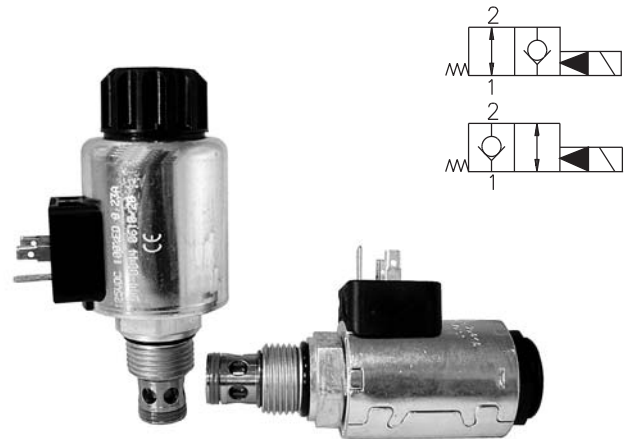


- Cartridge and module design as well as housing for pipeline mounting
- Poppet design – no internal oil leakage
- High switching reliability also after long stand times
- High transmitted power



### Functional Description

The pilot operated 2/2 way solenoid actuated poppet valves control in the first line the start and stop function of the oil flow. The valve consists of the valve bushing (1), main control spool (2), return spring (3), cartridge with actuating system (4) and of the solenoid coil (5) that is mounted on the actuating system. The valve bushing is screwed into the cartridge part.

In the variant normally closed / normally open, the valve is securely held in the respective basic position by a spring. By energizing the solenoid coil the spring force is overcome and the pilot valve is pressed onto the seat or lifted. Opening and closing of the main control spool is hydraulically supported through the orifice boring created in the main control spool.

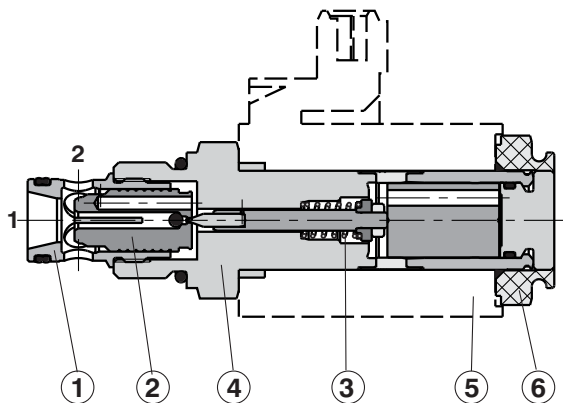
The DC solenoid coils can be delivered for 12 V and 24 V supply voltages. For AC applications 120 V/60 Hz or 230 V/50 Hz, the suitable rectifiers for the standard solenoid coils are available, with them being mounted in an additional terminal box. With the AC high power solenoid coils, the rectifiers are integrated directly in the connector. By loosening the fixing nut (6), the solenoid coil can be replaced or turned in the range of 360°.

**Notice.**

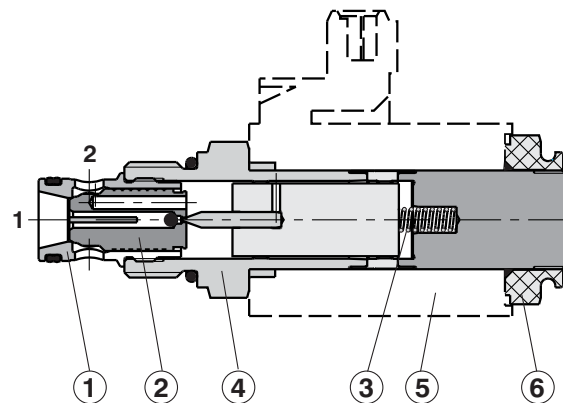
The valves are supplied without solenoids coils. The solenoid coil, the terminal box and the body for line mounting have to be ordered separately.

### Cartridge Valve

Absence of current opened 2O2



Absence of current closed 2L2



# Ordering Code

**SD3E-B2** /



**2/2 Way Solenoid Operated Directional Control Valve Poppet Type**

no designation  
**V**

**Seals**  
Standard (NBR)  
Viton (FPM)

Standard  
High Performance

**S**  
**H**

No designation  
**M2**  
**M5**  
**M9**

**Manual override**  
standard for 202  
covered with rubber bootn only for 202  
socket head screw  
without manual override

**Description**  
Refer to the table with functional symbols

Solenoid coil, terminal box and body for line mounting have to be ordered separately.

