

PRESSURE COMPENSATED  
PROPORTIONAL LOAD SENSING  
VALVE

**RPC** 130



**walvoil**  
HYDRAULIC CONTROL SYSTEMS

## Features

These valves are used for systems with fixed displacement pumps (open centre version) or variable displacement pumps (closed centre version).

**H** Load-independent flow control.

**H** Internal pilot oil supply built into inlet cover.

**H** Options for electrical LS unloading valves.

**H** Interchangeable spools.

**H** A wide variety of service ports valves.

**H** Available manual, hydraulic and electro-hydraulic proportional spool control kits.

**H** Available with compensated or non compensated working sections.

**H** Safety and diagnostics available on the 8ZR proportional electro-hydraulic control spool kit closed loop system, with electronic on board.

### Additional information

This catalogue shows the product in the most standard configurations.

Please contact Customer Service Dpt. for more detailed information or special request.

### WARNING!

All specifications of this catalogue refer to the standard product at this date.

Walvoil, oriented to a continuous improvement, reserves the right to discontinue, modify or revise the specifications, without notice.

**WALVOIL IS NOT RESPONSIBLE FOR ANY DAMAGE CAUSED BY AN INCORRECT USE OF THE PRODUCT.**

10<sup>th</sup> edition November 2002:

**This edition supercedes all prior documents.**

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## Function

The purpose of the Proportional Load-Sensing system is to maintain the constant pressure drop across a variable orifice.

The concept of this system is based on the close relationship between flow and pressure  $Q \propto A \times \sqrt{\Delta p}$ .

What happens is that as a volume of fluid flows across an opening, it will lose a predetermined amount of pressure.

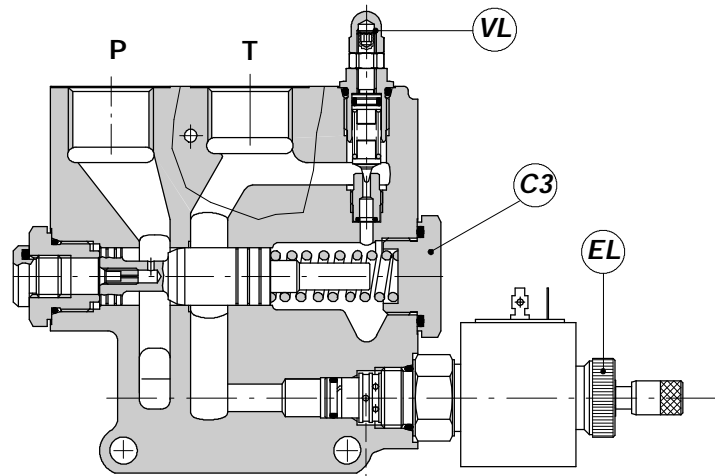
By comparing the pressure upstream and downstream of the spool, it is possible to measure the difference ( $\Delta p$ ) which must remain constant during valve spool operation.

Through selection, the highest pressure which becomes the feedback signal, is taken from the work ports. For a fixed displacement pump, the feedback signal is directed to the 3-way flow control valve inlet section.

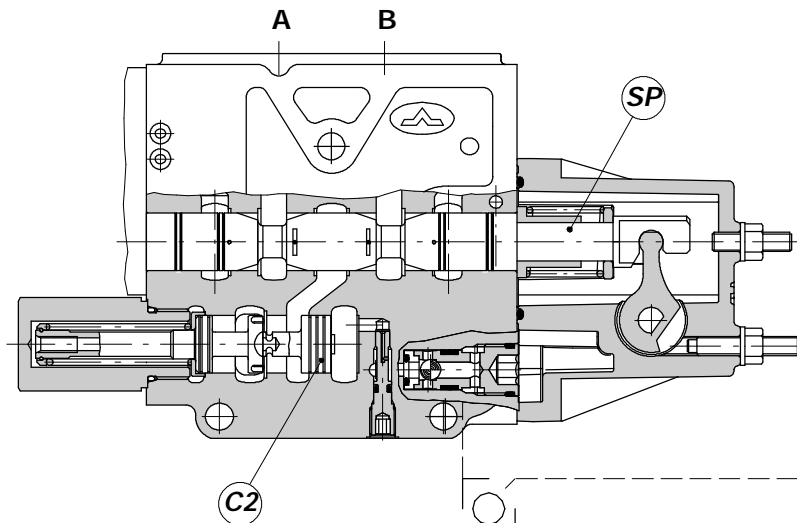
For a variable displacement pump the signal is directed to the pump load sense control.

- H Due to a two-way pressure compensator in each section, regulated flow remains virtually constant for a given spool position regardless of load pressure variations.
- H Simultaneous operations are possible regardless of the flow rates and pressure differences required for each actuator, with no interaction between the various services.
- H The maximum flow required for each port (A-B) in each working section can be pre-set.  
**Important note:** in order to avoid either a slow down or a stop of the actuator operating at the highest pressure, the inlet flow must be higher than the sum of the flows required by the services simultaneously operated.
- H Metering is controlled throughout spool travel, providing ultra-sensitive and accurate control.
- H Max. pressure can be set in each section with built-in adjustable L.S. pressure relief valves.

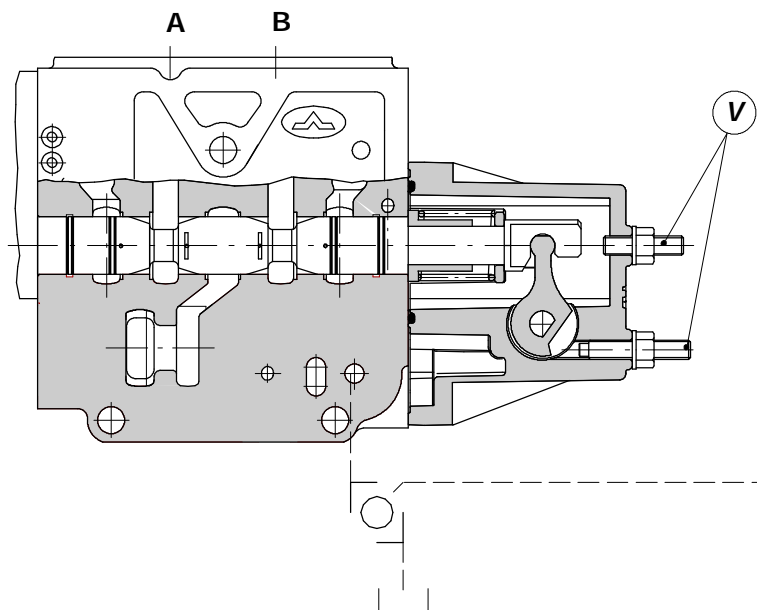
Inlet cover type BR



Working section with compensator type C10



Working section without compensator type D10



- VL** Pressure main relief valve
- C3** 3-ways flow control valve
- EL** Solenoid operate unloader valve
- SP** Main spool
- C2** 2-ways pressure compensator
- V** Max. oil flow adjustment screws for A and B ports

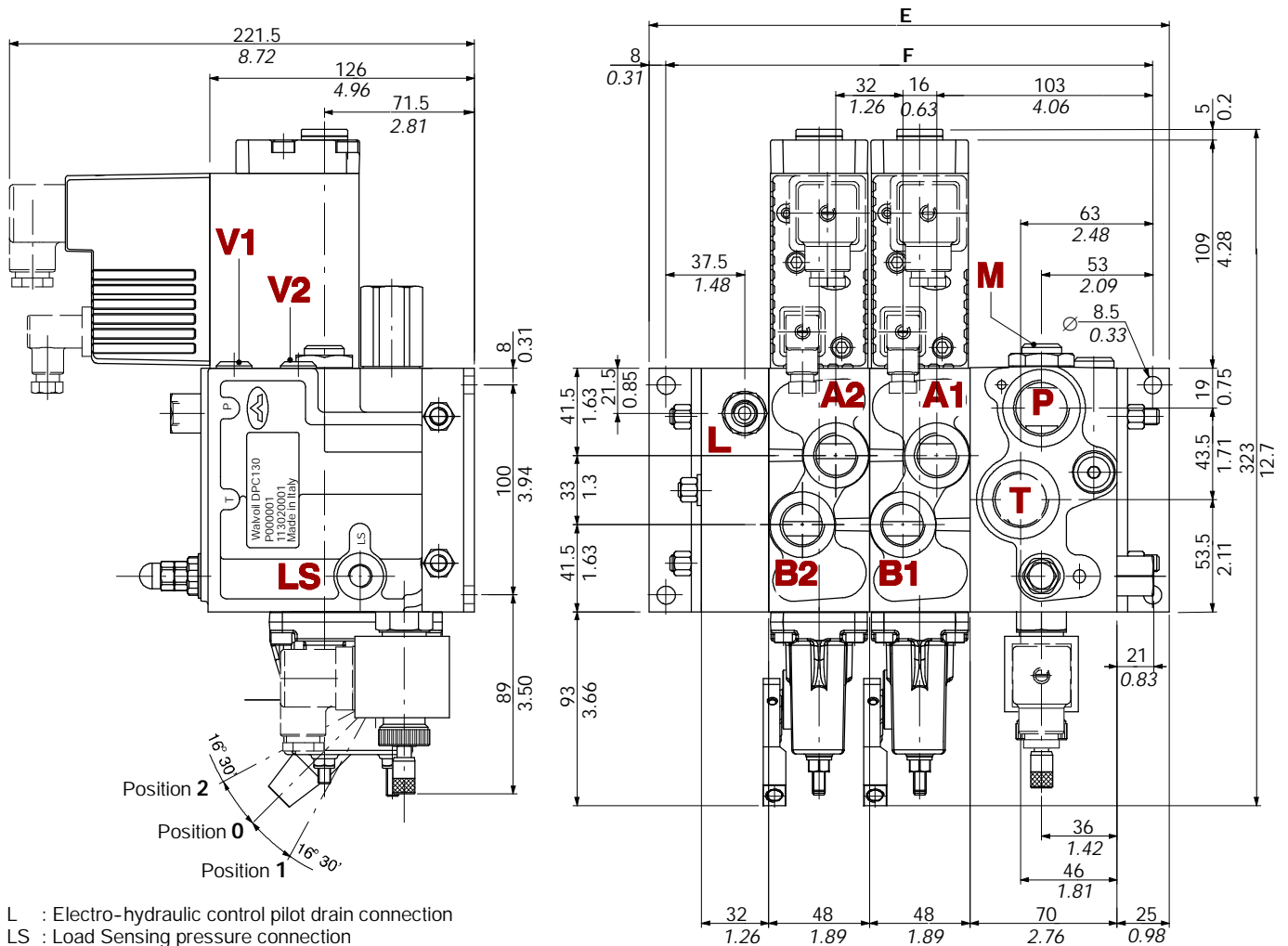
# DPC130

## Working conditions

This catalogue shows technical specifications and diagrams measured with mineral oil of 46 mm<sup>2</sup>/s - 46 cSt viscosity at 40°C temperature.

Nominal flow rating	<i>on inlet port P</i>	140 l/min	
	<i>on ports A and B with compensator</i>	100 l/min	
	<i>on ports A and B without compensator</i>	120 l/min	
Operating pressure (maximum)		315 bar	4600 psi
Max. back pressure	<i>on outlet port T</i>	25 bar	360 psi
	<i>on drain port L</i>	2.5 bar	36 psi
Internal leakage A(B)→T	$\Delta p = 100 \text{ bar} - 1450 \text{ psi}$ <i>fluid and valve at 40°C</i>	10 cm <sup>3</sup> /min	0.61 in <sup>3</sup> /min
Fluid		Mineral base oil	
Fluid temperature	<i>with NBR (BUNA-N) seals</i>	from -20° to 80°C	
	<i>with FPM (VITON) seals</i>	from -20° to 100°C	
Viscosity	<i>operating range</i>	from 15 to 75 mm <sup>2</sup> /s	from 15 to 75 cSt
	<i>min</i>	12 mm <sup>2</sup> /s	12 cSt
	<i>max</i>	400 mm <sup>2</sup> /s	400 cSt
Max level of contamination		18/15 - ISO 4406	
Ambient temperature		from -40° to 60°C	
Tie rod tightening torque (wrench 13)		28 Nm	20.6 lbft

NOTE - For different conditions please contact Customer Service.



- L : Electro-hydraulic control pilot drain connection
- LS : Load Sensing pressure connection
- M : Pump pressure gauge connection
- V1 : Pilot pressure connection to supply hydraulic remote servocontrols ( $P_{max}=20 \text{ bar}/290 \text{ psi}$   $P \Rightarrow \text{OUT}$ )
- V2 : Pilot pressure connection to operate, with an external source, the electro-hydraulic controls ( $P_{max}=315 \text{ bar}/4600 \text{ psi}$   $P \Rightarrow \text{IN}$ )

TYPE	E		F		Weight	
	mm	in	mm	in	kg	lb
DPC130/1	200	7.87	184	7.24	12.4	27.3
DPC130/2	248	9.76	232	9.13	19.4	42.8
DPC130/3	296	11.7	280	11	25.3	55.8
DPC130/4	344	13.5	328	12.9	31	68.3
DPC130/5	392	15.4	376	14.8	36.5	80.5

TYPE	E		F		Weight	
	mm	in	mm	in	kg	lb
DPC130/6	440	17.3	424	16.7	42.6	93.9
DPC130/7	488	19.2	472	18.6	48.7	107
DPC130/8	536	21.1	520	20.5	54.8	121
DPC130/9	584	23	568	22.4	60.9	134
DPC130/10	632	24.9	616	24.3	67	148

### Standard threads

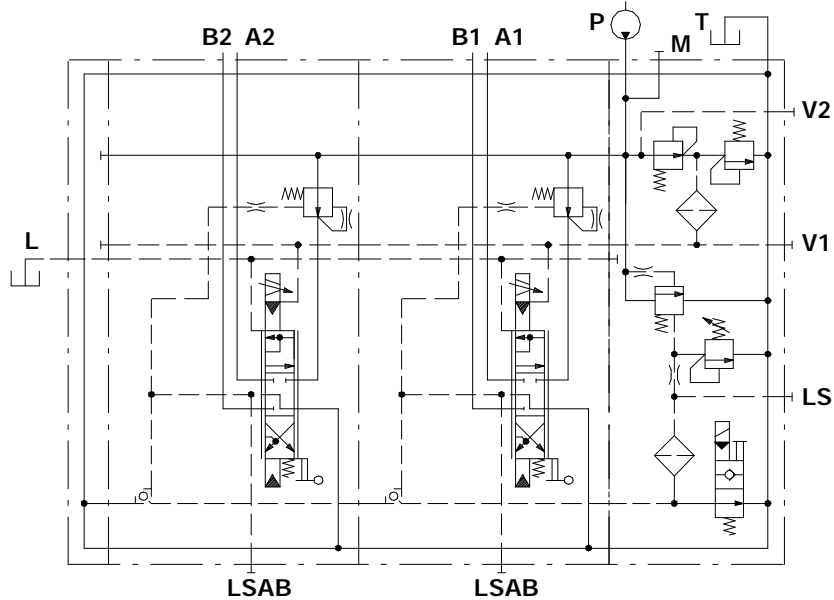
PORT	BSP (ISO 228/1)	UN-UNF (ISO 11926-1)
Inlet P and outlet T	G 3/4	1 1/16-12 UN-2B (SAE 12)
A and B ports	G 1/2	7/8-14 UNF-2B (SAE 10)
PILOT PORTS		
LS, M	G 1/4	9/16-18 UNF-2B (SAE 6)
L, V1, V2	G 1/4	9/16-18 UNF-2B (SAE 6)

## Hydraulic circuit

### Fixed displacement pump (open centre)

In this configuration there is a 3-way flow control valve in the inlet section.

It diverts to tank the full flow when no spool is operated or a portion of the inlet flow when one or more spools are activated.

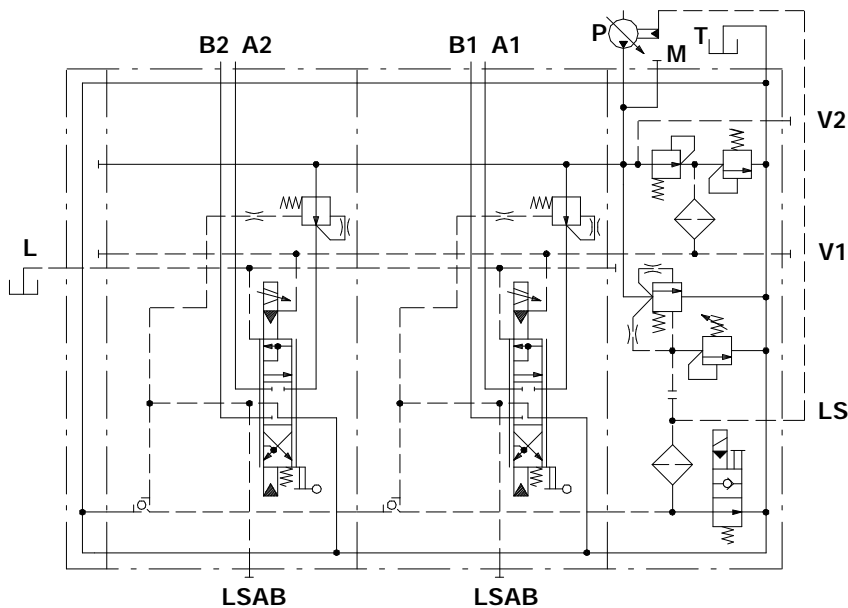


Description example: DPC130/2/BR11-S220-ELP/C10-18ZR3L0/C10-18ZR3L0/RF30-12VDC-<CVN>

### Variable displacement pump with load sensing compensator

In the neutral position the pump control sets the displacement so that leakage in the system is compensated for to maintain the set stand-by pressure.

The pressure adjustment spool of the valve will only open to tank when the pressure in channel P exceeds the set value of the pressure relief valve.

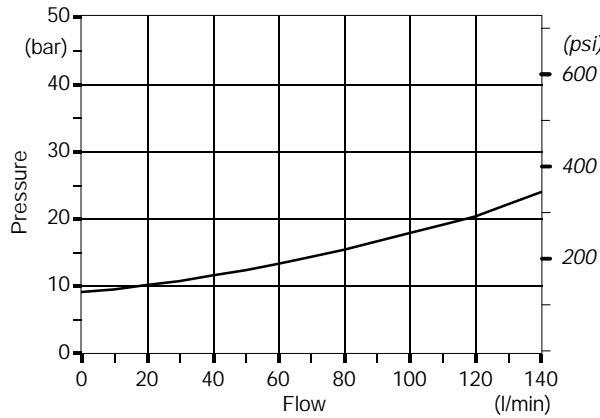


Description example: DPC130/2/BR21-S220-ELP/C10-18ZR3L0/C10-18ZR3L0/RF30-12VDC-<CVN>



**Open centre**

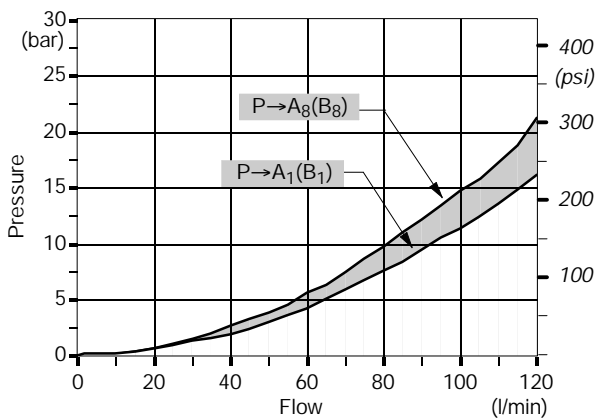
Inlet cover pressure drop curves for open centre valves (used with fixed displacement pumps).



