

# SCHIENLE

## MAGNETTECHNIK

**Flame proof solenoid**

**Operating instructions**

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Types :

**01 EX13 040x yzzz**

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## 1 Introduction

The solenoid was designed, manufactured and tested in compliance with the standards and regulations generally applicable within the standard family IEC 60079. On leaving the factory the solenoids safety-related conditions were proven to be faultless. The operator must only read and observe the notes and warnings provided with this operating instruction in order to maintain this status and to ensure safe operation.

The solenoid must only be installed and wire-connected by a qualified technician, who is familiar with and works according to the generally accepted engineering standards and the latest legal regulations and standards of explosion protection.

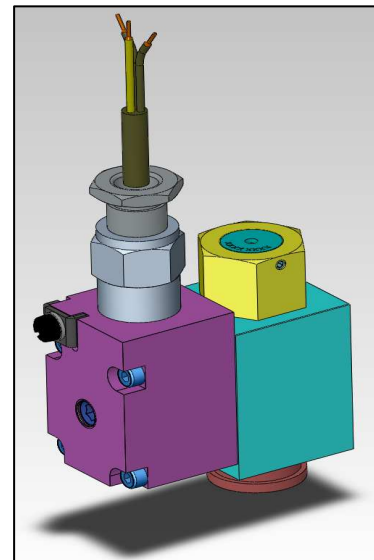
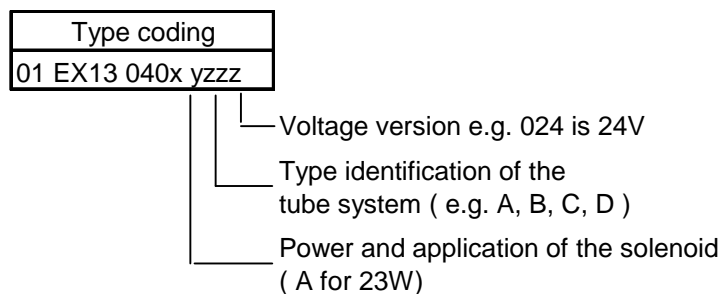
## 2 Usage

This solenoid is assigned to the group I, category M2 according to IEC 60079-0.

This device can be used for EPL (Equipment Protection Level) Mb. The maximum surface temperature (according to the specification in point 6 and 11) do not overstep 150°C.

The equipment was tested and proved according to following standards:

Please notice the points 5, 6 and 12 before the initiation and installation of the device.



**Table 1 Type coding**

Version	Type coding	Legend
A ( 23 Watt )	01 EX13 040A C024	Ex d I Mb

Example: Version A, 23 Watt, actuation system C, voltage 24 V

## 3 Electrical data

- Rated voltage:  $U_N$  [V DC]  $\pm 10\%$  max.
- Supply voltage:  $U_N$  [V DC] (for electronics)
- Ripple voltage:  $\pm 15\%$
- Resistance:  $R_{20}$  [ $\Omega$ ]  $\pm 5\%$  bei 20 [°C]
- Working duty: S1 (100%ED)

### 3.1 Version A with 23 Watt

**Table 2 Voltage versions A**

Type coding	Voltage	Resistance	Limiting current	Suppressor
	$U_N$	$R_{20}$	$I_G$	
	[VDC]	[Ohm]	[A]	
01 EX13 040x y012	12	6,5	1,35	Diode
01 EX13 040x y024	24	25,6	0,67	Diode

## 4 Initial installation

- The ambient temperature of -20°C until +40°C shall not be in excess while the maximum temperature of the medium (generally hydraulic fluid) shall not exceed 70°C
- It is the users duty to ensure free and unhindered heat emission during operation. This means that the solenoid shall neither be covered nor stored immediately adjacent to heat sources (e.g. fan heaters) during operation.
- Care is to be given that the solenoid is not subjected to direct sunlight during operation.

## 5 Installation notice - installation, mounting, demounting

The solenoid consist of different individual components (field coil, guide tube and screw nut). These components are fine-tuned to one another and must not be replaced individually.

