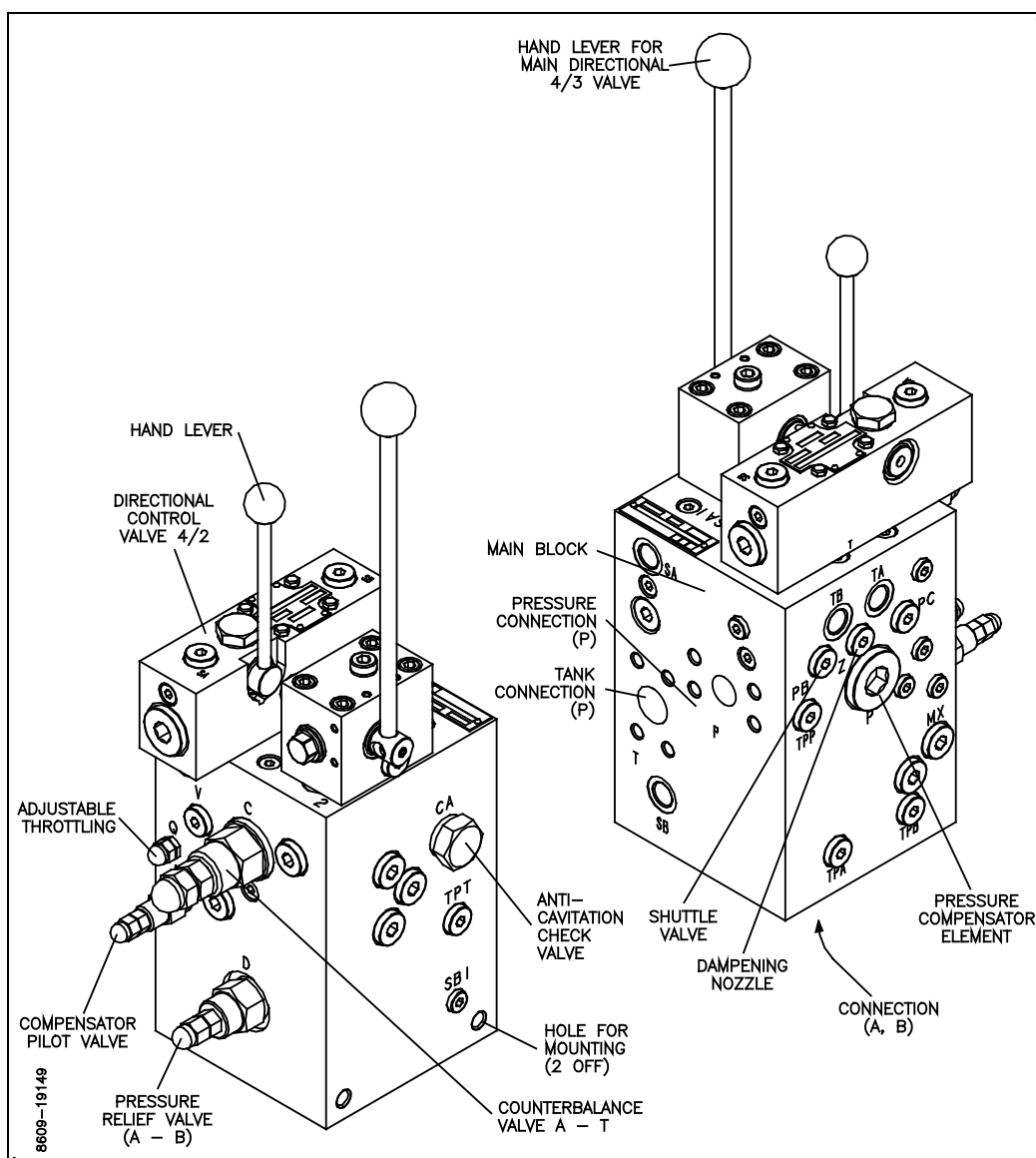


# INSTRUCTION MANUAL 8MB BASIC VERSIONS

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3D view of 8MB with two speed selector valve..

## FEATURES

8MB modular unit is a complete unit for control of hydraulically driven winches. 8MB is designed for constant pressure /variable pump system. 8MB has excellent metering characteristics, and is specially designed to withstand marine surroundings.

## GENERAL DESCRIPTION

8MB modular unit includes in basic version directional control valve (2), pressure compensation flow control system (P, PB, PA, PC and Z), free flow check valve (CA), load control (C and Q) and pressure relief (D). (See diagram page 7)

## INSTRUCTION MANUAL 8MB BASIC VERSIONS

## VALVE DESCRIPTION

**Item 1 Main block.**

The marking of ports and screw in cartridge valves is very distinct on the block, engraving is done in the CNC machining centre.

