

MONOBLOCK  
DIRECTIONAL CONTROL VALVE

S  
L  
M140

D  
L  
M140



 **walvoil**  
HYDRAULIC CONTROL SYSTEMS

## *DLM140*

1 to 6 sections monoblock valves for Load-Sensing variable displacement pump circuit.

- 3 ways 2 positions valve on L.S. line to prevent dropping load during rise action.
- Ports valves and control kits are the same of SDM140 directional valve.

### **Additional information**

This catalogue shows the product in the most standard configurations.  
Please contact Sales 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.

1<sup>st</sup> edition September 2005:

# SDM140-DLM140

## Working condition

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.

### DLM140

Nominal flow rating		110 l/min	
Operating pressure (maximum)		250 bar	3600 psi
Max. back pressure	on outlet port T	25 bar	360 psi
Internal leakage A(B)→T	$\Delta p = 100 \text{ bar} - 1450 \text{ psi}$ , fluid and valve at 40°C	3 cm <sup>3</sup> /min	0.18 in <sup>3</sup> /min
Hydraulic fluid		Mineral base oil	
Fluid temperature	with NBR seals	from -20° to 80°C	
	with FPM (VITON) seals	from -20° to 100°C	
Viscosity	operating range	from 15 to 75 mm <sup>2</sup> /s	from 15 to 75 cSt
	min	12 mm <sup>2</sup> /s	12 cSt
	max	400 mm <sup>2</sup> /s	400 cSt
Max level of contamination		-/19/16 - ISO 4406	
Ambient temperature	mechanical, hydraulic, pneumatic controls	from -40° to 60°C	
	electric controls	from -20° to 60°C	

NOTE - For different conditions please contact Sales Dept.

## Standard threads

### REFERENCE STANDARDS

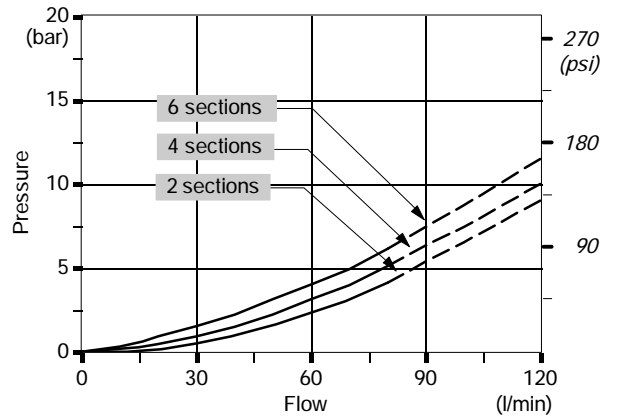
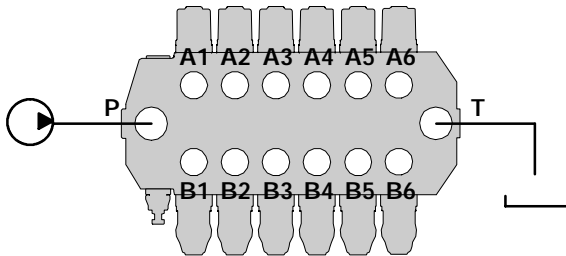
		BSP	UN-UNF	METRICA	NPTF
THREAD ACCORDING TO		ISO 228/1	ISO 263	ISO 262	ANSI B1.20.3
		BS 2779	ANSI B1.1 unified		
CAVITY ACCORDING TO	ISO	1179	11926	6149	
	SAE		J1926	J2244	J476a
	DIN	3852-2 shape X o Y			

### PORTS THREAD

MAIN PORTS	BSP	UN-UNF	METRIC
Inlet P and carry-over C	G 3/4	1 1/16-12 (SAE 12)	M27x2
Ports A and B	G 1/2	7/8-14 (SAE 10)	M22x1,5
Outlet T	G 3/4	1 1/16-12 (SAE 12)	M27x2
Load sensing LS	G 1/4	9/16-18 (SAE 6)	M14x1,5
CONTROL PILOT PORTS			
Pneumatics	NPTF 1/8-27	NPTF 1/8-27	NPTF 1/8-27
Hydraulics	G 1/4	9/16-18 (SAE 6)	G 1/4

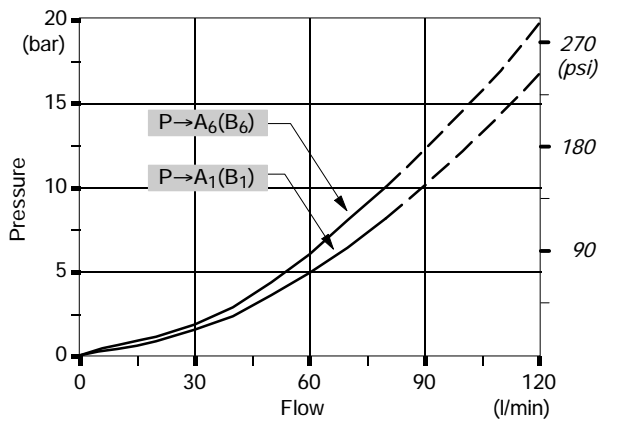
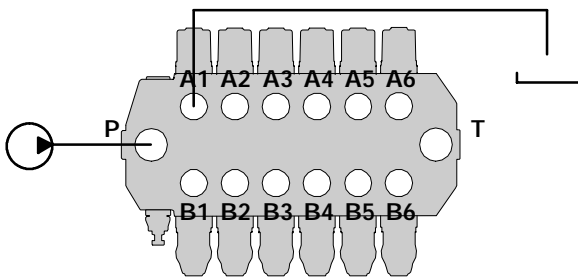
### Open centre

From top inlet to top outlet (execution PSA).



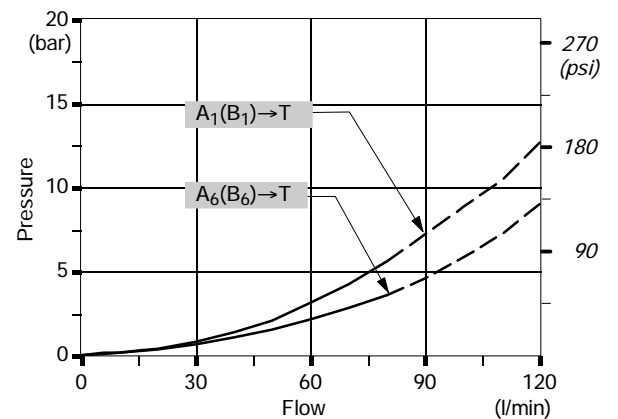
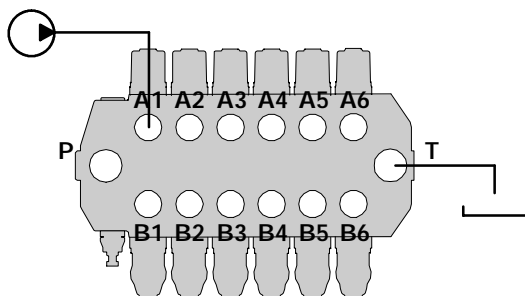
### Inlet to work port

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



### Work port to outlet

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



NOTE - Measured with spool type 1.

