

Solenoid Valve Island Type 3965

for the control of pneumatic actuators



**SAMSO
MATIC**

General

The Type 3965 Solenoid Valve Island is a compact solution for the centralized control of pneumatic actuators in chemical and pharmaceutical plants.

The modular design with various switching functions and connection options allows the solenoid valves to be configured to meet the individual requirements of a control task. The Type 3965 Solenoid Valve Island provides a high level of operating safety in hazardous areas. Thanks to a low power input, low-power binary signals over fieldbus or remote I/Os can be used for controlling.

General features

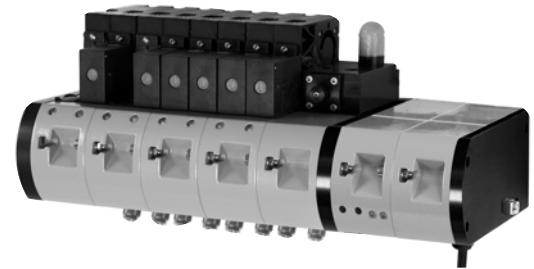
- Compact modular design with up to 16 switching functions
- Combination of different switching functions is possible
- Conversion of switching functions by the customer is possible
- Less wiring required thanks to common cable, multipole connector or bus connection for PROFIBUS-DP (Ex ia)
- Less tubing required thanks to common air supply and exhaust line
- Service life with over 20 million switching cycles
- Ambient temperature -25 to $+80^{\circ}\text{C}$
- Corrosion-resistant enclosure with degree of protection IP 54
- Wall mounting

Electric features

- e/p binary converter with nozzle/flapper assembly
- Type of protection Ex ia, Ex nA, Ex nL
- Nominal signal 6/12/24 V DC or 24 V AC
- Power consumption 6 to 27 mW or 0.04 VA
- Manual override
- Electric status indicator
- Connection with common cable, multipole connector, single plug-type connector or bus connection for PROFIBUS-DP (Ex ia)

Pneumatic features

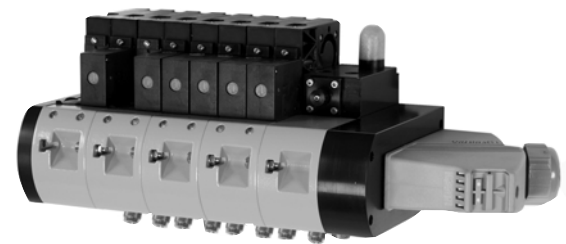
- Diaphragm elements with return spring
- 2/2, 3/2 or 5/2-way function
- K_{VS} value 0.13
- Air supply 2.2 to 6.0 bar
- Operating pressure maximum 6.0 bar
- Threaded connections G (NPT) $1/8$ and $1/4$



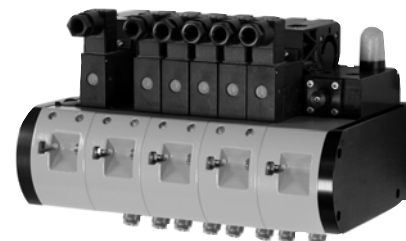
Bus connection for PROFIBUS-DP (Ex ia)



Electric connection with common cable



Electric connection with multipole connector



Electric connection with single plug-type connectors

Fig. 1 · Type 3965 Solenoid Valve Island

Examples of configuration

Bus connection for PROFIBUS-DP (Ex ia)

- ① Electric connection module for PROFIBUS-DP (Ex ia)
- ② Pneumatic connection module with pressure reducer
- ③ Base module with $2 \times 3/2$ or $2 \times 2/2$ -way solenoid valve
- ④ Base module with $1 \times 5/2$ -way solenoid valve
- ⑤ Left end plate
- ⑥ Electric status indicator
- ⑦ Manual override
- ⑧ Pilot valve
- ⑨ Booster valve
- ⑩ Filter G (NPT) $1/4$
- ⑪ Mounting bracket

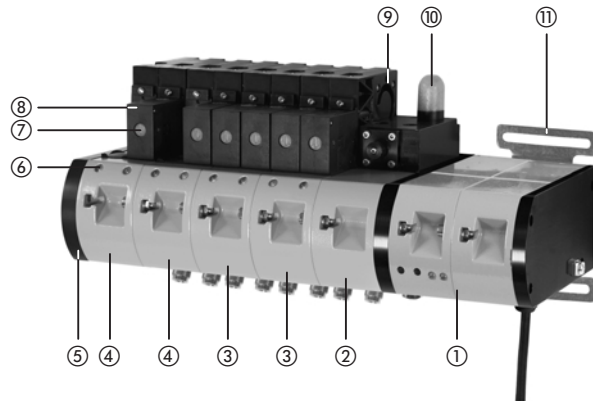


Fig. 2

Electric connection with common cable

- ① Right end plate with cable gland M 20 x 1.5
- ② Pneumatic connection module with pressure reducer
- ③ Base module with $2 \times 3/2$ or $2 \times 2/2$ -way solenoid valve
- ④ Base module with $1 \times 5/2$ -way solenoid valve
- ⑤ Left end plate
- ⑥ Electric status indicator
- ⑦ Manual override
- ⑧ Pilot valve
- ⑨ Booster valve
- ⑩ Filter G (NPT) $1/4$
- ⑪ Mounting bracket

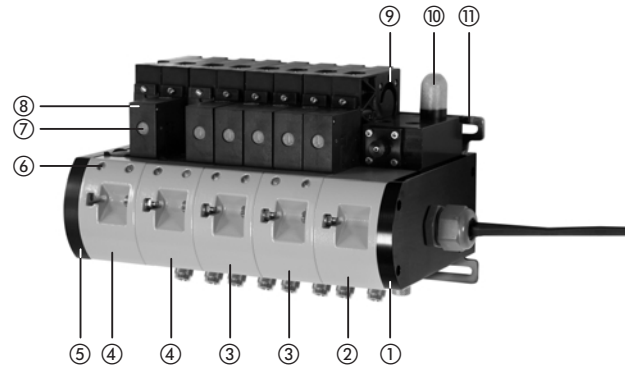


Fig. 3

Electric connection with multipole connector

- ① Right end plate with multipole connector
- ② Pneumatic connection module with pressure reducer
- ③ Base module with $2 \times 3/2$ or $2 \times 2/2$ -way solenoid valve
- ④ Base module with $1 \times 5/2$ -way solenoid valve
- ⑤ Left end plate
- ⑥ Electric status indicator
- ⑦ Manual override
- ⑧ Pilot valve
- ⑨ Pneumatic status indicator
- ⑩ Booster valve
- ⑪ Filter G (NPT) $1/4$
- ⑫ Mounting bracket

