



SDM141

MONOBLOCK
DIRECTIONAL CONTROL VALVE



 **walvoil**
HYDRAULIC CONTROL SYSTEMS

Features

Simple, compact and heavy duty designed 3 sections monoblock valves for open centre hydraulic systems.

H Fitted with a main pressure relief valve.

H Each spool has independent load check valve.

H Series circuit.

H Optional carry-over port.

H A wide variety of service port valves.

H Available 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 May 2001:

This edition supercedes all prior documents.

Contents

Working conditions	4
Dimensional data	5
Hydraulic circuit	6
Performance data	7
Ordering codes	8
Inlet relief options	10
Spool options	11
“A” side spool positioners	13
“B” side options	18
Hydraulic spool control	19
Port relief options	21
Inlet and outlet conversion port options	24
Installation and maintenance	25

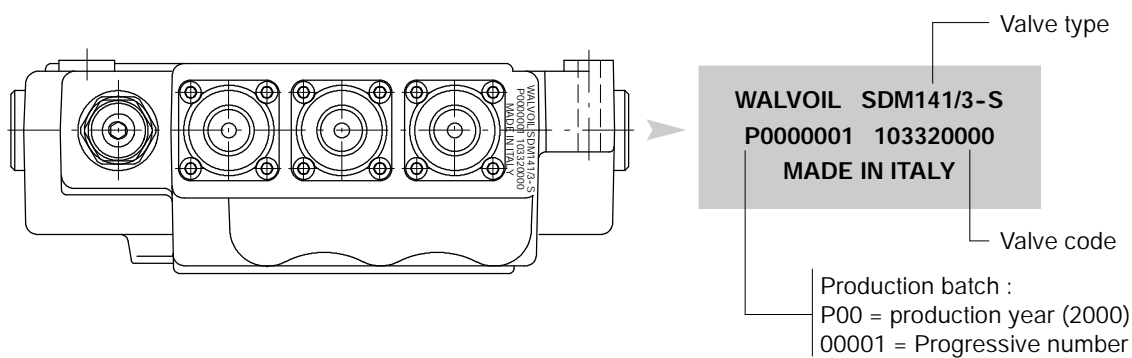
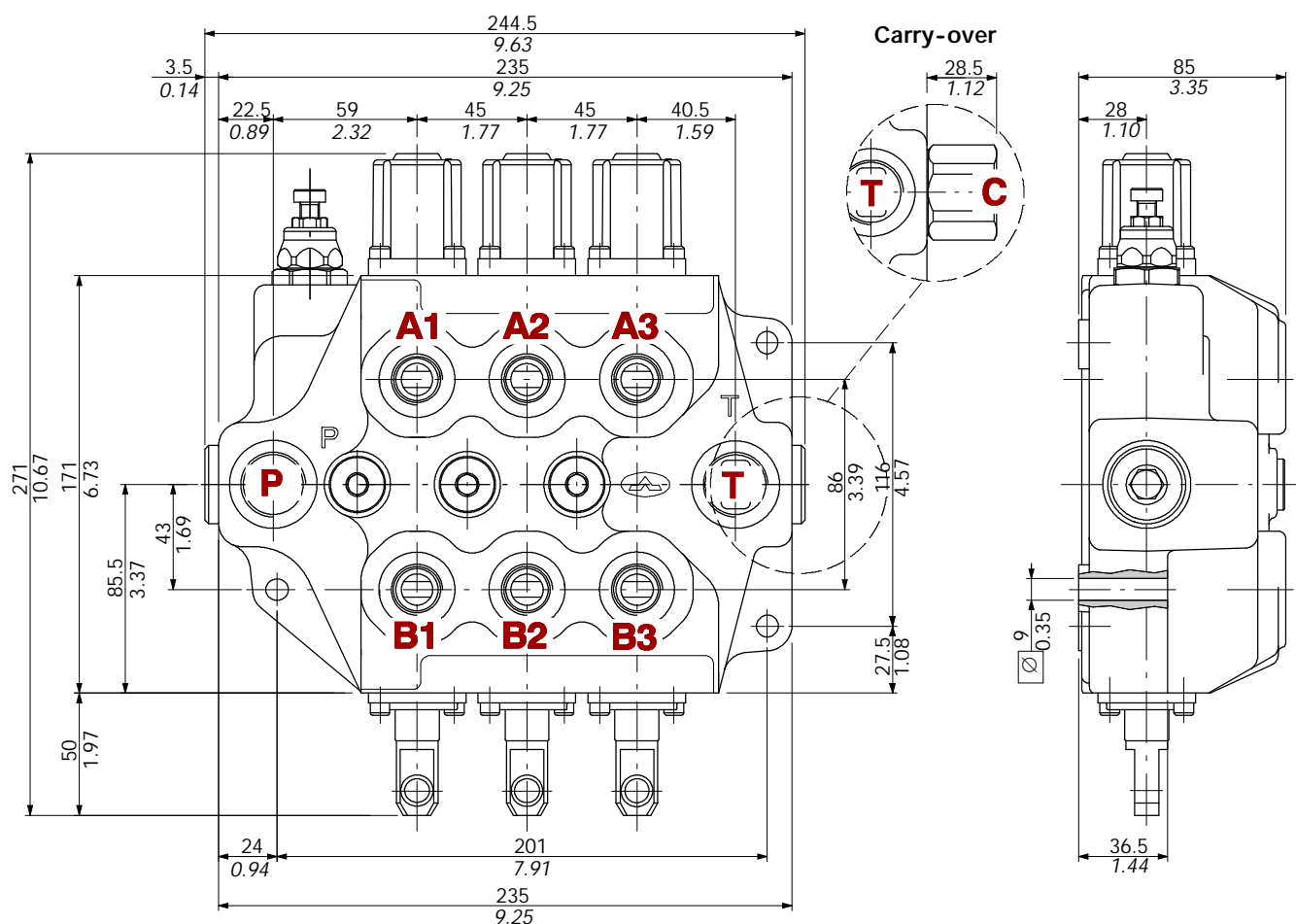
SDM141

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>	25 bar	360 psi
Internal leakage A(B)→T	<i>Δp=100 bar - 1450 psi fluid and valve at 40°C - 104°F</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.



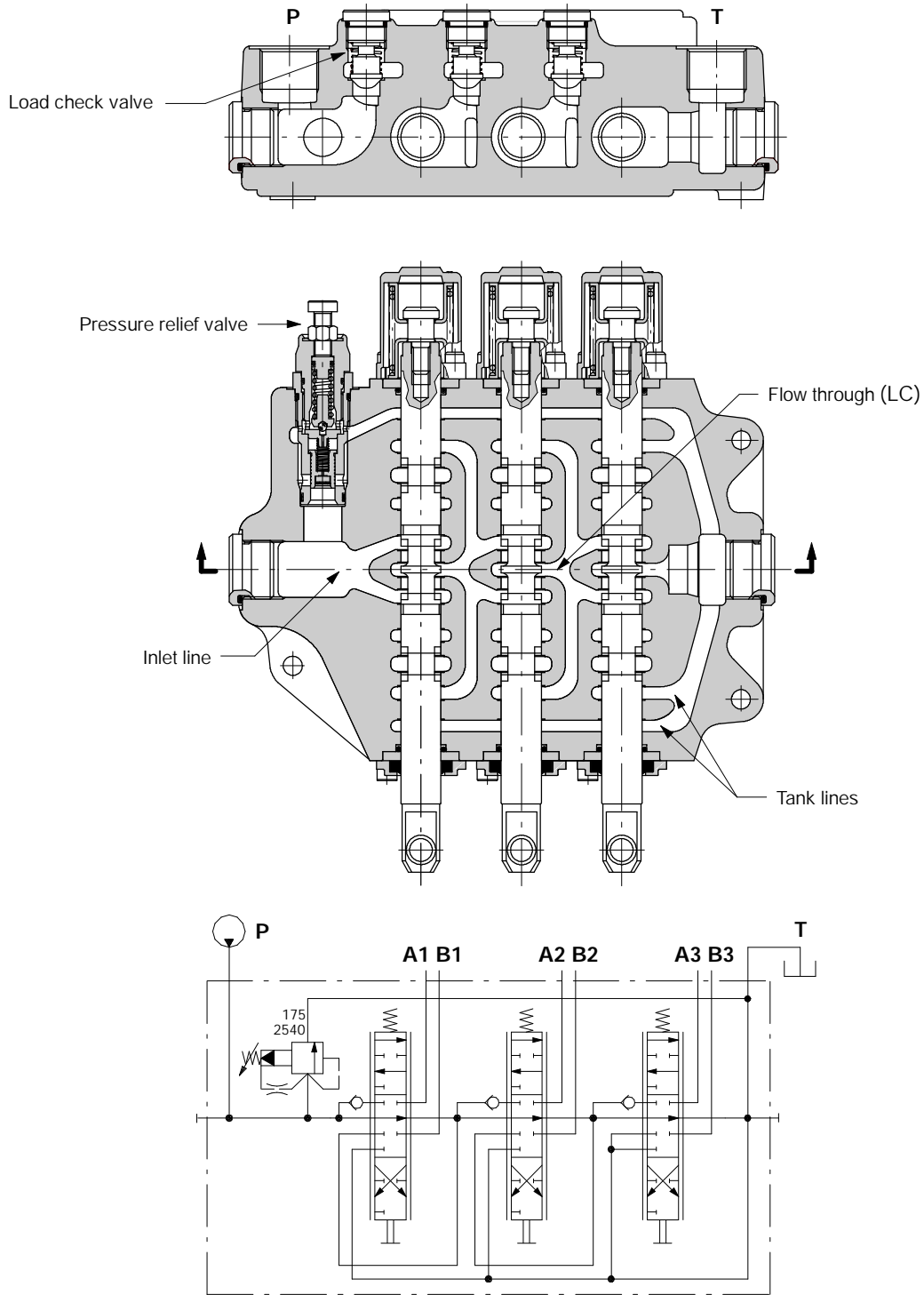
Standard threads

PORT	BSP (ISO 228/1)	UN-UNF (ISO 11926-1)
Inlet P and carry-over C	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)
Outlet T	G 3/4	1 1/16-12 UN-2B (SAE 12)
PILOT PORTS		
Hydraulic	G 1/4	9/16-18 UNF-2B (SAE 6)
Pneumatic	NPTF 1/8-27	NPTF 1/8-27

SDM141

Hydraulic circuit

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



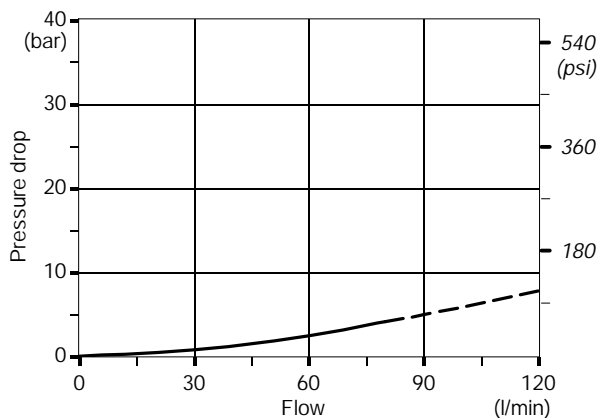
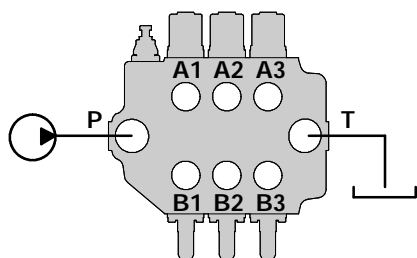
Ex.: SDM141/3-S(XG-175)/18SLP/18SLP/18SLP/PSA-<CVN>

NOTE - A symmetrical body allows the reverse assembly of spools and relative control kits (right inlet, ED configuration).