**Item 2 Directional control valve 4/3.**

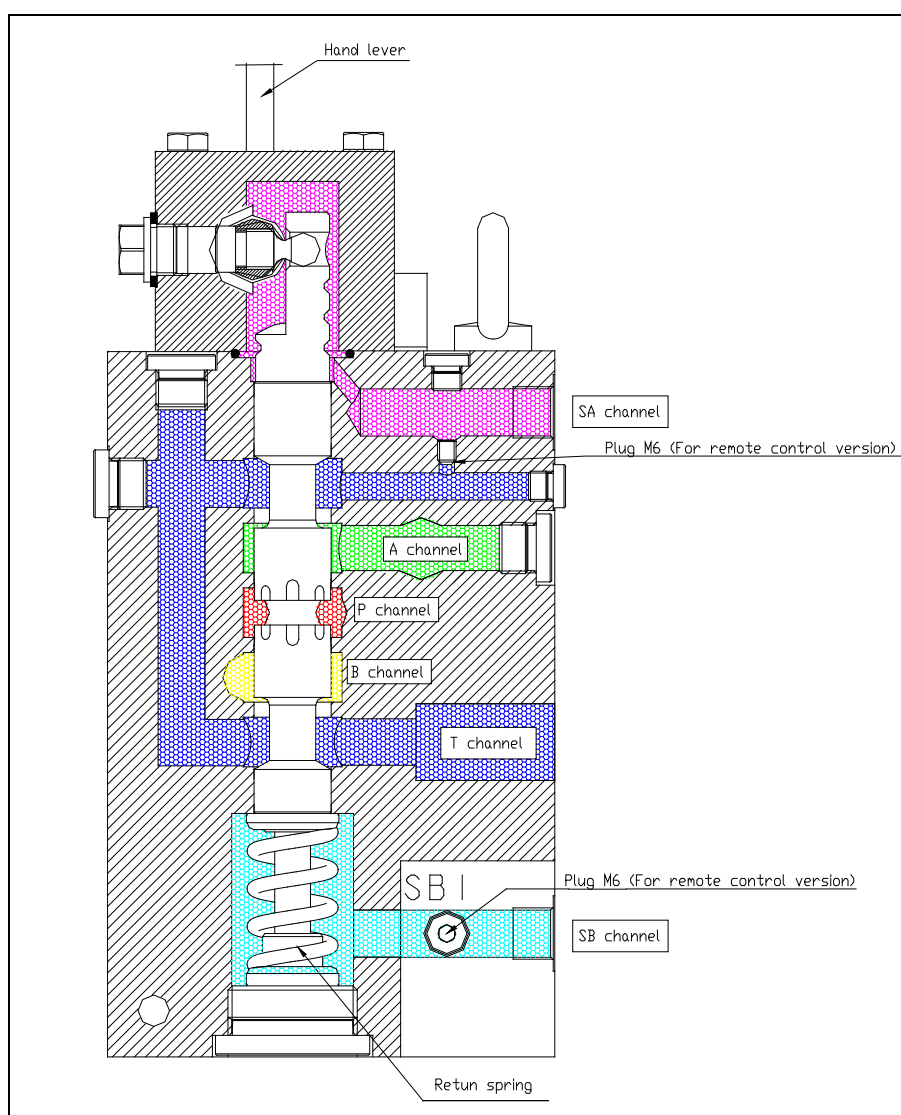
This is a three position directional spool valve with hand lever. When activating the directional valve handle, the operator controls the direction and drive speed on the drum. Throttling grooves in the main spool open progressively for flow either to A or B ports.

*Option code 37:*

Directional valve is prepared to be hydraulic proportional remote controlled. Pilot pressure 5-20 bar.

*Option code L:*

In neutral position there is a manual controlled safety lock for locking the spool. This is a mechanical device for preventing operation of the directional valve unless the safety lock is manually released.



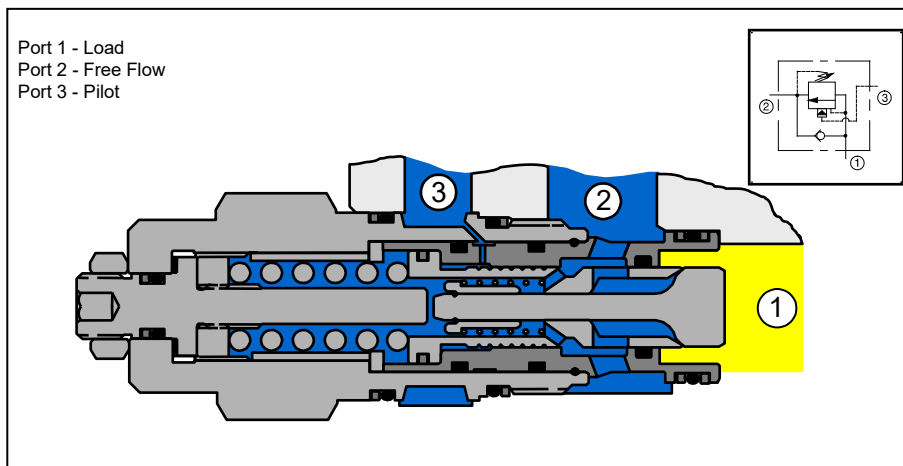
Section of main directional (2) valve of 8MB

# INSTRUCTION MANUAL 8MB BASIC VERSIONS

## Item C

### Counterbalance valve A→T.

The counter balance valve keeps the load under control during lowering operations. By the variation of opening area caused by input signal from B port/port 3 counter balance poppet open progressively for flow from A→T port, and thus give a smooth lowering operation and low pressure rise with full flow. The counter balance cartridge have integrated free flow check valve from P-A (section drawing port 2→1)

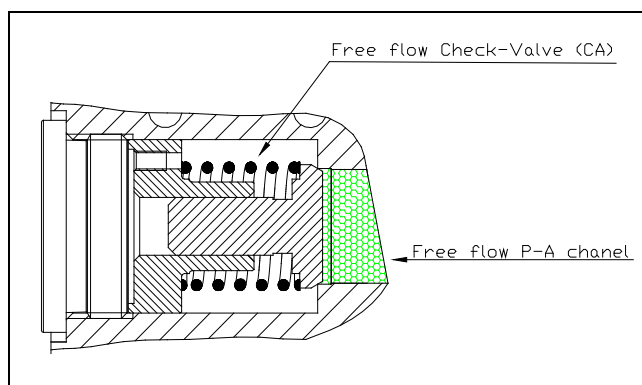


Section of Counter balance valve (C) with integrated free flow check valve 8MB-\*\*\*

## Item CA

### Check-valve free flow P→A

Free flow check valve in parallel with the counter balance valve, for reduced pressure drop in Heave P→A.

