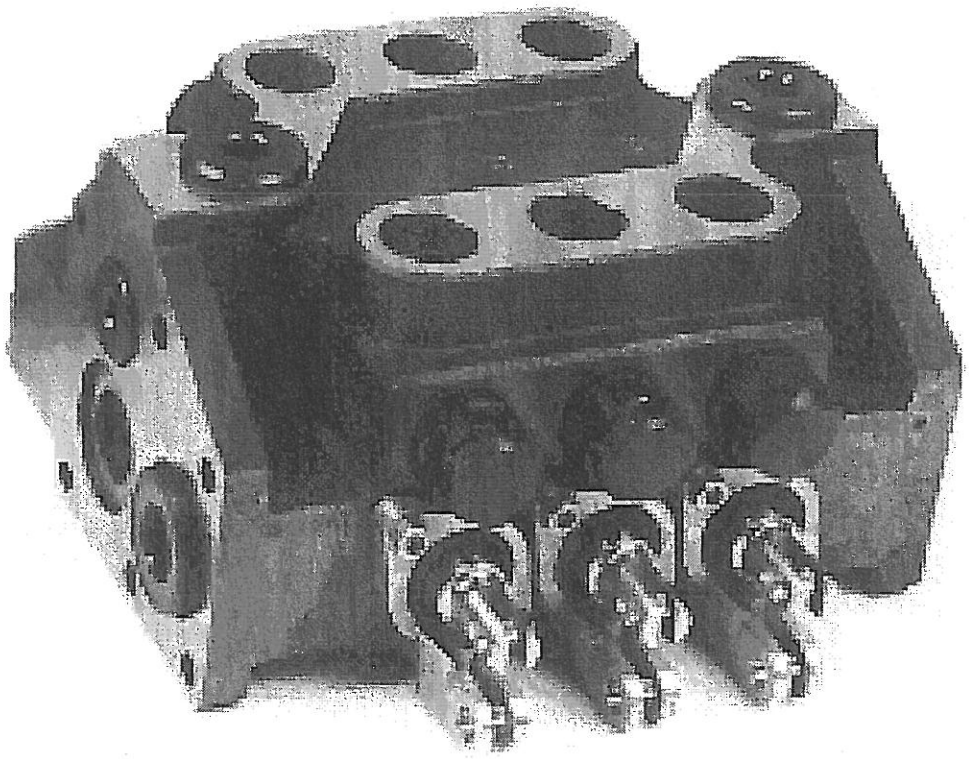
Directional Control Valve RM 310



The RM 310 is a modular parallel monoblock valve with 1 - 4 sections. It is designed for a maximum working pressure of 225 bar and for a recomended flow range of 40 - 120 l/min.

The valve has:

EXCELLENT CONTROL CHARACTERISTICS THROUGHOUT THE FLOW RANGE
Four groups of standard spools offer exceptional opportunities to optimize the control characteristics for particular applications.

FLOW CONTROL OVER A LARGE PROPORTION OF THE SPOOL TRAVEL
ensures good control of the load when inching as well as at full speed.

GOOD CONTROL CHARACTERISTICS
Several valve functions can be controlled simultaneously, even if the difference in load is high. Furthermore load check valves fitted between the funtions prevent communication from highly to lowly loaded functions.

LOW AND UNIFORM LEVER FORCES
are the result of careful balancing of the flow forces acting on the spool during the flow controlling portion of the spool movement.

A WIDE RANGE OF REMOTE CONTROLS
satisfy widely differing demands in a variety of applications.

The RM 310 valve offers the system designer wide opportunities for adaptation to the relevant application and provides the operator with control characteristics that are a cut above average. Overall system efficiency is improved by the low energy consuming resistans of RM 310.

