

INTERBUS Sensor - Actuator Boxes SM*12.1 in IP 65 Rating

Configuration

DOK-CONTRL-SM*12.1****-PRJ2-EN-P

- Title** Interbus sensor - actuator boxes SM*12.1 in IP65 rating
- Type of document** Configuration
- Document code** DOK-CONTRL-SM*12.1****-PRJ2-EN-P
- Internal file reference**
 - DOK-MTC200-Techn*Unterl-04M1-EN-P, Register PQ
 - Drawing number: 109-1077-4101-02
- Purpose of the document** This document is used for
 - Configuration, installation and commissioning of the sensor - actuator boxes.

Configuration control	Documentation identification of previous releases	Release date	Comment
	DOK-CONTRL-SM*12.1****-PRJ2-EN-P	07.1998	First issue

Copyright © INDRAMAT GmbH, 1998

Copying this document and giving it to others and the use or communication of the contents thereof without express authority are forbidden. Offenders are liable for the payment of damages. All rights are reserved in the event of the grant of a patent or the registration if a utility model or design. (DIN 34-1)

Validity All rights are reserved with respect to the content of this documentation and the availability of the product.

Published by INDRAMAT GmbH • Bgm.-Dr.-Nebel-Str. 2 • D-97816 Lohr a. Main
 Phone 09352/40-0 • Tx 689421 • Fax 09352/40-4885

Dept. ECS (RW)

Note This document is printed on paper bleached without chlorine.

Contents

1 General	1-1
1.1 Brief Description.....	1-1
1.2 General Specifications	1-2
General.....	1-2
Interfaces	1-2
Logic voltage (+U _{S1})	1-3
I/O power supply (+U _{S2})	1-3
EMC	1-3
Dimensions	1-4
2 INTERBUS Sensor Box SME12.1-08-DC024	2-1
2.1 Brief Description.....	2-1
2.2 Specifications SME12.1-08-DC024	2-2
Status and diagnosis indicators	2-2
2.3 Wiring Diagrams	2-3
Remote bus.....	2-3
Installation remote bus	2-4
Type code.....	2-4
3 INTERBUS Actuator Box SMA12.1-08-DC024-200	3-1
3.1 Brief Description.....	3-1
3.2 Specifications SMA12.1-08-DC024-200	3-2
Status and diagnosis indicators	3-3
3.3 Wiring Diagrams	3-3
Remote bus.....	3-4
Installation remote bus	3-4
Type code.....	3-5
4 INTERBUS Sensor - Actuator Box SMM12.1-44-DC024-200	4-1
4.1 Brief Description.....	4-1
4.2 Specifications SMM12.1-44-DC024-200.....	4-2
Status and diagnosis indicators	4-3
4.3 Wiring Diagrams	4-4
Remote bus.....	4-4
Installation remote bus	4-4
Type code.....	4-5

5 Typical Applications	5-1
5.1 INTERBUS Installation Remote Bus Interface	5-1
5.2 INTERBUS Remote Bus Interface	5-2
6 Accessories	6-1
6.1 Accessory Kit	6-1
6.2 Accessory Piece Parts	6-1

1 General

1.1 Brief Description

The SM*12.1 sensor- actuator boxes have been designed in IP65 rating as compact I/O units for utilization directly on the machines and in the vicinity of sensors and/or actuators. They enable 1-, 2-, 3-, or 4-wire initiators to be connected to the INTERBUS remote bus via initiator connectors. The voltage for bus logic and sensors can be supplied via a hybrid cable in the installation remote bus or via a separate power supply unit in the remote bus.

The power for the actuators must **always** be supplied separately. In the installation remote bus, an additional power supply unit is required for each module. In the remote bus, either a common power supply unit can be used for bus logic and actuators or - to ensure isolation - bus logic and actuators are fed by separate power supply units.

The following modules are available:

- SMA12.1-08-DC024-200 (8 digital outputs)
- SME12.1-08-DC024 (8 digital inputs)
- SMM12.1-44-DC024-200 (4 digital inputs/4 digital outputs)

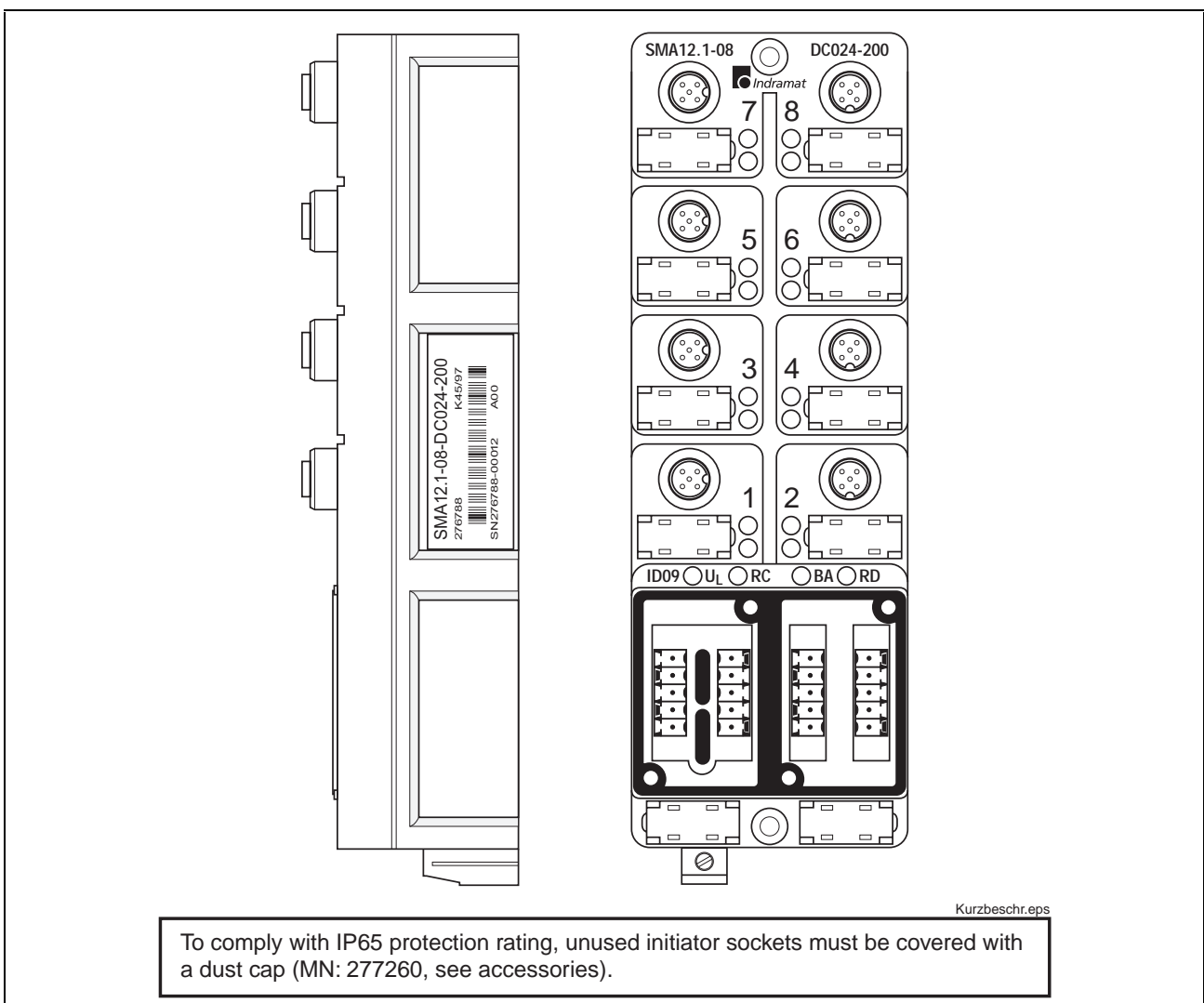


Figure 1-1: Example: SMA12.1-08-DC024-200 module

1.2 General Specifications

General

Permissible cable cross-section for feeder line in remote bus	max. 1.5 mm ²
PE connection cable cross-section:	1.5 mm ² ... 4 mm ²
Fastening:	Screwed with cylindric M4 screws onto installation surface or aluminum rails.
Protection rating:	IP 65, DIN VDE 0470, EN 60529 (with protective caps for unused initiator sockets)
Humidity:	75 %, no condensation (operation) 95%, no condensation (transport) DIN 40 040 Class F
Air pressure:	from 860 to 1080 hPa, 1500 m (operation) from 660 to 1080 hPa, 3500 m (transport)
Operating temperature:	from 0°C to 55°C, DIN 40 040 Class KV
Storage temperature:	from -25°C to 70°C
Isolation - Peripherals/bus logic: - Supply voltage/PE conductor:	500 VAC test voltage, 1 minute, 50 Hz 500 VAC test voltage, 1 minute, 50 Hz
Length of the installation remote bus segment:	max. 50 m
Length of the remote bus segment:	max. 400 m
Enclosure dimensions (L x W x H): (without cable glands)	188 mm x 62 mm x 77 mm
Distance between holes for M4 screws:	170 ± 0,1 mm

Note: To avoid distortion in the housing, the installation surfaces must be plane.

Interfaces

INTERBUS interface:	2 x 5-way connectors (mini COMBICON) two-wire remote bus (difference signal lines, twisted pairs)
Power consumption (without supply current for the initiators)	typical 100 mA

Logic voltage (+U_{S1})

Nominal value:	24 VDC
Permissible ripples:	3.6 V _{ss} within the permissible voltage range
Permissible voltage range:	18.5 ... 30.5 VDC, including ripples
Current carrying capacity:	4.5 A

Note: With the installation remote bus, the +U_{S1} logic voltage is looped through and can be tapped at the connector for the outgoing installation remote bus. A maximum continuous current of 4.5 A is possible. This corresponds to up to 9 modules connected to the installation remote bus.

