

D
P
M142

DIRECTIONAL CONTROL VALVE



 **walvoil**
HYDRAULIC CONTROL SYSTEMS

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 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.

7th edition November 2002:

This edition supercedes all prior documents.

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DLM142

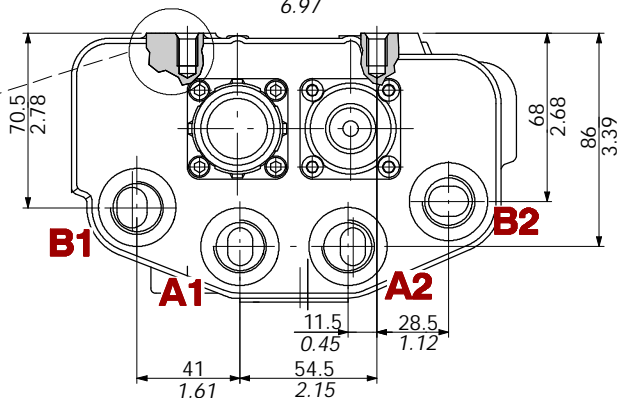
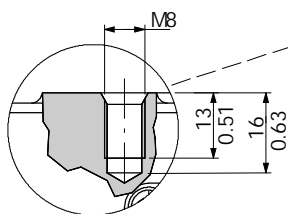
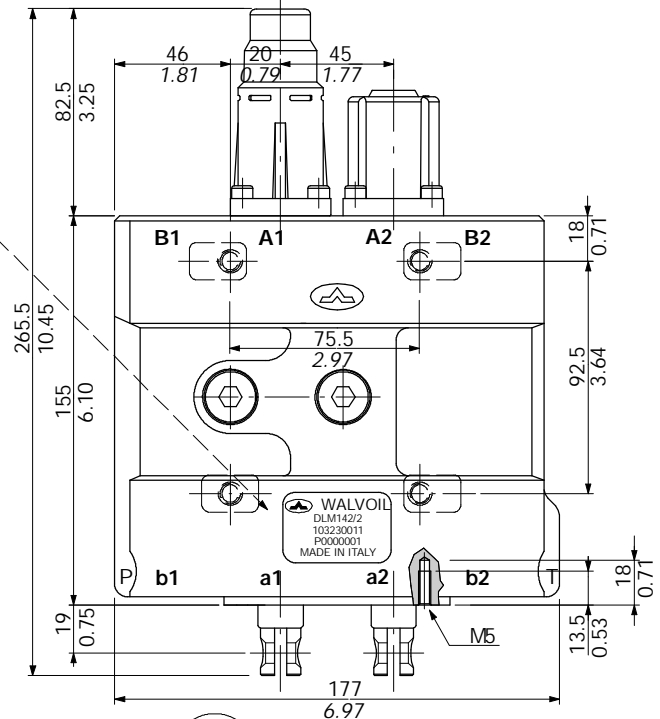
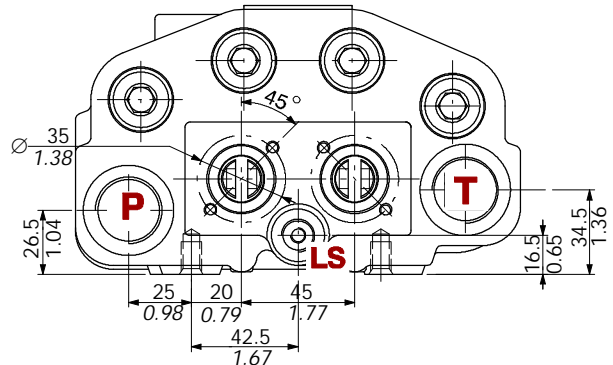
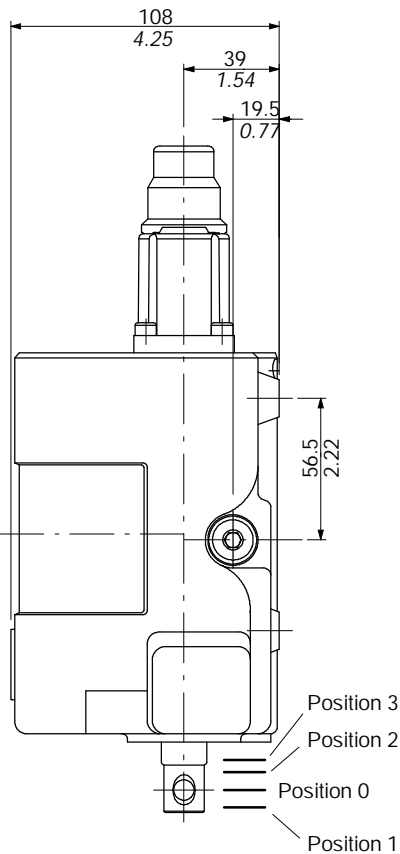
Working conditions

This catalogue shows technical specifications and diagrams measured with mineral oil of 46 mm²/s - 46 cSt viscosity at 40°C temperature.

Nominal flow rating		80 l/min	
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</i>	3 cm ³ /min	0.18 in ³ /min
Fluid		Mineral 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 ² /s	<i>from 15 to 75 cSt</i>
	<i>min.</i>	12 mm ² /s	12 cSt
	<i>max</i>	400 mm ² /s	400 cSt
Max level of contamination		19/16 - ISO 4406	
Ambient temperature		from -40° to 60°C	

NOTE - For different conditions please contact Customer Service.

Valve type  **WALVOIL**
 Valve code **DLM142/2**
 Production batch : **103230011**
 P00 = production year (2000) **P0000001**
 00001 = progressive number **MADE IN ITALY**



Standard threads

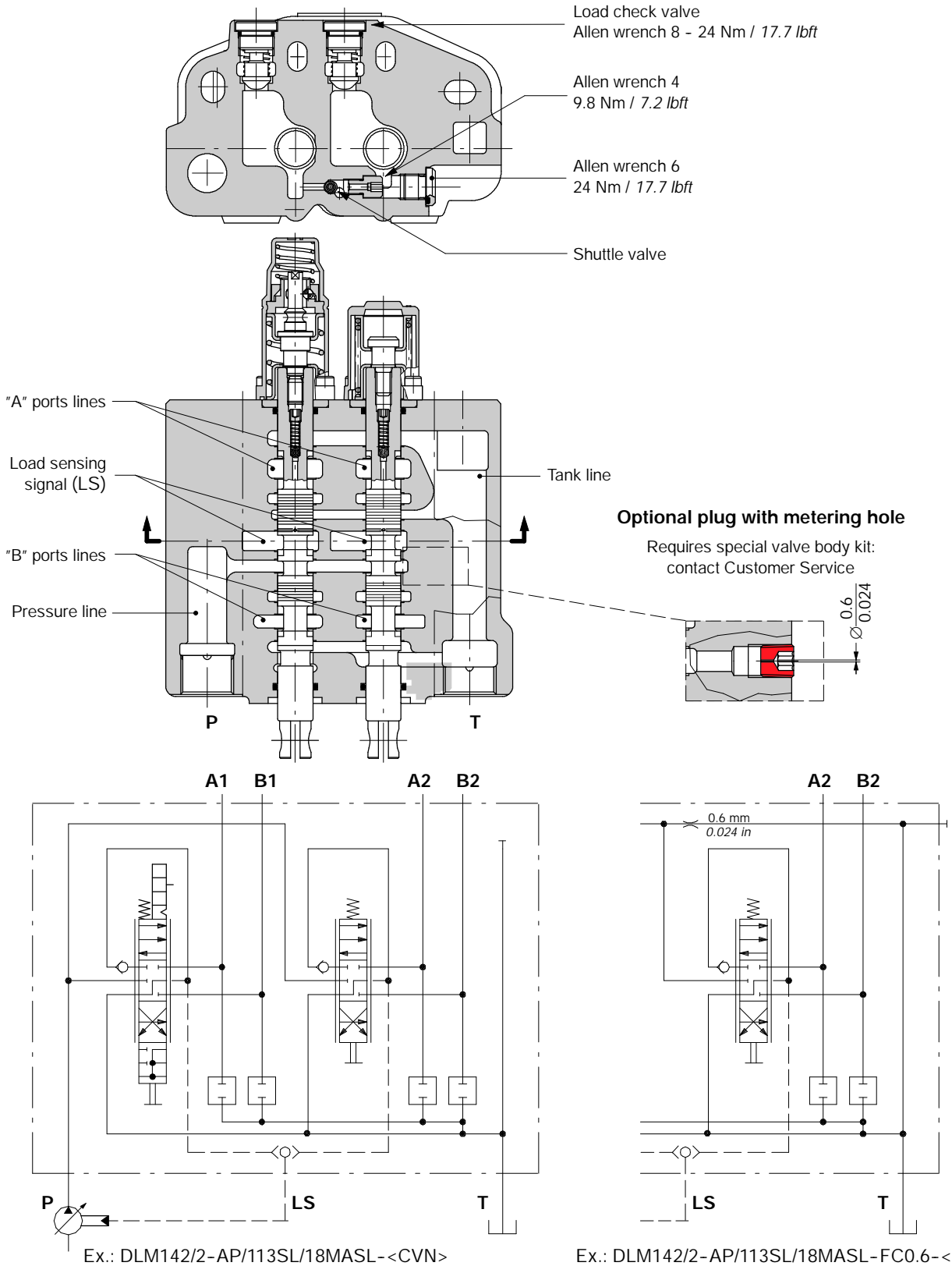
PORTS	BSP (ISO 228/1)	UN-UNF (ISO 11926-1)	METRIC (ISO 262)
Inlet P and outlet T	G 3/4	1 1/16-12 UN-2B (SAE 12)	M27x2
A and B ports	G 1/2	7/8-14 UNF-2B (SAE 10)	M22x1,5
Load sensing LS port	G 1/4	9/16-18 UNF-2B (SAE 6)	M14x1.5

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 ($\varnothing 0.6 \text{ mm} / 0.024 \text{ in}$).