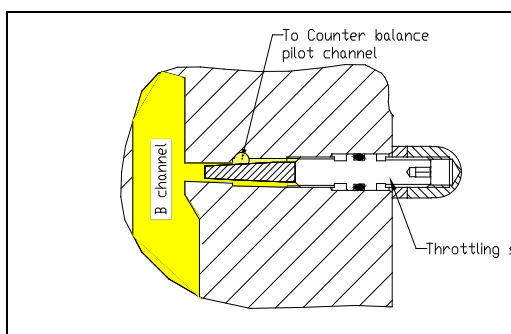


Section of Free flow check valve item CA

## Item Q

### Adjustable throttling.

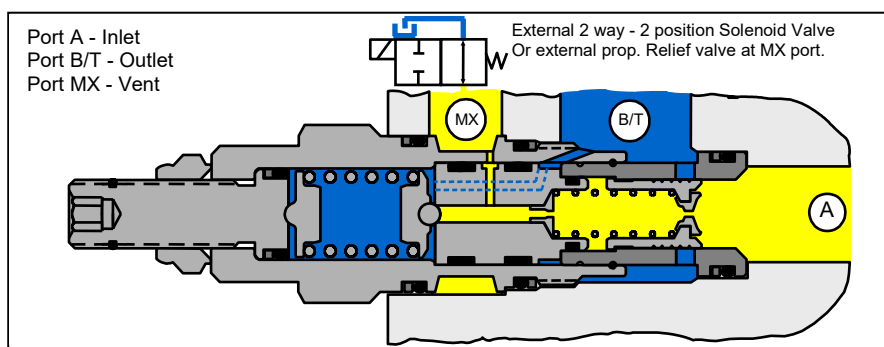
Throttling for the counter balance pilot channel. For dampening the counter balance valve if the valve is fluctuating.



## INSTRUCTION MANUAL 8MB BASIC VERSIONS

*Section of Throttling screw item Q***Item D Pressure relief valve A→B**

The pilot operated pressure relief valve is connected between motor ports A→B to secure the hydraulic motor and limit the maximum pressure. The pressure relief valve has an internal vent port for remote control of decreased pressure in tension mode.



# INSTRUCTION MANUAL 8MB BASIC VERSIONS

## Generally about the pressure compensator system.

This is a load independent system, which means that equal spool stroke on the directional valve will give equal flow independent on load at the motor.

Main directional spool (2) in conjunction with pressure compensator flow control system (P, PA, PB, PC and Z), regulate proportional oil flow to either A (Heave rotation) or B (Lower rotation) by sensing pressure either in A or B line through the shuttle valve (PC). When operating directional spool (2), spool will open progressively to A or B. Pressure compensation element will maintain equal  $\Delta p$  across the directional valve. Maximum flow over the main directional valve is depending on the force induced on the pressure compensator element (P). This force is made up of a spring force in the compensator element item (P), and adjustable spring force in the compensator pilot valve (PA) and the load pressure sensing in A or B via (PC). When setting is altered on the compensator pilot valve (PA), flow will change.

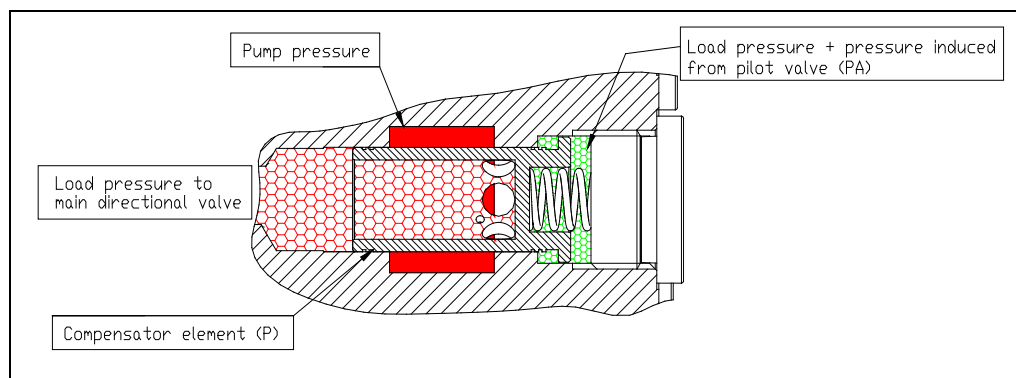
When adjusting compensator pilot valve PA, the  $\Delta p$  through the directional valve will alter, and thus maximum flow to the hydraulic motor.

### Item PC Shuttle valve for the pressure compensator.

Load sensing either in A or B line.

