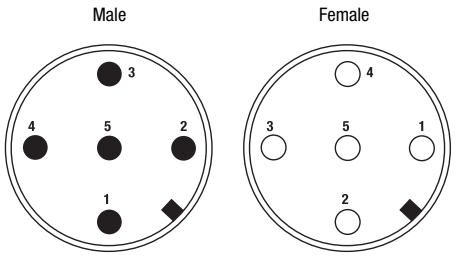
Wiring termination

Terminating resistors must be attached across line 1 and line 2 of the connectors At each end (scanner and last physical device) of the RIO link. The value of the resistor depends on the baud rate and extended node capability as Shown in the following table.

Baud Rate		Terminating resistor size	Maximum cable distance (Belden 9463)
Using extended	All baud	82 ohm 1/2 watt	3048 metres (10,000 ft) at 57.6 kbaud
Node capacity	rates		1524 metres (5,000 ft) at 115.2 kbaud
			762 metres (2,500 ft) at 230.4 kbaud
Not using	57.6 kbaud	150 ohm 1/2 watt	3048 metres (10,000 ft)
Extended node	115.2 kbaud	150 ohm 1/2 watt	1524 metres (5,000 ft)
capability	230.4 kbaud	82 ohm 1/2 watt	762 metres (2,500 ft)

Connections

AB RIO M12 Connector Details	
Pin Number	Signal
1	RIO 1
2	-
3	RIO 2
4	-
5	RIO SH



Address and baud rate settings

The following baud rates are supported by the VM10 node 57.6, 115.2 and 230.4 kbits/sec and are set via a rotary coded switch. The table below shows the switch positions for baud rate settings.

Baud Rate Kb/s	S2 Switch Position
230.4	1
115.2	2
57.6	3

Address setting is done via a rotary coded switch. The VM10 AB RIO node occupies one rack number (address) supporting up to sixteen different rack positions. The table below shows permissible rack numbers for supported scanner modules.

Rack Number(Address)		S1 Switch Position	
1747-SN	1771-SN	PLC5	
Rack 0	Rack 0	Not Vaild	1
Rack 1	Rack 1	Rack 1	2
Rack 2	Rack 2	Rack 2	3
Rack 3	Rack 3	Rack 3	4
	Rack 4	Rack 4	5
	Rack 5	Rack 5	6
	Rack 6	Rack 6	7
	Rack 7	Rack 7	8
		Rack 8	9
		Rack 9	10
		Rack 10	A
		Rack 11	B
		Rack 12	C
		Rack 13	D
		Rack 14	E
		Rack 15	F

Indicators

24V (Green) – This LED will only be energised when 24 volts is applied to the valve power terminal of the power supply connector.

5V (Green) – This LED will only be energised when the Network power is connected to the Network connector, indicating that the logic circuit of the module is powered.

Module Active (Green) – This LED indicates the status of the communication connection and is energised when the VM10 valve island is in an operating state.

Module Fault (Red) – This LED indicates the status of the communication layer

Indicator Status During Powering Up and Commissioning

Condition	24V	5V	Module Fault	Module Active
Power Up	On	On	Single Flash	Single Flash
Device In a Pre-operation State	On	On	Off	Blinking
Device In a Stopped State	On	On	Off	Blinking
Device In an Operation State	On	On	Off	On
Baud Rate Not Support	On	On	On	On

Commissioning

Due to the increasing number of compatible AB RIO master controllers it would be impractical to create detailed instructions for commissioning the Norgren node on a particular master. All Norgren RIO products are conformance tested to the latest specification by an independent authorised test site and are fully certified by Rockwell Automation. Because of this, the help guide and manual supplied with the users chosen PLC should be used during the commissioning stages of each Norgren node.

Related Web Sites

www.rockwellautomation.com	Rockwell Automation
www.ab.com	Allen-Bradley

13. AS-interface specification

Norgren AS-interface Fieldbus systems conform to AS-I V2.11 specification.

Communication System: 2-wire ASi bus communications + electronic & input power.

Number Of Nodes per Network: Master + 31 slaves (63 slaves for V 2.1 slaves which do not use 4 outputs)

Total Number Of I/O Per Network: 248 I/O.

