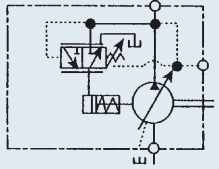
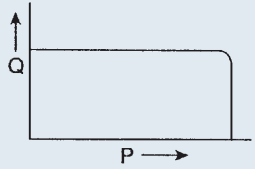
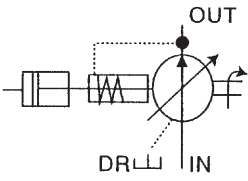
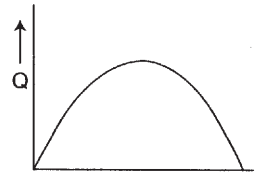
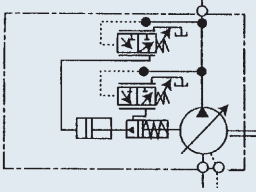
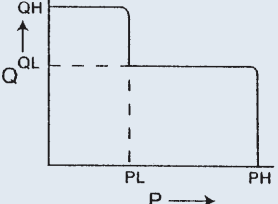
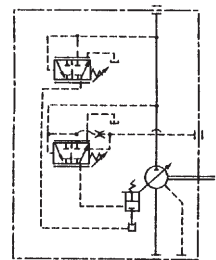
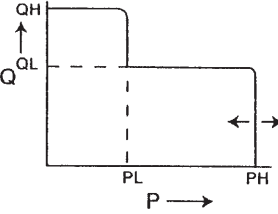
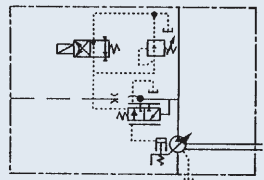
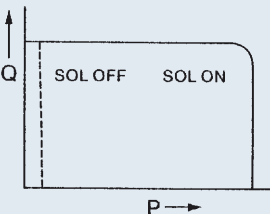
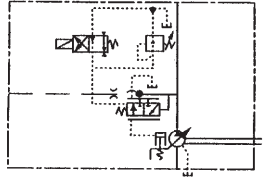
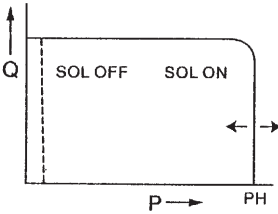




# V SERIES AXIAL PISTON PUMP

## Control Types

Control Types	JIS Symbols	Characteristics	Feature
<b>A: Pressure Compensator Control</b>			<ol style="list-style-type: none"> <li>1. When system pressure increase and reach preset pressure the flow decrease automatically and pressure maintain without changing.</li> <li>2. Power and pressure can be adjusted manually.</li> </ol>
<b>B: Multi-stage Flow &amp; Single stage Pressure Control Type (With Cylinder)</b>			<ol style="list-style-type: none"> <li>1. Flow can be adjusted from 0 to maximum and pressure can be maintaining at preset pressure.</li> <li>2. Absorbing impact and vibration which are produced by up and down motions of actuators. It is suitable for lifting equipment etc.</li> </ol>
<b>C: 2 stage Pressure &amp; Flow Control Type</b>			<ol style="list-style-type: none"> <li>1. Low consumption electric motor can be selected to save energy because of the functions of high flow at low pressure and low flow at high pressure.</li> <li>2. When pressure increase and reach preset pressure "PH", flow is reduced to "QL".</li> <li>3. Pressure "PH""PL", and Flow "QH""QL" can be adjusted optionally.</li> <li>4. It is applied to actuators requiring long unloaded or short loaded strokes. Speedy and horsepower efficient.</li> </ol>
<b>CG: 2 stage remote Pressure &amp; Flow Control Type</b>			<ol style="list-style-type: none"> <li>1. The same function of "C" control type.</li> <li>2. The pressure and the range can be adjusted remotely by the integrated remote pressure control valve.</li> <li>3. Proportional Electro-hydraulic pressure control can be applied with HYDROME proportional valve.</li> </ol>
<b>D: Solenoid Controlled Pressure Compensating Type with Unloading Device</b>			<ol style="list-style-type: none"> <li>1. Same as type A and unloading function added.</li> <li>2. It is applied to systems requiring long term unloading operation.</li> <li>3. When solenoid is turned off, pump operation under unloading condition maintains low noise level and oil heat generation.</li> </ol>
<b>DG: Solenoid Controlled Pressure Compensating Type with Unloading &amp; Remote Device</b>			<ol style="list-style-type: none"> <li>1. The same function of "C" control type.</li> <li>2. The pressure and the range can be adjusted remotely by the integrated remote pressure control valve.</li> <li>3. Proportional Electro-hydraulic pressure control can be applied with HYDROME proportional valve.</li> </ol>

# V SERIES AXIAL PISTON PUMP

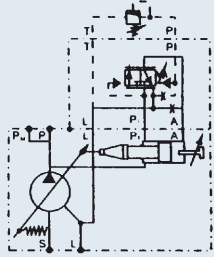
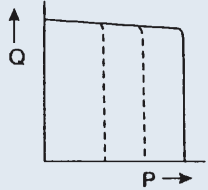
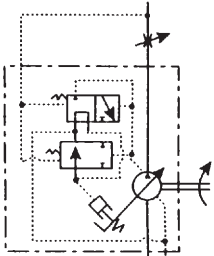
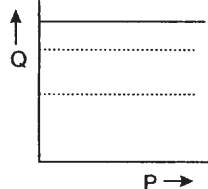
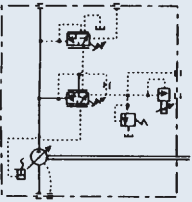
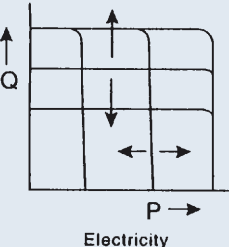
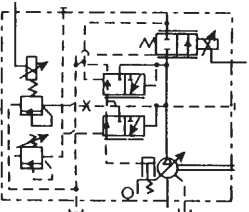
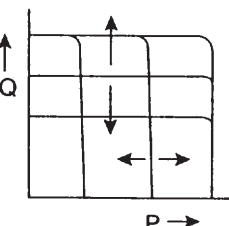
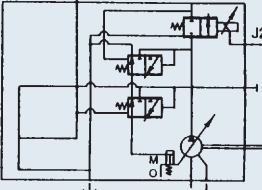
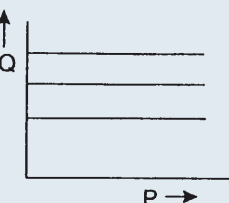
## Control Types

Control Types	JIS Symbols	Characteristics	Feature
<b>E:</b> Dual Pressure Control			<ol style="list-style-type: none"> <li>1. Preset high and low pressure can be controlled by switching directions of solenoid control valves.</li> <li>2. This type is applied to actuators requiring 2 stage pressures with single speed.</li> <li>3. One of "PL" and "PH" can be optionally be high pressure.</li> </ol>
<b>EG:</b> Dual & Remote Pressure Control			<ol style="list-style-type: none"> <li>1. The same function of "E" control type.</li> <li>2. The pressure and the range can be adjusted remotely by the integrated remote pressure control valve.</li> <li>3. Proportional Electro-hydraulic pressure control can be applied with HYDROME proportional valve.</li> </ol>
<b>F:</b> 2 flow-2 pressure p.c. by solenoid operated valve			<ol style="list-style-type: none"> <li>1. Actuators can be shifted slowly (high pressure low flow) and quickly (low pressure high flow) by switching directions of solenoid control valve. When solenoid valve turns on, pressure increase to "PH", and flow decrease to "QL".</li> <li>2. Pressure "PL", "PH" and flow "QL", "QH" can be adjusted optionally.</li> <li>3. This type is applied to actuator requiring operations of shift speed from high to low or low to high.</li> </ol>
<b>FG:</b> 2 flow-2 pressure p.c. by solenoid operated & remote valve			<ol style="list-style-type: none"> <li>1. The same function of "F" control type.</li> <li>2. The pressure and the range can be adjusted remotely by the integrated remote pressure control valve.</li> <li>3. Proportional Electro-hydraulic pressure control can be applied with HYDROME proportional valve.</li> </ol>
<b>G:</b> Remote pressure compensator control			<ol style="list-style-type: none"> <li>1. The same function of "A" control type.</li> <li>2. Pressure can be adjusted remotely by the integrated remote pressure control valve.</li> </ol>
<b>GJ:</b> Proportional Pressure with interface			<ol style="list-style-type: none"> <li>1. Same as Type "GM" and proportional valve added.</li> <li>2. The proportional valve is installed on the NG 6 interface to reach Proportional Electro-hydraulic control to save energy.</li> </ol>

# V SERIES AXIAL PISTON PUMP

## Control Types

B

Control Types	JIS Symbols	Characteristics	Feature
<b>GM:</b> Remote Interface (Not include pilot valve)			<ol style="list-style-type: none"> <li>1. GM control with a NG6 interface, supply an installation for pilot valve to prove the operating pressure. The pressure setting can be set directly from the control panel of the machine.</li> <li>2. The remote pressure compensator responds faster and offers more stable pressure.</li> <li>3. The adjustment can also be manual or proportional pressure control.</li> </ol>
<b>HL:</b> Load Sensing Compensator			<ol style="list-style-type: none"> <li>1. The pump outlet can be controlled by the setting pressure value of flow control valve. An ideal energy conservation system can be configured by combining the proportional directional control.</li> <li>2. When setting pressure value, flow is changed depending on throttle valve. The sensing flow feedback function can reach to low oil heat generation and saving energy.</li> </ol>
<b>HJ:</b> Load Sensing & Proportional Electro-hydraulic Pilot Relief Valve			<ol style="list-style-type: none"> <li>1. Same as Type "HL" and proportional pressure function added.</li> <li>2. Supplied with proportional Electro-hydraulic pilot relief valve can reach to horse-saving and energy-saving.</li> </ol>
<b>HK:</b> Proportional Electro-hydraulic Load Sensing Type			<ol style="list-style-type: none"> <li>1. HK type supplies the system pressure and flow depending on the proportional pressure and flow, voltage, and load value to save the energy. When in waiting circle, the outlet displacement and horse power loss are close to zero. When pressure reaches to preset value, the flow decrease to the min., and the pressure is constant to reach low oil heat generation and energy loss.</li> <li>2. HK type can save 30%~50% energy compare to vane pump and gear pump+PQ valve. It is an energy-saving and environmental design.</li> </ol>
<b>HQ:</b> Load-sensing Proportional Flow control			<ol style="list-style-type: none"> <li>1. Same as Type "HL" and proportional flow function added.</li> <li>2. The proportional flow control allows the adjustment of the pumps output flow with an electrical input signal. Supplied and adjusted the displacement by the electronic control module.</li> </ol>

