

Limit Switch Type 3776

With inductive or electric contacts and solenoid valve for linear actuators or rotary actuators according to VDI/VDE 3845



SAMSO
MATIC

General

The Type 3776 Limit Switch issues an electrical signal when an adjusted limit value is exceeded or not reached. The signal is suitable for reversing control signals, generating visual and audible alarms, or for connection to central control and alarm systems. The limit switch can be equipped with a solenoid valve for controlling the monitored actuator.

Versions

The Type 3776 Limit Switch offers a variety of different contacts, switching functions, connections, and mounting kits for all desired applications:

General

- Electrical connection using a cable gland M 20 × 1.5 to terminals or using a plug-type connector
- Internal AS-Interface module with bus connection (optional)
- Corrosion-resistant, rugged enclosure with degree of protection IP 54 or IP 65 for applications in aggressive environments
- Maximum permissible ambient temperature -45 to $+80$ °C, depending on the components and the type of protection
- Mounting kits for linear actuators or rotary actuators with interface according to VDI/VDE 3845

Contacts

- Maximum 3 easily and accurately adjustable contacts
- Inductive pick-ups, inductive double proximity switch, or electric microswitches

Solenoid valve

- Safety Integrity Level SIL 4 according to IEC 61508
- 1 or 2 integral pilot valves for single or double actuation of a booster valve
- e/p binary converter with proven flapper/nozzle assembly
- Type of protection II 2 G EEx ia IIC T6 or II 3 G EEx nA II T6 (optional)
- Nominal signals 6/12/24 V DC or 24/115/230 V AC
- Power consumption 6 to 27 mW or 0.04 to 0.46 VA, depending on the nominal signal
- Manual override (optional)
- Air supply 2.2 to 6.0 bar
- Flanged booster valve with diaphragm or piston
- 3/2, 5/2, or 5/3-way function
- K_{vs} 0.2 to 0.3
- Restrictors for adjusting different closing and opening times (optional)
- Threaded connection G 1/4 or 1/4 NPT
- Flanged connection block for actuation of an external Type 3756 Booster Valve G 1/4 or 1/4 NPT
- Threaded connection G 1/4 or 1/4 NPT



Fig. 1 · Type 3776 Limit Switch



Fig. 2 · Type 3776 Limit Switch for linear actuators or rotary actuators according to VDI/VDE 3845

Examples of application

SAMSON Type 3278 Rotary Actuator



Fig. 3

Type 3776-03203210127100 Limit Switch

- Without explosion protection
- 2 Type SB3,5-E2 inductive pick-ups
- Angle of rotation 0° to 100°
- Solenoid valve 24 V DC
- Manual override
- 3/2-way function with spring return mechanism
- Without restrictors
- Air connection G 1/4
- Electrical plug-type connection
- Degree of protection IP 65
- Ambient temperature -25 to +70 °C
- Without safety function

Mounting kit (order no. 1400-XXXX)

Rotary actuators according to VDI/VDE 3845 – fixing level 1



Fig. 4

Type 3776-12203290112000 Limit Switch

- Type of protection II 2 G EEx ia IIC T6
- 2 Type SJ3,5-SN inductive pick-ups
- Angle of rotation 0° to 100°
- Solenoid valve 24 V DC
- Manual override
- Connection block, double
- Without restrictors
- Air connection G 1/4
- Electrical terminal connection
- Degree of protection IP 54
- Ambient temperature -20 to +80 °C
- Without safety function

External Type 3756-3025 Booster Valve

- 5/2-way function with two locking positions
- K_{vs} 1.4
- Air connection G 1/4

Mounting kit (order no. 1400-XXXX)

Rotary actuators according to VDI/VDE 3845 – fixing level 2



Fig. 5

Type 3776-01203030150000 Limit Switch

- Without explosion protection
- 2 Type SC3,5-NO inductive pick-ups
- Angle of rotation 0° to 100°
- Solenoid valve 24 V DC
- Without manual override
- 5/2-way function with two locking positions
- Without restrictors
- Air connection G 1/4
- AS-Interface module with bus connection
- Degree of protection IP 54
- Ambient temperature -20 to +80 °C
- Without safety function

Mounting kit (order no. 1400-XXXX)

SAMSON Type 3241 Control Valve with rib according to DIN EN 60534-6-1



Fig. 6

Type 3776-12203210112100 Limit Switch

- Type of protection II 2 G EEx ia IIC T6
- 2 Type SJ3,5-SN inductive pick-ups
- Angle of rotation 0° to 100°
- Solenoid valve 24 V DC
- Manual override
- 3/2-way function with spring return mechanism
- Without restrictors
- Air connection G 1/4
- Electrical terminal connection
- Degree of protection IP 65
- Ambient temperature -20 to +80 °C
- Without safety function

Mounting kit (order no. 1400-XXXX)

SAMSON Type 3277 Linear Actuator



Fig. 7

Type 3776-02203210110100 Limit Switch

- Without explosion protection
- 2 Type SJ3,5-SN inductive pick-ups
- Angle of rotation 0° to 100°
- Solenoid valve 24 V DC
- Manual override
- 3/2-way function with spring return mechanism
- Without restrictors
- Air connection G 1/4
- Electrical terminal connection
- Degree of protection IP 65
- Ambient temperature -20 to +80 °C
- Without safety function

Mounting kit (order no. 1400-XXXX)

SAMSON Type 3277-5 with internal routing of the signal pressure

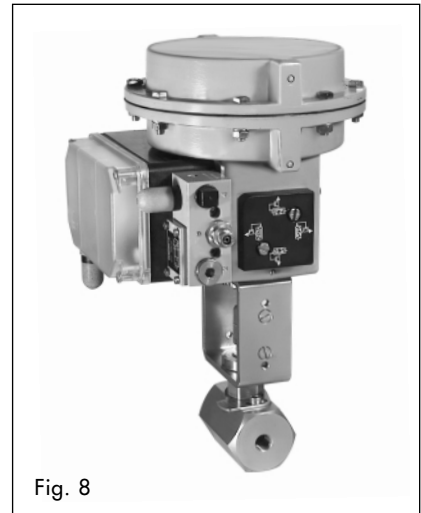


Fig. 8

Type 3776-12203210112000 Limit Switch

- Type of protection II 2 G EEx ia IIC T6
- 2 Type SJ3,5-SN inductive pick-ups
- Angle of rotation 0° to 100°
- Solenoid valve 24 V DC
- Manual override
- 3/2-way function with spring return mechanism
- Without restrictors
- Air connection G 1/4
- Electrical terminal connection
- Degree of protection IP 54
- Ambient temperature -20 to +80 °C
- Without safety function

Mounting kit (order no. 1400-XXXX)

Function

Contacts

The limit switch is equipped with a maximum of three inductive pick-ups, one inductive double proximity switch, or three electric microswitches.

