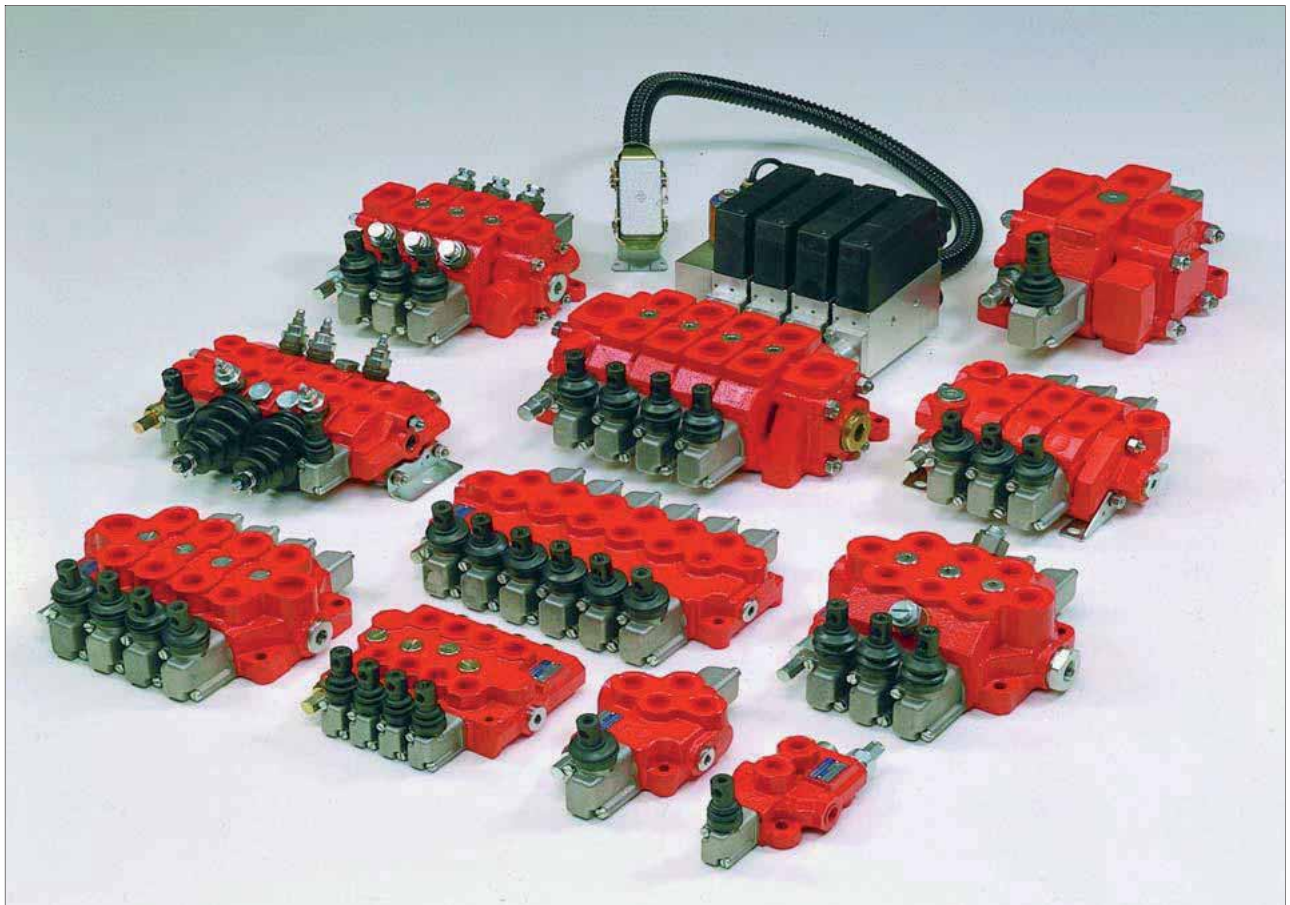
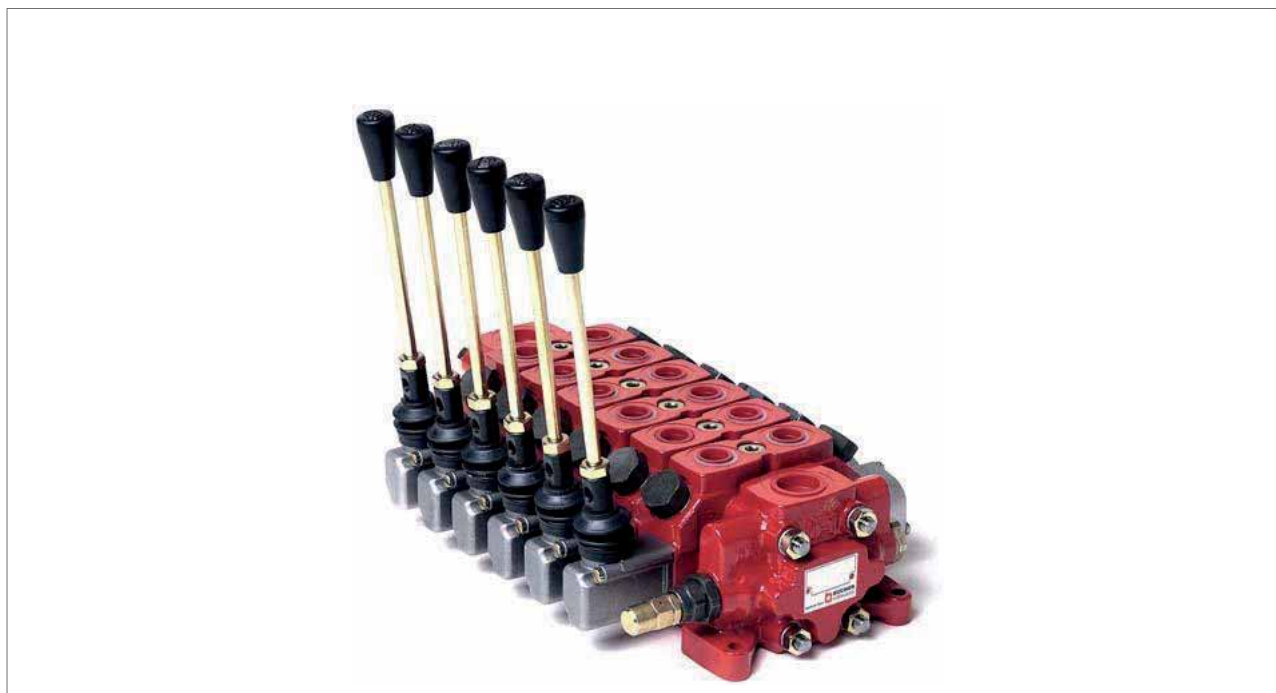


## Monobloc and Sectional Directional Control Valve **HDS30**



## Monobloc and Sectional Directional Control Valve HDS30

### 11 Sectional directional control valves HDS30



#### Contents

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## Monobloc and Sectional Directional Control Valve **HDS30**

HDS30

### 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 <sup>2</sup> /s	16 to 75
Oil filtration	μ	≤ 30

Spool leakage at 100 bar (1450 PSI), Temp. 50° C (120° F), viscosity 27 mm <sup>2</sup> /s:		
Maximum	cm <sup>3</sup> /min Cu. In./min	18 1.281
Average	cm <sup>3</sup> /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:

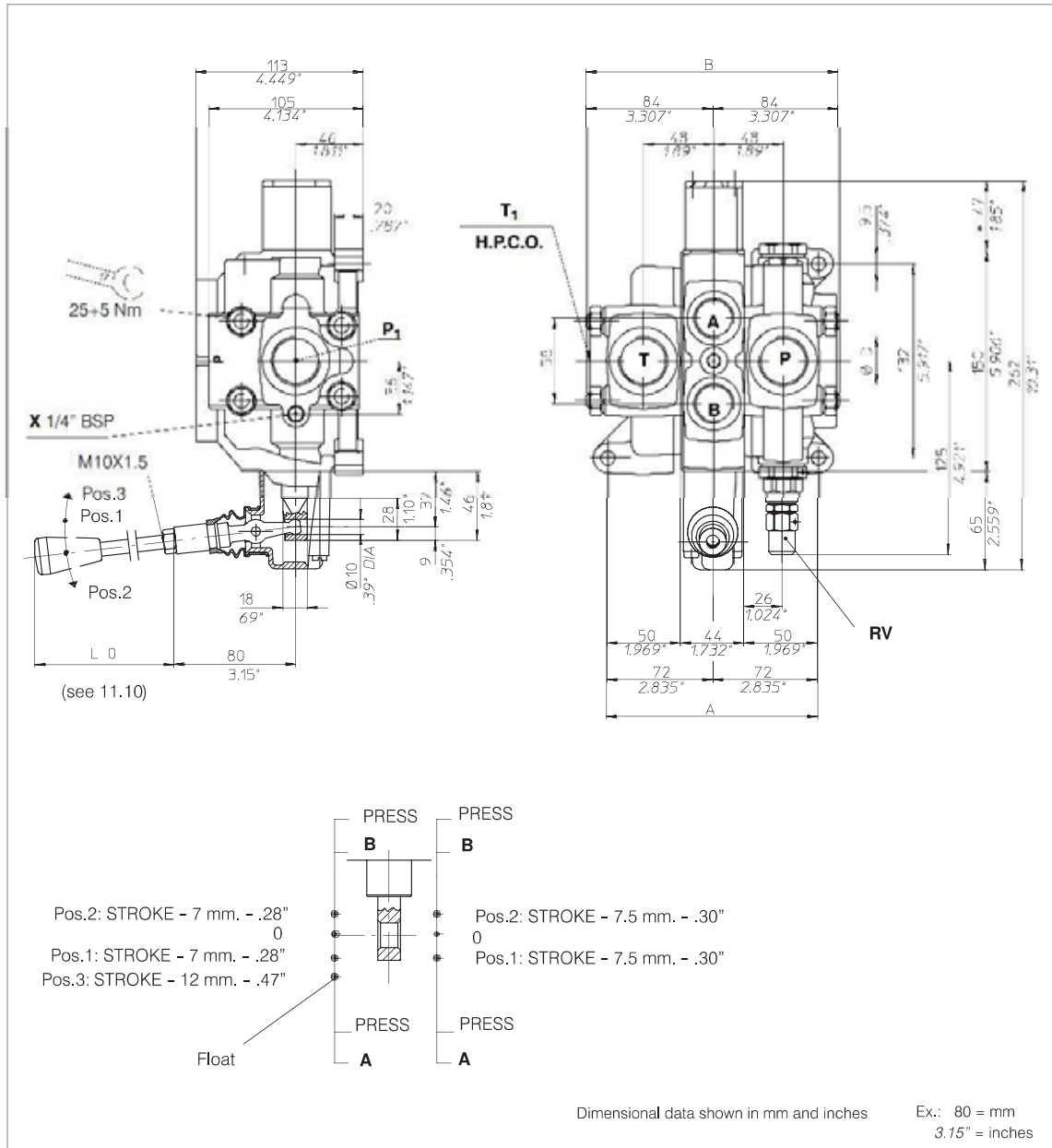
- 1) Open or closed centre circuit, 3 or 4 way operations, 3 or 4 position (float position), full open centre (motor spool) and other spool options.
- 2) Carry over.
- 3) Series connection and priority pressure.
- 4) Complete lever assembly.

#### 11.1.5 Symbols:

**P:** inlet port  
**T:** outlet port  
**A/B:** work ports  
**H.P.C.O.:** carry-over  
**RV:** relief valve  
**P<sub>1</sub>T<sub>1</sub>:** 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

## Monobloc and Sectional Directional Control Valve HDS30

### 11.2 Dimensional data



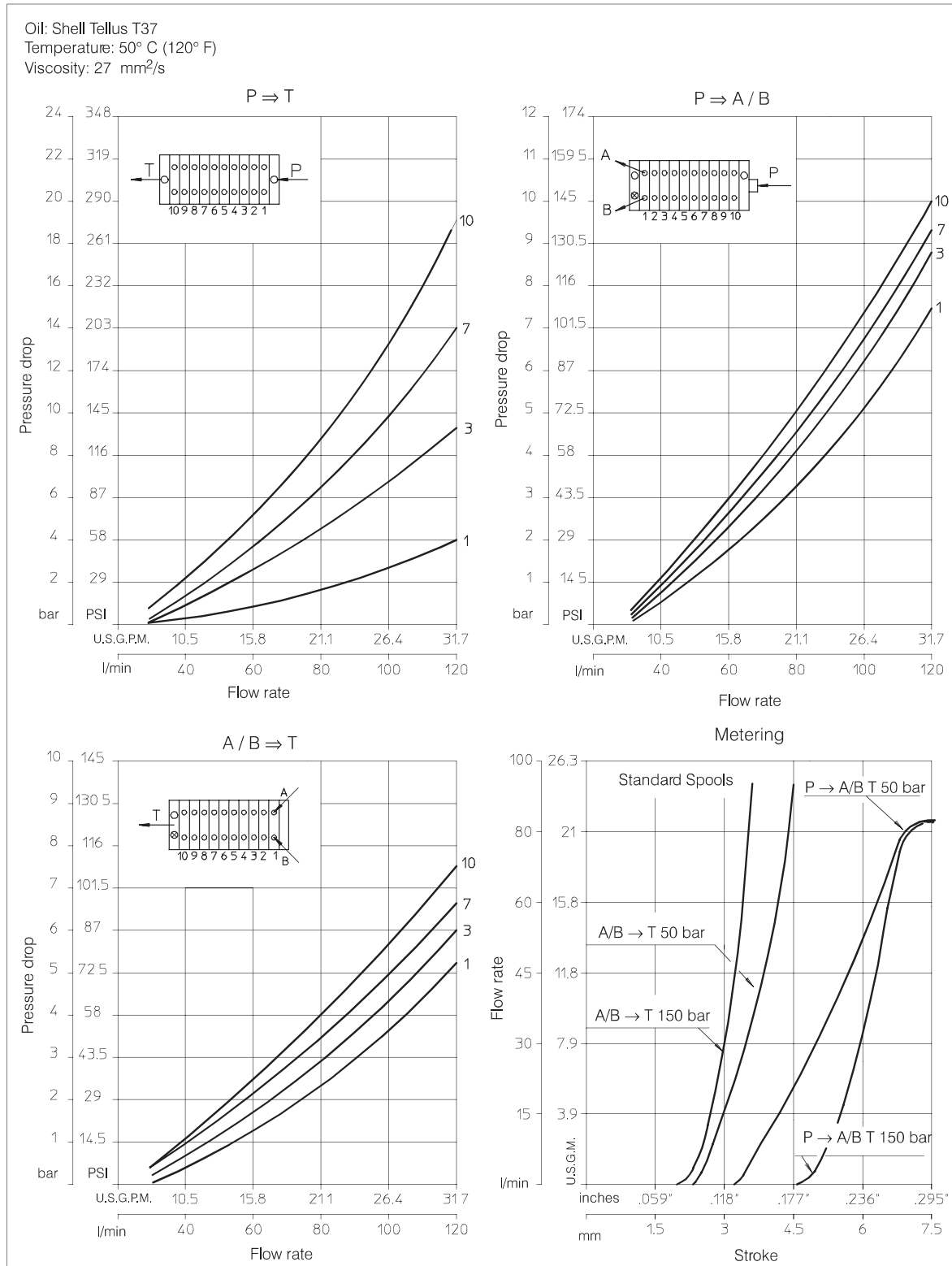
N. of sections		1	2	3	4	5	6	7	8	9	10
Dimension	A	144	188	232	276	320	364	408	452	496	540
		5.67"	7.40"	9.13"	10.86"	12.60"	14.33"	16.06"	17.80"	19.53"	21.26"
Dimension	B	168	212	256	300	344	388	432	476	520	564
		6.62"	8.34"	10.08"	11.81"	13.54"	15.28"	17.01"	18.74"	20.47"	22.21"