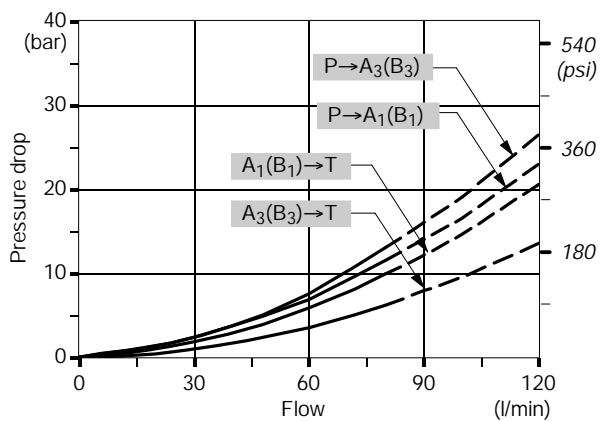
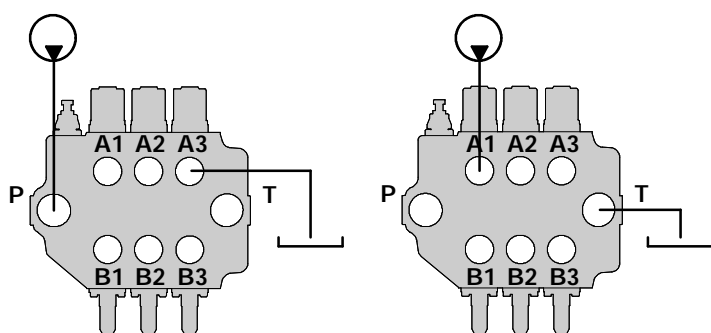
Performance data (pressure drop vs. flow)

Open centre

From top inlet to top outlet.

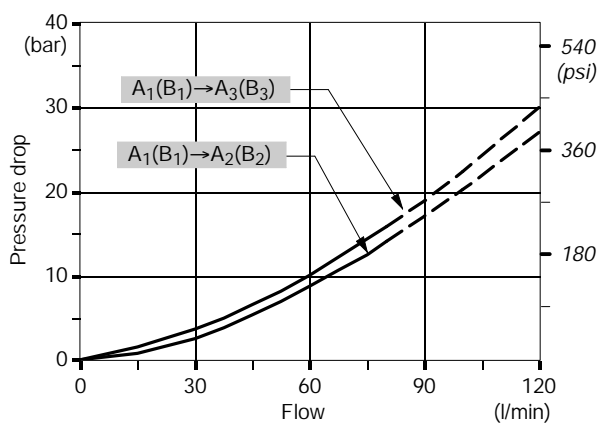
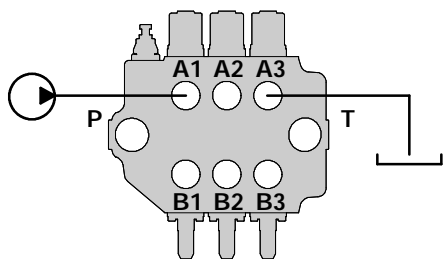


Inlet to work port and work port to outlet



Series circuit

From inlet to A₁(B₁) to A₂(B₂) or A₃(B₃) outlet.



NOTE - Measured with spool type 1.

SDM141

Ordering codes

Description example:

SDM141/ **3 - S** (XG - 175) / **1 8 SLP . P3T / 18SLP.P3T / 1 8IM . P3(G3 - 100) / PSA - <CVN> ***

1st section 2nd section 3rd section

1. 5. 6. 7. 8. 2. 3. 4.

Pressure relief valve setting in bar ← 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
3-S	5KC1913000	3 sections
	5KC1913001	" " prearranged for service port valves

Include body, seals, rings and load check valves.

5. Inlet relief options page 10

TYPE	CODE	DESCRIPTION
<u>VMP140 pilot operated pressure relief valve type X (standard)</u>		
(XG-175)	X134211175	Range 25 to 250 bar / 360 to 3600 psi standard setting 175 bar / 2500 psi
<u>VMD140 direct pressure relief valve type Y</u>		
(YG3-175)	X134121175	Range 125 to 250 bar / 1800 to 3600 psi standard setting 175 bar / 2500 psi

Standard setting is referred to 10 l/min flow.

SV	XTAP530590	Relief valve blanking plug
----	------------	----------------------------

6. Spool options page 11

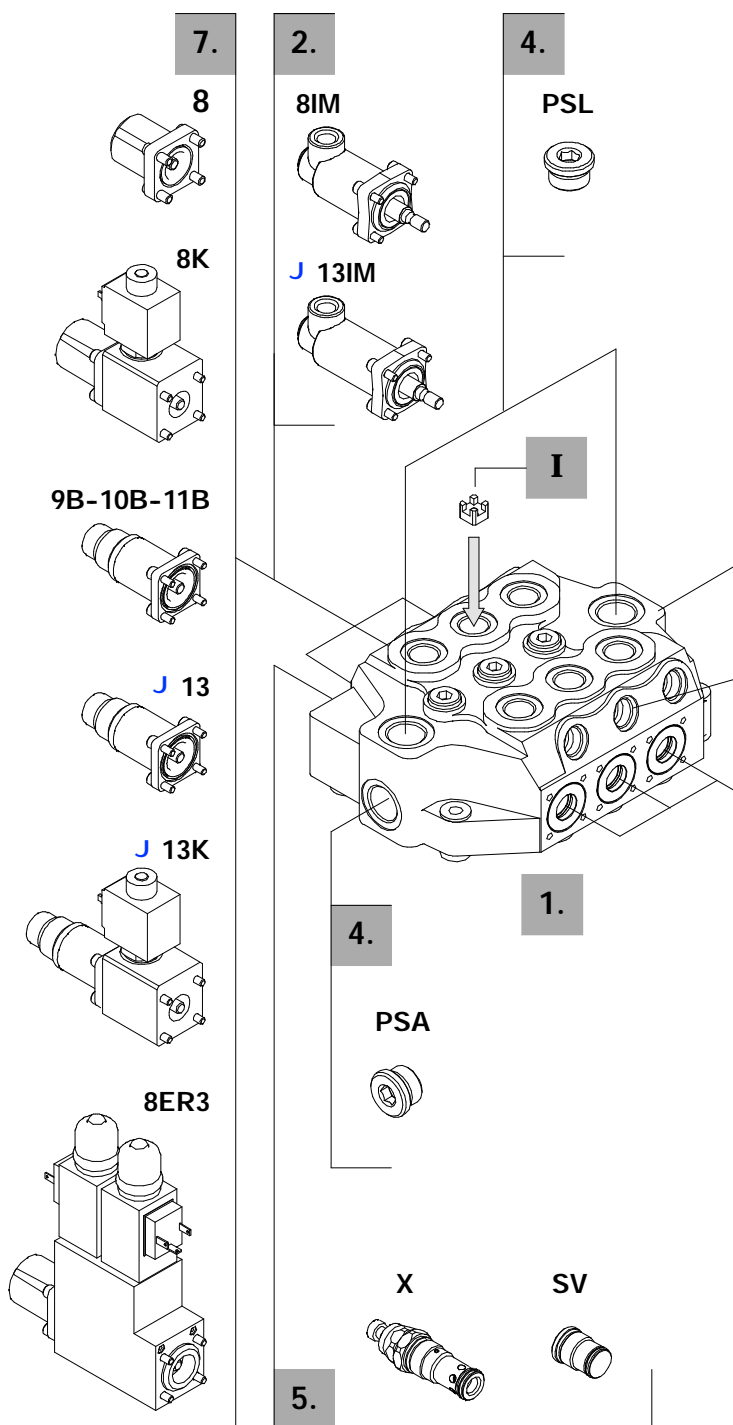
TYPE	CODE	DESCRIPTION
1	3CU1310301	Double acting, 3 positions, A and B closed in neutral position
J 5	3CU1340300	Double acting, 4 positions, A and B to tank in "spool in" 4 th floating position

7. "A" side spool positioners page 13

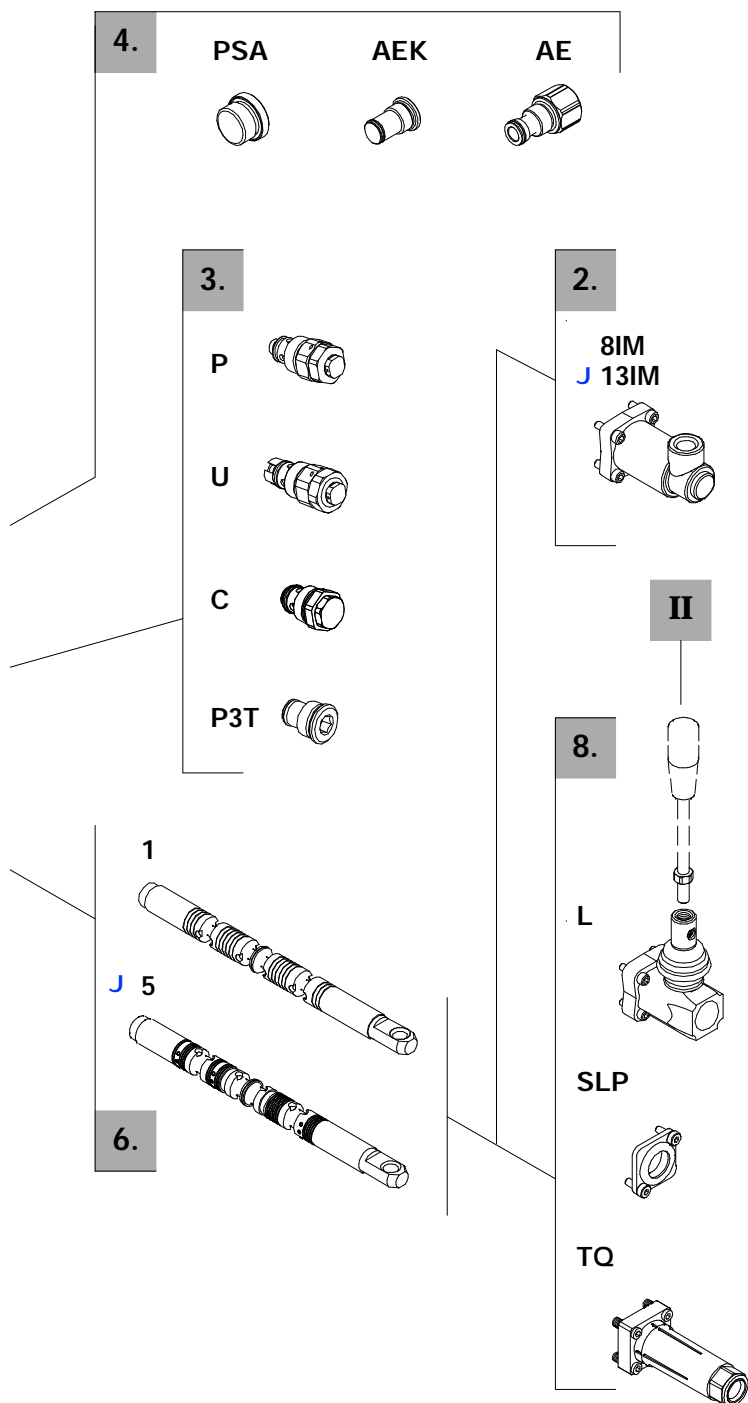
TYPE	CODE	DESCRIPTION
8	5V08108010	With spring return in neutral position
8K	5V08708112	With spring return in neutral position and 12 VDC spool solenoid lock device
	5V08708124	With spring return in neutral position and 24 VDC solenoid lock device
9B	5V09108040	With detent in position 1 and spring return 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
J 13	5V13108040	With detent in spool in position 3, spring return in neutral position
J 13K	5V13708112	With detent in spool in position 3, spring return in neutral position and 12 VDC spool solenoid lock device

Special positioner: **need special body kit**

8ER3	5V08108380	12 VDC ON/OFF electro-hydraulic kit
	5V08108390	24 VDC ON/OFF electro-hydraulic kit.