For most applications, the contacts are adjusted to provide a signal when the actuator has reached one of its end positions. The switching point can also be adjusted to any position within the rotary range or travel range to signalize an intermediate position (see Mounting and Operating Instructions EB 3776 EN).

The shaft of the limit switch is placed onto the stub of the rotary actuator or connected to the linear actuator over a coupling lever. The shaft is equipped with a maximum of three metal tags or cam disks and an indicating cap to indicate the valve position on the rotary actuator. On linear actuators, there is no indicating cap because the valve position is indicated on the actuator stem.

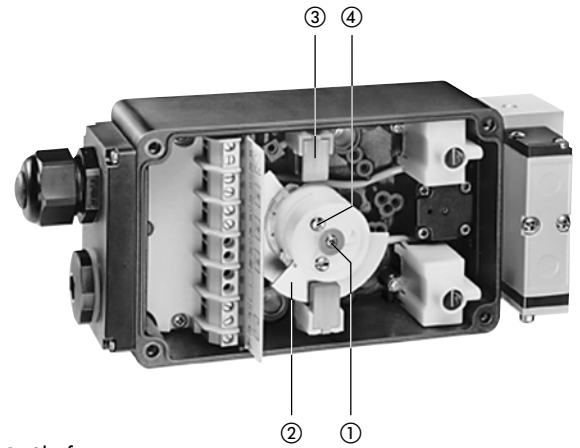
The shaft ① of the **limit switch with inductive pick-ups** (Fig. 9) is equipped with a maximum of three adjustable metal tags ②. When the metal tag ② enters the electromagnetic field of the pick-up ③, the initiator becomes attenuated and the output high-resistant (switching function "contact open"). When the metal tag ② leaves the electromagnetic field of the pick-up ③, the pick-up ③ is unattenuated and the output low-resistant (switching function "contact closed"). The metal tags ② can be adjusted to a switching point between 0° and 180° using the adjusting screws ④.

The **limit switch with inductive double proximity switch** (Fig. 10) is a low-cost version which can be used only on rotary actuators.

The shaft ① of the limit switch is equipped with an adjustable metal tag ②. When the metal tag ② enters the electromagnetic field of the proximity switch ③, the initiator becomes attenuated and the output high-resistant (switching function "contact open"). When the metal tag ② leaves the electromagnetic field of the proximity switch, the initiator ③ is unattenuated and the output low-resistant (switching function "contact closed"). The metal tag ② can be adjusted to a switching point of 70° or 90° using the adjusting screw ④.

The shaft ① of the **limit switch with electric microswitches** (Fig. 11) is equipped with a maximum of three adjustable cam disks ②. The cam disk ② actuates an electric microswitch ③ over the roller mounted on the switch lever ⑤. The cam disks ② can be adjusted to a switching point between 0° and 180° using the adjusting screws ④.

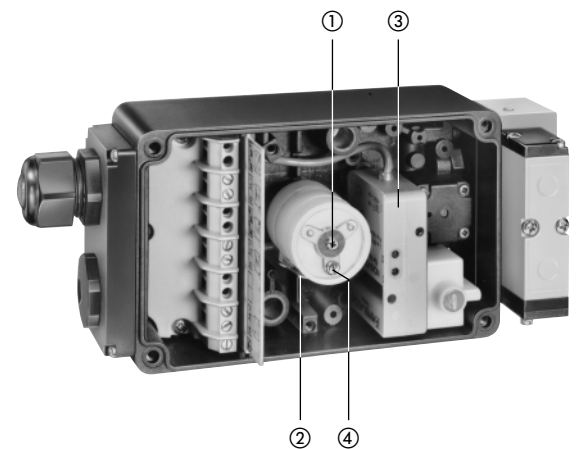
Inductive pick-ups



- ① Shaft
- ② Metal tag
- ③ Inductive pick-up
- ④ Adjusting screw

Fig. 9

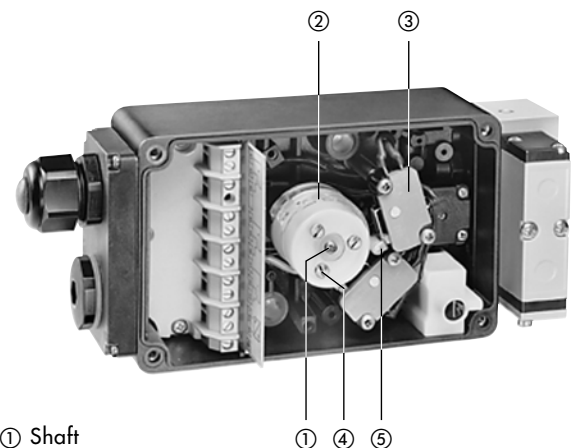
Inductive double proximity switch



- ① Shaft
- ② Metal tag
- ③ Inductive double proximity switch
- ④ Adjusting screw

Fig. 10

Electric microswitches



- ① Shaft
- ② Cam disk
- ③ Electric microswitch
- ④ Adjusting screw
- ⑤ Switch lever

Fig. 11

Function (continued from page 3)

Solenoid valve

The limit switch can be equipped with an optional solenoid valve for controlling the monitored actuator. The binary signals issued by an electric control unit are converted into binary pressure signals, which open or close the control valve (Figs. 12 and 13, symbols see Fig. 14, page 5).

The solenoid valve consists of one or two pilot valves and a single-actuated or double-actuated booster valve. The pilot valves are integrated and the booster valve is flanged to the enclosure. Alternatively, an external Type 3756 Booster Valve G 1/4 or 1/4 NPT can be attached to the actuator, which is pneumatically actuated by a connection block flanged to the enclosure (see "Examples of application", Fig. 4, page 2).

The **limit switch with one pilot valve** consists of an e/p binary converter A with manual override B and a single-actuated 3/2 or 5/2-way booster valve C with return spring. The air is fed to the binary e/p converter A from connection 9 over the pressure reducer 5 and the restrictor 6.

In 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 C builds up in the pressure divider that consists of a restrictor 6 and an outlet nozzle 1. When the solenoid 4 is energized by an electrical binary signal, the outlet nozzle 1 is closed by the flapper 2 against the force of the spring 3. As a result, the pressure in the pressure divider rises above the switch-on pressure of the booster valve C, thus switching it to the operating position. When the electrical binary signal is deactivated and thus the solenoid de-energized, the booster valve C is switched to the normal position by a return spring.

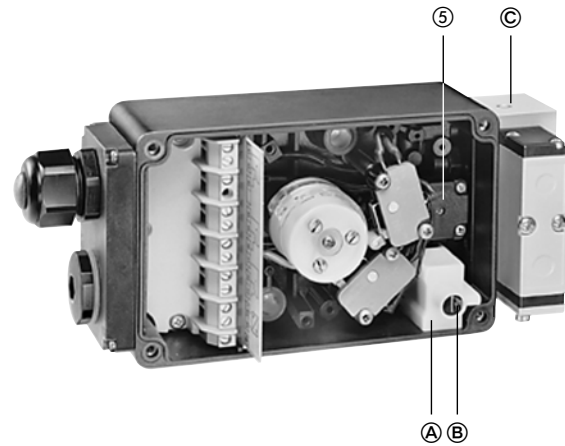
The **limit switch with two pilot valves** consists of two e/p binary converters A with manual override B and a double-actuated 5/2-way booster valve C with two locking positions or spring-centered 5/3-way booster valve C. The air is fed to the e/p binary converters A from the connections 9 over the pressure reducers 5 and the restrictors 6.

