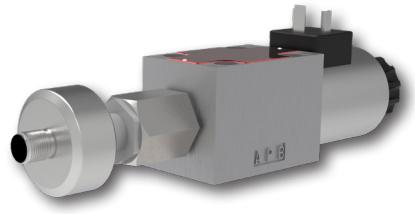
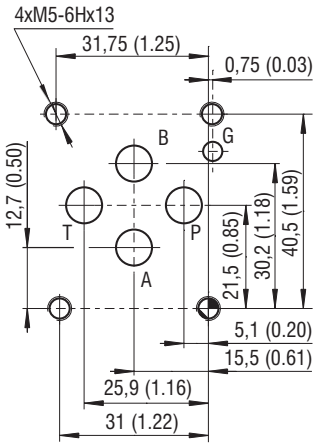
# RPE3-062x/xS3

Size 06 (D03) • $Q_{max}$ 80 l/min (21 GPM) • $p_{max}$ 350 bar (5100 PSI)

**FUNCTIONAL SAFETY**
**SIL 3 ČSN EN 61508**
**PL d ČSN EN ISO 13849**



**ISO 4401-03-02-0-05**




Ports P, A, B, T - max. ∅7,5 mm (0.29 in)

## Technical Features

- Direct acting solenoid operated spool valve with subplate mounting interface acc. to standards ISO 4401, DIN 24340 (CETOP 03)
- Contactless inductive spool position sensor with dual output signal for safe operation (e.g. of presses or forming machines)
- Certified level of functional safety: SIL 3, PL d
- High transmitted hydraulic power and low pressure drop
- Wide range of supply voltages and solenoid electrical connections
- Various spool types (special on request)
- In the standard version, the valve housing is phosphated for basic surface corrosion protection and as preparation for painting. Steel parts are zinc-coated for 240 h salt spray protection acc. to ISO 9227
- Enhanced surface protection for mobile sector available for the valve housing and steel parts (ISO 9227, 520 h salt spray)

## Technical Data

| | | | | |
|---|---|---|---|---|
| Valve size | | | 06 (D03) | |
| Max. flow | | l/min (GPM) | 80 (21.1) | |
| Max. operating pressure at ports P, A and B | | bar (PSI) | 350 (5080) | |
| Max. operating pressure at port T | | bar (PSI) | 210 (3050) | |
| Fluid temperature range (NBR, FPM) | | °C (°F) | -20 ... +80 (-4 ... +176) | |
| Ambient temperature range | | °C (°F) | -20 ... +50 (-4 ... +122) | |
| Ingress protection acc. to EN 60529 | | | IP65 | |
| Supply voltage tolerance | | % | AC: ±10 | DC: ±10 |
| Max. switching frequency | | 1/h | 15 000 | |
| Switching time at ν=32 mm²/s (156 SUS) | ON | ms | AC: 30 ... 40 | DC: 30 ... 50 |
| | OFF | ms | AC: 30 ... 70 | DC: 10 ... 50 |
| Weight | | kg (lbs) | 1.9 (4.2) | |
| | | Datasheet | Type | |
| General information | | GI_0060 | Products and operating conditions | |
| Coil types / connectors | | C_8007 / K_8008 | C22B* / K* | |
| Mounting interface | | SMT_0019 | Size 06 | |
| Spare parts | | SP_8010 | | |

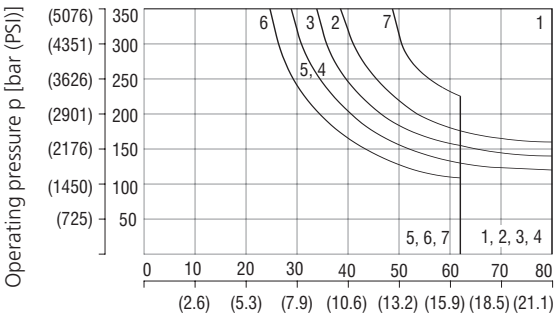
## Functional Description

The **4/2 RPE3-06x/xS3 valve** is a direct acting solenoid operated spool valve. The actual position of the spool is indicated by an inductive contactless sensor. The product is designed to control the movement direction of the output component of the consumer. **The valve with certified functional safety SIL 3, PL d**, acc. to standards ISO 4401, DIN 24340 (CETOP 03) is designed for usage in systems with increased reliability and safety requirements, e.g. hydraulic presses, plastic injection molding machines, forming machines or construction machinery.