### Item P Pressure compensator element.

Normally open modulating element which act as a pressure compensator to maintain a constant pressure drop across the directional valve (together with PC, PA, PB and Z).



Section of pressure compensator element (P) of 8MB-\*\*\*

### Item Z Nozzle

For dampening the pressure compensator element.

### Item PB Nozzle

Maintain flow to by pass compensator pilot valve PA.

### Item PA Compensator pilot valve.

The spring on the compensator is rather weak. Therefore, pressure created by adjustable pressure relief valve is added to the spring force.

# INSTRUCTION MANUAL 8MB BASIC VERSIONS

## Option Item T

### Directional control valve 4/2.

This is a two position directional spool valve. To be used for switching two-speed system in the hydraulic motor.

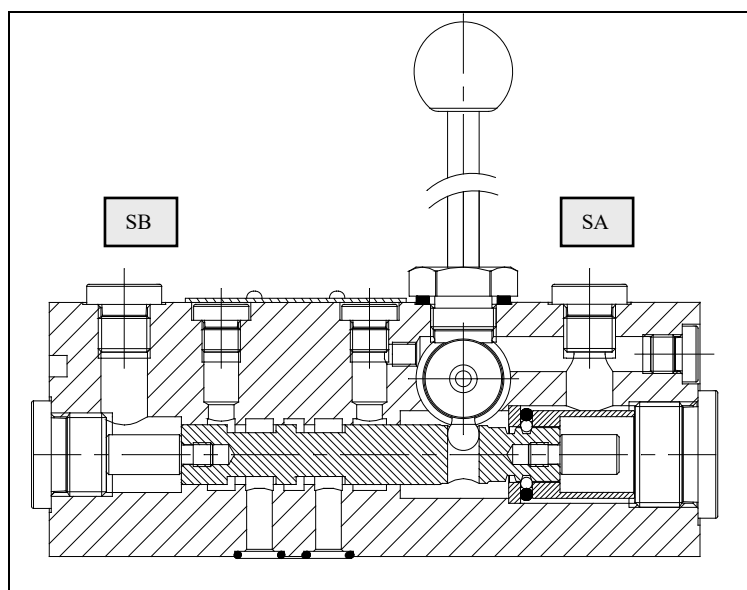
#### *Manual operated version:*

Manually controlled directional valve, where spool position and oil flow on/off is controlled by a hand lever. The valve can be delivered with centring spring and/or detents. After operating the valve to one of the end positions the centring spring will return the spool to neutral position, and hold it in this position. If the valve is supplied with detents, the lever can be left and the spool will remain in this position. Oil in the end chambers are drained to port T.

#### *Remote controlled version:*

Manual/remote controlled directional valve, where the spool position and oil flow on/off is controlled by hand lever or an external pilot pressure.

Pilot pressure at port SA or SB at the NG6 valve, controlled by an external valve, is applied direct to the pressure chamber and moves the main spool to one of the end positions.

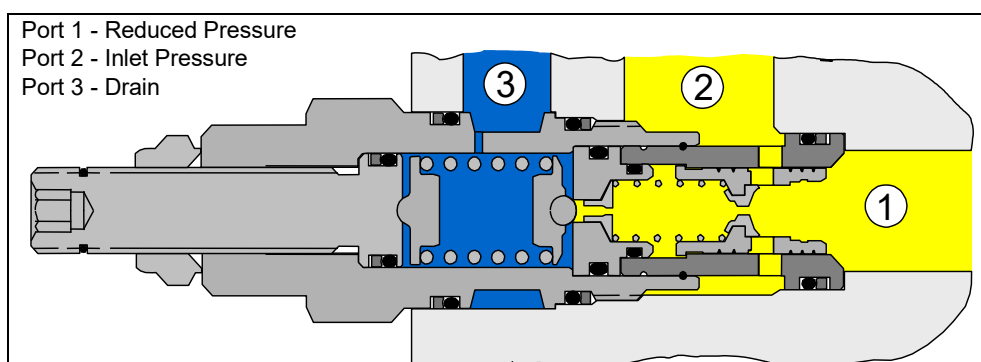


Section of NG6 directional valve item T.

