

BVS 16 ATEX E088 X, IECEx BVS 16.0053X

Device with 2G Ex ib IIC / 2D Ex ib IIIB approval

Geräte mit 2G Ex ib IIC / 2D Ex ib IIIB Zulassung

Appareils avec mode de protection 2G Ex ib IIC / 2D Ex ib IIIB



Operating Instructions

Bedienungsanleitung

Manuel d'utilisation



We reserve the right to make technical changes without notice.
Technische Änderungen vorbehalten.
Sous réserve de modifications techniques.

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Operating Instructions 1705/01_008F / Original DE

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1 OPERATING INSTRUCTIONS

The operating instructions describe the entire life cycle of the device. Keep these instructions in a location which is easily accessible to every user, and make these instructions available to every new owner of the device.

Important safety information.

Read the operating instructions carefully and thoroughly. Study in particular the chapters entitled “Basic safety instructions” and “Authorized use” as well as the “Application area” and the “Technical data”.

- The operating instructions must be read and understood.

1.1 Definition of term

The term “device” used in these instructions always stands for the cartridge solenoid valve Type 6164.

The abbreviation “Ex” used in these instructions stands for potentially explosive area.

1.2 Symbols

The following means of representation are used in these instructions.



DANGER!

Warns of an immediate danger!

- Failure to observe the warning may result in a fatal or serious injury.



WARNING!

Warns of a potentially dangerous situation!

- Failure to observe the warning may result in serious injuries or death.



CAUTION!

Warns of a possible danger!

- Failure to observe this warning may result in a moderate or minor injury.

NOTE!

Warns of damage to property!



Indicates important tips and recommendations.



Refers to information in these operating instructions or in other documentation.

- designates instructions for risk prevention.

→ designates a procedure which you must carry out.

2 AUTHORIZED USE

Non-conforming use of the Type 6164 may be a hazard to people, nearby equipment and the environment.

- ▶ The cartridge solenoid valve has been designed for application as a pneumatic valve. It controls neutral gases.
- ▶ Type 6164 is used exclusively to control the gaseous media permitted according to the technical data. It is designed for use in explosion group IIC, category 2G, temperature class T4, T5 or T6 as well as in explosion group IIIB, category 2D, surface temperature T155 °C. According to the application case, observe the values in the tables in the chapter Technical data.
- ▶ Do not use the Type 6164 outdoors or expose it to UV light.
- ▶ In the potentially explosion-risk area the device may be used only according to the specification on the separate Ex labeling, this operating instructions and contract documents. To use the device, observe the additional information with safety instructions for the Ex area enclosed with the device.
- ▶ Do not use devices without a separate Ex identification in the potentially explosive area.
- ▶ Use the device only in conjunction with installation dimensions as well as fixing components recommended by Bürkert and with the third-party devices and components authorized by Bürkert.

- ▶ The device must be used in compliance with the characteristics and commissioning and use conditions specified in the contractual documents and in the user manual.
- ▶ Correct transportation, storage and installation as well as careful operation and maintenance are essential for reliable and fault-free operation. Bürkert is not liable for any resulting damage. The user alone bears the risk.
- ▶ Use the device only as intended.

2.1 Ex-Approval

The Ex approval is only valid if you use the modules and components authorised by Bürkert in such a way as described in this operating instructions.

The Type 6164 may only be used in combination with additional components that have been approved by Bürkert. Otherwise, the Ex approval will expire. The explosion protection approval applies only to devices of Type 6164 with code PX36.

If you make any unauthorized changes to the device, the modules or the components, the Ex approval will also expire.

The following EU Type Examination Certificate and the IECEx certificate were issued by DEKRA EXAM GmbH:

BVS 16 ATEX E088 X
IECEx BVS 16.0053 X

Production is audited by:

PTB (Physikalisch Technische Bundesanstalt),
Bundesallee 100,
38116 Braunschweig (CE0102)

2.2 Special conditions



DANGER!

Risk of explosion caused by electrostatic charge.