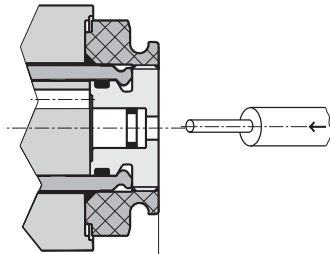
## Functional Symbols

| Designation | Symbol | Designation | Symbol |
|-------------|--------|-------------|--------|
| 202         |        | 2L2         |        |

## Manual Override

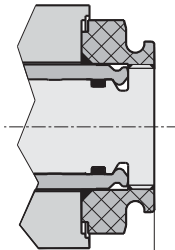
Dimensions in millimeters (inches)

No designation - Standard for 202



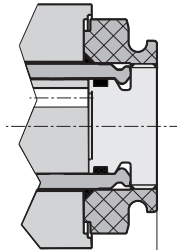
Standard valve ~70,5 (2.776)  
High performance valve ~83,0 (3.268)

Designation **M9** - for 2L2  
without manual override



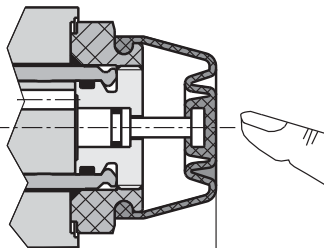
Standard valve ~71,0 (2.795)  
High performance valve ~83,0 (3.268)

Designation **M9** - for 202  
without manual override



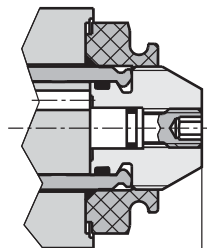
Standard valve ~70,5 (2.776)  
High performance valve ~83,0 (3.268)

Designation **M2** - for 202  
covered with rubber bootn



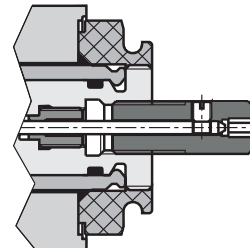
Standard valve ~82,0(3.228)  
High performance valve ~100,0(3.937)

Designation **M5** - for 202  
by screwing in of the socket head screw 2,5(0.098)



Standard valve ~78,0(3.071)  
High performance valve ~84,8(3.339)

Designation **M5** - for 2L2  
by screwing in of the socket head screw 2,5(0.098)



Standard valve ~78,0(3.071)  
High performance valve ~90,0(3.543)

# Technical Data

|  |                          | Standard   | High performance        |
|--|--------------------------|--|-------------------------|
| Cartridge thread                         |                          | 7/8-14 UNF -2B   |                         |
| Maximum flow                             | L/min (GPM)              | 50 (13.21)   | 75 (19.81)              |
| Max. operating pressure                  | bar (PSI)                | 250 (3626)   | 420 (6091)              |
| Pressure drop                            | bar (PSI)                | see $\Delta p$ -Q characteristics                      |                         |
| Hydraulic fluid                          |                          | Hydraulic oils of power classes (HL, HLP) to DIN 51524 |                         |
| Fluid temperature range                  | °C (°F)                  | -20 ... 60 (-4 ... 140)                                | -20 ... 80 (-4 ... 176) |
| Ambient temperature, max.                | °C (°F)                  | -20 ... 50 (-4 ... 122)                                | -20 ... 80 (-4 ... 176) |
| Viscosity range                          | mm <sup>2</sup> /s (SUS) | 10 ... 500 (49 ... 2450)                               |                         |
| Maximum degree of fluid contamination    |                          | Class 21/18/15 according to ISO 4406 (1999)            |                         |
| Coil groups (see the datasheet of coils) |                          | C04-23   | C06-22                  |
| Permissible rated voltage variation      | %                        | AC,DC ±10  | AC,DC ±15               |
| Max. switching frequency                 | 1/h                      | 15 000   |                         |
| Duty cycle                               | %                        | 100  |                         |
| Service life                             | cycles                   | 10 <sup>7</sup>  |                         |
| Enclosure type to EN 60529               |                          | IP 65  |                         |
| Maximum valve tightening torque          | Nm ( lbf.ft)             | 35+5 (25.81+3.68)                                      |                         |
| Maximum plastic nut tightening torque    | Nm ( lbf.ft)             | 3+1 (2.213+0.738)                                      | 5+1 (3.688+0.738)       |
| Weight                                   | kg (lbs)                 | 0.23 (0.51)  | 0.30 (0.66)             |
| Mounting position                        |                          | optional   |                         |

