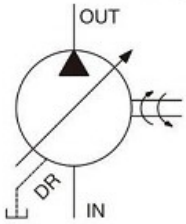


**Variable displacement Pistons Pumps
for open circuit**

PV SERIES





Max. Continuous Pressure: 350 bar
Max. Intermittent Pressure: 420 bar

1. New type of swash plate and large servo pistons with strong bias spring achieve fast response, reduce the noise due to active decompression of system at down stroke.
2. Nine piston and new precompression technology (precompression filter volume) result in unbeaten low outlet flow pulsation.
Complete compensator program.
3. Rigid and FEM-optimized body design for lowest noise level.
4. Thru drive for 100% nominal torque.
5. Pump combinations (tandem pumps) of same size and model and mounting interface for basically all metric or SAE mounting interfaces.

Quick Reference Data Chart

Model	Displacement		Pump Delivery (7Bar) 100 PSI					
			1200 RPM		1500 RPM		1800 RPM	
	cc/rev	In ³ /rev	LPM	U.S.GPM	LPM	U.S.GPM	LPM	U.S.GPM
PV016	16	0.98	19.2	5.1	24	6.3	28.8	7.6
PV020	20	1.2	24	6.3	30	7.9	36	9.5
PV023	23	1.4	27.6	7.3	34.5	9.1	41.4	10.9
PV032	32	1.9	38.4	10.1	48	12.7	57.6	15.2
PV040	40	2.4	48	12.7	60	15.9	72	19
PV046	46	2.8	55.2	14.6	69	18.2	82.8	21.9
PV063	63	3.8	75.6	20	94.5	25	113.4	30
PV071	71	4.3	85.8	22.7	107	28.3	128.7	34
PV080	80	4.8	96	25.4	120	31.7	144	38
PV092	92	5.6	110.4	29.2	138	36.5	165.6	43.8
PV140	140	8.5	168	44.4	210	55.5	252.1	66.6
PV180	180	11	216	57.1	270	71.3	324	85.6
PV270	270	16.5	324	85.6	405	107	486	128.4

Model	APPROX. Noise Levels Db(A) Full Flow and 1500 RPM			Input House Power, Max. Displacement & 345 bar (5000 PSI)		Operating Speed		Weight	
	70 bar (1KSI)	207 bar (3KSI)	343 bar (5KSI)	1500 RPM	1800 RPM	Max. RPM	Min. RPM	KG	LB
				KW (hp)	KW (hp)				
PV016	56	60	68	15.5 (20.8)	18.5 (24.8)	2750	300	19	41.8
PV020									
PV023									
PV032	59	62	69	31 (41.6)	35.1 (47.1)	2400	300	30	66
PV040									
PV046									
PV063	66	70	74	61.5 (82.4)	70.1 (94)	2100	300	60	132
PV071									
PV080									
PV092									
PV140	70	74	76	136 (182.3)	149.4 (200.3)	2200	300	90	198
PV180									
PV270									
PV270	77	79	81	263 (353)	298 (400)	1800	300	172	378.4

1. Installation outlet port top, the pipe have to less than 2bar.
2. The use of max. pressure override 6 min, hydraulic oil clean that see General Installation Information.

Order No.



PV
 063
 GT
 R
 M
 1
 A

Series Size and Compensator Displacement Rotation Mounting Threads Thru drive & 2nd pump Voltage Seals Design No.

Axial piston pump
variable
displacement high
pressure version

code	Compensator
※ Standard Type	
A2	10 ~ 140bar,
A3	40 ~ 210bar,
A4	70 ~ 350bar,
Remote Type	
※ GT	Remote Pressure compensator
※ GM	Remote Pressure compensator allows a pilot valve
GA	Remote Pressure compensator allows a pilot valve(valve included)
GJ	Layer Proportional pressure compensator(valve included)
Electrical unloading Type	
GR	Electrical unloading
GB	Dual pressure control
GC	Dual pressure+electrical unloading
Load-sensing Type	
※ HL	Load-sensing Type
HM	Load-sensing Type
HJ	2-valve load-sensing Type(valve included)
HA	2-valve load-sensing Type
HK	Proportional electro-hydraulic load sensing type
HQ	Load-sensing & Proportional flow control
Proportionable displacement Type	
FV	Proportionable displacement control
FR	Proportionable displacement control with pressure
FG	Proportionable displacement control with pressure control
Horse power Type	
PA <input type="checkbox"/>	Horse power compensator
※ PM <input type="checkbox"/>	Horse power compensator,pilot flow internal pressure pilot valv (valve included)
PG <input type="checkbox"/>	Horse power compensator,pilot flow internal
PL <input type="checkbox"/>	Horse power compensator, Load-sensing compensator
PH <input type="checkbox"/>	Horse power compensator,pilot flow external for load-sensing

code	Displacement cm3/rev(In3/rev)
016	16(0.98)
020	20(1.2)
023	23(1.4)
032	32(1.9)
040	40(2.4)
046	46(2.8)
063	63(3.8)
071	71(4.3)
080	80(4.8)
092	92(5.6)
140	140(8.5)
180	180(10.9)
270	270(16.5)

code	Rotation
※ R	clockwise 
L	counterclockwise 

code	Horse power	PV016 ~	PV032 ~	PV063 ~	PV140	PV180	PV270
		PV023	PV046	PV092			
A	3KW	●					
B	4KW	●					
C	5.5KW	●	●				
D	7.5KW	●	●				
E	11KW	●	●	●			
F	15KW		●	●			
G	18.5KW		●	●	●		
H	22KW		●	●	●	●	
I	30KW			●	●	●	
J	37KW			●	●	●	
K	45KW			●	●	●	●
L	55KW				●	●	●
M	75KW					●	●
N	90KW					●	●
O	110KW						●
P	132KW						●