## Option Item R

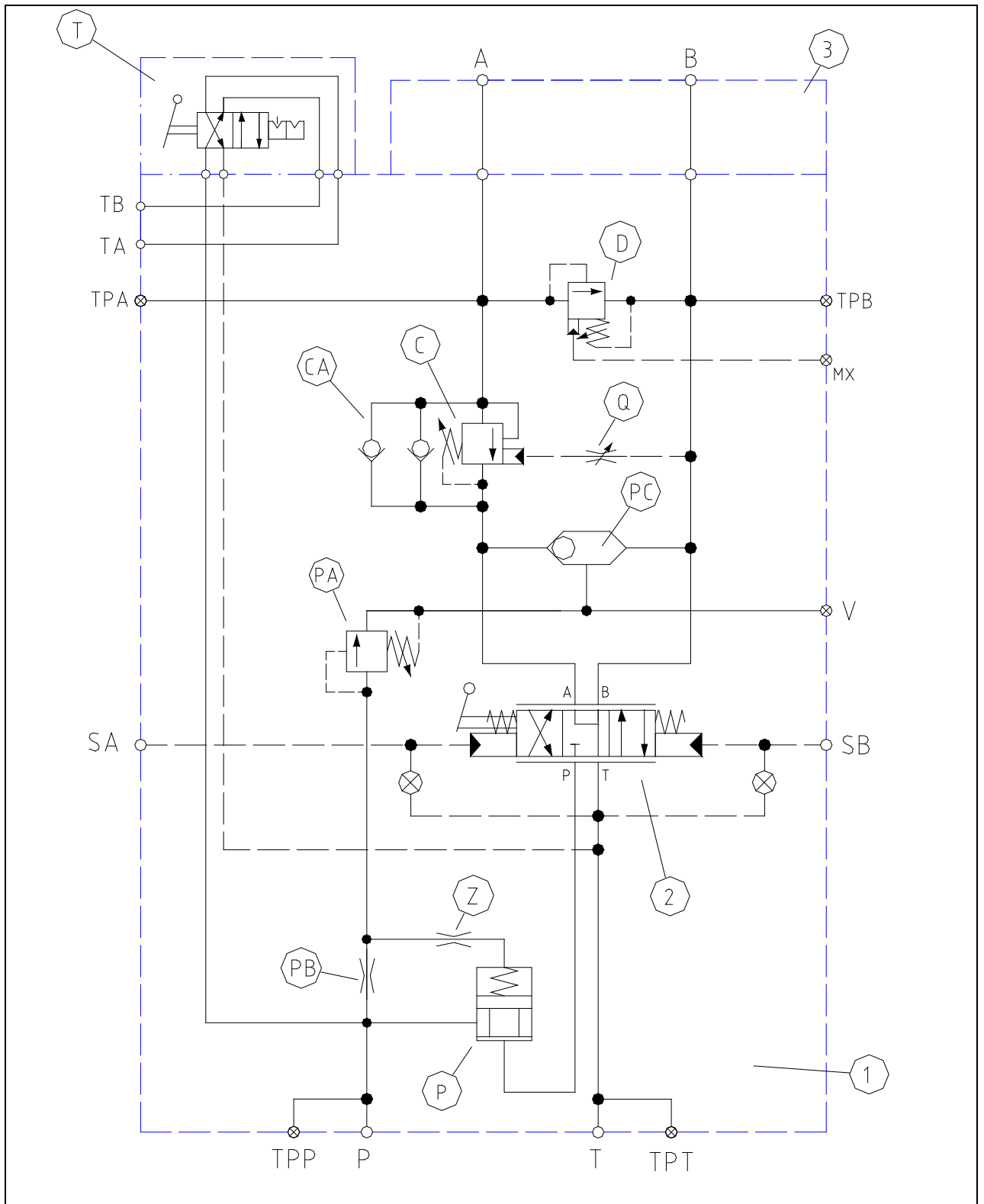
### Pressure reducing valve

Pilot operated pressure reducing valve for reduced pressure to the two-speed system.