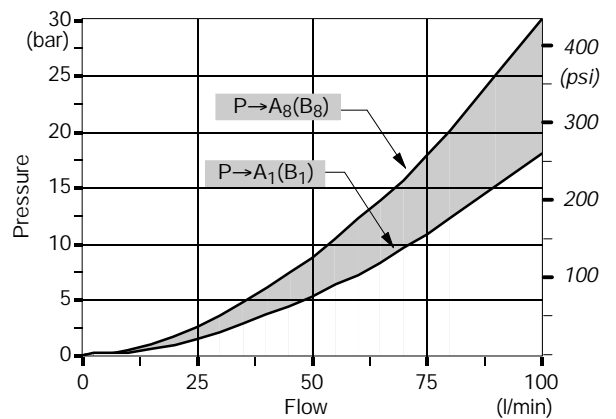
**Inlet to work port**

From P inlet to A port (spool in position 1) or B port (spool in position 2).

Working section without compensator

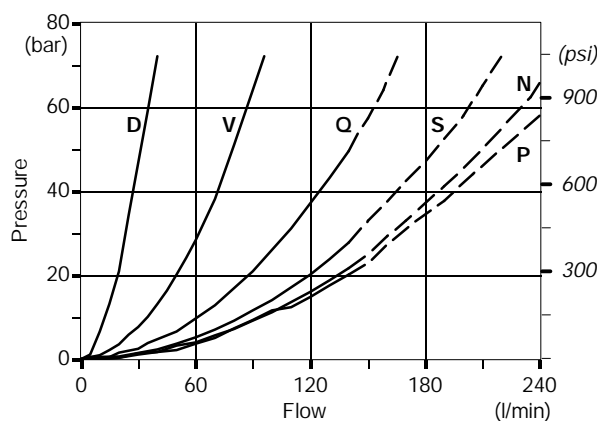


Working section with compensator



**Work port to outlet**

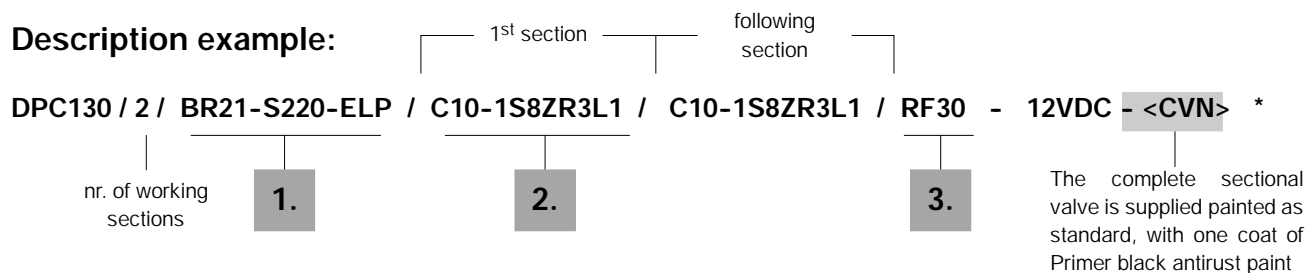
From A port (spool in position 2) or B port (spool in position 1) to T outlet.



# DPC130

## Ordering codes

### Description example:



### 1. Inlet cover \*

page 12

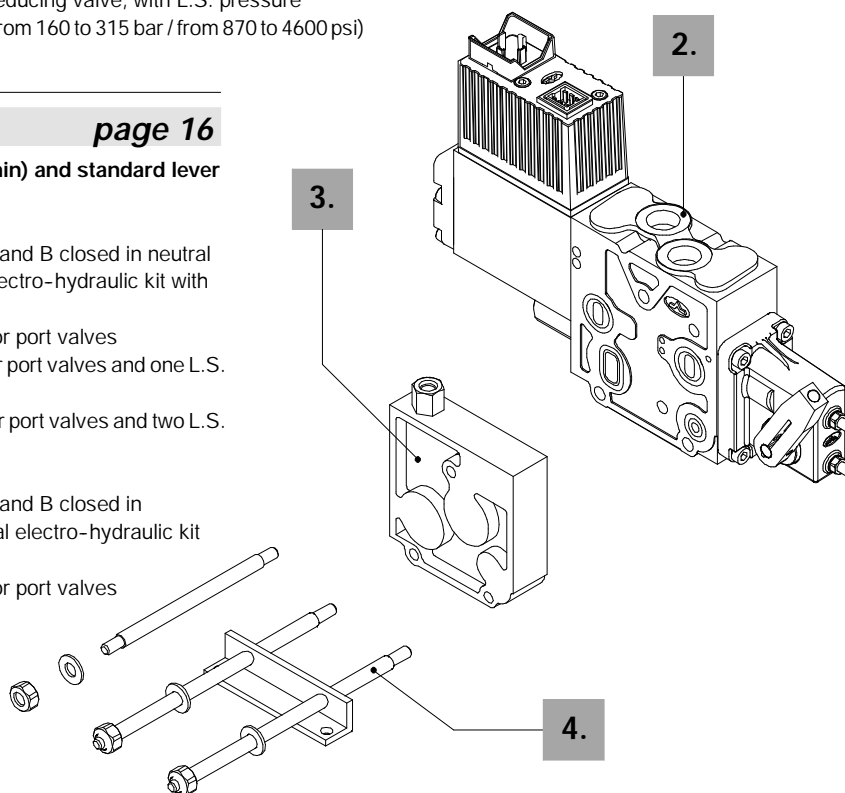
TYPE	CODE	DESCRIPTION
<u>Closed centre</u>		
BR21-S220-ELP	634210001	With pressure reducing valve and L.S. pressure relief valve (setting from 160 to 315 bar / from 870 to 4600 psi) and 12 VDC solenoid unloader valve with emergency push-button
BN21-S220	634220003	Without pressure reducing valve, with L.S. pressure relief valve (setting from 160 to 315 bar / from 870 to 4600 psi)
<u>Open centre</u>		
BR11-S220-ELP	634210002	With pressure reducing valve and L.S. pressure relief valve (setting from 160 to 315 bar / from 870 to 4600 psi) and 12 VDC solenoid unloader valve with emergency push-button
BN11-S220	634211002	Without pressure reducing valve, with L.S. pressure relief valve setting from 160 to 315 bar / from 870 to 4600 psi)

### 2. Working section \*

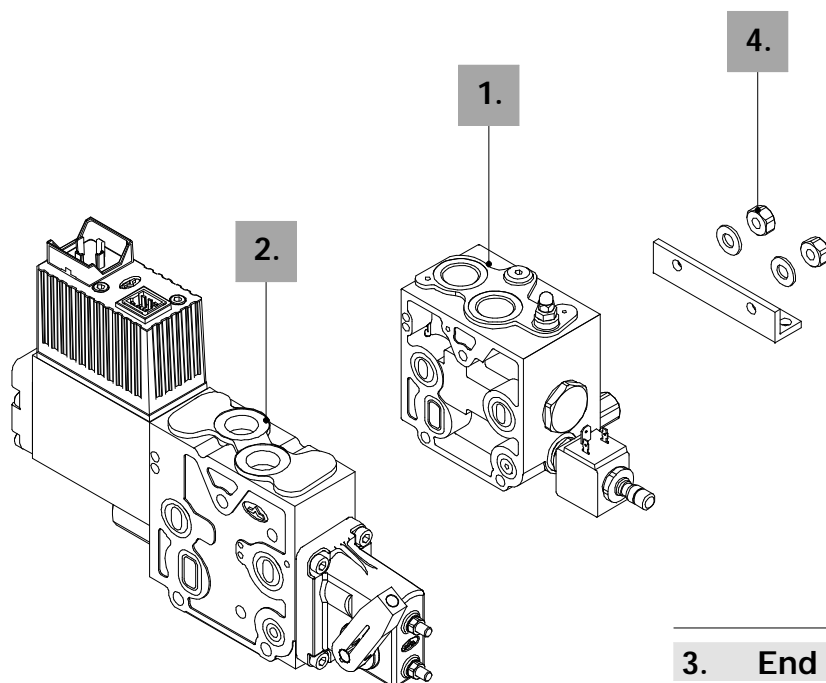
page 16

With electro-hydraulic control, spool type 1S (60 l/min) and standard lever

TYPE	CODE	DESCRIPTION
<u>With compensator</u>		
C10	634110001	Double acting spool with A and B closed in neutral position and proportional electro-hydraulic kit with feedback
C20	634110006	As C10 plus prearranged for port valves
C21	634110007	As C20 plus prearranged for port valves and one L.S. valve
C22	634110008	As C20 plus prearranged for port valves and two L.S. valves
<u>Without compensator</u>		
D10	634120001	Double acting spool with A and B closed in neutral position, proportional electro-hydraulic kit with feedback
D20	634120004	As D10 plus prearranged for port valves



NOTE - For the items, inlet covers and working sections composition, see the regarding pages.



**3. End cover \*** **page 35**

TYPE	CODE	DESCRIPTION
<u>Without P-T ports</u>		
<b>RF10</b>	634310001	Standard
<b>RF20</b>	634310000	For proportional operated kit 8IM (see pages 31 and 35)
<b>RF30</b>	634310002	With drain
<u>With P-T ports plugged</u>		
<b>RC11</b>	634310010	Standard
<b>RC21</b>	634310011	For proportional operated kit 8IM (see pages 31 and 35)
<b>RC31</b>	634310012	With drain
<u>With P-T ports plugged and LS port</u>		
<b>RD11</b>	634310013	Standard
<b>RD21</b>	634310014	For proportional operated kit 8IM (see pages 31 and 35)
<b>RD31</b>	634310015	With drain

**4. Assembling kit**

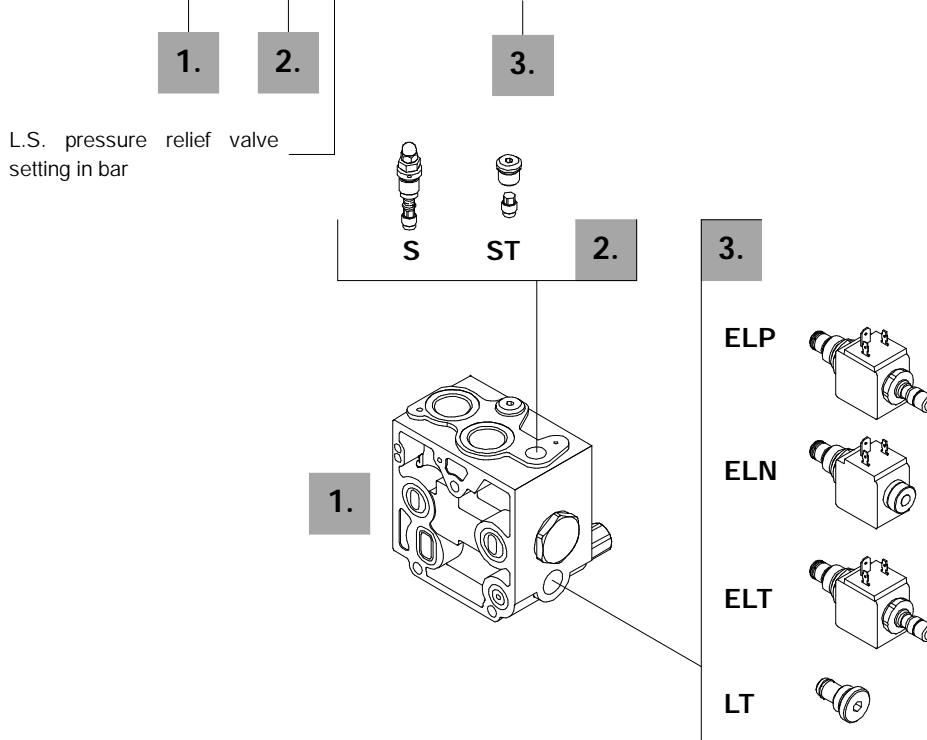
CODE	DIRECTIONAL VALVE
<b>5TIR108185</b>	Tie rods with nuts for 1 section
<b>5TIR108232</b>	Tie rods with nuts for 2 sections
<b>5TIR108281</b>	Tie rods with nuts for 3 sections
<b>5TIR108328</b>	Tie rods with nuts for 4 sections
<b>5TIR108376</b>	Tie rods with nuts for 5 sections
<b>5TIR108425</b>	Tie rods with nuts for 6 sections
<b>5TIR108472</b>	Tie rods with nuts for 7 sections
<b>5TIR108520</b>	Tie rods with nuts for 8 sections
<b>5TIR108568</b>	Tie rods with nuts for 9 sections
<b>5TIR108616</b>	Tie rods with nuts for 10 sections

NOTE (\*) - Items are referred to **BSP** thread.

## Ordering codes

### Description example:

FE DPC130 / BR21 - S 220 - ELP - 12VDC \*



### 1. Inlet body kit \*

With pressure reducing valve for electro-hydraulic positioners pilot

TYPE	CODE	DESCRIPTION
BR11	5FIA630301	Open centre
BR21	5FIA630300	Closed centre

Without pressure reducing valve

TYPE	CODE	DESCRIPTION
BN11	5FIA630303	Open centre
BN21	5FIA630302	Closed centre

### 2. Inlet relief options page 14

TYPE	CODE	DESCRIPTION
S	XCAR126215	Load Sensing pressure relief valve with setting from 40 to 180 bar / from 580 to 2600 psi
	XCAR126213	Load Sensing pressure relief valve with setting from 160 to 315 bar / from 2300 to 4600 psi
ST	5KIT126210	Relief valve blanking kit

### 3. Unloader valve options page 15

Only for BR type inlet cover, with pressure reducing valve

TYPE	CODE	DESCRIPTION
ELP	5CAR426302	Load Sensing solenoid controlled unloader valve with emergency push-button 12VDC
	5CAR426304	24VDC
ELN	5CAR426310	Load Sensing 12 VDC solenoid controlled unloader valve
ELT	5CAR426315	24 VDC
	5CAR426322	Load Sensing 12 VDC solenoid controlled unloader valve with emergency lock
LT	5CAR426324	24 VDC
	XTAP222340	Unloader valve blanking plug

NOTE (\*) - Items are referred to **BSP** thread.

Conversion kits are available to change from open centre to closed centre and vice versa:

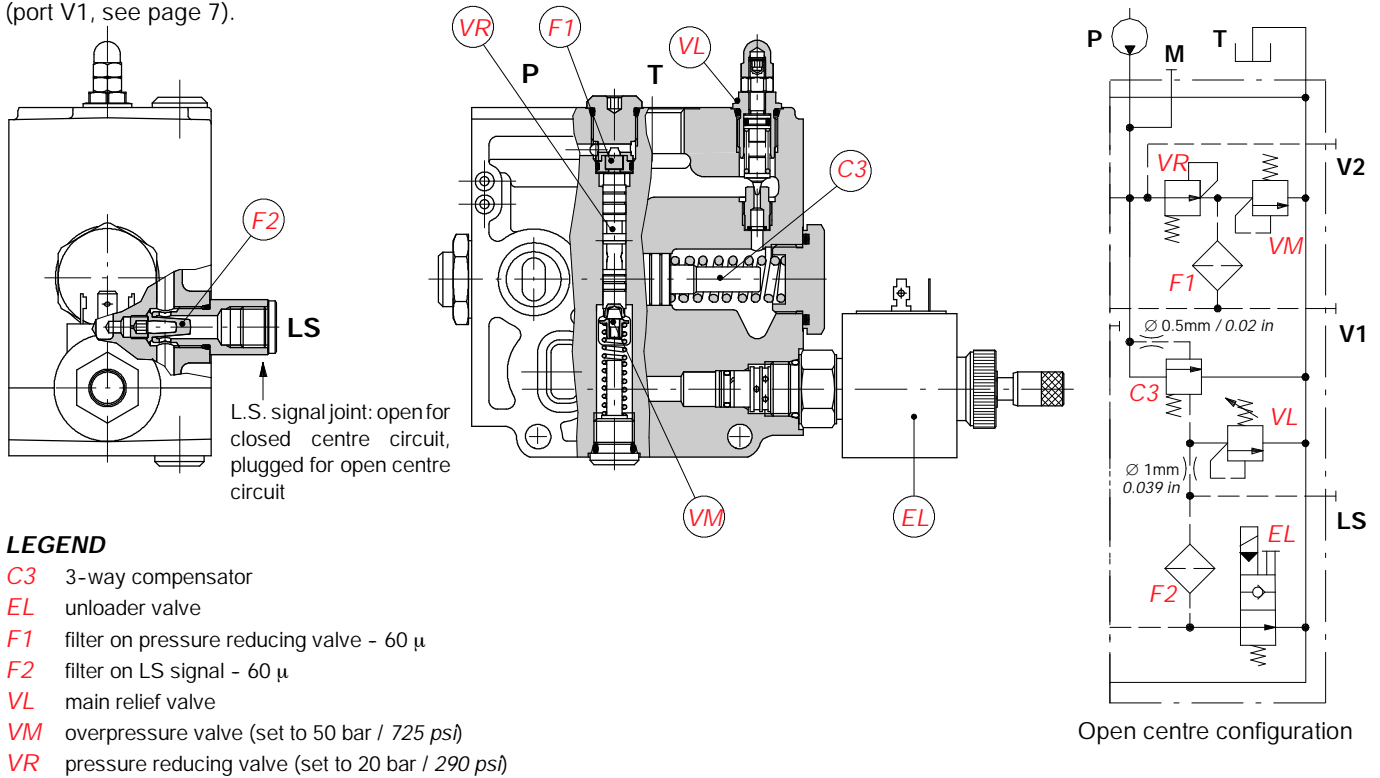
CA/CC code 5KIT130300 (include M8x1 plug, M5 restrictor and spool)

CC/CA code 5KIT130310 (include M8x1 restrictor, M5 (FC0,5) restrictor and compensator)

**BR: with pressure reducing valve**

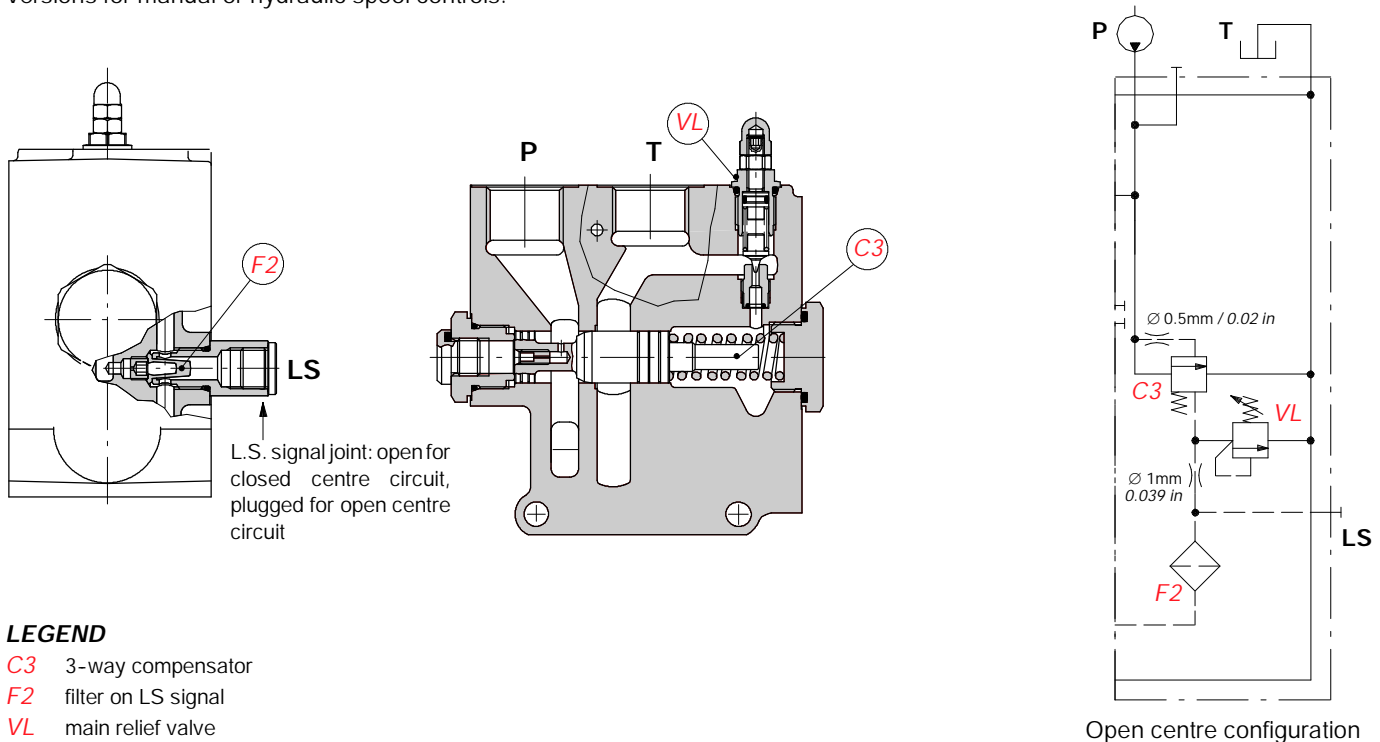
Pilot oil supply configuration for 8EZ3 and 8ZR3 electro-hydraulic spool positioner kits.