## p-Q Characteristics

Measured at  $v = 32 \text{ mm}^2/\text{s}$  (156 SUS)

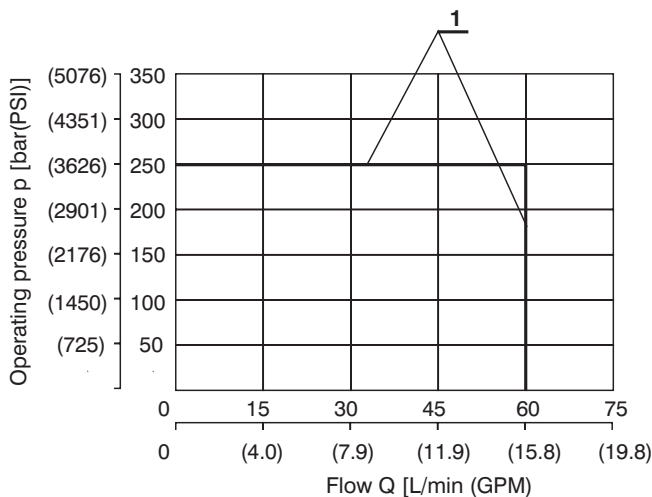
Operating limits for hydraulic power transferred by the directional valve. For respective spool type - see functional symbols.

### Standard valve

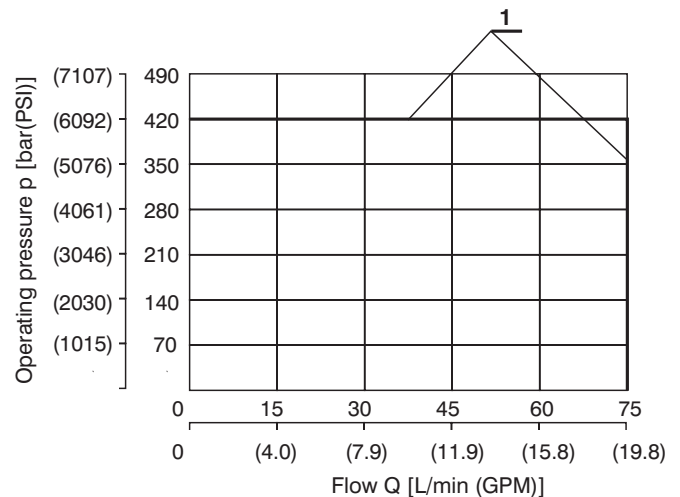
Oil 80 °C (176 °F) / Ambient temperature 50 °C (122 °F)  
Voltage Un -10% [V], 24V

### High performance valve

Oil 80 °C (176 °F) / Ambient temperature 50 °C (122 °F)  
Voltage Un -10% [V], 24V