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

**8. "B" side options** **page 18**

TYPE	CODE	DESCRIPTION
L	5LEV108000	Standard lever box
SLP	5COP108000	Without lever, with dust proof plate
TQ	5TEL108110	CD cable connection

2. Pilot hydraulic spool control **page 19**

TYPE	CODE	DESCRIPTION
Need special body kit		
8IM	5IDR208300	Proportional hydraulic operated with spring return in neutral position
J 13IM	5IDR208213	Proportional hydraulic operated with extra stroke for float position and spring return in neutral position

3. Port relief options **page 21**

TYPE	CODE	DESCRIPTION
<u>Anti-shock valve</u>		
P(G3-100)	3XCAR208113	Range 100 to 250 bar / from 1450 to 3600 psi standard setting 100 bar / 1450 psi
P(G4-200)	3XCAR208114	Range 200 to 315 bar / from 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 / from 900 to 1800 psi standard setting 63 bar / 900 psi
U(G3-100)	XCAR308115	Range 100 to 250 bar / from 1450 to 3600 psi standard setting 100 bar / 1450 psi
U(G4-200)	XCAR308114	Range 200 to 315 bar / from 2900 to 4600 psi standard setting 200 bar / 2900 psi
Standard setting is referred to 10 l/min flow.		
C	XCAR408110	Anti-cavitation
P3T	3XTAP524290	A and B ports valve blanking plugs

4. Inlet and outlet port options * **page 24**

TYPE	CODE	DESCRIPTION
PSA	3XTAP732200	Top inlet and outlet (n.2 G 3/4 plugs required)
PSL	3XTAP732200	Side inlet and outlet (n.2 G 3/4 plugs required)
AE	XGIU536695	G 3/4 carry-over sleeve

I Flow restrictor

TYPE	CODE	DESCRIPTION
R3,6	3SPE217060	Restrictor \varnothing 3.6 mm / 0.142 in for G 1/2 port

II Optional handlelever

TYPE	CODE	DESCRIPTION
AL01/M10x200	170012020	For L lever box L= 200 mm/7.87in

NOTE J - Spools and positioners with the same symbol must be assembled together: for more informations see relevant pages.

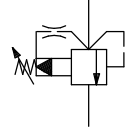
SDM141

Inlet relief options

Pilot operated pressure relief valve

VMP140 (X G - 175)

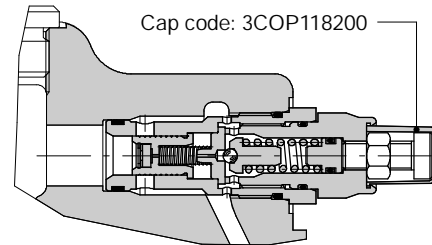
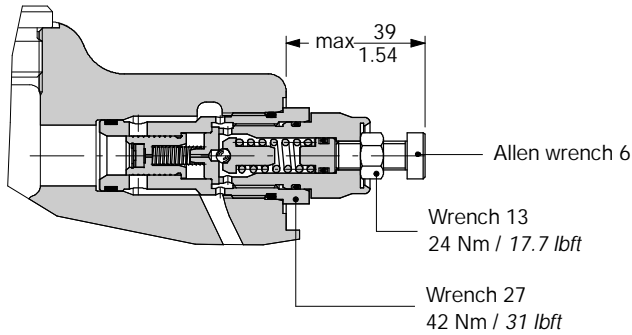
Pressure setting in bar (standard 175 / 2500 psi)
Adjustment type (G, Z)



Adjustment type

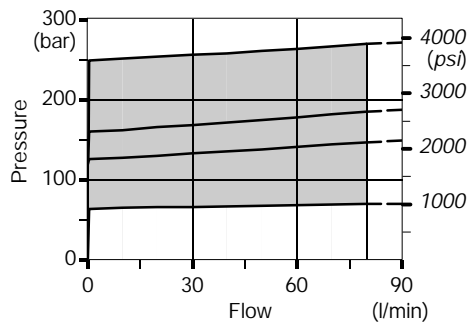
G: with screw

Z: with nylon tamper proof cap

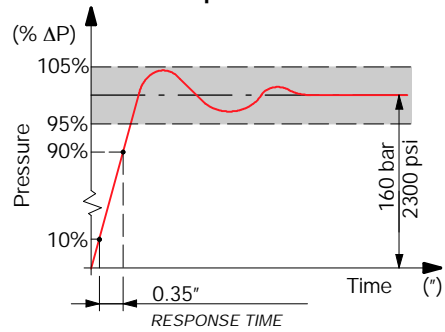


Performance data

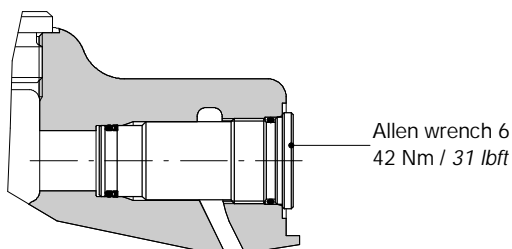
Range setting



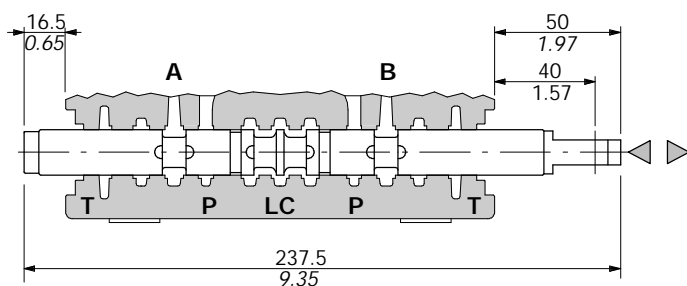
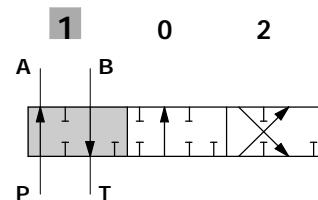
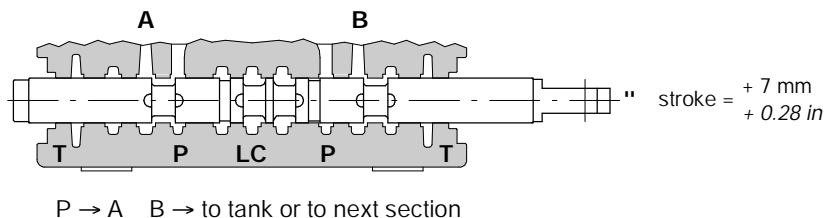
Response time



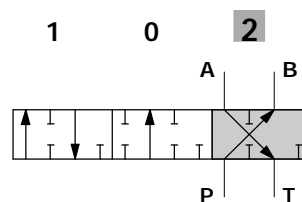
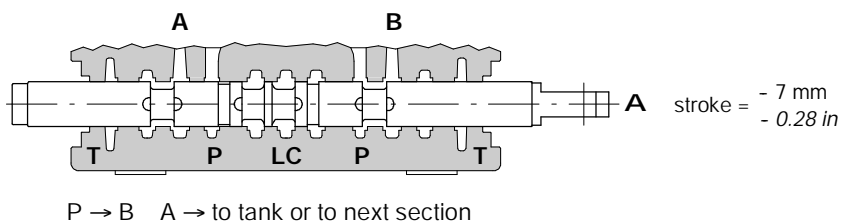
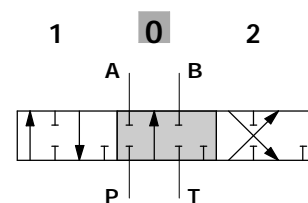
SV: relief valve blanking plug



Type 1

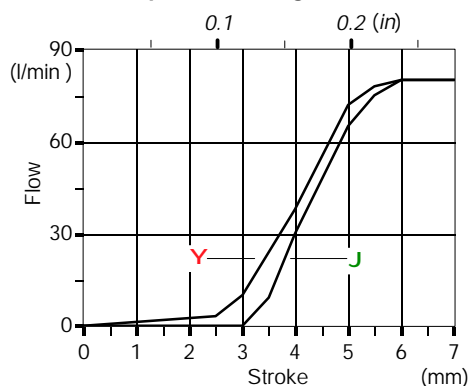


P-A-B-T closed, with flow through line (LC) open



Performance data

Spool metering P→A(B)



Q_{in} = 80 l/min

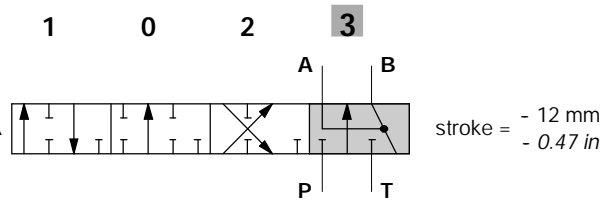
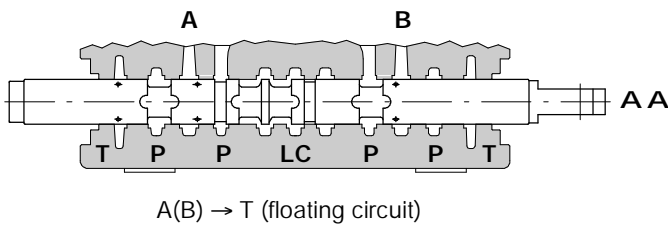
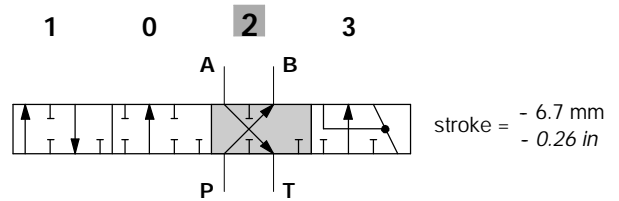
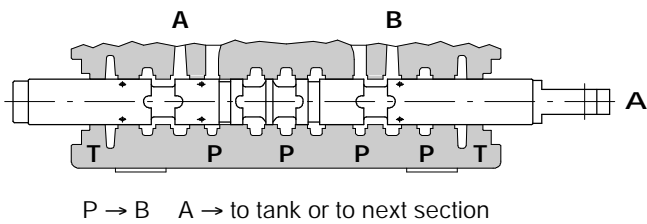
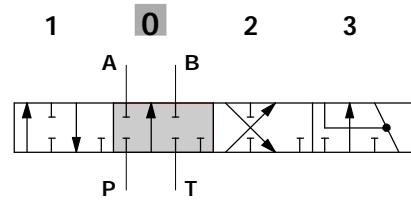
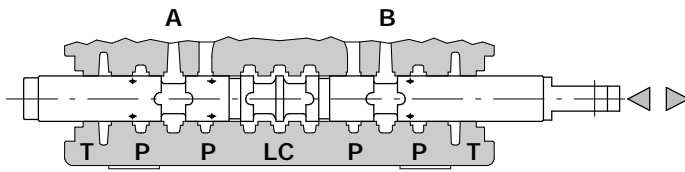
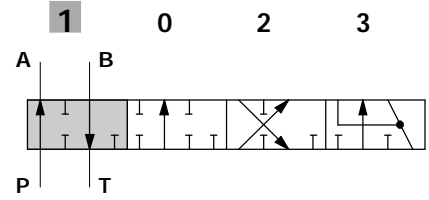
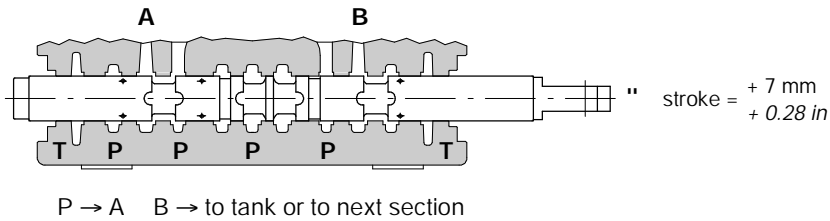
- Y P_(on ports) = 100bar/1450psi
- J P_(on ports) = 250bar/3600psi

SDM141

Spool options

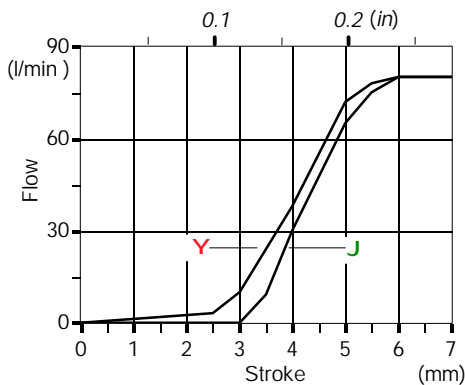
Type 5

Must be used with positioner kits type 13 or 13K (see page 17) and hydraulic spool control type 13IM (see page 19).



