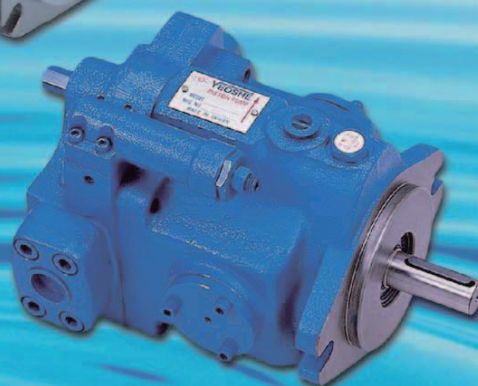
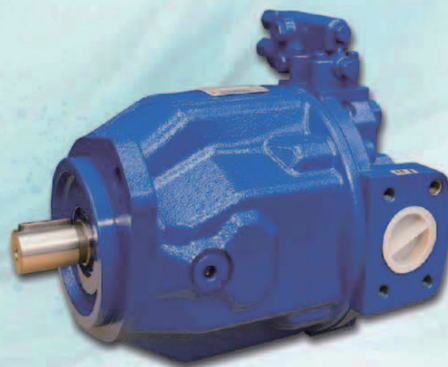




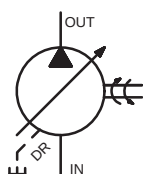
YEOSHE



High Efficient & Potential · Saving Power Technology



PV Axial Piston Pump



nominal pressure
350 bar
max. pressure
420 bar

1. New type of swash plate and large servo piston with strong bias spring achieves fast response, reduce the noise due to active decompression of system at down stroke.
2. Nine pistons and new precompression technology (precompression filter volume) result in unbeaten low outlet flow pulsation.
3. Complete compensator program offers multiple controls.
4. Rigid and FEM-optimized body design for lowest noise level.
5. Thru drive for 100% nominal torque.
6. Pump combinations (multiple pumps) of same size and model and mounting interface for basically all metric or SAE mounting interfaces.
7. Wide application in automobile industrial, ships, forging machines, tire machines, injection molding machines, machine tools, special-purpose machine.

Quick Reference Data Chart

Size	Model	Pressure		Displacement		Pump Delivery (7 bar) 100 PSI				APPROX. Noise Levels			Speed		Weight
		nominal pressure	max. pressure	cm ³ /rev	in ³ /rev	1500 RPM		1800 RPM		Db(A) Full Flow and 1500 RPM			Max. RPM	Min. RPM	
						LPM	U.S. GPM	LPM	U.S. GPM	70 bar (1 KSI)	207 bar (3 KSI)	343 bar (5 KSI)			KG (LB)
1	PV016			16	0.98	24	6.3	28.8	7.6	56	60	68	2750		19 (42)
	PV020			20	1.2	30	7.9	36	9.5						
	PV023			23	1.4	34.5	9.1	41.4	10.9						
2	PV032	350	420	32	1.9	48	12.7	57.6	15.2	59	62	69	2400		30 (66)
	PV040			40	2.4	60	15.9	72	19						
	PV046			46	2.8	69	18.2	82.2	21.9						
	PV056	280	350	56	3.41	84	22.1	100.8	26.6						
	PV065	250	315	65	3.96	97.5	25.7	117	30.9						
3	PV063			63	3.8	94.5	25	113.4	30	66	70	74	2100	300	60 (132)
	PV071			71	4.3	107	28.3	128.7	34				2100		
	PV080	350	420	80	4.8	120	31.7	144	38				2000		
	PV092			92	5.6	138	36.5	165.6	43.8				1900		
	PV110	250	280	110	6.7	165	43.6	198	52.3				1900		
	PV125	250	280	125	7.6	187.5	49.5	225	59.4				1900		
4	PV140	350	420	140	8.5	210	55.5	252.1	66.6	70	74	76	2200		90 (198)
	PV180			180	11	270	71.3	324	85.6	71	75	77			
	PV210	300	350	210	12.8	315	83.1	378	99.8	73	77	79	2100		
5	PV270	350	420	270	16.5	405	107	486	128.4	77	79	89	1800		172 (379)

1. Outlet port is on the top, the pipe pressure should be less than 2 bar.
2. The usage of max. Pressure for each circle never exceed 6 seconds. Please see the General Installation Information for hydraulic oil cleanliness manual.
3. YEOSHE offers tandem pump or other types of pump connection. The mounting has Metric and SAE dimensions.

PV Axial Piston Pump



Order No.

PV	063	GA	3	R	M	1	A	0	N	
①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪
Series	Size and Displacement	Compensator	Pressure adjusting	Rotation	Mounting	Threads	Thru drive & 2nd pump	Voltage	Seals	Design No.

E
④

Series

Horse power

①	PV	Axial piston pump variable displacement high pressure version	nominal pressure 350 bar	max. pressure 420 bar
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Size and Displacement

Code		016	020	023	032	040	046	056	065	063	071	080	092	110	125	140	180	210	270	
②	Size	1			2					3					4				5	
	Displacement	cm ³ /rev	16	20	23	32	40	46	56	65	63	71	80	92	110	125	140	180	210	270
		In ³ /rev	0.98	1.2	1.4	1.9	2.4	2.8	3.41	3.96	3.8	7.3	4.8	5.6	6.6	7.6	8.5	11	12.6	16.5

Compensator

③	A0	Standard Pressure compensator
	LN	None Pressure Compensator (fixed displacement) (pressure protection required)
	LS	Electrical 2-stages Pressure control (pressure protection required)
	LC	Fixed Displacement 2 stages Flow compensator (pressure protection required)
	Remote Type	
	GM	Remote Pressure compensator with NG6 interface
	GA	Remote Pressure compensator +Relief valve
	GJ	Remote Pressure compensator + Proportional Pressure valve
	Electrical unloading Type	
	GR	Remote Pressure compensator + Electrical unloading
	GB	Remote Pressure compensator + 2-stages pressure control
	GC	Remote Pressure compensator + electrical unloading + 2-stages Pressure control
	Load-sensing Type	
	HM	Load-sensing compensator with NG6 interface
	HA	Load-sensing compensator + Relief valve
	HJ	Load-sensing compensator + Proportional Pressure valve
	Load-sensing + Electrical unloading Type	
	HR	Load-sensing compensator + Electrical unloading
	HB	Load-sensing compensator + 2-stages Pressure control
	HC	Load-sensing compensator + Electrical unloading+ 2-stages Pressure control
	Proportional Pressure, flow Type	
	HQ	Load-sensing compensator + Proportional Flow valve+ Relief valve
	HK	Load-sensing compensator + Proportional Pressure valve+ Proportional Flow valve
	BQ	None-stage Flow compensator (Cylinder)
	2-Valve Load-sensing Type	
	VM	2-Valve load-sensing compensator with NG6 interface
	VA	2-Valve load-sensing compensator + Relief Valve
	VJ	2-Valve load-sensing compensator + Proportional Pressure valve
	2-Valve Proportional Pressure, flow Type	
	VQ	2-Valve load-sensing compensator + Proportional Flow valve+ Relief Valve
	VK	2-Valve load-sensing compensator + Proportional Pressure valve+ Proportional Flow valve
	Proportional compensation Type	
	FV	2-Valve load-sensing compensator + High Reacted Proportional Flow Valve+ Flow Feed Back+ Relief Valve
	FG	2-Valve load-sensing compensator + High Reacted Proportional Flow Valve+ Proportional Pressure+ Flow& Pressure Feed Back

PV Axial Piston Pump



Order No.

PV	063	GA	3	R	M	1	A	0	N	
①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪
Series	Size and Displacement	Compensator	Pressure adjusting	Rotation	Mounting	Threads	Thru drive & 2nd pump	Voltage	Seals	Design No.

E
④

Compensator

Horse power

Horse power Type	
③	PM Horse Power Compensator with NG6 interface
	PA Horse Power Compensator + Relief Valve
	PH Horse Power Load-sensing Compensator + Relief valve
	PQ Horse Power Load-sensing Compensator + Proportional Flow valve+ Relief valve
	PJ Horse power compensator + proportional pressure control
	PR Horse power compensator + relief valve + electrical unloading
	PS Horse power compensator + proportional pressure valve + load-sensing compensator

Pressure adjustment

2	10~140 bar (145~2030 PSI)	3	40~300bar (580~4350 PSI)	4	50~350 bar (1015~5075 PSI)
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Horse power Horse Power compensator : Start with P control

Displacement	Horse power (Horse Power efficiency curve diagram P.3-34)									
PV016~PV023	A 3 KW	B 4 KW	C 5.5 KW	D 7.5 KW	E 11 KW					
PV032~PV046,56,65			C 5.5 KW	D 7.5 KW	E 11 KW	F 15 KW	G 18.5 KW	H 22 KW		
PV063~PV092,110,125	E 11 KW	F 15 KW	G 18.5 KW	H 22 KW	I 30 KW	J 45 KW	K 45 KW			
PV140			G 18.5 KW	H 22 KW	I 30 KW	J 45 KW	K 45 KW	L 55 KW		
PV180,210	H 22 KW	I 30 KW	J 37 KW	K 45 KW	L 55 KW	M 75 KW	N 90 KW			
PV270			J 37 KW	K 45 KW	L 55 KW	M 75 KW	N 90 KW	O 110 KW	P 132 KW	

Rotation

(※From the shaft-side view)

5	R	clockwise	L	counter clockwise
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Mounting

Mounting	Body	1	2	3	4	5
⑥	Metric	M K R S	M K R S P	M K R S	M K R S P Q	M K R S
	Inch	N D J U	N D G J U	N D J U	N F D G J U	N D J U

(Dimensions refer to dimension diagram)

Threads

7	3	UNF (SAE)	1	BSPP (G)	2	PT (RC)	7	ISO 6149 (M)
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Thru drive & 2nd pump

Displacement	code									
PV016~PV270	A Single pump									
	B Prepared for thru drive									
PV016~PV023	C	D E		I J K						
PV032~PV046,56,65		D E F		I J K L						
PV063~PV092,110,125		D E F G		I J K L M						
PV140~PV180,210		D E F G		J K L M						
PV270		D E F G H		J K L M N						

Dimensions			
C	SAE AA, Ø50.8 mm	I	Metric, Ø63 mm
D	SAE A, Ø82.55 mm	J	Metric, Ø80 mm
E	SAE B, Ø101.6 mm	K	Metric, Ø100 mm
F	SAE C, Ø127 mm	L	Metric, Ø125 mm
G	SAE D, Ø152.4 mm	M	Metric, Ø160 mm
H	SAE E, Ø165.1 mm	N	Metric, Ø200 mm

Other pumps are acceptable to order

Voltage

9	0	None	A	AC100V (50/60HZ)	B	AC110V (60HZ)	C	AC200V (50/60HZ)
	D	AC220V (60HZ)	E	DC 12V	F	DC 24V		

Seals

10	N	NBR	V	VITON, FPM	E	Ethylen-propylene
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PV Axial Piston Pump Compensator

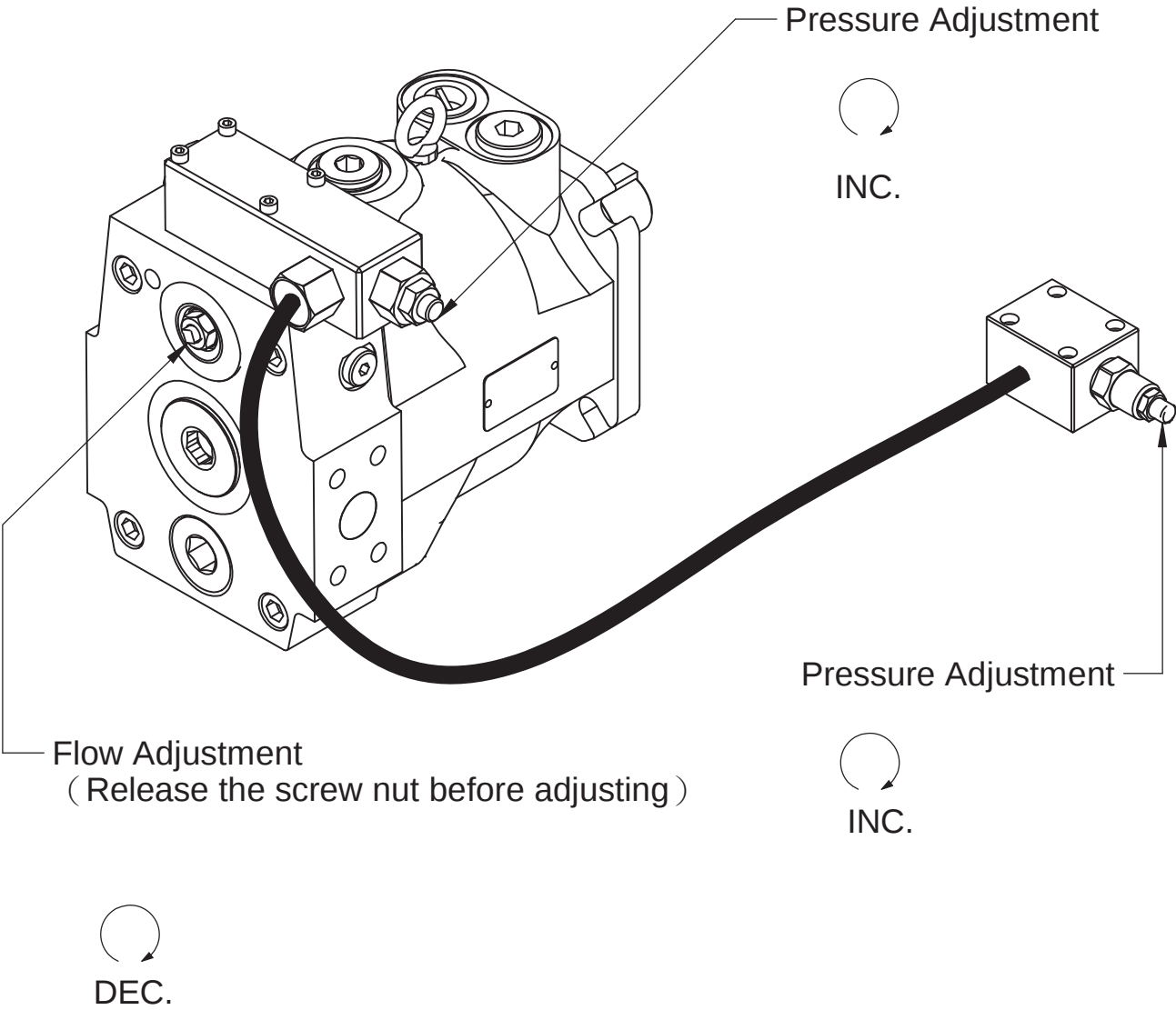
Compensator

A0	Standard Pressure compensator	Page 3-01
LN	None Pressure Compensator (fixed displacement) (pressure protection required)	Page 3-02
LS	Electrical 2-stages Pressure control (pressure protection required)	Page 3-03
LC	Fixed Displacement 2 stages Flow compensator (pressure protection required)	Page 3-04
	Remote Type	
GM	Remote Pressure compensator with NG6 interface	Page 3-05
GA	Remote Pressure compensator +Relief valve	Page 3-06
GJ	Remote Pressure compensator + Proportional Pressure valve	Page 3-07
	Electrical unloading Type	
GR	Remote Pressure compensator + Electrical unloading	Page 3-08
GB	Remote Pressure compensator + 2-stages pressure control	Page 3-09
GC	Remote Pressure compensator + electrical unloading + 2-stages Pressure control	Page 3-10
	Load-sensing Type	
HM	Load-sensing compensator with NG6 interface	Page 3-11
HA	Load-sensing compensator + Relief valve	Page 3-12
HJ	Load-sensing compensator + Proportional Pressure valve	Page 3-13
	Load-sensing + Electrical unloading Type	
HR	Load-sensing compensator + Electrical unloading	Page 3-14
HB	Load-sensing compensator + 2-stages Pressure control	Page 3-15
HC	Load-sensing compensator + Electrical unloading+ 2-stages Pressure control	Page 3-16
	Proportional Pressure, flow Type	
HQ	Load-sensing compensator + Proportional Flow valve+ Relief valve	Page 3-17
HK	Load-sensing compensator + Proportional Pressure valve+ Proportional Flow valve	Page 3-18
BQ	None-stage Flow compensator (Cylinder)	Page 3-19
	2-Valve Load-sensing Type	
VM	2-Valve load-sensing compensator with NG6 interface	Page 3-20
VA	2-Valve load-sensing compensator + Relief Valve	Page 3-21
VJ	2-Valve load-sensing compensator + Proportional Pressure valve	Page 3-22
	2-Valve Proportional Pressure, flow Type	
VQ	2-Valve load-sensing compensator + Proportional Flow valve+ Relief Valve	Page 3-23
VK	2-Valve load-sensing compensator + Proportional Pressure valve+ Proportional Flow valve	Page 3-24
	Proportional compensation Type	
FV	2-Valve load-sensing compensator + High Reacted Proportional Flow Valve+ Flow Feed Back+ Relief Valve	Page 3-25
FG	2-Valve load-sensing compensator + High Reacted Proportional Flow Valve+ Proportional Pressure+ Flow& Pressure Feed Back	Page 3-26
	Horse power Type	
PM	Horse Power Compensator with NG6 interface	Page 3-27
PA	Horse Power Compensator + Relief Valve	Page 3-28
PH	Horse Power Load-sensing Compensator + Relief valve	Page 3-29
PQ	Horse Power Load-sensing Compensator + Proportional Flow valve+ Relief valve	Page 3-30
PJ	Horse power compensator + proportional pressure control	Page 3-31
PR	Horse power compensator + relief valve + electrical unloading	Page 3-32
PS	Horse power compensator + proportional pressure valve + load-sensing compensator	Page 3-33

PV Axial Piston Pump Compensator



Pressure & Flow Adjustment

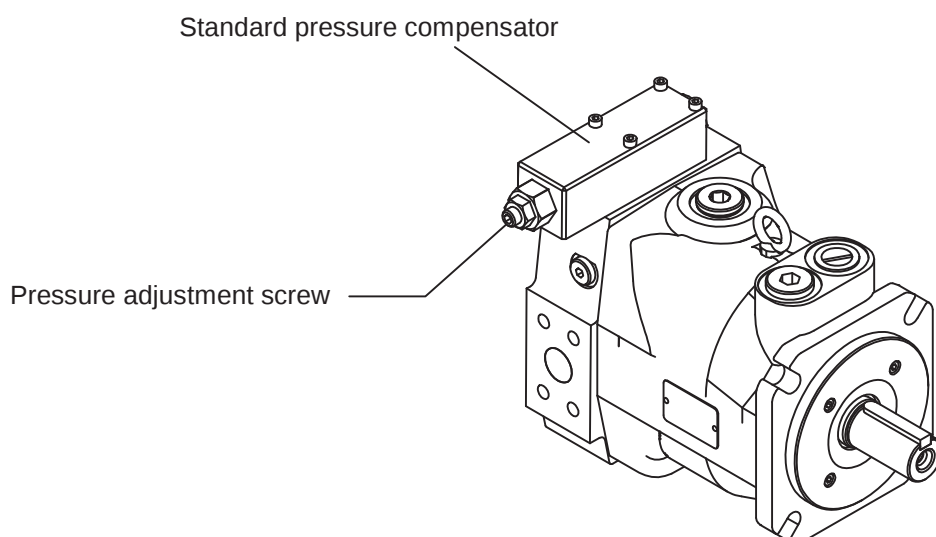
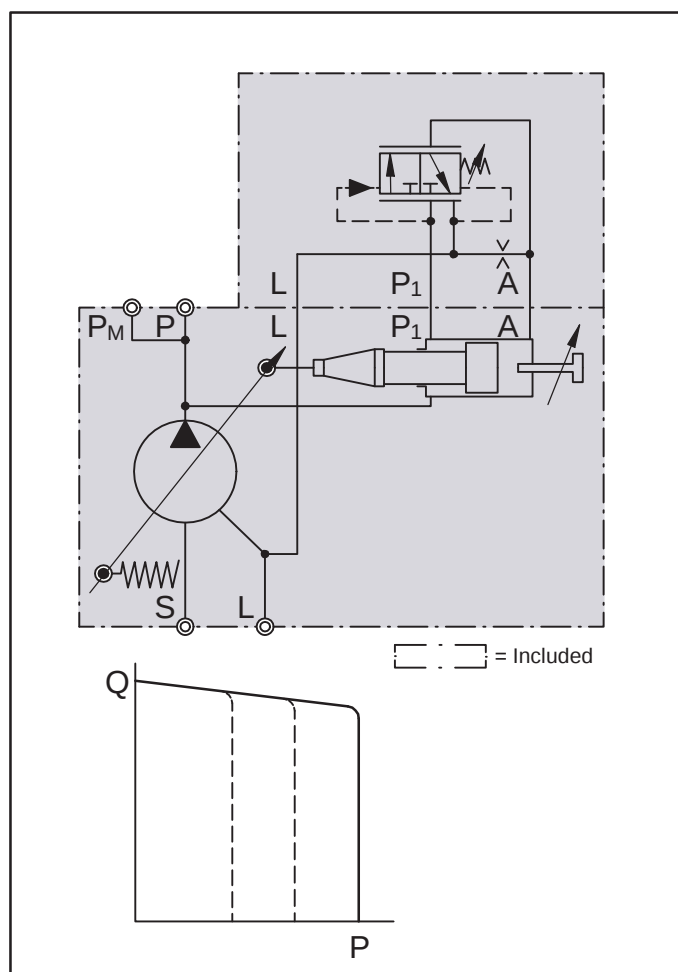


A0 Standard Pressure compensator

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 downstroking of the pump. The displacement of the pump is controlled in order to match the flow requirement of the system.

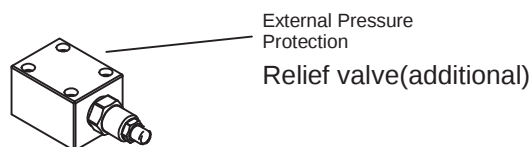
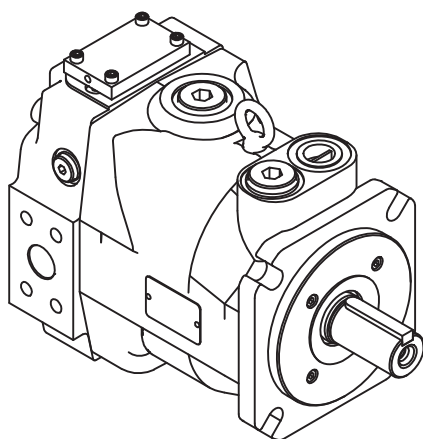
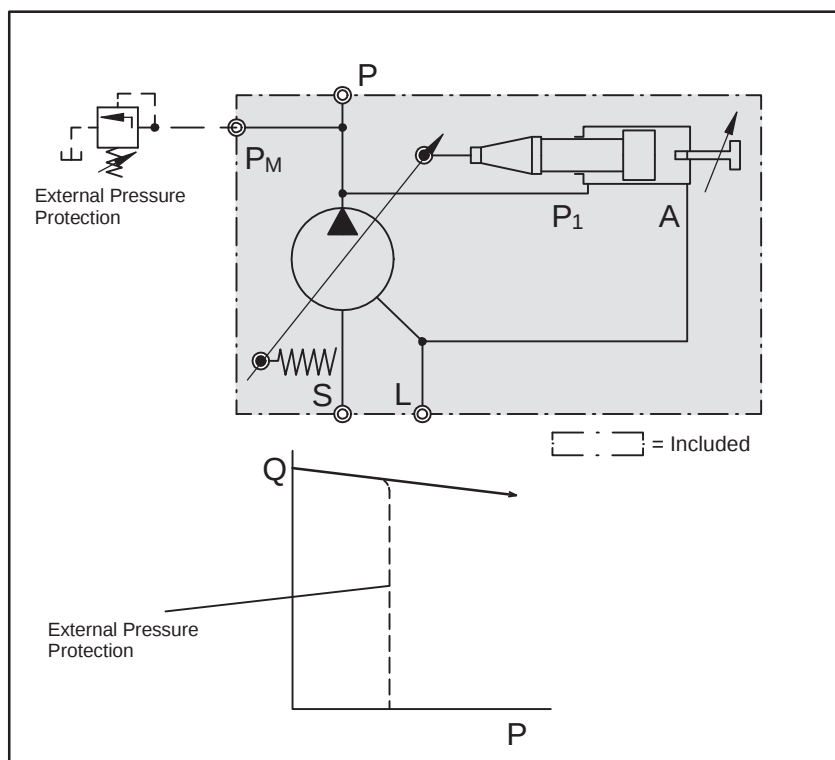


PV Axial Piston Pump Compensator

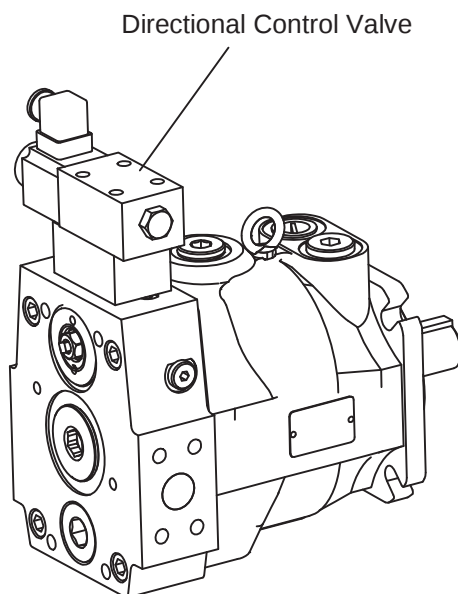
LN None Pressure Compensator (fixed displacement) (pressure protection required)

By using the system under stable displacement and pressure situation, standard pressure compensator can be omitted which helps cost down.

Notice: External Pressure Protection is necessarily added at port PM to limit the pressure; otherwise the system pressure will be over high .



Notice: External Pressure Protection is necessarily added at port PM to limit the pressure; otherwise the system pressure will be over high.