I/O power supply (+U_{S2})

Nominal value:	24 VDC
Permissible ripples:	3.6 V _{ss} within the permissible voltage range
Permissible voltage range:	18.5 ... 30.5 VDC, including ripples
Current consumption:	8 A

EMC

Noise emission to EN 55022:	Class A (industry environment)
Noise immunity to IEC 801-2 (ESD):	Class 3, judgement criterion 2
Noise immunity to IEC 801-3:	10 V/m, judgement criterion 1
Noise immunity to IEC 801-4 (burst):	Class 4, judgement criterion 2 (1 kV, no single fault)
Noise immunity to IEC 801-5 (surge):	Class 2, judgement criterion 3

Dimensions

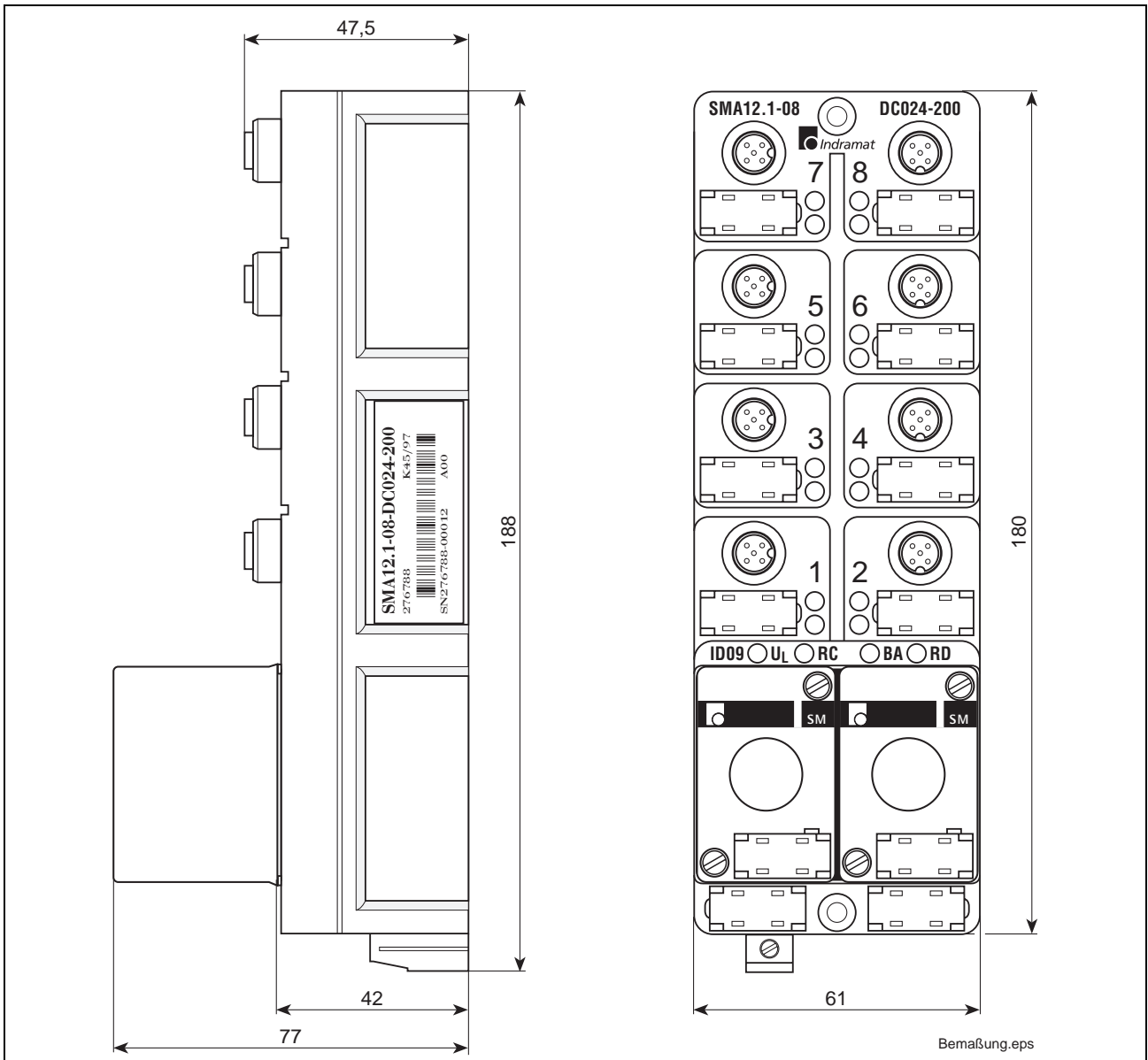


Figure 1-2: Dimensions of SM_12.1 module

2 INTERBUS Sensor Box SME12.1-08-DC024

2.1 Brief Description

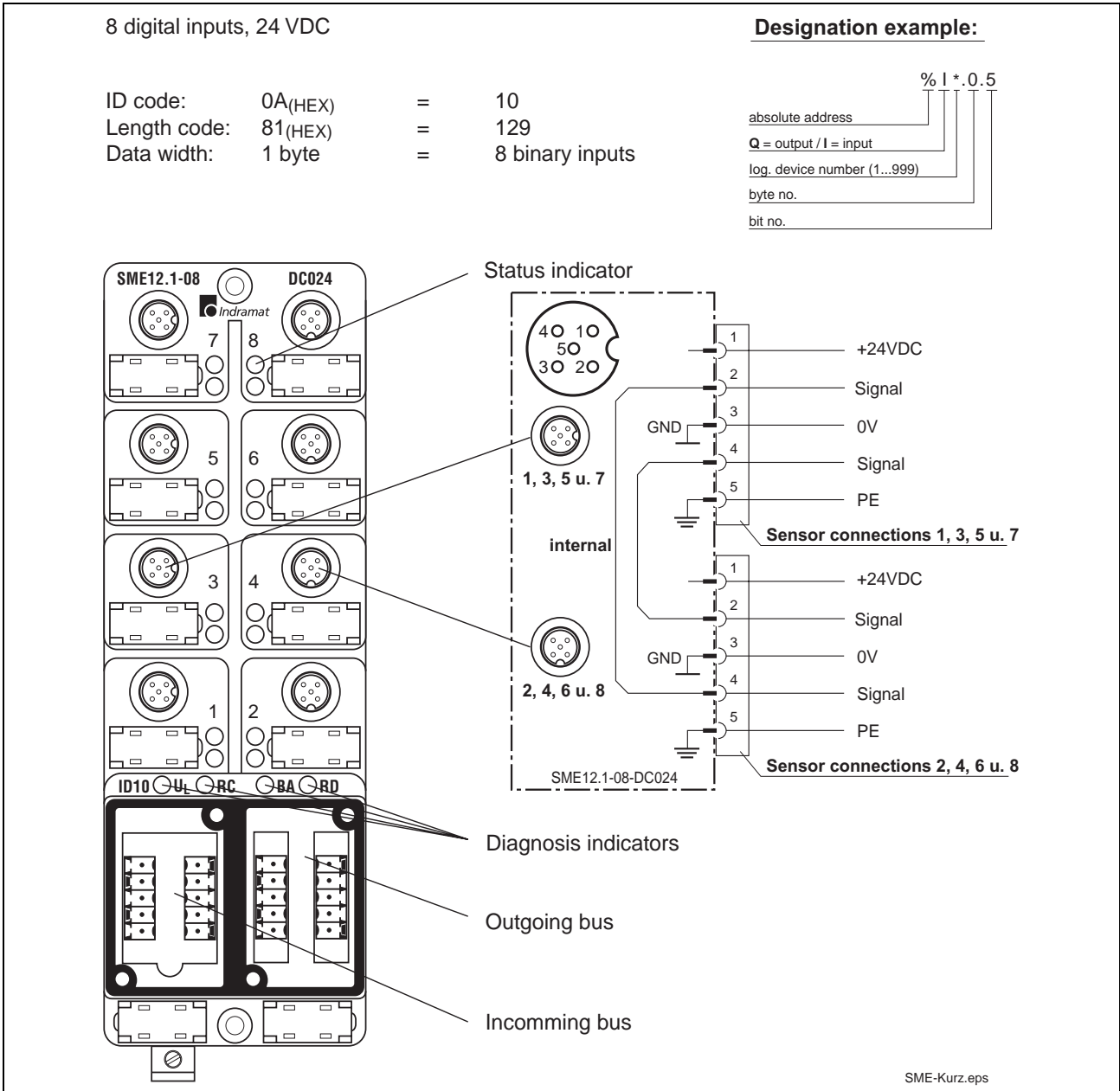


Figure 2-3: SME12.1-08-DC024

Note: Each initiator socket provides two signal inputs. Thus, initiators with two input signals may also be connected to an initiator socket. If this feature is used, the initiator socket with the same input assignments (see Table 1) must **not** be used.

Example: If, for example, a rotation encoder is connected to initiator socket 1, and if this encoder occupies the inputs 1 and 2 of this socket, initiator socket 2 must **not** be used because it employs the same inputs.

Initiator socket	Address	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5
1	%I*.0.0	+24V initiator- power supply	Input 2	Ground	Input 1	PE
2	%I*.0.1		Input 1		Input 2	
3	%I*.0.2		Input 4		Input 3	
4	%I*.0.3		Input 3		Input 4	
5	%I*.0.4		Input 6		Input 5	
6	%I*.0.5		Input 5		Input 6	
7	%I*.0.6		Input 8		Input 7	
8	%I*.0.7		Input 7		Input 8	

Figure 2-4: Table 1

2.2 Specifications SME12.1-08-DC024

Current consumption:	typical 100 mA + current for initiator voltage
Power consumption:	1.6 W
Input power loss (for 8 initiators):	2.2 W
Digital inputs:	
Input voltage range for signal 0:	-30 V ... +5 V
Input voltage range for signal 1:	+13 V ... +30 V
Input current per channel:	I_E typ. 7 mA at 24 V
Residual current for signal 0:	$I_E < 1.5$ mA
ON delay (0 > 1):	typ. 3 ms
OFF delay (1 > 0):	typ. 3 ms
Initiator voltage:	
Voltage:	+ U_{S1} -1V
Current per input:	max. 50 mA
Permissible total current (8 inputs):	max. 400 mA
Fusing:	electronic short-circuit and overload protection

Status and diagnosis indicators

UL	LED green	Module electronics power supply
	ON:	Supply voltage UL available
	OFF:	Supply voltage UL not available
		- incoming Interbus cable not installed
		- Fuse at bus terminal blown
		- internal power supply unit defective

RC	LED green	Remote bus Check Monitoring the incoming remote bus cable ON: Incoming remote bus connection established OFF: Incoming remote bus connection disturbed
BA	LED green	Bus Active ON: Data transfer on INTERBUS active OFF: No data transfer
RD	LED red	Remote bus Disable ON: The ongoing remote bus is disabled OFF: The ongoing remote bus is connected
XX	LED yellow	one status indicator per input ON: Input at 1 OFF: Input at 0

2.3 Wiring Diagrams

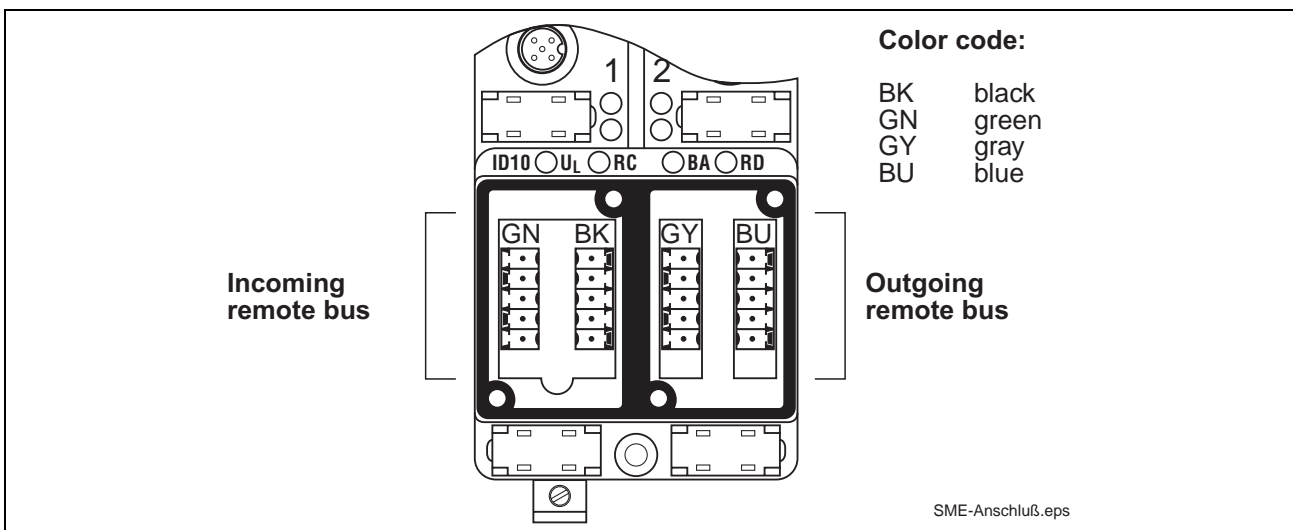


Figure 2-5: Terminals

Remote bus

At the remote bus, the power of bus logic and sensors must be supplied separately. The unused cable gland in the remote bus connection hood is used for this purpose.

