

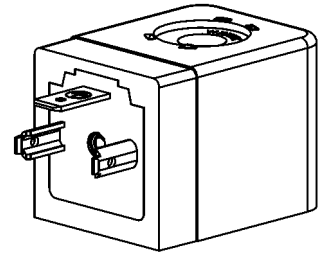
## Ex i Solenoid Operator Type 1259



PTB 02 ATEX 2154



IECEx PTB 08.0023



### Operating Instructions

Dear Customer!

To ensure the function and for your own safety, please read these enclosed operating instructions attentively before you begin with the installation. If you still have questions, please contact nass magnet GmbH.

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### General Conditions

- We are not liable for any damage caused by non-observation of this information as well as in case of improper intervention regarding this equipment. Furthermore, warranty for the equipment and accessories will become void. Our general terms and conditions apply
- The EC type-examination certificate exclusively covers solenoid operators with nass magnet armature assembly and with nass magnet solenoid coil; please consider the corresponding power levels.

Applied standards by the certification bodies:

EN 60079-0:2012+A11:2013

IEC 60079-0:2011 (Ed. 6),

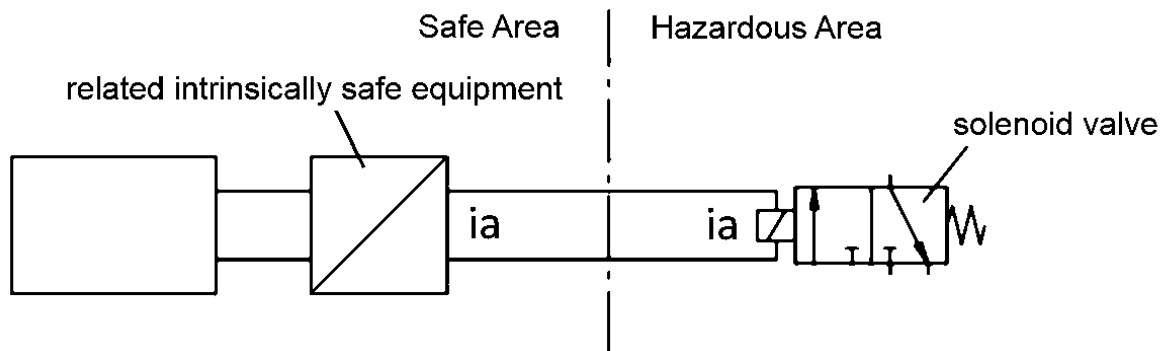
EN 60079-11:2012

IEC 60079-11:2011 (Ed. 6)

- In its installed state the equipment is appropriate for potentially explosive gas atmospheres of Group IIC or IIB with an ignition temperature higher than T4 or optional T6. The Equipment Protection Level (EPL) is Gb intended for use in Zone 1 .
- Beyond recognized rules of sound engineering practice, the EC type-examination certificate and these operating instructions refer to special conditions and further application conditions that must be observed in any case. However, these operating instructions cannot consider all possible conditions and applications completely and do not replace the specifications valid in each case.

# Installation

- At installation and maintenance, it is essential to observe applicable standards for electrical safety and for installations in potentially explosive atmospheres, especially IEC/EN 60079-14.
- Take suitable measures to exclude unintentional activation or inadmissible impairment.
- Before mounting the valve system, check that there is no dirt in the piping or the valve housing.
- Make sure not to damage O-rings and seals during assembly.
- **Caution! Make sure not to detach pipes and valves of pressurised systems!**
- The solenoids are suitable for a side-by-side manifold assembly at 100% duty cycle.
- Mounting is admissible in any position. Preferably the solenoid coil points upwards.
- The solenoid coil can be locked when offset by 45°.
- Observe the tightening torques according to the installation scheme.
- At choice of the material of the valve bodies must be observed:
  - Metal: The maximum admissible percent by weight may not exceed the following limits for EPL Gb and Db:  
in total 7.5 % magnesium, titanium and zirconium.
  - Plastics: In order to avoid the build-up of electrostatic charges the requirements according to IEC/EN 60079-0 section 7.4 must be observed.
- Contact connection in gaseous hazardous areas:  
Solder and plug-in terminals suitable for push-on receptacles 6.3 DIN 46247 or appliance socket according to EN 175301-803, version A, or ISO 4400 respectively.
- The solenoid must be supplied by an intrinsically safe source (e.g. an isolating amplifier or barrier) where the permissibility of the interconnection has to be assessed expertly. Exemplary block diagram:



- Connection to certified intrinsically safe ia circuits in:
 

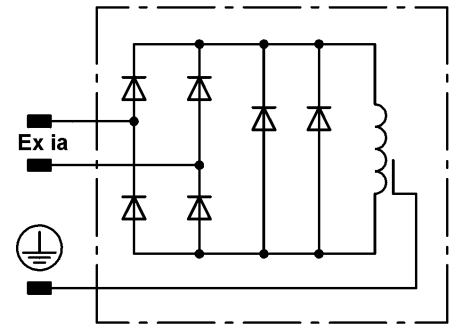
Category	IIC	with maximum values	$U_i = 28 \text{ V}$	$I_i = 115 \text{ mA}$	$P_i = 1.6 \text{ W}$
Category	IIB	with maximum values	$U_i = 32 \text{ V}$	$I_i = 195 \text{ mA}$	$P_i = 1.6 \text{ W}$

The effective inductance and capacitance are negligible low ( $L_i \approx 0$ ,  $C_i \approx 0$ ).

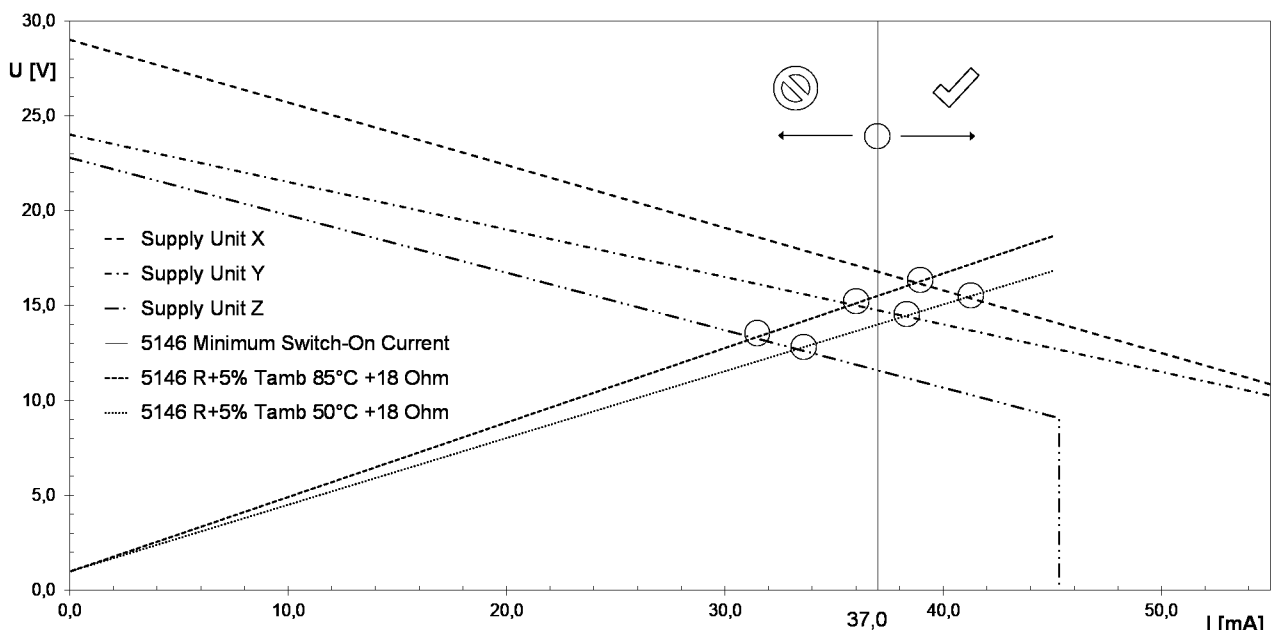
- A minimum switch-on current is required to ensure that the solenoid valve is turned on. This current is to be considered at the design of supply and wiring. The solenoid has a temperature-dependent coil resistance due to the specific properties of copper. The warm condition values from the table include a safety margin of 5% for the resistance, 100% duty cycle with minimum switch-on current in a side-by-side manifold assembly and low heat dissipation by the valve. Two exemplary ambient temperatures are shown. Other conditions can be determined specifically.