In 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 C builds up in the pressure divider that consists of a restrictor 6 and an outlet nozzle 1. When the solenoid 4 is energized by an electrical binary signal, the outlet nozzle 1 is closed by the flapper 2 against the force of the spring 3. As a result, the pressure in the pressure divider rises above the switch-on pressure of the booster valve C, thus switching it to the operating position. When the electrical binary signal is deactivated and thus the solenoid de-energized, the operating position of the booster valve C with locking position will be retained until a reverse signal is received. The spring-centered booster valve C is switched to mid-position by return springs.

Note for use in safety systems:

The solenoid valve of the limit switch is suitable for use in safety systems with a hardware fault tolerance of 1 or 2 up to SIL 4 according to IEC 61508 (for detailed results see Report No. V 60 2004 T1).

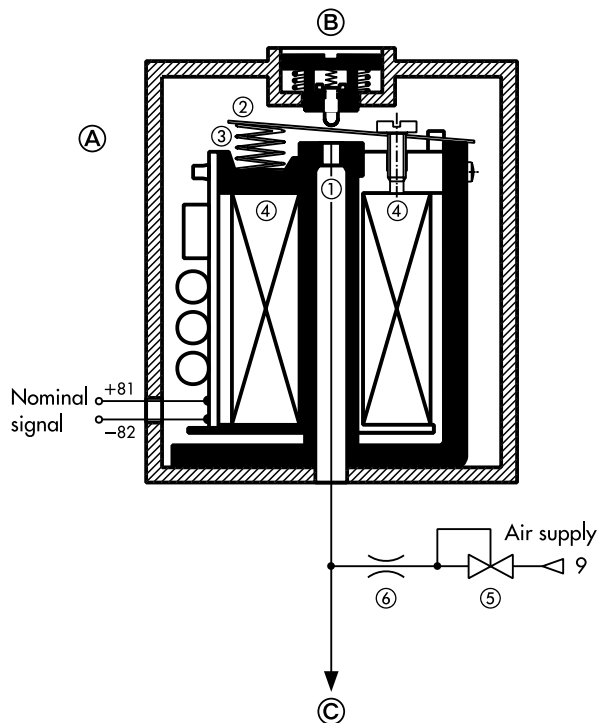
Solenoid valve



- Ⓐ e/p binary converter
- ⑤ Pressure reducer
- Ⓑ Manual override (optional)
- Ⓒ Booster valve

Fig. 12

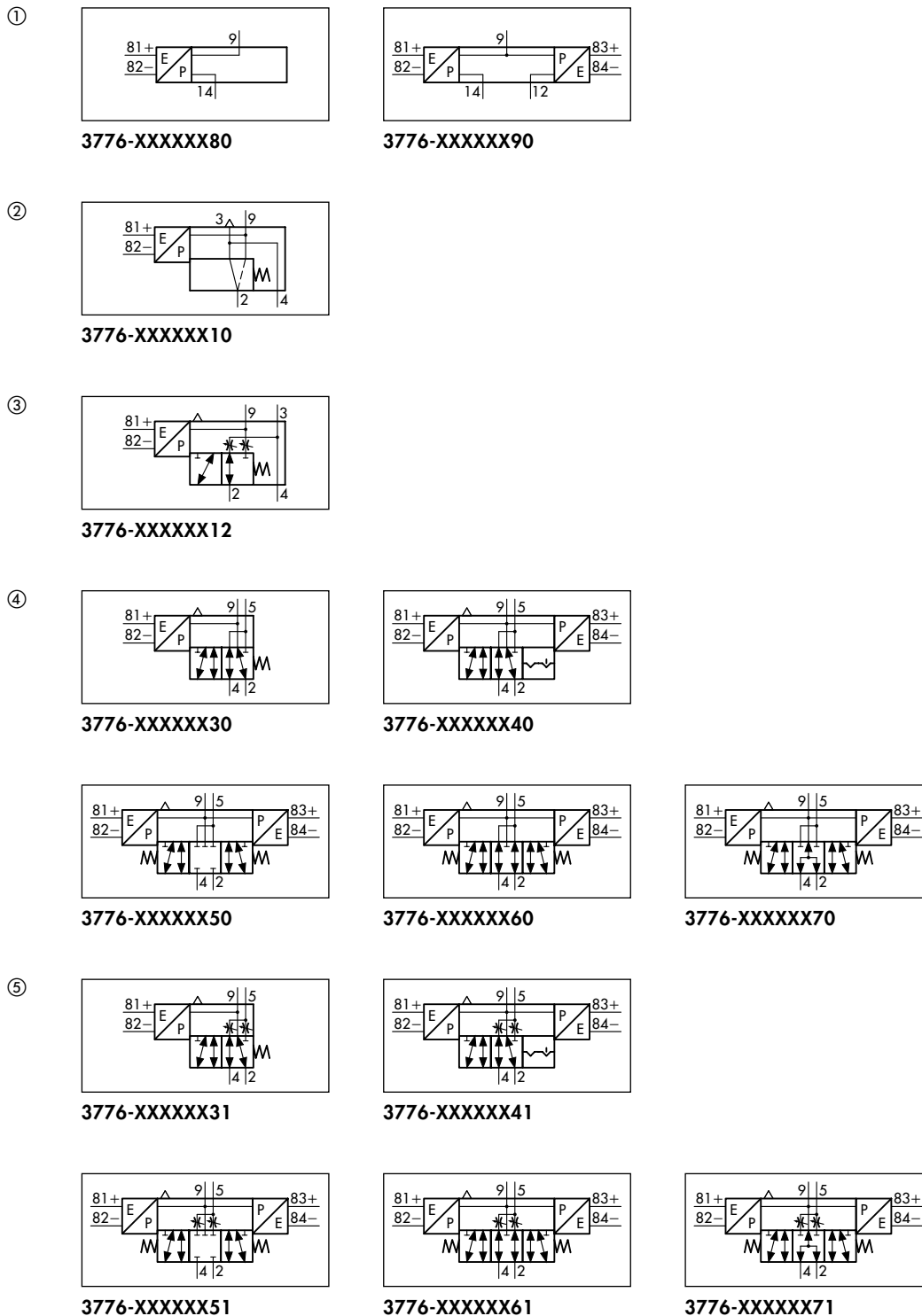
Functional diagram of the solenoid valve



