MODULAR UNIT 7MB

GENERAL DESCRIPTION

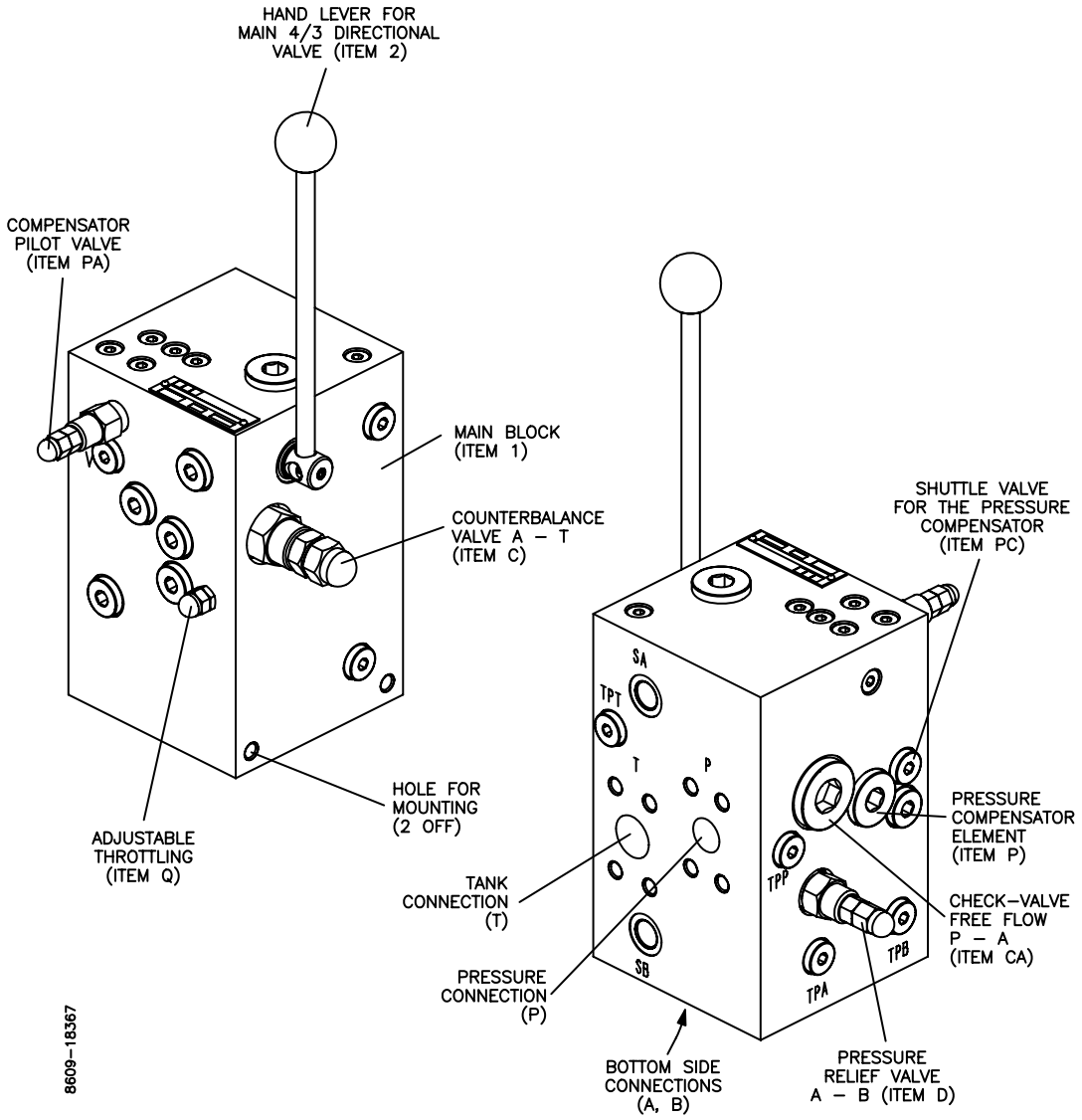


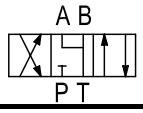
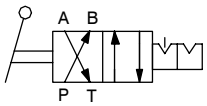
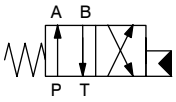
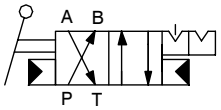
Figure 1 7MB basic version General Arrangement