Cover prearranged for electrical L.S. unloading valve and external connection to supply hydraulic remote controls (port V1, see page 7).



**BN: without pressure reducing valve**

Versions for manual or hydraulic spool controls.

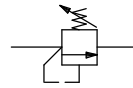
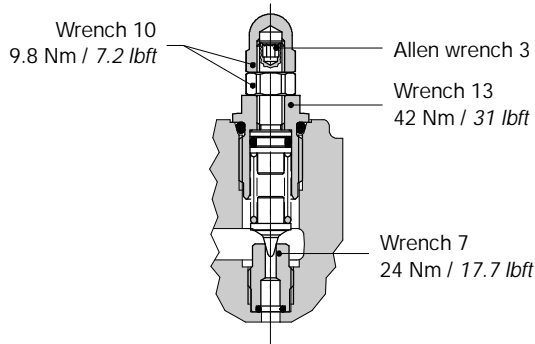


**Inlet relief options**

**S: load-sensing pressure relief valve**

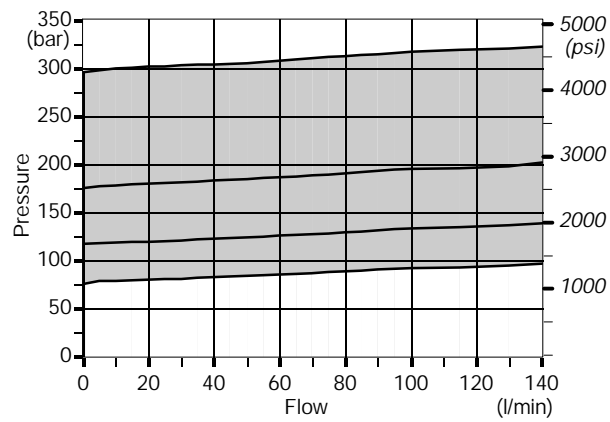
**S 220**

Pressure setting in bar

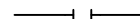
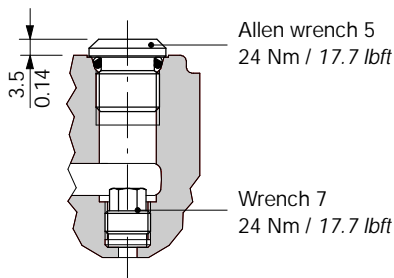


**Performance data**

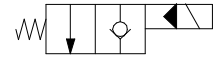
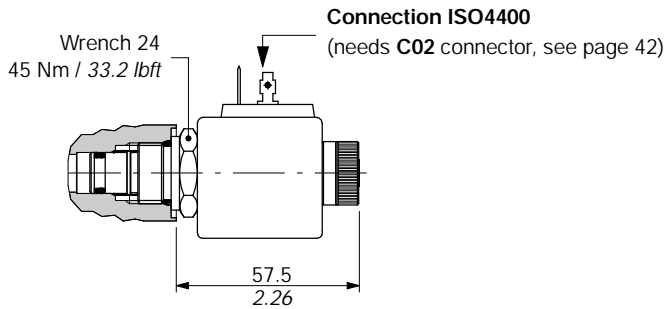
**Range setting**



**ST: relief valve blanking kit**



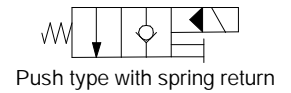
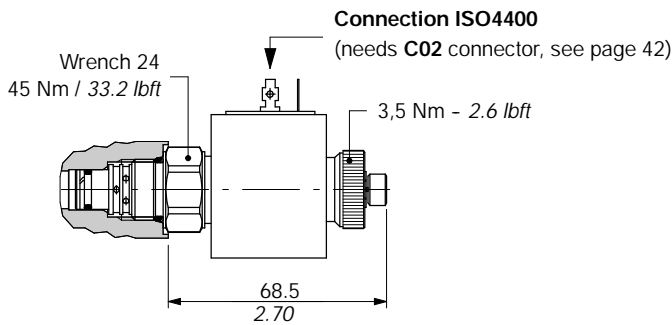
**ELN: without emergency push button**



**Solenoid operating features**

Nominal voltage ..... : 12 VDC / 24 VDC  
 Power rating ..... : 18 W  
 Duty cycle ..... : 100%

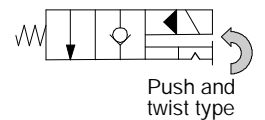
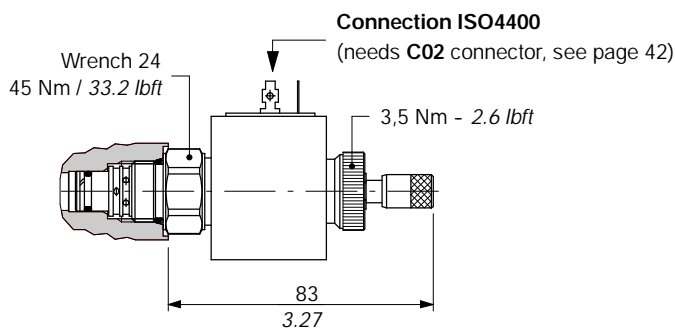
**ELP: with emergency push-button**



**Solenoid operating features**

Nominal voltage ..... : 12 VDC / 24 VDC  
 Power rating ..... : 17 W  
 Duty cycle ..... : 100%

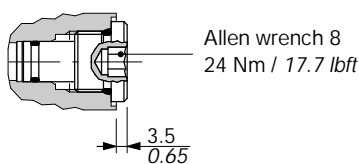
**ELT: with emergency lock**



**Solenoid operating features**

Nominal voltage ..... : 12 VDC / 24 VDC  
 Power rating ..... : 17 W  
 Duty cycle ..... : 100%

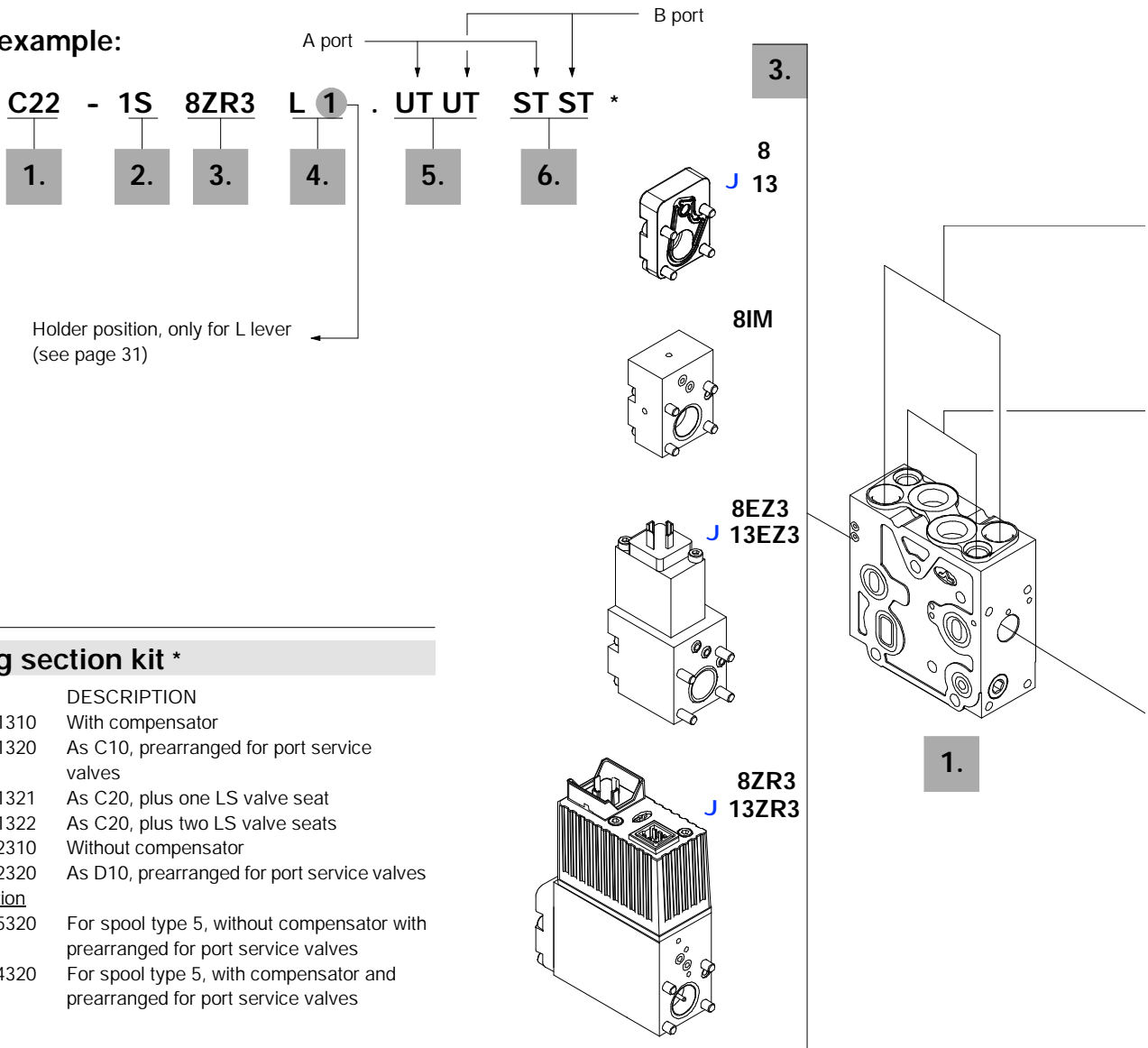
**LT: unloader valve blanking plug**



## Ordering codes

### Description example:

EL DPC130/ **C22** - **1S** **8ZR3** **L 1** . **UT UT** **ST ST \***



### 1. Working section kit \*

TYPE	CODE	DESCRIPTION
C10	5EL6301310	With compensator
C20	5EL6301320	As C10, prearranged for port service valves
C21	5EL6301321	As C20, plus one LS valve seat
C22	5EL6301322	As C20, plus two LS valve seats
D10	5EL6302310	Without compensator
D20	5EL6302320	As D10, prearranged for port service valves

#### Special working section

J G20	5EL6305320	For spool type 5, without compensator with prearranged for port service valves
J F20	5EL6304320	For spool type 5, with compensator and prearranged for port service valves

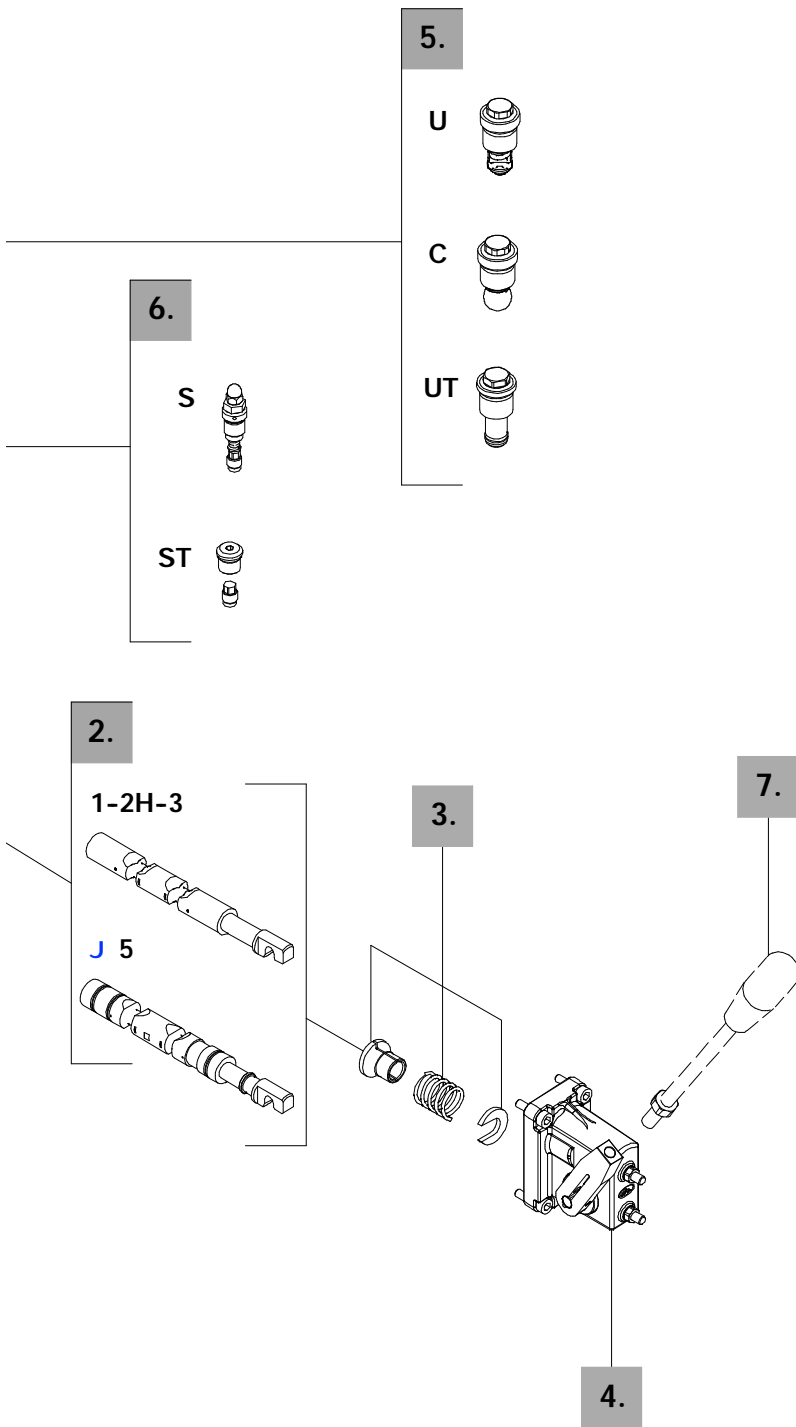
### 2. Spool options

page 21

TYPE	CODE						DESCRIPTION
	10 l/min	25 l/min	40 l/min	60 l/min	80 l/min	100 l/min	
CIRCUIT	D	V	Q	S	N	P	Nominal flow (see page 24)
1	3CU4010010	3CU4010025	3CU4010040	3CU4010060	3CU4010080	3CU4010100	Double acting, 3 positions, A and B closed in neutral position
2H	3CU4025010	3CU4025025	3CU4025040	3CU4025060	3CU4025080	3CU4025100	Double acting, 3 positions, with A and B partially open to tank in neutral position
3		3CU4031025	3CU4031040	3CU4031060	3CU4031080		Single acting on A, 3 positions B plugged
<u>Special spool:</u>							
J 5		3CU4041025	3CU4041040	3CU4041060	3CU4041080		Double acting, 4 positions, A and B to tank in 4 <sup>th</sup> position (float)

NOTE (\*) - Items are referred to **BSP** thread.





NOTE **J** - Items with the same symbol must be assembled together: for more informations see relevant pages.

**7. Optional handlever**

TYPE	CODE	DESCRIPTION
AL01/M8x170	170011117	For L lever box L= 170 mm / 6.69 in

**3. "A" side positioners page 25**

TYPE	CODE	DESCRIPTION
<b>7FT</b>	5V07130000	Friction with center sensor
<b>8</b>	5V08130000	With spring return in neutral position
<b>8EZ3</b>	5V08130780	12 VDC proportional operated electro-hydraulic kit (suitable for ON/OFF applications as well)
	5V08130781	24 VDC
<b>8ZR3</b>	5V08130900	Proportional electro-hydraulic kit with feedback (12 or 24VDC)
<b>8IM</b>	5V08130800	Proportional operated with spring return in neutral position
<u>Special positioners</u>		
<b>J 13</b>	5V13130000	With detent in position 3 and spring return neutral position
<b>J 13EZ3</b>	5V13130780	As type 13 12VDC proportional electro-hydraulic
	5V13130781	24VDC
<b>J 13ZR3</b>	5V13130900	As type 13EZ3 with feedback (12 or 24VDC)

**4. "B" side options page 31**

TYPE	CODE	DESCRIPTION
<b>L</b>	5LEV130710	Standard lever box
<b>LN</b>	5LEV130700	Box without holder

**5. Port relief options page 32**

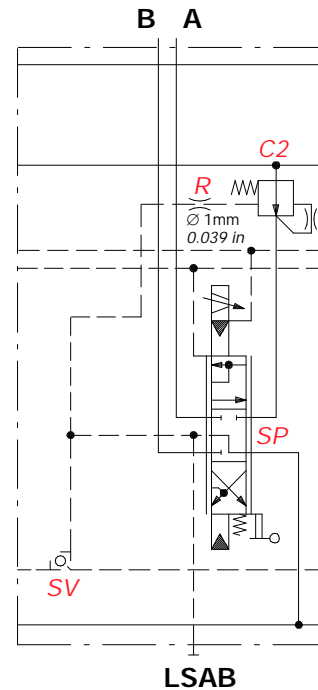
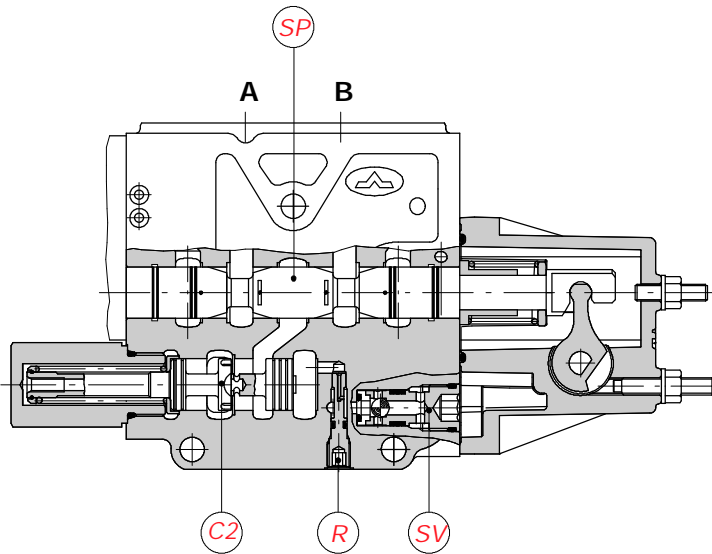
TYPE	CODE	DESCRIPTION
Anti-shock and anti-cavitation valves fixed setting in bar (10 l/min)		
<b>U050</b>	5KIT330050	Setting to 50 bar / 725 psi
<b>U063</b>	5KIT330063	Setting to 63 bar / 913 psi
<b>U080</b>	5KIT330080	Setting to 80 bar / 1160 psi
<b>U100</b>	5KIT330100	Setting to 100 bar / 1450 psi
<b>U125</b>	5KIT330125	Setting to 125 bar / 1812 psi
<b>U140</b>	5KIT330140	Setting to 140 bar / 2030 psi
<b>U150</b>	5KIT330150	Setting to 150 bar / 2175 psi
<b>U160</b>	5KIT330160	Setting to 160 bar / 2320 psi
<b>U175</b>	5KIT330175	Setting to 175 bar / 2538 psi
<b>U190</b>	5KIT330190	Setting to 190 bar / 2755 psi
<b>U210</b>	5KIT330210	Setting to 210 bar / 3045 psi
<b>U230</b>	5KIT330230	Setting to 230 bar / 3335 psi
<b>U250</b>	5KIT330250	Setting to 250 bar / 3625 psi
<b>U280</b>	5KIT330280	Setting to 280 bar / 4060 psi
<b>U300</b>	5KIT330300	Setting to 300 bar / 4350 psi
<b>U320</b>	5KIT330320	Setting to 320 bar / 4640 psi
<b>C</b>	5KIT430000	Anti-cavitation valve
<b>UT</b>	XTAP522440	A and B port valve blanking plug