# V SERIES AXIAL PISTON PUMP

## Performance curves

### MEASURING CONDITIONS

ROOM TEMPERATURE: 20±2°C

SPEED OF ROTATION: 1800 rpm

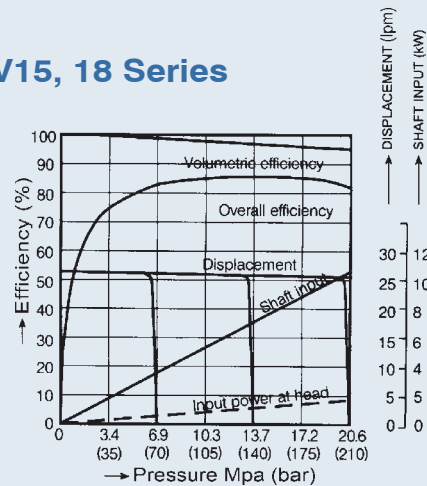
OIL: ISO VG 32-68

OIL CAPACITY: 40 lpm

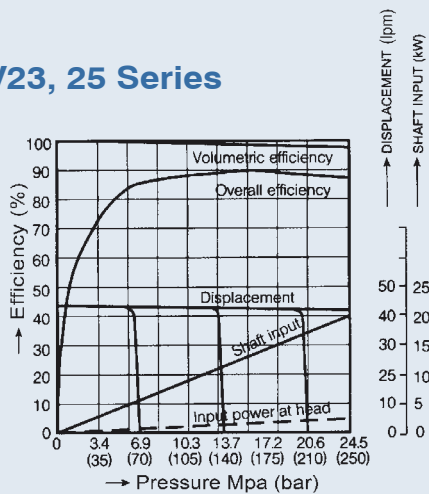
ADOPTS SEALED CIRCUIT: 70 bar

ADJUST PRESSURE: 35 bar

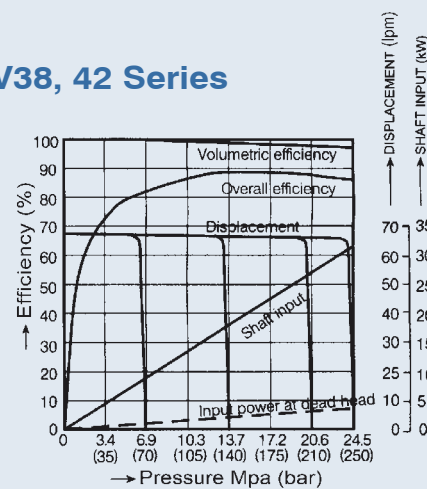
### V15, 18 Series



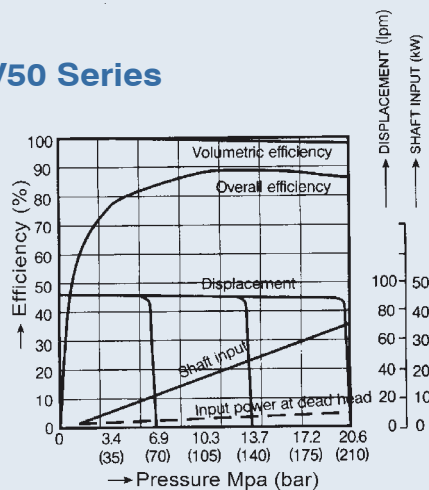
### V23, 25 Series



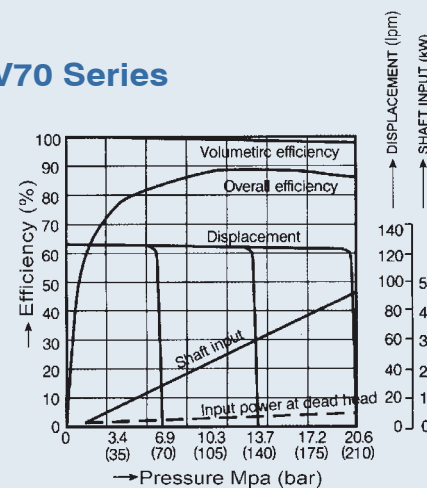
### V38, 42 Series



### V50 Series



### V70 Series

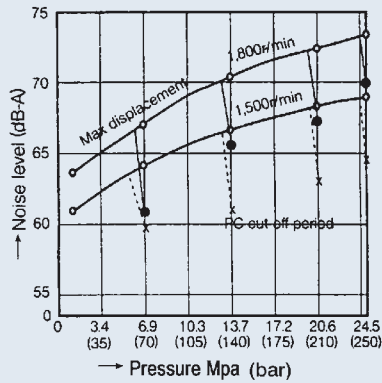


# V SERIES AXIAL PISTON PUMP

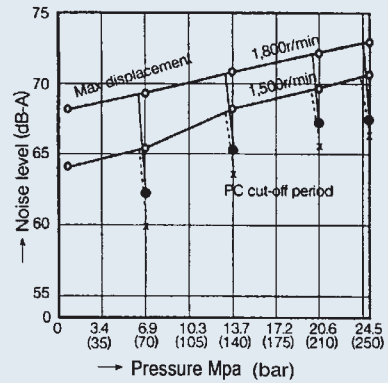
## Performance curves

B

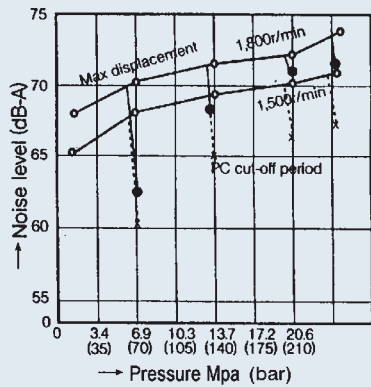
**V15, 18**



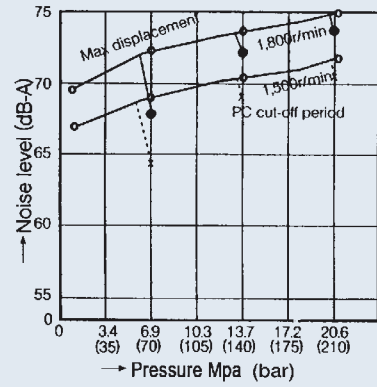
**V23, 25**



**V38, 42**

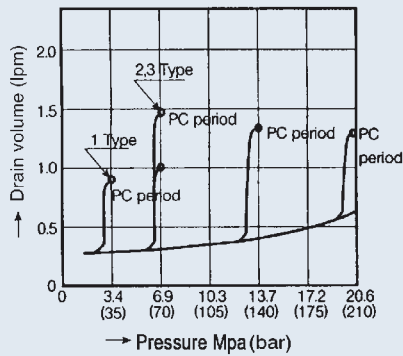


**V50, 70**



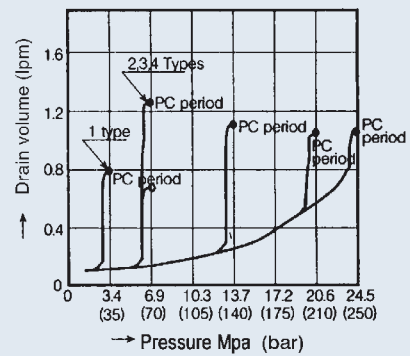
**V15, 18**

**Drain volume characteristic**



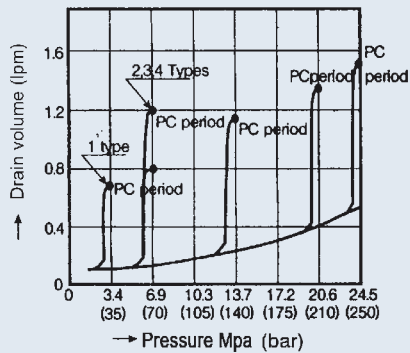
**V23, 25**

**Drain volume characteristic**



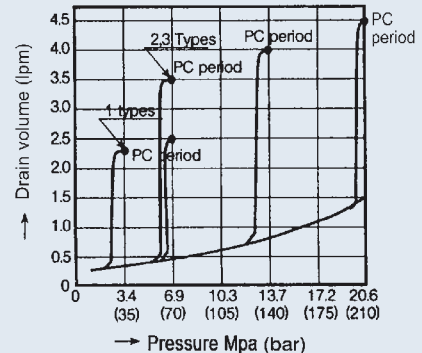
**V38, 42**

**Drain volume characteristic**



**V50, 70**

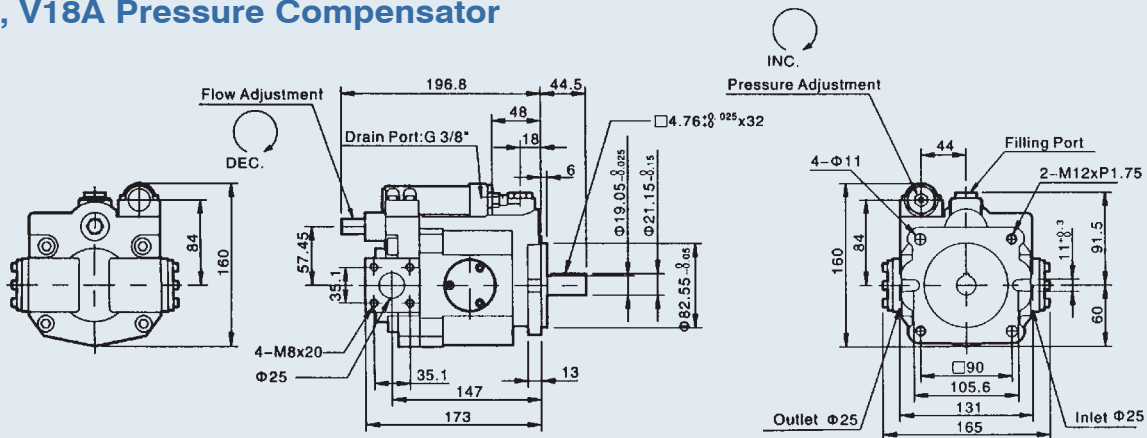
**Drain volume characteristic**



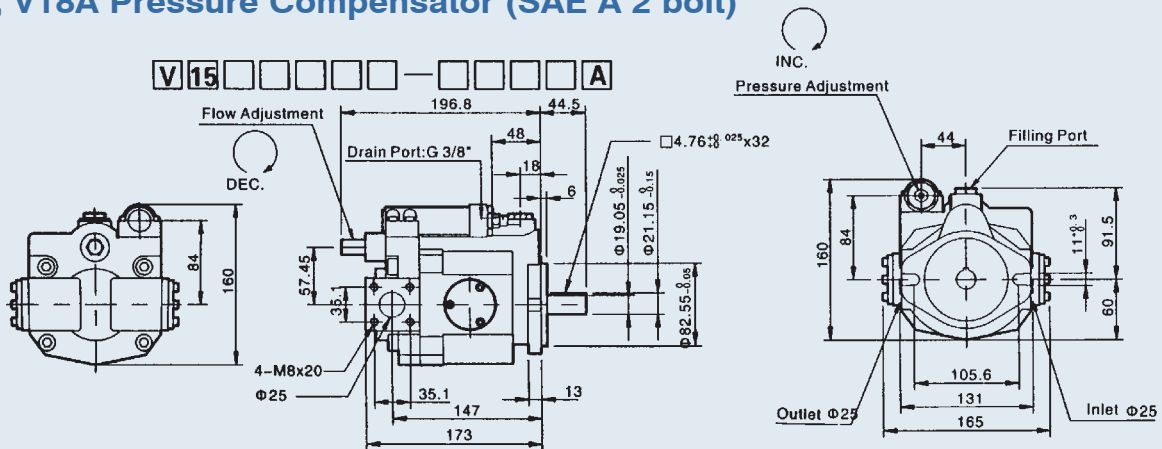
# V SERIES AXIAL PISTON PUMP

## Dimensions

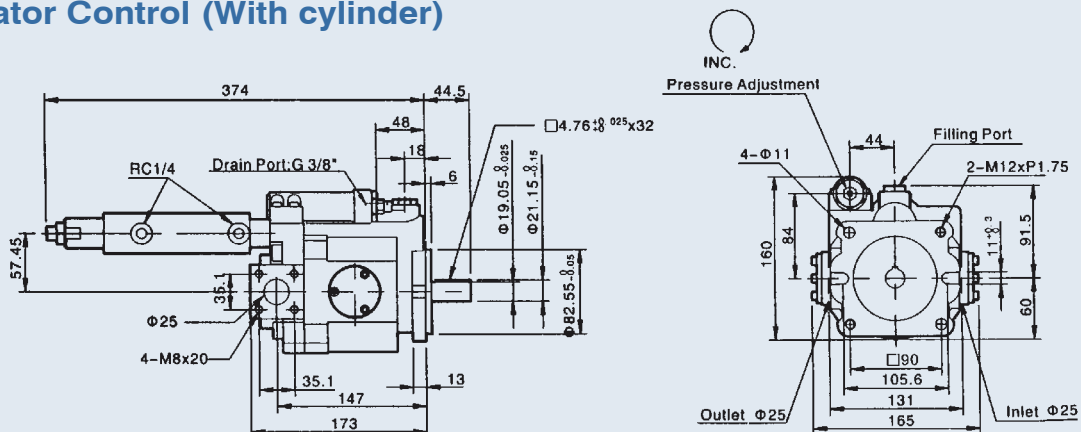
### V15A, V18A Pressure Compensator



### V15A, V18A Pressure Compensator (SAE A 2 bolt)



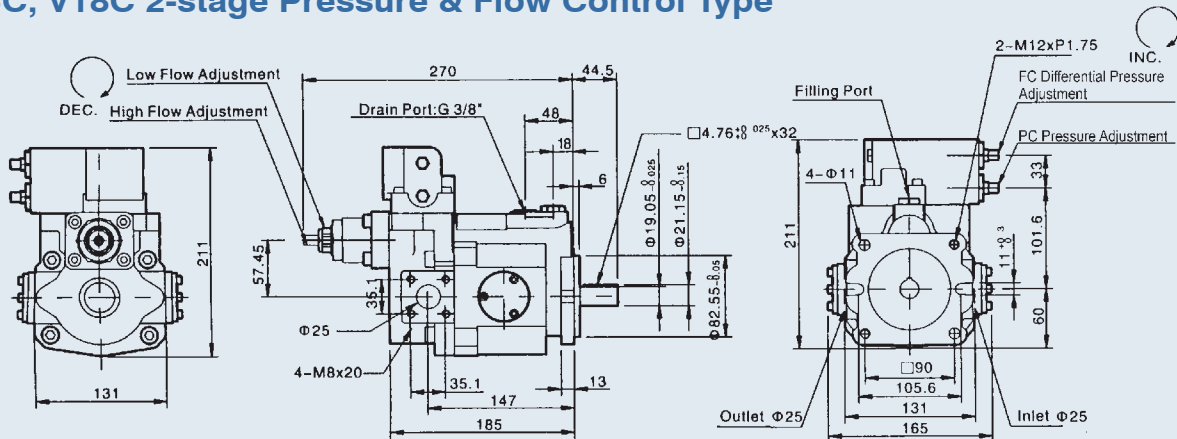
### V15B, V18B Multi-stage Flow & Single-stage Pressure Compensator Control (With cylinder)



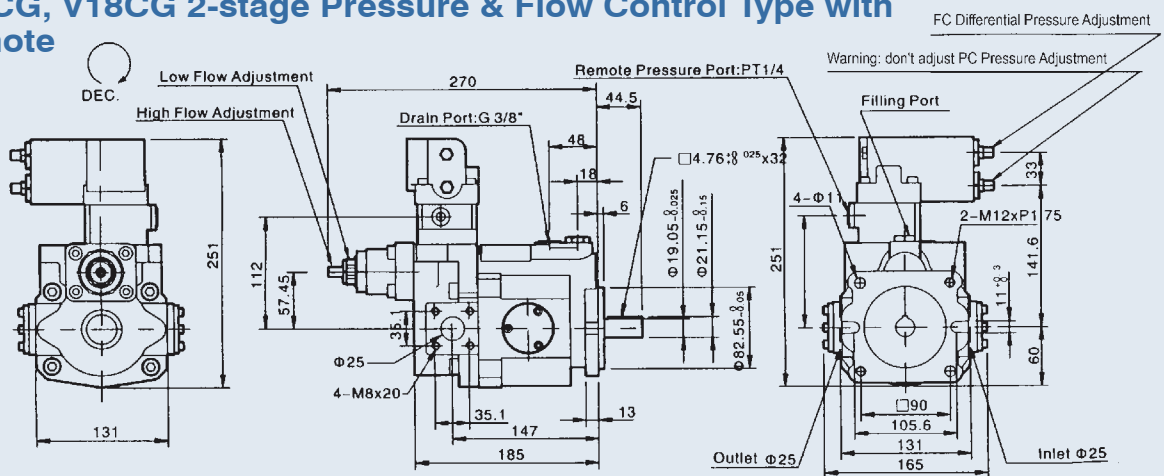
# V SERIES AXIAL PISTON PUMP

## Dimensions

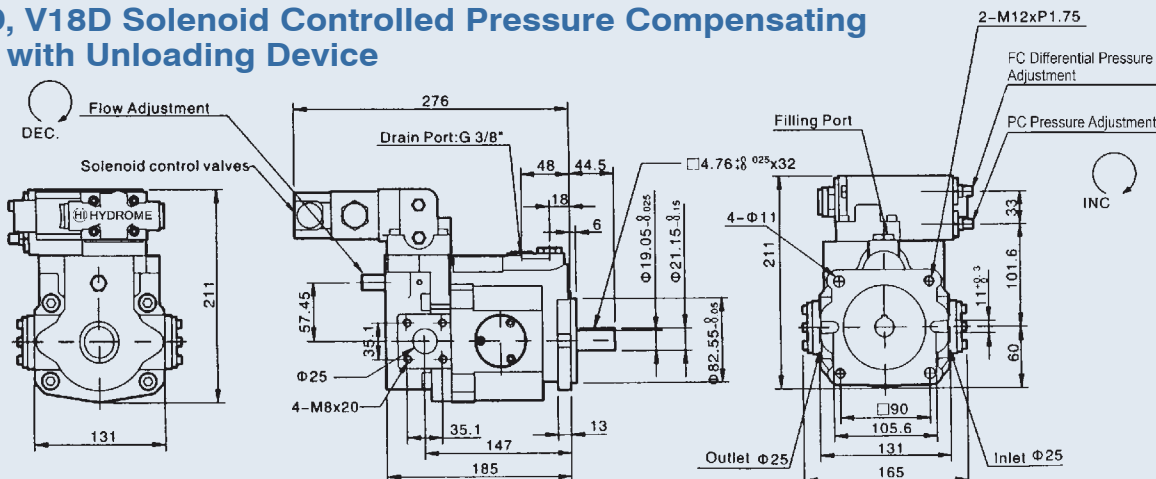
### V15C, V18C 2-stage Pressure & Flow Control Type



### V15CG, V18CG 2-stage Pressure & Flow Control Type with Remote



### V15D, V18D Solenoid Controlled Pressure Compensating Type with Unloading Device

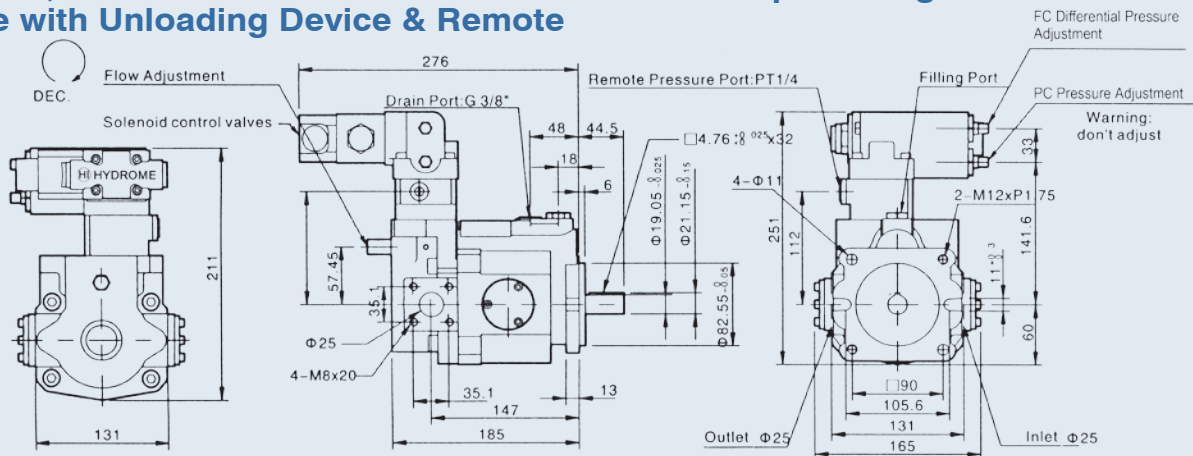




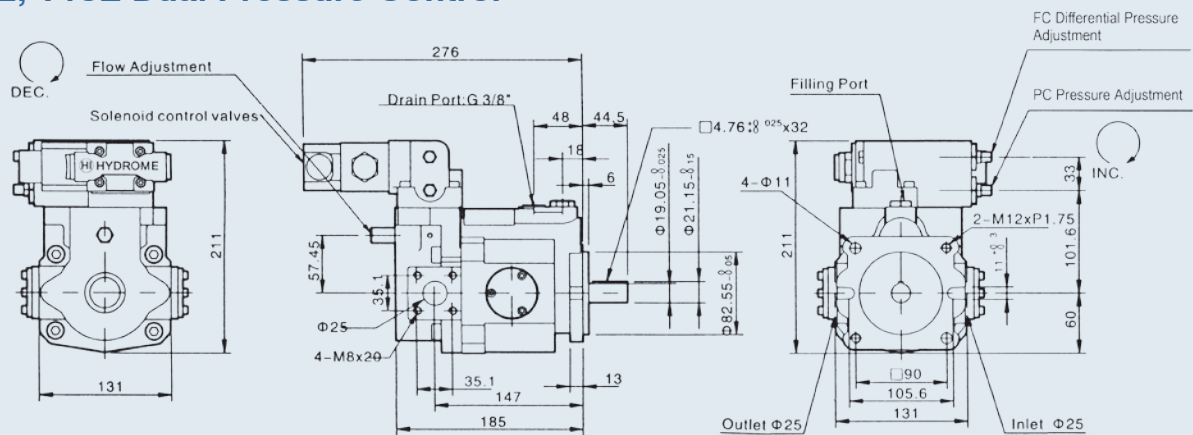
# V SERIES AXIAL PISTON PUMP

## Dimensions

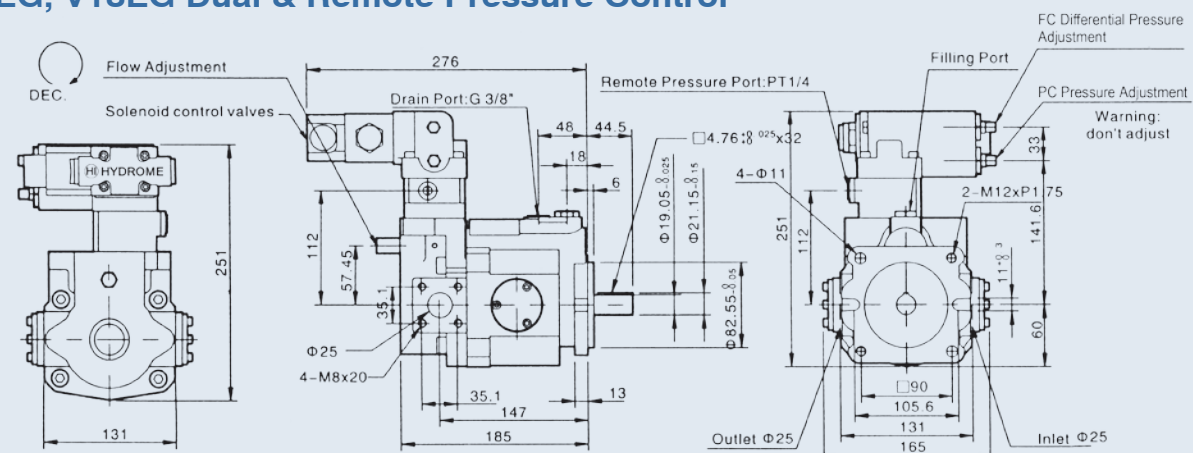
### V15DG, V18DG Solenoid Controlled Pressure Compensating Type with Unloading Device & Remote



### V15E, V18E Dual Pressure Control



### V15EG, V18EG Dual & Remote Pressure Control

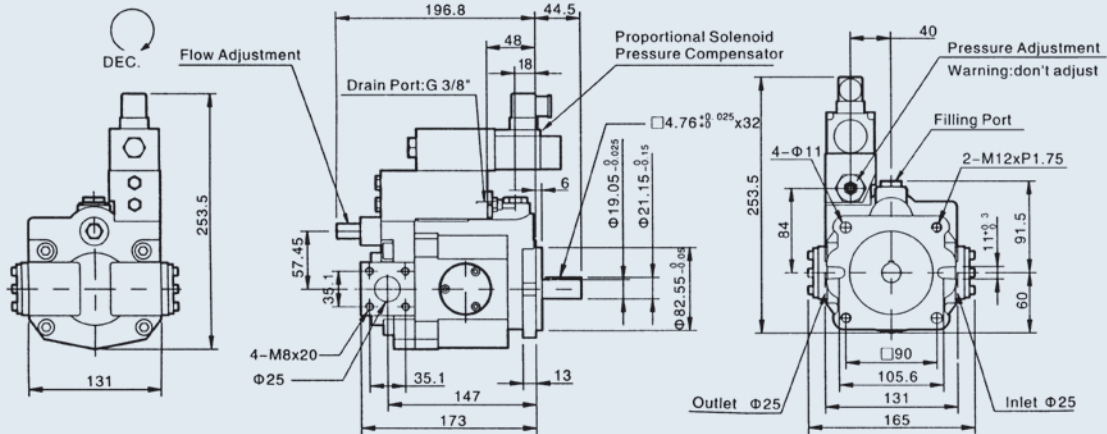




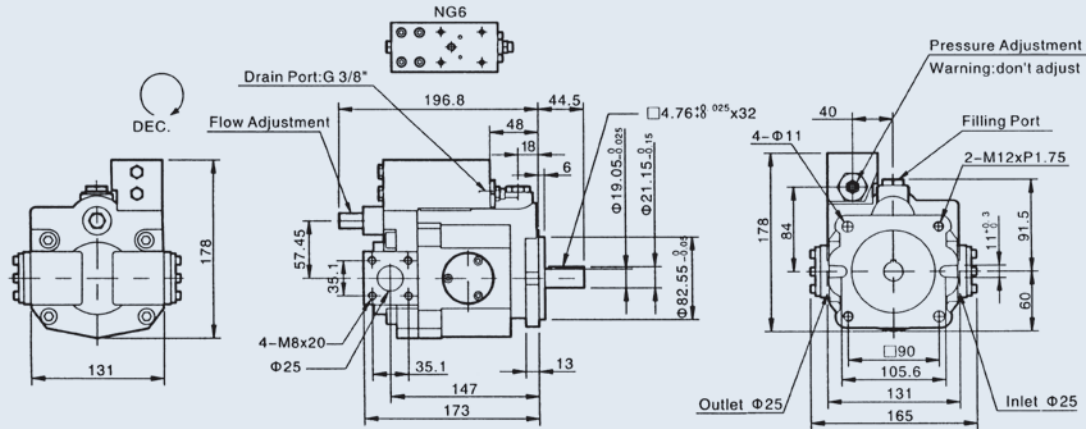
# V SERIES AXIAL PISTON PUMP

## Dimensions

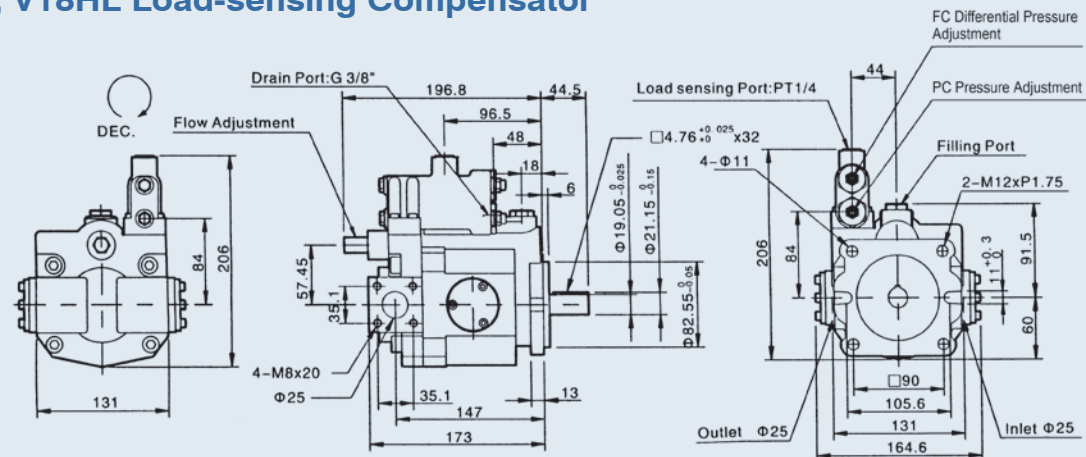
### V15GJ, V18GJ Proportional Pressure with Interface



### V15GM, V18GM Remote Interface (Not include valve)



### V15HL, V18HL Load-sensing Compensator

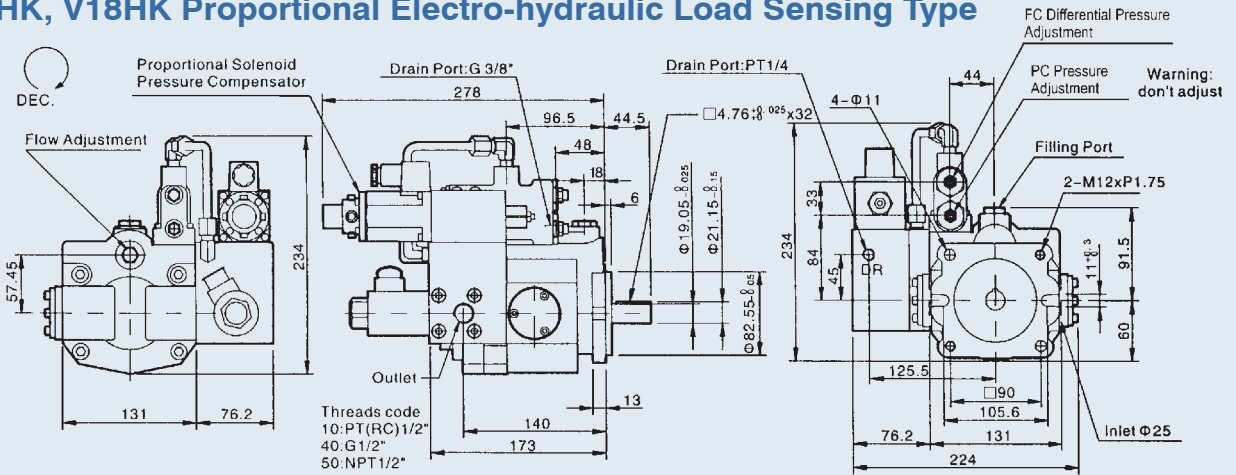


# V SERIES AXIAL PISTON PUMP

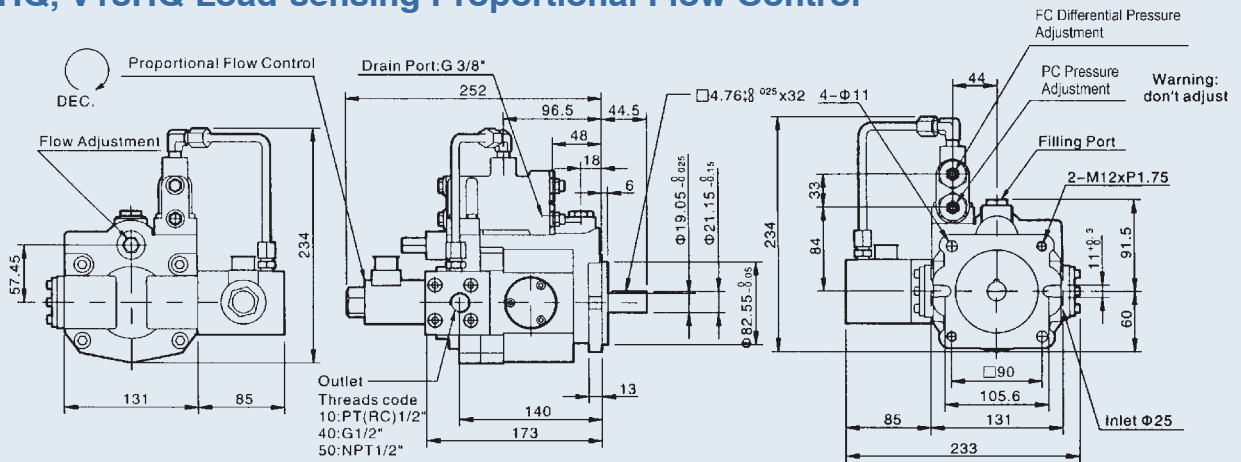
## Dimensions

B

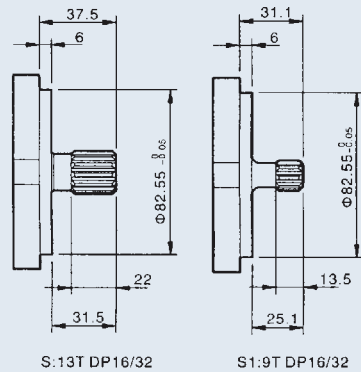
### V15HK, V18HK Proportional Electro-hydraulic Load Sensing Type