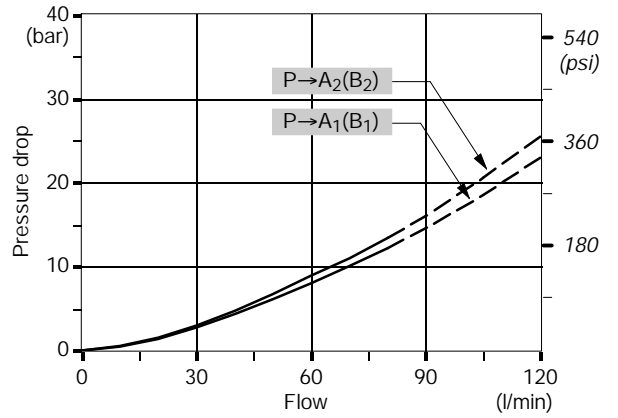
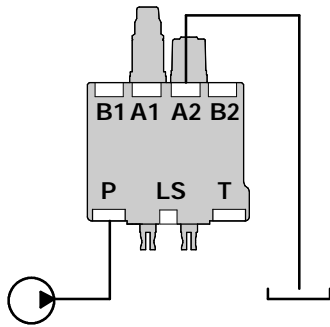
There is a small amount of flow constantly going to tank, but this system keeps the valve body warm with spools in neutral position. This configuration is particularly suitable for application in cold environment.



Performance data (pressure drop vs. flow)

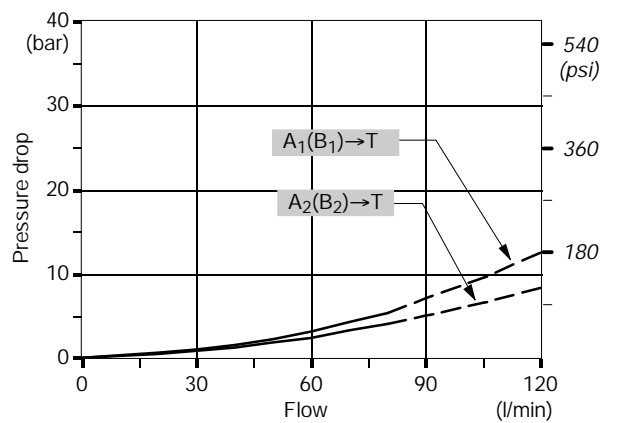
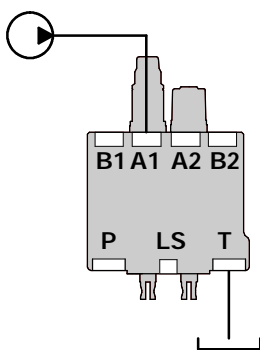
Inlet to work port

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



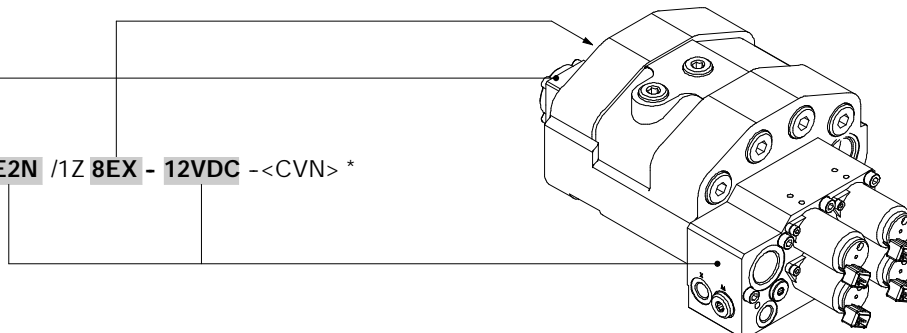
Work port to outlet

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



DLM142 valve with proportional electro-hydraulic control

Description example:

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

Code of this configuration: 103230029

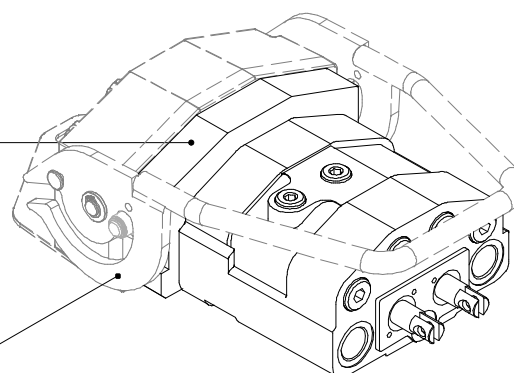
DLM142 valve with quick-action coupling

Description example:

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

Code of this configuration: 103230021

Lock cam not included (for code see page 24)



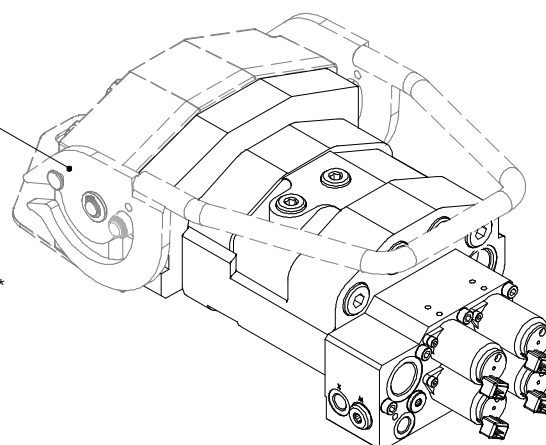
DLM142 valve with proportional electro-hydraulic control and quick-action coupling

Lock not included (for code see page 24)

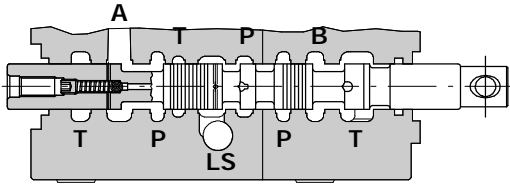
Description example:

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

Code of this configuration: 103230030

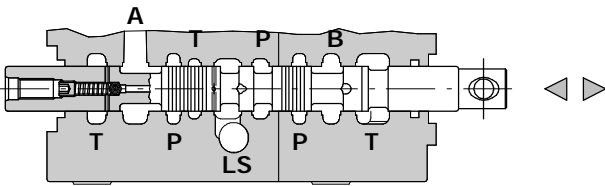
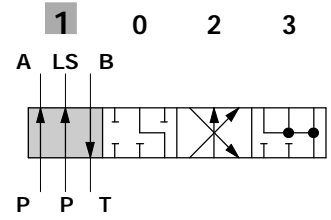


Type 1 and 1TR

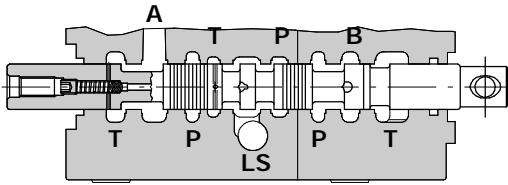
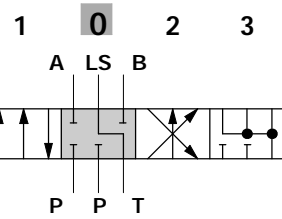


" stroke = + 7 mm
+ 0.28 in

P → A-LS B → T



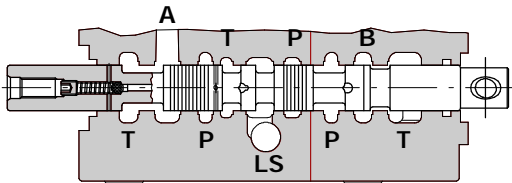
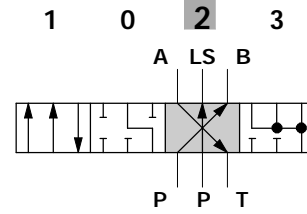
P-A-B-T closed, with load sensing (LS) line to tank



A stroke = - 7 mm
- 0.28 in

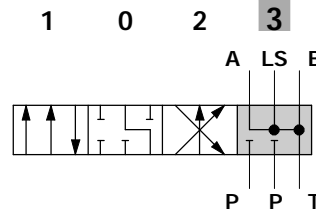
A stroke = - 6.7 mm
- 0.26 in

P → B-LS A → T



A stroke = - 12 mm
- 0.47 in

A-B-LS → T (floating circuit)

