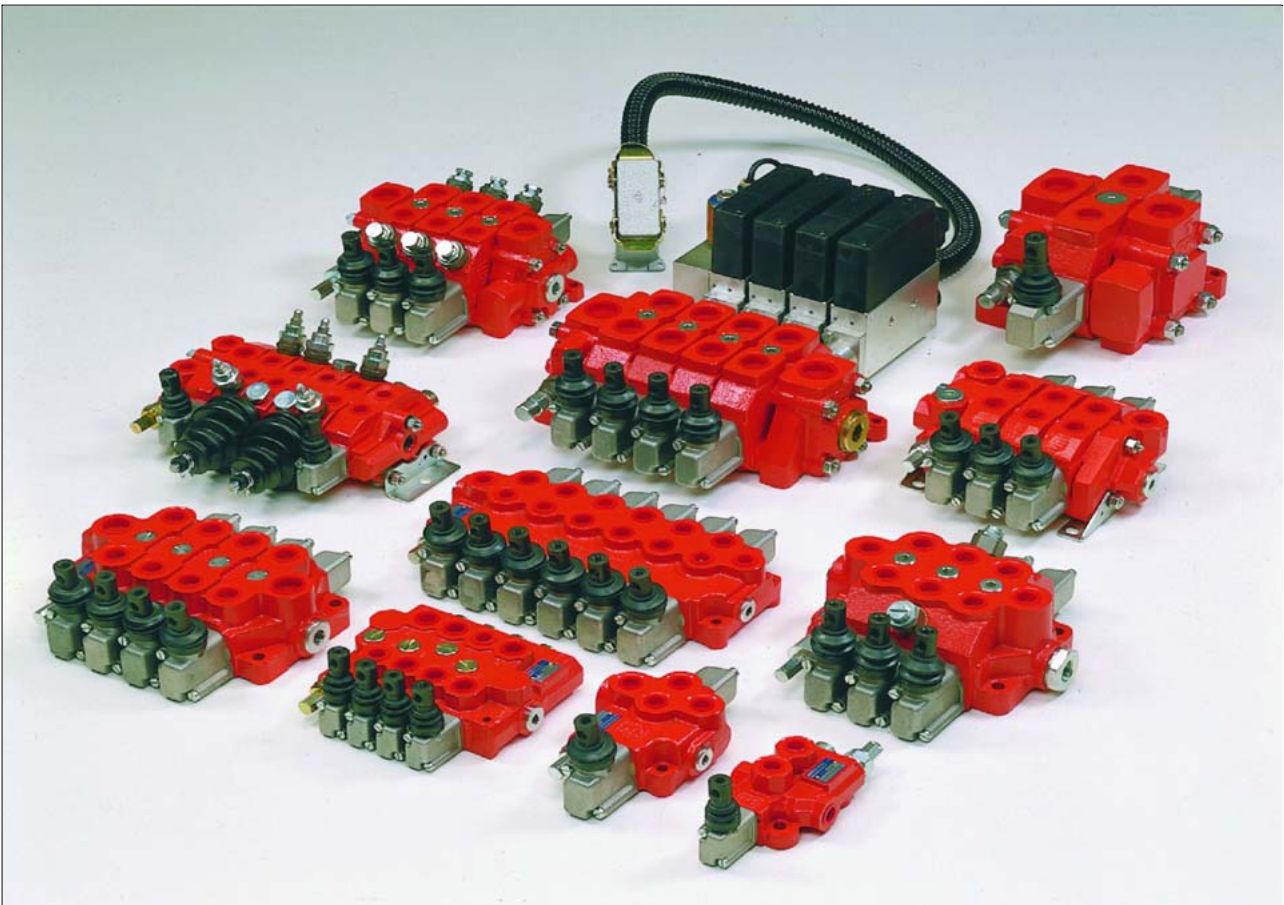


## Monobloc and Sectional Directional Control Valves



**8 Sectional directional control valves HDS11**

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## 8A Standard valves

### 8A.1 General specifications

Technical specification		
Max flow rate	l/min U.S.G.P.M.	45 12
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 tank port T	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	12 0.854
Average	cm <sup>3</sup> /min Cu. In./min	6 0.427

Number of spools	1 to 10
Adjustable direct operated 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
Mechanical release check valve	RSM1

#### 8A.1.1 Weight

Version	kg	lb
Inlet with RV and P	1	2.21
1 spool section (standard without options)	1.30	2.86
End cover standard	0.65	1.43
End cover with T and H.P.C.O.	0.75	1.65

#### 8A.1.2 Material specification:

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

#### 8A.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 selections inlets, work ports, and outlets threaded ports.
- 5) Negative overlapping of the spool.

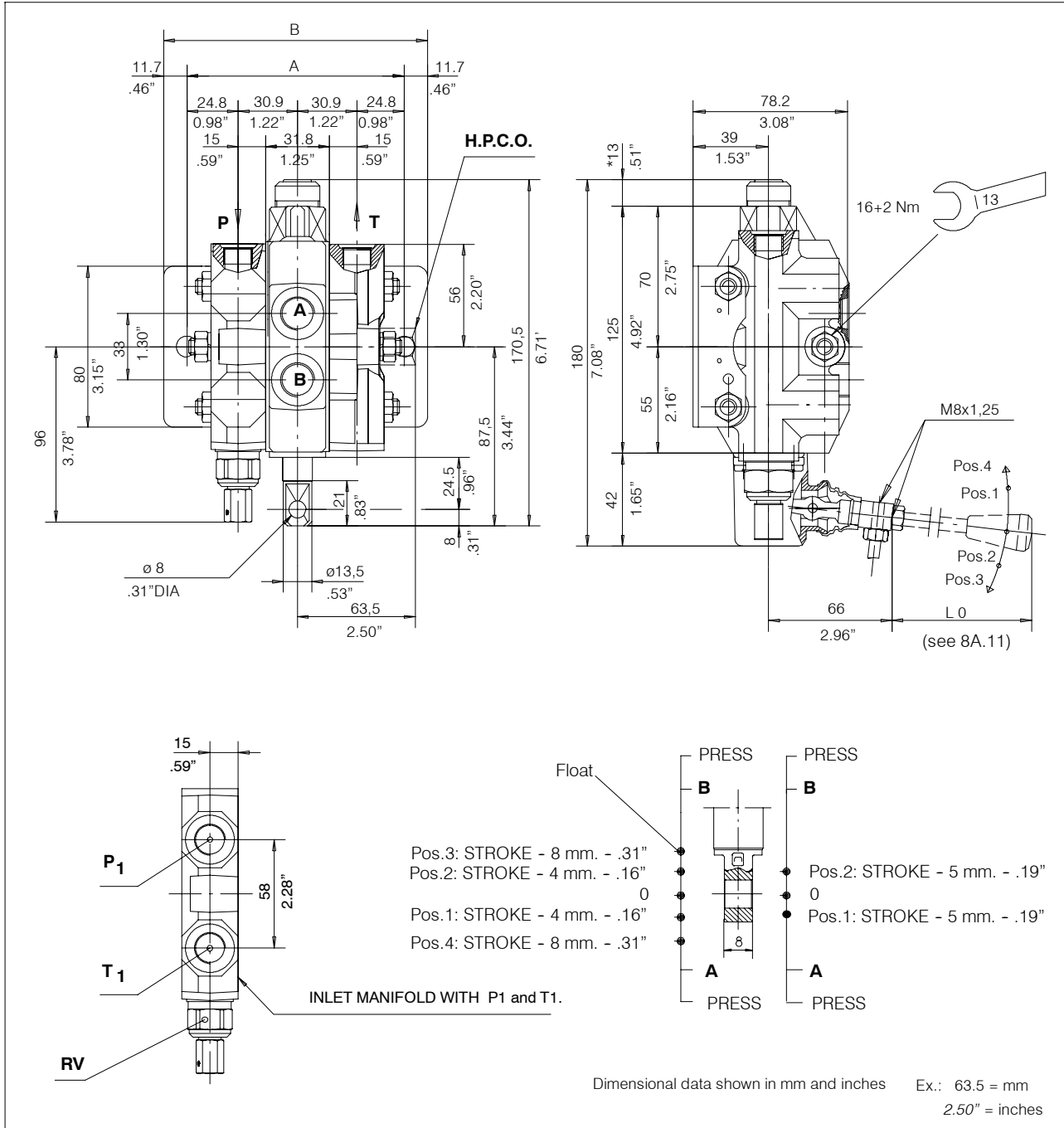
#### 8A.1.4 Optional features available:

- 1) Open or closed centre positions, 3 or 4 way operations, 3 or 4 position (float position), full open centre (motoring spool) and other spool options.
- 2) Carry over.
- 3) Series connection and priority pressure.
- 4) Pressure compensated flow control.
- 5) Complete lever assembly.

#### 8A.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>**: top inlet and outlet  
3.1.0.2: spool position  
**P**: pressure line  
**T**: exhaust line  
**E**: centre line (by pass).

**8A.2 Dimensional data**

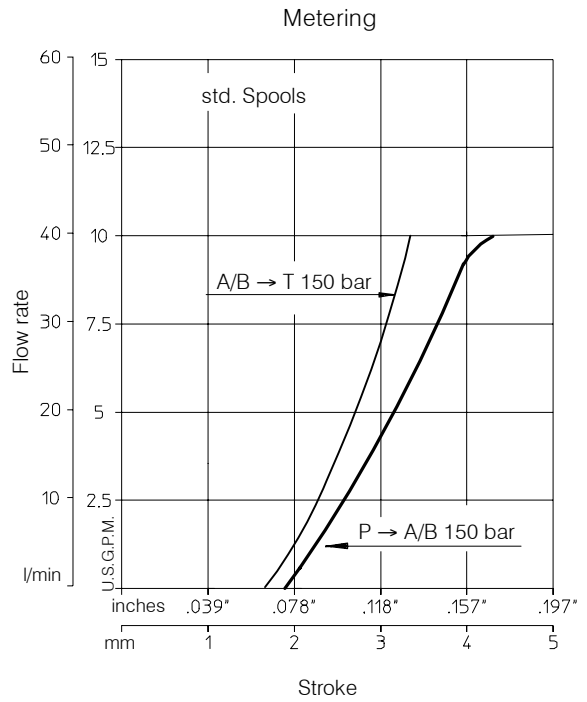
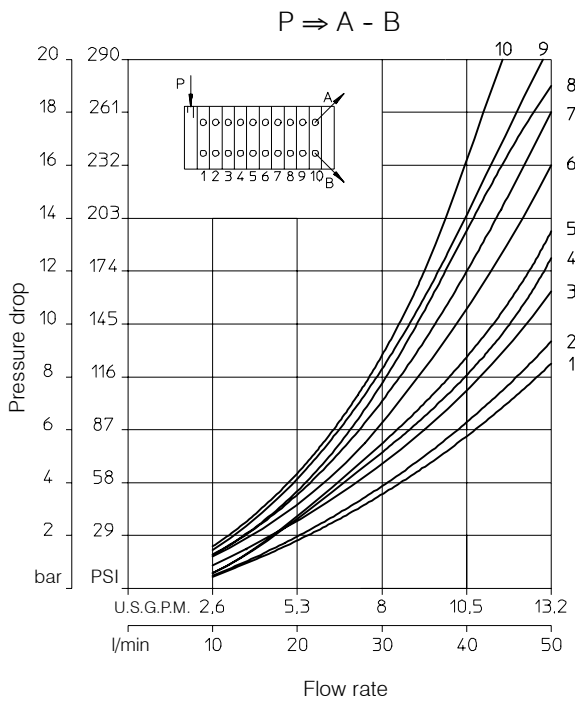
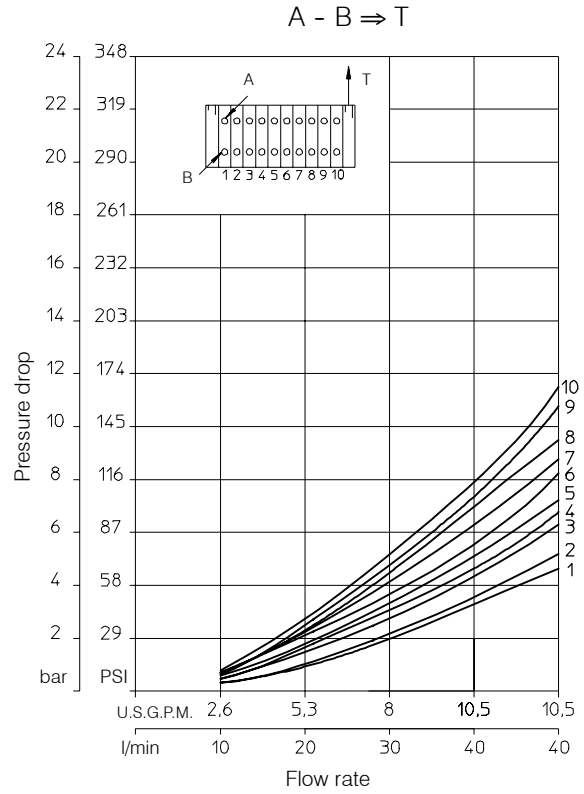
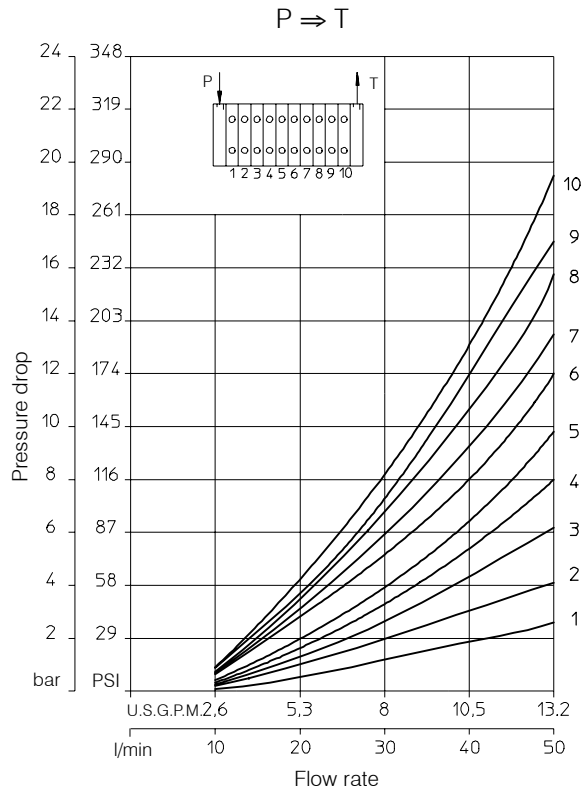


N. of sections		1	2	3	4	5	6	7	8	9	10
Dimension	A	111.4	143.2	175	206.8	238.6	270.4	302.2	334	365.8	397.6
		4.38"	5.64"	6.89"	8.14"	9.39"	10.64"	11.90"	13.15"	14.40"	15.65"
Dimension	B	134.8	166.6	198.4	230.2	262	293.8	325.6	357.4	389.2	421
		5.31"	6.56"	7.81"	9.06"	10.31"	11.57"	12.82"	14.07"	15.32"	16.57"

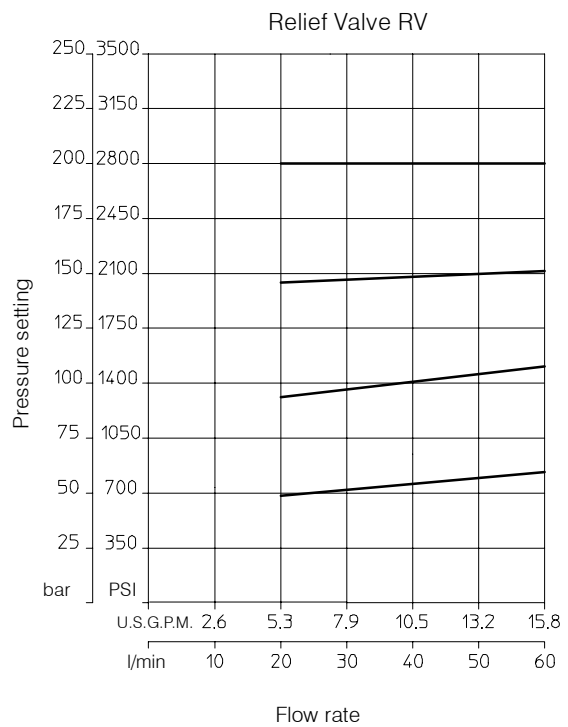
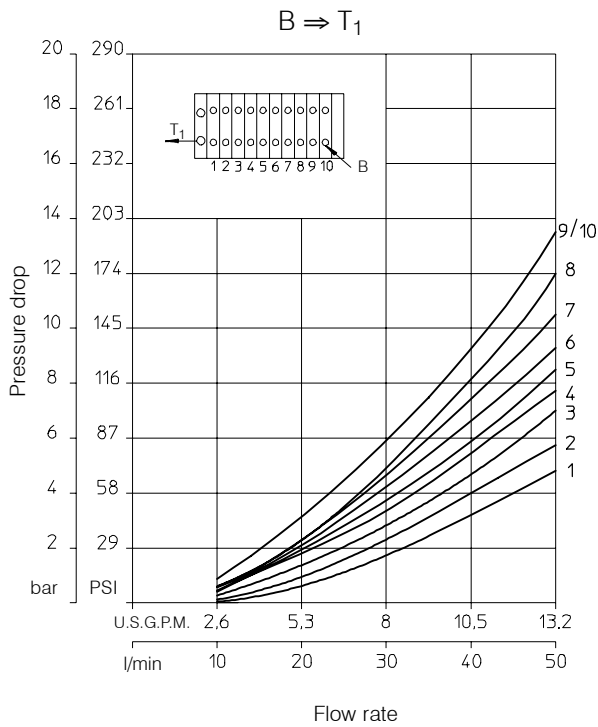
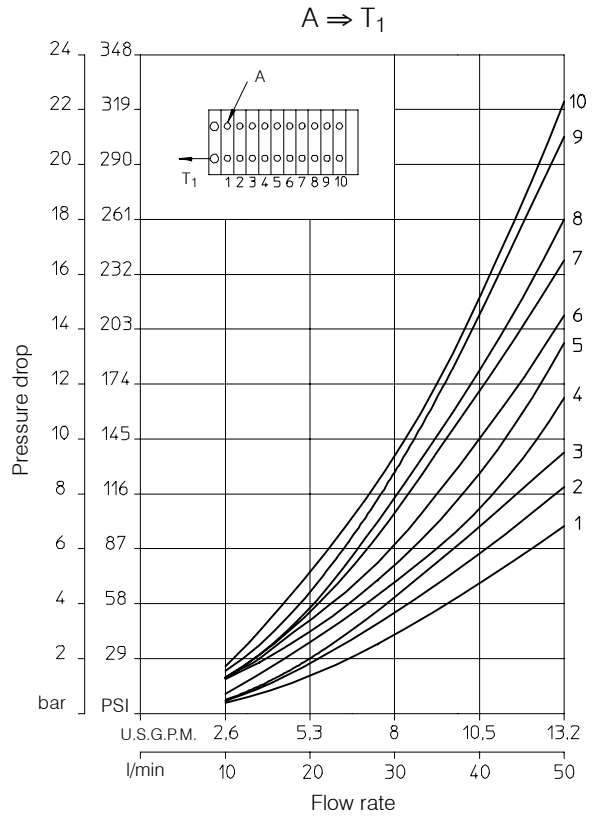
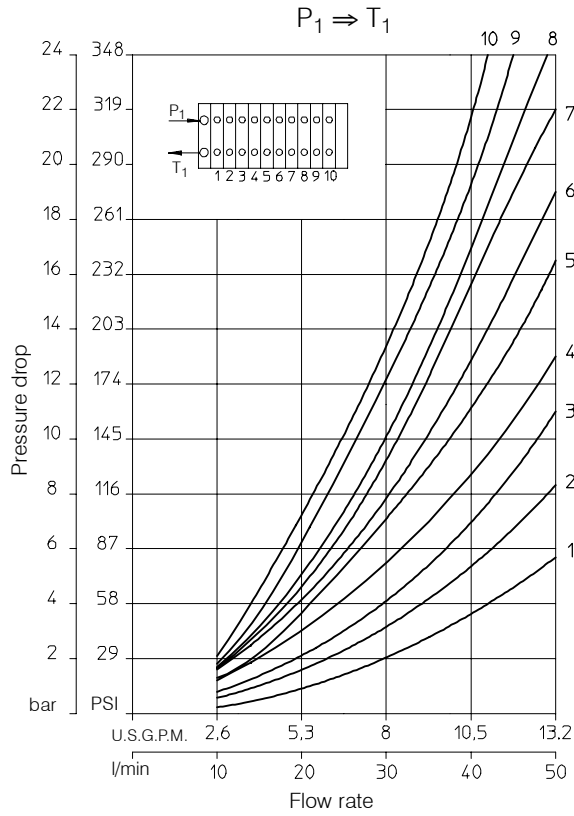
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## 8A.3 Performance curves

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



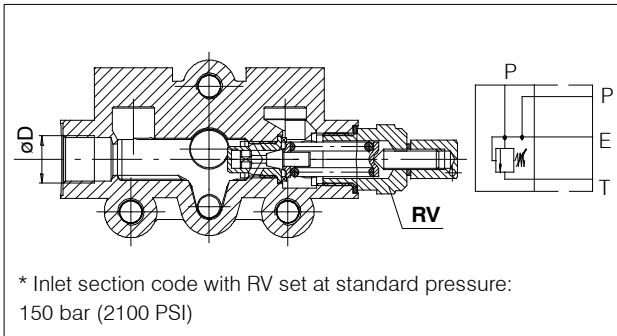
Oil: Shell Tellus T37  
 Temperature: 50° C (120° F)  
 Viscosity: 27 mm<sup>2</sup>/s



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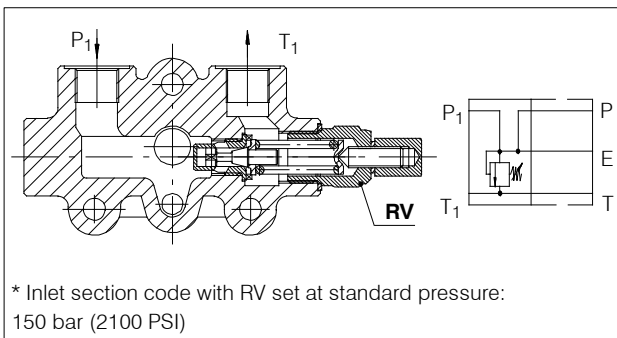
## 8A.4 Inlet and outlet covers

