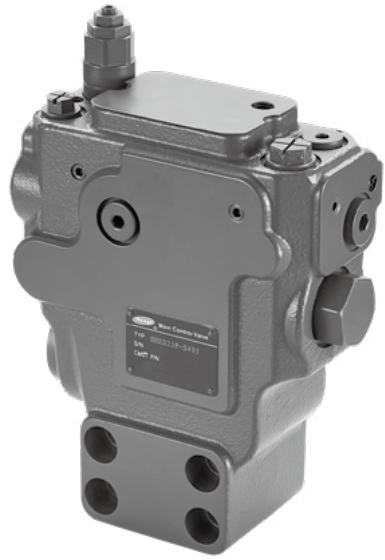
3.3

HHRB TYPE

AUTOMATIC CHECK VALVE

Size	20	25	32	36
Rated pressure (bar)	398	403	400	400
Rated flow (L/min)	250	360	600	1200



Contents

Features

1. Structure

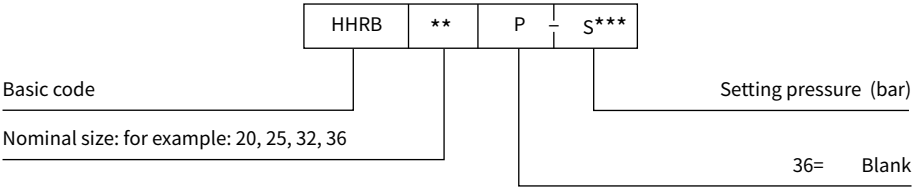
· No lowering of the load in the neutral position, e.g. In excavators, cranes.
· Direct attachment on the cylinder with SAE connection ports.
· Pipe burst protection for heavy duty applications.
· Very good, smooth fine control characteristics in each cylinder position.
· Minimization of power losses (Δp values) during lifting operation.

2. Applications

Excavators

Cranes

Ordering code



Function and symbols (HHRB20, 25 Type)

The automatic check valve is mounted on the excavator cylinder to prevent the risk of arm drop caused by the burst of the pipe (hose).

Flow from port A to port B: the hydraulic liquid flows through lock check valve to port B and eventually arrives at the cylinder. The reverse flow (from port B to port A) is locked and controlled by a leak-free poppet valve that is held closed by the spring force, and opening of the poppet valve is controlled by the pilot pressure; the spring chamber is connected to the tank through the DR port, thus the pilot pressure for opening the poppet valve is independent from the load.

This valve includes a cartridge type pressure relief valve. When the cylinder is overloaded or vibrates, the pressure relief valve will relieve the flow and opens the main valve to unload the B chamber, which is connected to the cylinder.

Typical application: this valve can also be used as part of load holding and load lowering system designed to comply with the ISO 8643 standard.

DR: Port connected to the tank, is to be connected to the “low pressure tank line” (control oil return line or directed connected to the tank).

B: Input port of the cylinder.

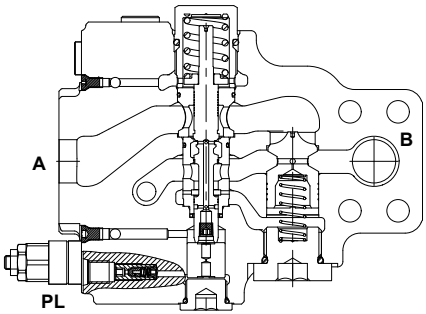
A: Connected to the MCV hose .

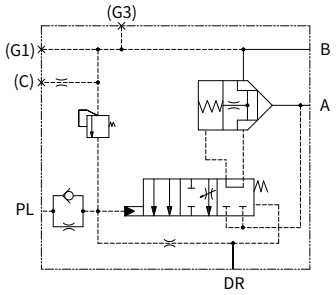
PL: Pilot control oil port.

(C): If two automatic check valves are installed on two pairs of cylinders, the orifice (C) must be connected to the "equal pressure oil line", in the event of a pilot pressure failure and a necessary emergency lowering of the boom, the two automatic check valves can be used as valves for "output to the tank".