31-02-RM310-01

Technical Data

Max system pressure
(depending on appl.): .....225 bar 22,5 (MPa)

Max recommended pump flow:.....180 l/min

Operating force
directly on the spool: .....180 N (18kp)

Max continuous
return line pressure:.....10 bar (1,0 MPa)

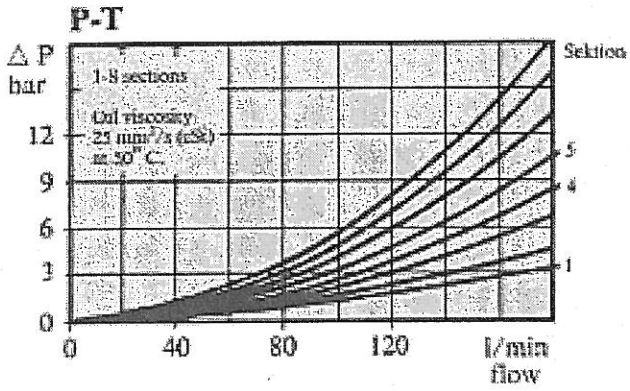
Hydraulic fluid temperature range for
continuous operation:.....-15°C - + 80°C

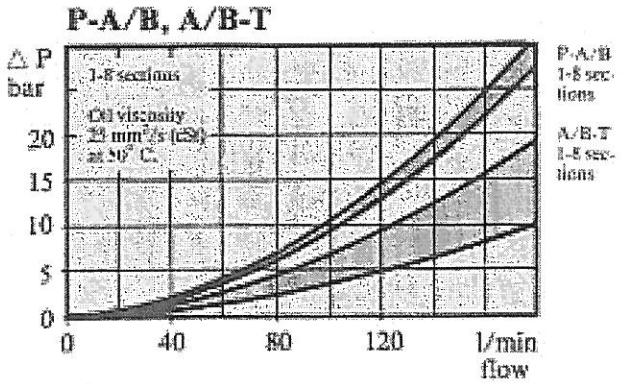
Contamination level:
Normally.....
Equal to or better than ISO 18/14
At high system pressures and/or remote control.....
Equal to or better than ISO 16/12

Hydraulic fluid viscosity range:
.....10-400 mm²/s (cSt)