### 8A.4.1 Inlet manifold (standard) with P and RV



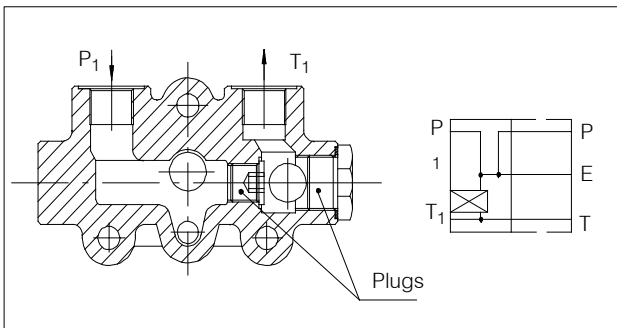
Ø D	Type	Code
SAE6	<b>T06</b>	* 200.9310.6002.0
SAE8	<b>T07</b>	* 200.9310.7003.0
3/8" BSP	<b>T09</b>	* 200.9310.2002.0
M18X1.5	<b>T10</b>	* 200.9310.1003.0

### 8A.4.2 Inlet manifold with P<sub>1</sub> - T<sub>1</sub> - RV



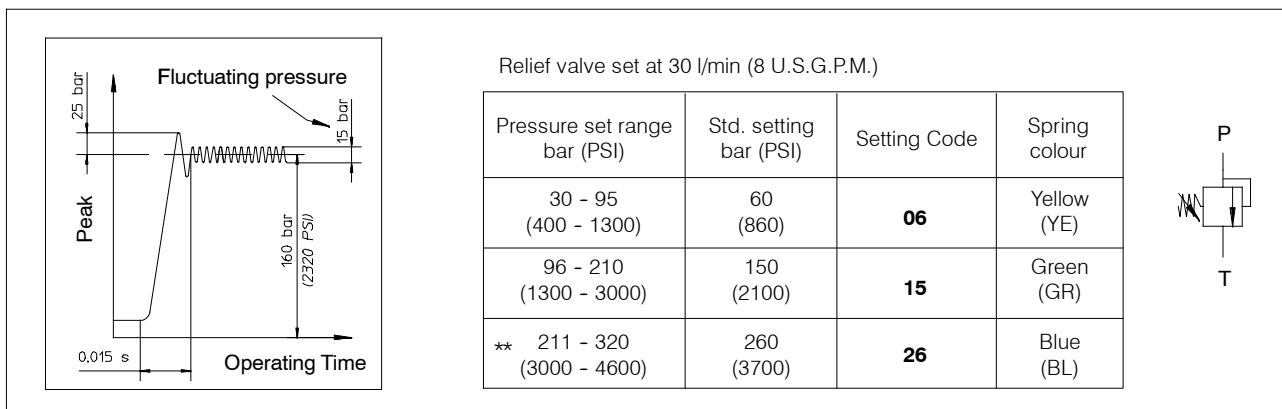
Ø D	Type	Code
SAE6	<b>T11</b>	* 200.9310.6003.0
SAE8	<b>T12</b>	* 200.9310.7002.0
3/8" BSP	<b>T14</b>	* 200.9310.2003.0
M18X1.5	<b>T15</b>	* 200.9310.1002.0

### 8A.4.3 Inlet manifold with P<sub>1</sub> - T<sub>1</sub>



Ø D	Type	Code
SAE6	<b>T16</b>	200.9310.6004.0
SAE8	<b>T17</b>	200.9310.7005.0
3/8" BSP	<b>T19</b>	200.9310.2004.0
M18X1.5	<b>T20</b>	200.9310.1004.0

## 8A.5 Adjustable direct acting pressure Relief Valve RV

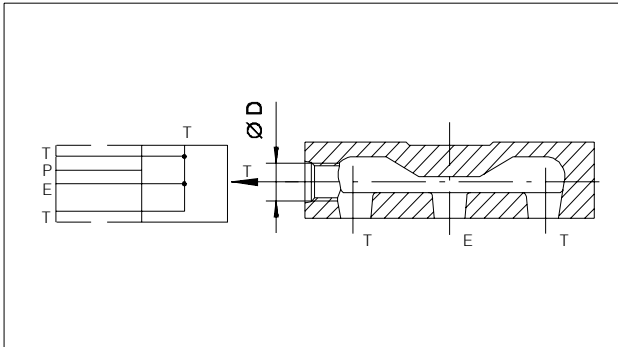


\*\* The maximum operating pressure for each valve series is indicated in the "Technical specification" at the first page of each valve section.

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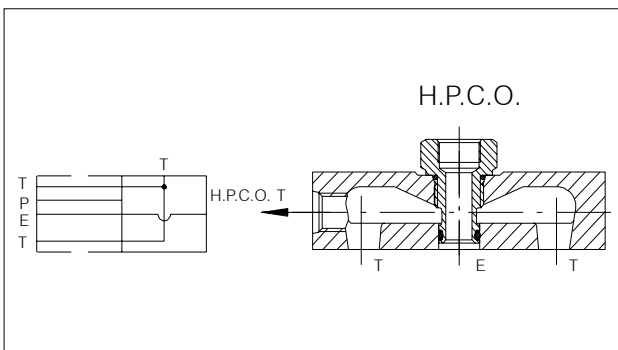
## 8A.6 End covers

### 8A.6.1 Outlet manifold (std) with T and open center



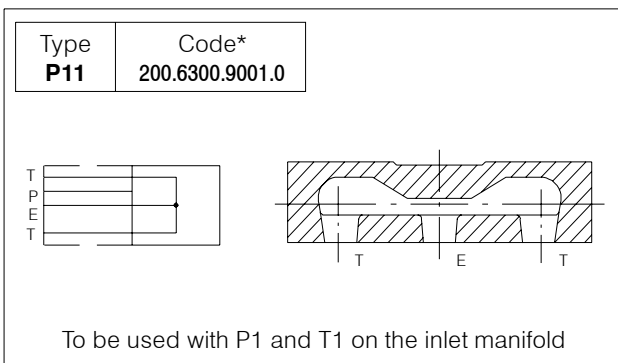
Ø D	Type	Code
SAE6	<b>P01</b>	200.6300.6001.1
SAE8	<b>P02</b>	200.6300.7001.0
3/8" BSP	<b>P04</b>	200.6300.2001.1
M18X1.5	<b>P05</b>	200.6300.1001.0

### 8A.6.2 Outlet manifold with T and H.P.C.O. (power beyond)

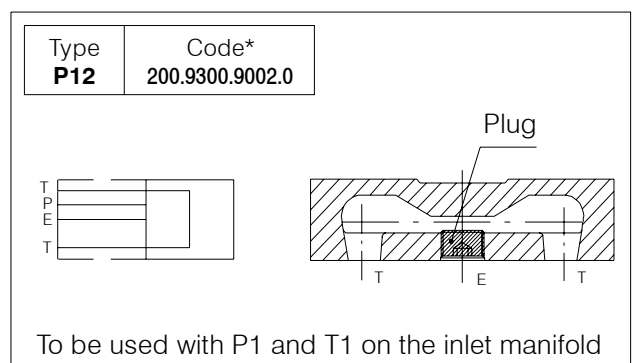


Ø D	Type	Code
SAE6	<b>P06</b>	200.9300.6002.0
SAE8	<b>P07</b>	200.9300.7002.0
3/8" BSP	<b>P09</b>	200.9300.2002.0
M18X1.5	<b>P10</b>	200.9300.1002.0

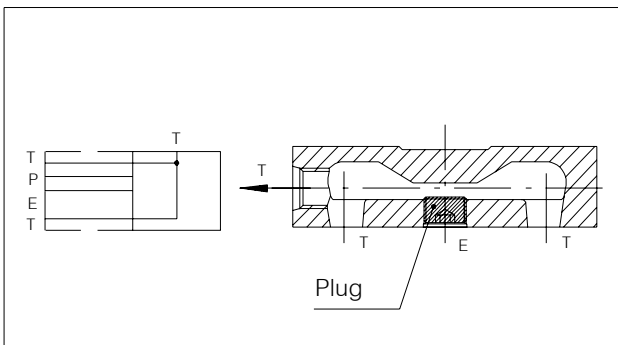
### 8A.6.3 Outlet manifold with open center



### 8A.6.4 Outlet manifold with closed center



### 8A.6.5 Outlet manifold with T and closed center



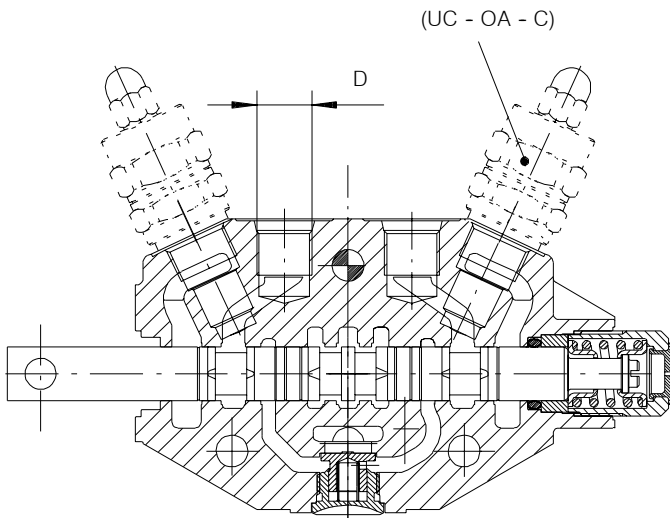
Ø D	Type	Code
SAE6	<b>P13</b>	200.9300.6003.0
SAE8	<b>P14</b>	200.9300.7003.0
3/8" BSP	<b>P16</b>	200.9300.2003.0
M18X1.5	<b>P17</b>	200.9300.1003.0



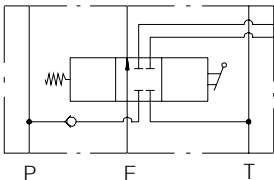
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## 8A.7 Sectional bodies

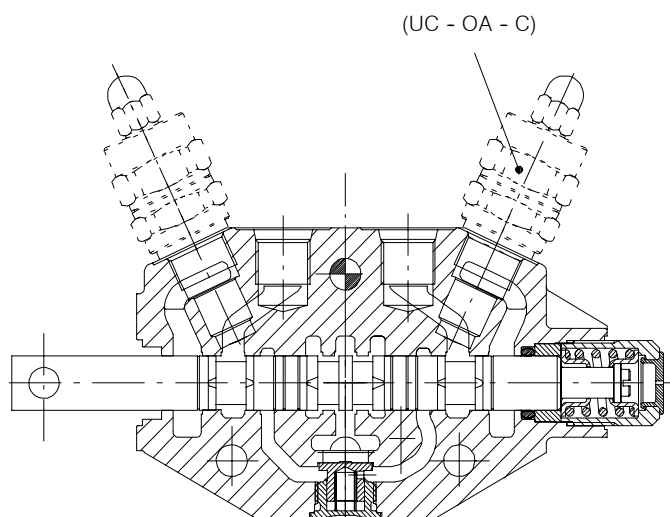
### 8A.7.1 Standard circuit: parallel



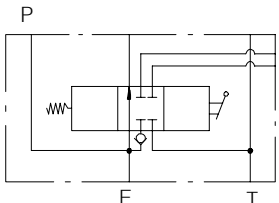
Ø D	Type/Code	
	Standard	Section with valve UC - OA - C
SAE6	<b>K01</b> 200.9413.6051.0	<b>K06</b> 200.9413.6053.0
SAE8	<b>K02</b> 200.9413.7027.0	<b>K07</b> 200.9413.7028.0
3/8" BSP	<b>K04</b> 200.9413.2624.0	<b>K09</b> 200.9413.2625.0
M18X1.5	<b>K05</b> 200.9413.1272.0	<b>K10</b> 200.9413.1273.0



### 8A.7.2 Optional circuit: series and tandem



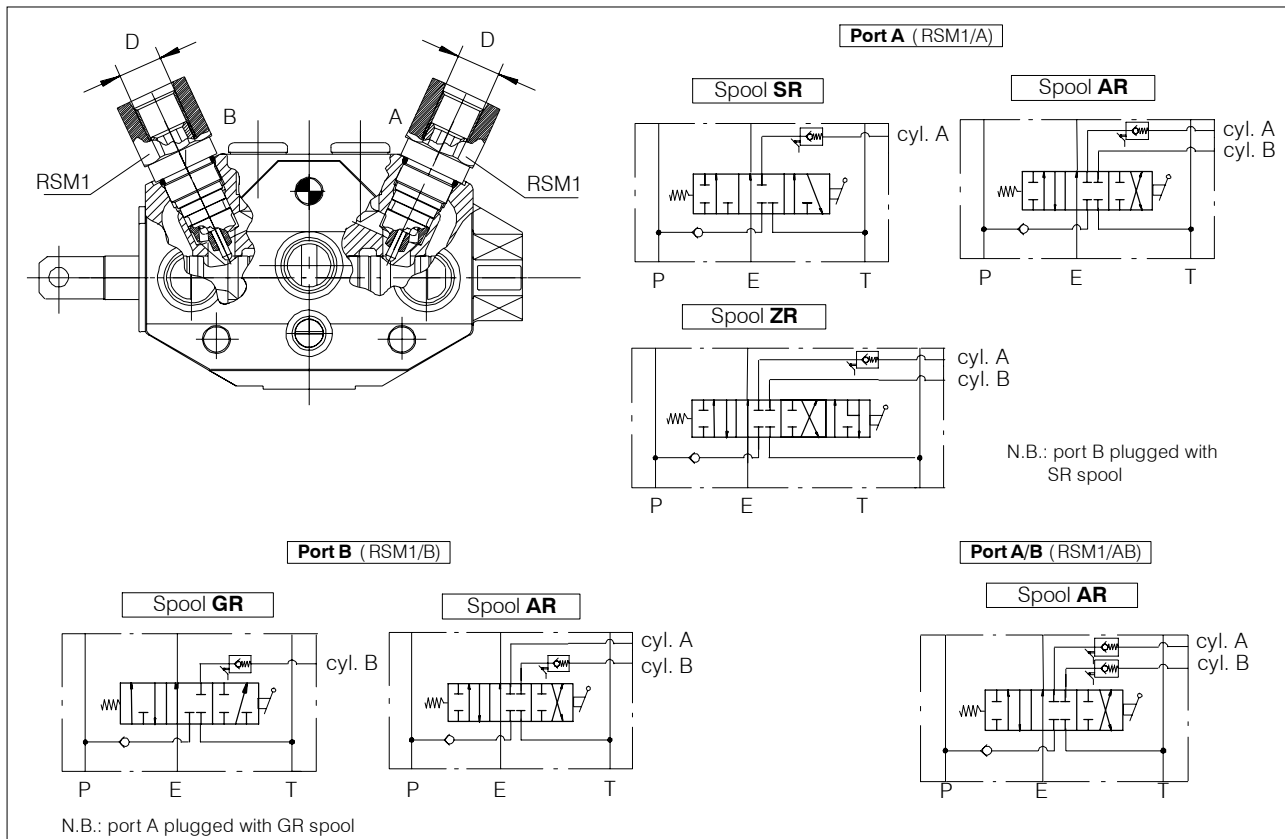
Ø D	Type/Code	
	Standard	Section with valve UC - OA - C
SAE6	<b>K47</b> 200.9413.6052.0	<b>K52</b> 200.9413.6054.0
SAE8	<b>K48</b> 200.9413.7029.0	<b>K53</b> 200.9413.7030.0
3/8" BSP	<b>K50</b> 200.9413.2626.0	<b>K55</b> 200.9413.2627.0
M18X1.5	<b>K51</b> 200.9413.1274.0	<b>K56</b> 200.9413.1275.0



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

### 8A.7.3 Check valves with mechanical release RSM1 on A/B ports

The check valve taper seal is released by means of a taper on the spool and by a push rod.



### 8A.7.4 Directional control valve bodies for RSM1 valve

Ø D	RSM1/A		RSM1/B	RSM1/A-B	RSM1 Code
	Spool SR-AR	Spool ZR	Spool GR-AR	Spool AR	
	Type/Code	Type/Code	Type/Code	Type/Code	
SAE6	<b>K65</b> 200.9413.6061.0		<b>K66*</b> 200.9413.6062.0	<b>K62*</b> 200.9413.9014.0	200.7876.0192.0
3/8" BSP	<b>K63</b> 200.9413.2034.0	<b>K40**</b> 200.9413.2033.0	<b>K64*</b> 200.9413.2035.0		200.7876.0191.0
M18X1.5	<b>K60</b> 200.9413.1279.0	<b>K70**</b> 200.9413.1046.0	<b>K61*</b> 200.9413.1280.0		200.7876.0190.0

\* : K61 - K62 - K64 - K66 need special lever L153 - L353

\*\* : K40 - K70 need special lever L175-L375

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

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## 8A.8 Spool charts

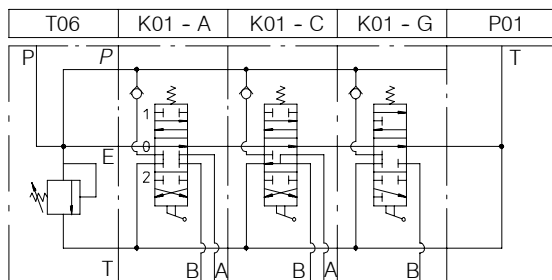
Spool scheme	Spool features	Type
	4 way - 3 position A/B closed E open by pass	<b>A</b> <b>AR**</b>
	High metering spool (max flow suggested 15 l/min.)	<b>AS</b>
	4 way - 3 position A/B-E closed	<b>B</b>
	4 way - 3 position A/B to tank in neutral E open by pass	<b>C</b>
	3 way - 3 position B closed E open by pass	<b>G</b> <b>GR**</b>

	3 way - 3 position A closed E open by pass	<b>S</b> <b>SR**</b>
	4 way - 3 position series connection	<b>X</b>
	4 way - 4 position 4 <sup>th</sup> floating position	<b>Z</b> <b>ZR**</b>
	4 way - 4 position 4 <sup>th</sup> floating position	<b>WW</b> <b>*</b>

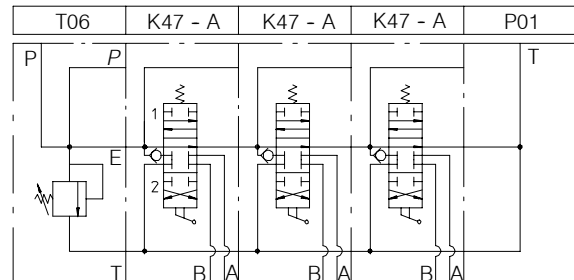
\* : "WW" spool require special body (K...), positioner (240) and lever (L192)  
\*\* : special body required

## 8A.9 Hydraulic circuits

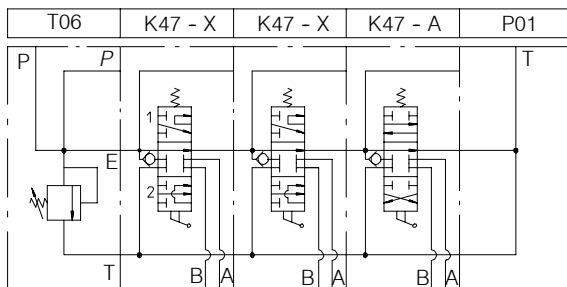
Standard parallel circuit



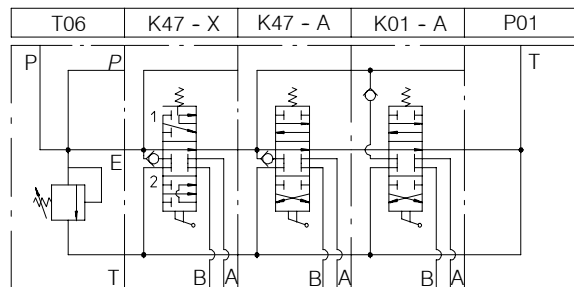
Optional tandem circuit



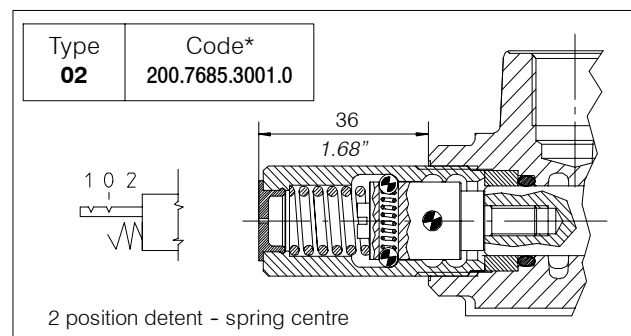
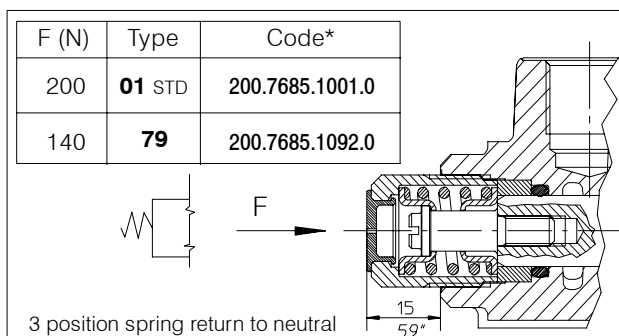
Optional series circuit