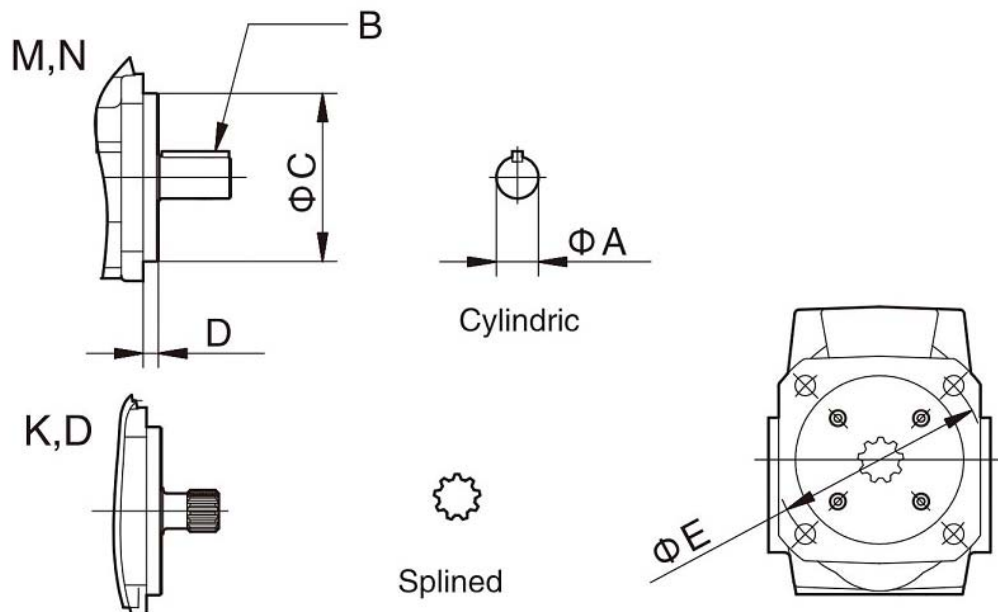
Order No. PV 063 GT R M 1 A

Series Size and Compensator Displacement Rotation Mounting Threads Thru drive& 2nd pump Voltage Seals Design No.

code	Mounting	
※ M(standard)	Metric	ISO3019/2 Cylindric,key
K		ISO3019/2 Splined,DIN5480
N		ISO3019/1 Cylindric,key
D		ISO3019/1 Splined,SAE

code	Threads
※ 1(standard)	BSPP(G)
2	PT(RC)
3	UNF
4	NPT
7	ISO6149

code	model	shaft		flange		mounting	
		A	B	C	D		
※ M	Metric	PV016 ~ PV023	Φ25	8x7x40	Φ100	9	Φ125
		PV032 ~ PV046	Φ32	10x8x56	Φ125	9	Φ160
		PV063 ~ PV092	Φ40	12x8x80	Φ160	9	Φ200
		PV140 ~ PV180	Φ50	12x8x80	Φ160	9	Φ200
		PV270	Φ65	12x8x80	Φ200	9	Φ250
K	Metric	PV016 ~ PV023	W25x1.5x15x8f DIN5480		Φ100	9	Φ125
		PV032 ~ PV046	W32x1.5x20x8f DIN5480		Φ125	9	Φ160
		PV063 ~ PV092	W40x1.5x25x8f DIN5480		Φ160	9	Φ200
		PV140 ~ PV180	W50x2x24x9g DIN5480		Φ160	9	Φ200
		PV270	W60x2x28x9g DIN5480		Φ200	9	Φ250
N	Inch	PV016 ~ PV023	Φ1"	0.25" x0.25" x1.6"	Φ4"	3/8"	Φ5"
		PV032 ~ PV046	Φ1-1/4"	5/16" x5/16" x2.2"	Φ5"	1/2"	Φ6.37"
		PV063 ~ PV092	Φ1-3/4"	7/16" x7/16" x3.15"	Φ6"	1/2"	Φ9"
		PV140 ~ PV180	Φ2"	1/2" x1/2" x2.95"	Φ6"	1/2"	Φ9"
		PV270	Φ2"	1/2" x1/2" x2.95"	Φ6.5"	5/8"	Φ12.5"
D	Inch	PV016 ~ PV023	Splined 15T 16/32DP ANSI B92.1		Φ4"	3/8"	Φ5"
		PV032 ~ PV046	Splined 14T 12/24DP ANSI B92.1		Φ5"	1/2"	Φ6.37"
		PV063 ~ PV092	Splined 13T 8/16DP ANSI B92.1		Φ6"	1/2"	Φ9"
		PV140 ~ PV180	Splined 15T 8/16DP ANSI B92.1		Φ6"	1/2"	Φ9"
		PV270	Splined 15T 8/16DP ANSI B92.1		Φ6.5"	5/8"	Φ12.5"



Order No. PV 063 GT R M 1 A

Series Size and Displacement Compensator Rotation Mounting Threads Thru drive & 2nd pump Voltage Seals Design No.

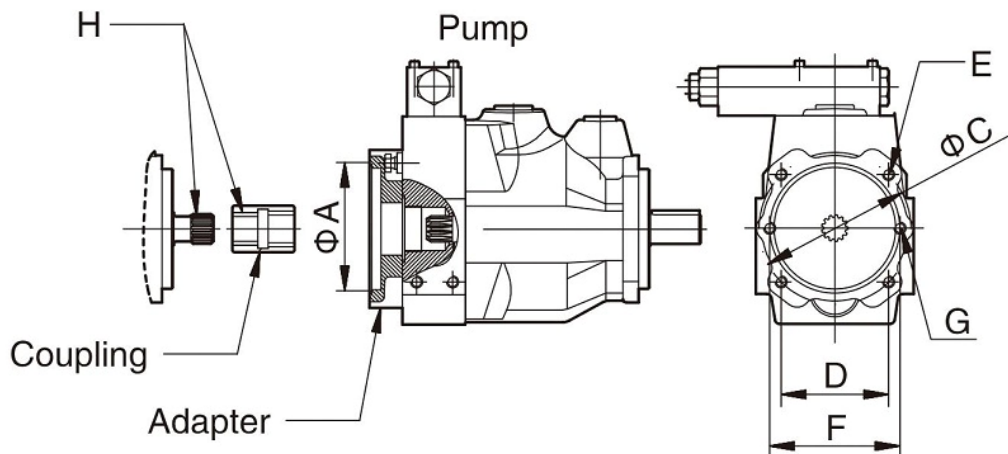
code	Thru drive&2nd pump	
※ A(standard)	Single pump	
※ B	Prepared for thru drive	
With adaptor for 2nd pump		
C	Inch	SAE AA, Φ2" (Φ50.8mm)
D		SAE A, Φ3-1/4" (Φ82.55mm)
E		SAE B, Φ4" (Φ101.6mm)
F		SAE C, Φ5" (Φ127mm)
G		SAE D, Φ6" (Φ152.4mm)
H		SAE E, Φ6.5" (Φ165.1mm)
I	Metric	Metric, Φ63
J		Metric, Φ80
K		Metric, Φ100
L		Metric, Φ125
M		Metric, Φ160
N		Metric, Φ200
Other pump are acceptable order		

