

Proportional Directional Control Valves Size 10



Direct actuated, electrically adjustable, position-controlled
Interface to DIN 24 340 and ISO 4401

PN [$p_{max.}$] = 315 bar

7502257.06.03.06

Description (standard units)

Design

The proportional directional control valve, size 10, is based on the 5-chamber system and is in the form of a slide valve. The valve is actuated by proportional solenoids. The valve setting is monitored by a displacement measurement system and fed to the position control loop as an actual value. Interference variables are eliminated, ensuring that the selected setpoint is always precisely achieved. The actual position value is monitored by an inductive differential transformer with integrated electronic circuitry.

Application

The proportional directional control valve can be used to control the direction and speed of hydraulic cylinders and hydraulic motors and is employed in cases where a servo valve would be too expensive and a normal directional control valve would not offer a sufficient range of functions. The electrical control allows the wide variety of motions to be executed simply and extremely precisely by means of the continuously-controllable signal.

Mounting

The units are bolted onto subplates and sealed by O-rings.

Line connection

Subplate, interface to DIN 24 340-A 10 and ISO 4401-AC-05-4-A.



Features

- Speed and direction control in accordance with setpoint specification
- Program control, remote control
- Spring-centred, robust design
- Inexpensive system solution
- High repetition accuracy and low hysteresis, thanks to position control
- With pressure balance, load-independent speed control
- Full pressure drop across valve is available also without pressure balance (up to 315 bar)

Type key

Proportional directional control valves

S	10	UR	10	G	O	...
					1	2	3		4

1 Symbol:	187	
	233	
	212	

- 2 Code: **016** - see characteristic curves
019 - see characteristic curves
- 3 Engineering version: **2**
- 4 Sealing material: **V** - FKM (e.g. Viton)

Subplate

P	S	10	G	...	001	...	O	O
				1		2		

- 1 Line connection: **4** - G 1/2 (Internal thread)
5 - G 3/4 to DIN ISO 228/1)
- 2 Engineering version: **2**

Parameters

Type	S 10 UR...
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General parameters

Description	Proportional directional control valve		
Symbol	See equipment survey		
Design	Direct operated spool valve, position-controlled		
Type of mounting	Flange		
Line connection	Subplate		
Mounting position	Valve axis horizontal		
Actuator type	Proportional solenoid, position-controlled		
Weight of valve		[kg]	7
Weight of subplate	G 1/2	[kg]	2.0
	G 3/4		3.4
Ambient temperature range	ϑ_{amb}	[°C]	-20 ... +50
Size	10		

Hydraulic parameters

Operating pressure range at P, A and B at T	p_{max}	[bar]	up to 315 up to 160
Pressure fluid temperature	ϑ_{max}	[°C]	+70
Viscosity range	ν	[mm ² /s]	12 ... 500
Max. flow	Q_{max}		See characteristic curve
Zero flow ($\Delta p = 100$ bar)	Q_l	[cm ³ /min]	100
Repeatability		[%]	≤ 1
Hysteresis		[%]	≤ 1
Sensitivity of response		[%]	≤ 0.5
Regulating time	0% ... 80%	[ms]	45
	80% ... 0%	[ms]	60
Filtration, absolute		[μm]	25

Electrical parameters of proportional solenoid

Cat. No. solenoid	7998/7999 with displacement sensor		
Rated current	I_N	[mA]	2400
Rated power	P_{20}	[W]	19
Resistance	R_{20}	[Ω]	3.3
Duty cycle		[%]	100
Electrical connection	Connection to DIN 43 650 A		
Degree of protection to DIN DIN 40 050	IP 65 (with connector)		

Electrical parameters of displacement sensor

System	Inductive differential transformer with integrated electronics		
Supply voltage		[V]	19.2 ... 28.8
Residual ripple		[%]	<5
Current consumption		[mA]	<40
Output voltage		[V]	7.5 ± 4.5

Parameters

Connection of displacement sensor

Connector	4-pin
Cable gland	M12 x 1
Degree of protection to DIN 40 050	IP 65
Connector bent 90°, metal connector with cable, 2 m	Cat. No. 0661748 Cat. No. 0681824

