

Electromagnetically operated shotbolt lock unit ATEX + IECEx

1

Product group

F MM E + F ST X

Funktion

- Pull type (de-energized locked) or push type (de-energized unlocked)
- Installed return spring
- Almost linear magnetic force vs. stroke characteristic

Construction

- Central fastening
- Maintenance free bearings with high service life
- Armature space protected by o-ring
- Robustly built stainless locking bolt
- Insulation materials of the excitation winding correspond to thermal class F
- Protection class according to DIN VDE 0470/DIN EN 60529 when properly installed: IP 65
- Integrated circuit with TVS diode
- Explosion protection: $\text{Ex II 2G Ex eb mb IIC T6 / T4 Gb}$
 $\text{Ex II 2D Ex tb IIIC T80°C / T130°C Db}$

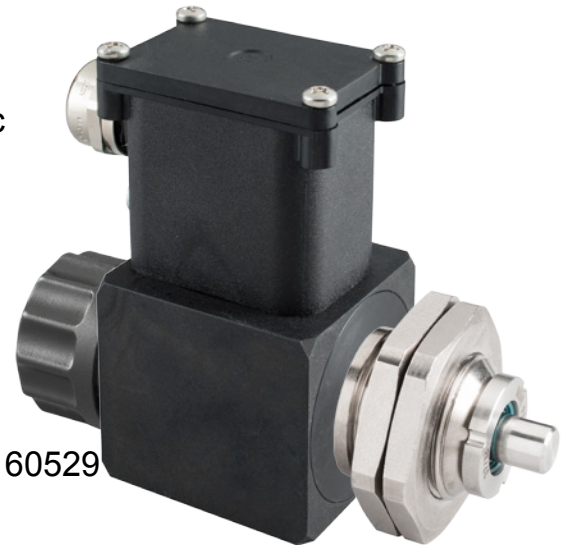


Fig. 1: Shotbolt lock unit ATEX consisting of magnetic body type F MM E and tube type F ST X

Application examples

- Application in explosive areas (gas, dust, zones: 1.21, EPL: Gb, Db) (according to the occupational safety and accident prevention regulations)
 - Locking of protection devices at machines and equipment of any kind
 - Blocking, limiting and interlocking of mechanical equipment of any kind

Options and accessories

- Protection class solenoid body IP 67
- AC version with bridge rectifier
- Deviating 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
- Quality management to ISO 9001, DIN EN ISO/IEC 80079-34
- ATEX, IECEx

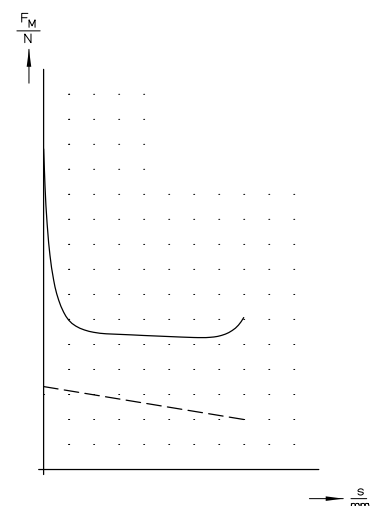


Fig. 2: Magnetic force-stroke-characteristic

Technical data

Size	035		045		060
	pull-type	push-type	pull-type	push-type	pull-type
IECEX Certificat of Conformity solenoid body	IECEX IBE 16.0023X				
EU-Type examination certificate magnetic body	IBEXU16ATEX1143X				
Operating mode	S1				
rel. duty cycle	100%				
Rated voltage U_N (VDC)	24				
Reference temperature ϑ_{13} (°C)	40				
Ambient temperature T_a (°C)	-30 ... +40				
Temperature classes	T4				
Stroke s (mm)	8		10		12
Magnetic force (N)	7	7	14	13.5	34
„Admissible lateral force in normal position“ (N)	600		900		2000
Rated power P_{20} (W)	12.1		20.4		30.3
Actuation time t_1 (ms)	147.8	163	278.1	144	260.6
Fall time t_2 (ms)	45	49	53.4	58	53.6
Inductance * (mH)					
• Armature in stroke start position s_0	935	807	418	443	334
• Armature in stroke end position s_{max}	551	543	309	321	228
Armature weight $m_{armature}$ (kg)	0.05	0.06	0.08	0.08	0.21
Solenoid weight m_M (kg)	0.7	0.7	1.0	0.9	2.1

* measured via switch-off energy (according to V1350.5786)

Table 1

Notes on the tables

The force values indicated in the tables refer to 90 % of the rated voltage, ($U_N = 24$ V, for other voltages deviations of magnetic force may occur) and in the normal operating temperature.