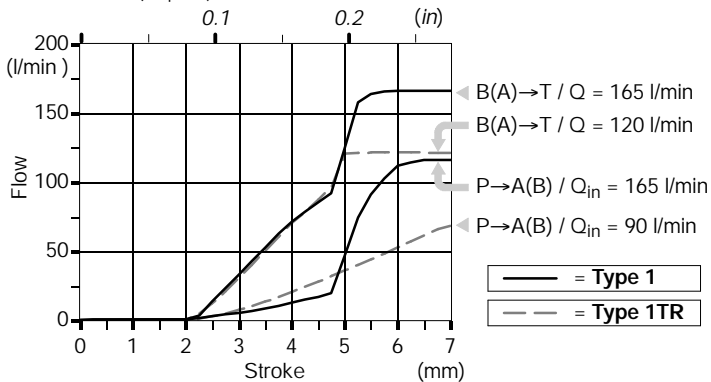


NOTE - **A** Only for positioner kit type 13

Performance data

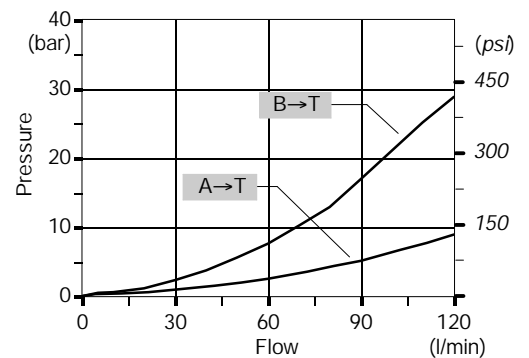
Spool metering P → A(B) → T

$P_{(on\ ports)} = 100\ bar / 1450\ psi$



Pressure drop in position 3

(in 1st section)



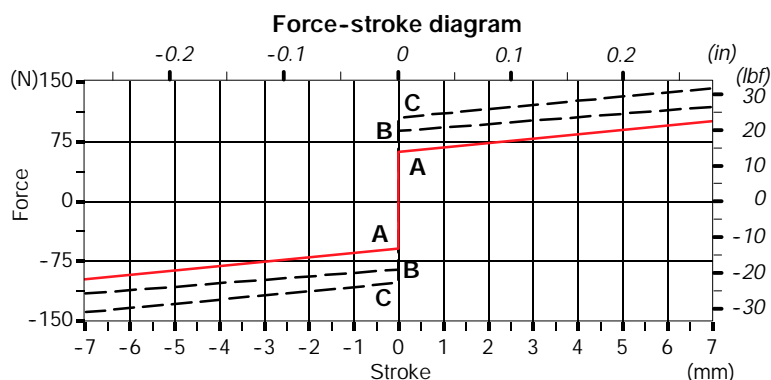
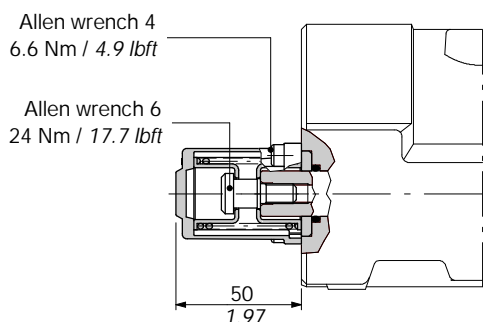
"A" side spool positioner

With spring return

8MA kit

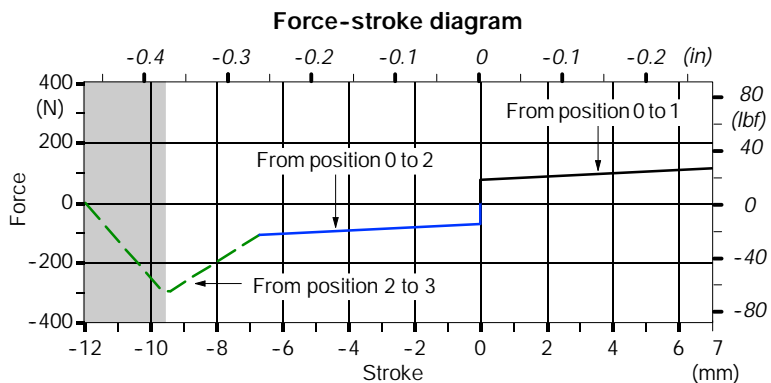
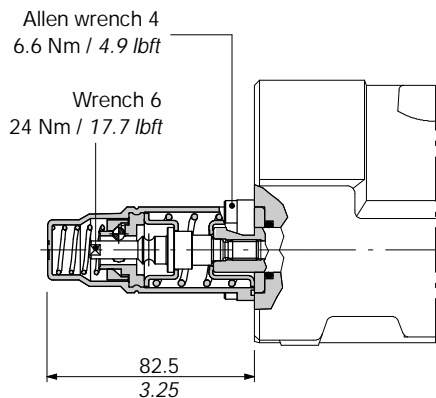
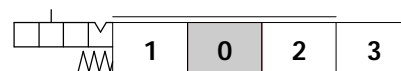
Supplied with standard spring type A (see force-stroke diagram).

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



With detent on 4th position float circuit

13 kit

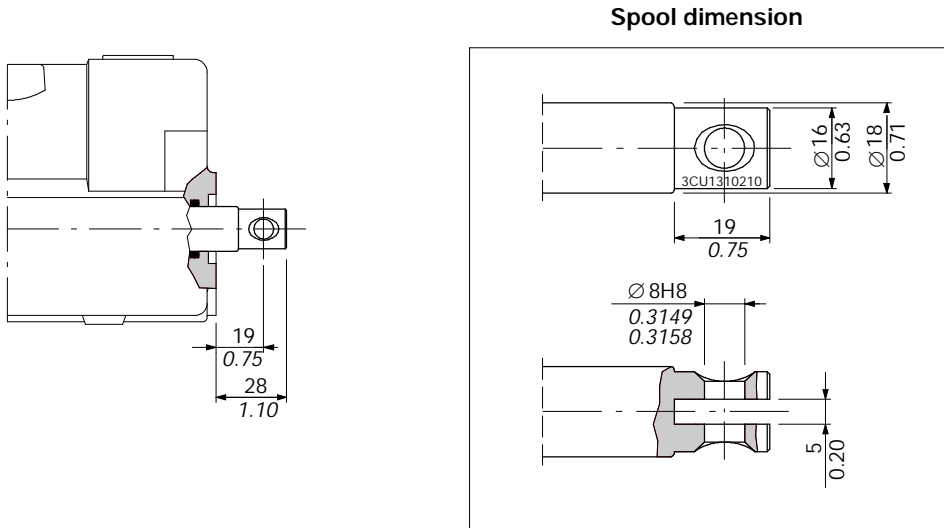


Locking-unlocking area
 Locking force: 300 N / 67.4 lbf ±10%
 Unlocking force: 270 N / 60.7 lbf ±10%

"B" side options

SL prearranged for mechanical remote control

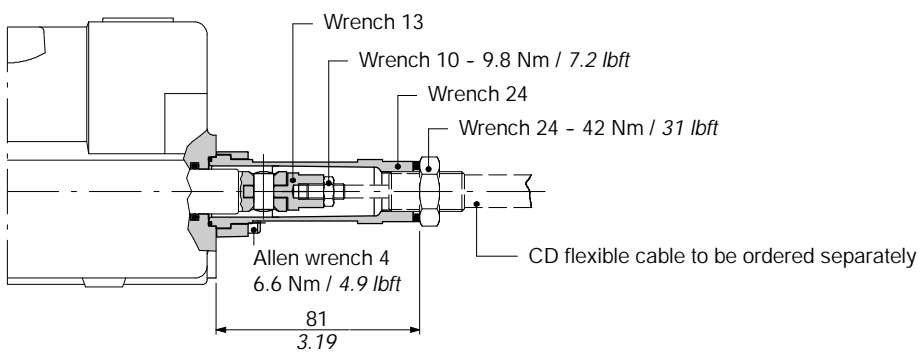
1	0	2
---	---	---



TQ cable remote control

Waterproof cap prearranged for remote control with flexible cable.

1	0	2
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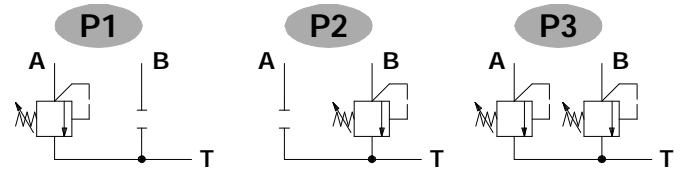


NOTE - For more information concerning remote cable control require appropriate documentation.

Anti-shock valve

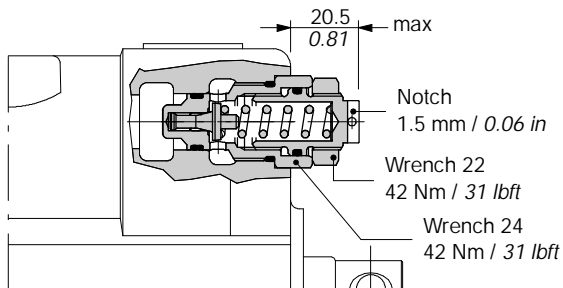
P 1 (G 3 - 100)

- 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.