Max. length of the remote bus segment 400 m

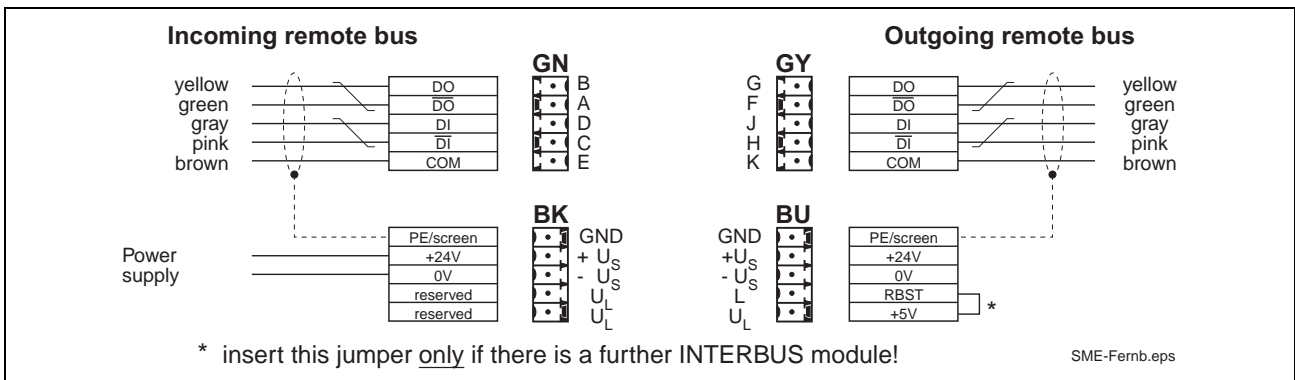


Figure 2-6: Remote bus connection

Installation remote bus

At the installation remote bus, the bus logic and sensor power supply (24 VDC) is contained in the hybrid cable.

Max. length of the installation remote bus segment: 50 m

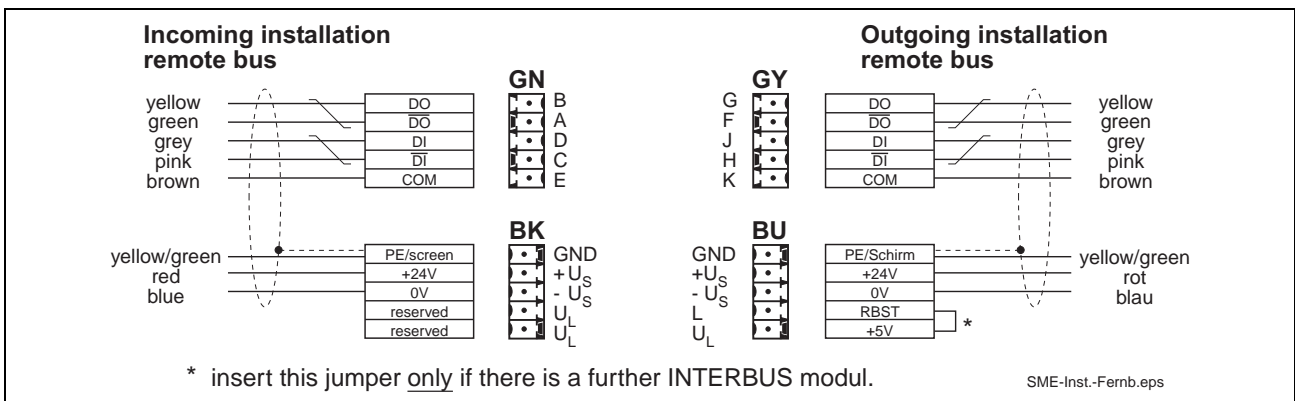


Figure 2-7: Installation remote bus connection

Type code

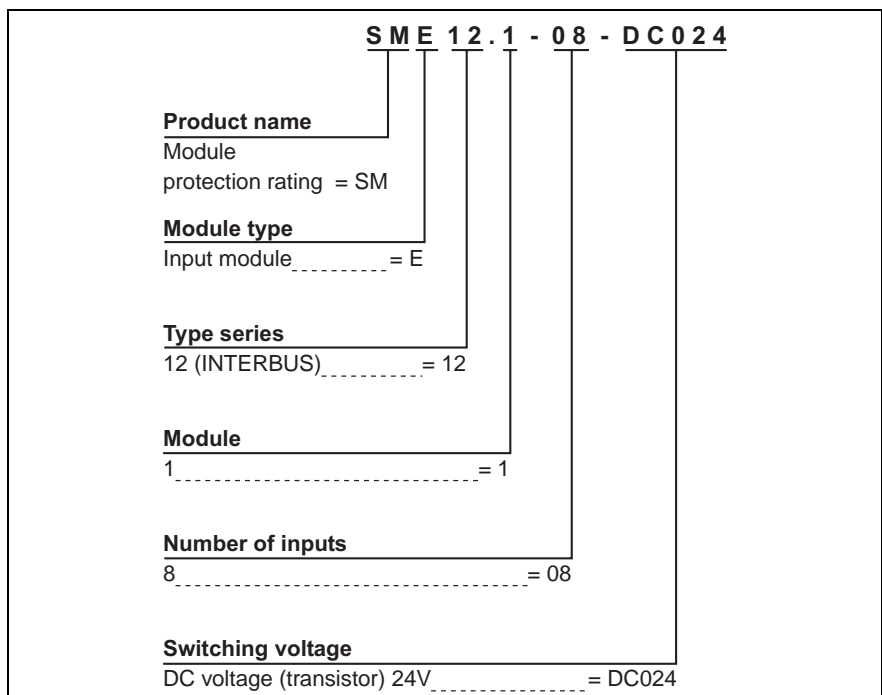
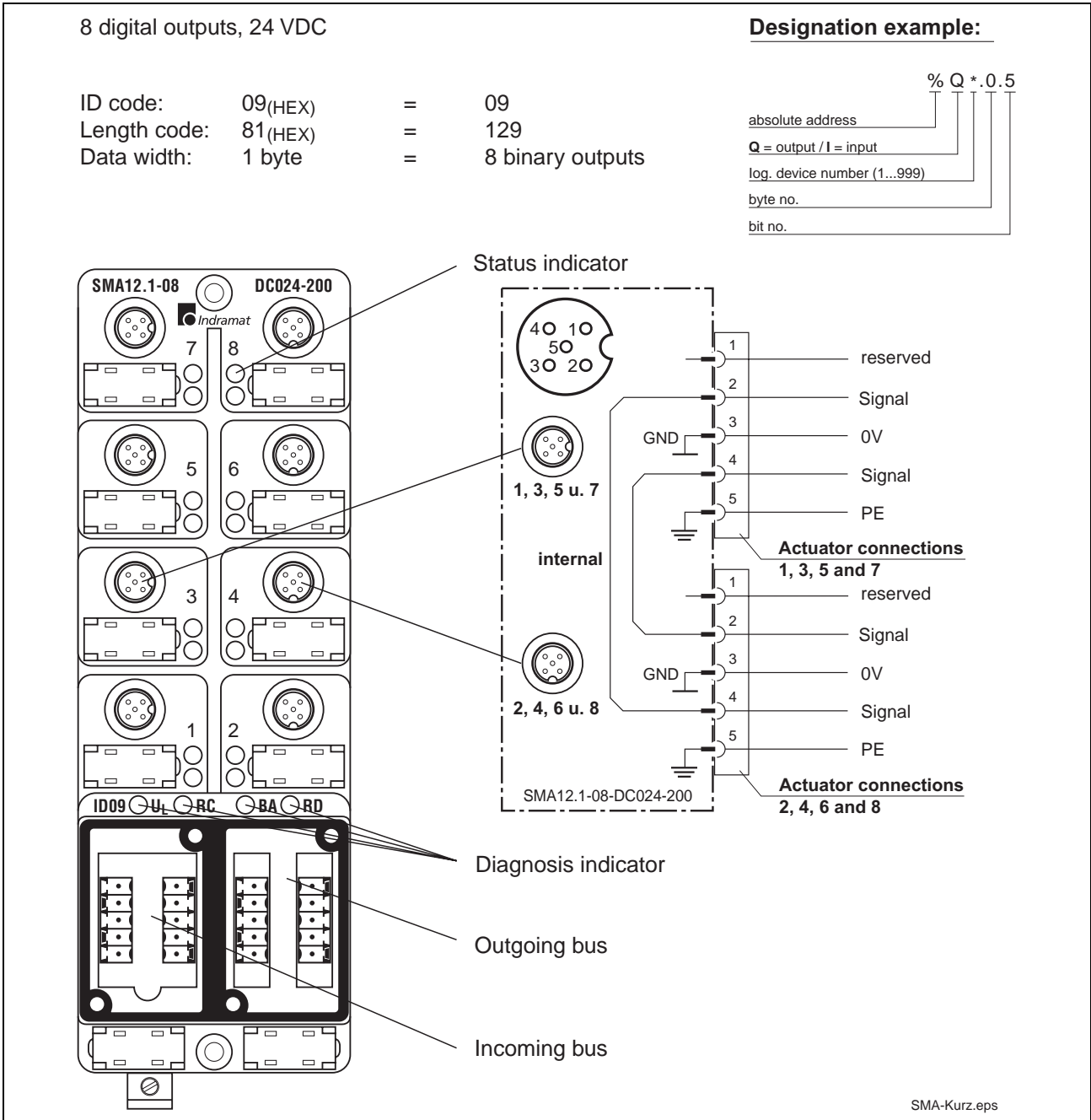


Figure 2-8: Type code SME12.1-08-DC024

3 INTERBUS Actuator Box SMA12.1-08-DC024-200

3.1 Brief Description



Note: Each initiator socket provides two outputs. Thus, actuators with two output signals may also be connected to an initiator socket. If this feature is used, the initiator socket with the same output assignments (see Table 2) must **not** be used.