Performance data

Spool metering P→A(B)



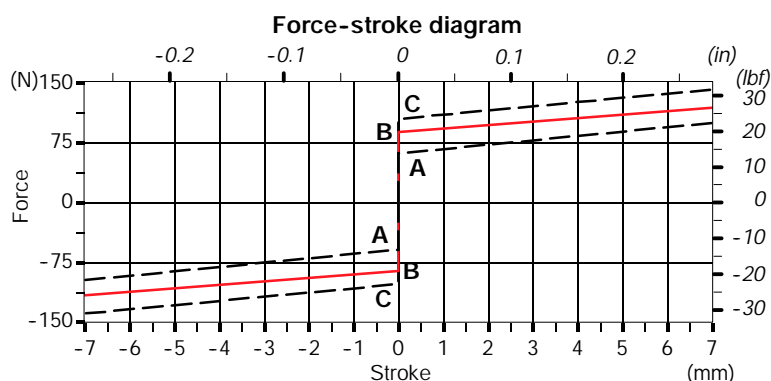
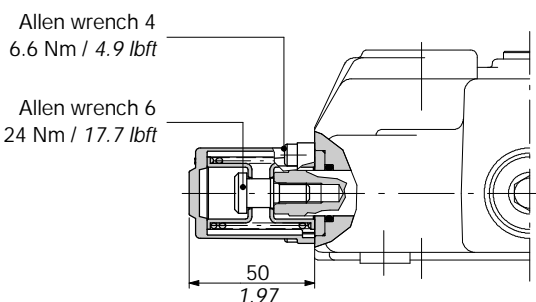
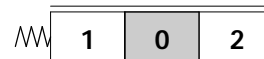
Qin = 80 l/min

With spring return

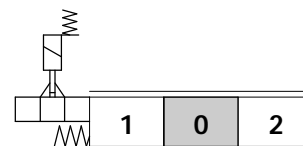
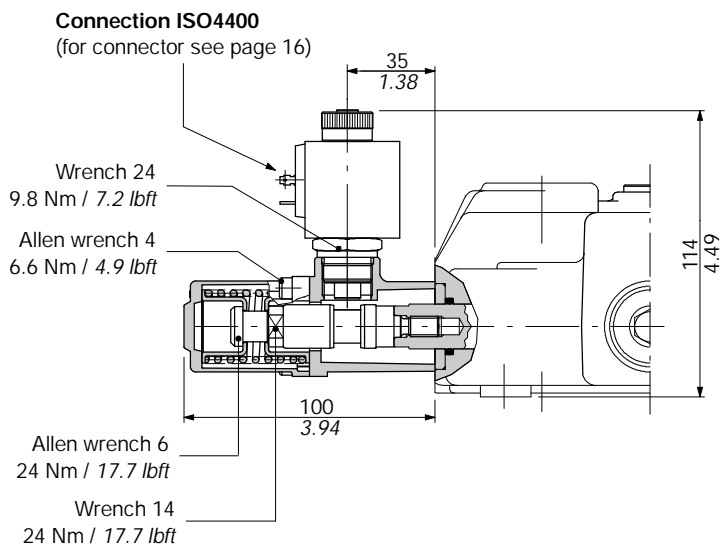
8 kit

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

Available with lighter spring type A (**8MA** code: 5V08108240) or heavier type C (**8MC** code: 5V08208000).



8K kit



Solenoid operating features

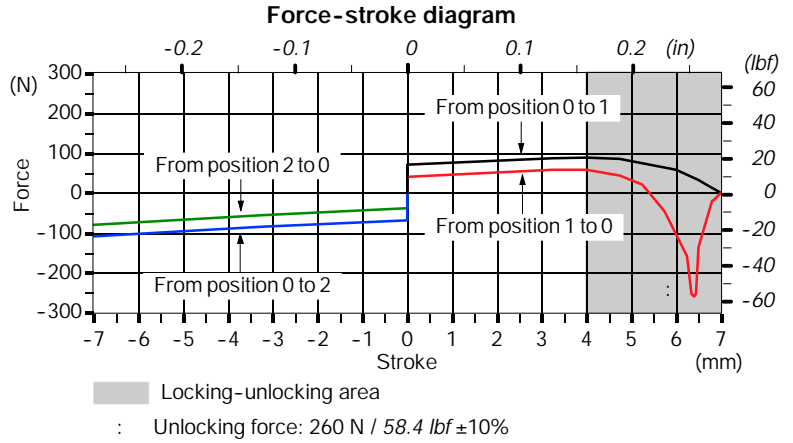
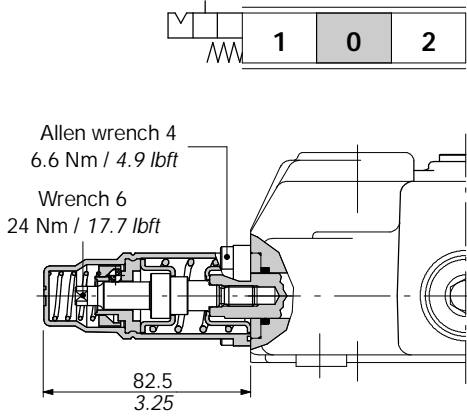
Nominal voltage : 12 VDC / 24 VDC
 Power required : 18 W
 Insertion : 100%
 Electrical insulation : class F (VDE0580)

SDM141

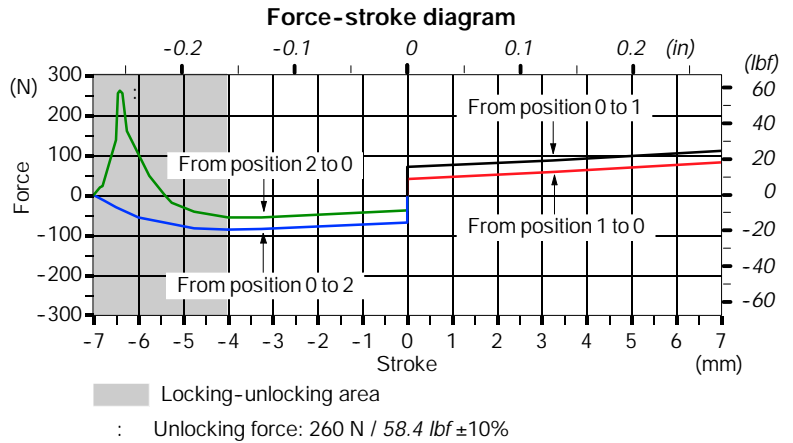
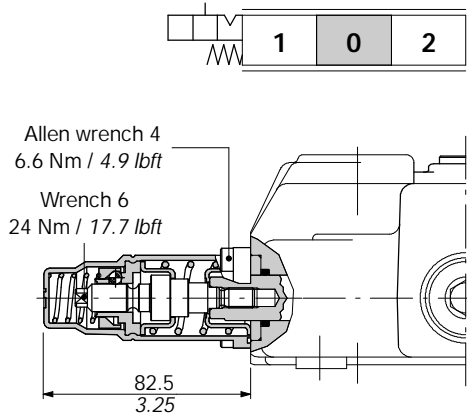
"A" side spool positioners

With detent

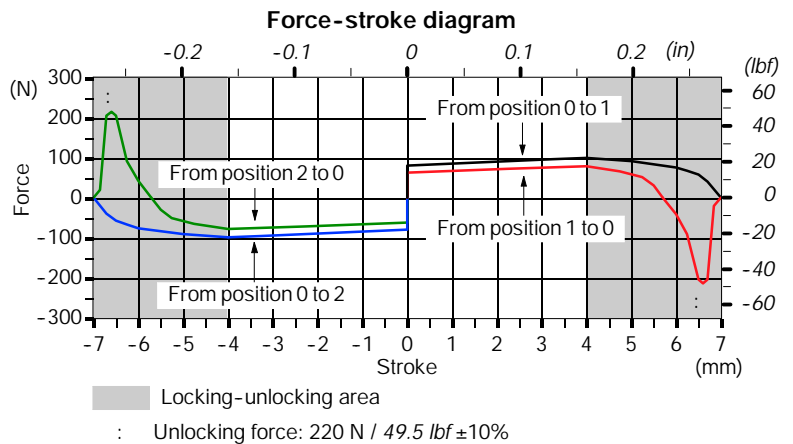
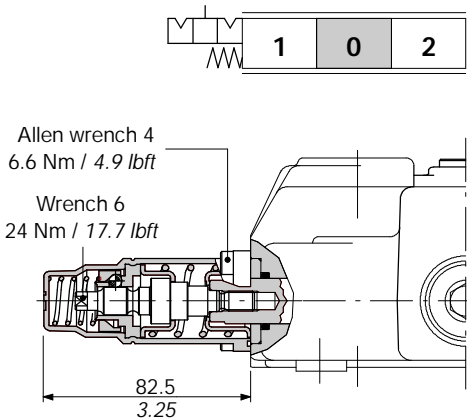
9B kit



10B kit



11B kit

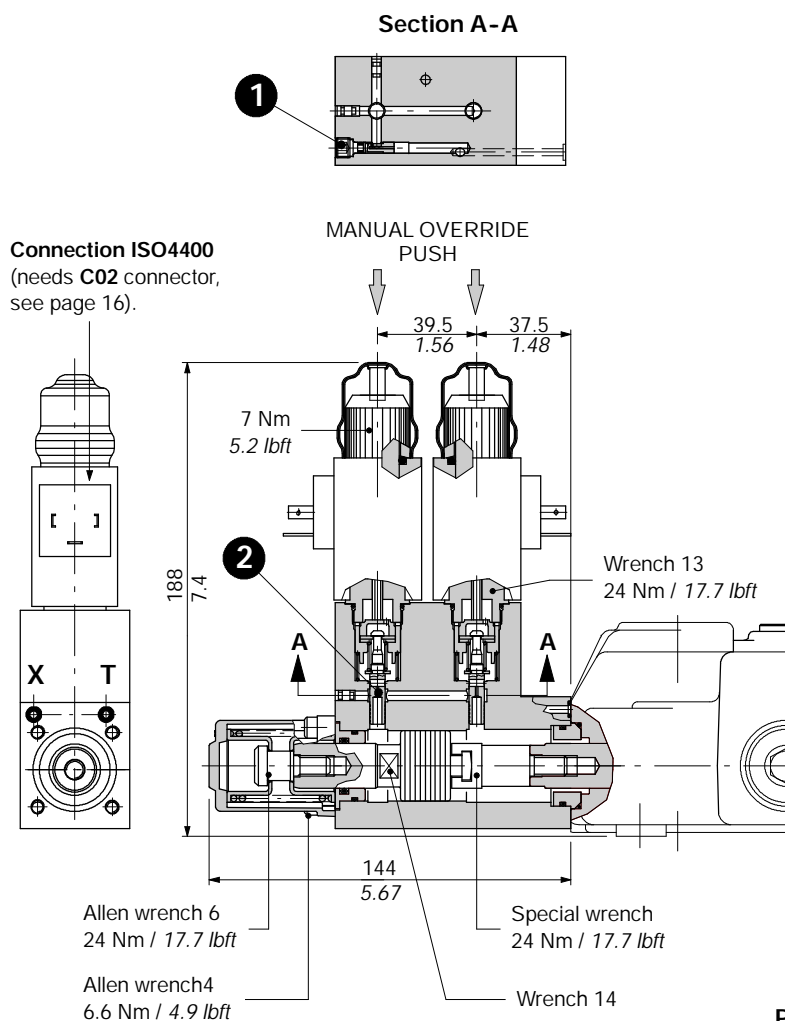


8ER3 kit

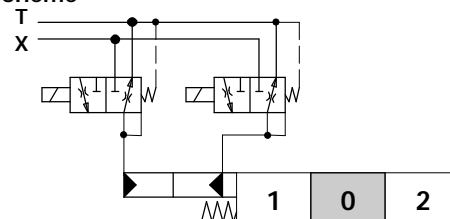
This ON-OFF solenoid actuator contains two 3-ways reducing valves.
 A internal pilot source of 8 bar / 116 psi is required to operate (see VRC valve on page 16).