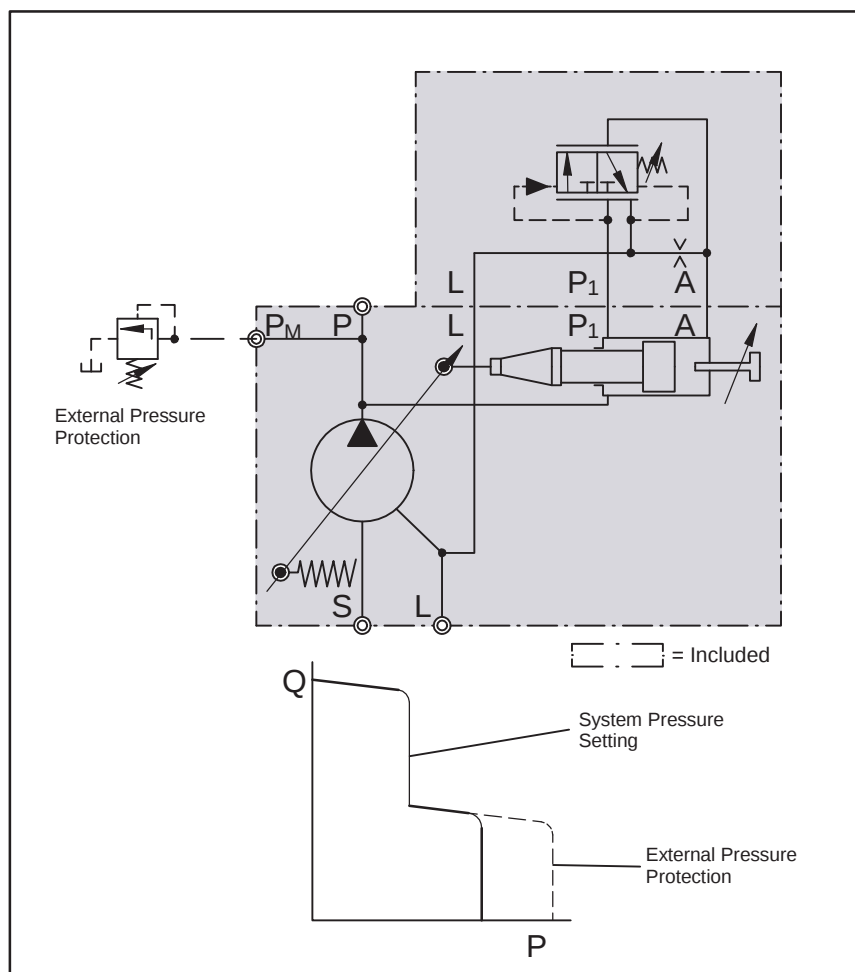


PV Axial Piston Pump Compensator

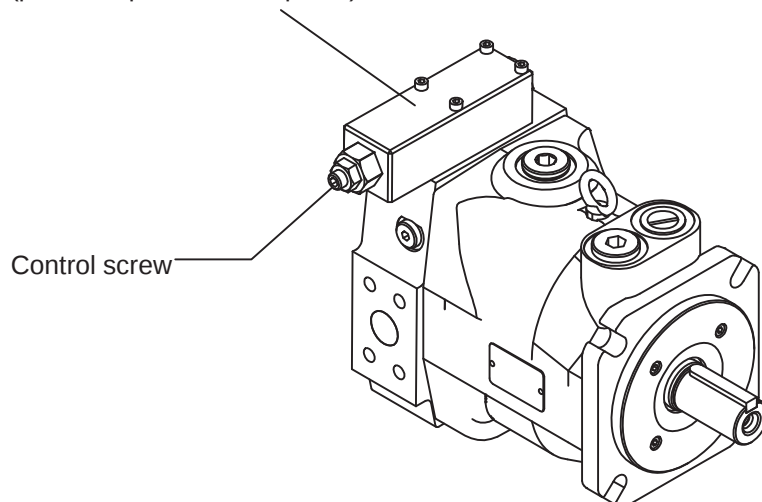
Fixed Displacement 2 stages Flow compensator LC (pressure protection required)

Control the hydraulic circuit change by using the system pressure setting to achieve the switch of big and small flow. LS control is applied to two-stage stroke and different speed system.

Notice: External Pressure Protection is necessarily added at port PM to limit the pressure; otherwise the system pressure will be over high.



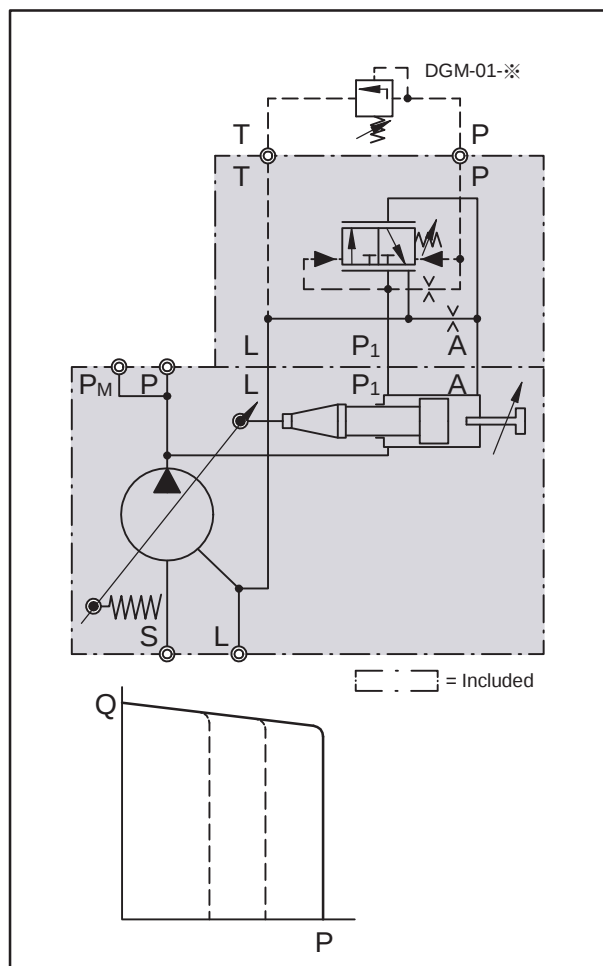
Fixed Displacement 2 stages Flow compensator
(pressure protection required)



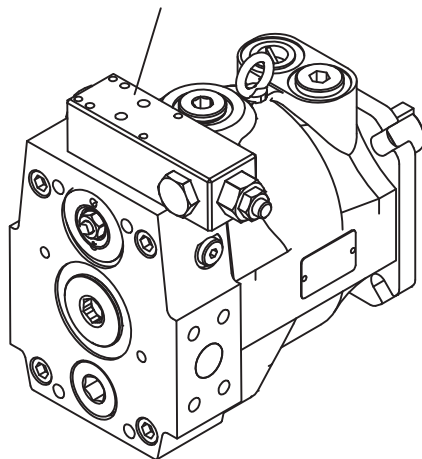
GM Remote Pressure compensator with NG6 interface

Version GM of the 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. YEOSHE offers a variety of these compensator accessories ready to install. All remote pressure compensator have a factory setting of 15 bar differential pressure. With this setting, the controlled pressure at the pump outlet is higher than the pressure controlled by the pilot valve.



Remote Pressure compensator with NG6 interface

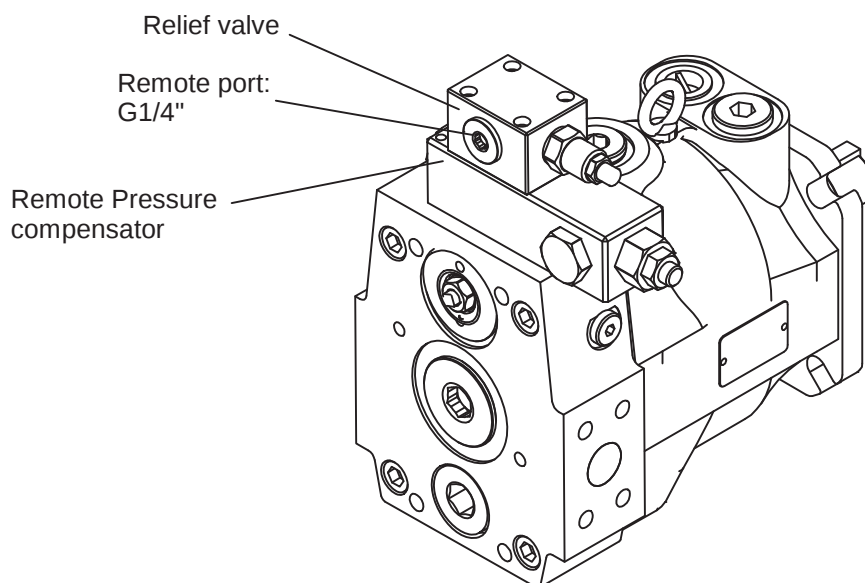
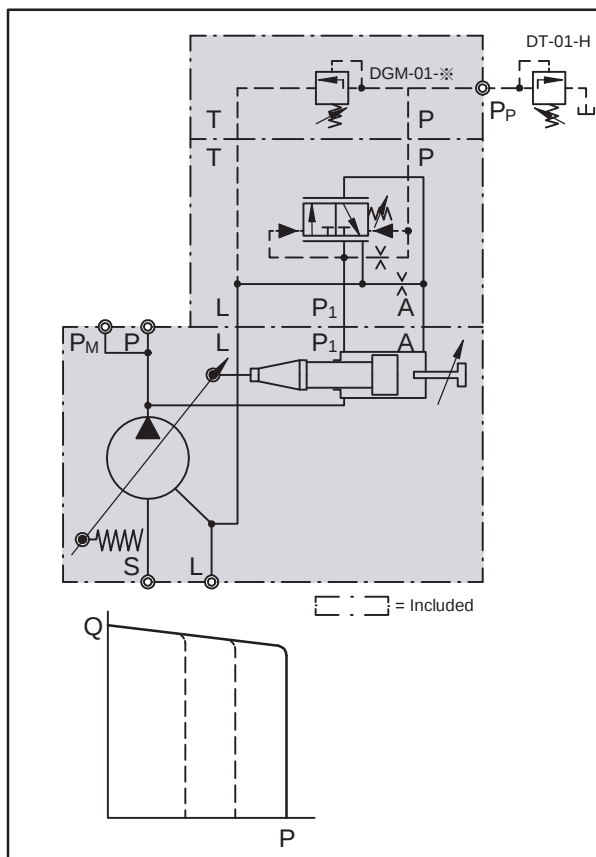


GA Remote Pressure compensator +Relief valve

The pressure is set directly at the compensator spring, and the setting of remote pressure compensator can be achieved by any suitable pilot pressure valve connected to pilot port PP.

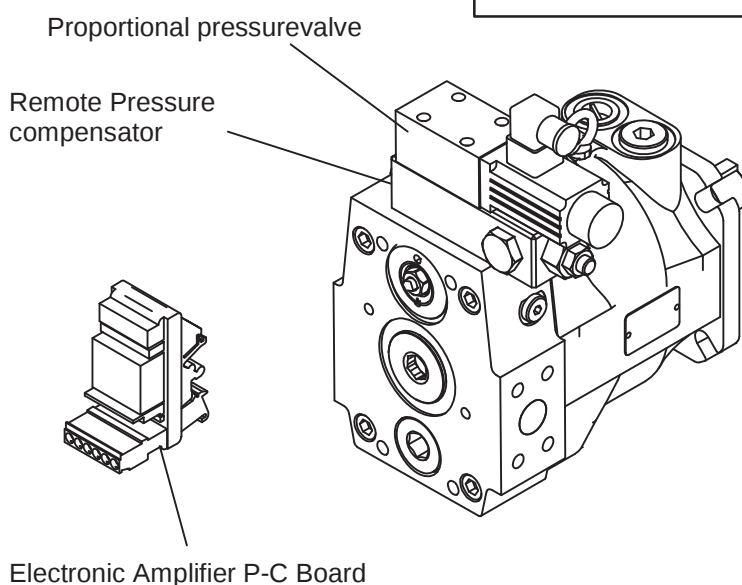
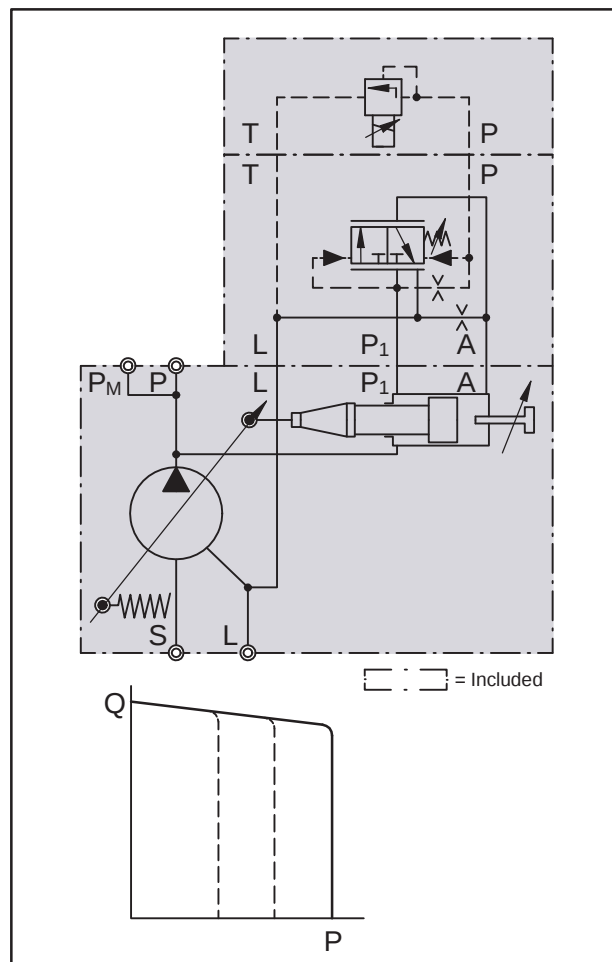
The pilot valve can be installed remote from the pump in some distance.

That allows pressure setting, e.g. from the control panel of the machine. The pilot flow supply is internal through the valve spool, and the pilot flow is 1~1.5 L/min.

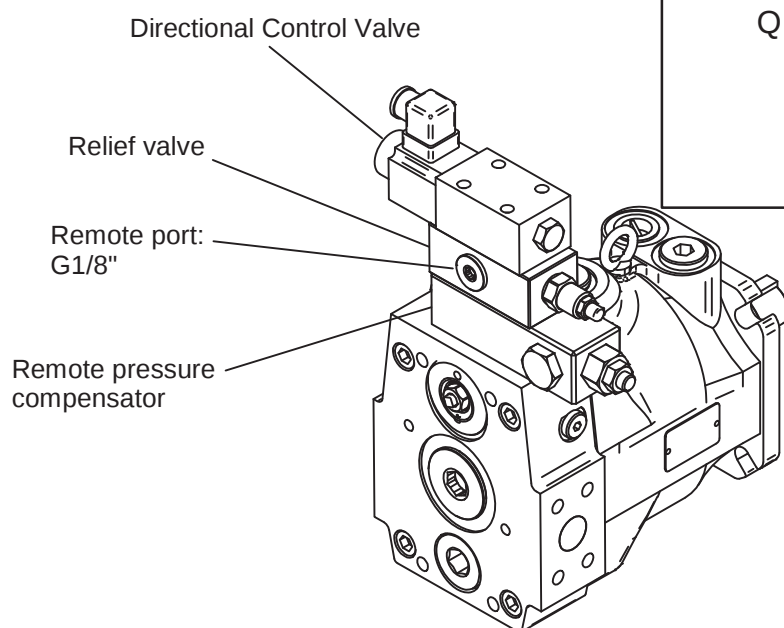


GJ Remote Pressure compensator + Proportional Pressure valve

Fulfill the actual displacement and maintain the preset system pressure. By adding YEOSHE proportional pressure valve, Electrical proportional pressure control is available.



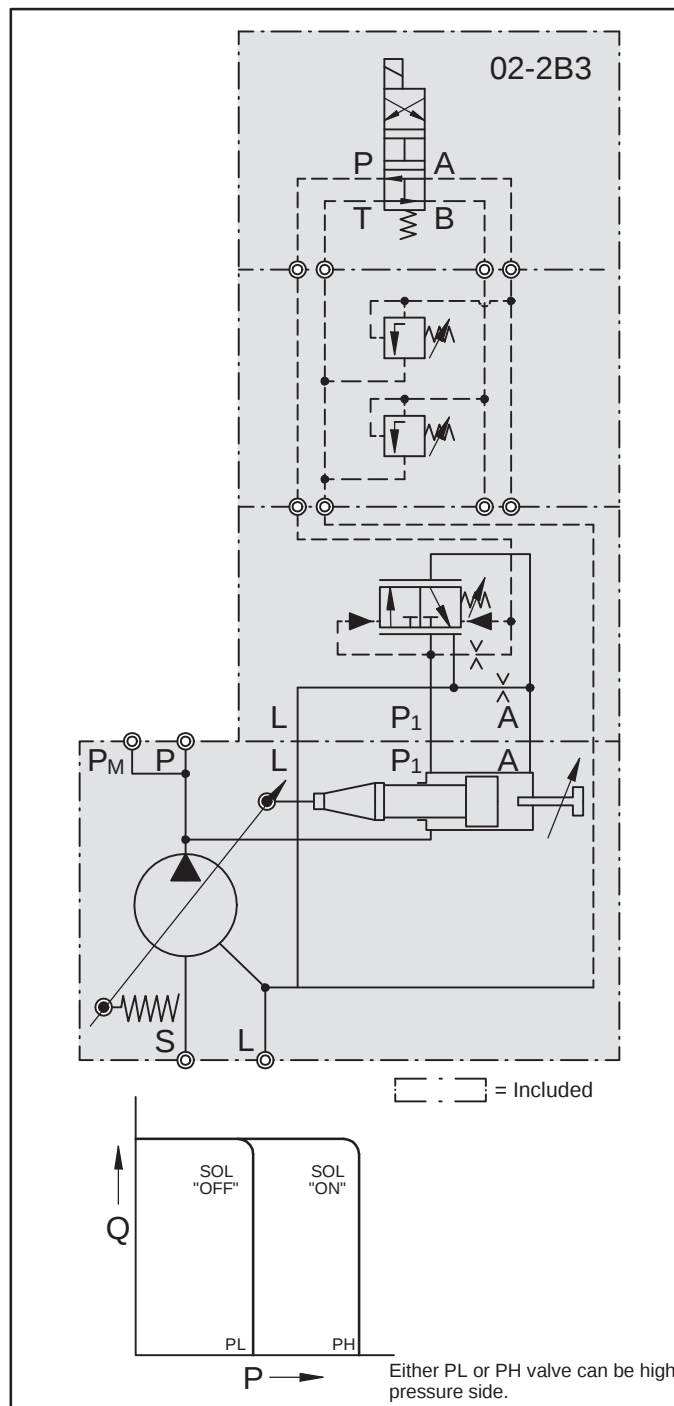
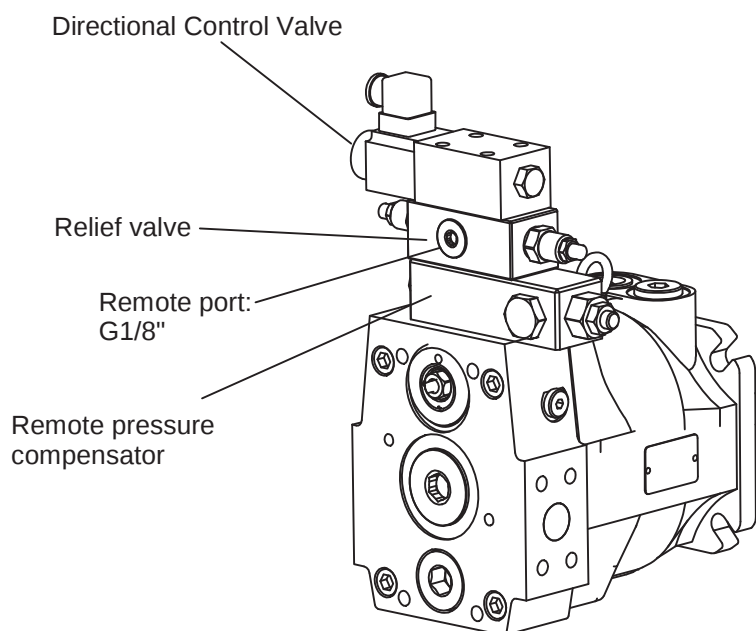
By adding a relief valve and a Directional Control Valve on the compensator makes the pump have both function.
GR control is for long unloading situation.
When the system stops, oil temperature and noise maintain low level while being through the unloading.



GB Remote Pressure compensator + 2-stages pressure control

By adding a Relief Valve and Directional Control Valve on the compensator makes it adjust two different stage limited pressure.

GB control is for two-stage working pressure under the constant cylinder speed.



GC Remote Pressure compensator + electrical unloading + 2-stages Pressure control

Control two different-stage limited pressure by adding Directional Control Valve, and unloading function.

When the system stops, oil temperature and noise maintain low level by unloading function.

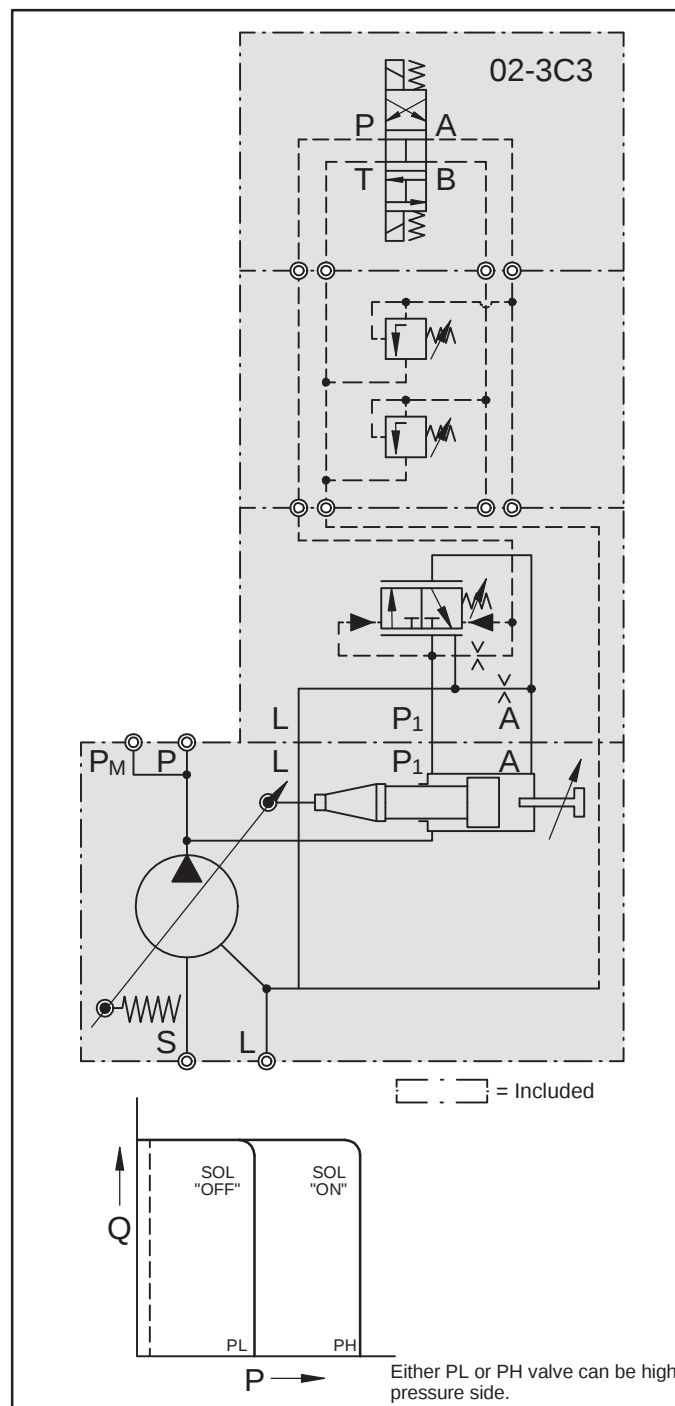
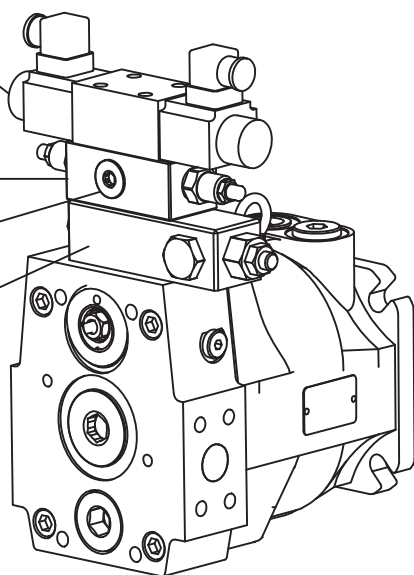
Usable for stable cylinder speed, two-stage pressure, and long unloading situation.

Directional Control Valve

Relief valve

Remote port:
G1/8"

Remote pressure
compensator

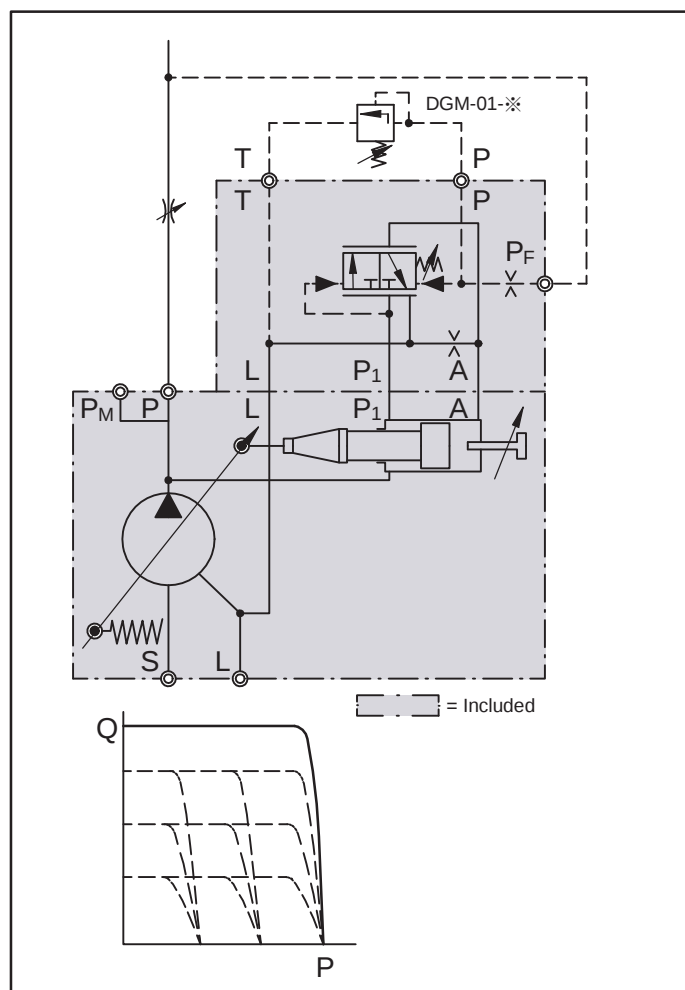


Version HM of remote pressure compensator provides an interface NG6 on its top side.