**6. L.S. relief options page 34**

TIPO	CODICE	DESCRIZIONE
<b>S</b>	XCAR126215	Load Sensing pressure relief valve with setting from 40 to 180 bar / from 580 to 2600 psi
	XCAR126213	Load Sensing pressure relief valve with setting from 160 to 315 bar / from 2300 to 4600 psi
<b>ST</b>	5KIT126210	Relief valve blanking plug

Hydraulic circuit with compensator

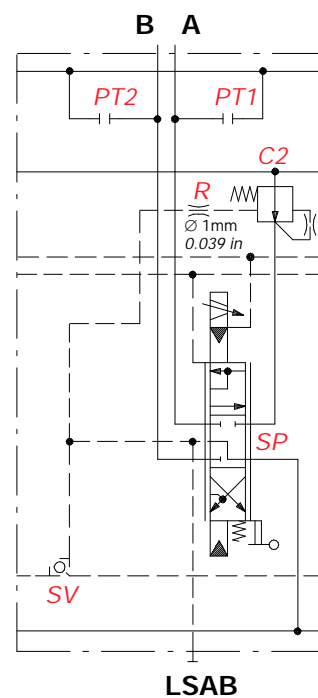
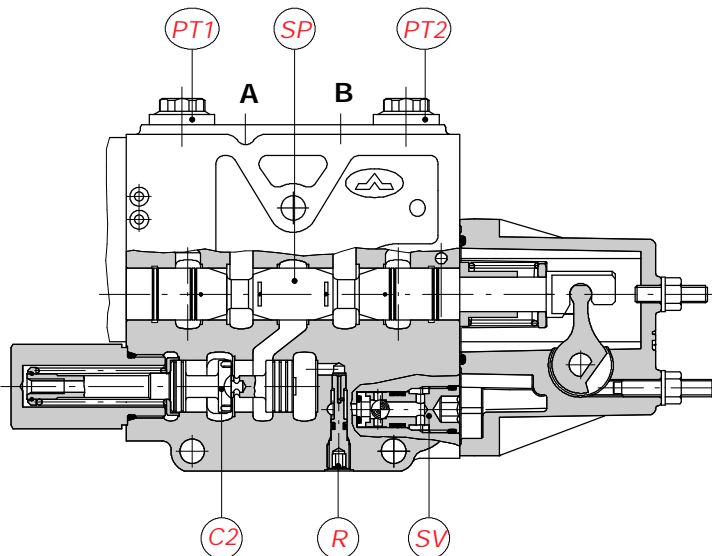
C10: without service valve prearrangement



LEGEND

- C2 2-way compensator
- R restrictor
- SP spool
- SV shuttle valve

C20: with service valve prearrangement

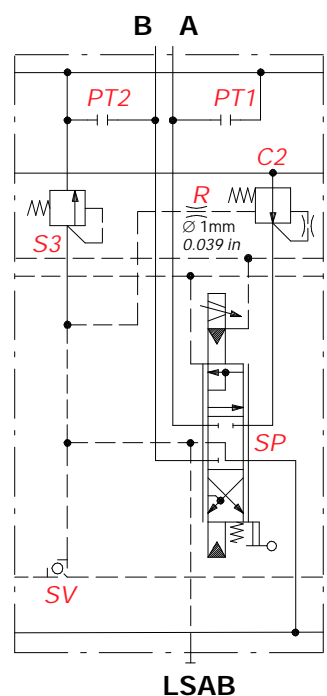
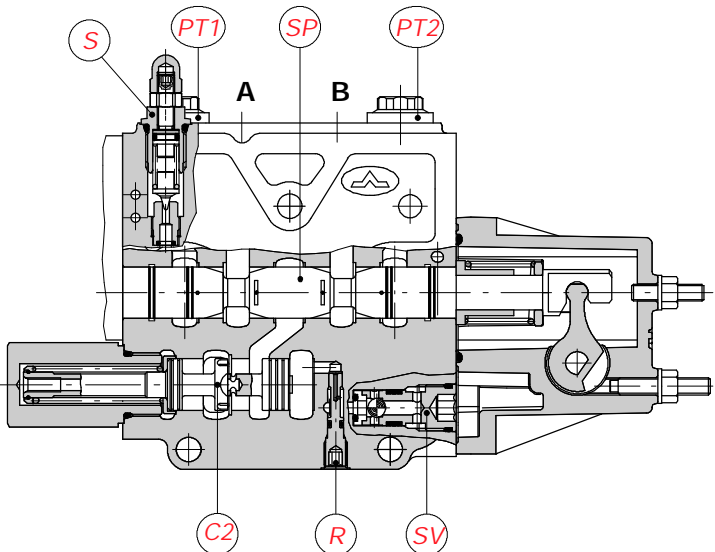


LEGEND

- C2 2-way compensator
- PT1 service valve prearrangement on port A
- PT2 service valve prearrangement on port B
- R restrictor
- SP spool
- SV shuttle valve

Hydraulic circuit with compensator

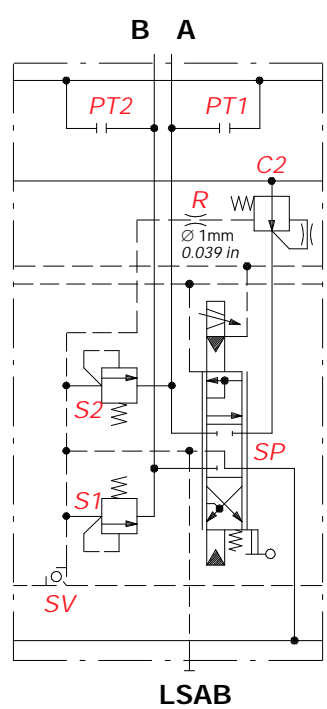
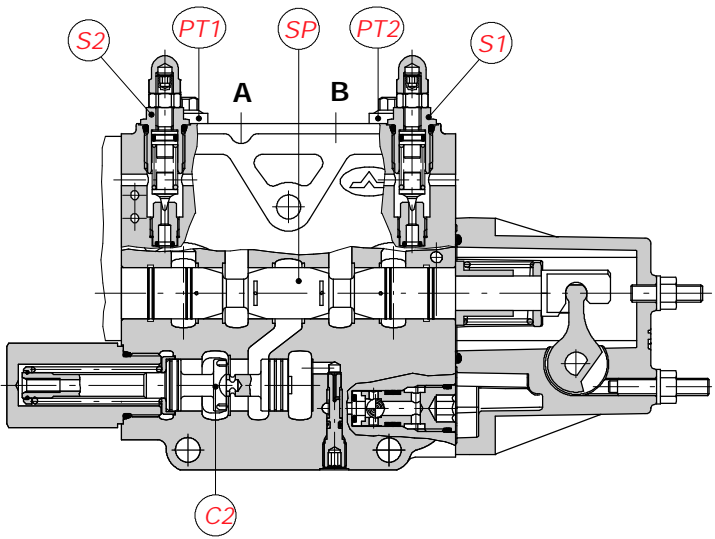
C21: with one L.S. pressure relief valve and service valve prearrangement



LEGEND

- C2 2-way compensator
- PT1 service valve prearrangement on port A
- PT2 service valve prearrangement on port B
- R restrictor
- S3 pressure relief valve on ports A and B
- SP spool
- SV shuttle valve

C22: with two L.S. pressure relief valve and service valve prearrangement

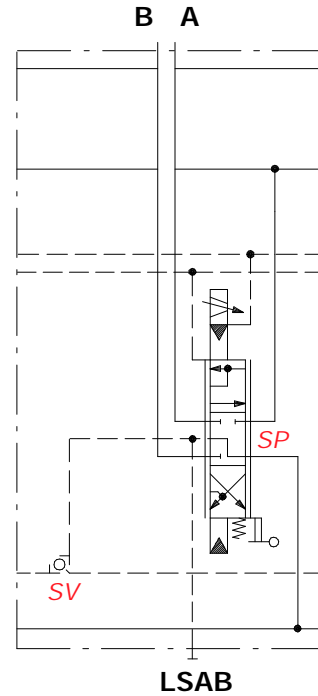
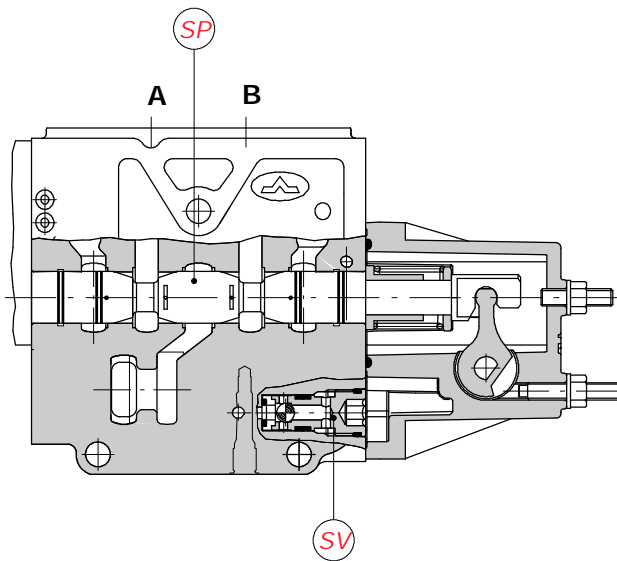


LEGEND

- C2 2-way compensator
- PT1 service valve prearrangement on port A
- PT2 service valve prearrangement on port B
- R restrictor
- S1 pressure relief valve on port A
- S2 pressure relief valve on port B
- SP spool
- SV shuttle valve

Hydraulic circuit without compensator

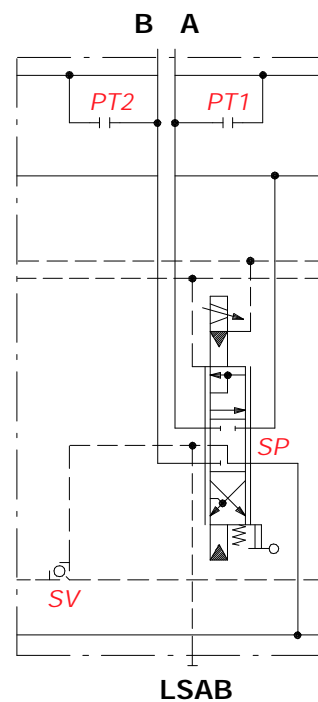
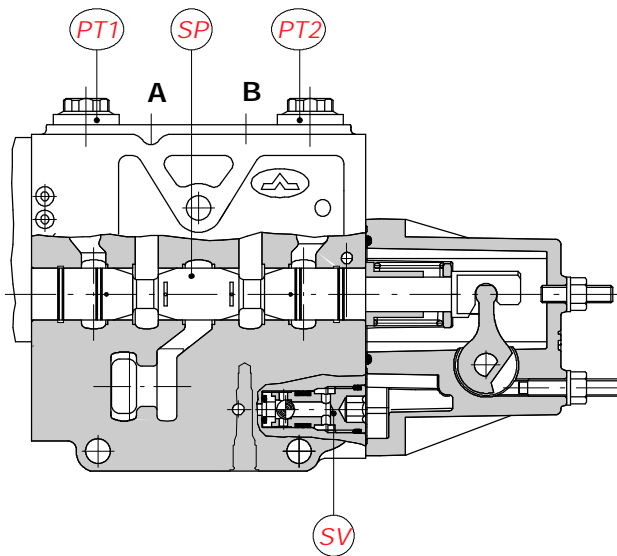
D10: without service valve prearrangement



LEGEND

- SP spool
- SV shuttle valve

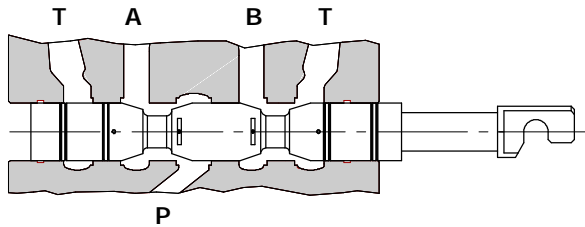
D20: with service valve prearrangement



LEGEND

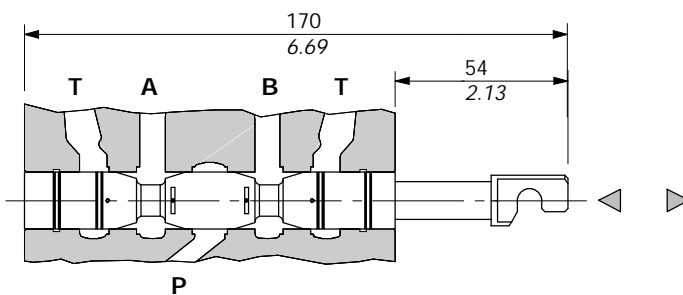
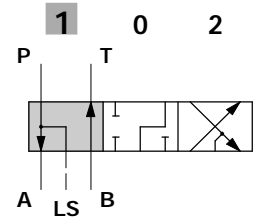
- PT1 service valve prearrangement on port A
- PT2 service valve prearrangement on port B
- SP spool
- SV shuttle valve

Type1

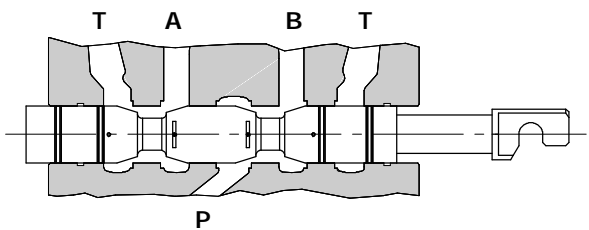
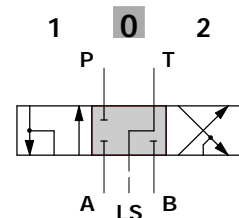


P → A B → T

stroke = + 7 mm  
+ 0.28 in

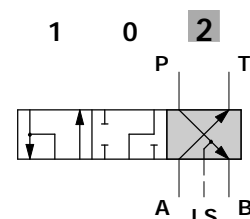


P-A-B-T closed, with load sensing (LS) line to tank

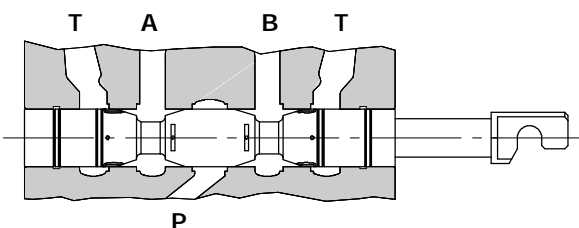


P → B A → T

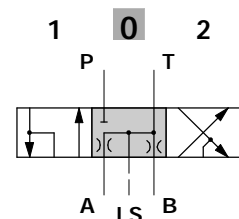
stroke = - 7 mm  
- 0.28 in



Type 2H

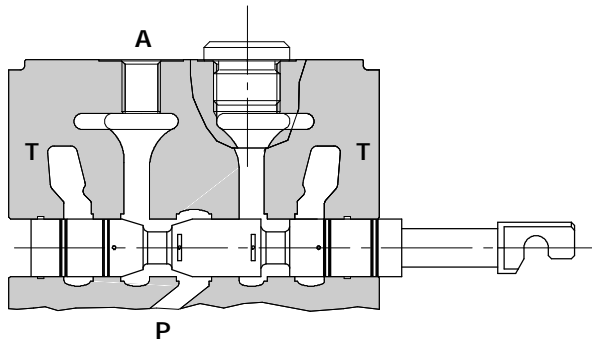


P closed, A-B partially open to tank



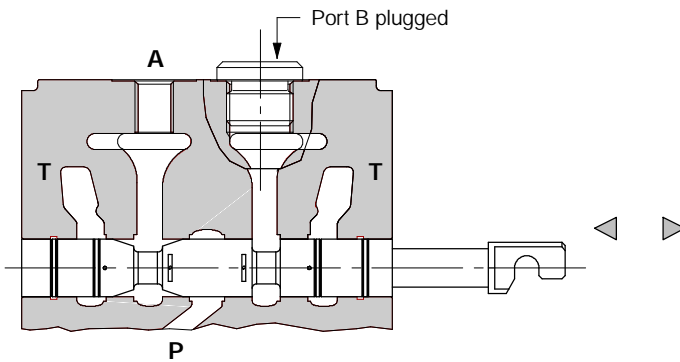
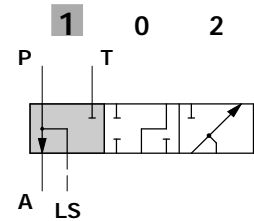
Spool options

Type 3

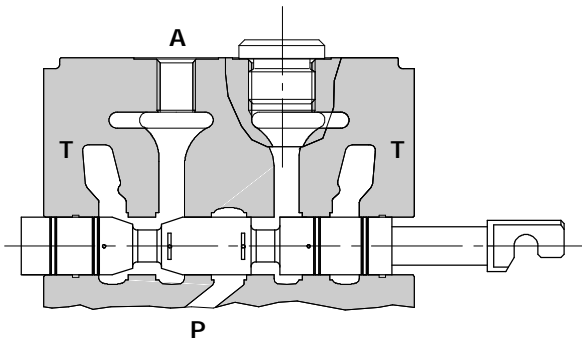
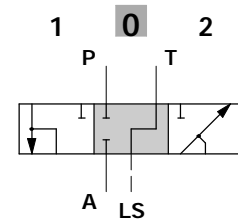


P → A

stroke = + 7 mm  
+ 0.28 in

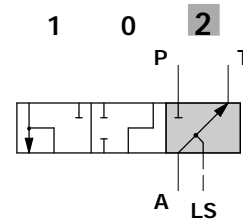


P-A-B-T closed, with load sensing (LS) line to tank



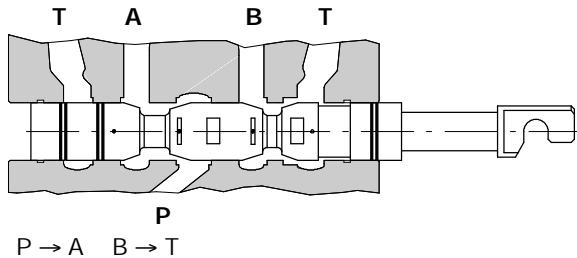
A → T

stroke = - 7 mm  
- 0.28 in

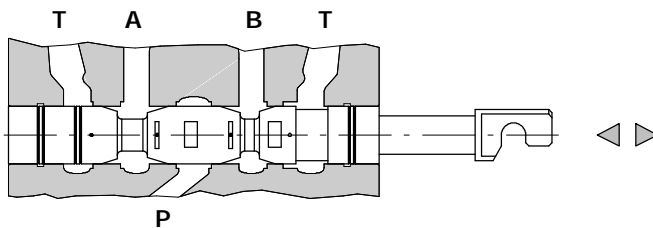
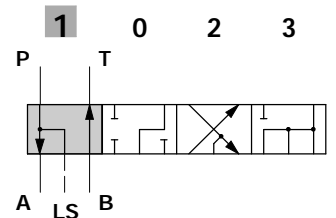


Type 5

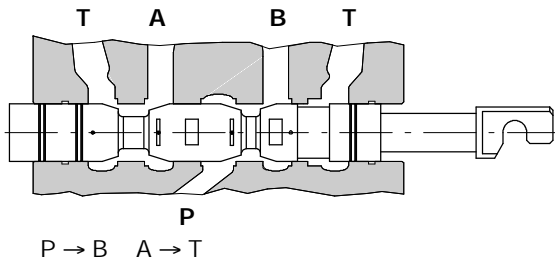
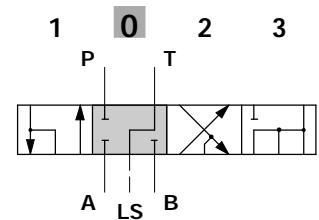
This spool needs special body with extra machining and must be used only with spool positioner type 13, 13EZ3 or 13ZR3 (see page 16).