Winding W	Min switch-on current [mA]	Resistance nominal [Ω] (20 °C)	Resistance +5% Tamb 50 °C [Ω]	Resistance +5% Tamb 85 °C [Ω]	Nominal width ; max. operating pressure [mm]; [kPa]/[bar]
5146	37 (at 1 bar)	275	329 (@ 37mA)	374 (@ 37mA)	0.8 ; 800 / 8
					0.6 ; 1000 / 10
7210	27 (at 1 bar)	400	481 (@ 27mA)	540 (@ 27mA)	0.6 ; 800 / 8

- The characteristics of the supply units can be learnt from the manufacturer's data sheets.
- For the characteristic curve of the solenoid, a series voltage of 1 V must be taken into account, which is required for the internal electronics. See adjacent schematic diagram.
- As an example, possible characteristic curves for interconnection checks are charted below. Operating, the units work at the point of intersection of the characteristic curves of the solenoid and the supply unit. For a safe switch-on this operating point must be on or to the right of the line of the minimum switch-on current (in this example winding 5146 with 37 mA).



From the resulting operating points it can be concluded:  
 Supply unit X is suited whereas supply unit Z is not suited.  
 Supply unit Y is not suited for higher temperatures.  
 An additional resistance of 18 Ohms for the supply lines and the series voltage of 1 V is accounted for in the characteristic curves of the solenoid shown below.



- The minimum switch-on current is given for a supporting operating pressure of 100 kPa / 1 bar for series standard plunger strokes. A higher pressure and reduced plunger strokes can reduce the min switch-on current and be considered as support.
- Before operational start-up of the equipment it must be ensured that the entire machine or system complies with the local regulations, e.g. the EMC Directive.