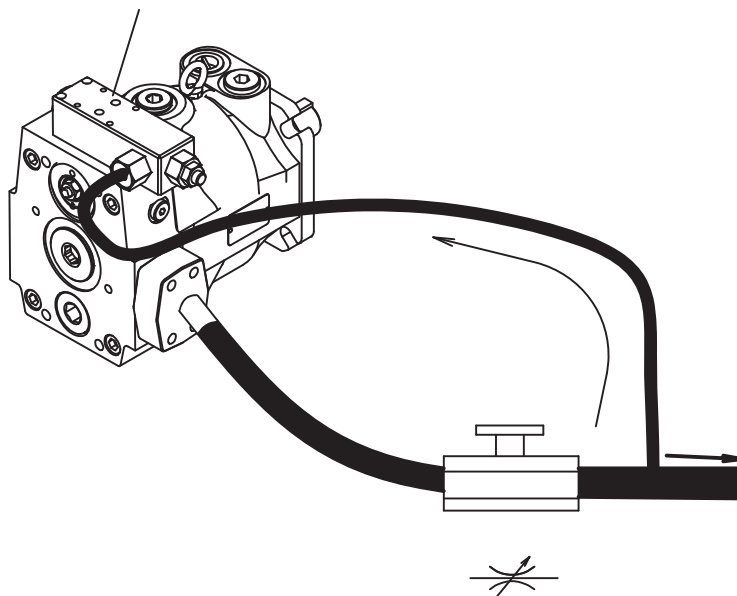
The load-sensing compensator has an external pilot pressure supply. Factory setting for the differential pressure is 10 bar.

The input signal to the compensator is the differential pressure at the 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 the speed of the actuator.

By adding YEOSHE proportional pressure valve, Electrical proportional pressure control is available.



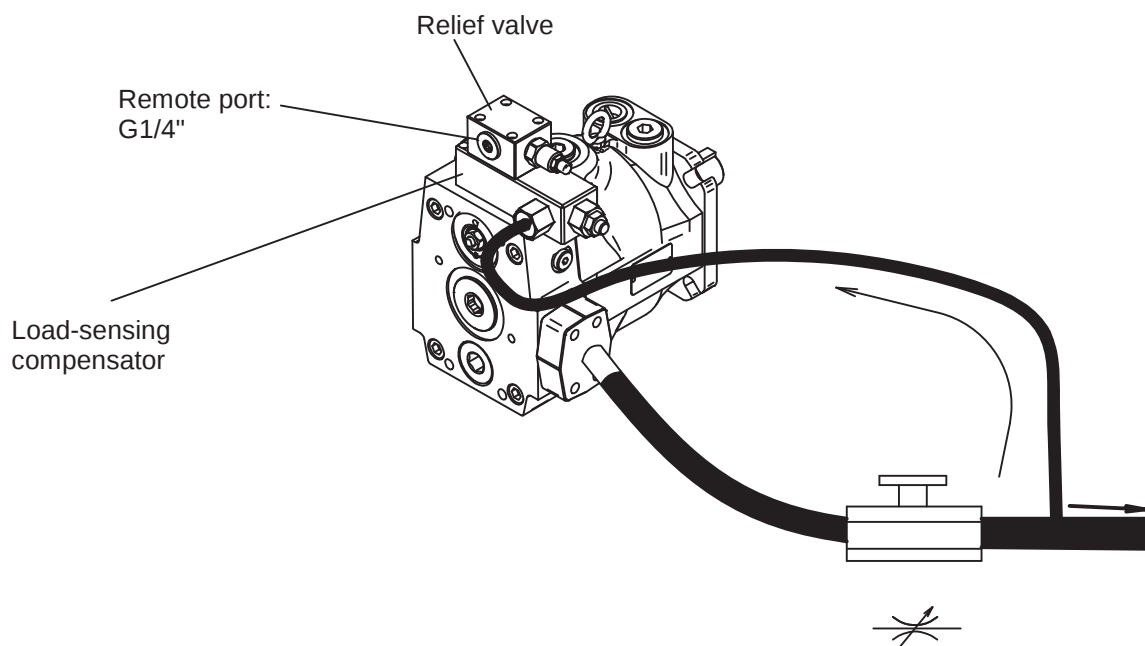
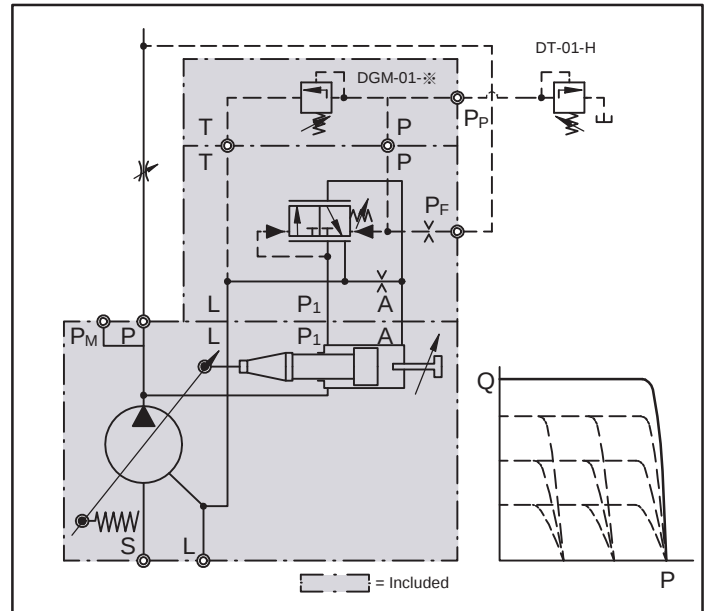
Load-sensing compensator with NG6 interface



HA Load-sensing compensator + Relief valve

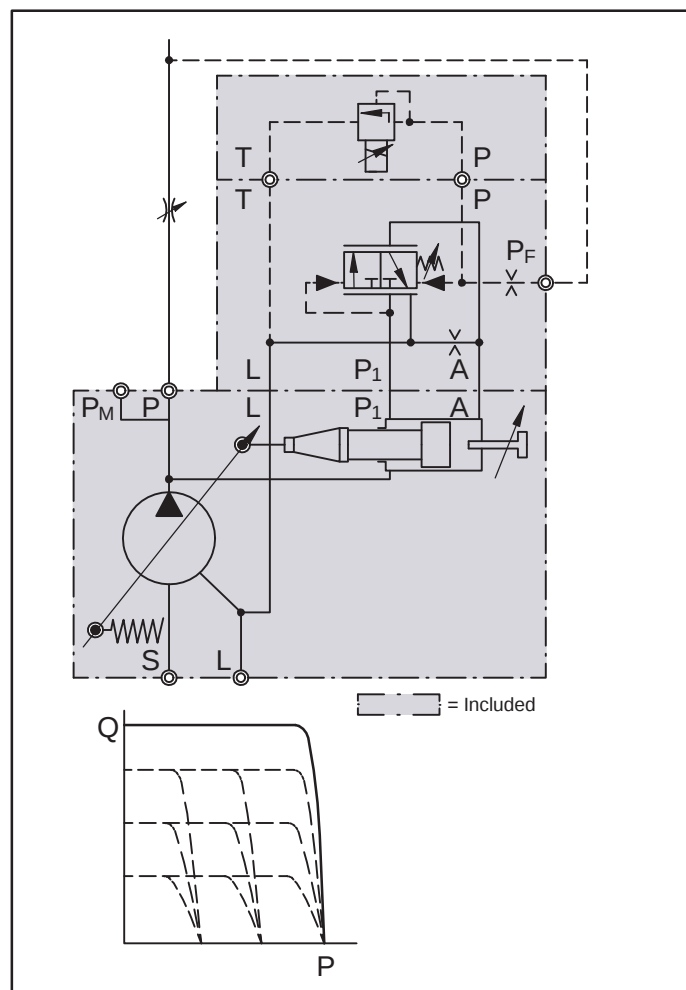
The load-sensing compensator has an external pilot pressure supply. Factory setting for the differential pressure is 10bar. The input signal to the compensator is the differential pressure at the main stream resistor. A load-sensing compensator represents mainly a flow control for the pump output flow, because the compensator keeps the pressure drop at the main stream resistor constant. A variable input speed or a varying load(-pressure) has consequent no influence on the output flow of the pump and the speed of the actuator. Relief valve has adjustment function.

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 pilot flow supply is internal through the valve spool, and the pilot flow is 1-1.5 L/min.



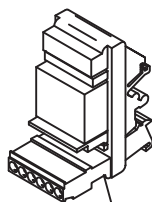
HJ Load-sensing compensator + Proportional Pressure valve

The load-sensing compensator has an external pilot pressure supply. Factory setting for the differential pressure is 10bar. The input signal to the compensator is the differential pressure at the main stream resistor. A load-sensing compensator represents mainly a flow control for the pump output flow and the speed of the actuator. Proportional pressure valve is for electrical proportional pressure control.

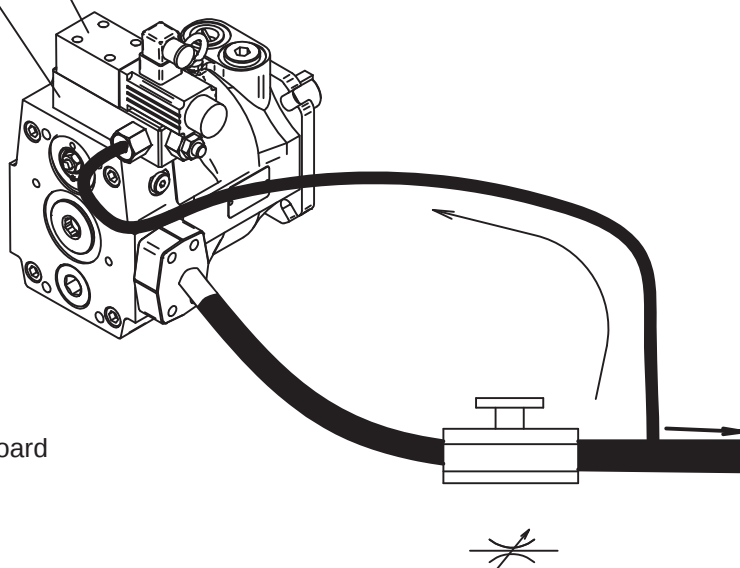


Load-sensing compensator

Proportional valve



Electronic Amplifier P-C Board

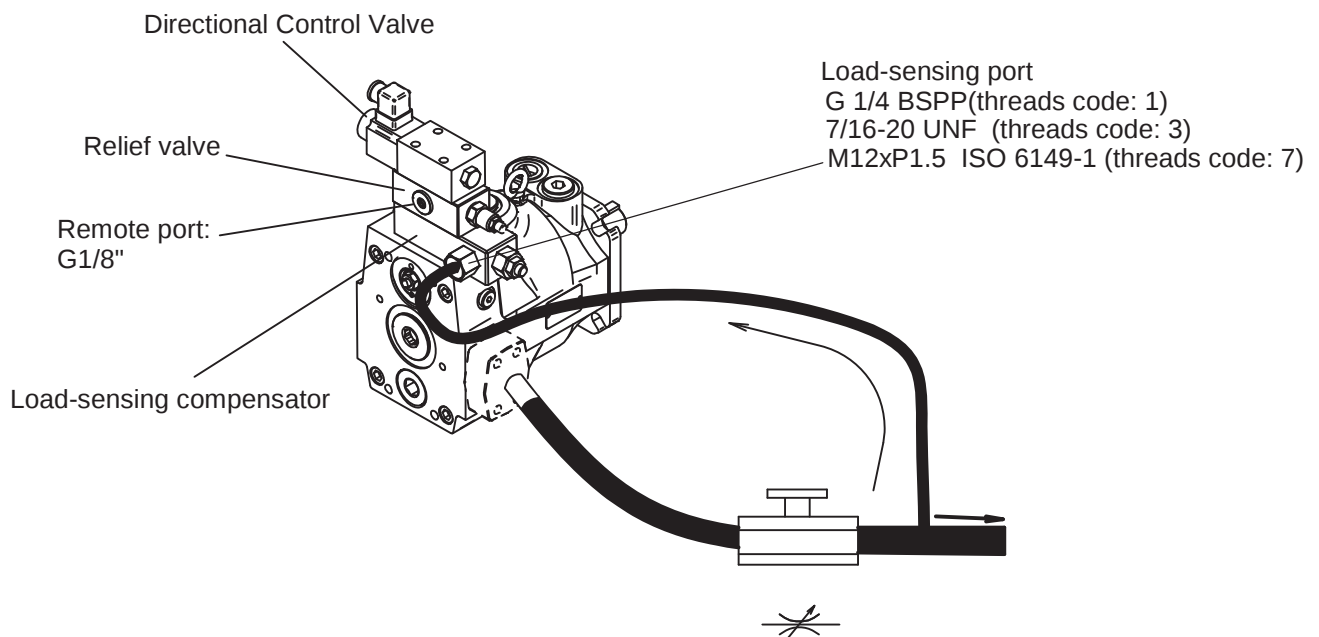
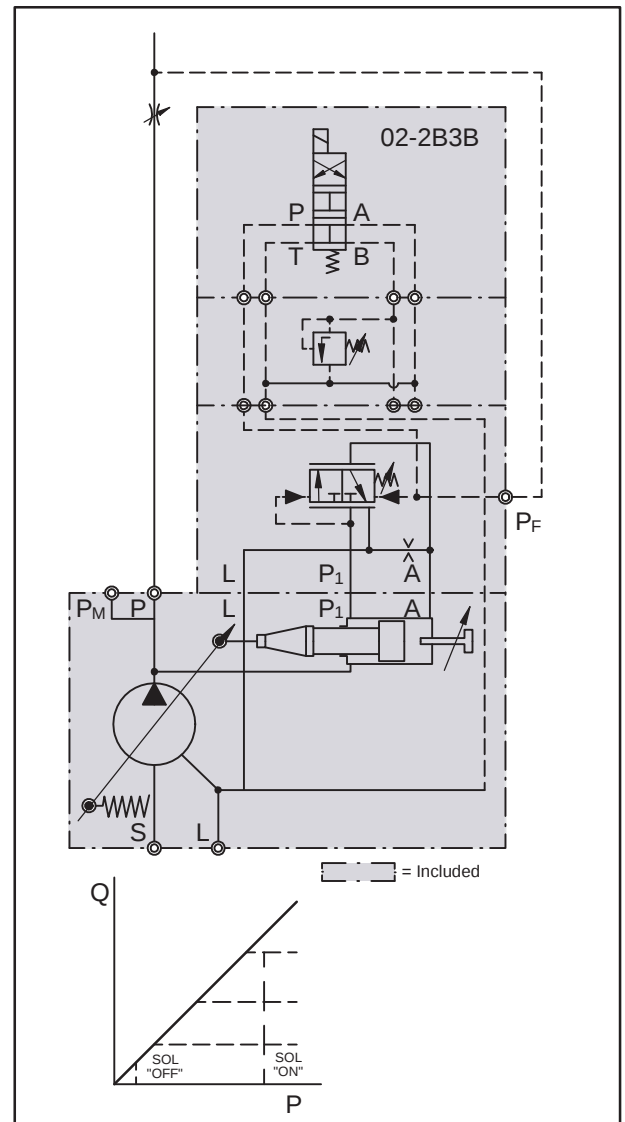


HR Load-sensing compensator + Electrical unloading

The load-sensing compensator has all external pilot pressure supply. Factory setting for the differential pressure is 10bar. The input signal to the compensator is the differential pressure at the 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 on the output flow of the pump and speed of the actuator.

By adding a pilot orifice ($\Phi 0.8\text{mm}$) and a pressure pilot valve pressure compensation can be added to the flow control function. See the circuit diagram left.

By adding a relief valve and a directional control valve on the compensator makes the pump have both function. HR control is for long unloading situation. When the system stops, oil temperature and noise maintain low level while being through the unloading.

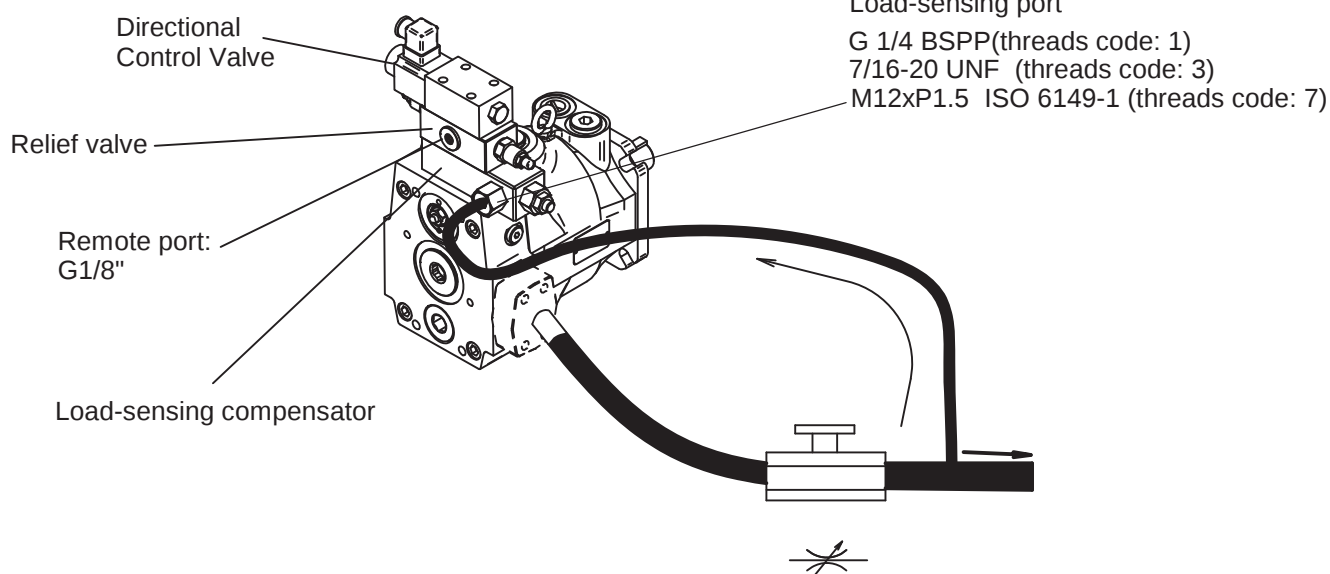
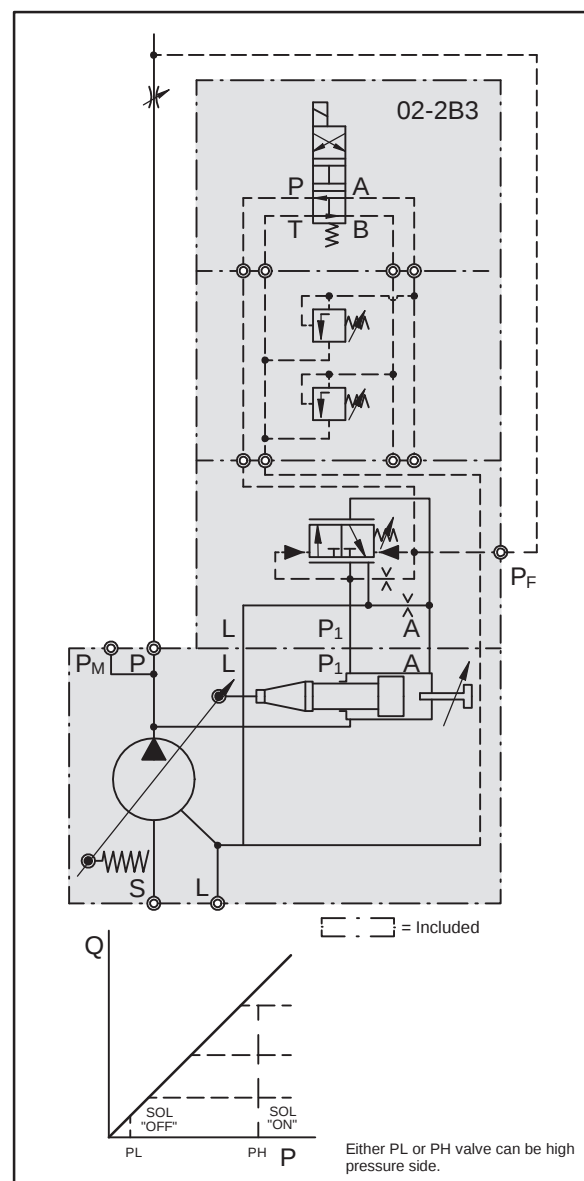


HB Load-sensing compensator + 2-stages Pressure control

The load-sensing compensator has an external pilot pressure supply. Factory setting for the differential pressure is 10bar. The input signal to the compensator is the differential pressure at the 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 on the output flow of the pump and speed of the actuator.

By adding a pilot orifice ($\Phi 0.8\text{mm}$) and a pressure pilot valve pressure compensation can be added to the flow control function. See the circuit diagram left.

By adding a relief valve and directional control valve on the compensator makes it adjust two different stage limited pressure. HB control is for two-stage working pressure under the constant cylinder.



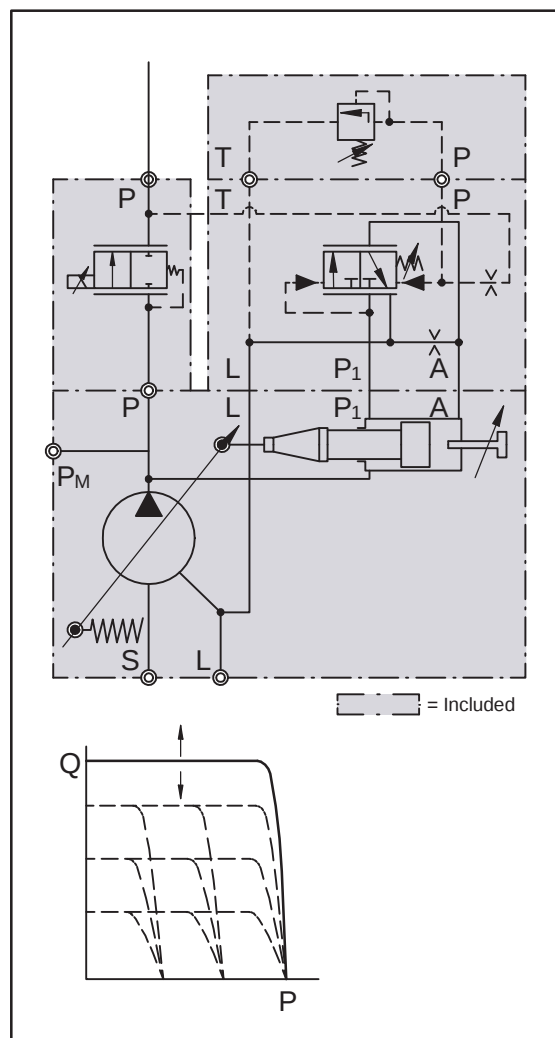
By adding a relief valve and a directional control valve on the compensator makes the pump have both function. HC control is for long unloading situation. When the system stops, oil temperature and noise maintain low level while being through the unloading.



HQ Load-sensing compensator + Proportional Flow valve+ Relief valve

The load-sensing compensator has an external pilot pressure supply. Factory setting for the differential pressure is 10bar. The input signal to the compensator is the differential pressure at the 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.

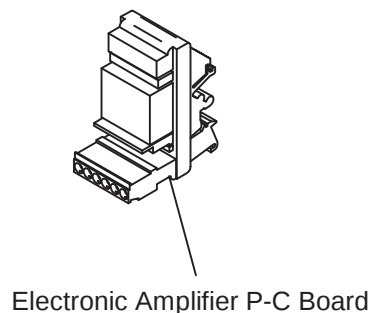
By adding YEOSHE proportional flow valve, Electrical proportional flow control is available.



Load-sensing compensator

Relief valve

Proportional flow control



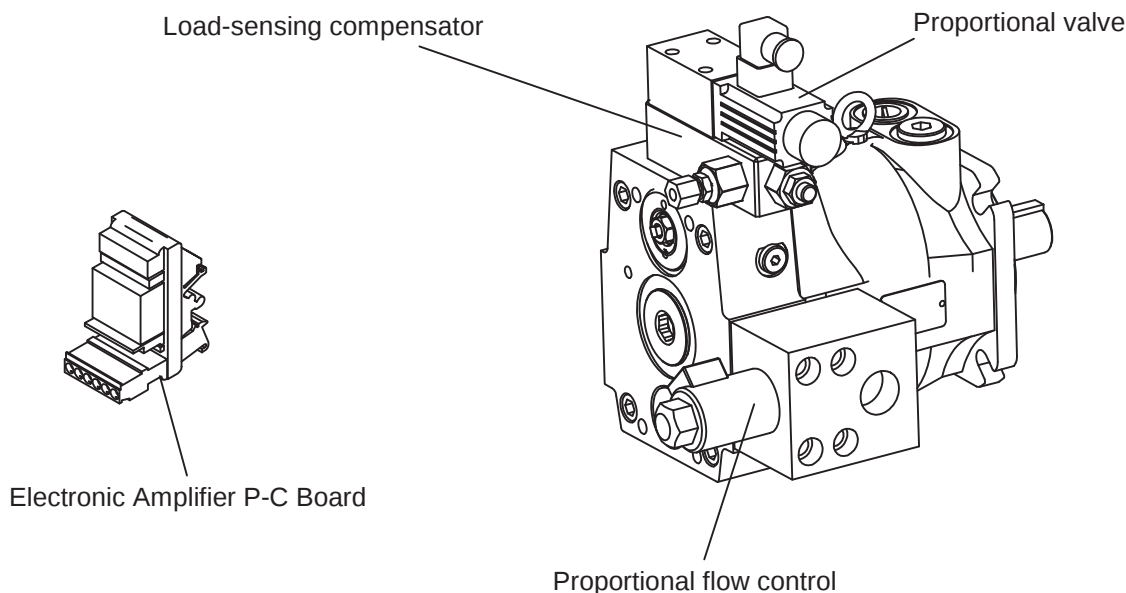
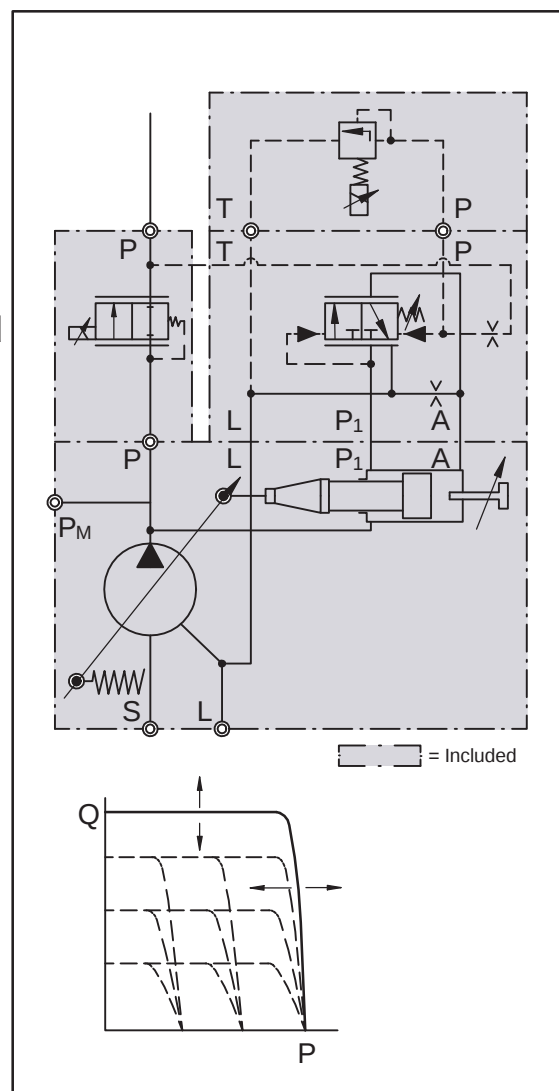
Electronic Amplifier P-C Board

HK Load-sensing compensator + Proportional Pressure valve+ Proportional Flow valve

HK is for saving energy. It offers the smallest pressure and flow according to the different requirement.