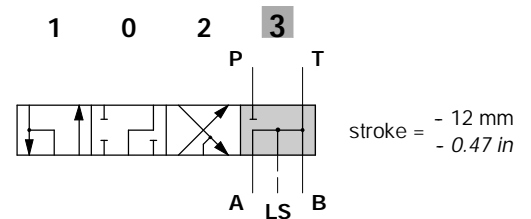
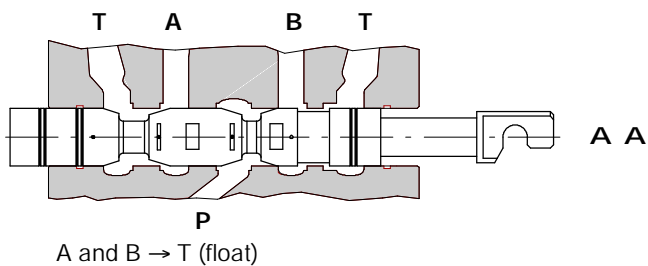
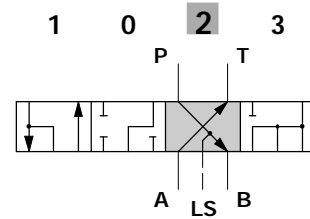
stroke = + 7 mm  
+ 0.28 in



P-A-B-T closed, with load sensing (LS) line to tank



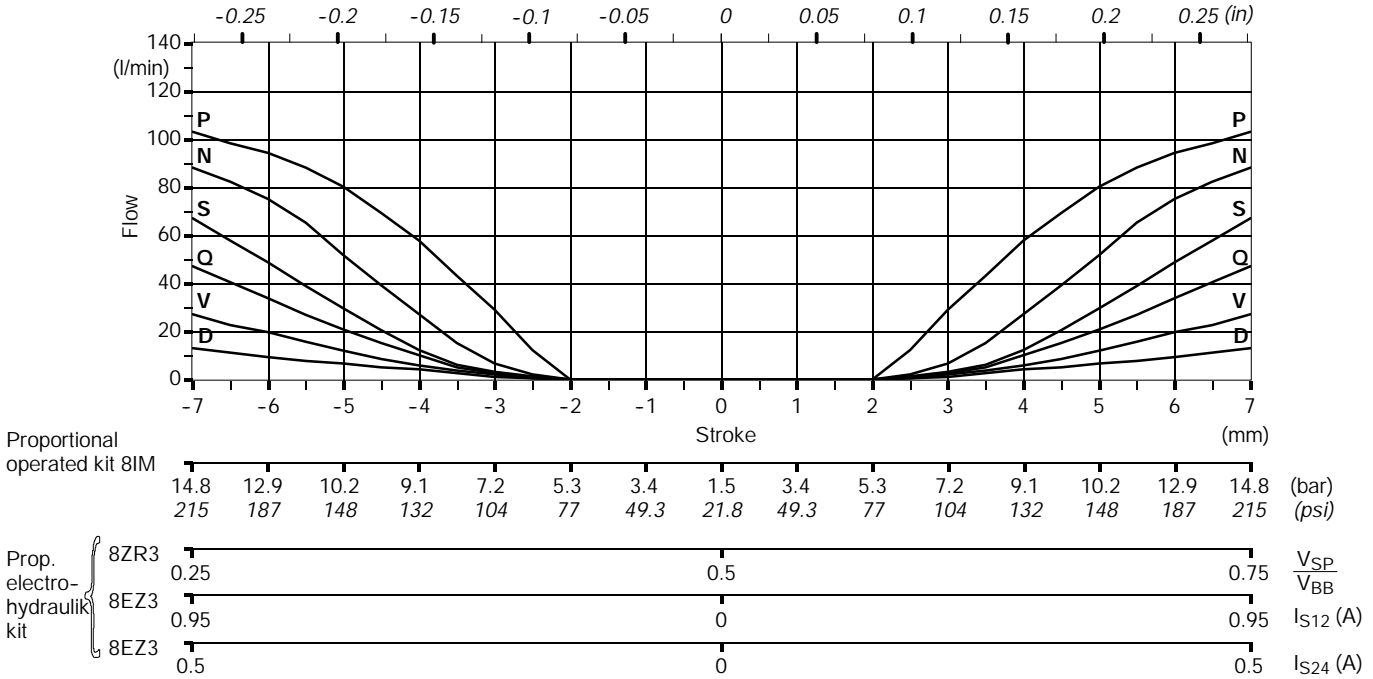
stroke = - 7 mm  
- 0.28 in



Spool options

Performance data (type 1 spool)

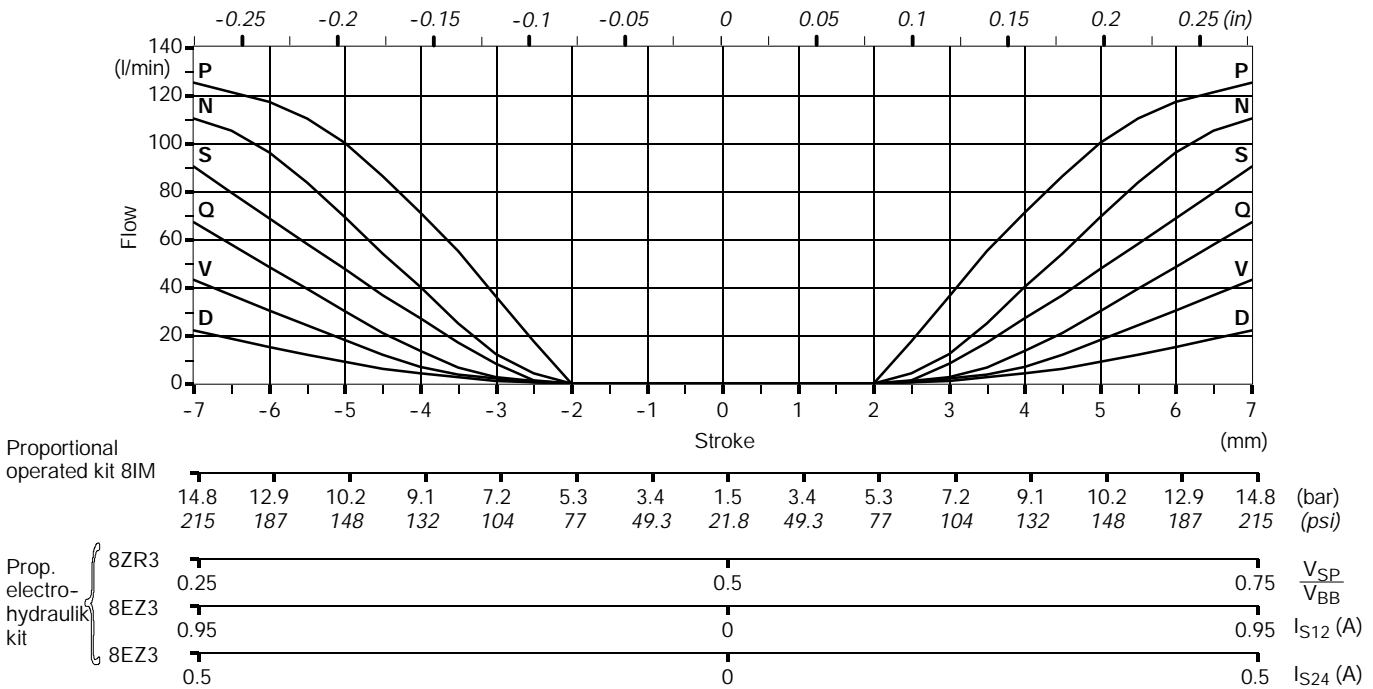
Pressure compensated section, open or closed centre



NOTE - Q<sub>p</sub> = pump flow, Q<sub>s</sub> = spool flow. The characteristic curves have been tested with Q<sub>p</sub> q 1,05 - Q<sub>s</sub>.  
 Over than 80 l/min (spool N and P) when the pump flow is the same of spool flow (Q<sub>p</sub>=Q<sub>s</sub>), the flow obtained in 8<sup>th</sup>, 9<sup>th</sup> e 10<sup>th</sup> working section is lower of 5%.

Pressure non compensated section, open centre

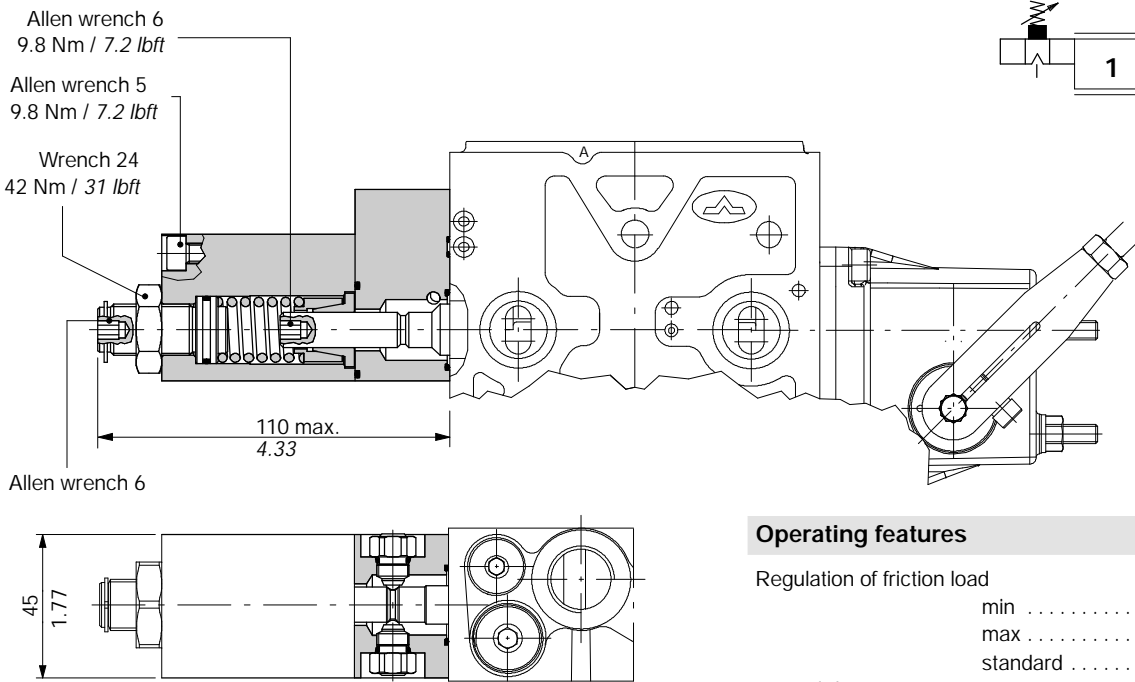
The characteristics are measured with a pump oil flow Q<sub>p</sub> = 140 l/min and only one section working.



V<sub>SP</sub> = joystick set point voltage V<sub>BB</sub> = battery supply voltage (12V or 24V) I<sub>S12</sub> = solenoid current (12V) I<sub>S24</sub> = solenoid current (24V)



With friction 7FT kit

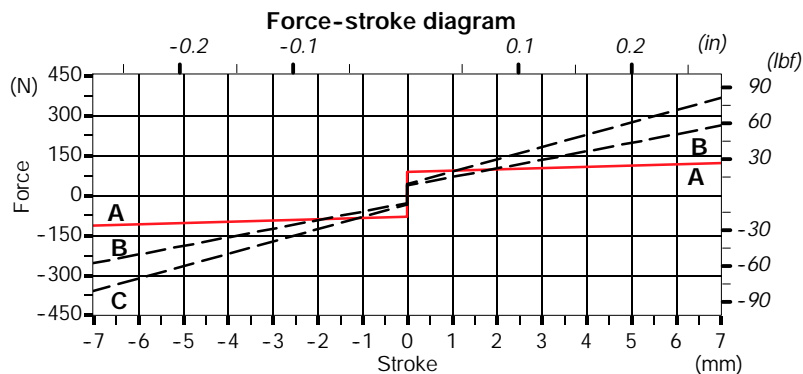
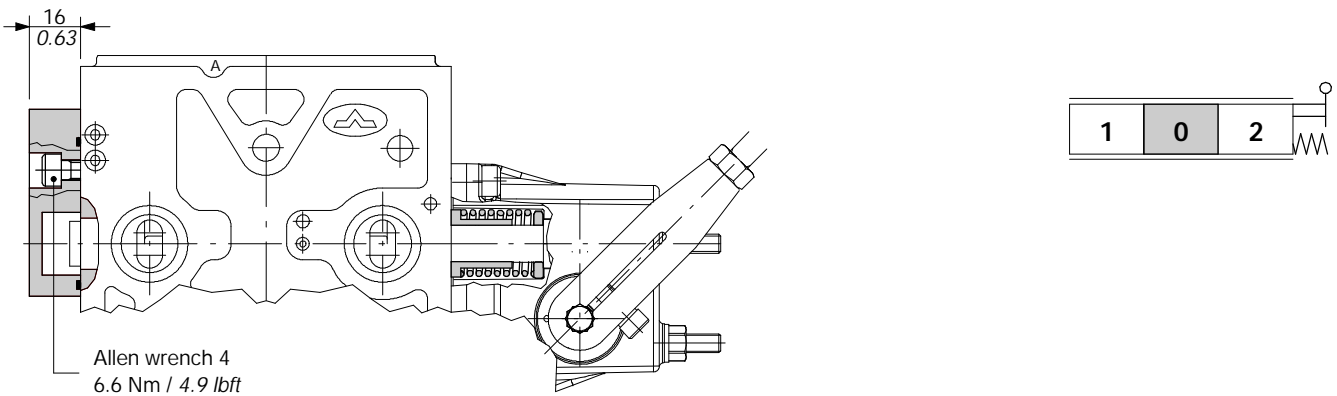


With spring return 8 kit

It's assembled inside of lever box.

Supplied with standard spring type A (see force-stroke diagram).

Available with lighter spring type B (**8MB** code: 5V08330000) or heavier spring type C (**8MC** code: 5V08230000).



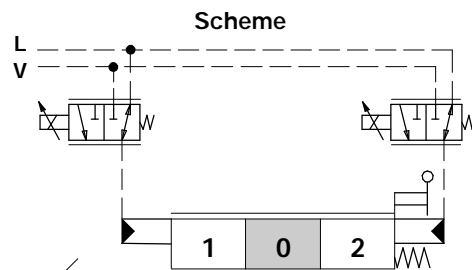
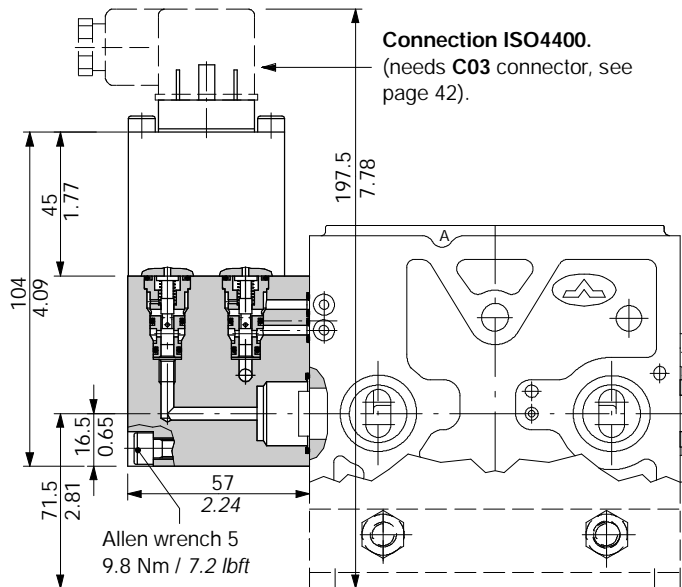
"A" side spool positioners

8EZ3 electro-hydraulic kit

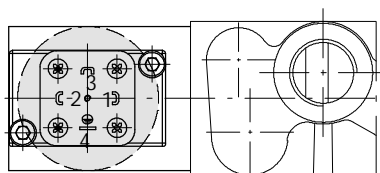
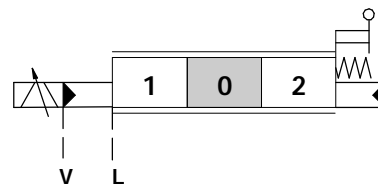
Proportional solenoid controlled, pilot operated actuators, are designed to provide open loop electronic control system for remote operation.

It contains two proportional pressure reducing cartridges.

For more information about electrical system requirements refer to ARC300 catalog.