- The user has to safeguard each solenoid with a fuse:  $I_N \leq 3 \times I_G$ , with trigger characteristic "slow blow". The breaking capacity of the fuse link has to be stronger than the max short circuit current at the users operating area.
- EX-secured components must be used during mounting in case the fuse and/or the interface are within the EX-range.
- In addition, the solenoid must be connected to ground via the purpose-built ground clamp an the connector casing.
- The EX-Solenoid presented herewith shall only be operated with a valve body according to the Instructions in point 11.
- The guide tubes and field coils fixing nuts must be tightened with 10 Nm. In addition, the fixing nut must be secured against disengagement with a headless screw.
- The coil must never be operated separately.
- The connection cable must be laid out with sufficient cover and cord grip.

## 6 Specification

- Coils and plug cavity to be molded watertight. Insulation class "F"(155C)
- Protection type IAW DIN VDE 0470, EN 60529 and/or IEC 529 Device: IP 67
- Surface protection (casing). Zinc coated or gas-nitride and oxidized self
- Max. temperature of operating medium (generally hydraulic fluid): 70°C
- Max. ambient temperature: +40°C, minimum -20°C
- **Please note: is not allowed to change the cable or the cable connection!**

## 7 Suppressor

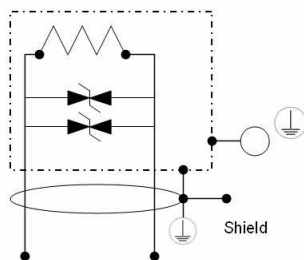


Figure 1 — D-Bidirectional voltage limiter – diodes:  
 $U_Z = 36V$ , bipolar for  $U_N = 12$  and  $24V$

## 8 Maintenance, service, troubleshooting

- The solenoid generally requires almost no maintenance. All electrical connections shall be checked regularly for possible damages (visual check)
- The surface of the device shall be checked regularly for dust deposits, which should be cleaned off.
- Do not try to open or to repair the device. If any troubles occur, please contact the manufacturer.

## 9 Standards and regulations

IEC 60079-0:2007: Electrical apparatus for explosive gas atmospheres - Part 0: General requirements  
 IEC 60079-1:2007: Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d".

## 10 Safety notice – Please read carefully

- In case the solenoid shows any signs of a defect, malfunctioning or external damage (including corrosion), the device must immediately be taken out of operation.
- Any deposits on the surface of the device shall not obstruct heat emission
- To maintain legibility of the data plate, the solenoid must not be coated.

### Caution:

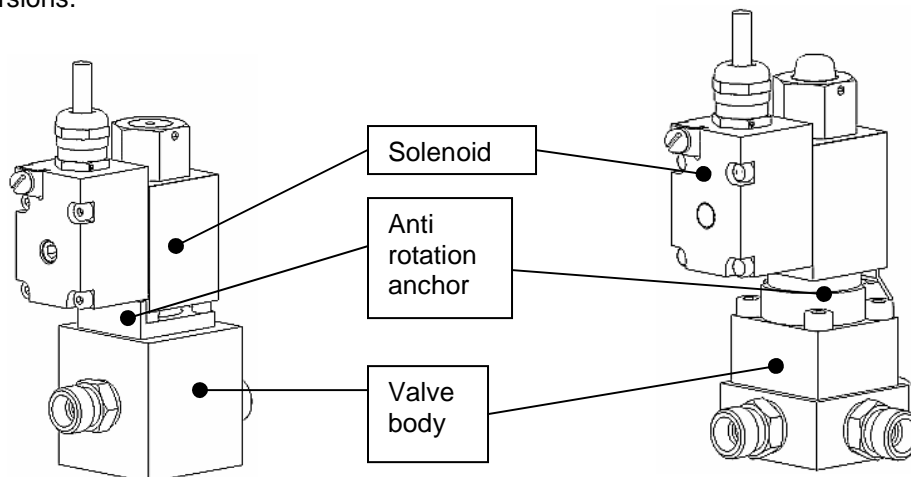
- Always disconnect the solenoid from the power supply before any maintenance or other work on it.
- Always exchange the complete solenoid (field coil system and guiding tube). Do not try to repair the solenoid.
- In no case shall any changes be made to the solenoid or the connecting cable.
- Never operate the solenoid when disconnected from the valve body. (See also item 11)
- Demount the solenoid only in secure areas (not in EX-areas). If this is not possible, the solenoid must cool off to a temperature below 50°C before it is demounted.