In the event of a sudden discharge from electrostatically charged devices or individuals, there is a risk of explosion in the explosion-risk area.

- ▶ Ensure that the metallic bodies of the installed valve cannot be touched or that they are connected to a potential equalization.



Ambient temperature may deviate from the usual value ranges (observe temperature tables in chapter [“6.8”](#)).

3 BASIC SAFETY INSTRUCTIONS

These safety instructions do not make allowance for any

- contingencies and events which may arise during the assembly, operation, and maintenance.
- local safety regulations – the operator is responsible for observing these regulations, also in relation to the installation personnel.



Risk of explosion.

If the permitted temperature values are exceeded, there is a risk of explosion.

- ▶ Observe permitted temperature values.
- ▶ Do not remove the device during operation.

Risk of injury from high pressure in the system or device.

- ▶ Before working on the system or device, cut off the pressure and deaerate or drain lines.

Risk of injury due to electrical shock.

- ▶ Before working on the system or device, switch off and isolate the power supply to prevent reactivation of the device.
- ▶ Observe applicable accident prevention and safety regulations for electrical equipment!

Risk of burns or risk of fire if used for a prolonged duty cycle through hot device surface.

- ▶ Keep the device away from highly flammable substances and medium and do not touch with bare hands.

Risk of injury due to malfunction if device used outdoors.

- ▶ Do not use the device outdoors and avoid heat sources which may cause the permitted temperature range to be exceeded.

General hazardous situations.

To prevent injury, ensure:

- ▶ Secure the device from unintentional actuation.
- ▶ Only trained technicians may perform installation and maintenance work.
- ▶ Install the valves in accordance with the valid regulations of the respective country.
- ▶ After an interruption in the power supply, ensure that the process is restarted in a defined or controlled manner.
- ▶ Observe the general rules of technology.

To prevent damage to property of the device, ensure:

- ▶ Do not use the cartridge solenoid valve for fluids.
- ▶ Do not feed aggressive or combustible media into the media connections of the system.
- ▶ Do not carry out any external modifications to the devices.

4 GENERAL INFORMATION

4.1 Contact address

Germany

Bürkert Fluid Control Systems
Sales Center
Christian-Bürkert-Str. 13-17
D-74653 Ingelfingen
Tel. + 49 (0)7940 10-91 111
Fax + 49 (0)7940 10-91 448
E-mail: info@de.buerkert.com

International

Contact addresses are found on the Internet under:

www.burkert.com

4.2 Warranty

The warranty is only valid if the device Type 6164 is used as authorized in accordance with the specified application conditions.

4.3 Information on the Internet

The operating instructions and data sheets for Type 6164 can be found on the Internet at: www.burkert.com

5 APPLICATION AREA

Type 6164 is intended for use in roofed rooms. It must not be used outdoors.

5.1 Conditions for safe operation

When operating type 6164, observe the following requirements:

- Maximum permitted ambient temperature
The maximum permitted ambient temperature depends on the installation situation, the selected coil version and the maximum input values. The corresponding values are listed in chapter [“6 Technical data”](#).
- Installation conditions
The suitability of the valve for the different installation situations depends on the values indicated in the “Technical data”. Also observe the specifications in chapter [“7 Installation”](#).

6 TECHNICAL DATA



DANGER!

Risk of explosion.

If the permitted temperature values are exceeded, there is a risk of explosion.

- ▶ Observe permitted temperature values.
- ▶ Do not remove the device during operation.

Exceeding the voltage stated on the device may cause the device to overheat.

- ▶ Do not connect the device to a voltage higher than indicated on the device and in the operating instructions.

6.1 Conformity

The device is compliant with EU directives as stated in the EU Declaration of Conformity.

6.2 Standards

The applied standards, which are used to demonstrate compliance with the EU Directives, are listed in the EU type test certificate and/or the EU Declaration of Conformity.

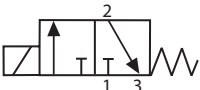
6.3 Operating conditions

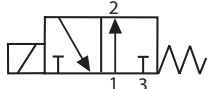


If parts of the compressed air network are subject to lower temperatures than the ambient temperature, select the humidity class so that the pressure dew point is 10 K below the minimum expected temperature to prevent the risk of icing over. To do this, observe DIN ISO 8573-1.