Spool leakage at 100 bar och 30 mm²/s (cSt):
.....<10 cm³/min

Pressure drop





Control characteristics

Spool type D — — —

Pump flow: 60 l/min

I = load pressure 50 bar

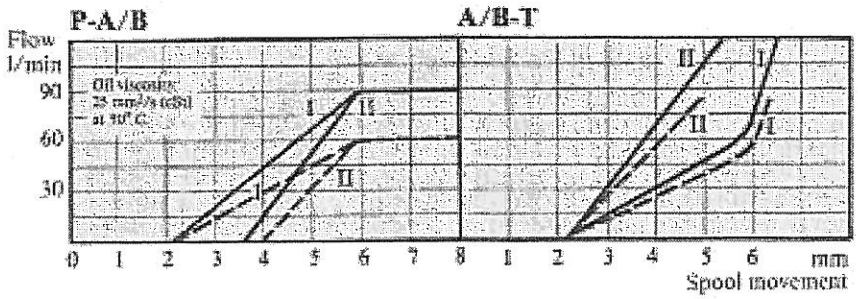
II = load pressure 250 bar

Spool type G ————

Pump flow: 90 l/min

I = load pressure 50 bar

II = load pressure 250 bar



Spool type K — — —

Pump flow: 120 l/min

I = load pressure 50 bar

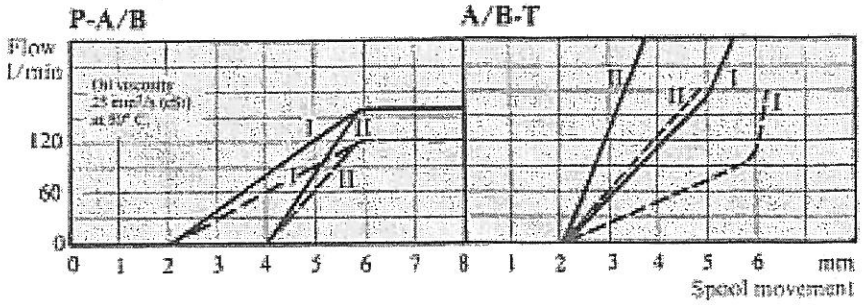
II = load pressure 250 bar

Spool type Q ————

Pump flow: 160 l/min

I = load pressure 50 bar

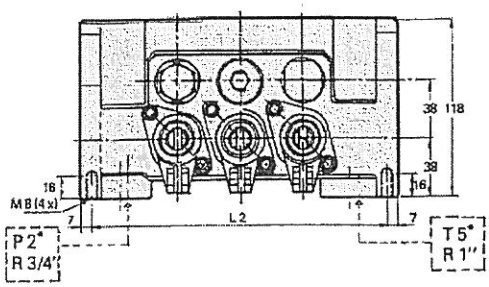
II = load pressure 250 bar



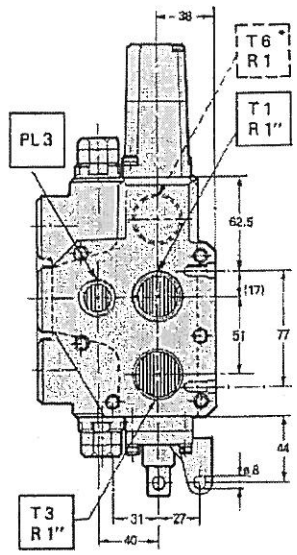
Dimensions, Weight

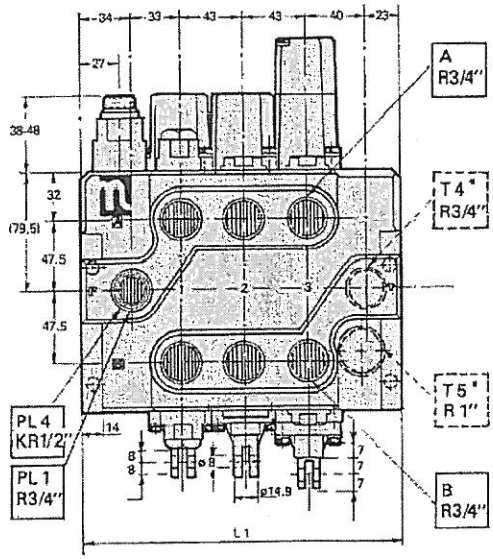
Connections drilled on special order only.

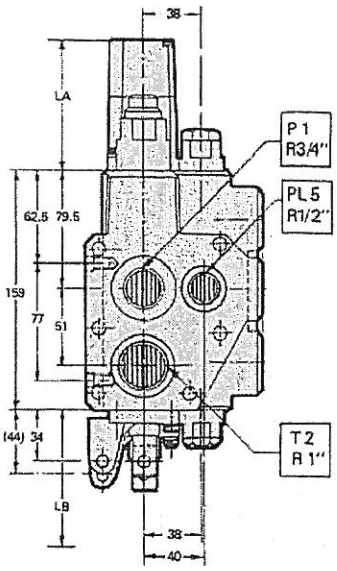
All dimensions in mm.
Type R. thread = B.S.P. thread.
SAE port treads available on request.



