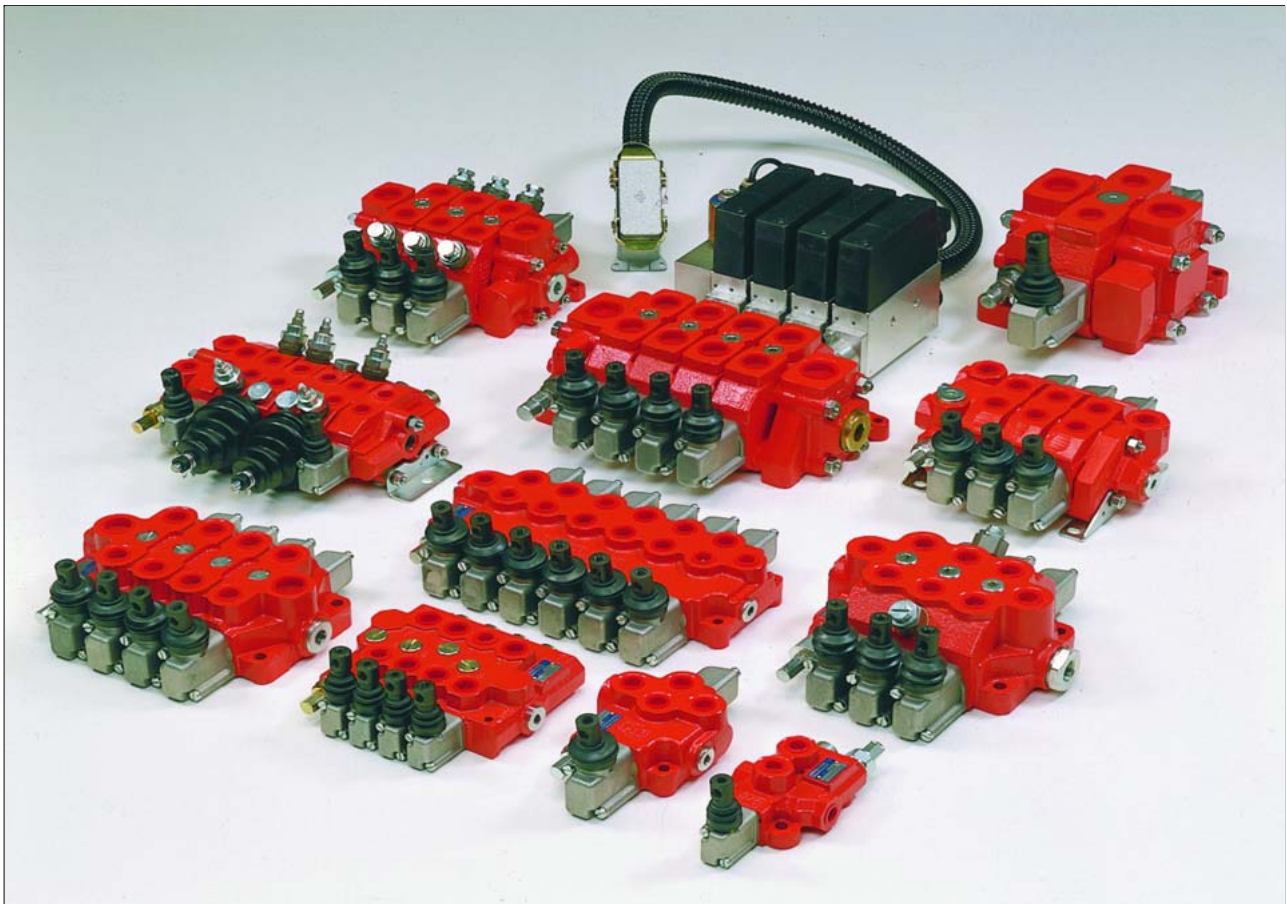


Monobloc and Sectional Directional Control Valves



11 Sectional directional control valves HDS30

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11.1 General specifications

Technical specification		
Max flow rate	l/min U.S.G.P.M.	120 31
Max continuous operating pressure supply port P	bar PSI	250 3600
Max intermittent peak pressure Work port A/B	bar PSI	320 4600
Max back pressure	bar PSI	30 430
Oil temperature	° C ° F	-10 to +80 14 to 180
Oil viscosity	mm ² /s	16 to 75
Oil filtration	μ	≤ 30

Spool leakage at 100 bar (1450 PSI), Temp. 50° C (120° F), viscosity 27 mm ² /s:		
Maximum	cm ³ /min Cu. In./min	18 1.281
Average	cm ³ /min Cu. In./min	12 0.854
Lower values on demand (to be agreed with our Sales Dept..)		

Number of spools	1 to 10
Adjustable direct acting relief valve (tamper-proof seal available on request)	RV
Load hold check valve in each section	LC
Cartridge anti-shock, anti-cavitation and service relief valve	OA-UC-C

11.1.1 Weight

Version	kg	lb
Inlet with RV	3.65	8.04
1 spool section	4.12	9.08
End cover standard	2.40	5.29

11.1.2 Material specification:

Body: High strength cast-iron.
Spool: Hardened steel – Chrome plated.
Seals: Buna “N”.

11.1.3 Standard features:

- 1) Internal load holding check valves (prevent reverse flow through valve when shifting)
- 2) Parallel circuit.
- 3) Balanced interchangeable spools (provides minimum leakage, smooth operation)
- 4) Wide selection inlets, work ports, and outlets threaded ports.
- 5) Negative overlapping of the spool.

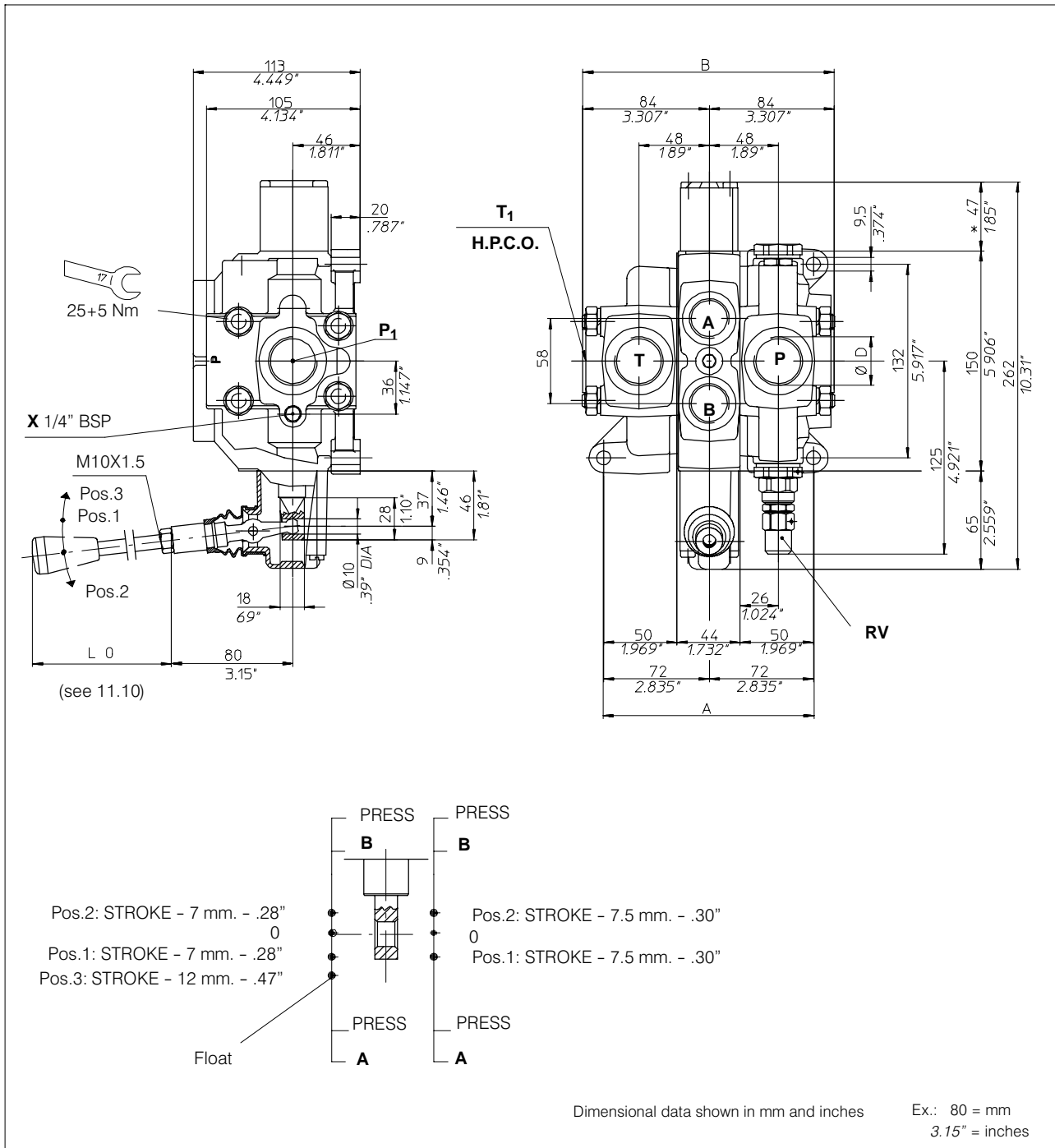
11.1.4 Optional features available:

- 1) Open or closed centre circuit, 3 or 4 way operations, 3 or 4 position (float position), full open centre (motor spool) and other spool options.
- 2) Carry over.
- 3) Series connection and priority pressure.
- 4) Complete lever assembly.

