bürkert
FLUID CONTROL SYSTEMS

# 3/2-way pneumatic cartridge solenoid valve

- Compact design measuring 11 mm in width per station
- Nominal diameter of 0.5 mm (9 bar) to 1.2 mm (1.5 bar)
- Increased service life and reliability
- Low electrical power consumption and optional ATEX Ex ib variant
- Designed for optimum integrability

Product variants described in the data sheet may differ from the product presentation and description.

## Type description

Our customers' unique applications are becoming ever more complex, and installation space, fluidic performance and cost savings are critical factors. This places greater demands and more exacting requirements on the components used. Type 6164 was developed with the aim of enabling pneumatic actuation through optimal integration of the pilot valve into block or plastic injection-moulded parts, thus achieving a more compact design. The valve's uncompromising reliability, above-average lifespan, and exceptional fluidic properties mean that this valve type raises the bar.

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## 1. General technical data

| | |
|---|---|
| **Product properties** | |
| Dimensions | Further information can be found in chapter "5. Dimensions" on page 6. |
| **Material** | |
| Seal | TPU |
| Body | PEEK |
| Further wetted materials | PA, LCP, MS, stainless steel<br>Further information can be found in chapter "4.2. Material specifications" on page 5. |
| Permissible leakage | Vac...10 bar (depending on variant) [1.] |
| Weight | 6 g (standard variant) |
| Orifice | DN 0.5, DN 0.8, DN 1.0, DN 1.2 |
| Circuit function | A, B, C, D and T<br>Further information can be found in chapter "2. Circuit functions" on page 4. |
| Typical product service life | 100,000,000 switching cycles (according to laboratory endurance tests) [2.] |
| **Performance data** | |
| Pressure range | DN 0.5 (Vac...9 bar) [1.], DN 0.8 (Vac...7.5 bar) [1.], DN 1.0 (Vac...5 bar) [1.], DN 1.2 (Vac...1.5 bar) [1.] |
| Duty cycle | 100 % continuous operation |
| Switching time [3.] | Opening: < 5 ms (pressure build-up 0...10 %)<br>Closing: < 5 ms (pressure reduction 100...90 %) |
| **Electrical data** | |
| Operating voltage | 12 or 24 V DC (other voltages on request) |
| Power consumption | 0.7 W<br>2.8 W/0.3 W (with external electric power reduction)<br>0.3 W (for explosion proof variant) |
| Switching frequency | 16 Hz |
| Switching noise | 42 dB [4.] |
| Voltage tolerance | ± 10 % |
| **Medium data** | |
| Operating medium | Neutral gases |
| Medium temperature | - 10 °C...+ 55 °C |
| **Product connections** | |
| Electrical connection | Plug/Solder pin, flying leads |
| Port connection | Bürkert cartridge connection diagram |
| **Approvals and conformities** | |
| **Degree of protection** | |
| Pins | IP00 |
| Male cable plug | IP40 |
| Flying leads | IP54 |
| Explosion protection | Further information can be found in chapter "3.4. Explosion protection" on page 4. |
| **Environment and installation** | |
| Installation position | As required |
| Ambient temperature [5.] | - 10 °C...+ 55 °C |

1.) Technical vacuum (- 0.8 bar)
2.) Life span is dependent on temperature, pressure, seal material and operating conditions.
3.) Measurement at valve outlet according to DIN ISO 12238:2001
4.) According to ISO 3745, test environment suspended in brass block
5.) Depends on the installation situation (see operating instructions), higher temperatures are possible on request.

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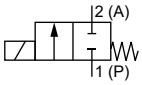
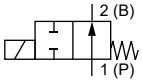
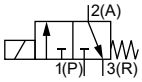
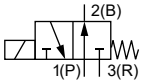
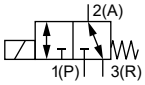
## 2. Circuit functions

**Note:**
See "Pin assignment standard variant" on page 10

| Symbol | Description |
|---|---|
|  | **Circuit function A (CF A)**<br>2/2-way solenoid valve<br>Direct-acting<br>Normally closed |
|  | **Circuit function B (CF B)**<br>2/2-way solenoid valve<br>Direct-acting<br>Normally open |
|  | **Circuit function C (CF C)**<br>3/2-way solenoid valve<br>Direct-acting<br>Normally closed |
|  | **Circuit function D (CF D)**<br>3/2-way solenoid valve<br>Direct-acting<br>Normally open |
|  | **Circuit function T (CF T)**<br>3/2-way solenoid valve<br>Direct-acting<br>Flow direction optional<br>Normally closed |

## 3. Approvals and conformities

### 3.1. General notes

- The approvals and conformities listed below must be stated when making enquiries. This is the only way to ensure that the product complies with all required specifications.
- Not all available variants can be supplied with the below mentioned approvals or conformities.

### 3.2. Conformity

In accordance with the Declaration of Conformity, the product is compliant with the EU Directives.