⚠ WARNING:

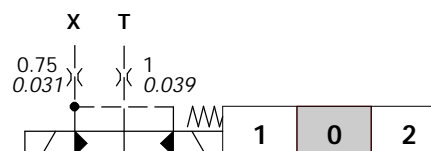
Engaging the override will operate any impliment connected to the aux circuit.
 Be sure to secure a "safe zone" around impliment to prevent injury.



Scheme



Scheme ISO 1219



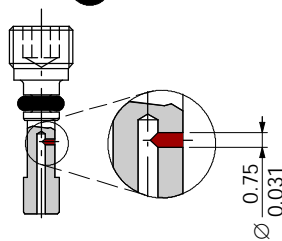
Solenoid operating features

- Nominal voltage : 12 VDC / 24 VDC
- Power rating : 28 W
- Insertion : 100%

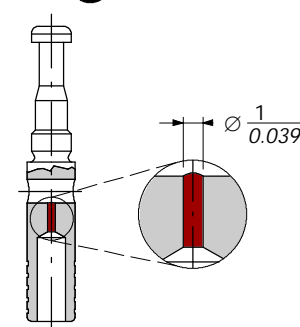
Solenoid ordering codes

CODE	DESCRIPTION
5SOL712012	12VDC solenoid
5SOL712024	24VDC solenoid

Part 1



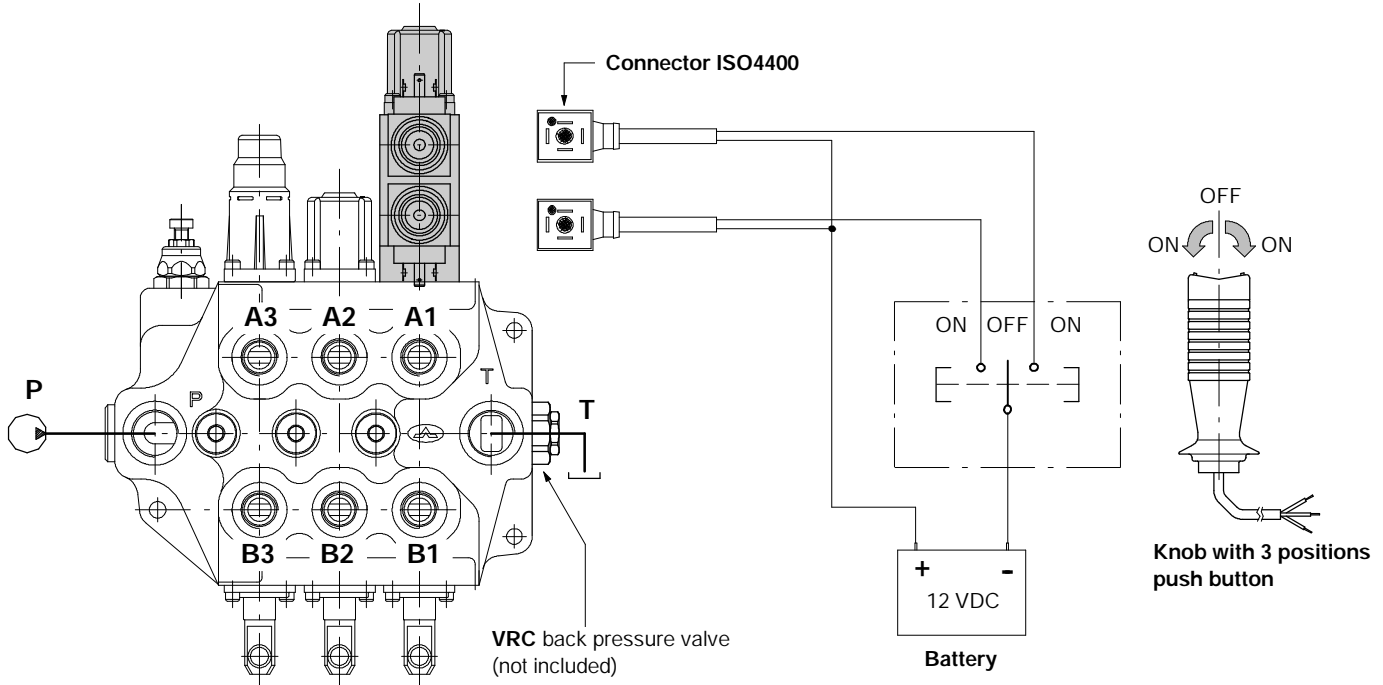
Part 2



"A" side spool positioners

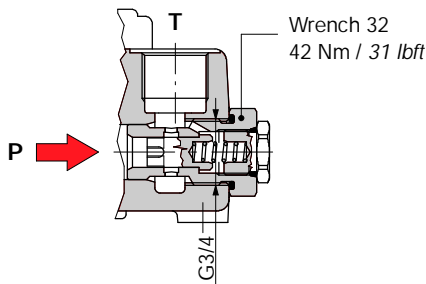
8ER3 kit

Wiring scheme example

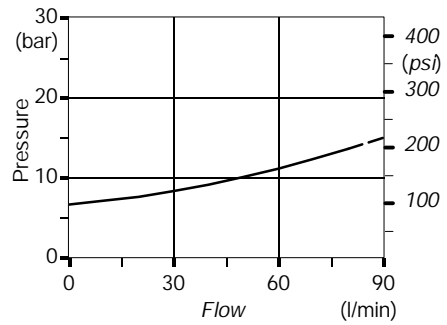


VRC valve: code X147600007

Valve assembled on flow through passage provides pilot pressure to the actuator.

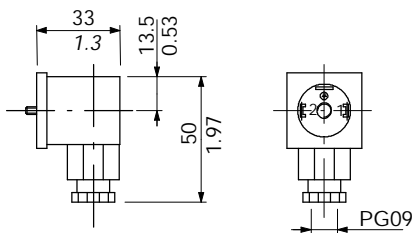


Pressure drop P→T



C02 connector code: 2X1001010

Connector according to ISO4400 / DIN43650-A

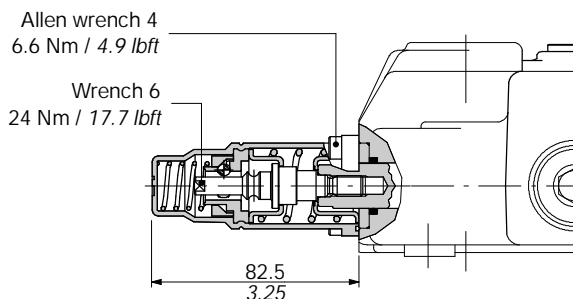
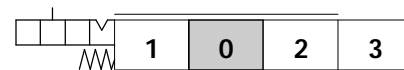


Operating features

- Nominal voltage : 250 VAC / 300 VDC
- Nominal Current : 10 A
- Permitted cable section : 1.5 mm² / 23x10⁻⁴ in²
- Weather protection : IP65

For spool type 5 (page12)

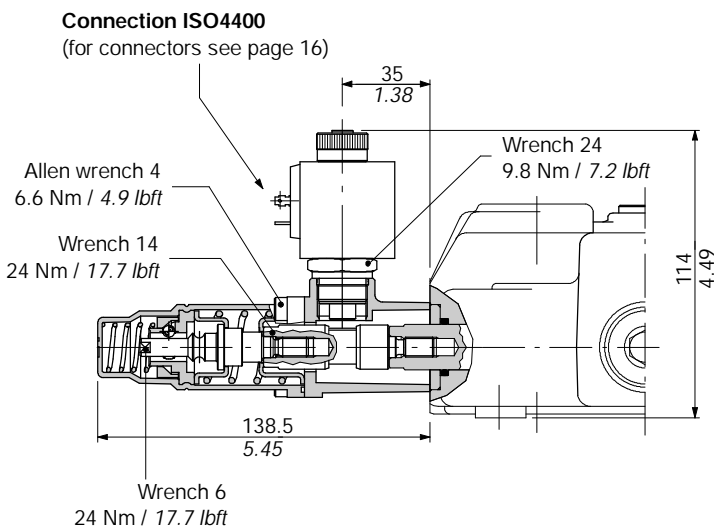
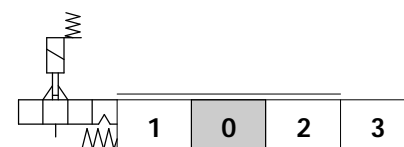
13 kit



Operating features

Locking force : 330 N / 74.2 lbf ±10%
 Unlocking force : 240 N / 54 lbf ±10%

13K kit



Operating features

Locking force : 330 N / 74.2 lbf ±10%
 Unlocking force : 240 N / 54 lbf ±10%

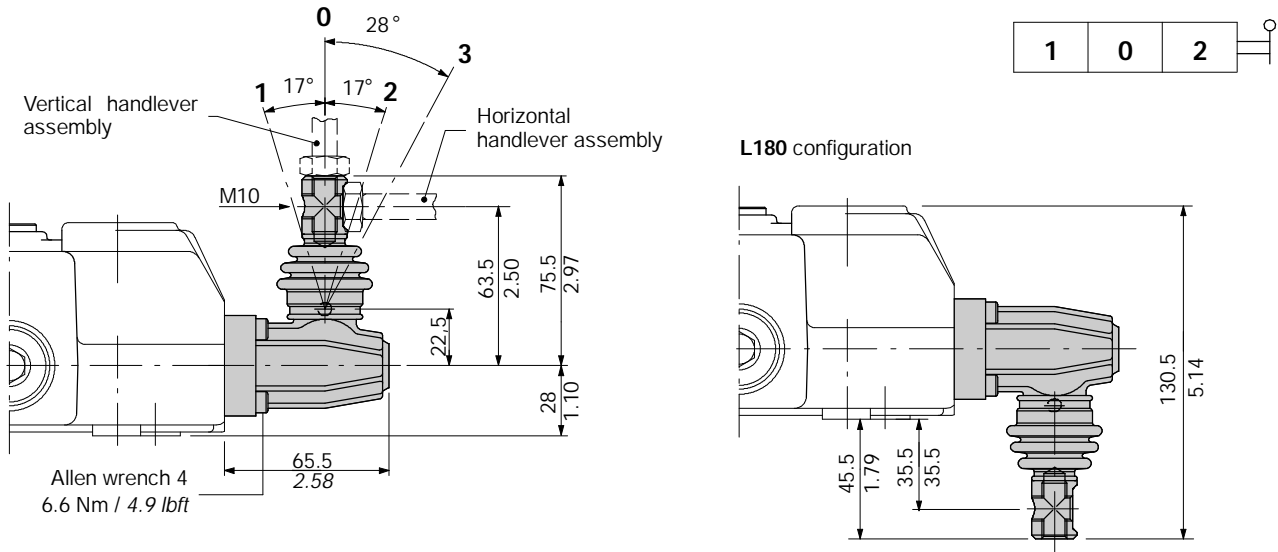
Solenoid operating features

Nominal voltage : 12 VDC / 24 VDC
 Power required : 18 W
 Insertion : 100%
 Electrical insulation : class F (VDE0580)