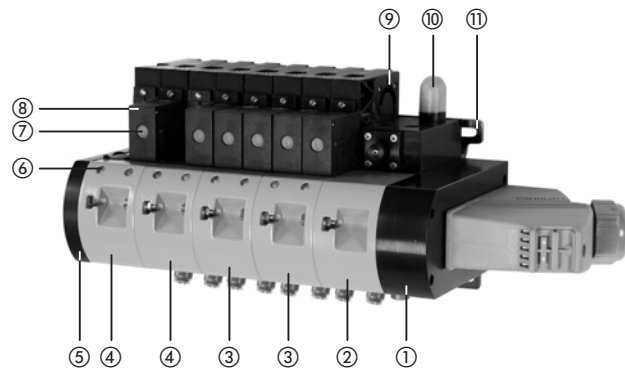


Fig. 4

Electric connection with single plug-type connectors

- ① Right end plate
- ② Pneumatic connection module with pressure reducer
- ③ Base module with $2 \times 3/2$ or $2 \times 2/2$ -way solenoid valve
- ④ Base module with $1 \times 5/2$ -way solenoid valve
- ⑤ Left end plate
- ⑥ Manual override
- ⑦ Pilot valve
- ⑧ Plug-type connector according to EN 175301-803
- ⑨ Booster valve
- ⑩ Filter G (NPT) $1/4$
- ⑪ Mounting bracket

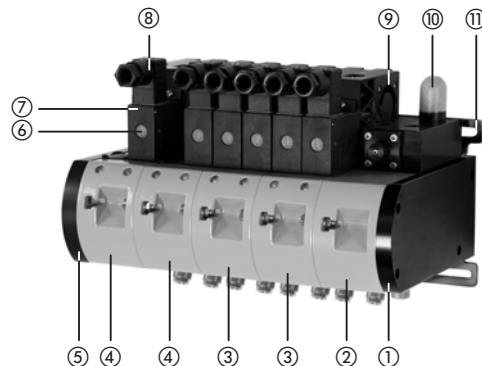


Fig. 5

Modules

Base modules

2 × 2/2-way solenoid valve

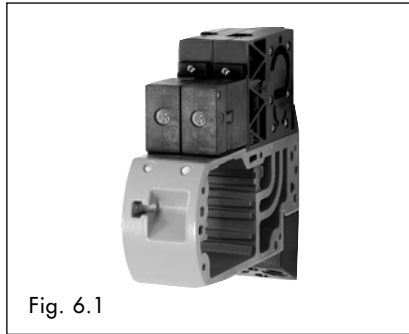


Fig. 6.1

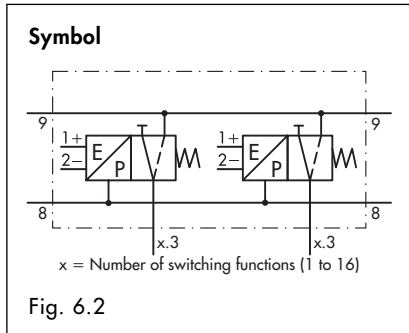


Fig. 6.2

- Ex version (optional)
- Nominal signal 6/12/24 V DC or 24 V AC
- Electric status indicator (optional)
- Manual override (optional)
- 2 × 2/2-way function
- Spring return
- K_{VS} value 0.13
- Output connections G (NPT) $1/8$

2 × 3/2-way solenoid valve

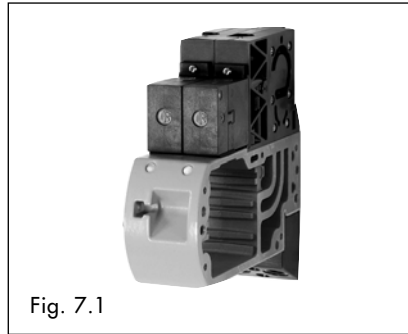


Fig. 7.1

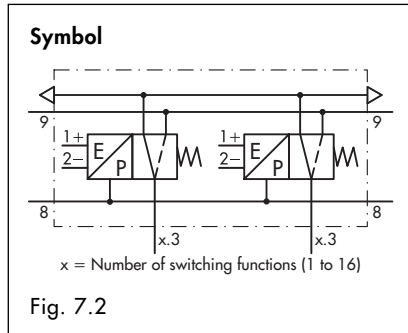


Fig. 7.2

- Ex version (optional)
- Nominal signal 6/12/24 V DC or 24 V AC
- Electric status indicator (optional)
- Manual override (optional)
- 2 × 3/2-way function
- Spring return
- K_{VS} value 0.13
- Output connections G (NPT) $1/8$

1 × 5/2-way solenoid valve

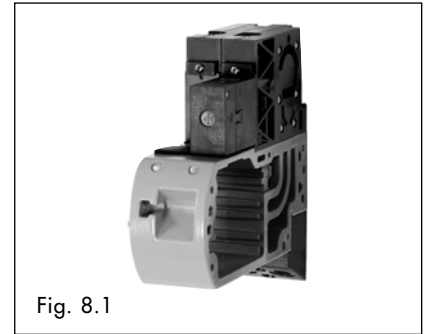


Fig. 8.1

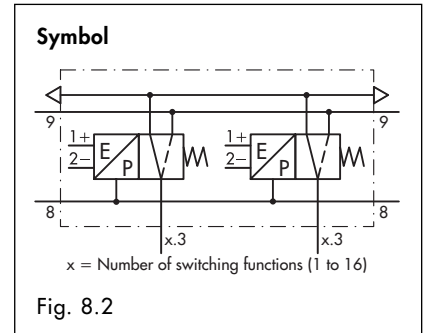


Fig. 8.2

- Ex version (optional)
- Nominal signal 6/12/24 V DC or 24 V AC
- Electric status indicator (optional)
- Manual override (optional)
- 1 × 5/2-way function
- Spring return
- K_{VS} value 0.13
- Output connections G (NPT) $1/8$