Scheme ISO 1219

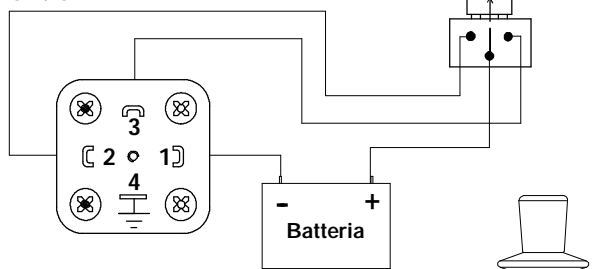


8EZ3 connector pin

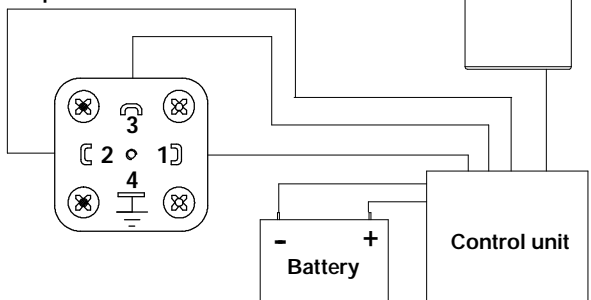
- 1 Voltage supply (-)
- 2 Port B
- 3 Port A
- 4 (Gnd) Protective earth

Connecting examples

On / Off



Proportional



Solenoid operating features

Nominal supply voltage	12 VDC	24VDC
Max supply voltage	15 V	30 V
Power rating		9,5 W
Resistance (20°C)	6.7Ω	27.2Ω
Duty cycle		100%
Actuating time from neutral to max oil flow		180 ms
Actuating time from max oil flow to neutral position		100 ms
Weather protection (IEC529)		IP65

Proportional

Total hysteresis	< 20%	
Min. initial shift current	500 mA	180 mA
Max. fully shift current	1000 mA	510 mA
Dither frequency	220/230 Hz	

ON-OFF

Current absorption	1,26 A	0,63 A
--------------------	--------	--------

Solenoid ordering code

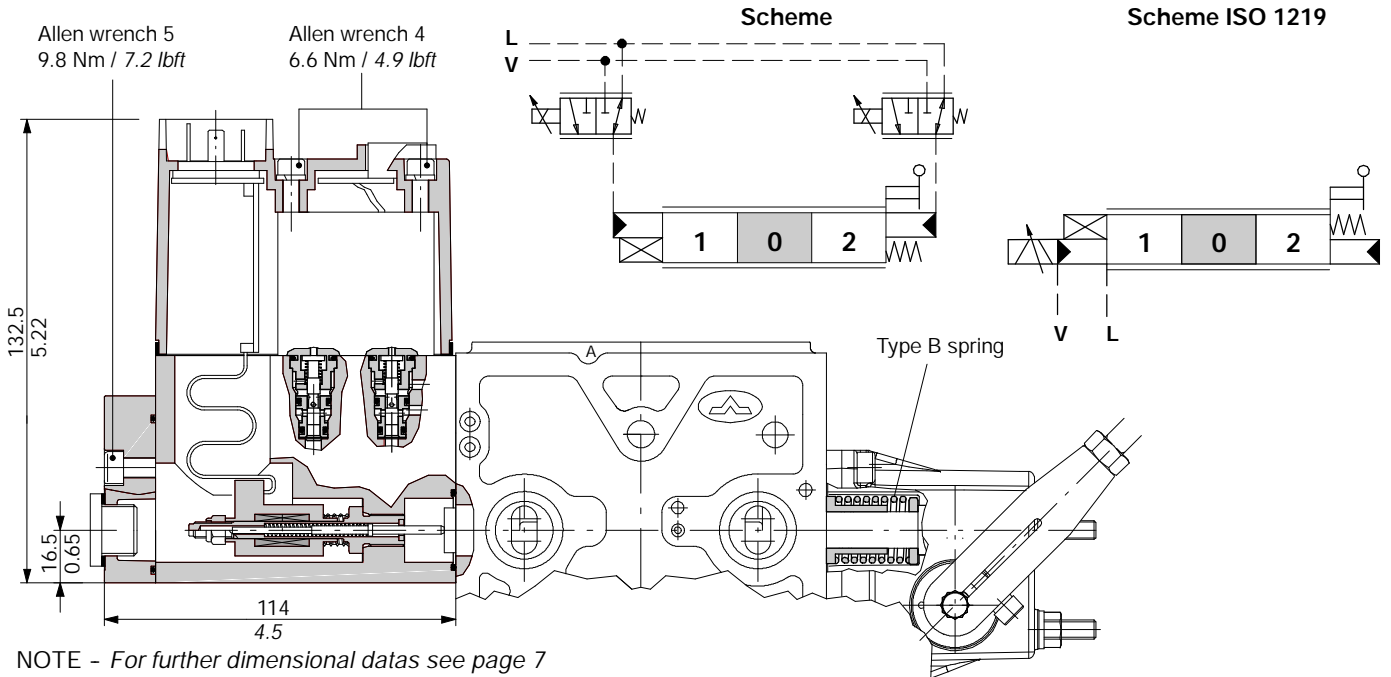
CODE	DESCRIPTION
4SOL650012	12 VDC solenoid
4SOL650024	24 VDC solenoid

**8ZR3 electro-hydraulic kit with feedback**

Proportional solenoid controlled, pilot operated actuators, are designed to provide closed loop electronic control system for remote operation.

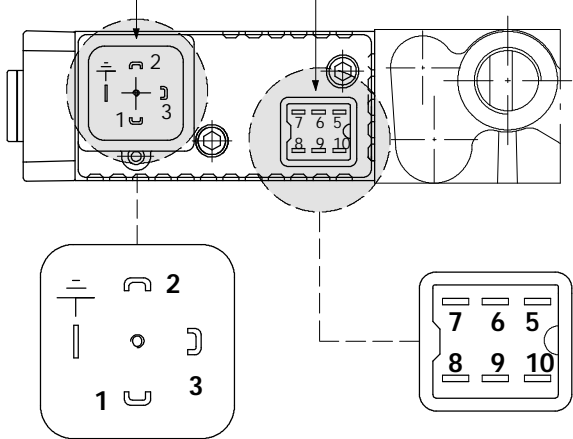
It contains two proportional pressure reducing cartridges and an inductive position transducer.

For more information about electrical system requirements refer to DRC330 catalog.



**Connection ISO4400.**  
(needs C03 connector, see page 42).

**Hirshmann G06UM male connector**  
supplied with standard protection  
plug code 5TAP919100 (needs C10  
connector, see page 42)



- MAIN CONNECTOR**
- 1** Power supply (+)
  - 2** Set point / CAN\_HI
  - 3** Alarm output / CAN\_LO
  - 4** Power supply (-)

- PROGRAMMING CONNECTOR**
- 5** Port A output
  - 6** Port B output
  - 7** Aux input
  - 8** Serial Rx
  - 9** Serial Tx
  - 10** Serial Gnd

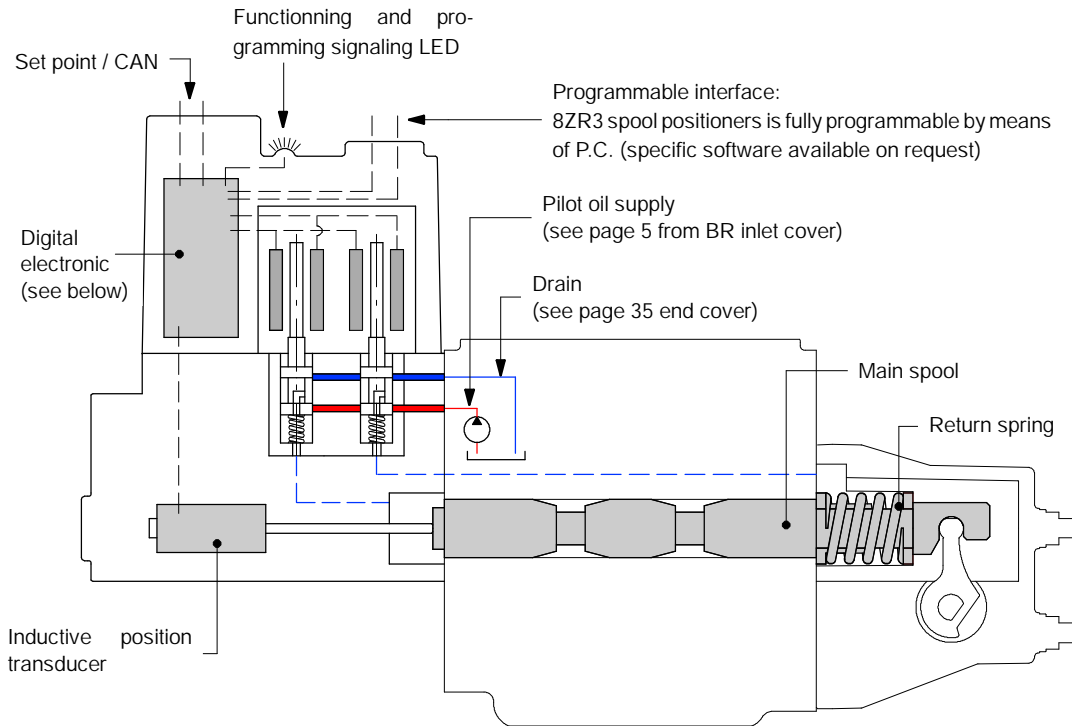
**Solenoid operating features**

Supply voltage	: 10-30 VDC
Power rating	: 12 W
Actuating time from neutral to max oil flow	: 150 ms ( max )
Actuating time from max oil flow to neutral position	: 100 ms ( max )
Weather protection	: IP65
Total hysteresis	: <1%
Joystick set point:	
neutral	: 0.5V <sub>BB</sub>
control range	: from 0.25V <sub>BB</sub> to 0.75V <sub>BB</sub>
Fault monitoring:	
max load	: 500mA
reaction time	: 500ms
Vibration test according to	: IEC 68-2-6
Shock test according to	: IEC 68-2-27
Bumps test according to	: IEC 68-2-29
EMC according to	: EN 50081-2, EN 50082-2 ISO 7637-1, ISO/CD 13766 ISO/CD 14892

**"A" side spool positioners**

**8ZR3 electro-hydraulic kit with feedback**

**Block diagram**



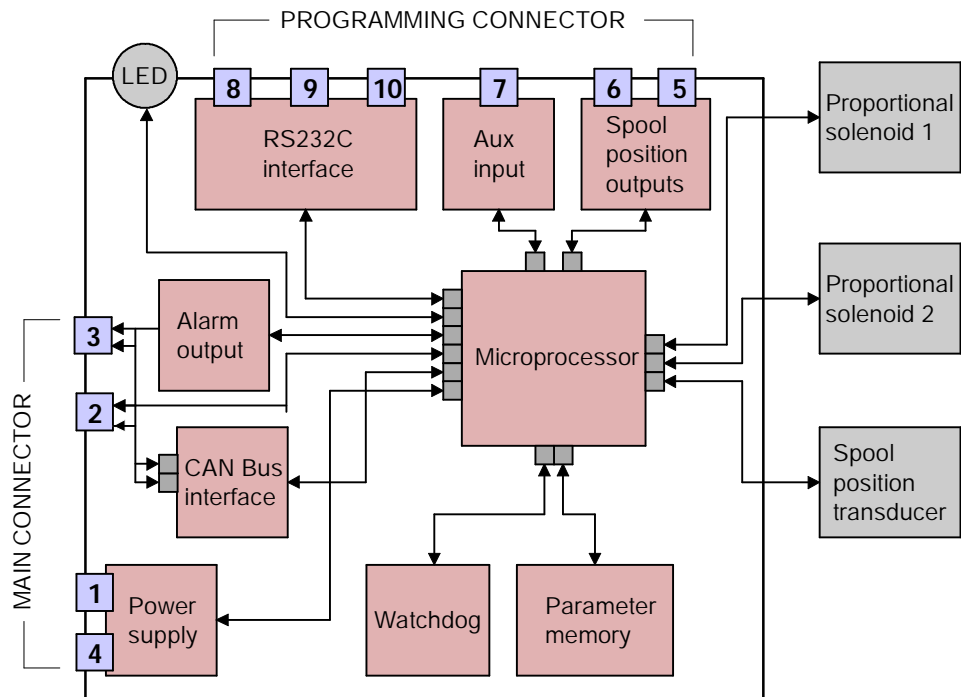
**Digital electronic**

**MAIN CONNECTOR**

- 1 Power supply (+)
- 2 Set point / CAN\_HI
- 3 Alarm output / CAN\_LO
- 4 Power supply (-)

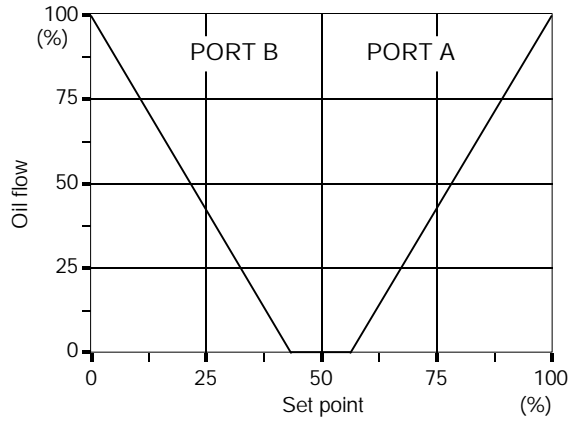
**PROGRAMMING CONNECTOR**

- 5 Port A output
- 6 Port B output
- 7 Aux input
- 8 Serial Rx
- 9 Serial Tx
- 10 Serial Gnd

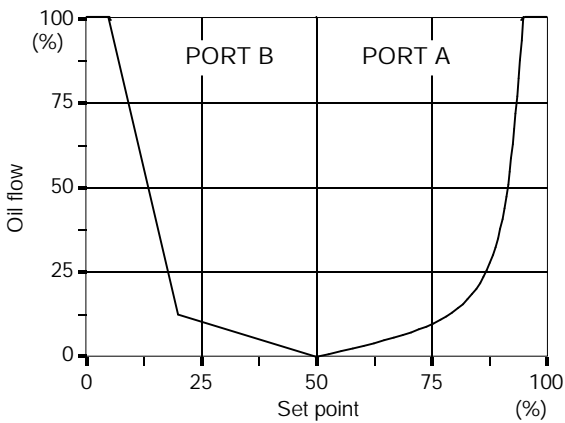


8ZR3 electro-hydraulic kit with feedback

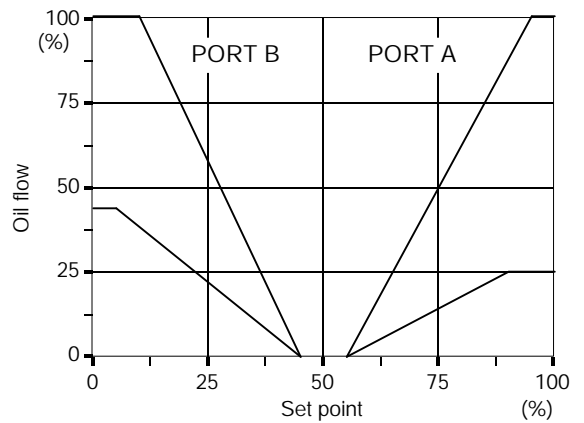
Standard curve shape



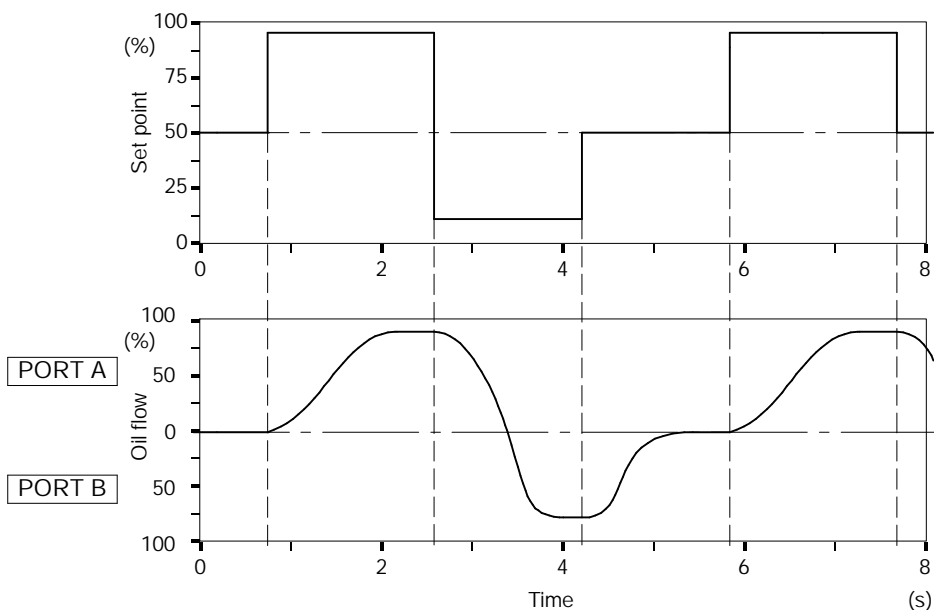
Example of programmable curve shapes



Example of programmable full/partial flow curves



Programmable ramp function

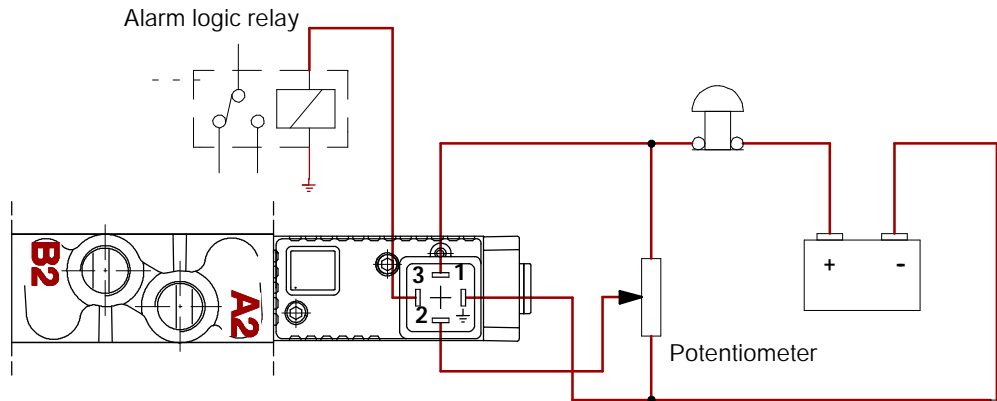


**"A" spool positioners**

**Principle of operation**

**8ZR connector pin**

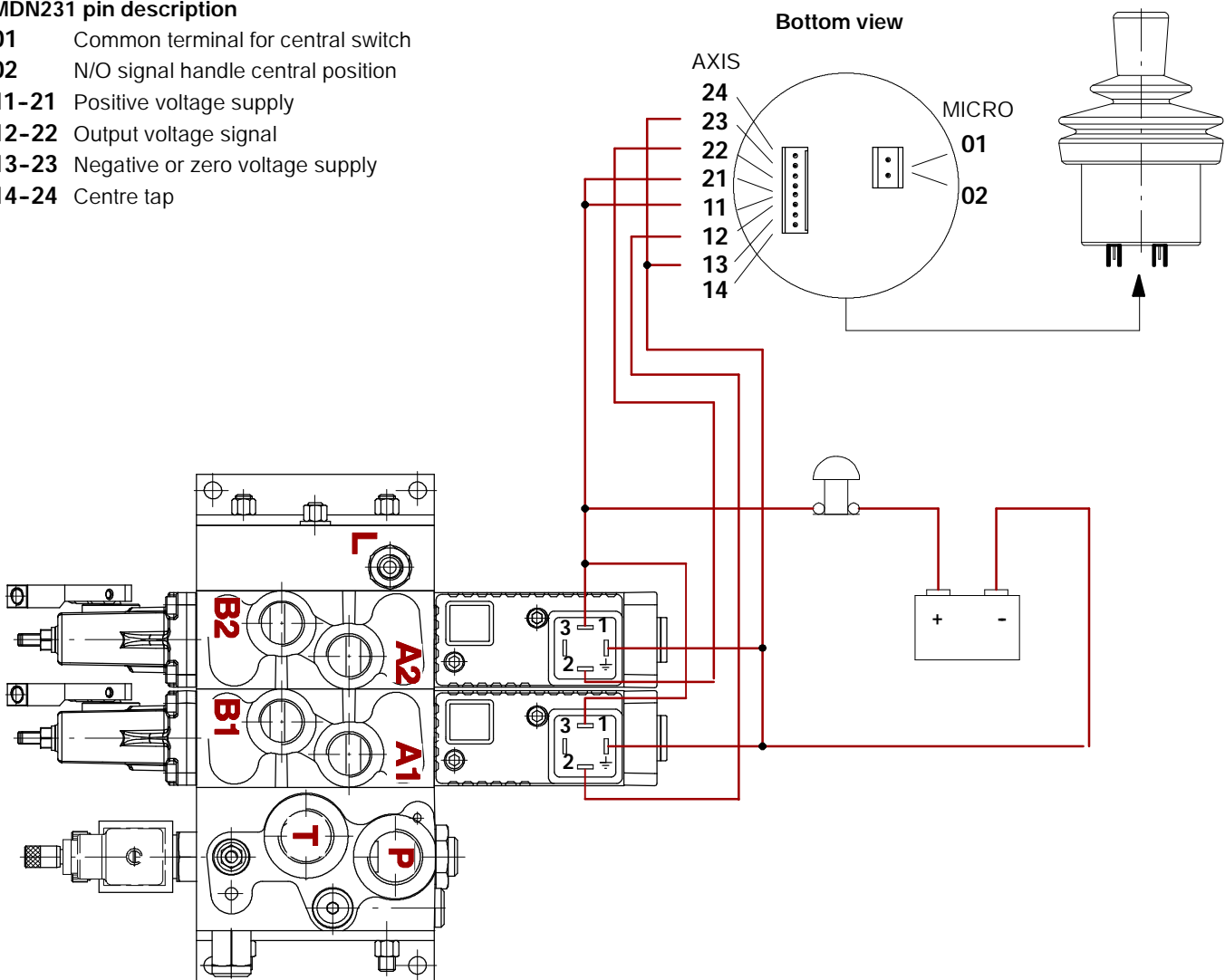
- 1 Voltage supply (+)
- 2 Set point signal
- 3 Alarm logic signal
- Gnd Voltage supply (-)