Due to natural dispersion the force values and the force values of the spring may deviate by ± 10 % from the values indicated in the tables.

The normal operating temperature is based on:

- Mounting on badly conductive base
- Rated voltage $= 24$ V
- Operating mode S1 (100%)
- Reference temperature 40° C

Functional description

In the illustrations 6-10 the devices are shown in de-energised condition. The shotbolt is held in the initial position by an installed return spring. When applying the supply voltage, the shotbolt is moved by the magnetic force against the spring force.

With the pulling types, the shotbolt is pulled into the device, with the pushing types the shotbolt travels out of the device. If the device is separated from the supply voltage again, it takes the initial position actuated by the spring, as long as the shotbolt is not impaired in its movement by external forces or obstacles.

Rated voltage

Rated voltage is $= 24$ V. An adaptation of the exciter coil to a rated voltage less than $= 250$ V is possible on request.

Standard values for voltage and operating mode: 24V, S1 (100%).

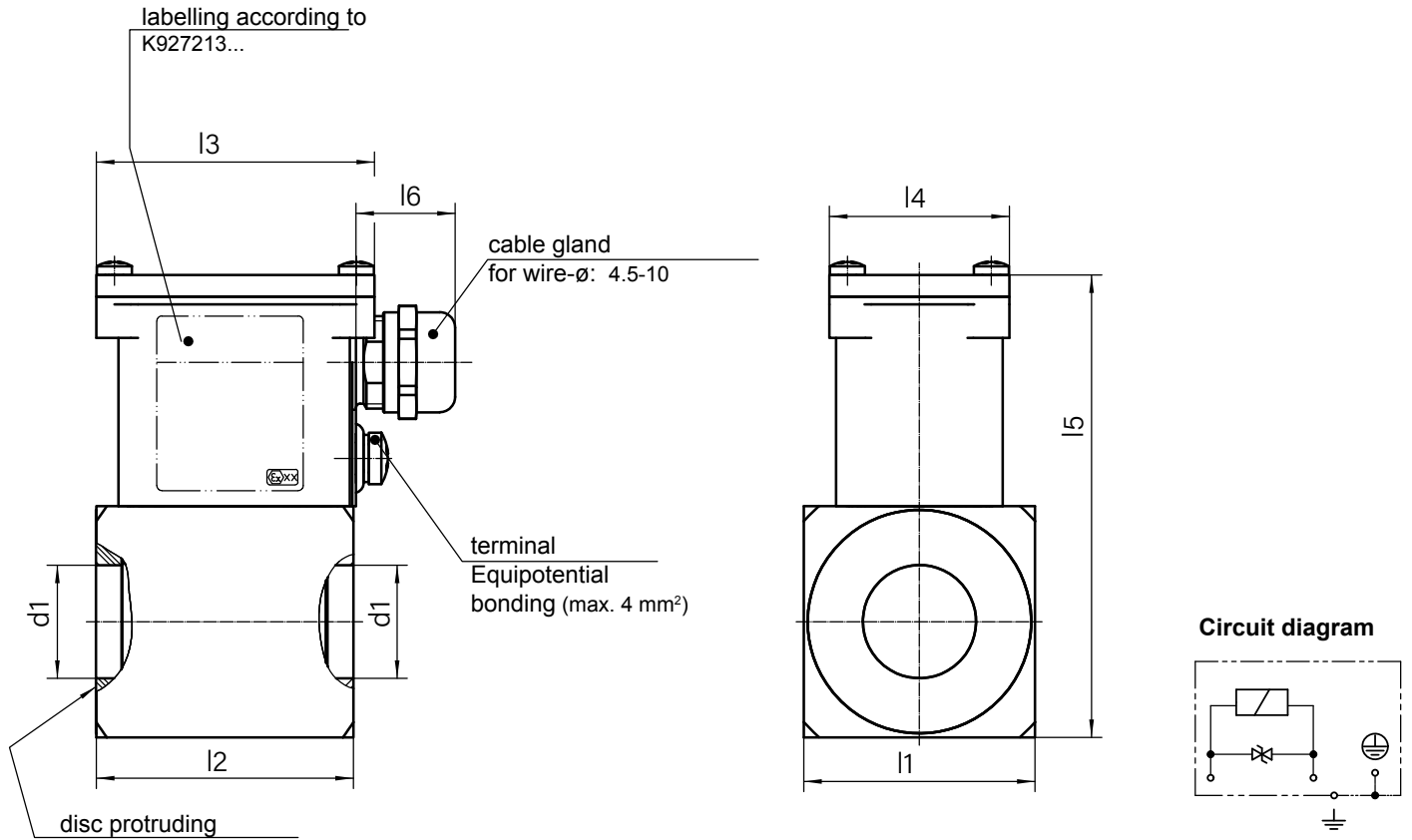
Protection class, protective conductor connection