(G1): Pressure measuring port.

(G3): Plug.

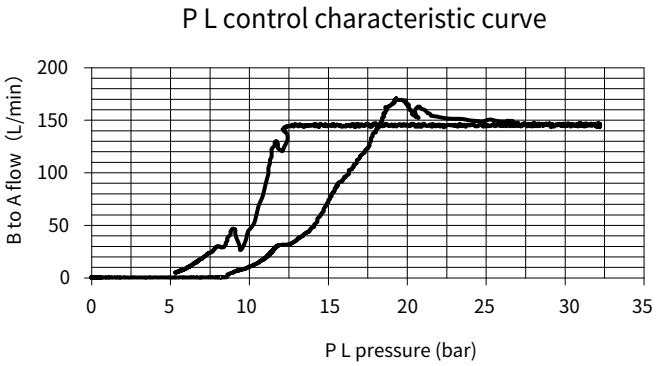


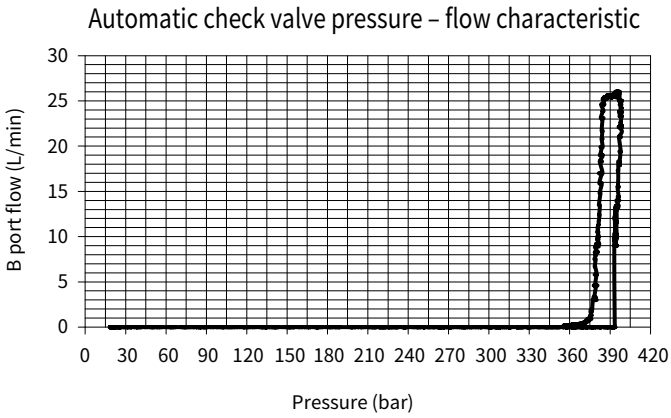


Technical Data (HHRB20, 25 Type)

Code		HHRB20P-S398	HHRB25P-S403
Hydraulic fluid		Mineral oil (HL, HLP) according to DIN 51524. Other hydraulic fluids, such as HEES (Synthetic Ester) according to VDMA 24568.	
Fluid temperature range	℃	-20℃～ +90℃	
Ambient temperature range	℃	-40℃～ +60℃	
Viscosity range	mm^2/s	10~380	
Degree of contamination		Maximum permissible degree of fluid contamination: Class 9. NAS 1638 or 20/18/15, ISO4406	
Inlet pressure	bar	420	
Rated flow	L/min	250	360
Cracking pressure	bar	PA = 0.4, when A port is pressurized	
		PPL = 4.8, when PL port is pressurized	PPL = 4.8, when PL port is pressurized
Port dimension		3/4 ' SAE J518 (high pressure version)	1 ' SAE J518 (high pressure version)
Main pressure relief valve setting pressure	bar	398	403
Leakage	cc/min	0.2 @ B port pressure P=100bar，50℃	

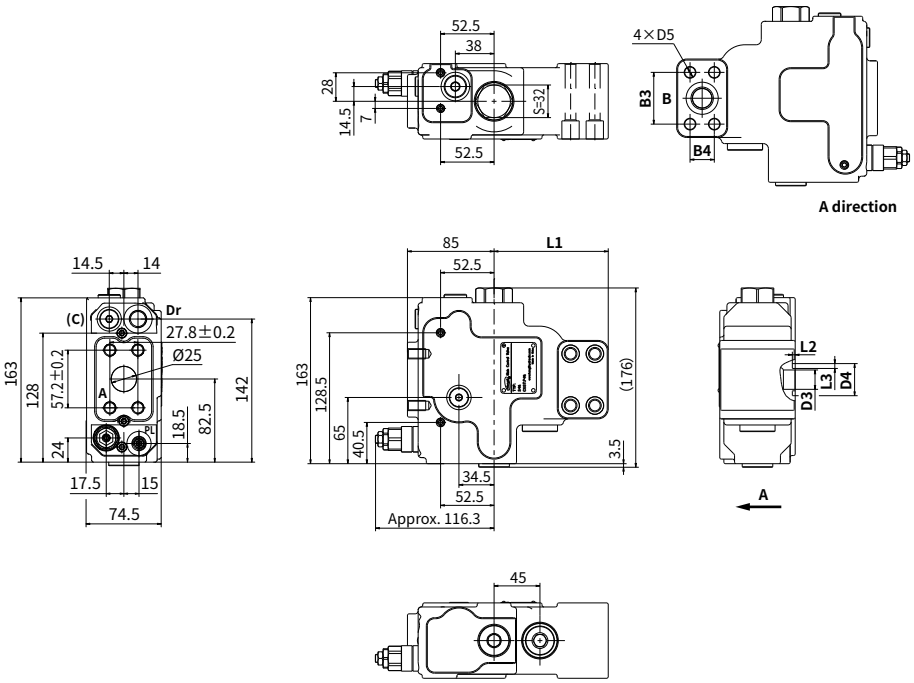
Characteristic curves (HHRB20, 25 Type)