Combined parallel/series circuit



## 8A.10 Spool positioners

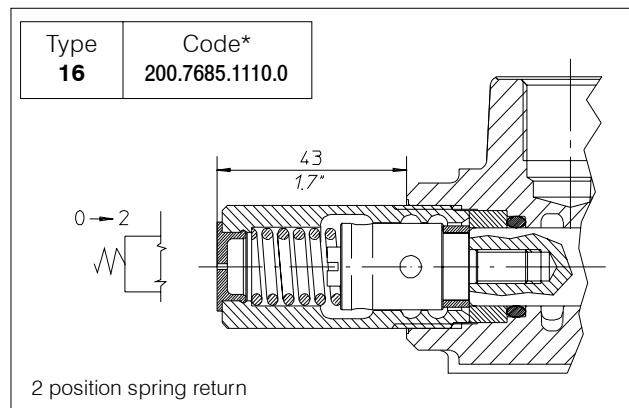
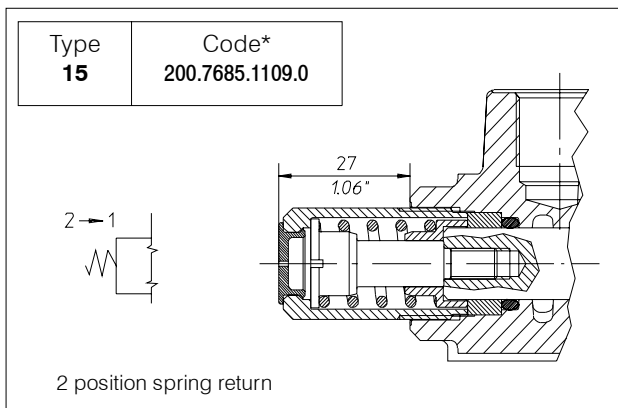
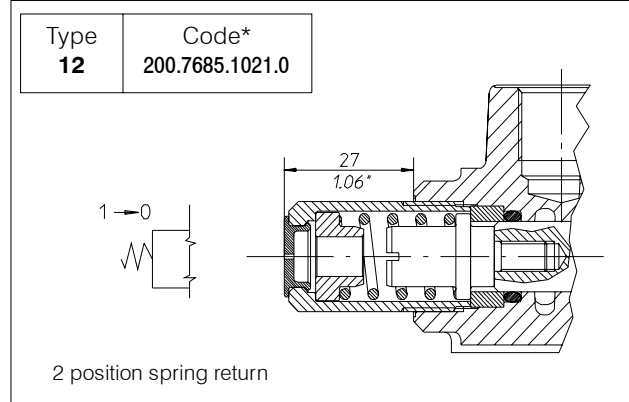
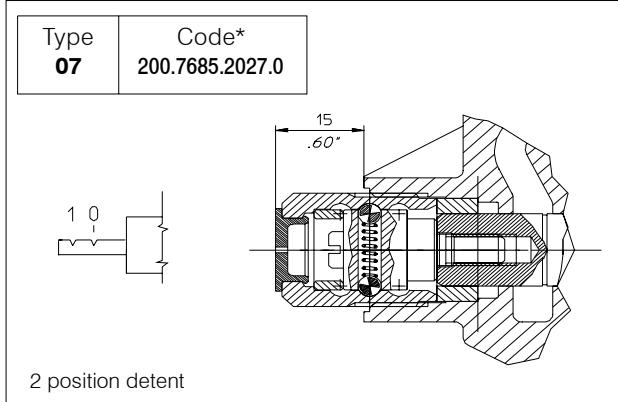
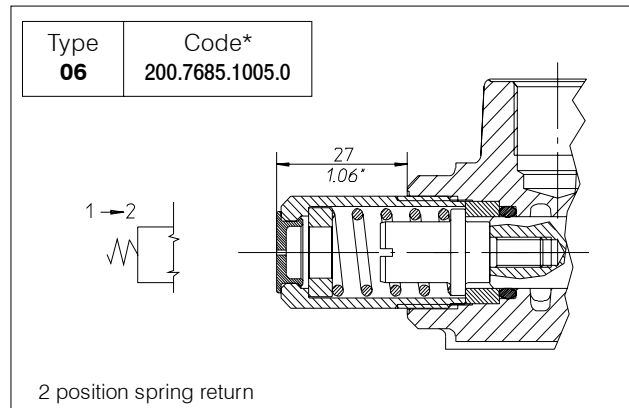
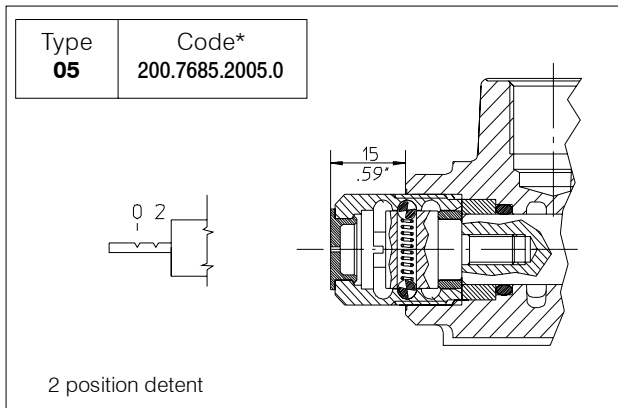
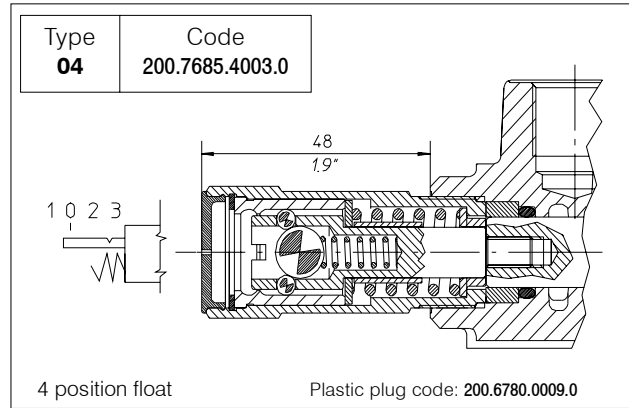
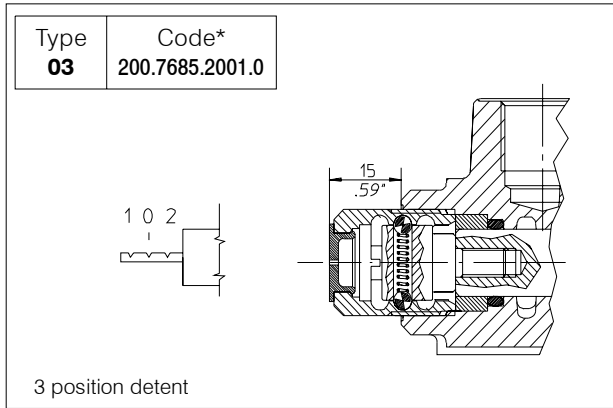


\* : code without plastic plug; plastic plug code: 200.6780.0008.0

Code F (N)\*\*: force in Newton (N) needed to operate the spool

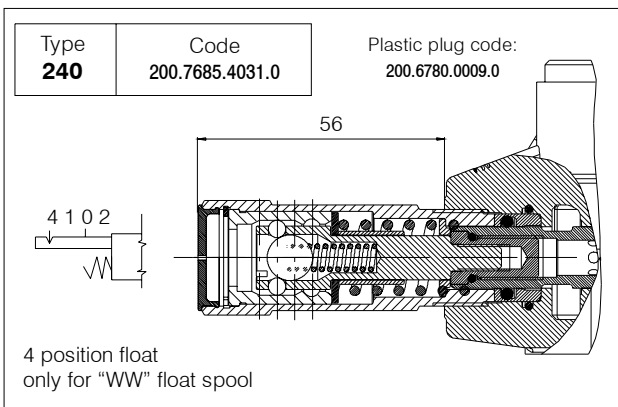
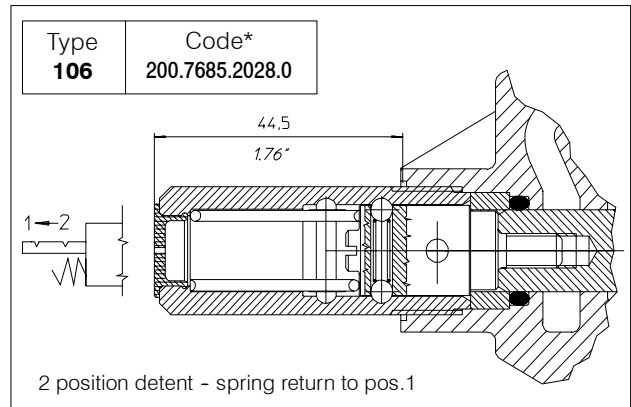
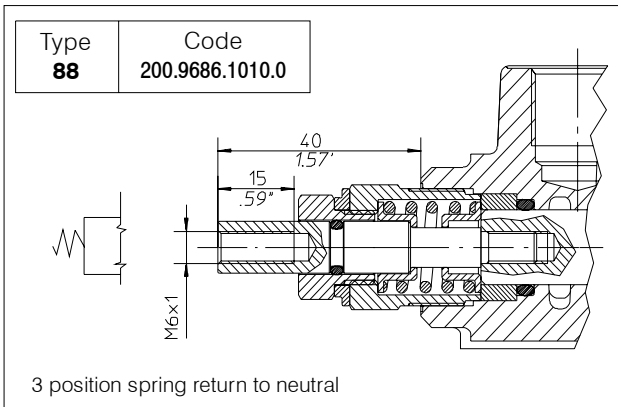
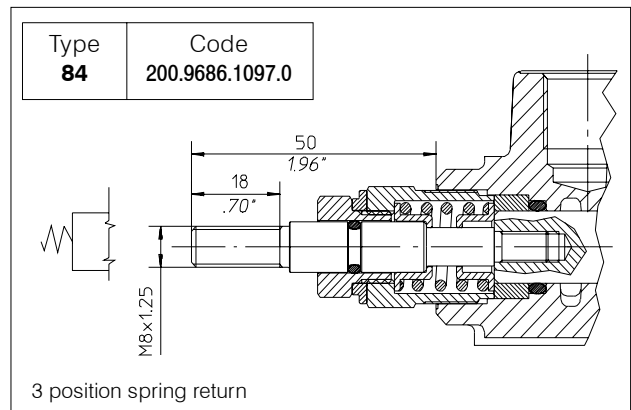
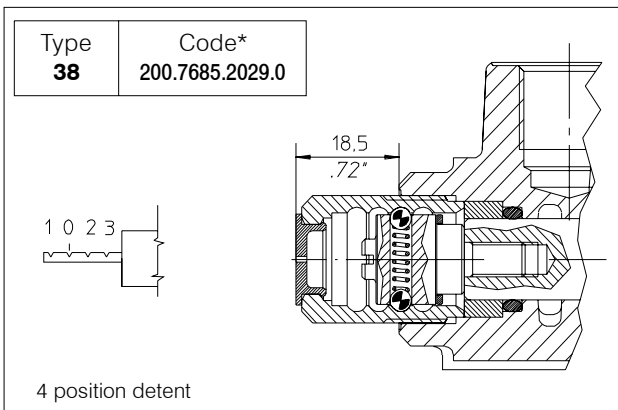
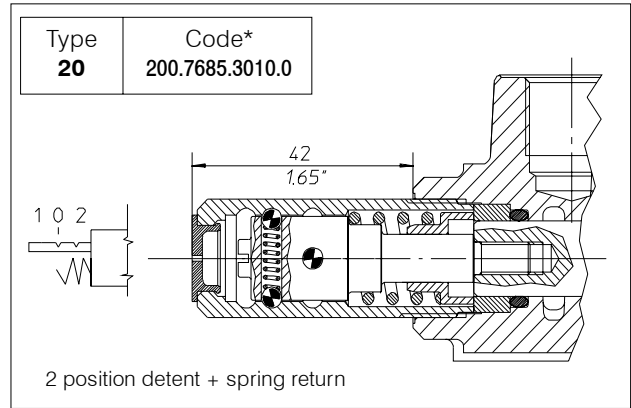
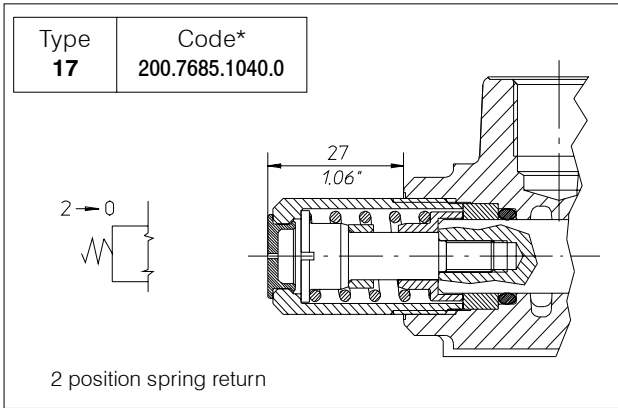
200 - P - 991210 - E - 03/09.2015

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\* : code without plastic plug; plastic plug code: 200.6780.0008.0

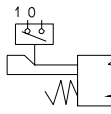
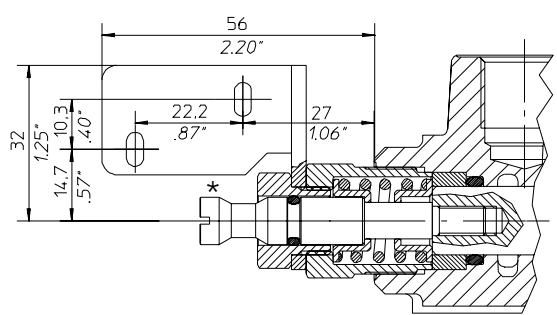
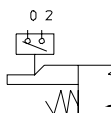
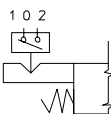
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\* : code without plastic plug; plastic plug code: 200.6780.0008.0

HDS11

### 8A.10.1 Microswitch control on each single element

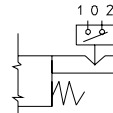
Type <b>30</b>	Code 200.9686.1050.0	Microswitch is operated when the spool is in pos. 1		
Type <b>32</b>	Code 200.9686.1060.0	Microswitch is operated when the spool is in pos. 2		
Type <b>34</b>	Code 200.9686.1064.0	Microswitch is operated when the spool is in pos. 1 and 2		

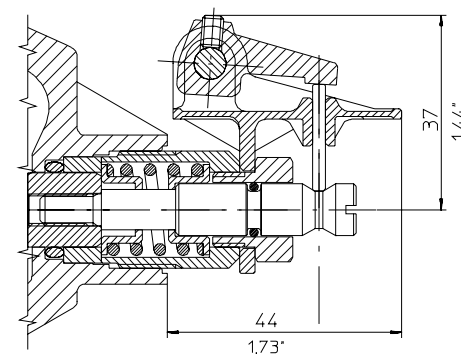
\* The microswitch is supplied only on customer's request

### 8A.10.2 Single microswitch control for multi-sectional valves (from 1<sup>st</sup> up to second-last element).

Type <b>39 (MSF)</b>	Code 200.9686.1139.0			
-------------------------	-------------------------	--	--	--

Microswitch is operated when the spool is in pos. 1 and 2

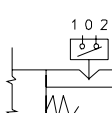


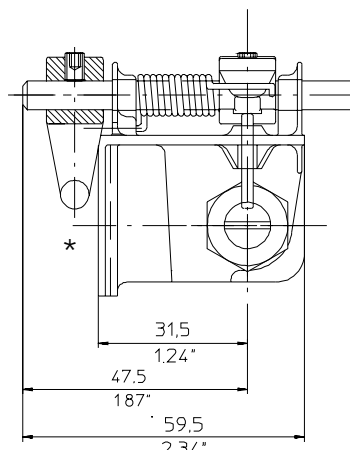


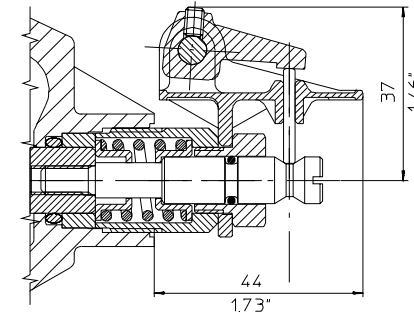
### 8A.10.3 Single microswitch control for multi-sectional valves (last element, T side).

Type <b>40 (MFL)</b>	Code 200.9686.1140.0			
-------------------------	-------------------------	--	--	--

Microswitch is operated when the spool is in pos. 1 and 2





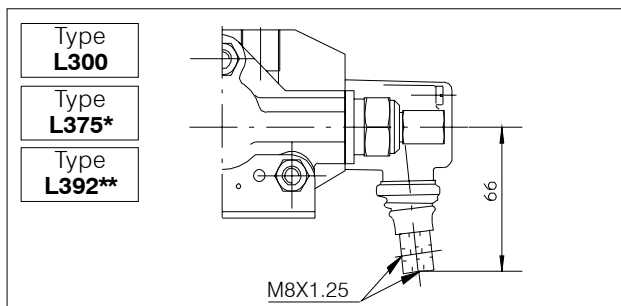
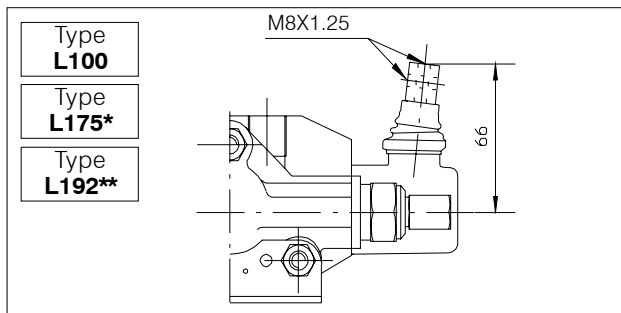
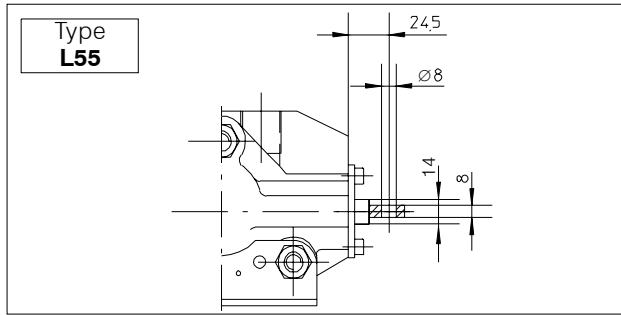


\* The microswitch is supplied only on customer's request

1 - Positioner 40 must be assembled only on the last element near T port  
2 - Positioner 40 require T port plugged. Use T1 on inlet cover

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## 8A.11 Lever styles

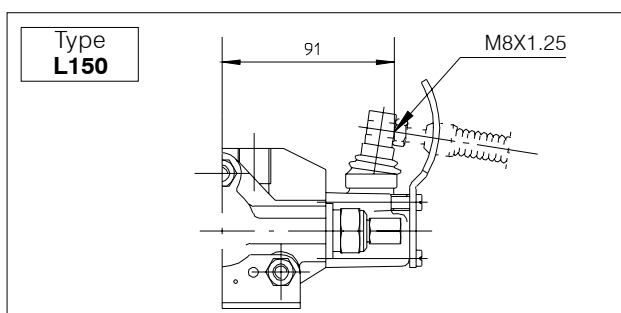
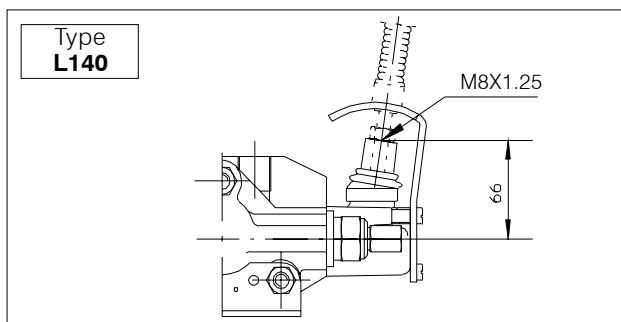


Lo		Type	Code
mm	inches		
150	5.90	<b>AL001</b>	200.7022.1019.0
200	7.87	<b>AL002</b>	200.7022.1003.0
250	9.84	<b>AL003</b>	200.7022.1005.0
300	11.81	<b>AL004</b>	200.7022.1006.0

\*: L175 - L375 only for "Z" spool application

\*\* : L192 - L392 only for "WW" spool application

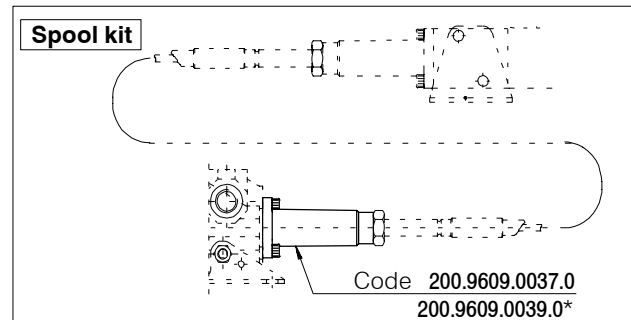
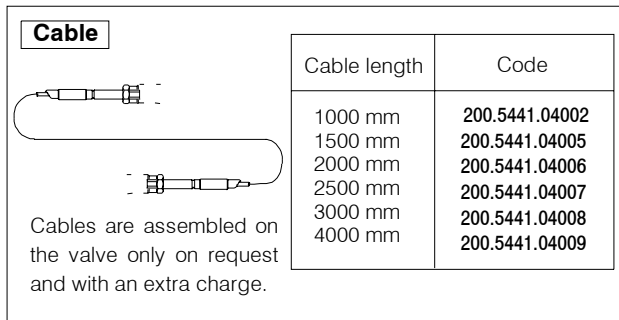
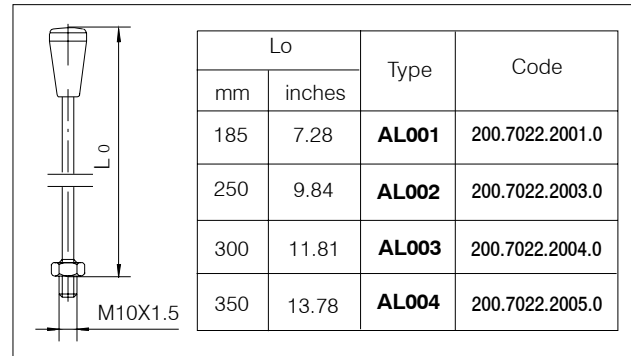
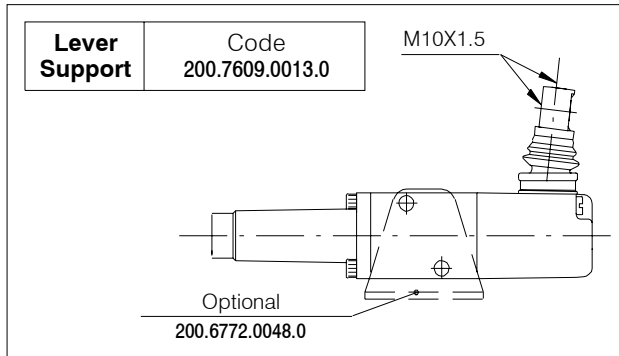
### 8A.11.1 Safety levers