### 3.3. Standards

The applied standards which are used to demonstrate compliance with the EU Directives are listed in the EU-Type Examination Certificate and/or the EU Declaration of Conformity.

### 3.4. Explosion protection

| Approval | Description |
|---|---|
| <br> | **Optional: Explosion protection**<br><br>**ATEX:**<br>BVS 16 ATEX E 088 X<br>II 2G Ex ib IIC T6...T4 Gb<br>II 2D Ex ib IIIB T155 °C Db<br><br>**IECEx:**<br>IECEx BVS 16.0053 X<br>Ex ib IIC T6...T4 Gb<br>Ex ib IIIB T155 °C Db |

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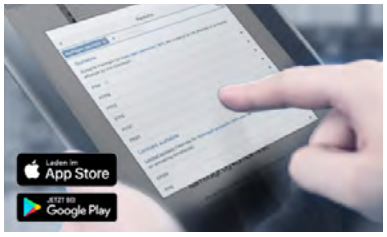
# 4. Materials

## 4.1. Bürkert resistApp

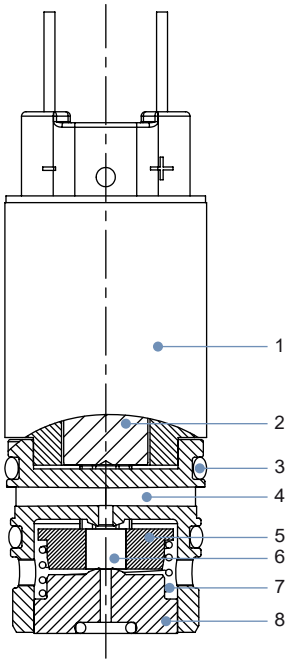



**Bürkert resistApp – Chemical resistance chart**

You want to ensure the reliability and durability of the materials in your individual application case? Verify your combination of media and materials on our website or in our resistApp.

Start chemical resistance check

## 4.2. Material specifications




| No. | Element | Material |
|---|---|---|
| 1 | Coil housing | Stainless steel 1.4113 |
| 2 | Core[1.] | Stainless steel 1.4113 |
| 3 | O-ring[1.] | NBR |
| 4 | Body[1.] | PEEK |
| 5 | Seal switch[1.] | PA6 |
| 6 | Seal[1.] | TPU |
| 7 | Spring[1.] | Stainless steel 1.4310 |
| 8 | Fitting[1.] | Brass |
| – | Coil body[1.] (not visible) | LCP |

1.) Wetted

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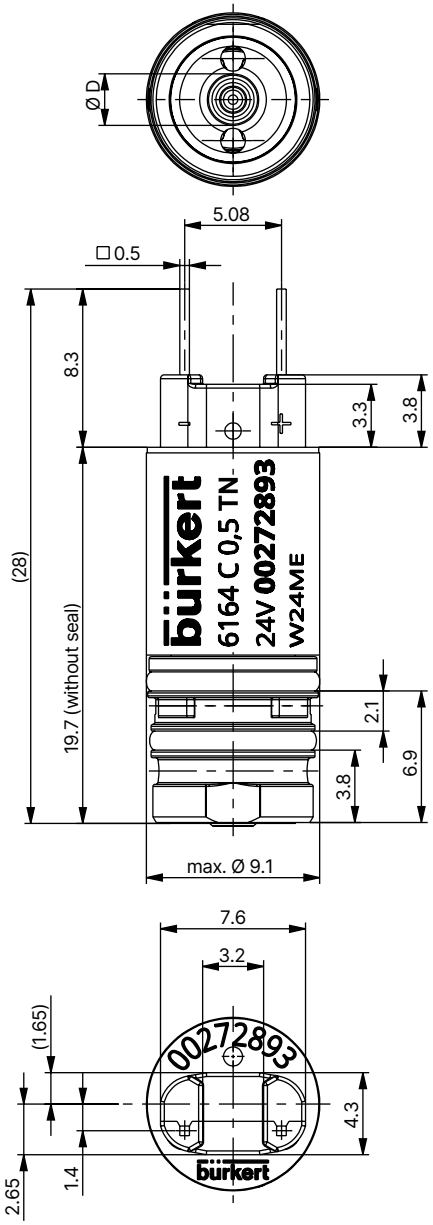
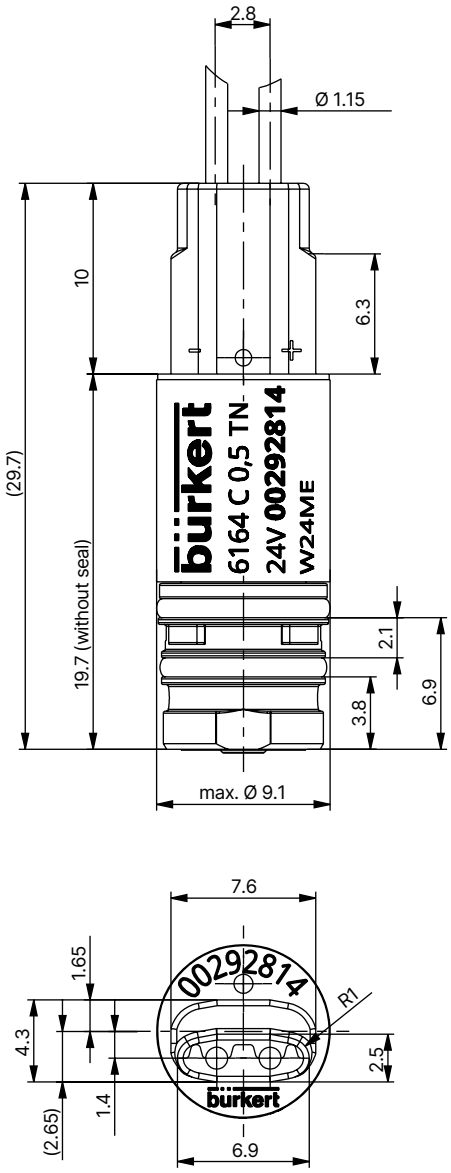
# 5. Dimensions