The devices correspond to protection class I.

Due to their construction devies 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.

The user has to ensure that the tube resp. the mechanics connected to it are properly connected to the protective conductor.

Solenoid body

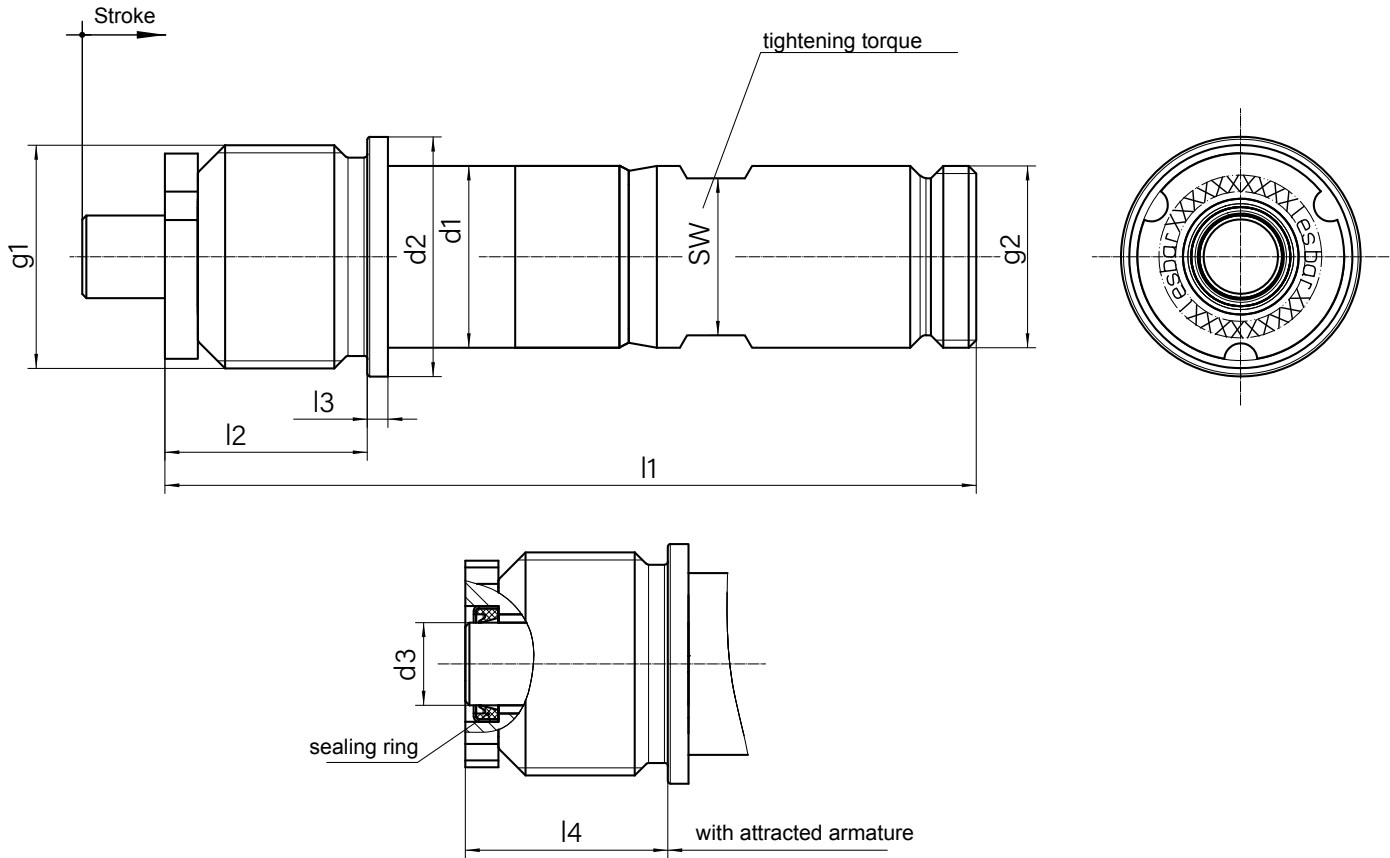


Size	035	045	060
Material no.	927213	927214	927215
Dimensions in mm / electrical data see table 1			
d1	Ø 19	Ø 22 *	Ø 31
l1	□35	□45	□60
l2	50	50	72
l3	54	54	54
l4	35	35	35
l5	80	90	105
l6	max. 22.5	max. 22.5	max. 22.5