The displacement is nearly zero when the system stands by, and the motor output is also nearly zero. When the system reaches setting pressure, the pump displacement will reduce by itself. It only needs to add the system required flow, and the pressure remains the same which control the oil temperature.

Compared with vane pump, gear pump +PQ valve can save 30%-50% energy. The load-sensing compensator+ Proportional flow valve has all external pilot pressure supply. Factory setting for the differential pressure is 10 bar. The input signal to the compensator is the differential pressure at the main stream resistor. A load-sensing compensator represents mainly a flow control for the pump output flow of the pump and the speed of the actuator. Proportional pressure valve is for electrical proportional pressure control.

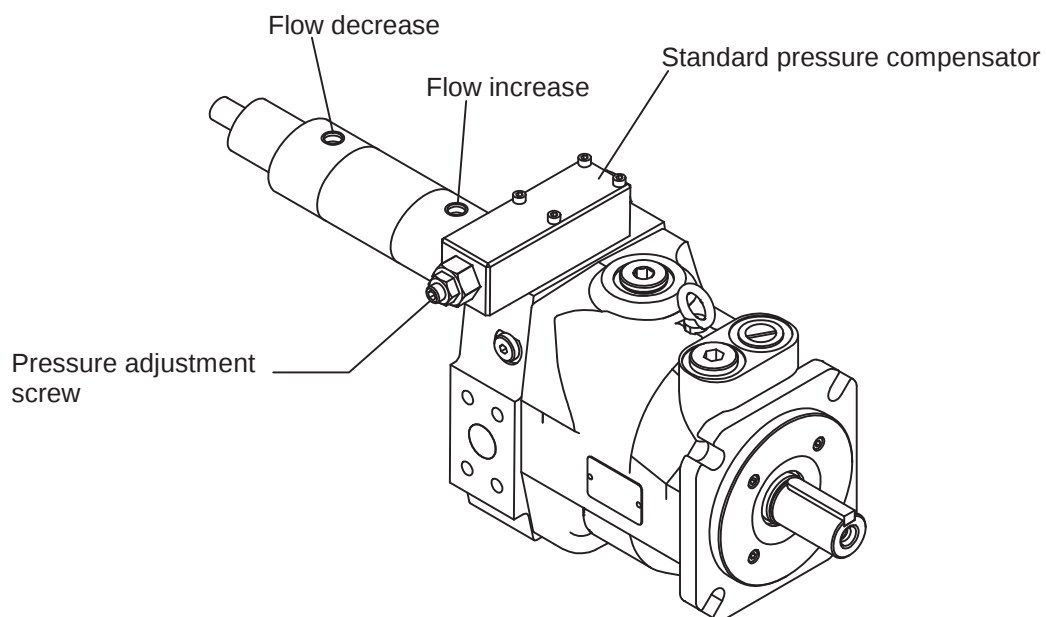
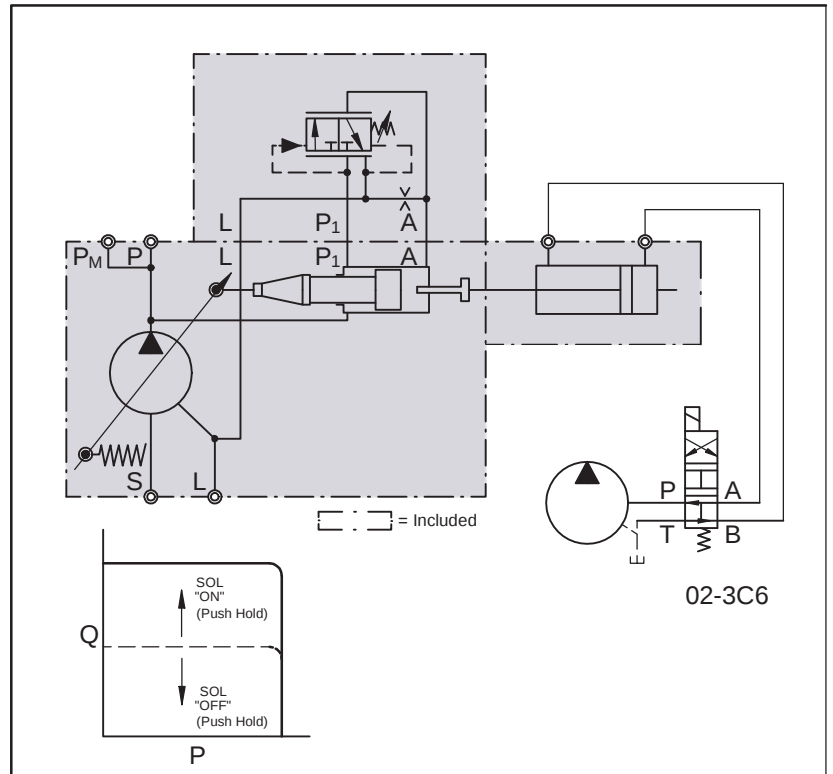


PV Axial Piston Pump Compensator

BQ None-stage Flow compensator (Cylinder)

Using added cylinder, external pilot pressure controls the forward and backward, and push the swash plate to change directions and make the single-stage pressure control. Displacement can be zero to Max, and pressure remains on setting pressure. Automatus flow control is much easier to repair, and cheaper than electrical proportional flow control.

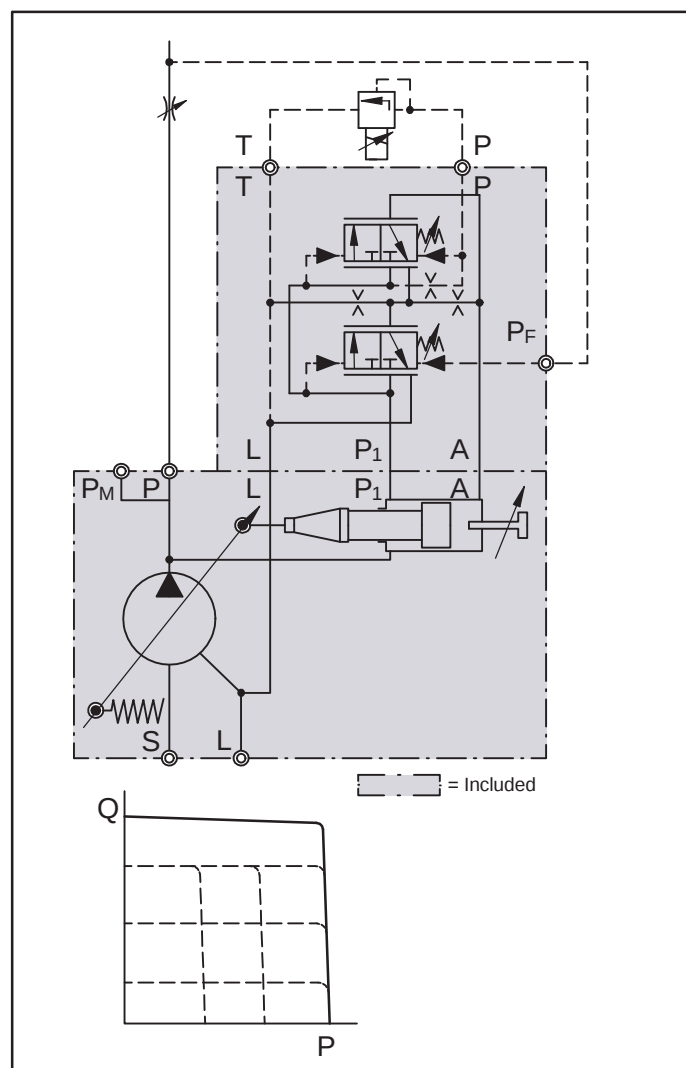
External control is more automated by using solenoid valve or hydraulic directional valve.



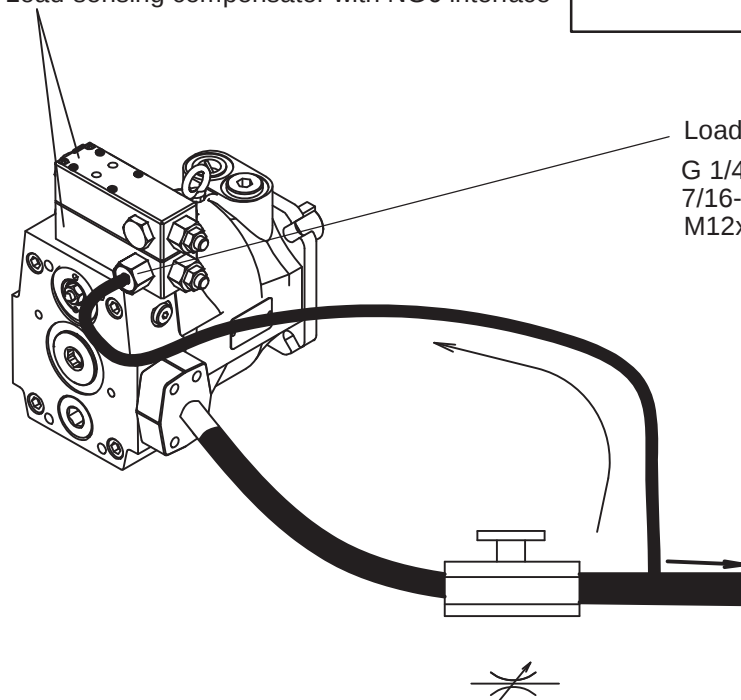
VM 2-Valve load-sensing compensator with NG6 interface

Two-valve loading-sensing compensator with NG6 interface is an option for limiting pressure precisely. By eliminating the impact between pressure and flow, the pump should add two different valves to control flow and pressure.

Version VM provides on its top side an interface NG6 which has pressure-adjusted function. If adding a YEOSHE proportional pressure control valve, Electrical Proportional Pressure control is available.



2-valve Load-sensing compensator with NG6 interface



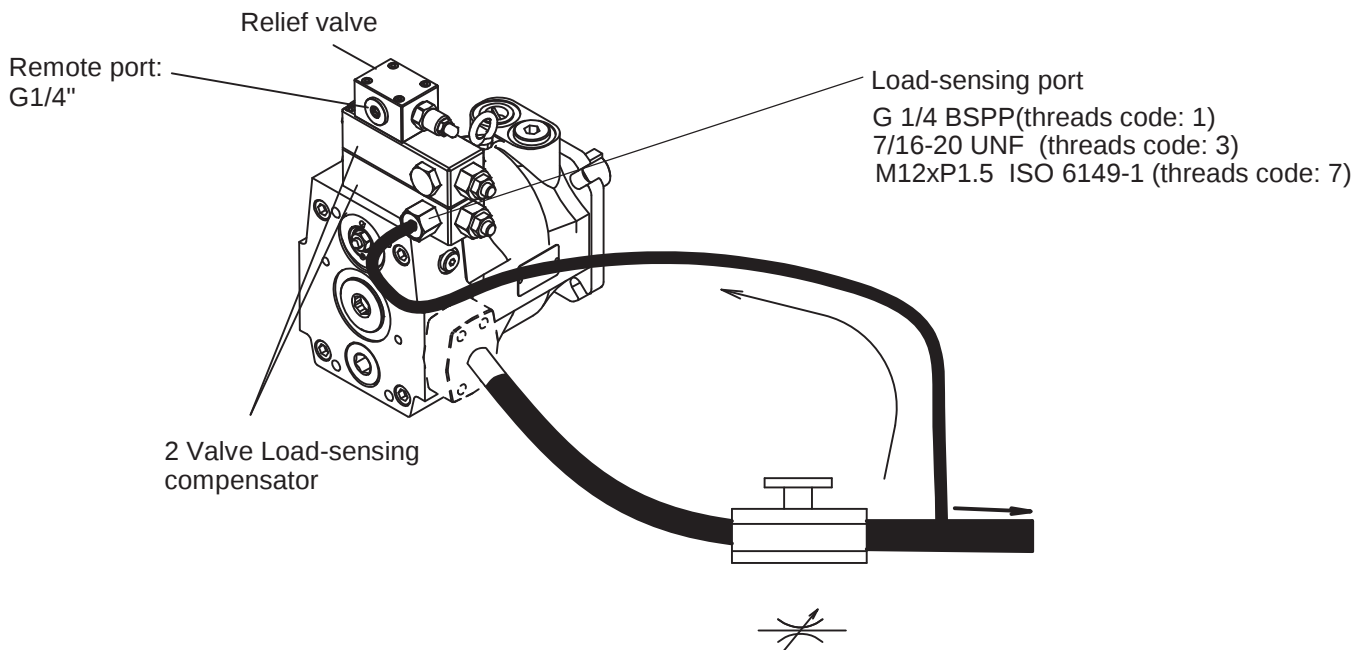
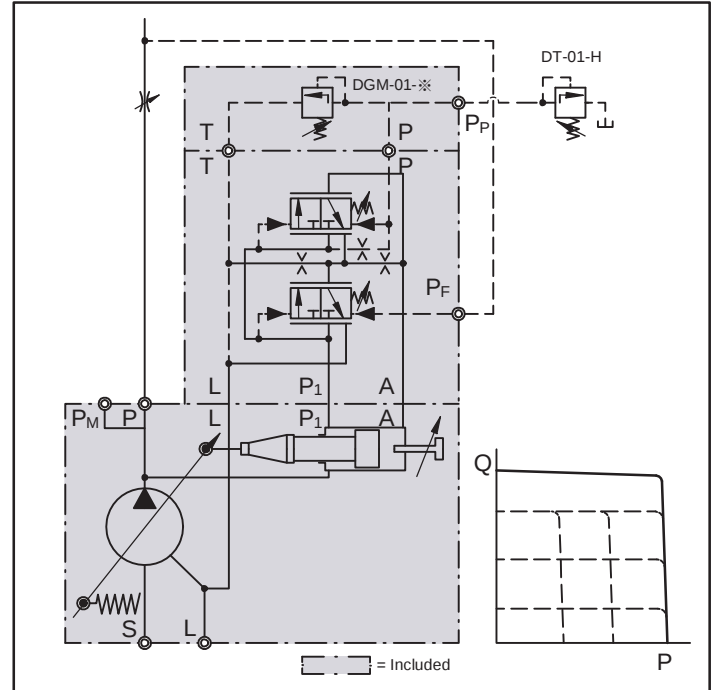
Load-sensing port

G 1/4 BSPP (threads code: 1)
7/16-20 UNF (threads code: 3)
M12xP1.5 ISO 6149-1 (threads code: 7)

VA 2-Valve load-sensing compensator + Relief Valve

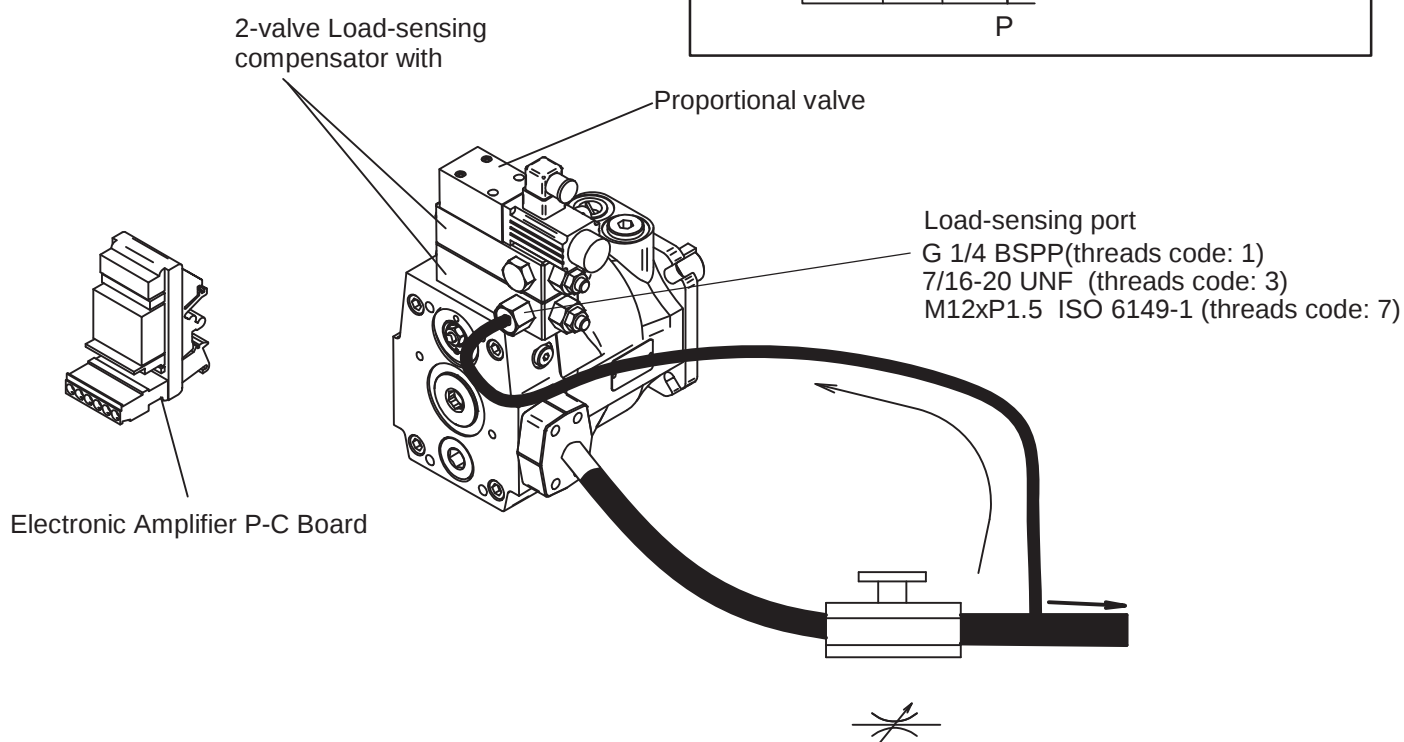
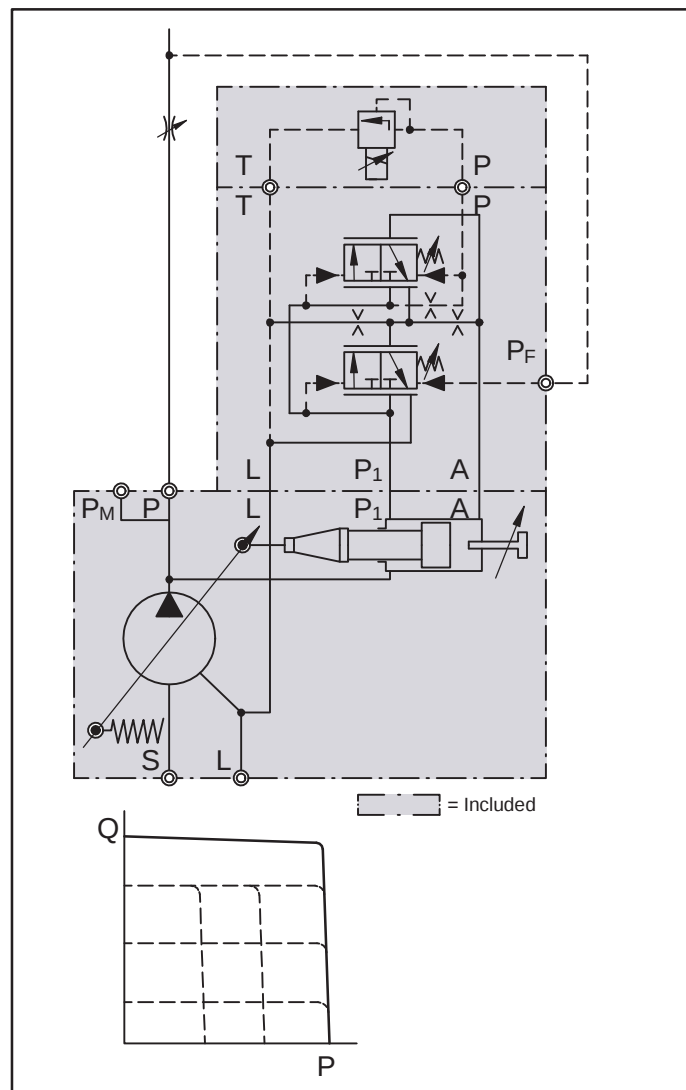
Two-valve loading-sensing compensator with NG6 interface is an option for limiting pressure precisely. By eliminating the impact between pressure and flow, the pump should add two different valves to control flow and pressure.

The pilot valve is free to be installed to remote in some distance. That allows pressure setting e.g. from the control panel of the machine. The pilot flow supply is internal through the valve spool, and the pilot flow is 1-1.5 L/min.



VJ 2-Valve load-sensing compensator + Proportional Pressure valve

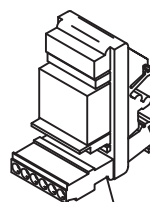
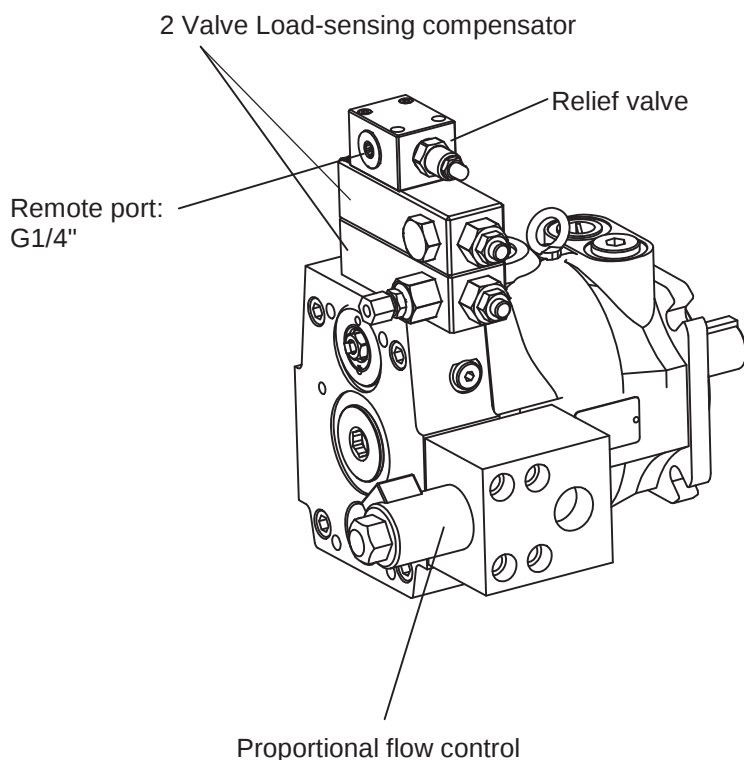
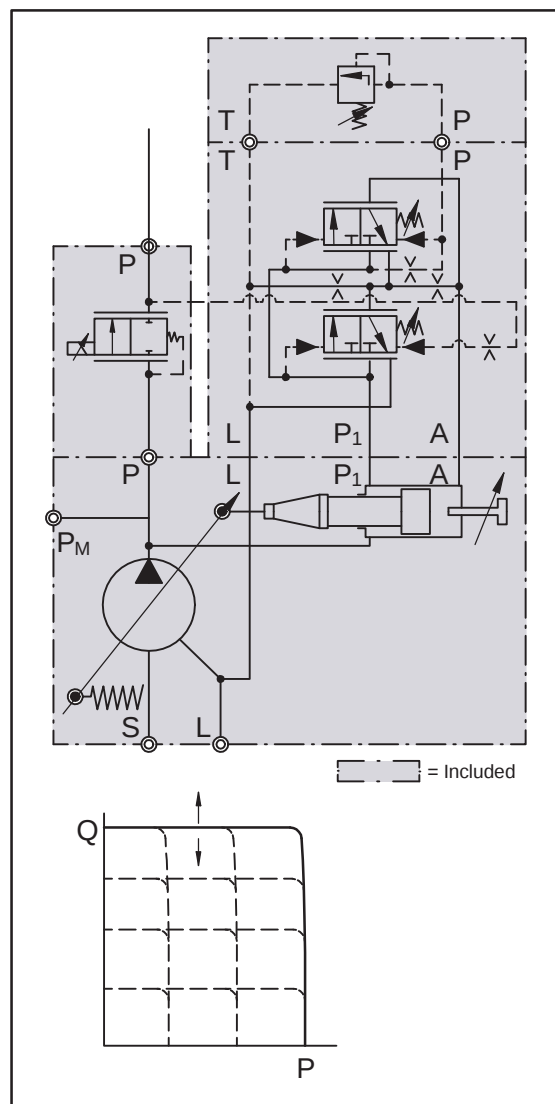
Two-valve loading-sensing compensator with NG6 interface is an option for limiting pressure precisely. By eliminating the impact between pressure and flow, the pump should add two different valves to control flow and pressure. Electrical proportional and pressure control is available by adding a YEOSHE proportional pressure valve on the Load-sensing compensator.



VQ 2-Valve load-sensing compensator + Proportional Flow valve+ Relief Valve

Type VQ is an option for limiting pressure precisely. The load-sensing compensator has an external pilot pressure supply. Factory setting for the differential pressure is 10bar. The input signal to the compensator is the differential pressure at the 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) consequently has no influence on the output flow of the pump and the speed of the actuator. Electrical proportional flow control is available by adding a YEOSHE proportional flow control valve.