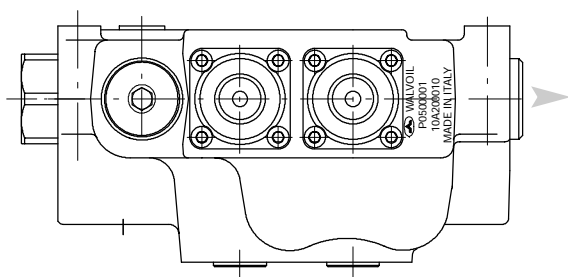
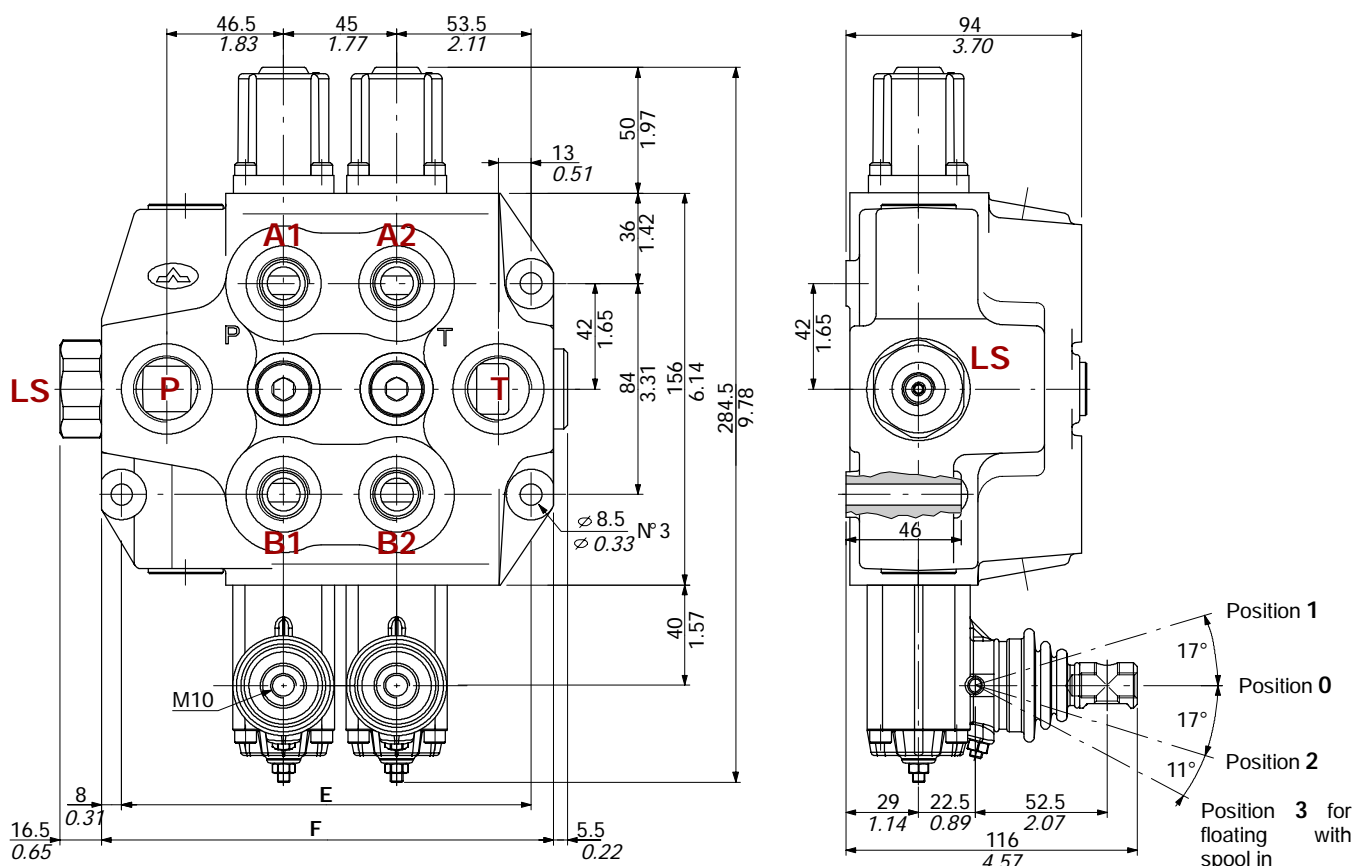


### DLM140 directional control valve

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# DLM140

## Dimensional data



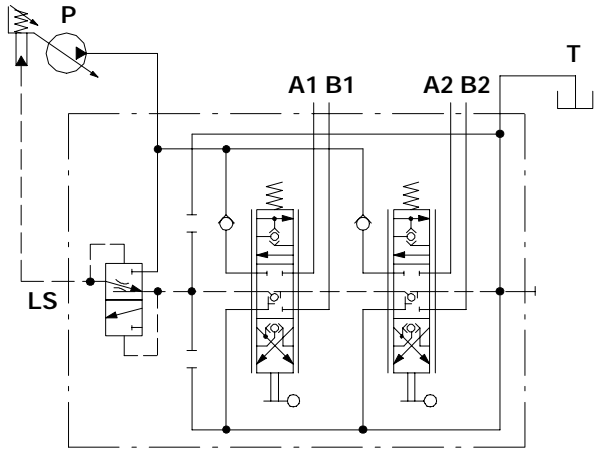
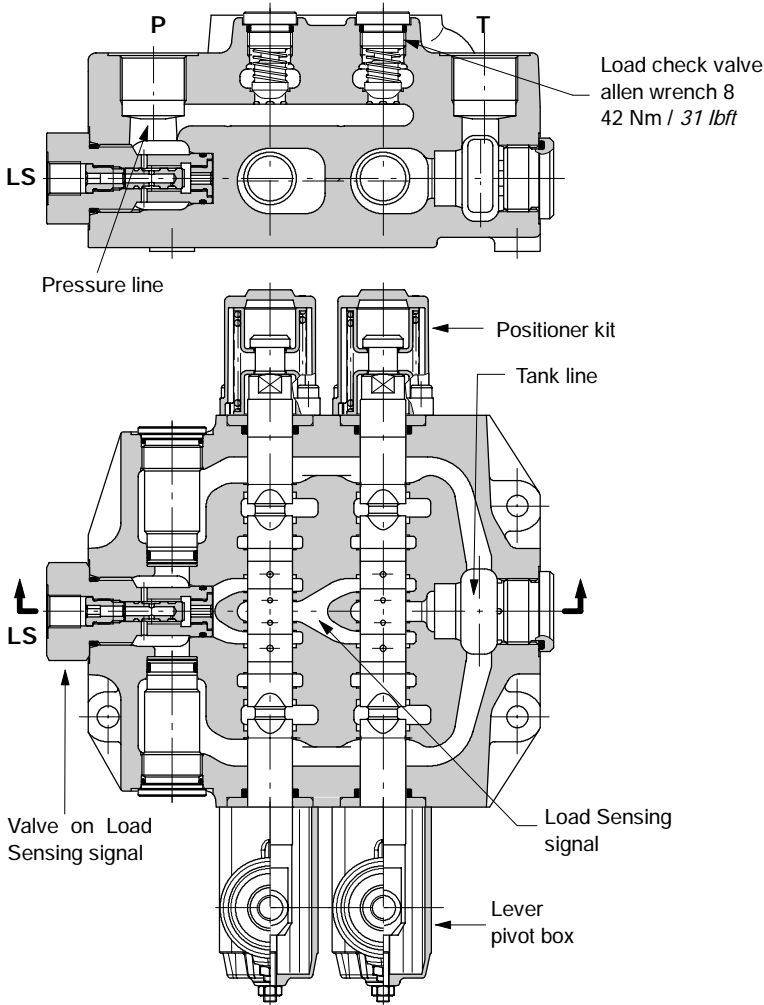
 **WALVOIL**  
**P0200001**  
**103020006**  
**MADE IN ITALY**