"B" side spool positioners

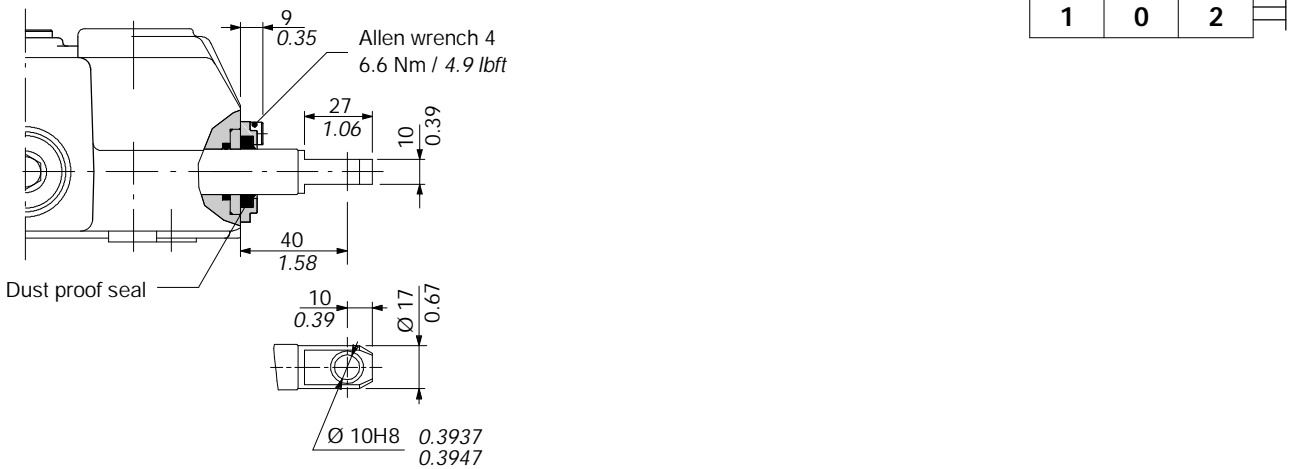
L lever box

Alluminium with protection boot lever pivot box; it can be rotated 180° (L180 configuration)



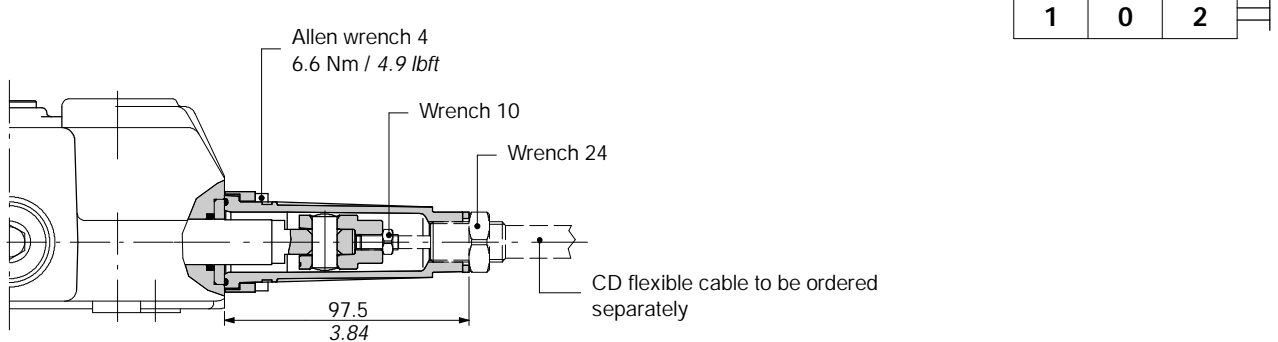
SLP dust proof plate

Mechanical control with dust proof plate.



TQ cable remote control

Waterproof cap prearranged for remote control with flexible cable.

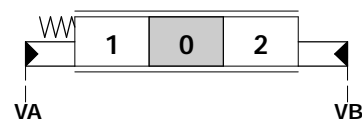
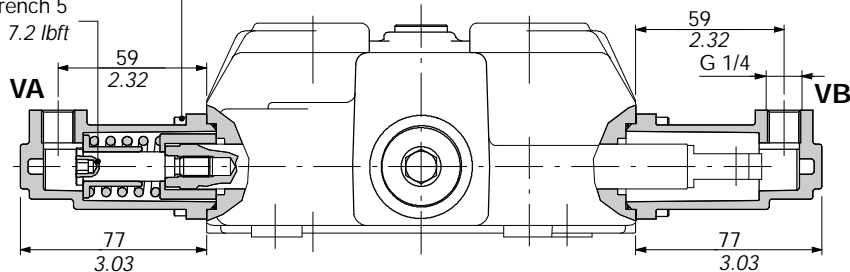


NOTE - For more information concerning remote cable control require appropriate documentation.

8IM kit (for single acting and double acting spools)

Allen wrench 4
6.6 Nm / 4.9 lbf

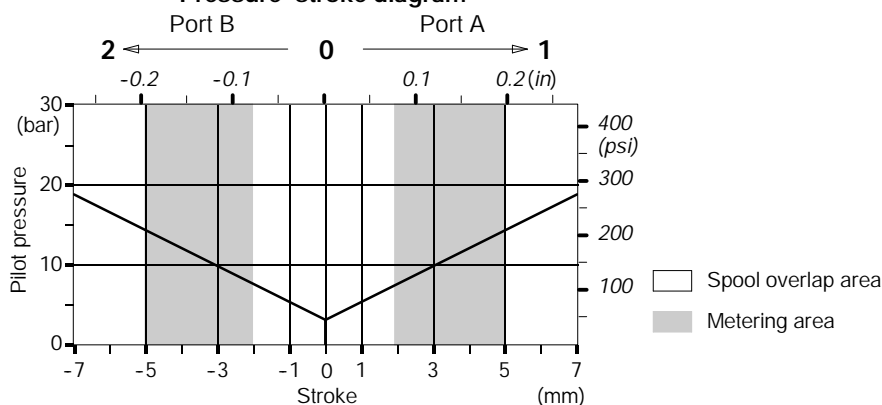
Allen wrench 5
9.8 Nm / 7.2 lbf



Operating features

Max.pilot pressure : 50 bar
: 720 psi

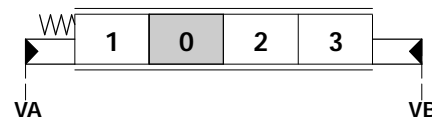
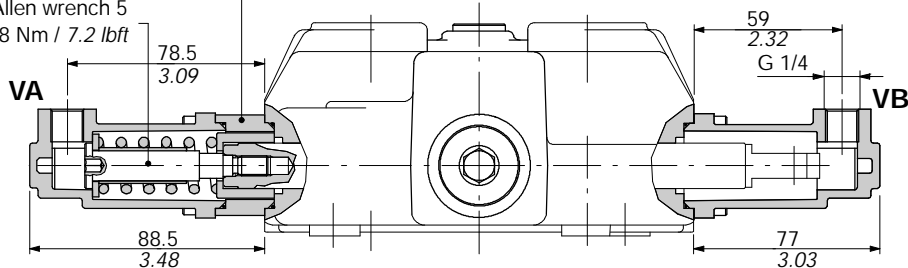
Pressure-stroke diagram



13IM kit (for spool type 5 with 4th float position, see pag.12)

Allen wrench 4
6.6 Nm / 4.9 lbf

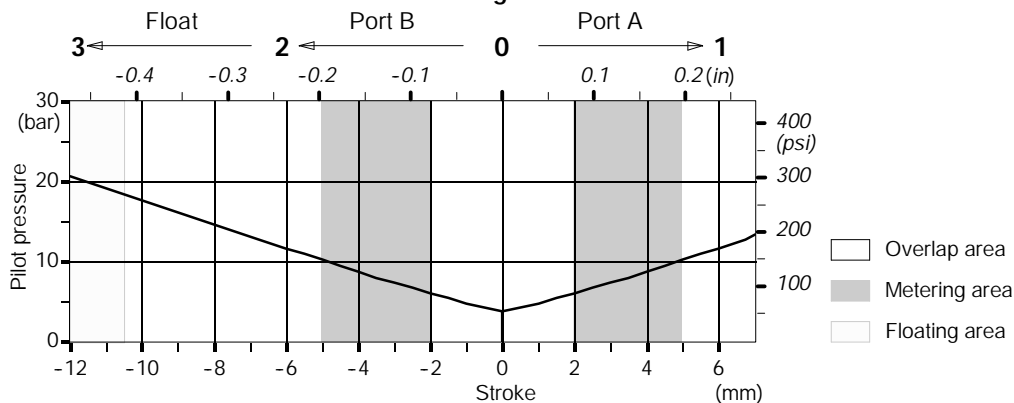
Allen wrench 5
9.8 Nm / 7.2 lbf



Operating features

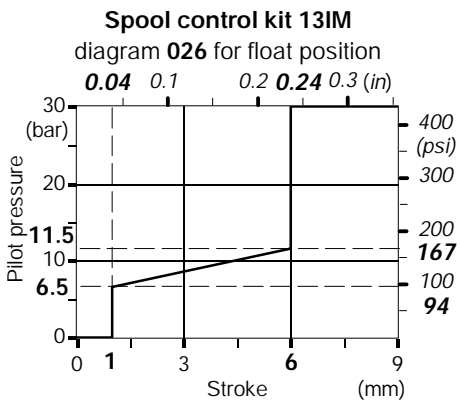
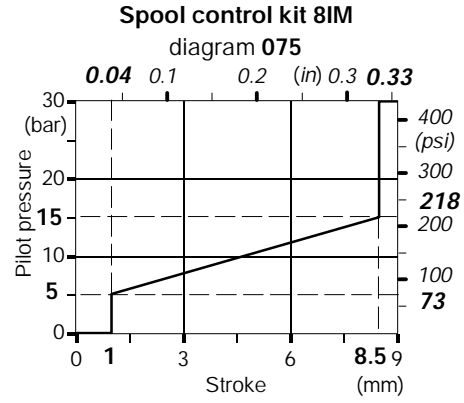
Max.pilot pressure : 50 bar
: 720 psi

