

## ON/OFF solenoid for hydraulic application

# 4



Product group

### F MM E + F HT S

#### Function

- Armature space pressure tight, rated pressure 250 bar
- Magnetic force vs. stroke characteristic increasing
- Short correction times
- Push type

#### Construction

- Electrical connection via robust terminal made of metal
- Construction size: 35mm, 45mm, 60mm
- Protection class according to DIN VDE 470/EN 60 529 when properly installed: IP65
- Integrated circuit with TVS diode
- Explosion protection:  II 2G Ex eb mb IIC T6 / T4 Gb  
 II 2D Ex tb IIIC T80°C / T130°C Db
- Fastening via central thread
- Easy exchange of the solenoid body without opening the hydraulic circuit
- Manual override

#### Application examples

- Hydraulic applications in explosive atmospheres (Gas: Zone 1 resp. EPL Gb, Dust: Zone 21 resp. EPL Db) e.g. in chemical companies, refineries and refueling facilities

#### Options and accessories on request

- Protection class IP 67
- AC version with bridge rectifier
- Other ambient temperatures
- In the framework of our platform for valve solenoids there is a variety of variation possibilities for customer specific requirements. We are pleased to work out your individual solution in a personal meeting.

#### Standards and approvals

- Design and testing according to DIN VDE 0580  
Production according to ISO 9001, DIN EN ISO/IEC 80079-34
- ATEX, IECEx



Fig. 1:  
Solenoid body type F MM E 035 K01 A01  
with complete tube F HT S 035

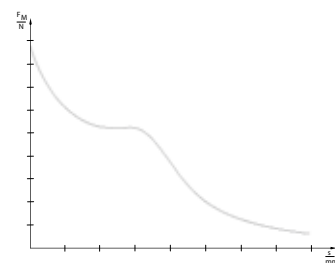
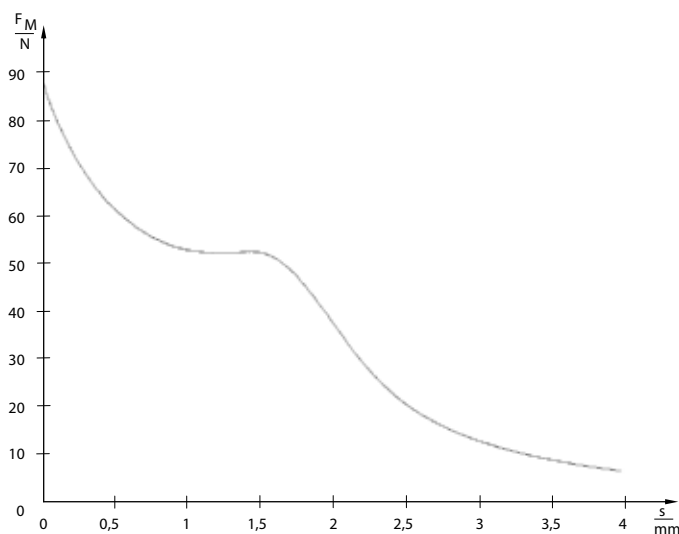