## Characteristics measured at ν = 32 mm²/s (156 SUS)

### Operating limits

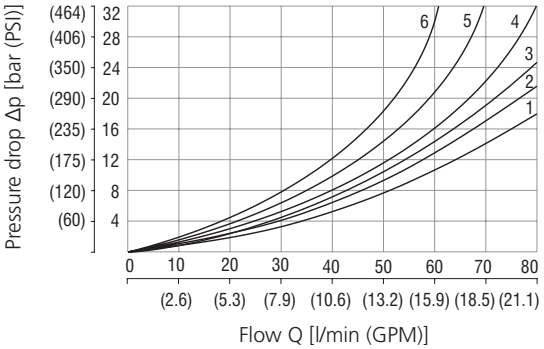
Operating limits for maximum hydraulic power at rated temperature and supply voltage equal to 90 % nominal.




| Spool symbol | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Z11 | C11 | H11 | R11 | R21 | C51 | Z51 | R31 | H51 | X11 | K11 | X32 | V51 | R30 | X30 |
| 1 | 5 | 4 | 2 | 3 | 5 | 1 | 4 | 4 | 2 | 6 | 3 | 3 | 7 | 7 |

For operating limits under conditions and flow directions other than shown contact our technical support. Admissible operating limits may be considerably lower with only one direction of flow (A or B plugged, or without flow.)

### Pressure drop related to flow rate




| Spool symbol | P-A | P-B | A-T | B-T | P-T |
|---|---|---|---|---|---|
| Z11,R1,R21,X11,X32 | 1 | 1 | 2 | 2 | |
| C11 | 5 | 5 | 5 | 6 | 2 |
| H11 | 1 | 1 | 1 | 2 | 2 |
| Z51,H51 | | 1 | 2 | | |
| C51 | 1 | | | 2 | 4 |
| R31 | 1 | | | 2 | |
| K11 | | 1 | 2 | | |
| R30 | 3 | 1 | 1 | 2 | |
| X30 | 1 | 1 | 2 | 3 | |
| V51 | 3 | 3 | | | |

## Ordering Code

**RPE3 - 06 2 ☐/☐☐ N1 ☐ S3 - ☐**

**4/2 Solenoid operated directional control valve**

**Valve size**

**Number of spool positions**

**Spool symbols**
see the table "Spool Symbols"

**Rated supply voltage of solenoids**
(at the coil terminals)

| | |
|---|---|
| 12 V DC / 2.72 A | **01200** |
| 24 V DC / 1.29 A | **02400** |
| 27 V DC / 1.07 A | **02700** |
| 205 V DC / 0.15 A | **20500** |
| 24 V AC / 1.56 A / 50 (60 Hz) | **02450** |
| 120 V AC / 0.26 A / 60 Hz | **12060** |
| 230 V AC / 0.15 A / 50 (60) Hz | **23050** |

**Surface treatment**

| | |
|---|---|
| **No designation** | standard |
| **A** | zinc-coated (ZnCr-3), ISO 9227 (240 h) |
| **B** | zinc-coated (ZnNi), ISO 9227 (520 h) |

**Spool monitoring**
axial sensor with two outputs

**Seals**

| | |
|---|---|
| **No designation** | NBR |
| **V** | FPM (Viton) |

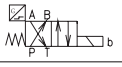
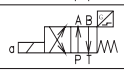
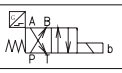
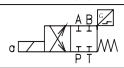
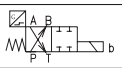
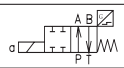
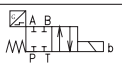
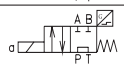
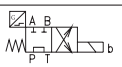
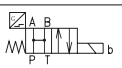
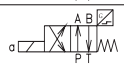
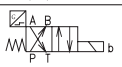
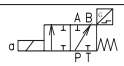
**Manual override**
cap nut covered