## 5.1. Pin and flying leads variant

**Note:**
Dimensions in mm

| Pin variant | Flying leads variant |
|---|---|
|  |  |



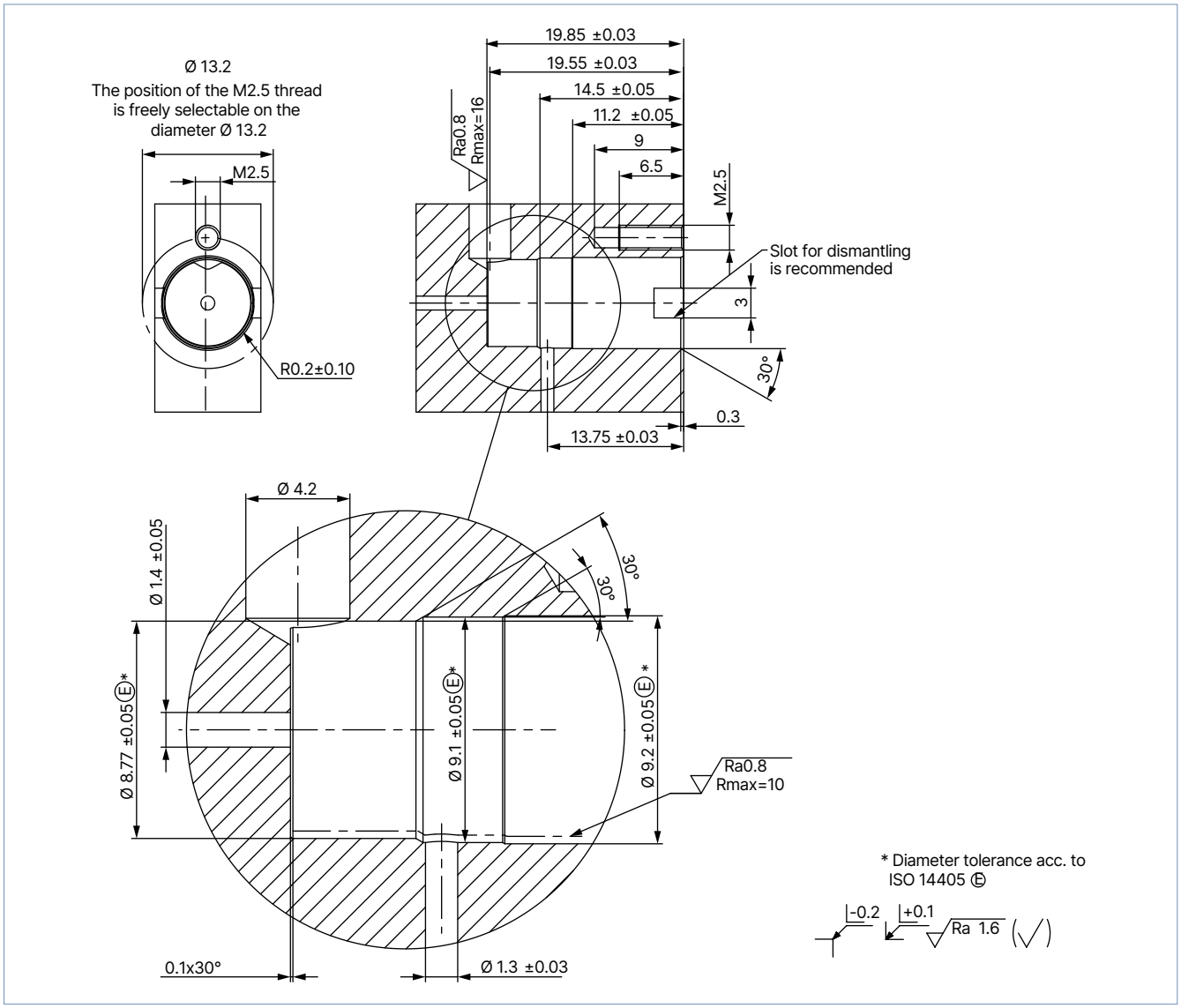
| Variant | Measurement D |
|---|---|
| DN < 0.65 | Ø 2.7 |
| DN > 0.65 | Ø 3.3 |