Connecting cable for displacement sensor

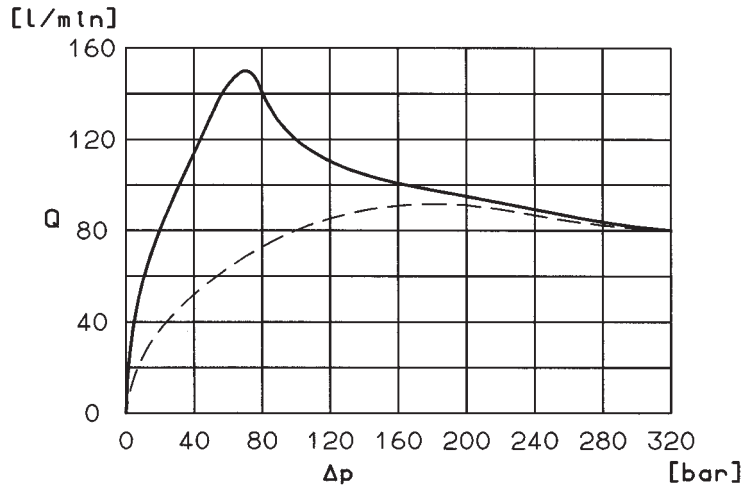
Cable	Displacement sensor-amplifier		
Type of cable	Screened, 3-core		
Cable length	max.	[m]	75
Cross-section	min. per core	[mm ²]	0.5
Resistance	max.	[Ω/m]	0.05
Capacitance max.	Core - core	[pF/m]	160
	Core - screen	[pF/m]	350
Type	e.g. LIYCY		

Characteristic curves

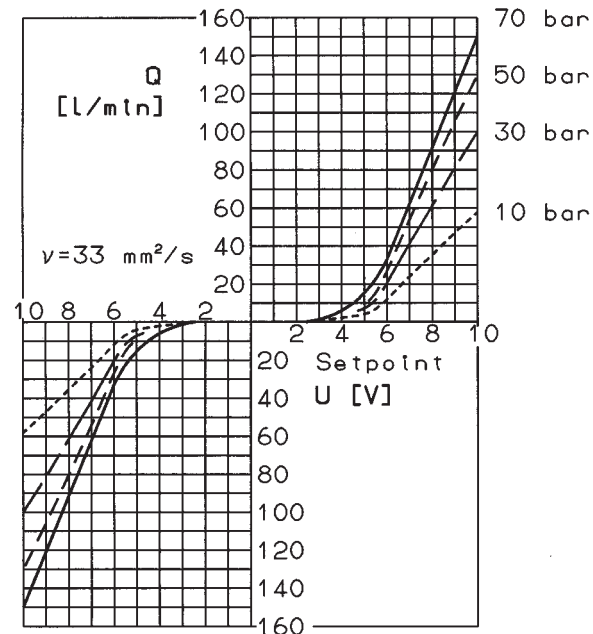
Proportional directional control valve, position controlled

Power limit

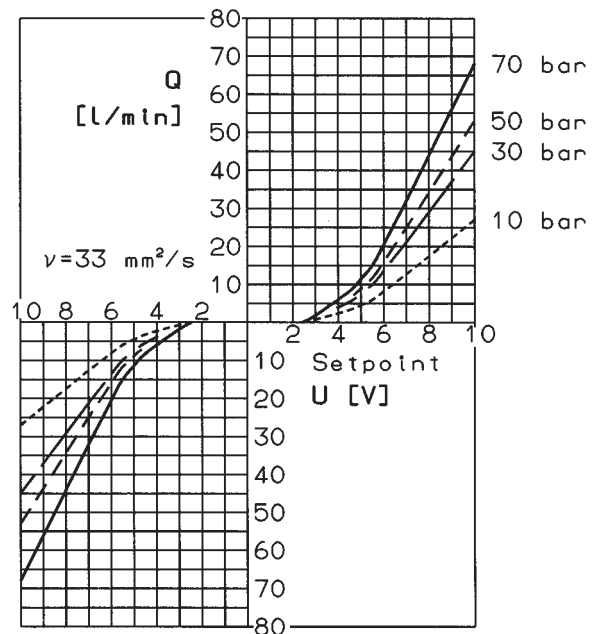
——— S 10 UR 016
 - - - - S 10 UR 019



S 10 UR ... 016



S 10 UR ... 019



Ordering

The units are designated by their type number. The composition of this number can be drawn from the type key. The standard versions are listed in the type survey. When ordering any of the standard versions, please state type number as well as catalog number to preclude possible misinterpretations.

