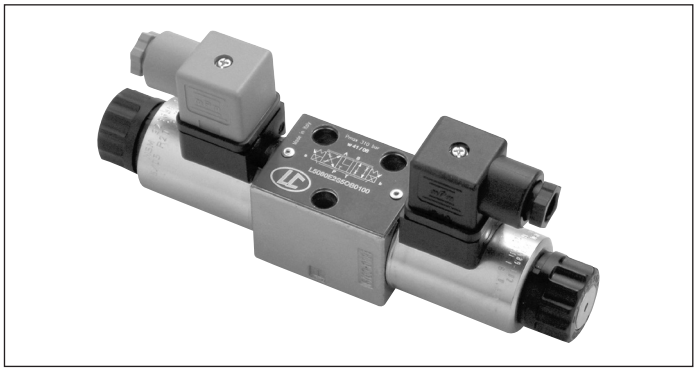
rexroth
A Bosch Company

4/3 - 4/2 Proportional directional valves solenoid operated (for open loop control)

LC04-P / LC02-P

RE 18303-03
Edition: 11.2024
Replaces: 02.2016



Size 4
Series 00
Maximum operating pressure 310 bar (4500 psi)
Maximum flow 12 l/min (3.17 gpm)

NEW spool position sensor available for this valve.
See RE18300-30

General specifications

Proportional solenoid operated directional spool valve.
Actuation by proportional solenoids with a central tube and removable coil.
Spring centered control spool.
For mounting on industry standard surface port pattern to CETOP RP121 H-4.2-P02.
Wet pin DC solenoids with removable coil and manual override.
Coil can be rotated by 360°.

Contents

Ordering details

01	02	03	04	05	06	07	08	09	10
L	**5**		**80**						**00**

Family

01	Directional Valve elements	**L**

Type

02	CETOP valves	**5**

Size

03	NG 4 (P02)	**0**
	NG 4 (R02)	**4**

Operation

04	Solenoid operated P45 proportional coil	**80**

Spools

05	P – T closed in neutral	**B**
	A and B to T in neutral	**E**

Hydraulic scheme

06	4/3 operated A and B side	**2**
	4/2 operated A side	**3**
	4/2 operated B side	**4**

Nominal flow [1)]

07	4 l/min (1.06 gpm)	**S3**
	8 l/min (2.11 gpm)	**S4**
	12 l/min (3.17 gpm)	**S5**

Voltage

08	Without coil	**00**
	12V DC	**OB**
	24V DC	**OC**

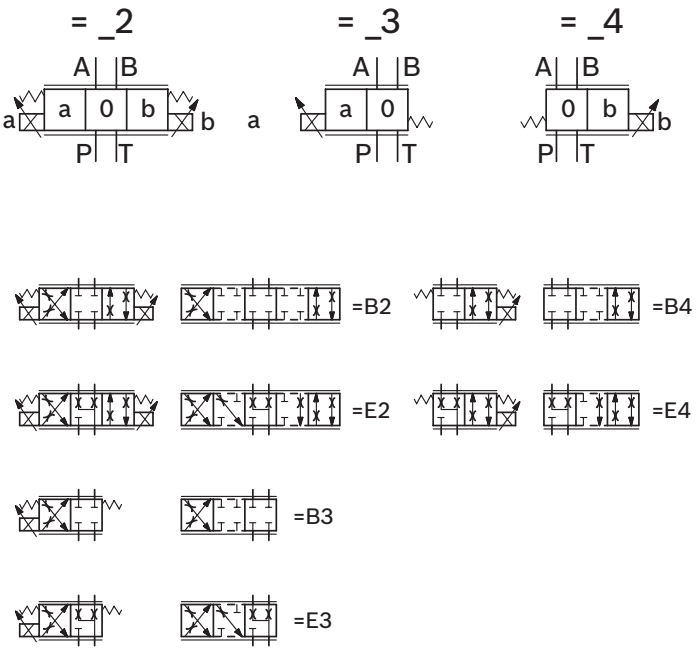
Electric connections

09	Without coils	**00**
	With coils, without mating connector DIN EN 175301-803	**01** [2)]
	With coils, with bi-directional diode, without mating connector vertical Amp-Junior	**03**