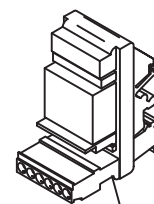
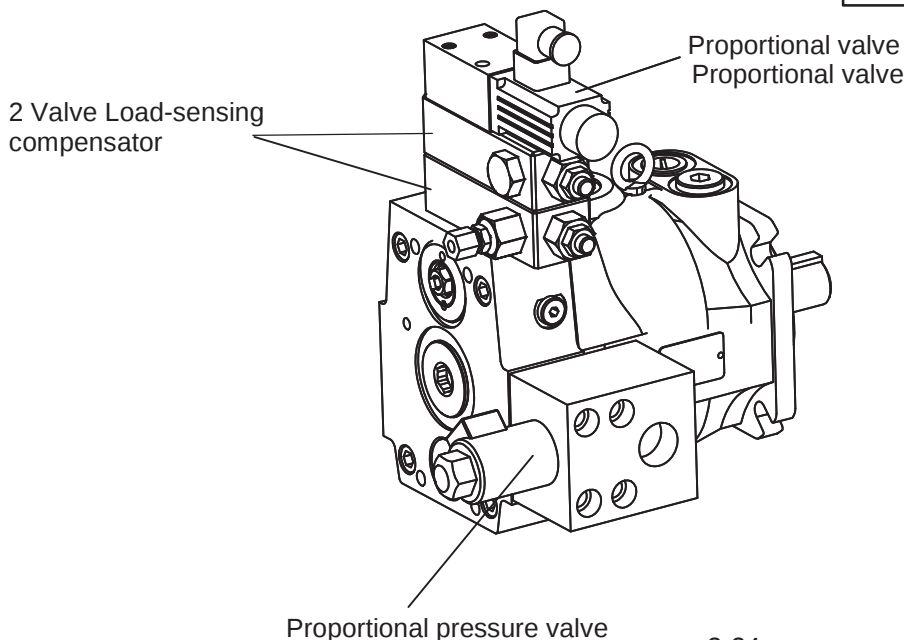
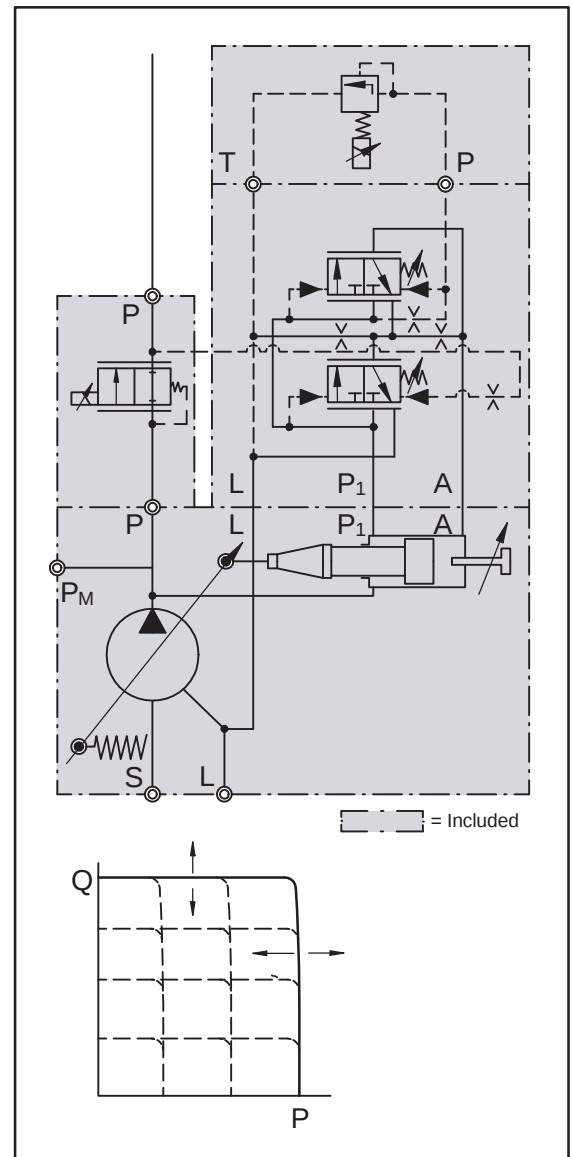
Electronic Amplifier P-C Board

VK 2-Valve load-sensing compensator + Proportional Pressure valve+ Proportional Flow valve

VK control has the same characters as HK control for saving energy. It offers the smallest pressure and flow according to the different request.

The displacement is nearly zero when the system stands by, and the motor output is also nearly zero. When the system reaches setting pressure, the pump displacement will reduce by itself. It only needs to add the system required flow, and the pressure remains the same which control the oil temperature.

Compared with vane pump, gear pump +PQ valve can save 30%-50% energy. The load-sensing compensator+ Proportional flow valve has external pilot pressure supply. Factory setting for the differential pressure is 10 bar. The input signal to the compensator is the differential pressure at the main stream resistor. A load-sensing compensator represents mainly a flow control for the pump output flow of the pump and the speed of the actuator. Proportional pressure valve is for electrical proportional pressure control.

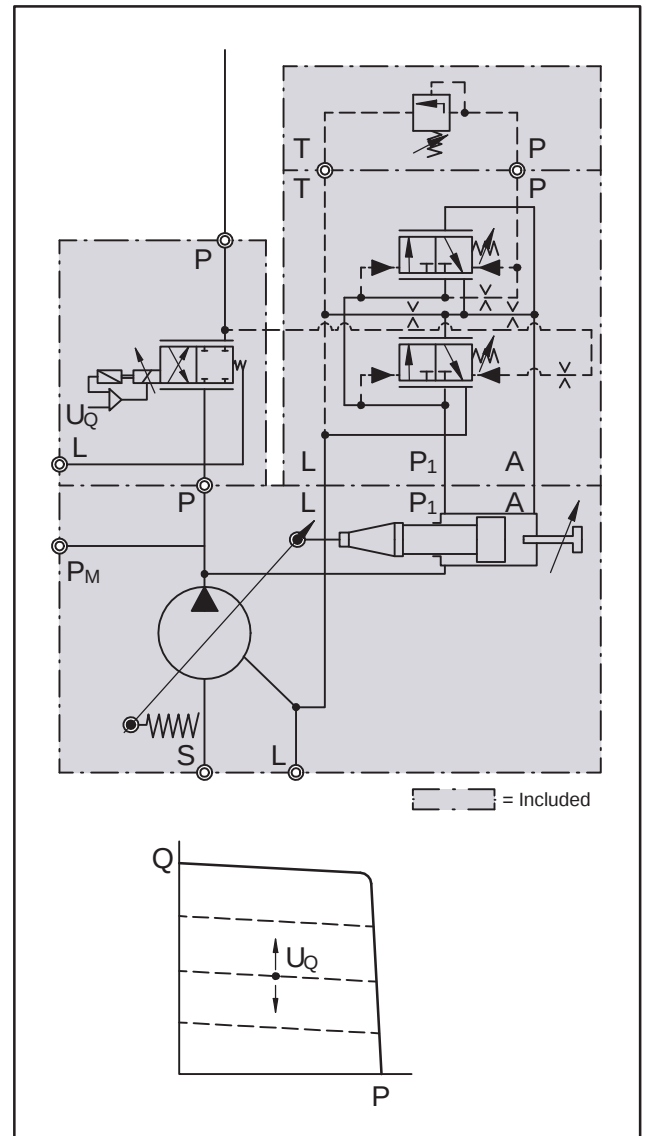


Electronic Amplifier P-C Board

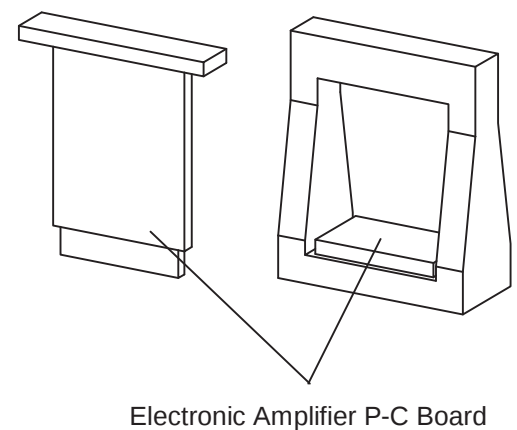
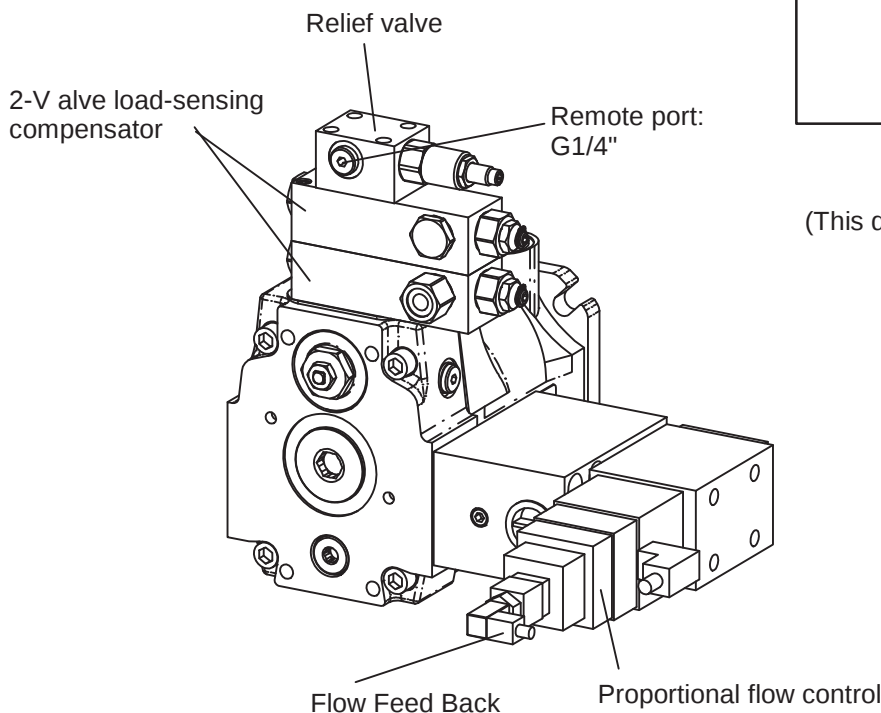
PV Axial Piston Pump Compensator

FV 2-Valve load-sensing compensator + High Reacted Proportional Flow Valve+ Flow Feed Back+ Relief Valve

FV control is an option for limiting pressure precisely. By eliminating the impact between pressure and flow, the pump should add two different valves to control flow and pressure. The electrical control permanently compares input command and actual displacement and powers the proportional flow solenoid of the control valve. A deviation from the commanded displacement leads to a modulation of the input current to the solenoid. The control valve changes the control pressure until the correct displacement is adjusted.

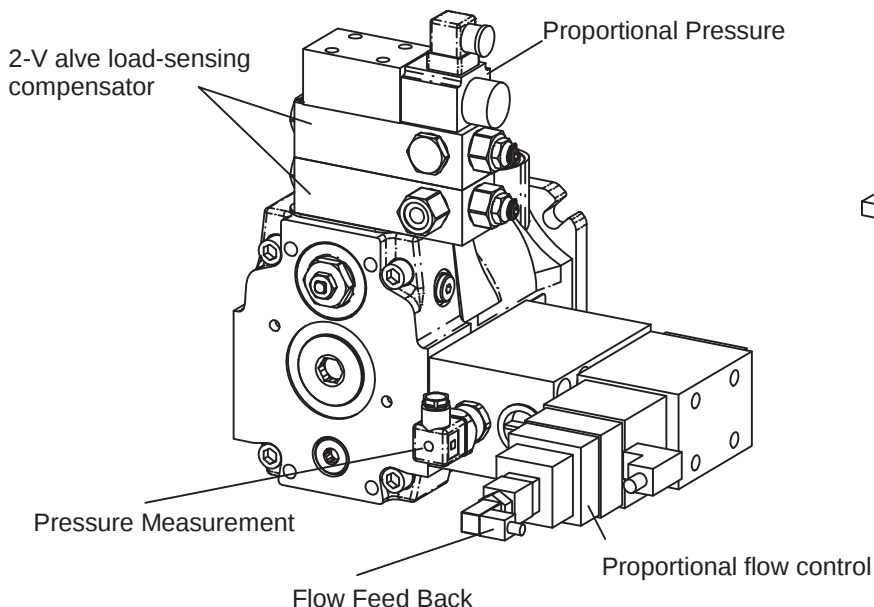
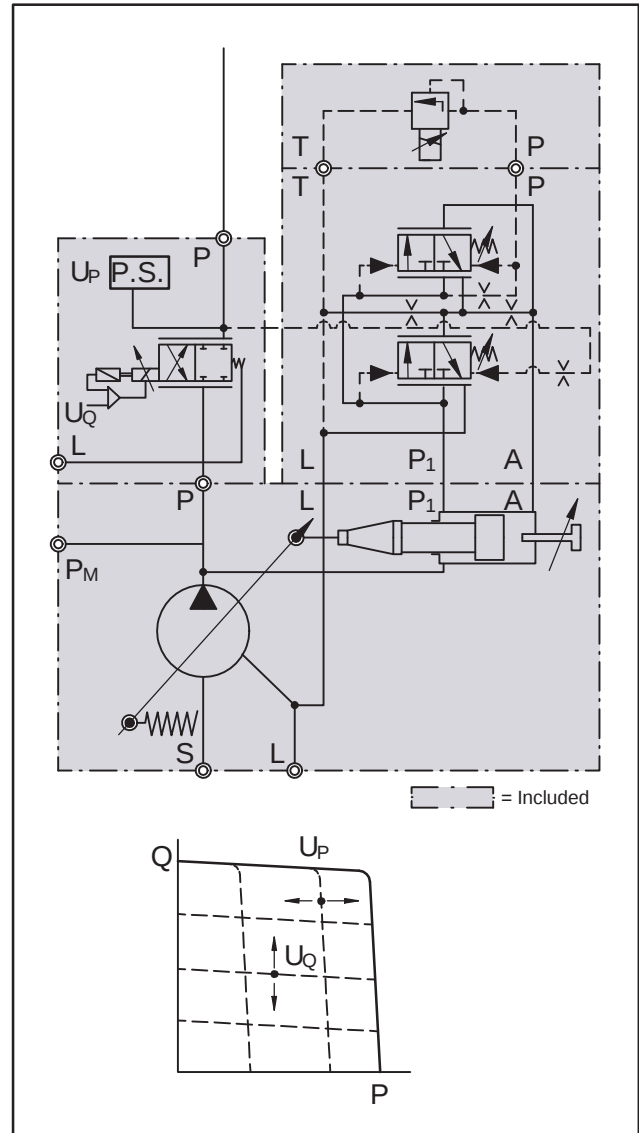


(This diagram is for PV body 1 and 2)

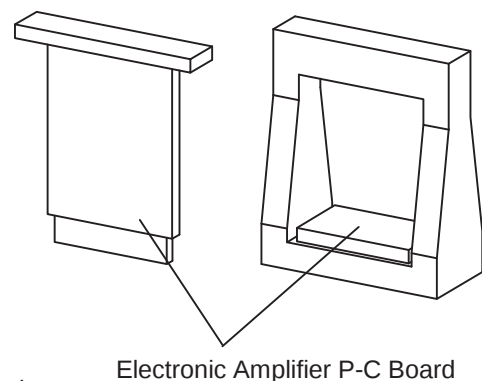


FG 2-Valve load-sensing compensator + High Reacted Proportional Flow Valve+ Proportional Pressure+ Flow& Pressure Feed Back

FG control is an option for limiting pressure precisely. By eliminating the impact between pressure and flow, the pump should add two different valves to control flow and pressure. By adding a YEOSHE proportional pressure valve, it would be Electrical Proportional Pressure Control. The electrical control permanently compares input command and actual displacement and powers the proportional flow solenoid of the control valve. A deviation from the commanded displacement leads to a modulation of the input current to the solenoid. The control valve changes the control pressure until the correct displacement is adjusted. Adding a pressure sensor achieves pressure feedback control.

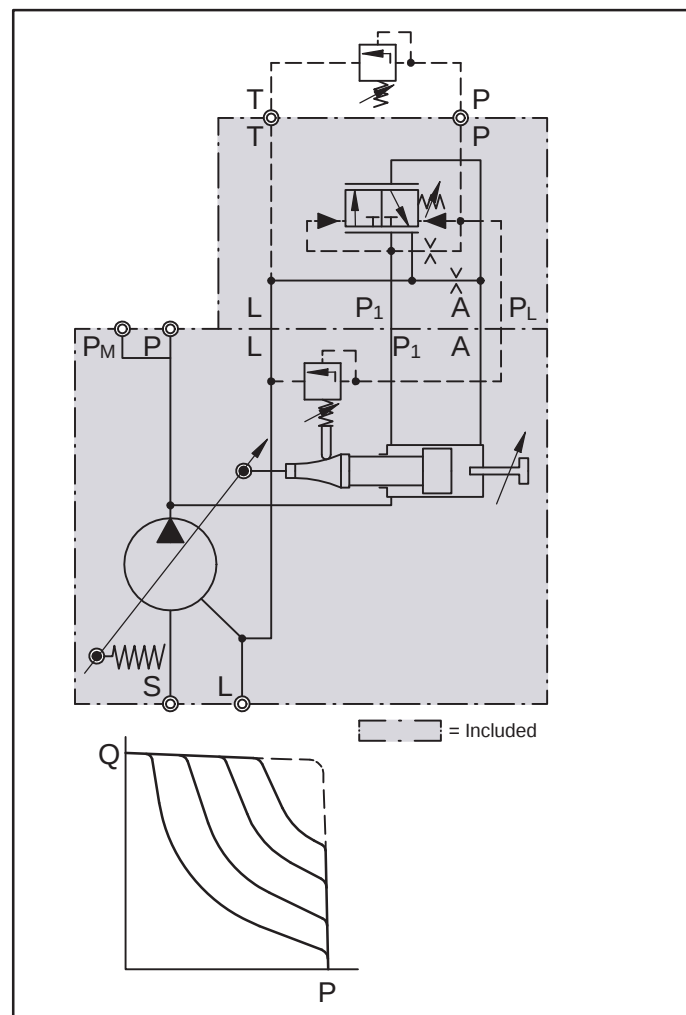


(This diagram is for PV body 1 and 2)

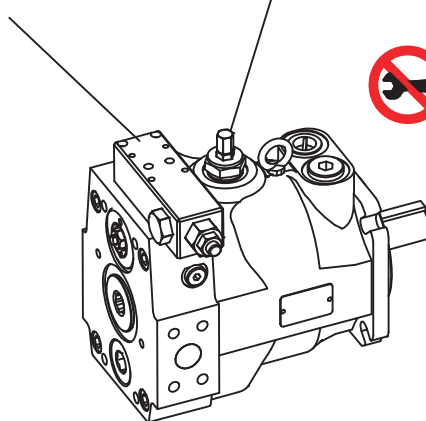


PM Horse Power Compensator with NG6 interface

The hydraulic- mechanical horse power compensator consists of a modified remote pressure compensator or of a modified load-sensing compensator 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. Horse power is optional when order. Working pressure can be adjusted by adding YEOSHE pressure leading valve. Adding the proportional pressure valve achieves the Electrical Proportional Pressure Control.



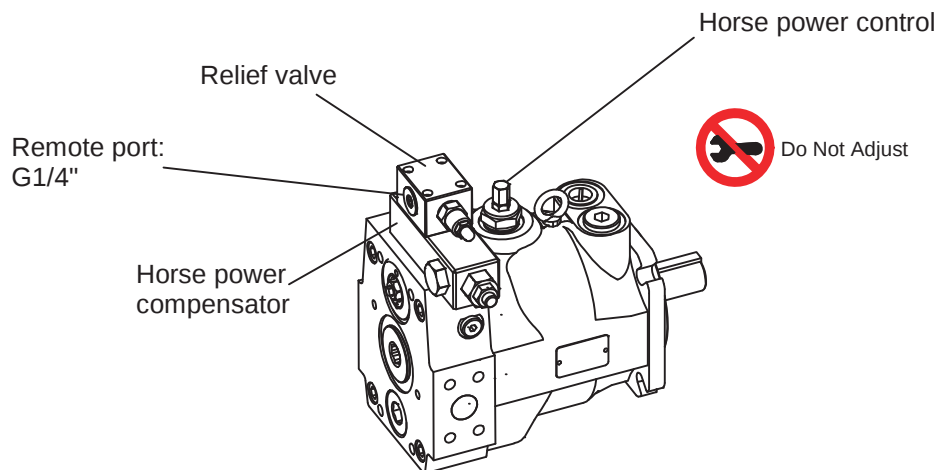
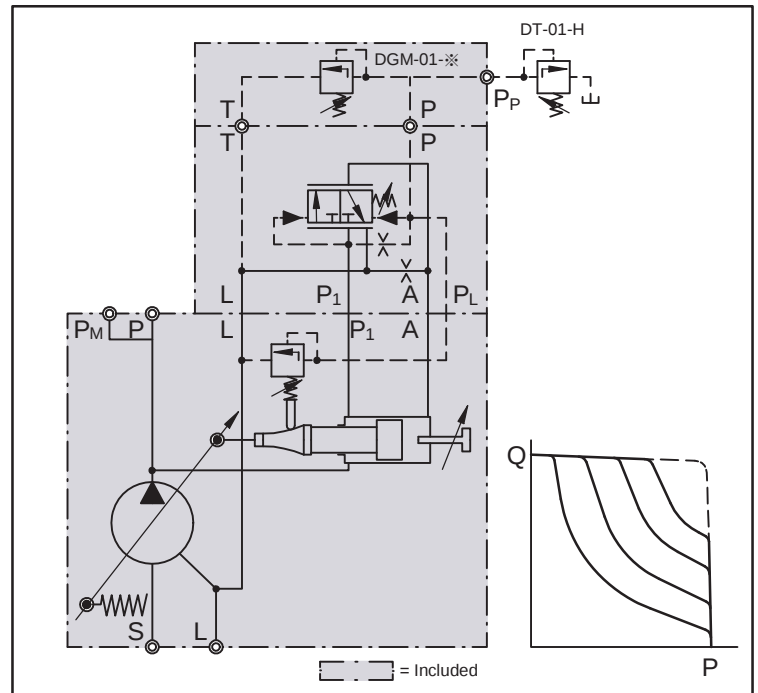
Horse power compensator with NG6 Interface Horse power control



Do Not Adjust

PA Horse Power Compensator + Relief Valve

The hydraulic- mechanical horse power compensator consists of a modified remote pressure compensator or of a modified load-sensing compensator 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. Horse power is optional when order. Working pressure can be adjusted by adding YEOSHE pressure leading valve. Adding the proportional pressure valve achieves the Electrical Proportional Pressure Control. 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 pilot flow supply is internal through the valve spool and the pilot flow is 1-1.5 L/min.

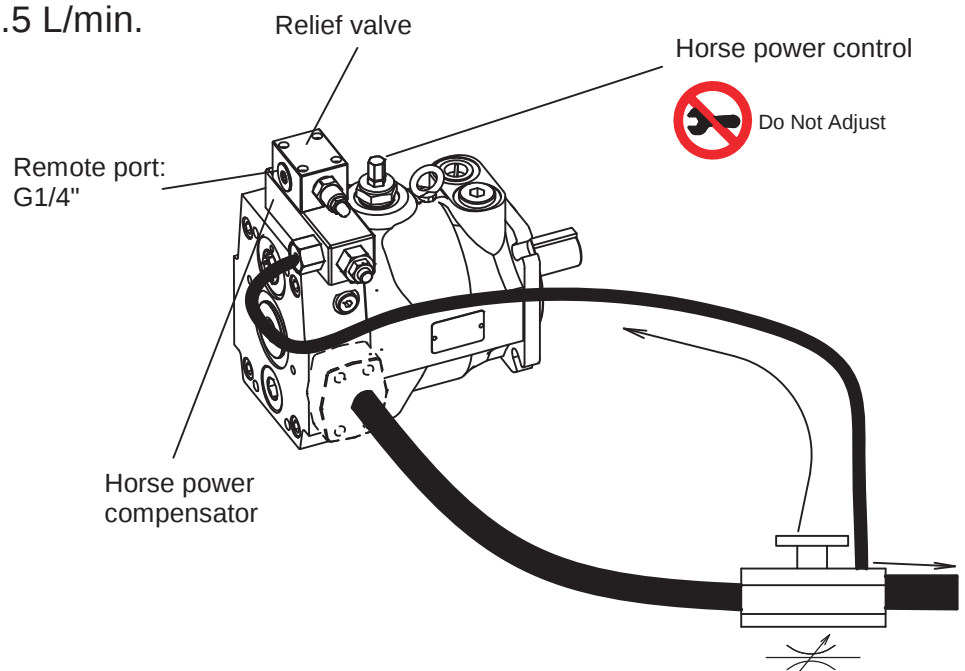
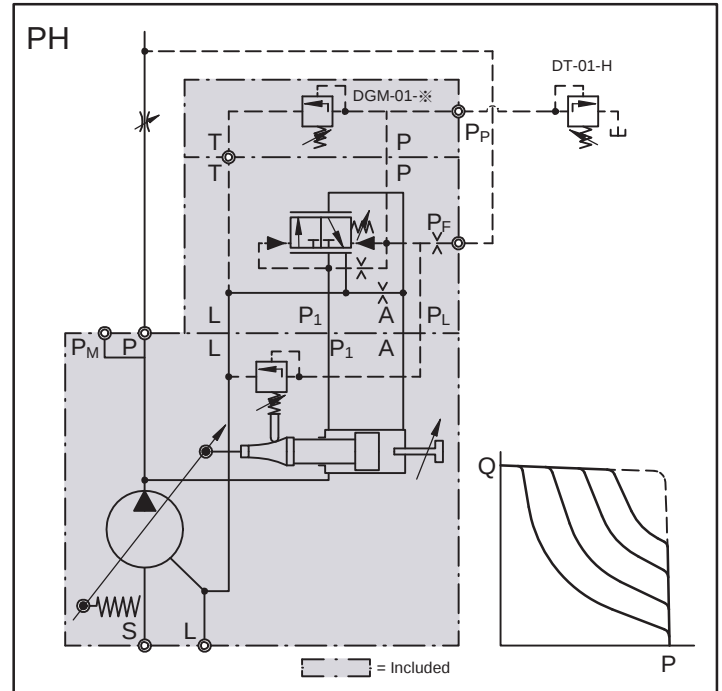


PH Horse Power Low-sensing Compensator + Relief valve

The hydraulic- mechanical horse power compensator consists of a modified remote pressure compensator or of a modified load-sensing compensator 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. Horse power is optional when order. Working pressure can be adjusted by adding a leading valve on the compensator, and pump flow can also be adjusted on the first pipe by adding an external feedback on the PF port as a control signal on the main stream.

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 pilot flow supply is internal through the valve spool, and the pilot flow is 1~1.5 L/min.