11.1.5 Symbols:

P: inlet port
T: outlet port
A/B: work ports
H.P.C.O.: carry-over
RV: relief valve
P₁T₁: side inlet and outlet
 3.1.0.2: spool position
P: pressure line
T: exhaust line
E: centre line (by pass).
X: remote control port for RV

11.2 Dimensional data



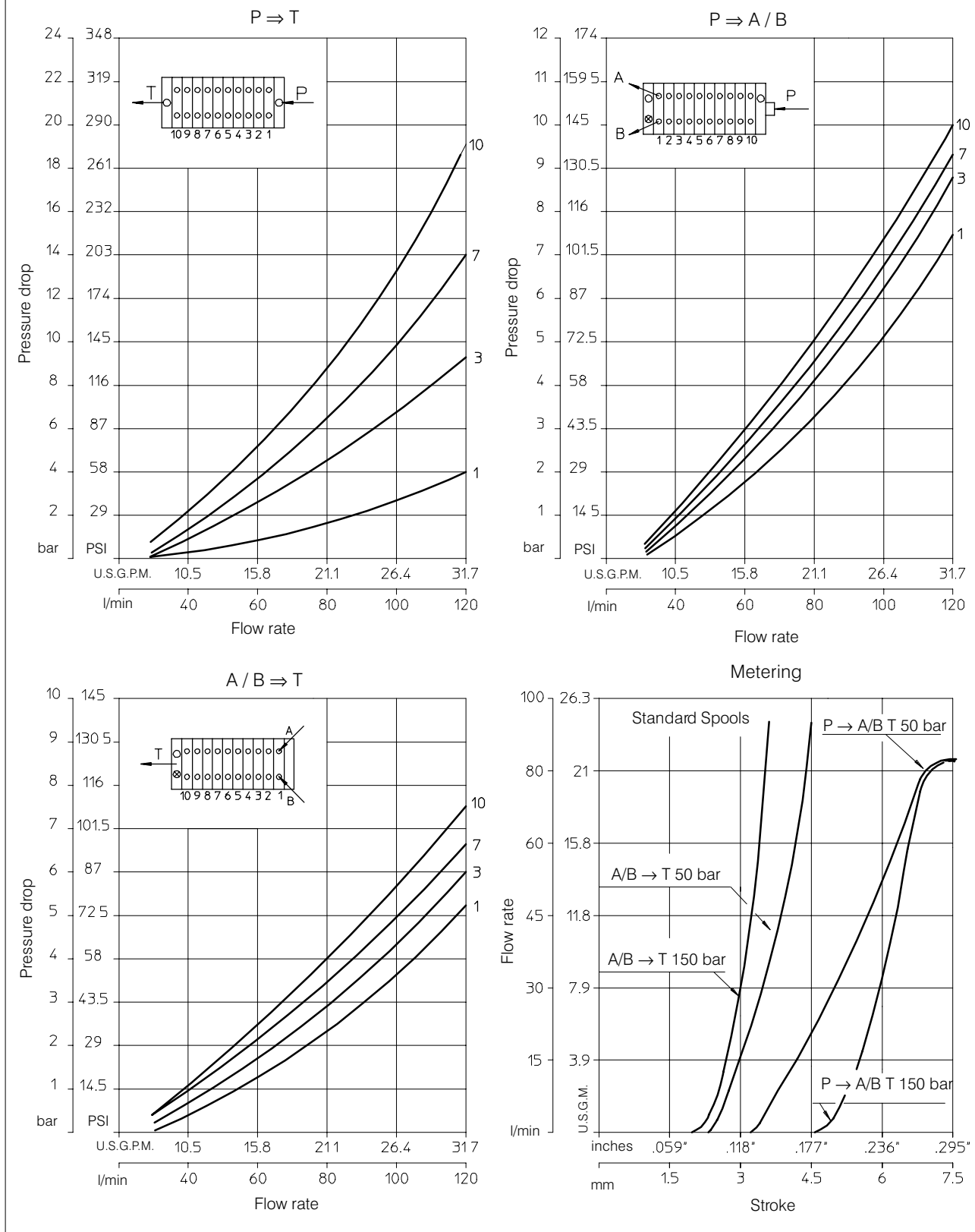
N. of sections		1	2	3	4	5	6	7	8	9	10
Dimension	A	144	188	232	276	320	364	408	452	496	540
		5.67"	7.40"	9.13"	10.86"	12.60"	14.33"	16.06"	17.80"	19.53"	21.26"
Dimension	B	168	212	256	300	344	388	432	476	520	564
		6.62"	8.34"	10.08"	11.81"	13.54"	15.28"	17.01"	18.74"	20.47"	22.21"

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11.3 Performance curves

11.3.1 Parallel circuit

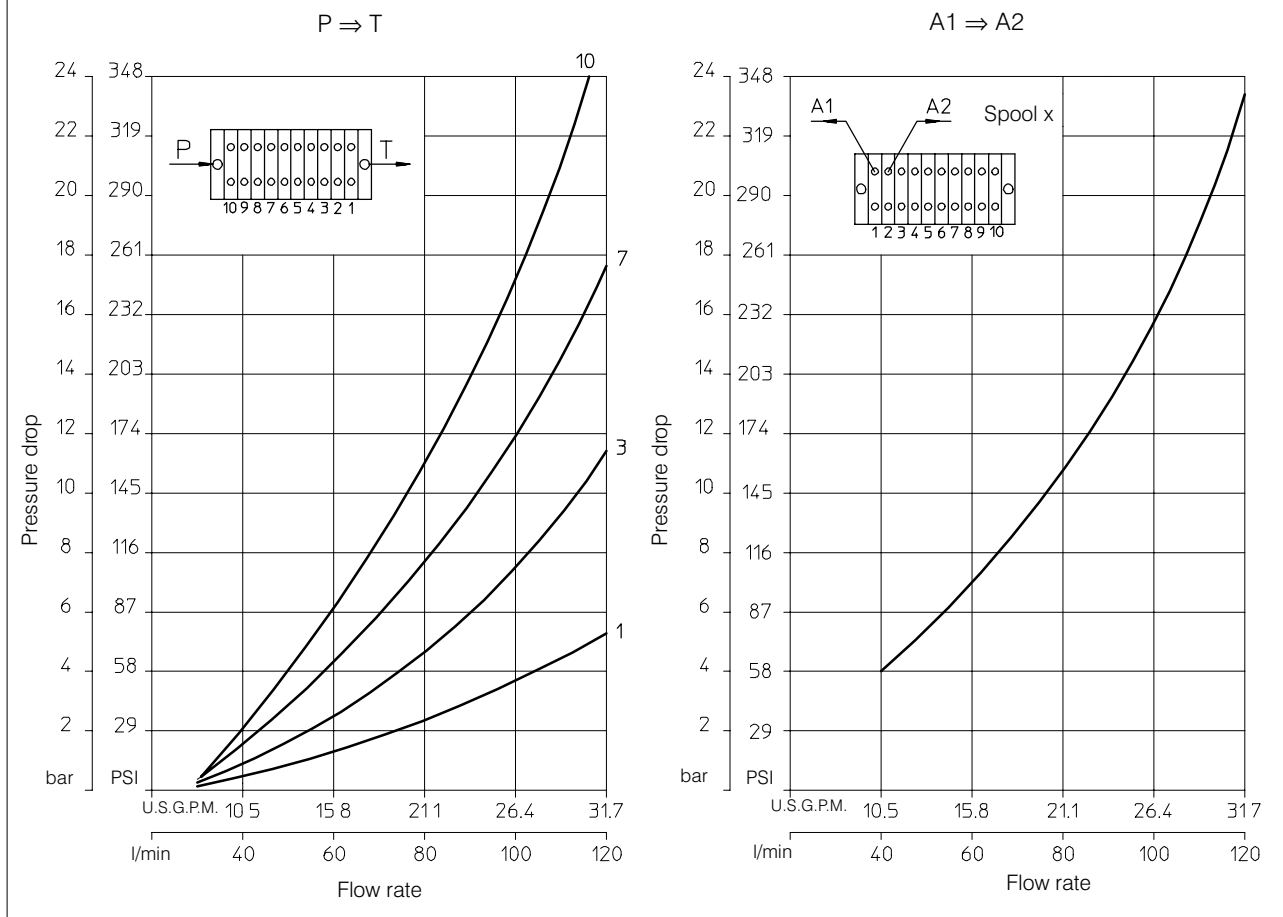
Oil: Shell Tellus T37
 Temperature: 50° C (120° F)
 Viscosity: 27 mm²/s



