

Application

Limit switch with two incorporated inductive switches and optionally one 3/2-way solenoid valve for attachment to pneumatic control valves

Rated travels from 7.5 to 120 mm



The limit switch is equipped with two inductive proximity switches which supply a signal when the valve travel exceeds or falls below an adjusted limit value.

Optionally, the limit switch is also available with an integral 3/2-way solenoid valve which registers a binary signal issued by control equipment and converts it into a binary signal pressure. When the solenoid valve is de-energized, the actuator moves the valve to the fail-safe position.

- It is possible to override all the limit contacts. They can be adjusted to be either an NC or NO contact.
- Versions for use in hazardous areas in type of protection intrinsically safe Ex ia IIC T6 are available (refer to the summary of explosion protection approvals).
- Direct attachment to Type 3277 Pneumatic Actuator
- Attachment to actuators according to IEC 60534 (NAMUR)
- Attachment to rotary actuators according to VDI/VDE 3845

For more information on the selection and application of positioners and limit switches, refer to Information Sheet

► T 8350.

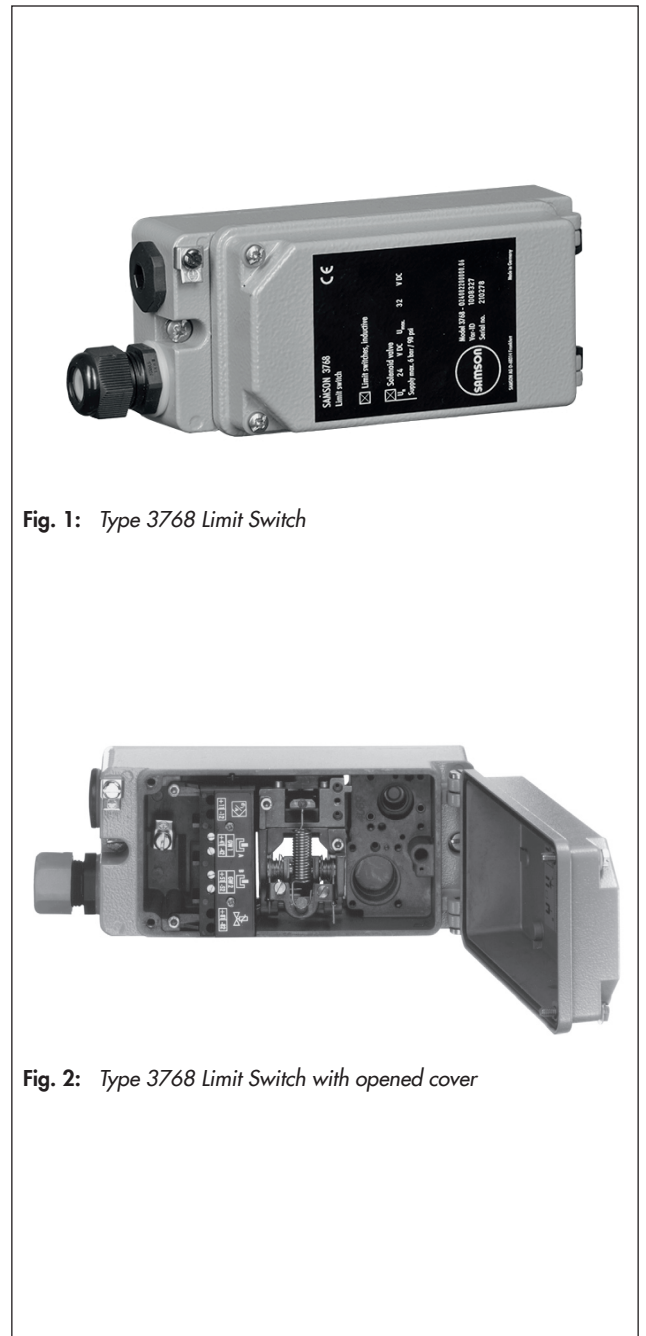


Fig. 1: Type 3768 Limit Switch

Fig. 2: Type 3768 Limit Switch with opened cover

Principle of operation (Fig. 3 and Fig. 4)

When the limit switch is attached to a control valve, the valve travel is transmitted via the pin (1.1) to the lever (1) of the actuator. Any change in travel is converted into a rotary motion of the shaft (2). The shaft (2) is fitted with two adjustable metal tags (4) which operate the associated proximity switches (5).