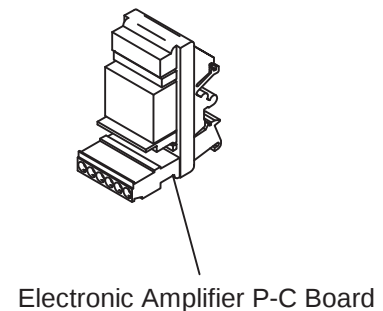
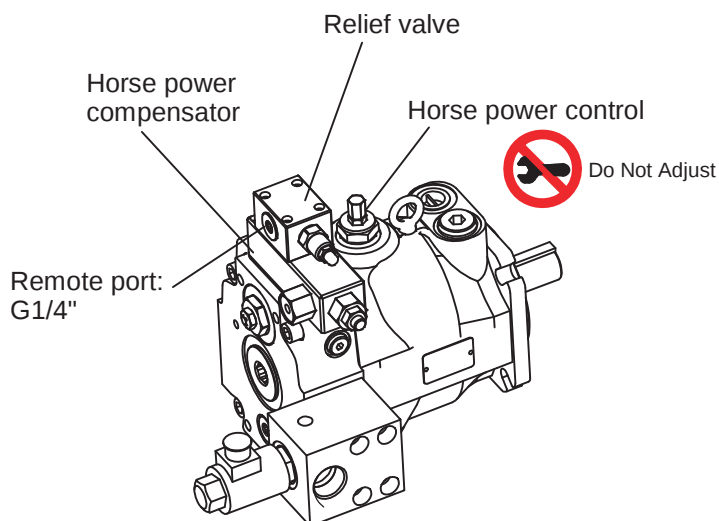
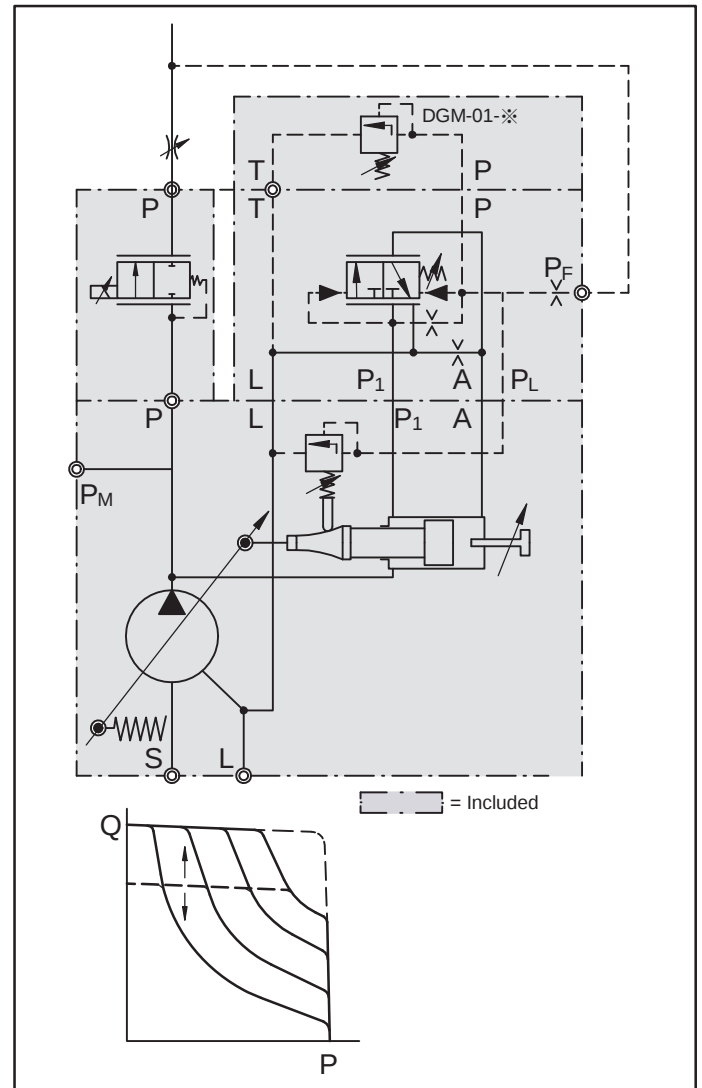


PV Axial Piston Pump Compensator

PQ Horse Power Low-sensing Compensator + Proportional Flow valve+ Relief valve

The hydraulic- mechanical horse power compensator consists of a modified remote pressure compensator or of a modified load-sensing compensator 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.

Pressure can be adjusted by adding a leading valve in the compensator, and pump flow can also be adjusted on the first pipe by adding an external feedback on the PF port as a control signal on the main stream. Adding a proportional flow control valve on the P port achieves Electrical Proportional Flow Control.

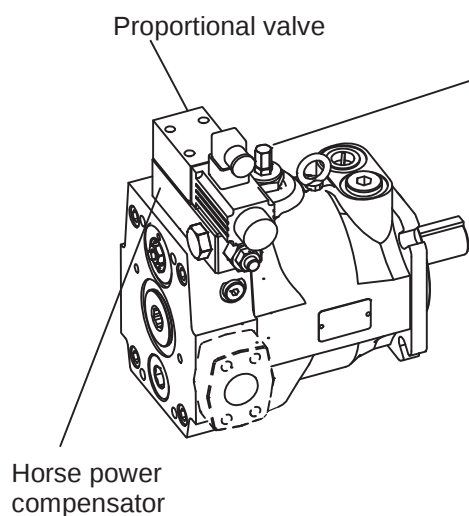
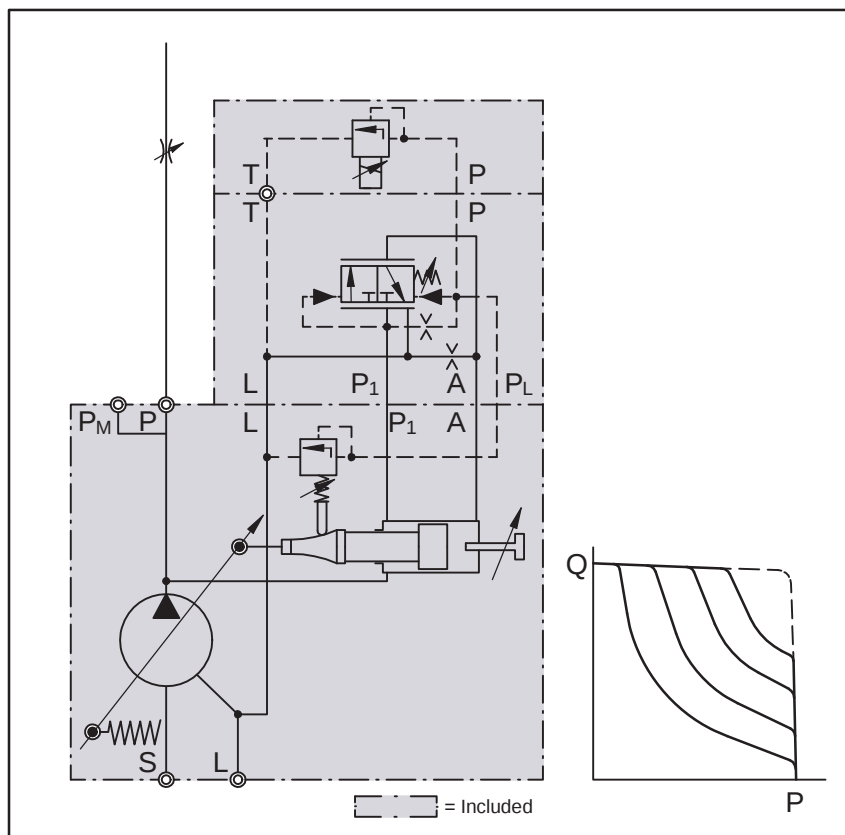


PV Axial Piston Pump Compensator

PJ Horse Power Compensator + Proportional Pressure Valve

The hydraulic- mechanical horse power compensator consists of a modified remote pressure compensator or of a modified load-sensing compensator 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.

Pressure-adjusted function is optional by adding a leading proportional pressure valve.

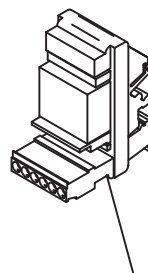


Horse power compensator

Horse power control



Do Not Adjust



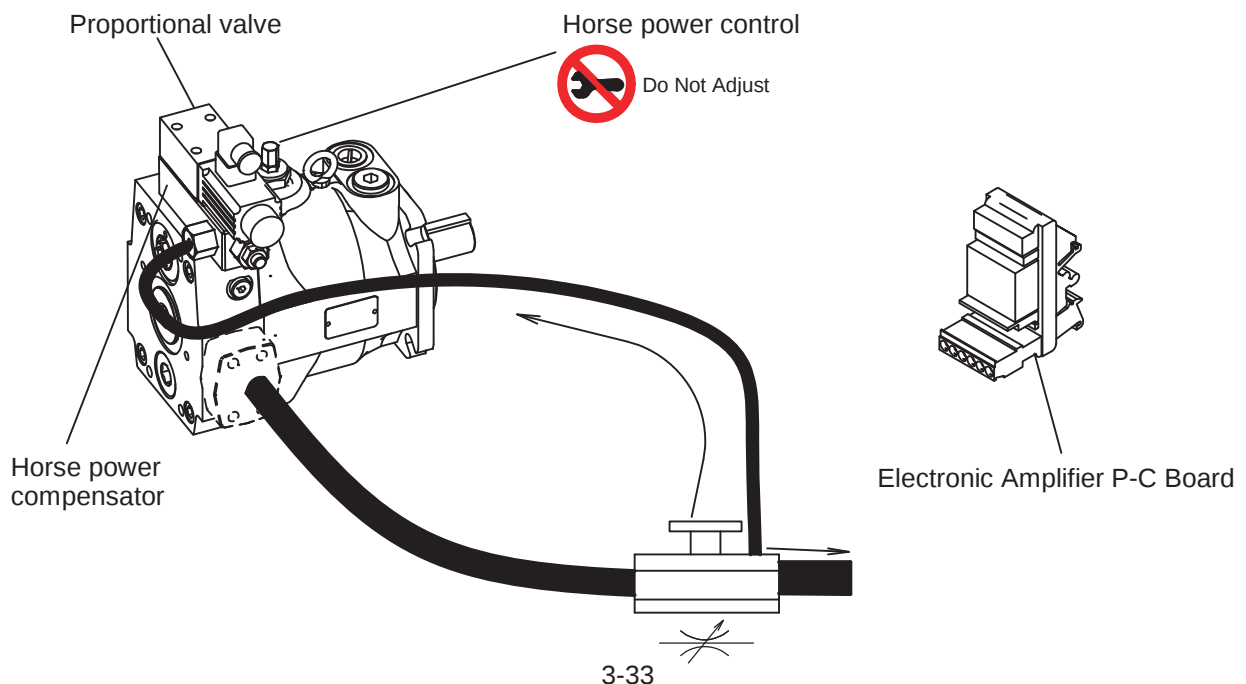
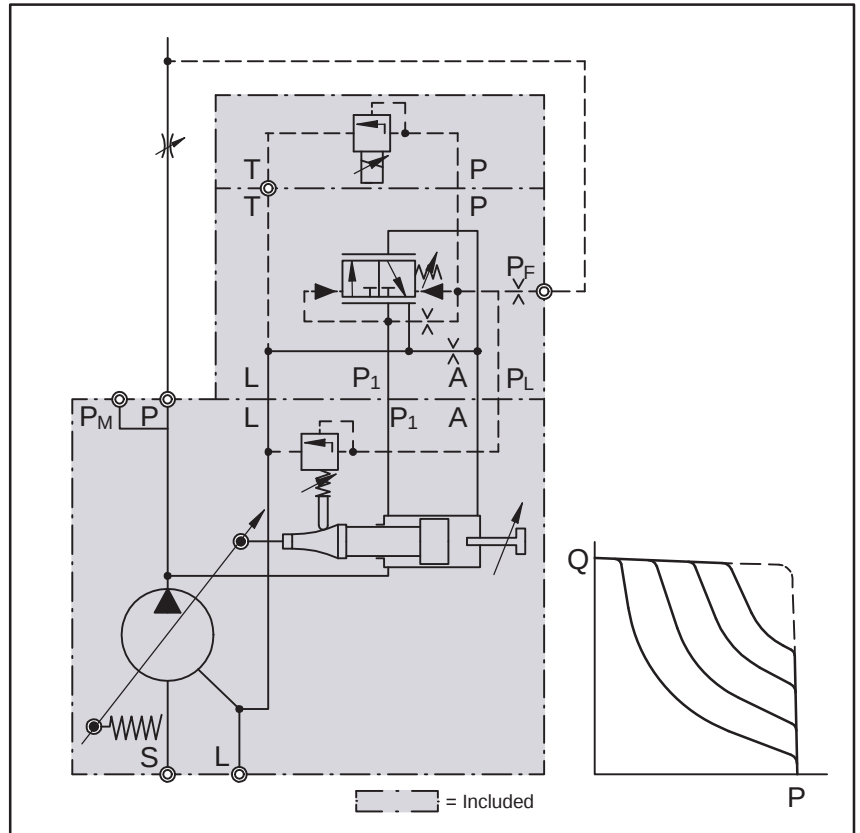
Electronic Amplifier P-C Board

[illegible]

PV Axial Piston Pump Compensator

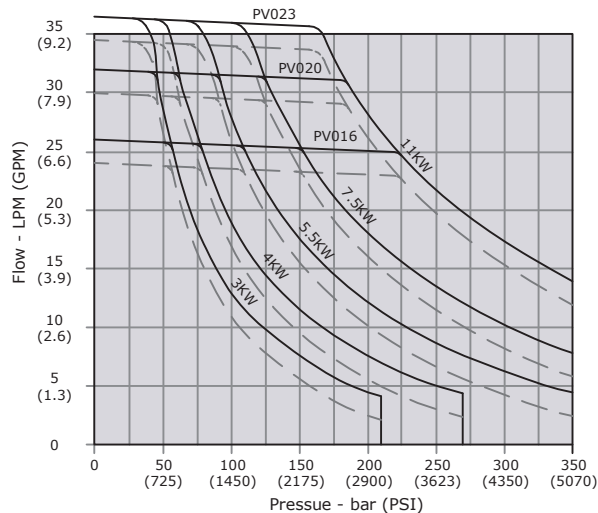
PS Horse Power Low-sensing Compensator + Proportional Pressure valve

The hydraulic- mechanical horse power compensator consists of a modified remote pressure compensator or of a modified load-sensing compensator 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. Electrical pressure-adjusted function is optional by adding a leading proportional pressure valve, and pump flow can also be adjusted on the first pipe by adding an external feedback on the PF port as a control signal on the main stream.

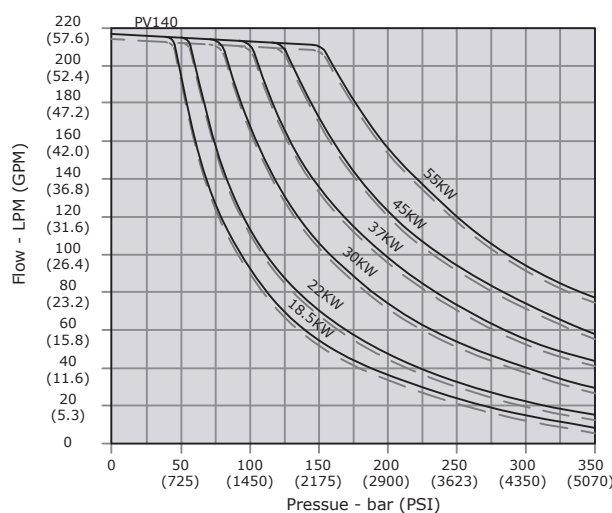


Horse Power Compensator, diagrams

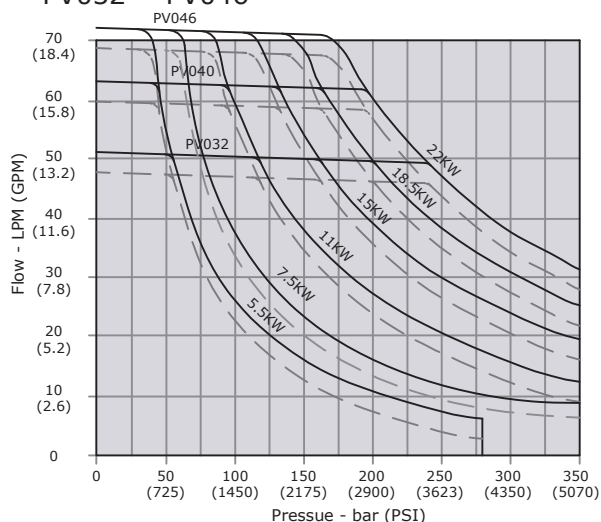
PV016 ~ PV023



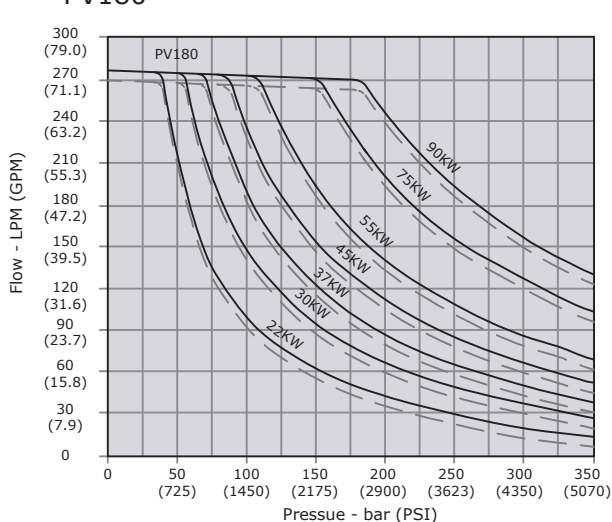
PV140



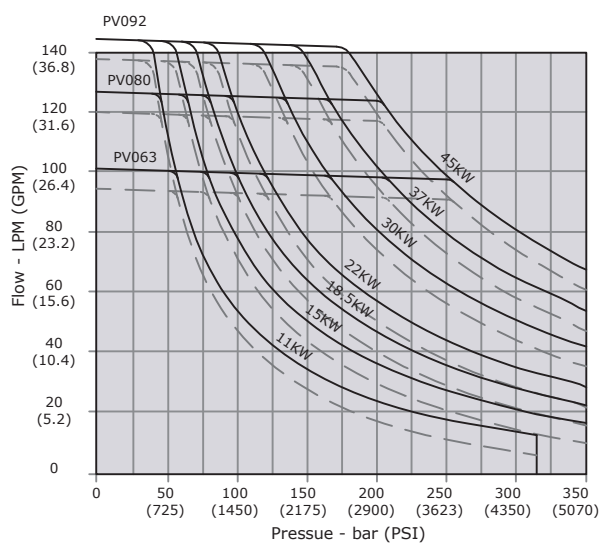
PV032 ~ PV046



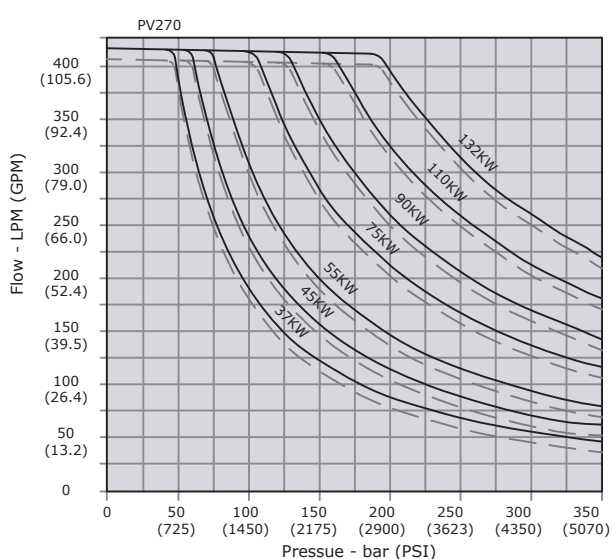
PV180



PV063 ~ PV092



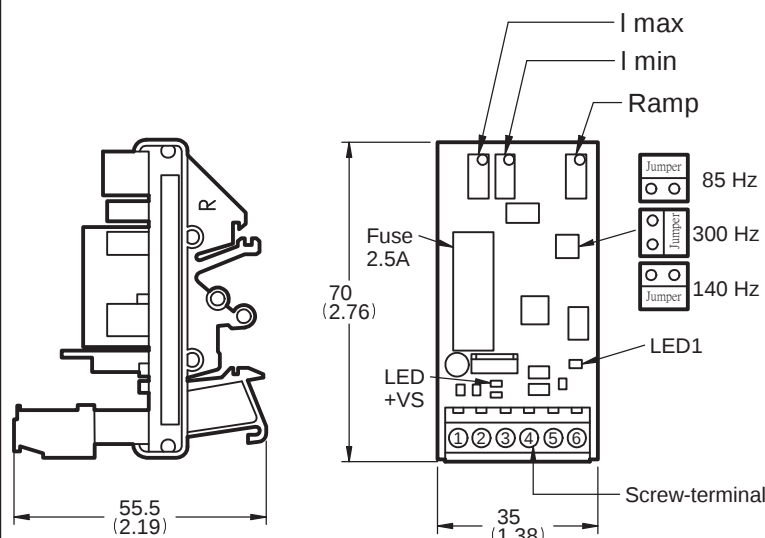
PV270



The diagrams are only valid for the following working conditions:
 speed: $n=1500$ (— — —) and 1800 (————) rev/min
 temperature: $t=50^{\circ}\text{C}$
 fluid: mineral oil HLP, ISO VG46
 viscosity: $v=46$ mm²/s at 40°C

PROPORTIONAL AMPLIFIER

PCB-2600



UNIT:mm
(inch)

NOTICE

Do not remove the amplifier from the coil while the power is on.
This will cause a failure in the internal circuits of the amplifier, resulting in loss of output to the coil.

INSTRUCTIONS FOR SETTING

SUPPLY Green LED

RAMP Ramping up/down time adjustment.
For long ramping times, turn potentiometers clockwise, for short ramping times, turn potentiometers counter-clockwise.

MAX/MIN I max / I min

There are multi-course potentiometers for adjustment of min-max and also ramp time.

FREQUENCY ADJ.

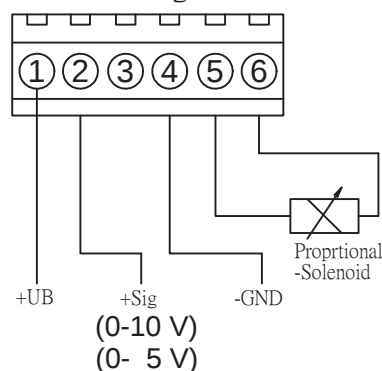
The dither frequency can be set with a Jumper to 85, 140, or 300 Hz.

TECHINCAL DATA

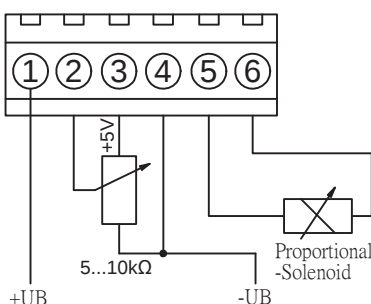
Supply Voltage :	10-35	VDC
Max. Current :	0-2600 mA adjustable for 12 and 24 VDC (Output is a PWM-DC)	
Min. Current :	0-600 mA adjustable	
Ramp Adjustment :	0~5	Sec.
Dither Frequency :	85, 140, 300 Hz to be set by jumper(Standard 140 Hz)	
Ambient Operating temperature	-15~140 °F	-10~60 °C
Weight :	0.05	Kg

Connections

External Voltage Control



Potentiometer Control

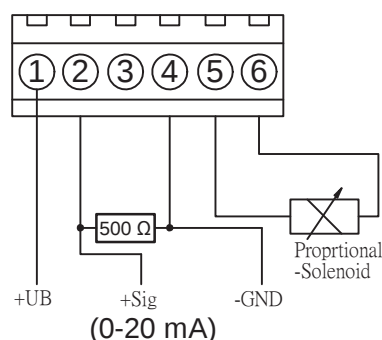


- . Clamp Connections plug in connector
- Pin 1 = + UB; Supply voltage (10-35 VDC)
- Pin 2 = control voltage (+ Sig)
- Pin 3 = Auxiliary voltage (+ 5 VDC)
- Pin 4 = Ground (GND)
- Pin 5 = Solenoid (-)
- Pin 6 = Solenoid (+)

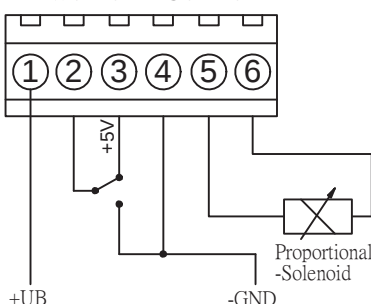
. Potentiometer

Turn clockwise means increasing current or Extension of ramp time
App. 10 turns for complete range

External Current Control



Two Point Control



.Fuse

Standard 20 mm Glass fuse 2.5 A T

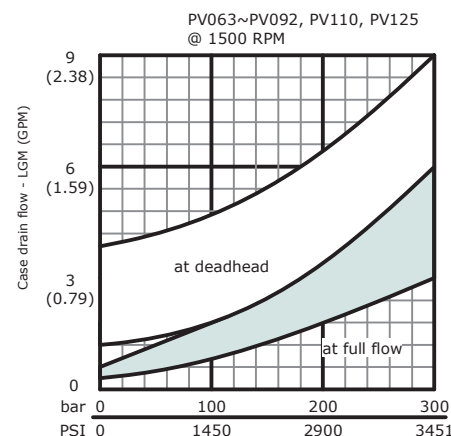
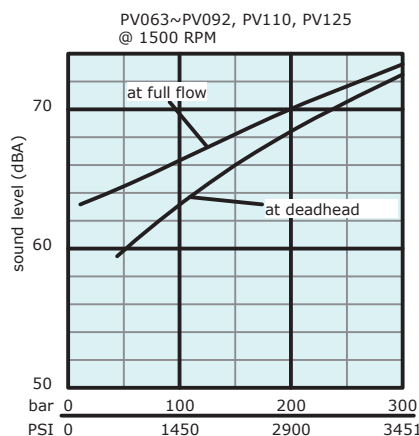
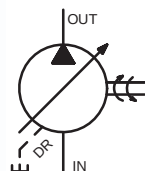
.LED's

LED +VS (green) = lights, when voltage supply and fuse are in order
LED1 (red) = lights, if there is an output to the solenoid

PV Axial Piston Pump

Efficiency and case drain flows

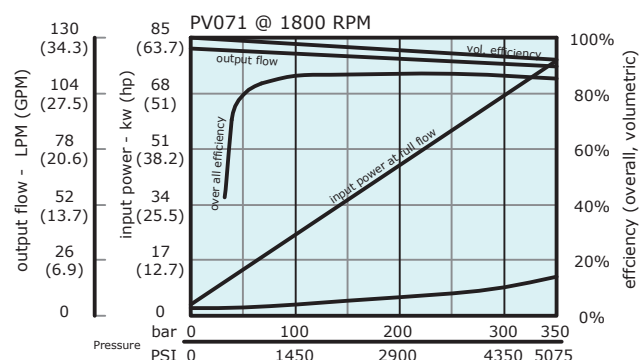
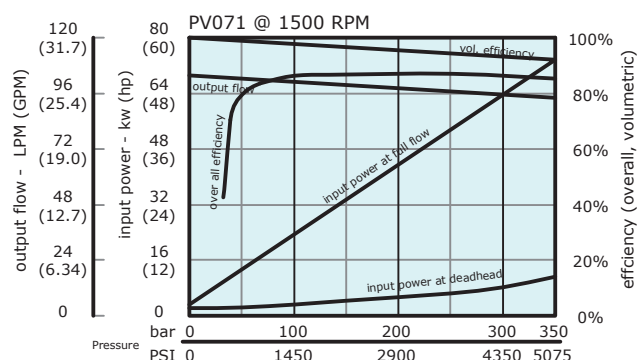
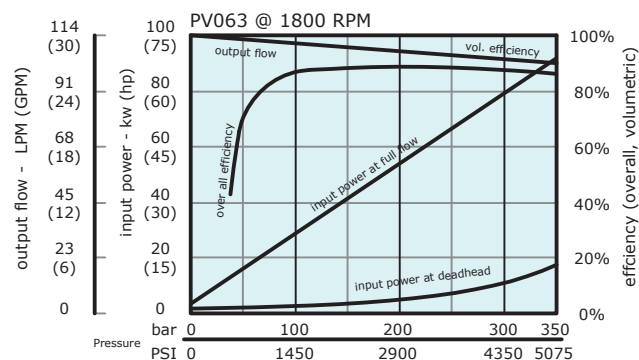
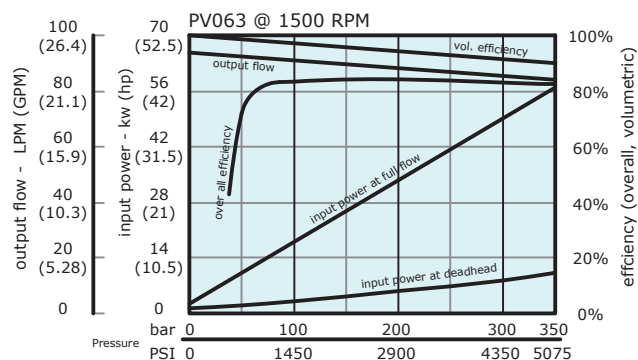
PV063 ~ PV092, PV110, PV125 (Body 3)



The efficiency and power graphs are measured at an input speed of $n = 1500$ RPM, a temperature of 40°C and a fluid viscosity of $46 \text{ mm}^2/\text{s}$.