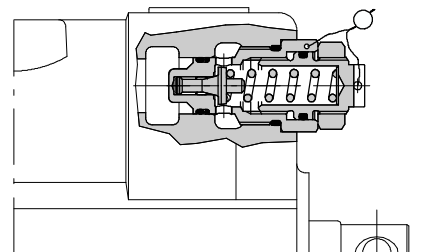


Adjustment type

G: with screw

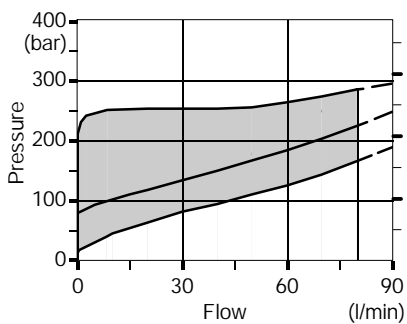


H: valve set and locked

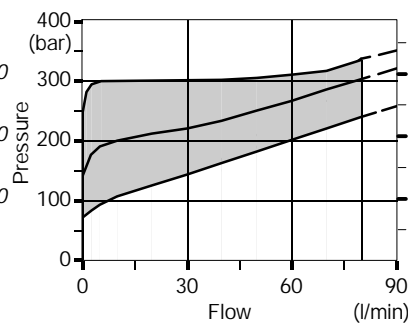


Performance data

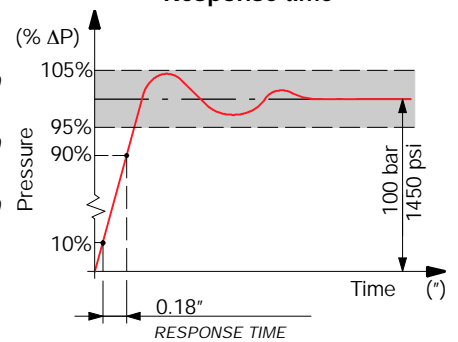
Spring nr. 3 (blue band)



Spring nr. 4 (red band)



Response time

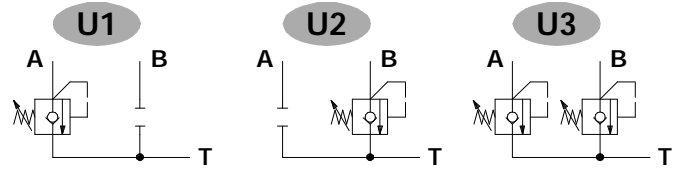


Port relief options

Anti-shock and anti-cavitation valve

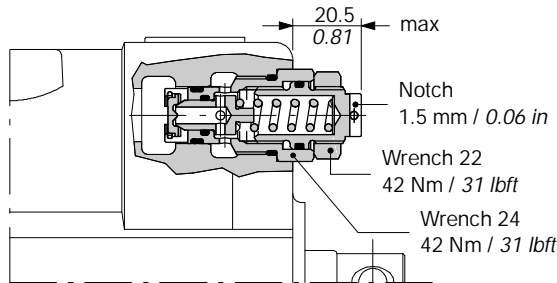
U 1 (G 3 - 100)

- 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.

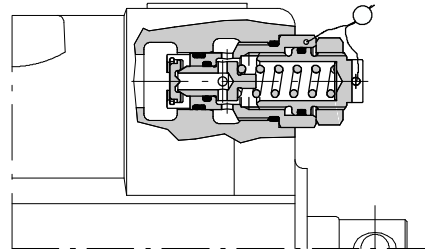


Adjustment type

G: with screw

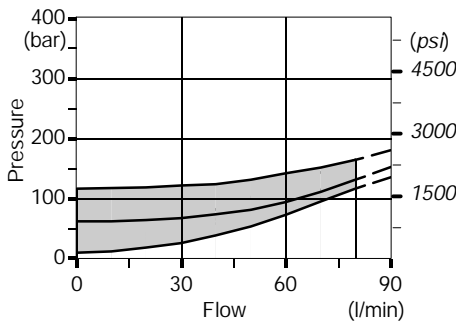


H: valve set and locked

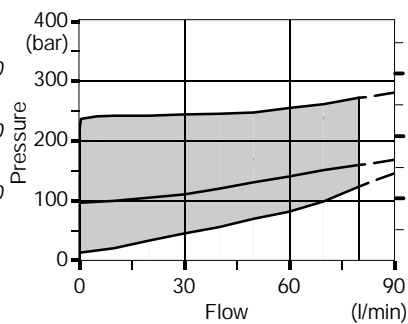


Performance data

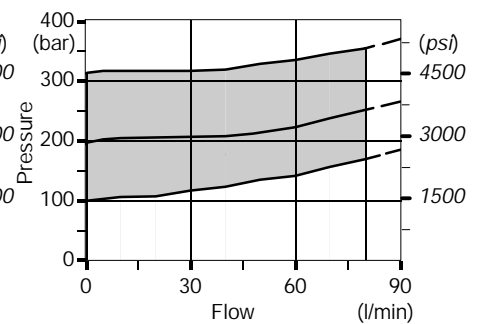
Spring nr. 2 (green band)



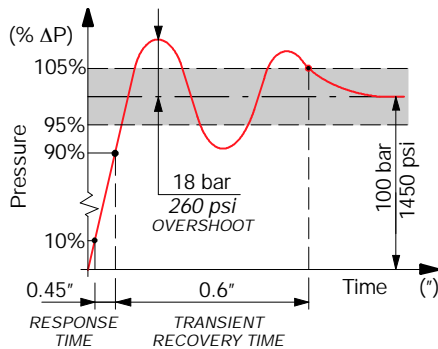
Spring nr. 3 (blue band)



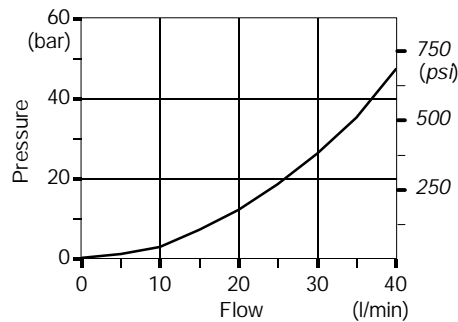
Spring nr. 4 (red band)



Response time



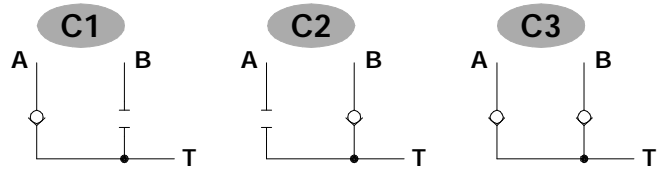
Pressure drop



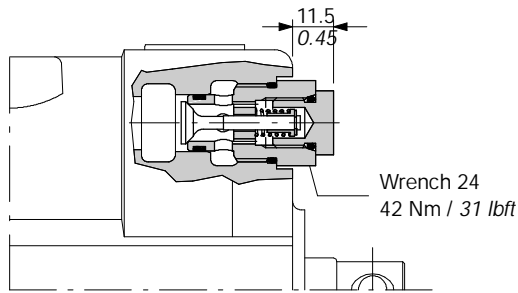
Anti-cavitation valve

C 1

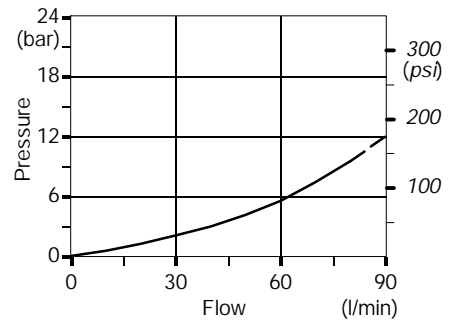
- 1 mounted on A port.
- 2 mounted on B port.
- 3 mounted on A and B ports.



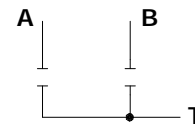
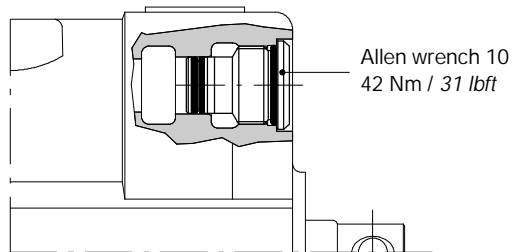
Performance data



Pressure drop



P3T: port relief valve blanking plug





Proportional electro-hydraulic control

..... page 18



Quick-action coupling

..... page 22

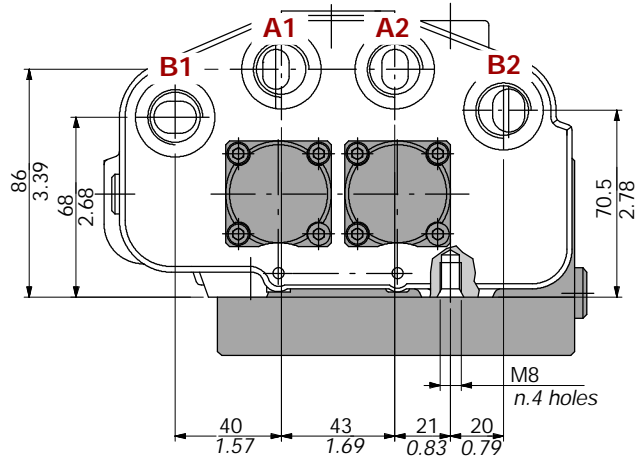
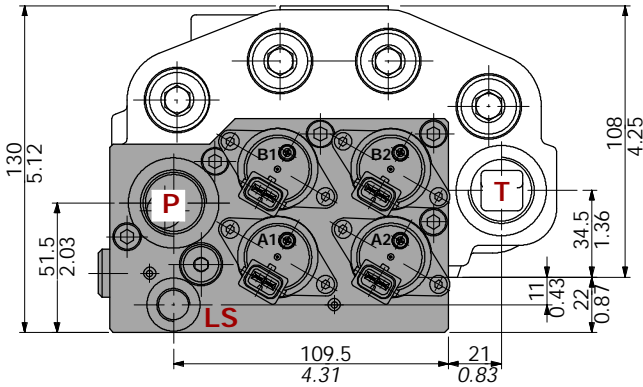