code	Voltage
A	AC100V(50-60Hz)
B	AC110V(60Hz)
C	AC200V(50-60Hz)
D	AC220V(60Hz)
E	DC12V
F	DC24V

code	Seals
※ N	NBR
V	FPM
E	Ethylene-propylen

Thru drive&2nd pump								
code	Model	ΦA	ΦC	D	E	F	G	H
C	SAE AA, Φ2" (Φ50.8mm)	Φ2" (Φ50.8)				3.25" (82.55mm)	5/16" -18	9T 20/40 DP
D	SAE A, Φ3-1/4" (Φ82.55mm)	Φ3-1/4" (Φ82.55)				4.188" (106.3mm)	3/8" -16	9T 16/32 DP
E	SAE B, Φ4" (Φ101.6mm)	Φ4" (Φ101.6)		3.536" (89.8mm)	1/2" -13	5.75" (146.05mm)	1/2" -13	13T 16/32 DP 15T 16/32 DP
F	SAE C, Φ5" (Φ127mm)	Φ5" (Φ127)		4.508" (114.5mm)	1/2" -13	7.125" (180.98mm)	5/8" -11	14T 12/24 DP 15T 16/32 DP
G	SAE D, Φ6" (Φ152.4mm)	Φ6" (Φ152.4)		6.364" (161.6mm)	5/8" -11	9" (228.6mm)	5/8" -11	13T 8/16 DP 15T 8/16 DP
H	SAE E, Φ6.5" (Φ165.1mm)	Φ6.5" (Φ165.1)		8.839" (224.5mm)	3/4" -10			15T 8/16 DP
I	Metric, Φ63	Φ63	Φ85		M8	100	M8	
J	Metric, Φ80	Φ80	Φ103		M8	109	M10	
K	Metric, Φ100	Φ100	Φ125		M10	150	M12	W25x1.5x15x8f
L	Metric, Φ125	Φ125	Φ160		M12	180	M16	W32x1.5x20x8f
M	Metric, Φ160	Φ160	Φ200		M16	224	M20	W40x1.5x25x8f W50x2x24x9g
N	Metric, Φ200	Φ200	Φ250		M20			W50x2x24x9g

Coupling		
code	pump	H
A-D1	PV016 ~ PV023	D1 9T 20/40 DP
A-D2		D2 9T 16/32 DP
A-D3		D3 13T 16/32 DP
A-D4		D4 15T 16/32 DP
A-W1		W1 W25x1.5x15x8f
B-D2	PV032 ~ PV046	D2 9T 16/32 DP
B-D3		D3 13T 16/32 DP
B-D4		D4 15T 16/32 DP
B-D5		D5 14T 12/24 DP
B-W1		W1 W25x1.5x15x8f
B-W2		W2 W32x1.5x20x8f
C-D2	PV063 ~ PV092	D2 9T 16/32 DP
C-D3		D3 13T 16/32 DP
C-D4		D4 15T 16/32 DP
C-D5		D5 14T 12/24 DP
C-D6		D6 13T 8/16 DP
C-D7		D7 15T 8/16 DP
C-W1		W1 W25x1.5x15x8f
C-W2		W2 W32x1.5x20x8f
C-W3		W3 W40x1.5x25x8f
C-W4		W4 W50x2x24x9g
D-D2	PV140 ~ PV180	D2 9T 16/32 DP
D-D3		D3 13T 16/32 DP
D-D4		D4 15T 16/32 DP
D-D5		D5 14T 12/24 DP
D-D6		D6 13T 8/16 DP
D-D7		D7 15T 8/16 DP
D-W1		W1 W25x1.5x15x8f
D-W2		W2 W32x1.5x20x8f
D-W3		W3 W40x1.5x25x8f
D-W4		W4 W50x2x24x9g
E-D2	PV270	D2 9T 16/32 DP
E-D3		D3 13T 16/32 DP
E-D4		D4 15T 16/32 DP
E-D5		D5 14T 12/24 DP
E-D6		D6 13T 8/16 DP
E-D7		D7 15T 8/16 DP
E-W1		W1 W25x1.5x15x8f
E-W2		W2 W32x1.5x20x8f
E-W3		W3 W40x1.5x25x8f
E-W4		W4 W50x2x24x9g
E-W5		W5 W60x2x28x9g



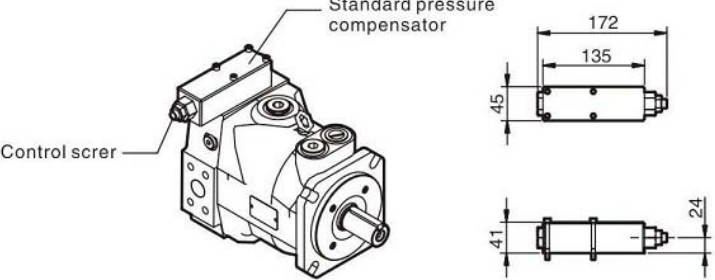
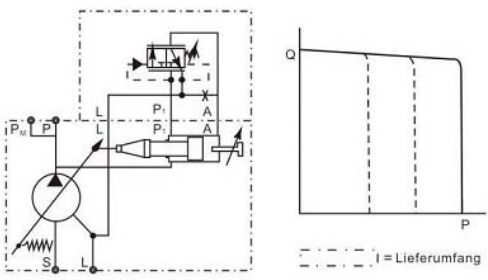
Compensator