Unit dimension (HHRB20, 25 Type)

(Dimensions in mm)



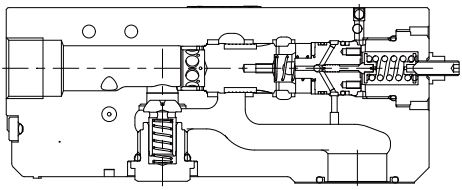
Code	B1	B2	B3	B4	D1	T1	D2	D3	D4	D5	L1	L2	L3	Specification of O-ring at B
HHRB 20P-S398	50.8	23.8	50.8	23.8	M10	18	19	19	31.52	10.5	112	2.82	4.78	24.99×3.53
HHRB 25P-S403	57.2	27.8	57.2	27.8	M12	18	25	25	39.45	13	125	2.82	4.78	32.92×3.53

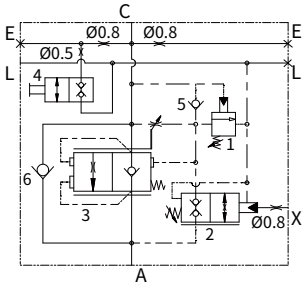
Function and symbols (HHRB32 Type)

The upward flow (A--C) is not restricted and can flow through check valve 6 to the hydraulic cylinder while the downward flow(C--A) is controlled by check valve 6 and non-leakage main spool 3. It remains closed under the spring force and pressure of load port C.

Under the action of the pilot pressure of port X (operating rod), the pilot spool 2 changes the direction, and the spring cavity of the main spool 3 and port A are connected thus the pressure decreases. The other end of the main spool 3 opens under the pressure of port C. The opening degree of the main spool 3 is proportional to the opening of the pilot spool 2. The pilot pressure X can finely control the opening of the pilot spool 2, and accurately control the downward flow (C-A). The plug-in relief valve (1) can detect the pressure of port C and open under overload or impact conditions so that the pressure difference between the left and right chambers of the main spool (3) occurs. The main spool opens then the hydraulic cylinder pressure is released downstream through the main hose (V2) and the main control valve.

For safer and compact assembly, the C port is mounted directly on the actuator via a gasket.

