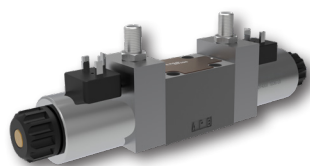


# 4/2 and 4/3 Directional Control Valve, Solenoid Operated

## RPE3-06

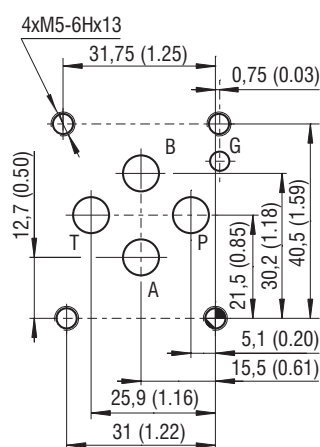
Size 06 (D03) • Q<sub>max</sub> 80 l/min (21 GPM) • p<sub>max</sub> 350 bar (5100 PSI)



### Technical Features

- › Direct acting, directional control valve with subplate mounting interface acc. to ISO 4401, DIN 24340 (CETOP 03)
- › High transmitted hydraulic power up to 350 bar with optimized design to minimize pressure drop
- › Five chamber housing design with reduced hydraulic power dependence on fluid viscosity
- › The valve is available with interchangeable DC solenoids, also for AC power supply using a built-in rectifier bridge
- › Wide range of solenoid electrical terminal versions available
- › Wide range of interchangeable spools and manual overrides available
- › CSA Certificate upon request
- › Inductive contactless Normally Open and Normally Closed spool position sensor option
- › Soft-shift spool speed control option
- › The coil is fastened to the core tube with a retaining nut and can be rotated by 360° to suit the available space
- › 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)

### ISO 4401-03-02-0-05



Ports P, A, B, T - max Ø7.5 mm (0.29 in)

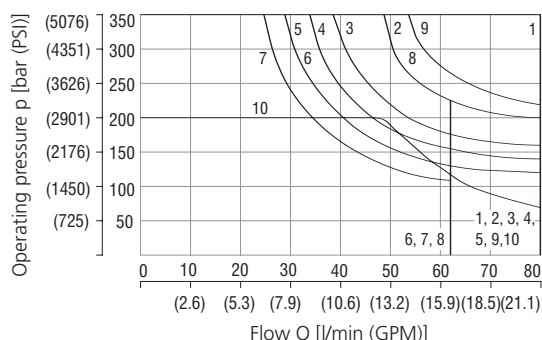
### Technical Data

|                                          |                                              |
|------------------------------------------|----------------------------------------------|
| Valve size                               | 06 (D03)                                     |
| Max. flow                                | 80 (21.1)                                    |
| Max. operating pressure at ports P, A, B | standard 350 (5080)                          |
|                                          | 320 (4640) acc. to CSA                       |
| Max. operating pressure at port T        | 210 (3050)                                   |
| Fluid temperature range (NBR)            | -30 ... +80 (-22 ... +176)                   |
| Fluid temperature range (FPM)            | -20 ... +80 (-4 ... +176)                    |
| Ambient temperature range                | -30 ... +50 (-22 ... +122)                   |
| Supply voltage tolerance                 | % AC: ±10 DC: ±10                            |
| Max. switching frequency                 | 1/h 15 000                                   |
| Switching time at v=32 mm/s (156 SUS)    | ON ms AC: 30 ... 40 DC: 30 ... 50            |
|                                          | OFF ms AC: 30 ... 70 DC: 10 ... 50           |
| Weight - valve with 1 solenoid           | kg (lbs) 1.6 (3.52)                          |
| - valve with 2 solenoids                 | 2.2 (4.85)                                   |
| General information                      | Datasheet Type                               |
| Coil types / connectors                  | HA 0060 HA 8007 / HA 8008                    |
| Mounting interface                       | HA 0019                                      |
| Spare parts                              | HA 8010                                      |
|                                          | Products and operating conditions C22B* / K* |
|                                          | Size 06                                      |