Medium:	compressed air, neutral and gaseous media (filtering 10 µm), technical vacuum
Life time:	if devices have device key NL07 (installation without lubrication), the life time will be reduced accordingly
Degree of protection:	in the installed state depending on the electrical connection: Special plug: IP40 Wires: IP54
Protection class:	3 according to IEC 61140

6.4 Fluidic data

Circuit function		
C		3/2-way valve, direct-acting, de-energized output 2 depressurized

D		3/2-way valve, direct-acting, de-energized output 2 pressurized
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Fluidic connections

1	P	Pressure port
2	A	Working port
3	R	Exhaust air port

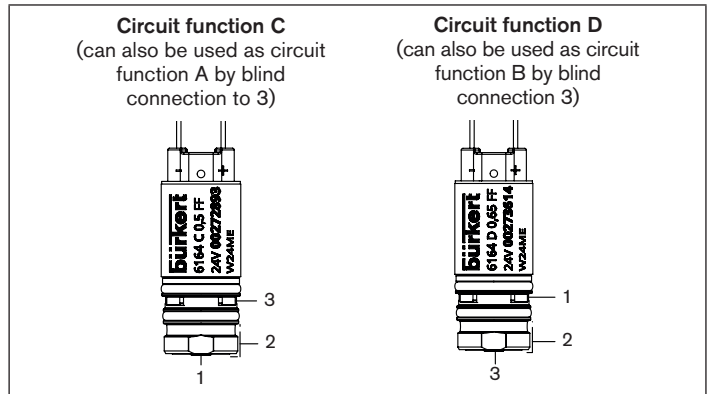
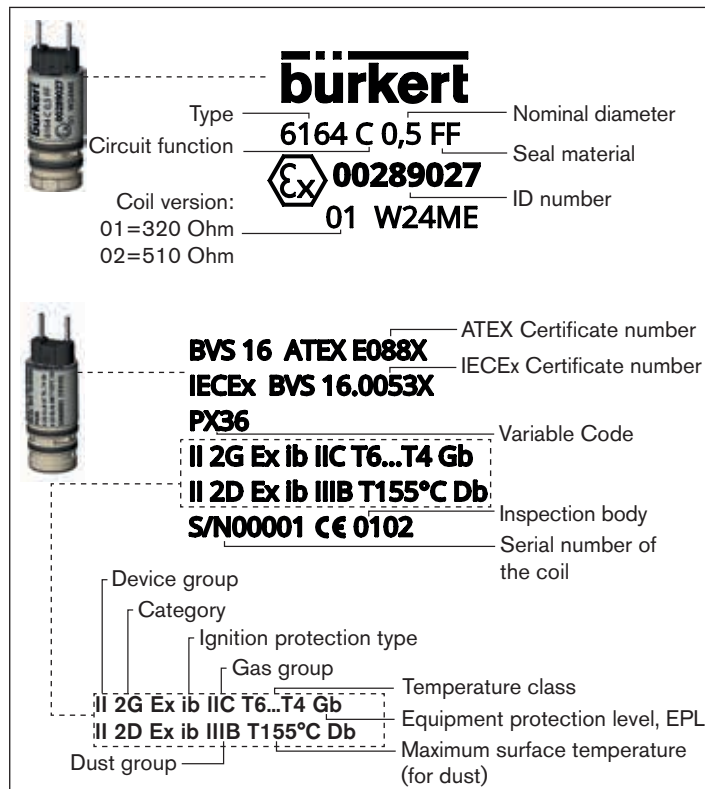