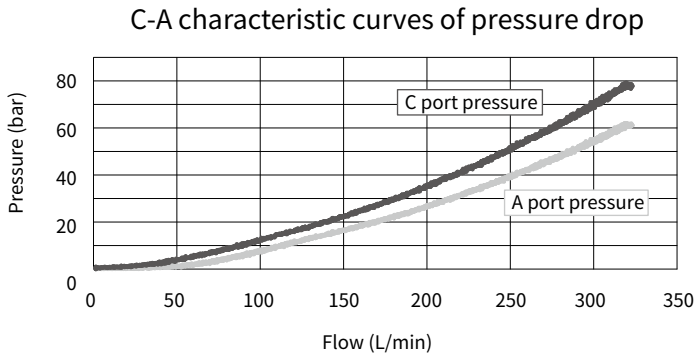


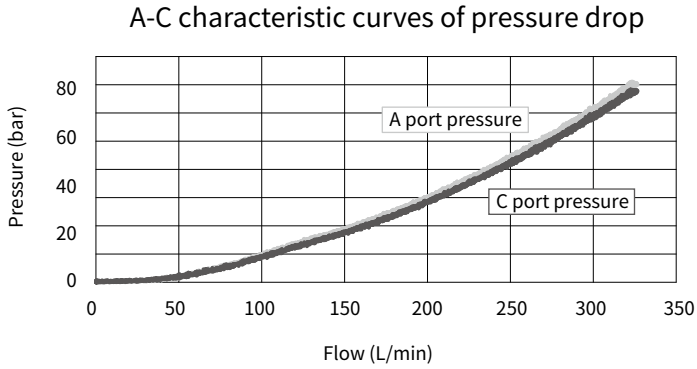


Technical Data (HHRB32 Type)

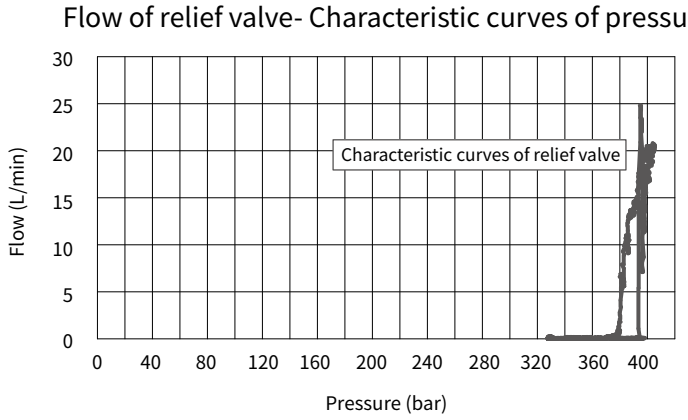
Code		
Max. operating pressure	bar (psi)	460(6670)
Max. flow	L/min (gpm)	600(158)
Hydraulic fluid		ISO VG46 or VG32
Oil Cleanliness		NAS 1638-8 Level or less
Operating temperature	℃	-20~90
C port without	cc/min	⩽ 2 @ 80% of the set pressure
Port dimension	A、C port	1_1/4” — SAE 6000PSI
	X、L、E port	G1/4” — ISO 1179-1
Relief valve 1 setting parameters	pressure adjustment range	300~460 bar
	Pressure adjusted by rotating the screw for one circle	168 bar/circle
	Factory default setting pressure	390±5 bar@5L/min
Pilot valve 2 setting parameters	Pilot operating pressure range	7~13 bar
	Pressure adjusted by rotating the screw for one circle	3 bar/circle
	Factory default starting pressure	7±0.3 bar

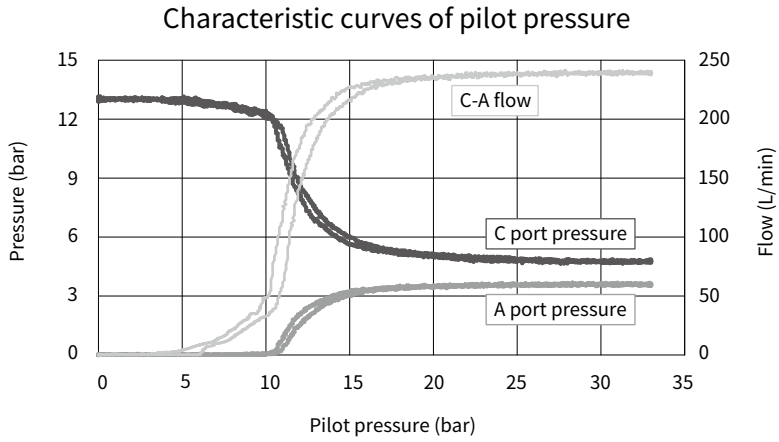
Characteristic curves (HHRB32 Type)