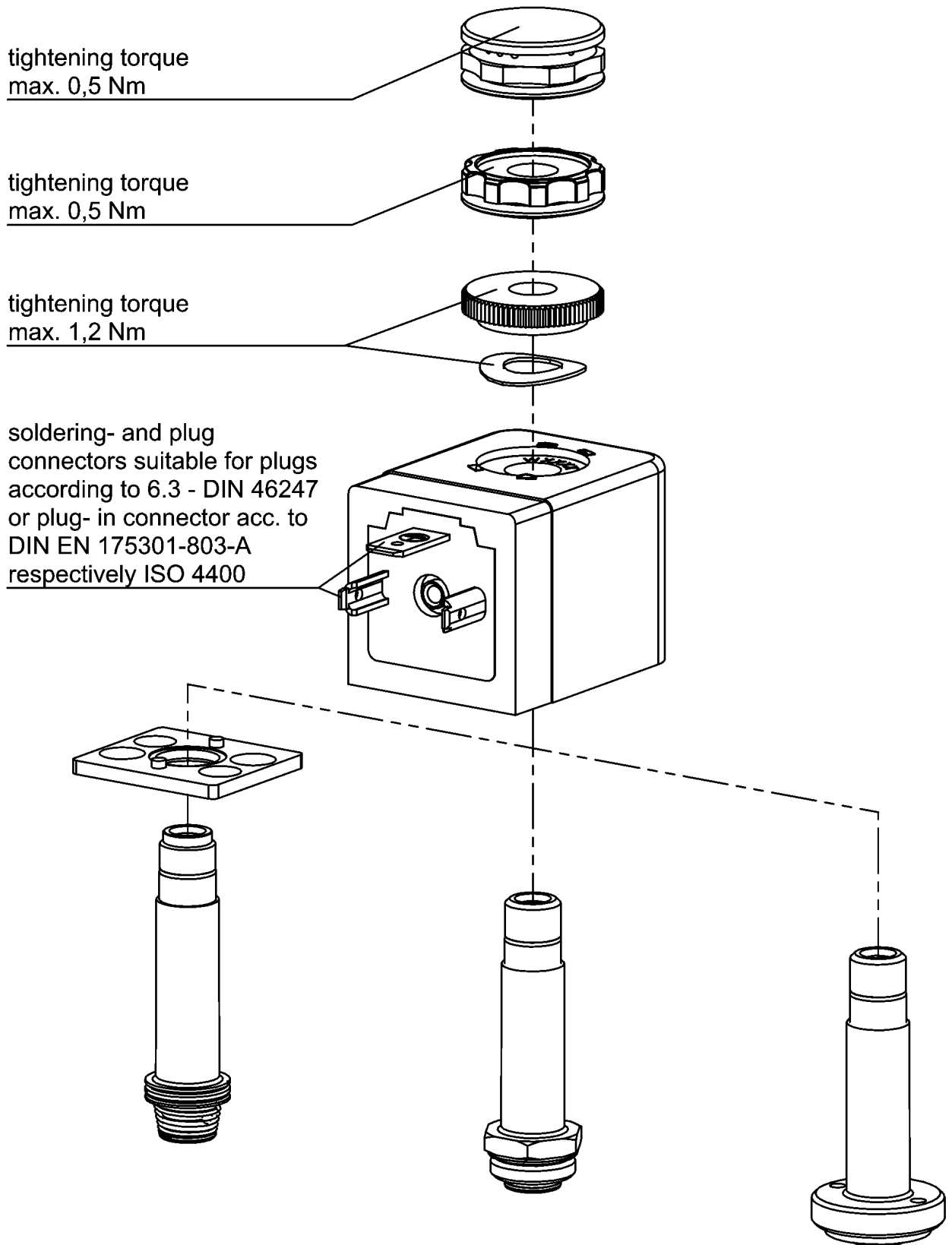
## Operation

- The solenoid operators 1259 00 to 1259 49 of temperature class T6 are suitable for the following conditions:
  - Ambient temperature range from -40 °C to +50 °C
  - Maximum admissible media temperature: +70 °C
- The solenoid operators 1259 50 to 1259 99 of temperature class T4 are suitable for the following conditions:
  - Ambient temperature range from -40 °C to +85 °C
  - Maximum admissible media temperature: +80 °C
- The solenoid operators are suitable for side-by-side manifold assembly at a 100% duty cycle.
- **Caution! Risk of injury! The solenoid valve can be very hot!**
- The equipment's operating pressure depends on the armature system used. The mass magnet standard armature system is suited for up to 1200 kPa / 12 bars and has no extra marking. For other demands please enquire.
- Admissible media are solely gas and liquids that do not affect the system and the gasket material contained therein.
- Prevent the equipment's exterior surfaces from getting in contact with liquid or corrosive media.
- Frequent occurrence of condensate can lead to critical accumulation of water, for which the rated protection class IP65 is not sufficient. Exposure to natural weather is generally not permitted.
- Do not strain the system by bending or torsion.
- Prevent the connecting cables from being buckled or damaged in order to avoid short circuits and interruptions.

## Troubleshooting

- At malfunctioning, check the cable connections, operating voltage and pressure.
- Should the problem persist, the equipment must be put out of operation. Make sure to disconnect pressure and electrical power supply.
- Damaged or defective equipment must not be repaired but must be replaced. Please order replacement by indicating the identification number provided on the units.

# Installation scheme





## EU Declaration of Conformity

This declaration of conformity is issued under the sole responsibility of the manufacturer:  
<sup>0102</sup>

**nass magnet GmbH**  
**Eckenerstrasse 4-6**  
**30179 Hannover, Germany**

Product, Type-number / Object of the declaration:

**Solenoid operator Type 1259 00 to 1259 99**

The object of the declaration described above is in conformity with the relevant Community harmonisation legislation:

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**2014/34/EU**

Equipment and protective systems intended for use in potentially explosive atmospheres  
(recast of 26 February 2014)

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**2011/65/EU, with (EU) 2015/863 and (EU) 2018/741**

on the restriction of the use of hazardous substances in electrical and electronic equipment  
(recast of 8 June 2011, amended 31 March 2015 and 1 March 2018)

Regarding pressure-induced hazards, the relevant requirements of Directive 2014/68/EU are complied with.

Notified body (no.) that performed the EC-type examination and no. of the certificate:

**Physikalisch Technische Bundesanstalt (No. 0102), PTB 02 ATEX 2154.**

Relevant harmonised standards used and references to the specifications in relation to which conformity is declared. In case of newer editions as referenced in the certificate we confirm that the changed requirements are either not applicable or the products listed above comply with them:

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**EN IEC 60079-0:2018**

Explosive atmospheres - Part 0: Equipment - General requirements

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**EN 60079-11:2012**

Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"

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**EN IEC 63000:2018**

Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

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**DIN VDE 0580:2011**

Electromagnetic devices and components - General specifications

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Signed for and on behalf of

**nass magnet GmbH, Hannover, 14 June 2021**

**Patrick Oelkers**  
General Manager