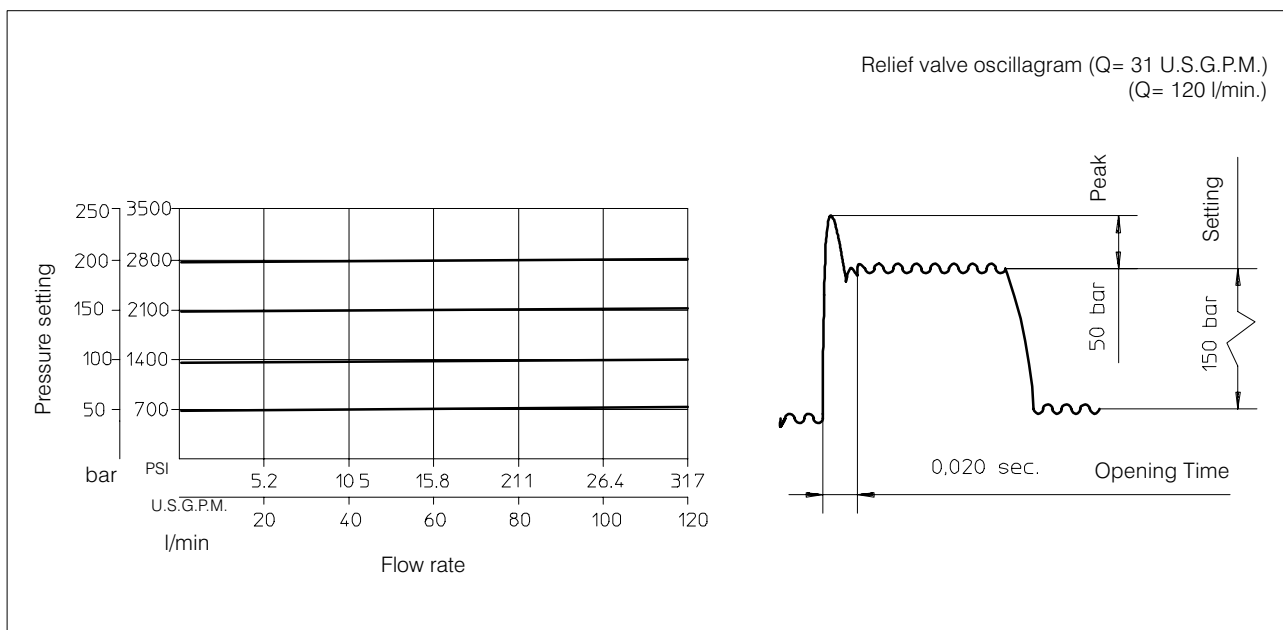
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11.3.2 Series circuit

Oil: Shell Tellus T37
 Temperature: 50° C (120° F)
 Viscosity: 27 mm²/s



11.3.3 Transient hydraulic characteristics Relief Valve RV



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11.4 Inlet covers

11.4.1 Right and left standard inlet cover

Port relief valve settings

Pressure set range bar (PSI)	Setting bar (PSI)	Type
* 30 - 320 (420 - 4600)	150 (2100)	15

* The maximum operating pressure for each valve series is indicated in the "Technical specification" at the first page of each valve section.

Right inlet cover with P and RV for parallel circuit

Ø D	Type/Code
1" BSP std	T02** 200.9316.5001.0
SAE 16	T04** 200.9316.9001.0

Left inlet cover with P and RV for series circuit

Ø D	Type/Code
1" BSP	T10** 200.9316.5002.0
SAE 16	T12** 200.9316.9002.0

11.4.2 System RV remote control: vent type

Code **S**

X = 1/4" BSP

Ø D	Type/Code
1" BSP std (right)	T25** 200.9316.5010.0
1" BSP (left)	T24** 200.9316.5009.0

11.4.3 System RV remote control: electrical type

Normally closed

Code **EC**

Normally open

Code **EA**

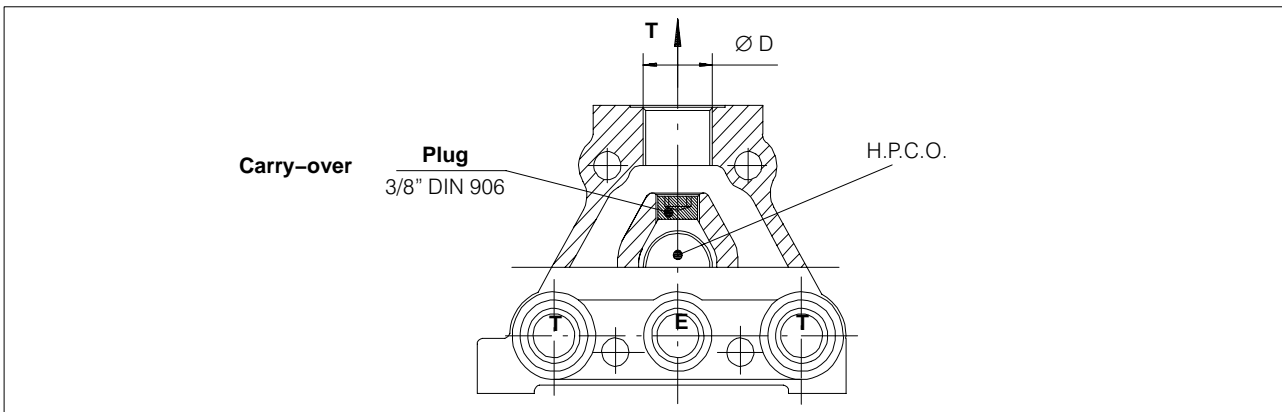
Solenoid series mini	12 V.DC.	24 V. DC.
Power consumption (W)	For 12 V version please contact our Sales Dept.	20.64
Intensity of current (A)		0.86
Resistance (Ω)		28
ED (%)		100
Voltage (V. D.C. ±10 %)		110
Solenoid code		200.5412.20016

** Group code with RV set at standard pressure (150 bar / 2100 PSI)

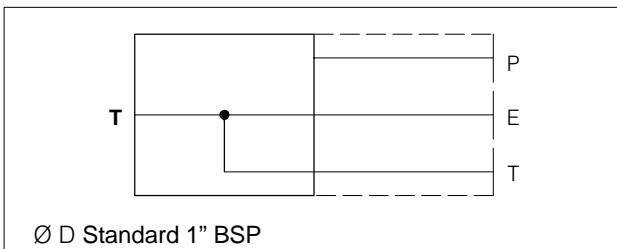
Ø D	Without WE... valve	With WE A valve	With WE C valve
1" BSP std(right)	T22** 200.7316.5007.0	T26** 200.7316.5017.0	T26** 200.7316.5011.0
1" BSP (left)			
1" BSP std(right)	T23** 200.7316.5008.0	T27** 200.7316.5030.0	T27** 200.7316.5012.0
1" BSP (left)			
1" BSP std(right)	T22**	T26**	T26**
1" BSP (left)	T23**	T27**	T27**

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11.5 End covers

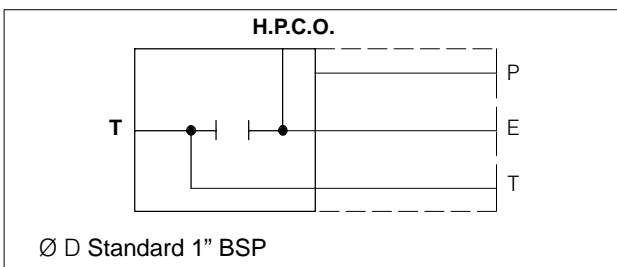


11.5.1 Left outlet cover with T for parallel circuit (Standard)



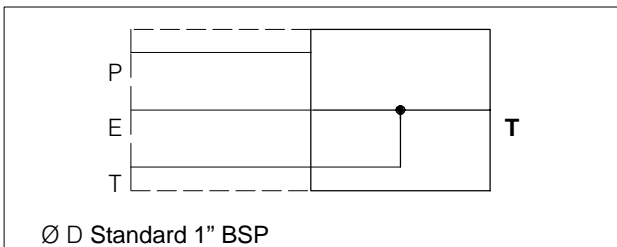
Ø D	Type	Code
1" BSP std	P02	200.9306.5001.0
SAE 16	P04	200.9306.9001.0

11.5.2 Left outlet cover with T and carry-over H.P.C.O.



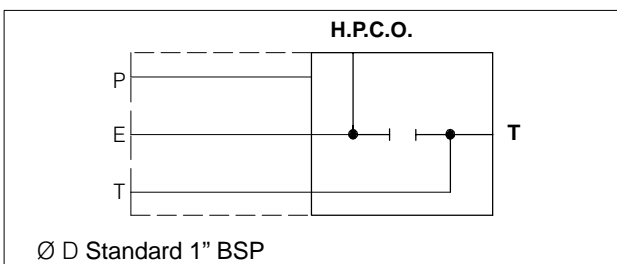
Ø D	Type	Code
1" BSP std	P06	200.9306.5002.0
SAE 16	P08	200.9306.9002.0

11.5.3 Right outlet cover with T (standard on series circuit)



Ø D	Type	Code
1" BSP std	P10	200.6306.5003.0
SAE 16	P12	200.6306.9003.0

11.5.4 Right outlet cover with T and carry-over H.P.C.O.



Ø D	Type	Code
1" BSP std	P14	200.9306.5004.0
SAE16	P16	200.9306.9004.0

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11.6 Sectional bodies

11.6.1 Standard circuit: parallel

Ø D	Type/Code	
	Standard	Section with valve UC - OA - C
3/4" BSP	K02 200.9417.4001.0	K06 200.9417.4011.0
SAE 12	K04 200.9417.9002.0	K08 200.9417.9003.0

11.6.2 Optional circuit: series and tandem

Ø D	Type/Code	
	Standard	Section with valve UC - OA - C
3/4" BSP	K47 200.9417.4003.0	K51 200.9417.4010.0
SAE 12	K49 200.9417.9004.0	K53 200.9417.9005.0

Note: Body code consist of machined casting, seals and hold check valve only. Not to be used for complete valve order.