Fig. 1: Fluidic connections

6.5 Designation on the device



bürkert

Type **6164 C 0,5 FF** Nominal diameter

Circuit function **Ex 00289027** Seal material

Coil version: **01 W24ME** ID number
01=320 Ohm
02=510 Ohm

BVS 16 ATEX E088X ATEX Certificate number

IECEX BVS 16.0053X IECEX Certificate number

PX36 Variable Code

II 2G Ex Ib IIC T6...T4 Gb Inspection body

II 2D Ex Ib IIIB T155°C Db Serial number of the coil

S/N00001 C€ 0102

Device group

Category

Ignition protection type

Gas group

Temperature class

Equipment protection level, EPL

Dust group

Maximum surface temperature (for dust)

Fig. 2: Designation on the device (example)

6.6 Electrical data

Type 6164 in ignition protection type intrinsic safety Ex ib IIC/IIIB has the following characteristics which must be observed. Connect the device only to certified intrinsically safe circuits with the following maximum values:

	Gas	Dust
Explosion group	IIC	IIIB
Category	ib	ib
Temperature class	T4, T5, T6 (see table chapter "6.8")	T155° C
Safety data (Pi, Ui, li)	see table chapter "6.8"	
Li, Ci	negligible	

6.7 Coil version

Version	Resistor R20 [Ohm]	Minimum terminal voltage [V]	Minimum current [mA]
01: Version for use with 300 Ω - supply module	320	9.3	29
02: High-resis- tance version	510	11.7	23

6.8 Data specific to temperature class

6.8.1 Installation situation

To ensure that the device functions perfectly, the cartridge solenoid valve must always be installed in an installation block with appropriate fluidic connections. This installation position is either fully recessed or semi-recessed. As the material of the installation block depends on the corresponding application, the installation options listed in the technical data are only examples.

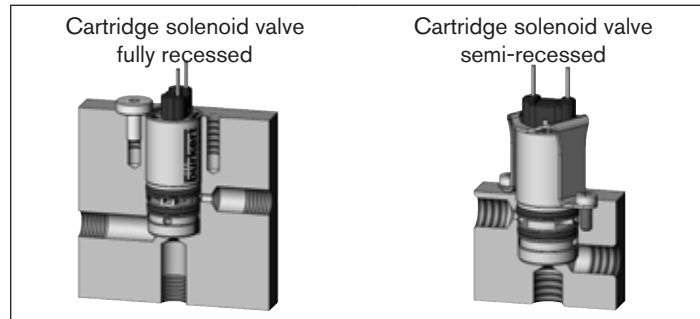
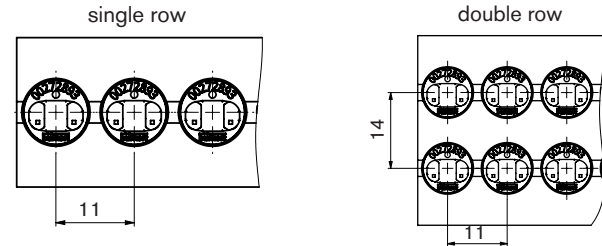


Fig. 3: Installation situation

When selecting the installation material, observe the following:

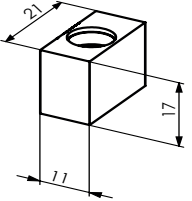
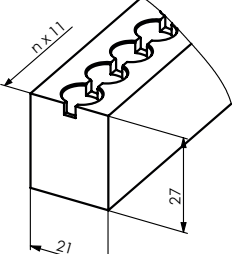
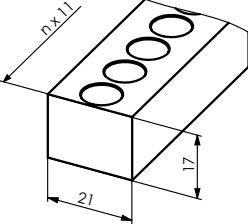
- Material with thermal conductivity of at least 120 W/mK (e.g. brass): The values of the metal blocks apply.
- Material with thermal conductivity of at least 0.3 W/mK (e.g. PA): The values of the plastic blocks apply.