No. sect	Weight kg	L1 mm	L2 mm
1	11,1	130	116
2	15,4	173	159
3	19,6	216	202
4	23,8	259	245







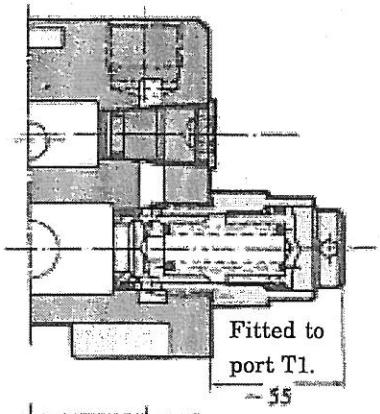
The measurements given above apply to the valve housing and spool control positions

Length mm	Spool control type (see page 5)					
	9	9M	10-15	L81-L83	P/PP	EP
LA	41	72	87	102	99	max 134
LB	-	-	-	-	-	-

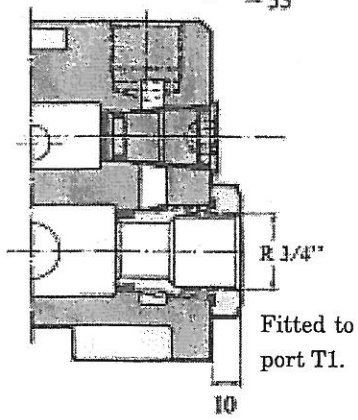
Length mm	Spool control type (see page 5)						
	MM	HD HPD	HPDM	EH	EHP	3W	4W
LA	-	72	-	max 189	185	-	-
LB	92	72	92	-	-	100	110

Pilot pressure valve TMB 300

Adjustment range: 4 - 20 bar



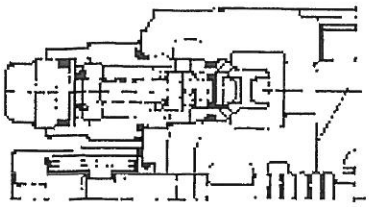
Carry-over nipple



Relief Valve and Auxiliary Valves

Main relief valve TBB 201

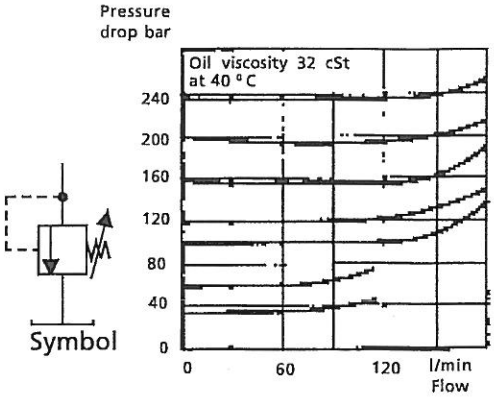
Differential area relief valve for the main circuit.



Setting range:

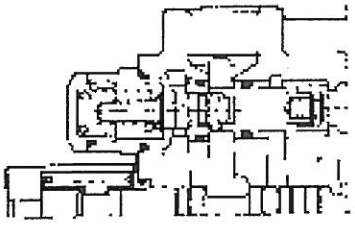
35 - 65 bar
65 - 95 bar
95 - 125 bar
125 - 160 bar
160 - 200 bar
200 - 240 bar
240 - 250 bar

Relief function characteristic



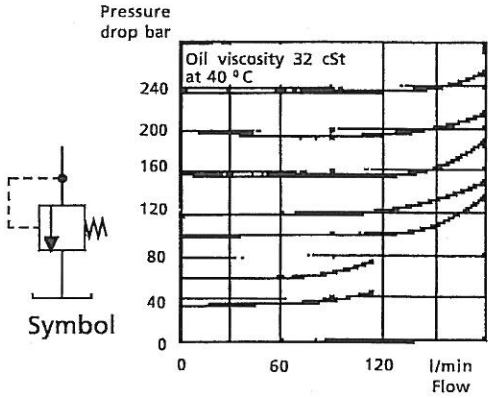
Service line relief valve TB 202

Differential area relief valve for the secondary circuit.