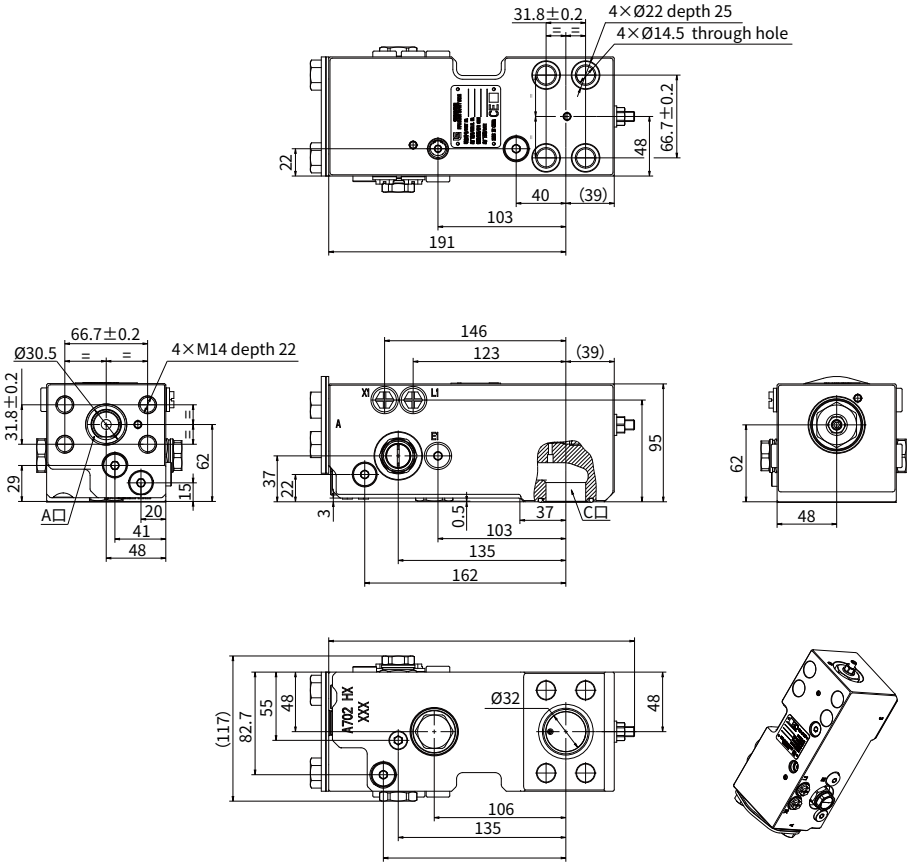
Characteristic curves (HHRB32 Type)





Unit dimension (HHRB32 Type)

(Dimensions in mm)



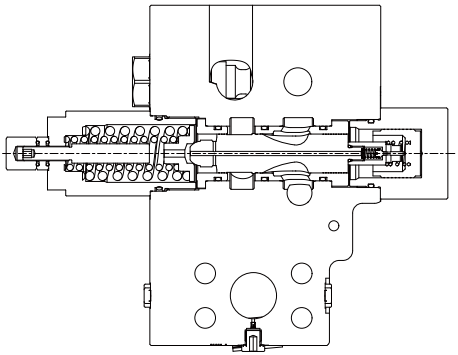
Function and symbols (HHRB36 Type)

The upward flow (A-C) is not restricted and can flow to the hydraulic cylinder through check valve 2 while the downward flow (C—A/C—R) is locked and controlled by check valve 2 and non-leakage main spool 1.It remains closed under the spring force and pressure of load port C.

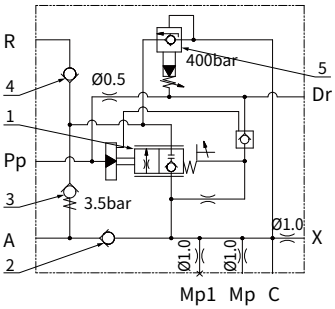
Under the action of the pilot pressure of the Pp port (operating rod), the spring cavity of the main spool 1 is connected with the Dr port to release the non-leakage lock. The pilot pressure at the Pp port increases further, and the main spool 1 opens.