### Characteristics measured at v = 32 mm<sup>2</sup>/s (156 SUS)

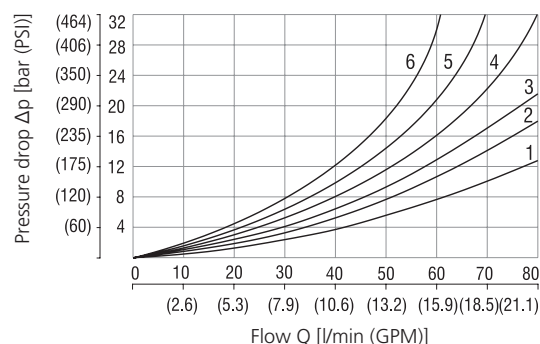
#### Operating limits

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



| Spool symbol |       |        |  |
|--------------|-------|--------|--|
| 1 Z11        | 5 F11 | 7 Z91  |  |
| 6 C11        | 3 R11 | 5 R31  |  |
| 5 H11        | 4 R21 | 5 H51  |  |
| 1 P11        | 5 A51 | 7 F51  |  |
| 2 Y11        | 1 P51 | 3 X11  |  |
| 5 L21        | 2 Y51 | 7 K11  |  |
| 8 B11        | 6 C51 | 7 N11  |  |
| 6 Y41        | 1 Z51 | 10 X25 |  |
| 1 Z21        | 7 Z71 | 1 J15  |  |
| 5 C41        | 7 Z81 | 9 J75  |  |

#### Pressure drop related to flow rate



| Spool symbol    | P-A | P-B | A-T | B-T | P-T |
|-----------------|-----|-----|-----|-----|-----|
| Z11,L21,B11,R11 | 2   | 2   | 3   | 3   |     |
| R21,X11,N11,J15 | 5   | 5   | 5   | 6   | 3   |
| C11             | 2   | 2   | 2   | 3   | 3   |
| H11             | 1   | 1   | 3   | 3   |     |
| P11             | 2   | 2   | 2   | 2   |     |
| Y11             | 3   | 3   | 3   | 3   |     |
| Y41             |     | 2   | 3   |     |     |
| Z21,Z51,H51     |     | 4   |     |     | 5   |
| C41             | 1   | 4   |     | 3   | 3   |
| F11             | 2   | 2   |     |     |     |
| A51,J75         | 2   | 2   |     |     |     |

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.)

4/2 and 4/3  
directional control valve,  
solenoid operated

two positions  
three positions

see the table "Spool Symbols"

23050

E12A with quenching diode

E12A  
E13A

- Besides the commonly used valve versions shown other special models are available. Contact our technical support for their identification, feasibility and operating limits.

orifice  $\varnothing$  0.7 mm (0.03 inch) in solenoid\*

without manual override

## Page 2

## Type of Solenoid Coil in millimeters (inches)

| E1, E2 / IP65 | E3A, E4A / IP67 | E5 / IP65 | E8, E9 | E12A, E13A / IP67 / 69K |
|---------------|-----------------|-----------|--------|-------------------------|
|               |                 |           |        |                         |

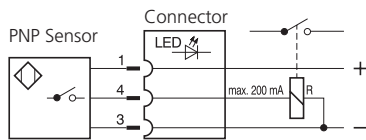
The specified IP rating applies only in the case of correctly connected connectors (male + female) with the corresponding IP rating.

## Manual Override in millimeters (inches)

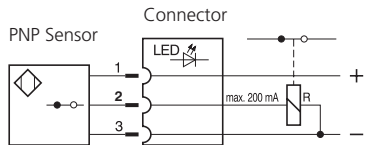
| No designation - standard      | N1- cap nut covered               | N2- rubber boot protected | N3 - detent assembly with the ball | N4 - hand screw                                                                                                                                                                                                                                |
|--------------------------------|-----------------------------------|---------------------------|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                |                                   |                           |                                    |                                                                                                                                                                                                                                                |
| N5 - socket head screw, size 3 | N7 - detent assembly with the nut | N8 - with ball            | N9 - without manual override       | In case of solenoid malfunction 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

### S1 - Circuit diagram for the normally - OPEN sensor



### S4 - Circuit diagram of the normally - CLOSED sensor



### Function of the position sensor:

In the basic position (when the solenoid is switched off), a steel core, connected to the spool, is under the position sensor. The sensor is activated, it means contacts of the sensor S1 are closed and contacts of the sensor S4 are open. After switching on the solenoid the spool with core moves out of the sensor range and the sensor is deactivated.

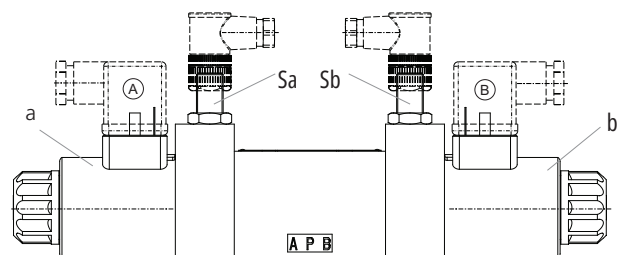
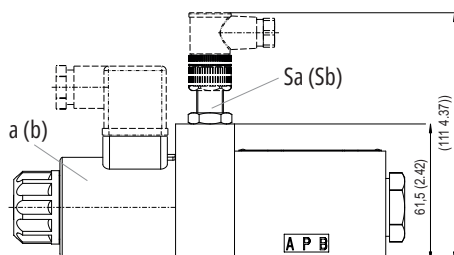
### Typical configurations of the valve with a sensor:

3-position valve with two solenoids, equipped with two sensors  
2-position valve with one solenoid, equipped with one sensor on the solenoid side  
2-position valve with a detent assembly of spool, equipped with one sensor on the side of the solenoid which moves the spool from the basic position to the switched position according to the spool symbol  
**Note:** the sensor always indicates the change of spool position realised by the energised solenoid, mounted on the side of the sensor.

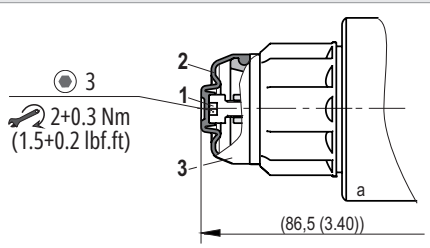
| Technical Data of the Sensor           |           | S1, S4                     |
|----------------------------------------|-----------|----------------------------|
| Rated power supply voltage             | V         | 24 DC                      |
| Power supply voltage range             | V         | 10 ... 30 DC               |
| Rated current                          | mA        | 200                        |
| Sensor enclosure protection (EN 60529) |           | IP 67                      |
| Max. operating pressure at port T      | bar (PSI) | 210 (3046)                 |
| Switching frequency                    | Hz        | 1000                       |
| Ambient temperature range              | °C (°F)   | -25 ... +80 (-13 ... +176) |
| Technical Data of the Connector        |           |                            |
| Power supply voltage range             | V         | 10 ... 30 DC               |
| Ambient temperature range              | °C (°F)   | -25 ... +80 (-13 ... +176) |
| Indicator                              |           | yellow LED                 |

| Two-Position Directional Control Valve |          |     |     |     |
|----------------------------------------|----------|-----|-----|-----|
| ① a(b)                                 | ③ Sa(Sb) | LED |     |     |
|                                        | S1       | S4  | S1  | S4  |
| 0                                      | 1        | 0   | ON  | OFF |
| 1                                      | 0        | 1   | OFF | ON  |

| Three-Position Directional Control Valve |   |          |    |    |    |          |          |          |          |
|------------------------------------------|---|----------|----|----|----|----------|----------|----------|----------|
| ① a(b)                                   |   | ③ Sa(Sb) |    |    |    | LED      |          |          |          |
|                                          |   | S1       |    | S4 |    | S1       |          | S4       |          |
| a                                        | b | Sa       | Sb | Sa | Sb | Sa - LED | Sb - LED | Sa - LED | Sb - LED |
| 0                                        | 0 | 1        | 1  | 0  | 0  | ON       | ON       | OFF      | OFF      |
| 1                                        | 0 | 0        | 1  | 1  | 0  | OFF      | ON       | ON       | OFF      |
| 0                                        | 1 | 1        | 0  | 0  | 1  | ON       | OFF      | OFF      | ON       |

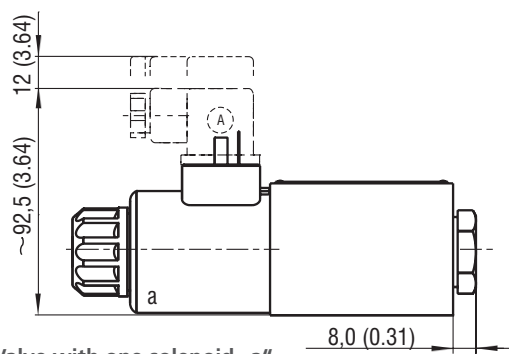
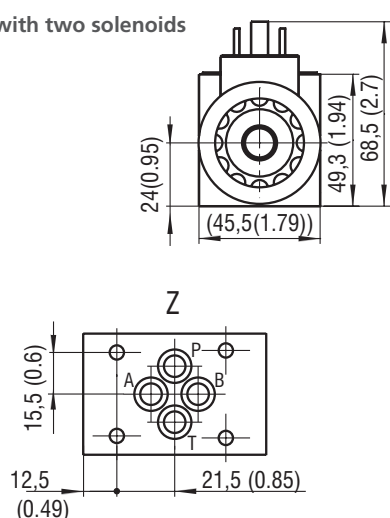