The Modular Unit 7 MB is a complete unit for controlling of hydraulically driven winches and has the following improved characteristics:

- Extremely compact design, all valves integrated in one unit.
- Pressure compensated flow control system, which gives excellent metering.
- Designed to withstand marine surroundings.
- Hand lever with 34° control movement in each direction.
- Prepared to fit directly to different hydraulic motor flanges with an adapter.

For more details about types and options, please refer to section 'MODULAR CODE'.

MODULAR CODE

Options	Remarks	Design Code	Fill in
Standard			
- Main block - Directional valve - Pressure compensated flow control - Counterbalance valve in A - Free flow check valve (In Heave) - Pressure relief valve A → B		**7MB**	
Size			
Pressure drop at Q = 60 l/min	Flow area 30-65 l/min	**60**	
Pressure drop at Q = 120 l/min 32 bar	Flow area 65-120 l/min	**120**	
P: ¾" SAE 6000			
T: 1" SAE 3000			
A, B: ½" SAE 6000			
Directional Control Valve 4/3			
Manually operated		**1**	
Manually/remote operated		**37**	
Proportionally electrical remote ctrl.	Includes separate R	**37E**	
Proportionally electrical remote	With integrated R	**37ER**	
Spool type			
	No option	**2C**	
Two-speed valve			
Manual operated		**T**	
Manual operated with reduced pressure		**TR**	
Hydraulic operated		**TH**	
Hydraulic operated with reduced pressure		**THR**	
Manual/hydraulic operated with reduced pressure		**TMHR**	
Modification			
Code		**(001-999)**	

In example a 7MB intend for flow 110 l/min, manually operated main directional control valve, manual operated two-speed valve will have modular code: **7MB-120-1-2C-T**

VALVE DESCRIPTION 7MB (basic version)