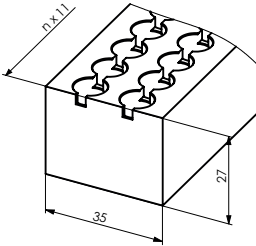
In multiple blocks the minimum possible add-on dimension of 11 mm and therefore the most critical state is taken into account:



With an add-on dimension of 25 mm there is no longer any heating effect on the adjacent devices. The device can then be regarded as a single device. The minimum dimensions of the installation blocks used are indicated in the following table:

	<p>Single block metal, plastic fully recessed</p>
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	<p>Single block metal, plastic semi-recessed with bracket</p>
	<p>Multiple block, single row metal, plastic fully recessed</p>
	<p>Multiple block, single row metal, plastic semi-recessed with bracket</p>

	<p>Multiple block, double row metal, plastic fully recessed</p>
--	---



The maximum permitted ambient temperature depends on the installation situation, the selected coil version and the maximum input values of the barrier. The permitted values are listed in the following separate tables for each temperature class.



The following applies to the permitted media temperature: If the ambient temperature is restricted according to the tables in chapter [“6.8.2”](#), [“6.8.3”](#) and [“6.8.4”](#), limit the media temperature to the same value.



The authorized lower limit of the ambient temperature and media temperature is generally -20° C.

6.8.2 Temperature class T4

Installation situation	Max. permitted ambient temperature [°C]	Version [Ohm]	Max. input voltage Ui [V]	Max. input current Ii [mA]	Max. input power Pi [W]
Single block Metal fully recessed	75	320	20.5	285	1.4
		510	25.4	138	
Single block Plastic fully recessed	75	320	19.9	314	1.0
		510	25.1	156	
Single block Metal semi-recessed with bracket	75	320	19.3	348	1.4
		510	25.4	138	
Single block Plastic semi-recessed with bracket	75	320	18.7	387	1.0
		510	23	193	
Multiple block single row Metal fully recessed	75	320	19.9	314	1.0
		510	24.2	171	
Multiple block single row Plastic fully recessed	75	320	17.5	410	1.0
		510	21.8	231	
	60	320	19.4	342	1.2
		510	24.2	171	

Multiple block single row Metal semi-recessed with bracket	75	320	17.5	410	1.0
		510	21.8	231	
	70	320	18.7	387	1.1
		510	23.7	180	
Multiple block single row Plastic semi-recessed with bracket	75	320	16.2	410	1.0
		510	20.5	285	
	60	320	18.7	387	1.2
		510	23.7	180	
Multiple block double row Metal fully recessed	75	320	17.5	410	1.0
		510	21.8	231	
	60	320	19.9	314	1.2
		510	24.2	171	
Multiple block double row Plastic fully recessed	75	320	14.8	410	1.0
		510	18.7	387	
	55	320	17.5	410	1.2
		510	22.1	221	
	45	320	18.7	387	1.25
		510	23	193	

6.8.3 Temperature class T5

Installation situation	Max. permitted ambient temperature [°C]	Version [Ohm]	Max. input voltage Ui [V]	Max. input current Ii [mA]	Max. input power Pi [W]
Single block Metal fully recessed	75	320	20.1	304	1.4
		510	25.4	152	
Single block Plastic fully recessed	75	320	15.6	410	1.4
		510	19.7	325	
	55	320	19.1	361	
		510	24.1	173	
Single block Metal semi-recessed with bracket	75	320	18	410	1.4
		510	22.7	202	
	60	320	19.3	348	
		510	25.4	152	
Single block Plastic semi-recessed with bracket	75	320	12.7	410	1.4
		510	16.1	410	
	50	320	16.8	410	
		510	21.3	250	
Multiple block single row Metal fully recessed	75	320	14.2	410	1.4
		510	18	410	
	60	320	18	410	
		510	22.7	202	

Multiple block single row Plastic fully recessed	75	320	12.7	410	1.4
		510	16.1	410	
	60	320	15.6	410	
		510	19.7	325	
Multiple block single row Metal semi-recessed with bracket	75	320	12.7	410	1.4
		510	16.1	410	
	55	320	15.6	410	
		510	19.7	325	
Multiple block single row Plastic semi-recessed with bracket	70	320	12.7	410	1.4
		510	16.1	410	
	50	320	15.6	410	
		510	19.7	325	
Multiple block double row Metal fully recessed	75	320	12.7	410	1.4
		510	16.1	410	
	55	320	15.6	410	
		510	19.7	325	
Multiple block double row Plastic fully recessed	65	320	12.7	410	1.4
		510	16.1	410	
	50	320	14.2	410	
		510	18	410	