*Proportional electro-hydraulic control
and quick-action coupling*

..... page 23

Proportional electro-hydraulic control

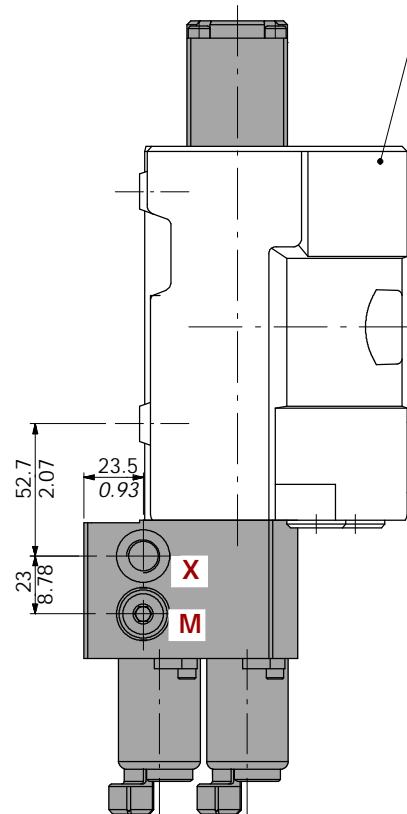
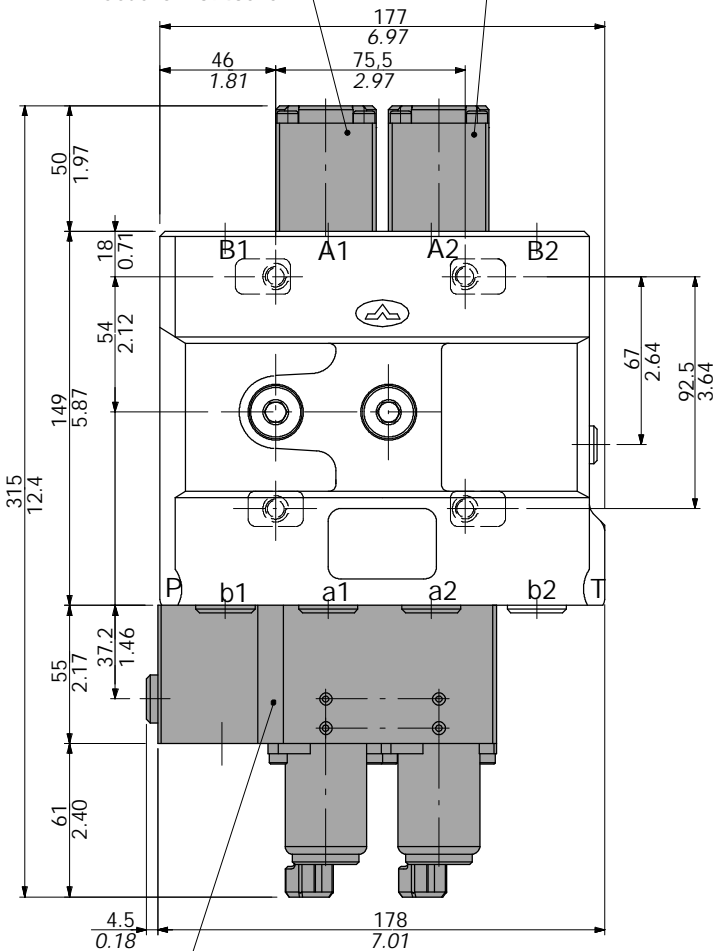
Dimensional data



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

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

Special body kit (special body).
Code: **5KC1903007**

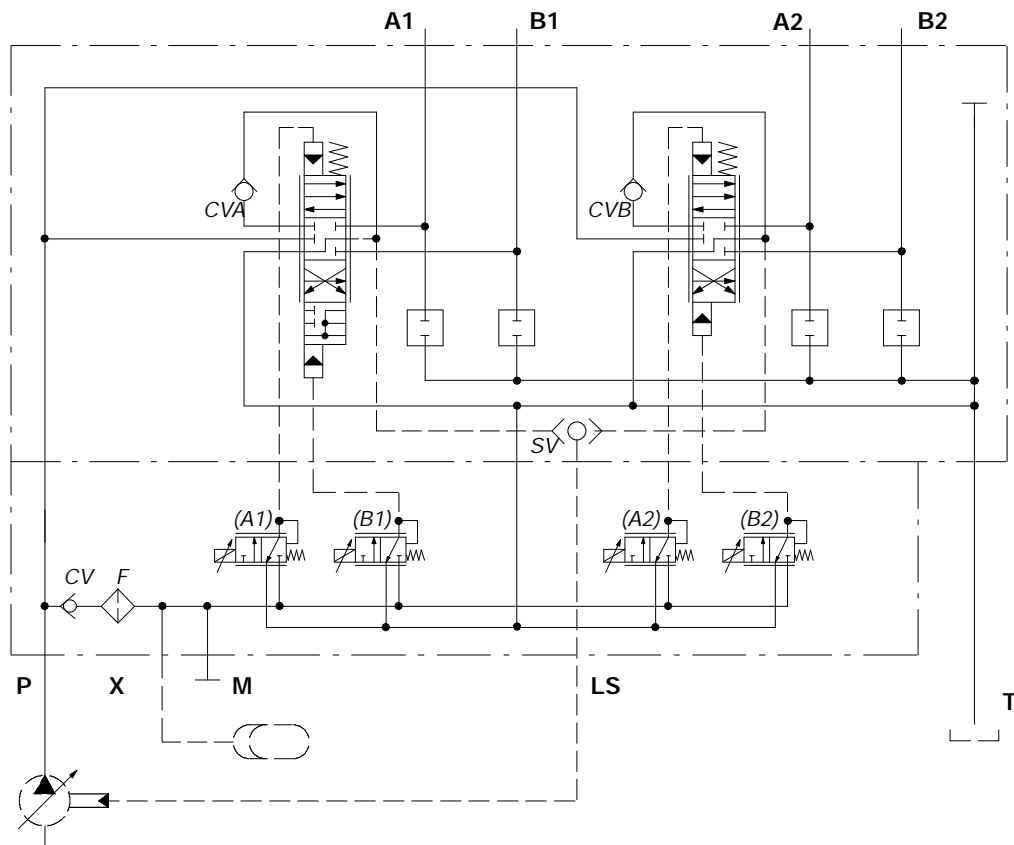


Electro-hydraulic proportional module type **KE2N-12VDC**
Code: **5IDR818312**

NOTE - For threads refer to page 5

Hydraulic circuit

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



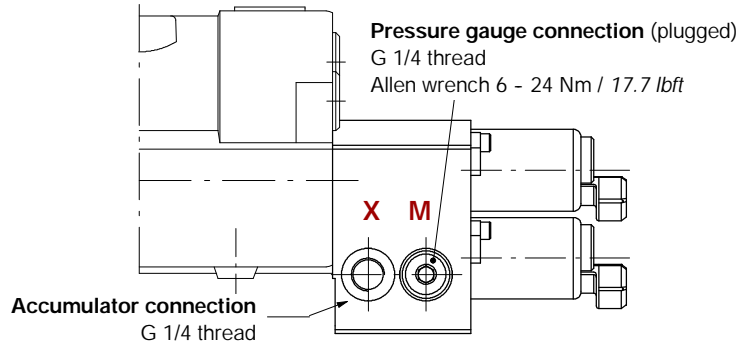
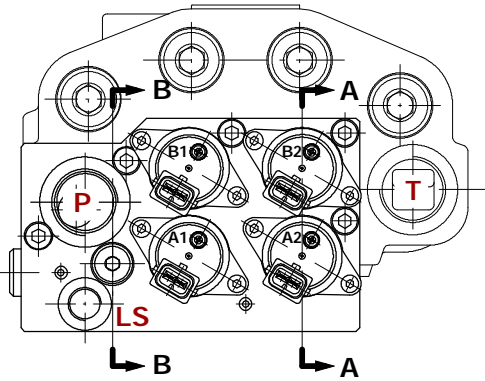
Es.: DLM142/2-APF/1Z13EX/KE2N/1Z8EX-12VDC-<CVN>

LEGEND

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

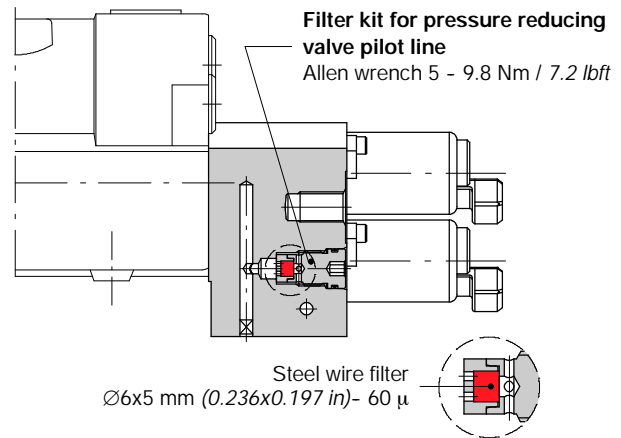
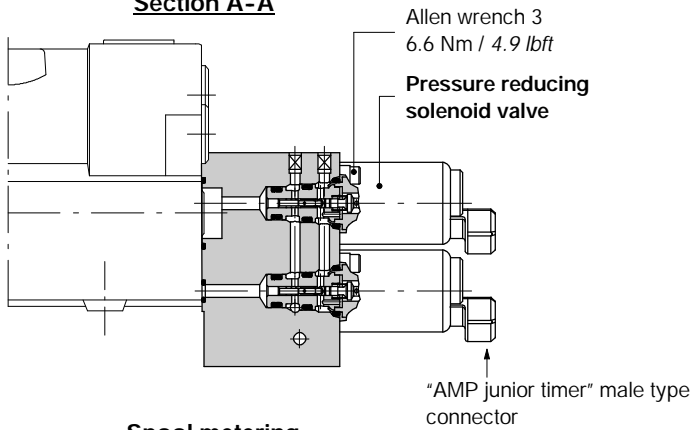
Proportional electro-hydraulic control