Pressure-stroke diagram

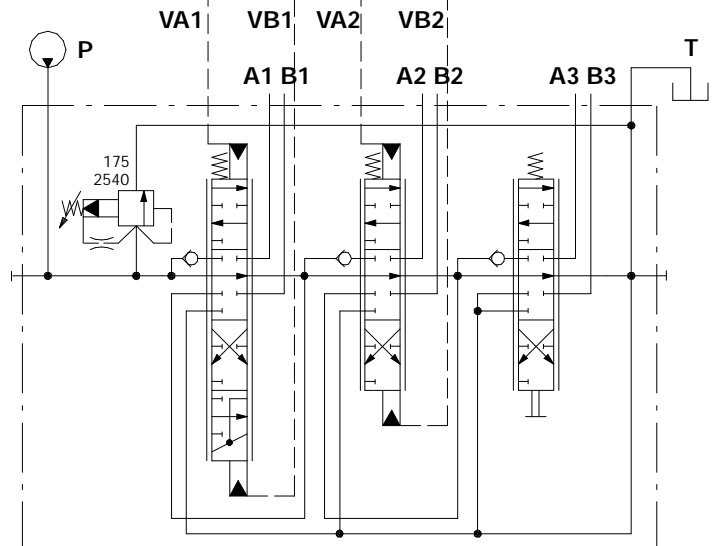
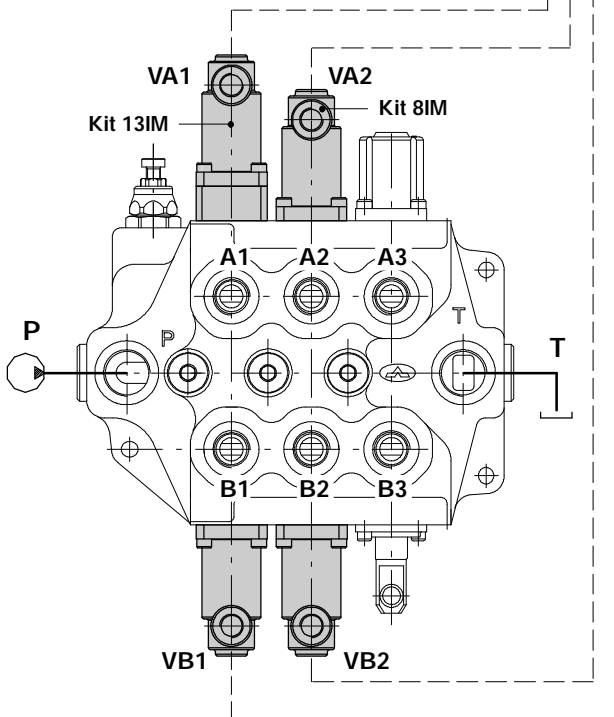
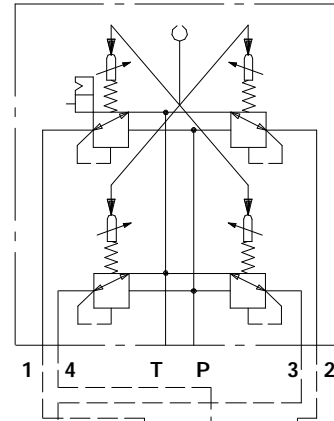
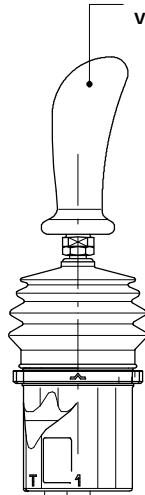


Hydraulic spool control

Connection example



Hydraulic pilot control valve series SV01

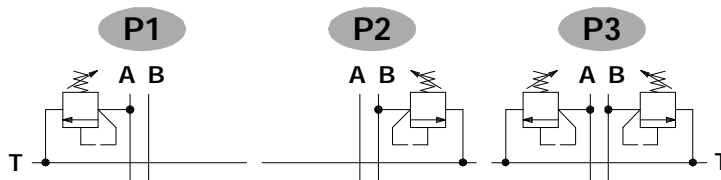


Ex.: SDM141/3-S(XG-175)/513IM/18IM/18SLP/PSA -<CVN>
 + SV01-B/15W-070-075-070-075

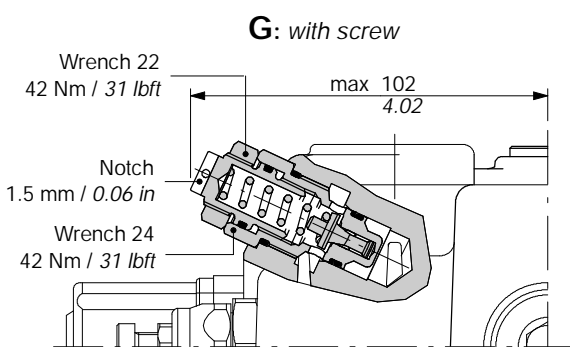
Anti-shock valve

P 1 (G 3 - 100)

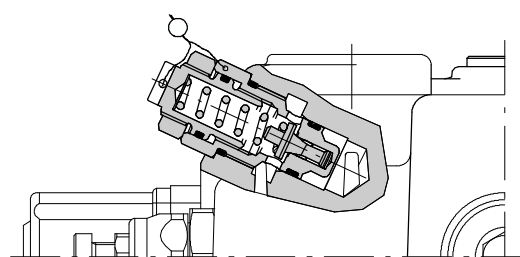
- Pressure setting in bar.
- Spring type (3, 4).
- Adjustment type (G, H).
- 1 mounted on A port.
- 2 mounted on B port.
- 3 mounted on A and B ports.



Adjustment type

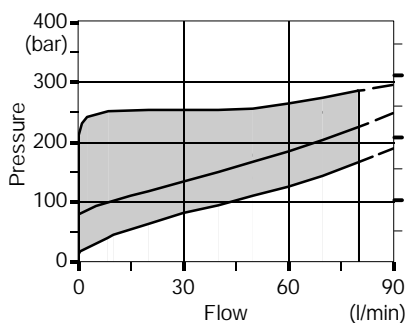


H: valve set and locked

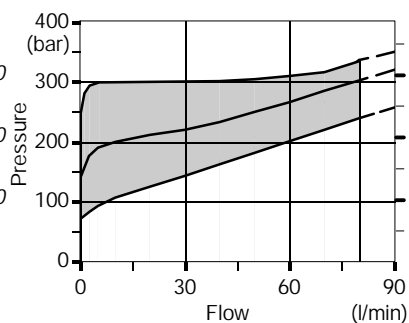


Performance data

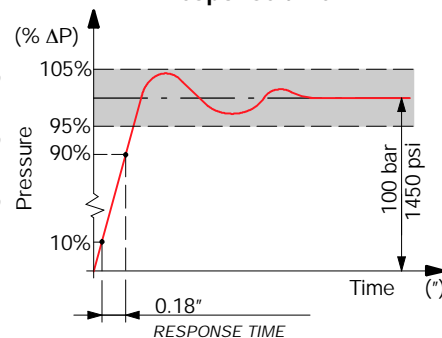
Spring nr. 3 (blue band)



Spring nr. 4 (red band)



Response time

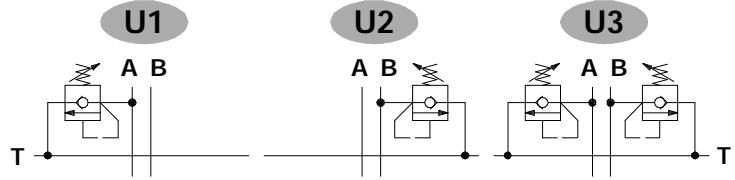


Port relief options

Anti-shock and anti-cavitation valve

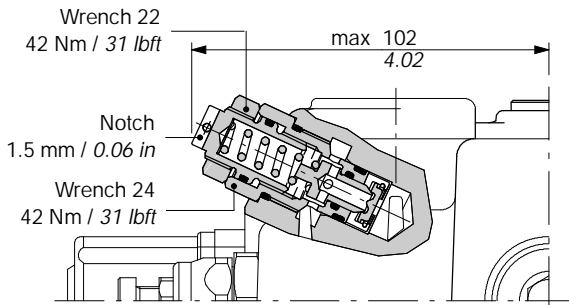
U 1 (G 3 - 100)

- 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.

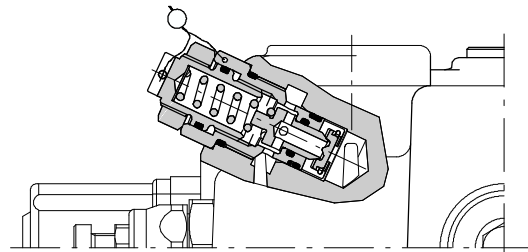


Adjustment type

G: with screw

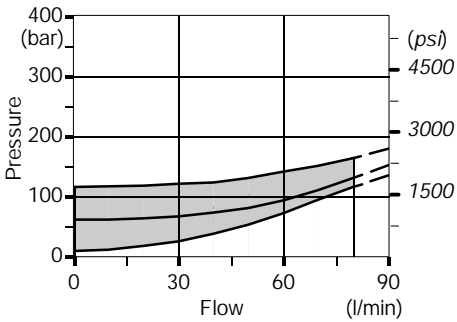


H: valve set and locked

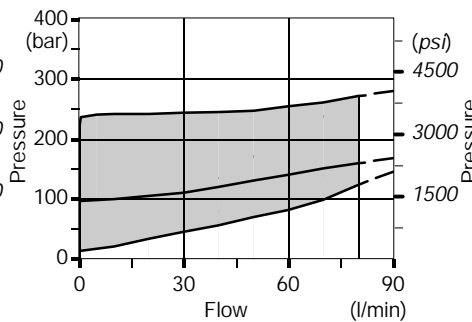


Performance data

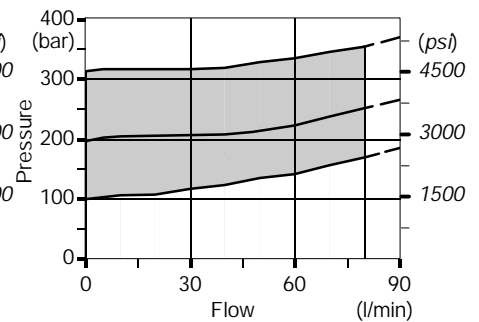
Spring nr. 2 (green band)



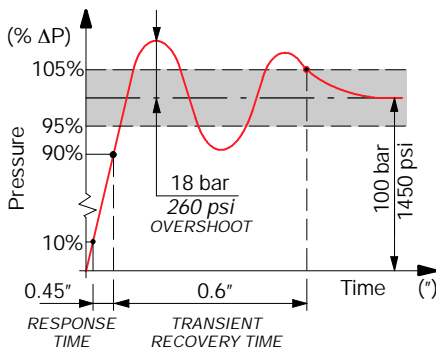
Spring nr. 3 (blue band)



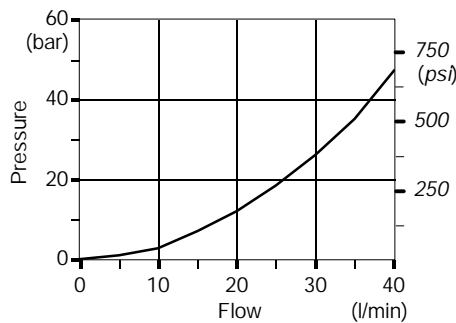
Spring nr. 4 (red band)



Response time



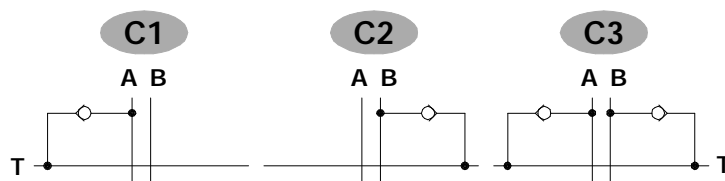
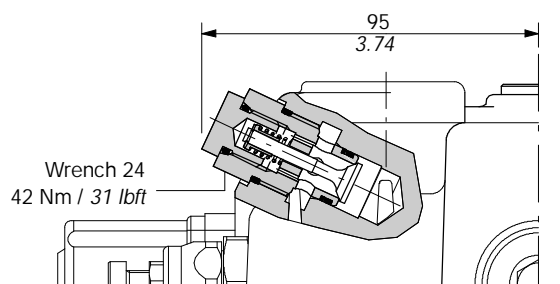
Pressure drop



Anticavitation valve

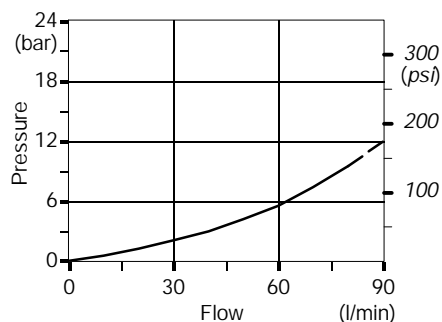
C 1

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



Performance data

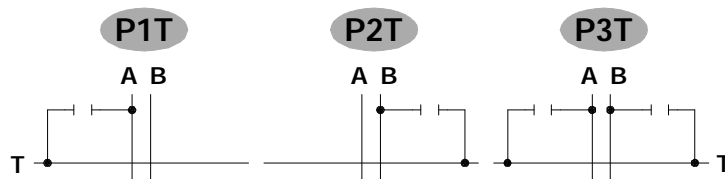
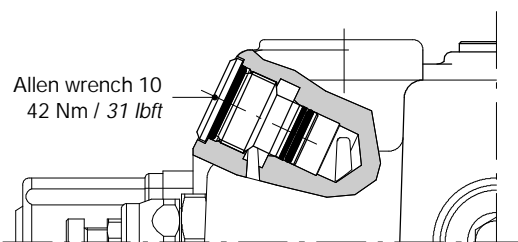
Pressure drop