* Variants with \varnothing 19 mm and \varnothing 23 mm on request

Table 2

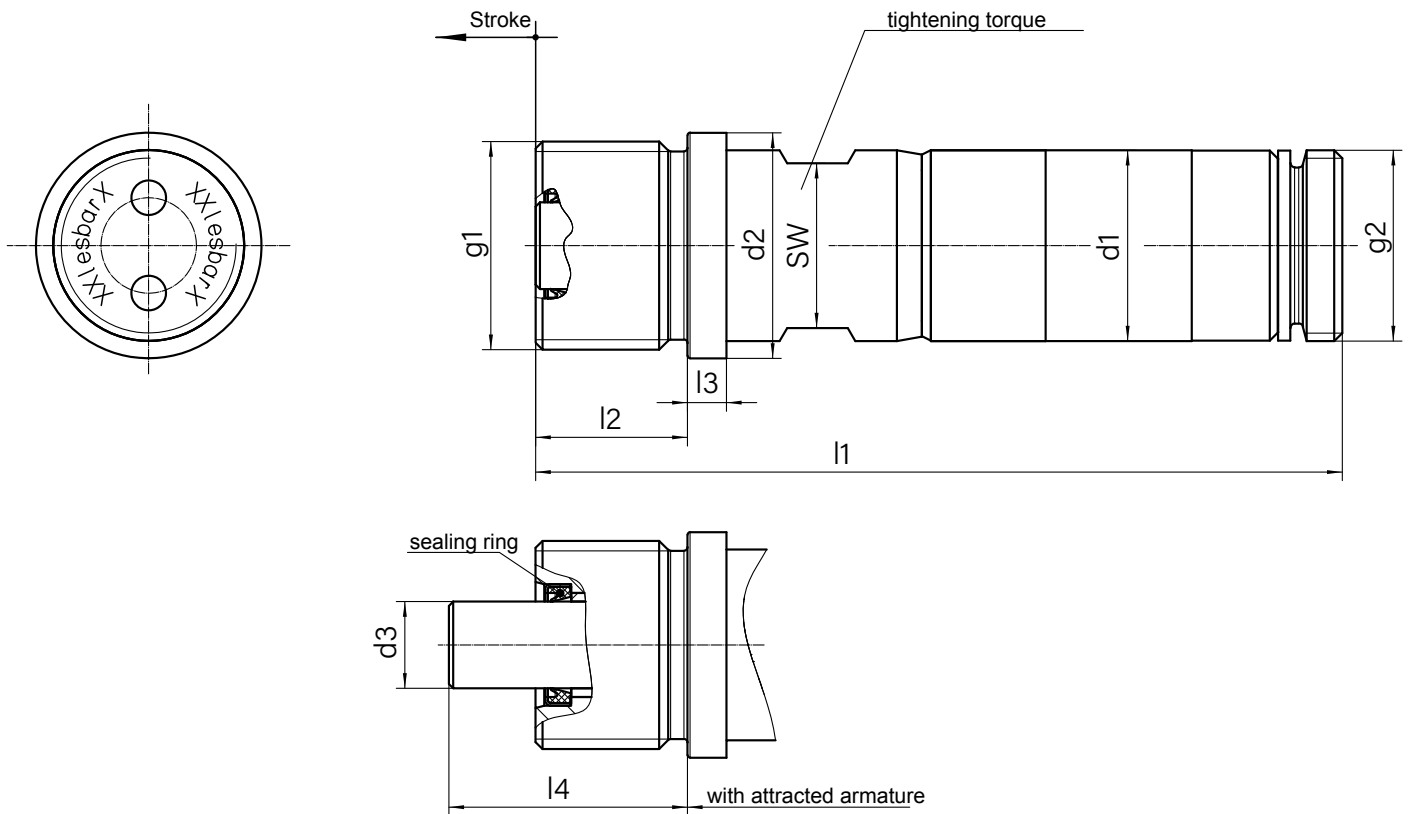
Tube pull-type



Size	035 / 037	045	060 / 063
Material no.	926477	925755	925752
Dimensions in mm			
d1	Ø 19	Ø 22	Ø 31
d2	Ø 25 -0.1	Ø 29 -0.1	Ø 37 -0.1
d3	Ø 8	Ø 10	Ø 14
l1	92.1	98.2	133.2
l2	21.5	24.5	29
l3	2.5 ±0.4	2.5 ±0.3	3 ±0.4
l4	21.5 ±0.55	24.5 ±0.55	29 ±0.55
Hub	8	10	12
SW	SW17	SW19	SW27