Fig. 2:  
Magnetic force-stroke-characteristic

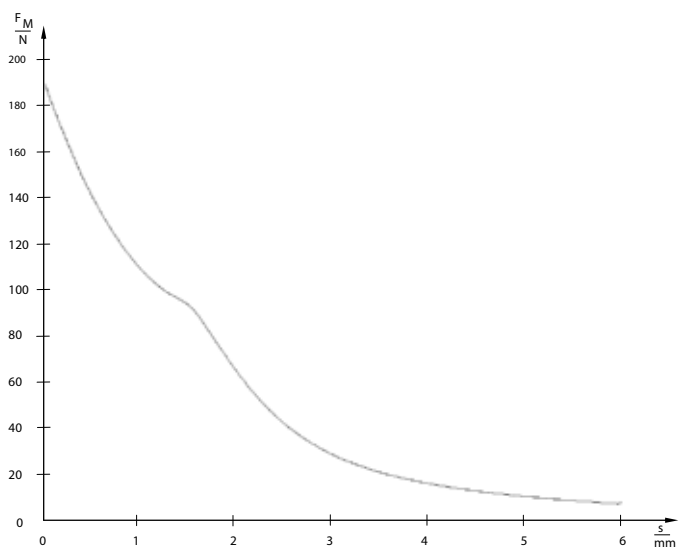
## Technical data

Solenoid body F MM E ... K01 A01 completed with tube F HT S		035 037926099	045 045923690	060 063923685
Operating mode		S1 (100 %)		
Reference temperature $\vartheta_{11}$ <sup>1)</sup>	(°C)	50		
Ambient temperature $T_a$ <sup>1)</sup>	(°C)	-30 ... +50		
Rated voltage $U_N$	(V DC)	24±10%		
Temperature class		T4		
Total stroke s	(mm)	<b>Magnetic force <math>F_M</math> (N)</b>		
	0	90	189	363
	0,5	61	145	298
	1	53	112	253
	1,5	52	95	213
	2	37	67	185
	2,5	20	43	166
	3	12	29	154
	3,5	8	21	146
	4	6	17	125
	5		11	74
6		8	49	
7			34	
8			25	
Working stroke $s_W$	(mm)	1,5	1,5	3,5
Rated work $W_N$ with working stroke $s_W$	(Ncm)	7,8	14,3	51,1
Rated power $P_{20}$	(W)	17,5	22,5	41,4
Operating frequency		(1/h) 3.600		
Armature weight $m_A$	(kg)	0,044	0,061	0,18
Solenoid weight $m_M$	(kg)	0,42	0,71	1,84
The heating test is based on the assembly on a hydraulic valve with base plate and the minimum dimensions	hydraulic valve	(mm) 46 x 76 x 66		67 x 67 x 82 + 105x32x116
	material	iron or material with the same or better heat conduction		

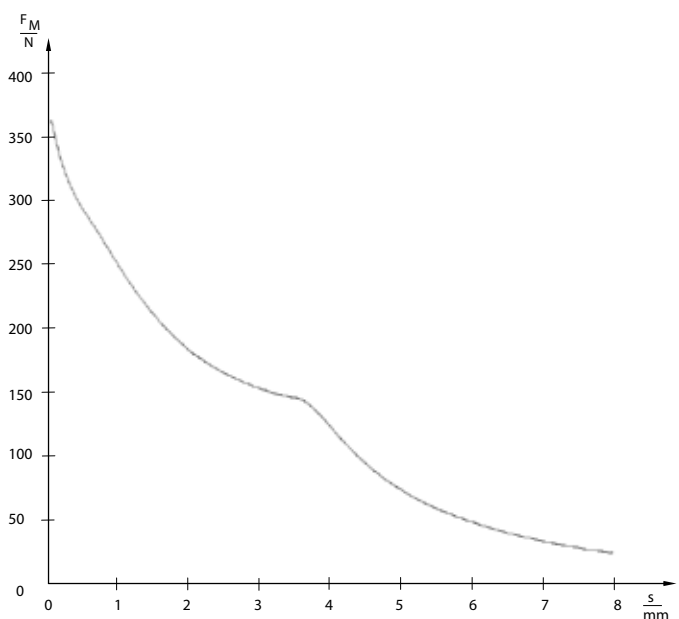
<sup>1)</sup> The reference temperature resp. ambient temperature may also not be exceeded by a heat input via an operating medium (e.g. oil).



**Fig. 2:** Magnetic force vs. stroke characteristic size 035



**Fig. 3:** Magnetic force vs. stroke characteristic size 045



**Fig. 4:** Magnetic force vs. stroke characteristic size 060

The indicated technical data refer to a power supply of the AC network via bridge rectifiers.

An adaptation of the exciter coil to other current and resistance values is possible on request.

Further temperature classes and ambient temperature ranges see part list F MM E.

The force values shown in the diagram refer to 90% of the rated voltage ( $U_n = 24\text{ V}$ ) and to the normal operating temperature according to DIN VDE EN 0580. For other voltages deviations of the magnetic force may occur.

Due to natural dispersion the magnetic force values may deviate by about  $\pm 5\%$  from the table values.

The interior of the solenoid and the armature bearing are resistant against all neutral liquids normally used in hydraulics. Please contact us when using other operating media.

#### Protection class, protective conductor connection

The devices correspond to protection class I.

Due to their construction devices with renewable solenoid body do not have a continuous proper protective conductor connection between the protective conductor connector of the solenoid body and the tube.

A proper protective conductor connection of the tube resp. of the connected valve is to be ensured by the user.

**Information and remarks concerning European directives** can be taken from the correspondent information sheet which is available under [Produktinfo.Magnet-Schultz.com](http://Produktinfo.Magnet-Schultz.com).