## 5.2. Defining of the installation area

**Cartridge connection (fully recessed)**

**Note:**

- Dimensions in mm
- Observe max. tightening torque of the screw (see **operating instructions Type 6164** ▶)
- Refer to chapter **"8. Product design and assembly" on page 12** for more information.

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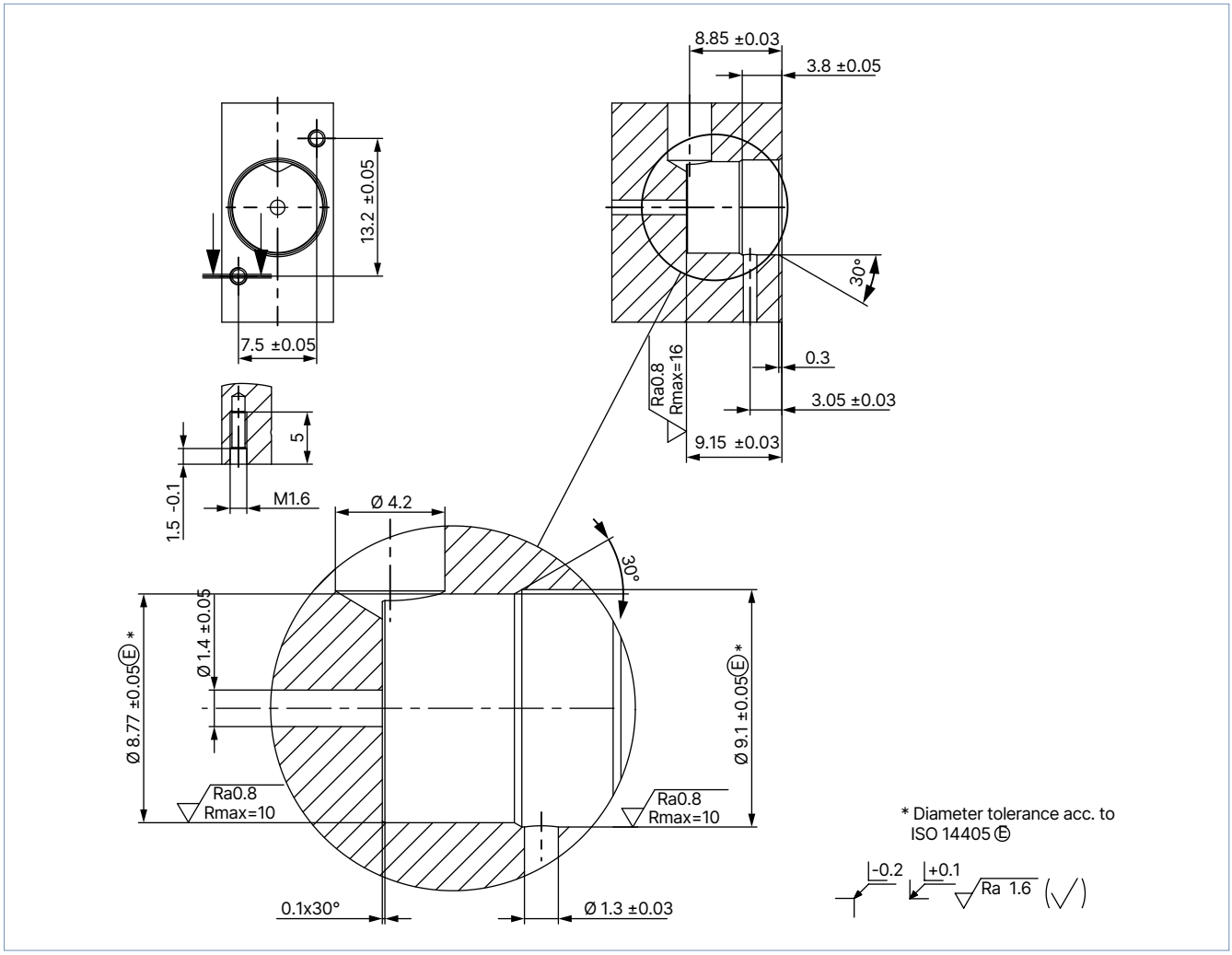
### Cartridge connection (half recessed)

**Note:**

- Dimensions in mm
- The mounting bracket set is required for installation, see "10.5. Ordering chart accessories" on page 16.
- Refer to chapter "8. Product design and assembly" on page 12 for more information.