|   | Connection |
|---|------------|
| 1 | 2L2        |
| 1 | 2O2        |



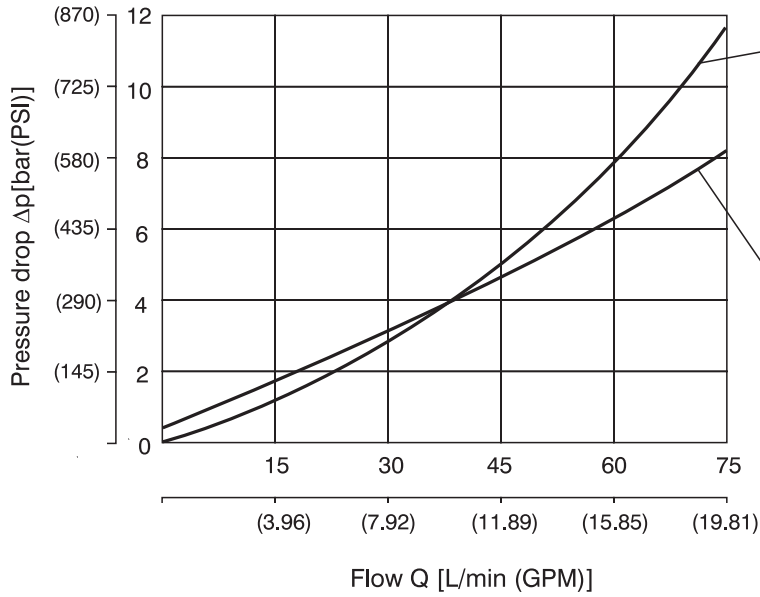
|   | Connection |
|---|------------|
| 1 | 2L2        |
| 1 | 2O2        |

# Δp-Q Characteristics

Measured at  $v = 32 \text{ mm}^2/\text{s}$  (156 SUS)

Pressure drop  $\Delta p$  related to flow rate.

## Standard valve + High performance valve



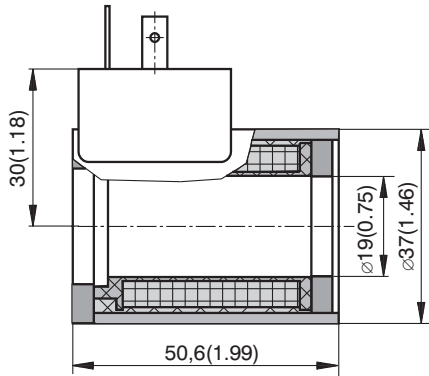
|   | Connection | Dirrection |
|---|------------|------------|
| 1 | 2L2        | 2 → 1      |
| 2 | 2L2        | 1 → 2*     |
| 1 | 2O2        | 1 → 2*     |
| 1 | 2O2        | 2 → 1      |

\*Solenoid switched off

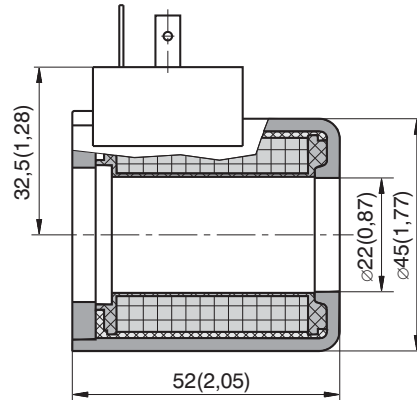
## Type of the Solenoid Coils

Dimensions in millimeters (inches)

Coil for Standard valve  
C04-23



Coil for High performance valve  
C06-22



| Solenoid | Connector                        | Standard valve   | High performance valve |
|----------|----------------------------------|------------------|------------------------|
|          |                                  | SD3E-B2 / S...   | SD3E-B2 / H...         |
|          |                                  | Type code        | Type code              |
| 12 VDC   | EN 175301-803-A                  | C04-23-012DC-E1  | C06-22-012DC-E1        |
| 24 VDC   | EN 175301-803-A                  | C04-23-024DC-E1  | C06-22-024DC-E1        |
| 12 VDC   | AMP-Junior-Timer ( 2-pins)       | C04-23-012DC-E3  | C06-22-012DC-E3A       |
| 24 VDC   | AMP-Junior-Timer ( 2-pins)       | C04-23-024DC-E3  | C06-22-024DC-E3A       |
| 12 VDC   | Flying leads**                   | C04-23-012DC-E8  | C06-22-012DC-E8        |
| 24 VDC   | Flying leads**                   | C04-23-024DC-E8  | C06-22-024DC-E8        |
| 12 VDC   | Deutsch DT04-2P                  | ---              | C06-22-012DC-E12       |
| 24 VDC   | Deutsch DT04-2P                  | ---              | C06-22-024DC-E12       |
| 120 VAC  | EN 175301-803-A                  | C04-23-106DC-E1* | C06-22-106DC-E1*       |
| 230 VAC  | EN 175301-803-A                  | C04-23-205DC-E1* | C06-22-205DC-E1*       |
| 120 VAC  | EN 175301-803-A (with rectifier) | C04-23-120AC-E5  | C06-22-120AC-E5        |
| 230 VAC  | EN 175301-803-A (with rectifier) | C04-23-230AC-E5  | C06-22-230AC-E5        |

\*Use the terminal box with rectifier!