When inquiring about or ordering units not listed in our type survey of this publication, the type number made up by you by means of the type key, however, will do. The corresponding catalog number will then be stated in our confirmation of order. O-rings are enclosed with flanged units. The pressure balance, subplate, drive electronics and mounting screws must be ordered separately.

Example of order

Proportional directional control valve, Size 10 for flange mounting. Symbol 187, with Code 016, pressure balance, with corresponding subplate G 1/2 and drive electronics.

Proportional directional control valve:

Type: S 10 UR 10 G 187 016 2 O V
Cat. No.: **5204816.9000**

Subplate:

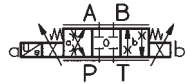
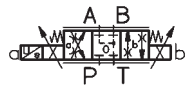
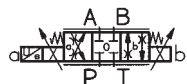
Type: P S 10 G 4 001 2 O O
Cat No.: **1065184**

Mounting screws: (4 bolts required)

Socket head screws (M 6 x 60 DIN 912-10.9)
Cat. No.: **0700416**

The electronic control unit is to be ordered separately, see table on page 5.

Type survey (standard versions)

Description	Symbol	Symbol No.	Type	Cat. No.
Proportional directional control valve		187	S 10 UR 10 G 187 016 2 O V S 10 UR 10 G 187 019 2 O V	5204816.9000¹⁾ 5205023.9000¹⁾
		233	S 10 UR 10 G 233 016 2 O V S 10 UR 10 G 233 019 2 O V	5204818.9000¹⁾ 5205024.9000¹⁾
		212	S 10 UR 10 G 212 016 2 O V S 10 UR 10 G 212 019 2 O V	5204817.9000¹⁾ 5205025.9000¹⁾
Subplate G 1/2	-	-	P S 10 G 4 001 2 O O	1065184
G 3/4	-	-	P S 10 G 5 001 1 O O	2840036
Mounting screws	Socket head screws (M 6 x 60 DIN 912 - 10.9)			0700416

Accessories

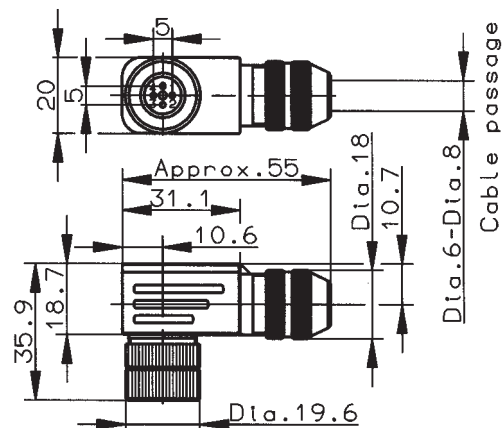
Description	Cat. No.
Connector to DIN 43 650 Form A	0657859
Connector to DIN 43 650 Form B	0570275
Connector for displacement sensor, bent 90°, metal	0661748
Connector for displacement sensor, bent 90°, with cable, 2 m	0681824

Connector are not enclosed in the scope of delivery. Please order them separately.