KE2N-12VDC module

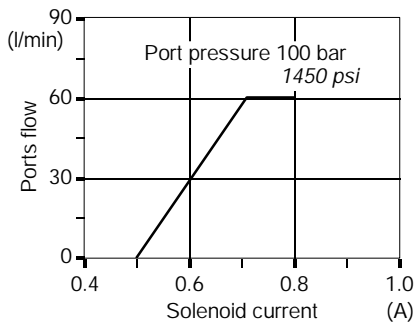


Section A-A

Section B-B



Spool metering

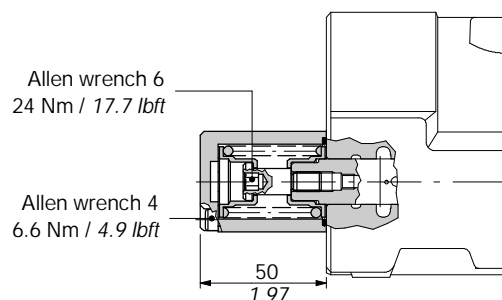
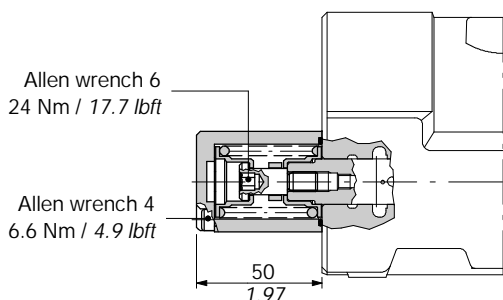


Solenoid valve operating features

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

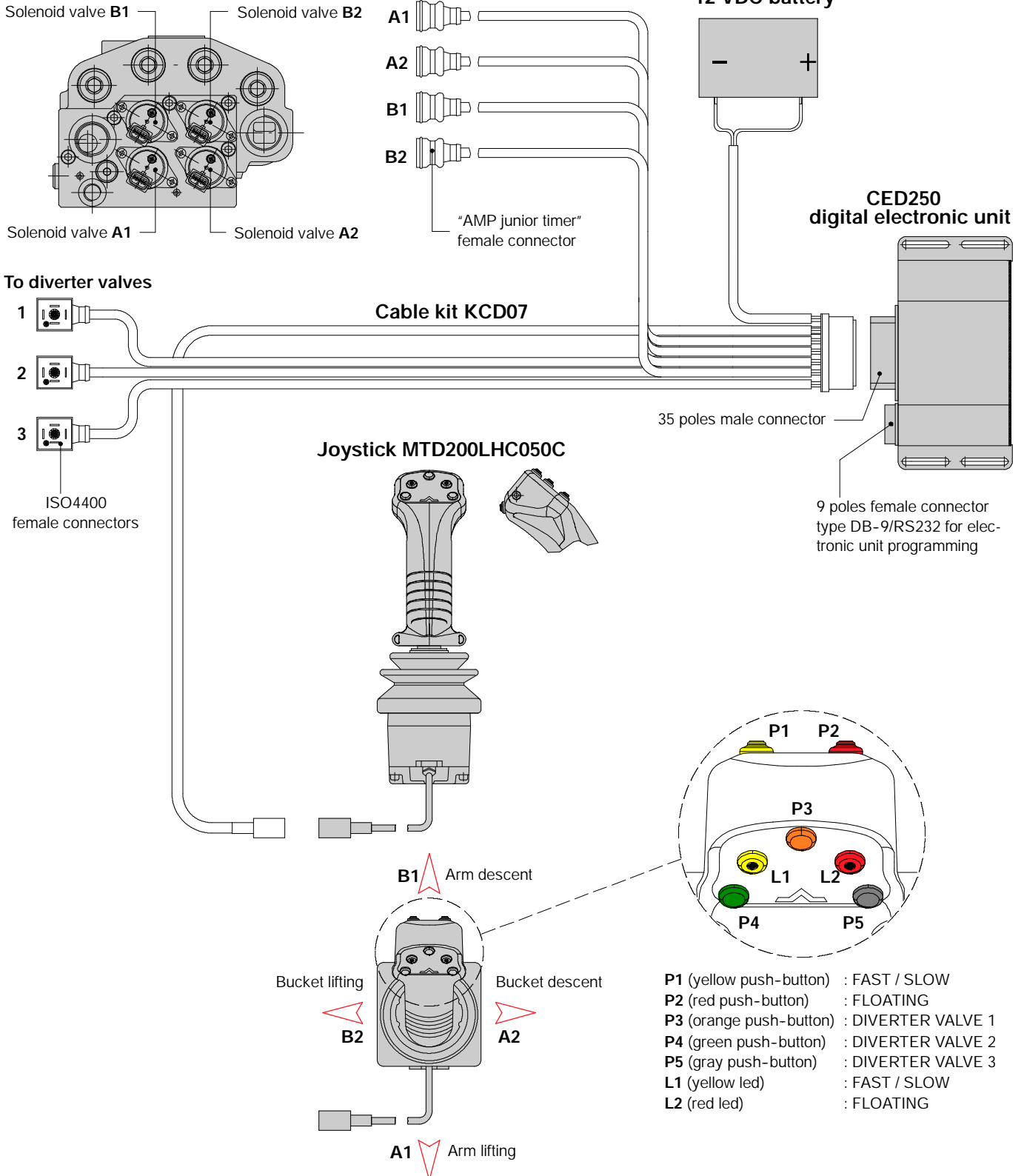
Positioner kit type 8EX

Positioner kit type 13EX



Example of electrical connection

DLM142/2-APF directional valve



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

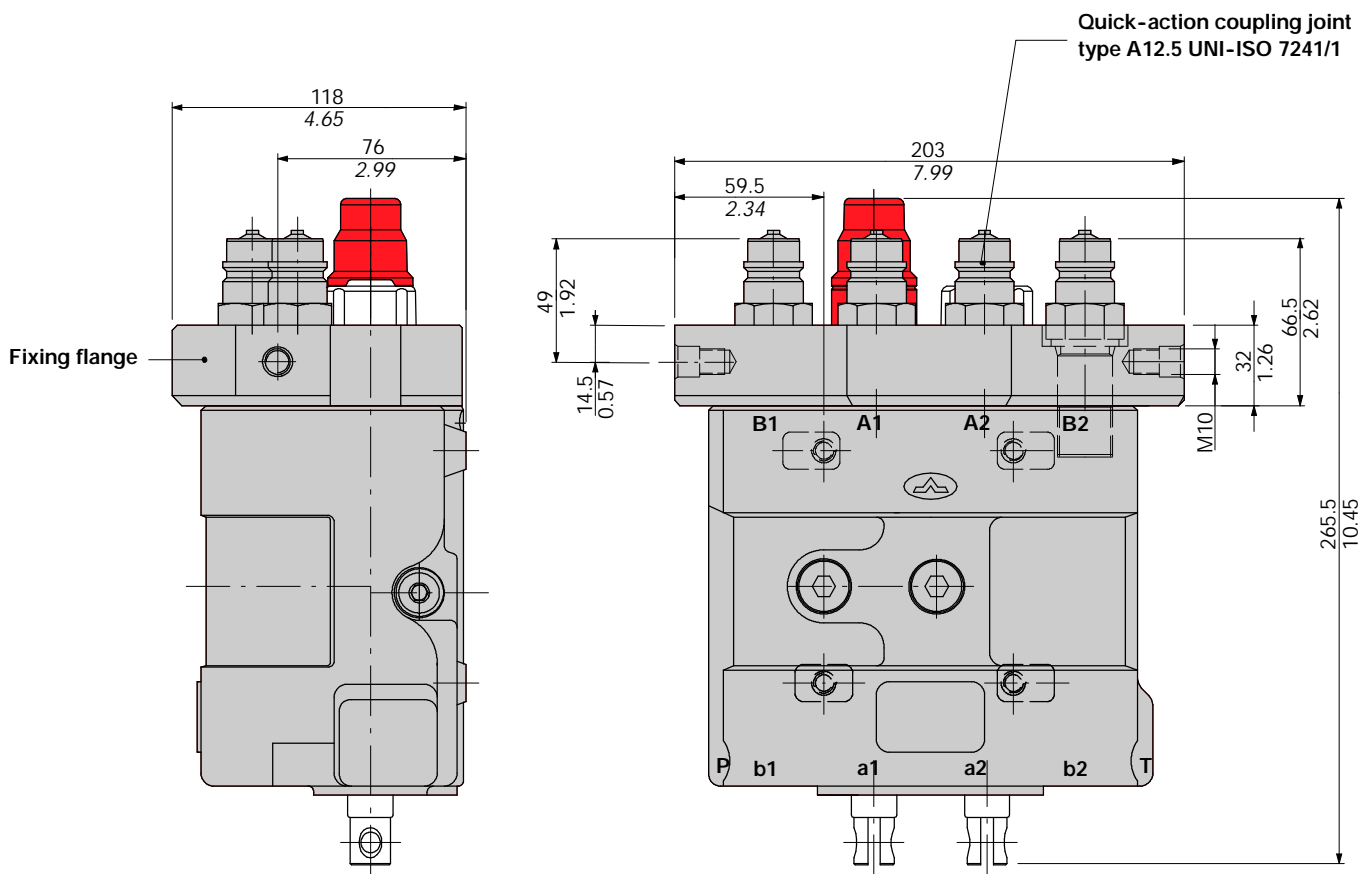
Quick-action coupling

For DLM142 valve with manual control

This prearrangement requires special valve body kit code: **5KC1903030**, 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**.