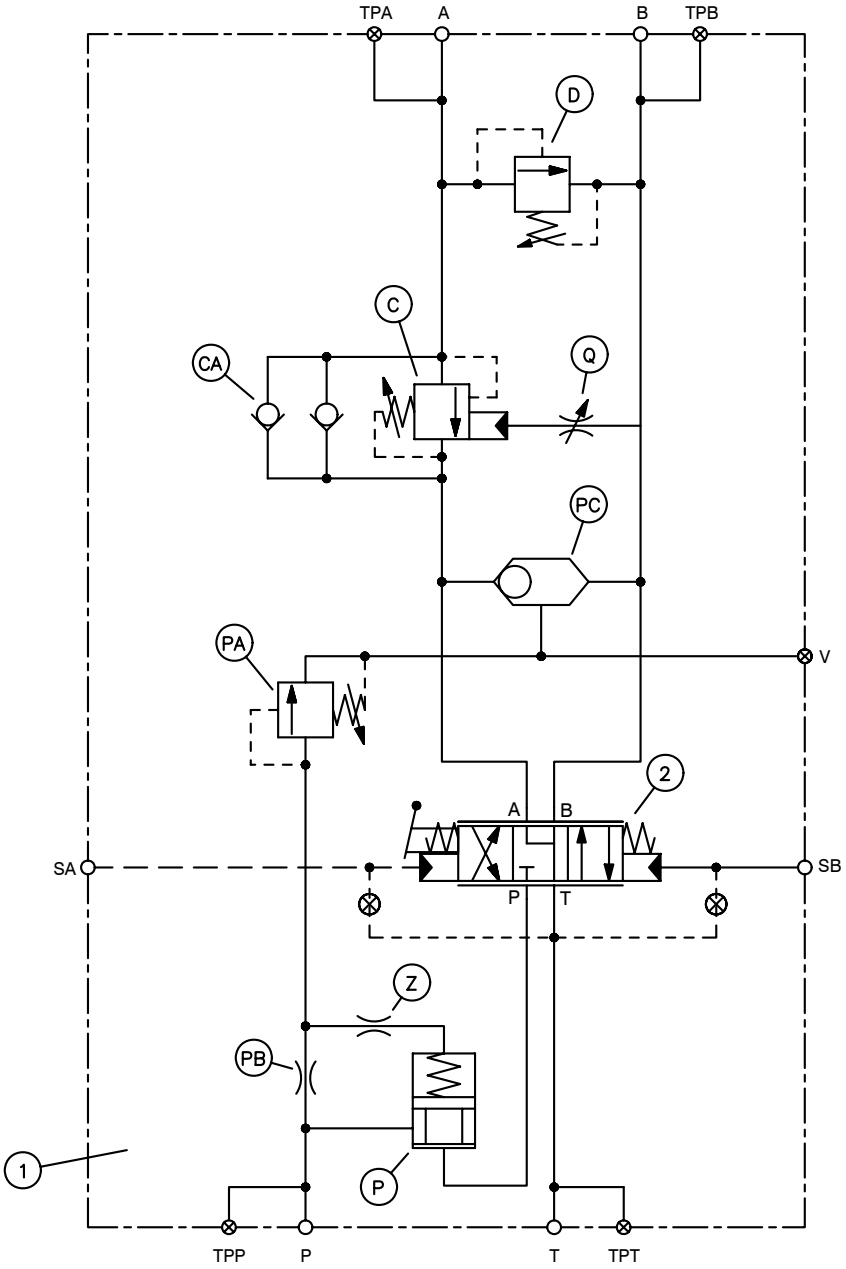


*Figure 2 Hydraulic Schematic 7MB-***-37-2C*

Item 1 **Main block.**

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 of the drum. Throttling groves in the main spool open progressively for flow either to A or B port.

Option code 37:
The directional valve is prepared to be hydraulically proportional remote controlled.

Pilot pressure 5-20 bar.

Item C **Counterbalance valve A→T.**
The counter balance valve keeps the load under control during lowering operations.

Throttling groves in the counter balance spool open progressively for flow from A→T port, and thus give a smooth lowering operation.

Pilot ratio counterbalance valve: *4.5:1*

Factory preset to 325 bar.

Item Q **Adjustable throttling.**
Throttling for the counter balance pilot channel. For dampening the counter balance valve if the valve is fluctuating.

Factory preset to ½ turn counter clockwise (ccw) from closed position.

Item CA **Check-valve free flow P→A.**
Bypassing the counter balance valve in Heave.

Item D **Pressure relief valve A→B.**
The pilot operated pressure relief is connected between motor ports A→B to secure the hydraulic motor and limit the maximum pressure.

If presetting is not stated in the order, the pressure relief valve item D is set to its minimum.

Generally about the pressure compensator system.
This is a load independent system, which means that a given spool stroke on the directional valve will give equal flow independent of the motor/drum load.

The main directional spool (2) in conjunction with the pressure compensator flow control system (P, PA, PB, PC and Z), regulates the proportional oil flow to either A (Heave rotation) or B (Lower rotation) by sensing the pressure either in A or B line through the shuttle valve (PC). When operating directional valve (2), the spool will open progressively to A or B. The pressure compensation element will maintain equal an Δp 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 an adjustable spring force in the compensator pilot valve (PA) and the load pressure sensing in A or B via (PC). When the setting is altered on the compensator pilot valve (PA), the flow will change.

When adjusting pressure relief valve PA, the Δp through the directional valve will alter, and thus maximum flow to the hydraulic motor.

Item PC **Shuttle valve for the pressure compensator.**
Port V can be used for load sensing or in some applications for a hydraulically operated brake release valve.

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

Item Z **Throttle for the pressure compensator element.**

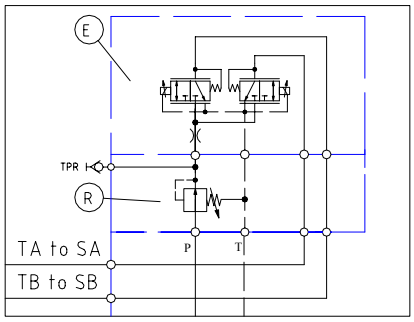
Item PB **Nozzle.**
Maintains flow to compensator pilot valve PA.