# INSTRUCTION MANUAL 8MB BASIC VERSIONS

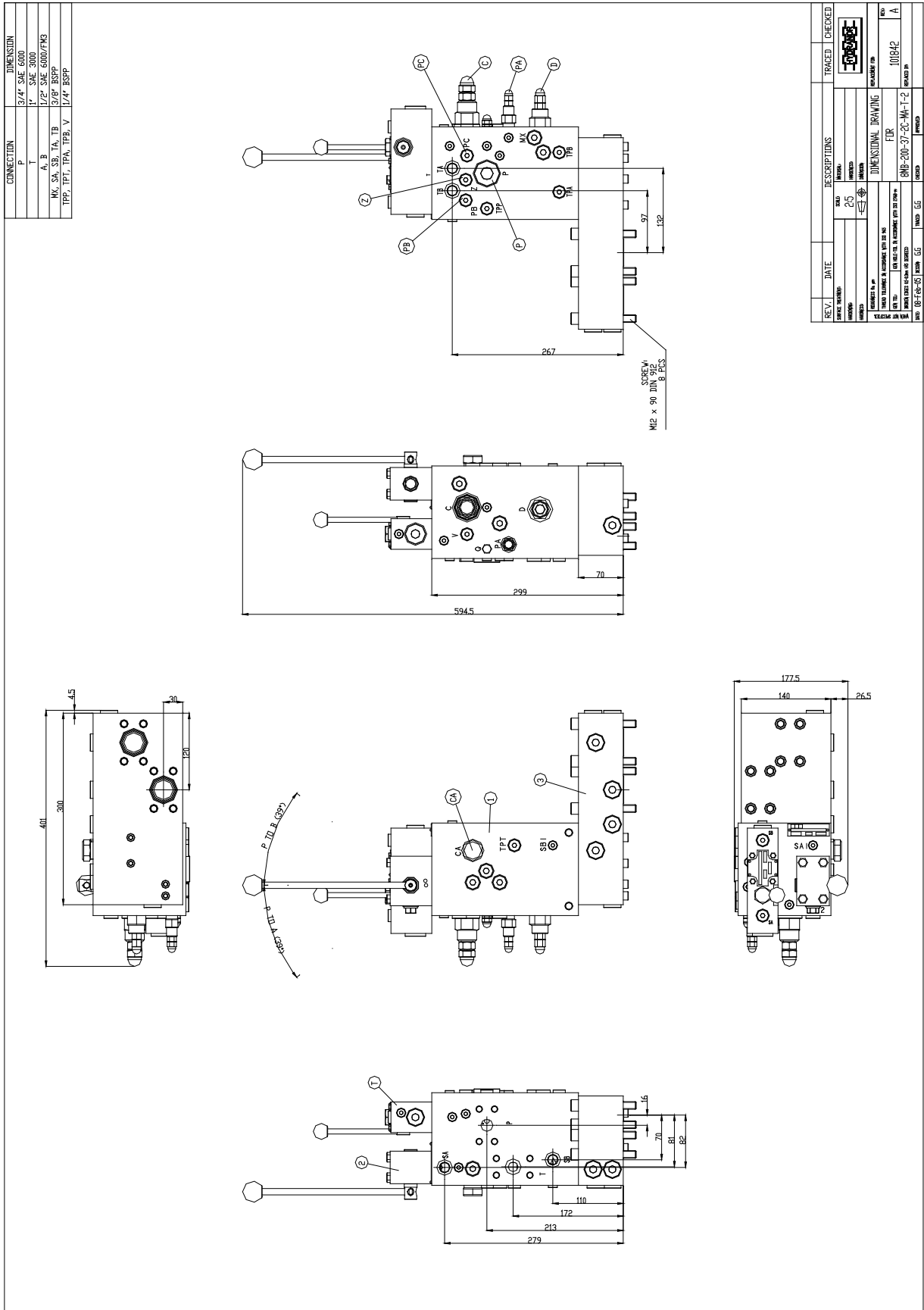
## HYDRAULIC DIAGRAM 8MB



*Hydraulic diagram of 8MB\* (Hydraulic remote controlled version, with two-speed selector valve and adapter for motor mounting)*

# INSTRUCTION MANUAL 8MB BASIC VERSIONS

## DIMENSIONAL DRAWING 8MB



Dimensional drawing 8MB\* (Shown version, with two-speed selector valve and adapter for motor mounting)



# INSTRUCTION MANUAL 8MB BASIC VERSIONS

## ADJUSTMENT PROCEDURE

AS Hydranor has performed a complete function and pressure test before shipment, to ensure that every unit fulfil its given specification.

### PREPARATION BEFORE ADJUSTMENT

- Check that all connections are properly connected and according to existing drawings.
- Operate the directional valve (2) and run motor unloaded in both directions until air is evacuated and system is preheated.

### ADJUSTMENT OF COUNTER BALANCE VALVE (C)

*Counter balance is factory preset to 325 bar. Recommended presetting for the counter balance valve is 1.3 times the maximum load pressure. (250 bar load pressure x 1.3 = 325 bar)*

It is difficult to set the counterbalance valve in the field, ideally it should be set in a test rig.

Alternative procedure for adjusting counter balance valve in field to approximately to 325 bar.

- Connect pressure gauge in port TPB.
- Loosen cap nut and nut for the counter balance valve adjusting screw.
- Turn adjusting screw counter clockwise to max.
- Turn adjusting screw clockwise 1 turn to reduce setting. Verify opening pressure is 60 bar. Switch directional valve to lower. Do not have full deflection on the handle, but check at minimum flow. Counter balance valve opens when the motor start to rotate.
- Tighten nut and cap nut.
- Disconnect pressure gauge in TPB

### ADJUSTMENT OF THROTTLING (Q) FOR THE COUNTER BALANCE VALVE

*Factory preset to ½ turn from closed position.*

**Note: Be sure that the throttle screw is not in closed (bottom) position; this will prevent the counter balance valve from opening. Closed (bottom) position is when screw is turned completely clockwise.**

In lowering phase it can occur that the counter balance valve will knock if the dampening (Q) is not correct adjusted. When adjusting the throttle valve (Q) the reaction of the counterbalance valve will change.

If having fluctuation:

- Loosen cap nut and nut for the throttle valve (Q).
- Switch directional valve to lower.
- Turn screw clockwise to increase dampening.
- Turn screw counter clockwise to decrease dampening. Recommended adjustment is ½-¾ from closed position. Turn adjustment screw to achieve satisfactory stability.
- Tighten nut and cap nut for item (Q).

# INSTRUCTION MANUAL 8MB BASIC VERSIONS

## **ADJUSTMENT OF PRESSURE RELIEF VALVE (D)**

*Factory preset to min, if not pressure setting is specified in the order.*

- Connect pressure gauge in port TPA.
- Block the motor.
- Loosen cap nut and nut for the relief valve adjusting screw (D).
- Switch directional valve to Heave. Do not have full deflection on the handle, but adjust at minimum flow.
- Turn adjusting screw clockwise to increase pressure setting for the pressure relief valve (D). Turn adjusting screw counter clockwise to decrease pressure setting for the pressure relief valve (D). Full adjustment range is 5 turns.
- Tighten nut and cap nut for item (D).

## **ADJUSTMENT OF MAX FLOW**

- Loosen cap nut and nut for the adjustable spring on relief valve (PA).
- Switch directional valve to Heave, and move the operator handle in full deflection.
- Turn adjusting screw clockwise on the relief valve (PA) to increase the flow, and thus increase force induced on the pressure compensator element. Turn adjusting screw counter clockwise on the relief valve (PA) to decrease the flow. Full adjustment range is 5 turns.
- Tighten nut and cap nut for item (PA).