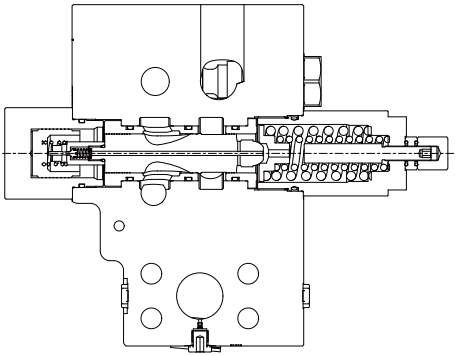
The plug-in relief valve 5 opens under pressure overload or impact conditions at port C as overload protection.

For safer and compact assembly, the C port is mounted directly on the actuator via a gasket.



HHRB36 Type-L





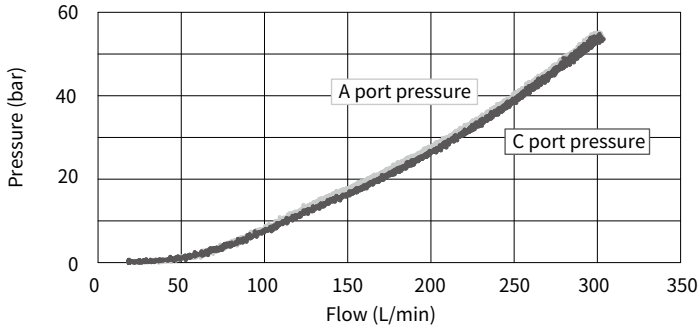
HHRB36 Type-R

Technical Data (HHRB36 Type)

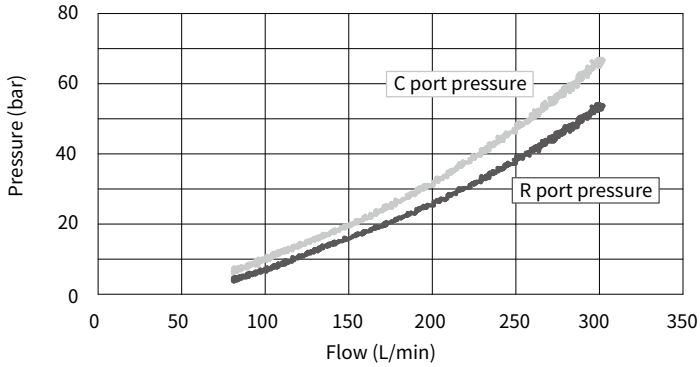
Code		
Max. operating pressure	bar (psi)	420(6090)
Max. flow	L/min (gpm)	1200(316)
Hydraulic fluid		ISO VG46 or VG32
Oil Cleanliness		NAS 1638-8 Level or less
Operating temperature	℃	-20~80
C port without	cc/min	⩽ 2 @ 80% of the set pressure
Port dimension	A、C port	1_1/2”—SAE 6000PSI
	R port	1”—SAE 6000PSI
	Pp、Dr port	G1/2—ISO 1179-1
	X、Mp、MP1 port	G1/4—ISO 1179-1
Relief valve setting parameters	pressure adjustment range	300~420 bar
	Factory default setting pressure	400±5 bar@5L/min

Characteristic curves (HHRB36 Type)

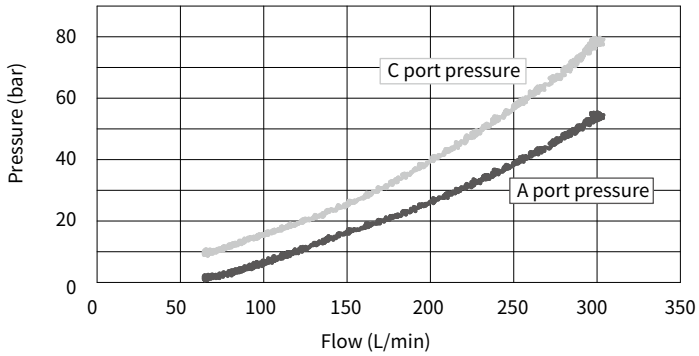
A-C characteristic curves of pressure drop