Optional

10	Standard	**00**

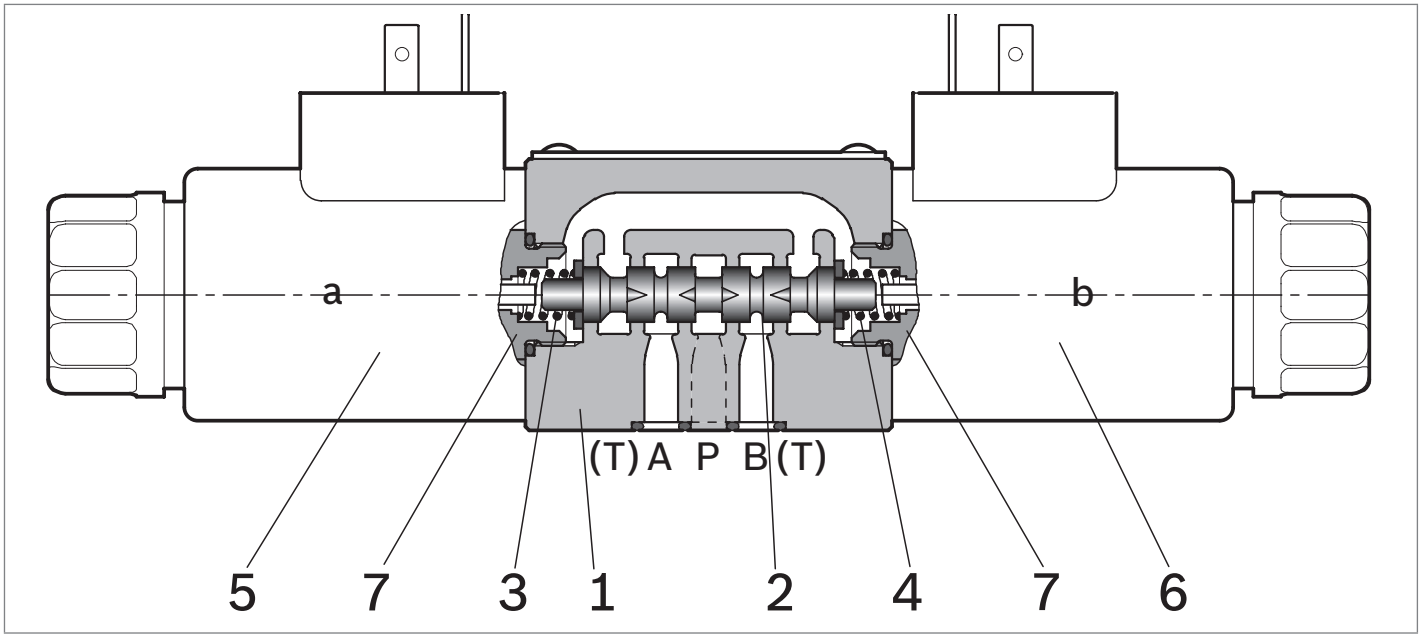
▼ Spool variants



1) With Δp (P > T) 10 bar (145 psi), corresponding approx. to Δp P>A,B 5 bar (73 psi).

2) For connectors ordering code see data sheet RE 18325-90.

Functional description



Type L5080

The proportional valves type L5080 are designed as the solenoid operated ones; they are actuated by proportional electromagnets and the current supply to the solenoids is controlled by external electronic control system (Power Wave Modulator, or PWM). They provide 3 or 4 way flow control, usually from port P to either port A or B, and the consequent flow return to T from B or A respectively.
The valves are composed by a central cast iron body (**1**) which mounts on industry standard surfaces where the flow ports and the installation holes are located; the central body houses the precisely machined directional control spool (**2**) which is held in the neutral or initial position by the return springs (**3**) and (**4**). One or two solenoids (**5**) and (6), composed by a central tube and a surrounding coil (a) and (b), are fitted to the body at the spool's ends: when one coil is energized, the magnetic field develops a force on the oil immersed mobile plunger incorporated in the tube which pushes the control spool from the initial position into a displaced position: the spool displacement is proportional to the electric input.
Example for solenoid (**6**):
- when coil (b) is energized, the spool (**2**) travels to the left proportionally to the electric input supply then the corresponding opening area of the spool notches is achieved.
- Across the orifice-like openings, flow becomes possible from P to A, and from B to T.
- When coil (**b**) is de-energized, the force of spring (**3**) pushes the spool (**2**) back to the central position.

Type L5080.3... and L5080.4...

These valves have one solenoid, either (**a**) or (**b**), consequently the directional control spool can travel from the initial position to one side only. A blinding threaded plug (**7**) is fitted in place of the second solenoid.