## **OPTION: ADJUSTMENT OF PRESSURE REDUCING VALVE (R)**

*Factory preset to min, if not pressure setting is specified in the order.*

- Connect pressure gauge in port TPR.
- Loosen cap nut and nut for the reducing valve adjusting screw (R).
- Turn adjusting screw clockwise to increase pressure setting for the pressure reducing valve (R). Turn adjusting screw counter clockwise to decrease pressure setting for the pressure reducing valve (R). Full adjustment range is 5 turns.
- Tighten nut and cap nut for item (R).

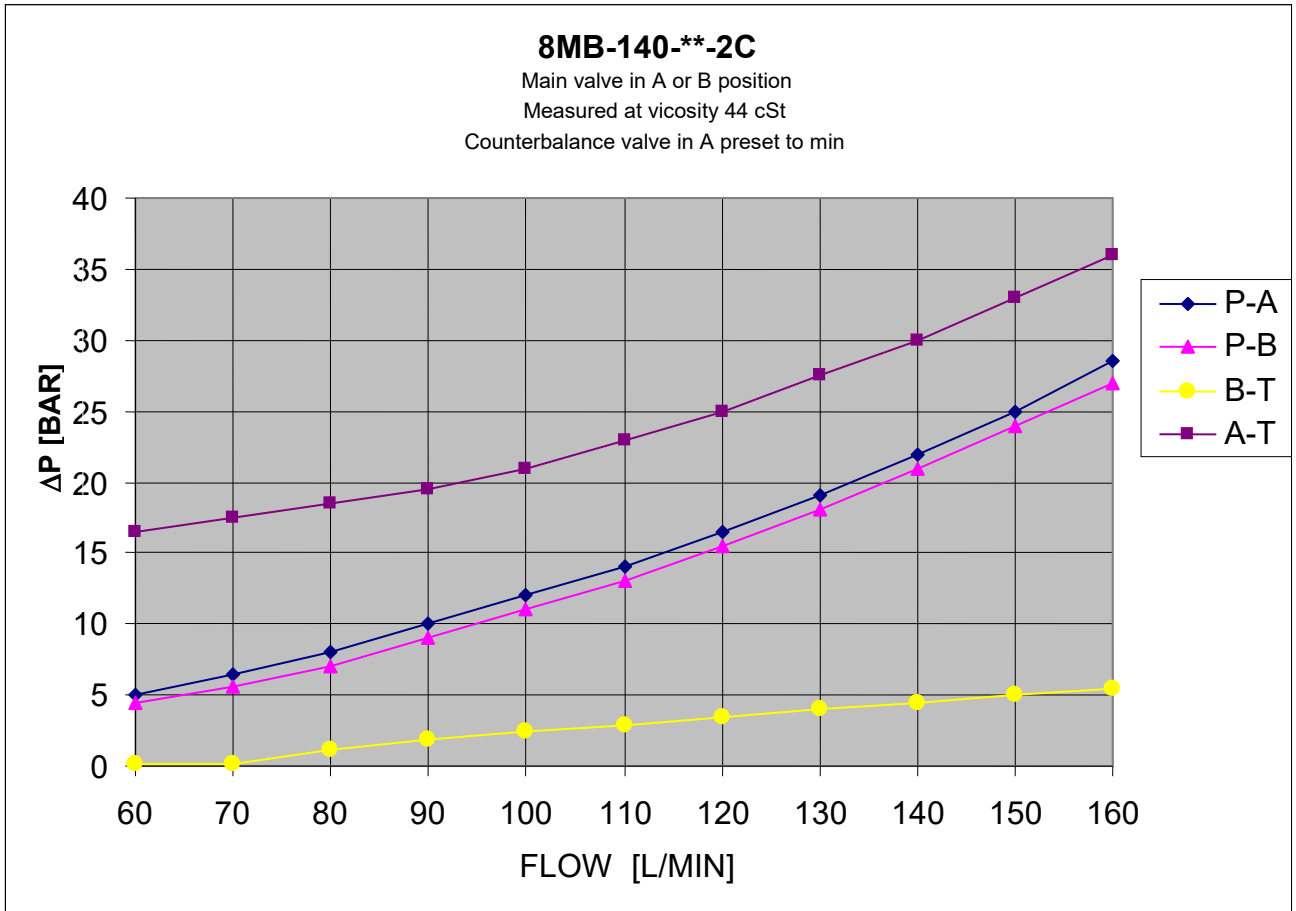
## INSTRUCTION MANUAL 8MB BASIC VERSIONS

## TECHNICAL DATA

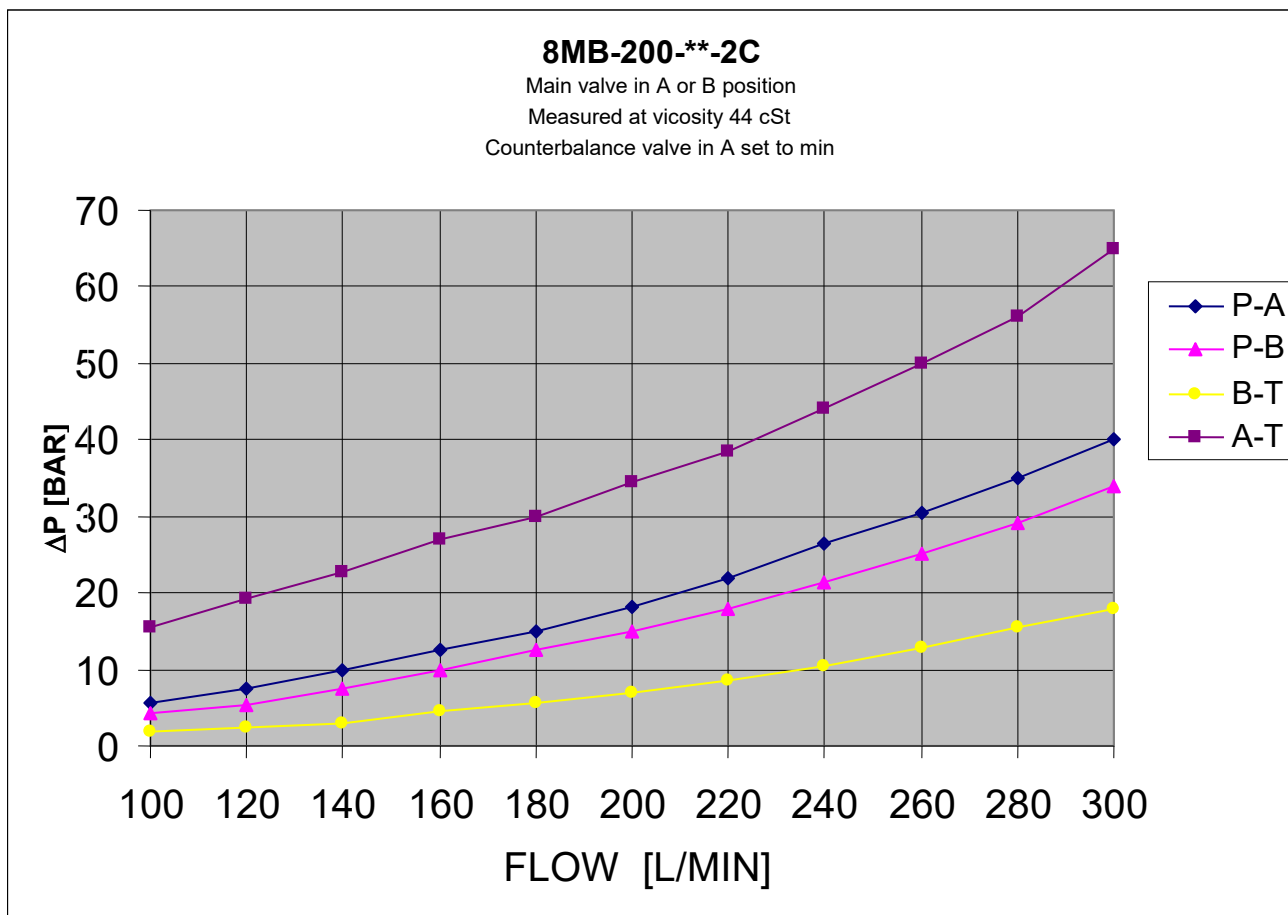
Description	Symbol	Unit	Value	
			8MB-140	8MB-200
Flow	$Q_{max}$	l/min	70-150	140-220
Max. operating pressure in port P, A and B	$p_{nom}$	bar	315	
Test pressure P, A and B	$p_{max}$	bar	420	
Max operating pressure in T	$p_{nom}$	bar	20	
Test pressure T	$p_{max}$	bar	50	
Directional valve pilot pressure	$p$	bar	5-20	
Weight basic version	$m$	kg	32	
Hydraulic fluid			Mineral oils for hydraulic systems.	
Viscosity range	$v$	mm <sup>2</sup> /s	10 to 350 (cSt)	
Viscosity index	VI		>120	
Filtration Recommended filter with $\beta_{20} \geq 100$	Class 9 according to NAS 1638, 18/15 according to ISO 4406			
Fluid temperature range	T	°C	-20 to +70	
Ambient temperature range	T	°C	-20 to +50	
Body material			EN-GJS-400-15 (GGG40)	