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

Fig. 13

Symbols



Connection block	Order no.
① Connection block, single	3776-XXXXXX80
Connection block, double	3776-XXXXXX90
Booster valve	Order no.
② 3/2-way function with spring return mechanism	3776-XXXXXX10
③ 3/2-way function with spring return mechanism, 1 supply air/1 exhaust air restrictor	3776-XXXXXX12
④ 5/2-way function with spring return mechanism	3776-XXXXXX30
5/2-way function with two locking positions	3776-XXXXXX40
5/3-way function with spring-centered mid-position (connections 2 and 4 closed)	3776-XXXXXX50
5/3-way function with spring-centered mid-position (connections 2 and 4 vented)	3776-XXXXXX60
5/3-way function with spring-centered mid-position (connections 2 and 4 to air supply)	3776-XXXXXX70
⑤ 5/2-way function with spring return mechanism, 2 exhaust air restrictors	3776-XXXXXX31
5/2-way function with two locking positions, 2 exhaust air restrictors	3776-XXXXXX41
5/3-way function with spring-centered mid-position (connections 2 and 4 closed), 2 exhaust air restrictors	3776-XXXXXX51
5/3-way function with spring-centered mid-position (connections 2 and 4 vented), 2 exhaust air restrictors	3776-XXXXXX61
5/3-way function with spring-centered mid-position (connections 2 and 4 to air supply), 2 exhaust air restrictors	3776-XXXXXX71

Fig. 14

Technical data

General data		
Type 3776		
Angle of rotation	0° ... 100° or 0° ... 180°, adjustable, 70° or 90°, fixed	
Travel range	7.5 ... 120 mm for attachment to linear actuators (e.g. SAMSON Type 327X)	
Material		
Enclosure	Polyamide PA6-3-T, black	
Enclosure cover	Polycarbonate 2807, transparent	
Follower clamp shaft	Polyoxymethylene	
Filter	Filter made of polyethylene, Filter check valve made of polyamide or stainless steel 1.4305	
Screws	Stainless steel 1.4301	
Degree of protection	IP 54 with filter, IP 65 with filter check valve	
Mounting position	Special mounting position (see Mounting and Operating Instructions EB 3776 EN)	
Ambient temperature, depending on the components and the type of protection	Without explosion protection	Permissible components
	–20 ... +80 °C	All components Type SB3,5-E2 inductive pick-up (max. +70 °C)
	–40 ... +80 °C	Type SC3,5-N0 inductive pick-up Type SJ3,5-SN inductive pick-up Electric microswitch Pilot valve AC/DC Adapter 1/2 NPT made of aluminum Cable gland made of brass Male connector (manufactured by Harting) made of aluminum Filter check valve made of stainless steel 1.4305
	–45 ... +80 °C	Type SJ3,5-SN inductive pick-up Pilot valve AC/DC Adapter 1/2 NPT made of aluminum Cable gland made of brass Male connector (manufactured by Harting) made of aluminum Filter check valve made of stainless steel 1.4305
	Type of protection EEx ia IIC¹⁾	Permissible components
	–20 ... +60 °C (temperature class T6) –20 ... +70 °C (temperature class T5) –20 ... +80 °C (temperature class T4)	Type SC3,5-N0 inductive pick-up Type SJ3,5 SN inductive pick-up Type NCN3-F24R-N4 inductive double proximity switch Electric microswitch Pilot valve DC All electrical connection options All filter options
	–45 ... +60 °C (temperature class T6) –45 ... +70 °C (temperature class T5) –45 ... +80 °C (temperature class T4)	Type SC3,5-N0 inductive pick-up Type SJ3,5 SN inductive pick-up Pilot valve DC Adapter 1/2 NPT made of aluminum Cable gland made of brass Male connector (manufactured by Harting) made of aluminum Filter check valve made of stainless steel 1.4305
	Type of protection EEx nA II²⁾	Permissible components
	–45 ... +60 °C (temperature class T6) –45 ... +70 °C (temperature class T5) –45 ... +80 °C (temperature class T4)	Type SC3,5-N0 inductive pick-up Type SJ3,5 SN inductive pick-up Electric microswitch Pilot valve DC Adapter 1/2 NPT made of aluminum Cable gland made of brass Male connector (manufactured by Harting) made of aluminum Filter check valve made of stainless steel 1.4305
	Electrical connection	Terminal connection, plug-type connection or internal AS-Interface module with bus connection (see "Versions and ordering data", page 14)
Weight approx.	450 g (without connection block/booster valve)	

1) II 2 G EEx ia IIC T6 according to EC Type Examination Certificate PTB 98 ATEX 2072

2) II 3 G EEx nA II T6 according to Statement of Conformity PTB 02 ATEX 2007 X

Technical data (continued from page 6)

Contact						
Type 3776	-X1	-X2	-03	-07	-X5	-X6
Version	Inductive pick-up			Inductive double proximity switch	Electric microswitch	
	SC3,5-N0 with LED, yellow	SJ3,5-SN	SB3,5-E2 with LED, yellow	NCN3-F24R-N4 with LED, yellow	Silver contact	Gold contact
Switching function	Break contact	Break contact	Make contact (PNP)	2 break contacts	Switchover contact	
Switching hysteresis	0.03 ... 0.2 mm	≤ 0.03 mm	0.4 ... 0.6 mm	0.3 ... 1.2 mm	Approx. 0.3 mm	
Angle of rotation	≤ 4.0°	≤ 1.1°	≤ 1.7°	≤ 4.0°	≤ 2.0°	
Travel	≤ 1.8 mm	≤ 0.5 mm	≤ 0.75 mm	≤ 1.8 mm	≤ 0.9 mm	
Switching point drift						
Angle of rotation _{Δ50 K}	≤ 2.5°	≤ 0.5°	≤ 1.0°	≤ 2.5°	≤ 0.5°	
Travel _{Δ50 K}	≤ 1.0 mm	≤ 0.2 mm	≤ 0.4 mm	≤ 1.0 mm	≤ 0.2 mm	
Nominal voltage U ₀	8 V DC	8 V DC	10 ... 30 V DC	8 V DC	42 V AC/5.5 A, 42 V DC/0.25 A, 20 V DC/5.5 A	
Operating voltage U _B						
Loading capacity max.						
Current consumption						
Metal tag undetected	3 mA (LED on)	3 mA	3 mA (LED off)	3 mA (LED on)		
Metal tag detected	1 mA (LED off)	1 mA	1 mA (LED on)	1 mA (LED off)		
Ambient temperature	-40 ... +80°C	-45 ... +80°C	-25 ... +70°C	-20 ... +80°C	-40 ... +80°C	
Contact with type of protection EEx ia IIC¹⁾ for use in hazardous areas (zone 1)						
Type 3776	-11	-12		-17	-15	-16
Permissible maximum values when connected to a certified intrinsically safe circuit						
Input voltage U _i	16 V		16 V		15 V	
Input current I _i	25 mA	52 mA	25 mA	52 mA	25 mA	52 mA
Power dissipation P _i	64 mW	169 mW	64 mW	169 mW	64 mW	169 mW
Internal capacitance C _i	150 nF		30 nF		100 nF	
Internal inductance L _i	150 μH		100 μH		100 μH	
Ambient temperature in temperature class						
I _i = 52 mA ³⁾ P _i = 169 mW ³⁾	T6	-45 ... + 45°C	-45 ... + 45°C		-45 ... + 55°C	T6
	T5	-45 ... + 60°C	-45 ... + 60°C		-45 ... + 70°C	
	T4	-45 ... + 80°C	-45 ... + 80°C		-45 ... + 85°C	
I _i = 25 mA ³⁾ P _i = 64 mW ³⁾	T6	-45 ... + 65°C	-45 ... + 65°C		-45 ... + 70°C	T5
	T5	-45 ... + 80°C	-45 ... + 80°C		-45 ... + 80°C	
	T4	-45 ... +100°C	-45 ... +100°C		-45 ... +100°C	
Contact with type of protection EEx nA II²⁾ for use in hazardous areas (zone 2 or 22)						
Type 3776	-81	-82		-87	-85	-86
Ambient temperature in temperature class						
	T6	-45 ... +60°C	-45 ... +60°C		-45 ... +60°C	-45 ... +60°C
	T5	-45 ... +70°C	-45 ... +70°C		-45 ... +70°C	-45 ... +70°C
	T4	-45 ... +80°C	-45 ... +80°C		-45 ... +80°C	-45 ... +80°C