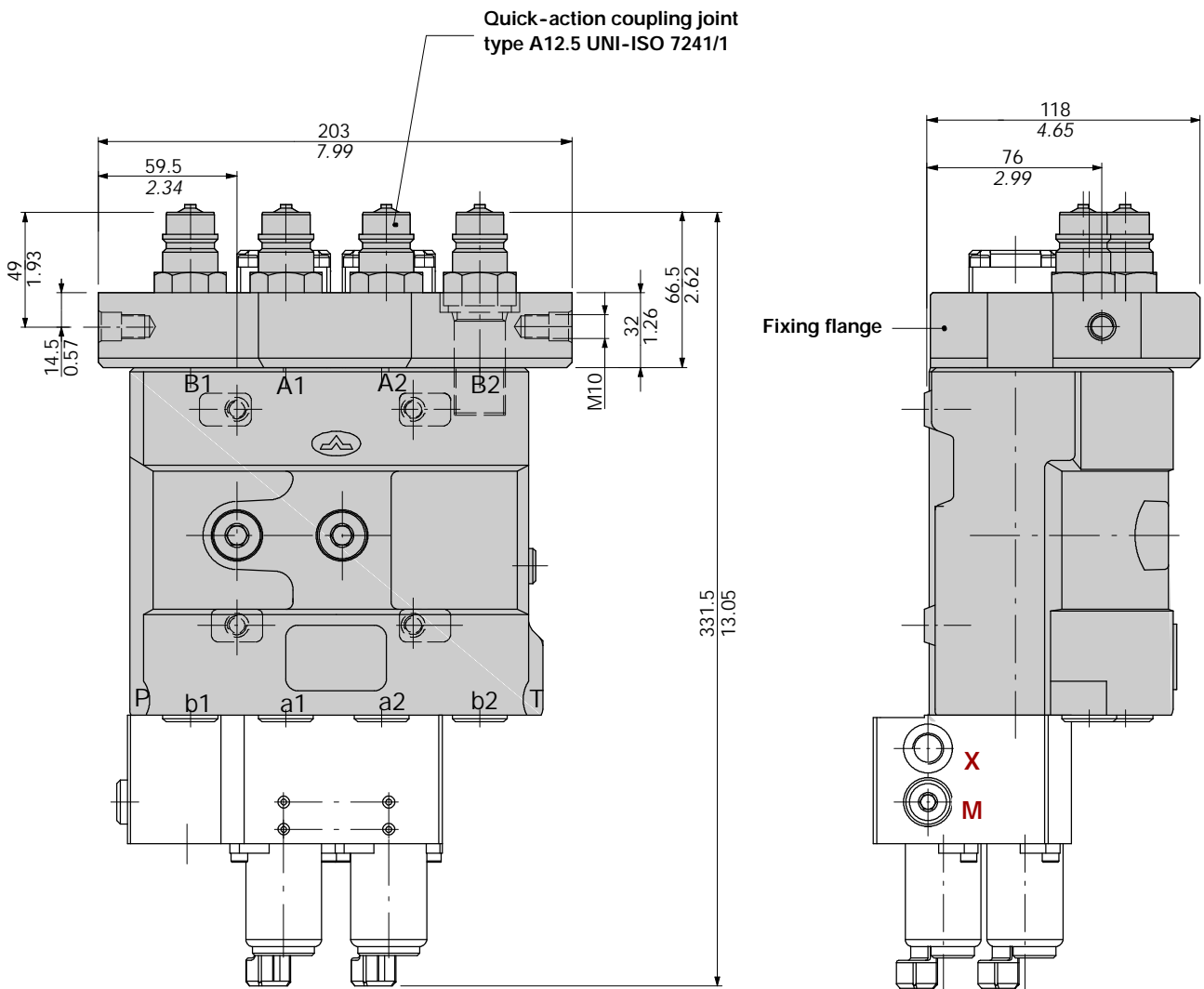
- body kit
- special kit type13



For DLM142 valve with proportional electro-hydraulic control

This prearrangement requires special valve body kit code: **5KC1903020**, which include body, seals, load check valves, fixing flange and quick-action coupling joints.

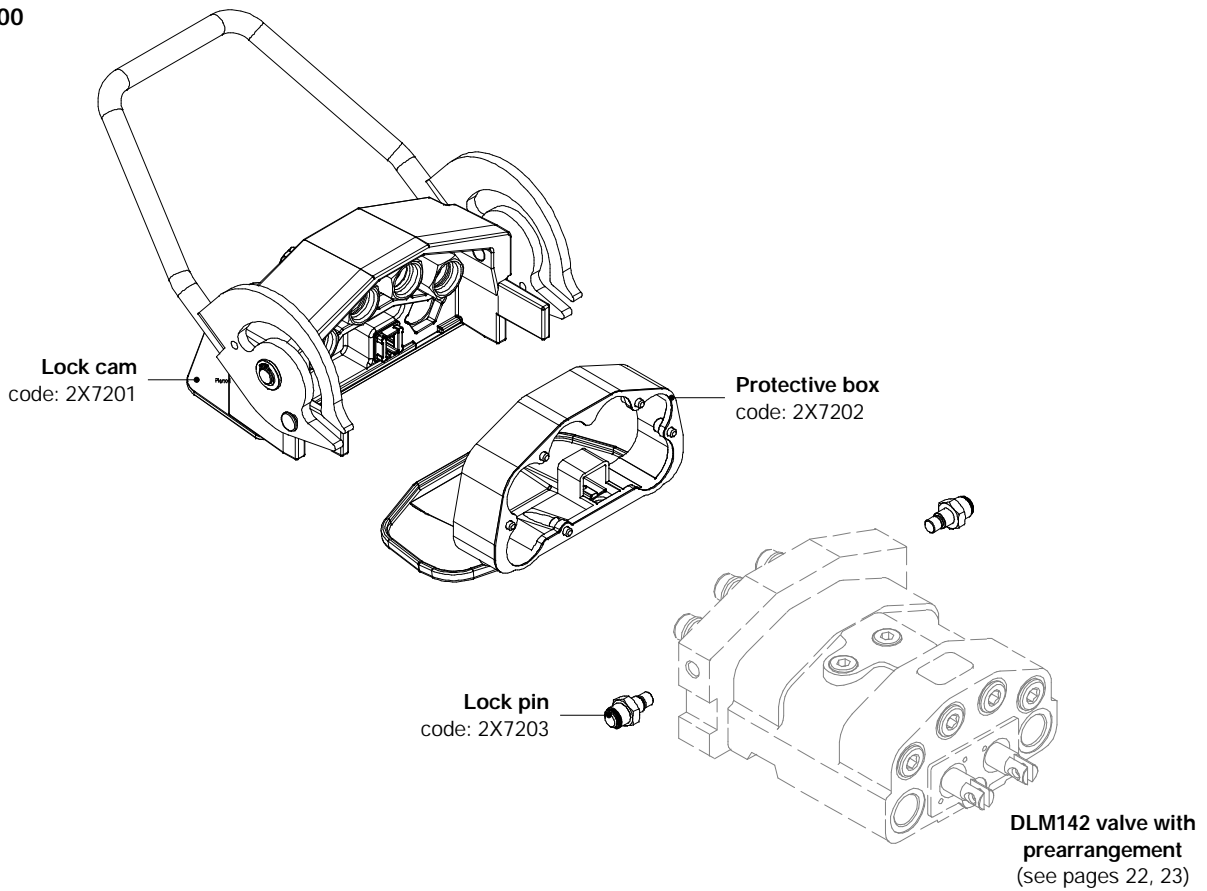
- body kit
- prop. electro-hydraulic control (see page 18)