The operation of the inductive limit switches requires switching amplifiers to be connected in the output circuit. When the tag (4) is located in the inductive field of the switch, the switch assumes a high resistance. When it moves outside the field, the switch assumes a low resistance.

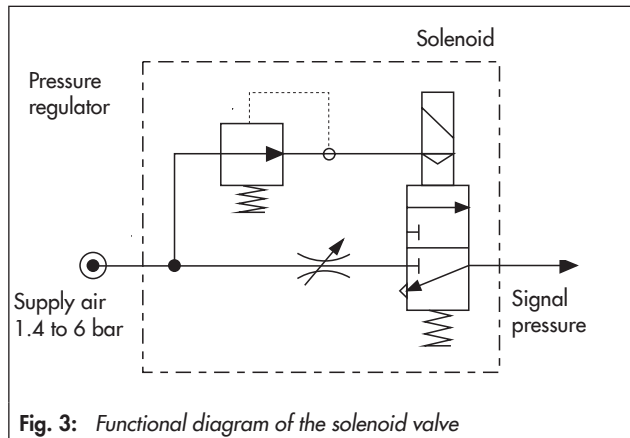


Fig. 3: Functional diagram of the solenoid valve

When the integrated solenoid valve is energized, supply air is applied to the actuator. The speed of air supply is adjustable at a restriction. When the solenoid valve is de-energized, the actuator is vented and the control valve moves to its fail-safe position.

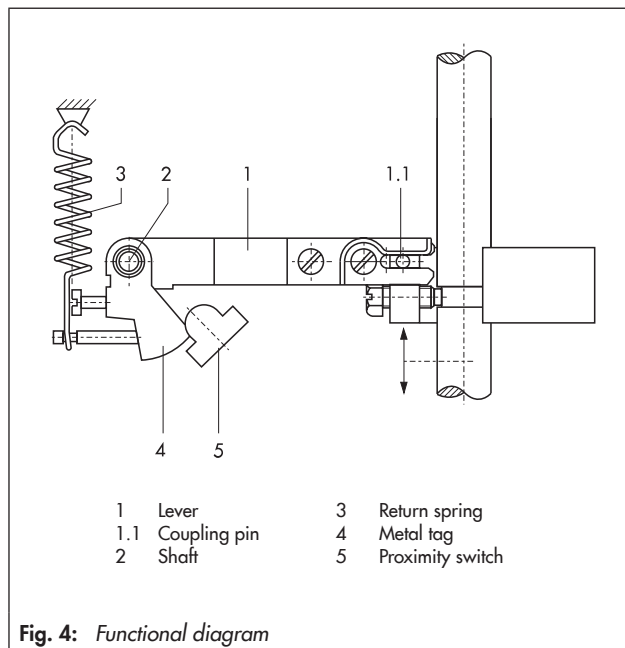


Fig. 4: Functional diagram








Table 1: Technical data

Travel range	Direct attachment to Type 3277 Actuator: 7.5 to 30 mm			
	Attachment according to IEC 60534 (NAMUR): 7.5 to 120 mm			
Inductive proximity switches	2x SJ2-SN			
Control circuit	Specifications corresponding to connected switching amplifier			
Hysteresis at rated travel	≤ 1 %			
Permissible ambient temperature	-20 to 80 °C with plastic cable gland -40 to 80 °C with metal cable gland (special version down to -45 °C) The limits in the type examination certificate additionally apply to explosion-protected versions.			
Solenoid valve				
Supply air	Supply air: 1.4 to 6 bar (20 to 90 psi)			
Input	Binary DC voltage signal			
Nominal signal	6 V DC	12 V DC	24 V DC	
Signal '0' (no response) ¹⁾	≤ 1.2 V	≤ 2.4 V	≤ 4.7 V	
Signal '1' (response) ²⁾	≥ 5.4 V	≥ 9.6 V	≥ 18.0 V	
Coil resistance R _i at 20 °C	2909 Ω	5832 Ω	11714 Ω	
K _v coefficient	0.14 m ³ /h			
Air consumption	'OFF' ≤ 60 l _n /h · 'ON' ≤ 10 l _n /h			
Closing time with Type 3277 Actuator For rated travel with bench range	240 cm ²	350 cm ²	700 cm ²	
	0.2 to 1 bar	≤ 1 s	≤ 1.5 s	≤ 4 s
	0.4 to 2 bar	≤ 2 s	≤ 2.5 s	≤ 8 s
	0.6 to 3 bar	≤ 1 s	≤ 1.5 s	≤ 5 s
Degree protection without/with solenoid valve	Without	IP 65		
	With	IP 65 (IP 65 and NEMA 4X, filter check valve, see accessories on p. 4)		
Compliance	CE · EAC			