- Standard Type**
 A: Standard Pressure compensator
- Remote Type**
 GT: Remote Pressure compensator
 GM: Remote Pressure compensator allows a pilot valve
 GA: Remote Pressure compensator allows a pilot valve (valve included)
 GJ: Layer Proportional pressure compensator (valve included)
- Electrical unloading Type**
 GR: Electrical unloading
 GB: 2 pressure electrical selection
 GC: 2 pressure+electrical unloading

- Load-sensing Type**
 HL: Load-sensing compensator
 HM: Load-sensing compensator
 HJ: 2-valve load-sensing compensator
 HA: 2-valve load-sensing compensator (valve included)
 HK: Proportional electro-hydraulic load sensing type
 HQ: Load-sensing & Proportional flow control
- Horse power Type**
 PA: Horse power compensator
 PM: Horse power compensator, pilot flow internal pressure pilot valve included
 PG: Horse power compensator, pilot flow internal
 PL: Horse power compensator, Load-sensing compensator
 PH: Horse power compensator, pilot flow external for load-sensing

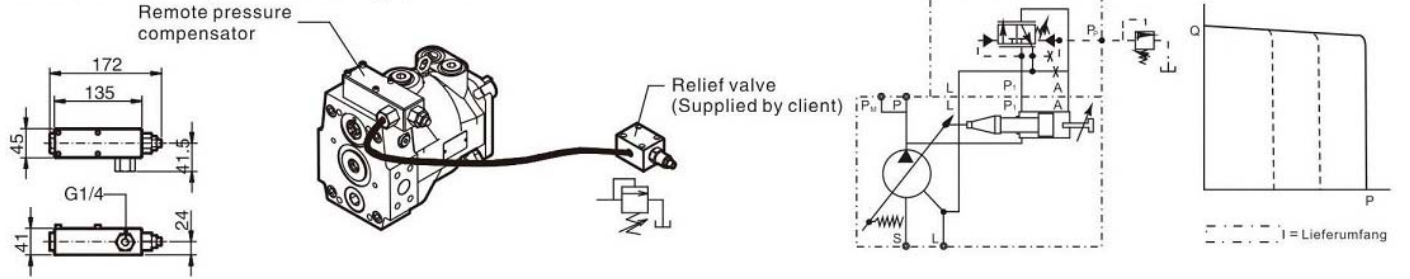
Standard Pressure compensator

The standard pressure compensator adjusts the pump displacement according to the actual need of the system in order to keep the pressure constant. As long as the system pressure at outlet port P is lower than the set pressure (set as spring preload of the compensator spring) the working port A of the compensator valve is connected to the case drain and the piston area is unloaded. Bias spring and system pressure on the annulus area keep the pump at full displacement. When the system pressure reaches the set pressure the compensator valve spool connects port P1 to A and builds up a pressure at the servo piston resulting in a down stroking of the pump. The displacement of the pump is controlled in order to match the flow requirement of the system.



GT: Remote Pressure compensator

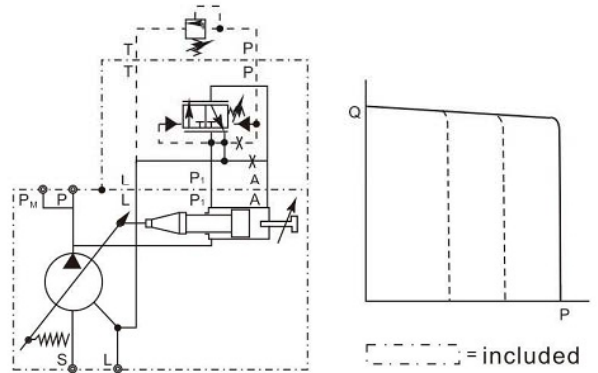
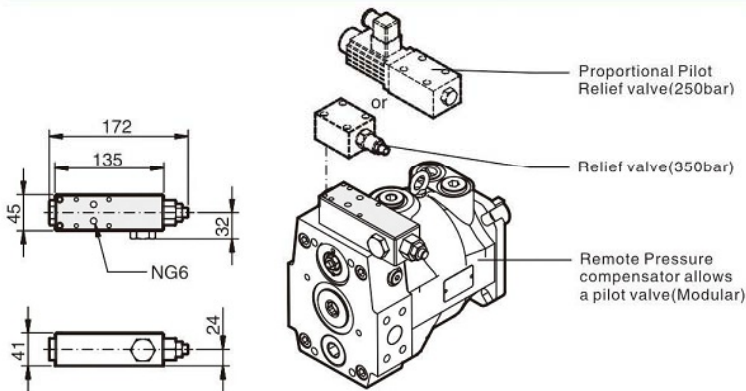
While at the standard pressure compensator the pressure is set directly at the compensator spring, the setting of the remote pressure compensator can be achieved by any suitable pilot pressure valve connected to pilot port PP. The pilot flow supply is internal through the valve spool. The pilot flow is 1-1.5L/min. The pilot valve can be installed remote from the pump in some distance. That allows pressure setting e.g. from the control panel of the machine. The remote pressure compensator is able to solve instability problems that may occur with a standard pressure compensator in critical applications. The pressure pilot valve can also be electronically controlled (proportional pressure valve) or combined with a directional control valve for low pressure standby operation.



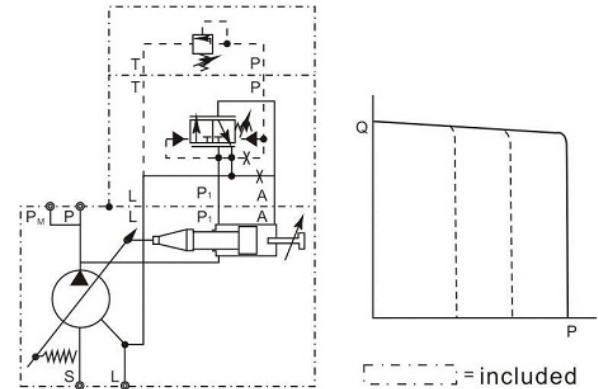
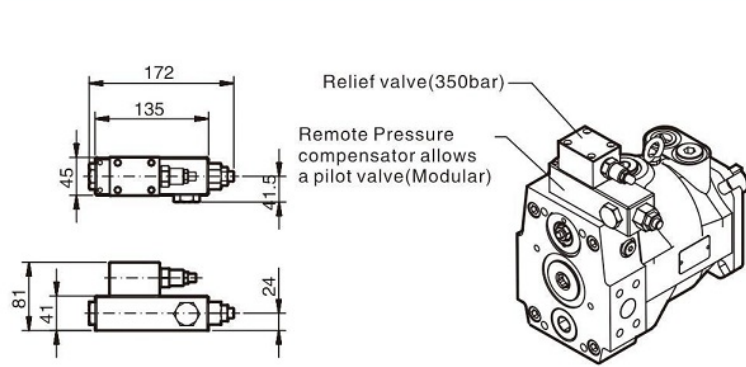
Remote Pressure compensator allows a pilot valve