Technical data

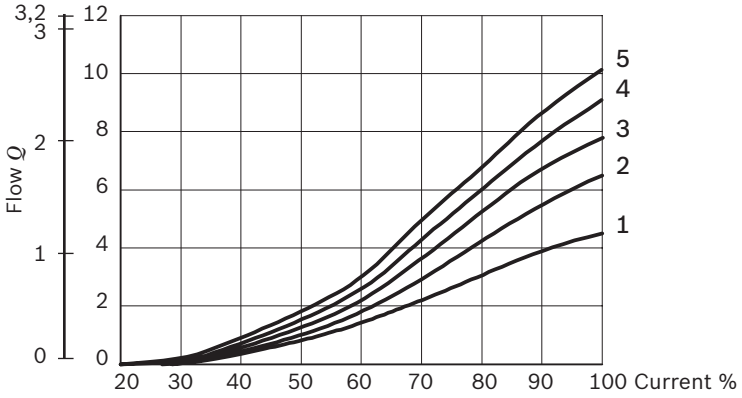
General			
Valve element with 2 solenoids		kg (lbs)	1.27 (2.8)
Valve element with 1 solenoid		kg (lbs)	0.91 (2.0)
Mounting position			Unrestricted
Ambient Temperature		°C (°F)	–20....+50 (-4....+122) (NBR seals)
Hydraulic			
Maximum pressure at P, A and B ports		bar (psi)	310 (4500)
Maximum pressure at T		bar (psi)	180 (2610)
Maximum inlet flow		l/min (gpm)	29 (7.66)
Nominal flow at ΔP = 10 bar		l/min (gpm)	4, 8, 12 (1.06, 2.11, 3.17)
E-schemes p closed in the neutral position (connection from A to T and B to T)			Approx. 2.3% of the nominal cross-section
Hysteresis		%	≤ 5
Hydraulic fluid General properties: it must have physical lubricating and chemical properties suitable for use in hydraulic systems such as, for example:			Mineral oil based hydraulic fluids HL (DIN 51524 part 1). Mineral oil based hydraulic fluids HLP (DIN 51524 part 2). For use of environmentally acceptable fluids (vegetable or polyglycol base) please consult us.
Fluid Temperature		°C (°F)	–20....+80 (-4....+176) (NBR seals)
Permissible degree of fluid contamination			ISO 4572: $\beta_x \geq 75$ X=10...12 ISO 4406: class 19/17/14 NAS 1638: class 8
Viscosity range		mm^2/s	20....380 (optimal 30....46)
Electrical			
Voltage type		PWM	120 Hz
Voltage tolerance (nominal voltage)		%	-10 .... +10
Duty			Continuous, with ambient temperature ≤ 50°C (122°F)
Coil wire temperature not to be exceeded		°C (°F)	150 (302)
Insulation class			H
Compliance with			Low Voltage Directive LVD 73/23/EC (2006/95/EC), 2004/108/EC
Coil weight		kg (lbs)	0.228 (0.503)
Voltage		V	12 24
Nominal 100% current		A	1.76 0.94
Coil resistance (nominal at 20°C (68°F))	- Cold value	Ω	3.71 13
	- Max. hot value	Ω	6.1 22.9

Note
For applications with different specifications consult us

Code	Voltage [V]	Connector type	Coil description	Marking	Coil Mat no.
=OB 01	12 DC	EN 175301-803 (Ex. DIN 43650)	P45 01	12 DC	R933000088
=OB 03	12 DC	AMP JUNIOR	P45 03	12 DC	R933000089
=OC 01	24 DC	EN 175301-803 (Ex. DIN 43650)	P45 01	24 DC	R933000090
=OC 03	24 DC	AMP JUNIOR	P45 03	24 DC	R933000091

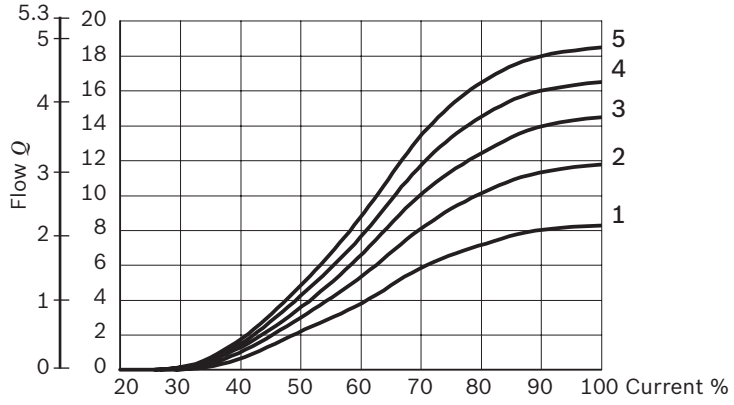
Characteristic curves

Ordering code S3: it supplies 4 l/min (1.06 gpm) nominal flow at 100% duty cycle, with 10 bar (145 psi) pressure drop.