11.7 Spool charts

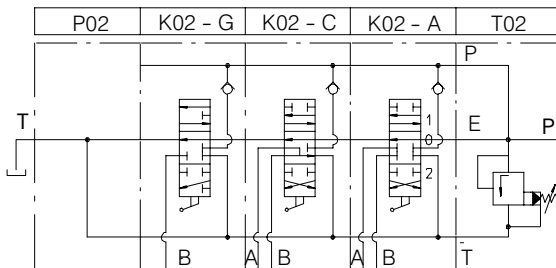
Spool scheme	Spool features	Type
	4 way - 3 position A/B: blocked E: open by pass	A
	4 way - 3 position A/B: blocked E: closed	B
	4 way - 3 position A/B to tank in neutral E: open by pass	C
	4 way - 3 position A: blocked B: to tank in neutral	D
	3 way - 3 position B: blocked E: open by pass	G
	4 way - 3 position B: blocked A: to tank in neutral	L
	4 way - 3 position with regenerative spool in 2 nd pos.	R**

** : special body required

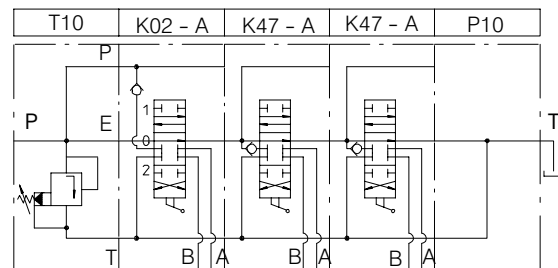
	3 way - 3 position A: blocked E: open by pass	S
	4 way - 3 position A/B: blocked series connection	X
	4 way - 3 position A/B: to tank in neutral series connection	XC
	4 way - 4 position 4 th float position	Z
	4 way - 3 position A/B: blocked Load Sensing	LSA **
	4 way - 3 position A/B: to tank in neutral Load Sensing	LSC **
	3 way - 3 position B: blocked Load Sensing	LSG **
	3 way - 3 position A: blocked Load Sensing	LSS **

11.8 Hydraulic circuits

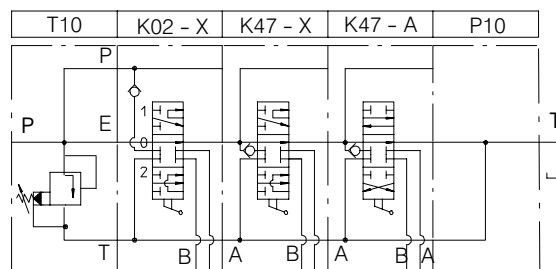
11.8.1 Standard parallel circuit



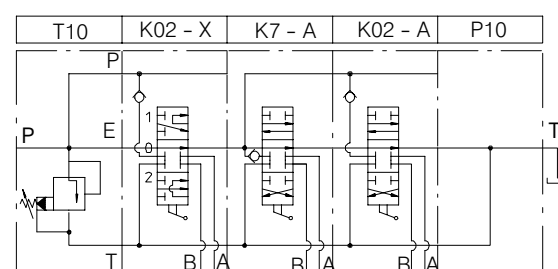
11.8.3 Optional tandem circuit



11.8.2 Optional series circuit



11.8.4 Combined parallel/series circuit

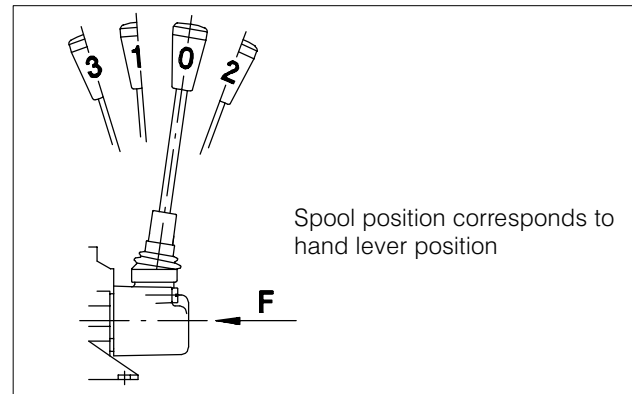


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11.9 Spool actions

Spool position				Stroke mm	Type	Code
3	1	0	2			
	○	*	○	7.5	01	200.9686.1002.0
	●	●	○	7.5	02	200.9686.3002.0
	●	●	●	7.5	03	200.9686.2002.0
		●	●	7.5	05	200.9686.2004.0
	*		○	15	06	200.9686.1004.0
	●	●		7.5	07	200.9686.2007.0
	○	*		7.5	09	200.9686.1011.0
	●		●	15	11	200.9686.2009.0
	○	●	●	7.5	19	200.9686.3008.0
	○	*	○	7.5	24	200.9686.5013.0
	○	*	○	7.5	31	200.9686.1054.0
	○	*	○	7.5	46	200.9686.1076.0
	○	*	○	7.5	47	200.9686.1078.0
	○	*	○	7.5	50	200.9686.5020.0
	○	*	○	7.5	56	200.9686.1086.0
	○	*	○	7.5	83	200.9686.1096.0
●	○	*	○	5 - 7 - 7	125	200.9686.4007.0

- * Initial hand lever position
- Hand lever in detent position
- Spring return position of hand lever

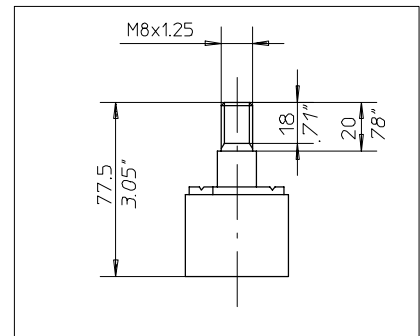
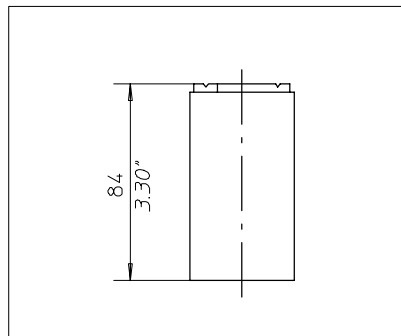
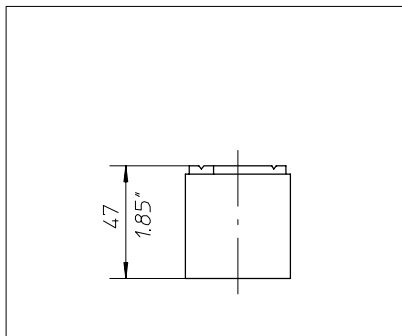


F (N) = force in Newton (N) needed to operate the spool

F (N)	Spool position control Type
350	01 (standard)
280	56

Note: consult factory for different configurations.

11.9.1 Spool positioners dimensions



Spool positioners: 01 - 02 - 03 - 05 - 06 07 - 09 - 11 - 19 - 56	Spool positioner: 125 (Z spool type)	Spool positioner: 83
--	---	--------------------------------