**Connector**

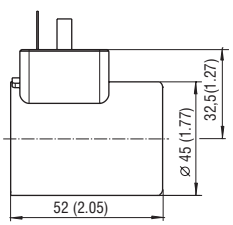
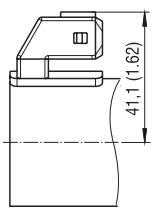
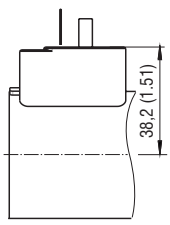
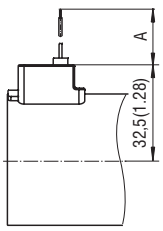
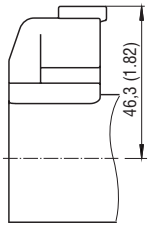
| | |
|---|---|
| **E1** | EN 175301-803-A |
| **E2** | E1 with quenching diode |
| **E3A** | AMP Junior Timer - axial direction (2 pins; male) |
| **E4A** | E3A with quenching diode |
| **E5** | EN 175301-803-A with integrated rectifier |
| **E8** | Loose conductors (two insulated wires) |
| **E9** | E8 with quenching diode |
| **E12A** | Deutsch DT04-2P - axial direction (2 pins; male) |
| **E13A** | E12A with quenching diode |

- For AC voltage supply use coils with connector type E5.
- For other solenoid voltage supply options see datasheet C_8007.
- The solenoid operated valves are delivered without connectors. For available connectors see datasheet K_8008.
- Mounting bolts M5 x 45 DIN 912-10.9 or studs must be ordered separately. Tightening torque is 8.9+1 Nm (7+0.7 lbf.ft).
- Besides the commonly used valve versions there are other special models available. Contact our technical support for their identification, feasibility and operating limits.

## Spool Symbols

| Type | Symbol | Interposition | Type | Symbol | Interposition |
|---|---|---|---|---|---|
| R11 |  |  | X11 |  |  |
| R30 |  |  | X30 |  |  |
| Z51 |  |  | K11 |  |  |
| R31 |  |  | Z11 |  |  |
| C51 |  |  | C11 |  |  |
| H51 |  |  | H11 |  |  |
| R21 |  |  | X32 |  |  |
| V51 |  |  | | | |

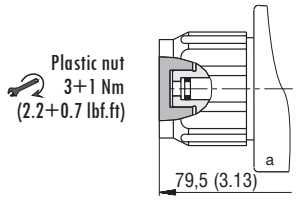
## Solenoid Coil in millimeters (inches)

| E1, E2<br>Ingress protection IP65 | E3A, E4A<br>Ingress protection IP67 | E5<br>Ingress protection IP65 | E8, E9 | E12A, E13A<br>Ingress protection IP67 / IP69K |
|---|---|---|---|---|
|  |  |  |  <br>Note:<br>A = Standard 300 mm (11.8 in)<br>other lengths on demand |  |

The specified IP rating applies only in the case of correctly connected connectors (male + female) with the corresponding IP rating.

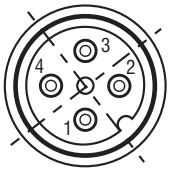
## Manual Override in millimeters (inches)

Designation N1
- cap nut covered




In case of solenoid or power failure, the spool of the valve can be shifted by manual override as long as the pressure in port T does not exceed 25 bar (363 PSI). For alternative manual overrides contact our technical support.