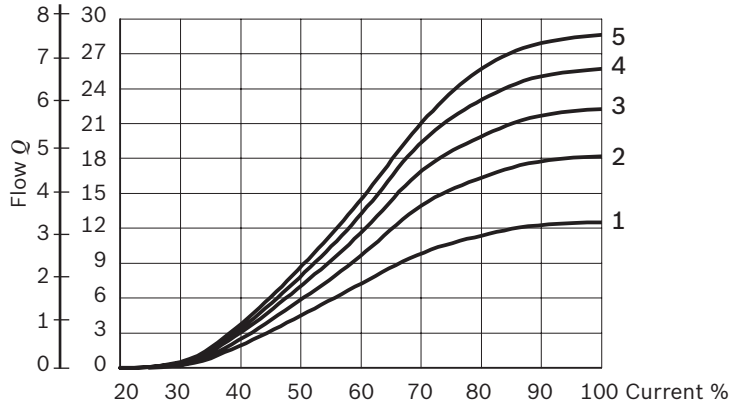
1 ΔP = 10 bar (145 psi) constant
2 ΔP = 20 bar (290 psi) constant
3 ΔP = 30 bar (435 psi) constant
4 ΔP = 40 bar (580 psi) constant
5 ΔP = 50 bar (725 psi) constant

Ordering code S4: it supplies 8 l/min (2.11 gpm) nominal flow at 100% duty cycle, with 10 bar (145 psi) pressure drop.



1 ΔP = 10 bar (145 psi) constant
2 ΔP = 20 bar (290 psi) constant
3 ΔP = 30 bar (435 psi) constant
4 ΔP = 40 bar (580 psi) constant
5 ΔP = 50 bar (725 psi) constant

Ordering code S5: it supplies 12 l/min (3.17 gpm) nominal flow at 100% duty cycle, with 10 bar (145 psi) pressure drop.



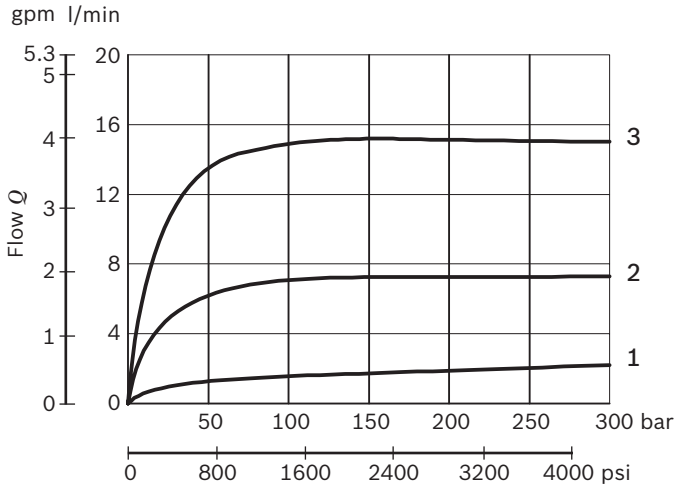
1 ΔP = 10 bar (145 psi) constant
2 ΔP = 20 bar (290 psi) constant
3 ΔP = 30 bar (435 psi) constant
4 ΔP = 40 bar (580 psi) constant
5 ΔP = 50 bar (725 psi) constant

Measured with hydraulic fluid ISO-VG32 at 45° ±5 °C (113° ±9 °F); ambient temperature 20 °C (68 °F).

Δp= valve pressure differential (inlet pressure Pp minus load Pl and minus return pressure Pt).
The characteristic curves are obtained with 4 way connected, P→A / B→T or P→B / A→T.