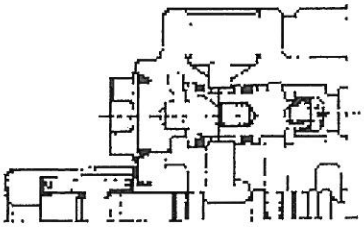
Setting range:

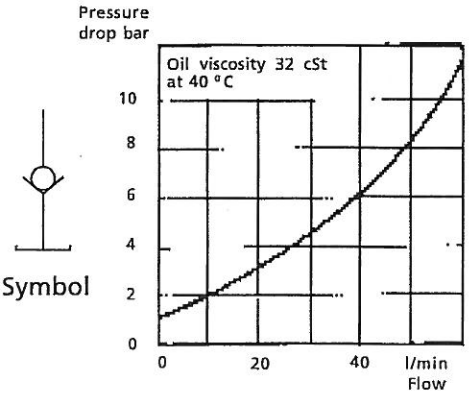
35 - 65 bar
65 - 95 bar
95 - 125 bar
125 - 160 bar
160 - 200 bar
200 - 240 bar
240 - 300 bar



Anti-cavitation valve SB 250

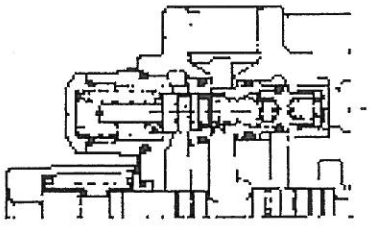
Check valve for equalising vacuum in the secondary circuit.

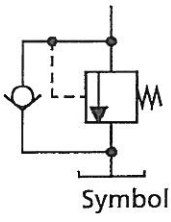




Line relief and Anti-cavitation valve TBS 202

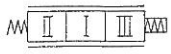
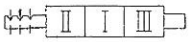
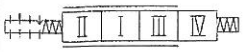
Combination of relief and anti-cavitation valve for the secondary circuit.

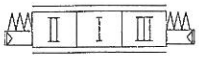
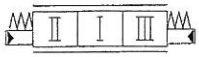
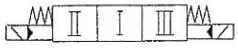




Characteristics:
See particulars of the line relief valve and anti-cavitation valve

Spool Controls

Symbol	Description	Type
	Spring centred. Marine version	9 9M
	Detent in positions 1, 2 and 3.	10
	Spring centred. Detent in position 4.	11
	Spring centred. Detent in positions 3 and 4	12
	Spring centred. Detent in position 2.	13
	Spring centred. Detent in position 3.	14
	Spring centred. Detent in position 2 and 4.	15
	External kick-out from spool, pos 2. ***	L81

Symbol	Description	Type
	External kick-out from spool, pos. 3. ***	L82
	External kick-out from spool, pos 2 and 3.. ***	L83
	PP= pneumatic proportio-nal.	PP
	Electric pneumatic on/off. Rated voltage 12/24V= *	EP
	Hydraulic on/off.*** Pilot pressure min 7 bar. Pilot pressure max 40 bar.	HD
	Hydr. proportional.*** Pilot pressure 6 - 16 bar. Pilot pressure max 40 bar.	HPD4
	El. hydr. on/off.. *** Flow demand 1 l/min for opera-tion. Pilot pressure min 7 bar. Pilot pressure max 40 bar.Duty factor 100%.**	EH

In addition to presented spool controls following standard spool controls are available:

- MM- marine/enclosed hand lever.
- HPDM- hydr. prop., with hand lever.
- 3W, 4W, - spool controls for cable control.

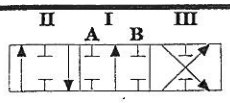
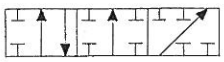
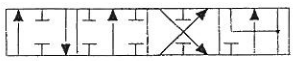
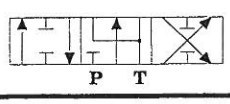
Contact us for further infromation.

* Rated current 350/190mA. Energizing power 2,3 W. Min. holding power 0,15 W. Max voltage variation. ±5%. Duty factor 100%. Conn. M5.For hose 6 x 1.