#### Note on the RoHS Directive

According to our current state of knowledge the devices pictured in this document do not contain any substances in concentration values or applications for which putting into circulation with products manufactured from them is prohibited in accordance to RoHS.

**Please note the respective operating manual delivered with each device. An EC conformity declaration of the manufacturer is attached to every delivery one time.**

**Please make sure that this device is suitable for your application.**

**For this application please note DIN EN 60079-14.**

This part list is a document for technically qualified personnel.

The present publication is for informational purposes only and shall not be construed as mandatory illustration of the products unless otherwise confirmed expressly.

## Solenoid body

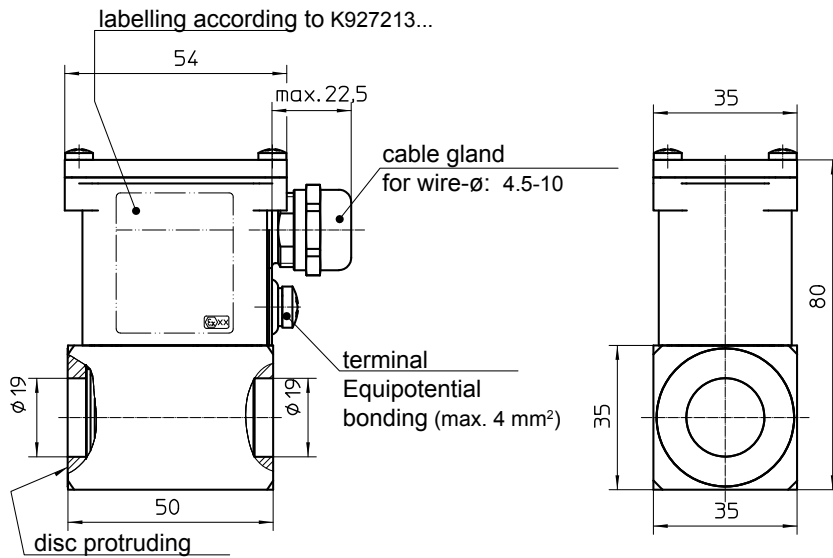


Fig. 6: Construction size 035 (type F MM E 035 K01 A01)

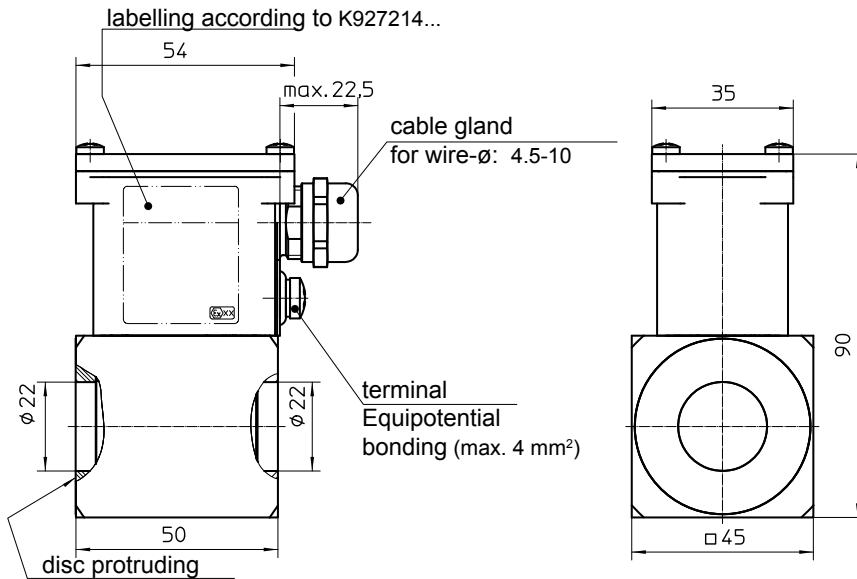


Fig. 7: Construction size 045 (type F MM E 045 K01 A01)