Pneumatic connection modules

Without pressure reducer

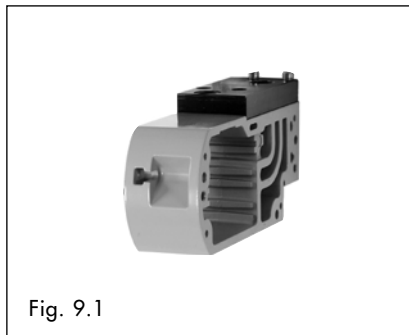


Fig. 9.1

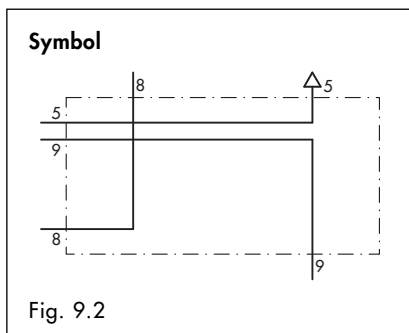


Fig. 9.2

- External air supply over connection 8
- Operating medium over connection 9
- Operating pressure max. 6.0 bar
- Supply air/exhaust air connections G (NPT) $1/4$

With pressure reducer

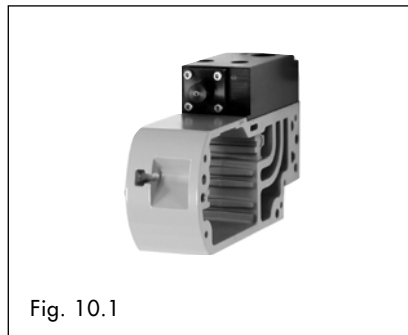


Fig. 10.1

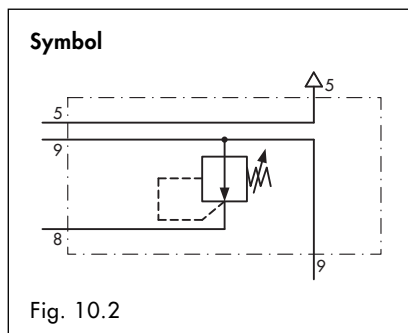


Fig. 10.2

- Pressure reducer
- Internal air supply over connection 9
- Operating medium over connection 9
- Operating pressure 2.2 to 6.0 bar
- Supply air/exhaust air connections G (NPT) $1/4$

Electric connection module

Bus connection for PROFIBUS-DP (Ex ia)



Fig. 11.1

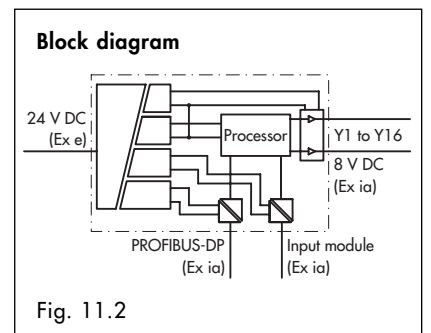


Fig. 11.2

- Intrinsically safe version (Ex ia)
- Control of 16 solenoid valves (6 V DC)
- Connection of 2 input modules for 32 NAMUR sensors
- Cable break and short-circuit monitoring

Function

The Type 3965 Solenoid Valve Island consists of lined-up base and connection modules, which are connected over separate channels for operating medium and exhaust air.

The line starts with a pneumatic connection module for common air supply and exhaust line. The base modules include solenoid valves, consisting of a pilot valve and a booster valve. The pilot valves can be controlled over a common cable, multipole connector, single plug-type connectors or a connection module for PROFIBUS-DP.

Pneumatic connection modules

The pneumatic connection module provides a common air supply and exhaust line.

The pneumatic connection module is fitted with a pressure reducer for internal air supply over connection 9. For external air supply over connection 8, a pneumatic connection module without pressure reducer is used.

Pilot valves

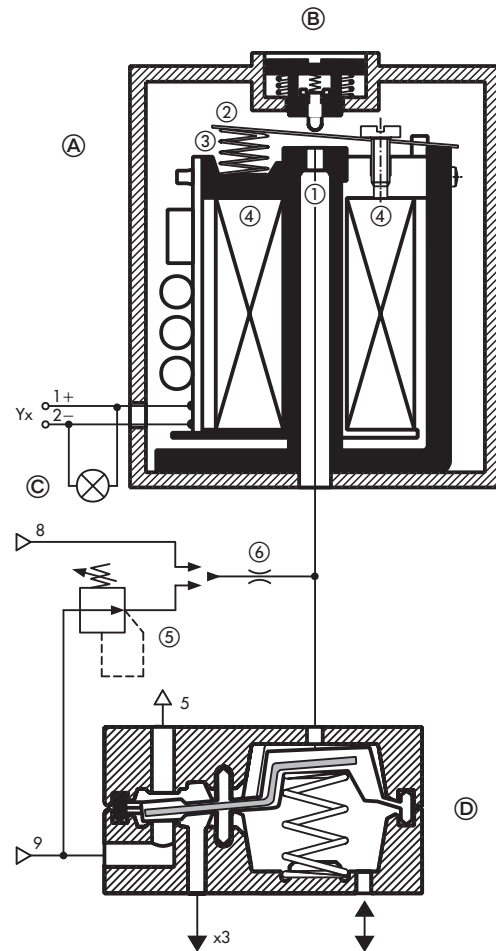
The pilot valves consist of an e/p binary converter **A** with manual override **B** and an LED **C**. The air is fed to the e/p binary converter **A** over the pressure reducer **5** and the restrictor **6** (Fig. 12).