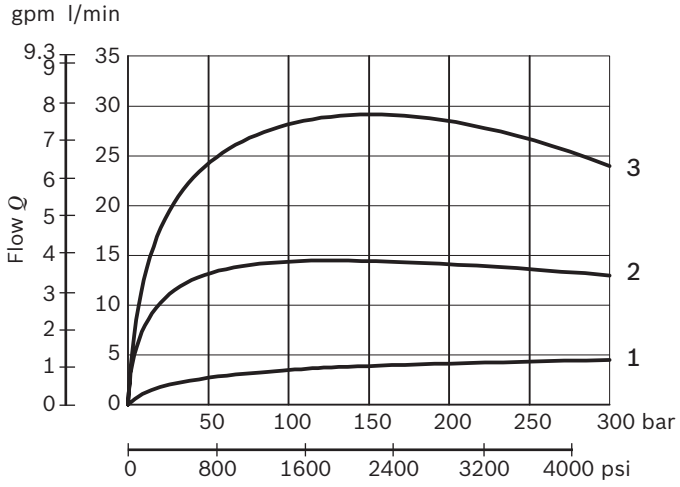
Characteristic curves

Ordering code S3



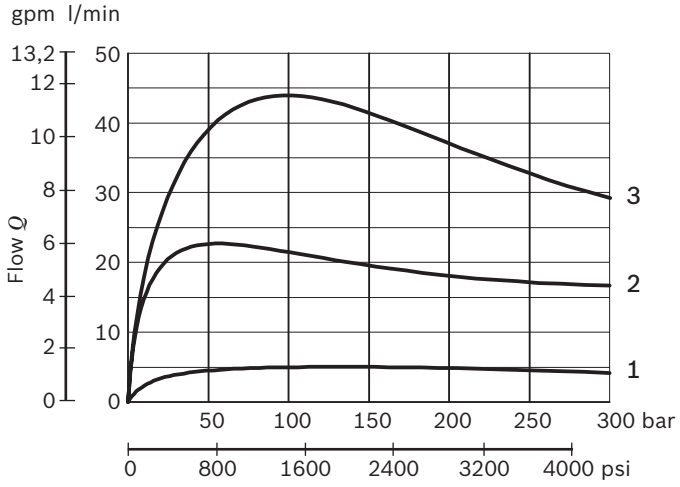
1 at 40% mean current
2 at 70% mean current
3 at 100% mean current