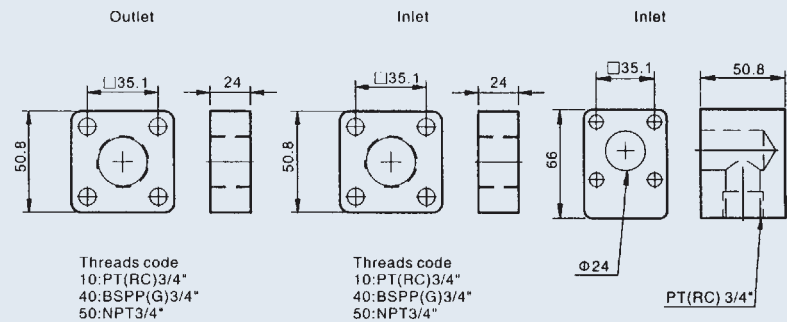
### V15HQ, V18HQ Load-sensing Proportional Flow Control



### V15, V18 Splined Shaft Type



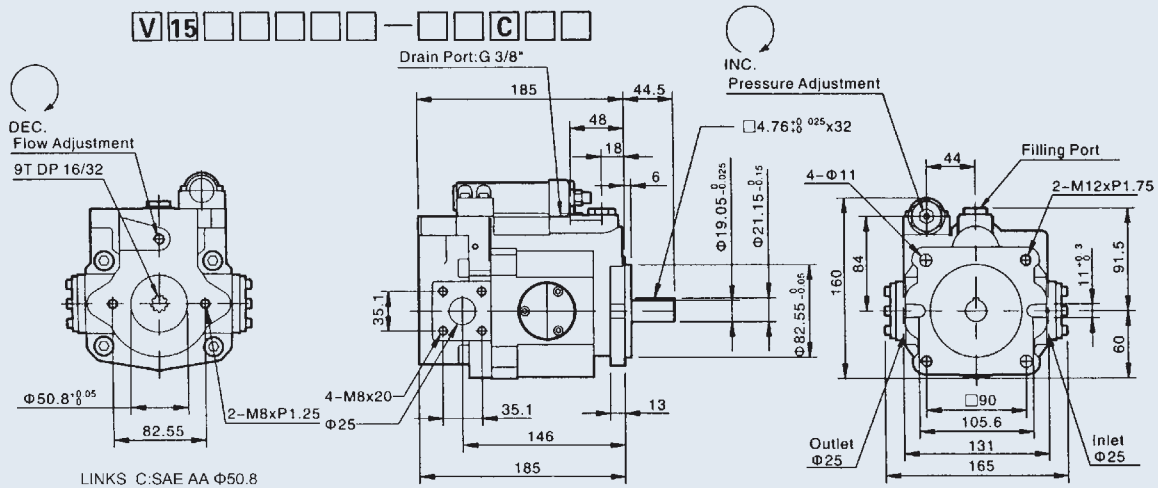
### V15, V18 Hydraulic Flange



# V SERIES AXIAL PISTON PUMP

## Dimensions

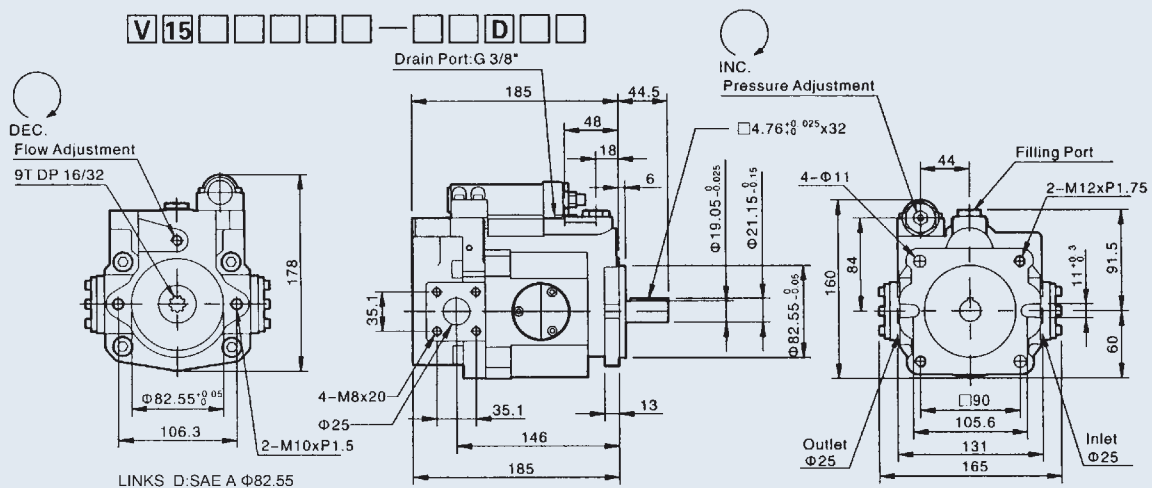
### V15, V18 Prepared for Thru Drive (SAE AA $\phi$ 50.8)



Type	A	B	C	CG	D	DG	E	EG	F	FG	G	GJ	GM	HL	HK	HQ
	O				O	O	O	O			O	O	O	O	O	O

Thru Drive Option

### V15, V18 Prepared for Thru Drive (SAE A $\phi$ 82.55)



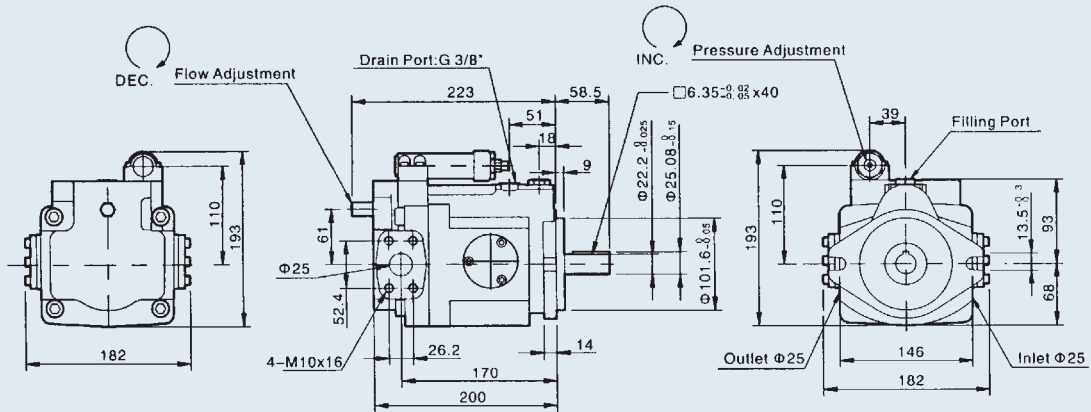
Type	A	B	C	CG	D	DG	E	EG	F	FG	G	GJ	GM	HL	HK	HQ
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Thru Drive Option

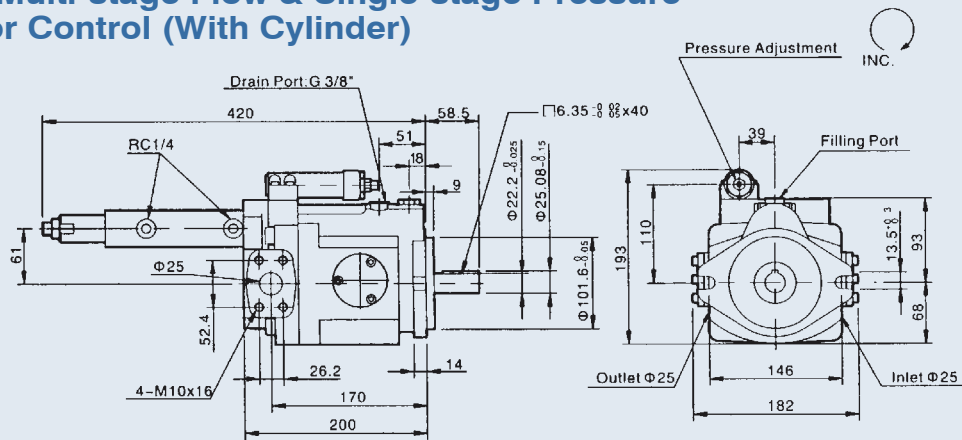
# V SERIES AXIAL PISTON PUMP

## Dimensions

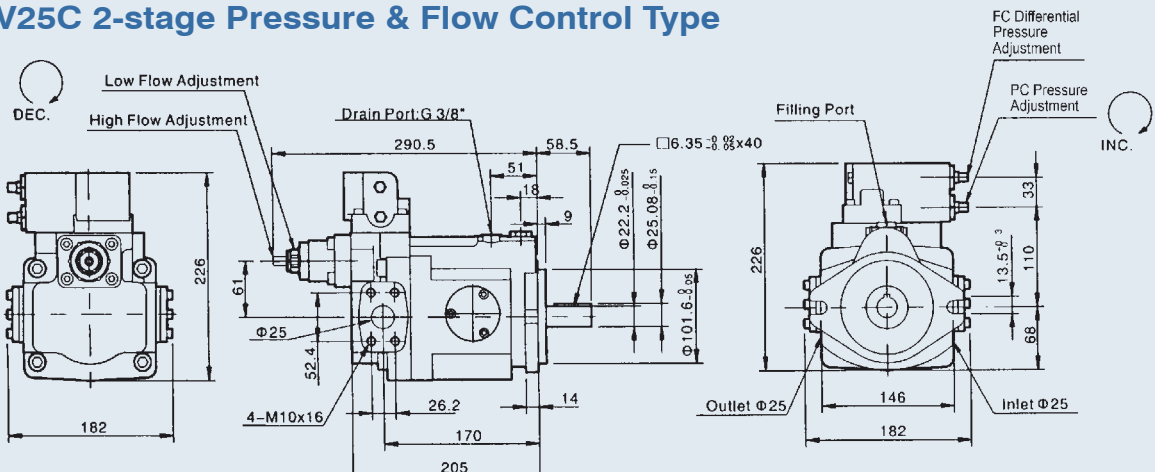
### V23A, V25A Pressure Compensator



### V23B, V25B Multi-stage Flow & Single-stage Pressure Compensator Control (With Cylinder)



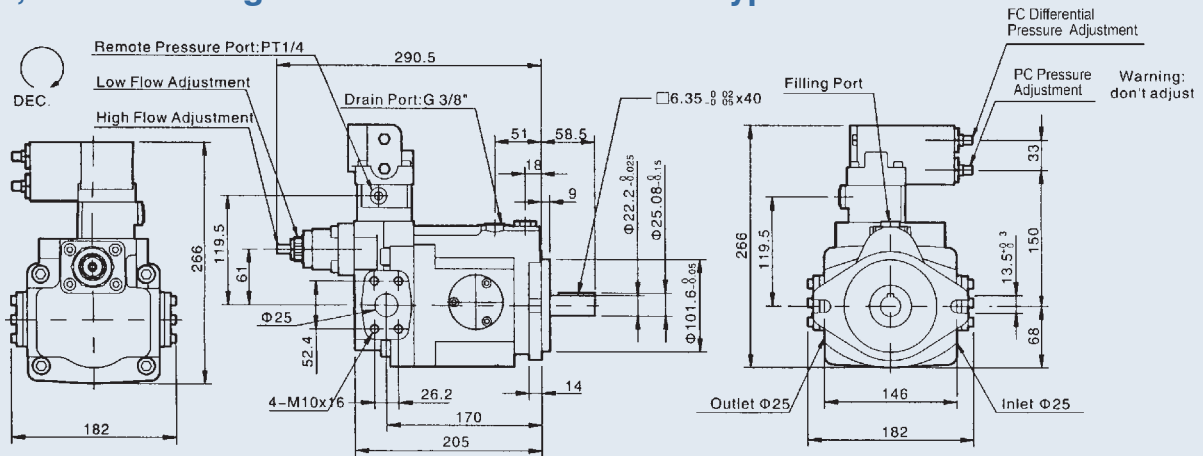
### V23C, V25C 2-stage Pressure & Flow Control Type



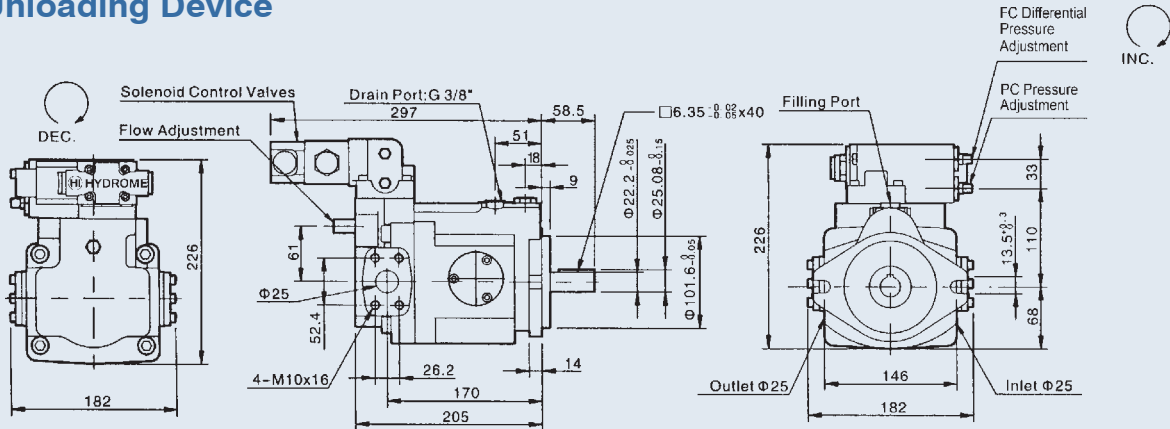
# V SERIES AXIAL PISTON PUMP

## Dimensions

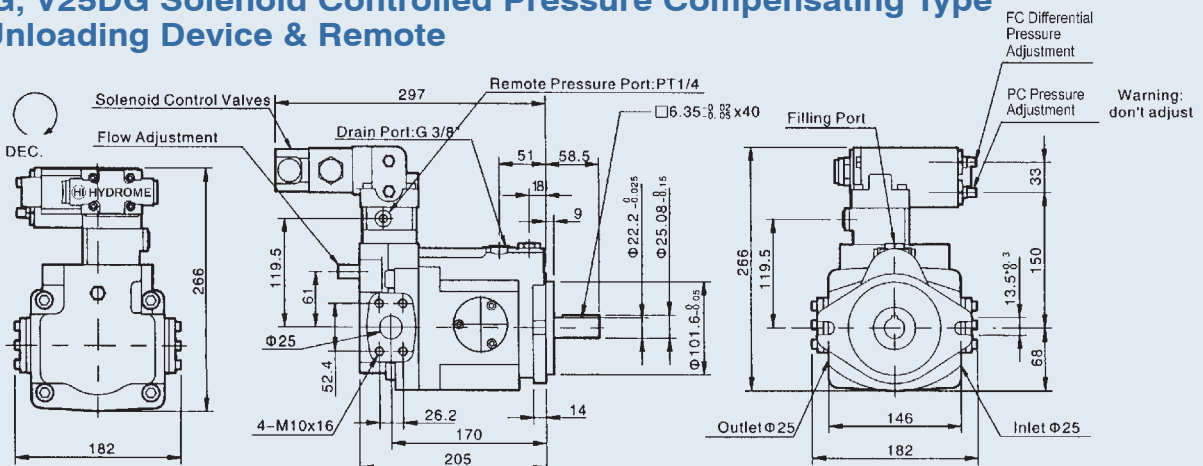
### V23CG, V25CG 2-stage Pressure & Flow Control Type with Remote



### V23D, V25D Solenoid Controlled Pressure Compensating Type with Unloading Device



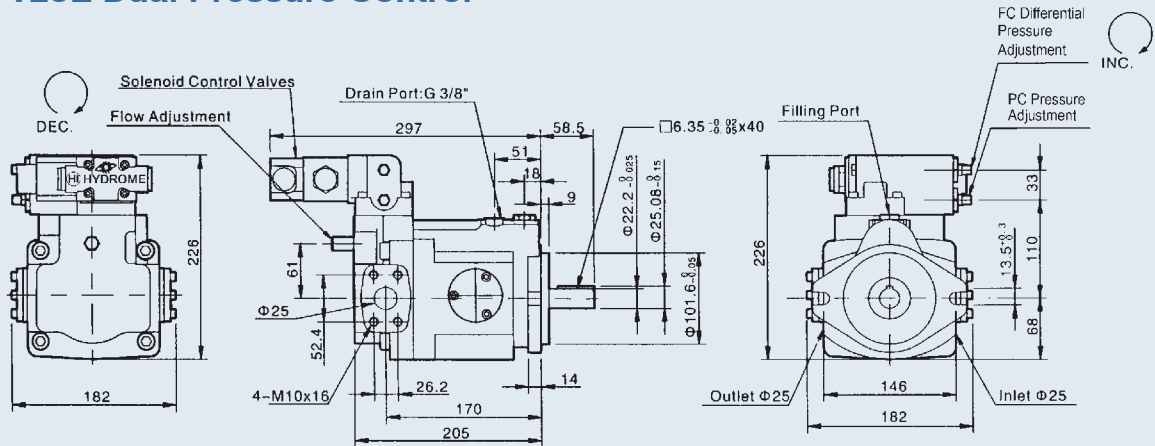
### V23DG, V25DG Solenoid Controlled Pressure Compensating Type with Unloading Device & Remote