**Example with MDN231 double axis joystick**

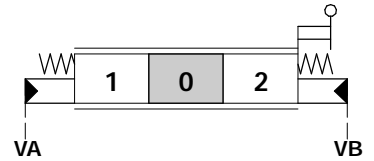
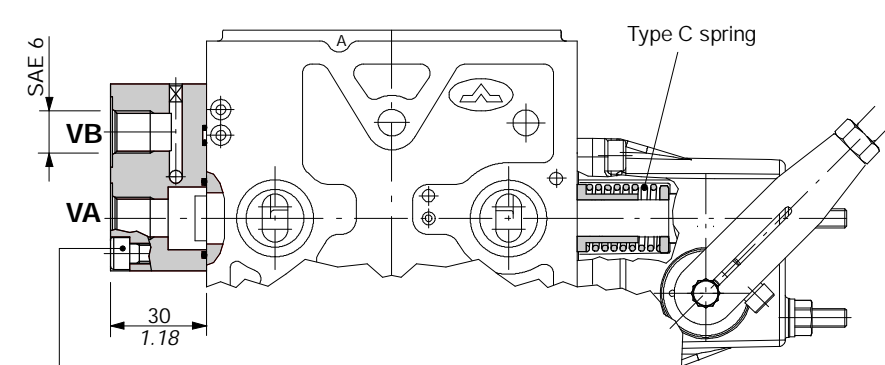
**MDN231 pin description**

- 01 Common terminal for central switch
- 02 N/O signal handle central position
- 11-21 Positive voltage supply
- 12-22 Output voltage signal
- 13-23 Negative or zero voltage supply
- 14-24 Centre tap

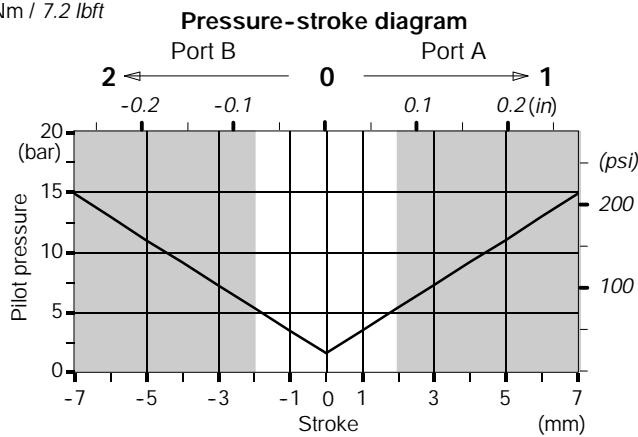


NOTE: For connection assembly please contact Customer Service. See pages 40 and 41 for diagnostic table.

Proportional operated 8IM kit



Allen wrench 5  
9.8 Nm / 7.2 lbf



Operating features

Setting range . . . . . : 5 B 15 bar / 73 to 215psi  
(curva 020 - curve)

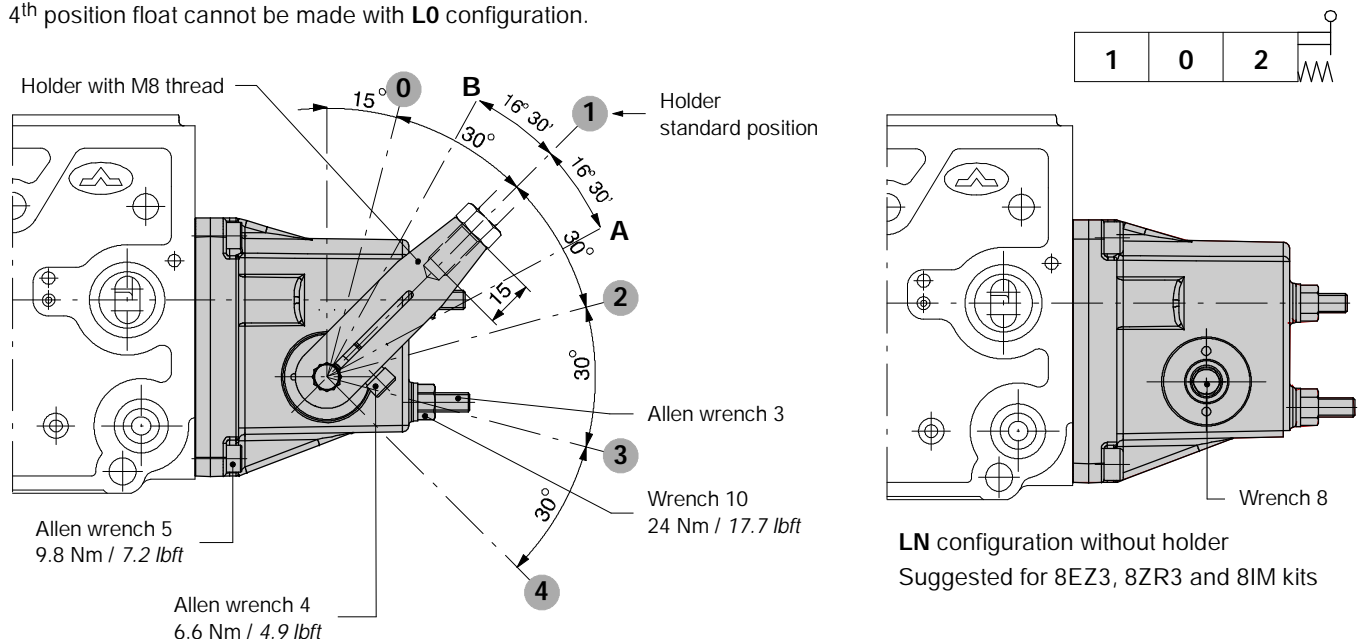
Max pilot pressure . . . . . : 50 bar / 725 psi

NOTE - For more information concerning hydraulic pilot valves refer to DFT010E catalogue.

"B" side options

L lever box

Supplied with holder with L1 standard configuration; L0, L2, L4 can be obtained by means of rotating the holder.  
4<sup>th</sup> position float cannot be made with L0 configuration.

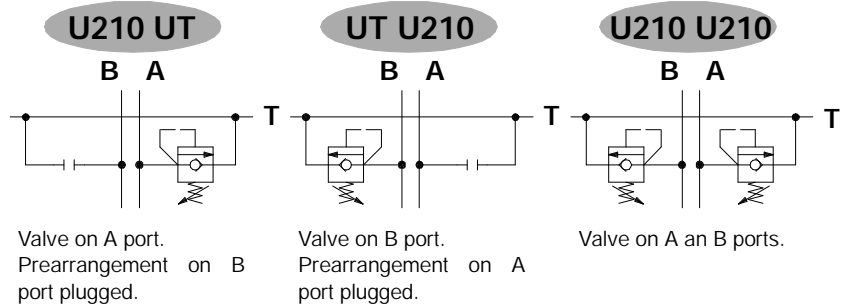
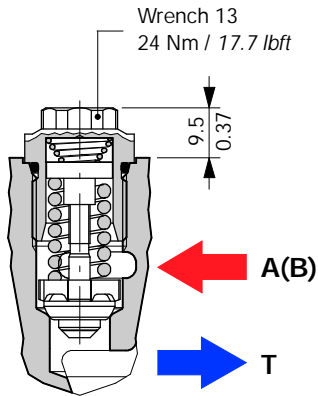


Port relief options

Anti-shock and anti-cavitation valve

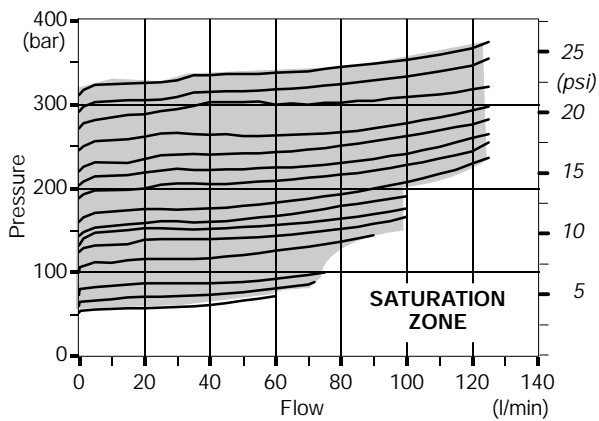
U 210

Pressure setting in bar

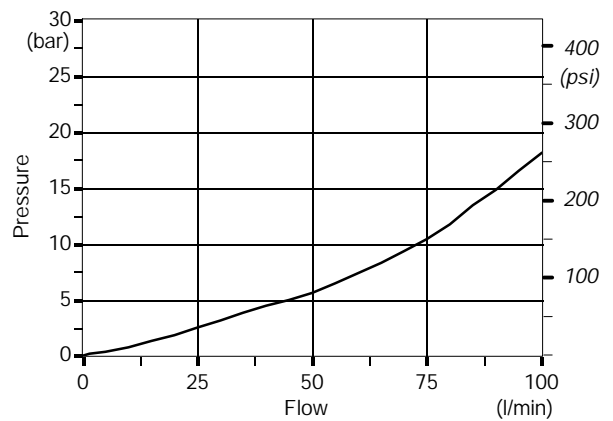


Performance data

Range setting



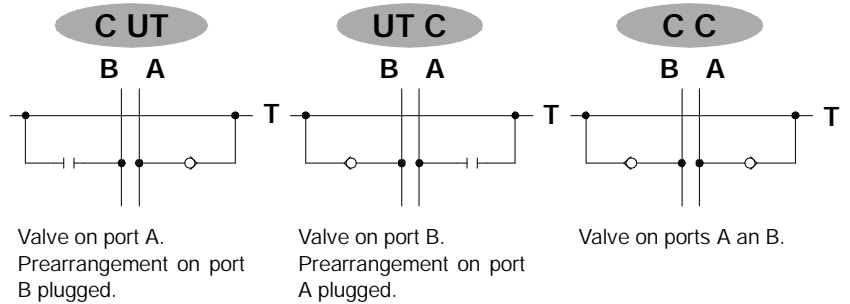
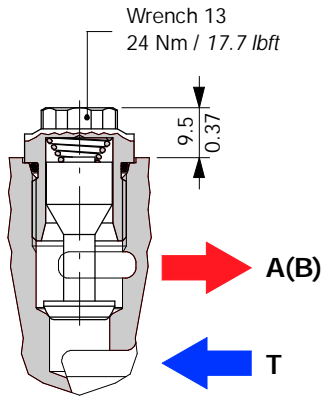
Pressure drop





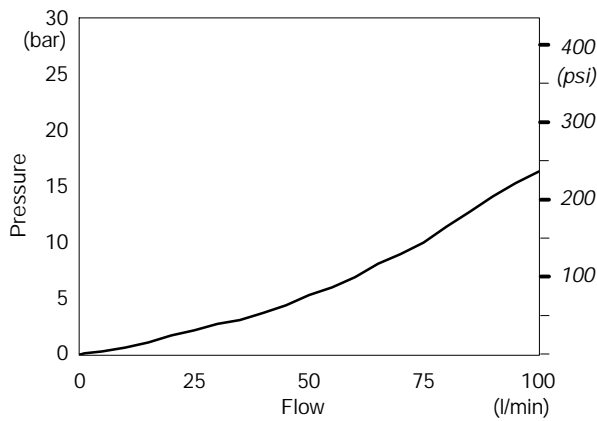
Anti-cavitation valve

C



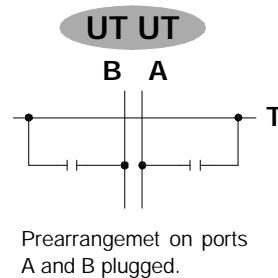
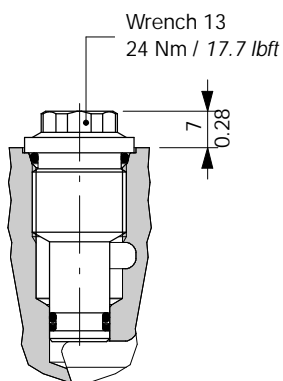
Performance data

Pressure drop



Port relief valve blanking plug

UT

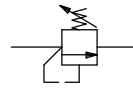
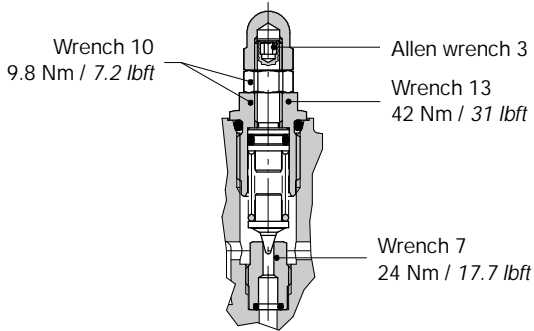


L.S. relief options

S: load-sensing pressure relief valve

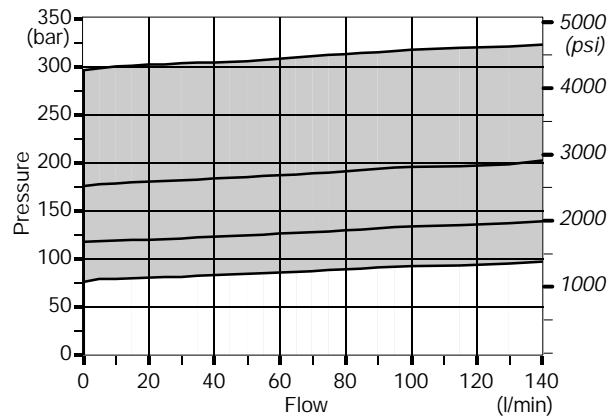
S 220

Pressure setting in bar

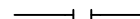
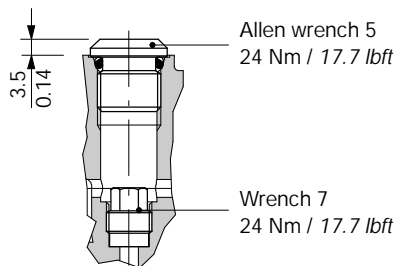


Performance data

Range setting



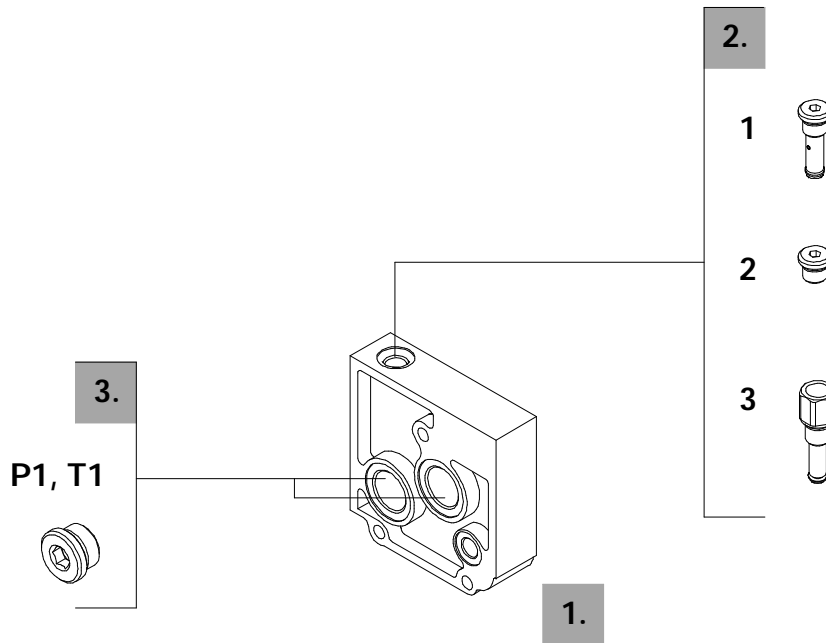
ST: relief valve blanking kit



Description example:

FS DPC130 / RC 3 1 \*

1. 2. 3.