¹⁾ DC voltage signal at -20 °C

²⁾ DC voltage signal at +80 °C

Table 2: Summary of explosion protection approvals

Type	Certification	Number	Date	Valid until	Type of protection
3768-1		GYJ15.1218X	2015-06-16	2020-06-15	Ex ia IIC T4...T6 Gb
	 EC type examination certificate	PTB 02 ATEX 2077	2002-07-19		II 2G Ex ia IIC T6
3768-3		1607265	2005-06-19		Ex ia IIC T6; Class I Zone 0; Class I, II, Div. 1, Groups A, B, C, D, E, F, G; Class I, II, Div. 2, Groups A, B, C, D, E, F, G;
		3020228	2005-02-28		Class I, Zone 0 AEx ia IIC Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G Class I, Div. 2, Groups A, B, C, D; Class II, Div. 2 Groups F, G; Class III
3768-8		GYJ15.1219X	2015-06-16	2020-06-15	Ex ic IIC T4...T6 Gc Ex nA IIC T4...T6 Gc
	 Statement of conformity	PTB 03 ATEX 2182 X	2003-09-30		II 3G Ex nA II T6
3768-9		RU C-DE08.B.00199	2014-02-14	2019-02-13	1Ex ia IIC T6/T5/T4 Gb X Ex tb IIIC T80°C Db X 2Ex nA IIC T6/T5/T4 Gc X 2Ex ic IIC T6/T5/T4 Gc X Ex tc IIIC T80°C Dc X

Article code

Limit switch	Type 3768-	x	2	x	0	0	x	x	x	x	0	x	x
Explosion protection													
Without		0					2/7						
 II 2G Ex ia IIC T6 according to ATEX		1											
CSA/FM intrinsically safe/non incandive		3											
 II 3G Ex nA II T6 acc. to ATEX		8					2/7						
Solenoid valve													
Without				0									
6 V DC				2									
12 V DC				3									
24 V DC				4									
Pneumatic connections													
Without				0		0							
¼-18 NPT						1							
ISO 221/1-G ¼						2							
Electrical connection													
Plastic cable gland M20 x 1.5, blue							1		0				
Plastic cable gland M20 x 1.5, black							2		0				
Cable gland M20 x 1.5, nickel-plated brass							7		2				
Body version													
Aluminum									0				
CrNiMo steel									2				
Temperature range													
Standard									0				
-45 to +80 °C									2				
Special versions													
On request		x									x	x	x