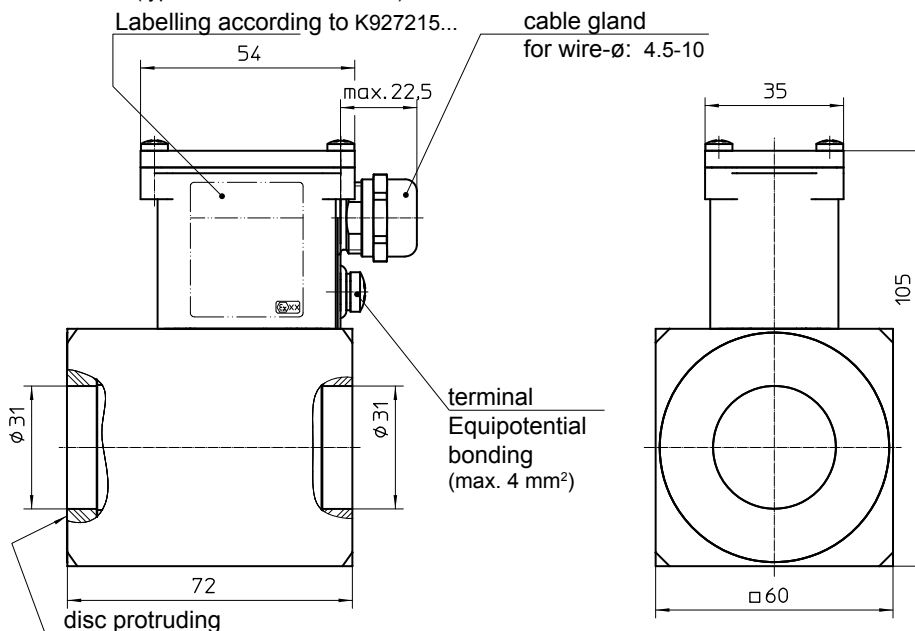
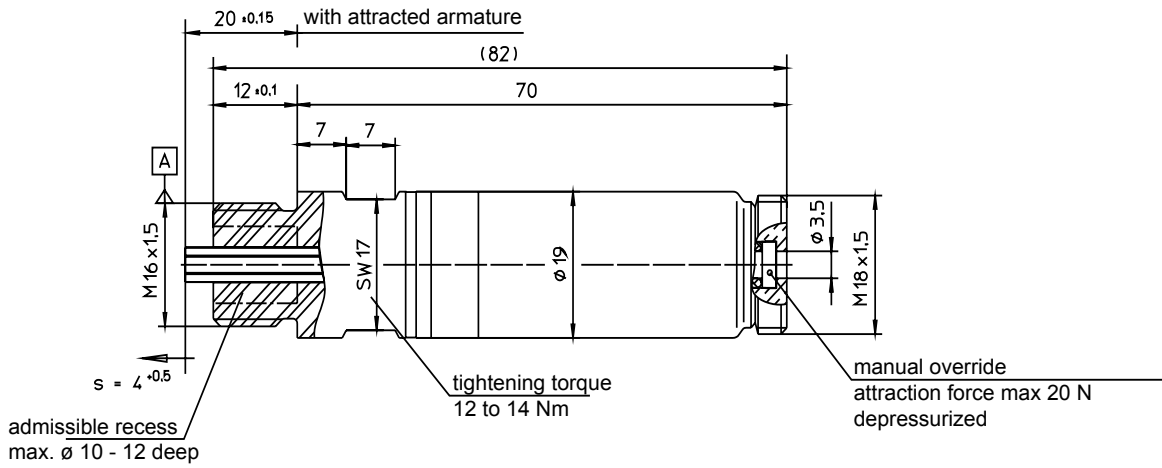
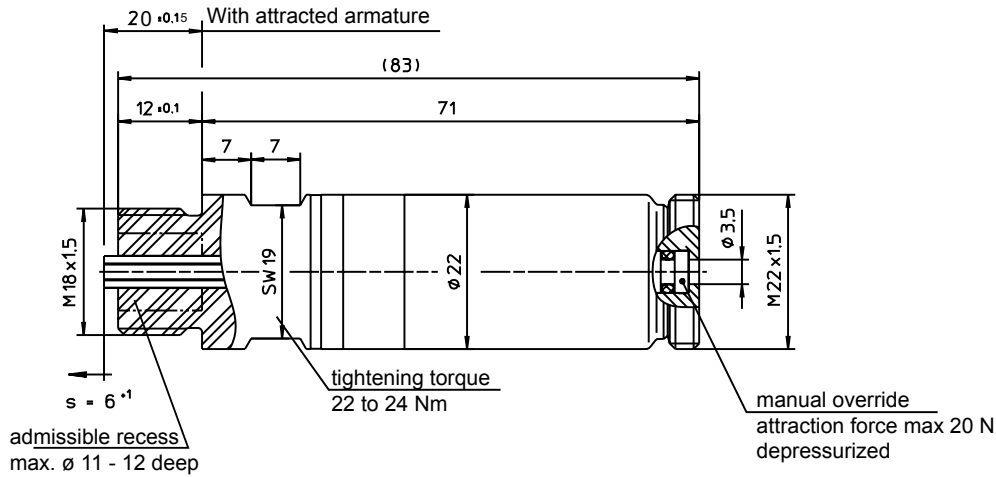