¹⁾ II 2 G EEx ia IIC T6 according to EC Type Examination Certificate PTB 98 ATEX 2072

²⁾ II 3 G EEx nA II T6 according to Statement of Conformity PTB 02 ATEX 2007 X

³⁾ Permissible maximum values of upstream isolating amplifiers

Technical data (continued from page 7)

Pilot valve								
Electrical data								
Type 3776		-XXXX1	-XXXX2	-XXXX3	-OXXX8	-OXXX6	-OXXX5	
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⁾	115 V AC Max. 130 V ¹⁾	230 V AC Max. 255 V ¹⁾	
	f_N				48 ... 62 Hz			
Switching point "On"	$U_{+80^\circ\text{C}}$	≥ 4.8 V	≥ 9.6 V	≥ 18 V	19 ... 36 V	82 ... 130 V	183 ... 255 V	
	$I_{+20^\circ\text{C}}$	≥ 1.41 mA	≥ 1.52 mA	≥ 1.57 mA	≥ 1.9 mA	≥ 2.2 mA	≥ 2.6 mA	
	$P_{+20^\circ\text{C}}$	≥ 5.47 mW	≥ 13.05 mW	≥ 26.71 mW	≥ 0.04 VA	≥ 0.17 VA	≥ 0.46 VA	
	"Off"							
	$U_{-25^\circ\text{C}}$	≤ 1.0 V	≤ 2.4 V	≤ 4.7 V	≤ 4.5 V	≤ 18 V	≤ 36 V	
Impedance	$R_{+20^\circ\text{C}}$	2.6 kΩ	5.5 kΩ	10.7 kΩ	Approx. 10 kΩ	Approx. 40 kΩ	Approx. 80 kΩ	
Temperature effect		0.4 %/°C	0.2 %/°C	0.1 %/°C	0.1 %/°C	0.05 %/°C	0.03 %/°C	
Ambient temperature		-45 ... +80 °C						
Pilot valve with type of protection EEx ia IIC²⁾ for use in hazardous areas (zone 1)								
Type 3776		-1XXX1	-1XXX2	-1XXX3				
Permissible maximum values for connection to an intrinsically safe circuit								
Output voltage ⁴⁾	U_i	25 V	27 V	28 V	30 V	32 V		
Output current ⁴⁾	I_i	150 mA	125 mA	115 mA	100 mA	85 mA		
Power dissipation	P_i	250 mW	No limitation					
External capacitance	C_i	≈ 0						
External inductance	L_i	≈ 0						
Ambient temperature in temperature class								
	T6	-45 ... +60 °C						
	T5	-45 ... +70 °C						
	T4	-45 ... +80 °C						
Pilot valve with type of protection EEx nA II³⁾ for use in hazardous areas (zone 2 or 22)								
Type 3776		-8XXX1	-8XXX2	-8XXX3				
Ambient temperature in temperature class								
	T6	-45 ... +60 °C						
	T5	-45 ... +70 °C						
	T4	-45 ... +80 °C						
Pneumatic data								
Type 3776		-XXXX1	-XXXX2	-XXXX3	-OXXX8	-OXXX6	-OXXX5	
K_{vs} ⁵⁾		0.01						
Air supply	Medium	Instrument air, free of corrosive particles						
	Pressure	2.2 ... 6.0 bar						
Output signal		1.5 ... 2.5 bar						
Air consumption	"On"	≤ 10 l/h at 1.4 bar air supply						
	"Off"	≤ 60 l/h at 1.4 bar air supply						
Switching time		≤ 50 ms						
Temperature effect		0.4 %/°C						
Switching cycles		≥ 2 × 10 ⁷						

1) Permissible maximum value at 100 % continued on-time. For Ex versions, the permissible maximum value U_i applies

2) II 2 G EEx ia IIC T6 according to EC Type Examination Certificate PTB 98 ATEX 2072

3) II 3 G EEx nA II T6 according to Statement of Conformity PTB 02 ATEX 2007 X

4) The U_i/I_i values apply to nominal signals 6/12/24 V DC

5) 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 m³/h

Technical data (continued from page 8)

Booster valve									
Type 3776	-XXXXXX10	-XXXXXX12	-XXXXXX3X	-XXXXXX4X	-XXXXXX5X	-XXXXXX6X	-XXXXXX7X		
Version	3/2-way function with spring return mechanism	with spring return mechanism	5/2-way function with spring return mechanism	with two locking positions	5/3-way function with spring-centered mid-position, connections 2 and 4 closed			connections 2 and 4 vented	connections 2 and 4 to air supply
$K_{vs}^{1)}$	0.20		0.30						
With restrictors		0.01 ... 0.18	0.01 ... 0.23						
Construction	Seat valve, soft seating	Piston valve, metal-to-metal seating, without overlap							
Fail-safe function	SIL 4 ²⁾								
Material									
Enclosure	GD AlSi12, powder-coated, grayish beige RAL 1019								
Gaskets	Silicone rubber	Perbunan, nitrile butadiene rubber							
Filter	Polyethylene								
Screws	Stainless steel 1.4571								
Actuation ³⁾	Single-actuated				Double-actuated				
Operating medium	Instrument air, free of corrosive particles or nitrogen								
Operating pressure	2.2 ... 6.0 bar								
Switching cycles	$\geq 10^7$	$\geq 2 \times 10^7$							
Ambient temperature	-45 ... +80 °C								
Connection	G 1/4 or 1/4 NPT								
Weight approx.	150 g	175 g							