## Spool Position Sensor

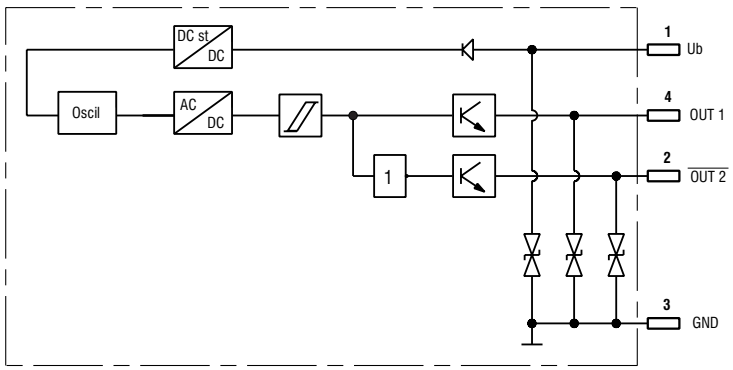



4-pin connector with the thread M12

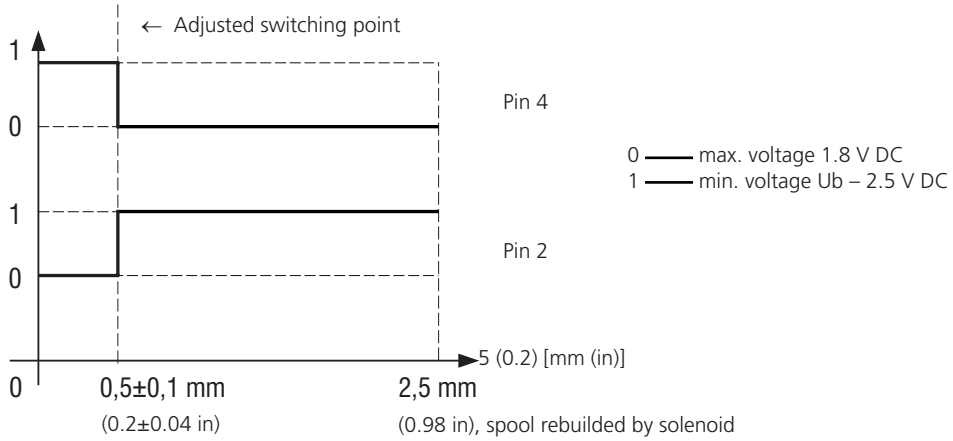
| Technical Data | | |
|---|---|---|
| Max. pressure resistance | bar (PSI) | 315 (dynamic) |
| Operating temperature | °C (°F) | -20 … +85 (-4 ... +185) |
| Storage temperature | °C (°F) | -25 … +85 (-13 ... +185) |
| Supply voltage Ub | V | 24 V DC ± 20 % |
| Current consumption (max.) | mA | 20 |
| Output voltage (min.) | V | min. Ub-2.5 V |
| Output current | mA | max. 250 |
| Ingress protection (EN 60529) | | IP65 |
| Hysteresis of switching point (max.) | mm (in) | 0.06 (0.002) |
| Reproducibility at 25 °C (77 °F) | mm (in) | ± 0.02 (± 0.0008) |
| Temperature drift | mm / °C | 0.002 |
| Weight | kg (lbs) | 0.250 (0.55) |

**Description of sensor:**
Contactless inductive sensor with two transistor type switching outputs. The output $\overline{\text{OUT 2}}$ is inverted. The dual output signal is protected against mutual interference and increases the reliability of the spool end position signalization, which is important for command system ensuring the safety of such machines like presses, forming machines etc. The sensor is set at the factory so that it switches when the spool is moved from the basic position by 0.5 ± 0.1 mm. The relative position of the sensor components is indicated in red .

**Connection scheme of the spool position sensor**



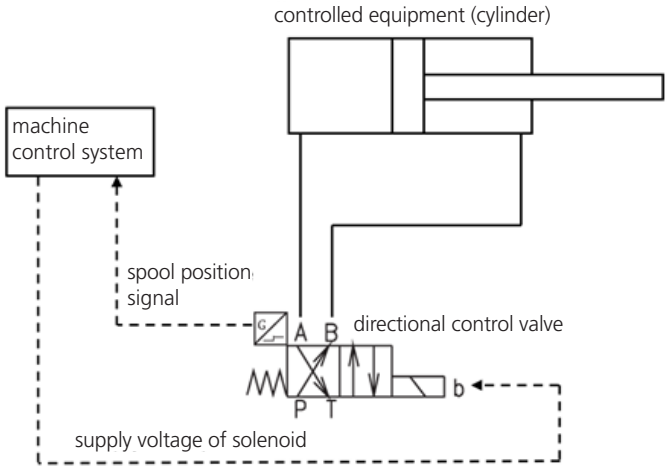

**Switching diagram of contacts:**



## Valve safety function

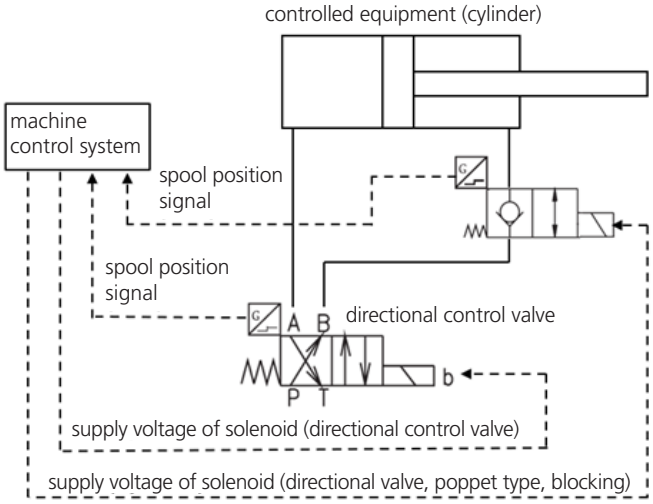
**The condition for using the safety function of the valve** is the correct connection to the hydraulic circuit and integration into the control system of the machine. The basic rule is that the spool is in the safety position when the solenoid is off. This condition corresponds to a control system failure or a power failure of the machine.