\*\*Standard length of connecting wire is 300 mm, other lengths on request.

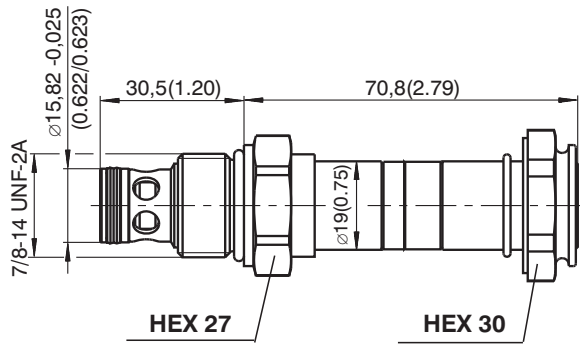
**Note:**

- For other voltages, connector variants, quenching diodes or rectifiers refer to Coil data sheet HA 8007

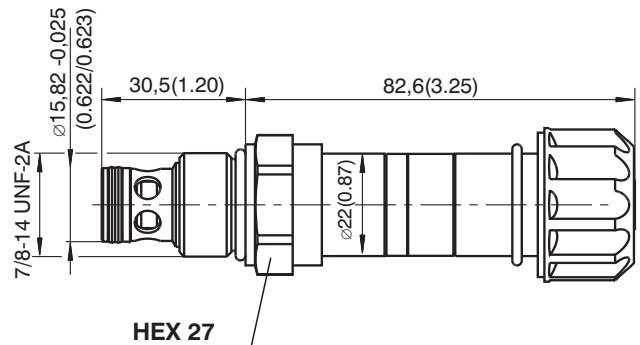
# Valve Dimensions

Dimensions in millimeters (inches)

## Standard valve

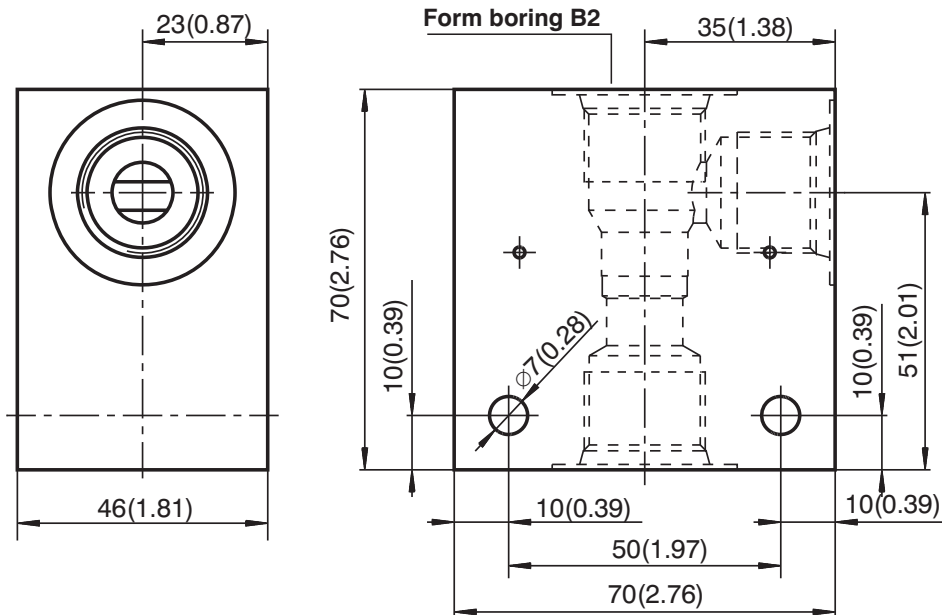


## High performance valve



# Valve Body

Dimensions in millimeters (inches)