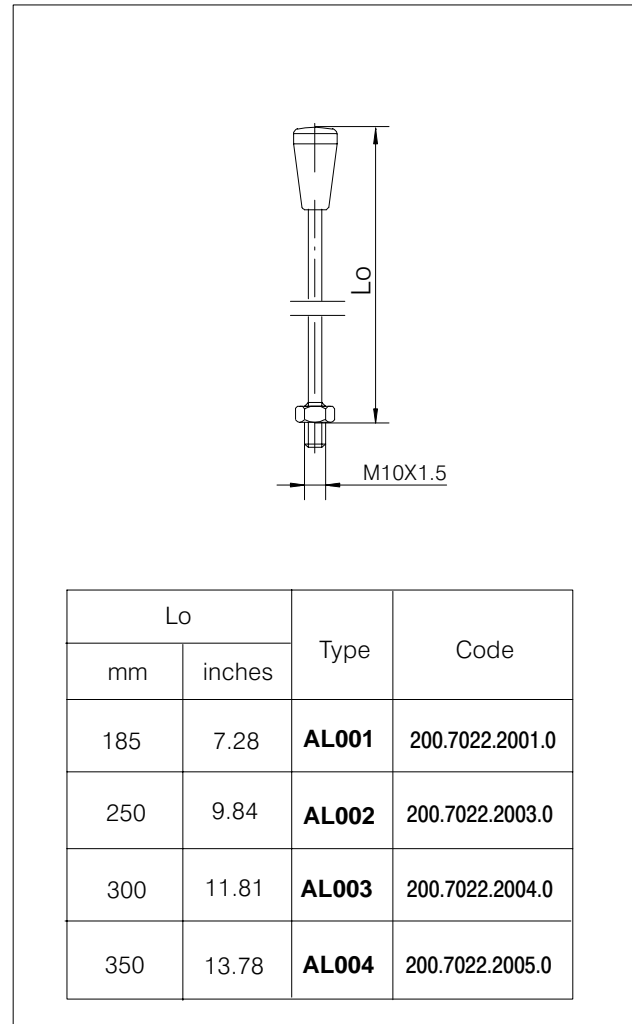
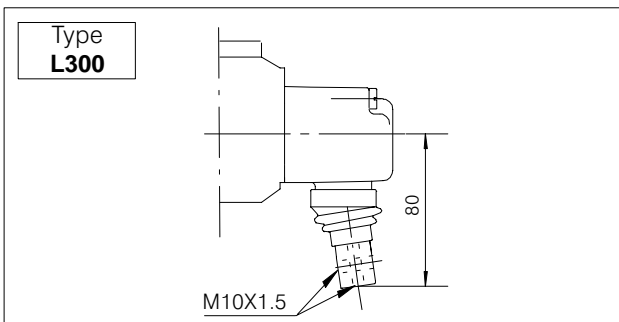
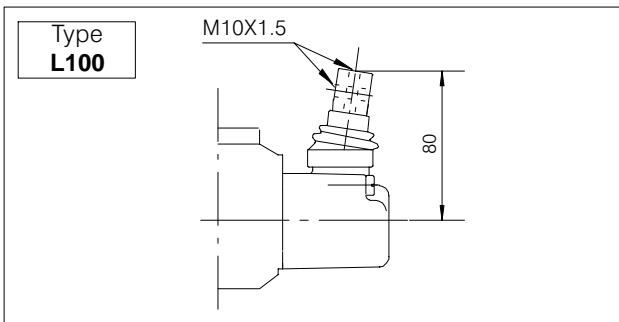
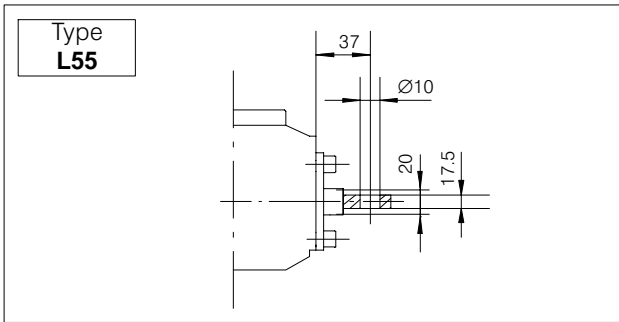
11.9.2 Microswitch control

Type 31	Microswitch is operated when the spool is in pos.1 and 2	
Type 46	Microswitch is operated when the spool is in pos.1	
Type 47	Microswitch is operated when the spool is in pos.2	

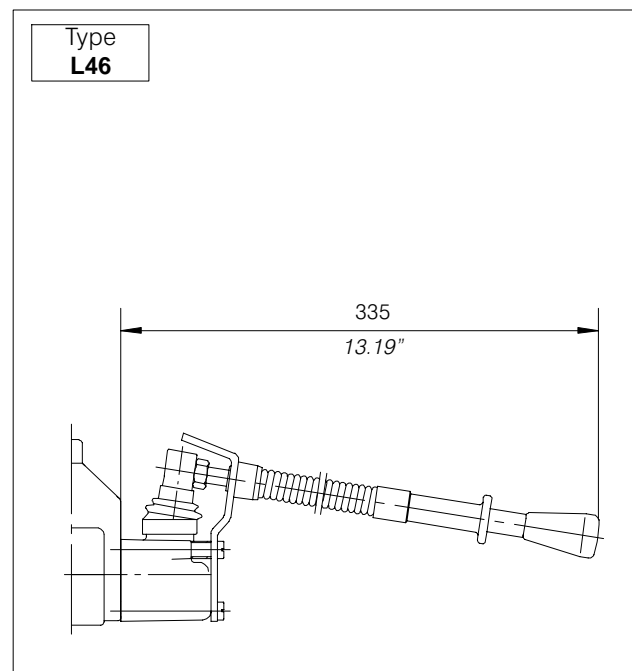
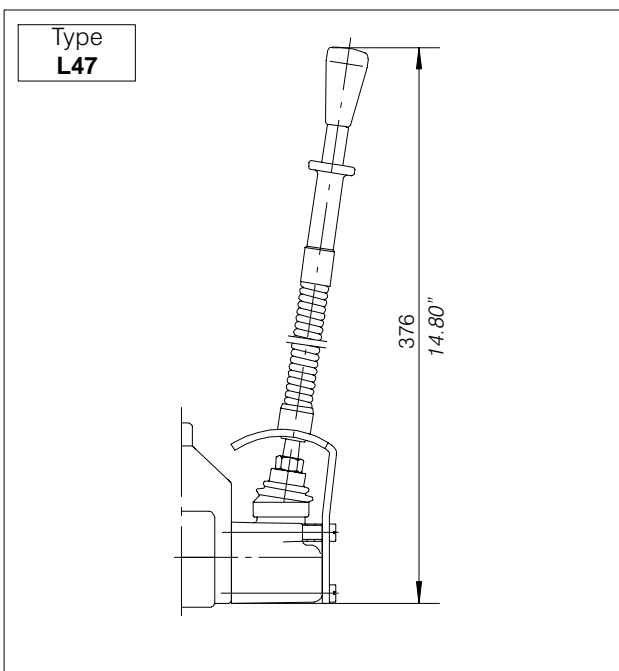
The microswitch is supplied only on customer's request.

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11.10 Lever styles



11.10.1 Safety levers



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11.10.2 Remote cable control

Lever Support	Code 200.7609.0013.0
----------------------	-------------------------

M10X1.5

Optional 200.6772.0048.0

Lo		Type	Code
mm	inches		
185	7.28	AL001	200.7022.2001.0
250	9.84	AL002	200.7022.2003.0
300	11.81	AL003	200.7022.2004.0
350	13.78	AL004	200.7022.2005.0

Cable	Cable length	Code
--------------	--------------	------

1000 mm	200.5441.04002
1500 mm	200.5441.04005
2000 mm	200.5441.04006
2500 mm	200.5441.04007
3000 mm	200.5441.04008
4000 mm	200.5441.04009

Cables are assembled on the valve only on request and with an extra charge.

Spool Kit	Code 200.9609.0002.0
------------------	-------------------------

Type L142	Code 200.7071.2012.0
---------------------	-------------------------

M10X1.5

Optional 200.6772.0048.0

Only for rod remote control

Type L133	Code 200.9759.3020.0
---------------------	-------------------------

Fulcrum

(AL010)

Stick Lever M12X1.75

Fulcrum

11.10.3 Cross joystick for dual axis control

Type AL010	Code 200.7022.3004.0
----------------------	-------------------------

L0=250

M12X1.75

Type L134	Code 200.9759.3020.0
---------------------	-------------------------

1 2

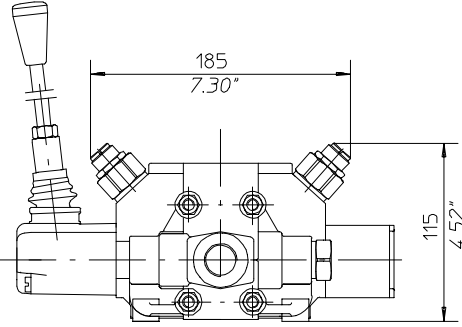
Fulcrum

Fulcrum

L133-L134 are supplied complete with rubber bellow protection

HDS30

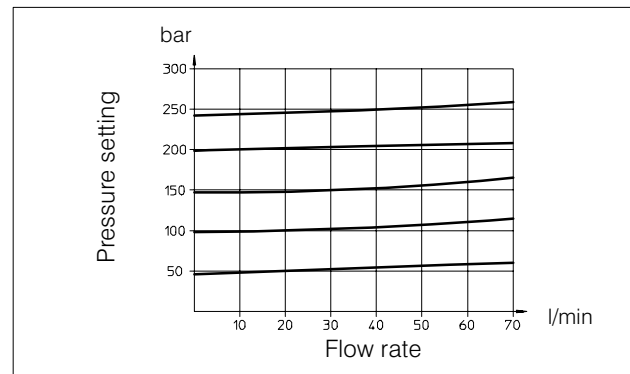
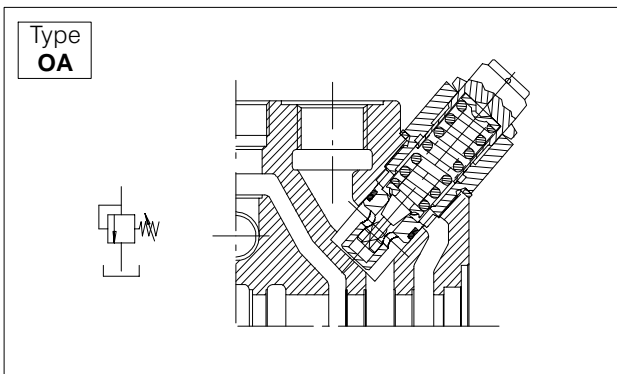
11.11 Anti-shock and anti-cavitation valves