¹⁾ 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 m³/h

²⁾ Safety Integrity Level SIL 4 according to IEC 61508 (Report No. V 60 2004 T1)

³⁾ Actuation by one or two pilot valves

Connection block		
Type 3776	-XXXXXX80	-XXXXXX90
Version	Single ¹⁾	Double ²⁾
Safety function	SIL 4 ³⁾	
$K_{vs}^{4)}$	0.01	
Material		
Enclosure	GD AlSi 12, powder-coated, grayish beige RAL 1019	
Gaskets	Perbunan	
Screws	Stainless steel 1.4571	
Ambient temperature	-45 ... +80 °C	
Connection	G 1/4 or 1/4 NPT	
Weight approx.	150 g	

¹⁾ For single pneumatic actuation of an external Type 3756 3/2 or 5/2-way Booster Valve G 1/4 or 1/4 NPT

²⁾ For double pneumatic actuation of an external Type 3756 5/2 or 5/3-way Booster Valve G 1/4 or 1/4 NPT

³⁾ Safety Integrity Level SIL 4 according to IEC 61508 (Report No. V 60 2004 T1)

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 m³/h

Technical data (continued from page 9)

Type 3776-0XXXXXXXX5X AS-Interface Module	
Version ¹⁾	Internal AS-Interface module for use in non-hazardous areas (see Mounting and Operating Instructions EB 3776 EN) Transmission of power supply and binary signals over a common two-wire cable Connection of maximum two Type SC3,5-N0 or SJ3,5-SN inductive pick-ups/ one Type NCN3-F24R-N4 inductive double proximity switch and two pilot valves 24 V DC Watchdog function "On"/"Off" Cable break and short circuit monitoring
Status indicators	
AS-Interface module	LED green "Power supply on", LED red "Cable break, short circuit, or interruption of communication"
Initiators	LED yellow "Unattenuated"
Pilot valves	LED yellow "Actuated"
Power supply	24 V DC
Ambient temperature	-25 ... +80 °C
Connection	Cable adapter for AS-i flat cable, 2 wires, made of polyamide, black, or round plug connector M 12 × 1, 4 poles, made of brass, nickel-plated ²⁾

¹⁾ Certification Document No. 28001 of the AS-International Association

²⁾ The female connector is not included in the scope of delivery (see "Spare parts and accessories", page 15)

Dimensions

Limit switch

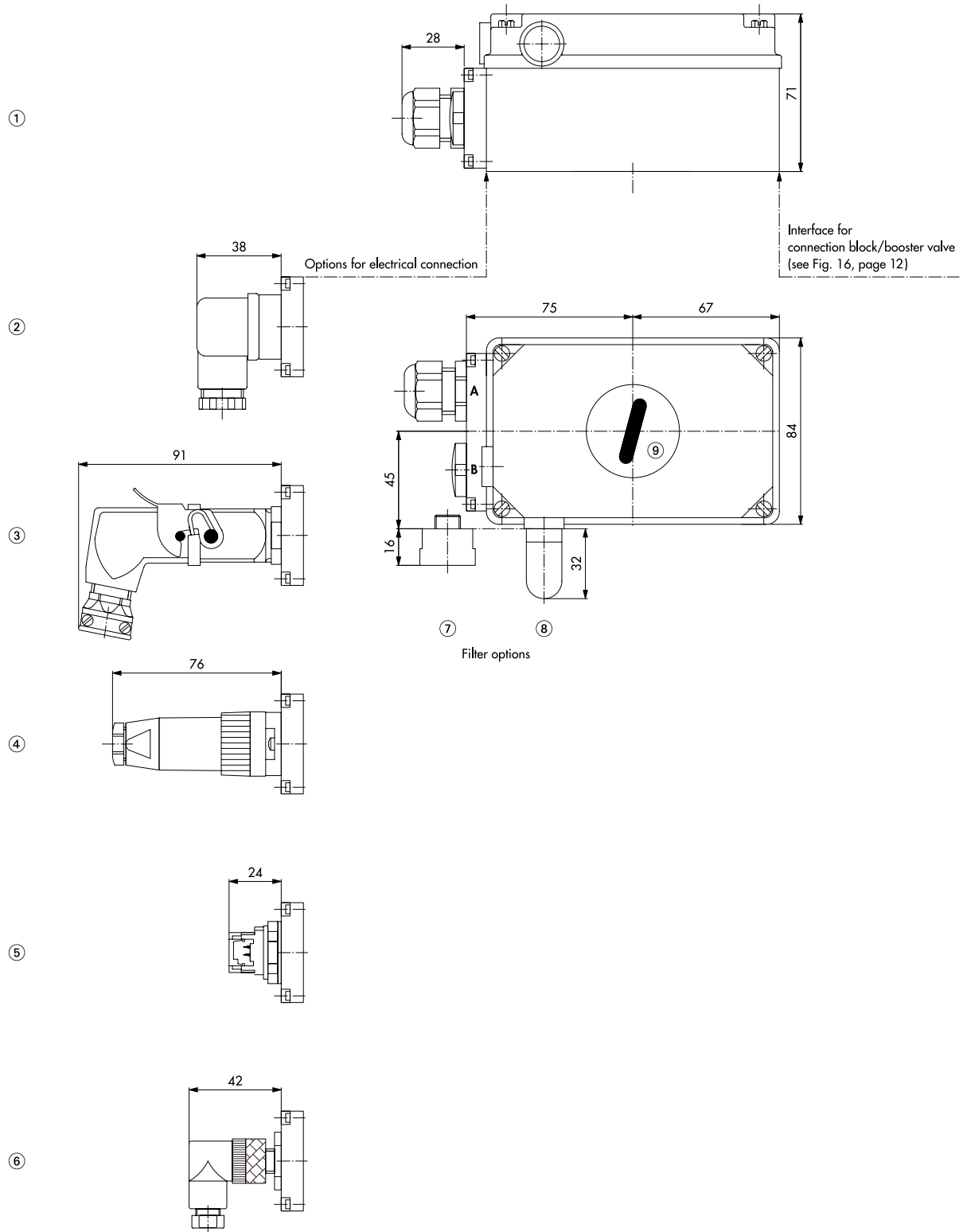
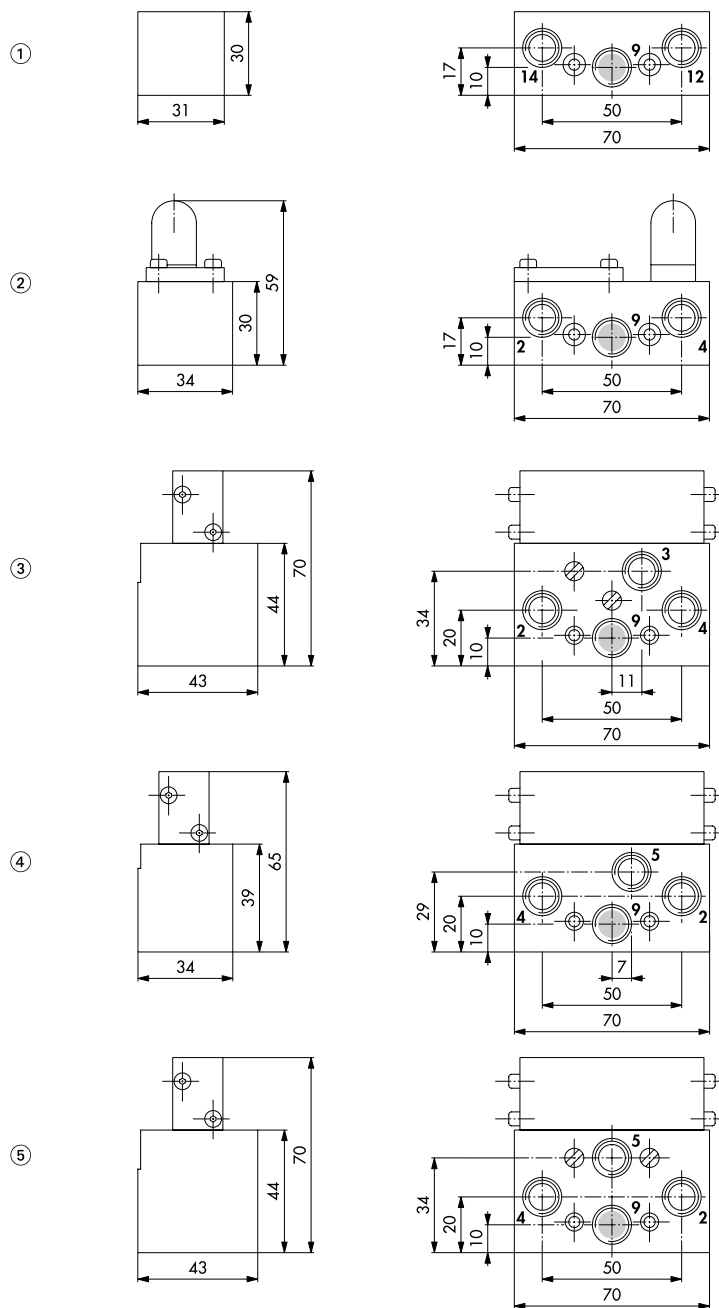