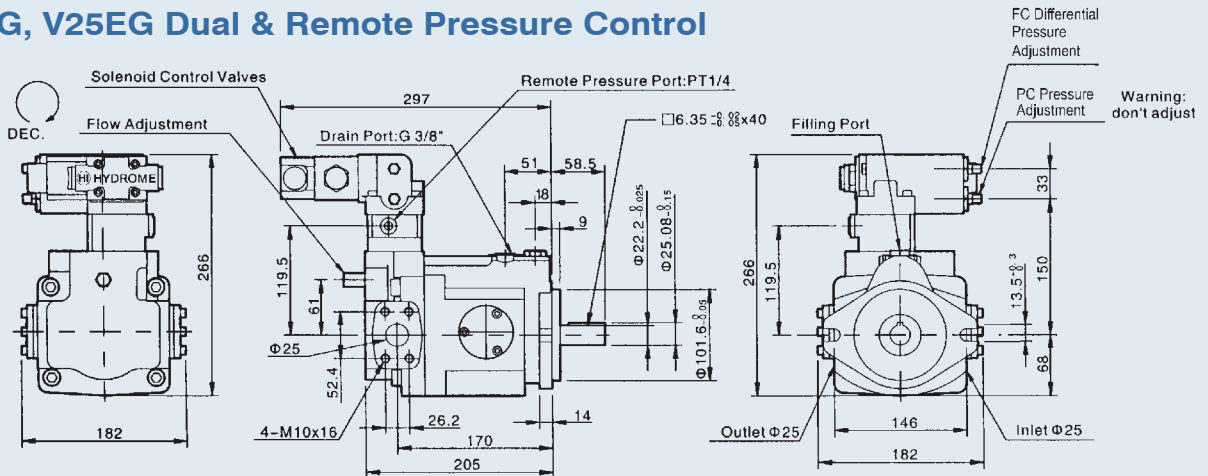
# V SERIES AXIAL PISTON PUMP

## Dimensions

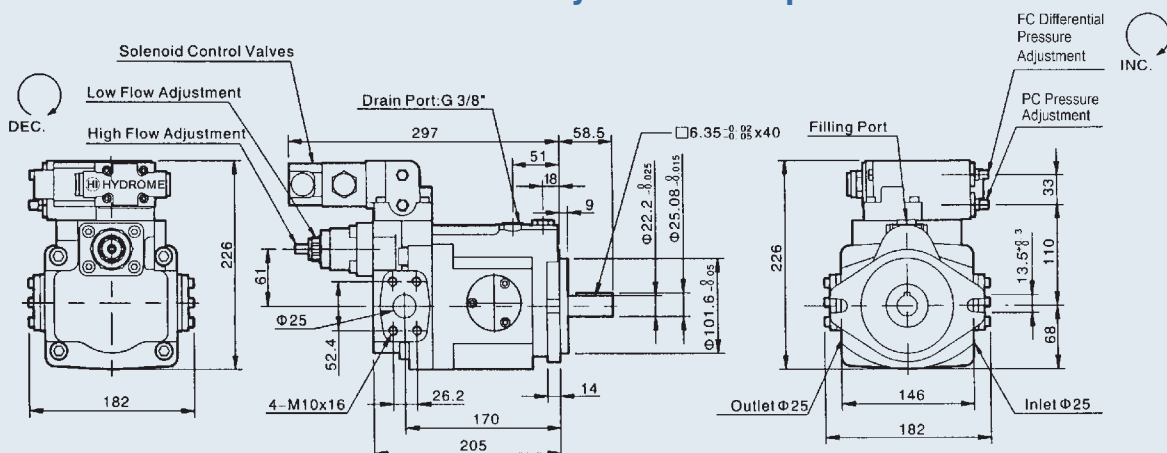
### V23E, V25E Dual Pressure Control



### V23EG, V25EG Dual & Remote Pressure Control



### V23F, V25F 2 Flow-2 Pressure Control by Solenoid Operated Valve

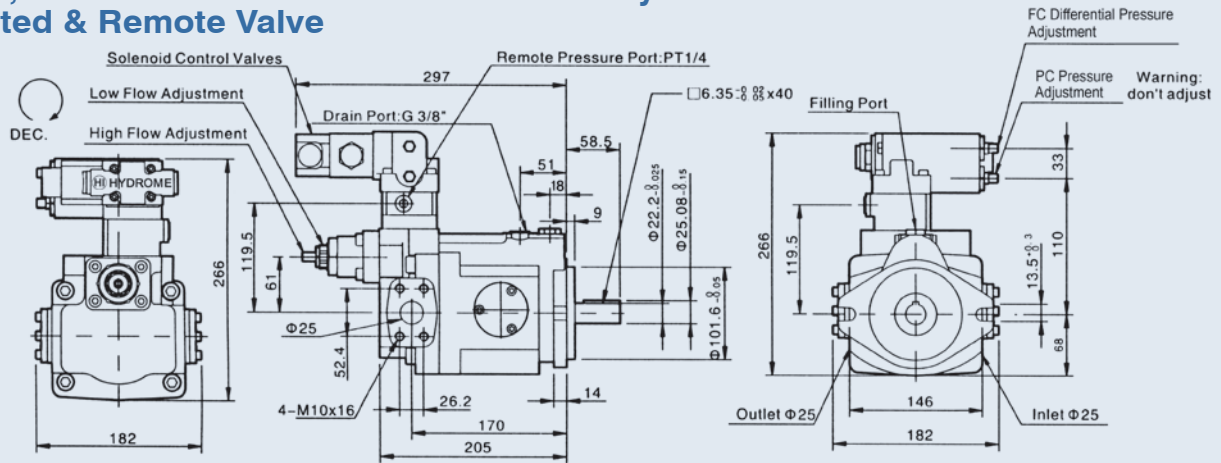




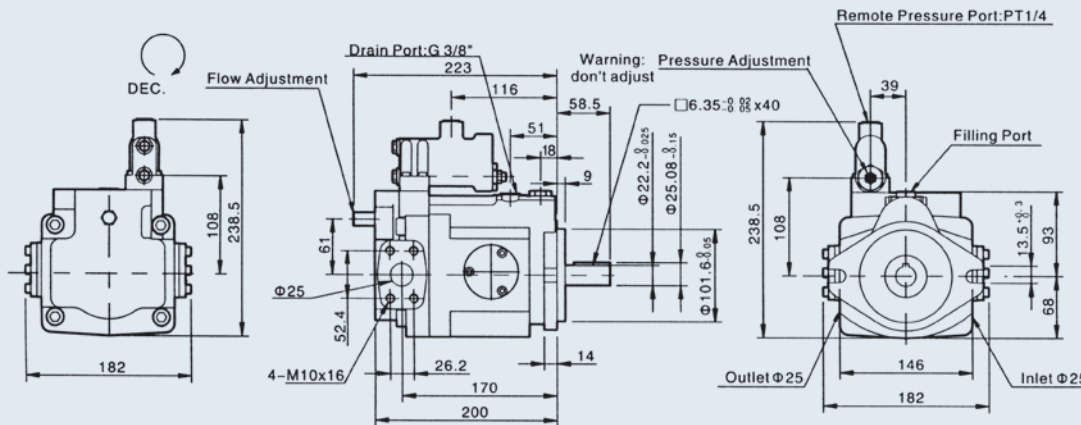
# V SERIES AXIAL PISTON PUMP

## Dimensions

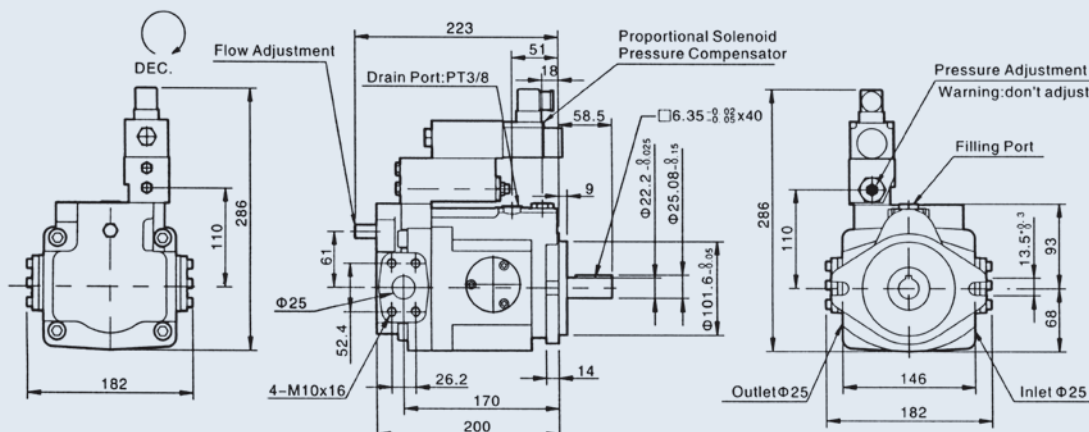
### V23FG, V25FG 2 Flow-2 Pressure Control by Solenoid Operated & Remote Valve



### V23G, V25G Remoted Pressure Compensator Control



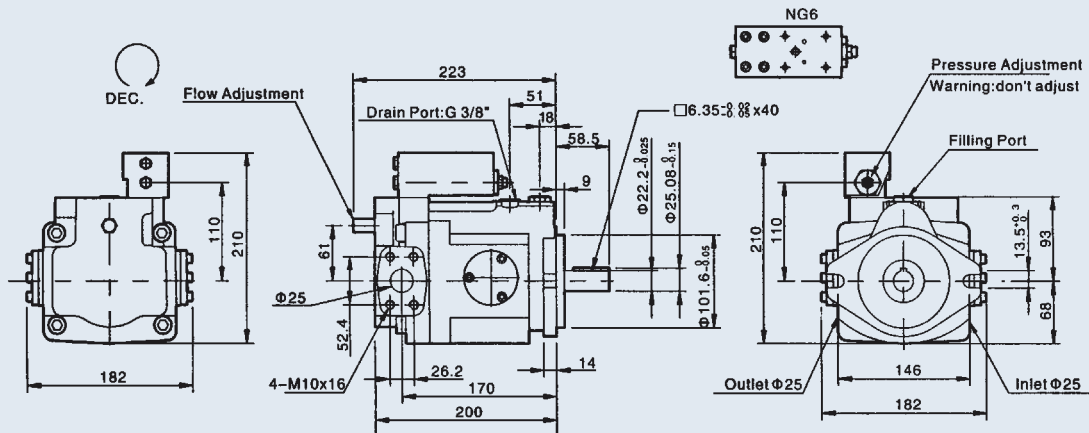
### V23GJ, V25GJ Proportional Pressure with interface



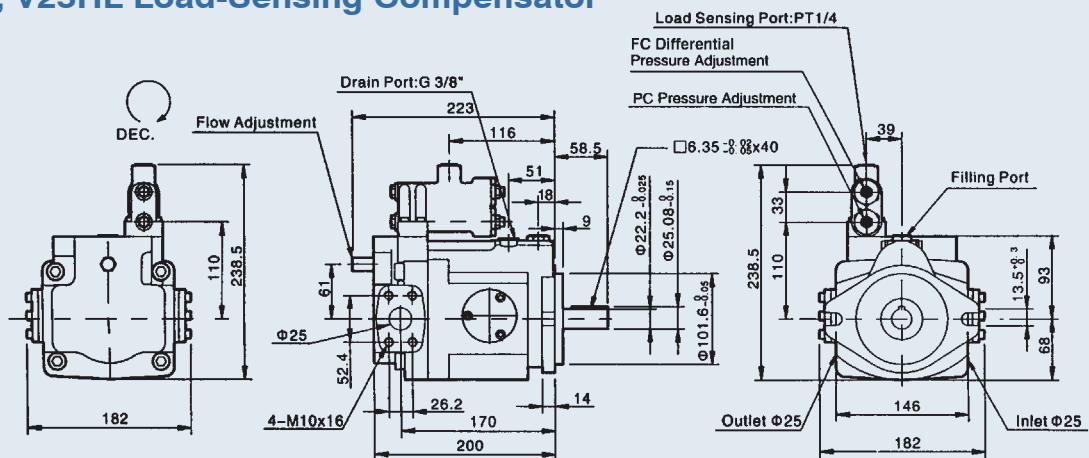
# V SERIES AXIAL PISTON PUMP

## Dimensions

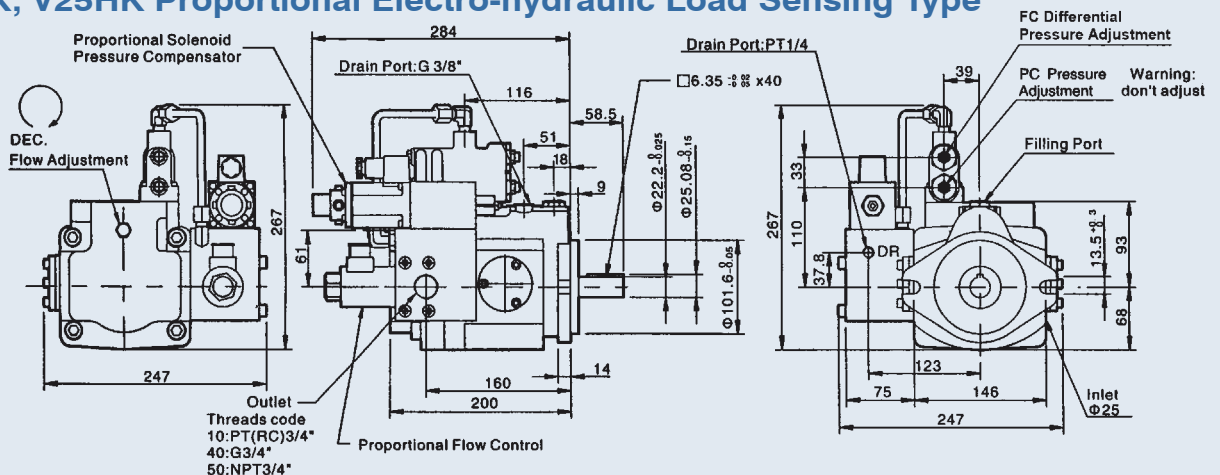
### V23GM, V25GM Remoted Interface (Not include valve)



### V23HL, V25HL Load-Sensing Compensator



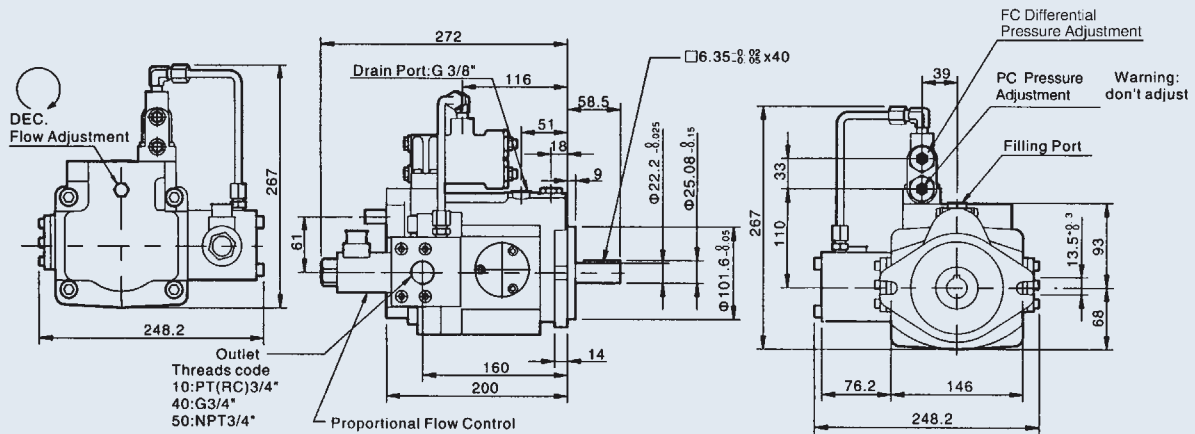
### V23HK, V25HK Proportional Electro-hydraulic Load Sensing Type



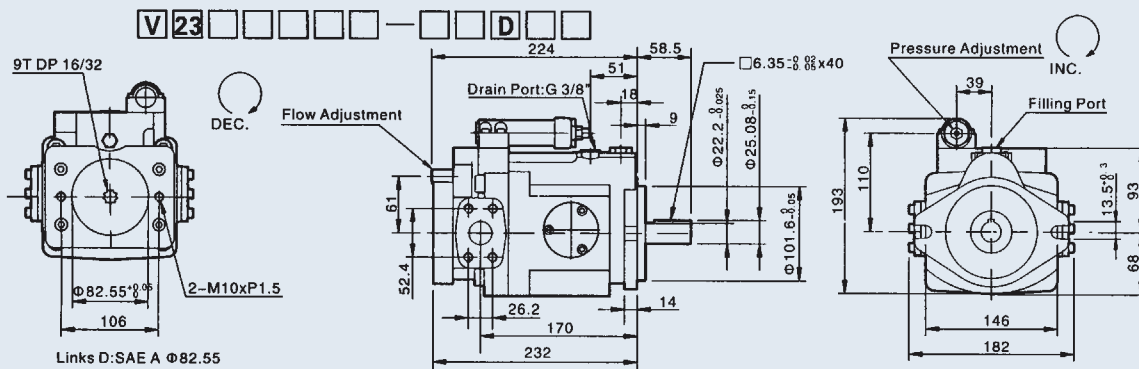
# V SERIES AXIAL PISTON PUMP

## Dimensions

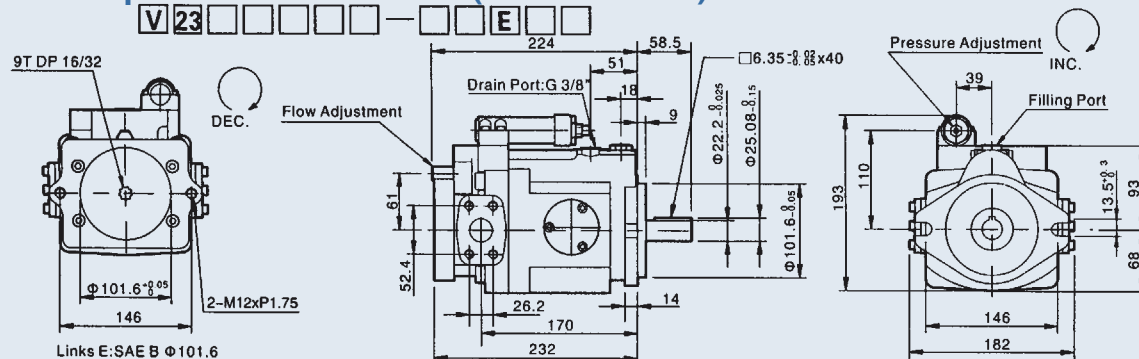
### V23HQ, V25HQ Load-Sensing Proportional Flow Control



### V23, V25 Prepared for Thru Drive (SAE Aø82.55)



### V23, V25 Prepared for Thru Drive (SAE Bø101.6)



Type	A	B	C	CG	D	DG	E	EG	F	FG	G	GJ	GM	HL	HK	HQ
Thru Drive Option	O				O	O	O	O			O	O	O	O	O	O

Thru Drive Option

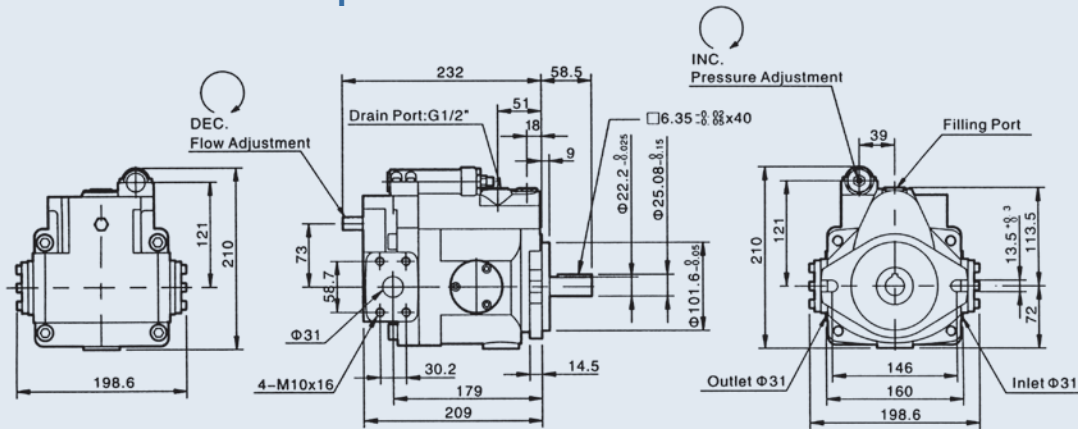
B



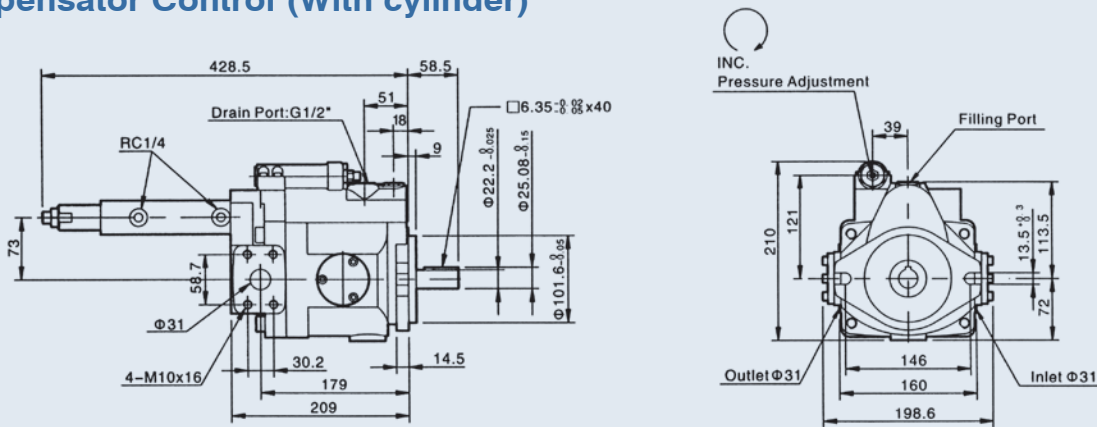
# V SERIES AXIAL PISTON PUMP

## Dimensions

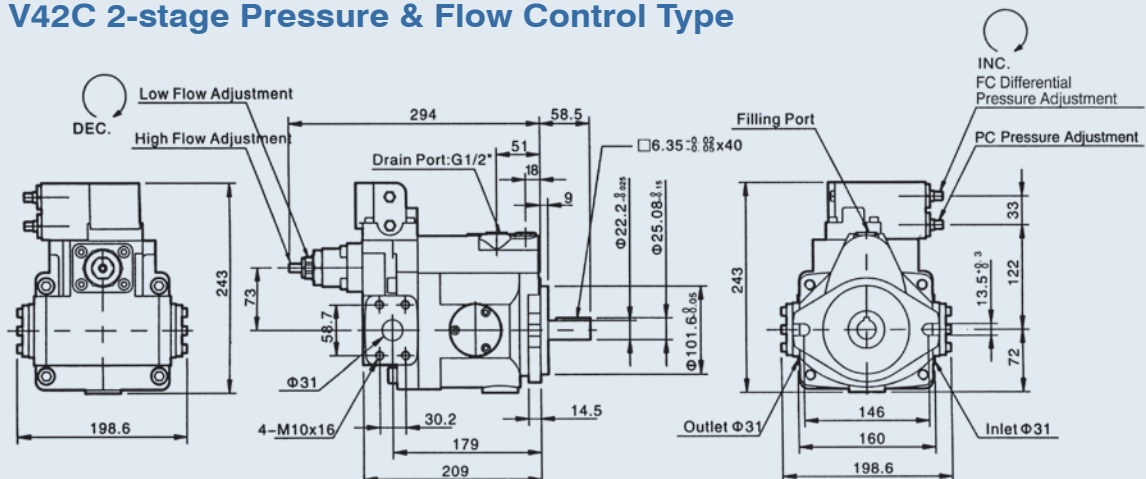
### V38A, V42A Pressure Compensator



### V38B, V42B Multi-stage Flow & Single-stage Pressure Compensator Control (With cylinder)



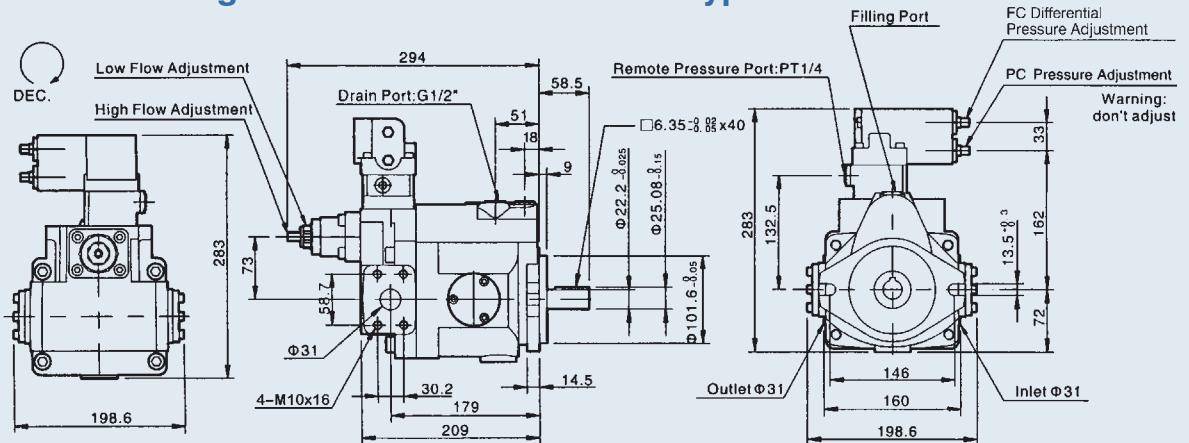
### V38C, V42C 2-stage Pressure & Flow Control Type