Version GM of remote pressure compensator provides on its top side an interface NG6, DIN24340(CETOP 03 at RP35H, NFPA D03). This interface allows a direct mounting of a pilot valve. Beside manual or electrohydraulic operated valves it is also possible to mount complete multiple pressure circuits directly on the compensator body. We offers a variety of these compensator accessories ready to install. All remote pressure compensator have a factory setting of 15bar differential pressure. With this setting, the controlled pressure at the pump outlet is higher than the pressure controlled by the pilot valve.

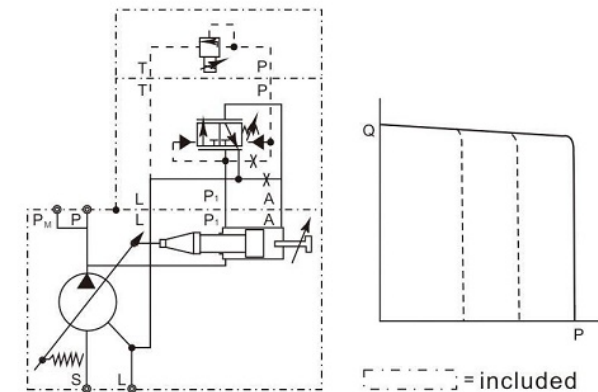
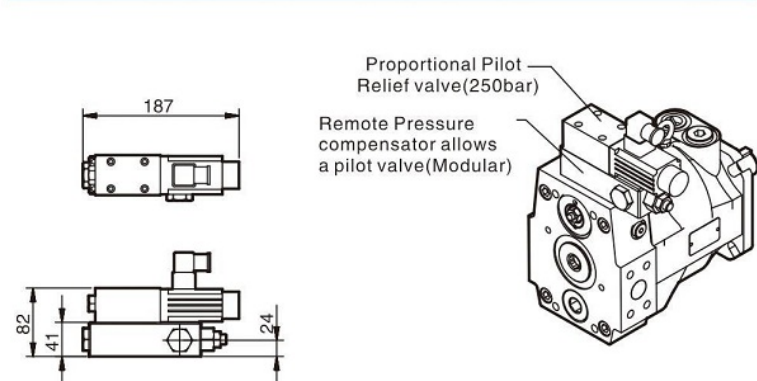
GM: Remote Pressure compensator allows a pilot valve



GA: Remote Pressure compensator allows a pilot valve(valve included)



GJ: Layer Proportional pressure compensator(valve included)

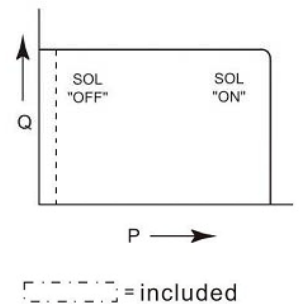
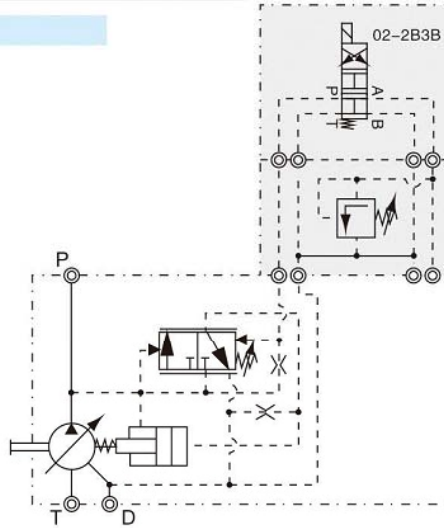
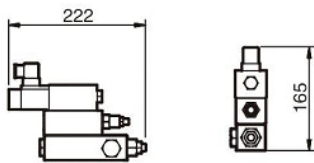
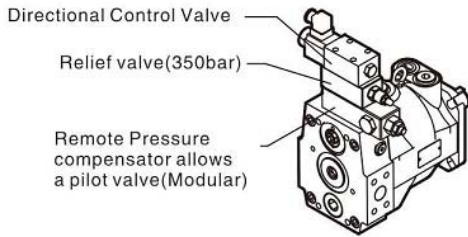


Electrical unloading Type

PV pump with fast response remote pressure control, relief valve with 2 pressure stages, electrical pressure selection, nitrile seals, spindle adjustment, 24 VDC solenoid, plug to DIN46350 accessories fitted.

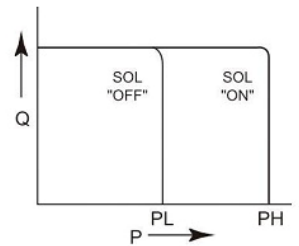
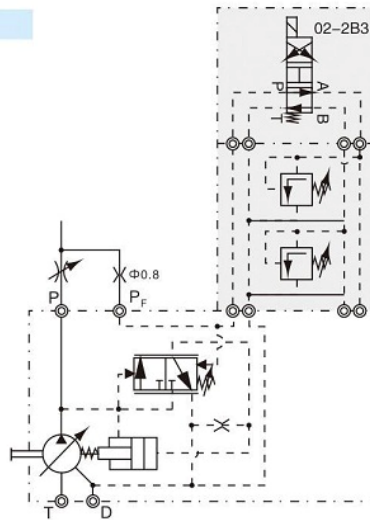
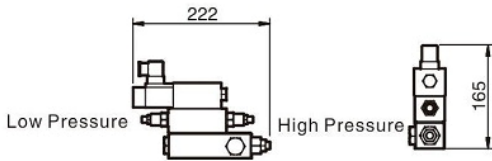
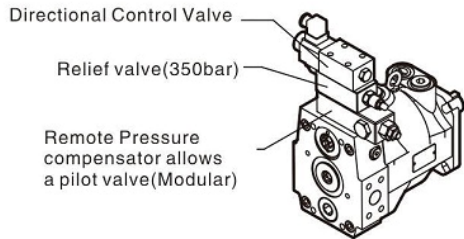
Usable for horsepower control and proportional volume control, too.