**Rated voltage 12/24V =.Rated current 180/90 mA. Max voltage variaation ± 16%. Selection time to extr. pos. 200 ms, spring centering time 110 ms.

*** Connection: 1/4" BSP

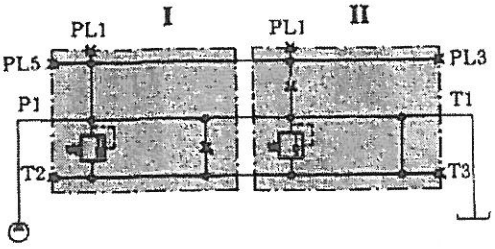
Spools

Symbol	Recommended flow range, l/min					Notes
	40-75	50-100	60-110	80-130	120-180	
	1D	1F 1FS	1HR 1HSR 1G	1K 1KR	1Q	Further standard spools and variants are available. R = spool with round solid lever end, for joy-stick hand lever.
	-	2F 2FB	-	2K 2KB	-	
	-	-	-	3K	-	
	-	-	-	4K	4Q	

Valve combinations

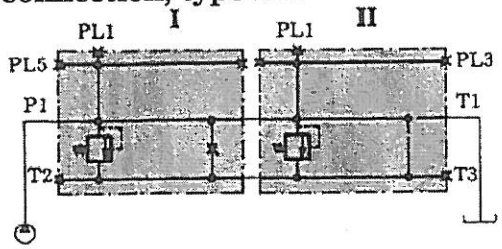
The RM 310 monoblock valve has a parallel spool circuit, i.e. the valve sections in the block can be actuated simultaneously. The valve blocks are designed for use as separate units or in various combinations. In the latter case, two or more blocks can be bolted togheter or interconnected by means of pipes.

Single-pump operation with parallel connection, type K1.



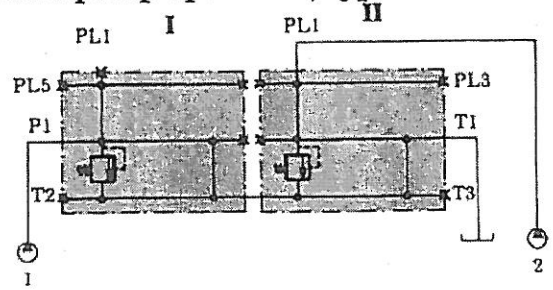
Valve blocks connected for parallel operation. The valve sections in blocks I and II can be actuated simultaneously.
The main relief valve in block II can be replaced with a special plug.

Single-pump operation with carry-over connection, type K2.



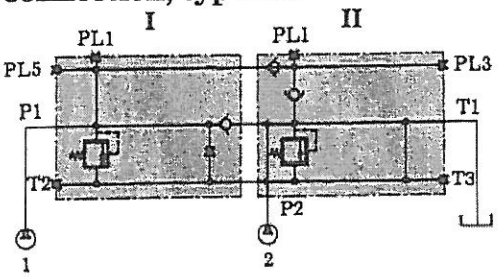
When the valve blocks are connected for carry-over, spools actuated in the first block recieve priority and with only excess flow passing to block II.
The main relief valve in block II can be replaced with a special plug

Two-pump operation, type K3.



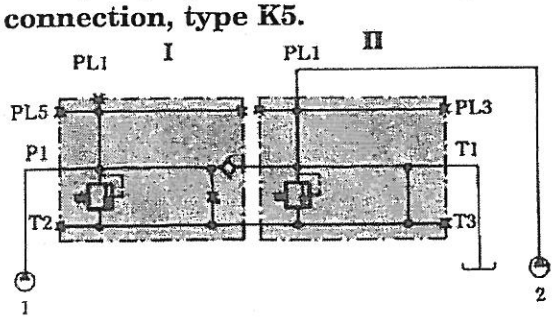
Block I and block II can be operated simultaneously.
Only the line to the tank is common.

Two-pump operation with parallel connection, type K4.