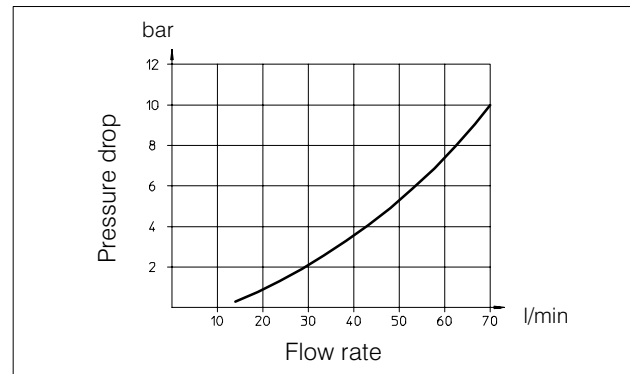
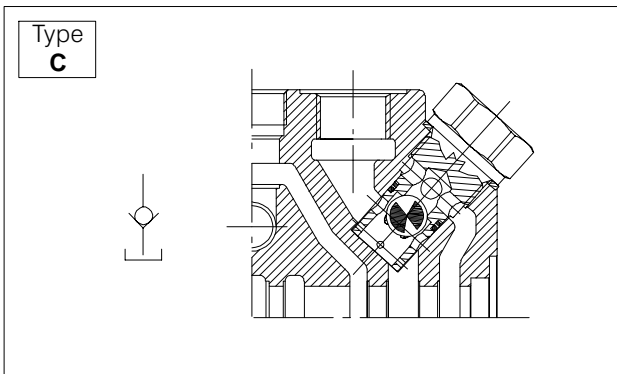
Port relief valve settings

Pressure set range bar (PSI)	Std. setting bar (PSI)	Type	Spring colour
30 - 95 (400 - 1300)	60 (860)	06	Yellow (YE)
96 - 210 (1300 - 3000)	150 (2100)	15	Green (GR)
211 - 320 (3000 - 4600)	260 (3700)	26	Blue (BL)

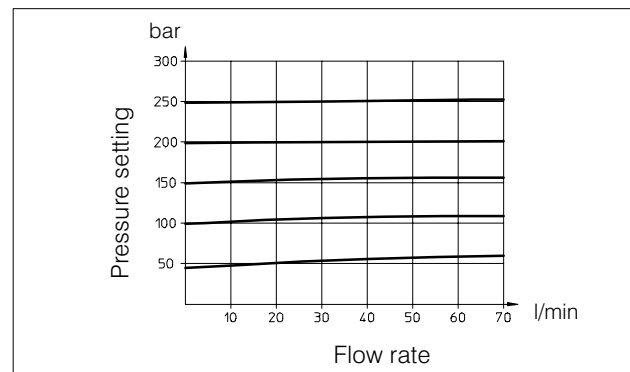
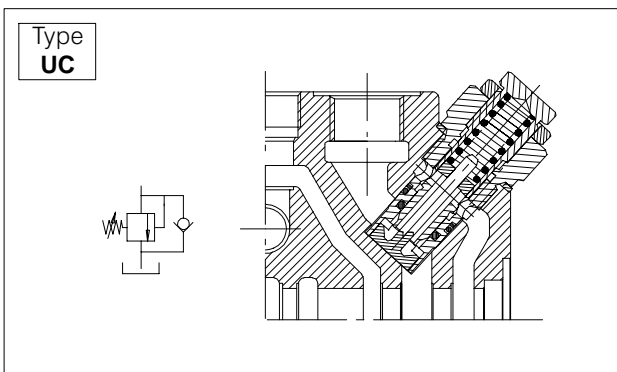
11.11.1 Port relief valve



11.11.2 Anti-cavitation valve




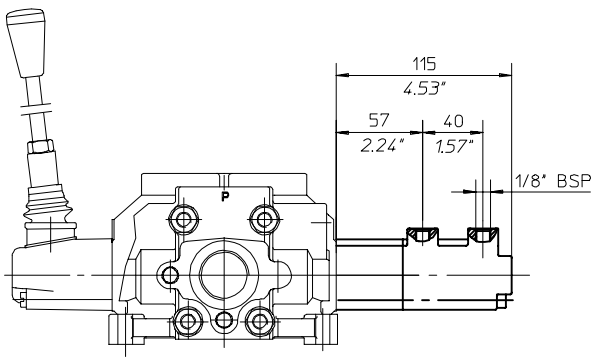
11.11.3 Combined port relief and anti-cavitation valve



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11.12 Hydraulic-Pneumatic controls

Type	Code
HP 24	200.9686.5013.0

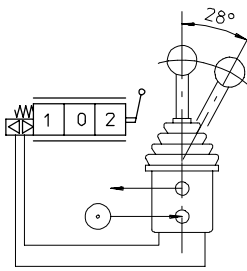
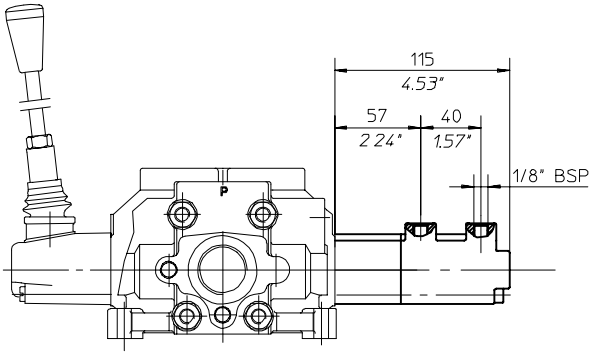
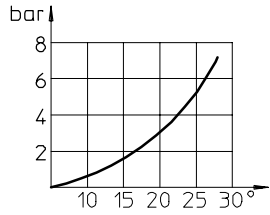
Operating conditions
 Hydraulic control:
 Pressure range: (bar): Min. 6 - Max. 15
 (PSI): Min. 85 - Max. 215

Pneumatic control:
 Pressure range: (bar): Min. 6 - Max. 10
 (PSI): Min. 85 - Max. 145

11.13 Pneumatic controls

11.13.1 Pneumatic proportional control

Type	Code
PP 151	200.9686.5010.0

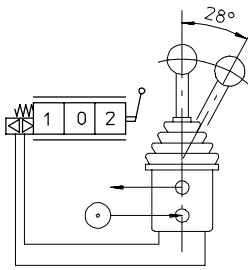
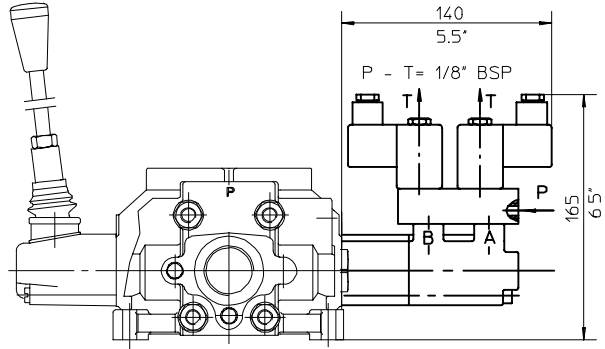
bar

8
6
4
2

10 15 20 25 30°

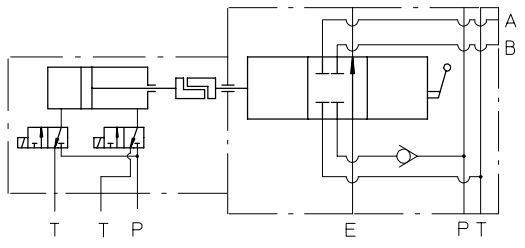
11.13.2 Electro-pneumatic control ON-OFF

Voltage	Type	Code
12 VDC	EP 77	200.9686.6024.0
24 VDC	EP 78	200.9686.6027.0

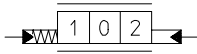
Electrical data
 Insulation class H - 180° C (356° F)
 Encapsulation material: nylon
 Temperature range:
 -10° C to 80° C (14° F to 170° F)
 Duty cycle: 100% at 20° C ambient (68° F)
 Voltage variation: -10% to + 15% of nominal voltage
 Power consumption DC - 10 W
 Electrical connection: DIN43650/A (2P + E)
 Cable connection PG9
 Protection class: IP65 (with connector)

Operating conditions
 Pressure range: (bar): Min. 6 - Max. 10
 (PSI): Min. 85 - Max. 145
 Ambient temperature: -10° C to 50° C (14° F to 122° F)
 Response time: 6 - 8 milliseconds
 Mounting in any position