Case drain flow and compensator control flow leave via the drain port of the pump. To the values shown are to be added 1 to 1.2 l/min, if at pilot operated compensators (codes G*, H*, P*, horse power compensator and p/Q-control) the control flow of the pressure pilot valve also goes through the pump.

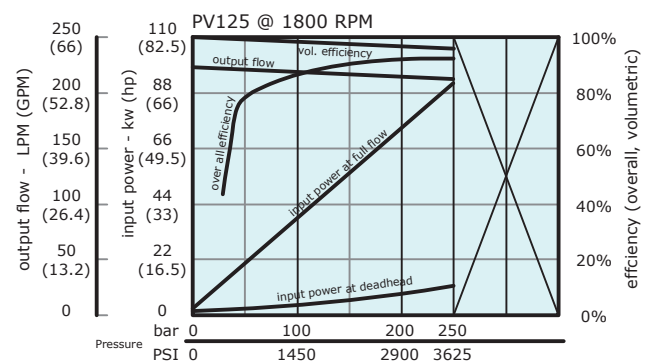
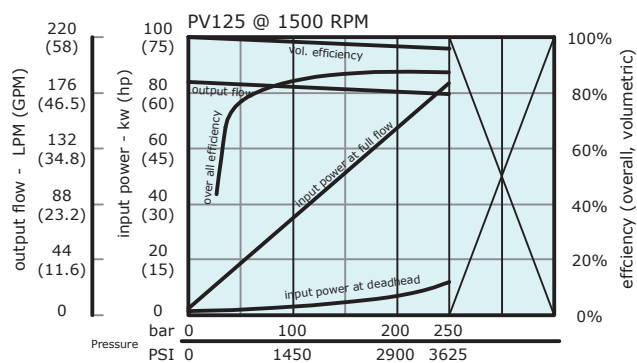
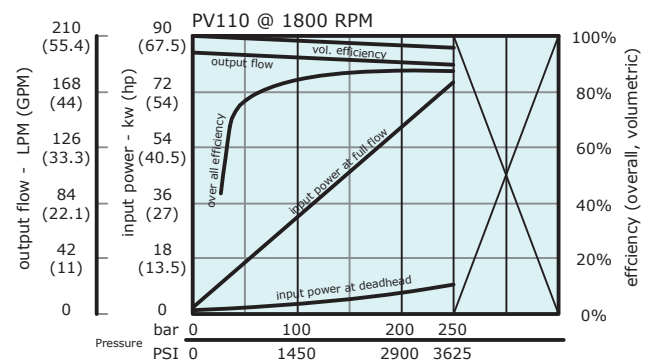
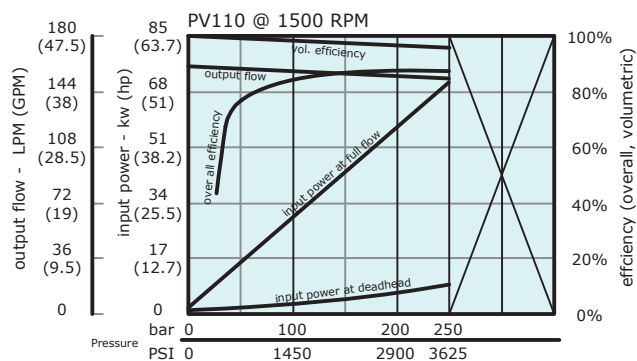
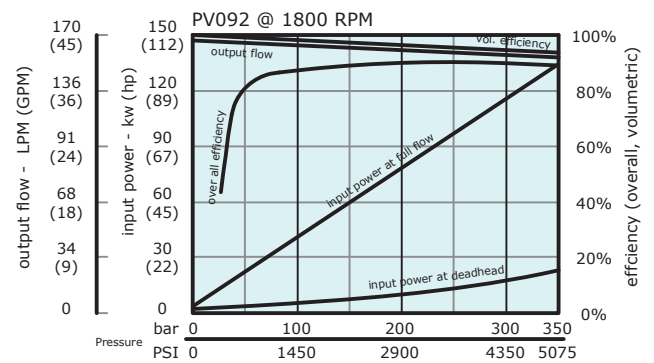
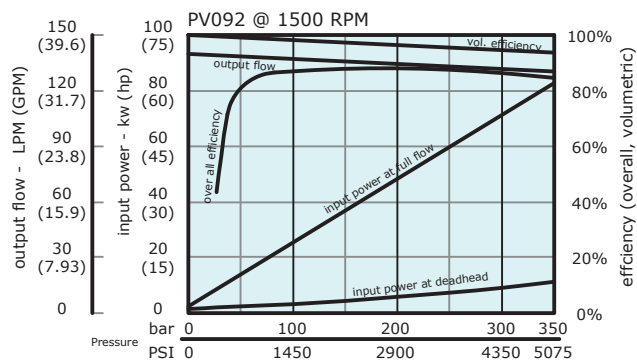
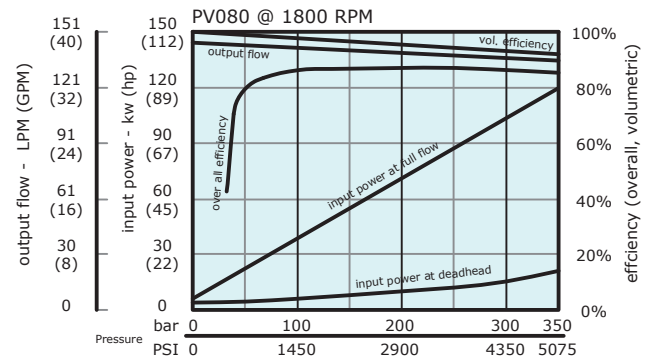
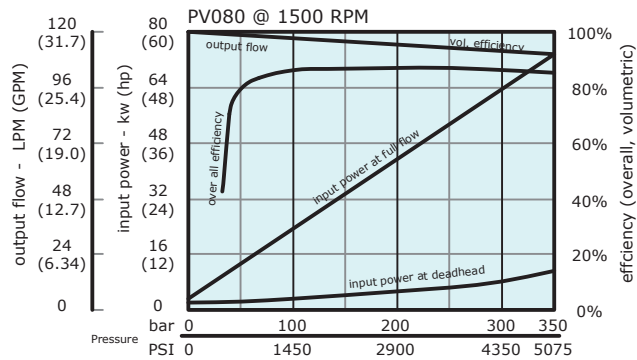
Please note: The values shown below are only valid for static operation. Under dynamic conditions and at rapid compensation of the pump the volume displaced by the servo piston also leaves the case drain port. This dynamic control flow can reach up to 80 l/min! Therefore the case drain line is to lead to the reservoir at full size and without restrictions as short and direct as possible.



PV Axial Piston Pump

Efficiency and case drain flows

PV063 ~ PV092, PV110, PV125 (Body 3)



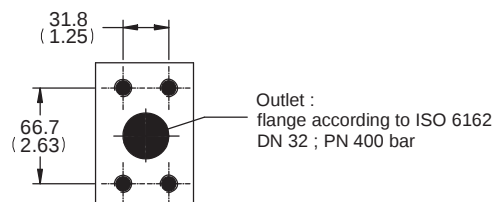
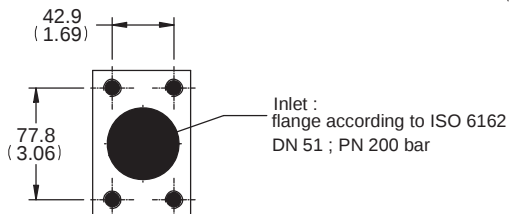
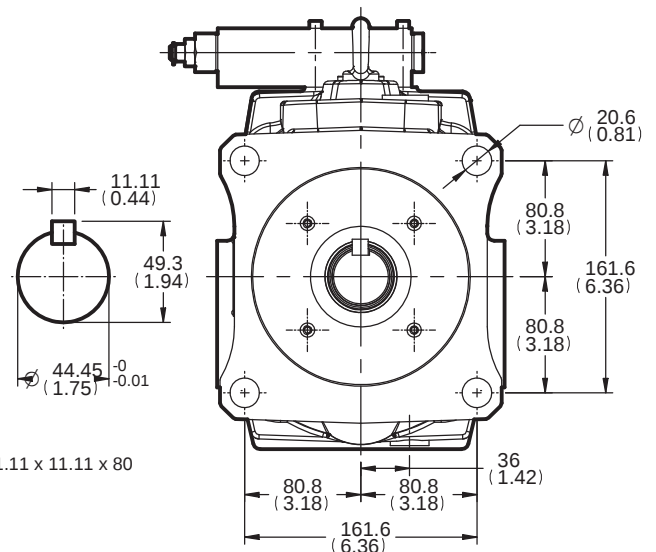
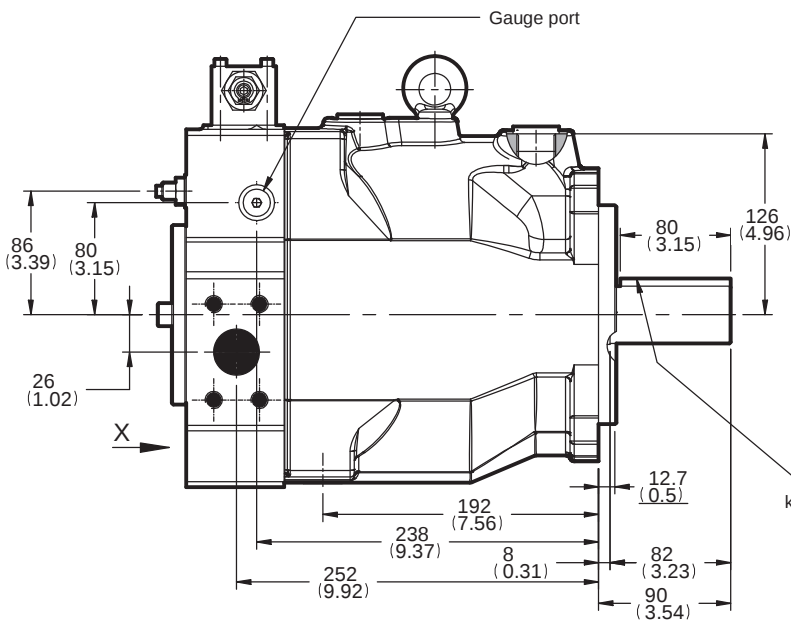
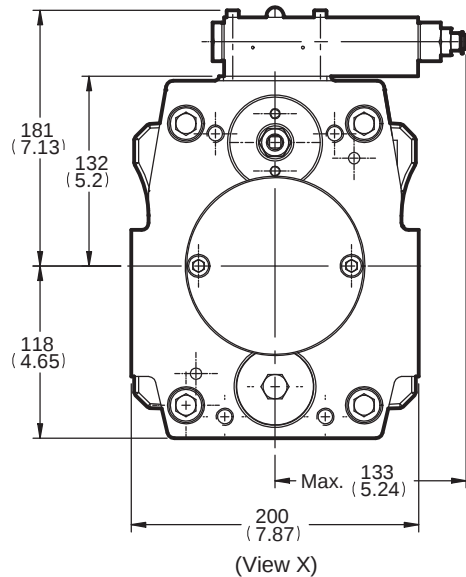
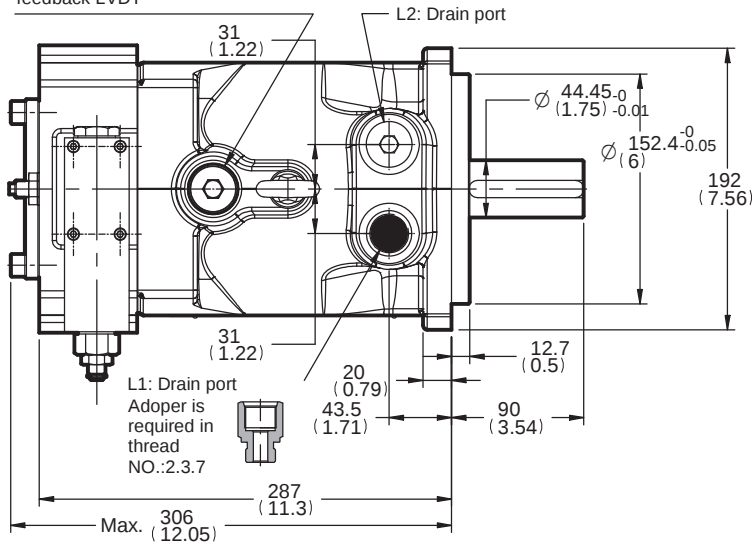
PV Axial Piston Pump

Dimension

PV063 ~ PV092, PV110, PV125 (Body 3)

metric version (Motor Mounting $\phi 152.4$)

Mounting hole for horse power compensator pilot or displacement feedback LVDT



Ports

Thread	3	1	2	7
	UNF(SAE)	BSPP(G)	PT(RC)	ISO 6149(M)
Inlet	$\phi 47$ 1/2"-13 UNC 20 deep	$\phi 47$ M12*P1.75 20 deep	$\phi 47$ M12*P1.75 20 deep	$\phi 47$ M12*P1.75 20 deep
Outlet	$\phi 32$ 1/2"-13 UNC 20 deep	$\phi 32$ M12*P1.75 20 deep	$\phi 32$ M12*P1.75 20 deep	$\phi 32$ M12*P1.75 20 deep
Drain port (L1/ L2)	1 1/16"-12 UNF	G 3/4"-14	PT 3/4"-14	M27*P2.0
L3	7/8"-14 UNF	G 1/2"-14	PT 1/2"-14	M22*P1.5
Gauge port	7/16"-20 UNF	G 1/4"-19	PT 1/4"-19	M12*P1.5

threads code: 3 & 7 are not standard, not it stock, specially fabricate.
Adoper is required in thread NO.:2.3.7 (Drain port)



PV Axial Piston Pump

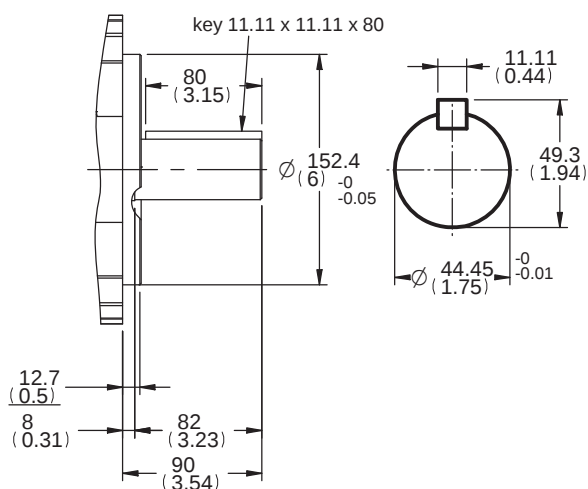
Dimension

PV063 ~ PV092, PV110, PV125 (Body 3)

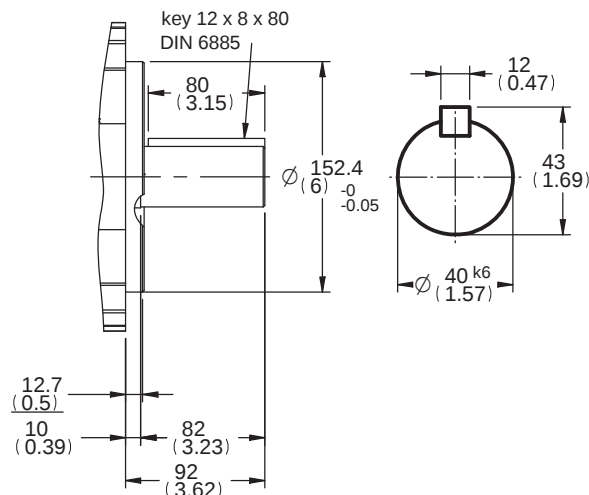
SAE version (Motor Mounting $\phi 152.4$)

Shaft type :

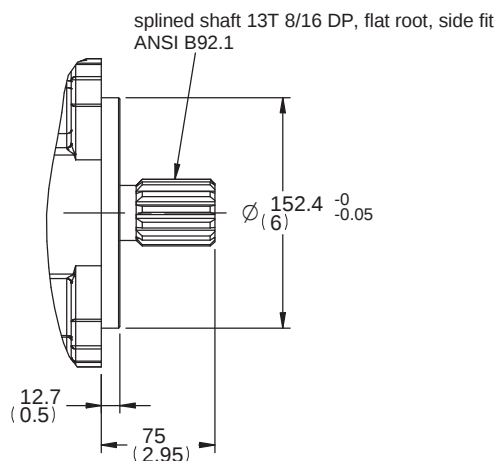
Mounting: **N**



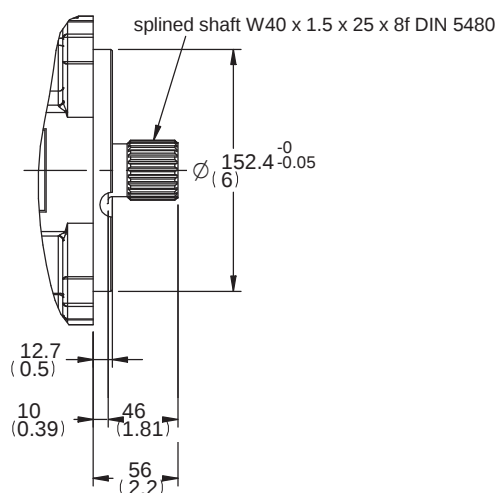
Mounting: **J**



Mounting: **D**



Mounting: **U**



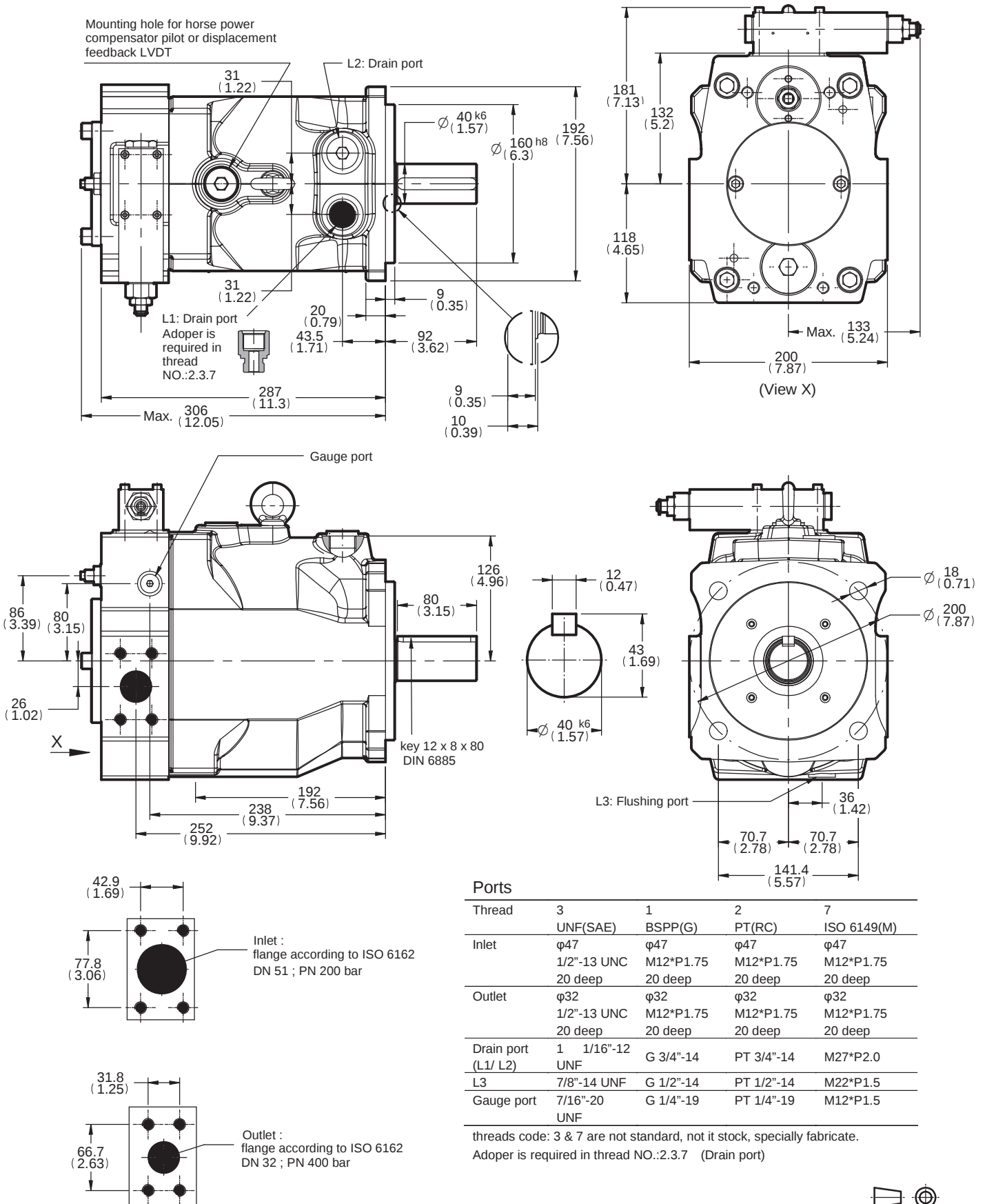
PV Axial Piston Pump

Dimension

PV063 ~ PV092, PV110, PV125 (Body 3)

metric version (Motor Mounting $\phi 160$)

Mounting hole for horse power compensator pilot or displacement feedback LVDT

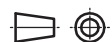


Ports

Thread	3	1	2	7
	UNF(SAE)	BSPP(G)	PT(RC)	ISO 6149(M)
Inlet	$\phi 47$ 1/2"-13 UNC 20 deep	$\phi 47$ M12*P1.75 20 deep	$\phi 47$ M12*P1.75 20 deep	$\phi 47$ M12*P1.75 20 deep
Outlet	$\phi 32$ 1/2"-13 UNC 20 deep	$\phi 32$ M12*P1.75 20 deep	$\phi 32$ M12*P1.75 20 deep	$\phi 32$ M12*P1.75 20 deep
Drain port (L1/ L2)	1 1/16"-12 UNF	G 3/4"-14	PT 3/4"-14	M27*P2.0
L3	7/8"-14 UNF	G 1/2"-14	PT 1/2"-14	M22*P1.5
Gauge port	7/16"-20 UNF	G 1/4"-19	PT 1/4"-19	M12*P1.5

threads code: 3 & 7 are not standard, not it stock, specially fabricate.