Tightening torque (Nm)	23 up to 25	46 up to 48	72 up to 74
g1	M24x1.5	M27x1.5	M36x1.5
g2	M18x1.5	M22x1.5	M30x1.5

Table 3

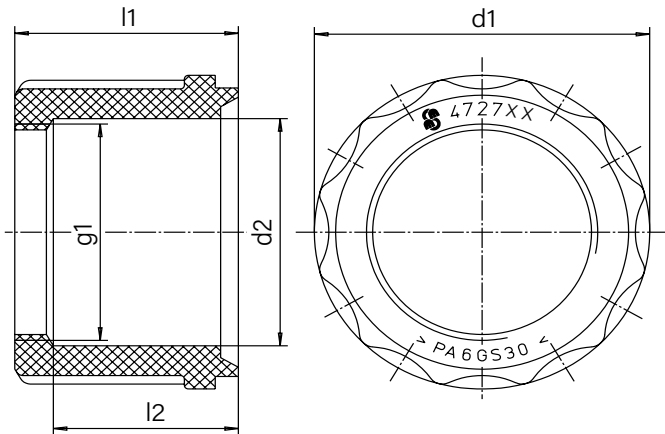
Tube push-type



Size	035 / 037	045
Material no.	926345	926552
Dimensions in mm		
d1	Ø 19	Ø 22
d2	Ø 23 -0.1	Ø 26 -0.1
d3	Ø 8	Ø 10
l1	88.5	93
l2	15.5	17.5
l3	4.5	4.5
l4	23.4 ±0.6	27.5 ±0.6
Hub	8	10
SW	SW17	SW19
Tightening torque (Nm)	19 up to 21	37 up to 39
g1	M22x1.5	M24x1.5
g2	M18x1.5	M22x1.5