Fig. 15 · Dimensions in mm

Dimensions

Connection block/booster valve



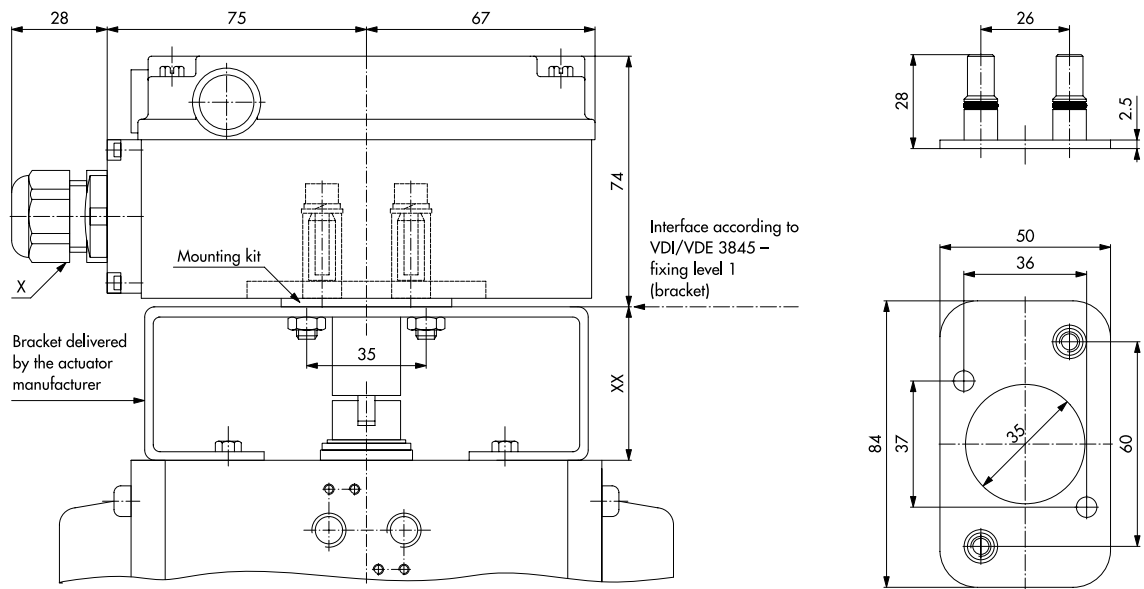
All connections with tapped holes G $\frac{1}{4}$ or $\frac{1}{4}$ NPT

Connection block	Order no.
① Connection block, single	3776-XXXXXX80
Connection block, double	3776-XXXXXX90
Booster valve	Order no.
② 3/2-way function with spring return mechanism	3776-XXXXXX10
③ 3/2-way function with spring return mechanism, 1 supply air/1 exhaust air restrictor	3776-XXXXXX12
④ 5/2-way function with spring return mechanism	3776-XXXXXX30
5/2-way function with two locking positions	3776-XXXXXX40
5/3-way function with spring-centered mid-position (connections 2 and 4 closed)	3776-XXXXXX50
5/3-way function with spring-centered mid-position (connections 2 and 4 vented)	3776-XXXXXX60
5/3-way function with spring-centered mid-position (connections 2 and 4 to air supply)	3776-XXXXXX70
⑤ 5/2-way function with spring return mechanism, 2 exhaust air restrictors	3776-XXXXXX31
5/2-way function with two locking positions, 2 exhaust air restrictors	3776-XXXXXX41
5/3-way function with spring-centered mid-position (connections 2 and 4 closed), 2 exhaust air restrictors	3776-XXXXXX51
5/3-way function with spring-centered mid-position (connections 2 and 4 vented), 2 exhaust air restrictors	3776-XXXXXX61
5/3-way function with spring-centered mid-position (connections 2 and 4 to air supply), 2 exhaust air restrictors	3776-XXXXXX71