**1. Plate kits \***

TYPE	CODE	DESCRIPTION
RF	5FIA730000	Without any connections
RC	5FIA730310	With ports P1 and T1
RD	5FIA730320	With ports P1, T1 and LS1

**2. Drain sleeve options**

TYPE	CODE	DESCRIPTION
1	XTAP517460	Plug to be used with 8 or 7FT positioners
2	XTAP217160	Plug to be used with proportional operated kit 8IM
3	XCAR119611	G 1/4 sleeve to be used with electro-hydraulic kit 8EZ3 and 8ZR3 *

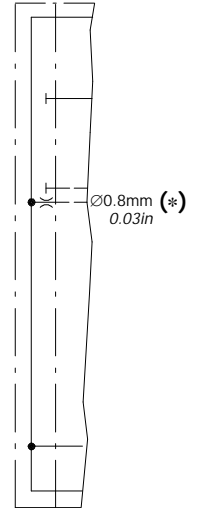
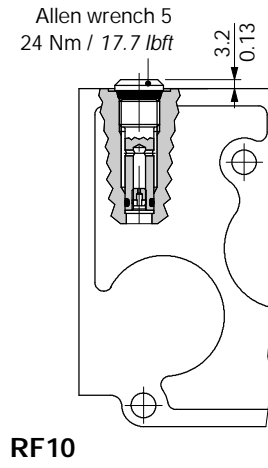
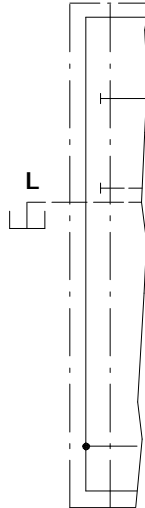
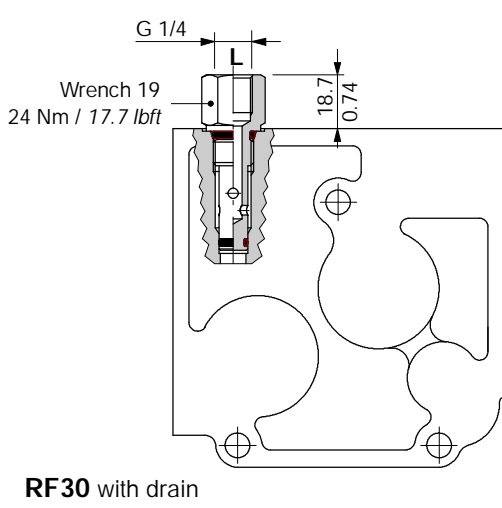
**3. Port options**

TYPE	CODE	DESCRIPTION
0	-	Without P1 and T1 ports (only RF plate)
1	3XTAP732200	G 3/4 plug (nr.2 required), P1 and T1 ports plugged
2	3XTAP732200	G 3/4 plug (nr.1 required), P1 port plugged, T1 port open
3	3XTAP732200	G 3/4 plug (nr.1 required) T1 port plugged, P1 port open
4	-	P1 and T1 ports open

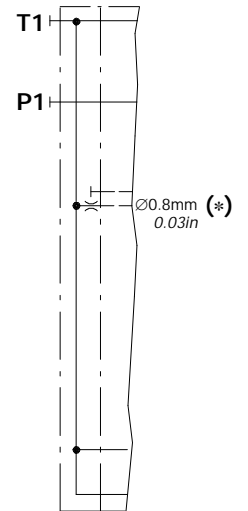
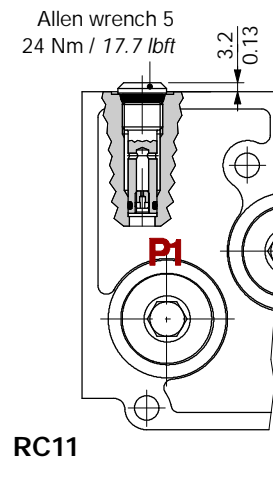
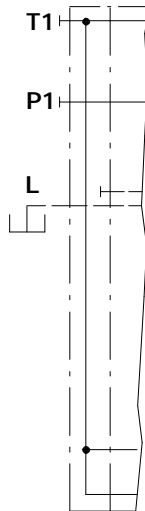
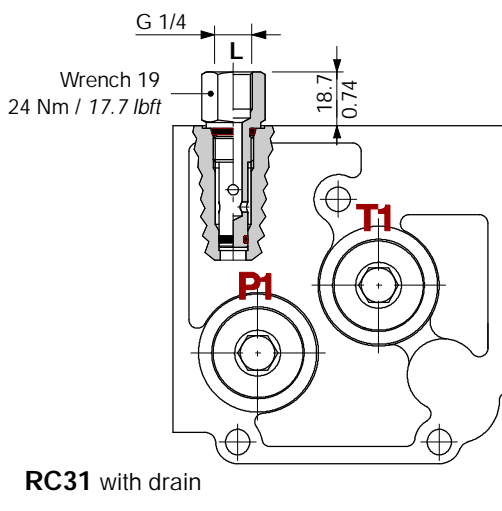
NOTE (\*) - Items are referred to **BSP** thread.

Hydraulic circuit

RF: without ports

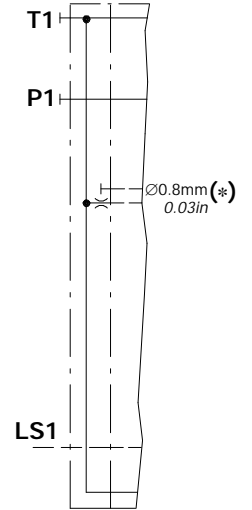
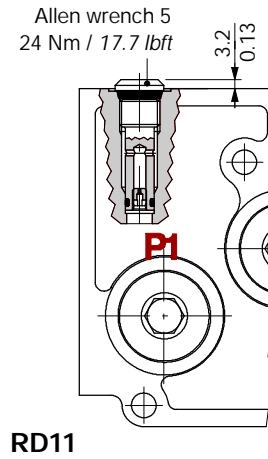
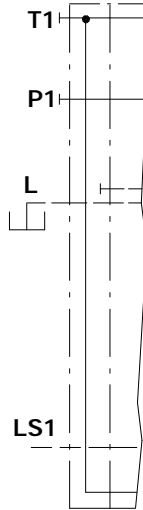
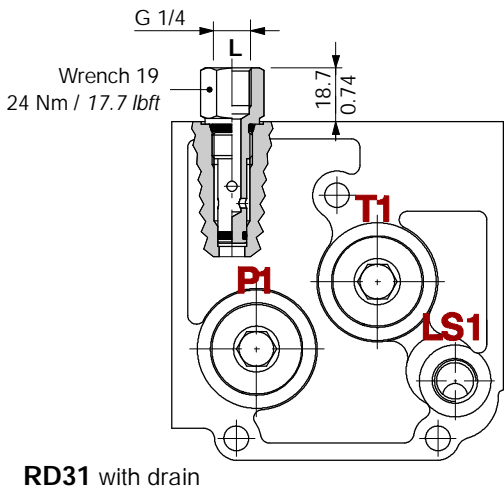


RC: with P1, T1 ports



NOTE (\*) - In order to absorb pressure spikes between T return line and L drain line, a 0.8 flow restrictor has been provided.

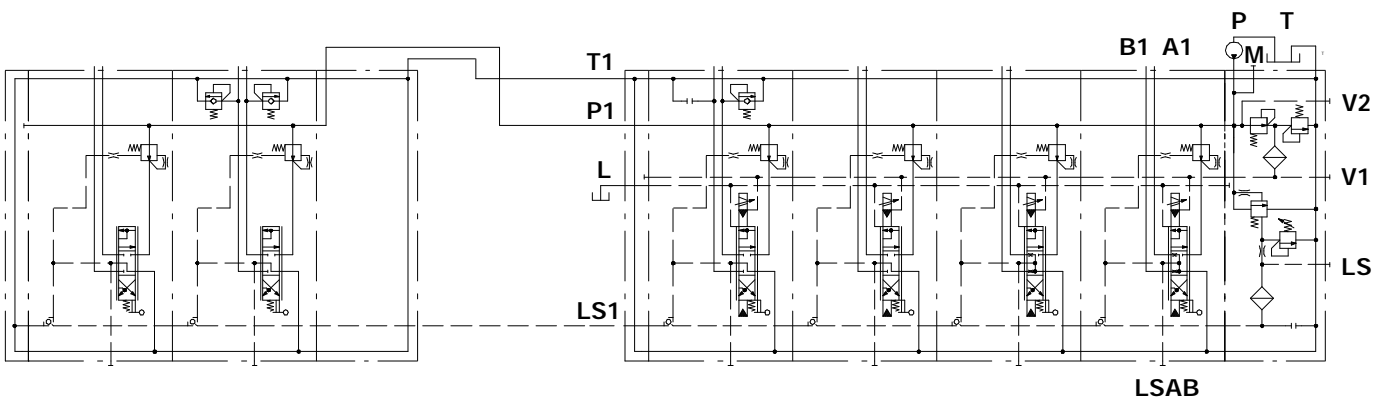
RD: with P1, T1 and LS1 ports



NOTE - The port LS1 must not be plug (in case it's not used it has to be connected to tank).

Parallel connection of two valves

The circuits with fix displacement pump (open centre) is possible connect two valves, by using the flow compensator of first valve and join the Load-Sensing signal lines together.



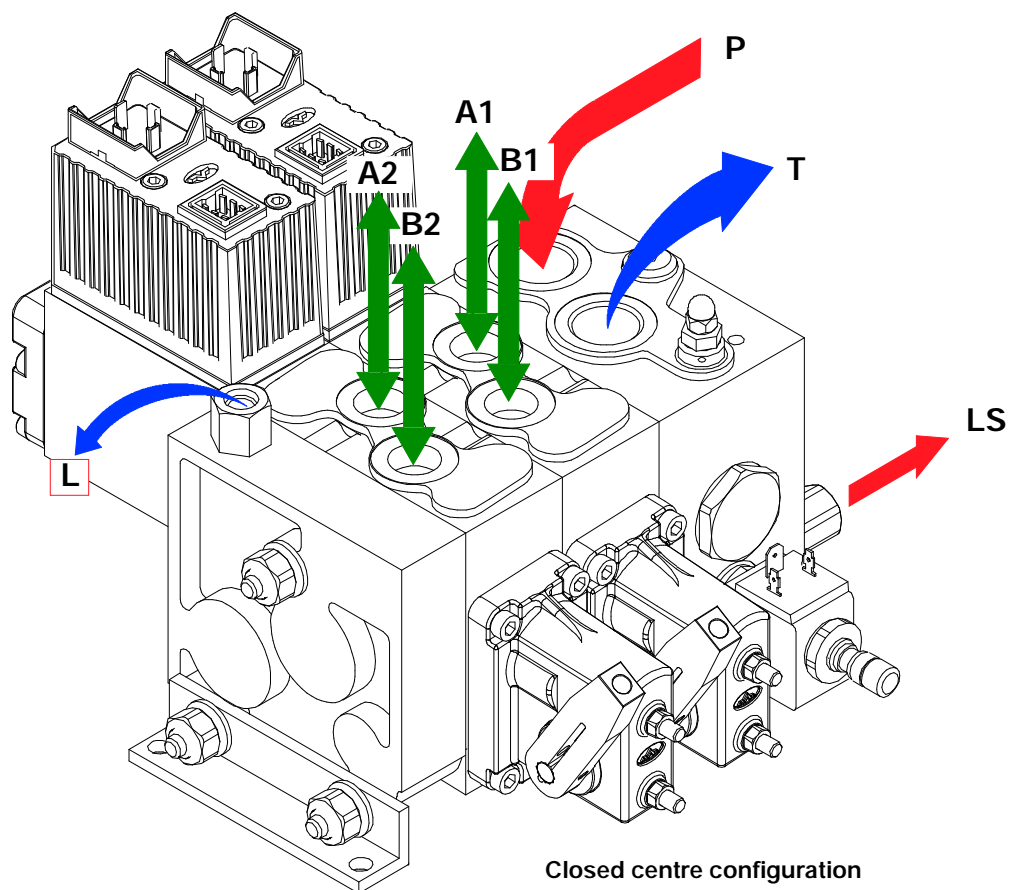
# DPC130

## Installation and maintenance

The DPC130 valve is assembled and tested as per the technical specification of this catalogue.

Before the final installation on your equipment, follow the below recommendations:

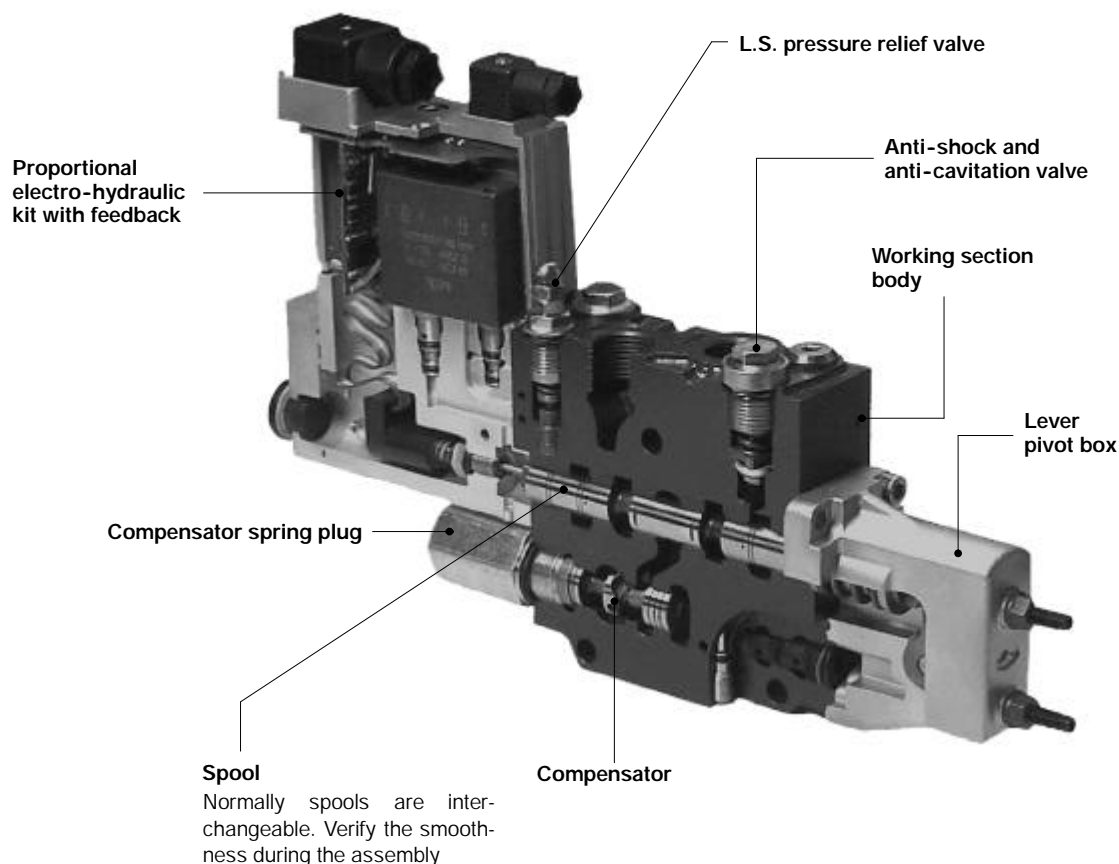
- the valve can be assembled in any position; in order to prevent working sections deformation and spool sticking mount the product on a flat surface;
- in order to prevent the possibility of water entering the lever box and spool control kit, do not use high pressure wash down directly on the valve;
- prior to painting, ensure plastic port plugs are tightly in place.



### Fitting tightening torque - Nm / lbf

THREADS TYPE	P and T ports	A and B ports	L and LS ports
BSP (ISO 228/1)	G 3/4	G 1/2	G 1/4
With O-Ring seal	70 / 51.6	50 / 36.9	25 / 18.4
With copper washer	70 / 51.6	60 / 44.3	30 / 22.1
With steel and rubber washer	70 / 51.6	60 / 44.3	16 / 11.8
UN-UNF (ISO 11926-1)	1 1/16-12 UN-2B (SAE 12)	7/8-14 UNF-2B (SAE 10)	9/16-18 UNF-2B (SAE 6)
With O-Ring seal	95 / 70.1	60 / 44.3	30 / 22.1

NOTE - These torque are recommended. Assembly tightening torque depends on many factors, including lubrication, coating and surface finish. The manufacturer shall be consulted.




Malfunction	Cause	Remedy
External leakage lever or control kit side.	Worn seal due to mechanical actuation or high back pressure.	Locate the leakage and replace the seal. Check back pressure level.
Excessive internal leakage on A and B ports.	Increase clearance between spools and body due to high wear	Replace the directional control valve and check the oil contamination level.
Inability to build pressure on A and B ports.	Pressure relief valve blocked open.	Remove and clean the seat or replace the load check valve.
	Port relief valve open.	Remove and clean or replace the relief valve.
	Low pump pressure and flow.	Check the pump and circuit.

INTERNAL ERROR			
ERROR SOURCE	CORRECTIVE ACTION	OPTICAL ERROR DISPLAY	OUTPUT ERROR SIGNAL
Spool not in neutral position, during "switch on".	Internal pilot coils are switched off. Output error signals are active.	Red LED flashes slowly	Low
Spool far from desired position, for a time longer than the expected (E.G. Spool could be blocked by handlever).	Internal pilot coils are switched off. Output error signals are active.	Red LED turned on.	Low
Spool does not reach desired position. (E.G. Spool could be blocked by handlever).	Internal pilot coils are switched off. Output error signals are active.	Red LED turned on.	Low
Temperature out of defined normal working range.	Internal pilot coils are switched off. Output error signals are active.	Red LED flashes slowly if "switch-on" state is active else turned on continuously.	Low
LVDT signal missing.	Internal pilot coils are switched off. Output error signals are active.	Red LED flashes slowly if "switch-on" state is active else turned on continuously.	Low
Internal pilot coils connection missing (open-load detection).	Internal pilot coils are switched off. Output error signals are active.	Red LED flashes slowly if "switch-on" else turned on continuously.	Low
Current absorbed too high.	Replaceable fuse breaks. Internal pilot coils and electronic are switched off.	LED turned off.	Low
Processor faults.	Electronic card is maintained in "reset-state" by hardware. Only if microcontroller wakes-up, normal operations can start again. Internal pilot coils are switched off.	LED turned off.	Low



## Diagnostic table of 8ZR3 electronic circuit (page 27)

EXTERNAL ERROR			
ERROR SOURCE	CORRECTIVE ACTION	OPTICAL ERROR DISPLAY	OUTPUT ERROR SIGNAL
Set-point signal not in neutral position, during "awitch-on".	Internal pilot coils are switched off. Output error signals are active.	Red LED flashes slowly	Low
Set-point signal out of defined normal working range.	Internal pilot coils are switched off. Output error signals are active.	Red LED flashes slowly if "switch-on" else turned on continuously.	Low
Supply voltage out of defined normal working range.	Internal pilot coils are switched off. Output error signals are active.	Red LED flashes slowly if "switch-on" else turned on continuously.	Low
Supply voltage too low.	Electronic is unable to wake-up, all the electric functions are turned off.	LED turned off.	Low
Supply voltage inverted.	Electronic card is hardware protected by reverse battery protection diodes.	LED turned off.	Low
NO ERROR			
ERROR SOURCE	CORRECTIVE ACTION	OPTICAL ERROR DISPLAY	OUTPUT ERROR SIGNAL
No one error, mentioned above, is detected.	Fail situations are continuously checked, the valve is controlled by set point signal and internal parameters user programmed.	Green LED is turned on in stand-by operation, defined by set-point (and spool) in neutral position, otherwise flashes during valve controlling.	High

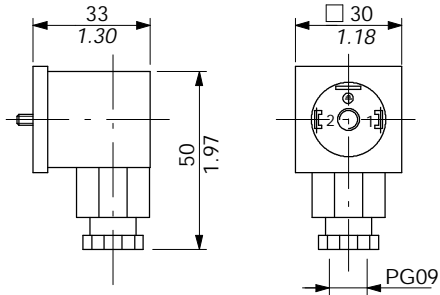
 **WARNING** - While in emergency state, uncontrolled load movements are possible if oil flow into the valve is not stopped: plant must be turned off.

NOTE - Each error detection can be enabled or disabled under user control.  
For each type of detected error, internal pilot coils are switched off and output error signal is low. This configuration is maintained until all faulty conditions are recovered.

### Connectors

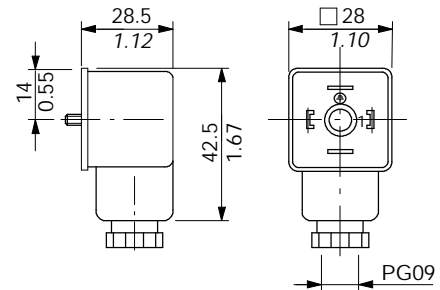
#### Type C02 code: 2X1001010

2P+T according to ISO4400 / DIN43650-A



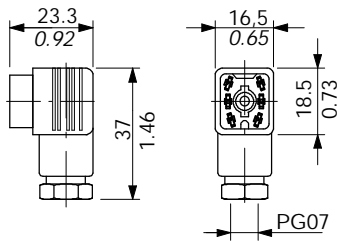
#### Type C03 code: 2X1001030

3P+T according to ISO4400 / DIN43650-A



#### Type C10 code: WW00617

6P female type Hirshmann "GO6WF"



TYPE	Poles	Nominal voltage	Nominal current	Permitted cable section	Weather protection
C02	2P + T	250 VAC / 300 VDC	10 A	1.5 mm <sup>2</sup> / 23x10 <sup>-4</sup> in <sup>2</sup>	IP65
C03	3P + T	250 VAC / 300 VDC	10 A	1.5 mm <sup>2</sup> / 23x10 <sup>-4</sup> in <sup>2</sup>	IP65
C10	6P	250 VAC / 300 VDC	6 A	0.5 mm <sup>2</sup> / 7.7x10 <sup>-4</sup> in <sup>2</sup>	IP65





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