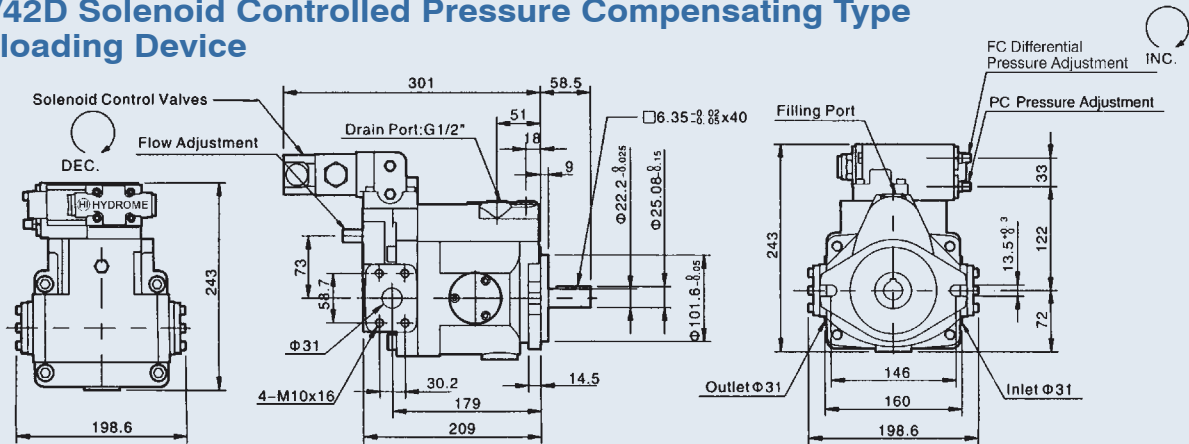
# V SERIES AXIAL PISTON PUMP

## Dimensions

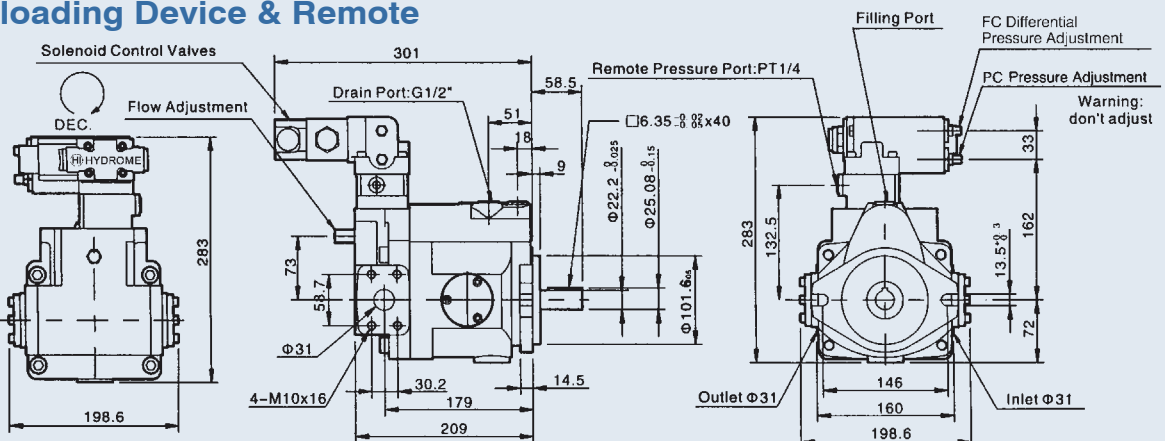
### V38CG, V42CG 2-stage Pressure & Flow Control Type with Remote



### V38D, V42D Solenoid Controlled Pressure Compensating Type with Unloading Device



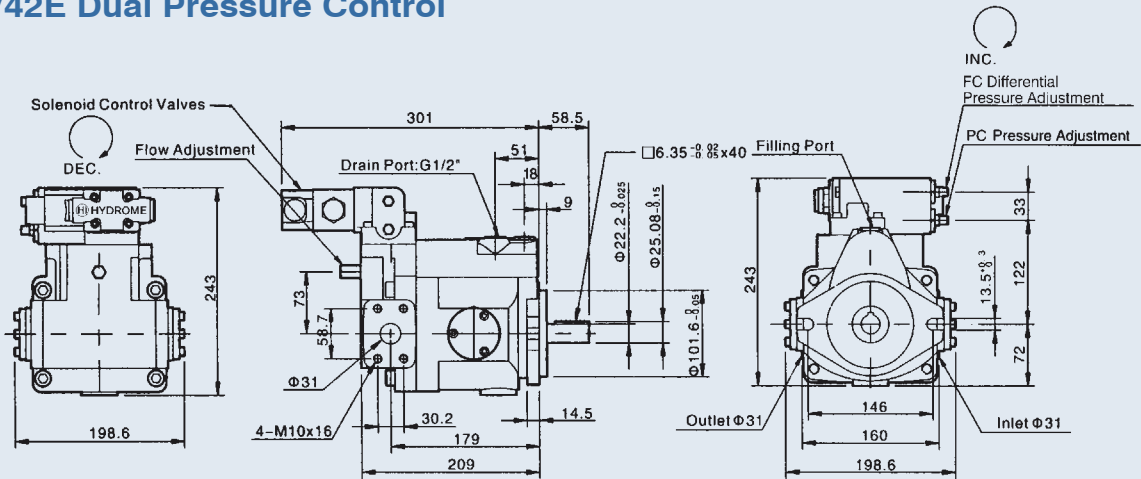
### V38DG, V42DG Solenoid Controlled Pressure Compensating Type with Unloading Device & Remote



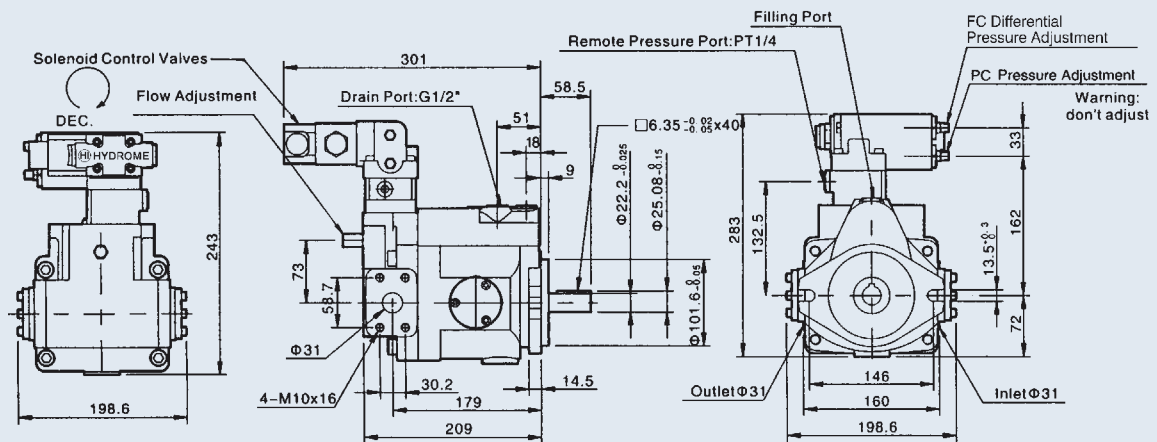
# V SERIES AXIAL PISTON PUMP

## Dimensions

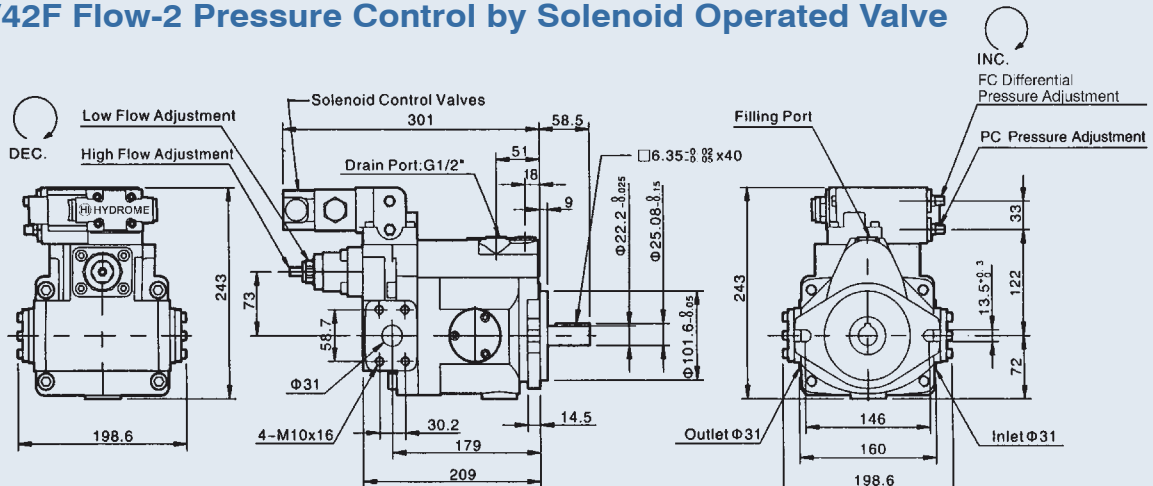
### V38E, V42E Dual Pressure Control



### V38EG, V42EG Dual & Remote Pressure Control



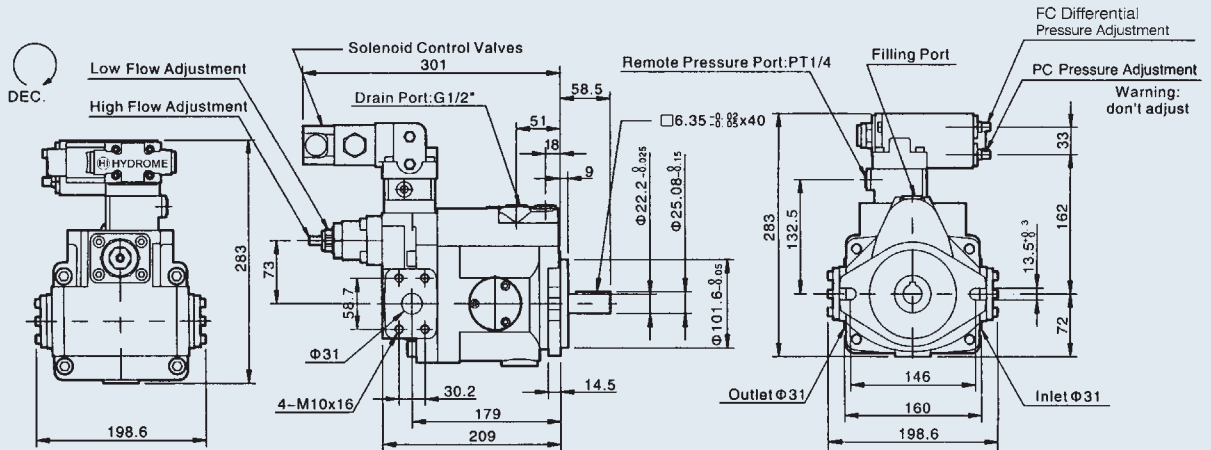
### V38F, V42F Flow-2 Pressure Control by Solenoid Operated Valve



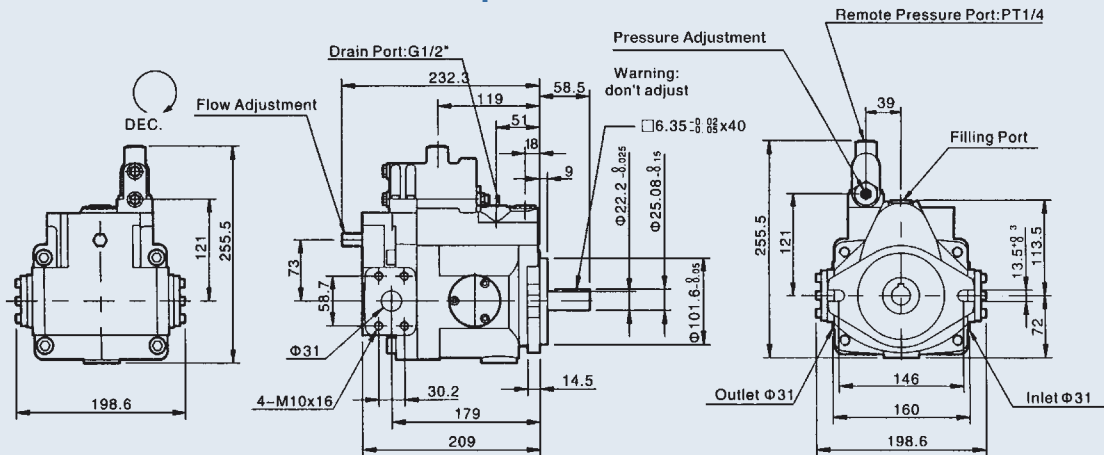
# V SERIES AXIAL PISTON PUMP

## Dimensions

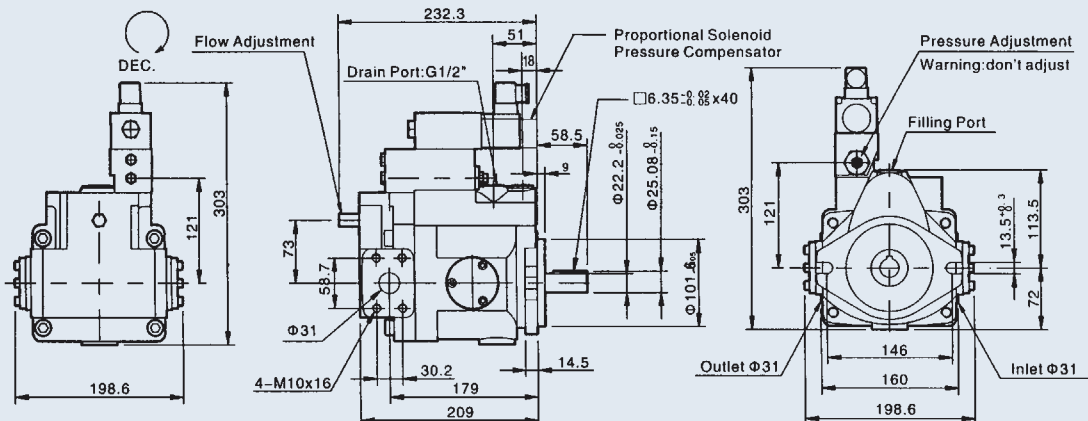
### V38FG, V42FG 2 Flow-2 Pressure Control by Solenoid Operated & Remote Valve



### V38G, V42G Remoted Pressure Compensator Control



### V38GJ, V42GJ Proportional Pressure with Interface

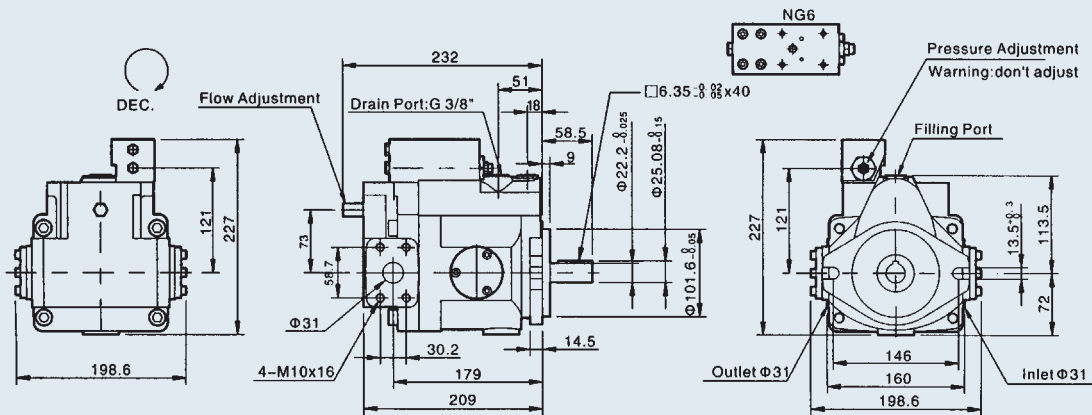




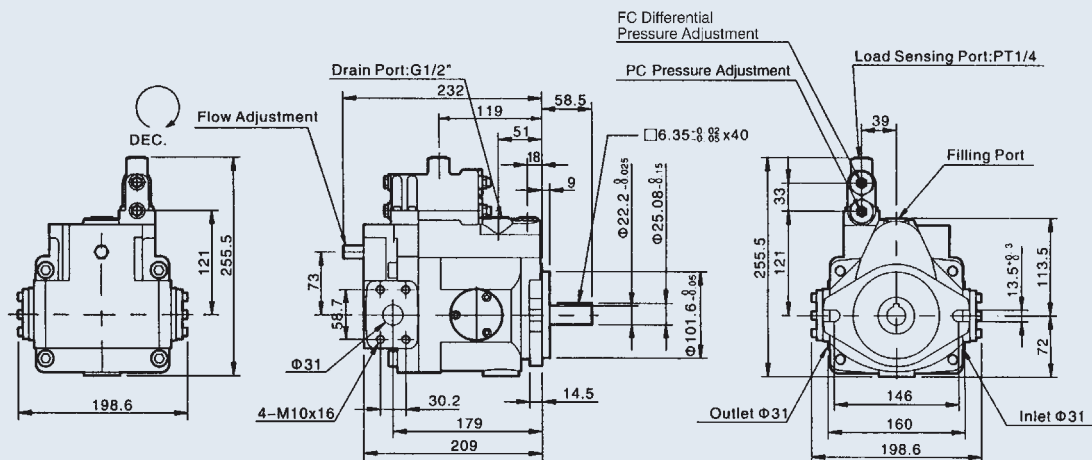
# V SERIES AXIAL PISTON PUMP

## Dimensions

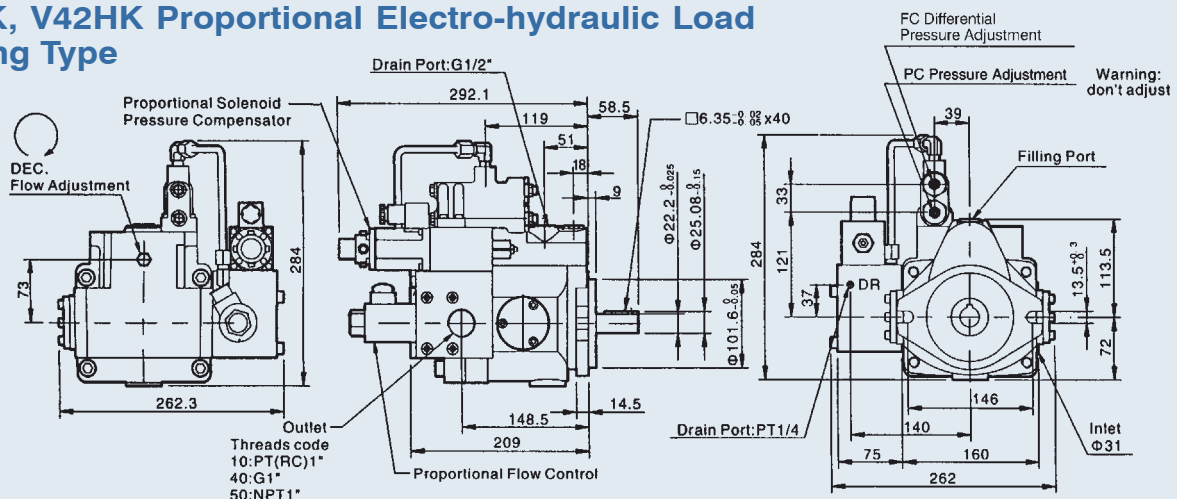
### V38GM, V42GM Remote Interface (Not include valve)



### V38HL, V42HL Load-sensing Compensator



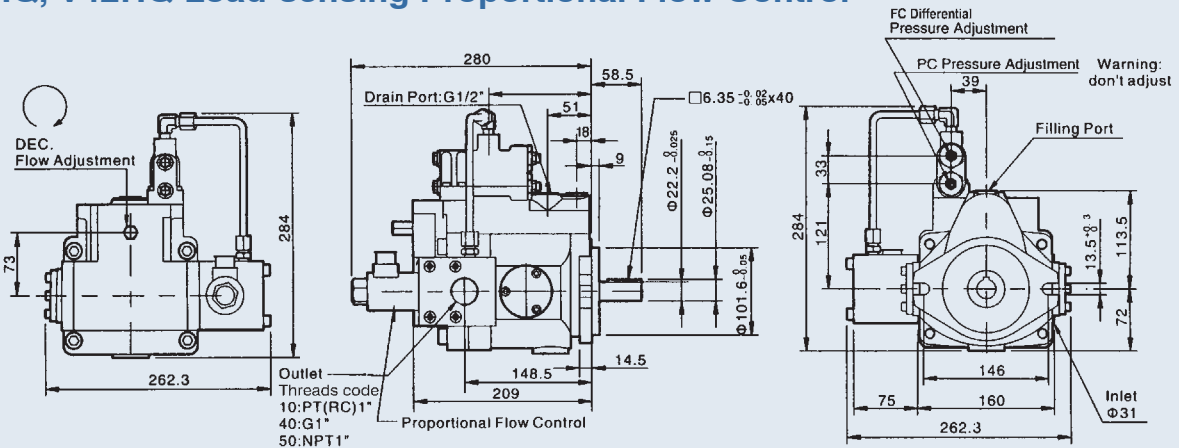
### V38HK, V42HK Proportional Electro-hydraulic Load Sensing Type