Quick-action coupling

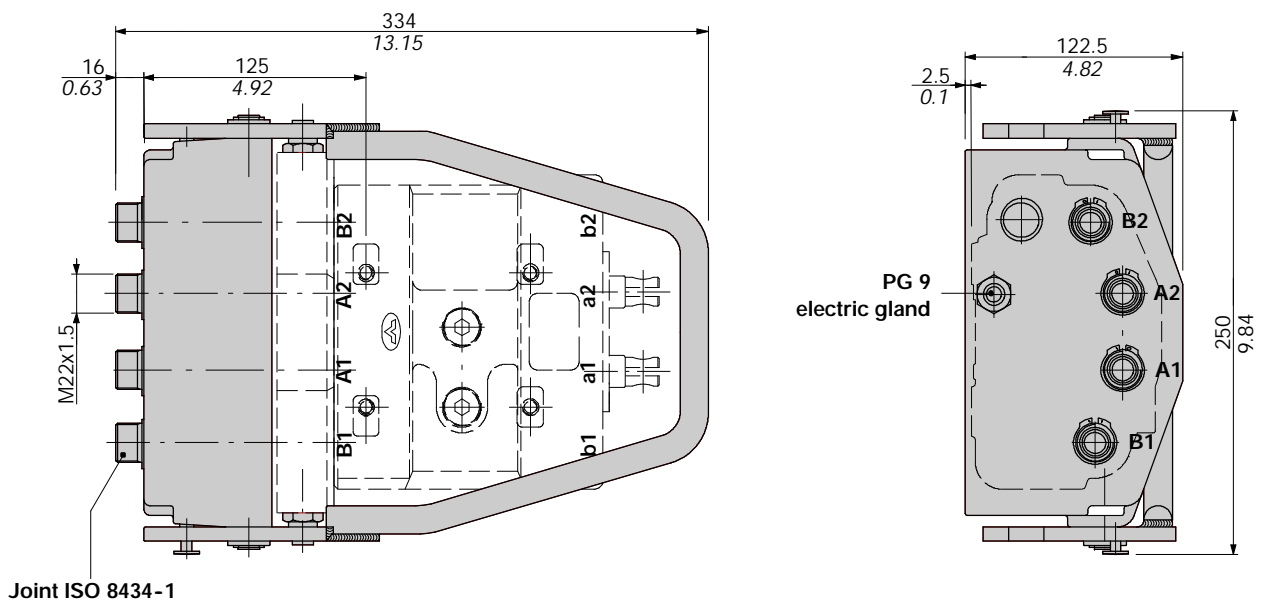
Lock cam kit

Code: 5X7200



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

Dimensional data

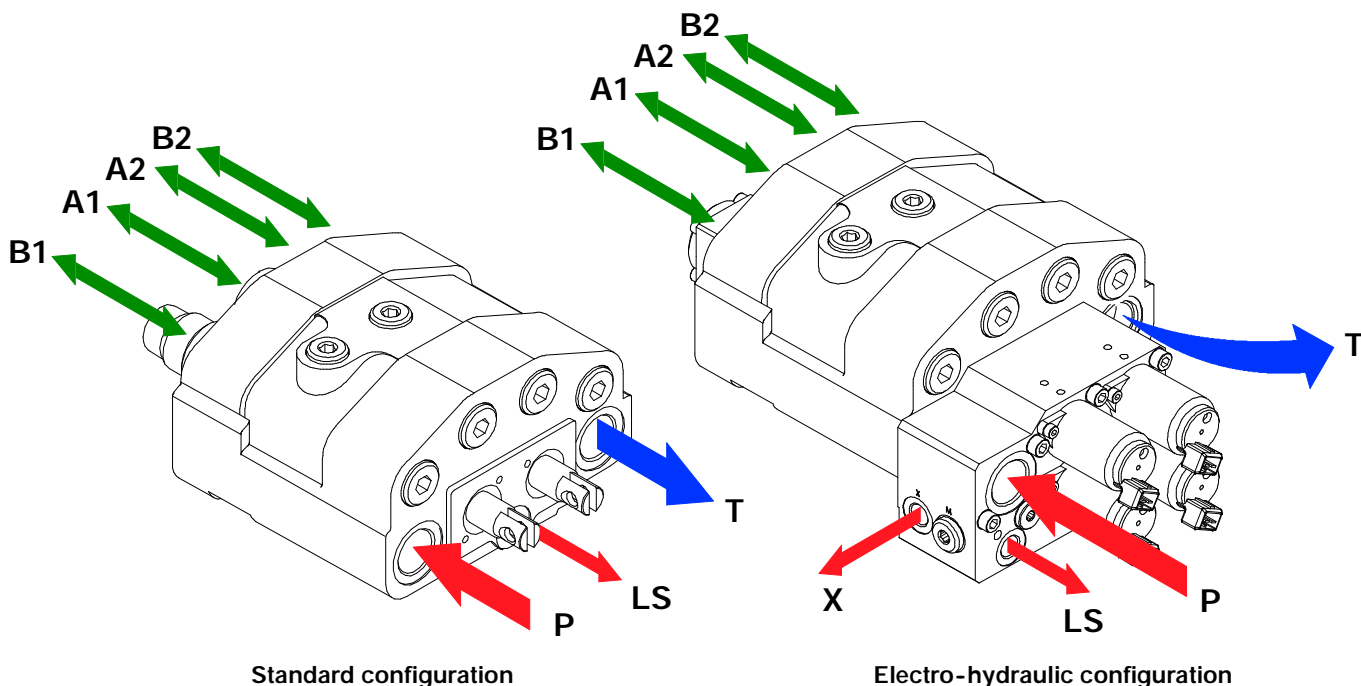


Installation and maintenance

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

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

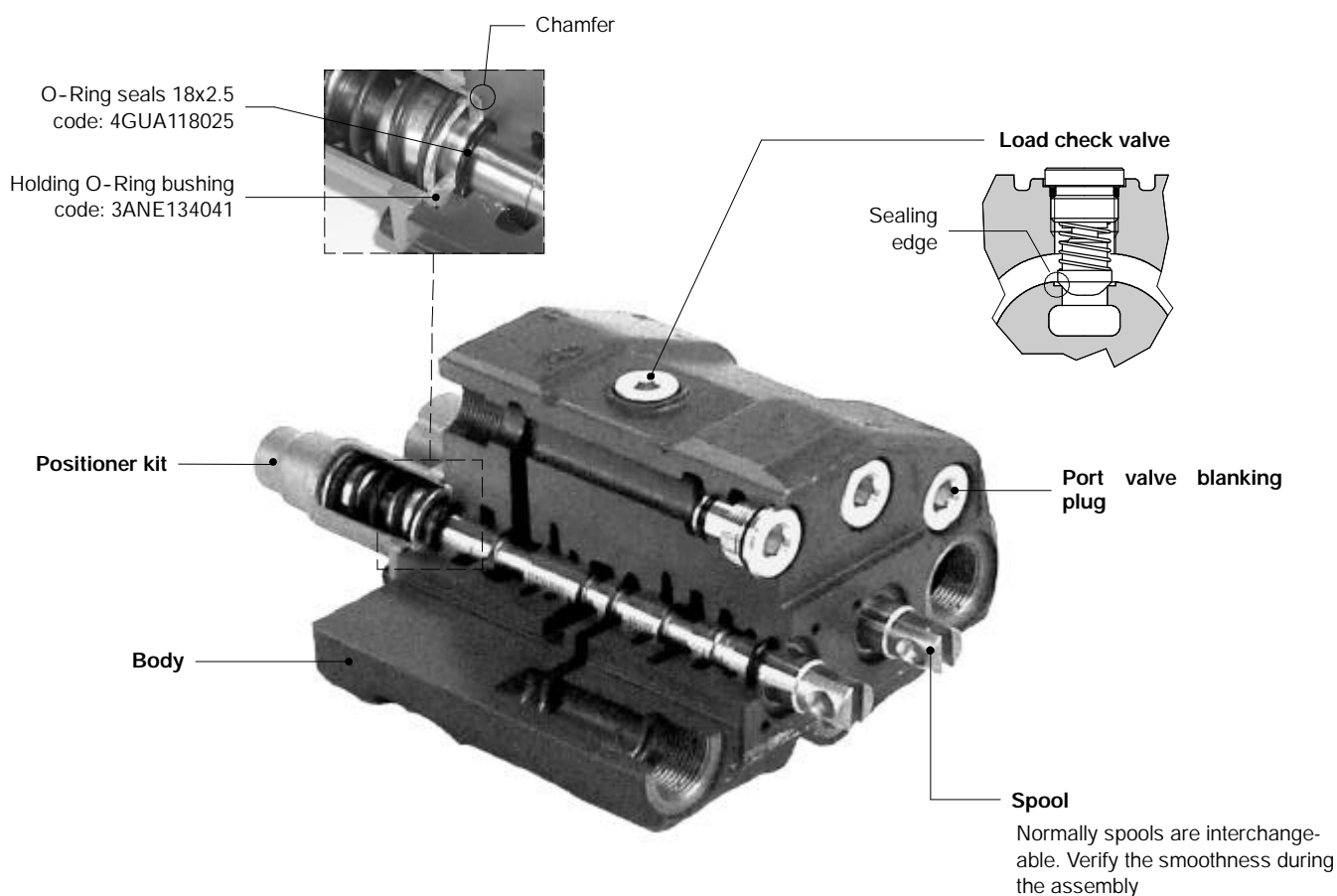
- the valve can be assembled in any position; in order to prevent body deformation and spool sticking mount the product on a flat surface;
- in order to prevent the possibility of water entering the spool control kit, do not use high pressure wash down directly on the valve;
- prior to painting, ensure 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
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 / 44.2	30 / 22.1
METRIC (ISO 262)	M27 x 2	M22 x 1.5	M14 x 1.5
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.



NOTE - All articulated parts inside cap are lubricated with synthetic base grease grade NLGI2 (not for directional valve with electro-hydraulic control).

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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