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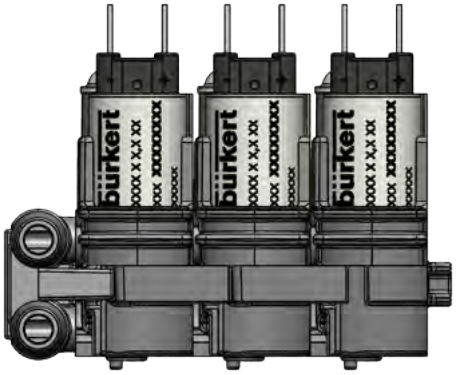
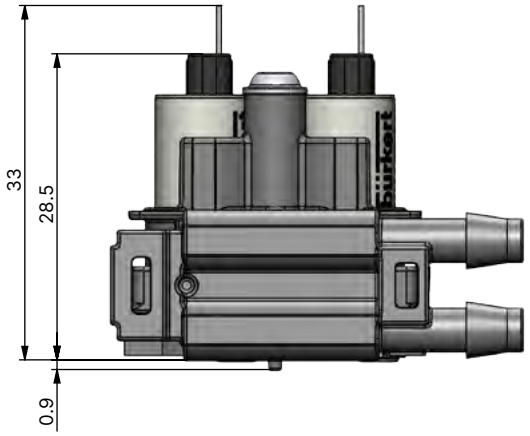
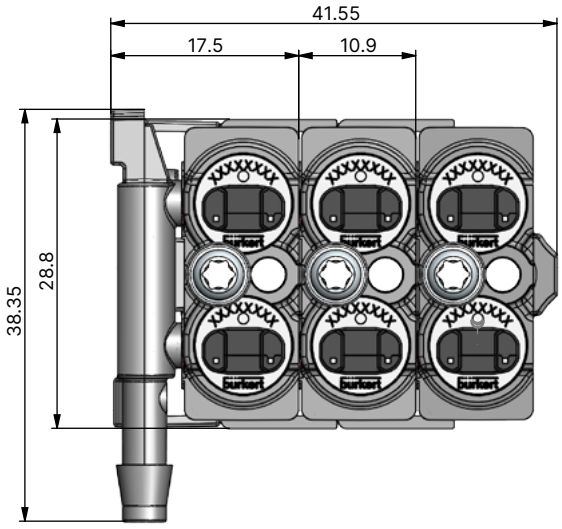
### Cartridge connection (double holder)

**Note:**

- Dimensions in mm
- Refer to chapter "8. Product design and assembly" on page 12 for more information.
- Available on request






Hose nozzle:
Inner diameter: 2.8 mm

Suitable for hose:
Inner diameter: 4 mm

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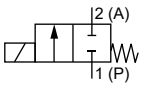
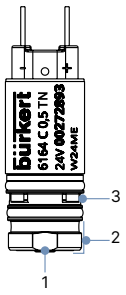
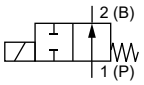
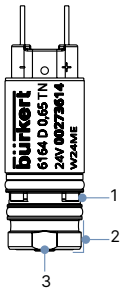
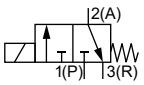
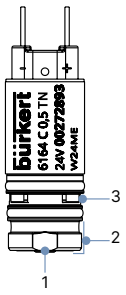
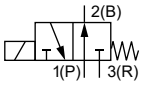
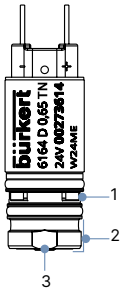
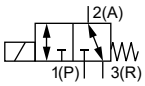
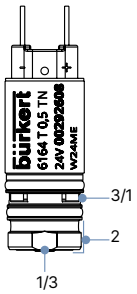
# 6. Product connections

## 6.1. Port connection

**Pin assignment standard variant**

**Note:**

- The pin assignment (marked No. 1, 2 and 3 in the drawings) depends on the circuit function. In the table, compare the respective pin assignment with the corresponding circuit function.
- The polarity must be observed only in the Ex variant.