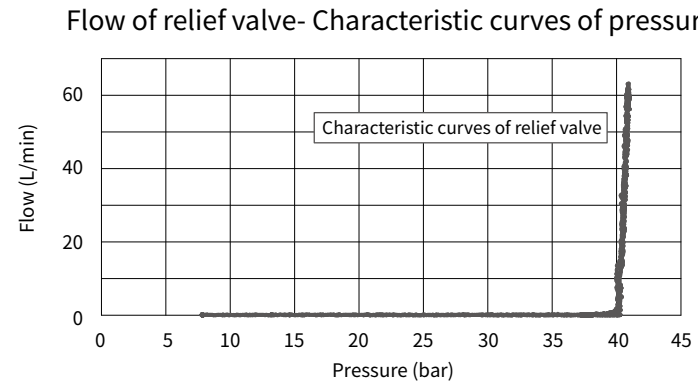
C-R characteristic curves of pressure drop

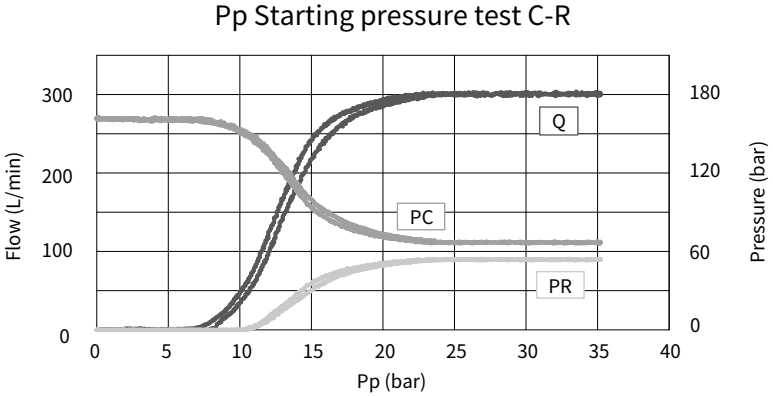


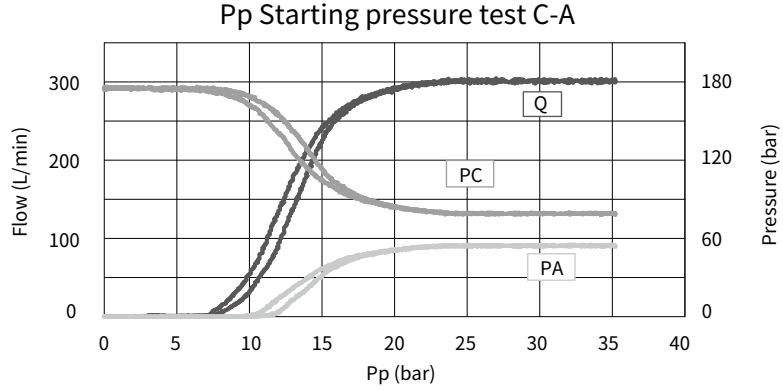
C-A characteristic curves of pressure drop



Characteristic curves (HHRB36 Type)