Electrical unloading Type



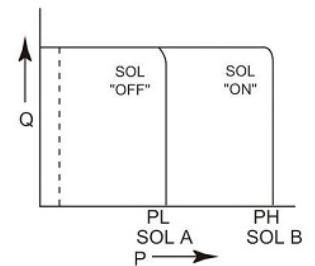
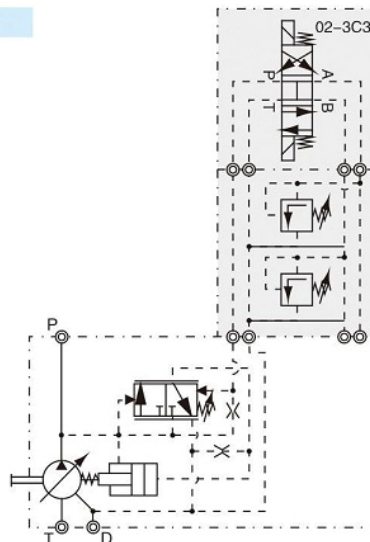
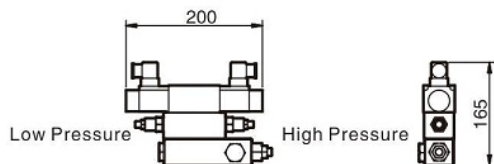
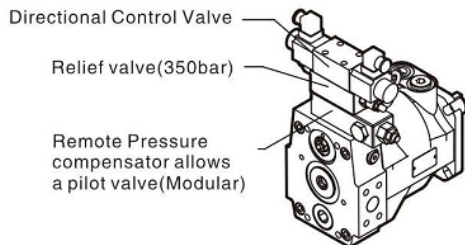
--- = included

GB: Dual pressure control



--- = included

GC: Dual pressure+electrical unloading

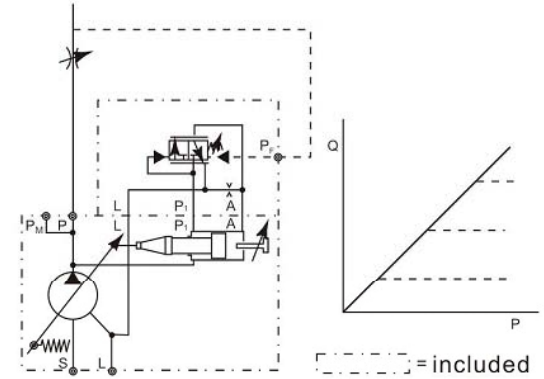
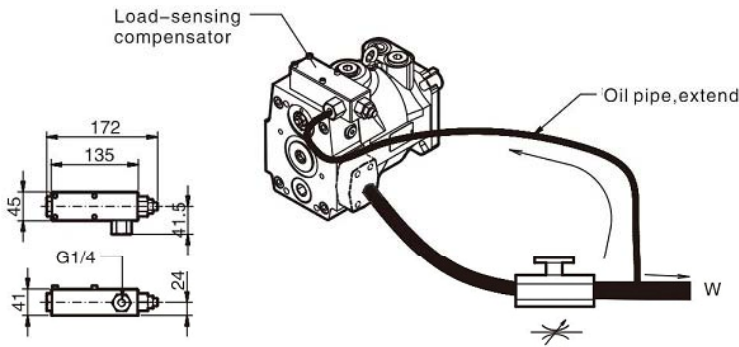


--- = included

Load-sensing Type

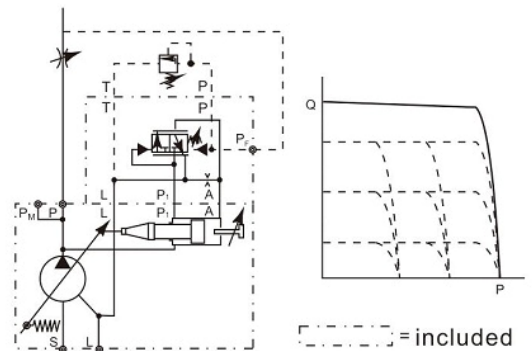
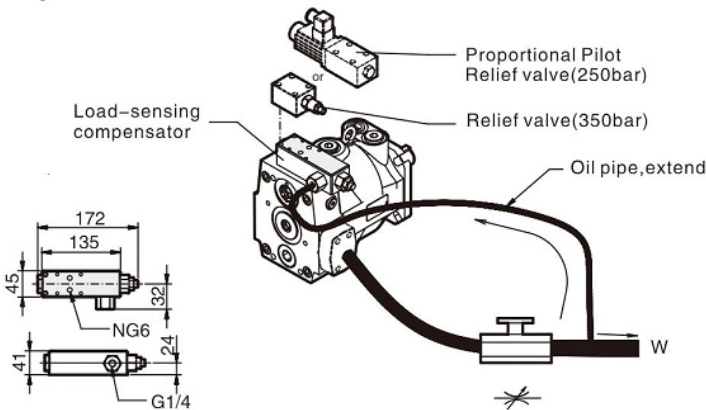
HL: Load-sensing compensator

The load-sensing compensator has an external pilot pressure supply. Factory setting for the differential pressure is 10 bar. The input signal to the compensator is the differential pressure at a main stream resistor. A load-sensing compensator represents mainly a flow control for the pump output flow, because the compensator keeps the pressure drop at the main stream resistor constant. A variable input speed or a varying load (pressure) has consequently no influence on the output flow of the pump and speed of the actuator. By adding a pilot orifice ($\Phi 0.8\text{mm}$) and compensation can be added to the flow control function. See the circuit diagram below, left.