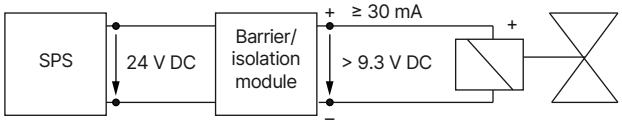
| Circuit functions | Port 1 | Port 2 | Port 3 | 3-way |
|---|---|---|---|---|
| **CF A**<br>2/2-way solenoid valve<br>Direct-acting<br>Normally closed<br>  <br>(same valve as for circuit function C, but with blind connection at 3) | Pressure port | Working port | Blind |  |
| **CF B**<br>2/2-way solenoid valve<br>Direct-acting<br>Normally open<br>  <br>(same valve as for circuit function D, but with blind connection at 3) | Pressure port | Working port | Blind |  |
| **CF C**<br>3/2-way solenoid valve<br>Direct-acting<br>Normally closed<br>  <br>(applicable to circuit function A by using blind connectors on 3) | Pressure port | Working port | Ventilation |  |
| **CF D**<br>3/2-way solenoid valve<br>Direct-acting<br>Normally open<br>  <br>(applicable to circuit function B by using blind connectors on 3) | Pressure port | Working port | Ventilation |  |
| **CF T**<br>3/2-way solenoid valve<br>Direct-acting<br>Flow direction optional<br>Normally closed<br>  | Pressure port | Working port | Ventilation |  |

# 7. Performance specifications

## 7.1. Electrical data explosion-proof variant Ex i

**Note:**

- The valve is intended for operation at 24 V DC outputs via the intermedia switching of a corresponding intrinsically safe operating resource (isolating module or barrier).
  Refer to **operating instructions Type 6164** ▶ for the permitted maximum values/value pairs.
- Type of protection:
  BVS 16 ATEX E 088 X: II 2G Ex ib IIC T6...T4 Gb & II 2D Ex ib IIIB T155 °C Db
  IECEx BVS 16.0053 X: Ex ib IIC T6...T4 Gb & Ex ib IIIB T155 °C Db




| Variant | Resistance at + 20 °C ± 4 % | Minimum terminal voltage | Minimum current |
|---|---|---|---|
| | [Ω] | [V] | [mA] |
| Variant for use with 300 Ω supply module | 320 | 9.3 | 29 |
| High-resistance variant | 510 | 11.7 | 23 |

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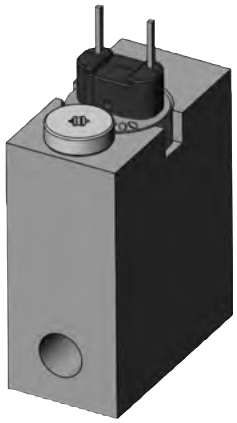
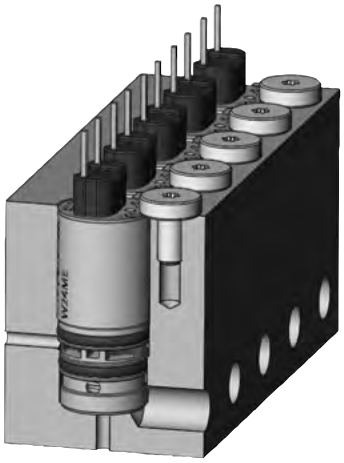
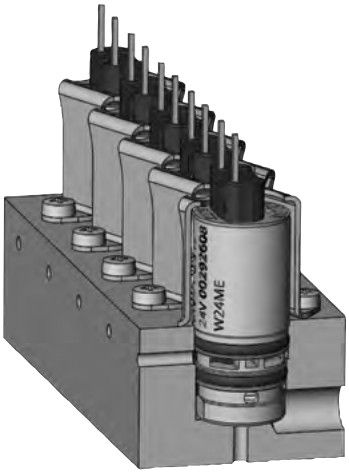
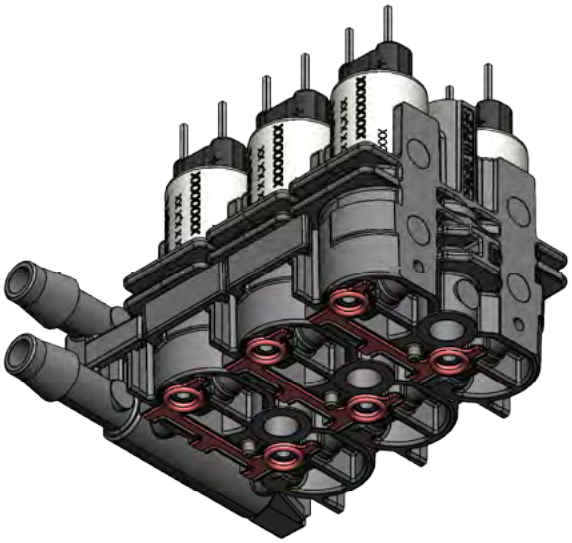
# 8. Product design and assembly

## 8.1. Application examples

| Single block | Cartridge installation position |
|---|---|
|  | |
| **Fully recessed multi-manifold** | **Semi-recessed multi-manifold** |
|  |  |
| **Clipped multi-manifold, stackable as required** | |
|  | |