# Spool Speed Control in millimeters (inches)

| Designation T1                                                                                                                                                                                                      | Important:                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <p>2+0.3 Nm<br/>(1.5+0.2 lbf.ft)</p> <p>(86,5 (3.40))</p>                                                                         | <p>This directional valve provides the means to control spool soft shifting by an orifice situated in the solenoid armature. To ensure the proper function of the valve, unobstructed venting of the solenoid is required through the bleeding plug (1). The plugs are accessible after removing the rubber boot (2) from the solenoid cap nut (3).</p> <p>The valve spool can be adjusted manually by pushing on the tightened bleeding plug.</p> |
| Switching time ON and OFF                                                                                                                                                                                           | 300 ... 800 ms                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <p>The switching times shown are valid for viscosity <math>\nu = 32 \text{ mm}^2/\text{s}</math> (156 SUS) and nominal voltage. They depend on working pressure and flow rate of the directional control valve.</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

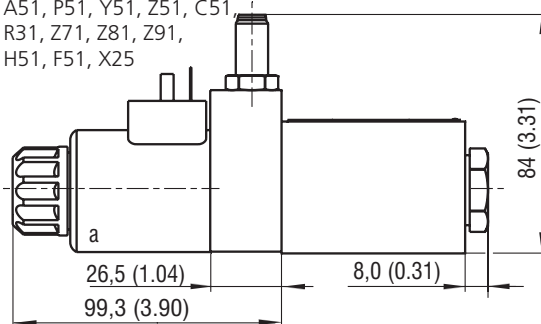
## Dimensions in millimeters (inches)

### Valve with two solenoids

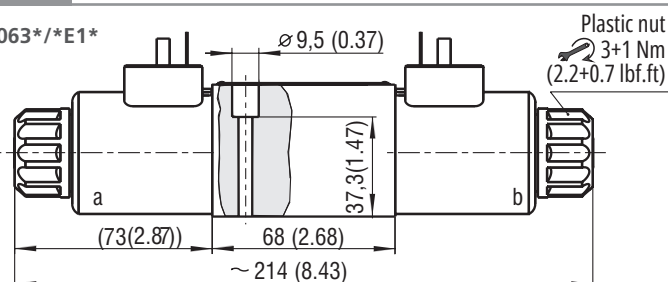


### Valve with one solenoid „a“

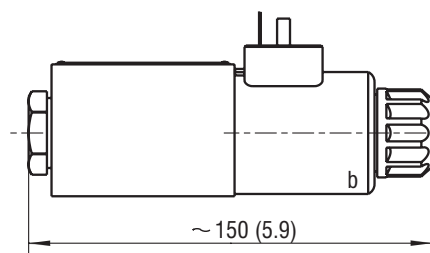
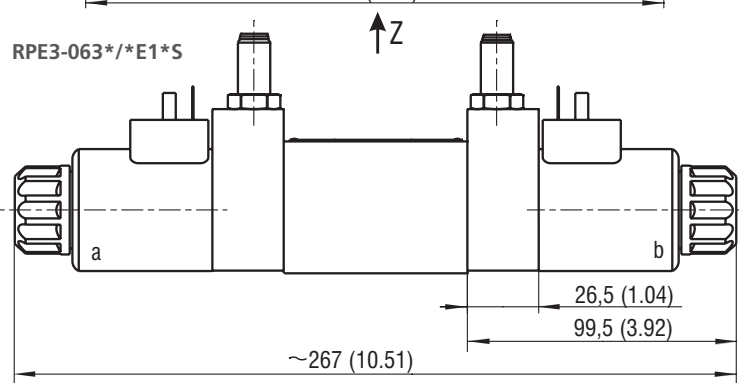
Spool symbols R11, R21, A51, P51, Y51, Z51, C51, R31, Z71, Z81, Z91, H51, F51, X25



### RPE3-063\*/E1\*

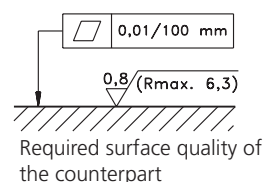
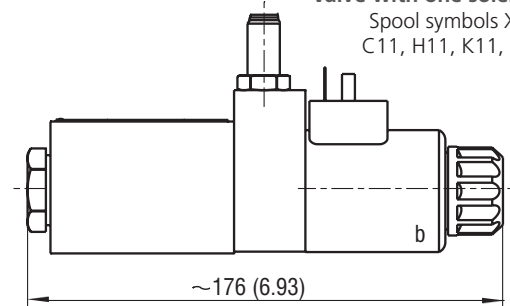


### RPE3-063\*/E1\*S



### Valve with one solenoid „b“

Spool symbols X11, Z11, C11, H11, K11, N11, F11



Mounting screws 8.9+1 Nm (6.56+0.7 lbf.ft)  
M5x45 DIN 912-10.9