In the normal position, the flapper **2** is lifted off the outlet nozzle **1** by the spring **3**. As a result, a pressure lower than the switch-off pressure of the booster valve **D** builds up in the pressure divider, consisting of a restrictor **6** and an outlet nozzle **1**. When the solenoid **4** is energized by a binary signal, the outlet nozzle **1** is closed by the flapper **2** against the force of the spring **3**. This causes the pressure in the pressure divider to rise above the switch-on pressure of the booster valve **D**, switching it to the operating position. When the binary signal is deactivated, the booster valve **D** is switched back to the normal position by a return spring.

Booster valves

The 2/2 and 3/2-way booster valves consist of a diaphragm element with return spring. The 5/2-way booster valve consists of two parallel controlled diaphragm elements with return spring. Up to 16 switching functions can be combined.

Function diagram of the 3/2-way solenoid valve



- A** e/p binary converter
- 1** Outlet nozzle
- 2** Flapper
- 3** Spring
- 4** Solenoid
- 5** Pressure reducer
- 6** Restrictor
- B** Manual override (optional)
- C** Light-emitting diode (optional)
- D** Booster valve

Fig. 12

Technical data

Pneumatic connection module			
Version		Without pressure reducer	With pressure reducer
Material	Module enclosure	GD AlSi12, powder-coated, grayish beige RAL 1019	
	Connection plate	GD AlSi12, anodized, black	
	Screws	Stainless steel 1.4571	
	Pressure reducer	–	GD AlSi12, anodized, black
	Diaphragm	–	Silicone rubber
	Spring	–	Stainless steel 1.4310
	Seat/plug	–	CuZn40Pb2
Air supply	Medium	Instrument air (free of corrosive particles) or nitrogen	
	Pressure	2.2 bar \pm 10 % ¹⁾	2.2 to 6.0 bar ²⁾
Operating medium		Instrument air (free of corrosive particles) or nitrogen ²⁾ , Instrument air (free of corrosive particles), oil containing air or noncorrosive gases ¹⁾	
Operating pressure		max. 6.0 bar ¹⁾	
Connec- tion	Air supply (8)	G (NPT) 1/8	–
	Operating medium (9)	G (NPT) 1/4	–
	Exhaust air (5)	G (NPT) 1/4	–
Degree of protection		IP 54	
Ambient temperature		– 25 to + 80 °C	
Weight approx.		150 g	200 g

Base module with solenoid valve			
Type 3965	-XXXXXX2	-XXXXXX0	-XXXXXX1
Switching function	2/2-way function ³⁾	3/2-way function ³⁾	5/2-way function
K_{VS} value ⁴⁾	0.13		
Construction	Solenoid with flapper/nozzle assembly and diaphragm element with return spring		
Material	Module enclosure	GD AlSi12, powder-coated, grayish beige RAL 1019	
	Connection plate	GD AlSi12, anodized, black	
	Valve enclosure	Polyamide PA6-3-T, black	
	Screws	Stainless steel 1.4571	
	Springs	Stainless steel 1.4310	
	Gaskets	Silicone rubber, nitrile butadiene rubber	
	Diaphragm	Chloroprene rubber	
Electric status indicator	Light-emitting diode, yellow: "Nominal signal present"		
Air consumption for each switching function	\leq 10 l/h (actuated), \leq 80 l/h (unactuated)		
Switching cycles	$\geq 2 \times 10^7$		
Switching time	\leq 65 ms		
Ambient temperature ⁵⁾	– 25 to + 80 °C		
Degree of protection		IP 54	
Connection	electric	see "End plates", page 6	
	pneumatic	G (NPT) 1/8	
Weight approx.		150 g	

1) With external air supply over connection 8

2) With internal air supply over connection 9

3) One or two switching functions are possible for each base module

4) Air flow at $p_1 = 2.4$ bar and $p_2 = 1.0$ bar can be calculated according to the following equation: $Q = K_{VS} \times 36.22$, expressed in m^3/h

5) The maximum permissible ambient temperature of the solenoid valve island depends on the permissible ambient temperature of the components, the type of protection and the temperature class

Electrical data for solenoid valves					
Type 3965		-XXXX1	-XXXX2	-XXXX3	-00XX8
Nominal signal	U_N	6 V DC max. 27 V ¹⁾	12 V DC max. 25 V ¹⁾	24 V DC max. 32 V ¹⁾	24 V AC max. 36 V ¹⁾
	f_N				48 to 62 Hz
Switching point "On"	$U_{+80^\circ\text{C}}$	≥ 4.8 V	≥ 9.6 V	≥ 18.0 V	19 to 36 V
	$I_{+20^\circ\text{C}}$	≥ 1.41 mA	≥ 1.52 mA	≥ 1.57 mA	≥ 1.9 mA
	$P_{+20^\circ\text{C}}$	≥ 5.47 mW	≥ 13.05 mW	≥ 26.71 mW	≥ 0.04 VA
	"Off"	$U_{-25^\circ\text{C}}$	≤ 1.0 V	≤ 2.4 V	≤ 4.7 V
Impedance	$R_{+20^\circ\text{C}}$	2.6 k Ω	5.5 k Ω	10.7 k Ω	Approx. 10 k Ω
Temperature effect		0.4 %/ $^\circ\text{C}$	0.2 %/ $^\circ\text{C}$	0.1 %/ $^\circ\text{C}$	0.1 %/ $^\circ\text{C}$
Type of protection Ex ia IIC ²⁾ for use in hazardous areas (zone 1 or 21)					
Type 3965		-11XX1	-11XX2	-11XX3	
Permissible maximum values for connection to a certified intrinsically safe circuit					
Output voltage ³⁾	U_i	The following values U_i/I_i apply for nominal signals 6/12/24 V DC: 25 V/150 mA, 27 V/125 mA, 28 V/115 mA, 30 V/100 mA, 32 V/85 mA			
Output current ³⁾	I_i				
Power dissipation ³⁾	P_i	250 mW	No limitation		
External capacitance ³⁾	C_i	≈ 0			
External inductance ³⁾	L_i	≈ 0			
Ambient temperature in temperature class					
	T6	-45 to +60 $^\circ\text{C}$			
	T5	-45 to +70 $^\circ\text{C}$			
	T4	-45 to +80 $^\circ\text{C}$			
Type of protection Ex nA II/Ex nL IIC ⁴⁾ for use in hazardous areas (zone 2 or 22)					
Type 3965		-81XX1	-81XX2	-81XX3	
Permissible maximum values for connection to a certified energy-limited circuit					
Output voltage ⁵⁾	U_i	32 V			
Output current ⁵⁾	I_i	132 mA			
Power dissipation ⁵⁾	P_i	250 mW	No limitation		
External capacitance ⁵⁾	C_i	≈ 0			
External inductance ⁵⁾	L_i	≈ 0			
Ambient temperature in temperature class					
	T6	-45 to +60 $^\circ\text{C}$			
	T5	-45 to +70 $^\circ\text{C}$			
	T4	-45 to +80 $^\circ\text{C}$			