6.8.4 Temperature class T6

Installation situation	Max. permitted ambient temperature [°C]	Version [Ohm]	Max. input voltage Ui [V]	Max. input current Ii [mA]	Max. input power Pi [W]
Single block Metal fully recessed	65	320	12	410	1.4
		510	14.5	410	
	55	320	15.8	410	
		510	20	309	
	45	320	19	367	
		510	23.9	176	
Single block Plastic fully recessed	50	320	12	410	1.4
		510	14.5	410	
	35	320	14.7	410	
		510	18.5	402	
	25	320	17	410	
		510	21.4	246	
Single block Metal semi-recessed with bracket	50	320	12	410	1.4
		510	15.1	410	
	40	320	14.5	410	
		510	19.4	342	
	25	320	18.2	410	
		510	23	193	

Single block Plastic semi-recessed with bracket	35	320	12	410	1.4
		510	14.5	410	
	25	320	14.5	410	
		510	18.2	410	
Multiple block single row Metal fully recessed	50	320	12	410	1.4
		510	15.1	410	
	40	320	13.4	410	
		510	16.9	410	
	25	320	15.9	410	
		510	19.3	348	
Multiple block single row Plastic fully recessed	35	320	12	410	1.4
		510	15.1	410	
Multiple block single row Metal semi-recessed with bracket	40	320	12	410	1.4
		510	15.1	410	
	30	320	13.4	410	
		510	16.9	410	
Multiple block single row Plastic semi-recessed with bracket	30	320	12	410	1.4
		510	15.1	410	
Multiple block double row Metal fully recessed	35	320	12	410	1.4
		510	14.6	410	
	25	320	13.4	410	
		510	16.9	410	

Multiple block double row Plastic fully recessed	25	320	12	410	1.4
		510	14.5	410	

6.8.5 Maximum surface temperature for dust

For dust (applies to all installation situations in consideration of the values indicated in the tables):

Maximum surface temperature: 155° C

7 INSTALLATION

7.1 Safety instructions



DANGER!

Risk of injury from high pressure in the system or device.

- Before working on the system or device, cut off the pressure and deaerate/drain lines.
- Observe applicable accident prevention and safety regulations for electrical equipment.



WARNING!

Risk of injury from improper installation.

- Installation may be carried out only by trained technicians and with the appropriate tools. Warning: Sharp solder pins.

Risk of injury due to inadvertent switching on of the system and uncontrolled restart.

- Secure system against unintentional activation.
- Following installation, ensure a controlled or defined restart.

Risk of short-circuit due to damaged connection lines.

- Lay valve connection lines securely and protect against damage.

7.3 Installation of Type 6164

→ Check the O-rings at the valve and the installation space for cleanliness.

! Outer O-rings are provided with an anti-friction coating at the factory. If required, use a suitable lubricant (e.g. water) during installation.

→ Define the alignment of the electrical contacting, use the front bore for this purpose (see "Fig. 5" right).

NOTE!

Damage to device caused by transverse forces on encapsulation or pin.

► Do not touch the socketing or pin.

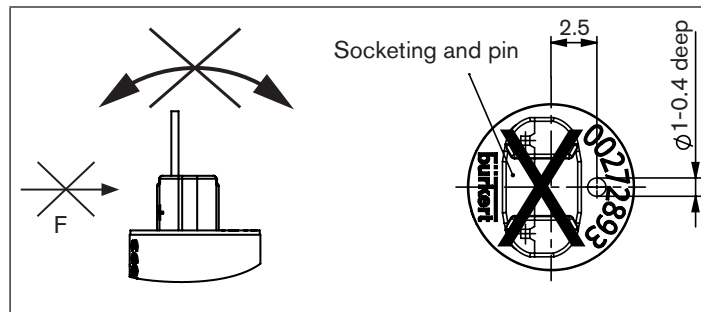


Fig. 5: Alignment of the electrical contacting

→ Install the valve (it can no longer be moved when installed).