## Monobloc and Sectional Directional Control Valve HDS30

### 11.3 Performance curves

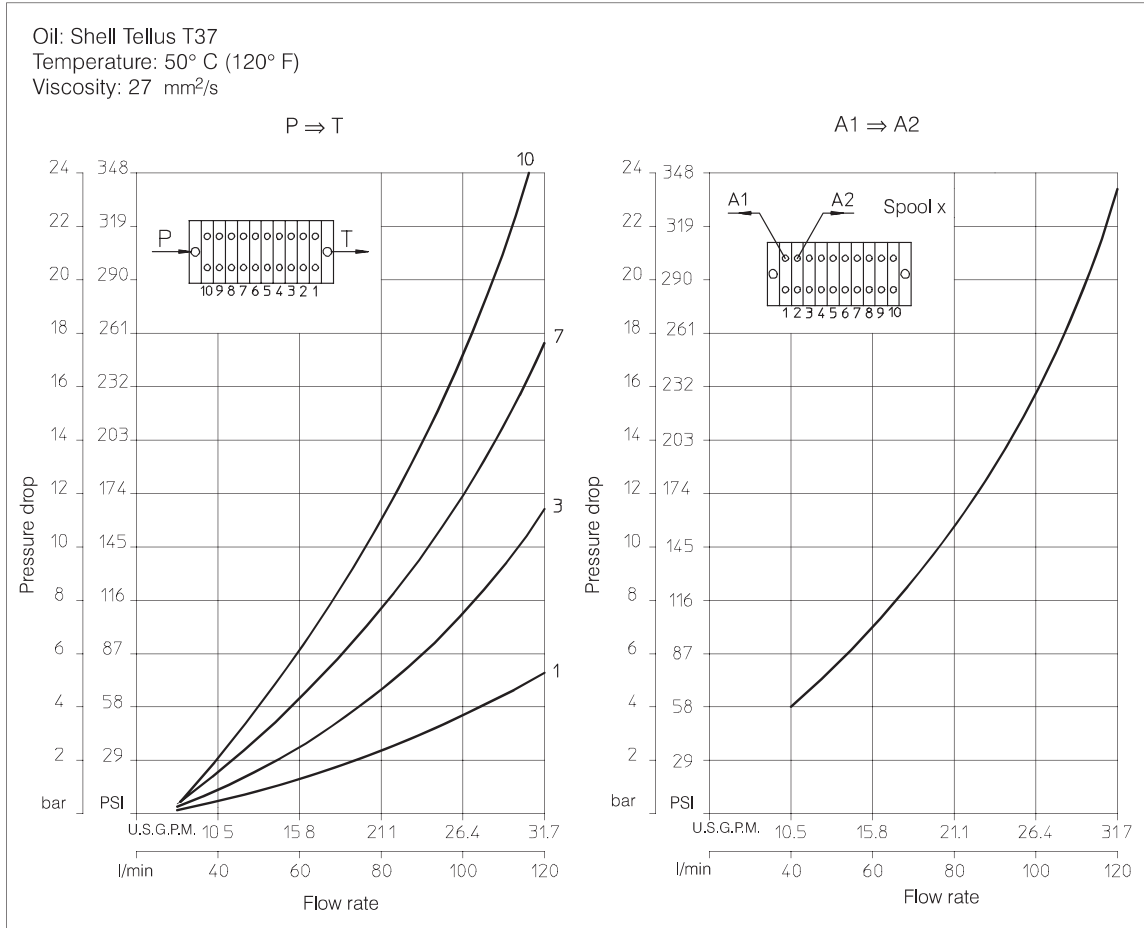
#### 11.3.1 Parallel circuit

Oil: Shell Tellus T37  
 Temperature: 50° C (120° F)  
 Viscosity: 27 mm<sup>2</sup>/s

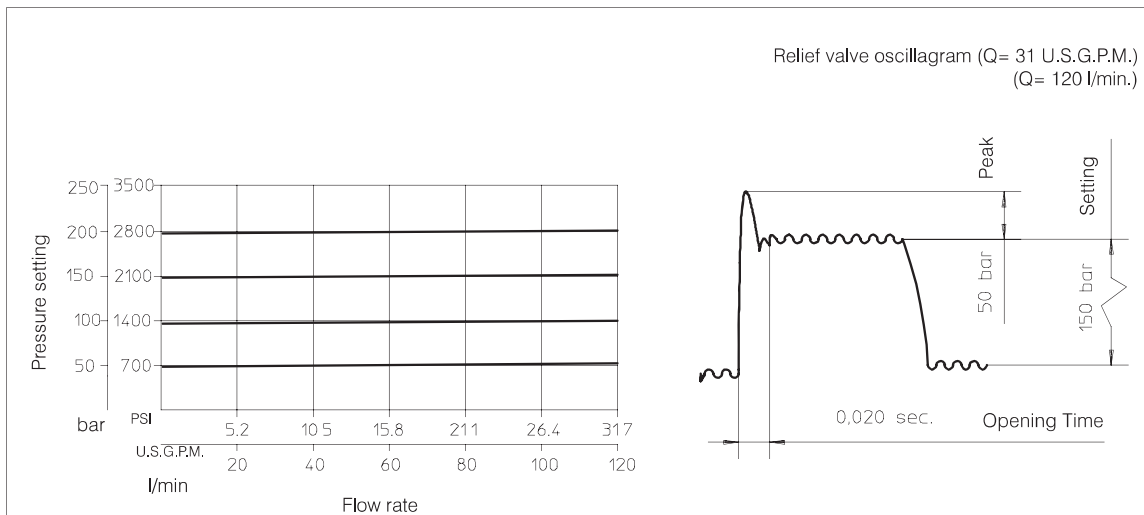


## Monobloc and Sectional Directional Control Valve HDS30

### 11.3.2 Series circuit



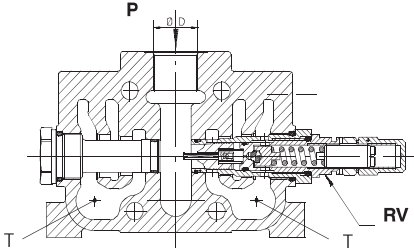
### 11.3.3 Transient hydraulic characteristics Relief Valve RV



## Monobloc and Sectional Directional Control Valve HDS30

### 11.4 Inlet covers

#### 11.4.1 Right and left standard inlet cover

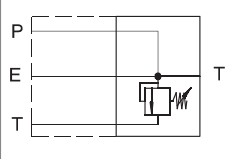


Port relief valve settings

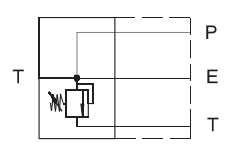
Pressure set range bar (PSI)	Setting bar (PSI)	Type
* 30 - 320 (420 - 4600)	150 (2100)	<b>15</b>

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

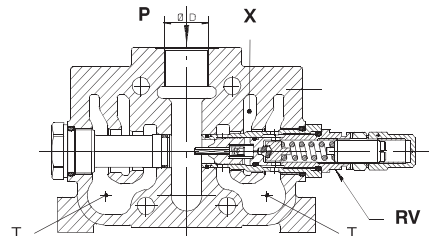
#### Right inlet cover with P and RV for parallel circuit

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

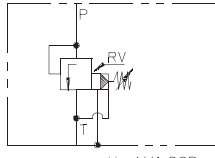
#### Left inlet cover with P and RV for series circuit

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

#### 11.4.2 System RV remote control: vent type



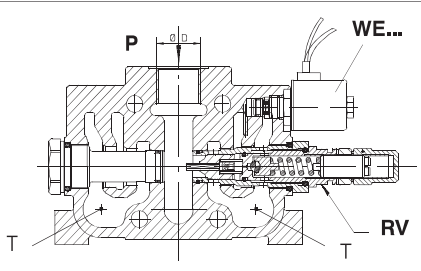
Code **S**



X = 1/4" BSP

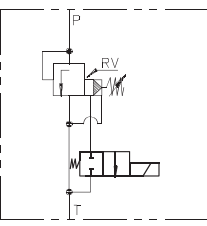
Ø D	Type/Code
1" BSP std (right)	<b>T25**</b> 200.9316.5010.0
1" BSP (left)	<b>T24**</b> 200.9316.5009.0

#### 11.4.3 System RV remote control: electrical type



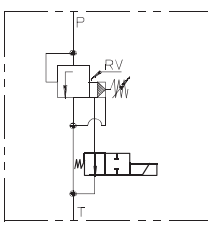
WE...

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

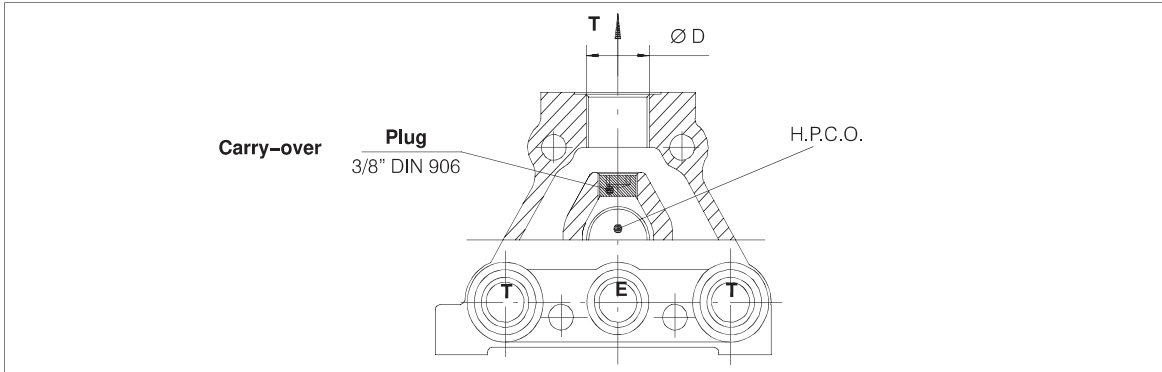
\*\* Group code with RV set at standard pressure (150 bar / 2100 PSI)

Ø D	Without WE... valve			With WE... valve		
	12 Volt	24 Volt	24 Volt	24 Volt	24 Volt	24 Volt
1" BSP std(right)	<b>T22**</b> 200.7316.5007.0	<b>T26**</b> 200.7316.5017.0	<b>T26**</b> 200.7316.5011.0	<b>T26**</b> 200.7316.5017.0	<b>T27**</b> 200.7316.5030.0	<b>T27**</b> 200.7316.5012.0
1" BSP (left)	<b>T23**</b> 200.7316.5008.0	<b>T26**</b> 200.7316.5030.0	<b>T26**</b> 200.7316.5012.0	<b>T27**</b> 200.7316.5030.0	<b>T27**</b> 200.7316.5012.0	<b>T27**</b> 200.7316.5012.0
1" BSP std(right)	<b>T22**</b> .....	<b>T26**</b> .....	<b>T26**</b> .....	<b>T27**</b> .....	<b>T27**</b> .....	<b>T27**</b> .....
1" BSP (left)	<b>T23**</b> .....	<b>T27**</b> .....	<b>T27**</b> .....	<b>T27**</b> .....	<b>T27**</b> .....	<b>T27**</b> .....