End plates					
Version		Left end plate	Right end plate		
Electrical connection		-	Common cable ⁶⁾ with cable gland M 20 x 1.5	Multipole connector ⁷⁾	Single plug-type connector according to EN 175301-803 ⁸⁾ at the pilot valve
Material	End plate	GD AlSi12, anodized, black			
	Gaskets	Silicone rubber			
	Screws	Stainless steel 1.4571			
	Exhaust air plug	Polyamide	-	-	-
	Plug-type connector	-	-	Polyamide	Polyamide
Degree of protection		IP 54			
Ambient temperature		-25 to +80 $^\circ\text{C}$			
Weight approx.		200 g	200 g	500 g	200 g

- 1) Permissible maximum value during continuous duty. For Ex versions, the permissible maximum value U_i applies
- 2) Marking II 2 G Ex ia IIC T6 (zone 1) and II 2 D IP 65 T 80 $^\circ\text{C}$ (zone 21) according to EC Type Examination Certificate PTB 05 ATEX 2044 X
- 3) Permissible maximum values for connection to a certified intrinsically safe circuit
- 4) Marking II 3 G Ex nA II T6 or II 3 G Ex nL IIC T6 (zone 2) and II 3 D IP 54 T 80 $^\circ\text{C}$ or II 3 D IP 65 T 80 $^\circ\text{C}$ (zone 22) according to Statement of Conformity PTB 06 ATEX 2003 X
- 5) Permissible maximum values for connection to a certified energy limited circuit
- 6) Conductor cross-section 0.25 mm², length 1.5 m
- 7) Max. 14 switching functions are possible when connected to galvanically isolated circuits
- 8) The female connector with flat gasket is not included in the scope of delivery (see "Accessories and spare parts", page 14)

Electric connection module for PROFIBUS-DP (Ex ia)		
Version		Electric connection module for PROFIBUS-DP (Ex ia) for use in hazardous areas; Controlling of 16 solenoid valves (6 V DC) with cable break monitoring; Connection of 2 input modules for 32 NAMUR sensors (Ex ia) with cable break and short-circuit monitoring.
Material	Module enclosure	GD AlSi12, powder-coated, grayish beige RAL 1019
	End plates	GD AlSi12, anodized, black
	Gaskets	Silicone rubber
	Screws	Stainless steel 1.4571
	Plug-type connector	Polyamide
Setting the bus address		With 2 rotary switches at the front
Status indicator		1 × LED green/red: "DP", 1 × LED green/red: "I/O"
Cycle time		< 100 ms (NAMUR sensors), < 500 ms (solenoid valves)
Power supply		24 V DC (−15 %/+10 %), 2.3 W (without input module) or 3 W (with 2 input modules)
Connection	Power supply	2-wire connecting cable, length 2 m
	PROFIBUS-DP	Plug-type connector, 9-pole
	Input modules	Round plug connector M 12 × 1, 5-pole (2 input modules can be connected)
Degree of protection		IP 40
Ambient temperature		−20 to +60 °C
Weight approx.		750 g

Input module for NAMUR sensors (Ex ia)		
Version		Input module for 16 NAMUR sensors (Ex ia) for use in hazardous areas
Material	Enclosure	Aluminum, polyamide
	Front plate	Printed circuit board FR 4, light gray, printed in black
Status indicators		1 × LED green: "Power supply on", 16 × LED green: "NAMUR sensor unattenuated" (LED flashes in the event of failure)
Mounting		Snap-on mounting for top hat rail TH 35 according to EN 60715
Connection	NAMUR sensors	Terminals, detachable
	BUS IN-/OUTPUT	Round plug connector M 12 × 1, 5-pole
Degree of protection		IP 20
Ambient temperature		−20 to +60 °C
Weight approx.		380 g

Dimensions

Example of configuration with common cable, multipole connector and single plug-type connectors