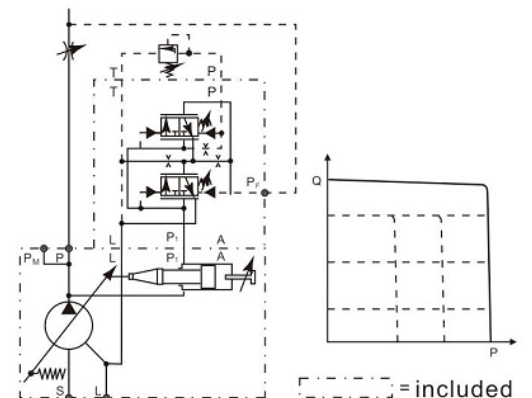
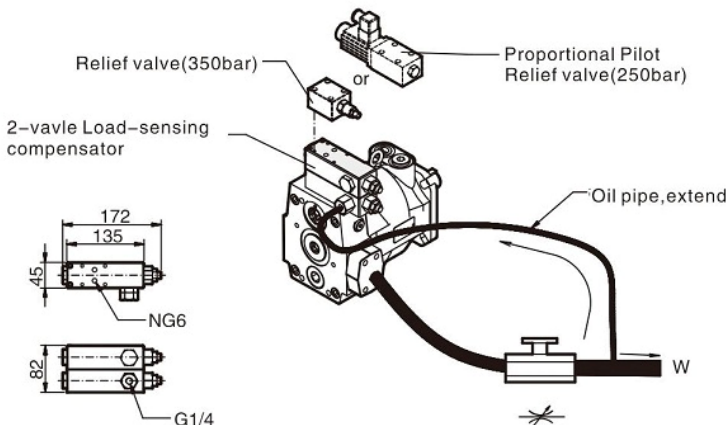
HM: Load-sensing compensator

Shown above is load sensing compensator code HM with an NG6 interface on top of the control valve. That allows direct mounting of a pilot valve for pressure compensation. This version includes the pilot orifice. Due to the interaction of flow and pressure compensation this package has not the "ideal" control characteristic. The deviation is caused by the pilot valves characteristic.

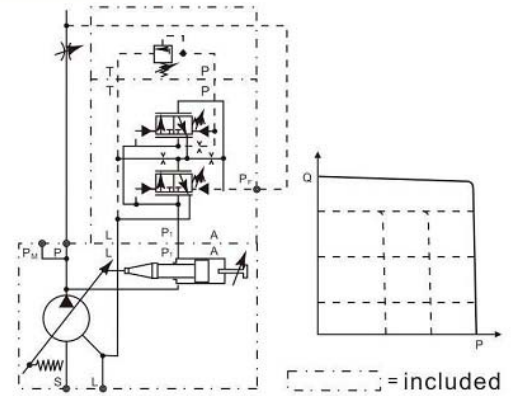
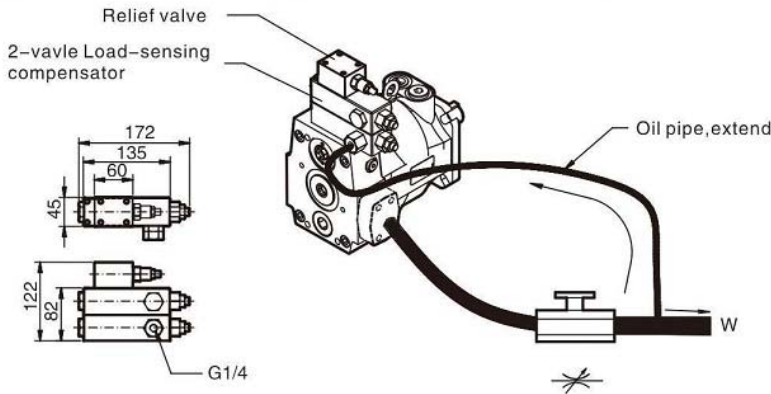


HJ: 2-valve load-sensing compensator

If a more accurate pressure compensation is required, the 2-valve load-sensing compensator code HJ can be used. The circuit diagram of this version is shown left. Here the interaction of the two control functions is avoided by using two separate control valves for flow and pressure compensation. The 2-valve compensator is equipped with an interface NG6 on the compensators top side.

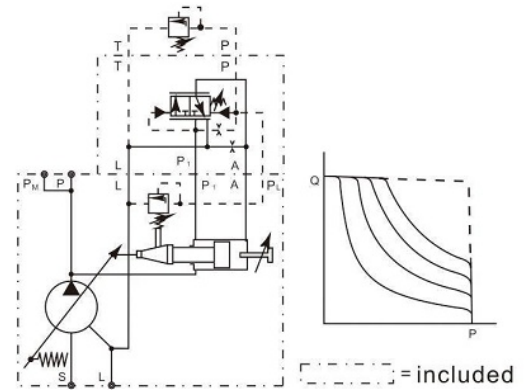
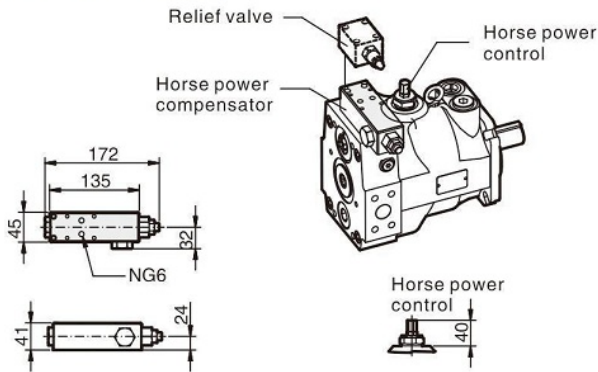


HA: 2-valve load-sensing compensator (valve included)