Item PA **Compensator pilot valve.**
The spring is rather weak. Therefore, pressure created by an adjustable pressure relief valve is added to the spring force.

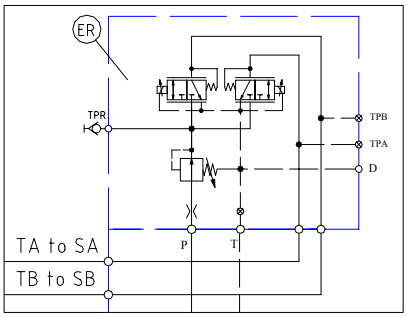
OPTIONS- DESCRIPTION 7MB

Code 37 Manually/remote operated.

Code 37E Manually/Proportionally electrical remote operated.
Proportional reducing valve item E is Hydranor 8FGB4131021-11/11.
Pressure reducing valve not integrated in 8FGB4131021-11/11, but separate sandwich component.



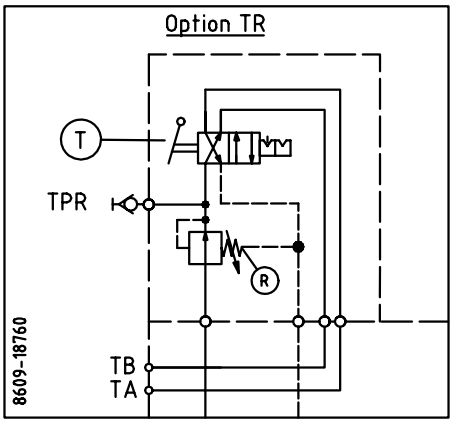
Code 37ER Manually/Proportionally electrical remote operated with integrated pressure reducing valve and external drain port D. T from ER to main block is plugged.
Proportional reducing valve item ER is Hydranor 8FGBR4431021-11/11-D



Two-speed valve module:
This is a two position directional spool valve with detent. In most cases to be used for switching two-speed system in the hydraulic motor.

Code	**T**	Manually operated 4/2-direction valve.
"	**TR**	Manually operated 4/2-direction valve with reduced pressure.
"	**TH**	Hydraulic operated 4/2-direction valve
"	**THR**	Hydraulic operated 4/2-direction valve with reduced pressure.
"	**TMHR**	Manually/hydraulic operated 4/2-direction valve with reduced pressure.