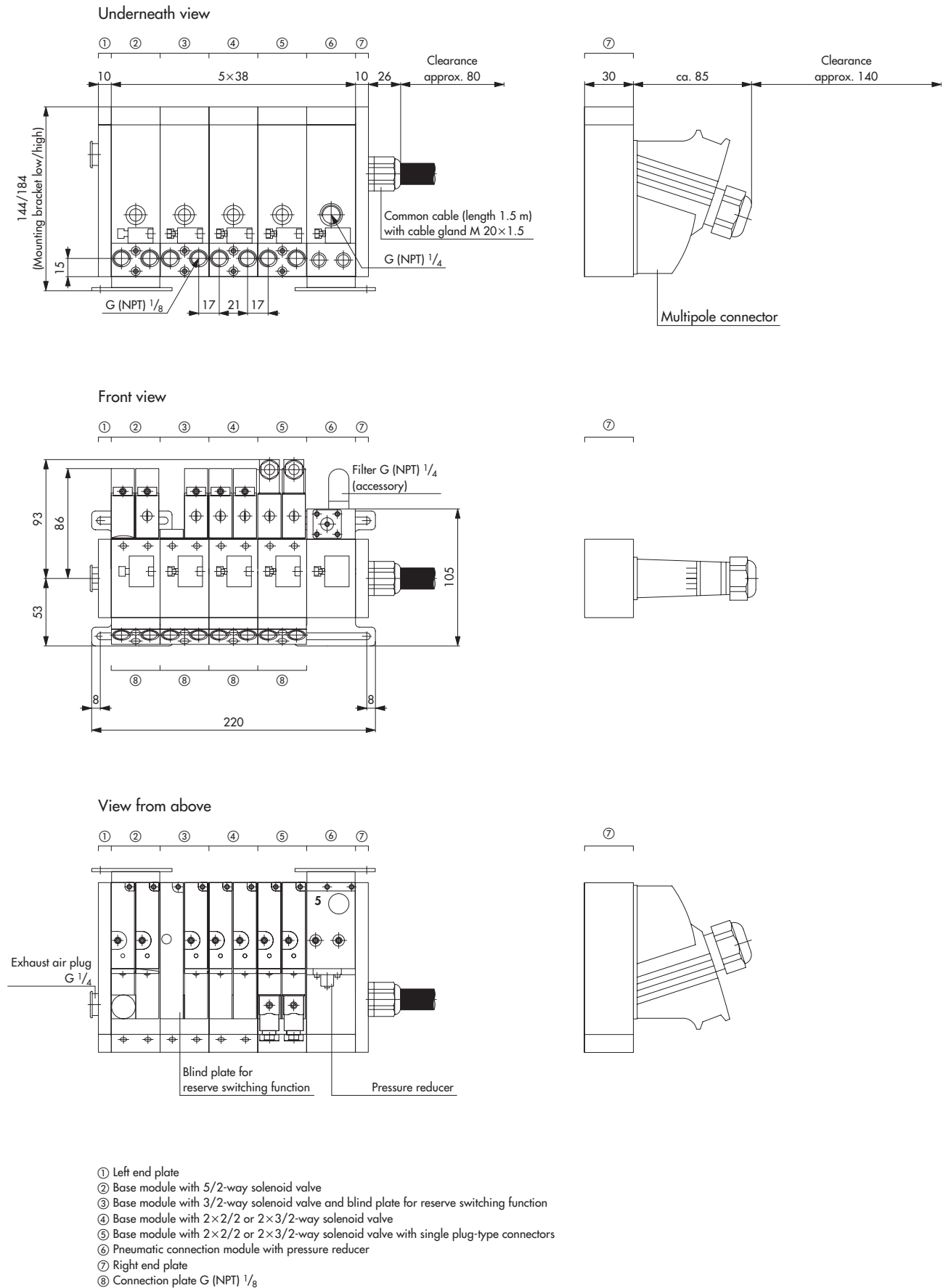
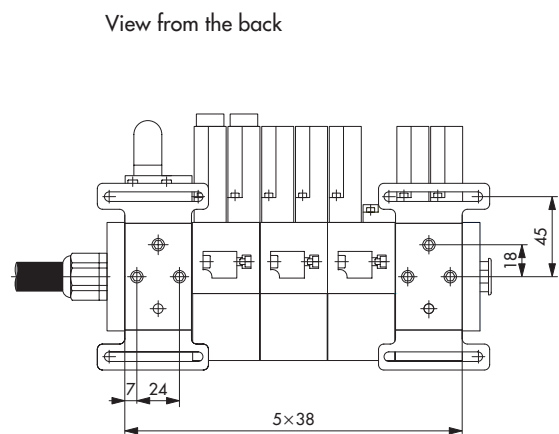
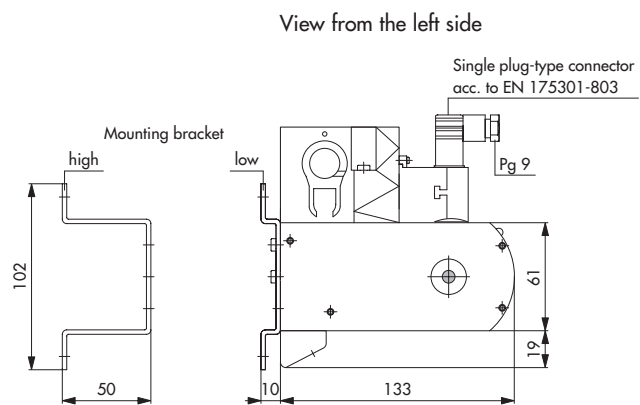
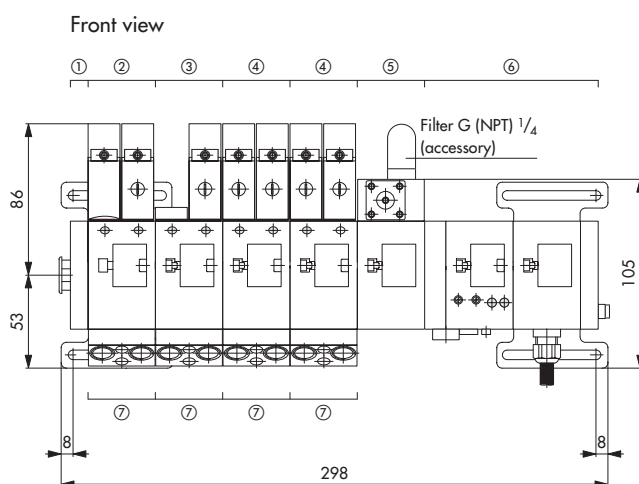
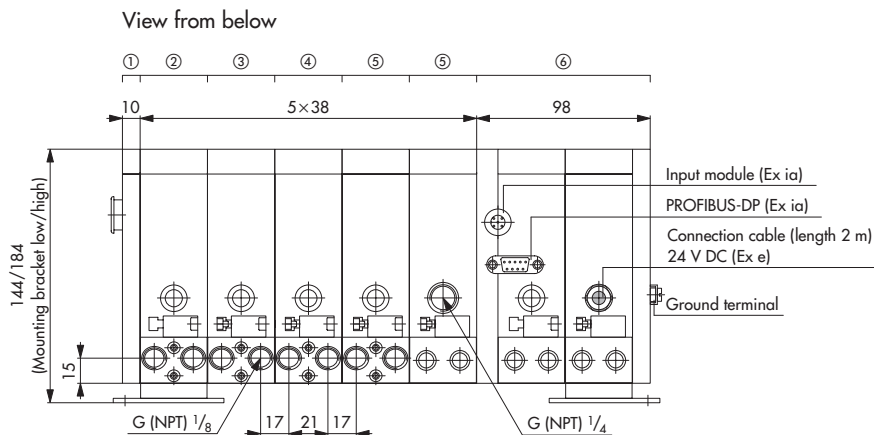