Production batch :  
 P05 = production year (2005)  
 00001 = progressive number  
 Code

TYPE	E		F		Weight	
	mm	in	mm	in	kg	lb
DLM140/1-P	118	4.65	157	6.18	9.8	21.6
DLM140/2-P	163	6.42	202	7.95	13.7	30.2
DLM140/3-P	208	8.19	247	9.72	17.6	38.8

TYPE	E		F		Weight	
	mm	in	mm	in	kg	lb
DLM140/4-P	253	9.96	292	11.50	21.5	47.4
DLM140/5-P	298	11.73	337	13.27	25.4	56
DLM140/6-P	343	13.50	382	15.04	29.3	64.6

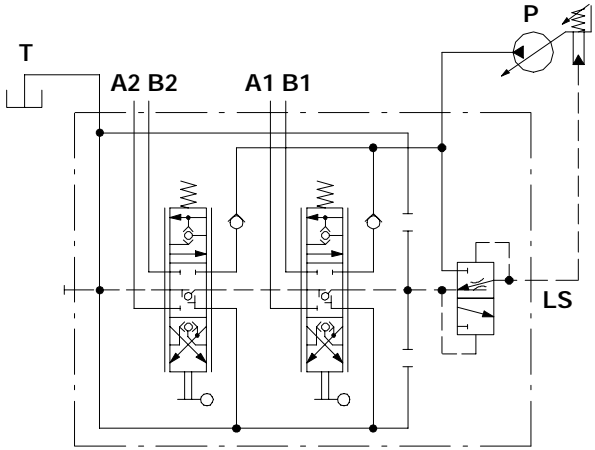
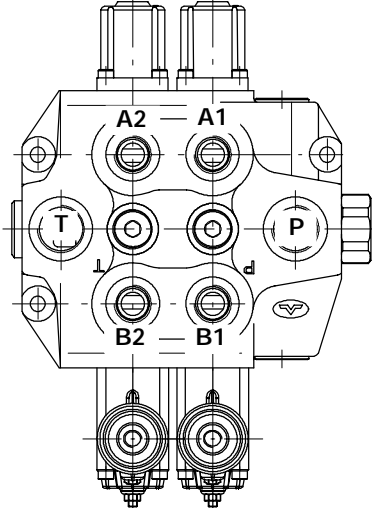
Standard configuration with top inlet and outlet ports (PSA execution).



Description example:  
DLM140/2-AP/1N8LF3/1N8LF3/PSA

Right inlet

Simmetrical body allows the reverse assembly of spools and relative kits (execution ED).

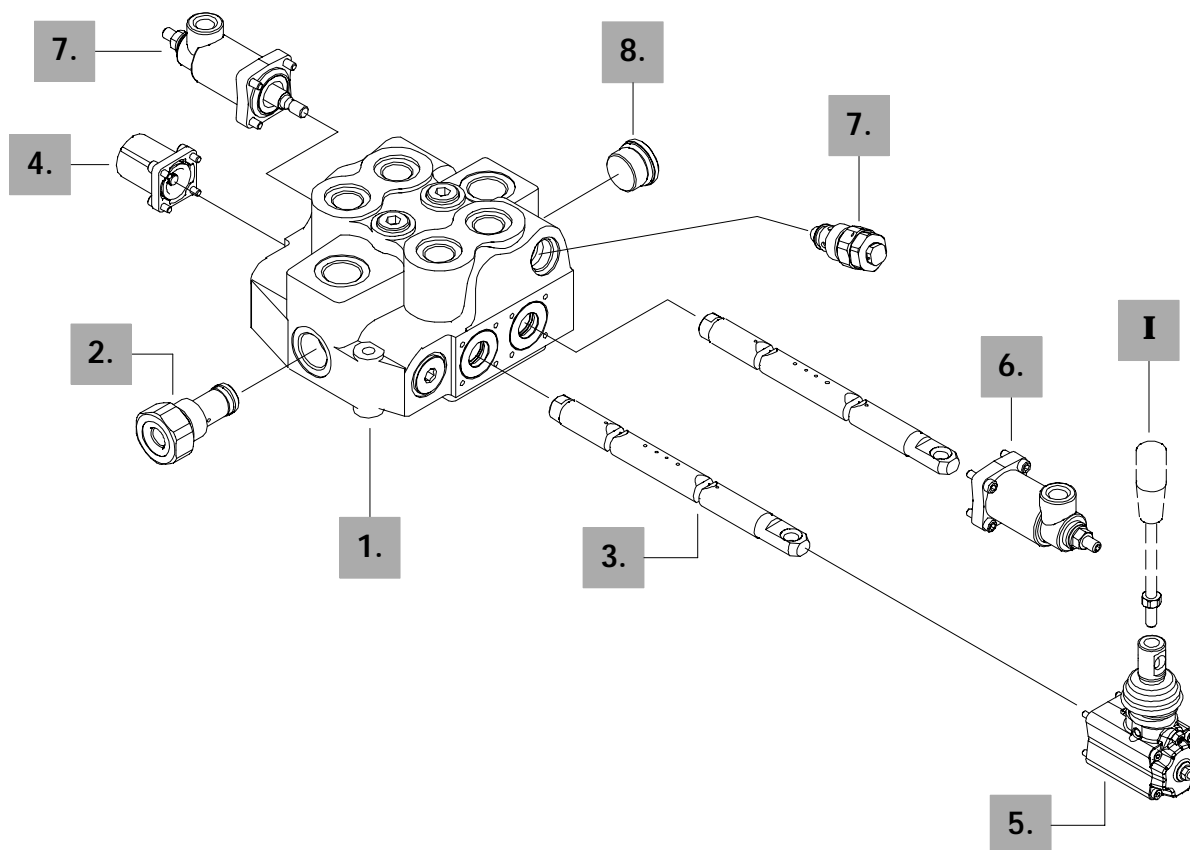
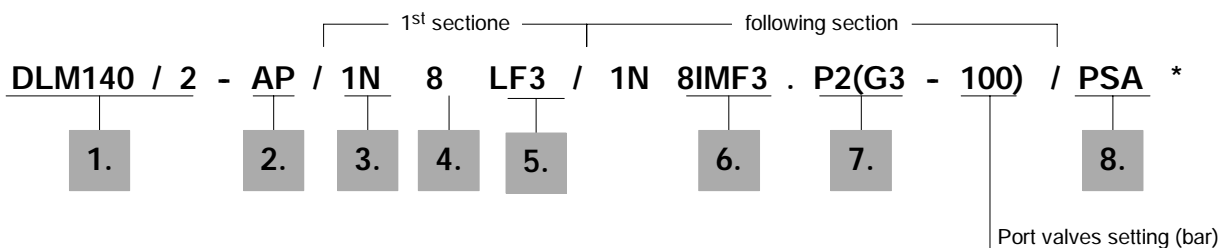


Description example:  
DLM140/2-AP/ED-1N8LF3/ED-1N8LF3/PSA

# DLM140

## Ordering codes

### Description example:



### 1. Body kit \*

TYPE	CODE	DESCRIPTION
<u>Without service port valves prearrangement</u>		
DLM140/1	5KC1973002	1 section
DLM140/2	5KC1963005	2 sections
DLM140/3	5KC1923019	3 sections
DLM140/4	5KC1933017	4 sections
DLM140/5	5KC1943012	5 sections
DLM140/6	5KC1953007	6 sections

*Include body, seals, rings and load check valves.*

### 2. Valve on LS signal \*

TYPE	CODE	DESCRIPTION
AP	XCOR236671	With G1/4 port

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



**3. Spool****page 52**

TYPE	CODE					DESCRIPTION
	20 l/min	40 l/min	60 l/min	85 l/min	110 l/min	
	V	Q	S	N	P	Nominal flow with pump stand-by = 20 bar / 290 psi
1	3CU1311020	3CU1311040	3CU1311060	3CU1310600	3CU1311110	Double acting, 3 position, with A and B closed in neutral position
<u>Special spools for particular positioner kits</u> . . . . . page 53						
5	3CU1341020	3CU1341040	3CU1341060	3CU1340600	3CU1341110	Double acting, 4 positions, floating circuit in 4 <sup>th</sup> position with spool in

**4. "A" side spool positioners****page 21**

TYPE	CODE	DESCRIPTION
8	5V08108010	With spring return in neutral position
8D	5V08108202	As type 8 and pin with M8 female thread for dual control
8D1	5V08108210	As type 8 and pin with $\varnothing$ 8mm (0.32in) radial hole
9B	5V09108040	With detent in position 1 and spring return in neutral position
10B	5V10108040	With detent in position 2 and spring return in neutral position
11B	5V11108040	With detent in position 1 and 2, spring return in neutral position
8K	5V08708112	With spring return in neutral position and 12 VDC spool solenoid lock device
	5V08708124	As previous 24 VDC
8MG3(NO)	5V08108050	With spring return in neutral position and microswitch in positions 1 and 2
8ED3	5V08108360	ON/OFF 12 VDC elettro-hydraulic kit
	5V08108361	ON/OFF 24 VDC elettro-hydraulic kit
8PG	5V08108708	Proportional pneumatic control
8EPG3	5V08108737	ON/OFF 12 VDC electro-pneumatic kit
	5V08108742	ON/OFF 24 VDC electro-pneumatic kit
<u>Particular positioner kits for special spools</u> . . . . . page 30		
13	5V13108040	4 pos. with spring return in neutral pos. and detent in 4 <sup>th</sup> pos.: <b>for spool 5</b>
13MG3F(NO)	5V13108051	As type 13 with microswitch in positions 1 and 2: <b>for spool 5</b>
13K	5V13708113	As type 13 with 12 VDC spool solenoid lock device: <b>for spool 5</b>
	5V13708124	As previous 24 VDC

**5. "B" side options****page 33**

TYPE	CODE	DESCRIPTION
LF3	5LEV108710	Lever box with spool stroke adjusting
SLP	5COP108000	Without lever box, with dust-proof plate
SLCY	5COP208060	Without lever box, with endcap
TQ	5TEL108110	Flexible cable connection
LCB	5CLO308100	Joystick lever for 2 sections operation

**I Optional hand levers**

TYPE	CODE	DESCRIPTION
AL01/M10x200	170012020	For L lever box L= 200 mm/ 7.87in
AL08/M12x200	170013120	For LB lever or LCB joystick L=200mm/7.87in

**8. Inlet and outlet options\*****page 54**

TYPE	CODE	DESCRIPTION
PSA	3XTAP732200G3/4	plug; nr.1 for upper inlet and outlet.
PASL	3XTAP732200G3/4	plug; nr.1 for upper inlet and side outlet.

**6. Complete controls \*****page 37**

TYPE	CODE	DESCRIPTION
8IMF3	5IDR208220	Proportional hydraulic control with spool stroke limiter

**7. Port valves****page 42****Need special body kit***Standard setting is referred to 10 l/min flow.*

TYPE	CODE	DESCRIPTION
PT	3XTAP524290	Valve blanking plug
DST	3XTAP624180	Valve blanking plug with connection to tank

Anti-shock valve

P(G3-100) 3XCAR208113 From 100 to 250 bar / 1450 to 3600 psi:  
standard setting 100 bar / 1450 psi

P(G4-200) 3XCAR208114 From 200 to 315 bar / 2900 to 4600 psi:  
Standard setting 200 bar / 2900 psi

Anti-shock/anti-cavitation valve

U(G2-63) XCAR308112 From 63 to 125 bar / 900 to 1800 psi:  
Standard setting 63 bar / 900 psi

U(G3-100) XCAR308115 From 100 to 250 bar / 1450 to 3600 psi:  
Standard setting 100 bar / 1450 psi

U(G4-200) XCAR308114 From 200 to 315 bar / 2900 to 4600 psi:  
Standard setting 200 bar / 2900 psi

Pilot operated anti-shock/anti-cavitation valve: fixed setting

UX(Z-63) X005410063 Setting 63 bar / 900 psi

UX(Z-80) X005410080 Setting 80 bar / 1150 psi

UX(Z-100) X005410100 Setting 100 bar / 1450 psi

UX(Z-125) X005410125 Setting 125 bar / 1800 psi

UX(Z-160) X005410160 Setting 160 bar / 2320 psi

UX(Z-200) X005410200 Setting 200 bar / 2900 psi

UX(Z-250) X005410250 Setting 250 bar / 3600 psi

UX(Z-315) X005410315 Setting 315 bar / 4600 psi

Pilot operated anti-shock/anti-cavitation valve: adjustable setting

UX(G-145) X143411145 From 100 to 280 bar / 1450 to 4050 psi:  
Standard setting

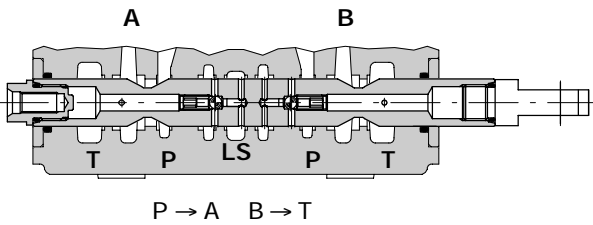
Anti-cavitation valve

C XCAR408110 Anti-cavitation valve

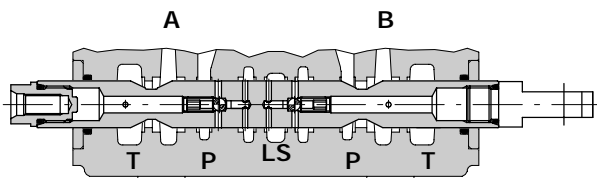
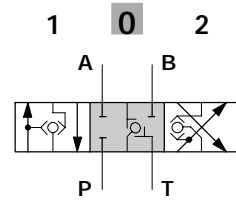
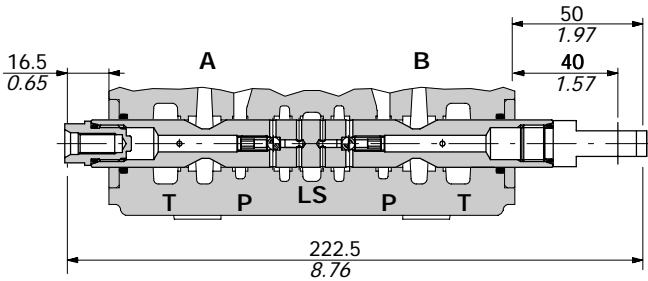
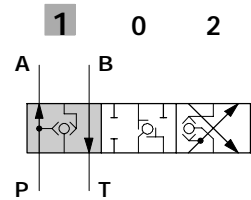
# DLM140

## Spool

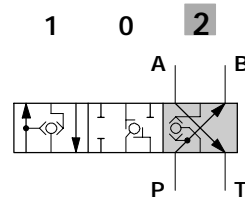
### Type 1



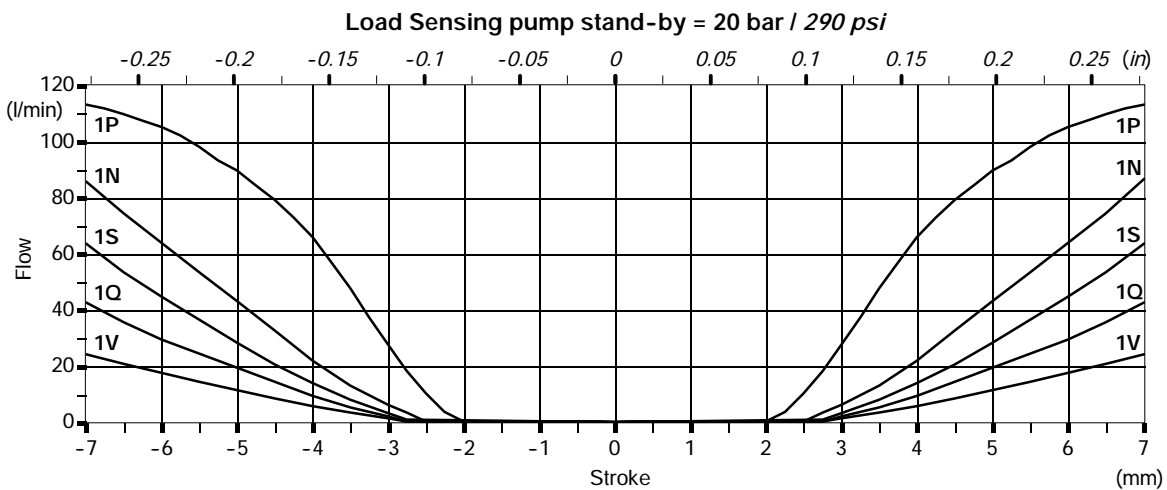
stroke:  
+ 7 mm / 0.28 in



stroke:  
- 7 mm / 0.28 in

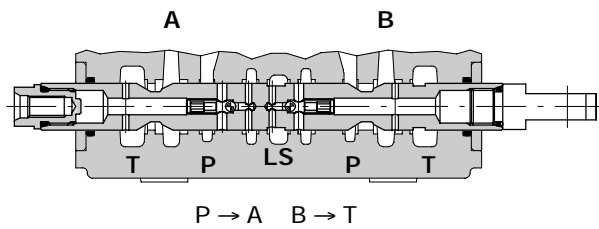


### Performance data

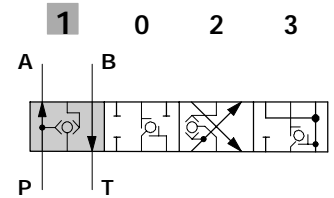


Type 5

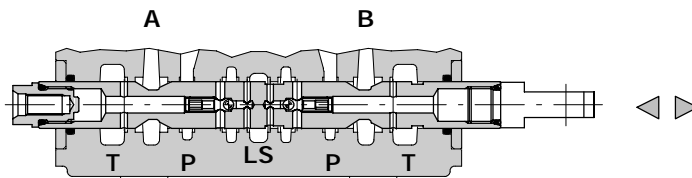
This spool must be used only with spool positioner type 13, 13MGF, 13K (see page 30).



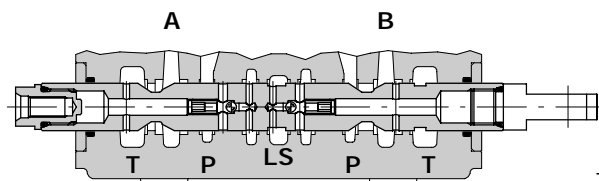
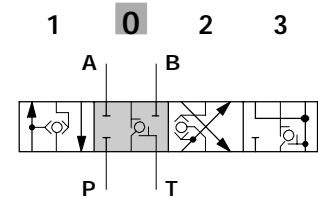
stroke:  
+ 7 mm / 0.28 in



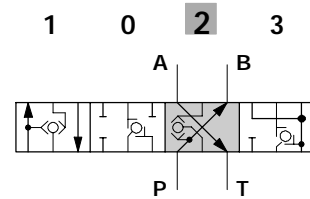
P → A B → T



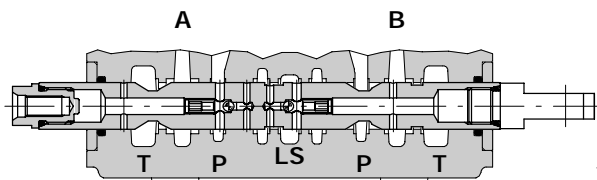
P-A-B-T closed



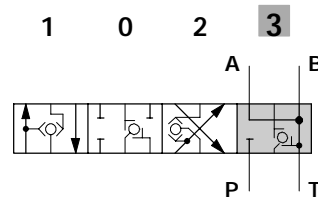
stroke:  
- 6.7 mm / 0.26 in



P → B A → T



stroke:  
- 12 mm / 0.47 in

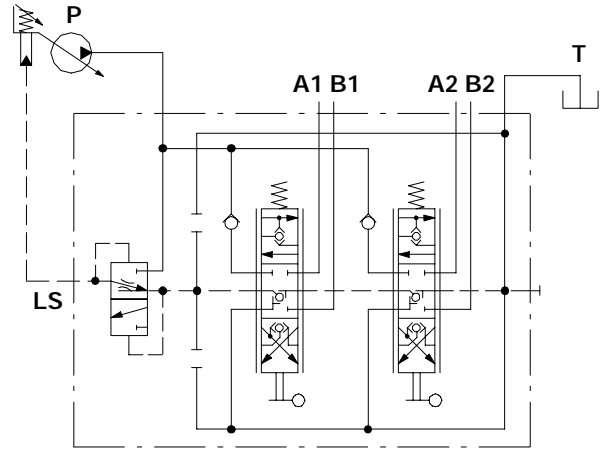
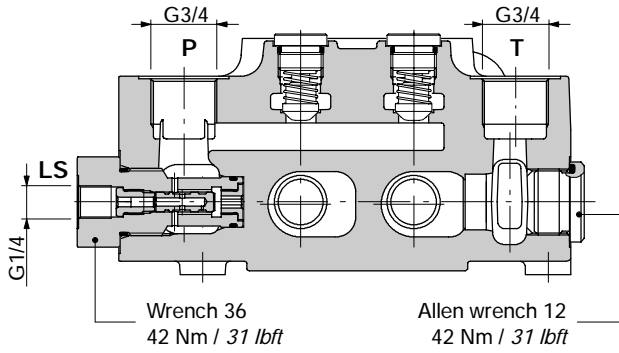


A(B) → T (floating)

# DLM140

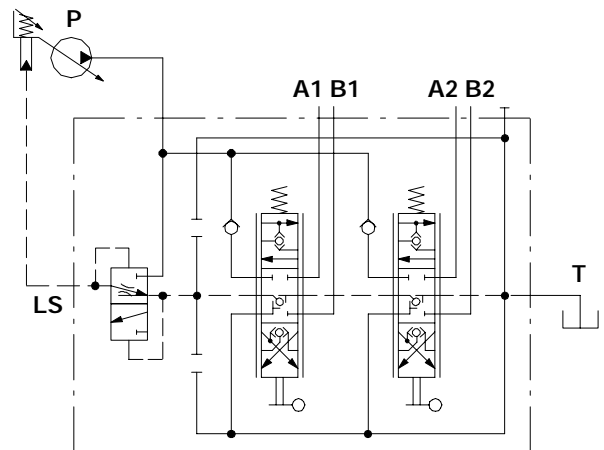
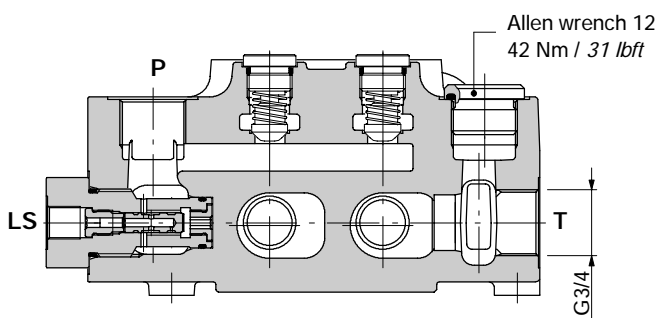
## Inlet and outlet options

### PSA: upper ports (standard)



Description example:  
DLM140/2-AP/1N8LF3/1N8LF3/PSA

### PASL: upper inlet and side outlet



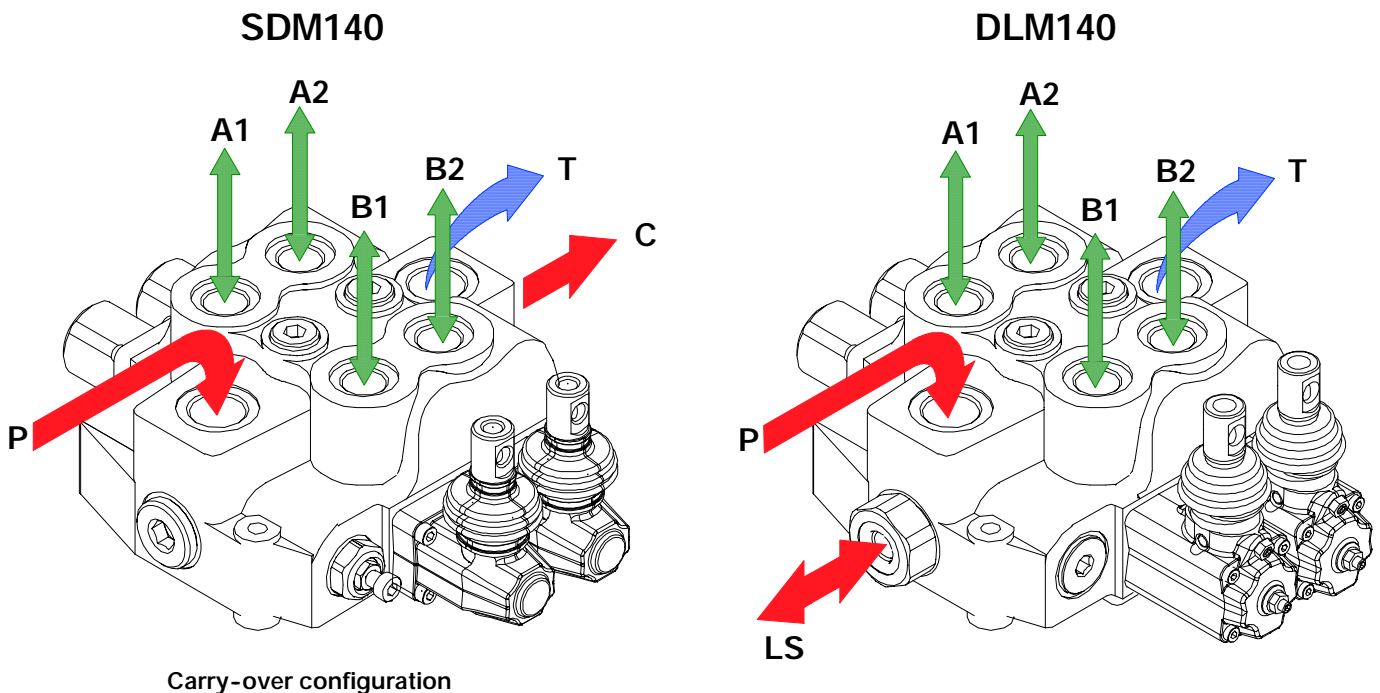
Description example:  
DLM140/2-AP/1N8LF3/1N8LF3/PASL

## Installation and maintenance

The SDM140 and DLM140 valves are assembled and tested as per the technical specification of this catalogue.