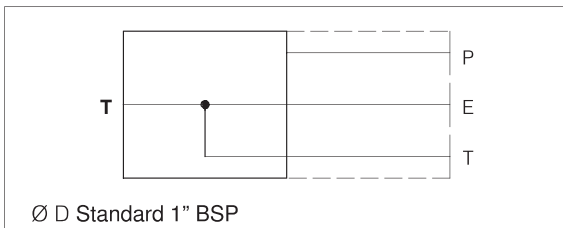


## Monobloc and Sectional Directional Control Valve HDS30

### 11.5 End covers

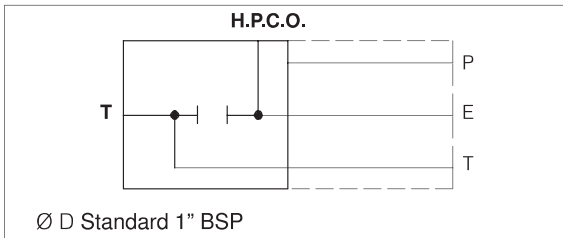


#### 11.5.1 Left outlet cover with T for parallel circuit (Standard)



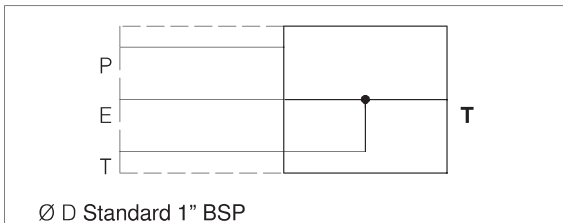
Ø D	Type	Code
1" BSP std	<b>P02</b>	200.9306.5001.0
SAE 16	<b>P04</b>	200.9306.9001.0

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



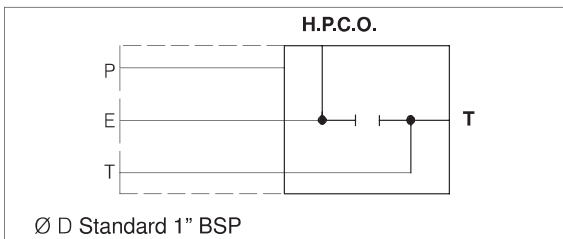
Ø D	Type	Code
1" BSP std	<b>P06</b>	200.9306.5002.0
SAE 16	<b>P08</b>	200.9306.9002.0

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



Ø D	Type	Code
1" BSP std	<b>P10</b>	200.6306.5003.0
SAE 16	<b>P12</b>	200.6306.9003.0

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



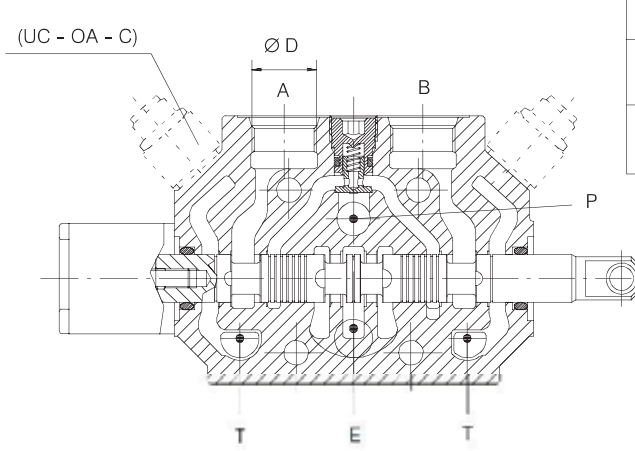
Ø D	Type	Code
1" BSP std	<b>P14</b>	200.9306.5004.0
SAE16	<b>P16</b>	200.9306.9004.0



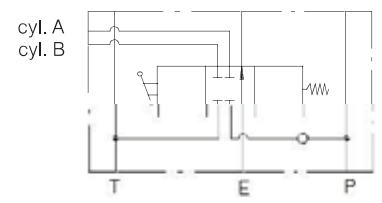
## Monobloc and Sectional Directional Control Valve HDS30

### 11.6 Sectional bodies

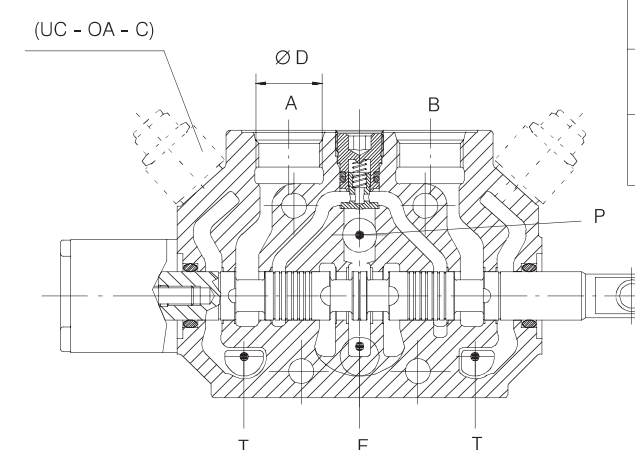
#### 11.6.1 Standard circuit: parallel



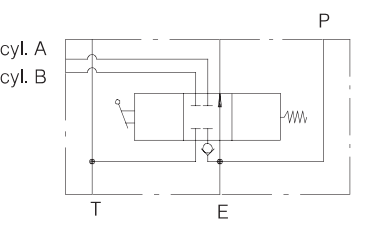
Ø D	Type/Code	
	Standard	Section with valve UC - OA - C
3/4" BSP	<b>K02</b> 200.9417.4001.0	<b>K06</b> 200.9417.4011.0
SAE 12	<b>K04</b> 200.9417.9002.0	<b>K08</b> 200.9417.9003.0



#### 11.6.2 Optional circuit: series and tandem



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

## Monobloc and Sectional Directional Control Valve HDS30

### 11.7 Spool charts

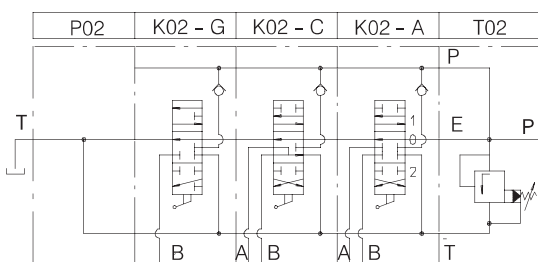
Spool scheme	Spool features	Type
	4 way - 3 position A/B: blocked E: open by pass	<b>A</b>
	4 way - 3 position A/B: blocked E: closed	<b>B</b>
	4 way - 3 position A/B to tank in neutral E: open by pass	<b>C</b>
	4 way - 3 position A: blocked B: to tank in neutral	<b>D</b>
	3 way - 3 position B: blocked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

\*\* : special body required

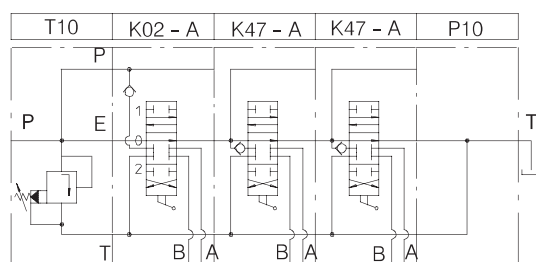
	3 way - 3 position A: blocked E: open by pass	<b>S</b>
	4 way - 3 position A/B: blocked series connection	<b>X</b>
	4 way - 3 position A/B: to tank in neutral series connection	<b>XC</b>
	4 way - 4 position 4 <sup>th</sup> float position	<b>Z</b>
	4 way - 3 position A/B: blocked Load Sensing	<b>LSA</b>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