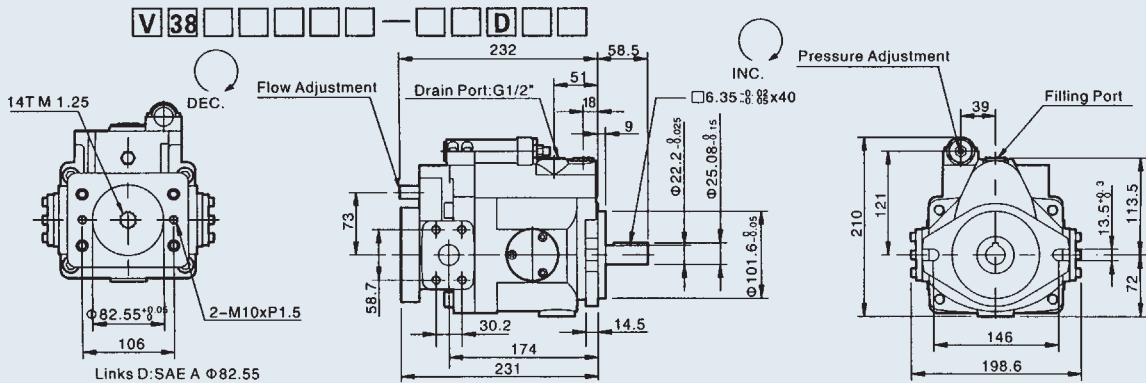
# V SERIES AXIAL PISTON PUMP

## Dimensions

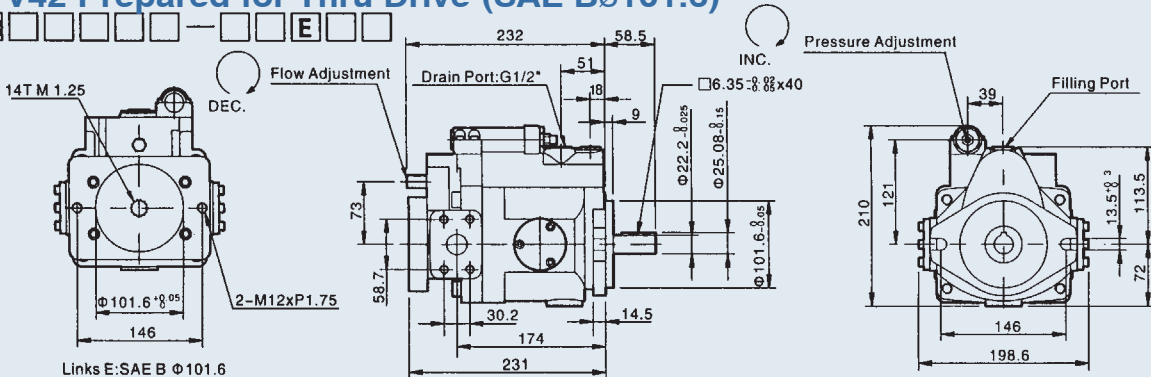
### V38HQ, V42HQ Load-sensing Proportional Flow Control



### V38, V42 Prepared for Thru Drive (SAE A $\phi 82.55$ )



### V38, V42 Prepared for Thru Drive (SAE B $\phi 101.6$ )



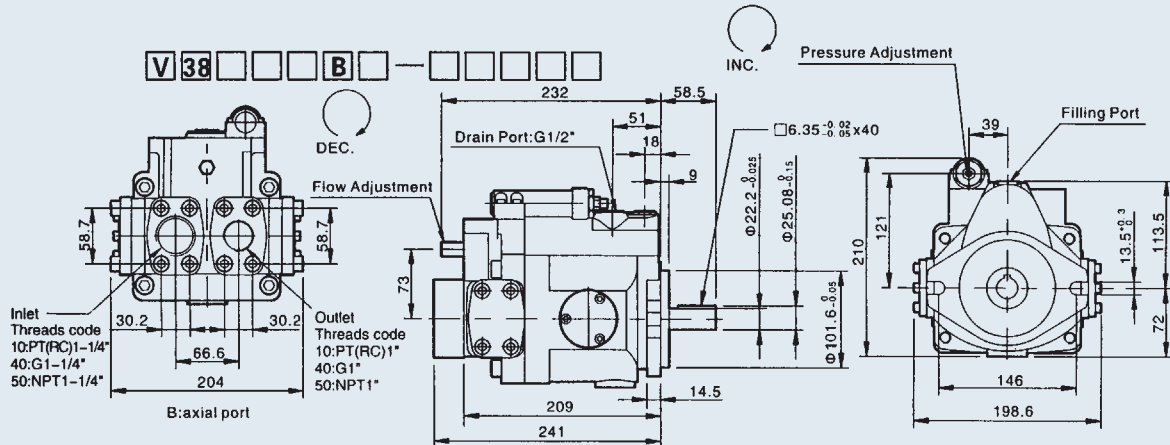
Type	A	B	C	CG	D	DG	E	EG	F	FG	G	GJ	GM	HL	HK	HQ
Thru Drive Option	O				O	O	O	O			O	O	O	O	O	O

Thru Drive Option

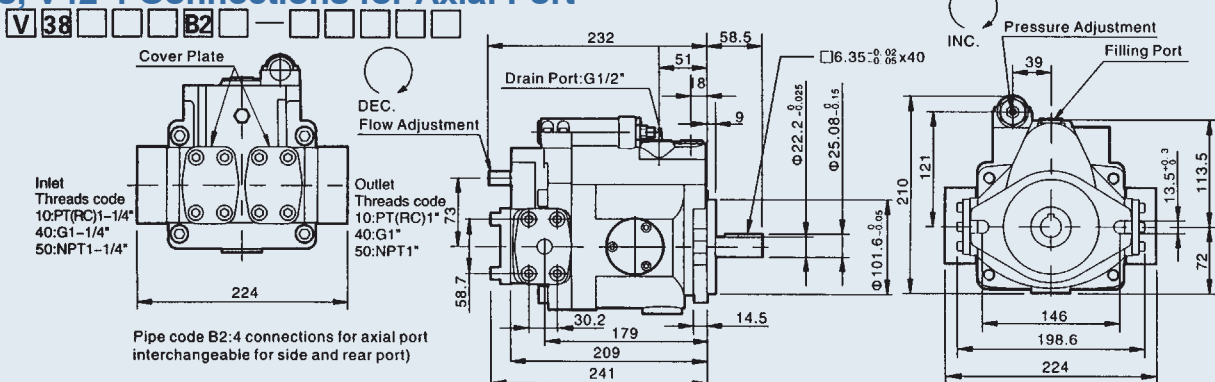
# V SERIES AXIAL PISTON PUMP

## Dimensions

### V38, V42 Axial Port

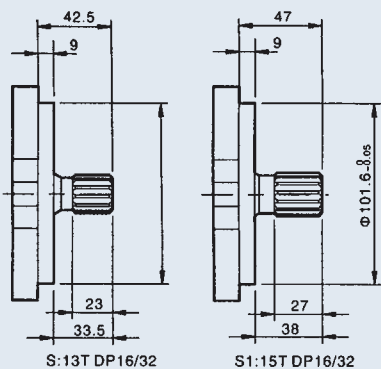


### V38, V42 4 Connections for Axial Port

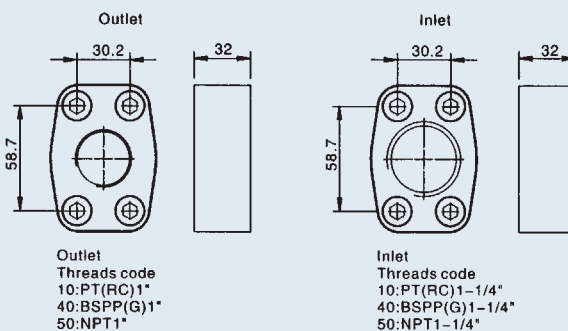


Type	A	B	C	CG	D	DG	E	EG	F	FG	G	GJ	GM	HL	HK	HQ
Axial Port Option	○	○	○	○					○	○	○	○	○	○		

### V38, V42 Splined Shaft Type



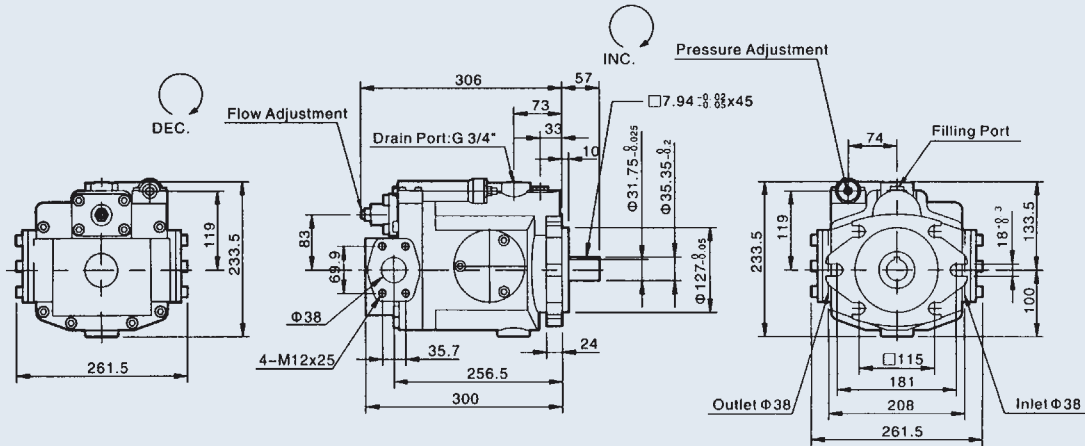
### V38, V42 Hydraulic Flange



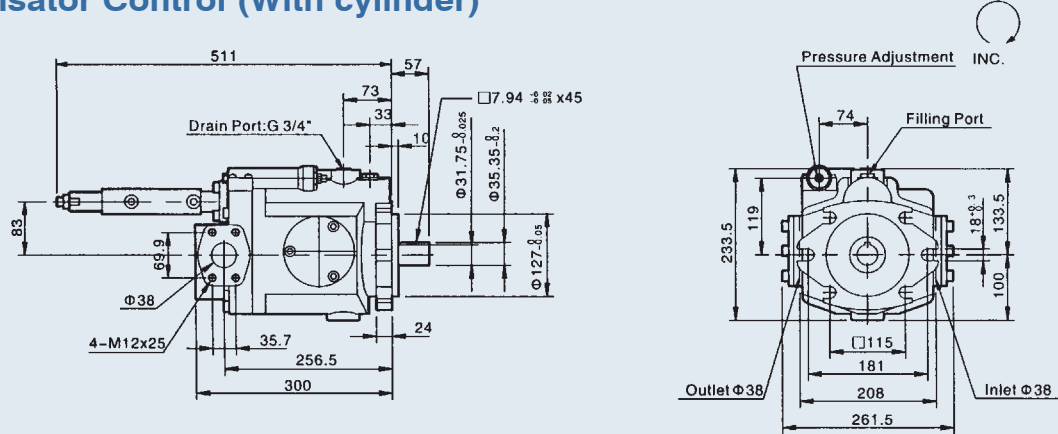
# V SERIES AXIAL PISTON PUMP

## Dimensions

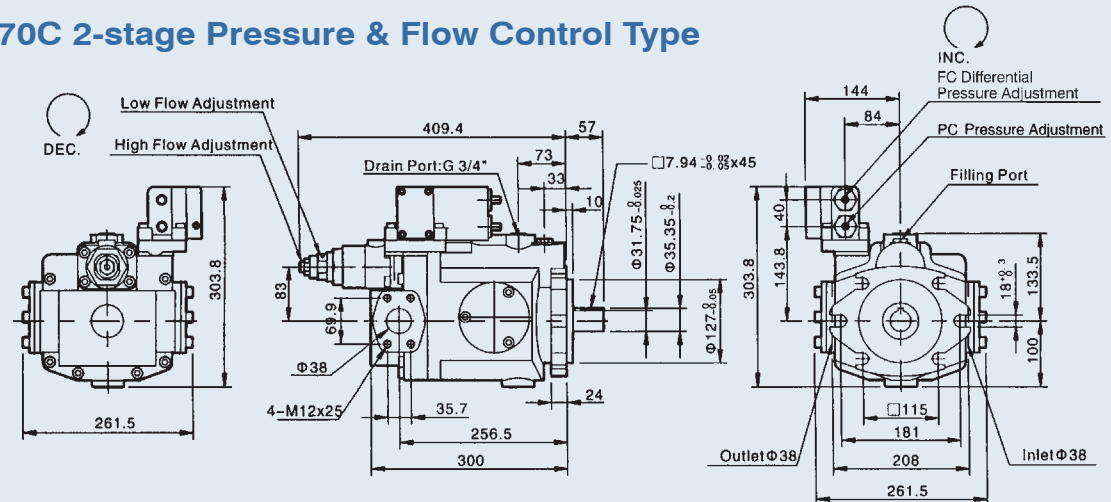
### V50A, V70A Pressure Compensator



### V50B, V70B Multi-stage Flow & Single-stage Pressure Compensator Control (With cylinder)



### V50C, V70C 2-stage Pressure & Flow Control Type

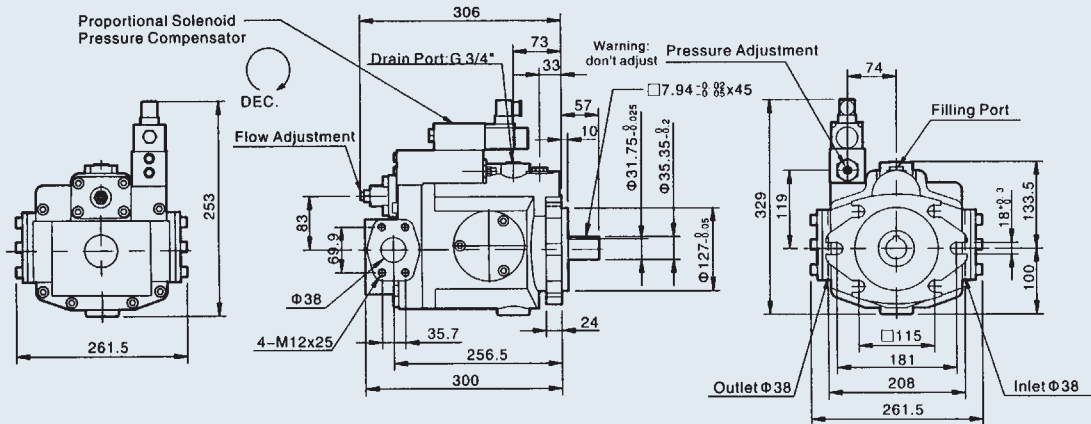




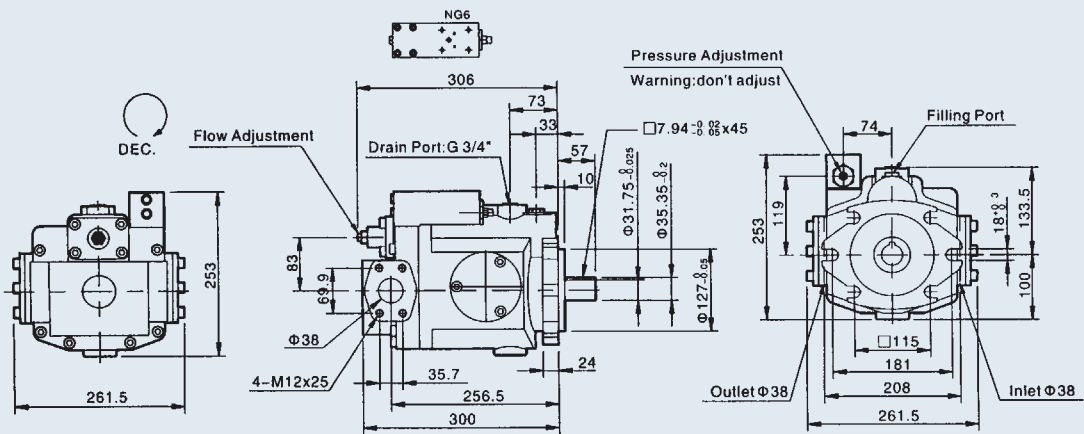
# V SERIES AXIAL PISTON PUMP

## Dimensions

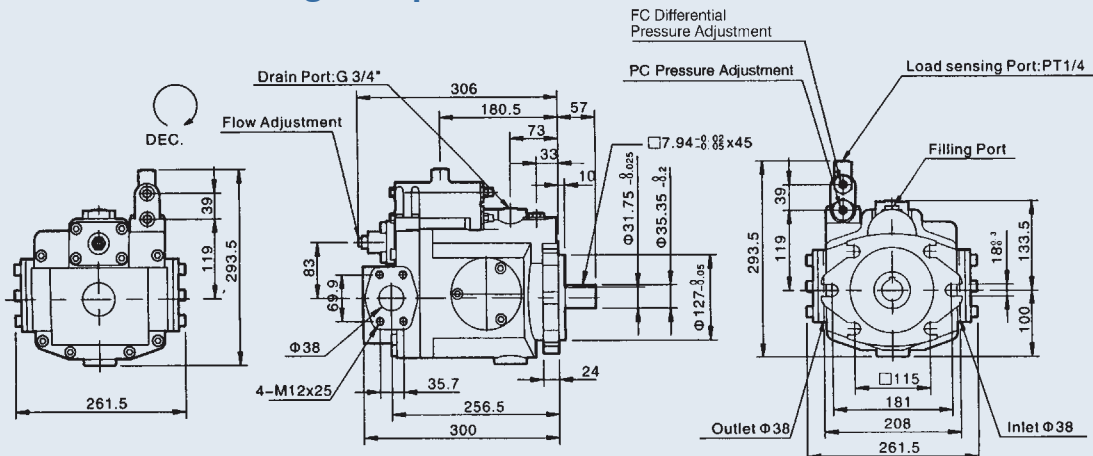
### V50GJ, V70GJ Proportional Pressure with interface



### V50GM, V70GM Remote Interface (Not include valve)



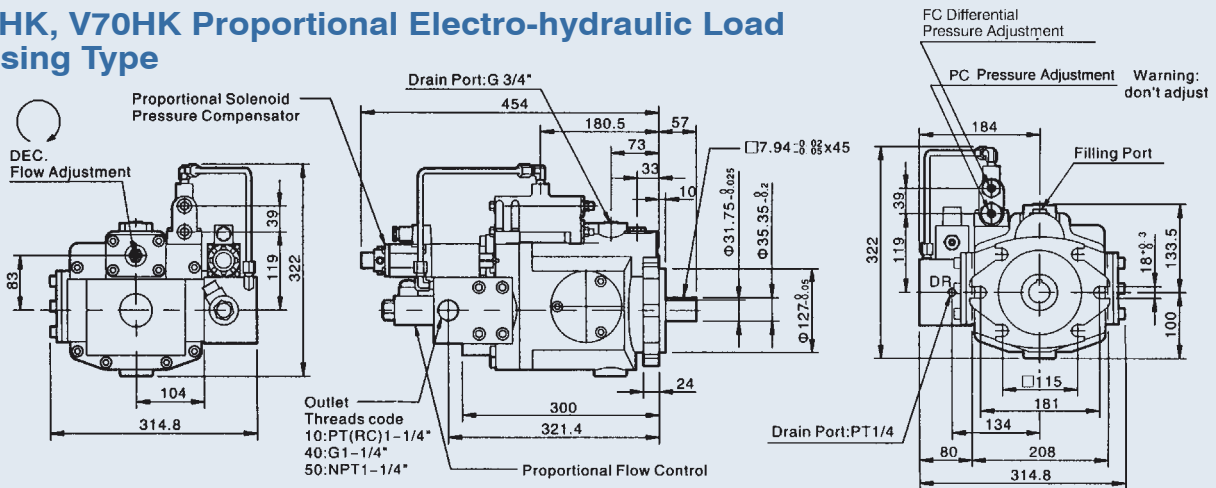
### V50HL, V70HL Load-sensing Compensator



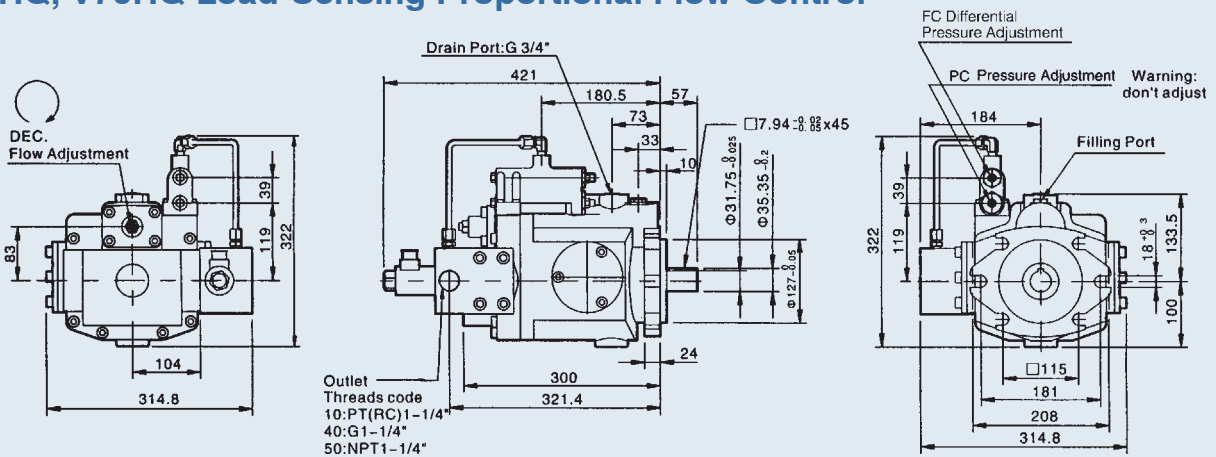
# V SERIES AXIAL PISTON PUMP

## Dimensions

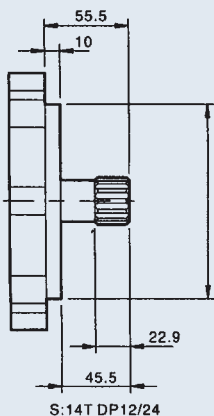
### V50HK, V70HK Proportional Electro-hydraulic Load Sensing Type



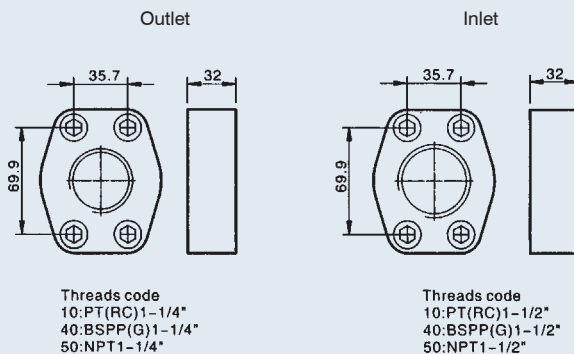
### V50HQ, V70HQ Load-Sensing Proportional Flow Control