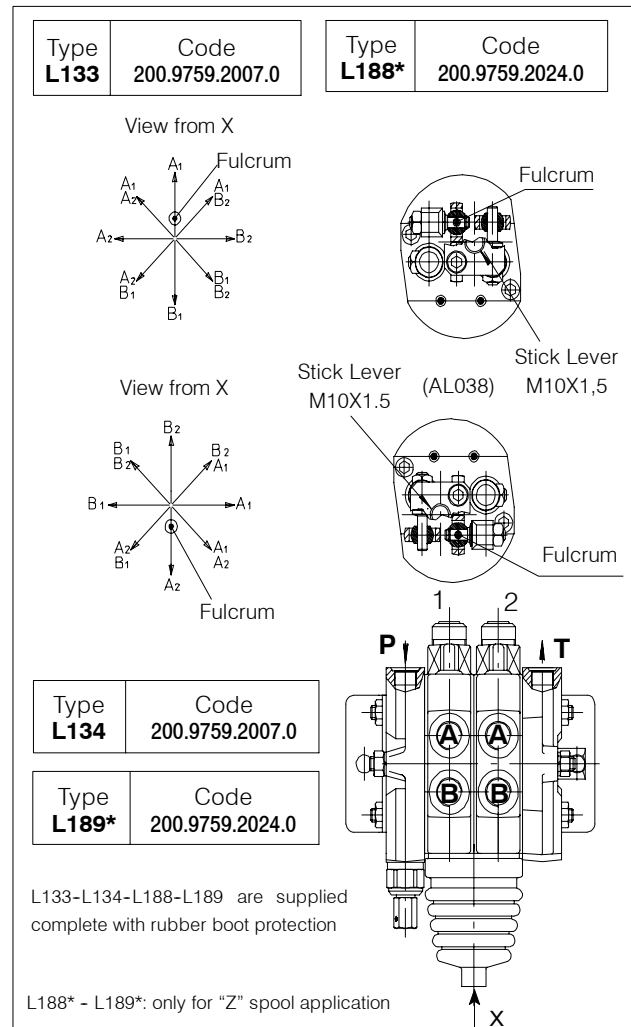
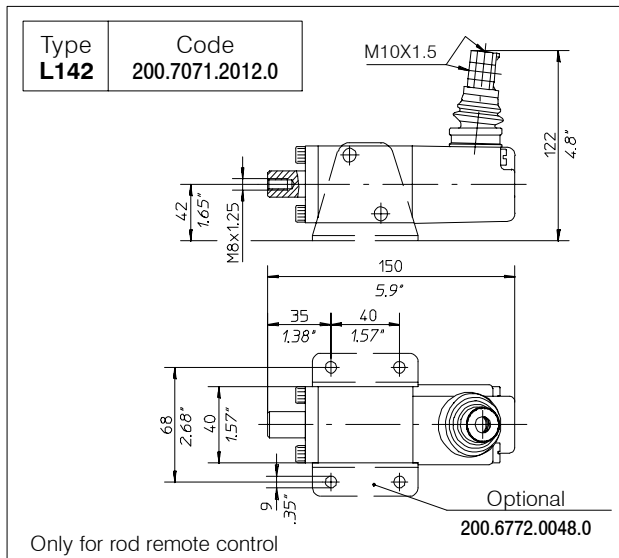
Lo		Type	Code
mm	inches		
160	6.30	<b>AL014</b>	200.7022.1009.0
180	7.08	<b>AL018</b>	200.7022.1011.0

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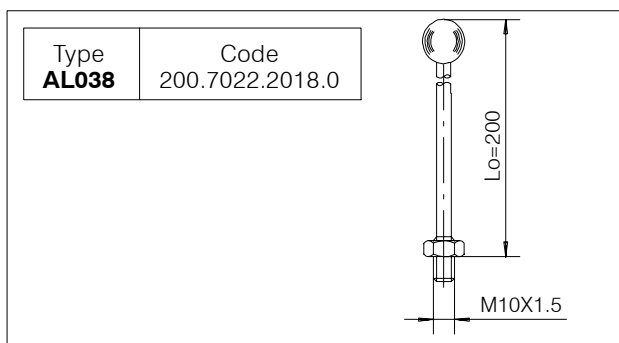
## 8A.11.2 Remote cable control



\* only for "Z" spool application



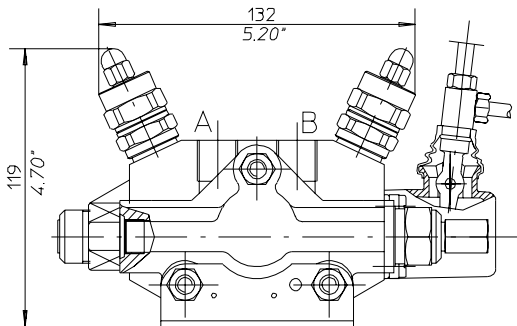
## 8A.11.3 Cross joystick for dual axis spool control





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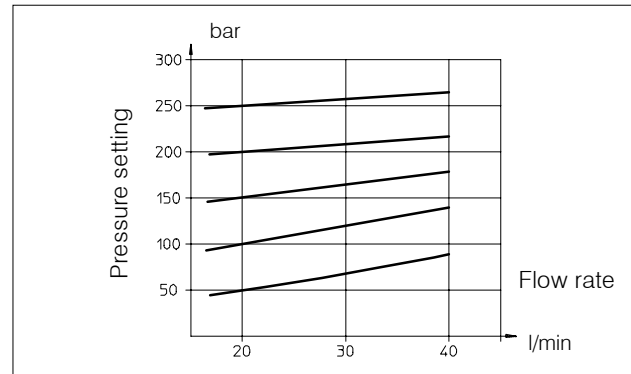
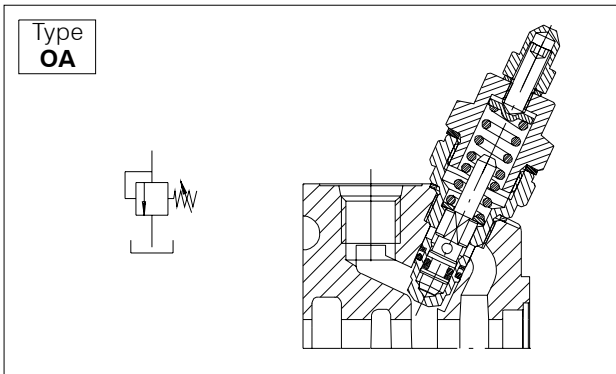
## 8A.12 Port relief and anti-cavitation valves



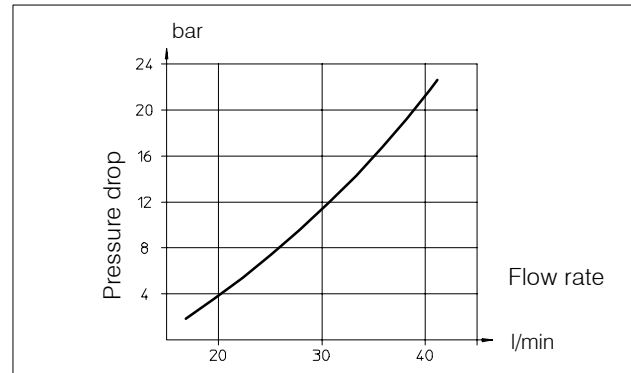
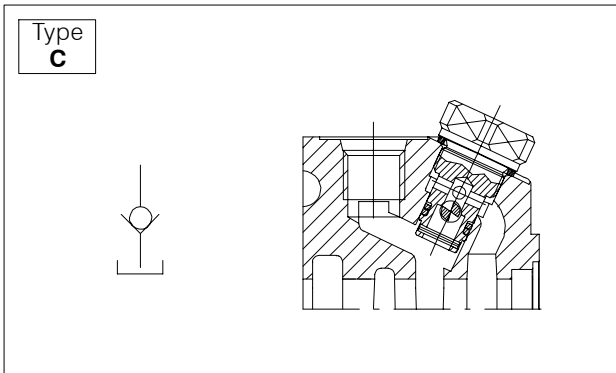
Port relief valve settings

Pressure set range bar (PSI)	Std. Setting bar (PSI)	Type	Spring colour
30 - 130 (400 - 1850)	60 (860)	<b>06</b>	Yellow (YE)
131 - 320 (1850 - 4600)	150 (2100)	<b>15</b>	Green (GR)

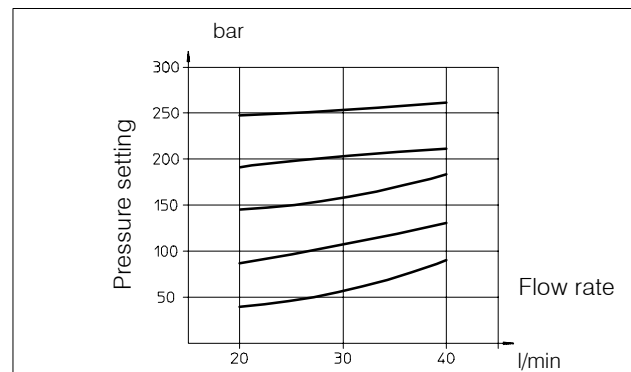
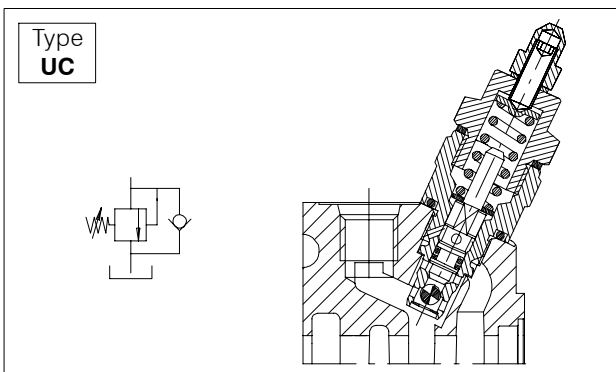
### 8A.12.1 Port relief valve



### 8A.12.2 Anti-cavitation valve



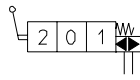
### 8A.12.3 Combined port relief and anti-cavitation valve



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**8A.13 Hydraulic-Pneumatic control ON-OFF**

Type	Code
<b>HP 24</b>	200.9686.5049.0



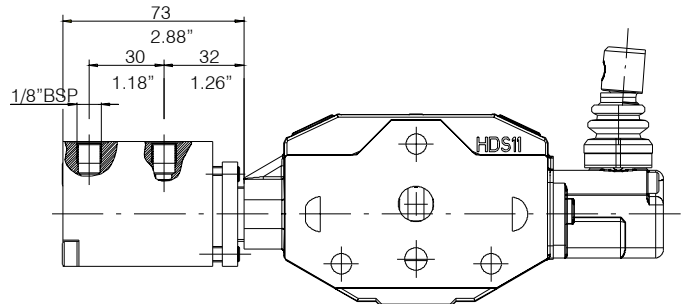
Operating conditions

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



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## 8B Electromagnetic control EMC (ON-OFF)

### 8B.1 General specifications

Technical specification		
Max flow rate	l/min U.S.G.P.M.	40 11
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 on the channel "T"	bar PSI	20 290
Oil temperature	° C ° F	-10 to +80 14 to 180
Oil viscosity	mm <sup>2</sup> /sec	20 to 50
Oil filtration	μ	≤ 25

Spool leakage at 100 bar (1450 PSI), Temp. 50° C (120° F), viscosity 27 mm <sup>2</sup> /sec:		
Maximum	cm <sup>3</sup> /min Cu. In./min	16 1.138
Average	cm <sup>3</sup> /min Cu. In./min	12 0.854

Number of spools	1 to 10
Adjustable direct operated 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

#### 8B.1.1 Material specification:

Body: High strength cast-iron.  
Spool: Hardened steel.  
Seals: Buna "N".

#### 8B.1.2 Optional features available

Series circuit;  
Load sensing circuit;  
Spool 3-way or 4-way at 2-3 positions;  
Port relief and anti-cavitation valves -OA-UC-C-  
Cross port relief valve - AA-

Pilot - Actuated Check Valve - RP-

#### 8B.1.3 Ports

P-T-P<sub>1</sub>-T<sub>1</sub>-A-B-HPCO ..... (M18X1.5 - 3/8" BSP  
-SAE6 - SAE8)

#### 8B.1.4 Input voltages

Continuous Current ..... 12VDC - 24VDC \*

#### 8B.1.5 Solenoid specification

Technical specification		
Continuous current voltage	V. D.C.	12 (24) +5% -10%
Power consumption	Watt (W)	36 (37)
Intensity of current	Ampere (A)	3 (1.55)
Resistance	Ohm (Ω)	4 (15.5)
Duty cycle (continuous)	ED	100%
Stabilized temperature at nominal voltage	° C	110
Ambient temperature	° C	-20 to +40

Protection class ..... IP65 (DIN 40050)  
Coil insulation ..... class H (VDEO 0580)  
STD. connection ..... (DIN 43650)  
Manual override.  
Explosion-proof version on demand.

#### 8B.1.6 Mechanical specification

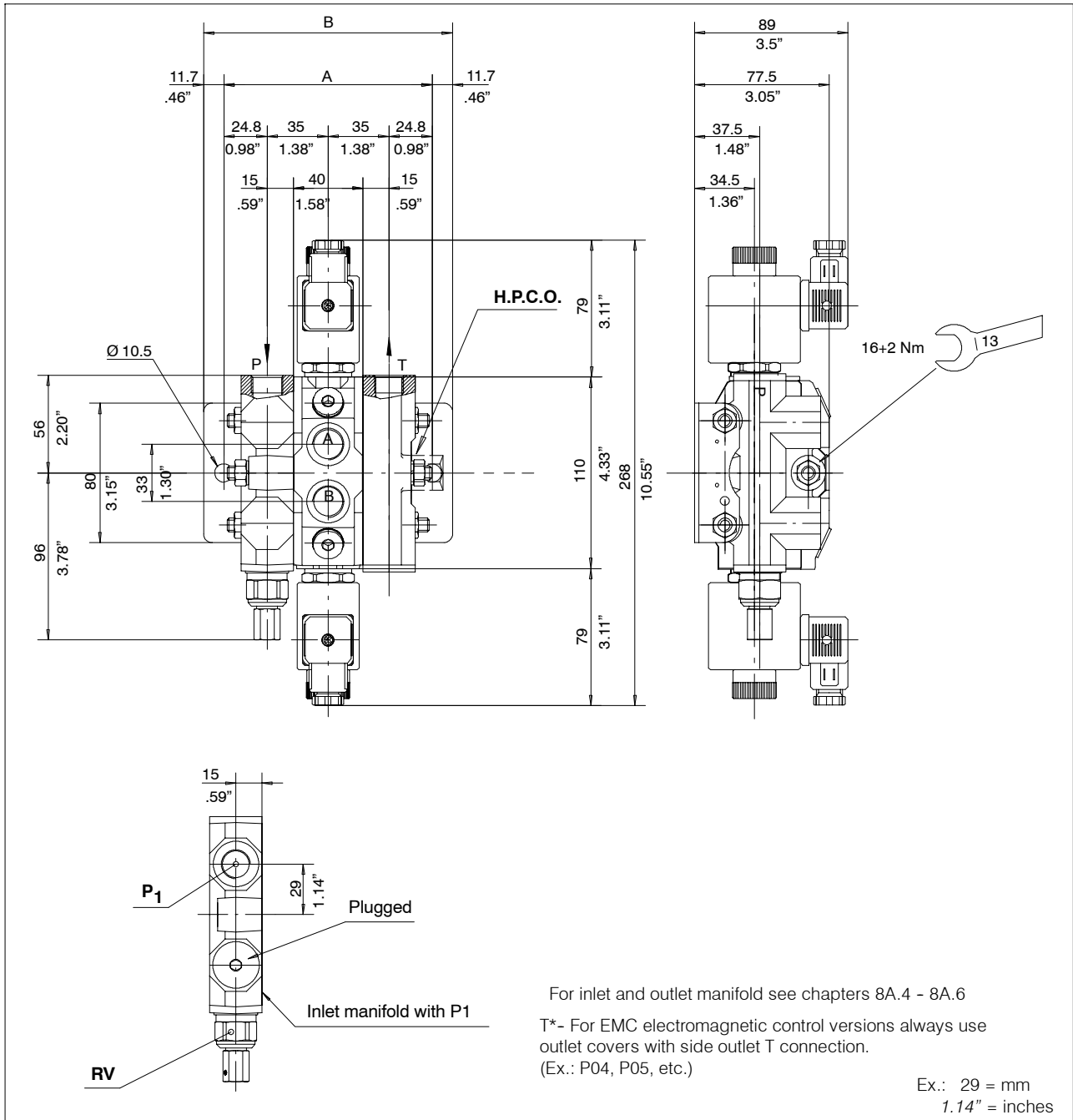
Spool diameter ..... 10 mm  
Spool stroke ..... 2.50 mm  
Overlapping ..... 1.25 mm  
Internal passage ..... 10 mm  
Dimensional section (width) ..... 40 mm

#### 8B.1.7 Weight

Version	kg	lb
Inlet with RV and P	1.0	2.23
1 spool section with 2 solenoid	2.50	5.50
1 spool with 1 solenoid	2.10	4.62
End cover with T and HPCO	0.75	1.65

\* for non indicated tension valves, please contact our Sales Department

8B.2 Dimensional data

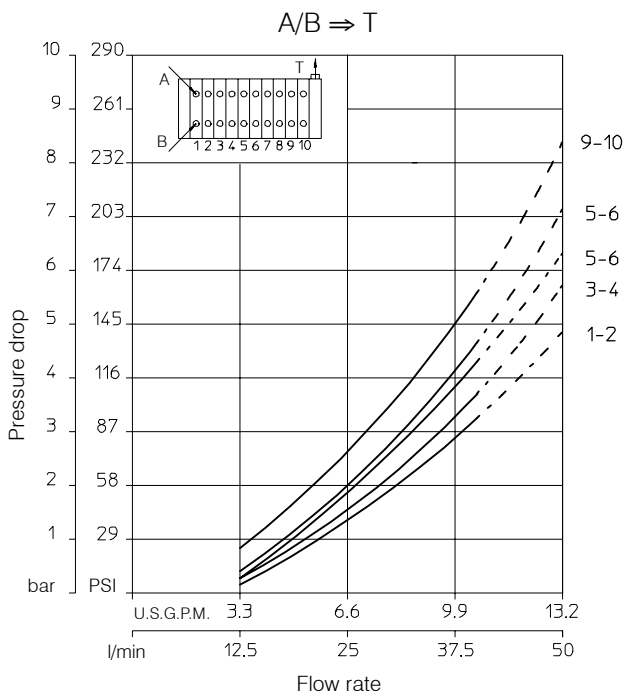
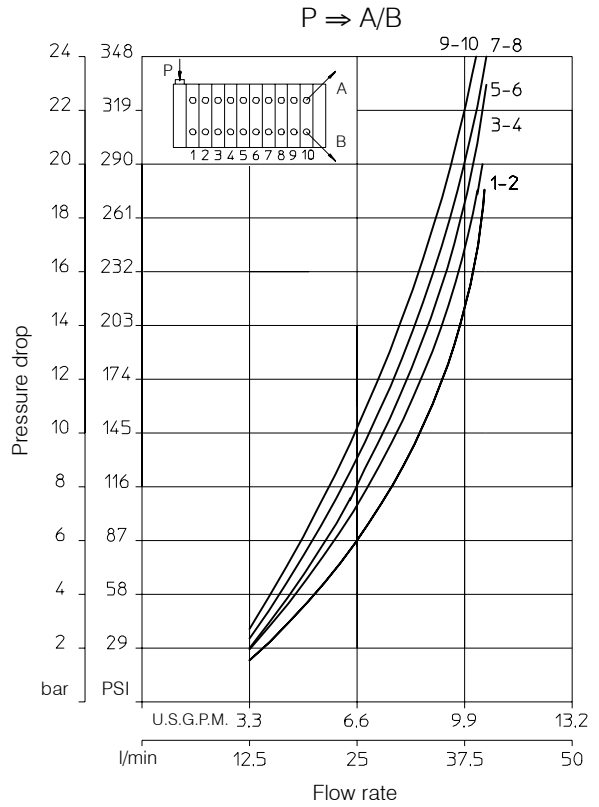
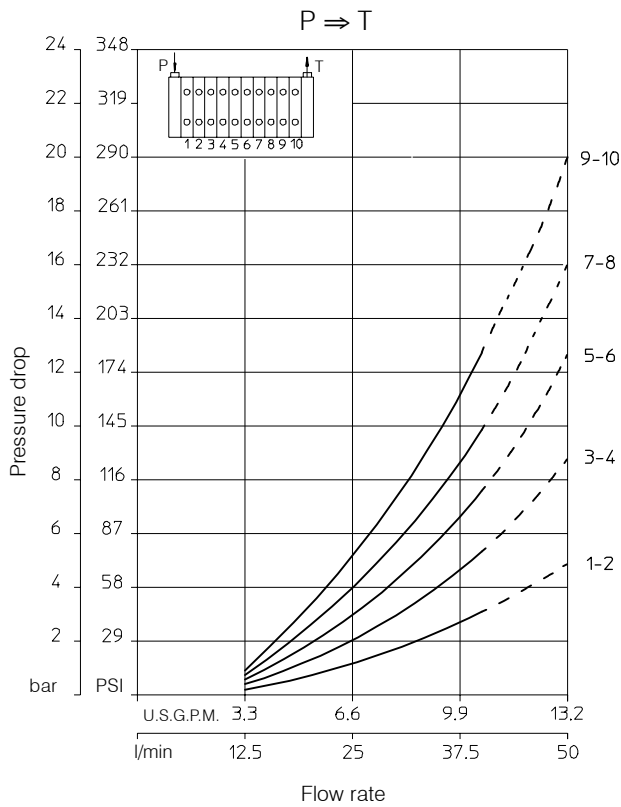


N. of sections		1	2	3	4	5	6	7	8	9	10
Dimension	A	119.6	159.6	199.6	239.6	279.6	319.6	359.6	399.6	439.6	479.6
		4.71"	6.28"	7.86"	9.43"	11.01"	12.58"	14.16"	15.73"	17.31"	18.88"
Dimension	B	143	183	223	263	303	343	383	423	463	503
		5.63"	7.20"	8.78"	10.35"	11.93"	13.50"	15.08"	16.65"	18.23"	19.80"