### 11.8 Hydraulic circuits

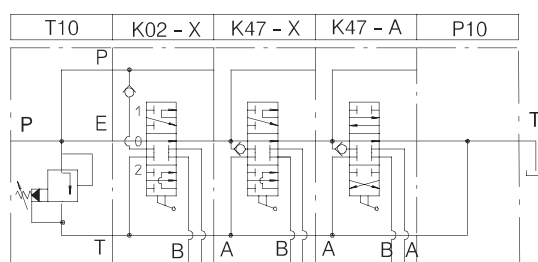
#### 11.8.1 Standard parallel circuit



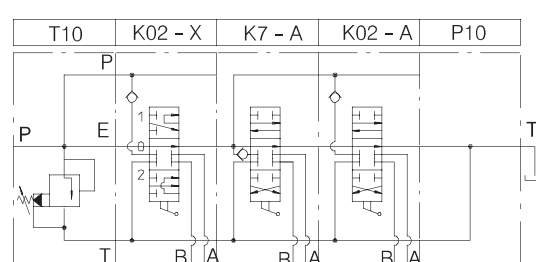
#### 11.8.3 Optional tandem circuit



#### 11.8.2 Optional series circuit



#### 11.8.4 Combined parallel/series circuit

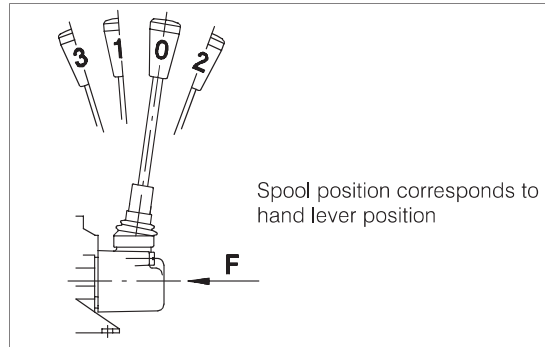


## Monobloc and Sectional Directional Control Valve HDS30

### 11.9 Spool actions

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

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

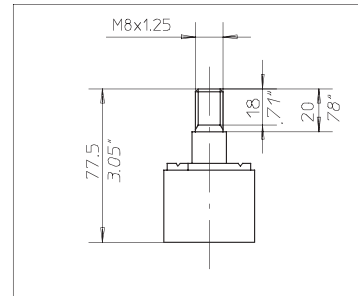
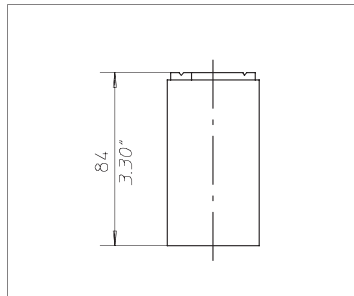
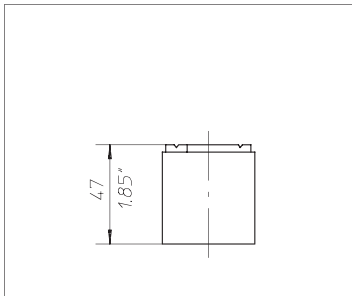


F (N) = force in Newton (N) needed to operate the spool

F (N)	Spool position control Type
350	<b>01</b> (standard)
280	<b>56</b>

Note: consult factory for different configurations.

#### 11.9.1 Spool positioners dimensions



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

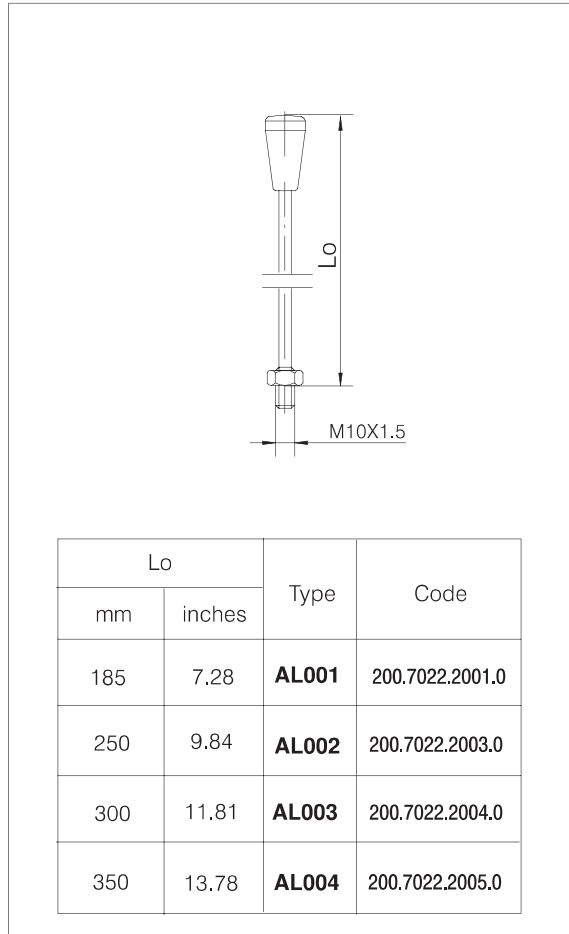
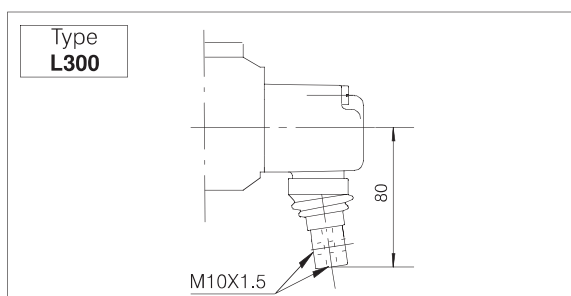
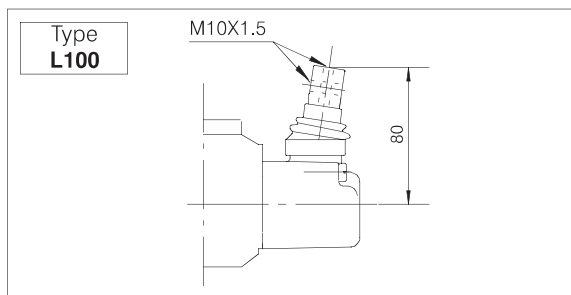
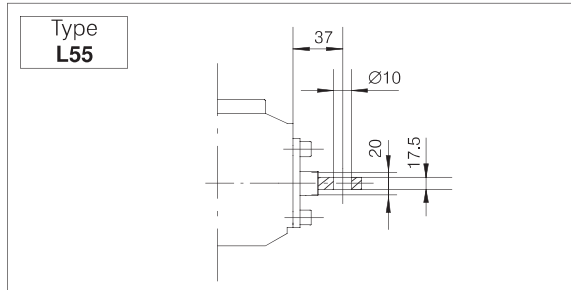
#### 11.9.2 Microswitch control

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

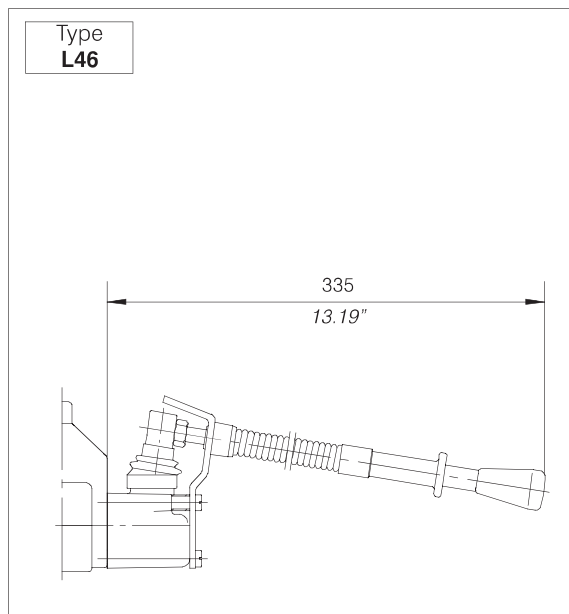
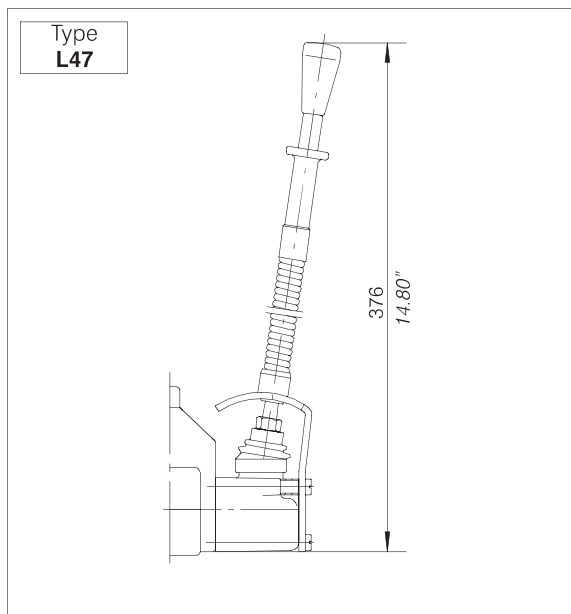
The microswitch is supplied only on customer's request.