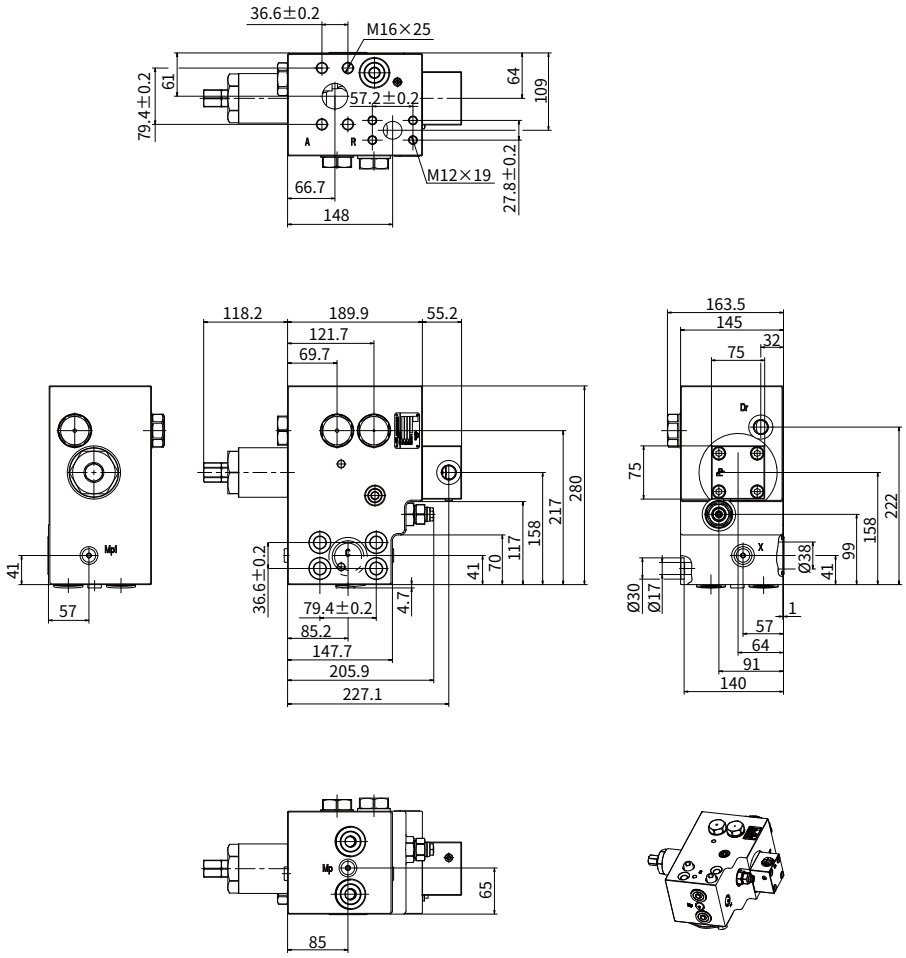






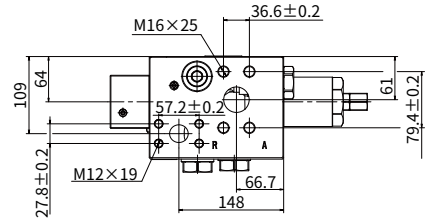
Unit dimension (HHRB36 Type-L)

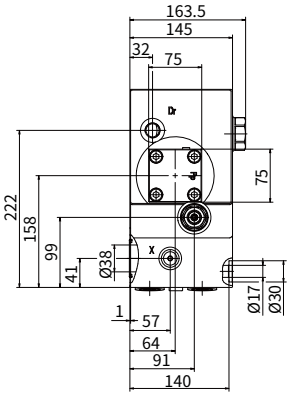
(Dimensions in mm)

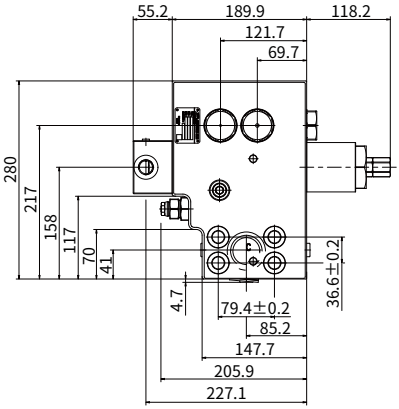


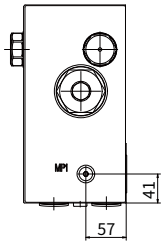
Unit dimension (HHRB36 Type-R)

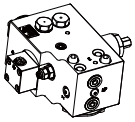
(Dimensions in mm)

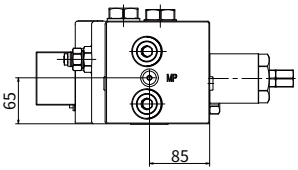












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