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## 8B.3 Performance curves

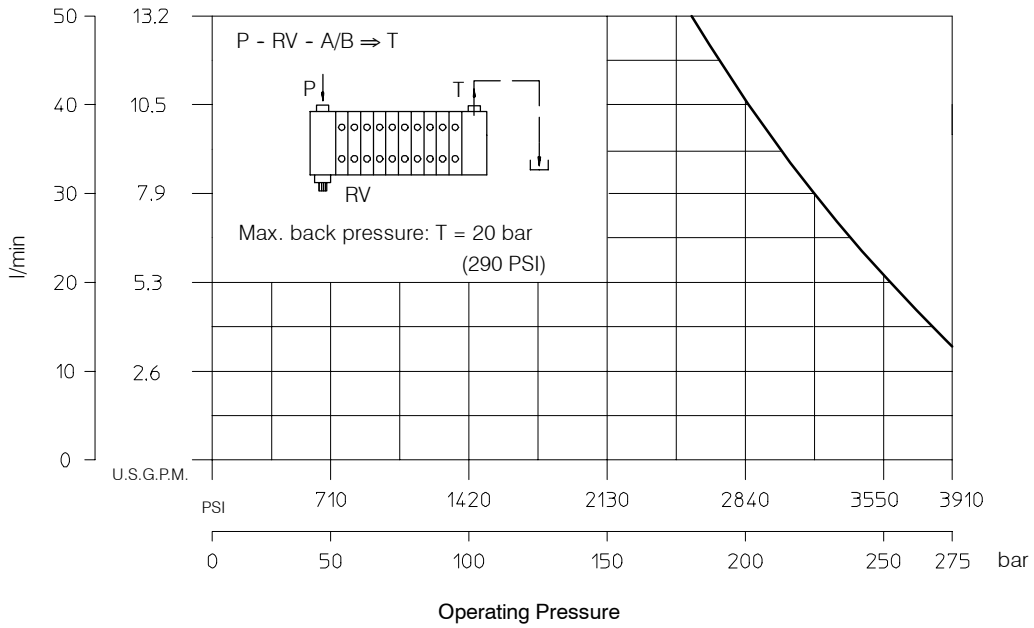
Oil: Shell Tellus T37  
 Temperature: 50°C (120°F)  
 Viscosity: 27 mm<sup>2</sup>/sec



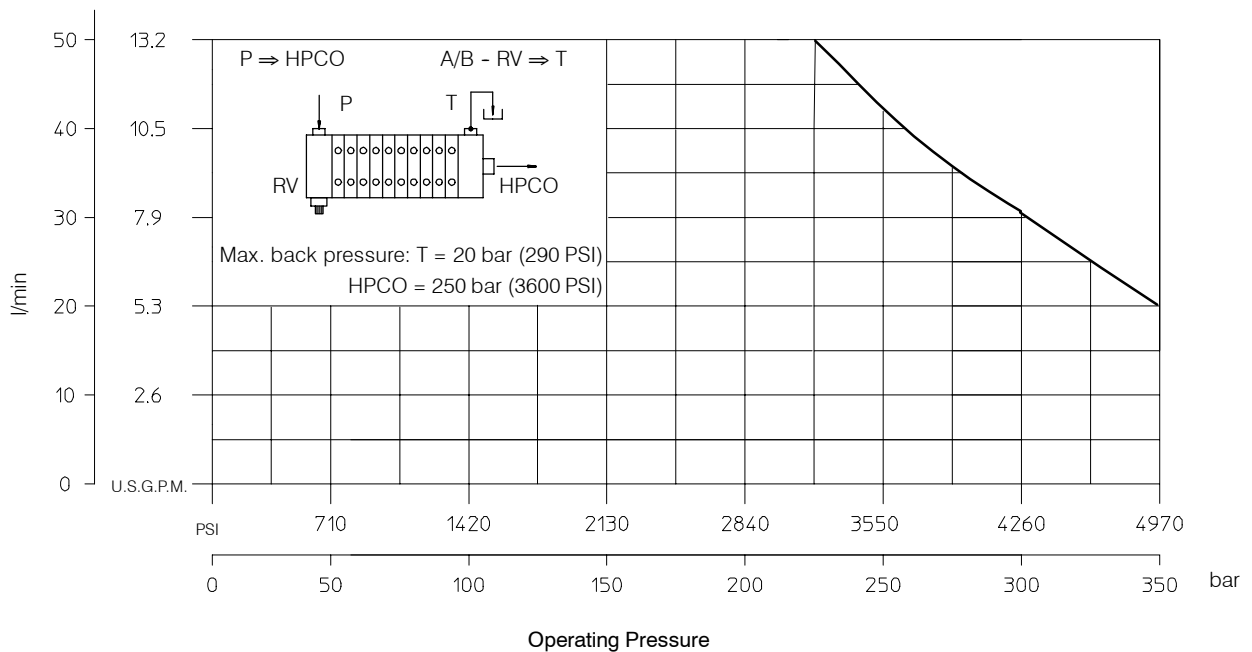
**8B.4 Operating limits**

Oil: Shell Tellus T37  
 Temperature: 50°C (120°F)  
 Viscosity: 27 mm<sup>2</sup>/sec  
 Tested with voltage V = -10%

**Standard Circuit**



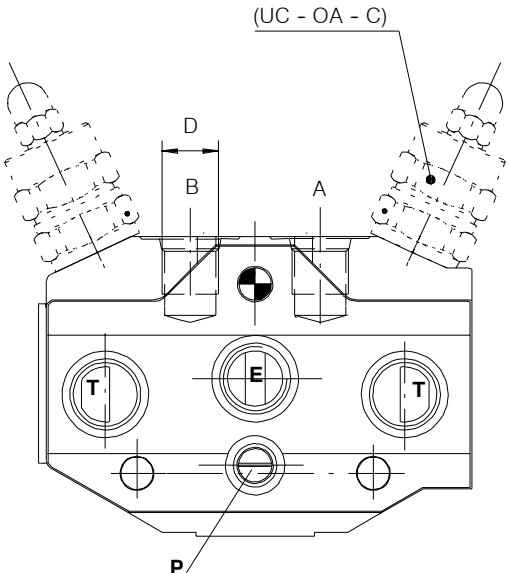
**Carry-over Circuit**



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## 8B.5 Sectional bodies

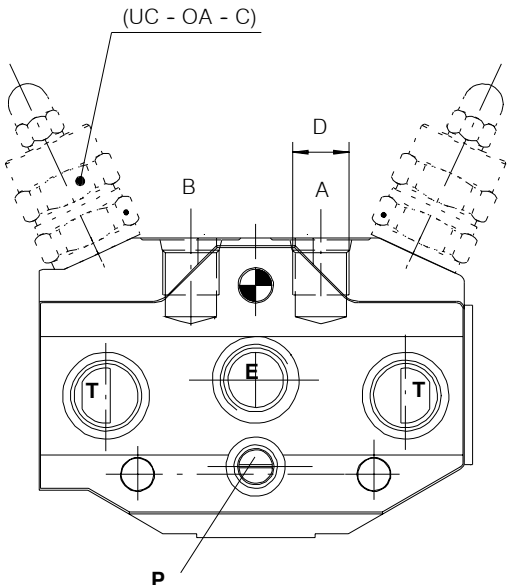
### 8B.5.1 Standard circuit: parallel



Ø D	Type/Code	
	Standard	Section with valve UC- OA- C
SAE6	<b>K201</b> 200.9413.6055.0	<b>K211</b> 200.9413.6060.0
SAE8	<b>K202</b> 200.9413.7031.0	<b>K212</b> 200.9413.7032.0
3/8" BSP	<b>K204</b> 200.9413.2628.0	<b>K214</b> 200.9413.2629.0
M18X1.5	<b>K205</b> 200.9413.1276.0	<b>K215</b> 200.9413.1277.0

cyl. A  
cyl. B

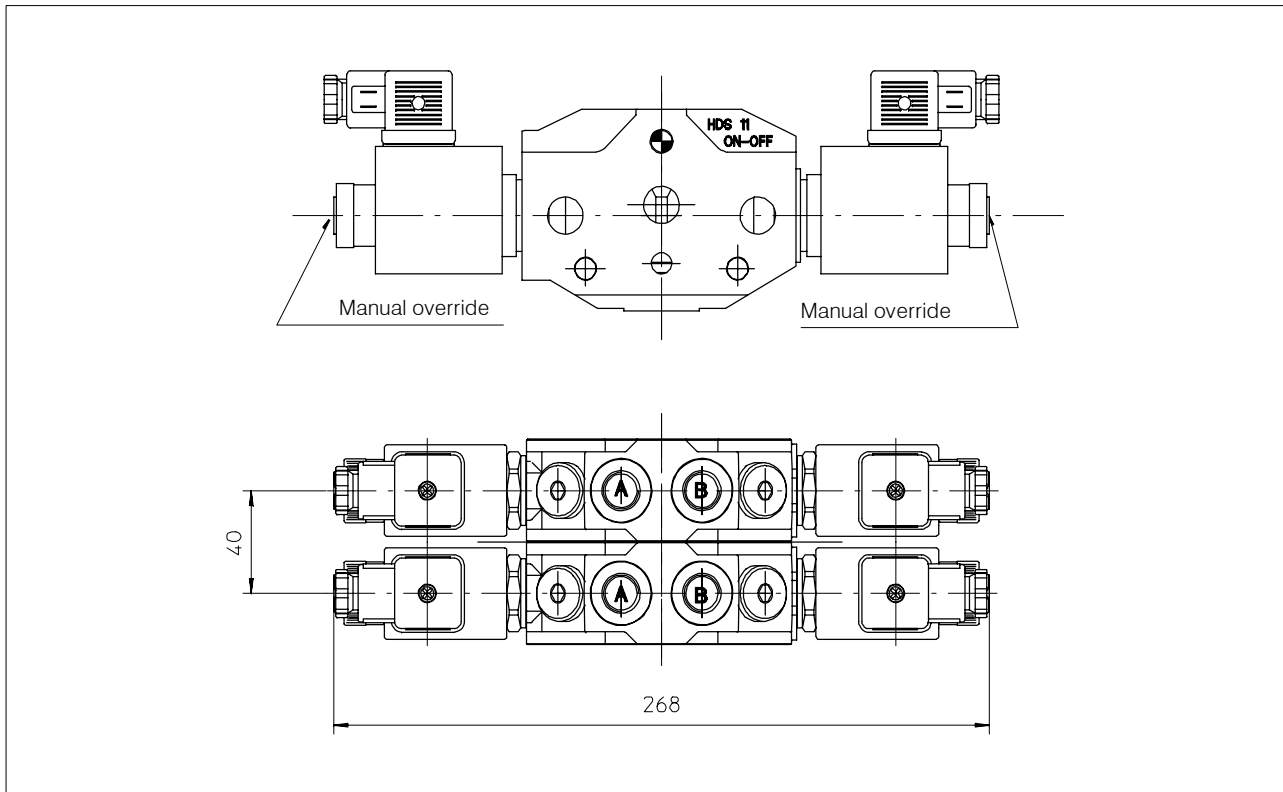
### 8B.5.2 Optional circuit: series and tandem



Ø D	Type/Code	
	Standard	Section with valve UC- OA- C
SAE6	<b>K247</b> 200.9413.6066.0	<b>K252</b> 200.9413.6070.0
SAE8	<b>K248</b> 200.9413.7039.0	<b>K253</b> 200.9413.7042.0
3/8" BSP	<b>K250</b> 200.9413.2042.0	<b>K255</b> 200.9413.2036.0
M18X1.5	<b>K251</b> 200.9413.1034.0	<b>K256</b> 200.9413.1037.0

cyl. A  
cyl. B

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



**8B.6 Spool charts**

Spool scheme	Spool features	Type
	4 way - 3 position A/B closed E open by pass	<b>AE</b>
	4 way - 3 position A/B-E closed	<b>BE</b>
	4 way - 3 position A/B to tank in neutral E open by pass	<b>CE</b>
	4 way - 3 position A closed B to tank in neutral	<b>DE</b>
	3 way - 3 position B closed E open by pass	<b>GE</b>
	4 way - 3 position B closed A to tank in neutral	<b>LE</b>
	3 way - 3 position A closed E open by pass	<b>SE</b>

	4 way - 3 position A/B closed series connection	<b>XE*</b>
	4 way - 3 position A/B to tank in neutral series connection	<b>XCE*</b>
	4 way - 3 position A/B closed Load Sensing	<b>LAE**</b>
	4 way - 3 position A/B to tank in neutral Load Sensing	<b>LCE**</b>
	3 way - 3 position B closed Load Sensing	<b>LGE**</b>
	3 way - 3 position A closed Load Sensing	<b>LSE**</b>
* series body required ** special body required		

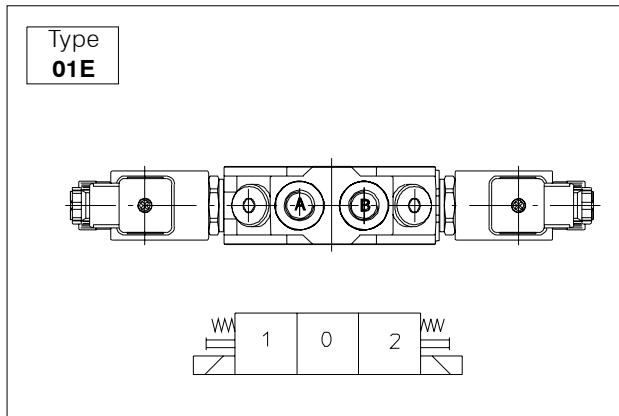
Note: For availability of L/S versions please contact our Sales Department



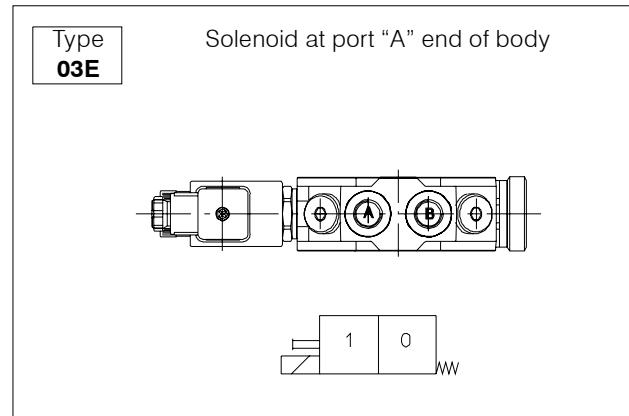
HDS11

## 8B.7 Spool actions

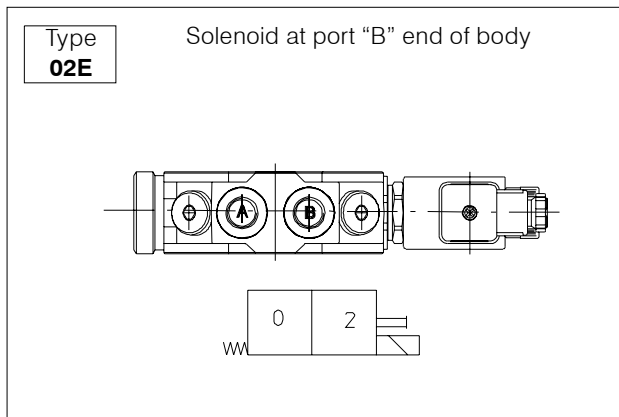
### 8B.7.1 Double-Solenoid spring-centered valves



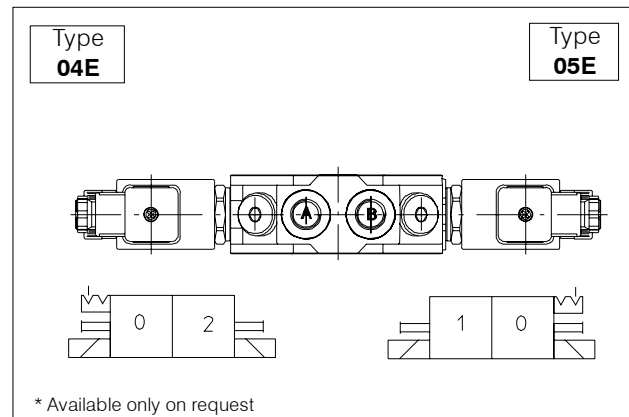
### 8B.7.3 Single Solenoid spring offset valves



### 8B.7.2 Single Solenoid spring offset valves



### 8B.7.4 Double Solenoid, two detent position valves\*



## 8B.8 4<sup>th</sup> Floating position

### 8B.8.1 Main features

Max operating pressure: ..... 250 bar  
 Max admitted flow: ..... 35 l/min

Average leakage: 30 cm<sup>3</sup>/min (100 bar, 50°C, 27 mm<sup>2</sup>s<sup>-1</sup>)  
 Solenoid power: ..... 48 Watt (12-24 Vdc)

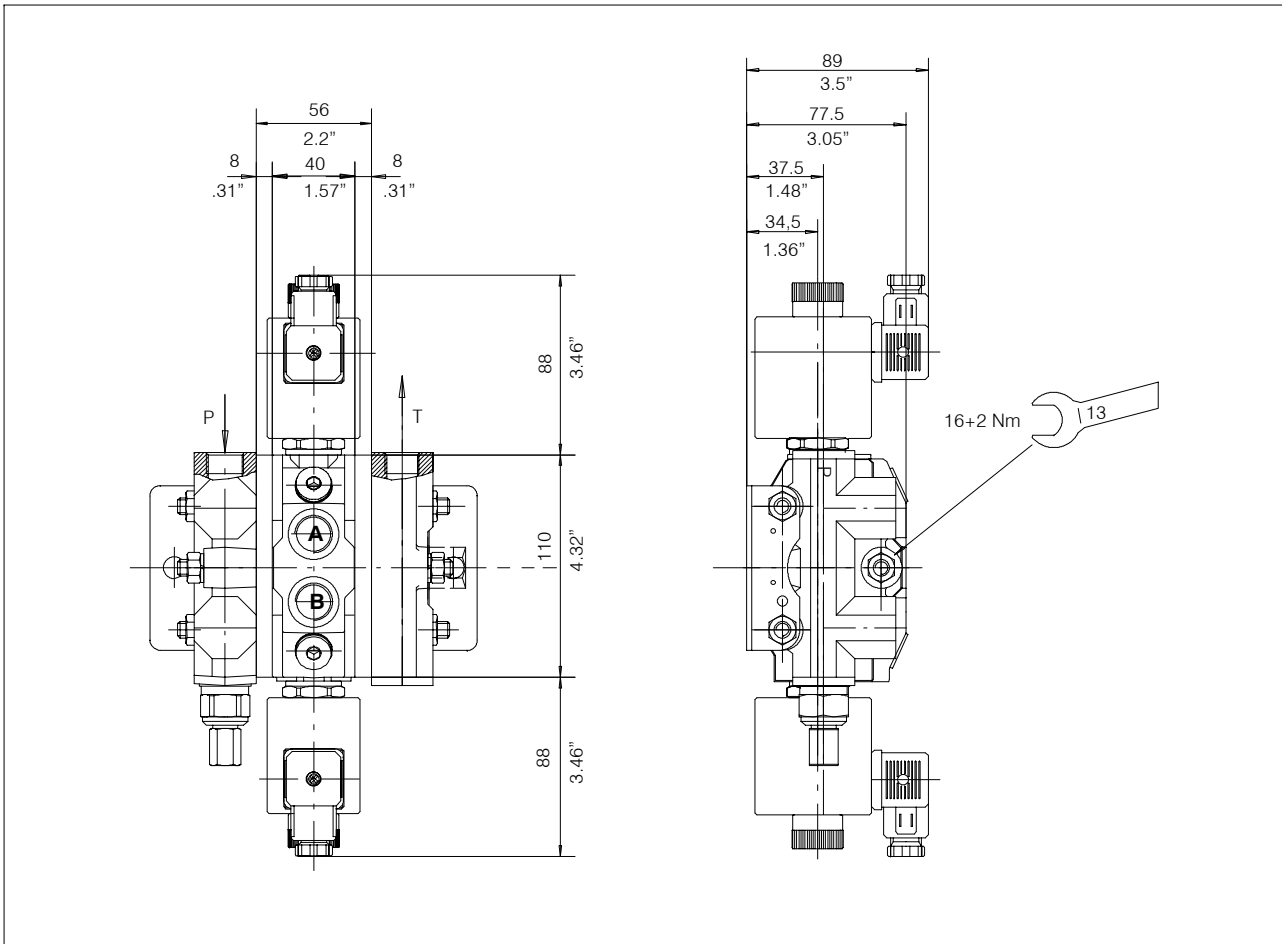
### 8B.8.2 General specification

- Pressure drops with 35 lt/min:
- Pos 0
- P ⇒ T ..... 2 bar
- Pos 1 and 2
- P ⇒ A / P ⇒ B ..... 9 bar
- B ⇒ T / A ⇒ T ..... 5.5 bar
- Pos 3 (4<sup>th</sup> floating position)
- A ⇒ T / B ⇒ T ..... 12.5 bar
- Parallel circuit, electric operated
- Compatible for assembling on HDS11 valve series
- Intermediate spacers 15 mm width needed

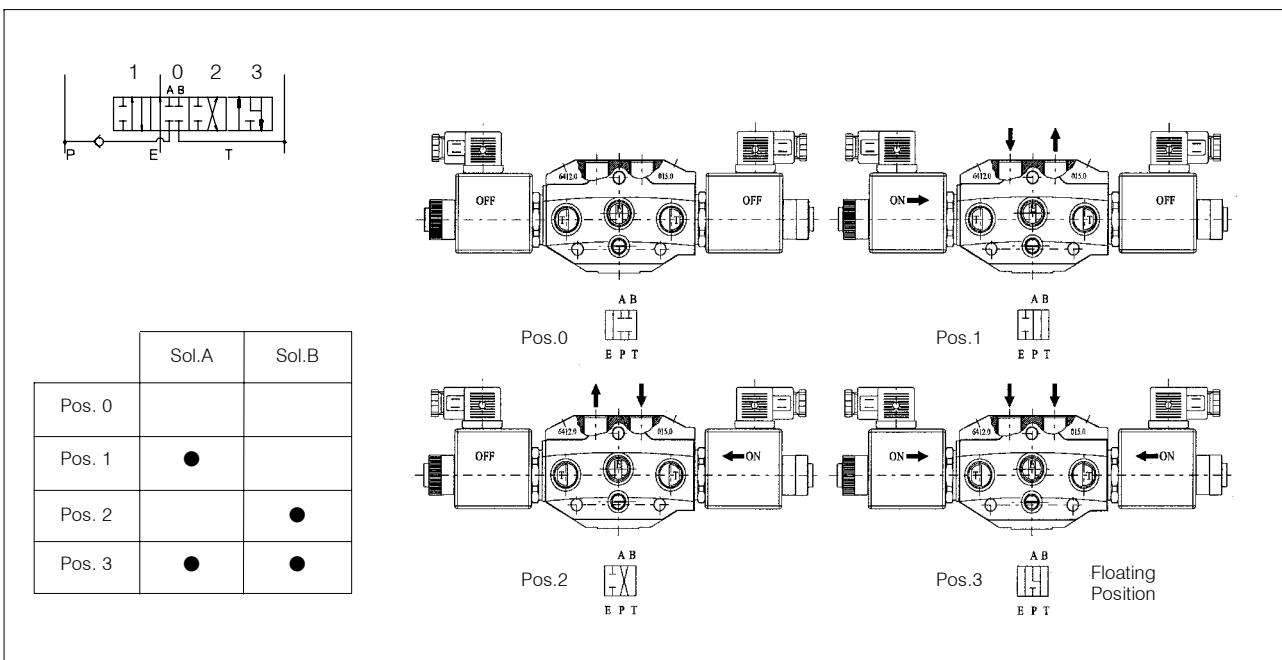
- In case the directional control valve consists of 2 or more sections, we suggest to position the section (or the sections) with 4<sup>th</sup> floating position as last section in the pack close to the "T" outlet cover.
- In the electric 4<sup>th</sup> floating position it is necessary to use always the cover with "T" side outlet (ex. P04, P05, etc.)
- To be used, if possible, in circuits without the carry-over version (on the contrary please contact our Sales Department)
- The 4<sup>th</sup> floating position must always be realized as from the "0" neutral position with both solenoids not energized.
- It is not possible to have versions with OA-C-UC valves with the 4<sup>th</sup> floating position section.