Bus Topology: Tree

Wiring specification

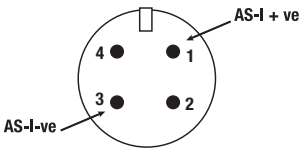
2-wire unshielded cable (AS-I Bus specific IDC type) or other 2-wire cable with sufficient current capacity.

Similar cable can be used for external power cables.

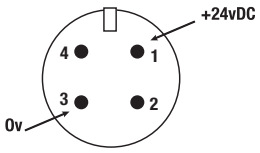
Line length

100 M including all branches (more possible with repeaters).

Connector details



Bus connector (x2)



Power connector

Address and baud rate setting

The addresses of the two As-interface nodes built in to a VM10 valve island are set by using a master controller or hand-held addressing device. Each node has a separate bus connector and are connected to the bus individually to change the default address 0 to the address required. The baud rate is fixed 125Kb.

Address of each valve output.

Some Norgren VM10 valve islands may have two ASi connectors. This is due to the limited number of **outputs** supported by the protocol. See table below for internal addressing of each valve.

Valve Island	Asi Nodes	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7	Station 8
4 Station Sol/Spg	1	Asi 1.0	Asi 1.1	Asi 1.2	Asi 1.3	N/A	N/A	N/A	N/A
4 Station Sol/Sol	2	Asi 1.0/1	Asi 1.2/3	Asi 2.0/1	Asi 2.2/3	N/A	N/A	N/A	N/A
6 Station	2	Asi 1.0/1	Asi 1.2/3	Asi 2.0	Asi 2.1	Asi 2.2	Asi 2.3	N/A	N/A
8 Station Sol/Spg	2	Asi 1.0	Asi 1.1	Asi 1.2	Asi 1.3	Asi 2.0	Asi 2.1	Asi 2.2	Asi 2.3

Default node address – 0

N.B. Whilst commissioning a valve island with two AS-interface connectors only one network connection should be made until that connection has been given a unique address.

Indicators

24V (Green) – This LED will only be energised when 24 volts is applied to the valve power terminal of the power supply connector.

ASi1 (Green) – This LED will only be energised when the Network power is connected to the Network connector, indicating that the Asi 1 logic circuit of the module is powered.

ASi2 (Green) – This LED will only be energised when the Network power is connected to the Network connector, indicating that the Asi 2 logic circuit of the module is powered.

Diag1 (Red) – The LED Indicates the status of the ASi IC.

Diag2 (Red) – The LED Indicates the status of the ASi IC.

Indicator Status During Powering Up and Commissioning

Condition	24V	ASI 1	ASI 2	Diag ASI 1	Diag ASI 2
Power Up	On	On	On	On	On
Device In a Pre-operation State	On	On	On	On	On
Device In an Operation state	On	On	On	Off	Off

I.D and I/O configuration codes

VM10 Valve island only offer output connections and each size of ASi node are configured to the fewest possible appropiate number of outputs and stores the corresponding ID code. Only one I.D and I/O configuration code are used with the VM10 valve islands.

VM10 ASi I.D and I/O configuration code: FF 08 h (Remote 4 Output)

I.D = FFh (15)

I/O configuration = 8 (4 outputs)

Commissioning

Due to the increasing number of compatible ASi 2.11 master controllers it would be impractical to create detailed instructions for commissioning the Norgren node on a particular master. All Norgren AS-Interface products are conformance tested to the latest specification by an independent authorised test site and are fully certified by the AS-interface international group. Because of this, the help guide and manual supplied with the users chosen PLC should be used during the commissioning stages of each Norgren node.

Related Web Sites

www.as-interface.com	AS-interface International Organisation
www.ad.siemens.de	Siemens Automation and Drive

14. Norgren Bus Communication Protocol

The Norgren bus is a serial communications system developed for the Norgren Fieldbus II system. The bus provides communications between the components of the system and allows configuration in distributed or centralised forms.

Communication System: 2 wire RS485 hardware communication protocol.

Maximum I/O per network: 64 inputs + 64 outputs.

Bus topology: Line from each side of main fieldbus node.

Wiring specification

The bus cable is a 12-core shielded cable (Belden 9506 CMG 6PR24) which carries Communications and configuration signals plus power for the logic circuits, remote input and outputs.