In the case of the semi-recessed model, the pins can be aligned

in relation to the screw axis only in the areas highlighted in gray (see "Fig. 6").

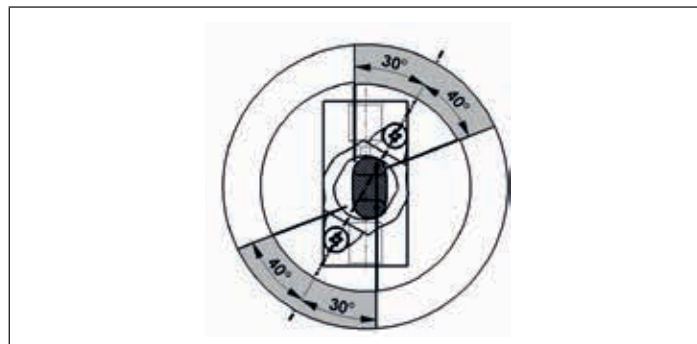


Fig. 6: Alignment of the pins for the semi-recessed valve

→ Secure the valve using the supplied fasteners (screw, bracket). To ensure that the valve functions perfectly, screw the screw head as far as the block support and ensure that the bracket is correctly positioned.

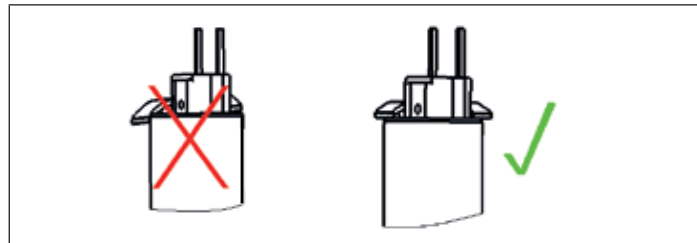


Fig. 7: Correct position of the bracket

- Observe tightening torques:
- fully recessed valves max. 0.65 Nm,
 - semi-recessed valves depending on material of the mounting block (e.g. brass max. 0.12 Nm).

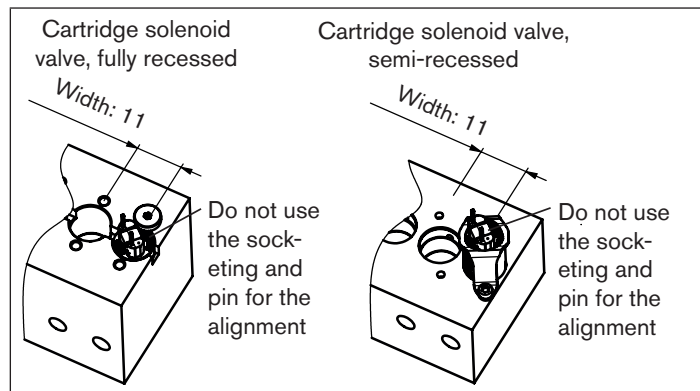


Fig. 8: Installation of the cartridge solenoid valve

- Connect valve to the power supply, ensuring correct polarity (see identification on the encapsulation or wire color).