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### 8B.8.3 Dimensional data



### 8B.8.4 Hydraulic circuit



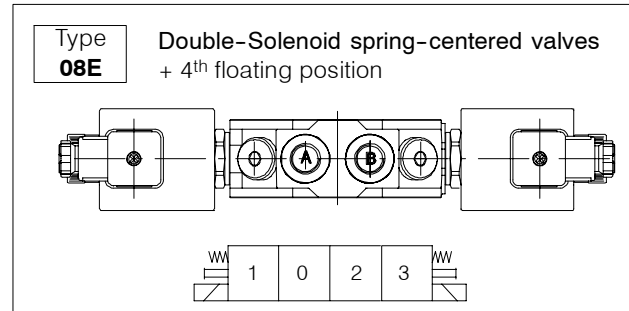
HDS11

## 8B.8.5 Spool chart

Spool scheme	Spool features	Type
	4 way - 4 position 4 <sup>th</sup> floating electric position	<b>ZE*</b>

\* Special body required

## 8B.8.6 Spool action



## 8B.8.7 Sectional body and manifold

∅ D	Type/Code
	Standard
SAE6	<b>K225</b> 200.9413.6071.0
SAE8	<b>K226</b> 200.9413.7043.0
3/8" BSP	<b>K227</b> 200.9413.2633.0
M18X1.5	<b>K228</b> 200.9413.1289.0

H	Code
8 mm	200.7649.0035.0

## 8C Elements with pressure and flow control PQ

### 8C.1 General specifications

Max continuous operating pressure supply port P ..... 250 bar  
 Max intermittent peak pressure work port A/B ..... 320 bar  
 Max back pressure tank port T ..... 30 bar  
 Nominal flow ..... max. 50 l/min

Adjustable setting flow range on 350° turning-knob:  
 Min flow ..... 0 l/min  
 Max flow (input) ..... 40 l/min

Fixed priority flow ..... VDPF = 0 to 40 l/min  
 Adjustable priority flow ..... VDP 06 = 0 to 6 l/min  
 ..... VDP 12 = 0 to 12 l/min  
 ..... VDP 25 = 0 to 25 l/min  
 ..... VDP 40 = 0 to 40 l/min

Control accuracy ..... ± 5 %  
 Pressure difference  $\Delta p$  ..... max. 6 bar  
 Oil temperature range ..... -10° to +80° C  
 Viscosity range ..... 16 to 75 mm<sup>2</sup>/sec  
 Recommended filtration ..... ≤25 micron

Adjustable direct acting:  
 Relief valve on the lines ..... Inlet flow: RV1  
 ..... Priority flow: RV2  
 ..... Residual flow: RV3

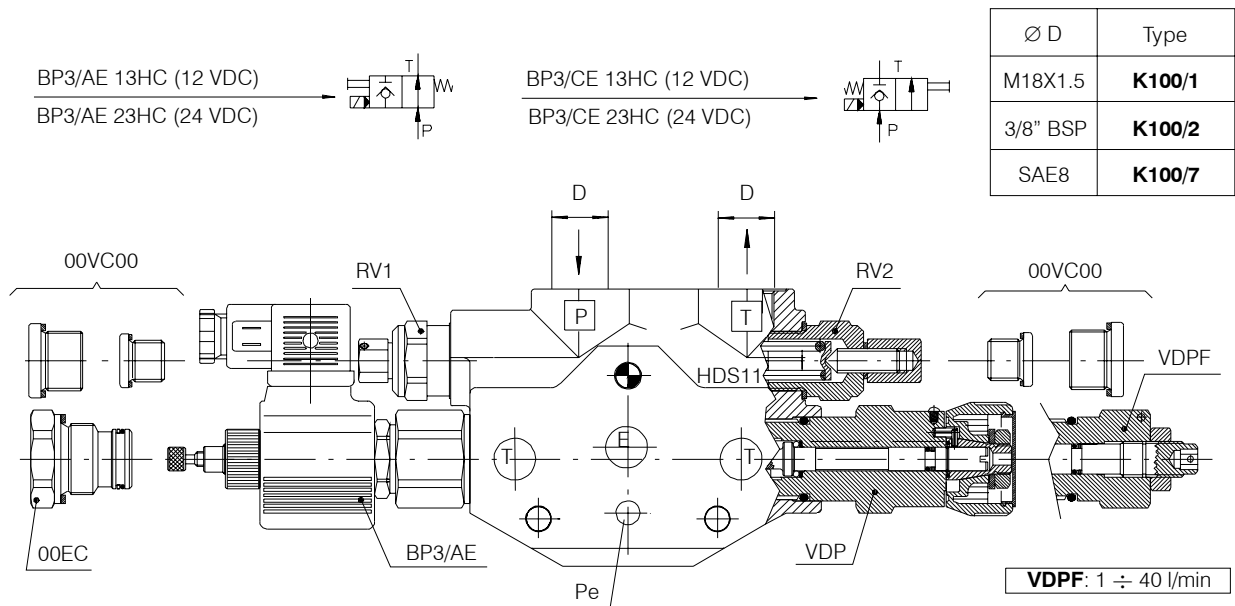
By-pass solenoid valve ..... BP3/AE  
 ..... BP3/CE

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## 8C.2 Sectional body K100

### 8C.2.1 Application variation

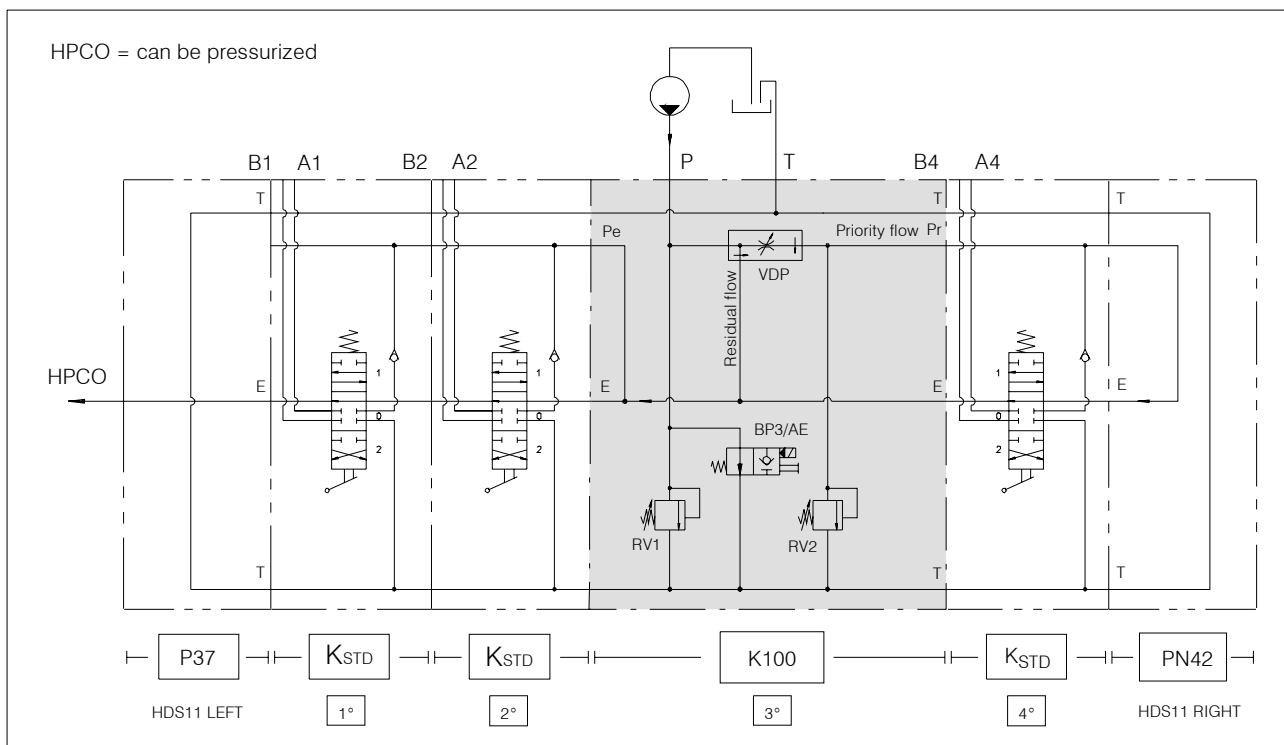
Intermediate section with priority flow divider pressure compensated valve, pressure relief valves and by-pass valve.



Pressure set range (bar)	Standard Setting bar	Relief valves Type
30 ÷ 95	60	<b>RV1 or RV2 - 06</b>
96 ÷ 210	150	<b>RV1 or RV2 - 15</b>
211 ÷ 320	260	<b>RV1 or RV2 - 26</b>

Flow set range (l/min)	Standard Setting l/min	Flow regulator Type
0 ÷ 6	6	<b>VDP 06</b>
0 ÷ 12	12	<b>VDP 12</b>
0 ÷ 25	25	<b>VDP 25</b>
0 ÷ 40	40	<b>VDP 40</b>

### 8C.2.2 Scheme example

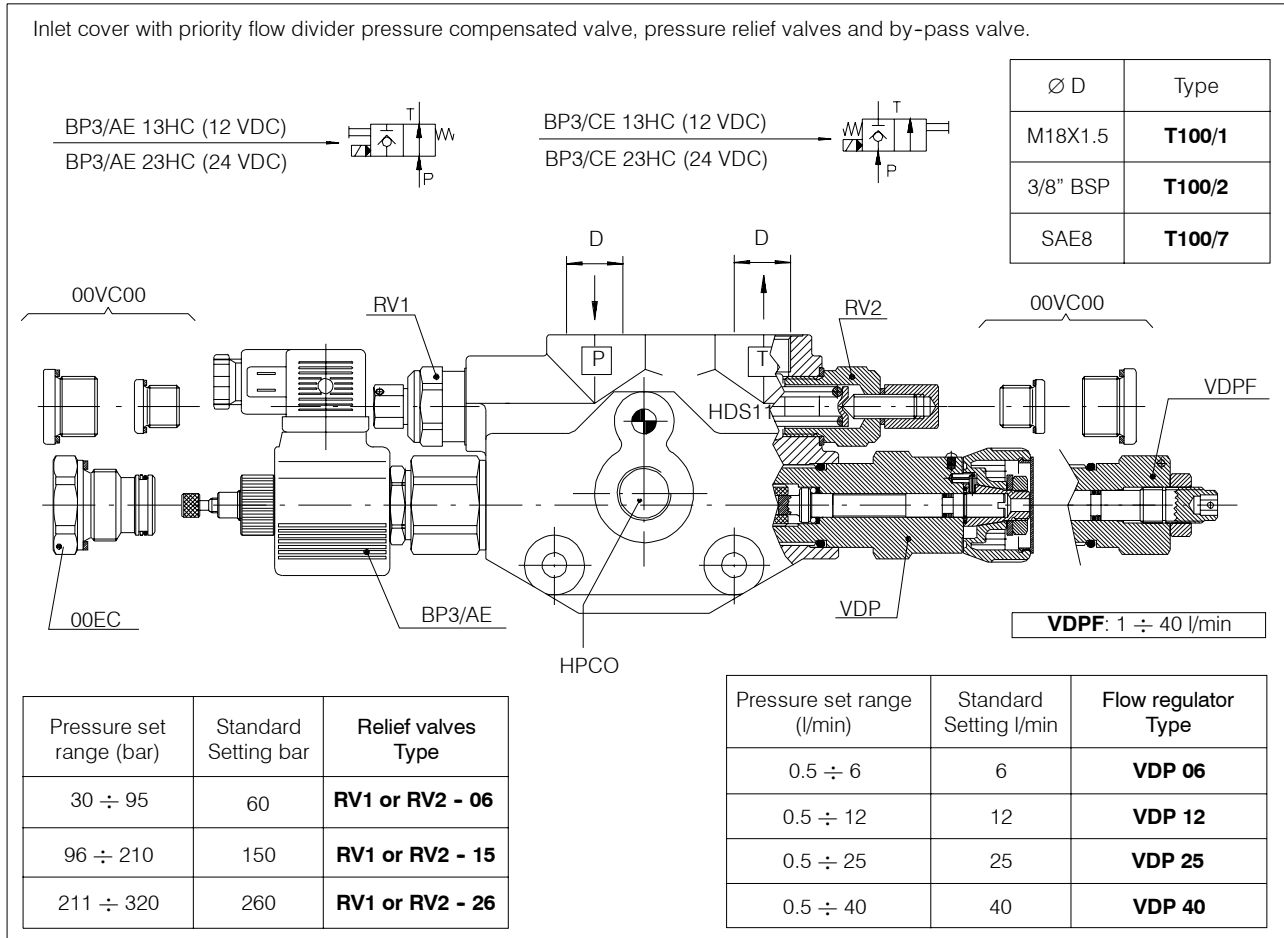


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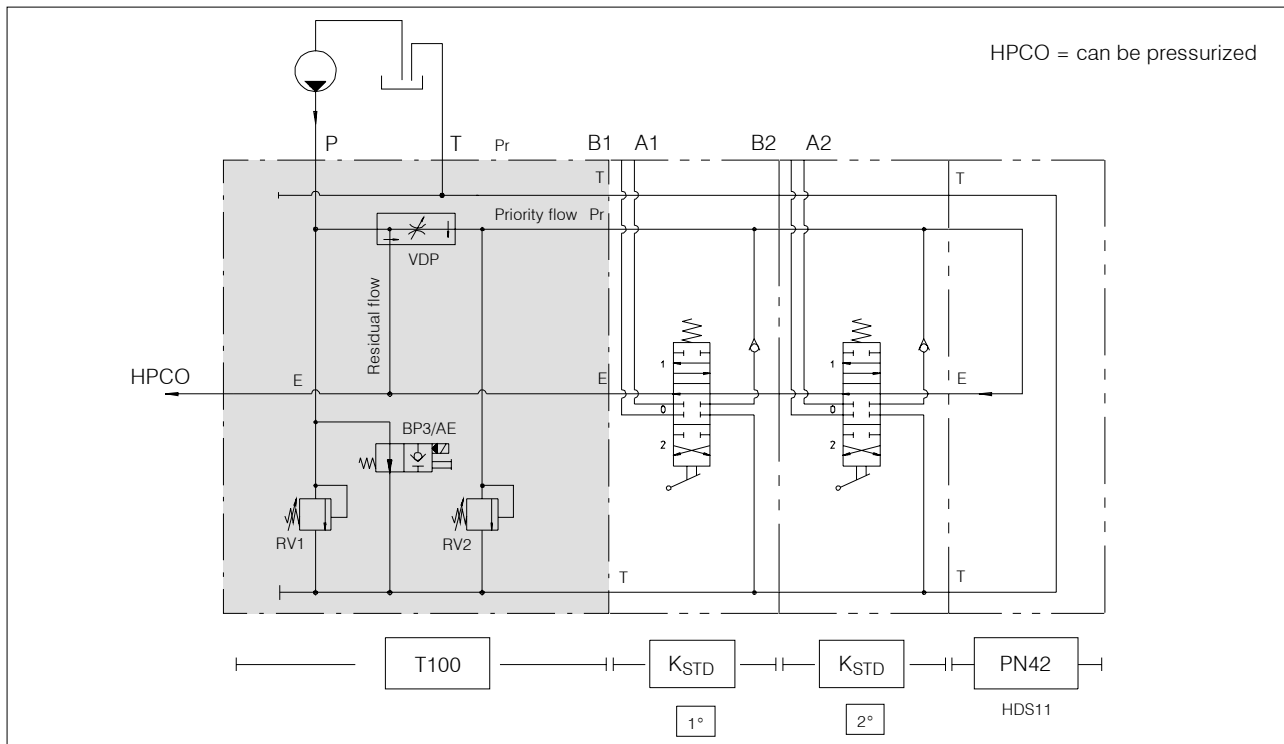
## 8C.3 Inlet cover T100

### 8C.3.1 Application variation

Inlet cover with priority flow divider pressure compensated valve, pressure relief valves and by-pass valve.



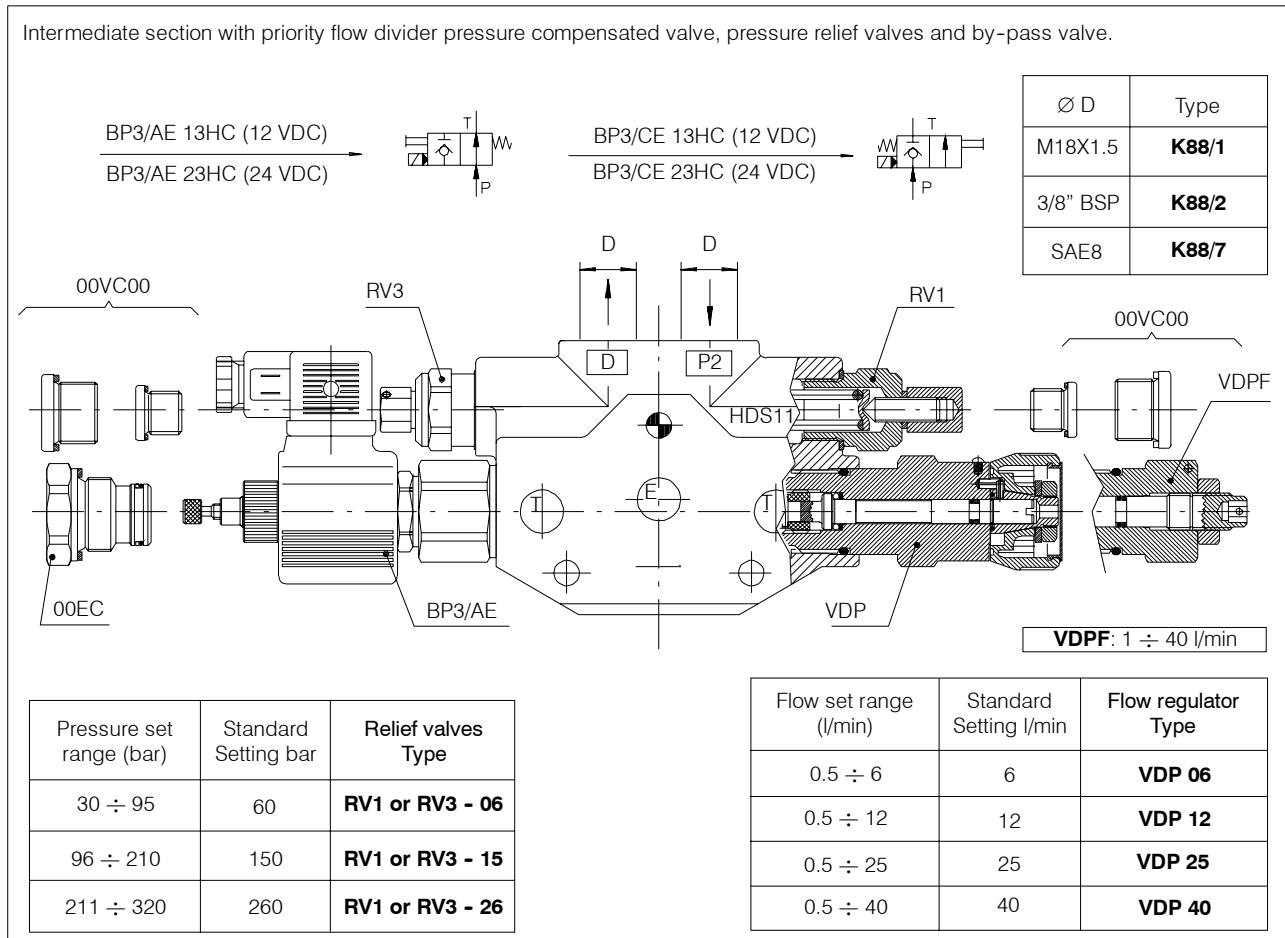
### 8C.3.2 Scheme example



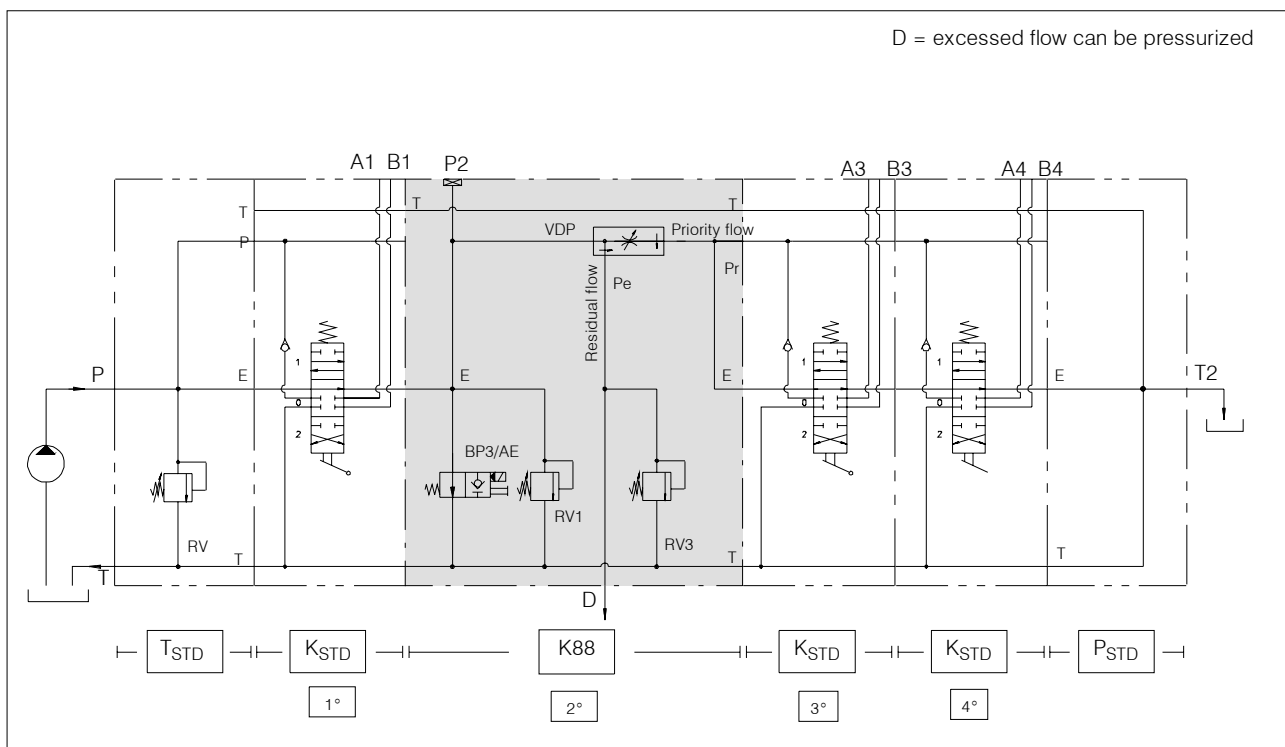
HDS11

## 8C.4 Sectional body K88

### 8C.4.1 Application variation



### 8C.4.2 Scheme example



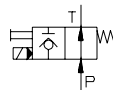
HDS11

## 8C.5 Inlet cover T88

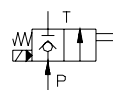
### 8C.5.1 Application variation

Inlet cover with priority flow divider pressure compensated valve, pressure relief valves and by-pass valve.