Ordering code S4



1 at 40% mean current
2 at 70% mean current
3 at 100% mean current

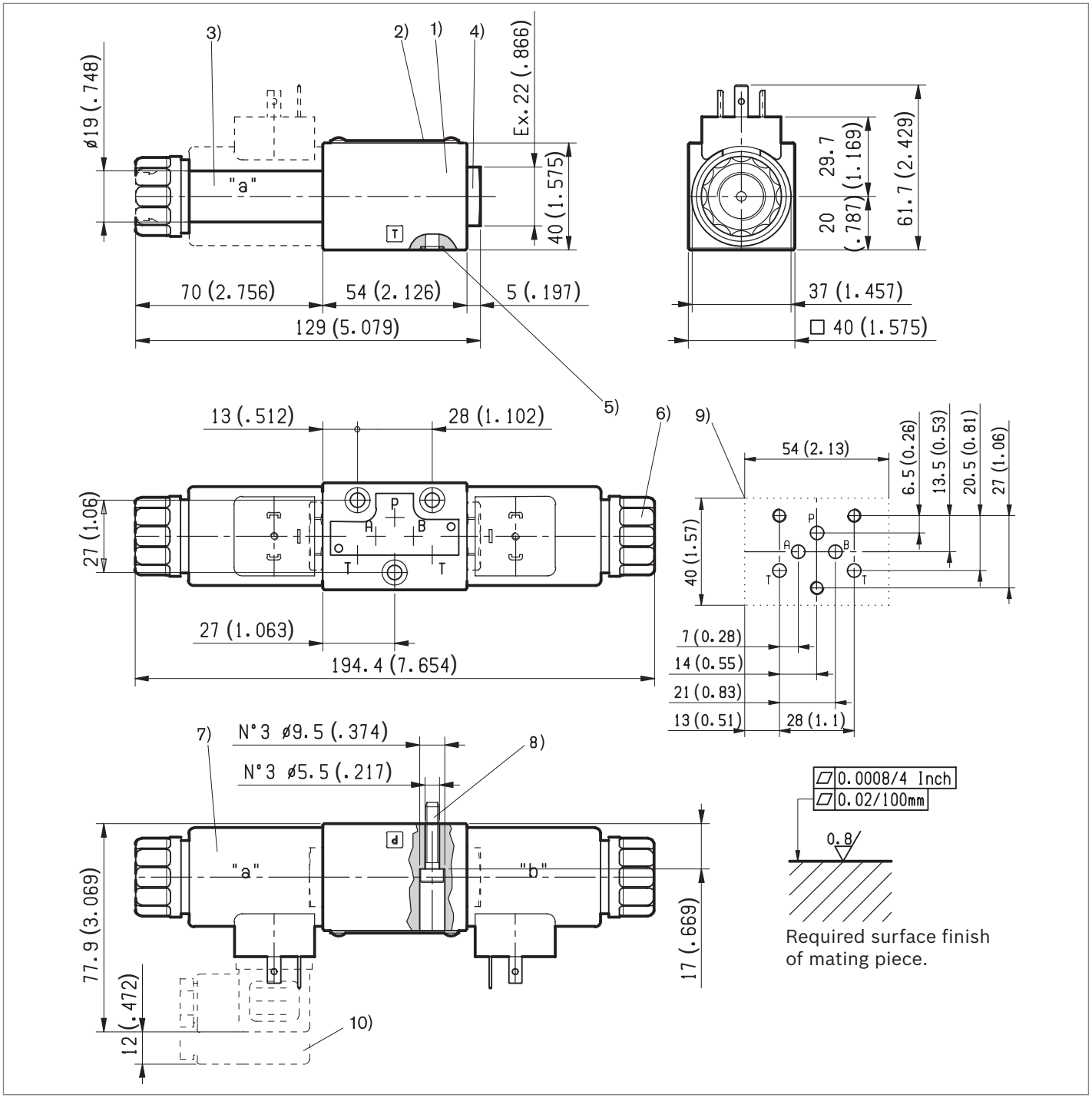
Ordering code S5



1 at 40% mean current
2 at 70% mean current
3 at 100% mean current

The performance curves are obtained with two ports connected,
P→A or P→B.

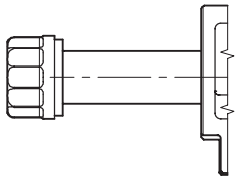
External dimensions and fittings



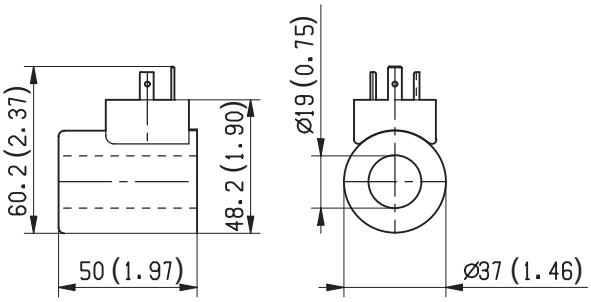
1 Valve body.
2 Identification label.
3 Proportional solenoid.
4 Blinding threaded plug, for versions L 5080.3... and L5080.4..., with 2 switched positions.
5 Seals (same O Ring) on ports A,B,P,T.
6 Threaded coil retainer nut. Torque 5÷6 Nm (3.69÷4.42 ft-lb).
7 Proportional solenoid, with coil (a).
8 Locking screws 3 pieces: ISO 4762 (UNI 5931) hexagon socket head cap screw M 5x25, recommended specific strength 8.8 class, to be ordered separately. Torque 5 ÷ 6 Nm (3.69 ÷ 4.42 ft-lb).
9 Drilling specifications of standard mounting surface according to CETOP RP 121 H-4.2-4-P02.
10 Clearance needed for connector removal.

Electric connection

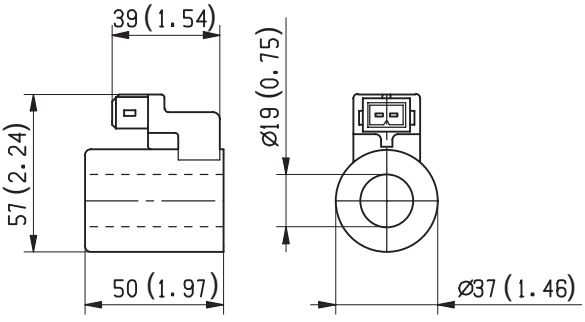
00 without coil



01 Protection class: IP 65 when connector with seal is properly screwed down.



03 Protection class: IP 65 with female connector properly fitted (see drawing).



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