Spools in block I and block II can be operated simultaneously.
Block I is supplyed by pump 1 and block II by pump 2.
With block I spools in neutral position flow from pump 1 passes to block II and is combined with pump 2.
To ensure simultaneous operation of two different loads the higher load must be on block II. For K4 combination, pump 2 must be connected to P2 (which is drilled only to special order).

Two-pump operation with carry-over connection, type K5.

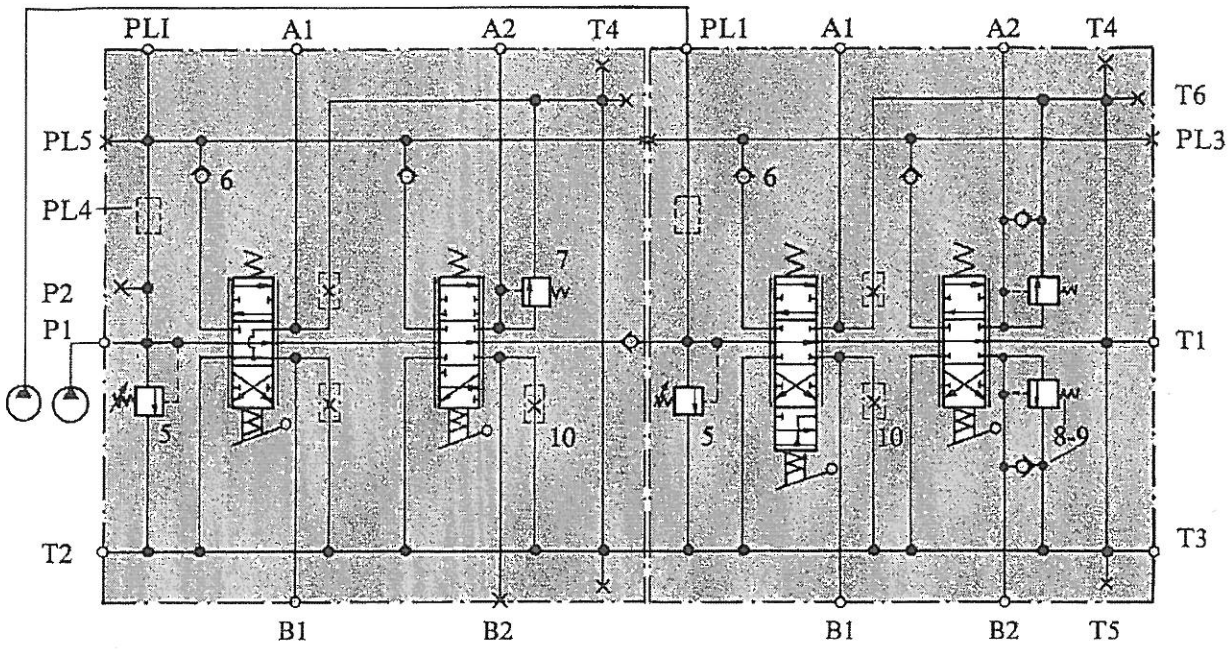


The valve sections in blocks I and II can be operated simultaneously.
Block I is always supplied with oil from pump1.
Block II is always supplied with oil from pump2.
When block I is not operated oil from pump1 passes to block II.

Connection diagram

RM 312
Block I

RM 312
Block II



DESCRIPTION

Two valve blocks RM 312 are connected toghether according to the valve combination with series connection (see page 6).
not connected, pump and tankports are to be plugged according to order.
The ports P2, T4, T6 and T5 are to be drilled according to special order.

1. Motor spool type 4.
2. Single acting spool type 2.
3. Double acting spool with float position type 3.
4. Double acting spool type 1.
5. Main relief valve TBB 201.
6. Load check valve.
7. Service line relief valve type TB 202.
8-9. Line relief and anti-cavitation valve TBS 202.
10. Shock plug.