Initiator socket	Address	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5
1	%Q*.0.0	reserved	Output 2	Ground	Output 1	PE
2	%Q*.0.1		Output 1		Output 2	
3	%Q*.0.2		Output 4		Output 3	
4	%Q*.0.3		Output 3		Output 4	
5	%Q*.0.4		Output 6		Output 5	
6	%Q*.0.5		Output 5		Output 6	
7	%Q*.0.6		Output 8		Output 7	
8	%Q*.0.7		Output 7		Output 8	

Figure 3-10: Table 2

3.2 Specifications SMA12.1-08-DC024-200

Current consumption (U_{S1}):	typical 100 mA
Power consumption:	4.6 W
Digital outputs:	
Min. output voltage at nominal current:	$U_{S2} - 1$ V
Nominal current per channel:	2 A short-circuit-proof
Short-circuit current limitation	< 25 A
Derating:	8 A (see Figure 3-11: Diagram 1)
Protective functions:	Electrical short-circuit
Limitation of inductive shutdown voltages:	to approximately -6 V
Switching frequency at inductive load:	0.1 Hz (inductivity value 1.2 mH) at 2 A 0.1 Hz (inductivity value 1.2 mH) at 0,5 A <= 0.8 mA to DIN VDE 19240)

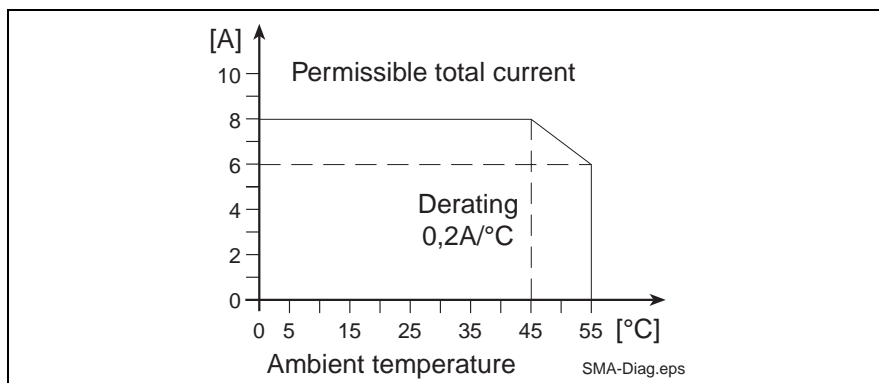


Figure 3-11: Diagram 1

Status and diagnosis indicators

UL	LED green ON: OFF:	Module electronics power supply Supply voltage UL available Supply voltage UL not available - incoming interbus cable not installed - Fuse at bus terminal blown - internal power supply unit defective
RC	LED green ON: OFF:	Remote bus Check Monitoring the incoming remote bus cable Incoming remote bus connection established Incoming remote bus connection disturbed
BA	LED green ON: OFF:	Bus Active Data transfer on INTERBUS active No data transfer
RD	LED red ON: OFF:	Remote bus Disable The ongoing remote bus is disabled The ongoing remote bus is connected
XX	LED yellow ON: OFF:	one status indicator per output Output at 1 Output at 0

3.3 Wiring Diagrams

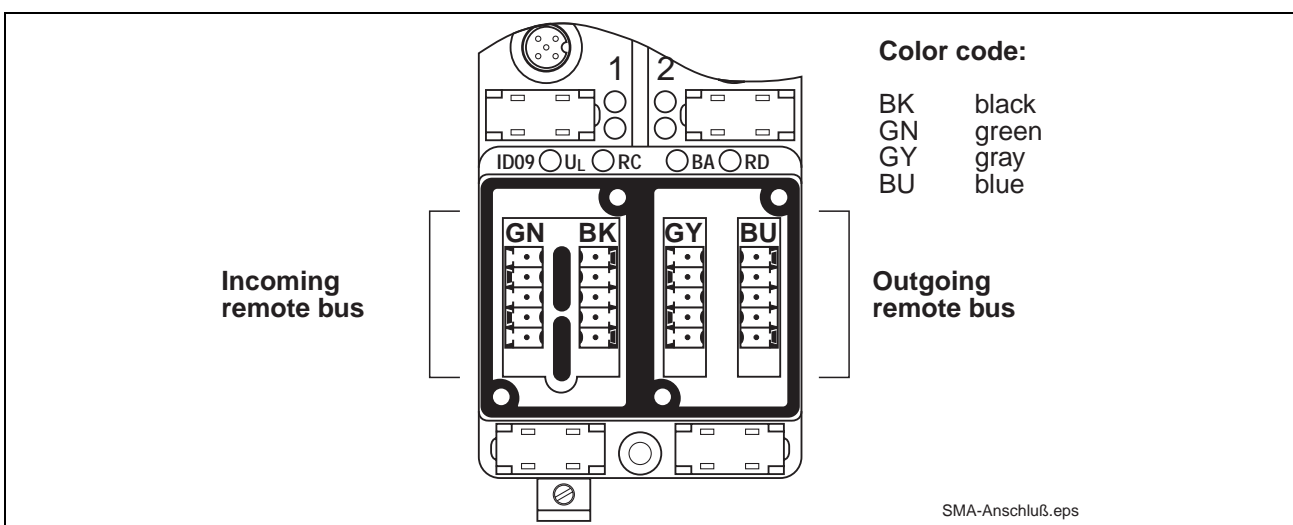


Figure 3-12: Terminals

Remote bus

At the remote bus, the power of bus logic and actuators must be supplied separately. The unused cable gland in the connection hood for the incoming remote bus is used for this purpose.

Max. length of the remote bus segment 400 m

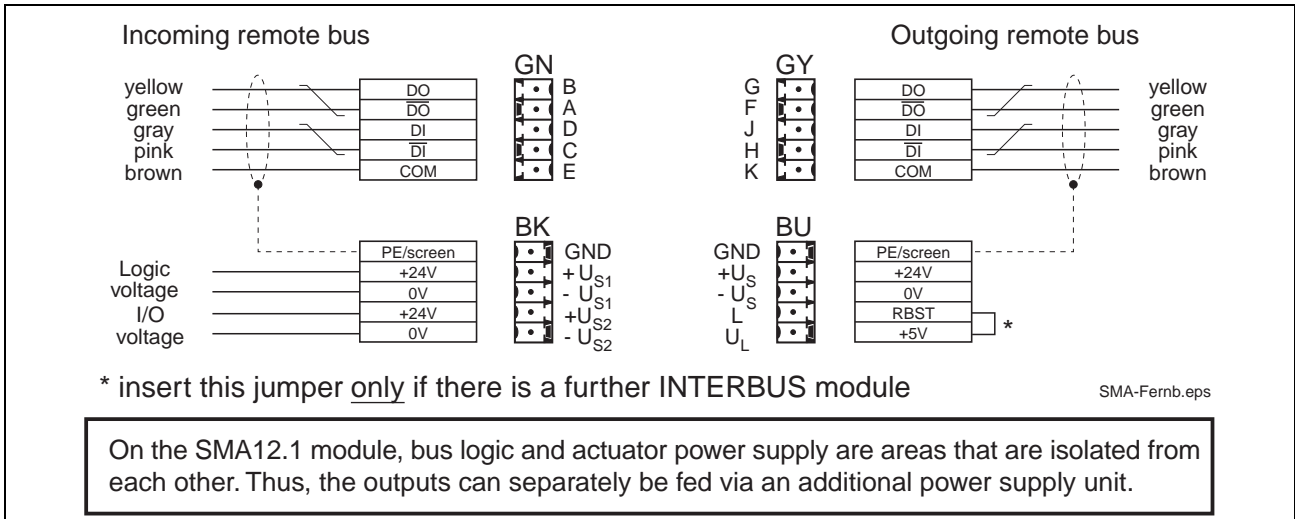


Figure 3-13: Remote bus connection

Installation remote bus

At the installation remote bus, the bus logic power supply (24 VDC) is contained in the hybrid cable. The actuators are fed separately. The unused cable gland in the connection hood for the incoming remote bus is used for routing this power supply.