Fig. 13 · Dimensions in mm



Dimensions

Example of configuration with electric connection module for PROFIBUS-DP (Ex ia)



- ① Left end plate
- ② Base module with 5/2-way solenoid valve
- ③ Base module with 3/2-way solenoid valve and blind plate for reserve switching function
- ④ Base module with 2×2/2 or 2×3/2-way solenoid valve
- ⑤ Pneumatic connection module with pressure reducer
- ⑥ Electric connection module for PROFIBUS-DP (Ex ia)
- ⑦ Connection plate G (NPT) 1/8

Input module for NAMUR sensors (Ex ia)

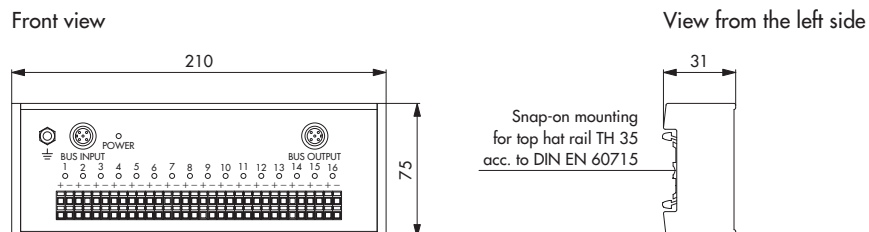


Fig. 14 · Dimensions in mm

Versions and ordering data Type 3964 Pilot Valve with single plug-type connector

Pilot valve Type 3964		Order no. 3964-	X	X	X	4	0	0	0	0	0	0	1	0
Type of protection	Without Ex-protection	0	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
	II 2 G Ex ia IIC T6 (ATEX) ¹⁾ , zone 1	1	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
	Ex ia IIC (CSA) and AEx ia IIC (FM)	3	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
	II 3 G Ex nA II T6 (ATEX) ²⁾ , zone 2	8	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Nominal signal	6 V DC, power consumption 5.47 mW	1	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
	12 V DC, power consumption 13.05 mW	2	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
	24 V DC, power consumption 26.71 mW	3	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
	24 V AC, power consumption 0.04 VA (without Ex-protection)	8	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Manual override	Without manual override SIL 4	0	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
	Pushbutton	1	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
	Pushbutton switch	2	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Mounting	CNOMO interface	0	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
	CNOMO adapter plate, 30 mm SIL 4	1	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
	CNOMO interface for Type 3965 with common cable	3	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
	CNOMO interface for Type 3965 with single plug-type connector	4	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
K _{VS} value ³⁾	0.01 without amplifier SIL 4	0	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
	0.02 with amplifier	1	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Pressure reducer	Without pressure reducer	0	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Electrical connection	Plug-type connector ⁴⁾ according to EN 175301-803, form C, contact clearance 8 mm	0	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
	Plug-type connector ⁴⁾ according to industrial standard, form C, contact clearance 9.4 mm	1	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
	Plug-type connector ⁵⁾ according to EN 175301-803, form C, contact clearance 8 mm	3	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Degree of protection	IP 54	0	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
	IP 20	2	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Air supply	1.4 ... 2.0 bar	0	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
	3.0 ... 3.6 bar	1	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
	3.0 ... 8.0 bar	2	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Indicator	Without indicator	0	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Ambient temperature ⁶⁾	-25 ... +60 °C	0	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
	-25 ... +80 °C	1	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
	-45 ... +80 °C	2	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
	-45 ... +60 °C	3	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Safety function	Without safety function	0	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
	SIL 4 ⁷⁾	1	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑

1) According to EC-Type Examination Certificate PTB 98 ATEX 2047

2) According to Statement of Conformity PTB 01 ATEX 2193 X

3) Air flow at p₁=2.4 bar and p₂=1.0 bar can be calculated according to the following equation: Q=K_{VS}×36.22, expressed in m³/h

4) The connector socket with flat gasket is not included in the delivery (see "Accessories and spare parts", page 14)

5) The female connector socket with flat gasket is included in the delivery

6) The permissible maximum temperature of the pilot valve depends on the type of protection and the temperature class

7) Safety Integrity Level SIL 4 according to IEC 61508 (Report No. V 60 2004 T1)

Versions and ordering data Type 3964 Pilot Valve for common cable, multiple connector or bus connection for PROFIBUS-DP