Port connection two-speed system:
TA/TB: ⅜" BSPP



DIMENSIONS

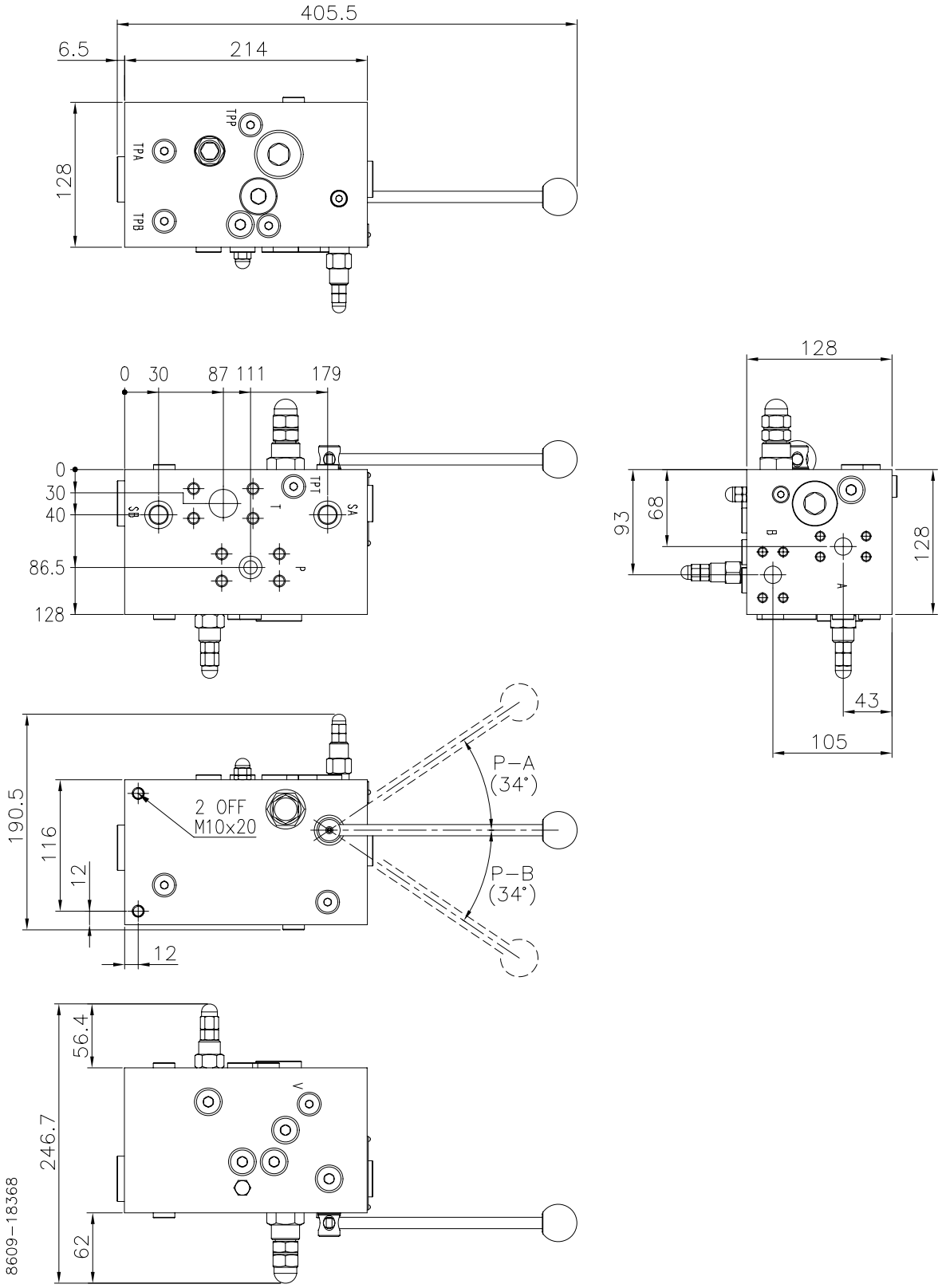


Figure 3 7MB-60/120 Dimensions

PRESSURE DROP 7MB

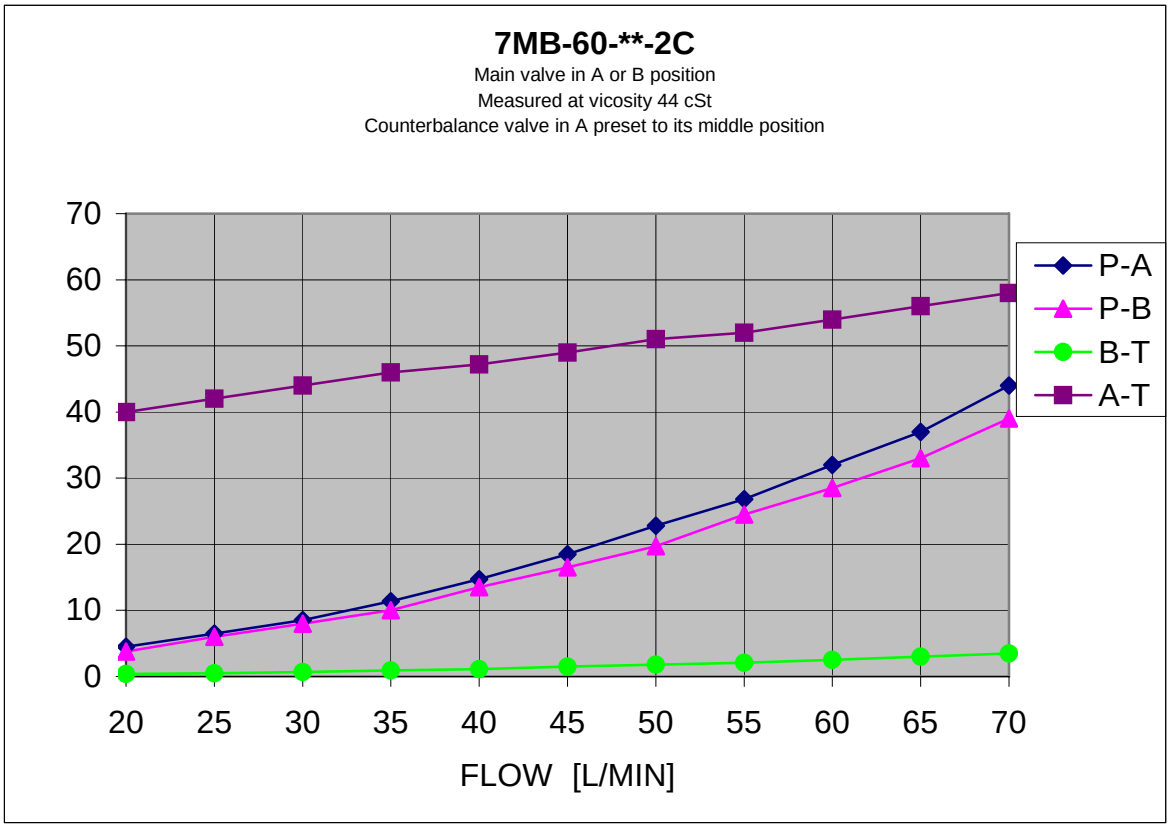


*Figure 4 7MB-60-**-2C pressure drop*

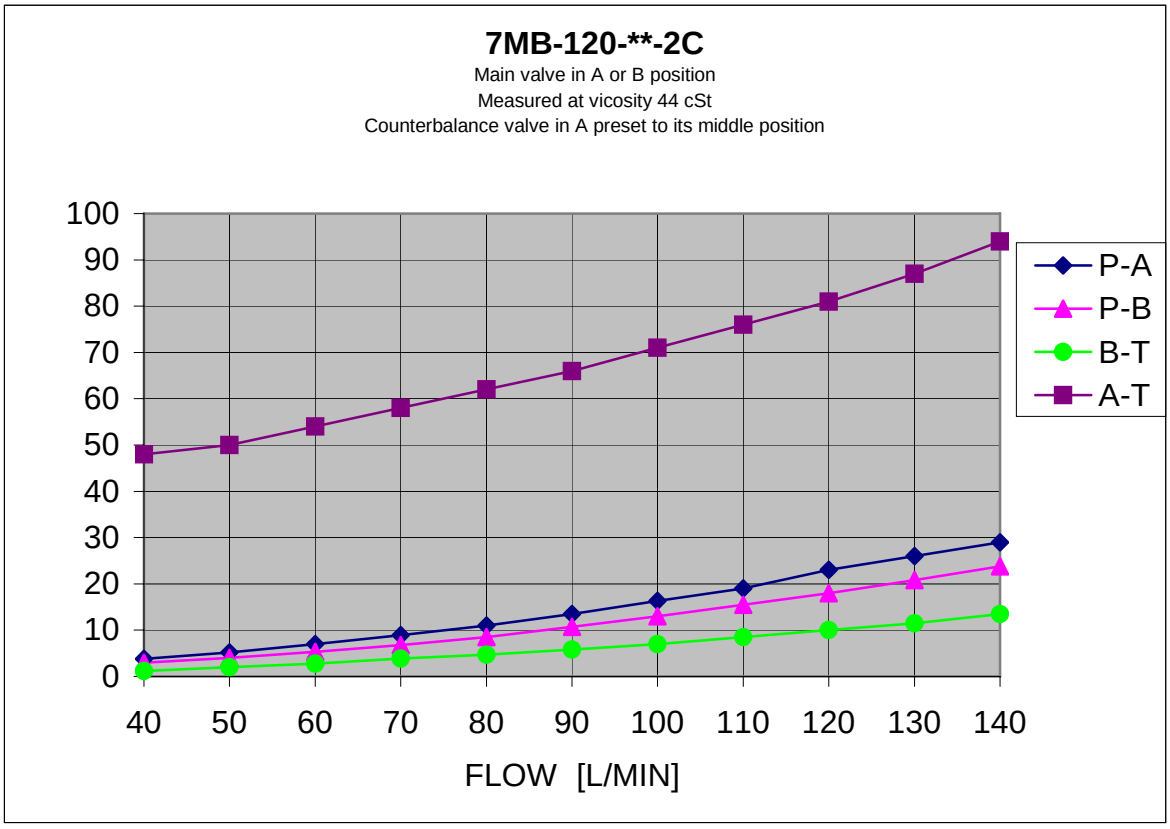


*Figure 5 7MB-120-**-2C pressure drop*

TECHNICAL DATA

Description	Symbol	Unit	Value	
Flow (Δp 32 bar)	Q_{max}	l/min	7MB-60	7MB-120
Flow area		l/min	30-65	65-120
Max. operating pressure	P_{max}	bar	315	
Recommended max. pressure in port T. See Note 1.	T_{max}	bar	20	
Directional valve pilot pressure	P	bar	5-20	
Weight basic version	m	kg	7MB-60	7MB-120
			≅23	
Hydraulic fluid			Mineral oils for hydraulic system	
Viscosity range:	v	m^2/s	10 to 350 (cST)	
Viscosity index:	VI	> 120		
Filtration, recommended filter with β 20 ≥ 100		Class 9 according to NAS 1638, 18/15 according to ISO 4406		
Fluid temperature range:	T		-20°C to + 70°C	
Ambient temperature range	T		-20°C to + 50°C	
Standard Body Material			EN-GJS-400-15 (GGG 40)	
Standard O-rings			Nitrile shore 70	