Max. length of the installation remote bus segment: 50 m

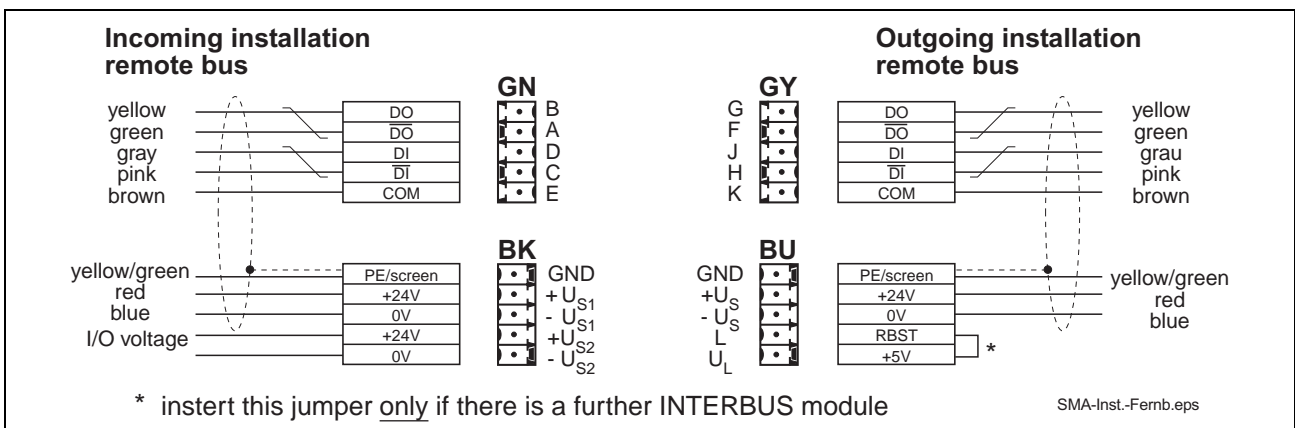


Figure 3-14: Installation remote bus connection

Type code

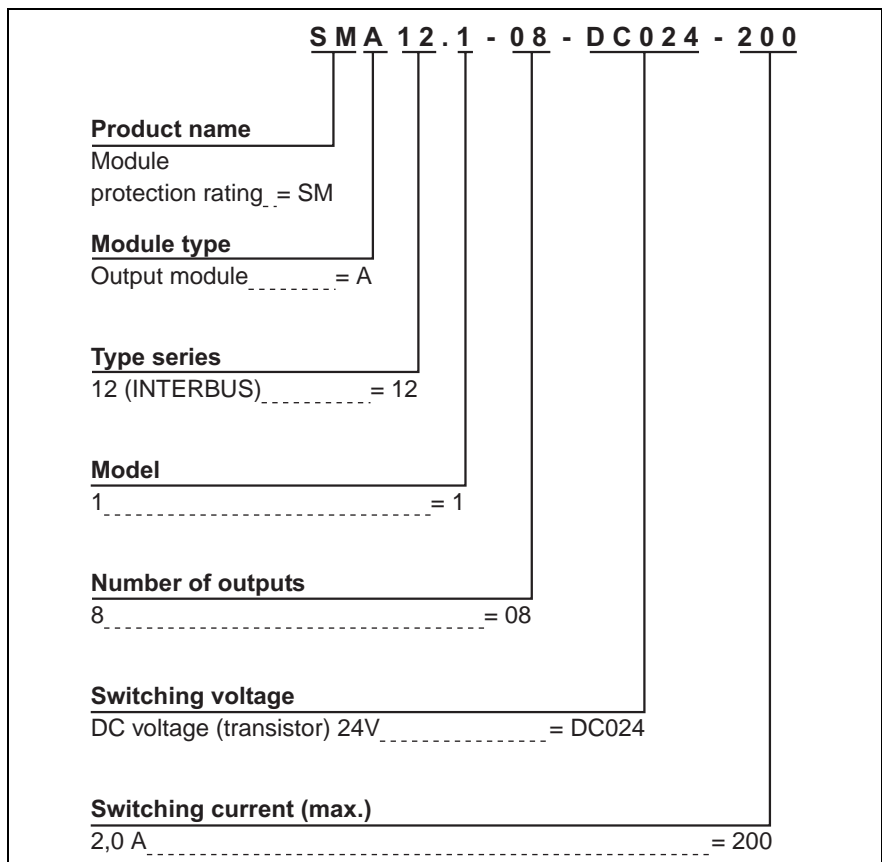


Figure 3-15: Type code SMA12.1-08-DC024-200

4 INTERBUS Sensor - Actuator Box SMM12.1-44-DC024-200

4.1 Brief Description

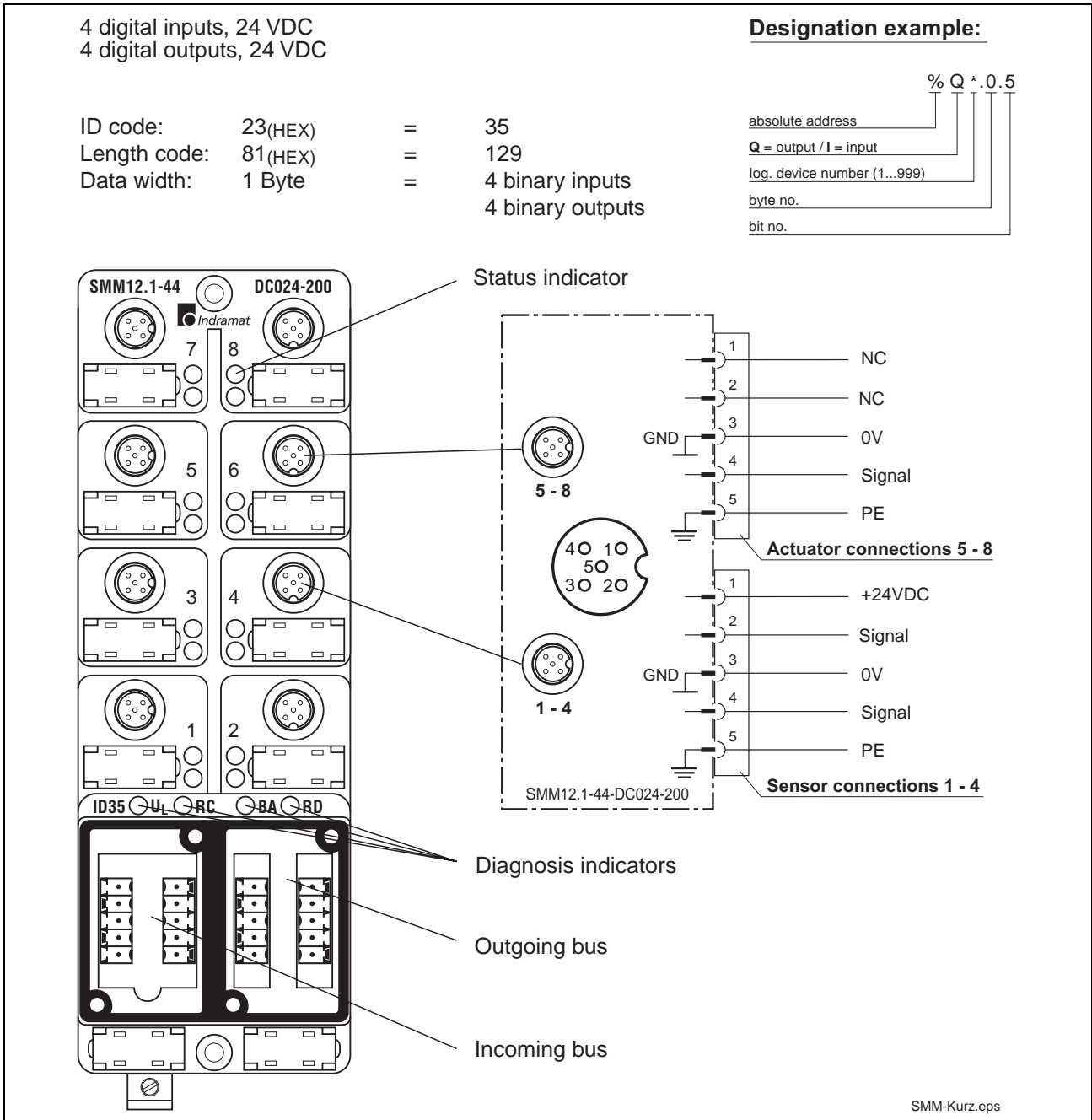


Figure 4-16: SMM12.1-44-DC024-200

Please refer to Table 3 for the address assignments of the initiator sockets.

Initiator socket	Address	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5
1	%I*.1.0	+24V initiator- power supply		Ground U_{S1}	Input 1	PE
2	%I*.1.1				Input 2	
3	%I*.1.2				Input 3	
4	%I*.1.3				Input 4	
5	%Q*.0.0	NC		Ground U_{S2}	Output 1	
6	%Q*.0.1				Output 2	
7	%Q*.0.2				Output 3	
8	%Q*.0.3				Output 4	

Figure 4-17: Table 3

4.2 Specifications SMM12.1-44-DC024-200

Current consumption (U_{S1}):	typical 100 mA
Power consumption:	4.6 W
Digital outputs:	
Min. output voltage at nominal current:	$U_{S2} - 1$ V
Nominal current per channel:	2 A short-circuit-proof
Short-circuit current limitation	< 25 A
Derating:	8 A (see Figure 4-18: Diagram 2)
Protective functions:	electrical short-circuit protection; free-wheeling circuit
Limitation of inductive shutdown voltages:	to approximately -6 V
Switching frequency at inductive load:	0.1 Hz (inductivity value 1.2 mH) at 2 A 0.1 Hz (inductivity value 1.2 mH) at 0,5 A <= 0.8 mA to DIN VDE 19240)
Digital inputs:	
Input voltage range for signal 0:	-30 V ... +5 V
Input voltage range for signal 1:	+13 V ... +30 V
Input current per channel:	I_E typ. 5 mA at 24 V
Residual current for signal 0:	$I_E < 1.5$ mA
ON delay (0 > 1):	typ. 3 ms
OFF delay (1 > 0):	typ. 3 ms
Initiator voltage:	
Voltage:	$+U_{S1} - 1$ V
Current per input:	max. 100 mA
Permissible total current (4 inputs):	max. 400 mA
Fusing:	thermal overload / short-circuit shutdown

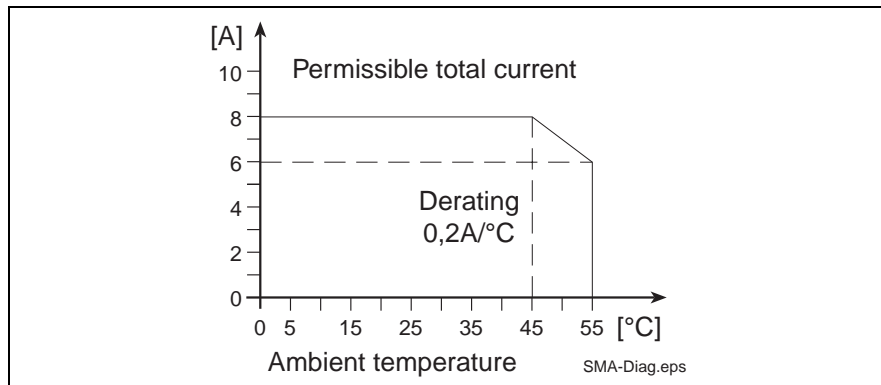


Figure 4-18: Diagram 2

Status and diagnosis indicators

UL	LED green ON: OFF:	Module electronics power supply Supply voltage UL available Supply voltage UL not available - incoming interbus cable not installed - Fuse at bus terminal blown - internal power supply unit defective
RC	LED green ON: OFF:	Remote bus Check Monitoring the incoming remote bus cable Incoming remote bus connection established Incoming remote bus connection disturbed
BA	LED green ON: OFF:	Bus Active Data transfer on INTERBUS active No data transfer
RD	LED red ON: OFF:	Remote bus Disable The ongoing remote bus is disabled The ongoing remote bus is connected
XX	LED yellow ON: OFF:	one status indicator per output Output at 1 Output at 0

4.3 Wiring Diagrams

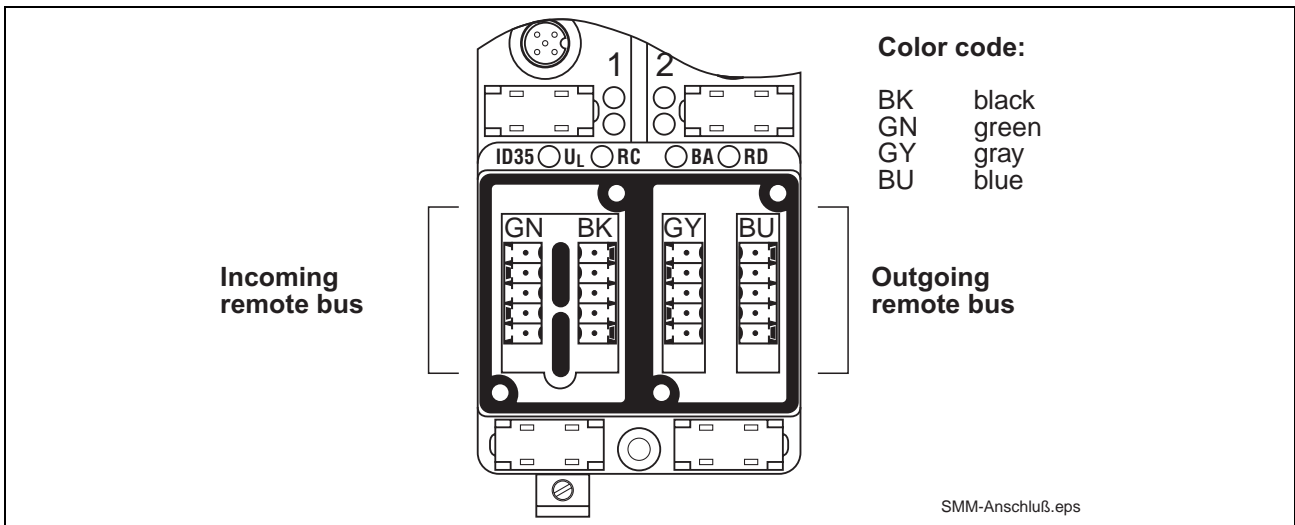


Figure 4-19: SMM module terminals

Remote bus

At the remote bus, the power of bus logic and actuators must be supplied separately. The unused cable gland in the connection hood for the incoming remote bus is used for this purpose.