## Monobloc and Sectional Directional Control Valve **HDS30**

### 11.10 Lever styles

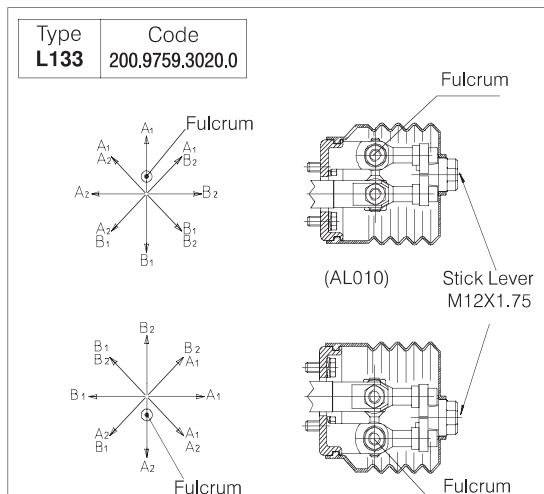
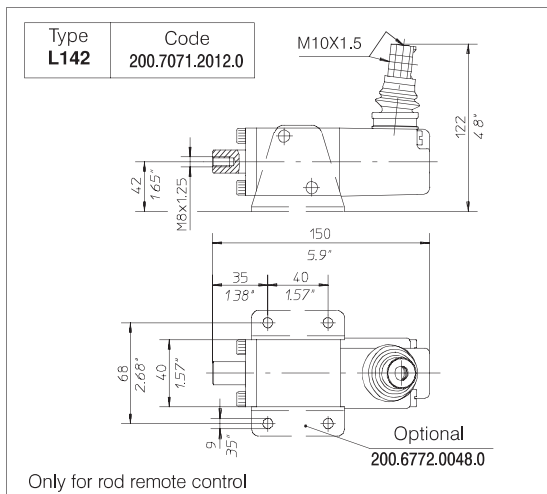
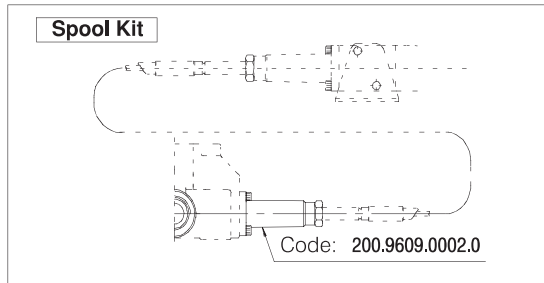
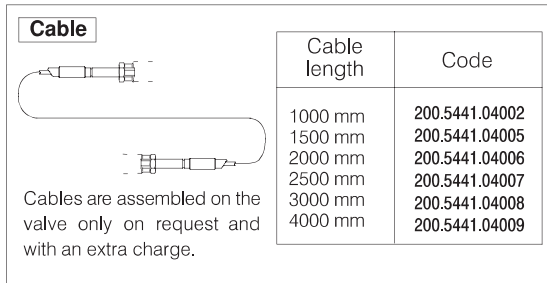
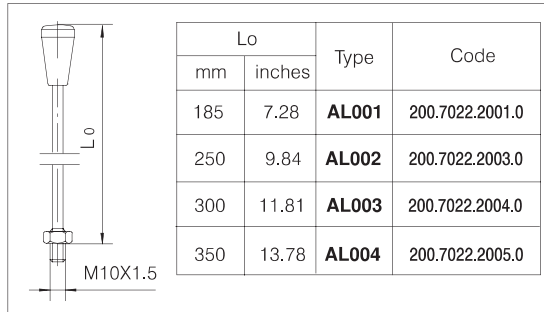
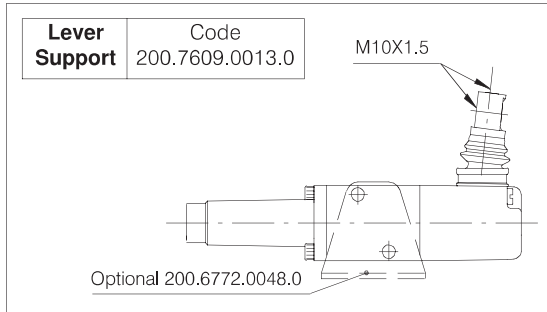


#### 11.10.1 Safety levers

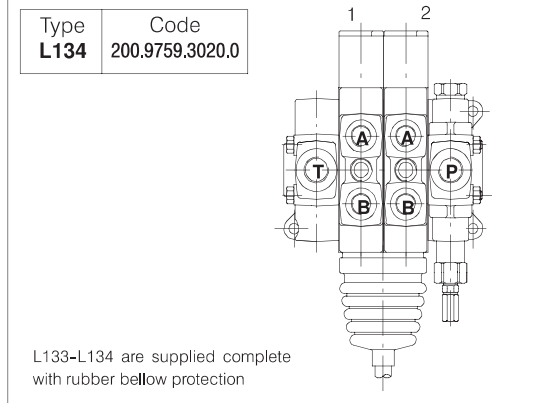
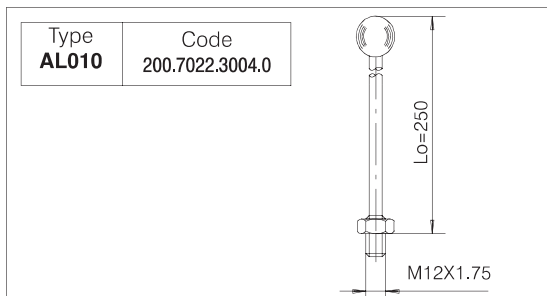


## Monobloc and Sectional Directional Control Valve HDS30

### 11.10.2 Remote cable control




### 11.10.3 Cross joystick for dual axis control



## Monobloc and Sectional Directional Control Valve HDS30

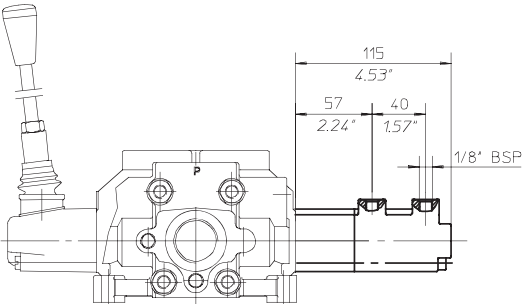
### 11.12 Hydraulic-Pneumatic controls

Type	Code
<b>HP 24</b>	200.9686.5013.0



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

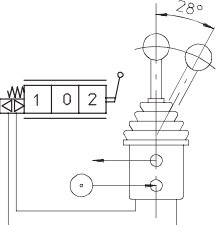
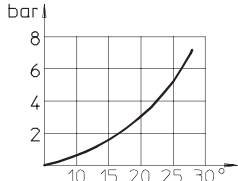
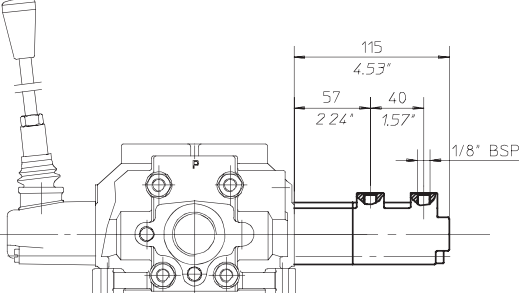
Pneumatic control:  
 Pressure range: (bar): Min. 6 - Max. 10  
 (PSI): Min. 85 - Max. 145



### 11.13 Pneumatic controls

#### 11.13.1 Pneumatic proportional control

Type	Code
<b>PP 151</b>	200.9686.5010.0

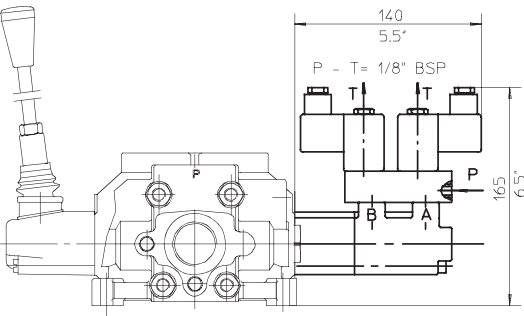
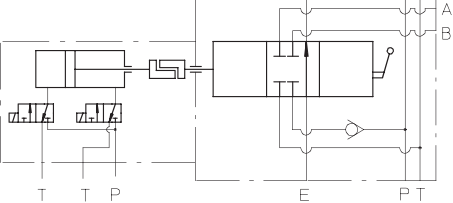




#### 11.13.2 Electro-pneumatic control ON-OFF

Voltage	Type	Code
12 VDC	<b>EP 77</b>	200.9686.6024.0
24 VDC	<b>EP 78</b>	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)