Pilot valve Type 3964		Order no. 3964-	X	1	X	3	0	0	1	0	0	0	1	0
Type of protection	Without Ex-protection		0	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
	II 2 G Ex ia IIC T6 (ATEX) ¹⁾ , zone 1		1											
	Ex ia IIC (CSA) and AEx ia IIC (FM)		3											
	II 3 G Ex nA II T6 (ATEX) ²⁾ , zone 2		8											
Nominal signal	6 V DC, power consumption 5.47 mW		1											
	12 V DC, power consumption 13.05 mW		2											
	24 V DC, power consumption 26.71 mW		3											
	24 V AC, power consumption 0.04 VA (without Ex-protection)		8											
Manual override	Without manual override SIL 4		0											
	Pushbutton		1											
	Pushbutton switch		2											
Mounting	CNOMO interface		0											
	CNOMO adapter plate, 30 mm SIL 4		1											
	CNOMO interface for Type 3965 with common cable		3											
	CNOMO interface for Type 3965 with single plug-type connector		4											
K _{VS} value ³⁾	0.01 without amplifier SIL 4		0											
	0.02 with amplifier		1											
Pressure reducer	Without pressure reducer		0											
Electrical connection	Plug-type connector ⁴⁾ according to EN 175301-803, form C, contact clearance 8 mm		0											
	Plug-type connector ⁴⁾ according to industrial standard, form C, contact clearance 9.4 mm		1											
	Plug-type connector ⁵⁾ according to EN 175301-803, form C, contact clearance 8 mm		3											
Degree of protection	IP 54		0											
	IP 20		2											
Air supply	1.4 ... 2.0 bar		0											
	3.0 ... 3.6 bar		1											
	3.0 ... 8.0 bar		2											
Indicator	Without indicator		0											
Ambient temperature ⁶⁾	-25 ... +60 °C		0											
	-25 ... +80 °C		1											
	-45 ... +80 °C		2											
	-45 ... +60 °C		3											
Safety function	Without safety function		0											
	SIL 4 ⁷⁾		1											

1) According to EC-Type Examination Certificate PTB 98 ATEX 2047

2) According to Statement of Conformity PTB 01 ATEX 2193 X

3) Air flow at p₁=2.4 bar and p₂=1.0 bar can be calculated according to the following equation: Q=K_{VS}×36.22, expressed in m³/h

4) The connector socket with flat gasket is not included in the delivery (see "Accessories and spare parts", page 14)

5) The female connector socket with flat gasket is included in the delivery

6) The permissible maximum temperature of the pilot valve depends on the type of protection and the temperature class

7) Safety Integrity Level SIL 4 according to IEC 61508 (Report No. V 60 2004 T1)

Accessories and spare parts

Order no.	Accessories
0790-6658	Female connector according to EN 175301-803, form C, made of polyamide, black, with cable gland Pg 9 (for cable diameter 4 to 8 mm) and flat gasket made of nitrile butadiene rubber
8831-...	Connecting cable, on both sides with round plug connector M 12 × 1, 5-pole (for electric connection module for PROFIBUS-DP and input module for NAMUR sensors) 8831-0873 – length 0.3 m 8831-0874 – length 1.0 m
1400-9321	Mounting bracket set low, consisting of 2 mounting brackets and 6 hexagon socket head screws ISO 4762 – M 5 × 6
1400-9322	Mounting bracket set high, consisting of 2 mounting brackets and 6 hexagon socket head screws ISO 4762 – M 5 × 6
0790-6123	Male connector M 5 for hose 4 × 1 mm made of brass (for test connector)
8582-1450	Male connector G 1/8 for hose 4 × 1 mm made of brass (for output connections)
8582-1436	Male connector 1/8 NPT for hose 4 × 1 mm made of brass (for output connections)
8582-1684	Male connector G 1/4 for hose 9 × 3 mm made of brass (for air supply connection)
8395-0040	Hose clamp, diameter 10 to 16 mm (for hose 9 × 3 mm)
8414-0136	Seal ring 10 × 13 × 1.5 mm made of polyvinyl chloride (for male connector G 1/8)
8414-0140	Seal ring 13.5 × 17 × 1.5 mm made of polyvinyl chloride (for male connector G 1/4)
8504-0066	Filter G (NPT) 1/4 (for exhaust air connection)

Order no.	Spare parts
3964-...	Type 3964 Pilot Valve according to Data Sheet T 3964 EN (see "Versions and ordering data", pages 12 and 13) 3964-XXX40010000010 for single plug-type connector 3964-X1X30010000010 for common cable, multipole connector or bus connection for PROFIBUS-DP (Ex ia) Booster valve and accessories
1400-9392	3/2-way booster valve, including mounting accessories
1400-9393	5/2-way booster valve, including mounting accessories
1400-9395	Connection plate G 1/8, including mounting accessories
1400-9396	Connection plate 1/8 NPT, including mounting accessories
0550-0189	Filter (for booster valve)
	Interface base module/booster valve
0430-1725	Reversible gasket for 3/2 and 5/2-way function
0430-1956	Reversible gasket for 2/2-way function
0430-1761	Molded gasket for air supply channel in the pilot valve
8421-0016	O-ring 2.7 × 1.5 for fixing screw at the booster valve
8421-0314	O-ring 12 × 1 for connection plate at the booster valve (2 pieces are necessary!)
1400-9394	Blind plate for reserve switching function, including mounting accessories
	Interface booster valve/pilot valve
1690-4844	Seal hose with restrictor
8421-0012	O-ring 2 × 1 (2 pieces are necessary!)
8421-0279	O-ring 8 × 1.5
0360-3350	Blind plate (for second booster valve for 5/2-way function)
0320-2501	Bracket (for pilot valve)
8336-1101	Self-tapping screw 2.5 × 10 (for bracket)
	Pneumatic connecting module and end plates
1400-9397	Pressure reducer with G connection, including mounting accessories
1400-9398	Pressure reducer with NPT connection, including mounting accessories
1400-9399	Connection plate with G connection, including mounting accessories
1400-9400	Connection plate with NPT connection, including mounting accessories
0430-1658	Molded gasket (for interface base module/pneumatic connection module or end plate)
0430-1858	Molded gasket (for interface pneumatic base module/pressure reducer or connection plate)
0550-0213	Filter G 1/4 (for air supply connection)
1690-3110	Exhaust air plug G 1/4 made of polyamide, black (for left end plate)
8808-1011	Cable gland M 20 × 1.5 made of polyamide, black (for common cable)
8808-1012	Cable gland M 20 × 1.5 made of polyamide, blue (for common cable)
1400-9389	Multipole connector, 32-pole, made of polyamide, gray
	Input module for NAMUR sensors
8862-0100	Input module for NAMUR sensors (Ex ia), IP 20

(Specifications subject to change without notice.)

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