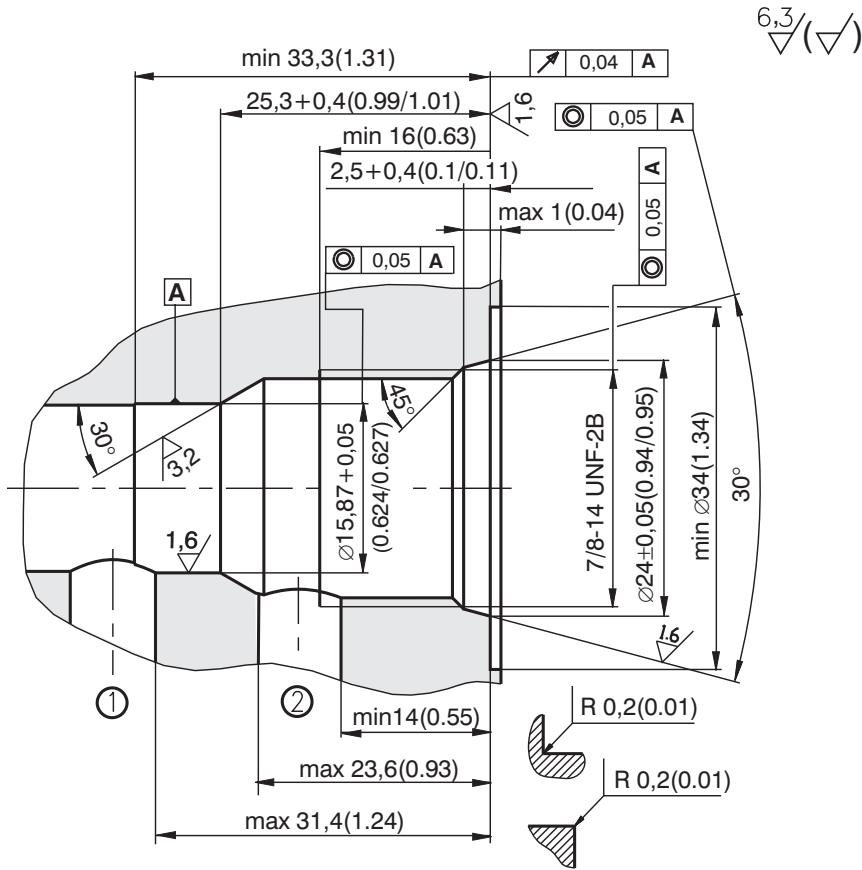
| Body material | Connecting size | Type code    | Operating pressures |
|---------------|-----------------|--------------|---------------------|
| Steel         | G3/8            | SB-B2-0103ST | 420 bar (6091 PSI)  |
| Steel         | SAE 8           | SB-B2-0104ST | 420 bar (6091 PSI)  |
| Aluminium     | G3/8            | SB-B2-0103AL | 250 bar (3626 PSI)  |
| Aluminium     | SAE 8           | SB-B2-0104AL | 250 bar (3626 PSI)  |

**Note:**

- For detailed valve body ordering code refer to data sheet HA 0018

# Cavity

Dimensions in millimeters (inches)



# Spare Parts

Dimensions in millimeters

## Standard and high performance valve

| Dualeal - PU               | O-ring - NBR      | O-ring - Viton    | Order number |
|----------------------------|-------------------|-------------------|--------------|
| 13,47 x 15,87 x 3,1 (1pc.) | 19,4 x 2,1 (1pc.) | -                 | 18960400     |
| 13,47 x 15,87 x 3,1 (1pc.) | -                 | 19,4 x 2,1 (1pc.) | 18960500     |

## Solenoid retaining nut with seal for standard valve

| Type of nut  | O-ring - Viton  |          |
|--------------|-----------------|----------|
| Standard nut | 18 x 1,5 (1pc.) | 20777000 |
| Nut M2       | 18 x 1,5 (1pc.) | 20777600 |

## Solenoid retaining nut with seal for high performance valve

| Type of nut  | O-ring - Viton |          |
|--------------|----------------|----------|
| Standard nut | 22 x 2 (1pc.)  | 15844600 |
| Nut M2       | 22 x 2 (1pc.)  | 18961700 |

# Caution!

- The packing foil is recyclable.
- The technical information regarding the product presented in this catalogue is for descriptive purposes only. It should not be construed in any case as a guaranteed representation of the product properties in the sense of the law.

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