**Any warranty claims are denied in case the regulations in this operating manual are not observed!**

## 11 Grouping of single solenoid and valve

### 11.1 General

The current single solenoid must only be operated with a valve body and an anti rotation anchor. Immediate to the solenoid an anti rotation anchor hooks up, which is performed in two different versions.



**Figure 2** — Anti rotation anchor version 1– Anti rotation anchor (bracket plate), valve body and version 2 Anti rotation anchor (plate and flange) and valve body

The cubic valve body hooks up immediate to the anti rotation anchor. The minimum dimensions of the valve body must correspond to the dimensions shown in **table 4**.

Also a possible group configuration with more than one valve body must correspond to the defaults shown in **table 4**.


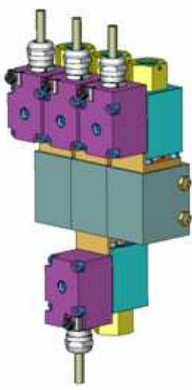
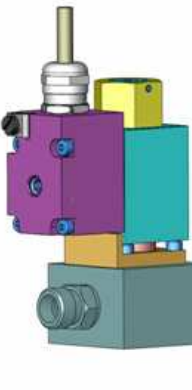
## 11.2 Indications – **Please read carefully**

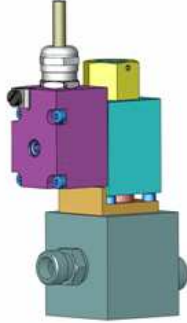
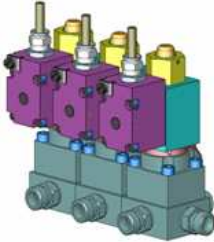
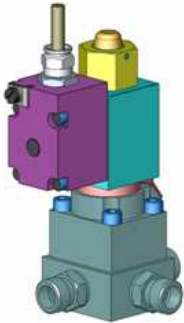
Principally attend following indications concerning table 3:

- The minimum dimensions of each valve body shall not fall below shown dimensions. Valve bodies with major dimensions then in table 3 can be used.
- The usage of other anti rotating anchor is only allowed when released by solenoid manufacturer, Schientle GmbH.
- In case multiple valve bodies are used, these must be lined up directly along the same axis and must be connected with appropriate connecting elements (screws or tie rods etc.).
- In case single valve body is used, it is the users duty to ensure free and unhindered heat emission during operation.
- A valve body can also be composed of many separate component parts, which are strong connected.
- If it is allowed to use 2 solenoids per valve body, they have to be mounted on opposite sides. Furthermore to follow:

The user has to take care that during working only one solenoid per valve body is actuated. A simultaneous activation of solenoids at one and the same valve body is forbidden. The user has to fulfil this by a proper electrical connection.

**Table 1 Type coding**

	Version 1 - valve bank -	Version 2 - valve bank -	Version 3 - single valve -
<b>Properties/criterion</b>			
Anti-rotation anchor type	Type 1	Type 1	Type 1
Minimum dimensions of a valve body Single valve resp. Valve bodies [mm] (tolerance acc. ISO 2768-c)	39,5 x 50 x 59	39,5 x 50 x 59	35 x 35 x 50
Solenoid may be connected (valve bank)	Yes	Yes	No
Solenoid may be used separately (single valve)	Yes	Yes	Yes
ON each valve body <b>may/must</b> be 2 solenoids on the opposite side of the valve	Always 2 solenoids	1 or 2 solenoids	Only one solenoid
Application on version 23W	Yes	Yes	Yes
Example – structure drawing			
<b>The indication in 11.2 is to be kept without fail</b>			

	Version 3a - single valve -	Version 4 - valve bank -	Version 5 - single valve -
<b>Properties/criterion</b>			
Anti-rotation anchor type	Type 1	Type 2	Type 2
Minimum dimensions of a valve body Single valve resp. Valve bodies [mm] (tolerance acc. ISO 2768-c)	40 x 40 x 50	25 x 46 x 50	29 x 45 x 50
Solenoid may be connected (valve bank)	No	Yes	No
Solenoid may be used separately (single valve)	Yes	Yes	Yes
ON each valve body <b>may/must</b> be 2 solenoids on the opposite side of the valve	Only one solenoid	Only one solenoid	Only one solenoid
Application on version 23W	Yes	Yes	Yes
Example – structure drawing			
	<b>The indication in 11.2 is to be kept without fail</b>		

**Valve bodies with larger volume may be used.**