Port relief valve blanking plug

P 1 T

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



SDM141

Inlet and outlet port options

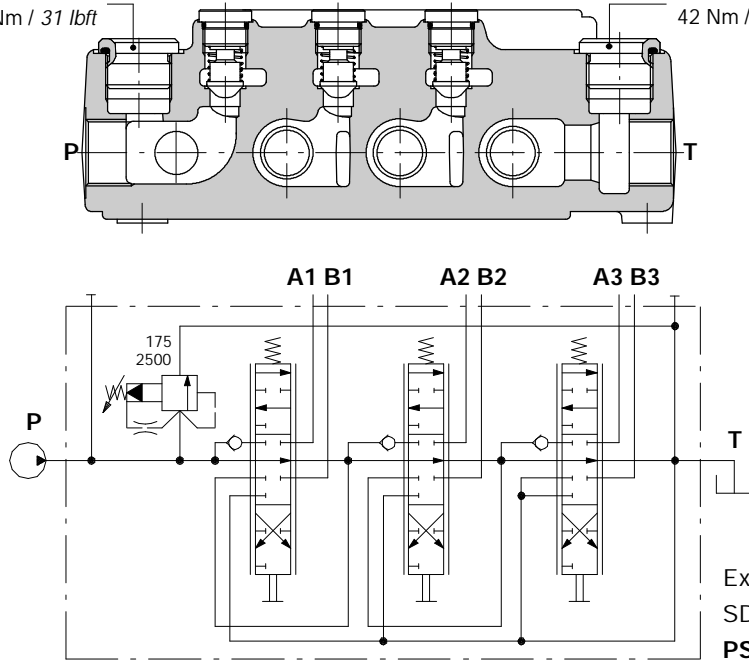
PSA: upper (standard)

See page 6

PSL: side

Allen wrench 12
42 Nm / 31 lbft

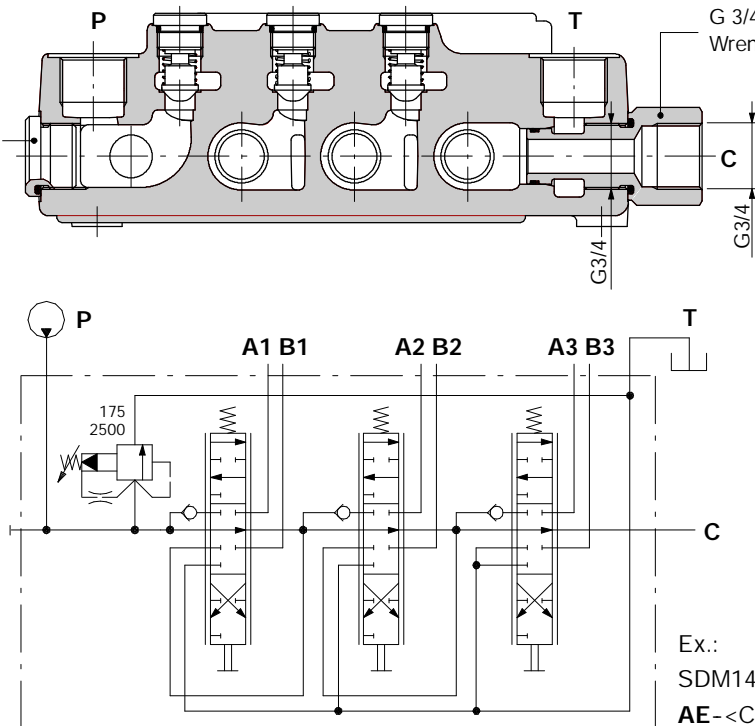
Allen wrench 12
42 Nm / 31 lbft



AE: with carry-over

Allen wrench 12
42 Nm / 31 lbft

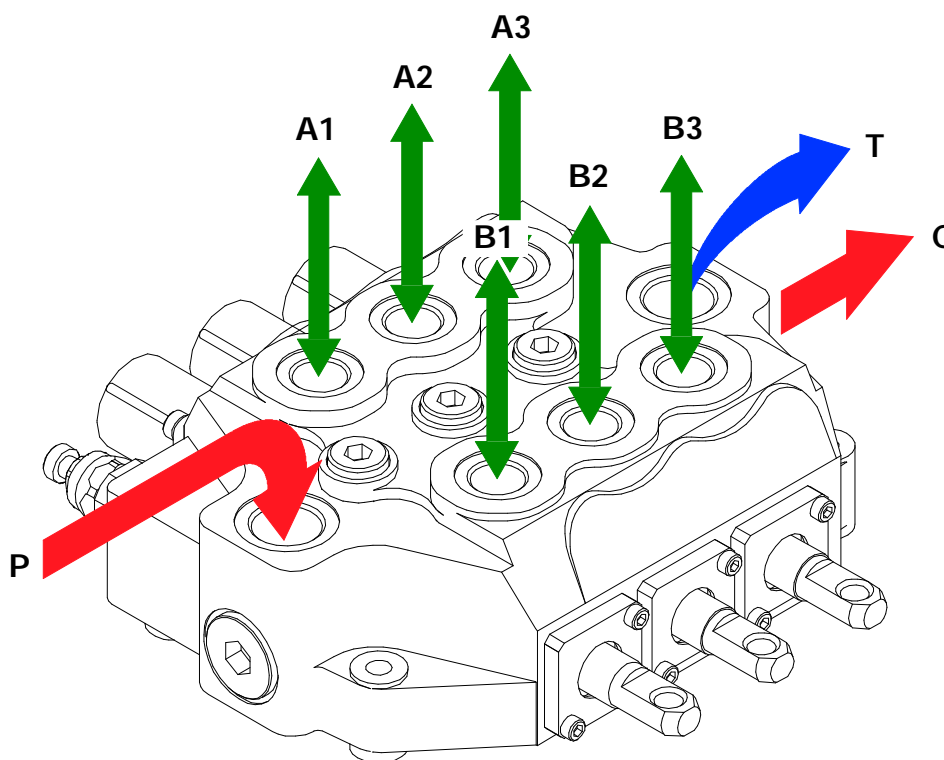
G 3/4 carry-over sleeve
Wrench 36 - 42 Nm / 31 lbft



The SDM141 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 dust proof plate 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.

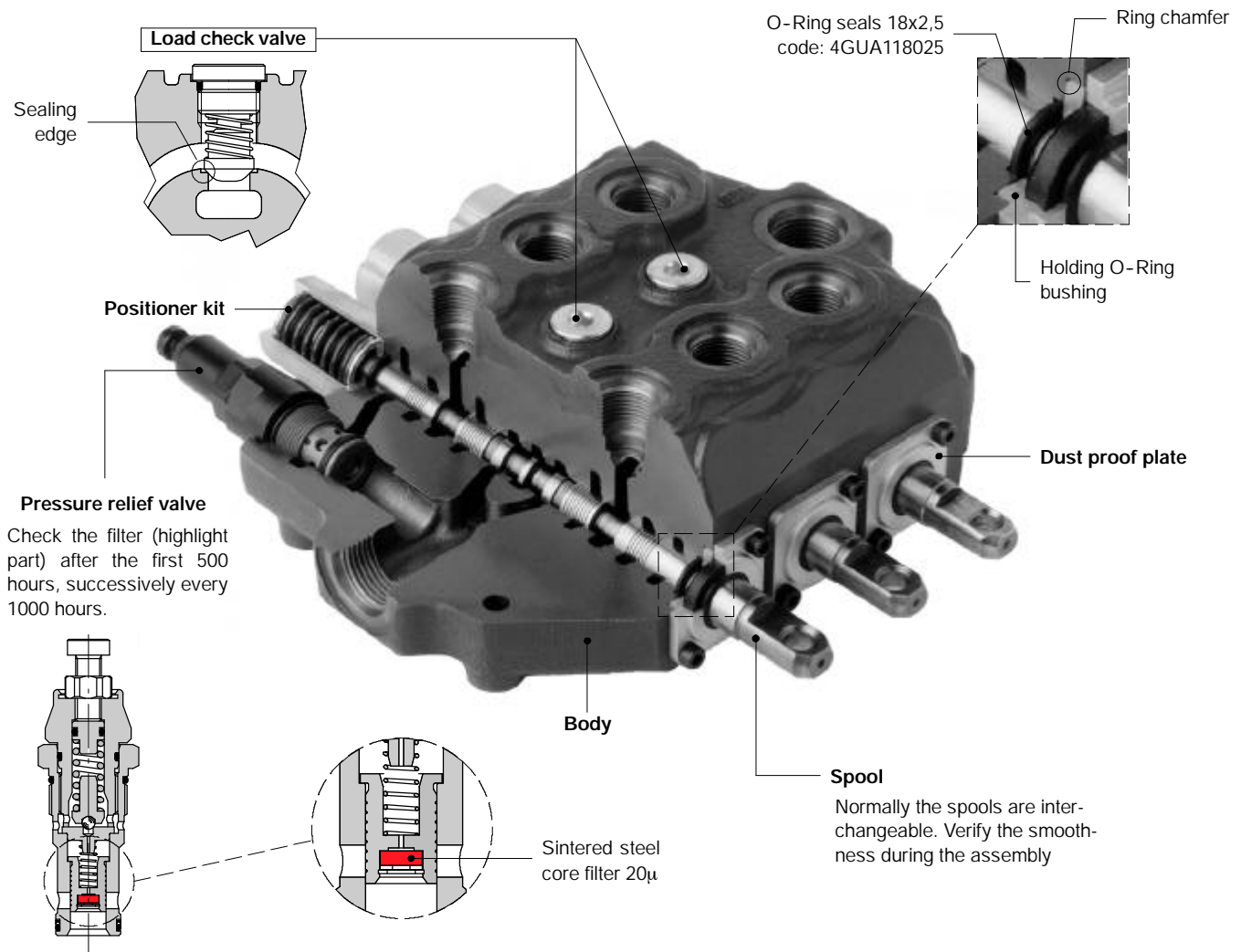


Carry-over configuration

Fitting tightening torque - Nm / lbft

THREAD TYPE	P and C ports	A and B ports	T port
BSP (ISO 228/1)	G 3/4	G 1/2	G 3/4
With O-Ring seal	70 / 51.6	50 / 36.9	70 / 51.6
With copper washer	70 / 51.6	60 / 44.3	70 / 51.6
With steel and rubber washer	70 / 51.6	60 / 44.3	70 / 51.6
UN-UNF (ISO 11926-1)	1 1/16-12 UN-2B (SAE 12)	7/8-14 UNF-2B (SAE 10)	1 1/16-12 UN-2B (SAE 12)
With O-Ring seal	95 / 70.1	60 / 44.2	95 / 70.1

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, lever box and mechanical joystick are lubricated with synthetic base grease grade NLGI2

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.	Main pressure relief valve blocked open.	Remove and clean or replace the main relief valve.
	Port relief valve open.	Remove and clean or replace the port relief valve.
	Low pump pressure and flow.	Check the pump and circuit.



WALVOIL S.P.A.

42100 REGGIO EMILIA • ITALY • VIA ADIGE, 13/D
TEL. +39.0522.932411 • FAX +39.0522.300984
E-MAIL: INFO@WALVOIL.COM • HTTP: //WWW.WALVOIL.COM

SALES DEPARTMENT

TEL. +39.0522.932555 • FAX +39.0522.932455

DAT008E