Fig. 16 · Dimensions in mm

Dimensions

Attachment to rotary actuators according to VDI/VDE 3845 – fixing level 1



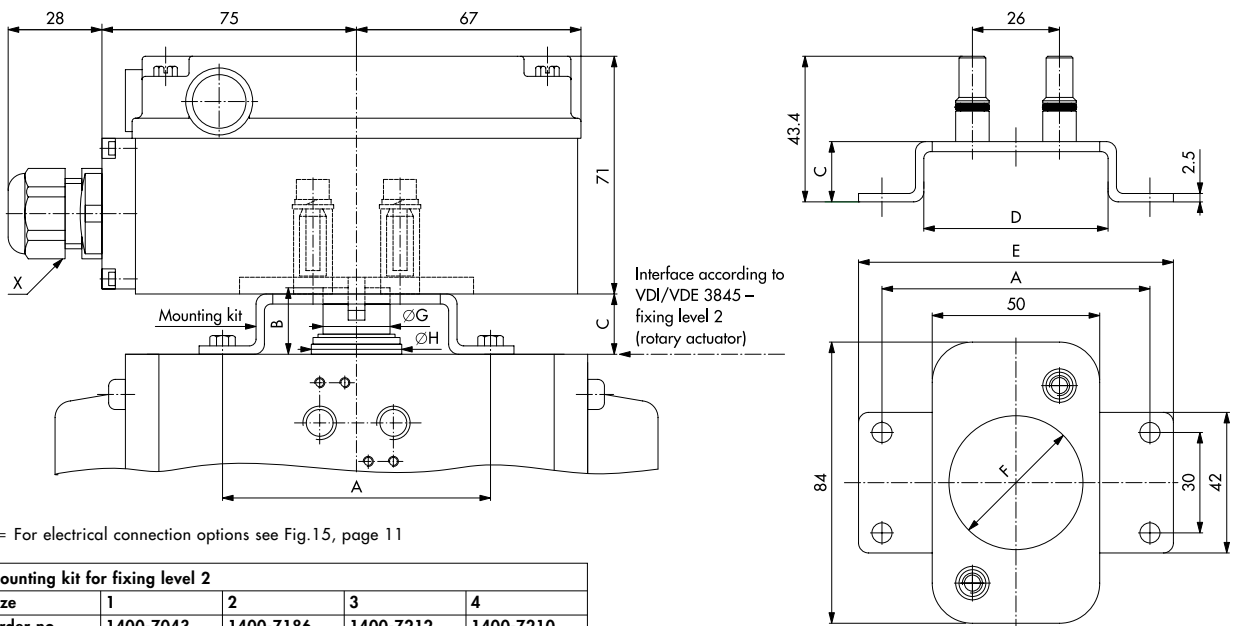
X = For electrical connection options see Fig.15, page 11
 XX = Dimension depends on manufacturer

Mounting kit for fixing level 1
 Order no. 1400-7041

Fig. 17 · Dimensions in mm

Dimensions

Attachment to rotary actuators according to VDI/VDE 3845 – fixing level 2



X = For electrical connection options see Fig.15, page 11

Mounting kit for fixing level 2				
Size	1	2	3	4
Order no.	1400-7043	1400-7186	1400-7212	1400-7210
Dimension A	80	80	130	130
Dimension B	20	30	30	50
Dimension C	18	28	28	48
Dimension D	55	55	105	105
Dimension E	94	94	144	144
Dimension F	40	40	48	48
Dimension G	$\leq (F - 1)$			
Dimension H	$\leq (D - 1)$			

Fig. 18 · Dimensions in mm

Spare parts and accessories

Order no.	Designation
0790-6658	Female connector according to EN 175301-803, type A, made of polyamide, black
1400-8298	Female connector (manufactured by Harting), 7 poles, made of aluminum, silvery gray
8801-2810	Sensor connecting cable, 2 wires, length 3 m, blue, with angle connector M 12 × 1, 4 poles, made of brass, nickel-plated
8831-0716	Female connector (manufactured by Binder), 7 poles, made of PBT GV, black
8831-0865	Female connector M 12 × 1, 4 poles, angle type, made of polyamide, black
1890-4875	Cable gland M 20 × 1.5 made of brass, nickel-plated
8808-0178	EEExe cable gland M 20 × 1.5 (manufactured by CEAG) made of polyamide, black
8808-1011	Cable gland M 20 × 1.5 made of polyamide, black
8808-1012	Cable gland M 20 × 1.5 made of polyamide, blue
0310-2149	Adapter 1/2 NPT made of aluminum, powder-coated, grayish beige RAL 1019
1089-1159	Enclosure cover made of polycarbonate, transparent, connection G 1/4 for filter/filter check valve
1890-4663	PCB for AS-Interface module
3994-0158	Cable break protection device with enclosure for top hat rail 35, degree of protection IP 20 (for Type 3776-XXXX1 with solenoid valve 6 V DC)
1790-7253	Filter check valve made of stainless steel 1.4305, connection G 1/4, degree of protection IP 65
1790-7408	Filter check valve made of polyamide, connection G 1/4, degree of protection IP 65
8504-0066	Filter made of polyethylene, connection G 1/4, degree of protection IP 54
	Mounting kits
1400-7216	Mounting kit made of stainless steel 1.4301 for Type 3278 Rotary Actuators, actuator size 160 cm ²
1400-7217	Mounting kit made of stainless steel 1.4301 for Type 3278 Rotary Actuators, actuator size 320 cm ²
1400-7041	Mounting kit made of stainless steel 1.4301 for rotary actuators according to VDI/VDE 3845 – fixing level 1
0469-0017	Follower clamp for mounting kit with fixing level 1
	Mounting kit made of stainless steel 1.4301 for rotary actuators according to VDI/VDE 3845 – fixing level 2
1400-7043	Size 1, hole spacing A = 80 mm, shaft stub length B = 20 mm
1400-7186	Size 2, hole spacing A = 80 mm, shaft stub length B = 30 mm
1400-7212	Size 3, hole spacing A = 130 mm, shaft stub length B = 30 mm
1400-7210	Size 4, hole spacing A = 130 mm, shaft stub length B = 50 mm
1400-7220	Mounting kit made of stainless steel 1.4301 for Type 3277 Linear Actuators, actuator size 240/350 cm ²
1400-7221	Mounting kit made of stainless steel 1.4301 for Type 3277 Linear Actuators, actuator size 700 cm ²
1400-7219	Mounting kit made of stainless steel 1.4301 for Type 3277-5 Linear Actuators (external)
1400-7222	Mounting kit made of stainless steel 1.4301 for Type 3277-5 Linear Actuators (internal), connection G 1/4
1400-7223	Mounting kit made of stainless steel 1.4301 for Type 3277-5 Linear Actuators (internal), connection 1/4 NPT
0430-1544	Seal hose for attachment to Type 3277-5 Linear Actuators (internal)
1400-7730	Mounting kit made of stainless steel 1.4301 for Type 3241 Control Valves, nominal size DN 15 to 100
1400-7735	Mounting kit made of stainless steel 1.4301 for Type 3351 Control Valves, nominal size DN 15 to 50
1400-7736	Mounting kit made of stainless steel 1.4301 for Type 3351 Control Valves, nominal size DN 65 to 80
1400-7737	Mounting kit made of stainless steel 1.4301 for Type 3351 Control Valves, nominal size DN 100
On request	Mounting kit made of stainless steel 1.4301 for stem valves, nominal size DN 15 to 150
On request	Mounting kit made of stainless steel 1.4301 for Series 250 and 280 Control Valves with NAMUR rib, nominal size DN 15 to 400
On request	Mounting kit made of stainless steel 1.4301 for Type 324X Control Valves, nominal size DN 200 to 300

(Specifications subject to change without notice.)

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