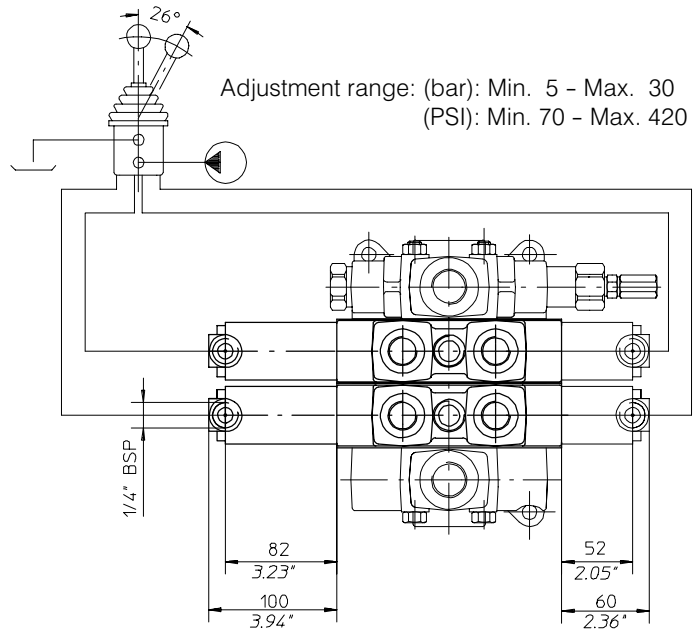
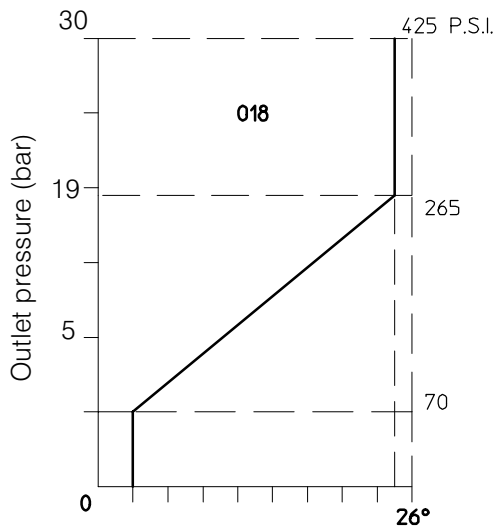


11.14 Hydraulic Proportional control

Type	Code
HP 50	200.9686.5017.0



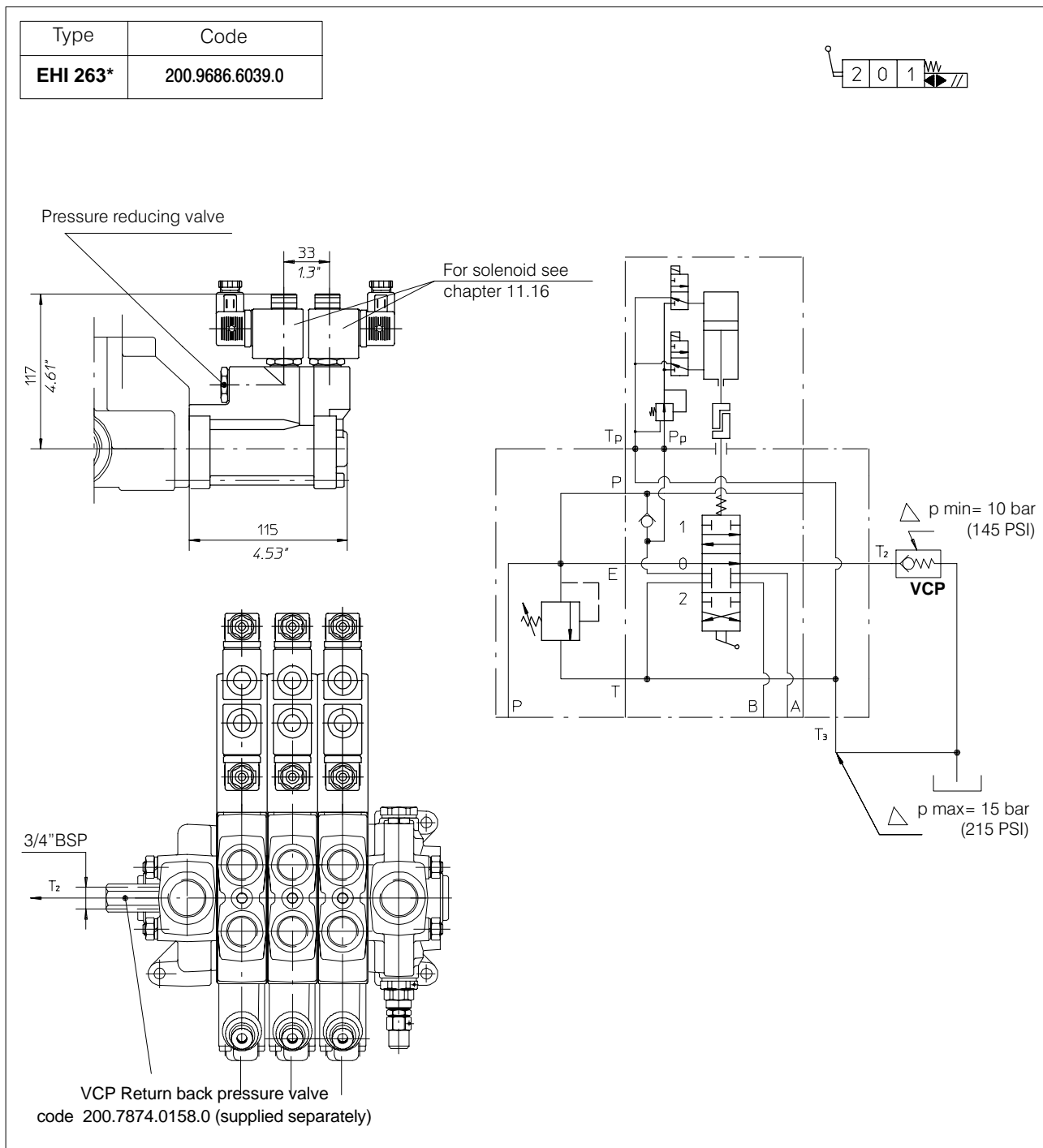
Joystick adjustment diagram



HDS30

11.15 Electro-Hydraulic controls

11.15.1 Electro-hydraulic control internal pilot version ON-OFF with pressure reducing valve



Mechanical and hydraulic features

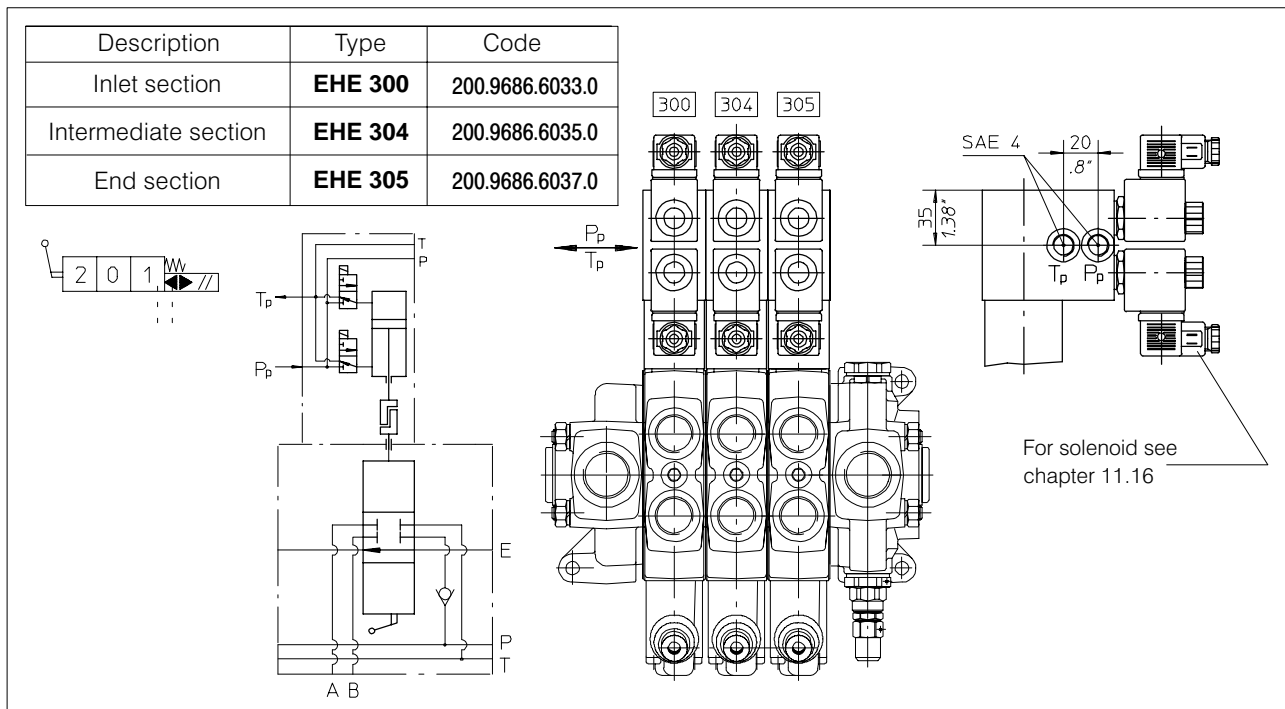
Max pressure on P_p port 300 bar (4300 PSI)
 Reduced pressure after pressure reducing valve 10 bar (145 PSI)
 Fixed delivery on P_p pilot line 1 l/min (0.26 U.S.G.P.M)
 Leakage of pressure reducing valve (in neutral pos.) 100 ml/min (6.1 in³/min)