Max. length of the remote bus segment 400 m

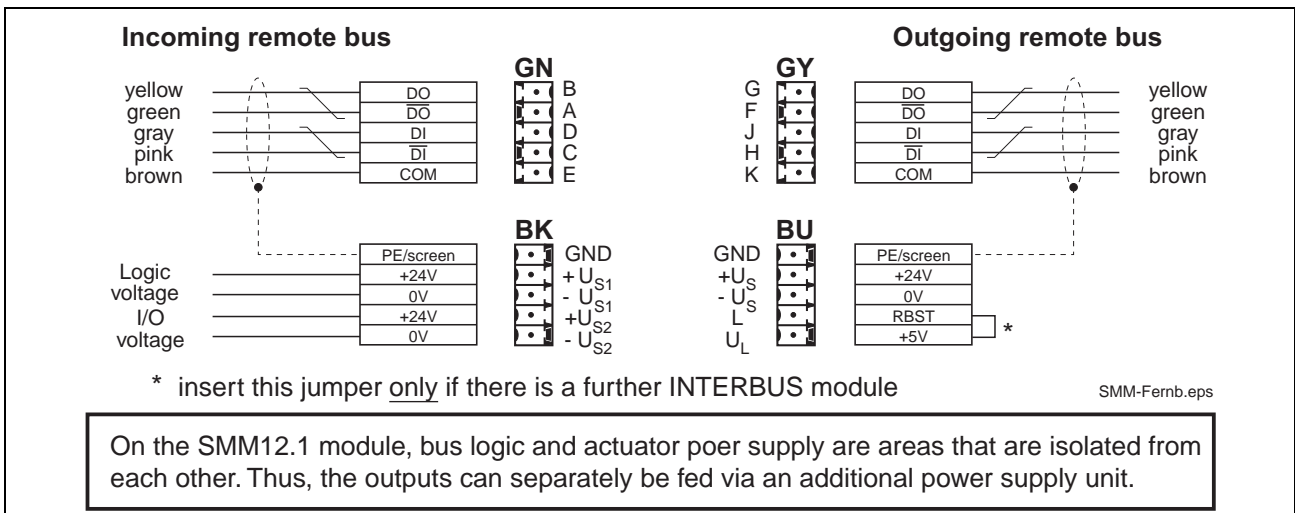


Figure 4-20: Remote bus connection

Installation remote bus

At the installation remote bus, the bus logic power supply (24 VDC) is contained in the hybrid cable. The actuators are fed separately. The unused cable gland in the connection hood for the incoming remote bus is used for routing the power supply.