¹⁾ Solenoid Cat. No. **9000** includes solenoid a = 7999 and solenoid b = 7998

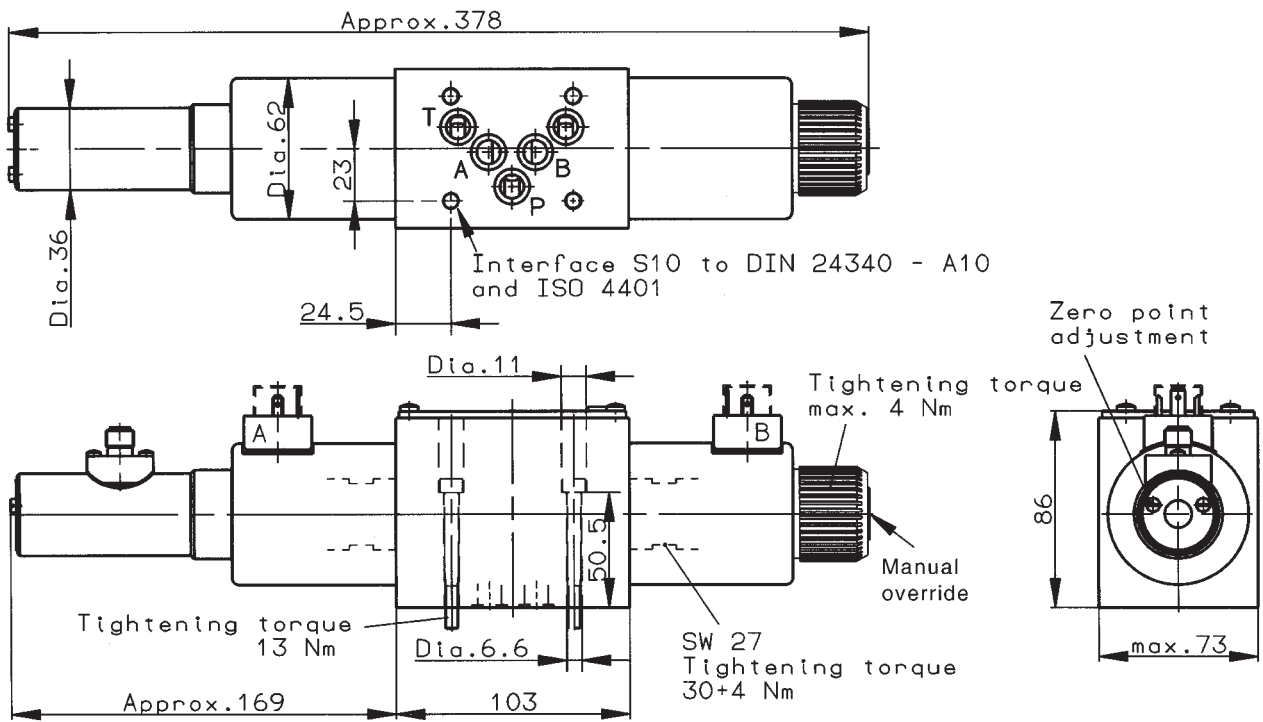
Dimensional drawing [mm]

Connector for displacement sensor, bent 90°, metal
Cat. No. **0661748**



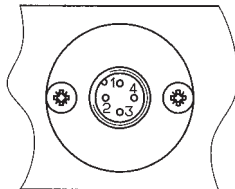
Dimensional drawing [mm]

Proportional directional control valve S 10 UR 10 G ...



Connections

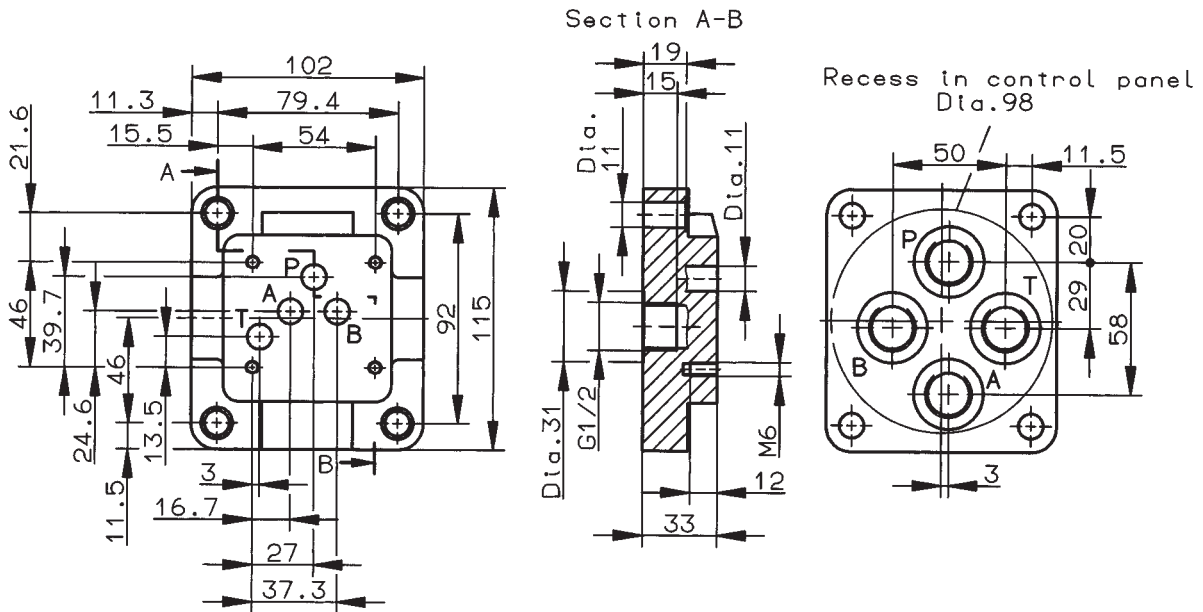
- 1 Output voltage
- 2 Supply voltage
- 3 Weight
- 4 Not used