Fig. 8: Construction size 060 (type F MM E 060 K01 A01)

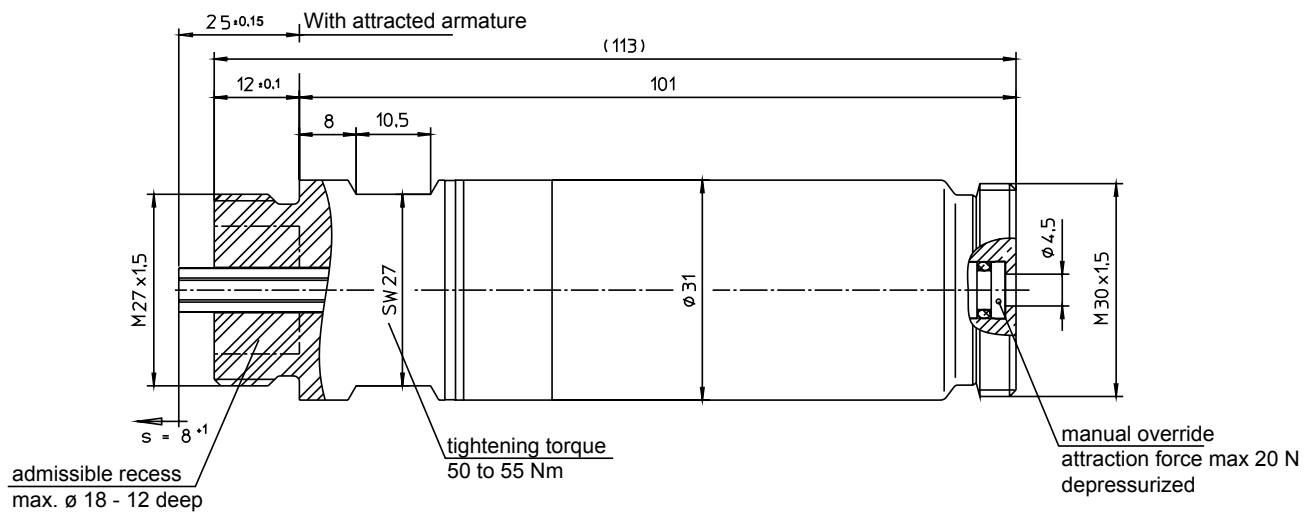
# Tube



**Fig. 9:** Construction size 035 (Part no. FHTS037926099)



**Fig. 10:** Construction size 045 (Part no. FHTS045923690)



**Fig. 11:** Construction size 060 (Part no. FHTS063923685)

## Fastening nut

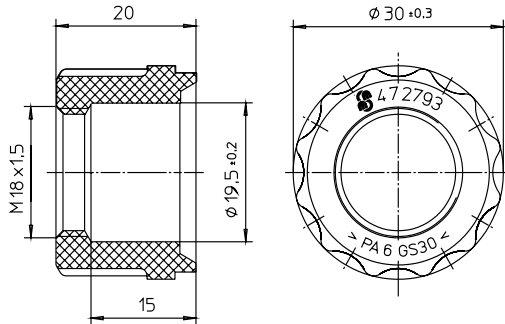


Fig. 12: Construction size 035 (Part no. 472793)

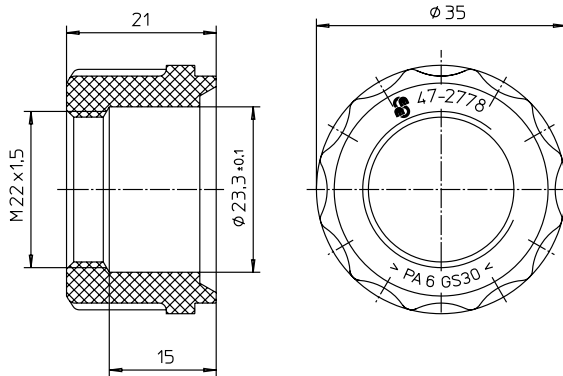


Fig. 13: Construction size 045 (Part no. 472778)