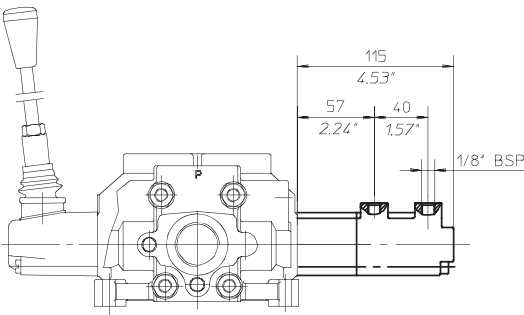
Operating conditions  
 Pressure range: (bar): Min. 6 - Max. 10  
 (PSI): Min. 85 - Max. 145  
 Ambient temperature: -10° C to 50° C (14° F to 122° F)  
 Response time: 6 - 8 milliseconds  
 Mounting in any position

## Monobloc and Sectional Directional Control Valve HDS30

### 11.12 Hydraulic-Pneumatic controls

Type	Code
<b>HP 24</b>	200.9686.5013.0

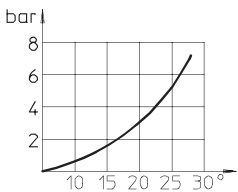
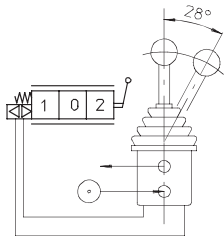
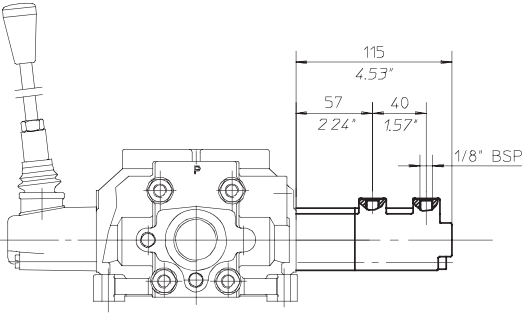
Operating conditions  
 Hydraulic control:  
 Pressure range: (bar): Min. 6 - Max. 15  
 (PSI): Min. 85 - Max. 215

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

### 11.13 Pneumatic controls

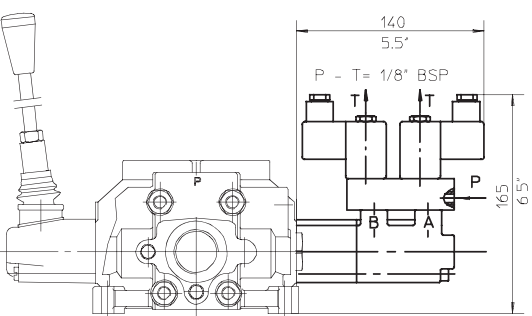
#### 11.13.1 Pneumatic proportional control

Type	Code
<b>PP 151</b>	200.9686.5010.0

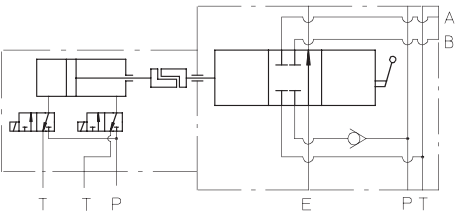
#### 11.13.2 Electro-pneumatic control ON-OFF

Voltage	Type	Code
12 VDC	<b>EP 77</b>	200.9686.6024.0
24 VDC	<b>EP 78</b>	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

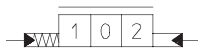




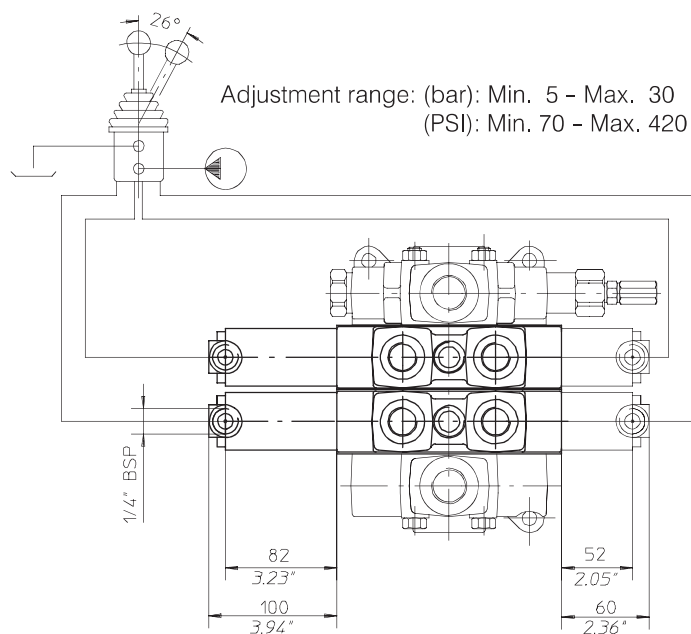
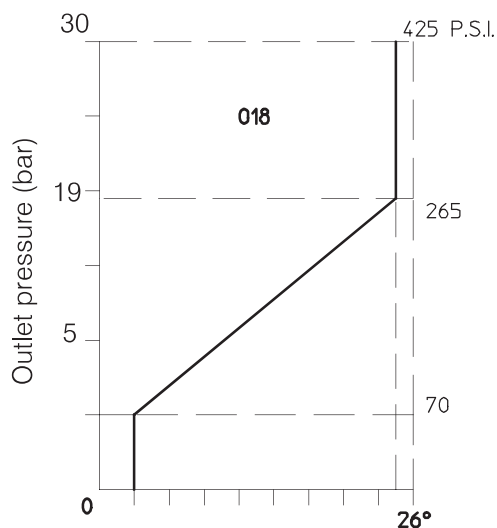
## Monobloc and Sectional Directional Control Valve **HDS30**