### V50, V70 Splined Shaft Type



### V50, V70 Hydraulic Flange

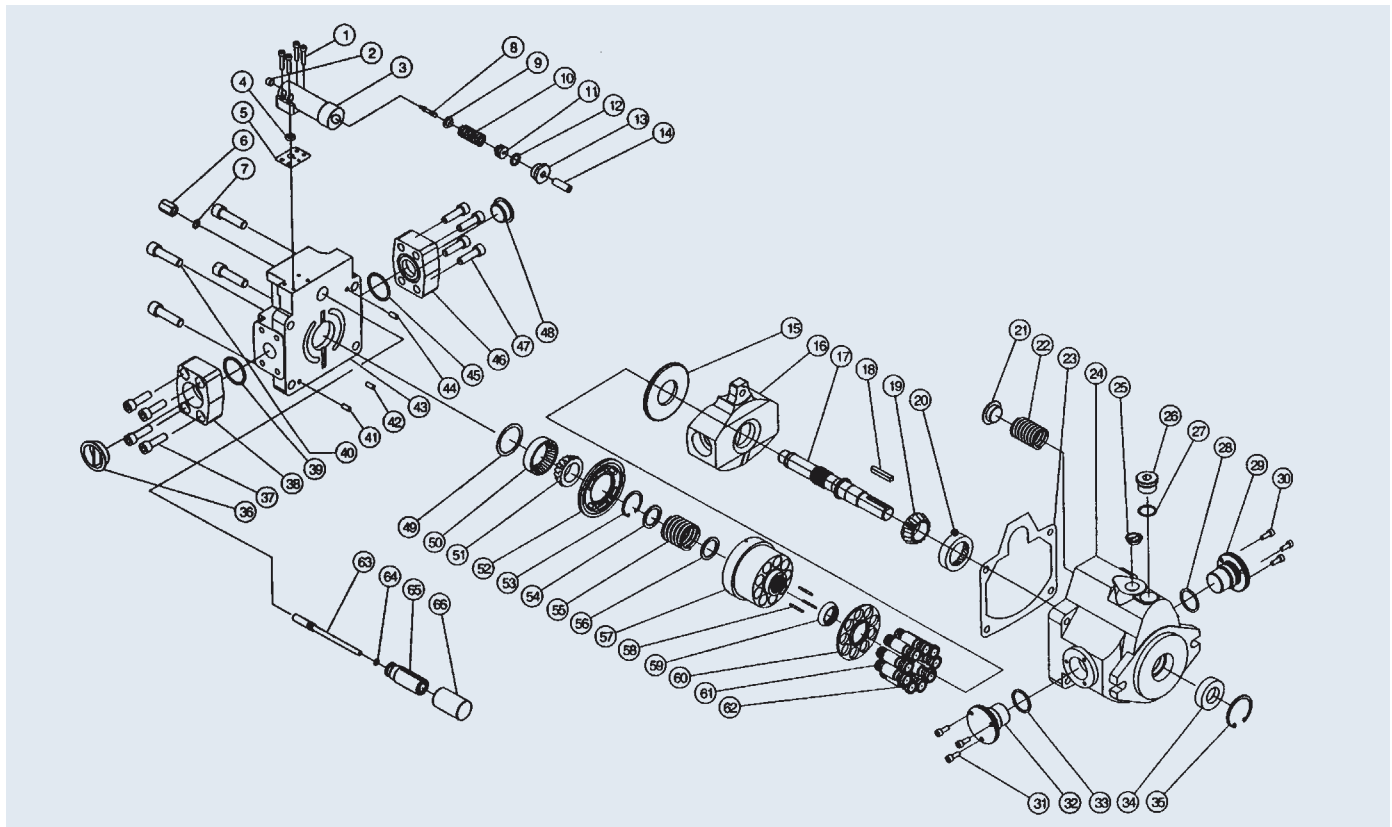






# V SERIES AXIAL PISTON PUMP

## Decomposition Chart



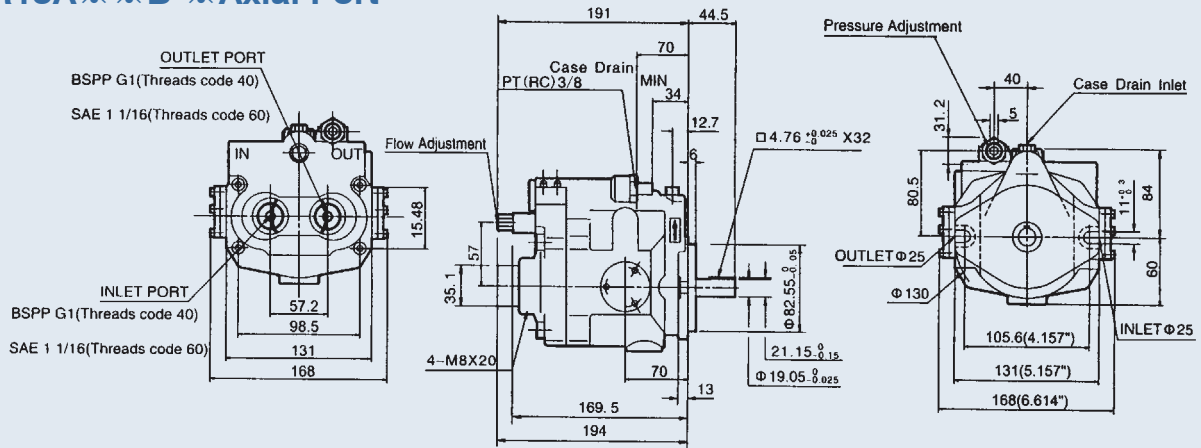
## List of parts

No.	Description	No.	Description	No.	Description	No.	Description
1	Bolt	18	Shaft Key	35	M snap ring	52	Valve plate
2	Port plug	19	Bearing of shaft	36	Plug	53	Snap ring
3	Pressure compensator	20	Bearing of shaft	37	Bolt	54	Washer cylinder block
4	O-ring	21	Servo spring washer	38	Flange	55	Retainer spring
5	Gasket	22	Servo spring	39	O-ring	56	Washer cylinder block
6	Lock nut	23	End cover seal	40	Bolt	57	Cylinder block
7	O-ring	24	Pump body	41	Roller	58	Roller
8	Control compensator shaft	25	Drain plug	42	Roller	59	Cylinder block holder
9	Spring washer	26	Filling screw	43	End cover	60	Slipper retainer
10	Control spring	27	O-ring	44	Roller	61	Pistons
11	O-ring washer	28	O-ring	45	O-ring	62	Piston head
12	O-ring	29	Swash shaft	46	Flange	63	Flow screw
13	Lock nut	30	Bolt	47	Bolt	64	O-ring
14	Screw	31	Bolt	48	Plug	65	Sleeve piston
15	Slipper plate	32	Swash shaft	49	Washer cylinder block	66	Servo piston sleeve
16	Swash	33	O-ring	50	Bearing of pump cover		
17	Shaft	34	Shaft seal	51	Bearing of pump cover		

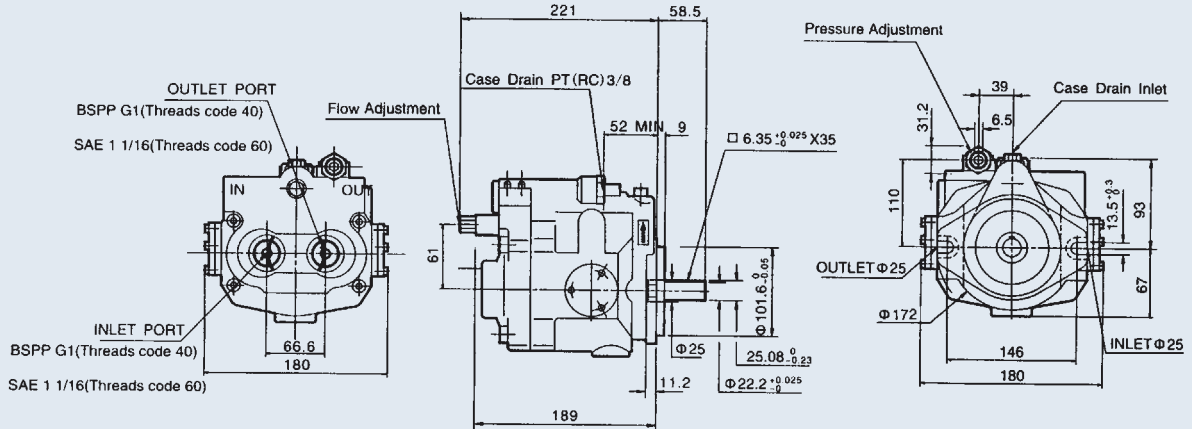
# VR SERIES AXIAL PISTON PUMP

## Dimensions

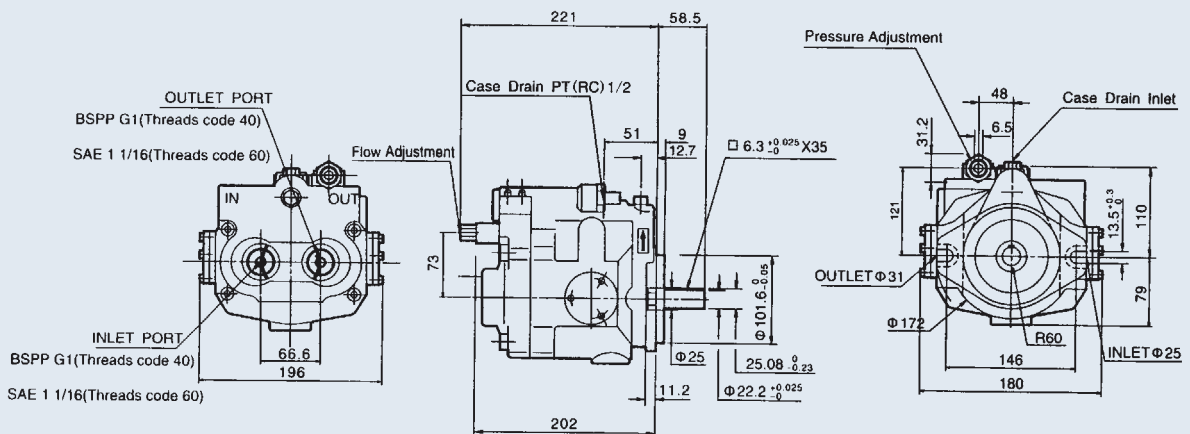
### VR15A\*\*B-Axial Port



### VR23A\*\*B-Axial Port (Pipe type)



### VR38A\*\*B-Axial Port (Pipe type)

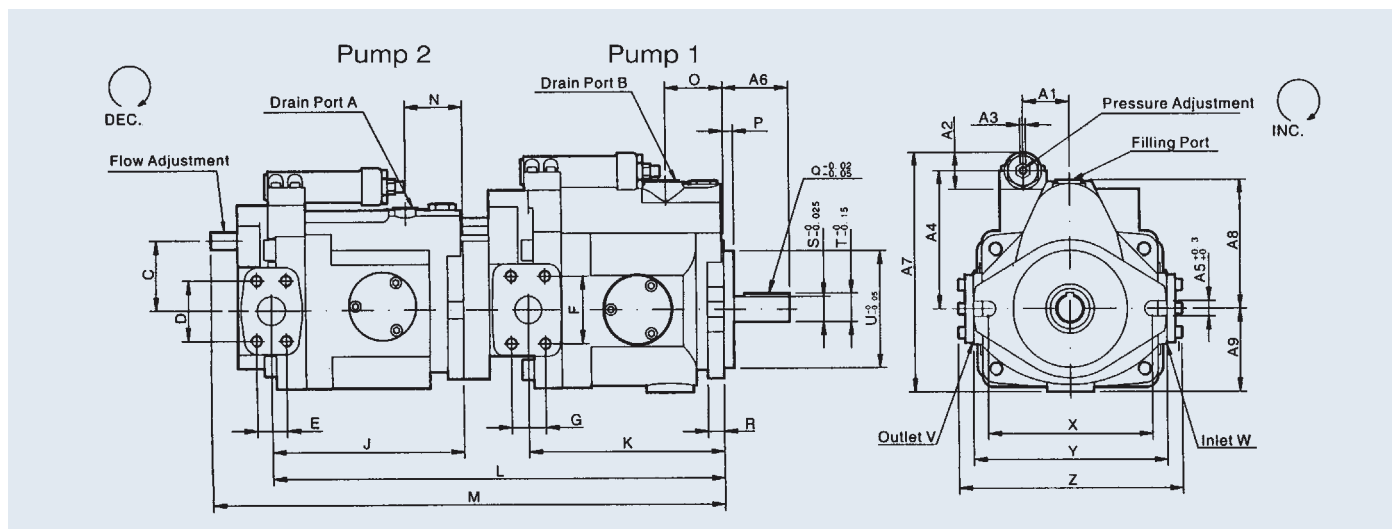


# V SERIES TANDEM AXIAL PISTON PUMP

Tandem pump (Multi-option for tandem pump)

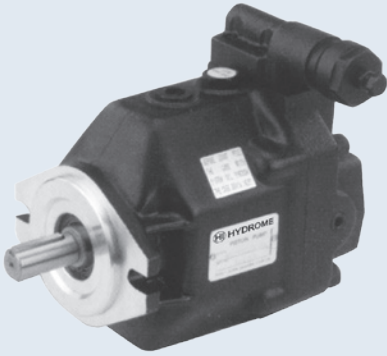
Pump 1	V15(V18)	V23(V25)	V23(V25)	V38(V42)	V38(V42)	V38(V42)	V50(V70)	V50(V70)	V50(V70)
Pump 2	V15(V18)	V15(V18)	V23(V25)	V15(V18)	V23(V25)	V38(V42)	V15(V18)	V23(V25)	V38(V42)
A	G 3/8"	G 3/8"	G 3/8"	G 3/8"	G 3/8"	G 1/2"	G 3/8"	G 3/8"	G 1/2"
B	G 3/8"	G 3/8"	G 3/8"	G 1/2"	G 1/2"	G 1/2"	G 3/4"	G 3/4"	G 3/4"
C	57.45	57.45	61	57.45	61	73	57.45	61	73
D	35.1	35.1	52.4	35.1	52.4	58.7	35.1	52.4	58.7
E	35.1	35.1	26.2	35.1	26.2	30.2	35.1	26.2	30.2
F	35.1	52.4	52.4	58.7	58.7	58.7	69.9	69.9	69.9
G	35.1	26.2	26.2	30.2	30.2	30.2	35.7	35.7	35.7
H	M8×20	M8×20	M10×16	M8×20	M10×16	M10×16	M8×20	M10×16	M10×16
I	M8×20	M10×16	M10×16	M10×16	M10×16	M10×16	M12×25	M12×25	M12×25
J	147	147	170	147	170	179	147	170	179
K	147	170	170	179	179	179	256.5	256.5	256.5
L	332	369	402	378	401	410	464	493	502
M	382	419	455	428	454	465	515	546	555
N	48	48	51	48	51	51	48	51	51
O	48	51	51	51	51	51	73	73	73
P	6	9	9	9	9	9	10	10	10
Q	4.76×32	6.35×40	6.35×40	6.35×40	6.35×40	6.35×40	7.94×45	7.94×45	7.94×45
R	13	14	14	14.5	14.5	14.5	24	24	24
S	ø19.05	ø22.22	ø22.22	ø22.22	ø22.22	ø22.22	ø31.75	ø31.75	ø31.75
T	21.15	25.08	25.08	25.08	25.08	25.08	35.35	35.35	35.35
U	ø82.55	ø101.6	ø101.6	ø101.6	ø101.6	ø101.6	ø127	ø127	ø127
V	ø25	ø25	ø25	ø31	ø31	ø31	ø38	ø38	ø38
W	ø25	ø25	ø25	ø31	ø31	ø31	ø38	ø38	ø38
X	106	146	146	146	146	146	181	181	181
Y	131	146	146	160	160	160	208	208	208
Z	165	182	182	198.6	198.6	198.6	261.5	261.5	261.5
A1	44	39	39	39	39	39	74	74	74
A2	31.2	31.2	31.2	31.2	31.2	31.2	40	40	40
A3	5	5	5	5	5	5	8	8	8
A4	84	110	110	121	121	121	119	119	119
A5	11	13.5	13.5	13.5	13.5	13.5	18	18	18
A6	44.5	58.5	58.5	58.5	58.5	58.5	57	57	57
A7	160	193	193	210	210	210	233.5	233.5	233.5
A8	91.5	93	93	113.5	113.5	113.5	133.5	133.5	133.5
A9	60	68	68	72	72	72	100	100	100

B

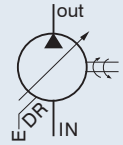


# AR SERIES AXIAL PISTON PUMP

## AR Control Type (see page. 15,16,17)



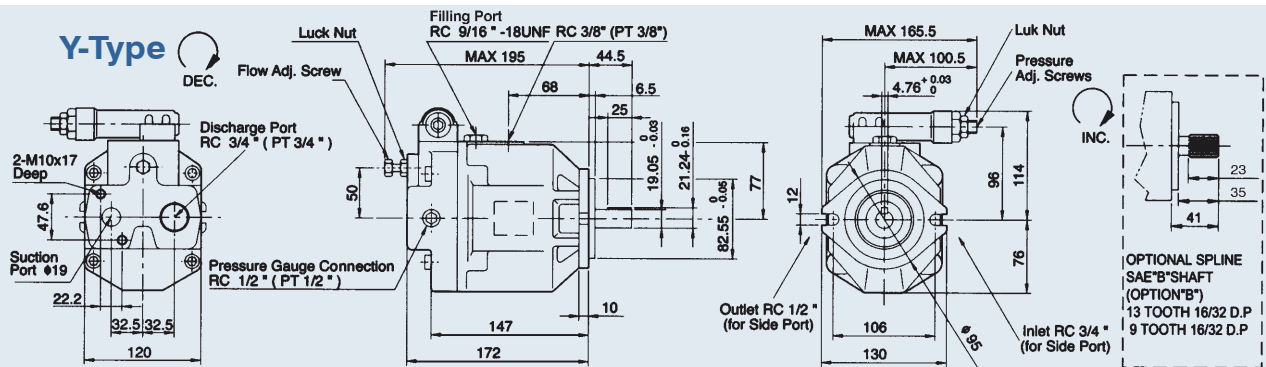
- 01: Pressure Compensator
- G: Remote Pressure Compensator
- GJ: Layer Porportional Pressure Compensator
- GR: Electrical Unloading
- GB: Dual Pressure Control
- GC: Dual Pressure+Electrical Unloading
- GM: Remote Pressure Compensator allows a pilot valve
- HL: Load-sensing Compensator



## Ordering Codes

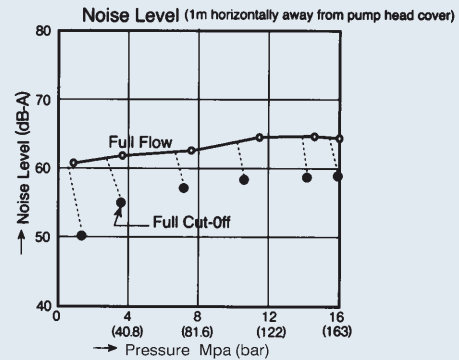
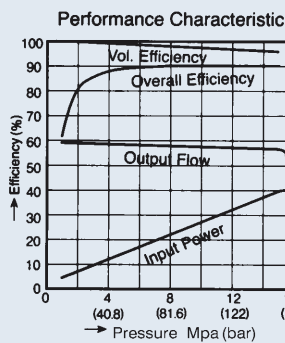
※Standard

Model	F	R	01	C	S	K	10	Y
Model	Mounting	Direction of Rotation	Control Type	Pres. Adj. Range bar (MPa)	Port Position	Shaft Extension	Threads Code	Design
AR16 (15.8cc/rev)	F: Flange Mtg.	Viewed from Shaft End * R: Clockwise (Standard) L: Counter Clockwise	01: Pressure Compensator Type HL: Load Sensing Compensator G: Remote Pressure Compensator	B:12~70 (1.2~7) C:12~210 (1.2~21)	None: Axial Port S: Side Port	*K: Keyed G: 16/32 DP-13T T: 16/32 DP-9T	*10: PT(RC) theard 40: BSPP(G) theard 50: NPT theard	X *Y
AR22 (22.2cc/rev)								



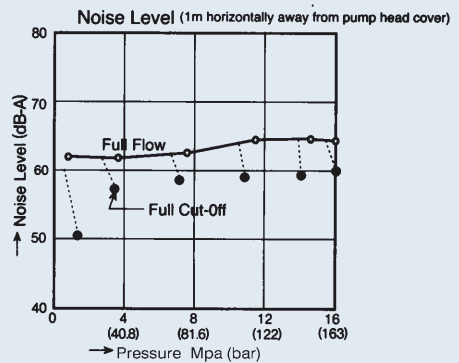
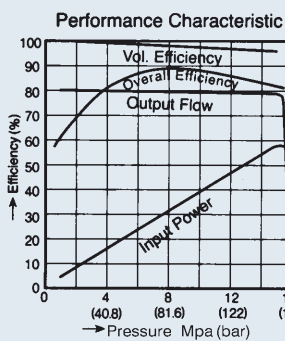
**AR-16** Input Speed:1800 rpm/min