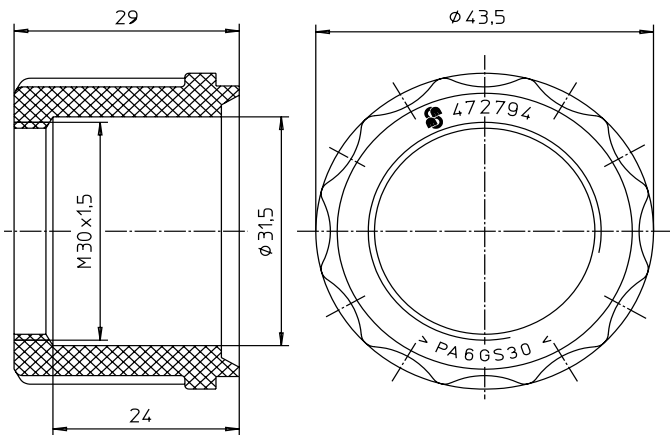


Fig. 14: Construction size 060 (Part no. 472794)

## Connection geometry

suitable o-ring 13,3x2,2

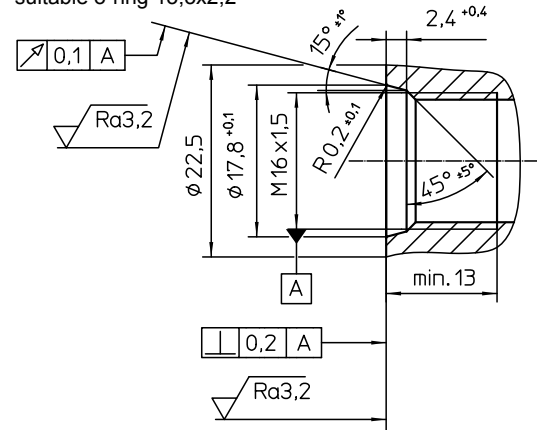


Fig. 15: Connection geometry to type 926099

suitable o-ring 15,3x2,2

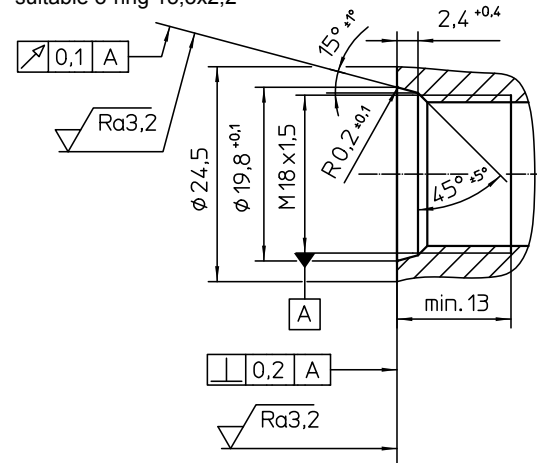


Fig. 16: Connection geometry to type 923690

suitable o-ring 24,3x2,2

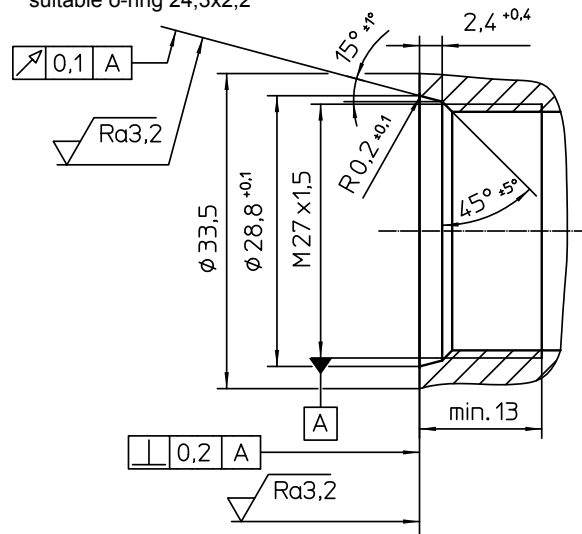
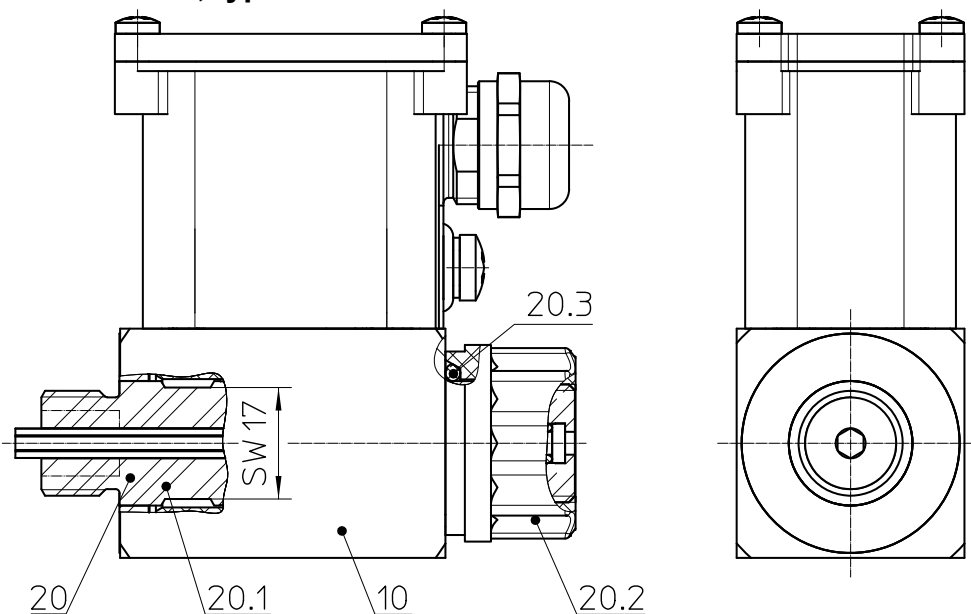
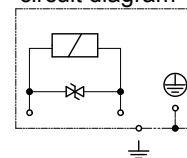


Fig. 17: Connection geometry to type 923685

## Complete ON/OFF solenoid, type code



circuit diagram




Size	Pos.	Designation	Part no.	Designation 2	Remark
035	10	<b>Solenoid body F MM E 035 K01 A01</b>	<b>927213-002</b>	<b>24VDC, T4, -30°C ... +50°C assembly on valve body</b>	<b>Order designation</b>
	20	<b>Tube complete</b>	<b>902312</b>	<b>bagged</b>	<b>Order designation</b>
	20.1	Tube	FHTS037926099		Delivery as tube cpl. (item 20)
	20.2	Fastening nut	472793	Suitable socket wrench SW26 (12 kt DIN 3124) Tightening torque 5+1 Nm	
	20.3	O-ring	781754	19x2,5 70 Sh-A NBR	
045	10	<b>Solenoid body F MM E 045 K01 A01</b>	<b>927214-002</b>	<b>24VDC, T4, -30°C ... +50°C assembly on valve body</b>	<b>Order designation</b>
	20	<b>Tube complete</b>	<b>902314</b>	<b>bagged</b>	<b>Order designation</b>