Min. suggested filtration 25 micron
 Operating oil temperature min.-30°C- max. 90°C
 min.-22°F - max 194°F

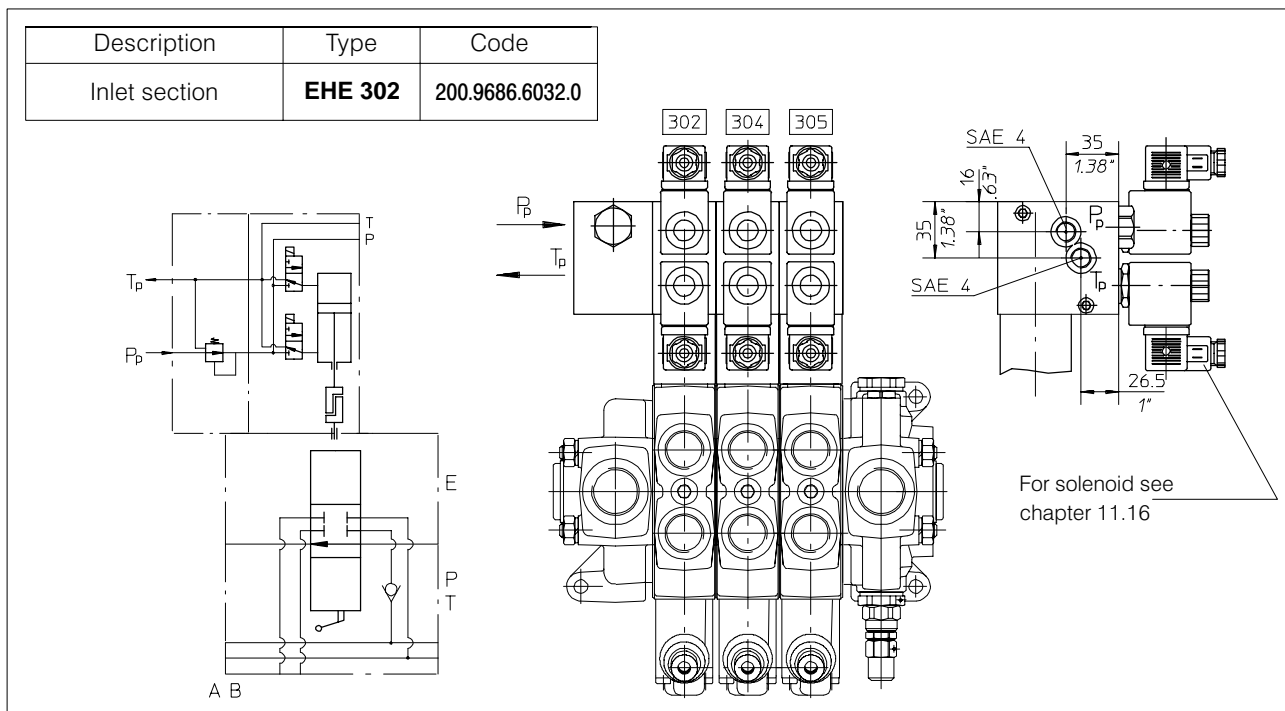
* EHI 263 Versions special body required

HDS30

11.15.2 Electro-hydraulic control external pilot version ON-OFF



11.15.3 Electro-hydraulic control external pilot version ON-OFF with pressure reducing valve on inlet manifold

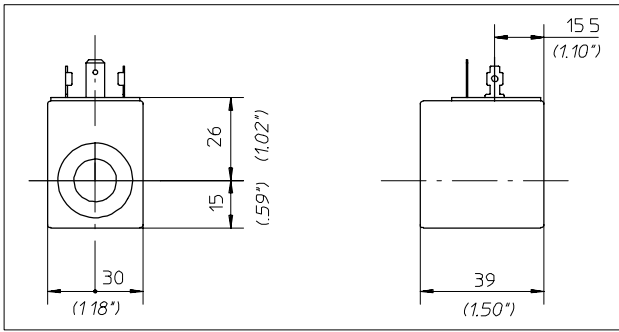


Mechanical and hydraulic features

Pilot pressure with pressure reducing valve 12 bar (175 PSI)
 Pilot flow to each working section: 1 l/min (0.26 U.S.G.P.M.)
 Operating oil temperature min.-30°C- max. 90°C
 min.-22°F - max. 194°F

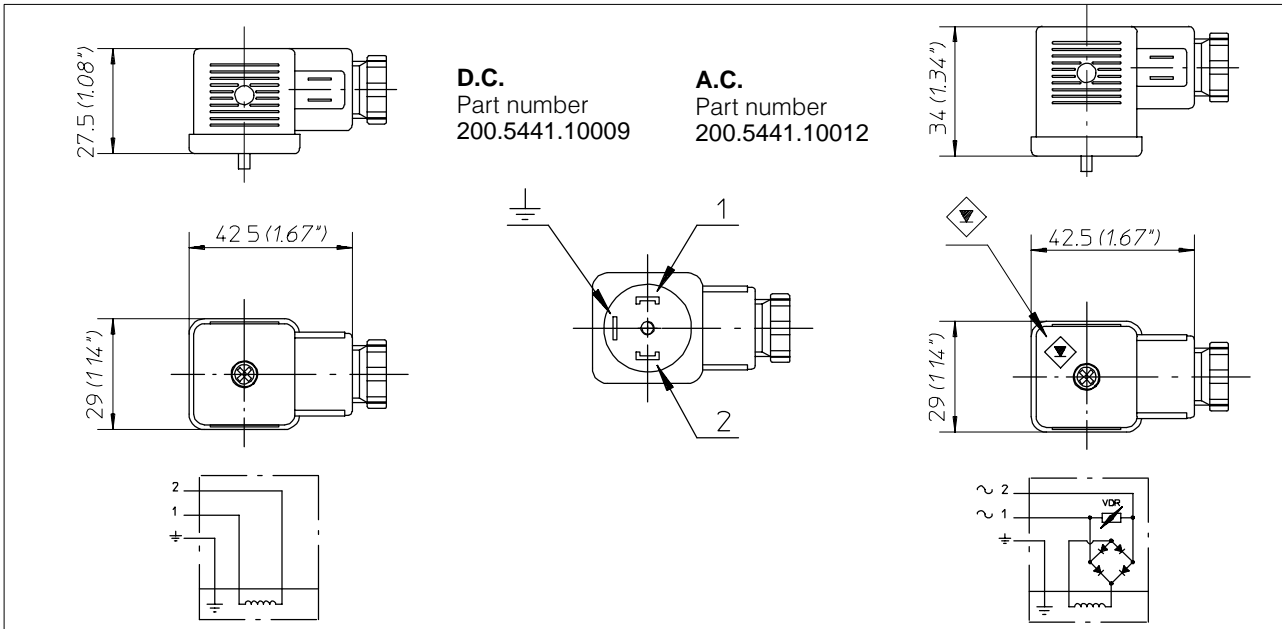
Leakage of pressure reducing valve (in neutral pos.) 100 ml/min (6.1 in³/min)
 Min. suggested filtration 25 micron

11.16 Solenoids for pilot electrovalves EHI-EHE



Wire class	F (VDE 0580)
Coil insulation	IP65 (DIN 40050)
Duty rating	ED 100%
Stabilized temperature	70 °C
Voltage tolerance	± 10%

Supply Voltage	Nominal coil voltage	Power (Watt)	Resistance (Ohm)		Current (Ampere)		Coil code
			Ambient temp.	Stabilized temp.	Ambient temp.	Stabilized temp.	
12 V. DC	12 V. DC	18.7	7.7	10.8	1.56	1.11	200.6749.1003.0
24 V. DC	24 V. DC	18.6	31	41.4	0.77	0.58	200.6749.2003.0
24 V. AC	21.6 V. DC	17.3	27	36	0.80	0.60	200.6748.2003.0
110 V. AC	98 V. DC	15.6	630	825	0.157	0.120	200.6748.4003.0
220 V. AC	198 V. DC	15.7	2500	3300	0.08	0.06	200.6748.6003.0



Armour clamp	Pg 9
Ø cable	6 - 8 mm
Diodes	1N 4007 GP
Overvoltage protection	VDR
Connector type	DIN 43650
Number of poles	2 + $\frac{1}{2}$
Supply voltage	max. 220 V
Nom. capacity at contacts	10 Ampere

Max capacity at contacts	16 Ampere
Resistance at contacts	≥ 4 mOhm
Max section of cable	1.5 mm ²
Outer material	Glass fibre reinforced nylon
Protection factor	IP65 (DIN 40050)
Insulation class	C (VDE 0110)
Temperature range	-40° +90°C

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We reserve the right of modification without prior notice.

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