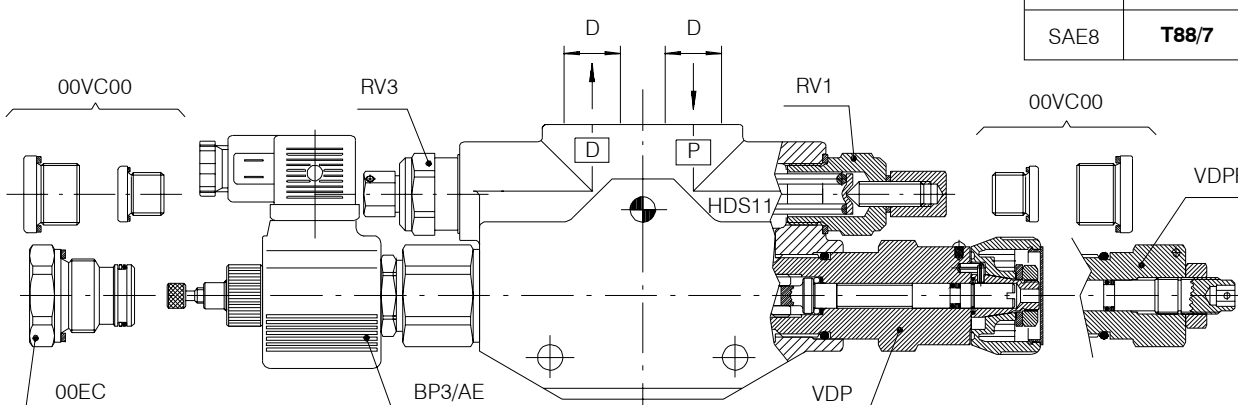
BP3/AE 13HC (12 VDC)  
BP3/AE 23HC (24 VDC)



BP3/CE 13HC (12 VDC)  
BP3/CE 23HC (24 VDC)



∅ D	Type
M18X1.5	<b>T88/1</b>
3/8" BSP	<b>T88/2</b>
SAE8	<b>T88/7</b>

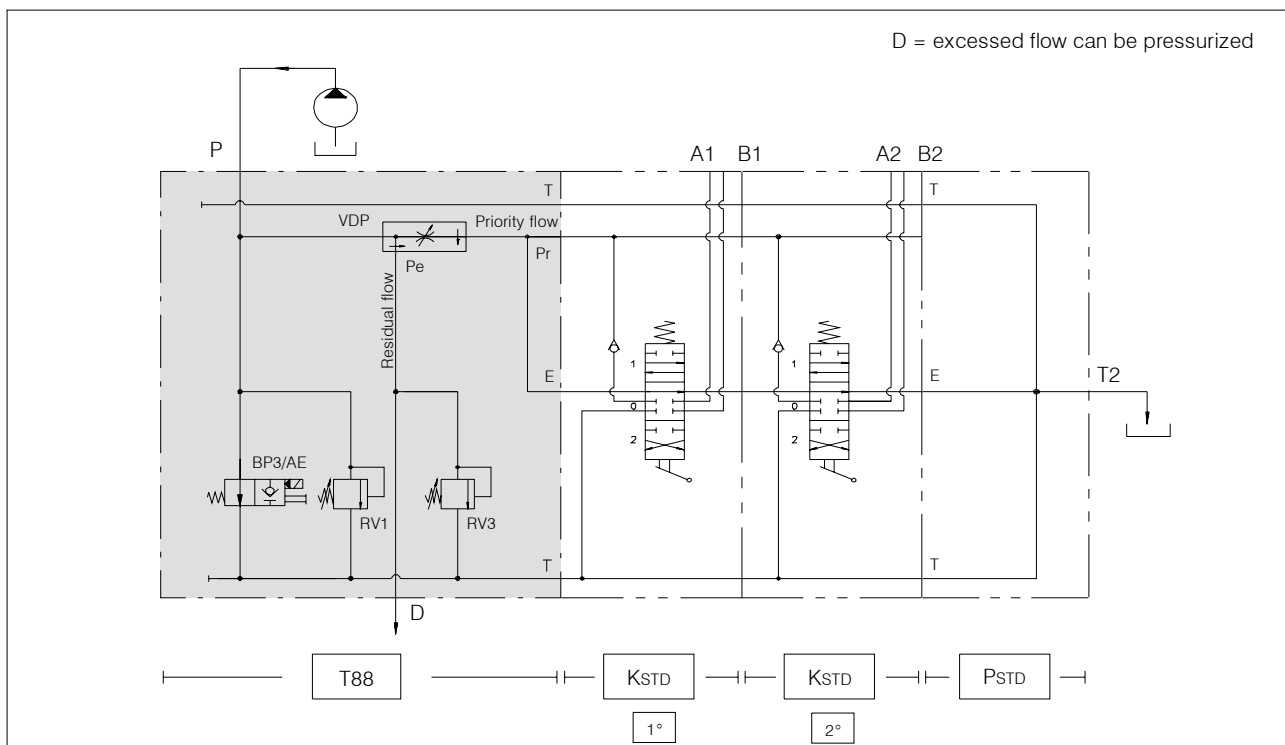


**VDPF: 1 ÷ 40 l/min**

Pressure set range (bar)	Standard Setting bar	Relief valves Type
30 ÷ 95	60	<b>RV1 or RV3 - 06</b>
96 ÷ 210	150	<b>RV1 or RV3 - 15</b>
211 ÷ 320	260	<b>RV1 or RV3 - 26</b>

Flow set range (l/min)	Standard Setting l/min	Flow regulator Type
0.5 ÷ 6	6	<b>VDP 06</b>
0.5 ÷ 12	12	<b>VDP 12</b>
0.5 ÷ 25	25	<b>VDP 25</b>
0.5 ÷ 40	40	<b>VDP 40</b>

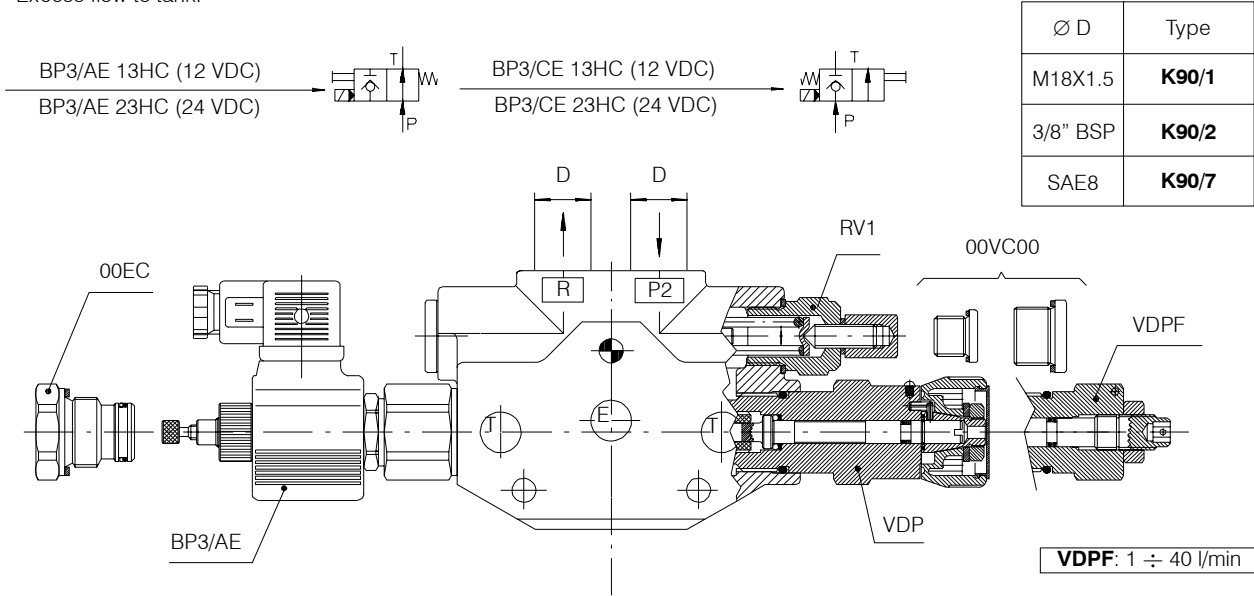
### 8C.5.2 Scheme example



**8C.6 Sectional body K90**

**8C.6.1 Application variation**

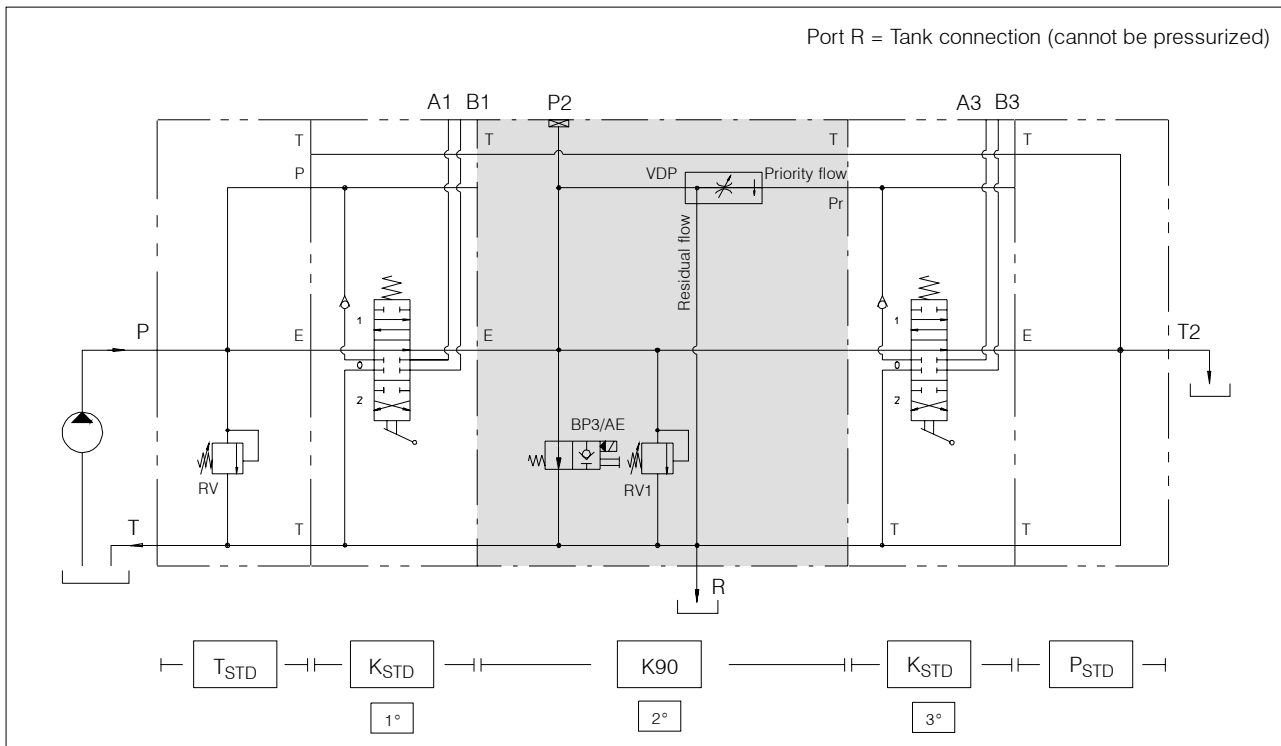
Intermediate section with priority flow divider pressure compensated valve, pressure relief valves and by-pass valve.  
Excess flow to tank.



Pressure set range (bar)	Standard Setting bar	Relief valves Type
30 ÷ 95	60	<b>RV1 - 06</b>
96 ÷ 210	150	<b>RV1 - 15</b>
211 ÷ 320	260	<b>RV1 - 26</b>

Flow set range (l/min)	Standard Setting l/min	Flow regulator Type
0.5 ÷ 6	6	<b>VDP 06</b>
0.5 ÷ 12	12	<b>VDP 12</b>
0.5 ÷ 25	25	<b>VDP 25</b>
0.5 ÷ 40	40	<b>VDP 40</b>

**8C.6.2 Scheme example**

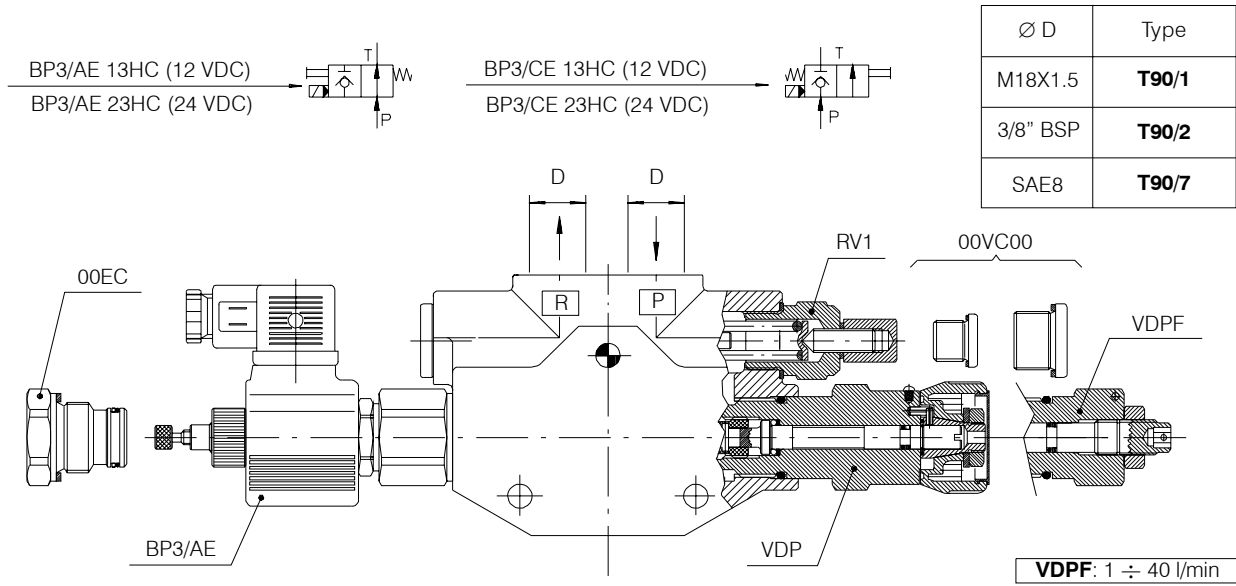




**8C.7 Inlet cover T90**

**8C.7.1 Application variation**

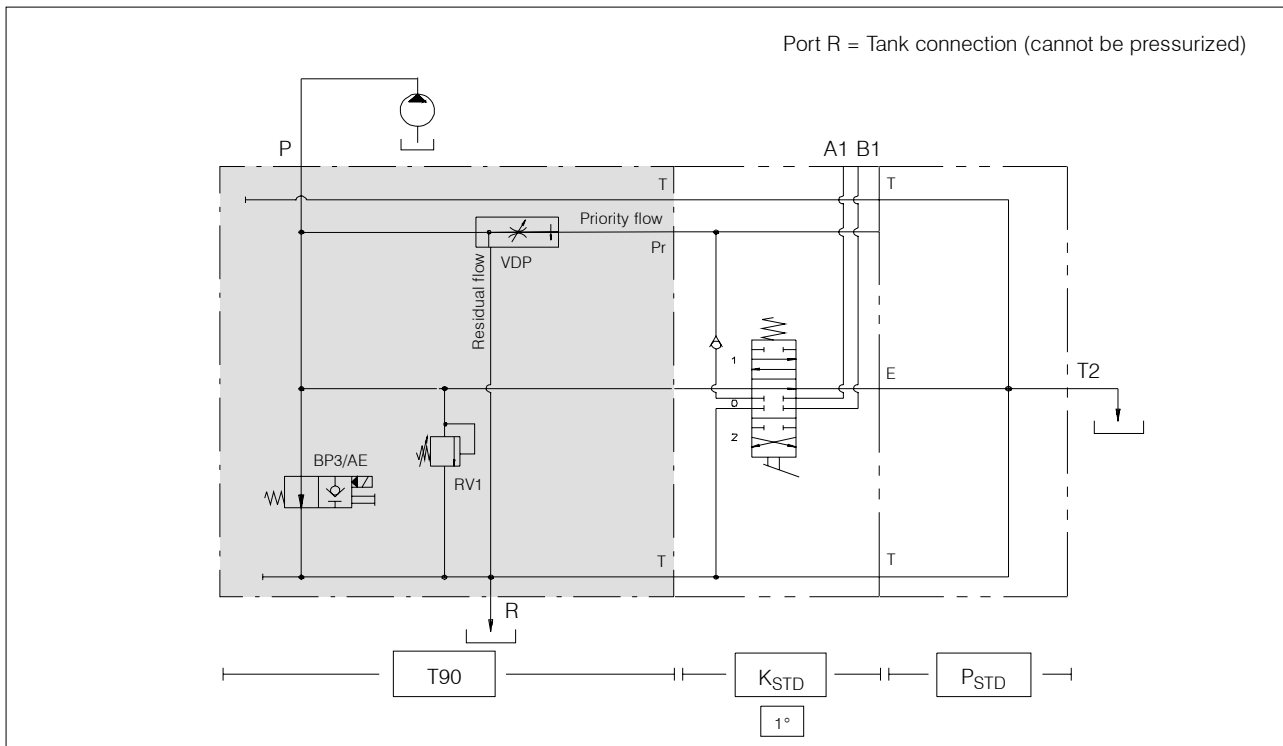
Inlet cover with priority flow divider pressure compensated valve, pressure relief valves and by-pass valve. Excess flow to tank.