	20.1	Tube	FHTS045923690		Delivery as tube cpl. (item 20)
	20.2	Fastening nut	472778	Suitable socket wrench SW30 (12 kt DIN 3124) Tightening torque 6+1 Nm	
	20.3	O-ring	781744	22x2,5 70 Sh-A NBR	
060	10	<b>Solenoid body F MM E 060 K01 A01</b>	<b>927215-002</b>	<b>24VDC, T4, -30°C ... +50°C assembly on valve body</b>	<b>Order designation</b>
	20	<b>Tube complete</b>	<b>902316</b>	<b>bagged</b>	<b>Order designation</b>
	20.1	Tube	FHTS063923685		Delivery as tube cpl. (item 20)
	20.2	Fastening nut	472794	Suitable socket wrench SW38 (12 kt DIN 3124) Tightening torque 6+1 Nm	
	20.3	O-ring	781755	31x2,5 70 Sh-A NBR	

## Example

Please note that for a functional unit always a combination of solenoid body and tube must be ordered.

Solenoid body	Type:	F MM E 035 K01 A01
	Rated voltage:	24VDC
	Ambient temperature range:	-30°C ..... + 50°C
	Temperature class:	T4
	Part no.:	927213-002
Tube	Type:	F HT S 037
	Part no.:	902312

## Specials designs

Please do not hesitate to ask us for application-oriented problem solutions. In order to find rapidly a reliable solution we need complete details about your application conditions. The details should be specified as precisely as possible in accordance with the relevant  -Technical Explanations.

If necessary, please request the support of our corresponding technical office.