Line lengths

The maximum length of the Norgren bus is 250 metres each side of a central node. The power for electronics and outputs is also contained within the bus cable and the voltage may reduce over long distances due to cable resistance. If this voltage falls below acceptable values (which may happen if many solenoids are turned on) then extra power can be supplied through an additional power connector.

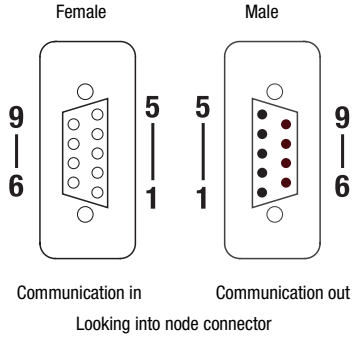
Wiring termination

The Norgren bus requires termination at the extreme ends. This is achieved by using a terminating D connector.

Connections

The Norgren bus is connected using 9-pin "D" connectors.

Pin No	9 Pin Male D-type	9 Pin Female D-type	Colour	Note
1	24 Volt output / valve	24 Volt output / valve	Red & Brown	Twisted Pair
5	0V24	0V24	Black(Red) & Black(Brown) &Black (White)	
4	24 Volt Electronics	24 Volt Electronics	White	Twisted Pair
2	5 Volt	5 Volt	Blue	Twisted Pair
3	0V5	0V5	Black(Blue)	
9	A	A	Green	Twisted Pair
7	B	B	Black(Green)	
8	Config Out	Config In	Yellow	Twisted Pair
6	Config Rtn	Config Rtn	Black(Yellow)	
	Shell	Shell	Screen	



Distributed System Cables

The cables that are used to connect the various V20/22 and VM10 modules together are available in three lengths:

1m Interconnection Cable	VE2FBC9P-9S010
3m Interconnection Cable	VE2FBC9P-9S030
5m Interconnection Cable	VE2FBC9P-9S050

Address and baud rate setting

A Norgren Fieldbus II system can consist of V20 and V22 valve islands , I/O modules and VM10 valve islands in any combination and position and are connected to the main Fieldbus node either directly or through serial cables.

Before use the node has to be configured in order to determine what components are present on the bus and allocate addresses to the inputs and outputs.

This is initiated by switch 10 on the underside of the node which when moved from it's current position to the other will cause the node to perform a configuration cycle which interrogates the system and allocates I/O.

Address of each valve output

The address bit of each output can change within a FieldbusII system dependant on which side of the node and where in the system the valve island is connected. See examples below.

A 6 station VM10 valve island configured on the right hand side of the FieldbusII node:

NODE	0	2	4	6	8	10	Solenoid 1-4
	1	3	5	7	9	11	Solenoid 1-2

A 6 station VM10 valve island configured on the left hand side of the FieldbusII node:

Solenoid 1-4	0	2	4	6	8	10	NODE
Solenoid 1-2	1	3	5	7	9	11	

Indicators

Status (Red/Green) – This LED indicates the status during the configuration of the Norgren Fieldbus II System

Indicator Status During Powering Up and Commissioning

Condition	Status
Power Up	Flash Green / Red
Device In a Pre-operation State	Green
Un-configured (No Assigned Address)	Flashing Red
Device In an Operation state	Off

Commissioning

Please refer to the Norgren Fieldbus II documentation 10975-C01 supplied with all Norgren Fieldbus II systems.

Appendix

Testing for correct bus termination

The bus connectors should be unplugged from all Fieldbus devices in the segment. Where this is not possible in exceptional cases (e.g. the bus cables are permanently attached to repeaters), the cables must be removed and temporarily connected together to ensure continuation of the incoming and outgoing data wires and shields.

Generally speaking, measurements can be made without opening up the bus connectors, although - depending on the bus connector type - this may still be necessary at the two ends of the segment to allow access to the terminating resistors.

A voltage measurement is first made at the one end of the segment between the A and B wires to ensure that no voltage is present. If a voltage can be detected, it is likely that an active device (e.g. repeater or Fieldbus device) is still connected to the bus segment. All active devices must be unplugged from the bus segment during the following resistance measurements!

Provided that no voltage is present on the bus, a resistance measurement should be carried out to check whether additional terminating resistors are unintentionally connected to the segment.

During this test, the bus terminating resistors must be removed from both ends of the segment.