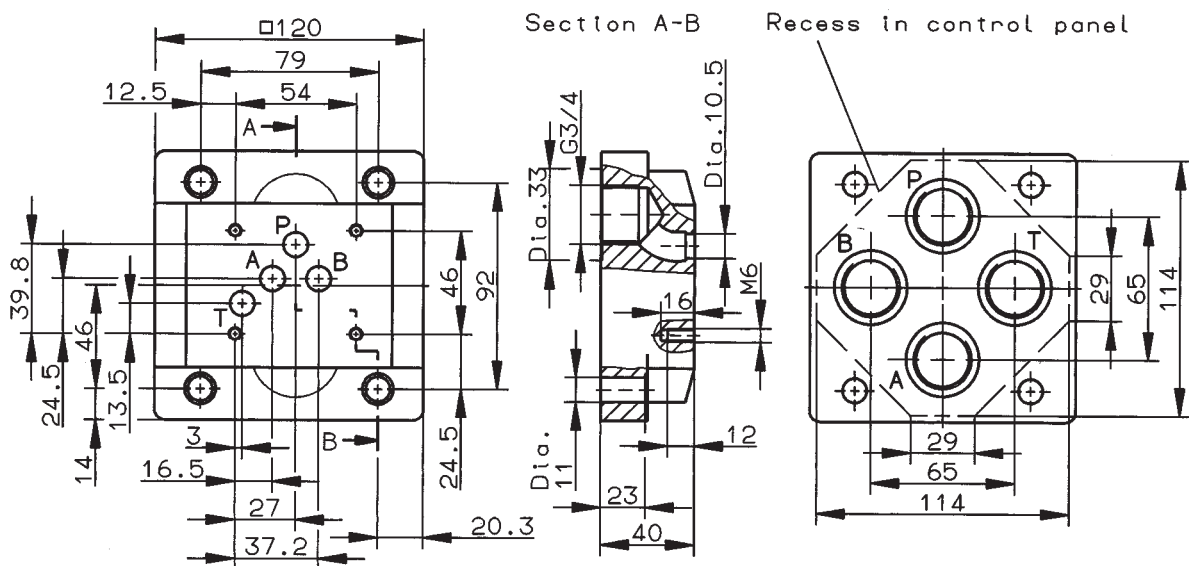
Dimensional drawings [mm]

Subplate with interface to DIN 24 340-A 10 and ISO 4401-AC-05-4-A

Subplate 1
Cat. No. 1065184
G 1/2



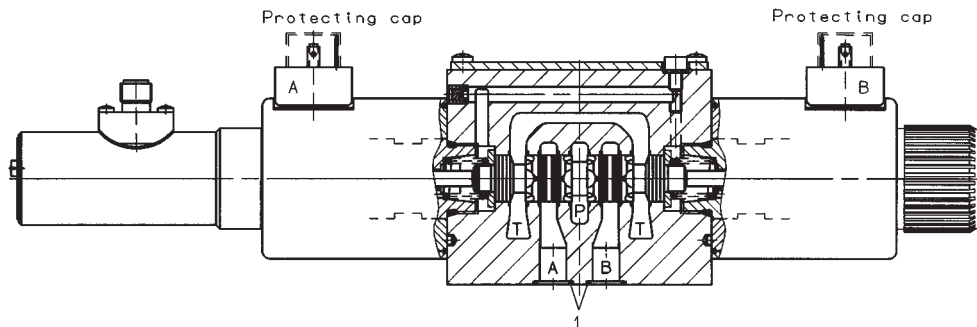
Subplate 2
Cat. No. 2840036
G 3/4



Spare part drawing

Proportional directional control valves

S 10 UR 10 G 187 ... 2 O V
S 10 UR 10 G 233 ... 2 O V
S 10 UR 10 G 212 ... 2 O V



Spare parts and mounting screws / Accessories

Spare parts for directional control valve

Part	Qty.	Description	Cat. No.
1	5	O-ring (12,4 x 1,8)	0701623

Mounting screws

-	4	Socket head screw (M6 x 60 DIN 912-10.9)	0700416
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Accessories

2	1	Connector to DIN 43 650 Form A	0657859
3	1	Connector to DIN 43 650 Form B	0570275
4	1	Connector for displacement sensor, bent 90°, metal	0661748
5	1	Connector for displacement sensor, bent 90°, with cable, 2 m	0681824

Notes:
