



D  
P  
M142

DIRECTIONAL CONTROL VALVE



 **walvoil**  
HYDRAULIC CONTROL SYSTEMS

# DLM142

## Features

Simple, compact and heavy duty designed 2 sections monoblock valve, for hydraulic systems with load sensing variable displacement pump.

H Each spool has independent load check valve.

H Parallel circuit.

H A wide variety of service port valves.

H Available with manual, electro-hydraulic and remote with flexible cables spool control kits.

H Diameter 18 mm - 0.71 in interchangeable spools.

### Additional information

This catalog 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 catalog 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.

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

**This edition supercedes all prior documents.**

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# DLM142

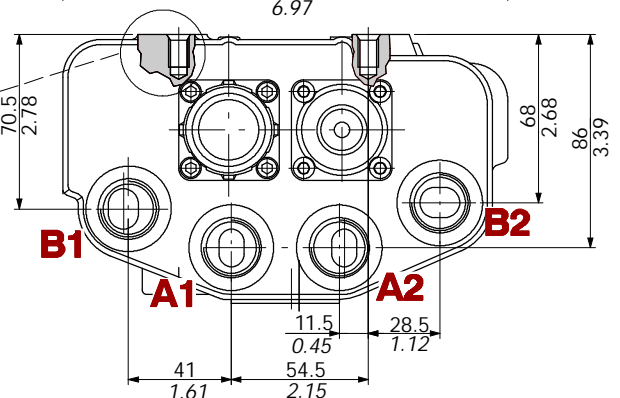
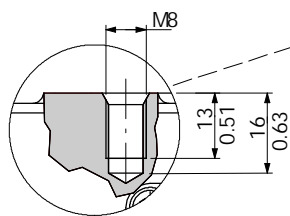
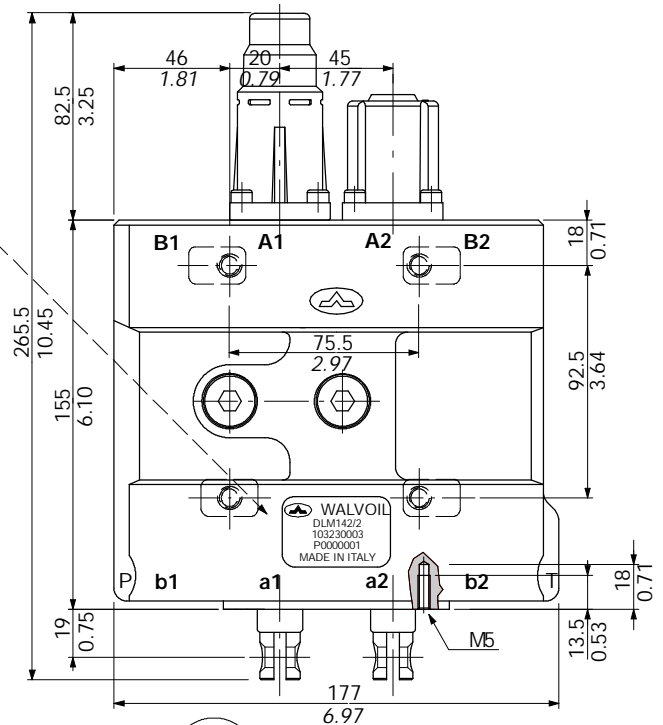
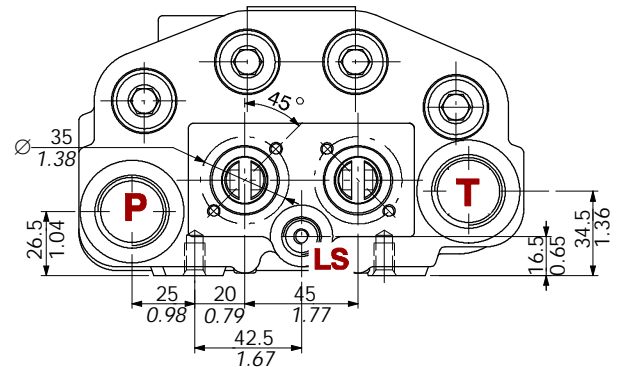
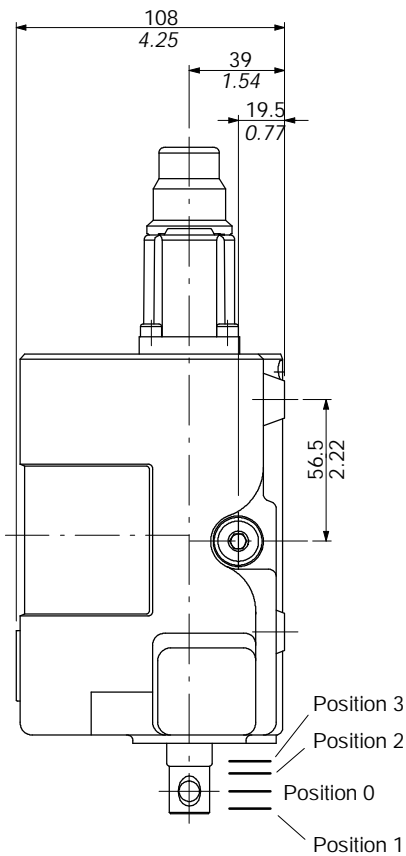
## Working conditions

This catalog shows technical specifications and diagrams measured with mineral oil of 46 mm<sup>2</sup>/s - 46 cSt viscosity at 40°C - 104°F temperature.

Nominal flow rating		80 l/min	21 US gpm
Operating pressure (maximum)		250 bar	3600 psi
Max. back pressure	<i>on outlet port T</i>	10 bar	145 psi
Internal leakage A(B)→T	<i>Δp=100 bar - 1450 psi fluid and valve at 40°C - 104°F</i>	3 cm <sup>3</sup> /min	0.18 in <sup>3</sup> /min
Fluid		Mineral oil	
Fluid temperature range	<i>with NBR (BUNA-N) seals</i>	from -20° to 80°C	<i>from -4° to 176°F</i>
	<i>with FPM (VITON) seals</i>	from -20° to 100°C	<i>from -4° to 212°F</i>
Viscosity	<i>operating range</i>	from 15 to 75 mm <sup>2</sup> /s	<i>from 15 to 75 cSt</i>
	<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		19/16 - ISO 4406	NAS 1638 - class10
Ambient temperature range		from -40° to 60°C	<i>from -40° to 140°F</i>

NOTE - For different conditions please contact Customer Service.

Valve type  **WALVOIL**  
 Valve code **DLM142/2**  
**103230003**  
 Production batch : **P0000001**  
 P00 = production year (2000)  
 00001 = progressive number  
**MADE IN ITALY**



### Standard threads

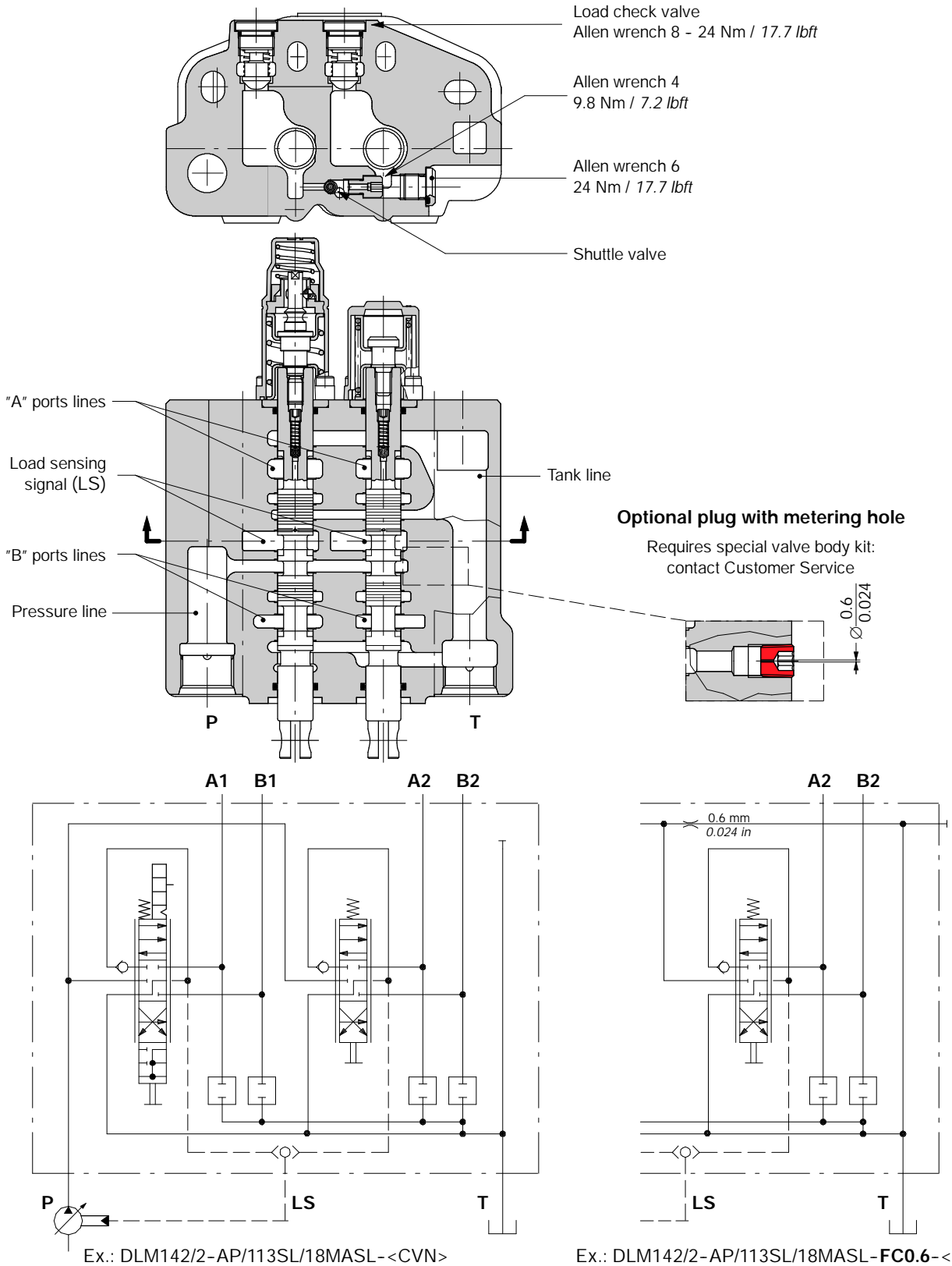
PORTS	BSP (ISO 228/1)	UN-UNF (ISO 11926-1)	METRIC (ISO 262)
Inlet <b>P</b> and outlet <b>T</b>	G 3/4	1 1/16-12 UN-2B (SAE 12)	M27x2
<b>A</b> and <b>B</b> ports	G 1/2	7/8-14 UNF-2B (SAE 10)	M22x1,5
Load sensing <b>LS</b> port	G 1/4	9/16-18 UNF-2B (SAE 6)	M14x1.5

# DLM142

## Hydraulic circuit

To prevent spools sticking due to temperature shock, the valve is available in a special configuration with the connection of the pressure line with tank through a small orifice ( $\varnothing 0.6 \text{ mm} / 0.024 \text{ in}$ ).

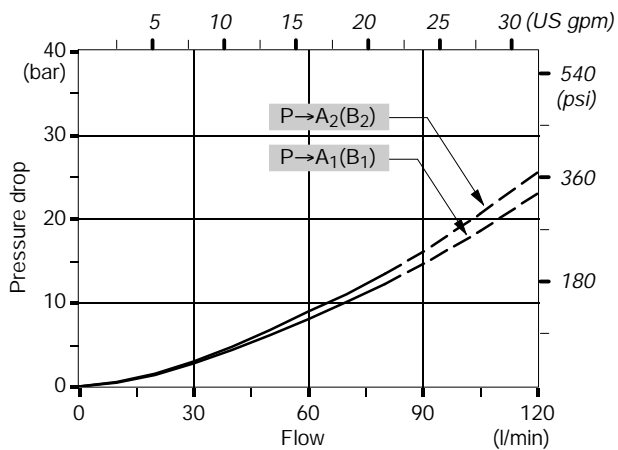
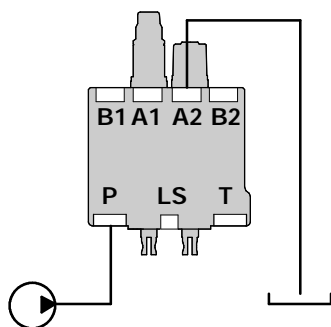
There is a small amount of flow constantly going to tank, but this system keeps the valve body warm with spools in neutral position. This configuration is particularly suitable for application in cold environment.



Performance data (pressure drop vs. flow)

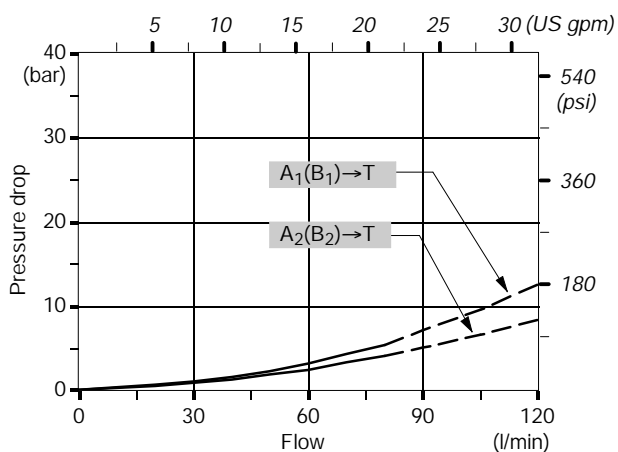
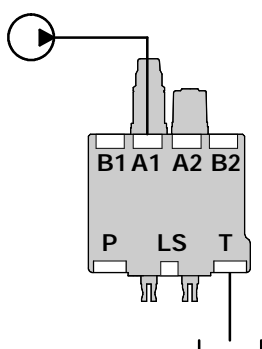
Inlet to work port

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



Work port to outlet

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



# DLM142

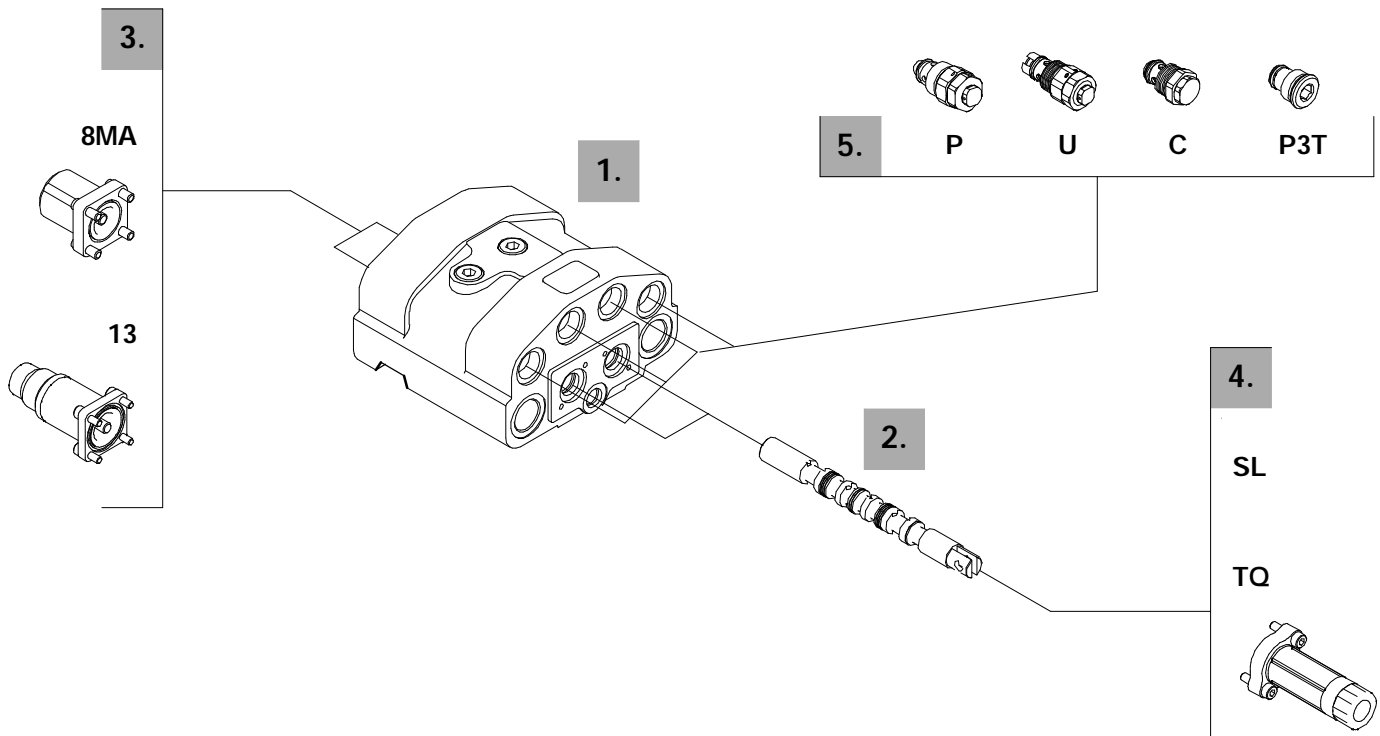
## Ordering codes

### Description example:

DLM142/ 2 - AP / 1 13 SL / 18MASL . P1(G3 - 100) - SAE - <CVN> \*

1st section      2nd section

1.      2.      3.      4.      5.      Port relief valve setting in bar      Valve is supplied painted as standard, with one coat of Primer black antirust paint



### 1. Body kit \*

TYPE	CODE	DESCRIPTION
2-AP	5KC1907003	2 sections

Include body, seals, rings and load check valves.

### 2. Spool page 10

With 8MA kit: double acting, 3 positions, A and B closed in neutral position

With 13 kit: double acting, 4 positions, A and B to tank in 4th positions (float)

TYPE	CODE	FLOW (with 10 bar / 1450 psi stand by)
1	3CU1310210	120 l/min
1TR	3CU1310220	60 l/min

### 3. "A" side spool positioner page 11

TYPE	CODE	DESCRIPTION
8MA	5V08108240	With spring return in neutral position
13	5V13108040	With detent in position 3 and spring return in neutral position

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

### 4. "B" side options page 12

TYPE	CODE	DESCRIPTION
SL	-	P rearranged for mechanical remote control
TQ	5TEL108220	P rearranged for cable remote control

### 5. Port relief options page 13

TYPE	CODE	DESCRIPTION
<u>Anti-shock valve</u>		
P(G3-100)	3XCAR208113	Range 100 to 250 bar / 1450 to 3600 psi standard setting 100 bar / 1450 psi
P(G4-200)	3XCAR208114	Range 200 to 315 bar / 2900 to 4600 psi standard setting 200 bar / 2900 psi
<u>Anti-shock and anti-cavitation valve</u>		
U(G2-63)	XCAR308112	Range 63 to 125 bar / 900 to 1800 psi standard setting 63 bar / 900 psi
U(G3-100)	XCAR308115	Range 100 to 250 bar / 1450 to 3600 psi standard setting 100 bar / 1450 psi
U(G4-200)	XCAR308114	Range 200 to 315 bar / 2900 to 4600 psi standard setting 200 bar / 2900 psi

Standard setting is referred to 10 l/min - 2.6 US gpm flow.

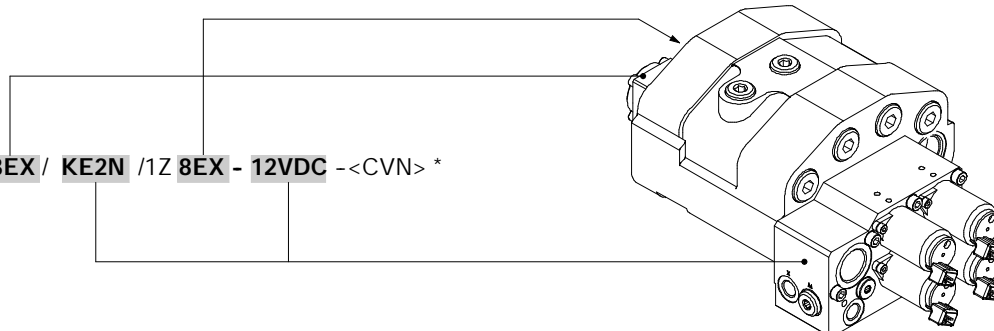
C	XCAR408110	Anti-cavitation
P3T	3XTAP524290	A and B ports valve blanking plugs



DLM142 valve with proportional electro-hydraulic control

Description example:

DLM142/2-APF/1Z **13EX** / **KE2N** /1Z **8EX** - **12VDC** -<CVN> \*



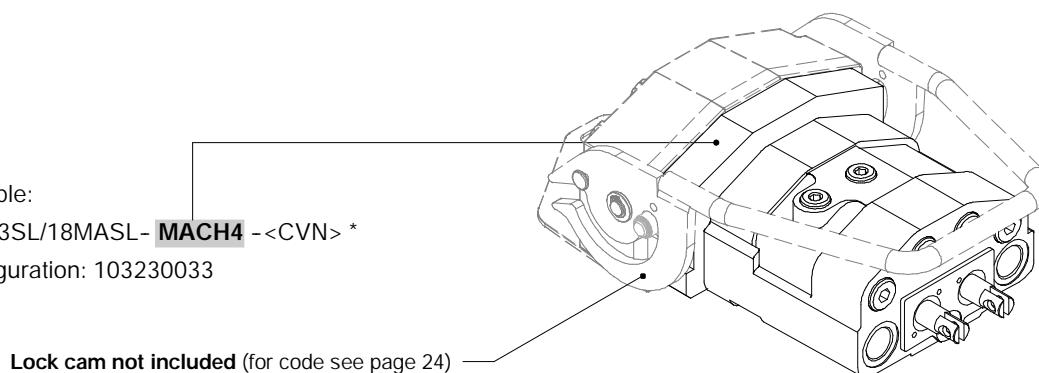
Code of this configuration: 103230032

DLM142 valve with quick-action coupling

Description example:

DLM142/2-AP/113SL/18MASL- **MACH4** -<CVN> \*

Code of this configuration: 103230033



Lock cam not included (for code see page 24)

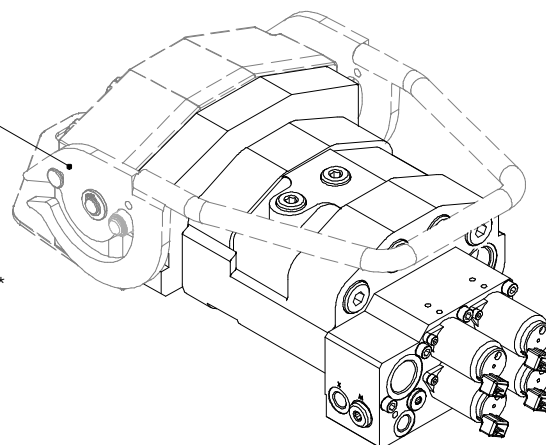
DLM142 valve with proportional electro-hydraulic control and quick-action coupling

Description example:

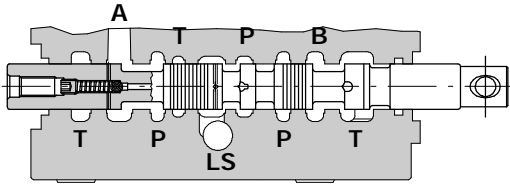
DLM142/2-APF/1Z**13EX**/**KE2N** /1Z **8EX**-**12VDC**-**MACH4**-<CVN> \*

Code of this configuration: 103230034

Lock not included (for code see page 24)

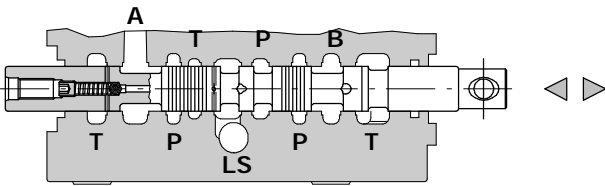
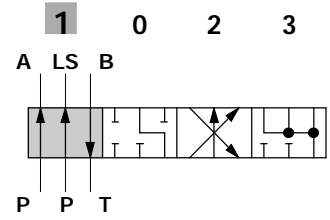


### Types 1 and 1TR

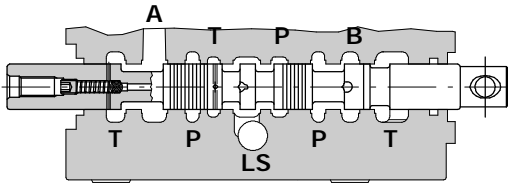
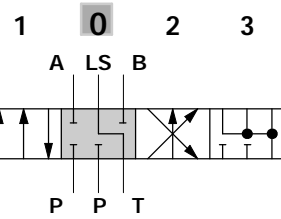


P → A-LS B → T

" stroke = + 7 mm  
+ 0.28 in



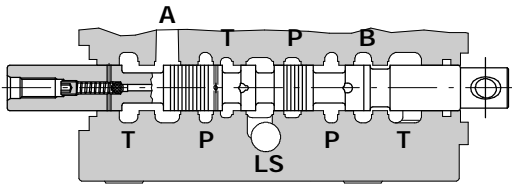
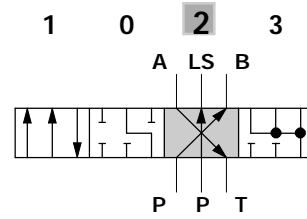
P-A-B-T closed, with load sensing (LS) line to tank



P → B-LS A → T

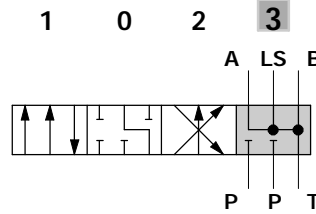
A stroke = - 7 mm  
- 0.28 in

**A** stroke = - 6.7 mm  
- 0.26 in



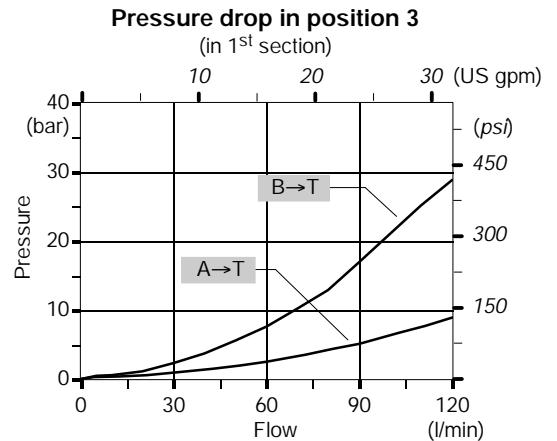
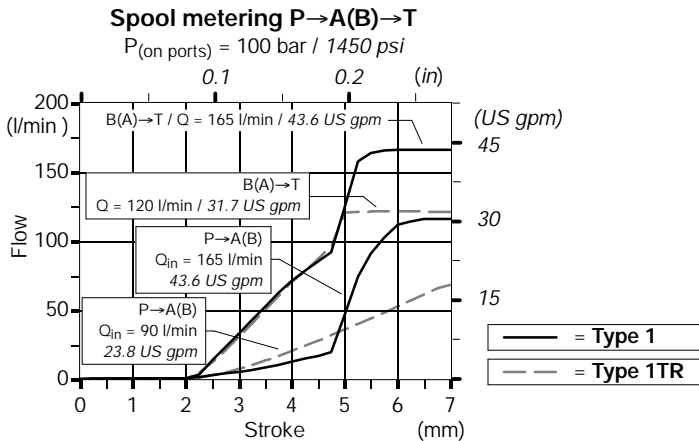
A-B-LS → T (floating circuit)

**A** stroke = - 12 mm  
- 0.47 in



NOTE - **A** Only for positioner kit type 13

### Performance data



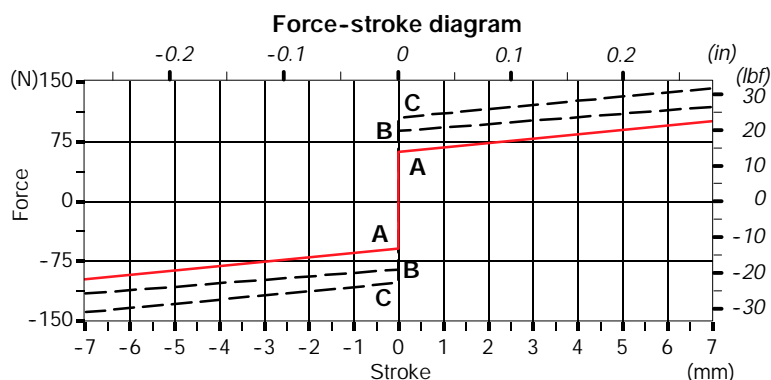
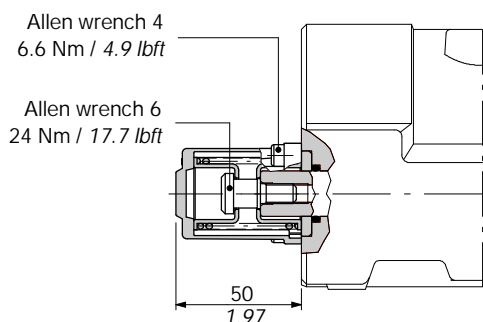
"A" side spool positioner

With spring return

8MA kit

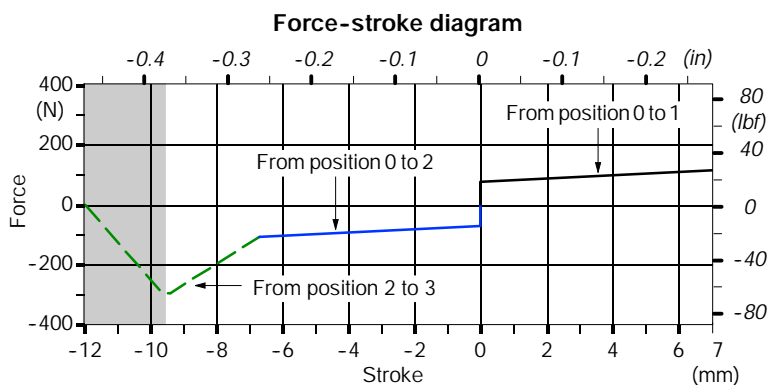
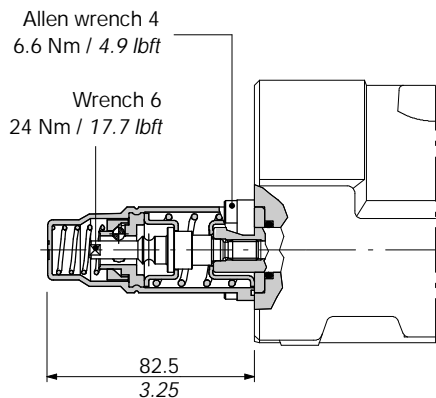
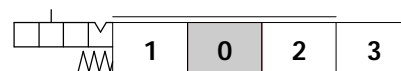
Supplied with standard spring type A (see force-stroke diagram).

Available with heavier spring type B (8 code: 5V08108010) or type C (8MC code: 5V08208000).



With detent on 4<sup>th</sup> position float circuit

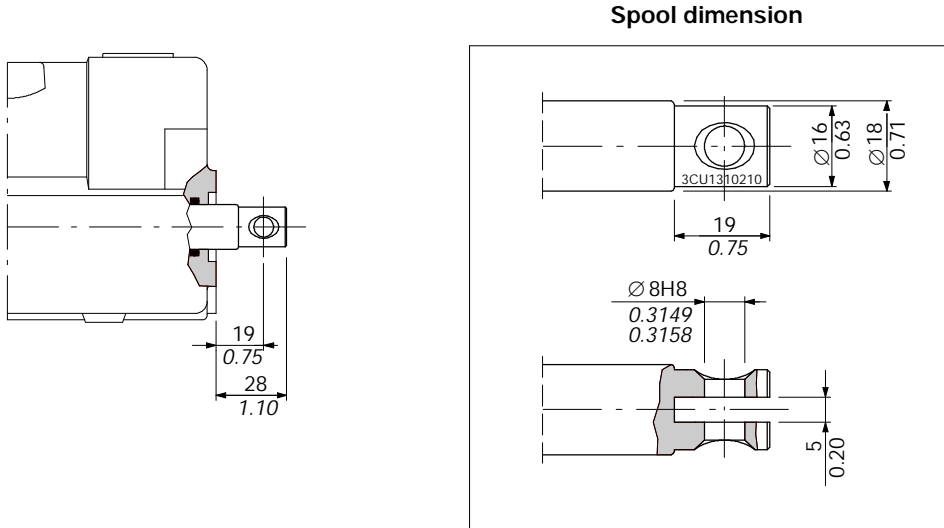
13 kit



## "B" side options

### SL prearranged for mechanical remote control

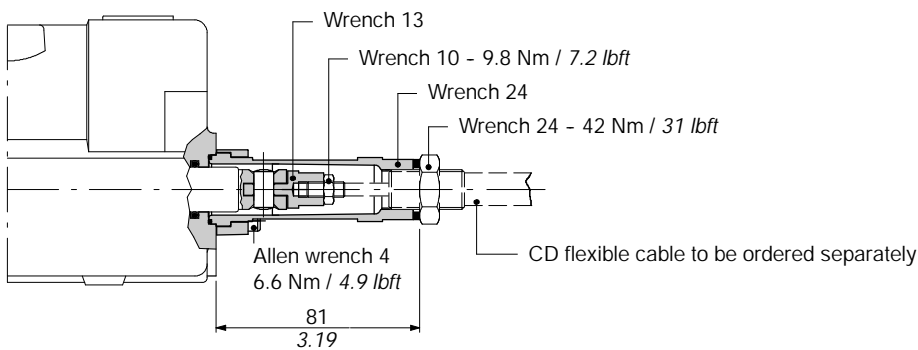
1	0	2
---	---	---



### TQ cable remote control

Waterproof cap prearranged for remote control with flexible cable.

1	0	2
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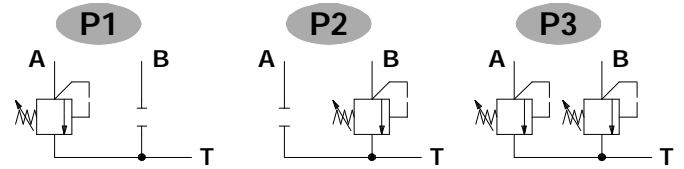


NOTE - For more information concerning remote cable control require appropriate documentation.

Anti-shock valve

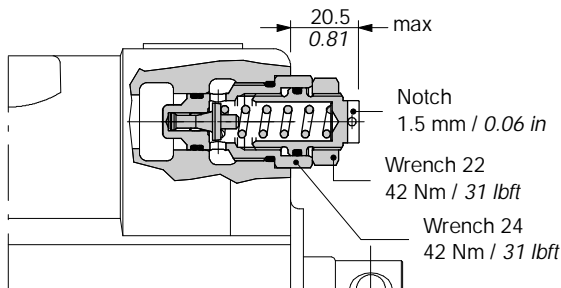
P 1 (G 3 - 100)

- Pressure setting in bar.
- Spring type (3, 4).
- Adjustment type (G, H).
- 1 mounted on A port.
- 2 mounted on B port.
- 3 mounted on A and B ports.

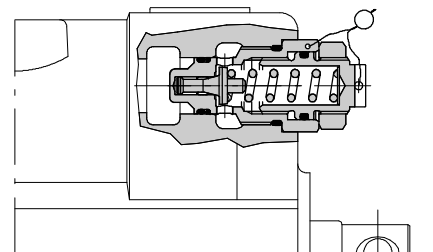


Adjustment type

G: with screw

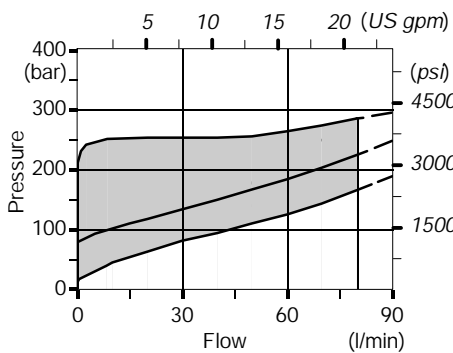


H: valve set and locked

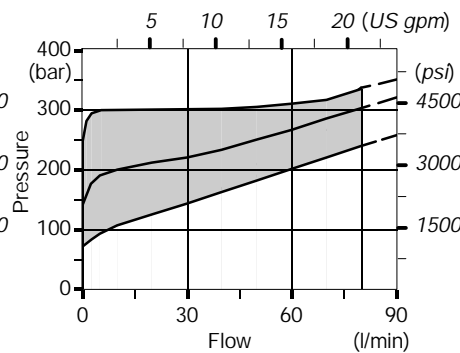


Performance data

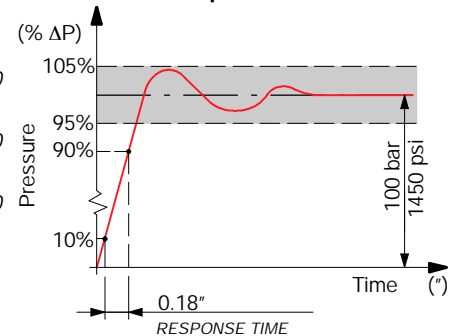
Spring # 3 (blue band)



Spring # 4 (red band)



Response time



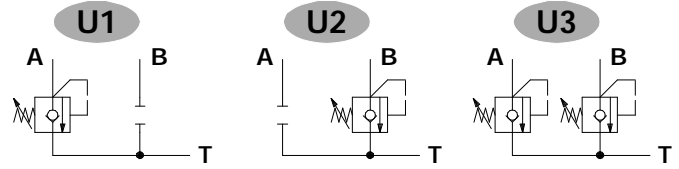
# DLM142

## Port relief options

### Anti-shock and anti-cavitation valve

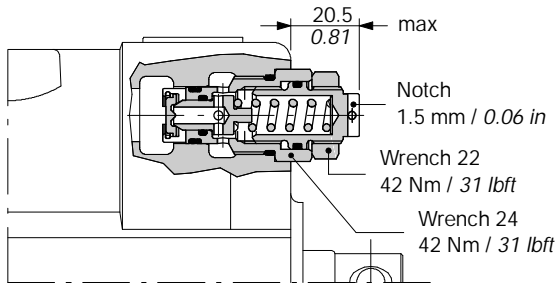
**U 1 ( G 3 - 100 )**

- Pressure setting in bar.
- Spring type (2, 3, 4).
- Adjustment type (G, H).
- 1** mounted on A port.
- 2** mounted on B port.
- 3** mounted on A and B ports.

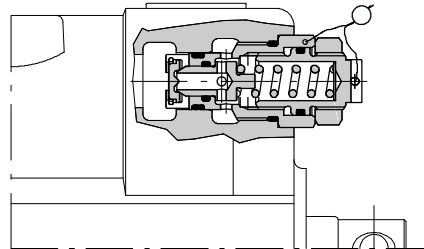


### Adjustment type

**G: with screw**

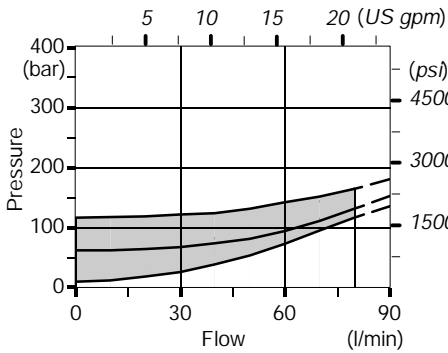


**H: valve set and locked**

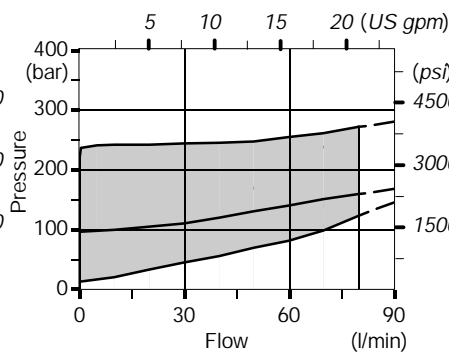


### Performance data

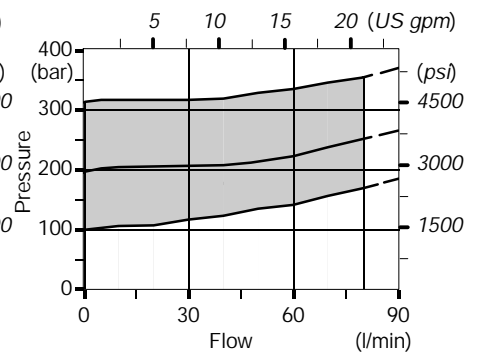
**Spring # 2 (green band)**



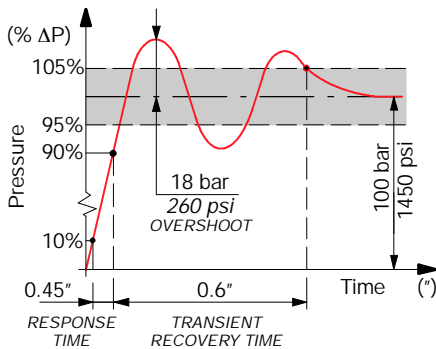
**Spring # 3 (blue band)**



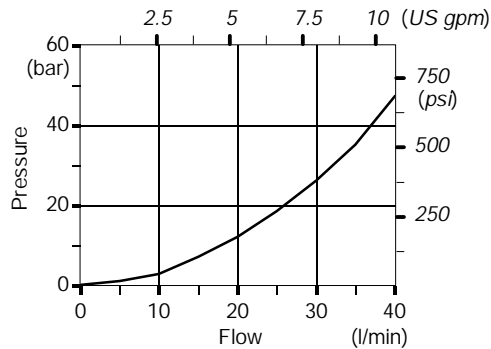
**Spring # 4 (red band)**



**Response time**



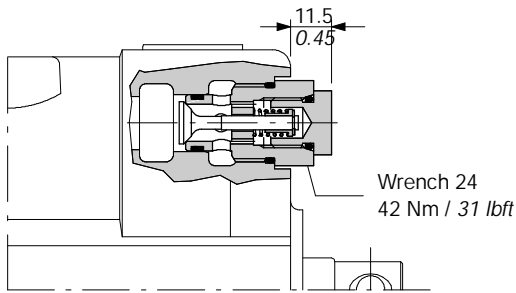
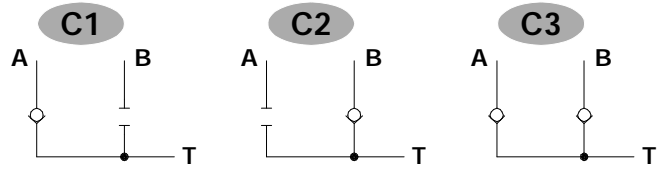
**Pressure drop**



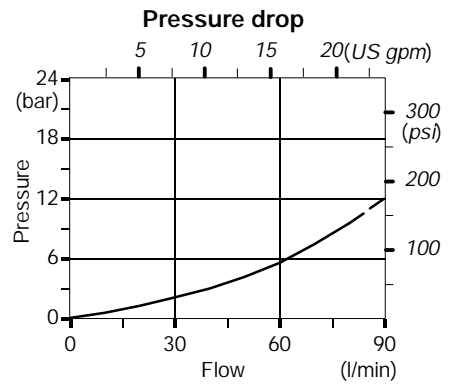
Anti-cavitation valve

C 1

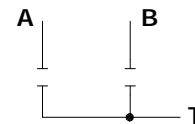
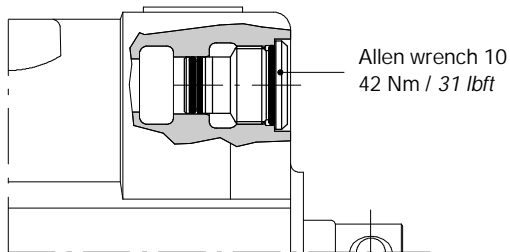
- 1 mounted on A port.
- 2 mounted on B port.
- 3 mounted on A and B ports.



Performance data



P3T: port relief valve blanking plug









*Proportional electro-hydraulic control*

..... page 18



*Quick-action coupling*

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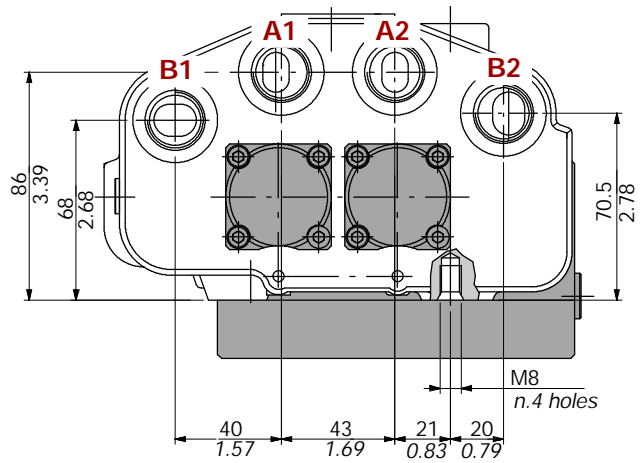
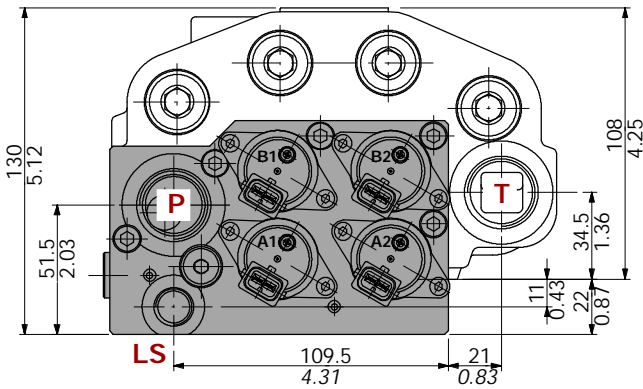


*Proportional electro-hydraulic control  
and quick-action coupling*

..... page 23

Proportional electro-hydraulic control

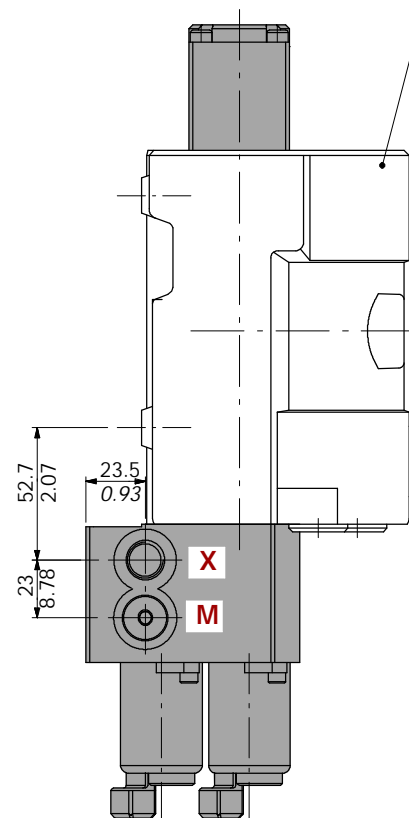
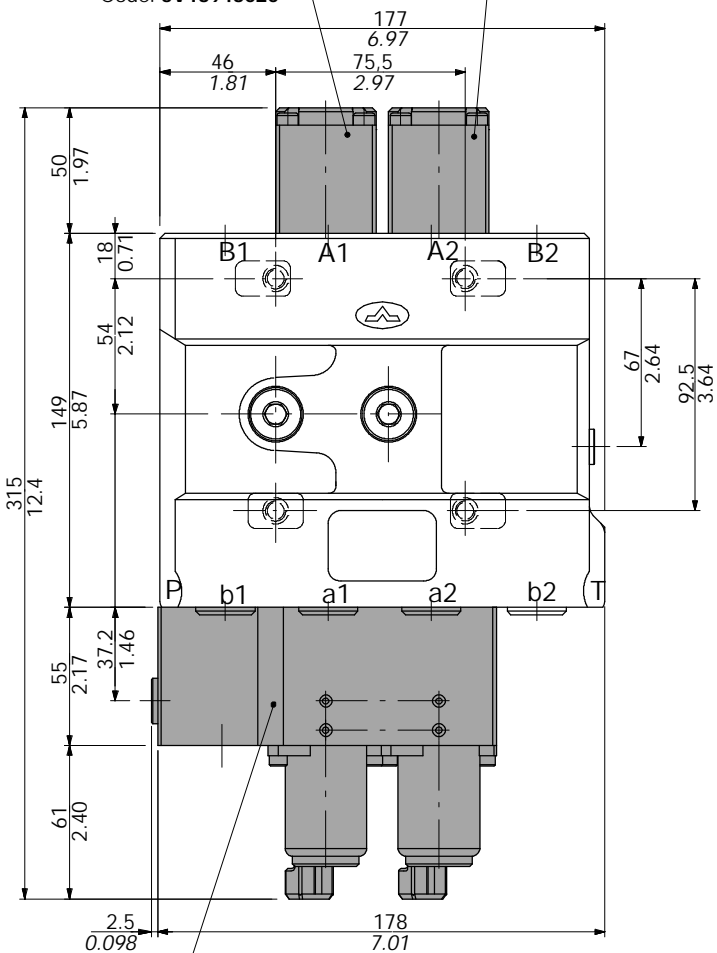
Dimensional data



Spool positioner kit type **13EX**  
(4 positions).  
Code: **5V13943020**

Spool positioner kit type **8EX** (3 positions).  
Code: **5V08643020**

Special body kit (special body).  
Code: **5KC1907007**

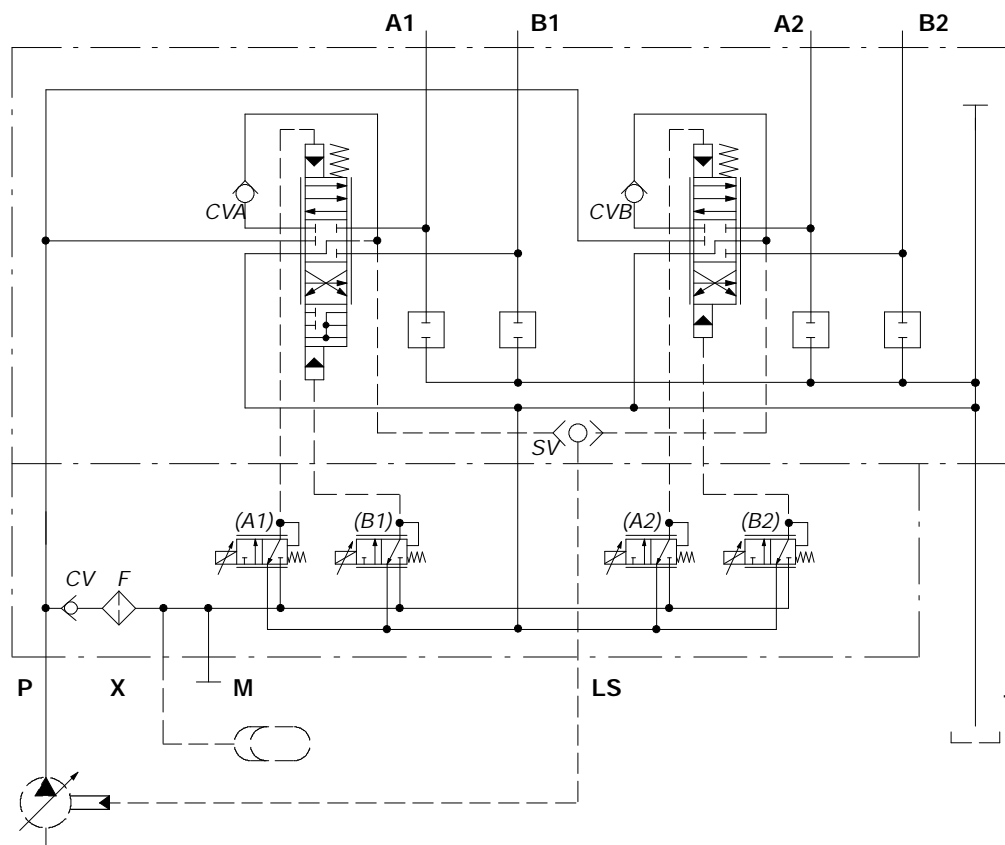


Electro-hydraulic proportional module type **KE2N-12VDC**  
Code: **5IDR818712**

NOTE - For threads refer to page 5

Hydraulic circuit

Standard execution is with closed center circuit for variable displacement pump.



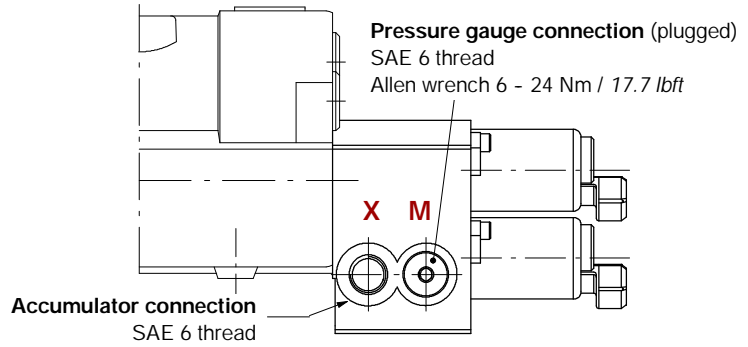
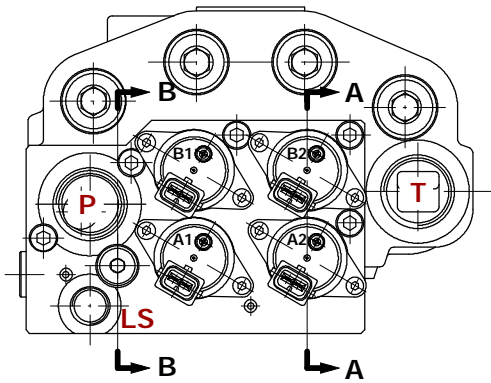
Description example: DLM142/2-APF/1Z13EX/KE2N/1Z8EX-12VDC-<CVN>

LEGEND

- (A1)-(B1) 1<sup>st</sup> section proportional solenoid pressure reducing valves
- (A2)-(B2) 2<sup>nd</sup> section proportional solenoid pressure reducing valves
- CV check valve on pilot line
- CVA load check valve on 1<sup>st</sup> section
- CVB load check valve on 2<sup>nd</sup> section
- F filter
- SV shuttle valve

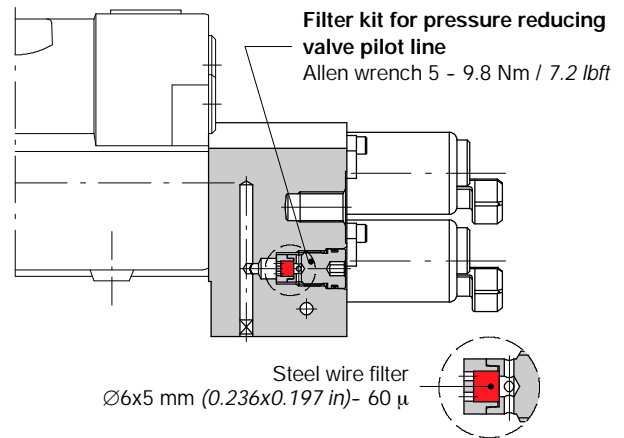
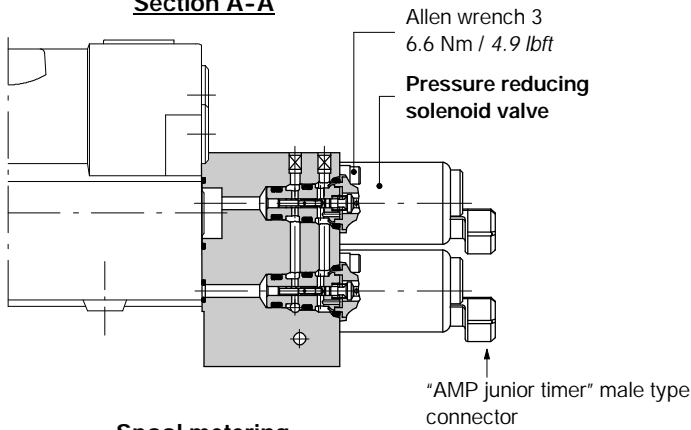
Proportional electro-hydraulic control

KE2N-12VDC module

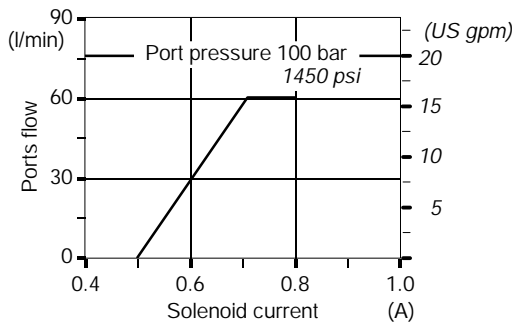


Section A-A

Section B-B



Spool metering

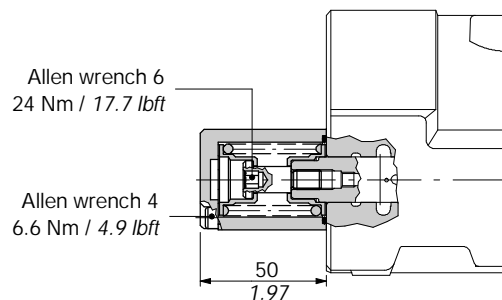
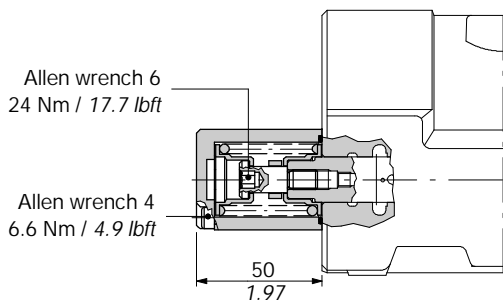


Solenoid valve operating features

- Max. flow on ports P-T : 6 l/min
- Max. pressure on inlet P : 315 bar / 4600 psi
- Min. feeding pressure : 40 bar / 580 psi
- Max. back pressure on outlet T : 20 bar / 290 psi
- Max. internal leakage : 3 cm<sup>3</sup>/min / 0.18 in<sup>3</sup>/min
- Max. hysteresis : 0.5 bar / 7.3 psi
- Nominal voltage : 12 VDC
- Coil resistance (20 °C) : 5.3 Ohm
- Max. current : 1.5 A
- Duty cycle : 100%
- Operating frequency : 125 Hz
- Weather protection : IP67

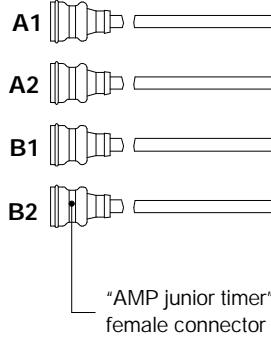
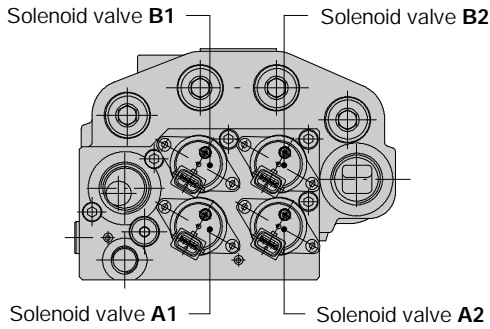
Positioner kit type 8EX

Positioner kit type 13EX

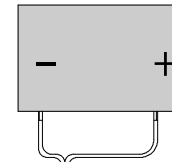


Example of electrical connection

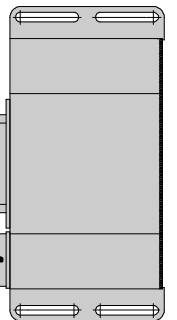
DLM142/2-APF directional valve



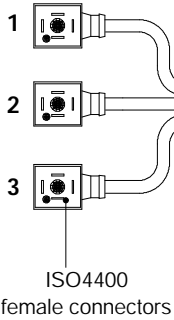
12 VDC battery



CED250 digital electronic unit



To diverter valves

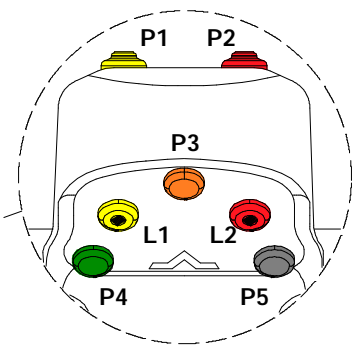
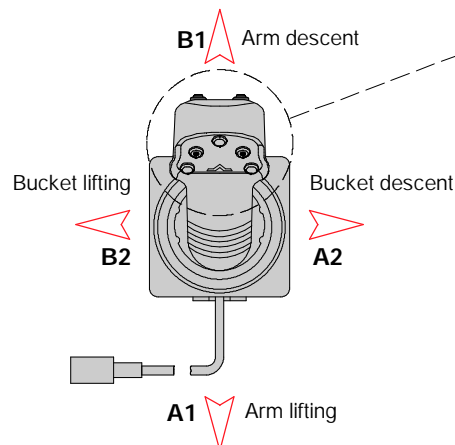
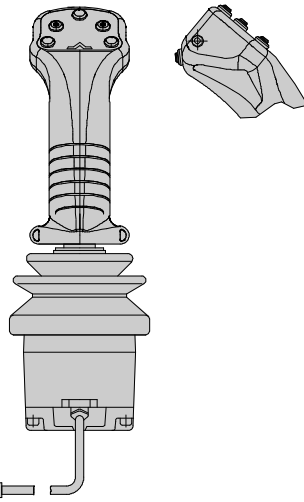


Cable kit KCD07

35 poles male connector

9 poles female connector type DB-9/RS232 for electronic unit programming

Joystick MTD200LHC050C



- P1 (yellow push-button) : FAST / SLOW
- P2 (red push-button) : FLOATING
- P3 (orange push-button) : DIVERTER VALVE 1
- P4 (green push-button) : DIVERTER VALVE 2
- P5 (gray push-button) : DIVERTER VALVE 3
- L1 (yellow led) : FAST / SLOW
- L2 (red led) : FLOATING

NOTE - For further information about electrical system requirements, contact Customer Service.

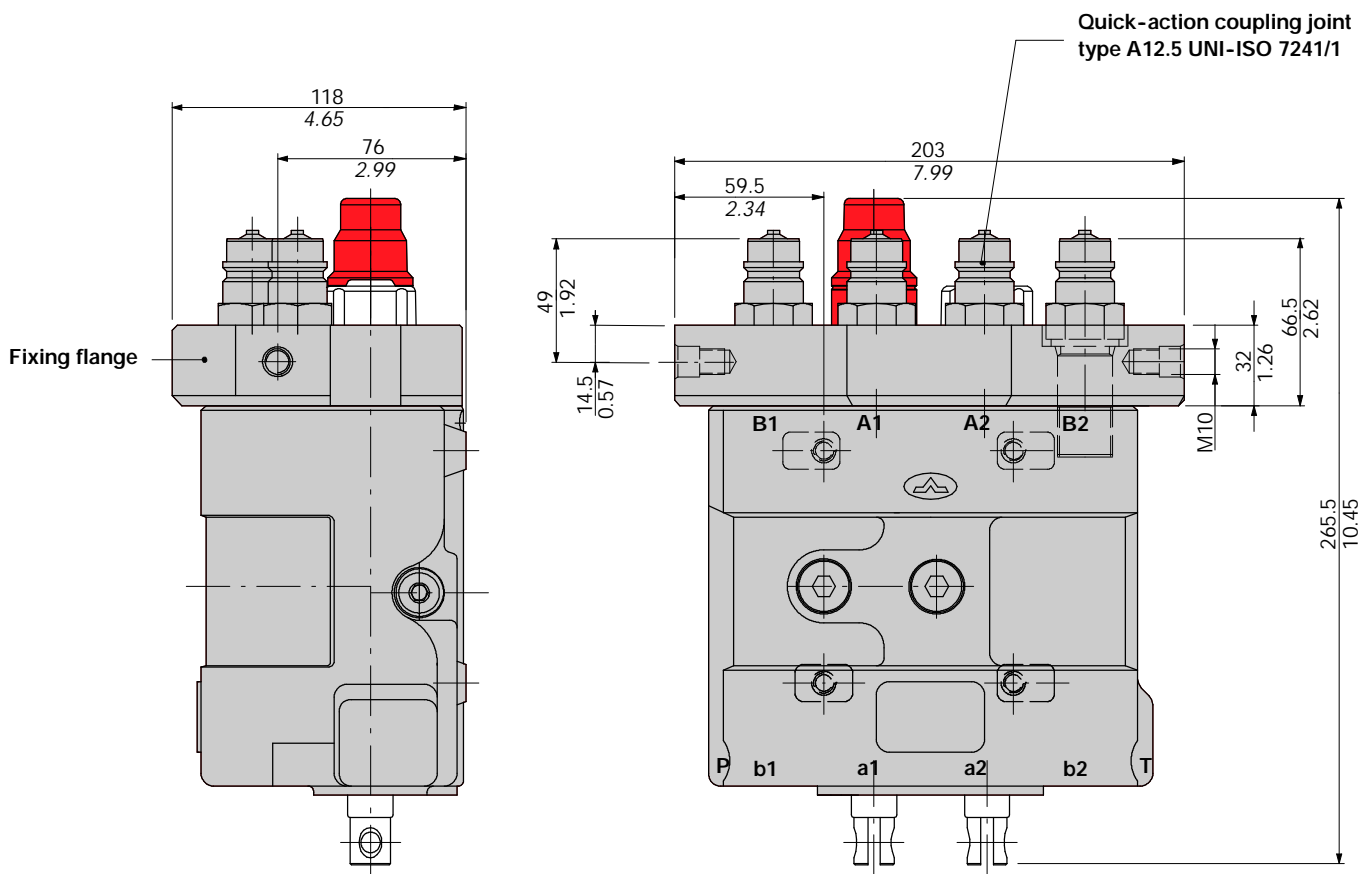
## Quick-action coupling

### For DLM142 valve with manual control

This prearrangement requires special valve body kit code: **5KC1907004**, which include body, seals, rings, load check valves, fixing flange and quick-action coupling joints.

This configuration needs special positioner kit type 13 code: **5V13108050**.

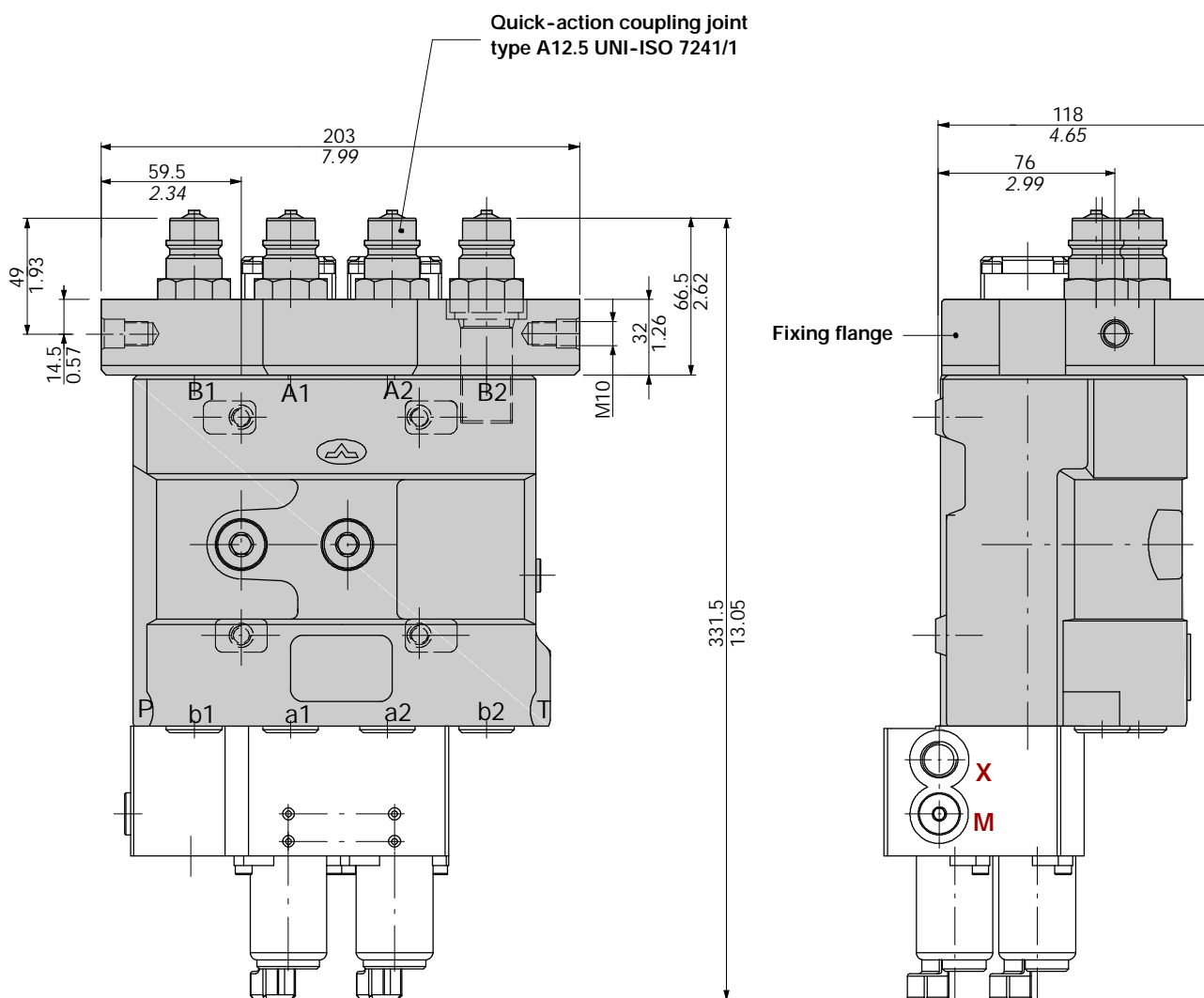
- body kit
- special kit type13



For DLM142 valve with proportional electro-hydraulic control

This prearrangement requires special valve body kit code: **5KC1907020**, which include body, seals, load check valves, fixing flange and quick-action coupling joints.

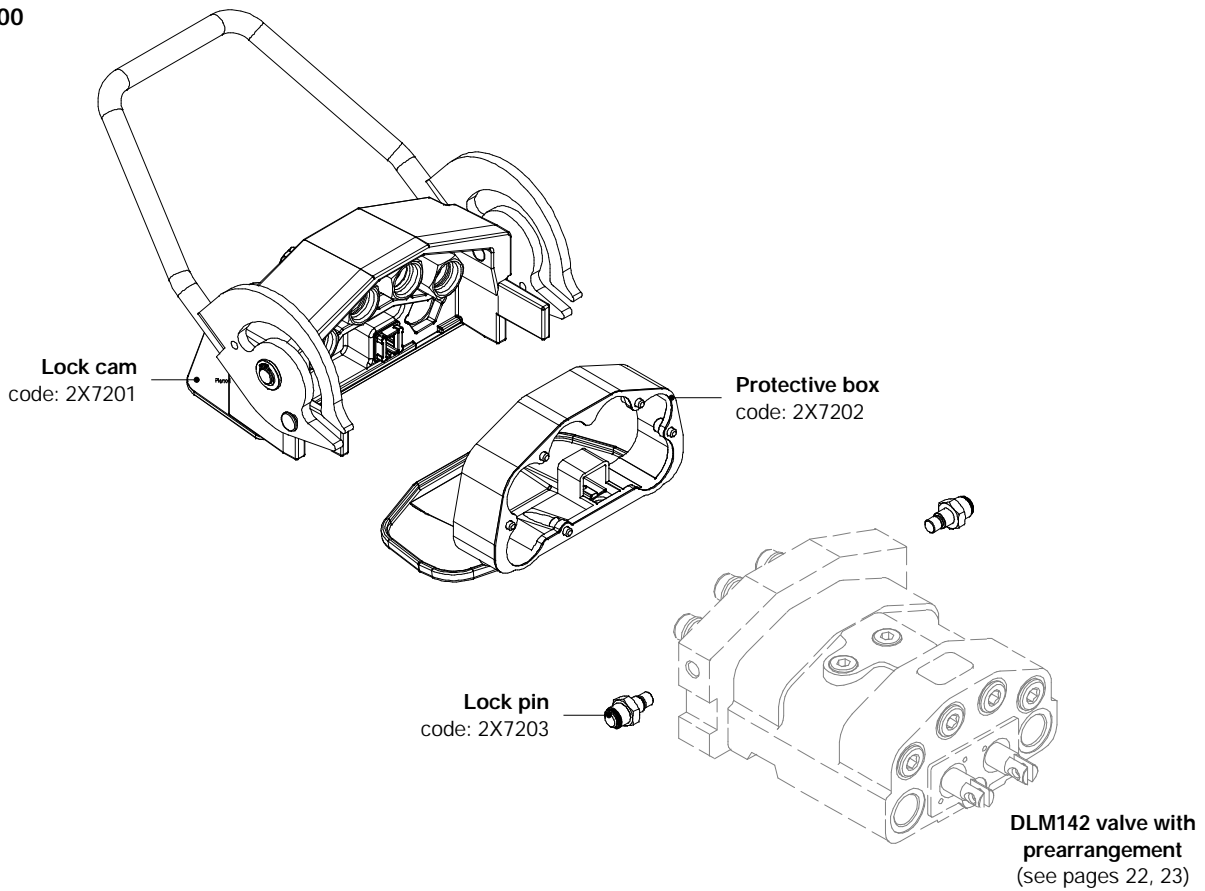
- body kit
- prop. electro-hydraulic control (see page 18)



Quick-action coupling

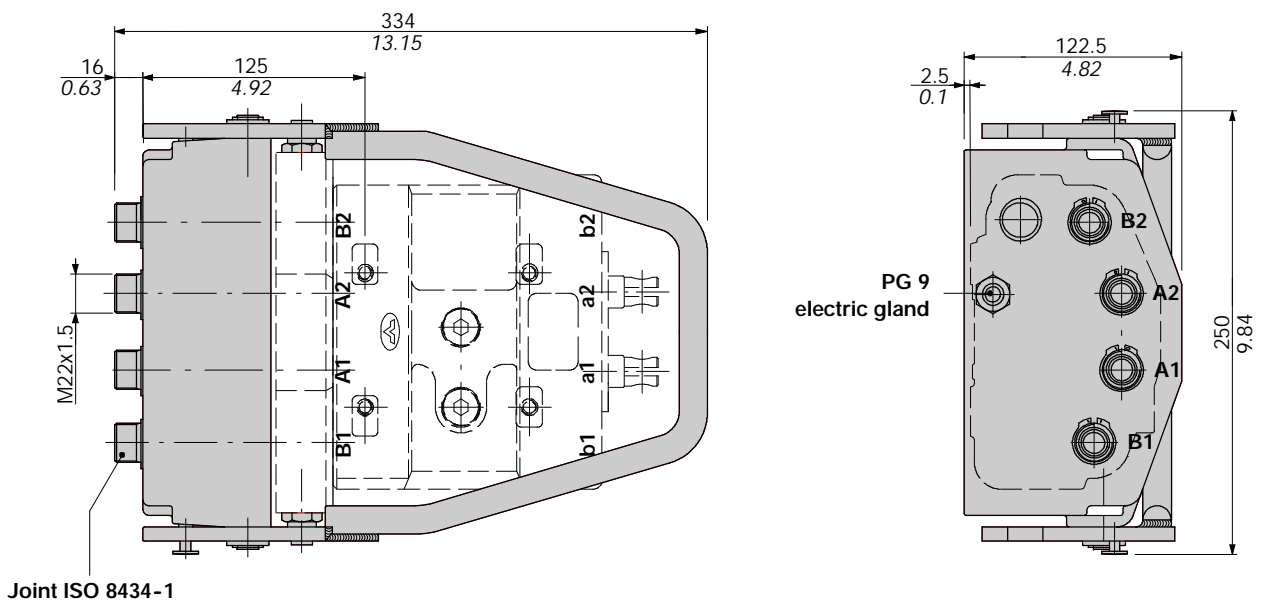
Lock cam kit

Code: 5X7200



NOTE - Availability for different type of quick-action coupling on request, contact Customer Service.

Dimensional data



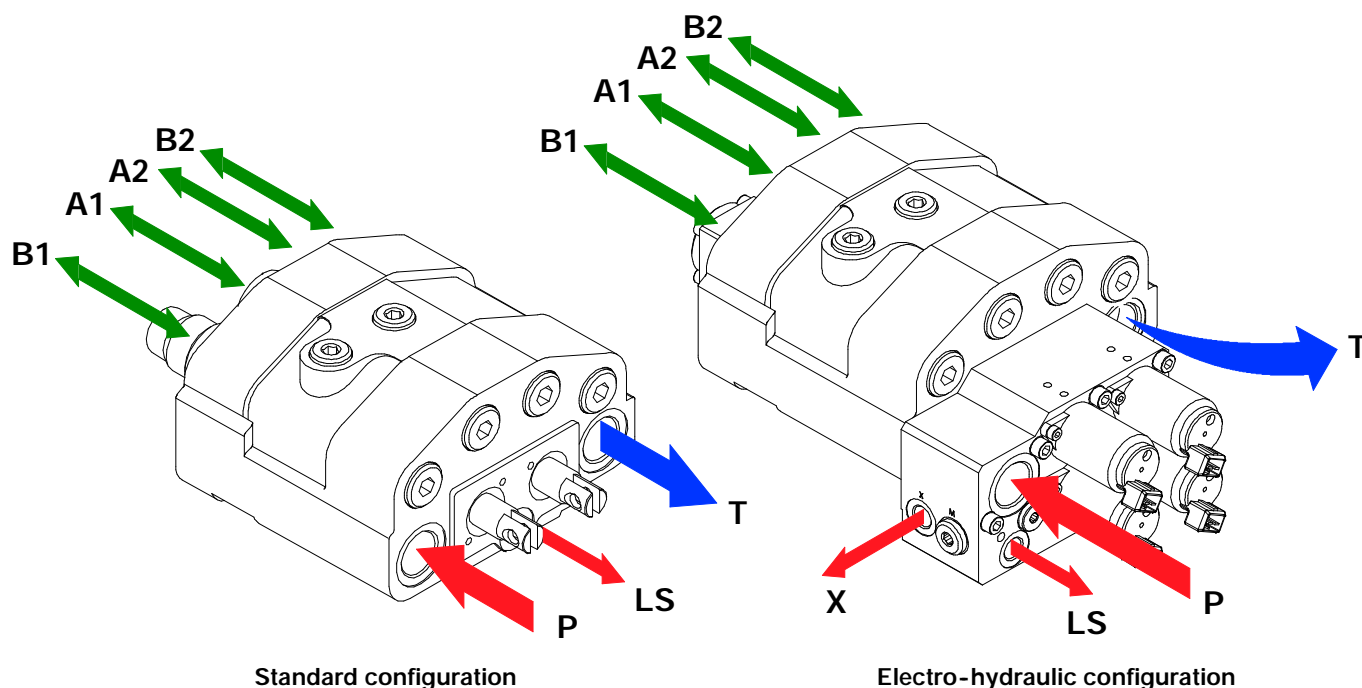


## Installation and maintenance

The DLM142 valve is assembled and tested as per the technical specification of this catalog.

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

- the valve 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 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.

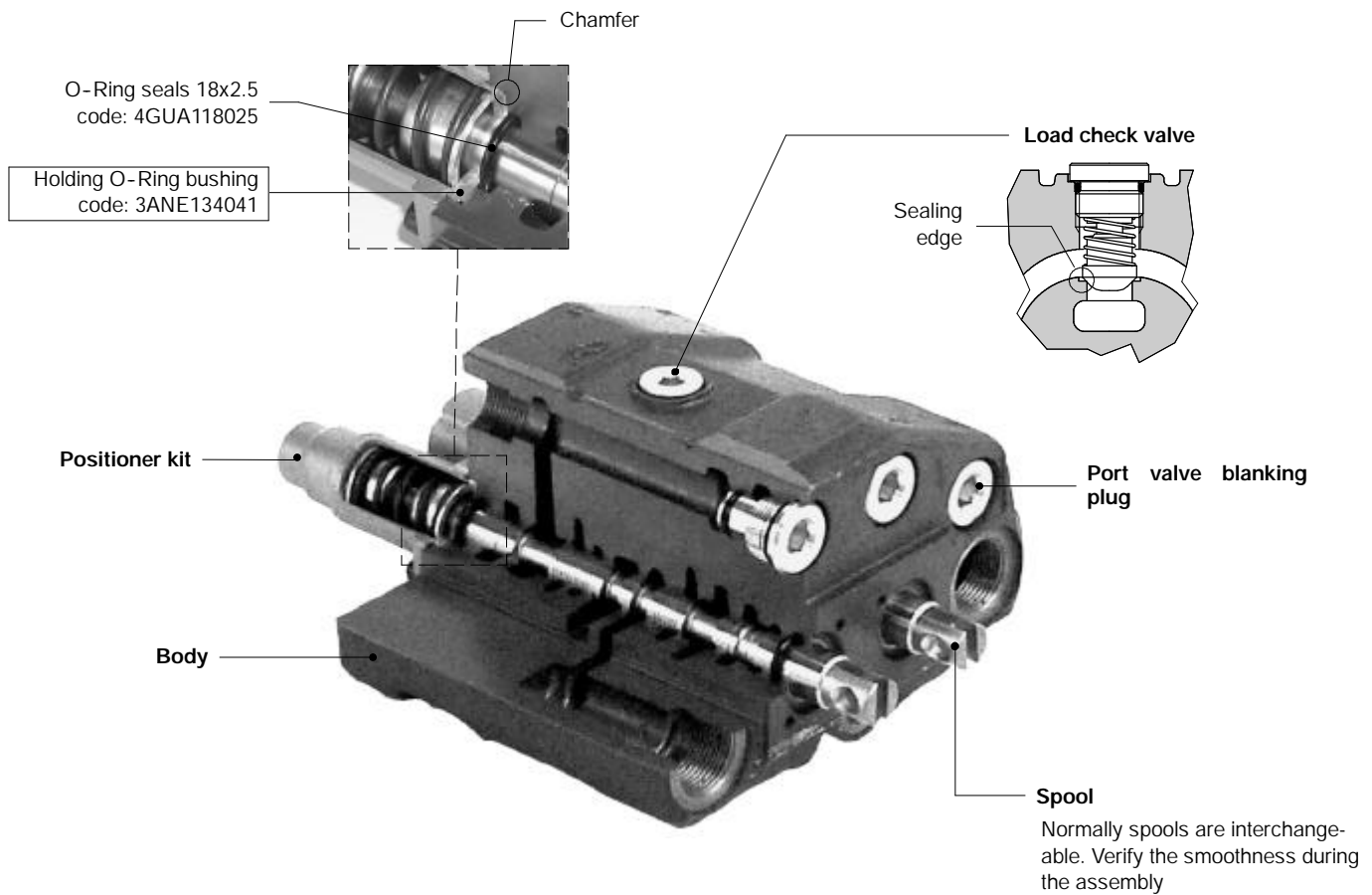


### Fitting tightening torque - Nm / lbft

THREAD TYPE	P and T ports	A and B ports	LS, X, M ports
<b>BSP (ISO 228/1)</b>	<b>G 3/4</b>	<b>G 1/2</b>	<b>G 1/4</b>
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
<b>UN-UNF (ISO 11926-1)</b>	<b>1 1/16-12 UN-2B (SAE 12)</b>	<b>7/8-14 UNF-2B (SAE 10)</b>	<b>9/16-18 UNF-2B (SAE 6)</b>
With O-Ring seal	95 / 70.1	60 / 44.2	30 / 22.1
<b>METRIC (ISO 262)</b>	<b>M27 x 2</b>	<b>M22 x 1.5</b>	<b>M14 x 1.5</b>
With O-Ring seal	90 / 66.4	50 / 36.9	25 / 18.4
With copper washer	60 / 44.3	40 / 29.5	30 / 22.1
With steel and rubber washer	70 / 51.6	60 / 44.3	20 / 14.8


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

## Installation and maintenance



NOTE (only for valve with mechanical control) - All articulated parts inside cap are lubricated with synthetic base grease grade NLG12.

Malfunction	Cause	Remedy
External leakage control kit or opposite 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.	Port relief valve open.	Remove and clean or replace the port relief valve.
	Low pump pressure and flow.	Check the pump and circuit.
	Low voltage supply.	Check electric system.
Electro-hydraulic control unproportional movement.	Proportional pressure reducing valve blocked.	Remove the valve and clean it.
	High spool friction.	Remove the spool and clean it carefully.

 Only for electro-hydraulic configuration





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