Pressure set range (bar)	Standard Setting bar	Relief valves Type
30 ÷ 95	60	<b>RV1 - 06</b>
96 ÷ 210	150	<b>RV1 - 15</b>
211 ÷ 320	260	<b>RV1 - 26</b>

Flow set range (l/min)	Standard Setting l/min	Flow regulator Type
0.5 ÷ 6	6	<b>VDP 06</b>
0.5 ÷ 12	12	<b>VDP 12</b>
0.5 ÷ 25	25	<b>VDP 25</b>
0.5 ÷ 40	40	<b>VDP 40</b>

**8C.7.2 Scheme example**

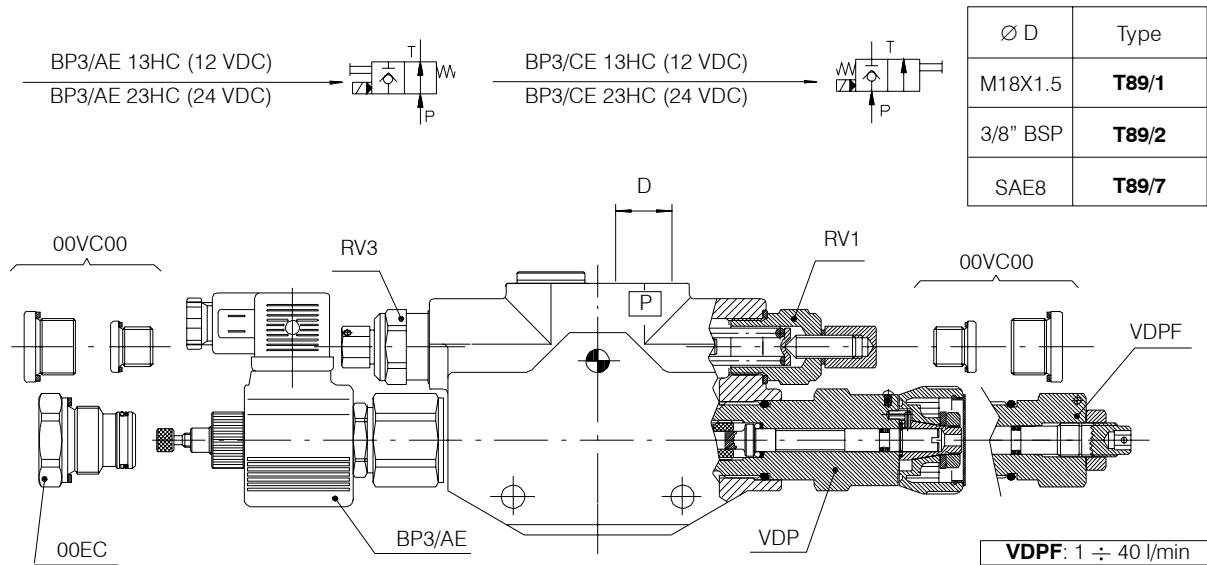


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## 8C.8 Inlet cover T89\*

### 8C.8.1 Application variation

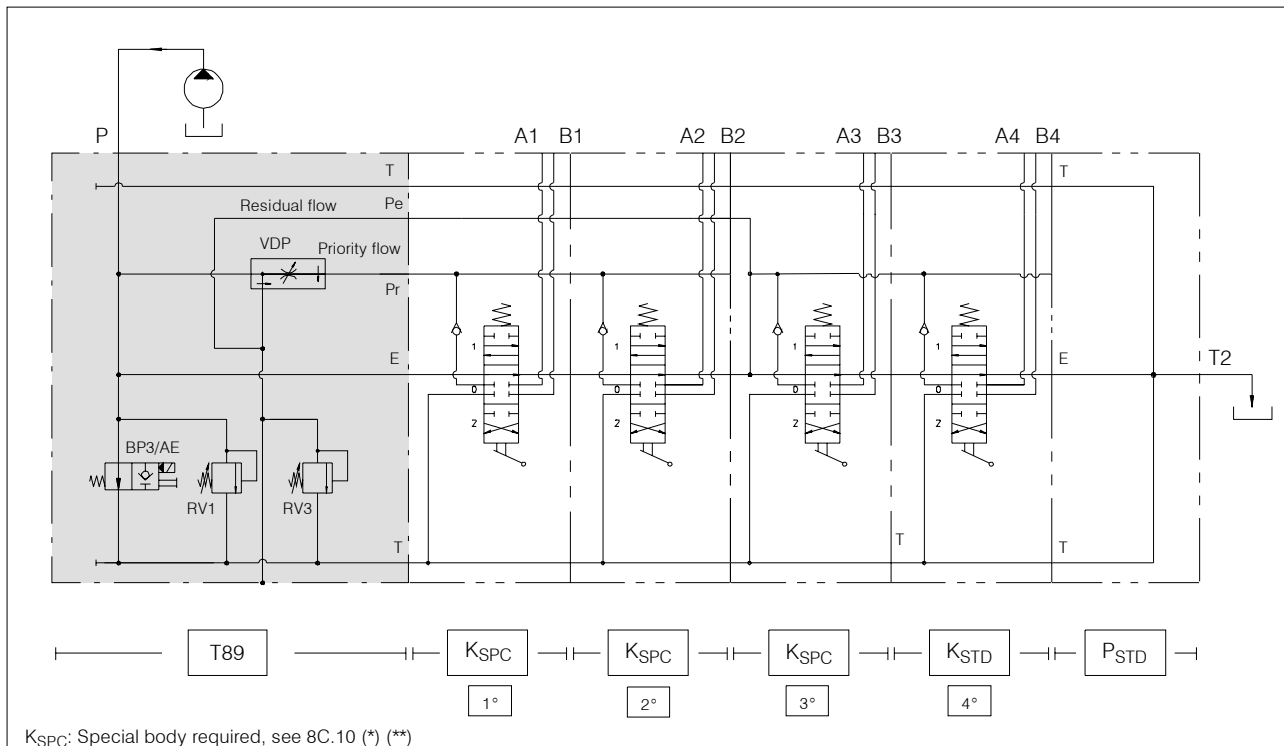
Inlet cover with priority flow divider pressure compensated valve, pressure relief valves and by-pass valve.



Pressure set range (bar)	Standard Setting bar	Relief valves Type
30 ÷ 95	60	<b>RV1 or RV3 - 06</b>
96 ÷ 210	150	<b>RV1 or RV3 - 15</b>
211 ÷ 320	260	<b>RV1 or RV3 - 26</b>

Flow set range (l/min)	Standard Setting l/min	Flow regulator Type
0.5 ÷ 6	6	<b>VDP 06</b>
0.5 ÷ 12	12	<b>VDP 12</b>
0.5 ÷ 25	25	<b>VDP 25</b>
0.5 ÷ 40	40	<b>VDP 40</b>

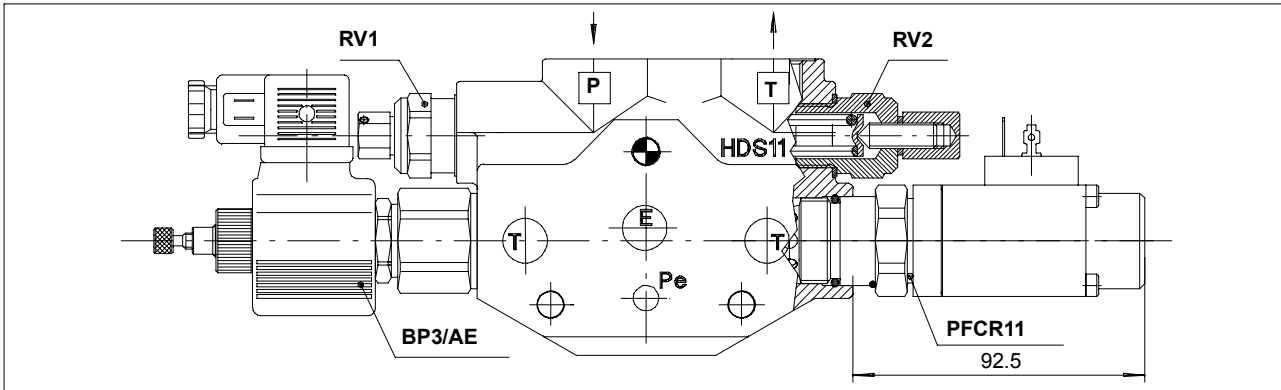
### 8C.8.2 Scheme example



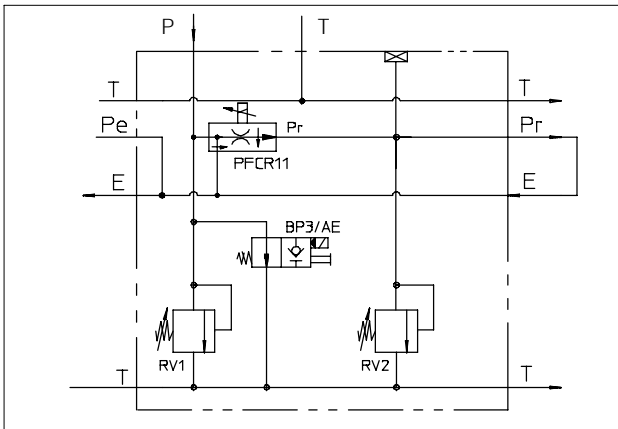
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## 8C.9 Proportional flow control PFCR11

### 8C.9.1 Example of application on K100 body



### 8C.9.2 Example of hydraulic scheme K100



### 8C.9.3 Electric performances

Electric performances		
Coil according to	VDE 0580	
Connector type	DIN 43650	
Duty rating	ED=100%	
Suggested dither	0-150 Hertz (*)	
Insulation class	IP54 (DIN 40050) without connector IP65 (DIN 40050) with connector	
Coil winding class	F	
Voltage $\pm 5\%$	12 V (DC)	24 V (DC)
Max. current	2.25 A.	1.08 A.
Resistance at 20 °C	2.8 Ohm	12.7 Ohm
Nominal power	17.2 Watt	17.4 Watt
Inductance	31 mH armature falling down	140 mH armature rising
	90 mH armature falling down	406 mH armature rising

### 8C.9.4 Code

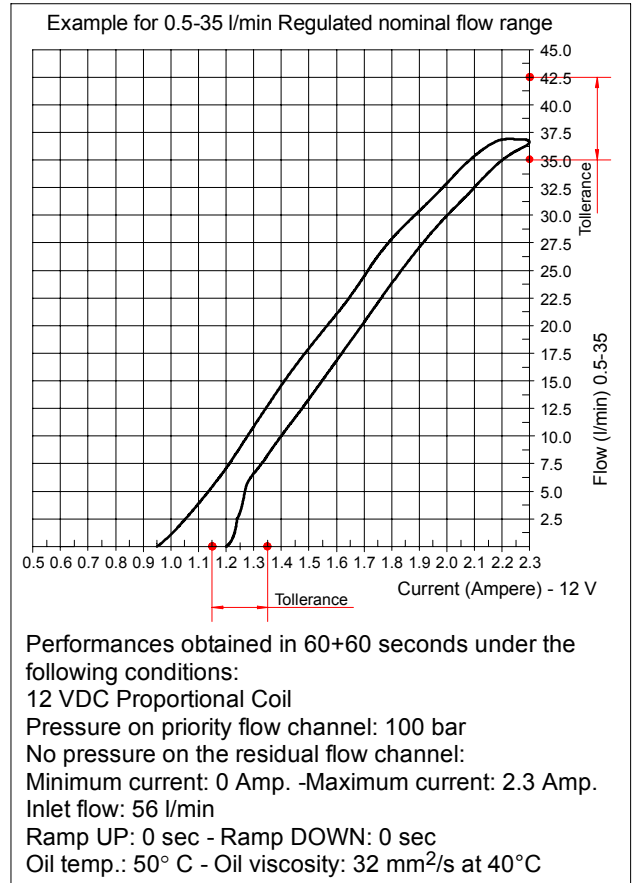
Flow l/min	Voltage	Type	Code**
14	12 V	<b>PFCR11/V2-14-P2-13</b>	200.7880.0011.0
14	24 V	<b>PFCR11/V2-14-P2-23</b>	200.7880.0012.0

35	12 V	<b>PFCR11/V8-35-P2-13</b>	200.7880.0007.0
35	24 V	<b>PFCR11/V8-35-P2-23</b>	200.7880.0008.0

### 8C.9.5 Hydraulic performances

Max. pressure	270 bar
Max. recommended pressure	230 bar
Regulated nominal flow range	0.5 - 14 l/min
	0.5 - 35 l/min
Temperature range	-5/+70° C

### 8C.9.6 Current/flow regulated diagram



(\*): frequency could affect the valve seal)  
 (\*\*): code without connector)

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## 8C.10 Special sectional bodies

### 8C.10.1 Special element (priority flow): to be used only with T89 (\*) inlet cover

Ø D	Type/Code	
	Standard	Section with valve UC - OA - C
SAE6	<b>K111</b> 200.9413.6064.0	<b>K27</b> 200.9413.6056.0
SAE8	<b>K112</b> 200.9413.7038.0	<b>K24</b> 200.9413.7037.0
3/8" BSP	<b>K113</b> 200.9413.2041.0	<b>K58</b> 200.9413.2040.0
M18X1.5	<b>K114</b> 200.9413.1033.0	<b>K59</b> 200.9413.1032.0

### 8C.10.2 Special element (residual flow): to be used only with T89 (\*\*) inlet cover

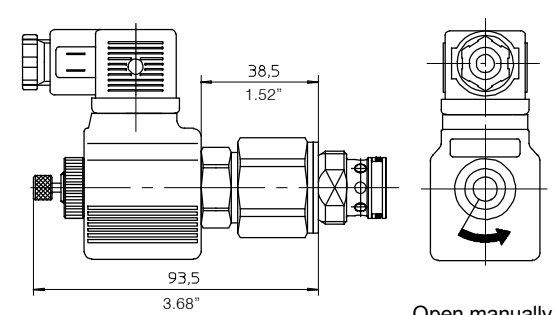
Ø D	Type/Code	
	Standard	Section with valve UC - OA - C
SAE6	<b>K116</b> 200.9413.6063.0	<b>K81</b> 200.9413.6059.0
SAE8	<b>K117</b> 200.9413.7036.0	<b>K82</b> 200.9413.7035.0
3/8" BSP	<b>K118</b> 200.9413.2039.0	
M18X1.5	<b>K119</b> 200.9413.1031.0	<b>K86</b> 200.9413.1030.0

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

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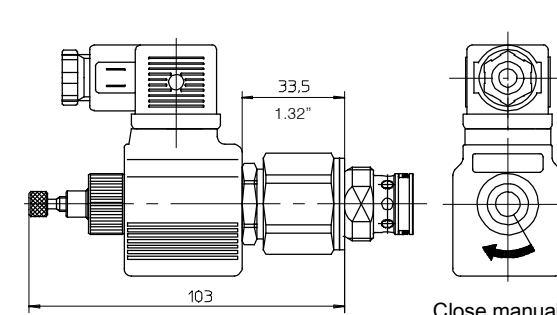
## 8C.11 By-Pass solenoid valve - BP3 -

### 8C.11.1 Normally closed with manual override



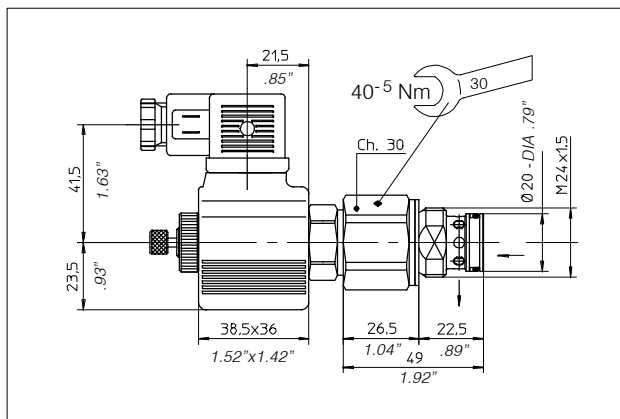
Voltage	Type	Code
without coil	<b>BP3/CE HDS11PQ p.m.</b>	200.7572.0048.0
12 V. D.C.	<b>BP3/CE 13- HC27 HDS11PQ</b>	200.9570.1007.4
24 V. D.C.	<b>BP3/CE 23- HC27 HDS11PQ</b>	200.9570.2007.1

### 8C.11.2 Normally open with manual override



Voltage	Type	Code
without coil	<b>BP3/AE HDS11PQ p.m.</b>	200.7572.0049.0
12 V. D.C.	<b>BP3/AE 13- HC27 HDS11PQ</b>	200.9570.1008.3
24 V. D.C.	<b>BP3/AE 23- HC27 HDS11PQ</b>	200.9570.2007.2

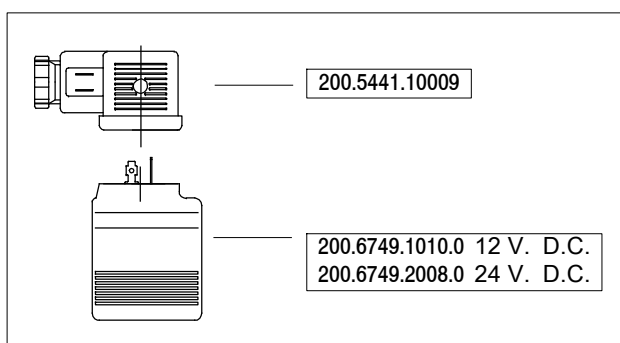
### 8C.11.3 Dimension



### 8C.11.4 BP3 Solenoid valve performances

Max. pressure	315 bar
Max. flow	60 l/min
Power	27 Watt
Intermittence	ED 100%
Voltage tolerance	± 10%
Temperature range	-20/+80 °C
Oil filtration	≤ 25 micron
Pressure drop Q= 30 l/min	7.5 bar
Pressure drop Q= 50 l/min	12.7 bar

### 8C.11.5 Spare parts



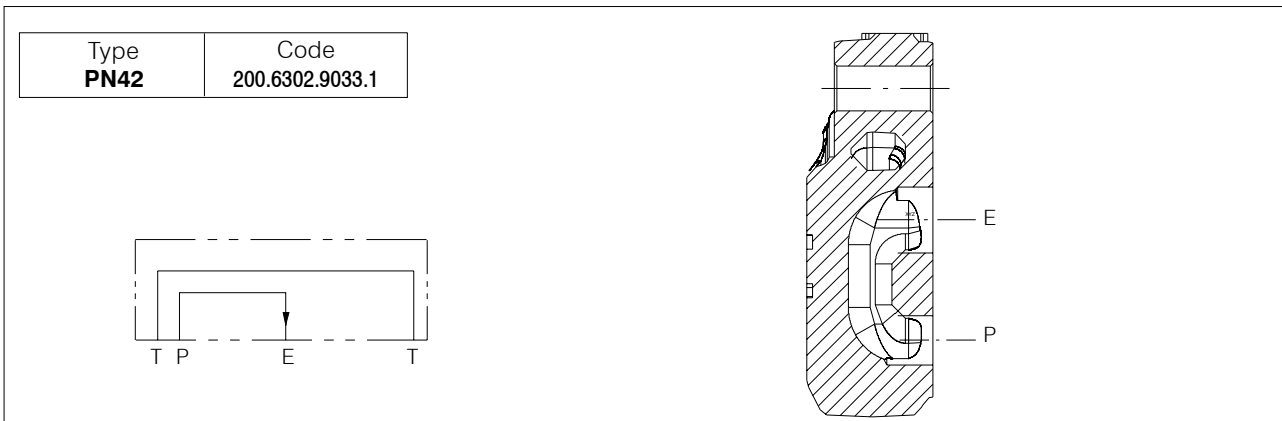
### 8C.11.6 Coil specifications

Voltage	12	24	V. D.C.
Power	27.2	27	Watt
Resistance (Ambient Temp.)	5.3	21.3	Ohm
Resistance (Stabilized Temp.)	8	32	Ohm
Current (Ambient Temp.)	2.2	1.12	Ampere
Current (Stabilized Temp.)	1.5	0.75	Ampere

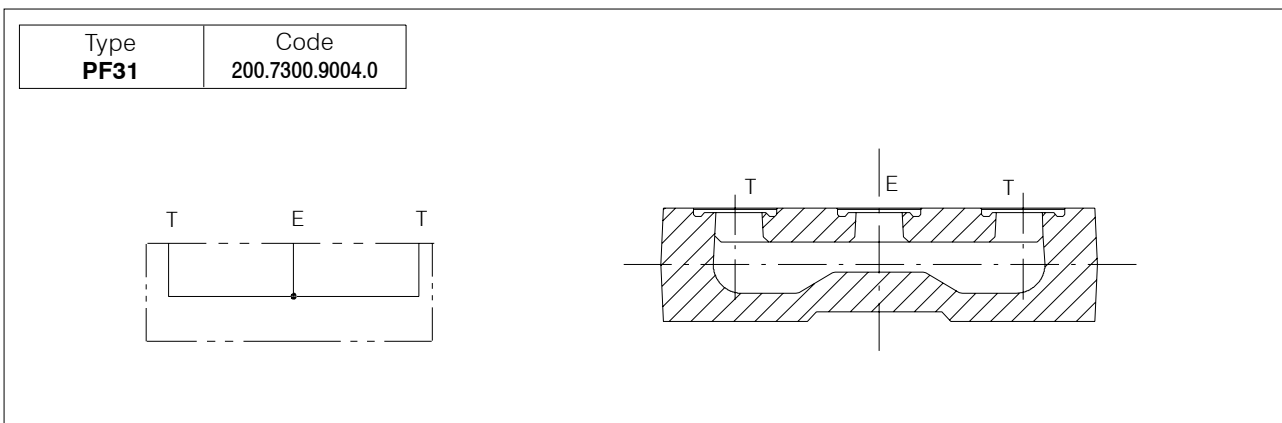
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**8C.12 End cover for K100 and T100**

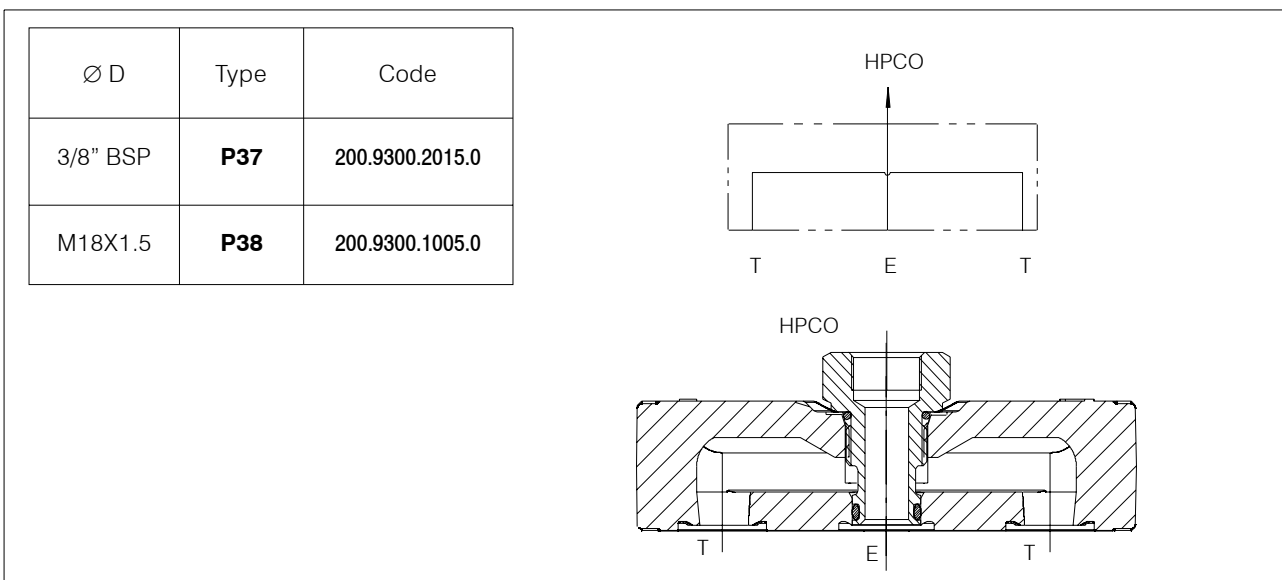
**8C.12.1 Right cover**



**8C.12.2 Standard left cover**



**8C.12.3 Carry-over left cover**



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