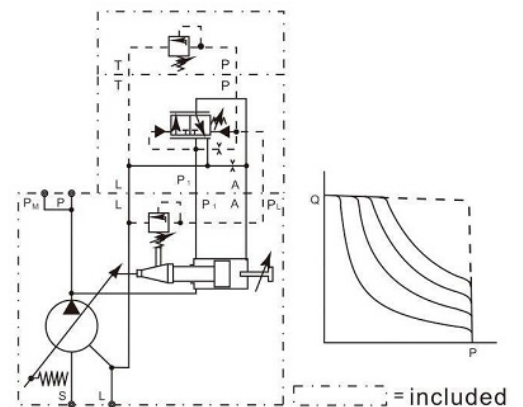
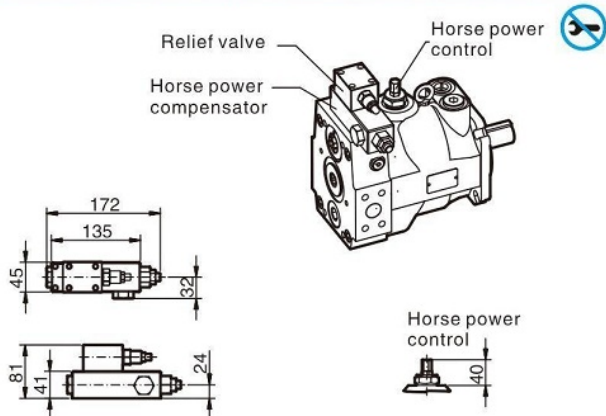


The hydraulic-mechanical horse power compensator consists of a modified remote pressure compensator (CodePG*, PM*) or of a modified load-sensing compensator (CodePH*) and a pilot valve. This pilot valve is integrated into the pump and is adjusted by a cam sleeve. The cam sleeve has a contour that is designed and machined for the individual displacement and the nominal horse power setting. At a large displacement the opening pressure (given by the cam sleeve diameter) is lower than at small displacements. This makes the pump compensate along a constant horse power (torque) curve. For all nominal powers of standard electrical motors, we offer a dedicated cam sleeve. The exchange of this cam sleeve (e.g. to change horse power setting) can easily be done without disassembly of the pump. On top of that an adjustment of the horse power setting can be done within certain limits by adjustment the preload of the pilot control cartridge spring. That allows an adjustment of a constant horse power setting for other than the nominal speeds (1500min⁻¹) or for other horse power.

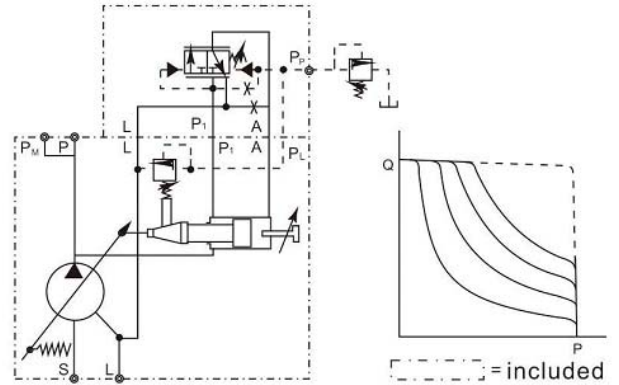
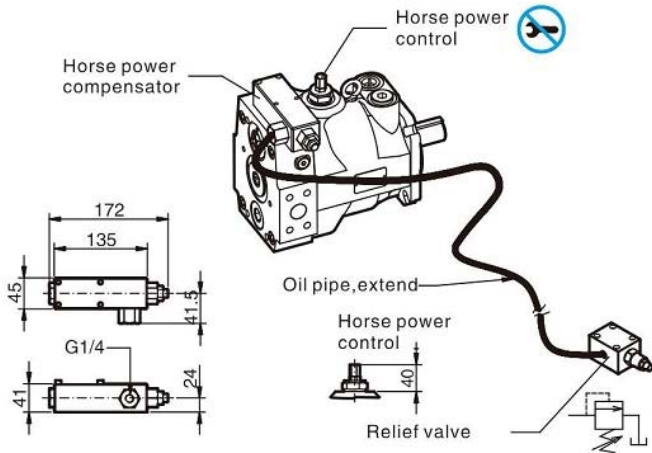
PA: Horse power compensator



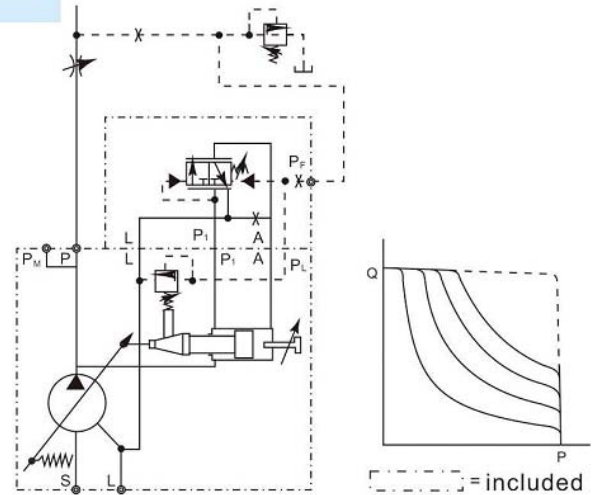
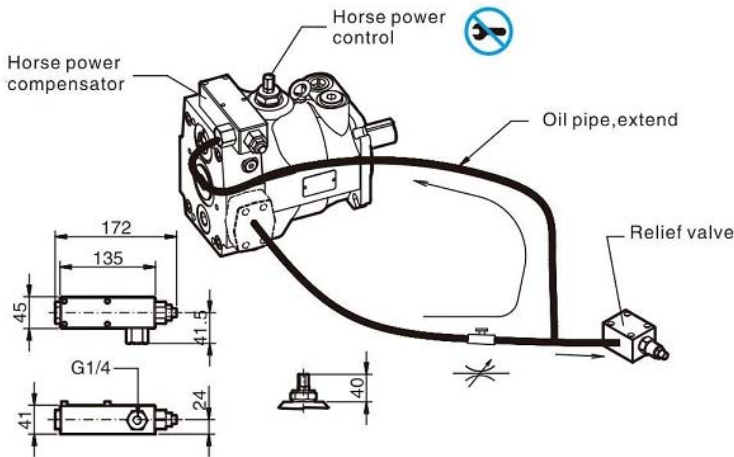
PM: Horse power compensator, pilot flow internal pressure pilot valve included



PG:
Horse power compensator, pilot flow internal



PL:
Horse power compensator, Load-sensing compensator



PH:
Horse power compensator, pilot flow external for load-sensing