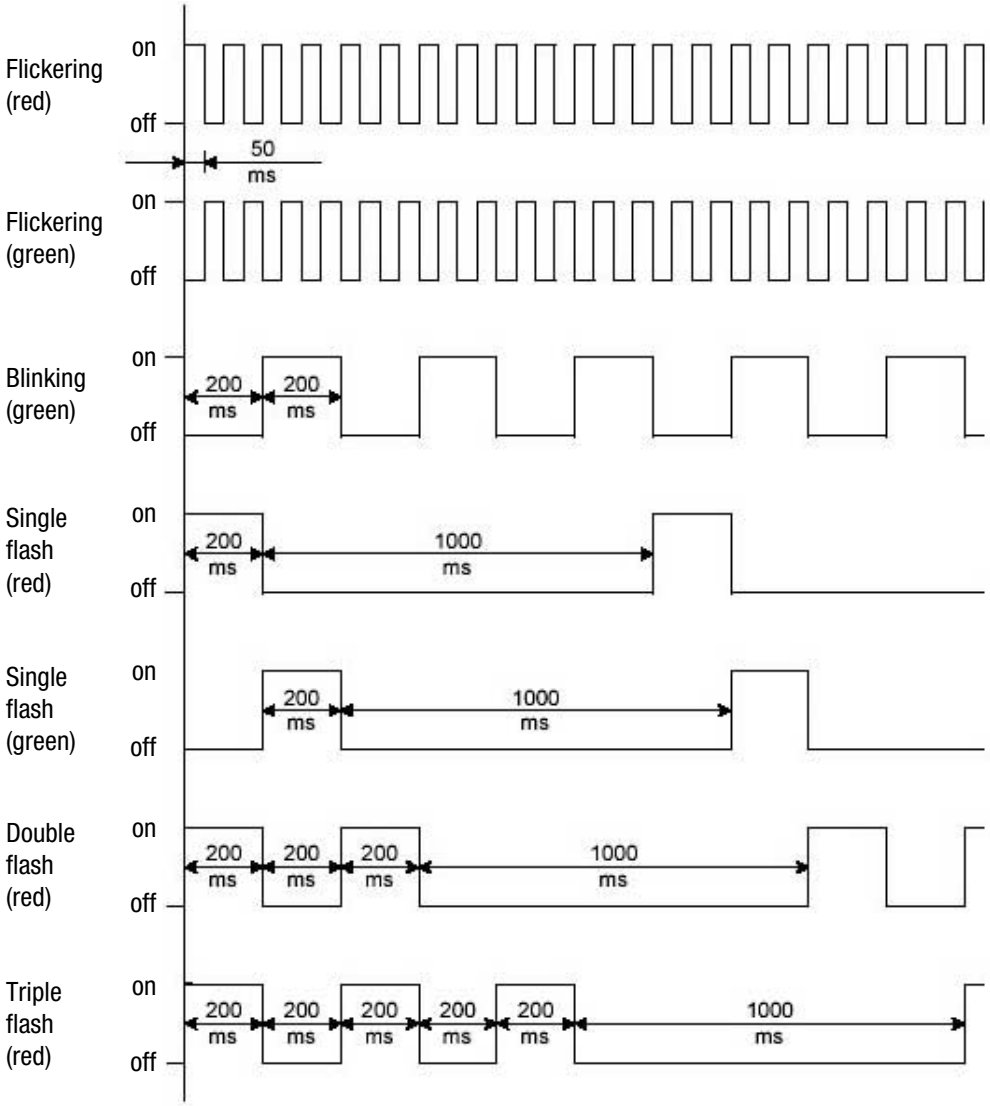
Standard bus termination connects a resistor between the communication wires.

If the test measurements shows an open circuit between the communication wires, the cable segment is correctly installed, other possibilities are as follows:

Measured value R < 220 ohms:	One or more additional terminating resistors are inserted in the segment or there is a short circuit between the A and B wires
Measured value R > 220 ohms to < 330 ohms:	If the segment length is max. 10000 m, one additional 220 ohm terminating resistor is inserted in the segment. The approximate distance X in m of the terminating resistor from the measurement point can then be calculated with X = 1000 * (R - 220) / Rs.

All additional terminating resistors should be removed from the bus segment.

Indicator states and flash rates



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