**Wetted parts cartridge holder:**
Housing material: PA 410
Seal material: TPE

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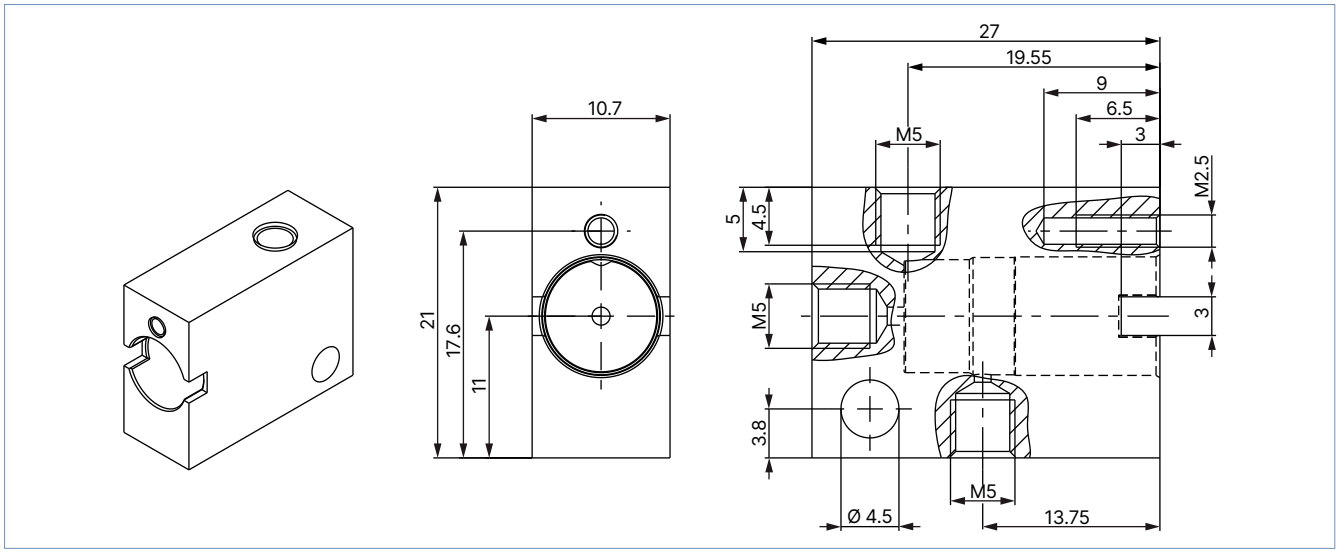
# 9. Product accessories

## 9.1. Single manifold fully recessed

**Note:**

- Dimensions in mm
- Observe maximum tightening torque of the screw (see **operating instructions Type 6164** ▶)




| Description | Article no. |
|---|---|
| Installation block 1-fold, brass | 695913 |

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# 10. Ordering information

## 10.1. Bürkert eShop

**Bürkert eShop – Easy ordering and quick delivery**

You want to find your desired Bürkert product or spare part quickly and order directly? Our online shop is available for you 24/7. Sign up and enjoy all the benefits.

Order online now

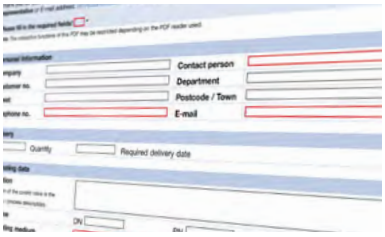
## 10.2. Bürkert product filter

**Bürkert product filter – Get quickly to the right product**

You want to select products comfortably based on your technical requirements?
Use the Bürkert product filter and find suitable articles for your application quickly and easily.

Try out our product filter

## 10.3. Bürkert Product Enquiry Form




**Bürkert Product Enquiry Form – Your enquiry quickly and compactly**

Would you like to make a specific product enquiry based on your technical requirements? Use our Product Enquiry Form for this purpose. There you will find all the relevant information for your Bürkert contact. This will enable us to provide you with the best possible advice.

Fill out the form now

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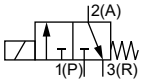
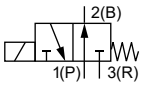
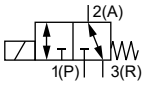
## 10.4. Ordering chart

**Standard variant**

| Circuit functions | Port connection | Orifice ventilation 1→2 [mm] | Orifice ventilation 2→3 [mm] | $Q_{Nn}$ value air 1.) 1→2 [l/min] | $Q_{Nn}$ value air 1.) 2→3 [l/min] | Voltage/ Frequency [V/Hz] | Nominal power [W] | Pressure range 2.) [bar] | Article no. with connection pins |
|---|---|---|---|---|---|---|---|---|---|
| **CF C**<br>3/2-way solenoid valve<br>Direct-acting<br>Normally closed<br>  | Bürkert cartridge connection diagram | 0.5 | 0.65 | 6 | 9.55 | 12/DC | 0.7 | Vac...9 | 273612 |
| | | | | | | 24/DC | | Vac...9 | 272893 |
| | | | | | | 24/DC | | 2.5...10 | 281022 |
| | | 0.8 | 1.1 | 16 | 20 | 24/DC | 2.8/0.3 3.) | Vac...7.5 | 285701 |
| | | 1.0 | 1.1 | 20 | 20 | | | Vac...5 | 285700 |
| | | 1.2 | 1.1 | 25 | 22 | | | Vac...1.5 | 272894 |
| **CF D**<br>3/2-way solenoid valve<br>Direct-acting<br>Normally open<br>  | Bürkert cartridge connection diagram | 0.65 | 0.5 | 6.5 | 6 | 12/DC | 0.7 | Vac...6 | 273615 |
| | | | | | | 24/DC | 0.7 | | 273614 |
| **CF T**<br>3/2-way solenoid valve<br>Direct-acting<br>Flow direction optional<br>Normally closed<br>  | Bürkert cartridge connection diagram | 0.5 | 0.65 | 6 | 6 | 24/DC | 0.7 | Vac...4 | 292608 |