### Examples of safe connection




*Example of valve connection with sensor, providing functional safety Pl. d*

**Suitable redundant connection** of another, for example blocking poppet, valve, can achieve an increase in functional safety.

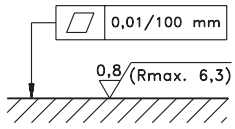



*Example of redundant connection of two valves to achieve functional safety Pl. e*

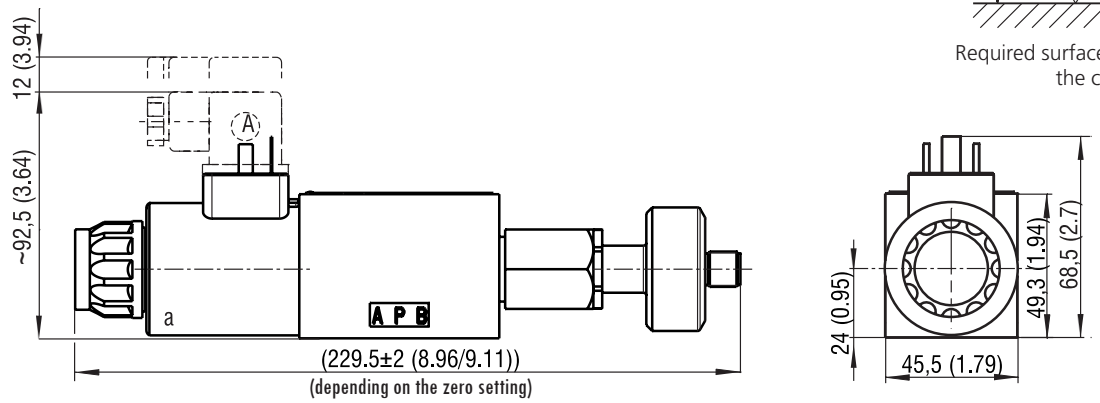
## Dimensions in millimeters (inches)

### Valve with one solenoid „a"

Spool symbols
R11, Z51, R31...

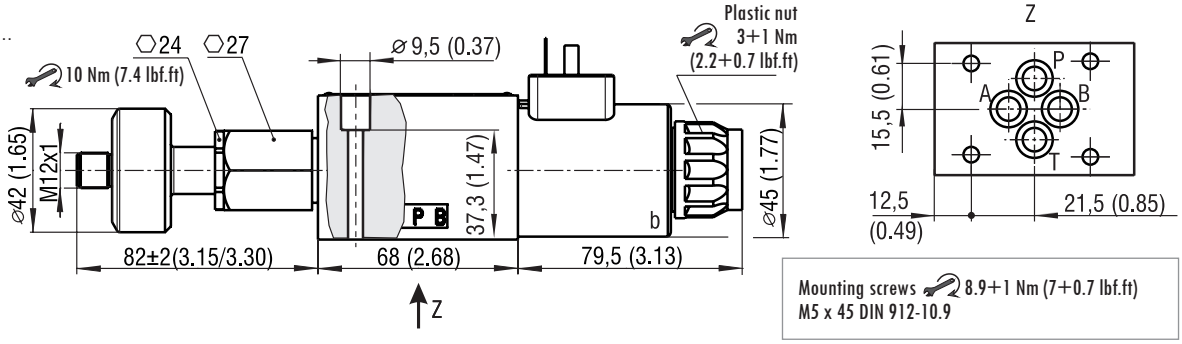



Required surface quality of the counterpart




### Valve with one solenoid „b"

Spool symbols
X11, K11, Z11...




Mounting screws 8.9+1 Nm (7+0.7 lbf.ft)
M5 x 45 DIN 912-10.9