Note1: Be aware that pressure on the tank port T is direct additive to valve setting for pressure relief valve item D, counterbalance valve item C, and pressure reducing valve item R (If selected option R). Pressure peaks in T port can influence on the stability of the system, particular proportional remote control of main directional valve.

Interfaces:

Ports	Port dimension
P	¾" SAE 6000
T	1" SAE 3000
A, B	½" SAE 6000
SA, SB, TA and TB	⅜" BSPP
V, TPP, TPT, TPA and TPB	¼" BSPP
Mouthing Screws:	2 off M 10 (Thread depth 20 mm)

INSTALLATION

The Modular unit 7MB is installed with 2 off screws with thread depth M10x20 to a bracket, or mounted to a motor flange by an adapter plate. Please refer to 'Interfaces' in section 'TECHNICAL DATA', for details about screws and o-rings.

OPERATION

Manual control is performed by the hand lever. The valve is delivered with a centring spring, which means that the main spool will return to the neutral position after operating the hand lever.

*Option 37 (*Manual/remote operated)*:*
Directional valve is prepared to be hydraulic proportional remote controlled. An external pilot pressure moves the spool to the requested position Pilot pressure 5-20 bar. The valve is equipped with a hand lever to override the pilot pressure.

VALVE ADJUSTMENTS

If presetting is not stated in the order, the pressure relief valve (item D) is set to its minimum. The counterbalance valve is preset to 325 bar opening pressure. Recommended presetting for the counterbalance valve is 1.3 times the maximum load pressure.
(250 bar load pressure x 1.3 = 325 bar).
Throttling item Q is factory preset to ½ ccw turn from closed position.

MAINTENANCE

Check the valve for proper function. Visually check the valve and if required, paint unpainted (damaged) areas.

CAUTION: Do not paint the hand levers shaft seals.

SPARE PART

Seal Kit Set is available.

STORAGE

If storage longer than 6 months is expected, the valve must be kept in a dry room, free from dust and protected against sudden large temperature variations. For storage longer than 12 months, the valve must be filled with inhibition oil. Before use check all visible seals and flush with clean oil.

MARKING

Inlets and outlets are marked; refer to figure in section 'GENERAL DESCRIPTION'.