7.4 Electrical connection

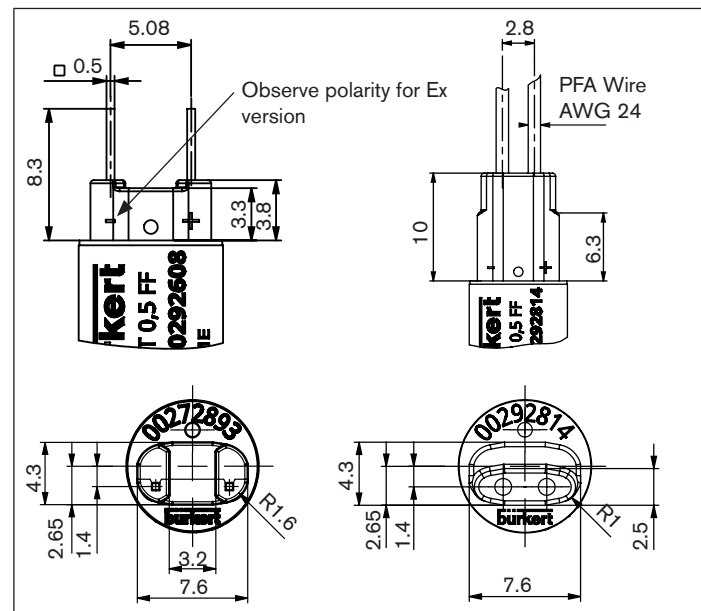


Fig. 9: Electrical connection



When directly soldering pins, do not exceed maximum soldering temperature of 350 °C short term.

8 MAINTENANCE, TROUBLESHOOTING



WARNING!

Risk of injury from improper maintenance work.

- ▶ Maintenance may be carried out only by trained technicians and with the appropriate tools.
- ▶ Secure system against unintentional activation.
- ▶ Following maintenance, ensure a controlled restart.

8.1 Maintenance

The device is maintenance-free under normal conditions.

8.2 Troubleshooting

In case of a fault, check:

- Port connections in accordance with circuit function.
- Operating pressure.
- Voltage supply and valve control.

If the valve still fails to respond, please contact the Bürkert Service dept.

9 SHUTDOWN

9.1 Safety instructions



DANGER!

Risk of injury from high pressure in the system or device.

- ▶ Before working on the system or device, cut off the pressure and deaerate or drain lines.



WARNING!

Risk of injury from improper disassembly.

- ▶ Disassembly may be carried out only by trained technicians and with the appropriate tools. Warning: Sharp solder pins.

9.2 Disassembly

Disassembly of type 6164 is not intended. If disassembly is still necessary, proceed as follows:

- Switch off the pressure and drain the lines.
- Remove the electrical contacts.
- Loosen the fasteners (screw, bracket).
- Use suitable pliers to take hold of the valve in the provided groove and extract it out.

NOTE!

Damage to device caused by transverse forces on encapsulation or pin.

- ▶ Do not touch the socketing or pin.

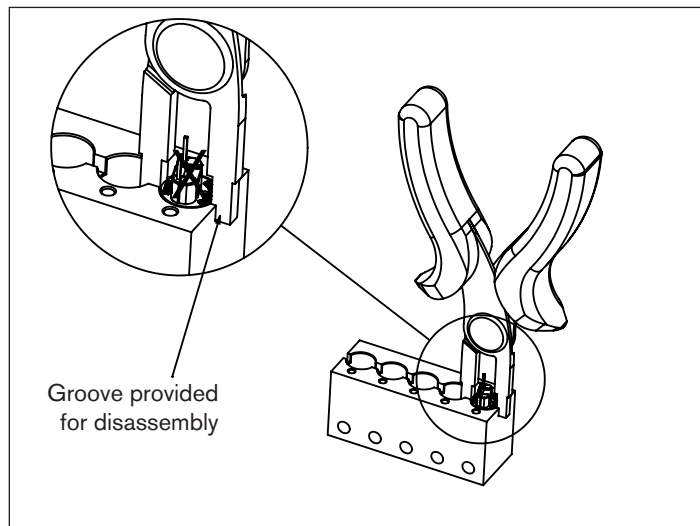


Fig. 10: Extracting a cartridge solenoid valve

→ Prior to installation of a new valve, thoroughly clean the installation space.

10 TRANSPORT, STORAGE, DISPOSAL

NOTE!

Transport damage.

Inadequately protected devices may be damaged during transportation.

- Protect the device against moisture and dirt in shock-resistant packaging during transportation.
- Prevent the temperature from exceeding or dropping below the permitted storage temperature.

Incorrect storage may damage the device.

- Store the device in a dry and dust-free location!
- Storage temperature: -10...+55 °C.

Damage to the environment caused by parts contaminated with medium.

- Dispose of the device and packaging in an environmentally friendly manner.
- Observe applicable disposal and environmental regulations.

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