Max. length of the installation remote bus segment: 50 m

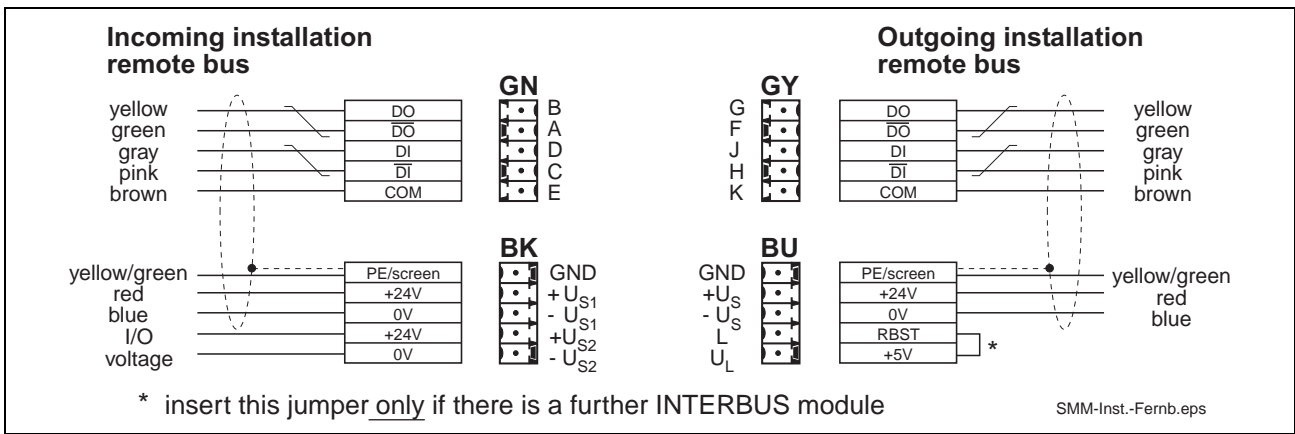


Figure 4-21: Installation remote bus connection

Type code

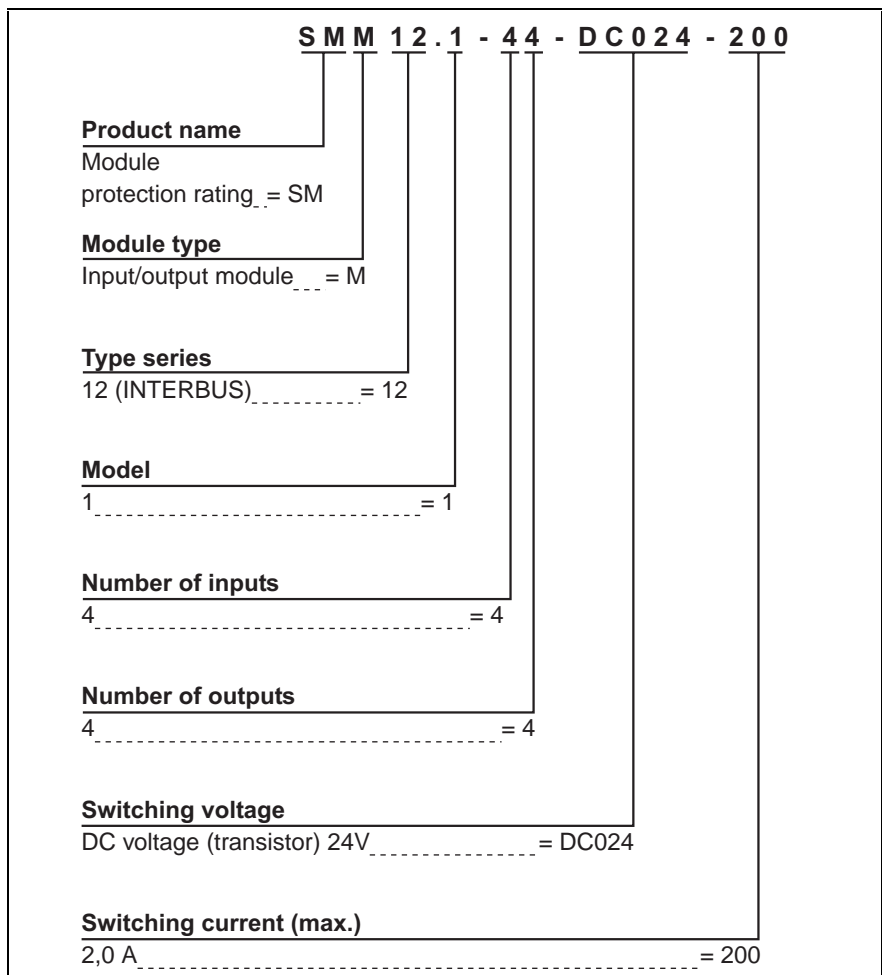


Figure 4-22: Type code SMM12.1-44-DC024-200

5 Typical Applications

5.1 INTERBUS Installation Remote Bus Interface

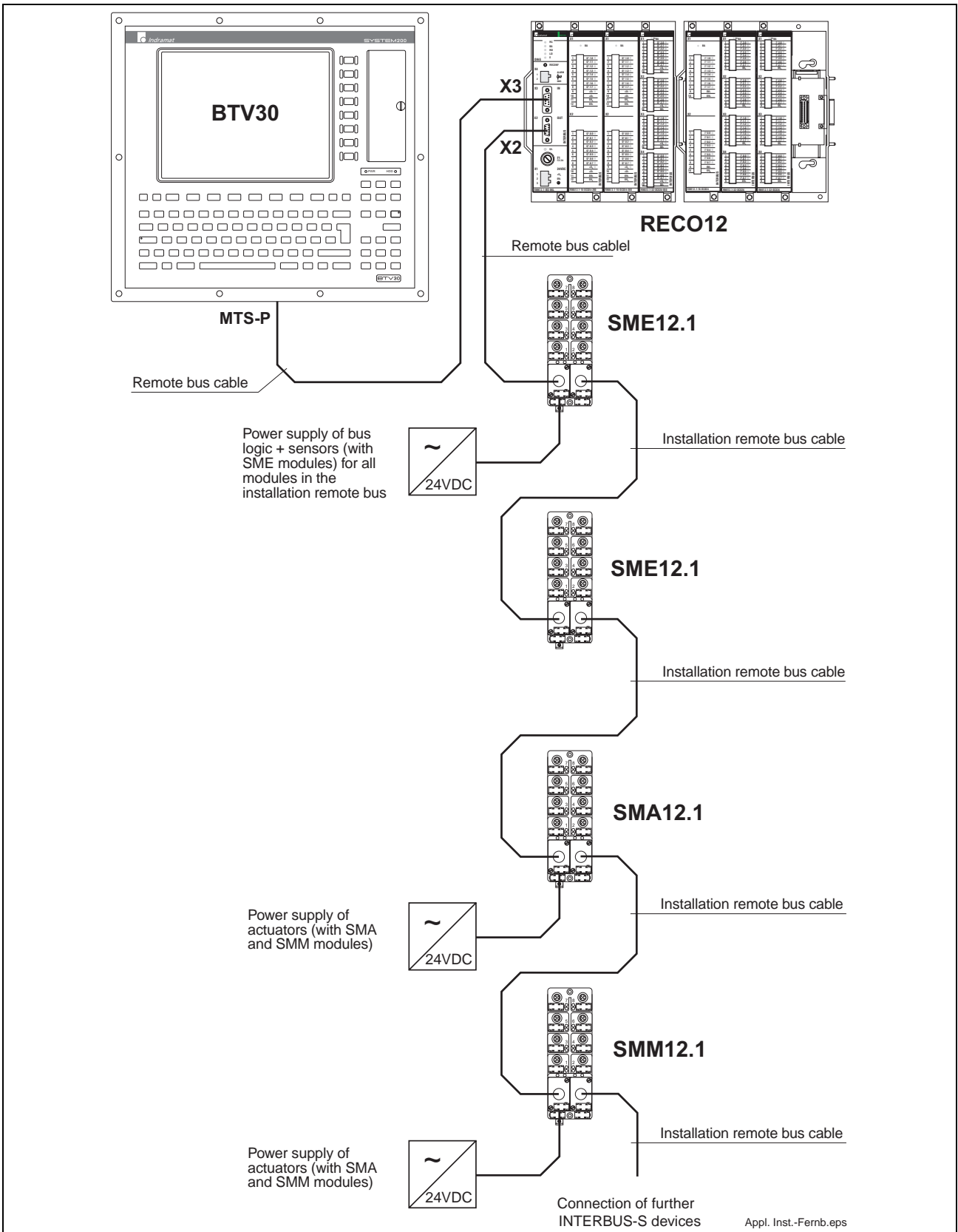


Figure 5-23: INTERBUS installation remote bus interface

5.2 INTERBUS Remote Bus Interface

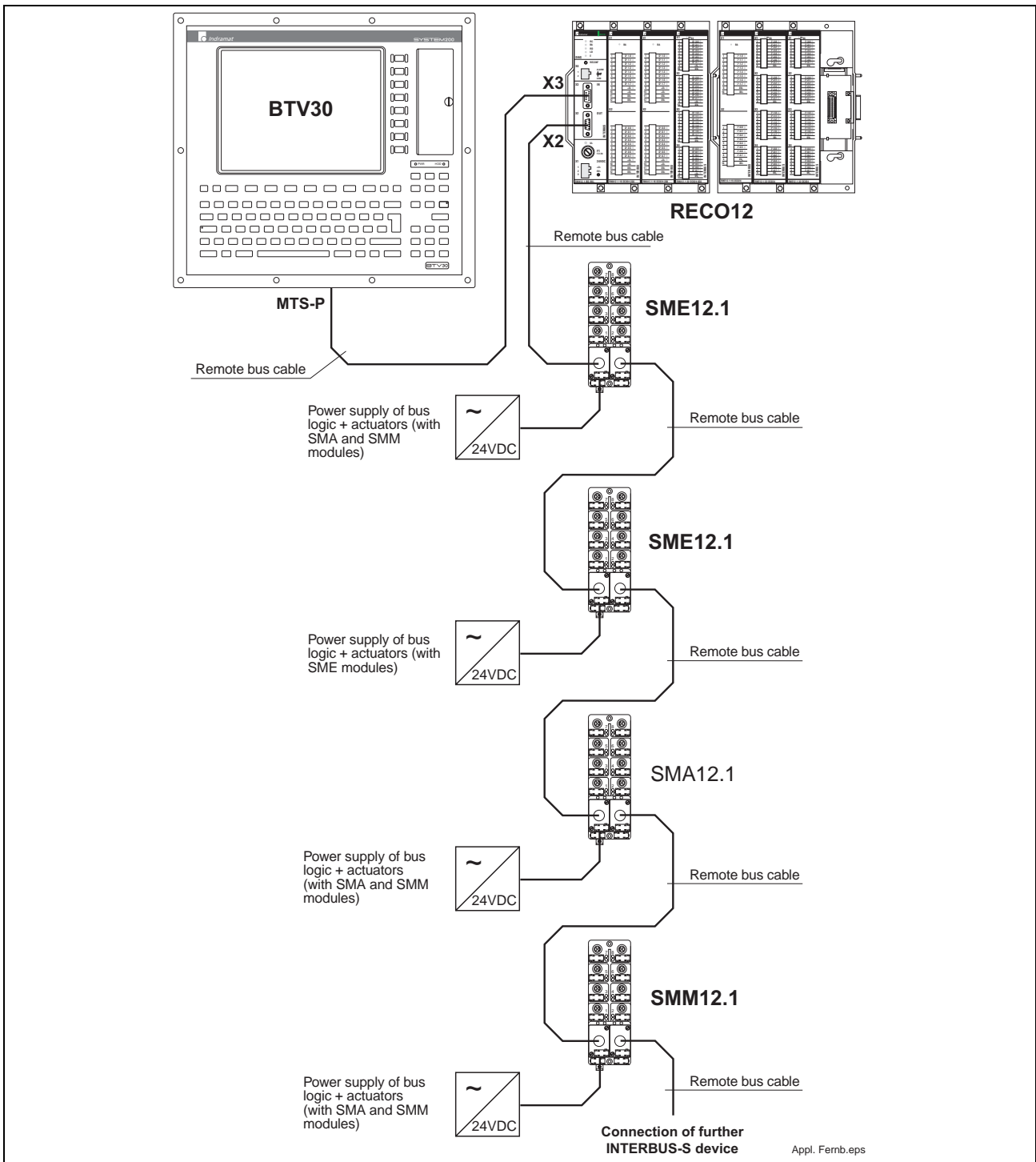


Figure 5-24: Remote bus interface

6 Accessories

6.1 Accessory Kit

An accessory kit SUP-M03-SM*12.1 (MN: 278 880) is available for expedient installation of the SM*12.1 modules.

This accessory kit contains the following components:

- 4 x MN: 252 435 Cable glands
- 4 x MN: 211 665 Cable gland nuts
- 5 x MN: 277 260 Dust cap
- 3 x MN: 277 261 Labels (15 off)

Writing on the module labels is possible using either a water-resistant felt pen (such as Edding pen) or a suitable plotter.

6.2 Accessory Piece Parts




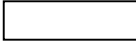
Unit designation	Accessories	Material number	INDRAMAT designation
SM*12.1	PVC-Verschr. PG9 	MN: 252 435	VERSCHR-PG09.0-GER-NN-06.5*09.5-PV-C4N-6
	Nut - PG9,6KT 	MN: 211 665	Mutter-6KT-PG9.0*-A-DIN46258-MS
	Protective cap 	MN: 277 260	SUP-M01-SM*12.1
	Labels 	MN: 277 261	SUP-M02-SM*12.1 (5 St.)

Figure 6-25: Accessories

Sales & Service Facilities

Germany

Germany Center <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service	Germany East <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service	Germany West <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service	Germany North <input checked="" type="checkbox"/> V/S <input type="checkbox"/> Service
INDRAMAT GmbH Bgm.-Dr.-Nebel-Str. 2 D - 97816 Lohr am Main Phone: +49 (0)9352/40-0 Fax: +49 (0)9352/40-4885	INDRAMAT GmbH Beckerstraße 31 D - 09120 Chemnitz Phone: +49 (0)371/35 55-0 Fax: +49 (0)371/35 55-333	INDRAMAT GmbH Harkortstraße 25 D - 40849 Ratingen Phone: +49 (0)2102/43 18-0 Fax: +49 (0)2102/41 315	INDRAMAT GmbH Kieler Straße 212 D - 22525 Hamburg Phone: +49 (0)40/85 31 57-0 Fax: +49 (0)40/85 31 57-15
Germany South <input checked="" type="checkbox"/> V/S <input type="checkbox"/> Service	Germany South-West <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service		INDRAMAT Service-Hotline
INDRAMAT GmbH Ridlerstraße 75 D-80339 München Phone: +49 (0)89/540138-30 Fax: +49 (0)89/540138-10	INDRAMAT GmbH Böblinger Straße 25 D-71229 Leonberg Phone: +49 (0)7152/9 72-6 Fax: +49 (0)7152/9 72-727		INDRAMAT GmbH Phone: +49 (0)172/660 04 06 or Phone: +49 (0)171/333 88 26

Service agencies in Germany

Europe

<p>Austria <input checked="" type="checkbox"/> V/S <input type="checkbox"/> Service</p> <p>Mannesmann Rexroth Ges.m.b.H. Geschäftsbereich INDRAMAT Hägelingasse 3 A - 1140 Wien</p> <p>Phone: +43 (0)1/9852540-400 Fax: +43 (0)1/9852540-93</p>	<p>Austria <input type="checkbox"/> V/S <input checked="" type="checkbox"/> Service</p> <p>Mannesmann Rexroth G.m.b.H. Geschäftsbereich INDRAMAT Industriepark 18 A - 4061 Pasching</p> <p>Phone: +43 (0)7221/605-0 Fax: +43 (0)7221/605-21</p>	<p>Belgium <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service</p> <p>Mannesmann Rexroth N.V.-S.A. Geschäftsbereich INDRAMAT Industrielaan 8 B-1740 Ternat</p> <p>Phone: +32 (0)2/5823180 Fax: +32 (0)2/5824310</p>	<p>Denmark <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service</p> <p>BEC AS Zinkvej 6 DK-8900 Randers</p> <p>Phone: +45 (0)87/11 90 60 Fax: +45 (0)87/11 90 61</p>
<p>England <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service</p> <p>Mannesmann Rexroth Ltd. INDRAMAT Division 4 Esland Place, Love Lane GB - Cirencester, Glos GL7 1YG</p> <p>Phone: +44 (0)1285/658671 Fax: +44 (0)1285/654991</p>	<p>Finland <input checked="" type="checkbox"/> V/S <input type="checkbox"/> Service</p> <p>Rexroth Mecman OY Ansatie 6 SF-017 40 Vantaa</p> <p>Phone: +358 (0)9/84 91 11 Fax: +358 (0)9/84 91 13 60</p>	<p>France <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service</p> <p>Mannesmann Rexroth S.A. Division INDRAMAT Parc des Barbannières 4, Place du Village F-92632 Gennevilliers Cedex</p> <p>Phone: +33 (0)141 47 54 30 Fax: +33 (0)147 94 69 41 Hotline: +33 (0)6 08 33 43 28</p>	<p>France <input checked="" type="checkbox"/> V/S <input type="checkbox"/> Service</p> <p>Mannesmann Rexroth S.A. Division INDRAMAT 270, Avenue de Lardenne F - 31100 Toulouse</p> <p>Phone: +33 (0)5 61 49 95 19 Fax: +33 (0)5 61 31 00 41</p>
<p>France <input checked="" type="checkbox"/> V/S <input type="checkbox"/> Service</p> <p>Mannesmann Rexroth S.A. Division INDRAMAT 91, Bd. Irène Joliot-Curie F - 69634 Vénissieux Cedex</p> <p>Phone: +33 (0)4 78 78 53 65 Fax: +33 (0)4 78 78 52 53</p>	<p>Italy <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service</p> <p>Mannesmann Rexroth S.p.A. Divisione INDRAMAT Via G. Di Vittoria, 1 I - 20063 Cernusco S/N.MI</p> <p>Phone: +39 (0)2/92 36 52 70 Fax: +39 (0)2/92 36 55 12</p>	<p>Italy <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service</p> <p>Mannesmann Rexroth S.p.A. Divisione INDRAMAT Via Borgomanero, 11 I - 10145 Torino</p> <p>Phone: +39 (0)11/7 71 22 30 Fax: +39 (0)11/7 71 01 90</p>	<p>Italy <input checked="" type="checkbox"/> V/S <input type="checkbox"/> Service</p> <p>Mannesmann Rexroth S.p.A. Divisione INDRAMAT Via del Progresso, 16 (Zona Ind.) I - 35020 Padova</p> <p>Phone: +39 (0)49/8 70 13 70 Fax: +39 (0)49/8 70 13 77</p>
<p>Italy <input type="checkbox"/> V/S <input checked="" type="checkbox"/> Service</p> <p>Mannesmann Rexroth S.p.A. Divisione INDRAMAT Via de Nicola, 12 I - 80053 Castellamare di Stabia NA</p> <p>Phone: +39 (0)81/8 72 30 37 Fax: +39 (0)81/8 72 30 18</p>	<p>Italy <input checked="" type="checkbox"/> V/S <input type="checkbox"/> Service</p> <p>Mannesmann Rexroth S.p.A. Divisione INDRAMAT Viale Oriani, 38/A I - 40137 Bologna</p> <p>Phone: +39 (0)51/34 14 14 Fax: +39 (0)51/34 14 22</p>	<p>Netherlands <input checked="" type="checkbox"/> V/S <input type="checkbox"/> Service</p> <p>Hydraudyne Hydrauliek B.V. Kruisbroeksestraat 1 P.O. Box 32 NL - 5281 RV Boxtel</p> <p>Phone: +31 (0)411/65 19 51 Fax: +31 (0)411/65 14 83</p>	<p>Netherlands <input type="checkbox"/> V/S <input checked="" type="checkbox"/> Service</p> <p>Hydrocare B.V. Kruisbroeksestraat 1 P.O. Box 32 NL - 5281 RV Boxtel</p> <p>Phone: +31 (0)411/65 19 51 Fax: +31 (0)411/67 78 14</p>
<p>Spain <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service</p> <p>Mannesmann Rexroth S.A. División INDRAMAT Centro Industrial Santiga Obradors s/n E-08130 Santa Perpetua de Mogoda Barcelona</p> <p>Phone: +34 937 47 94 00 Fax: +34 937 47 94 01</p>	<p>Spain <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service</p> <p>Goimendi S.A. División Indramat Jolastokieta (Herrera) Apartado 11 37 E - 20017 San Sebastian</p> <p>Phone: +34 9 43/40 01 63 Fax: +34 9 43/39 17 99</p>	<p>Sweden <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service</p> <p>Rexroth Mecman Svenska AB INDRAMAT Division Varuvägen 7 S - 125 81 Stockholm</p> <p>Phone: +46 (0)8/727 92 00 Fax: +46 (0)8/64 73 277</p>	<p>Switzerland - East <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service</p> <p>Mannesmann Rexroth AG Geschäftsbereich INDRAMAT Gewerbstraße 3 CH-8500 Frauenfeld</p> <p>Phone: +41 (0)52/720 21 00 Fax: +41 (0)52/720 21 11</p>
<p>Switzerland - West <input checked="" type="checkbox"/> V/S <input type="checkbox"/> Service</p> <p>Mannesmann Rexroth SA Département INDRAMAT Chemin de l'Ecole 6 CH-1036 Sullens</p> <p>Phone: +41 (0)21/731 43 77 Fax: +41 (0)21/731 46 78</p>	<p>Russia <input type="checkbox"/> V/S <input checked="" type="checkbox"/> Service</p> <p>Tschudnenko E.B. Arsenia 22 RUS - 153000 Ivanovo Rußland</p> <p>Phone: +7 093/223 96 33 oder/or +7 093/223 95 48 Fax: +7 093/223 46 01</p>	<p>Slowenia <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service</p> <p>DOMEL Elektromotorji in gospodinjski aparati d. d. Otoki 21 SLO - 64 228 Zelezniki</p> <p>Phone: +386 64/61 73 32 Fax: +386 64/64 71 50</p>	<p>Turkey <input checked="" type="checkbox"/> V/S <input type="checkbox"/> Service</p> <p>Mannesmann Rexroth Hidropar A..S. Fevzi Cakmak Cad No. 3 TR - 34630 Sefaköy Istanbul</p> <p>Phone: +90 212/541 60 70 Fax: +90 212/599 34 07</p>