Adoper is required in thread NO.:2.3.7 (Drain port)



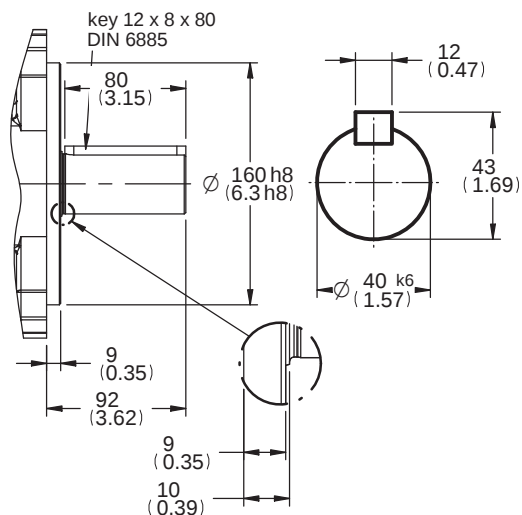
PV Axial Piston Pump

Dimension

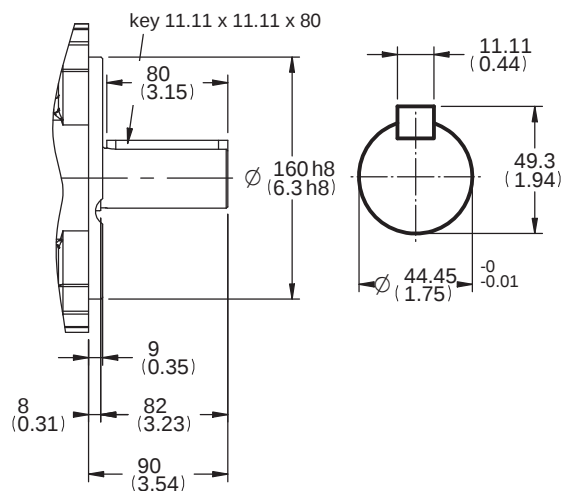
PV063 ~ PV092, PV110, PV125 (Body 3)
metric version (Motor Mounting $\phi 160$)

Shaft type :

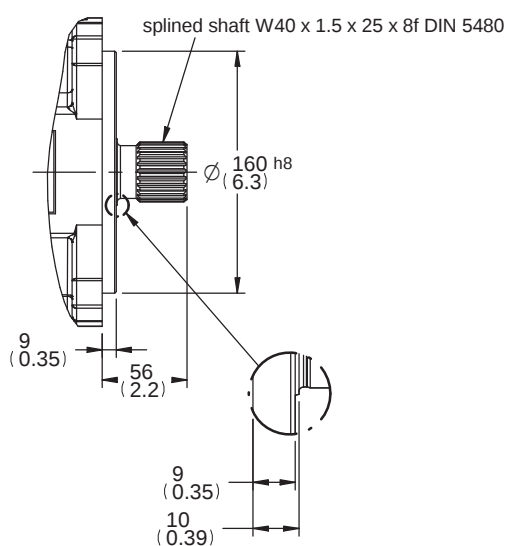
Mounting: **M**



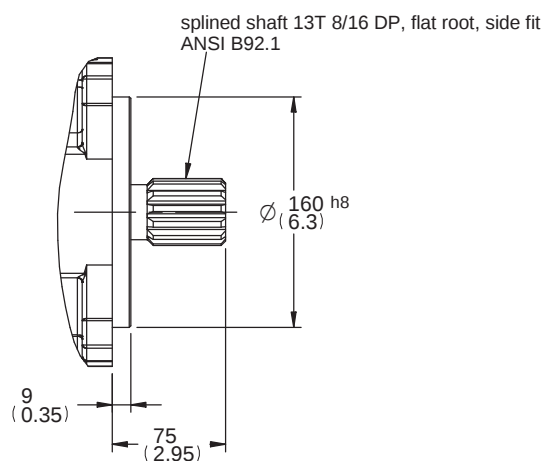
Mounting: **R**



Mounting: **K**



Mounting: **S**



PV Axial Piston Pump

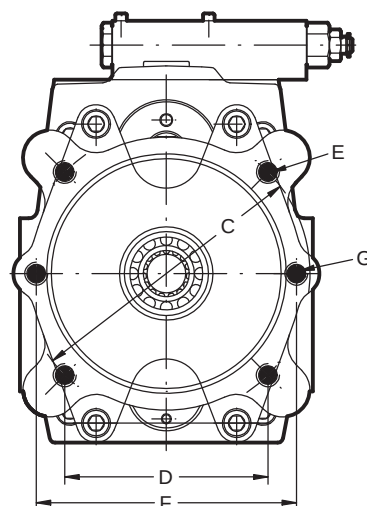
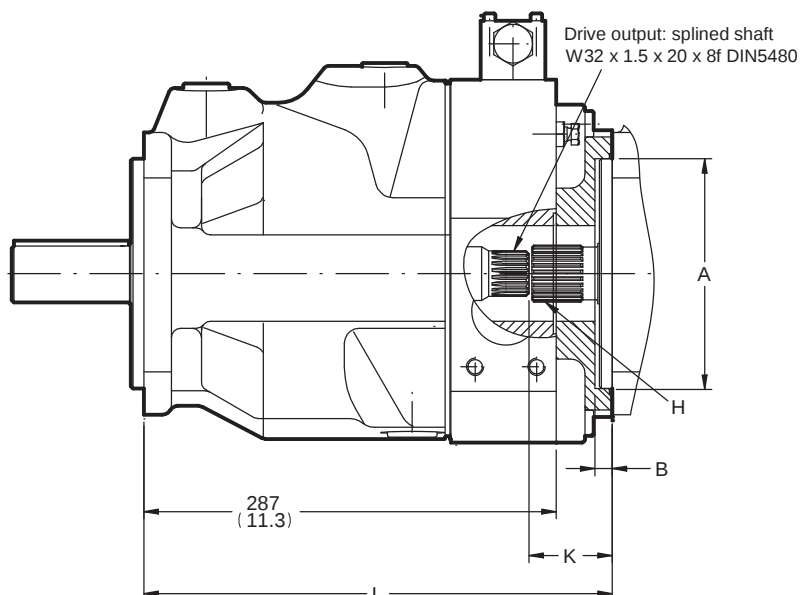
Dimension

PV063 ~ PV092, PV110, PV125 (Body 3)

Thru drive

thru drive:

D, E, F, G, I, J, K, L, M



Thru shaft adaptors are available with the following dimensions:									
thru code	A	B	C	D	E	F	G	K	L
I	63	10	85	-	M8	100	M8	58	326
J	80	10	103	-	M8	109	M10	58	326
K	100	12	125	-	M10	140	M12	58	326
L	125	12	160	-	M12	180	M16	58	326
M	160	12	200	-	M16	n. avail.	n. avail.	58	326
D	82.55	10	-	-	-	106	M10	58	326
E	101.6	12	-	89.8	M10	146	M12	58	326
F	127	14	-	114.5	M12	181	M16	58	326
G	152.4	14	-	161.6	M16	n. avail.	n. avail.	78	346

Thread codes are 3 and 7
the dimensions E and G are
UNC-2B threads

threads code: 3 and 7 Not
standard, not in stock
require special requests.

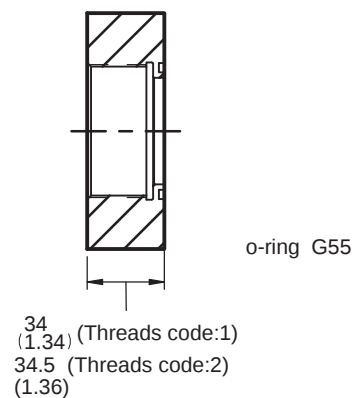
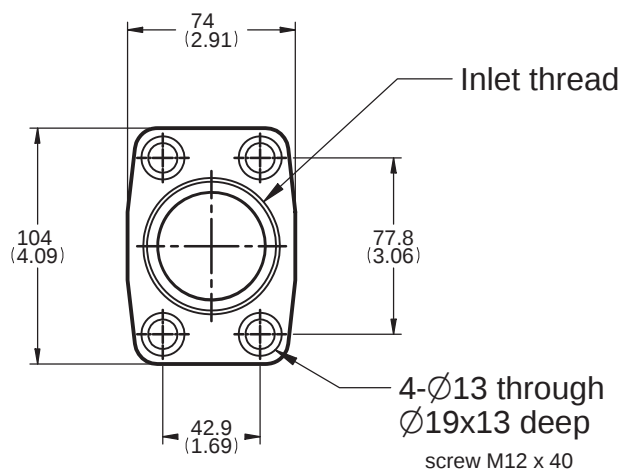


PV Axial Piston Pump

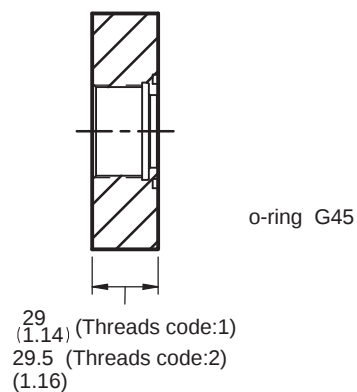
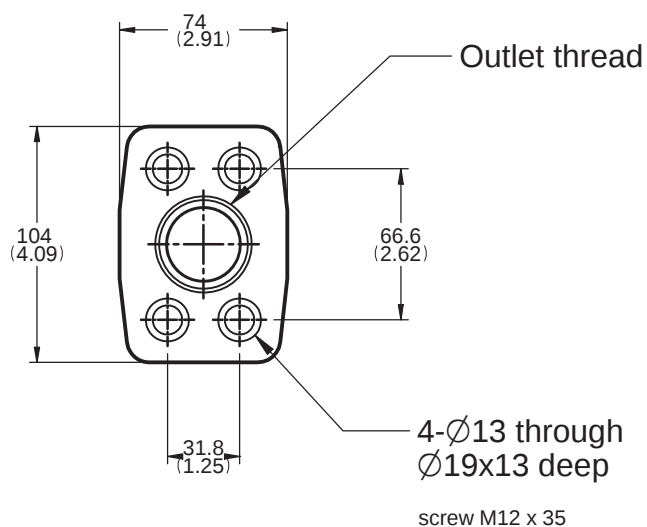
Dimension

PV063 ~ PV092, PV110, PV125 (Body 3)

Inlet Flange



Outlet Flange



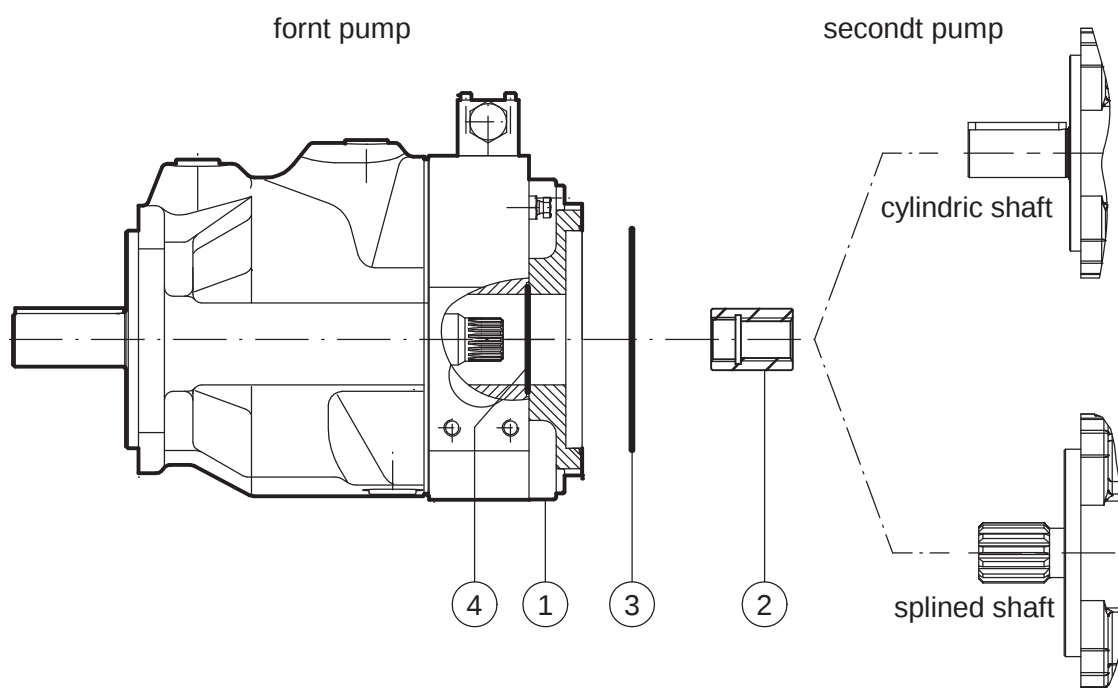
Ports

Thread code	3	1	2	7
	UNF(SAE)	BSPP(G)	PT(RC)	ISO 6149(M)
Inlet	2 1/2"-12 UN	G 2"-11	PT 2"-11	M60*P2.0
Outlet	1 5/8"-12 UN	G 1 1/4"-11	PT 1 1/4"-11	M42*P2.0

threads code: 3 & 7 are not standard, not it stock, specially fabricate.

PV Axial Piston Pump Dimension

Pump combination



NO.	Name
1	adapter
2	coupling
3	front pump o-ring
4	second pump o-ring

Order code refers to next page

PV Axial Piston Pump

Dimension



Pump combination

② coupling
order no.

second pump		fornt pump Size				
second pump shaft	model	Body 1 (PV016~023)	Body 2 (PV032~046, 056,065)	Body 3 (PV063~092, 110,125)	Body 4 (PV140~180, 210)	Body 5 (PV270)
SAE splined shaft						
9T 16/32 DP		4A505032	4A505037	4A505051	4A505058	4A505069
11T 16/32 DP		--	--	--	--	--
13T 16/32 DP		4A505033	4A505034	4A505047	4A505059	4A505070
15T 16/32 DP	(PV016~023) (PV032~046,056,065)	--	4A505040	4A505120	4A505060	4A505071
14T 12/24 DP	(PV032~046,056,065)	--	4A505036	4A505052	4A505061	4A505072
17T 12/24 DP		--	--	--	--	--
13T 8/16 DP	(PV063~092,110,125) (PV140~180,210)	--	--	--	4A505062	4A505073
15T 8/16 DP	(PV140~180,210) (PV270)	--	--	--	4A505063	4A505074
splined shaft DIN 5480						
15T W25x1.5x15	(PV016~023)	4A505031	4A505038	4A505049	4A505057	4A505068
20T W32x1.5x20	(PV032~046,056,065)	--	4A505039	4A505048	4A505056	4A505067
25T W40x1.5x25	(PV063~092,110,125)	--	--	4A505050	4A505055	4A505066
24T W50x2.0x24	(PV140~180,210)	--	--	--	4A505054	4A505065
28T W60x2.0x28	(PV270)	--	--	--	--	4A505075
cylindric shaft						
φ19.05*4.76		--	--	--	--	--
φ22.22*4.76		--	4A505042	4A505043	4A505053	4A505064
φ22.22*6.35		--	4A505042	4A505043	4A505053	4A505064
φ25.4*6.35	(PV016~023)	--	4A505041	--	--	--
φ31.75*7.94	(PV032~046,056,065)	--	--	--	--	--
φ44.45*11.11	(PV063~092,110,125) (PV140~180,210)	--	--	--	--	--
φ50.8*12.7	(PV140~180,210) (PV270)	--	--	--	--	--
cylindric shaft						
φ25*8	(PV016~023)	--	4A505035	--	--	--
φ32*10	(PV032~046,056,065)	--	--	--	--	--
φ40*12	(PV063~092,110,125)	--	--	--	--	--
φ50*14	(PV140~180,210)	--	--	--	--	--
φ65*18	(PV270)	--	--	--	--	--

PV Axial Piston Pump

Dimension



Pump combination

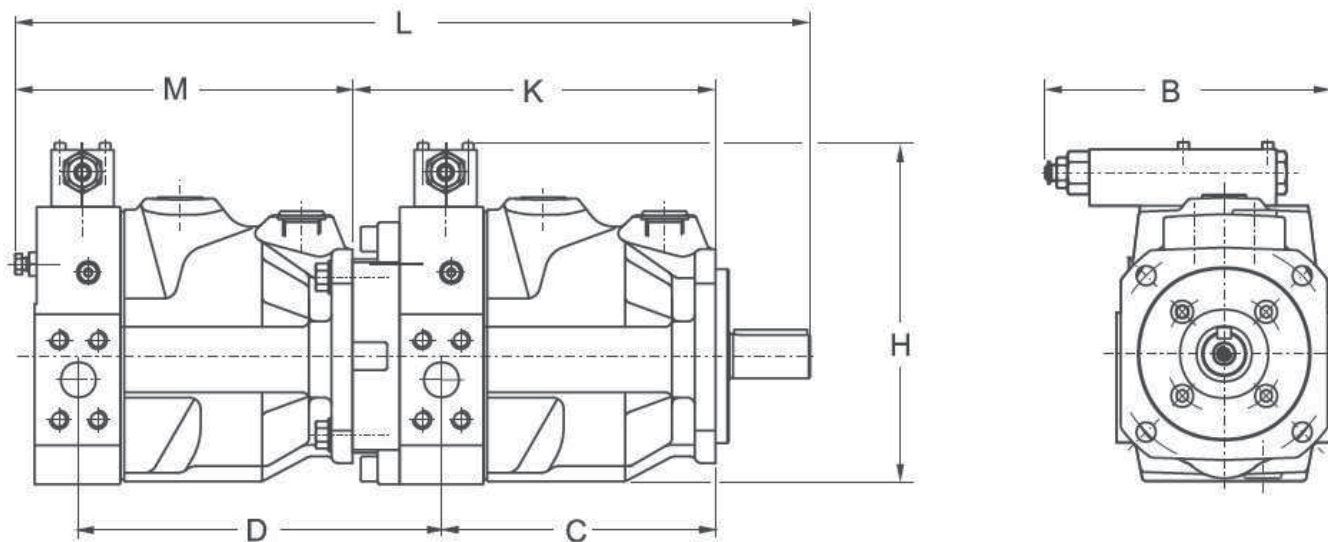
order no.

		①	③	④
fornt pump	Thru drive code	adapter	fornt pump o-ring	second pump o-ring
Body 1 (PV016~023)	I ϕ 63	4A504012	3AAA1BA134	3AAC1AA065
	J ϕ 80	4A504013	3AAA1BA134	3AAC1AA085
	K ϕ 100	4A504014	3AAA1BA134	3AAC1AA105
	C ϕ 50.8	4A504015	3AAA1BA134	3AAC1AA055
	D ϕ 82.55	4A504016	3AAA1BA134	3AAC1AA085
	E ϕ 101.6	4A504017	3AAA1BA134	3AAC1AA105
Body 2 (PV032~046,056,065)	I ϕ 63 (261L)	--	3AAA1BA146	--
	J ϕ 80 (261L)	--	3AAA1BA146	3AAD1AA080
	K ϕ 100 (261L)	4A504023	3AAA1BA146	3AAD1AA100
	L ϕ 125 (261L)	4A504024	3AAA1BA146	3AAD1AA125
	D ϕ 82.55 (261L)	4A504020	3AAA1BA146	3AAD1AA085
	E ϕ 101.6 (261L)	4A504021	3AAA1BA146	3AAD1AA100
	S ϕ 101.6 (276L)	4A504018	3AAA1BA146	3AAD1AA100
	F ϕ 127 (276L)	4A504019	3AAA1BA146	3AAD1AA130
Body 3 (PV063~092,110,125)	I ϕ 63	--	3AAA1BA146	--
	J ϕ 80	4A504030	3AAA1BA146	3AAD1AA080
	K ϕ 100	4A504031	3AAA1BA146	3AAD1AA100
	L ϕ 125	4A504032	3AAA1BA146	3AAD1AA125
	M ϕ 160	4A504033	3AAA1BA146	3AAF1AA316
	D ϕ 82.55	4A504025	3AAA1BA146	3AAD1AA085
	E ϕ 101.6	4A504026	3AAA1BA146	3AAD1AA100
	F ϕ 127	4A504027	3AAA1BA146	3AAD1AA130
	G ϕ 152.4	4A504028	3AAA1BA146	3AAA1AA163
Body 4 (PV140~180,210)	J ϕ 80	4A504039	3AAA1BA153	3AAD1AA080
	K ϕ 100	4A504040	3AAA1BA153	3AAD1AA100
	L ϕ 125	4A504041	3AAA1BA153	3AAD1AA125
	M ϕ 160	4A504042	3AAA1BA153	3AAF1AA316
	D ϕ 82.55	4A504035	3AAA1BA153	3AAD1AA085
	E ϕ 101.6	4A504036	3AAA1BA153	3AAD1AA100
	F ϕ 127	4A504037	3AAA1BA153	3AAD1AA130
	G ϕ 152.4	4A504038	3AAA1BA153	3AAA1AA163
Body 5 (PV270)	J ϕ 80	4A504049	3AAA1BA153	3AAD1AA080
	K ϕ 100	4A504050	3AAA1BA153	3AAD1AA100
	L ϕ 125	4A504051	3AAA1BA153	3AAD1AA125
	M ϕ 160	4A504052	3AAA1BA153	3AAF1AA316
	N ϕ 200	4A504053	3AAA1BA153	3AAF1AA320
	D ϕ 82.55	4A504044	3AAA1BA153	3AAD1AA085

PV Axial Piston Pump

Dimension

Double pump dimensions



main pump	second pump	interface main pump	L	B	C	D	H	K	M
PV016, 020 or 023	PV016, 020 or 023	100 B4 HW	489	196	170.5	225	220	225	212
PV032, 040 or 046	PV016, 020 or 023	125 B4 HW	541	208	197	235.5	245	261	212
	PV032, 040 or 046		574	208	197	261	245	261	245
PV063, 080 or 092	PV016, 020 or 023	160 B4 HW	630	232	252	244.5	299	326	212
	PV032, 040 or 046		663	232	252	271	299	326	245
	PV063, 080 or 092		724	232	252	326	299	326	306
PV140 or 180	PV016, 020 or 023	160 B4 HW	719	230	305	280.5	349	415	212
	PV032, 040 or 046		752	230	305	307	349	415	245
	PV063, 080 or 092		813	230	305	362	349	415	306
	PV140 or 180 ¹⁾		878	230	305	415	349	415	385
PV270	PV016, 020 or 023	200 B4 HW	860	255	403	299	406	531.5	212
	PV032, 040 or 046		893	255	403	325.5	406	531.5	245
	PV063, 080 or 092		954	255	403	380.5	406	531.5	306
	PV140 or 180		1033	255	403	433.5	406	531.5	385
	PV270 ¹⁾		1134	255	403	531.5	406	531.5	510

Thru drive, shaft load limitations

The max. Transferable torque in Nm for the different shafts options are:

Shaft code	PV16-23	PV32-46 PV56&65	PV63-125	PV140-180	PV270
N	300	550	1320	2000	2000
D	300	610	1218	2680	2680
F	-	-	-	1320	-
G	-	-	-	1640	-
M	300	570	1150	1900	2850
K	405	675	1400	2650	3980

Important notice

The max. allowable torque of the individual shaft must not be exceeded. For 2-pump combinations, there is no problem because PV series offers 100%thru torque. For 3-pump combinations (or more), the limit torque will be reached or exceeded.

Therefore, it is necessary to calculate the torque factor and compare with the allowed torque limit factor in the table.

**Requirement: calculated torque factor
< torque factor**

To make the necessary calculations easier and more user friendly it is not required to calculate actual torque requirements in Nm and compare them with the shaft limitations. The table on the right shows limit factors that include material specification, safety factors and conversion factors.

The total torque factor is represented by the sum of the individual torque factors of all pumps in the complete pump combination.

The torque factor of each individual pump is calculated by multiplying the max. operating pressure p of the pump(in bar)with the max. displacement V_g of the pump(in cm^3/rev)

pump	shaft	torque limit factor
PV016-PV023	N	17700
	D	17700
	M	17700
	K	20130
PV32-46 PV56&65	N	32680
	D	36380
	M	33810
	K	40250
PV063-PV092	N	77280
	D	72450
	M	67620
	K	83720
PV140-PV180	N	118400
	D	158760
	F	78750
	G	97650
	M	113400
	K	157500
PV270	N	119000
	D	159700
	M	170100
	K	236250

Total torque factor of the combination=
sum of individual torque factors of all pumps

Torque factor of any pump= $p \times V_g$
(pressure in bar x displacement in cm^3/rev)

A. Fluid recommendations

Premium quality hydraulic mineral oil fluids are recommended, like H-LP oils to DIN 51524, part2. The viscosity range should be 25 to 50 mm²/s (cSt) at 50° C. Operating temperatures –10 to +70°C. For other fluids such as phosphoric acid esters or for other operating conditions, please consult with YEOSHE for assistance.

B. Seals

NBR (Nitrile) seals are used for operation with hydraulic fluids based on mineral oil. For synthetic fluid, as perhaps phosphoric acid esters, Fluorocarbon seals are required. Please consult with YEOSHE for assistance.

C. Filtration

For maximum pump and system component functionability and life, the system should be protected from contamination by effective filtration.

Fluid cleanliness should be in accordance with ISO classification ISO 4406. The quality of filter elements should be in accordance with ISO standards.

(1) Minimum requirement for filtration rate $\times$ (mm):

General hydraulic systems for satisfactory operation:

Class 19/15, to ISO 4406 $X=25 \mu m$ ($\beta 25 \geq 75$) to ISO 4572

(2) Hydraulic systems with maximum component life and functionability:

Class 16/13, to ISO 4406 $X=10 \mu m$ ($\beta 10 \geq 75$) to ISO 4572

It is recommended to use return line or pressure filters. YEOSHE Filter Division offers a wide range of these filters for all common applications and mounting styles. The use of suction filters should be avoided, especially with fast response pumps.

Bypass filtration is a good choice for best filter efficiency.

D. Installation and mounting

Horizontal mounting:

Outlet port-side or top. Inlet port-side or bottom, drain port always uppermost.

Vertical mounting: Shaft pointing upwards.

Install pump and suction line in such way that the maximum inlet vacuum never exceeds 0.8 bar absolute. The inlet line should be as short and as straight as possible. A short suction line cut to 45° is recommended when the pump is mounted inside the reservoir, to improve the inlet conditions. All connections should be leak-free, otherwise the air in the suction line will cause cavitations, noise, and damage to the pump.

E. Shaft rotation and alignment

Pump and motor shafts must be aligned within 0.25mm T.I.R. maximum. A floating coupling must be used. Bellhousings and couplings can be ordered at manufacturers listed in this catalog. Please follow the coupling manufacturer's installation instructions. Please consult with YEOSHE for assistance on radial load type drives.

F. Start up

Prior to start up, the pump case must be filled with hydraulic fluid (use case drain port). Initial start up should be at zero pressure with an open circuit to enable the pump to prime. Pressure should only be increased once the pump has been fully primed.

Attention: Check motor rotation direction.

G. Operating noise of pumps

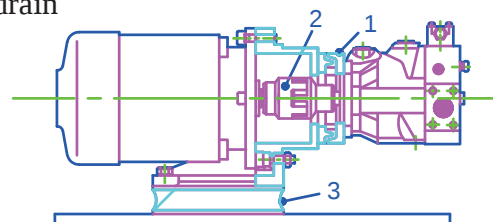
The normal operating noise of a pump and constantly-operation noise of the entire hydraulic system is largely determined by where and how the pump is mounted and how it is connected to the down stream hydraulic system. Besides, size, style, and installation of hydraulic tube are the major influence on the overall noise emitted by a hydraulic system.

H. Noise reduction measures

Flexible elements help to prevent pump body vibration from being transmitted to other construction elements, where amplification may occur. Such elements can be:

Bell housing with elastic dampening flange with vulcanized labyrinth

- (1) Floating and flexible coupling
- (2) Damping rails
- (3) Or silent blocks for mounting the electric motor or the foot mounting flange
- (4) Flexible tube connections (compensators) or hoses on inlet, outlet, and drain port of the pump.
- (5) Exclusive use of gas tight tube fittings for inlet connections to avoid ingress of air causing cavitations and excessive noise.



I. Drain line

The drain line must lead directly to the reservoir without restriction. The drain line must not be connected to any other return line. The end of the drain line must be below the lowest fluid level in the reservoir and as far away as possible from the pump inlet line. This ensures that the pump is not empty itself when it's not in operation and the hot airtreated oil will not be recirculated.

For the same reason, when the pump is mounted inside the reservoir, the drain line should be arranged in such a way that a siphon is created. This ensures that the pump is always filled with fluid. The drain pressure must not exceed 1 bar. Drain line length should not exceed 2 meters. Minimum diameter should be selected according to the port size and a straight low pressure fitting with maximized bore should be used.

	PV016~PV023	PV032~PV046	PV063~PV092	PV140~PV180	PV270
Size of pipe joints	3/8(φ8.5 or more)	1/2(φ12 or more)	3/4(φ16 or more)	1(φ19 or more)	1-1/4(φ22 or more)
I.D. of pipes	φ12 more	φ15 more	φ19 more	φ25 more	φ32 more
Length of drain	Under 1m	Under 1m	Under 1m	Under 1m	Under 1m



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