1.) Measurement at + 20 °C, 6 bar at valve inlet and 1 bar differential pressure
2.) Technical vacuum (- 0.8 bar)
3.) External power reduction electronics assembly required

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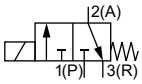
**ATEX/IECEx i variant**

| Circuit functions | Port connection | Orifice ventilation 1→2 | Orifice ventilation 2→3 | $Q_{Nn}$ value air[1.] 1→2 | $Q_{Nn}$ value air[1.] 2→3 | Pressure range[2.] | Resist-ance at +20 °C ±4 % | Min. holding current | Article no. with connection pins |
|---|---|---|---|---|---|---|---|---|---|
| | | [mm] | [mm] | [l/min] | [l/min] | [bar] | [Ω] | [mA] | |
| **CF C**<br>3/2-way solenoid valve<br>Direct-acting<br>Normally closed<br>  | Bürkert cartridge connection diagram | 0.5 | 0.65 | 6 | 9.5 | Vac...6 | 320 | 29 | 289027 |
| | | | | | | | 510 | 23 | 289028 |

1.) Measurement at + 20 °C, 6 bar at valve inlet and 1 bar differential pressure
2.) Technical vacuum (- 0.8 bar)

**Further variants on request**

| | |
|---|---|
| **Additional**<br>Leads variant up to 300 mm | **Voltage**<br>Voltages 9 V, 6 V, 3 V |
| **Approval**<br>Further information can be found in chapter "3. Approvals and conformities" on page 4. | |

## 10.5. Ordering chart accessories

**Single manifold fully recessed**

Ordering information and dimensions of the single manifold fully recessed can be found in chapter "9.1. Single manifold fully recessed" on page 13.

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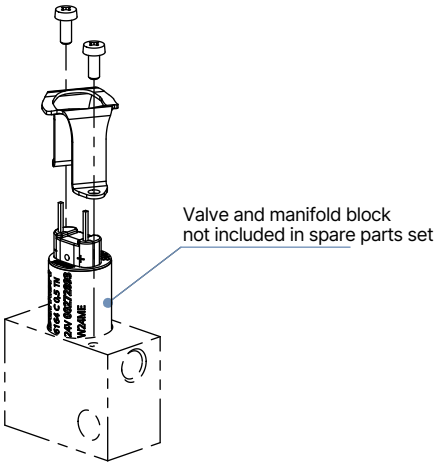
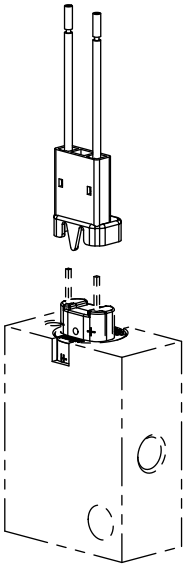
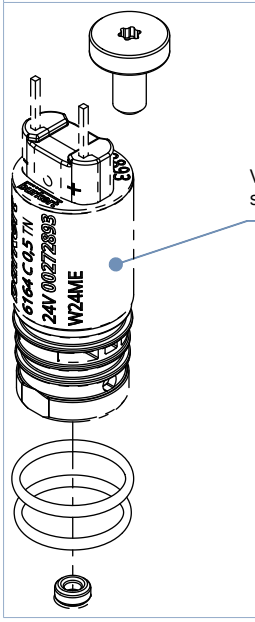
## Further accessories

| Accessories | Description | Article no. |
|---|---|---|
|  | **Mounting bracket set for semi-recessed mounting for Type 6164**<br><br>Scope of delivery:<br>• 2 x fastening screws M1.6×5, stainless steel A2<br>• 1 x mounting bracket 1.4310 | 696032 |
|  | **Plug for Type 6164 with two PVC wires, AWG 24, length 300 mm** | 695951 |
|  | **Spare parts set for Type 6164**<br><br>Scope of delivery:<br>• 1 x cheese head screw with internal TORX T8 M2.5×5, stainless steel A2<br>• 2 x O-ring large, NBR<br>• 1 x O-ring small, NBR | 696033 |

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