### 11.14 Hydraulic Proportional control

Type	Code
<b>HP 50</b>	200.9686.5017.0



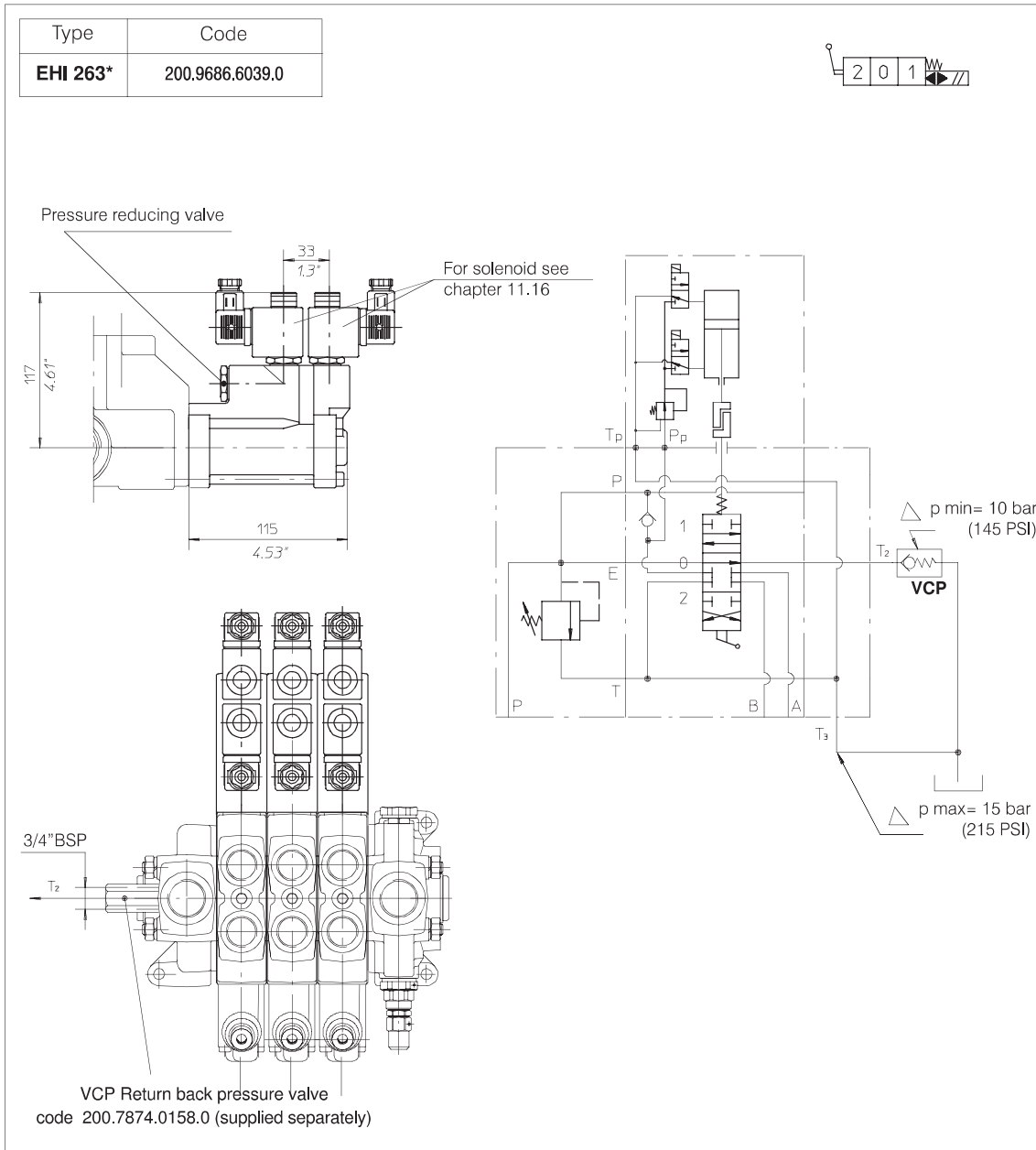
Joystick adjustment diagram



## Monobloc and Sectional Directional Control Valve 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

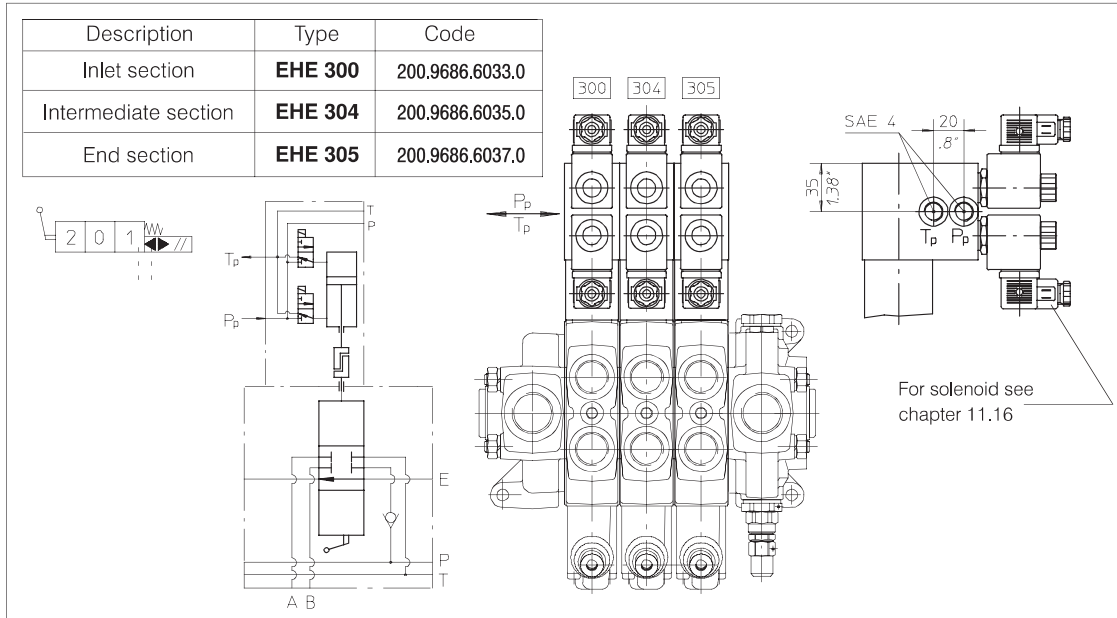
Max pressure on P<sub>p</sub> port . . . . . 300 bar (4300 PSI)  
 Reduced pressure after  
 pressure reducing valve . . . . . 10 bar (145 PSI)  
 Fixed delivery on P<sub>p</sub> pilot line . . . . 1 l/min (0.26 U.S.G.P.M)  
 Leakage of pressure reducing  
 valve (in neutral pos.) . . . . . 100 ml/min ( 6.1 in<sup>3</sup>/min)

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

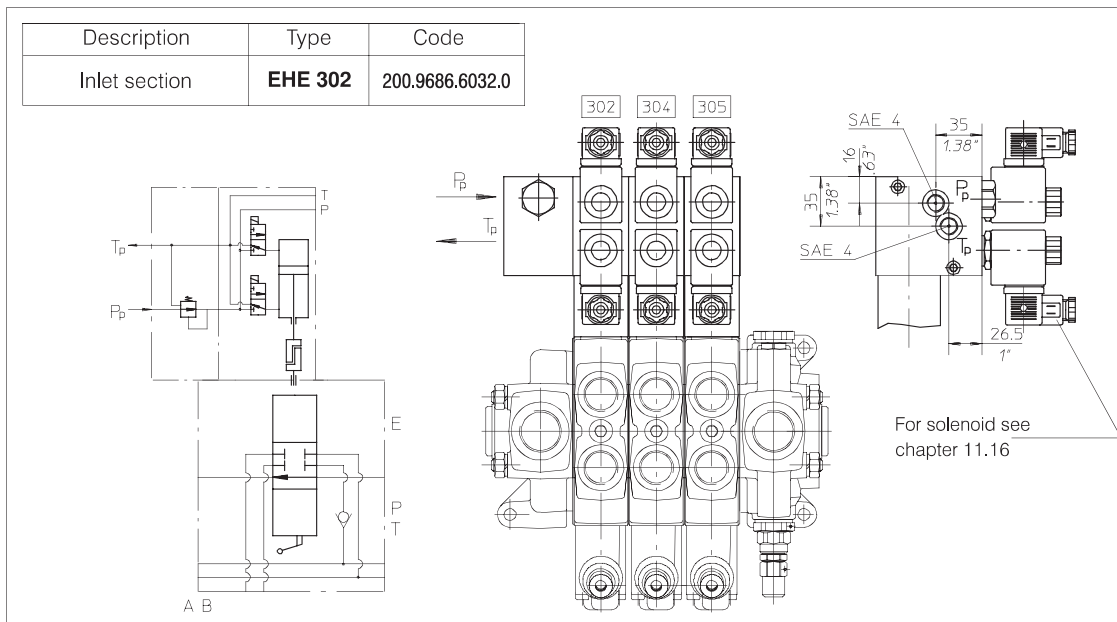
\* EHI 263 Versions special body required

## Monobloc and Sectional Directional Control Valve 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



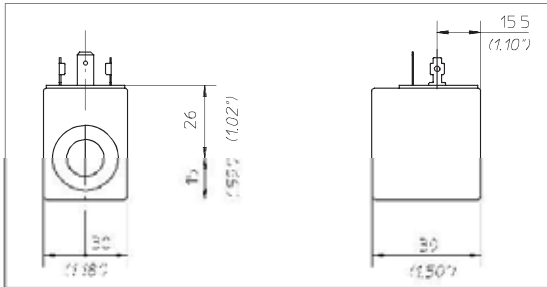
#### Mechanical and hydraulic features

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 in<sup>3</sup>/min)  
 Min. suggested filtration . . . . . 25 micron

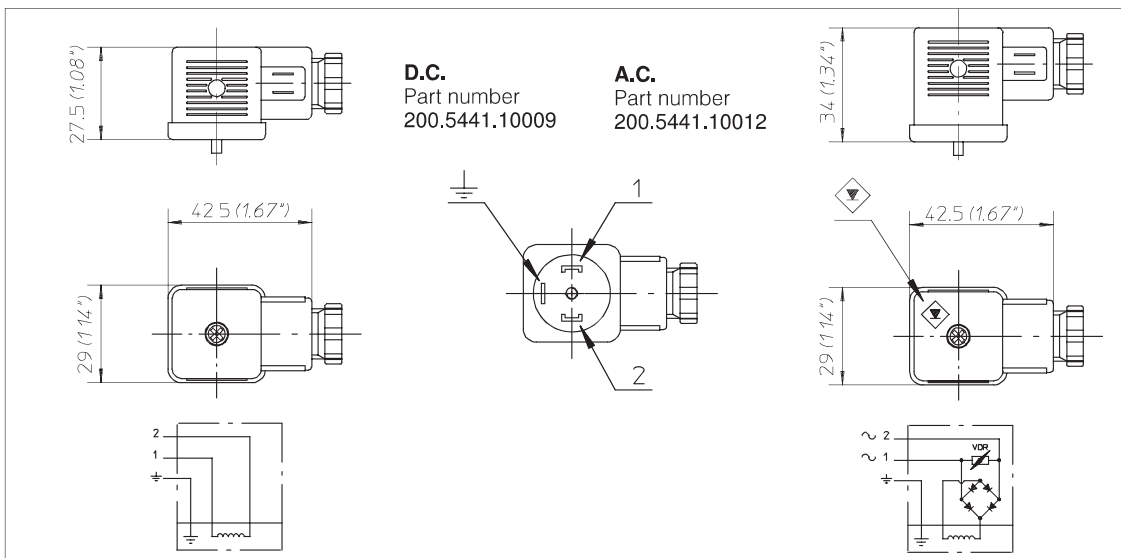
## Monobloc and Sectional Directional Control Valve HDS30

### 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 <sup>2</sup>
Outer material	Glass fibre reinforced nylon
Protection factor	IP65 (DIN 40050)
Insulation class	C (VDE 0110)
Temperature range	-40° +90°C