Table 4

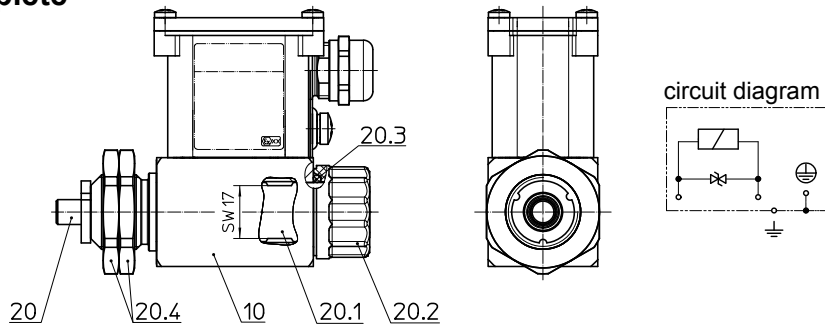
Fastening nut



Size	035 / 037	045	060 / 063
Material no.	472793	472778	472794
Dimensions in mm			
d1	Ø 30 ±0.3	Ø 35	Ø 43.5
d2	Ø 19.5 ±0.2	Ø 23.3 ±0.1	Ø 31.5
l1	20	21	29
l2	15	15	24
g1	M18x1.5	M22x1.5	M30x1.5

Tabelle 5

Shotbolt lock unit complete



Size	Pos.	Designation	Material no.	Designation 2	Remark
035 pull-type	10	Solenoid body F MM E 035 K01 A01	927213 001	24VDC, 100% ED, T4, -30°C ... +40°C	Order description for complete unit please order pos. 10 + 20
	20	Tube complete FSTX037	902354	bagged	
	20.1	Tube FSTX037	926477		Supplied as tube compl. (included in Pos. 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	
	20.4	Hex nut (2x)	611105	M24x1,5, SW36	
035 push-type	10	Solenoid body F MM E 035 K01 A01	927213 001	24VDC, 100% ED, T4, -30°C ... +40°C	Order description for complete unit please order pos. 10 + 20
	20	Tube complete FSTX037	902356	bagged	
	20.1	Tube FSTX037	926345		Supplied as tube compl. (included in Pos. 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	
	20.4	Hex nut (2x)	611079	M22x1,5, SW32	
045 pull-type	10	Solenoid body F MM E 045 K01 A01	927214 001	24VDC, 100% ED, T4, -30°C ... +40°C	Order description for complete unit please order pos. 10 + 20
	20	Tube complete FSTX045	902357	bagged	
	20.1	Tube FSTX045	925755		Supplied as tube compl. (included in Pos. 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	
	20.4	Hex nut (2x)	253350	M27x1,5, SW41	
045 push-type	10	Solenoid body F MM E 045 K01 A01	927214 001	24VDC, 100% ED, T4, -30°C ... +40°C	Order description for complete unit please order pos. 10 + 20
	20	Tube complete FSTX045	902358	bagged	
	20.1	Tube FSTX045	926552		Supplied as tube compl. (included in Pos. 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	
	20.4	Hex nut (2x)	611105	M24x1,5, SW 36	
060 pull-type	10	Solenoid body F MM E 060 K01 A01	927215 001	24VDC, 100% ED, T4, -30°C ... +40°C	Order description for complete unit please order pos. 10 + 20
	20	Tube complete FSTX063	902359	bagged	
	20.1	Tube FSTX063	925752		Supplied as tube compl. (included in Pos. 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	
	20.4	Hex nut (2x)	611111	M36x1,5, SW55	

Information and remarks concerning European directives
 can be taken from the correspondent information sheet which is
 available under *Produktinfo.Magnet-Schultz.com*.

**Please make sure that the described devices are suitable for
 your application. Our offers for these devices are based on
 the assumption of maximal 8 in an FMEA severity table, i. e.
 in case of malfunction of the device model as offered, there
 is, amongst others, no jeopardy of life or limb.**

For this application please note DIN EN 60079-14.

**For the magnetic body please observe the respective oper-
 ating manual delivered with each device. A manufacturer's
 declaration is enclosed once with the delivery**

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 expressively.


Example

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

Solenoid body	Designation:	Solenoid body F MM E 035 K01 A01
	Material no.:	927213 001
	Rated voltage:	24 VDC
	Ambient temperature range:	-30°C + 40°C
	Temperature class:	T4

Tube	Designation:	Tube F ST X 037
	Material no.:	902354

Specials designs

Please do not hesitate to ask for our assistance with the solution
 of your application-oriented task. 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.