European Service agencies (without Germany)

Outside Europe

<p>Argentina <input checked="" type="checkbox"/> V/S <input type="checkbox"/> Service</p> <p>Mannesmann Rexroth S.A.I.C. Division INDRAMAT Acassusso 48 41/7 RA - 1605 Munro (Buenos Aires)</p> <p>Phone: +54 (0)1/756 01 40 +54 (0)1/756 01 36</p>	<p>Argentina <input type="checkbox"/> V/S <input checked="" type="checkbox"/> Service</p> <p>NAKASE Asesoramiento Tecnico Calle 49, No. 5764-66 RA - 1653 Villa Balester Provincia de Buenos Aires</p> <p>Phone: +54 (0) 1/768 24 13 Fax: +54 (0) 1/768 36 43</p>	<p>Australia <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service</p> <p>AIMS - Australian Industrial Machinery Services Pty. Ltd. Unit 3/45 Horne ST Campbellfield 3061 AUS - Melbourne, VIC</p> <p>Phone: +61 (0)3/93 59 02 28 Fax: +61 (0)3/93 59 02 66</p>	<p>Brazil <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service</p> <p>Mannesmann Rexroth Automação Ltda. Divisão INDRAMAT Rua Georg Rexroth, 609 Vila Padre Anchieta BR - 09951-270 Diadema-SP [Caixa Postal 377] [BR-09901-970 Diadema-SP]</p> <p>Phone: +55 (0)11/745 90 60 +55 (0)11/745 90 70 Fax: +55 (0)11/745 90 50</p>
<p>Canada <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service</p> <p>Basic Technologies Corporation Burlington Division 3426 Mainway Drive Burlington, Ontario Canada L7M 1A8</p> <p>Phone: +1 905/335 55 11 Fax: +1 905/335-41 84</p>	<p>China <input checked="" type="checkbox"/> V/S <input type="checkbox"/> Service</p> <p>Mannesmann Rexroth (China) Ltd. Shanghai Office - Room 206 Shanghai Internat. Trade Centre 2200 Yanan Xi Lu PRC - Shanghai 200335</p> <p>Phone: +86 21/62 75 53 33 Fax: +86 21/62 75 56 66</p>	<p>China <input type="checkbox"/> V/S <input checked="" type="checkbox"/> Service</p> <p>Mannesmann Rexroth (China) Ltd. Shanghai Parts & Service Center 199 Wu Cao Road, Hua Cao Minhang District PRC - Shanghai 201 103</p> <p>Phone: +86 21/62 20 00 58 Fax: +86 21/62 20 00 68</p>	<p>China <input checked="" type="checkbox"/> V/S <input type="checkbox"/> Service</p> <p>Mannesmann Rexroth (China) Ltd. 15/F China World Trade Center 1, Jianguomenwai Avenue PRC - Beijing 100004</p> <p>Phone: +86 10/65 05 03 80 Fax: +86 10/65 05 03 79</p>
<p>China <input checked="" type="checkbox"/> V/S <input type="checkbox"/> Service</p> <p>Mannesmann Rexroth (China) Ltd. A-5F., 123 Lian Shan Street Sha He Kou District PRC - Dalian 116 023</p> <p>Phone: +86 411/46 78 930 Fax: +86 411/46 78 932</p>	<p>Hongkong <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service</p> <p>Rexroth (China) Ltd. 19 Cheung Shun Street 1st Floor, Cheung Sha Wan, Kowloon, Hongkong</p> <p>Phone: +852 27/41 13 51/-54 oder/or +852 27/41 14 30 Fax: +852 27/86 07 33</p>	<p>India <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service</p> <p>Mannesmann Rexroth (India) Ltd. INDRAMAT Division Plot. 96, Phase III Peenya Industrial Area IND - Bangalore - 560058</p> <p>Phone: +91 (0)80/8 39 21 01 Fax: +91 (0)80/8 39 43 45</p>	<p>India <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service</p> <p>Mannesmann Rexroth (India) Ltd. INDRAMAT Division Plot. A-58, TTC Industrial Area Thane Turbhe Midc Road Mahape Village IND - Navi Mumbai - 400 701</p> <p>Phone: +91 (0)22/7 61 46 22 Fax: +91 (0)22/7 68 15 31</p>
<p>Indonesia <input checked="" type="checkbox"/> V/S <input type="checkbox"/> Service</p> <p>PT. Rexroth Wijayakusuma Jl. Raya Bekasi Km 21 Pulogadung RI - Jakarta Timur 13920</p> <p>Phone: +62 21/4 61 04 87 +62 21/4 61 04 88 Fax: +62 21/4 60 01 52</p>	<p>Japan <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service</p> <p>Rexroth Automation Co., Ltd. INDRAMAT Division 1F, I.R. Building Nakamachidai 4-26-44 Tsuzuki-ku, Yokohama-shi J - Kanagawa-ken 224-004</p> <p>Phone: +81 459/42-72 10 Fax: +81 459/42-03 41</p>	<p>Korea <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service</p> <p>Mannesmann Rexroth-Seki Co Ltd. 1500-12 Da-Dae-Dong ROK - Saha-Ku, Pusan, 604-050</p> <p>Phone: +82 (0)51/2 60 06 18 Fax: +82 (0)51/2 60 06 19</p>	<p>Korea <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service</p> <p>Seo Chang Corporation Ltd. Room 903, Jail Building 44-35 Yeouido-Dong Yeoungdeungpo-Ku C.P.O.Box 97 56 ROK - Seoul</p> <p>Phone: +82 (0)2/7 80 82 08 +82 (0)2/7 80 82 09 Fax: +82 (0)2/7 84 54 08</p>
<p>Mexico <input checked="" type="checkbox"/> V/S <input type="checkbox"/> Service</p> <p>Rexroth Mexico S.A. de C.V. Calle Neptuno 72 Unidad Ind. Vallejo MEX - 07700 Mexico, D.F.</p> <p>Phone: +52 5 754 17 11 +52 5 754 36 84 +52 5 754 12 60 Fax: +52 5 754 50 73 +52 5 752 59 43</p>		<p>South Africa <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service</p> <p>HYTEC Automation (Pty) Ltd. 28 Banfield Road, Industria North RSA - Maraisburg 1700</p> <p>Phone: +27 (0)11/673 20 80 Fax: +27 (0)11/673 72 69</p>	<p>Taiwan <input checked="" type="checkbox"/> V/S <input type="checkbox"/> Service</p> <p>Rexroth Uchida Co., Ltd. No.1, Tsu Chiang Street Tu Cheng Ind. Estate Taipei Hsien, Taiwan, R.O.C.</p> <p>Phone: +886 2/2 68 13 47 Fax: +886 2/2 68 53 88</p>

Service agencies outside Europe

Outside Europe / USA

USA <input type="checkbox"/> V/S <input type="checkbox"/> Service	USA <input type="checkbox"/> V/S <input type="checkbox"/> Service	USA <input type="checkbox"/> V/S <input type="checkbox"/> Service	USA <input type="checkbox"/> V/S <input type="checkbox"/> Service
Mannesmann Rexroth Corporation INDRAMAT Division 5150 Prairie Stone Parkway USA - Hoffman Estates, IL 60192-3707 Phone: +1 847/6 45 36 00 Fax: +1 847/6 45 62 01	Mannesmann Rexroth Corporation INDRAMAT Division Central Region Technical Center USA - Auburn Hills, MI 48326 Phone: +1 248/3 93 33 30 Fax: +1 248/3 93 29 06	Mannesmann Rexroth Corporation INDRAMAT Division Southeastern Technical Center 3625 Swiftwater Park Drive USA - Suwanee Georgia 30174 Phone: +1 770/9 32 32 00 +1 770/9 32 19 03	Mannesmann Rexroth Corporation INDRAMAT Division Northeastern Technical Center 99 Rainbow Road USA - East Granby, Connecticut 06026 Phone: +1 860/8 44 83 77 +1 860/8 44 85 95
USA <input type="checkbox"/> V/S <input type="checkbox"/> Service Mannesmann Rexroth Corporation INDRAMAT Division Charlotte Regional Sales Office 14001 South Lakes Drive USA - Charlotte, North Carolina 28273 Phone: +1 704/5 83 97 62 +1 704/5 83 14 86			

Service agencies outside Europe / USA

Notes