Seals			Buna-N	
<b>Connections</b>				
<b>Code</b>	<b>Dimensions 8MB-140/200</b>			
P	¾" SAE 6000			
T	1" SAE 3000			
A, B	½" BSPP			
SA, SB, TA, TB	¾" BSPP			
TPP, TPT, TPA, TPB	¼" BSPP			

# INSTRUCTION MANUAL 8MB BASIC VERSIONS

## PRESSURE DROP 8MB



## INSTRUCTION MANUAL 8MB BASIC VERSIONS



## OPERATION PROCEDURE

**Normal operation:**

- *If two-speed:*  
Switch the two-speed directional valve item T to correct position.
- *If manual control safety lock:*  
Release manually the safety locks, by pulling out the locking pin L. The locking pin is secured by a stainless steel chain.
- Move the operating handle carefully to required direction and speed. Directional valve will immediately return to neutral position if the operator releases the handle.
- *If manual control safety lock:*
- When finished, put the locking pin back to its closed position.

## MAINTENANCE

Check the 8MB Modular Unit for proper function.

Visual check the 8MB Modular Unit, and if required, paint unpainted areas.

**CAUTION: Do not paint the hand levers shaft seals.**

## STORAGE

If longer storage than 6 months is expected, the valve must be kept in a dry room free from dust. Sudden large temperature variations must be avoided. For storage longer than one year, the valve must be filled with inhibition oil. Before use check all visible seals and flush with clean oil.

# INSTRUCTION MANUAL 8MB BASIC VERSIONS