Dimensions in mm

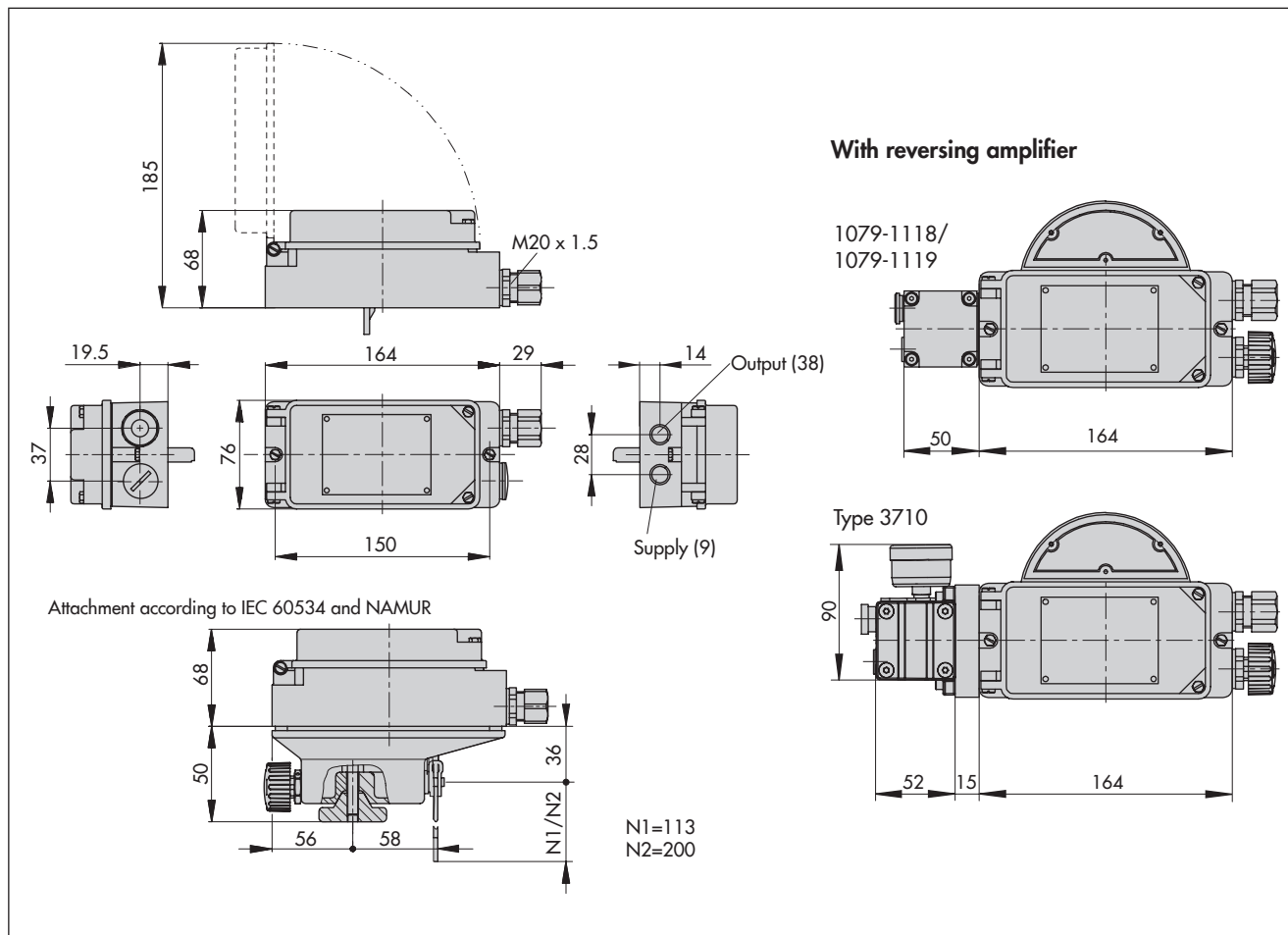
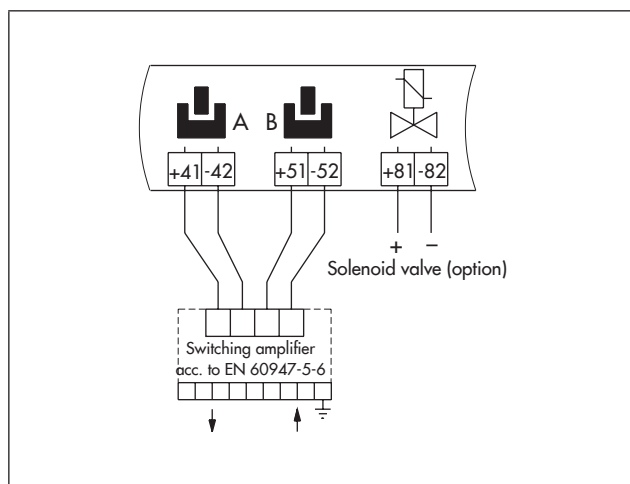


Table 3: Materials

Housing	Die-cast aluminum, chromated and plastic coated
External parts	Stainless steel 1.4571 and 1.4104

Electrical connections



Specifications subject to change without notice

Ordering text

Type 3768-... Inductive Limit Switch
(see article code on page 3)

Additional specifications

- Direct attachment to Type 3277 Actuator (120 to 700 cm²)
- Attachment according to IEC 60534 (NAMUR)
- Travel: ... mm, if applicable, rod diameter: ... mm
- Attachment to rotary actuators
- Opening angle: ...
Single-acting or double-acting actuator

Accessories

Adapter 1/2 NPT for electrical connections

- Filter check valve in housing with G 1/4 thread
 - Polyamide, IP 65 degree of protection
 - 1.4301, IP 65 degree of protection
 - Polyamide, NEMA 4 degree of protection
 - 1.4301, NEMA 4 degree of protection



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