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

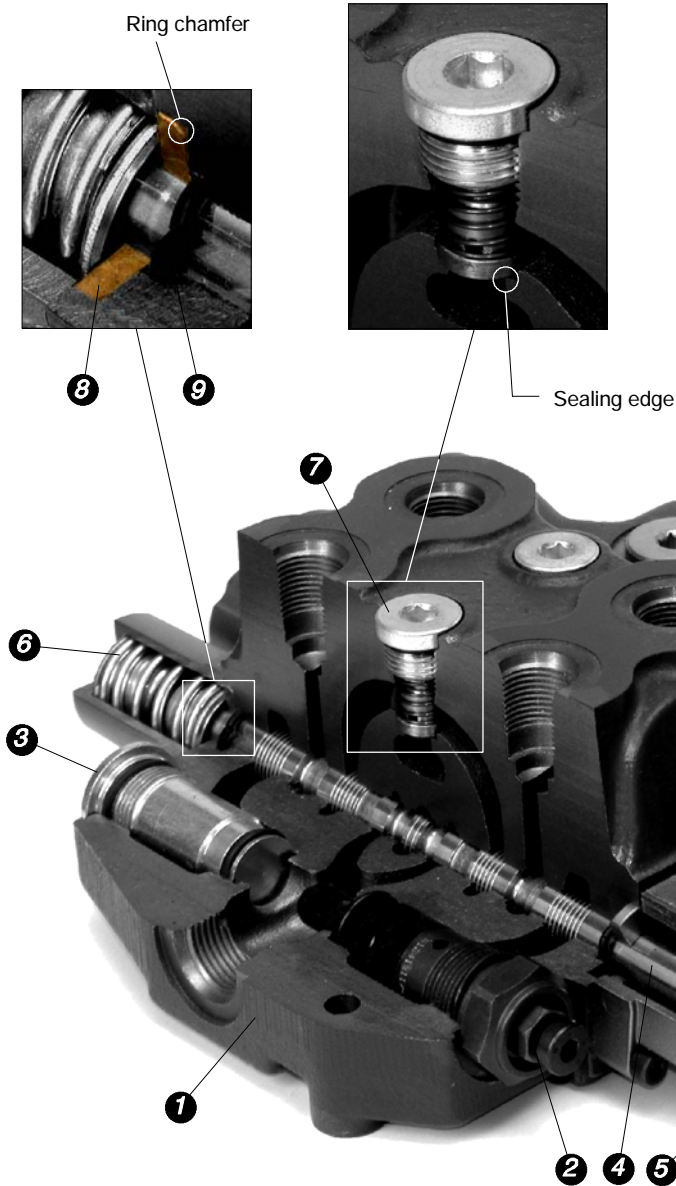
- the valves can be assembled in any position, in order to prevent body deformation and spool sticking mount the product on a flat surface;
- in order to prevent the possibility of water entering the lever box and spool control kit, do not use high pressure wash down directly on the valve;
- prior to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



## Fitting tightening torque - Nm / lbft

THREADS TYPE	P and C ports	A and B ports	T port	L.S. signal
BSP	G 3/4	G 1/2	G 3/4	G 1/4
With O-Ring seal	70 / 51.6	50 / 36.9	70 / 51.6	20 / 14.8
With copper washer	70 / 51.6	60 / 44.3	70 / 51.6	25 / 18.4
With steel and rubber washer	70 / 51.6	60 / 44.3	70 / 51.6	16 / 11.8
UN-UNF	1 1/16-12 (SAE 12)	7/8-14 (SAE 10)	1 1/16-12 (SAE 12)	9/16-18 (SAE 6)
With O-Ring seal	95 / 70.1	60 / 44.2	95 / 70.1	30 / 22.1
MET	M 27x2	M 22x1,5	M 27x2	M 14x1,5
With O-Ring seal	100 / 73.8	60 / 44.2	100 / 73.8	35 / 25.8

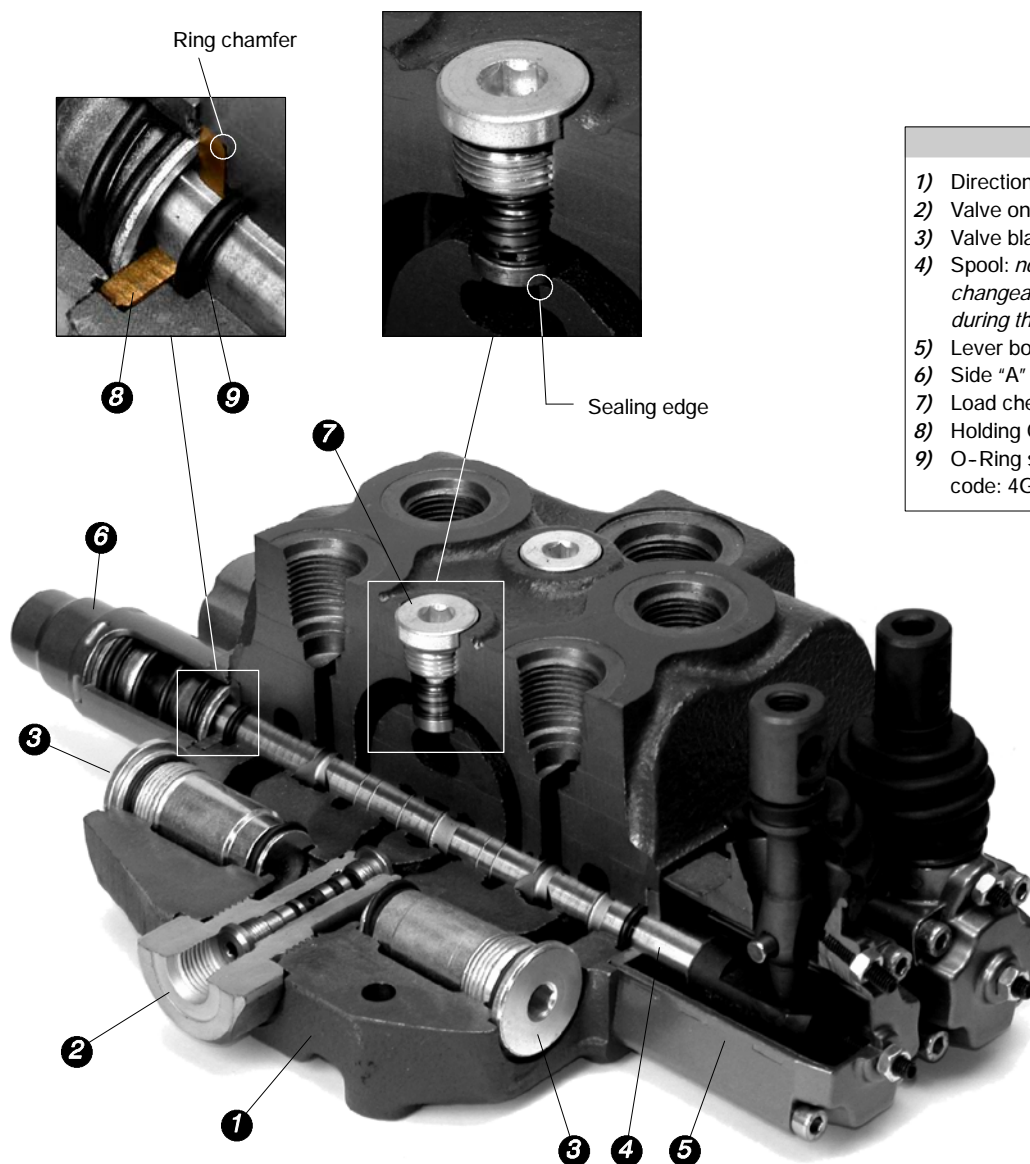
NOTE - These torque are recommended. Assembly tightening torque depends on many factors, including lubrication, coating and surface finish. The manufacturer shall be consulted.



Item list	
1)	Directional valve body
2)	Main relief valve
3)	Valve blanking plug
4)	Spool: <i>normally the spools are interchangeable. Verify the smoothness during the assembly</i>
5)	Lever box
6)	Side "A" spool positioner
7)	Load check valve
8)	Holding O-Ring bushing
9)	O-Ring seals 18x2.5 code: 4GUA118025

NOTE - All articulated parts inside cap, lever box and mechanical joystick are lubricated with synthetic base grease grade NLGI2

Malfunction	Cause	Remedy
External leakage pivot box lever or control kit side.	Worn spool 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.
Dropping load during transition while raising.	High leakage on the load check valve.	Remove the load check valve and clean the seat.
Inability to build pressure on A and B ports.	Pressure relief valve blocked open. Low pump pressure and flow.	Remove and clean or replace the valve. Check the pump and circuit.



Item list	
1)	Directional valve body
2)	Valve on Load Sensing signal
3)	Valve blanking plug
4)	Spool: <i>normally the spools are interchangeable. Verify the smoothness during the assembly</i>
5)	Lever box
6)	Side "A" spool positioner
7)	Load check valve
8)	Holding O-Ring bushing
9)	O-Ring seals 18x2.5 code: 4GUA118025

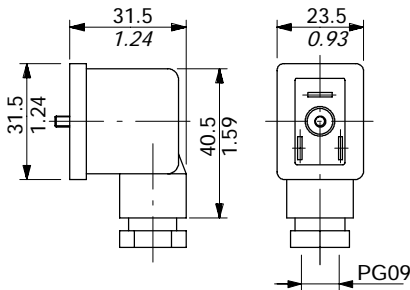
NOTE - All articulated parts inside cap, lever box and mechanical joystick are lubricated with synthetic base grease grade NLGI2

Malfunction	Cause	Remedy
External leakage pivot box lever or control kit side.	Worn spool 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.
Dropping load during transition while raising	High leakage on the load check valve.	Remove the load check valve and clean the seat.
Inability to build pressure on A and B ports.	Low pump pressure and flow. Valve on L.S. signal is jammed.	Check the pump and circuit. Remove and clean the valve; if necessary replace it.

### Connectors

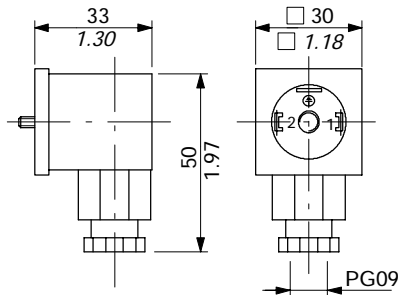
#### Type C01 code: 2X1001020

2P+T according to EN175301-803



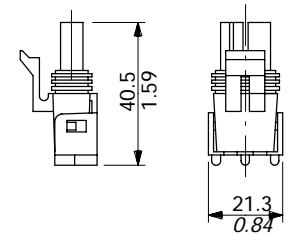
#### Type C02 code: 2X1001010

2P+T according to ISO4400 / EN175301-803



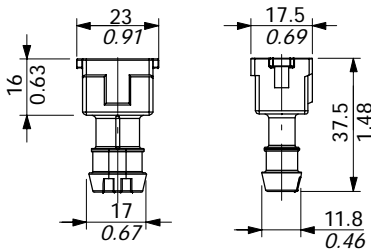
#### Type C07 code: 5CON001

2P male case with female end type PACKARD "Weather Pack"



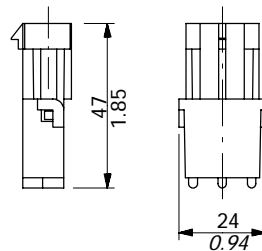
#### Type C08 code: 5CON003

2P female case with female end type AMP "Junior-Power-Timer"



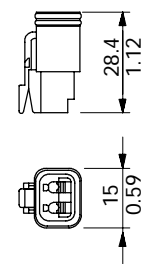
#### Type C17 code: 5CON005

2P female case with male end type PACKARD "Weather Pack"



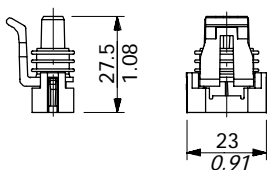
#### Type C19 code: 5CON007

2P male case with female end type Deutsch DT06-2S



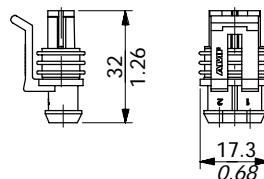
#### Type C20 code: 5CON017

2P male case with female end type PACKARD "Metri-Pack"



#### Type C24 code: 5CON0031

2P male case with female end type AMP "Superseal"



Type	Poles	Nominal voltage	Nominal current	Permitted conductor section range	Permitted cable diameter range	Weather protection
C01	2P + T	250 VAC / 300 VDC	10 A	max.1.5 mm <sup>2</sup> / max.0.0023 in <sup>2</sup>	6-8 mm / 0.24-0.31 in	IP65
C02	2P + T	250 VAC / 300 VDC	10 A	max.1.5 mm <sup>2</sup> / max.0.0023 in <sup>2</sup>	6-8 mm / 0.24-0.31 in	IP65
C07	2P	/	20 A	1-2 mm <sup>2</sup> / 0.00155-0.0031 in <sup>2</sup>	2.8-3.5 mm / 0.11-0.14 in	IP67
C08	2P	250 VAC	12 A	0.5-1 mm <sup>2</sup> / 0.00077-0.00155 in <sup>2</sup>	1.4-1.6 mm / 0.055-0.063 in	IP65
C17	2P	/	20 A	1-2 mm <sup>2</sup> / 0.00155-0.0031 in <sup>2</sup>	1.3-1.7 mm / 0.051-0.067 in	IP67
C19	2P	/	13 A	1-1.2 mm <sup>2</sup> / 0.00155-0.00186 in <sup>2</sup>	2.2-3.5 mm / 0.088-0.14 in	IP67
C20	2P	/	14 A	0.8-1 mm <sup>2</sup> / 0.00124-0.00155 in <sup>2</sup>	1.3-1.7 mm / 0.051-0.067 in	IP65
C24	2P	/	14A	0.3-0.5 mm <sup>2</sup> / 0.00046-0.00077 in <sup>2</sup>	1.4-1.7 mm / 0.055-0.067 in	IP67



SDM140 and DLM140 valves can be supplied with one coat of black paint (CVN configuration).

Description example: SDM140/2-P(YG3-175)/18L/18L/PSA-<CVN>     DLM140/2-AP/1N8LF3/1N8LF3/PSA-<CVN>

For different colours consult Sales Department.



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