Fluid:Standard Hydraulic Oil ISO VG32 @50°C



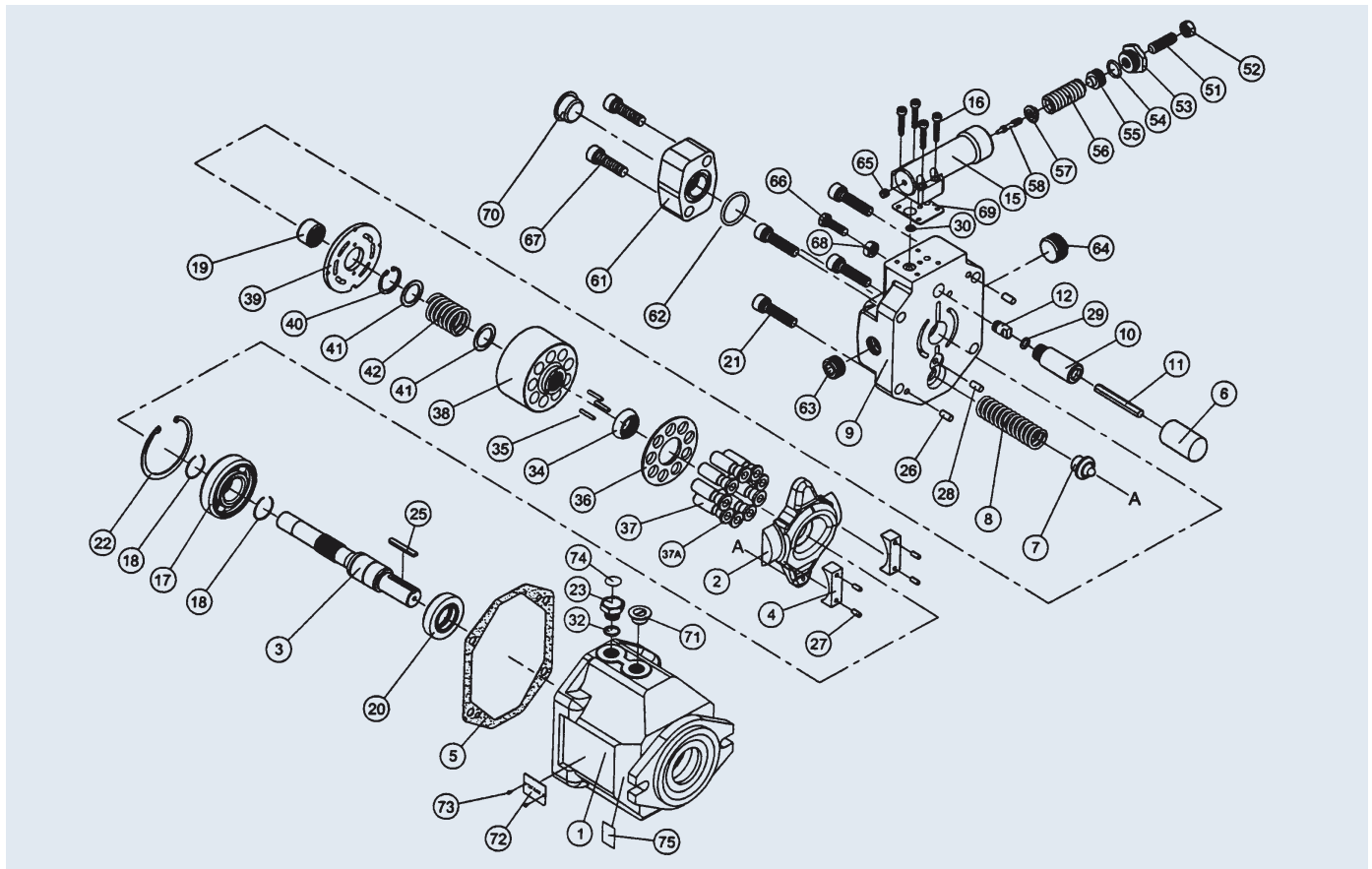
**AR-22** Input Speed:1800 rpm/min

Fluid:Standard Hydraulic Oil ISO VG32 @50°C



# AR SERIES AXIAL PISTON PUMP

## Decomposition Chart

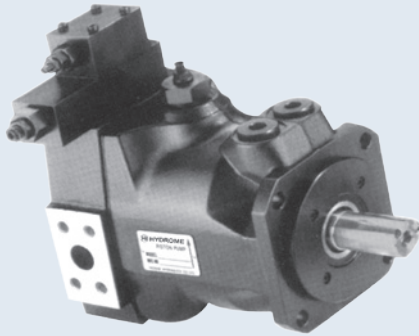


## List of parts

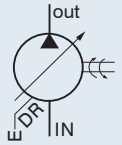
No.	Description	No.	Description	No.	Description	No.	Description
1	Pump body	18	C snap ring 1-1/2	36	Slipper retainer	58	Control compensator shaft
2	Swash	19	1715 bearing rear	37	Piston	61	Flange 506A (6")
3	Swash shaft	20	Shaft seal	37A	Head of piston	62	O-ring G30
4	Swash plate	21	Screw M10x40L	38	Cylinder block	63	Pipe plug 1/2
5	Body seal	22	R62 snap ring	39	Valve plate	64	Pipe plug 3/4
6	Servo piston sleeve	23	Plug, feeder	40	Snap ring for bore R28	65	NPT 1/16
7	Servo spring washer	25	Key	41	Washer cylinder block	66	Screw M8x35
8	Swash spring	26	Locator pin, body	42	Retainer spring	67	Screw M10x35
9	Pump body / end cover	27	Locator pin, cradle	51	Screw M10x30	68	Lock nut M8
10	Sleeve piston	28	Locator pin, ø6x12.8	52	Lock nut M10	69	Body seal
11	Flow bar	29	O-ring P8 70°	53	Control lock nut	70	Plastic plug 3/4
12	Seal	30	O-ring P7	54	O-ring P14 70°	71	Plastic plug 3/8
15	Valve	32	O-ring S11	55	Control washer	72-73	Name Plate
16	Screw M5x25L	34	Cylinder block holder	56	Control spring	74-75	Description label
17	6305 bearing front	35	Roller	57	Spring washer		

# PV SERIES AXIAL PISTON PUMP

## FEATURES



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.
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.



**Continuous: 350bar**  
**Intermittent: 420bar**

B

## Quick Reference Data Chart

Model	Displacement		Pump Delivery (7 bar) 100 PSI					
			1200 RPM		1500 RPM		1800 RPM	
	cc/rev	in <sup>3</sup> /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 Horse Power, Max. Displacement & 345 bar (5000PSI)		Operating Speed		Weight (kg)	
	70 bar (1 KPSI)	207 bar (3 KPSI)	343 bar (5 KPSI)	1500 rpm	1800 rpm	Max.	Min.	kg	lb
				KW(hp)	KW(hp)	RPM	RPM		
PV016	56	60	68	15.5 (20.8)	18.5 (24.8)	2750	300	19	41.8
PV020				19.5 (26.1)	23.4 (31.4)				
PV023				22.5 (30.2)	25.1 (33.6)				
PV032	59	62	69	31 (41.6)	35.1 (47.1)	2400	300	30	66
PV040				39 (52.3)	46.5 (62.3)				
PV046				45 (60.3)	50.2 (67.3)				
PV063	66	70	74	61.5 (82.4)	70.1 (94)	2100	300	60	132
PV071				70 (93.8)	80 (107.2)	2100			
PV080				78 (104.6)	89.2 (119.6)	2000			
PV092	70	74	76	89.5 (120)	136.8 (183.4)	1900	300	90	198
PV140				136 (182.3)	149.4 (200.3)	2200			
PV180				175 (235)	210 (282)	2200			
PV270	77	79	81	263 (353)	298 (400)	1800	300	172	378.4

1. Installation outlet port top, the pipe have to less than 2 bar.
2. The use of max. pressure override 6 min, hydraulic oil clean that see General Installation Information.
3. Hydrome offer tandem pumps, and other pumps connection, the connection type use metric version and SAE version dimensions.

# PV SERIES AXIAL PISTON PUMP

## How to order

**PV - 063 - GT - R - M - 1 - A - ✱ - ✱ - ✱**  
 1      2      3      4      5      6      7      8      9      10

### 1 Series Axial piston pump variable displacement high pressure version

### 2 Size and Displacement

Code	Displacement cc/rev (In <sup>3</sup> /rev)	Code	Displacement cc/rev (In <sup>3</sup> /rev)	Code	Displacement cc/rev (In <sup>3</sup> /rev)
016	16 (0.98)	046	46 (2.8)	140	140 (8.5)
020	20 (1.2)	063	63 (3.8)	180	180 (10.9)
023	23 (1.4)	071	71 (4.3)	270	270 (16.5)
032	32 (1.9)	080	80 (4.8)		
040	40 (2.4)	092	92 (5.6)		

### 3 Control Types

Code	Compensator	Code	Horse power	PV016~ PV023	PV032~ PV046	PV063~ PV092	PV140	PV180	PV270
✱	Standard Type Pressure Compensator	A	3 KW	●					
	A2 10~140 bar	B	4 KW	●					
	A3 40~210 bar	C	5.5 KW	●	●				
	A4 70~350 bar	D	7.5 KW	●	●				
✱	Remote Type	E	11 KW	●	●	●			
✱	GT Remote pressure compensator	F	15 KW		●	●			
✱	GM Remote pressure compensator allows a pilot valve	G	18.5 KW		●	●	●		
	GA Remote pressure compensator allows a pilot valve (valve included)	H	22 KW		●	●	●	●	
	GJ Layer proportional pressure compensator (valve included)	I	30 KW			●	●	●	
	Electrical Unloading Type	J	37 KW			●	●	●	●
	GR Electrical unloading	K	45 KW			●	●	●	●
	GB Dual pressure control	L	55 KW				●	●	●
	GC Dual pressure + electrical unloading	M	75 KW					●	●
	Load-sensing Type	N	90 KW					●	●
✱	HL Load-sensing type	O	110 KW						●
	HM Load-sensing type	P	132 KW						●
	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 valve (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								

### 4 Rotation (Viewed from shaft end)

Code	Rotation
✱ R	clockwise ↻
L	counterclockwise ↺



# PV SERIES AXIAL PISTON PUMP

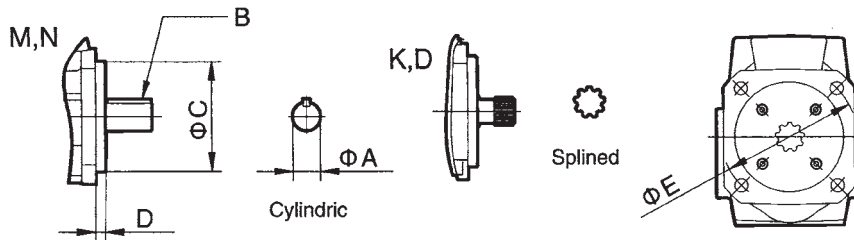
## How to order

**PV - 063 - GT - R - M - 1 - A - \* - \* - \***  
 1 2 3 4 5 6 7 8 9 10

### 5 Mounting

Code	Mounting	Code	Mounting
* M (standard)	Metric	N	Inch
K		D	

Code	Model	Shaft		Flange		Mounting		
		A	B	C	D	E		
*	M	Metric	PV016~PV023	ø25	8×7×40	ø100	9	ø125
			PV032~PV046	ø32	10×8×56	ø125	9	ø160
			PV063~PV092	ø40	12×8×80	ø160	9	ø200
			PV140~PV180	ø50	12×8×80	ø160	9	ø200
			PV270	ø65	12×8×80	ø200	9	ø250
K	Metric	PV016~PV023	W25×1.5×15×8f DIN5480		ø100	9	ø125	
		PV032~PV046	W32×1.5×20×8f DIN5480		ø125	9	ø160	
		PV063~PV092	W40×1.5×25×8f DIN5480		ø160	9	ø200	
		PV140~PV180	W50×2×24×9g DIN5480		ø160	9	ø200	
		PV270	W60×2×28×9g DIN5480		ø200	9	ø250	
N	Inch	PV016~PV023	ø1"	0.25"×0.25"×1.6"	ø4"	3/8"	ø5"	
		PV032~PV046	ø1-1/4"	5/16"×5/16"×2.2"	ø5"	1/2"	ø6.37"	
		PV063~PV092	ø1-3/4"	7/16"×7/16"×3.15"	ø6"	1/2"	ø9"	
		PV140~PV180	ø2"	1/2"×1/2"×2.95"	ø6"	1/2"	ø9"	
		PV270	ø2"	1/2"×1/2"×2.95"	ø6.5"	5/8"	ø12.5"	
D	Inch	PV016~PV023	Splined 15T 16/32DP ANSI B92.1		ø4"	3/8"	ø5"	
		PV032~PV046	Splined 14T 12/24DP ANSI B92.1		ø5"	1/2"	ø6.37"	
		PV063~PV092	Splined 13T 8/16DP ANSI B92.1		ø6"	1/2"	ø9"	
		PV140~PV180	Splined 15T 8/16DP ANSI B92.1		ø6"	1/2"	ø9"	
		PV270	Splined 15T 8/16DP ANSI B92.1		ø6.5"	5/8"	ø12.5"	



### 6 Threads

Code	Threads
* 1 (standard)	BSPP (G)
2	PT (RC)
3	UNF
4	NPT
7	ISO 6149



# PV SERIES AXIAL PISTON PUMP

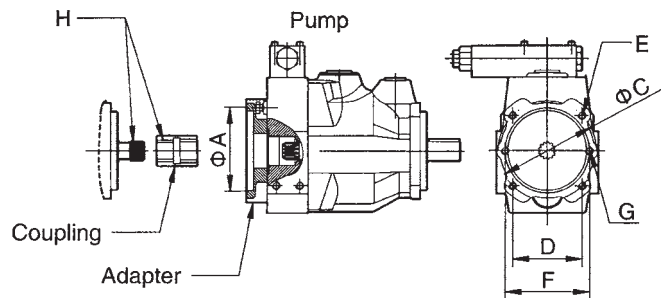
## How to order

### PV - 063 - GT - R - M - 1 - A - \*-\*-\*

1 2 3 4 5 6 7 8 9 10

#### 7 Thru drive & 2nd pump

Code	Thru drive & 2nd pump	
* A (standard)	Single pump	
* B	Prepared for thru drive	
With adaptor for 2nd pump		
C	Inch	SAE AA, $\phi 2"$ ( $\phi 50.8$ mm)
D		SAE A, $\phi 3-1/4"$ ( $\phi 82.55$ mm)
E		SAE B, $\phi 4"$ ( $\phi 101.6$ mm)
F		SAE C, $\phi 5"$ ( $\phi 127$ mm)
G		SAE D, $\phi 6"$ ( $\phi 152.4$ mm)
H		SAE E, $\phi 6.5"$ ( $\phi 165.1$ mm)
I	Metric	Metric, $\phi 63$
J		Metric, $\phi 80$
K		Metric, $\phi 100$
L		Metric, $\phi 125$
M		Metric, $\phi 160$
N		Metric, $\phi 200$
Other pump are acceptable order		



Code	Model	$\phi A$	$\phi C$	D	E	F	G	H
C	SAE AA, $\phi 2"$ ( $\phi 50.8$ mm)	$\phi 2"$ ( $\phi 50.8$ )				3.25" (82.55mm)	5/16"-18	9T 20/40 DP
D	SAE A, $\phi 3-1/4"$ ( $\phi 82.55$ mm)	$\phi 3-1/4"$ ( $\phi 82.55$ )				4.188" (106.3mm)	3/8"-16	9T 16/32 DP
E	SAE B, $\phi 4"$ ( $\phi 101.6$ mm)	$\phi 4"$ ( $\phi 101.6$ )		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, $\phi 5"$ ( $\phi 127$ mm)	$\phi 5"$ ( $\phi 127$ )		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, $\phi 6"$ ( $\phi 152.4$ mm)	$\phi 6"$ ( $\phi 152.4$ )		6.364" (161.6mm)	5/8"-11	9" (228.6mm)	5/8"-11	13T 8/16 DP, 15T 8/16 DP
H	SAE E, $\phi 6.5"$ ( $\phi 165.1$ mm)	$\phi 6.5"$ ( $\phi 165.1$ )		8.839" (224.5mm)	3/4"-10			15T 8/16 DP
I	Metric, $\phi 63$	$\phi 63$	$\phi 85$		M8	100	M8	
J	Metric, $\phi 80$	$\phi 80$	$\phi 103$		M8	109	M10	
K	Metric, $\phi 100$	$\phi 100$	$\phi 125$		M10	150	M12	W25 $\times$ 1.5 $\times$ 15 $\times$ 8f
L	Metric, $\phi 125$	$\phi 125$	$\phi 160$		M12	180	M16	W32 $\times$ 1.5 $\times$ 20 $\times$ 8f
M	Metric, $\phi 160$	$\phi 160$	$\phi 200$		M16	224	M20	W40 $\times$ 1.5 $\times$ 25 $\times$ 8f, W50 $\times$ 2 $\times$ 24 $\times$ 9g
N	Metric, $\phi 200$	$\phi 200$	$\phi 250$		M20			W50 $\times$ 2 $\times$ 24 $\times$ 9g

Coupling	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	PV032~ PV046	W1 W25 $\times$ 1.5 $\times$ 15 $\times$ 8f
B-D2		D2 9T 16/32 DP
B-D3		D3 13T 16/32 DP
B-D4		D4 15T 16/32 DP
B-D5	PV046	D5 14T 12/24 DP
B-W1		W1 W25 $\times$ 1.5 $\times$ 15 $\times$ 8f
B-W2		W2 W32 $\times$ 1.5 $\times$ 20 $\times$ 8f
C-D2	PV063~ PV092	D2 9T 16/32 DP
C-D3		D3 13T 16/32 DP
C-D4		D4 15T 16/32 DP

Coupling	pump	H
C-D5	PV063~ PV092	D5 14T 12/24 DP
C-D6		D6 13T 8/16 DP
C-D7		D7 15T 8/16 DP
C-W1		W1 W25 $\times$ 1.5 $\times$ 15 $\times$ 8f
C-W2	PV140~ PV180	W2 W32 $\times$ 1.5 $\times$ 20 $\times$ 8f
C-W3		W3 W40 $\times$ 1.5 $\times$ 25 $\times$ 8f
C-W4		W4 W50 $\times$ 2 $\times$ 24 $\times$ 9g
D-D2		D2 9T 16/32 DP
D-D3	PV140~ PV180	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 W25 $\times$ 1.5 $\times$ 15 $\times$ 8f

Coupling	pump	H
D-W2	PV140~ PV180	W2 W32 $\times$ 1.5 $\times$ 20 $\times$ 8f
D-W3		W3 W40 $\times$ 1.5 $\times$ 25 $\times$ 8f
D-W4		W4 W50 $\times$ 2 $\times$ 24 $\times$ 9g
E-D2		D2 9T 16/32 DP
E-D3	PV270	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	PV270	W1 W25 $\times$ 1.5 $\times$ 15 $\times$ 8f
E-W2		W2 W32 $\times$ 1.5 $\times$ 20 $\times$ 8f
E-W3		W3 W40 $\times$ 1.5 $\times$ 25 $\times$ 8f
E-W4		W4 W50 $\times$ 2 $\times$ 24 $\times$ 9g
E-W5		W5 W60 $\times$ 2 $\times$ 28 $\times$ 9g

#### 8 Voltage

Code	Voltage
0	None
A	AC100V (50-60Hz)
B	AC110V (60Hz)

Code	Voltage
C	AC200V (50-60Hz)
D	AC220V (60Hz)
E	DC12V

Code	Voltage
F	DC24V

#### 9 Seals

Code	Seals
* N	NBR
V	FPM

Code	Seals
E	Ethylen-propylen

#### 10 Design No. Not require for order

# PV SERIES AXIAL PISTON PUMP

## 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

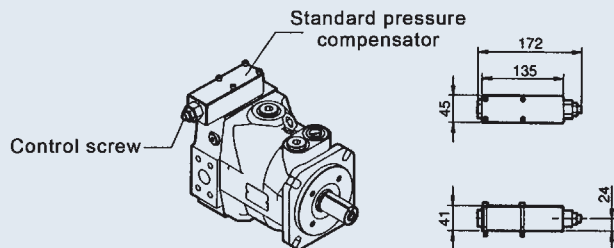
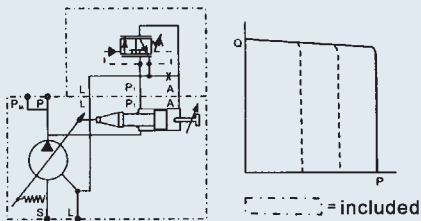
### Horse Power Type

- 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

#### A: 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.

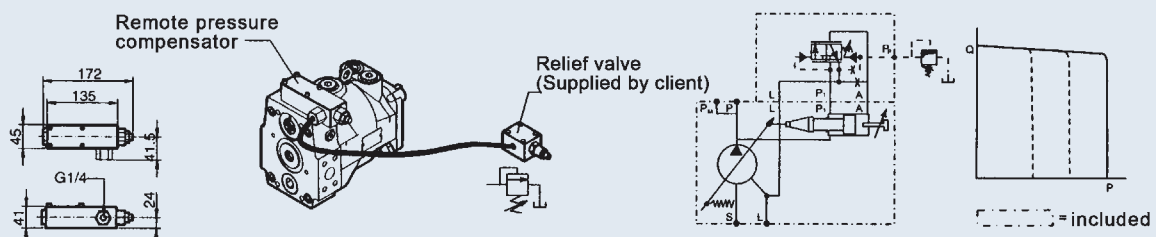
When the system pressure reaches the set pressure the compensator valve spool connects port P1 to A and builds up a pressure at the servo piston resulting in a down stroking of the pump. The displacement of the pump is controlled in order to match the flow requirement of the system.



#### 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 1-1.5 lpm. 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.



# PV SERIES AXIAL PISTON PUMP

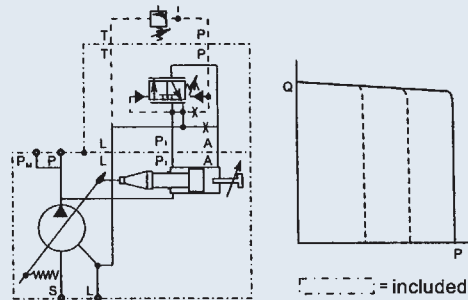
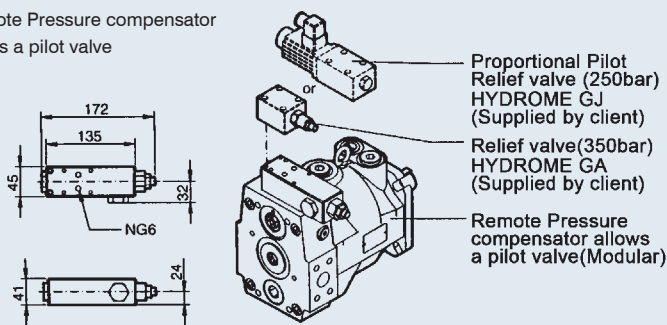
## Compensator

### Remote Pressure compensator allows pilot valve

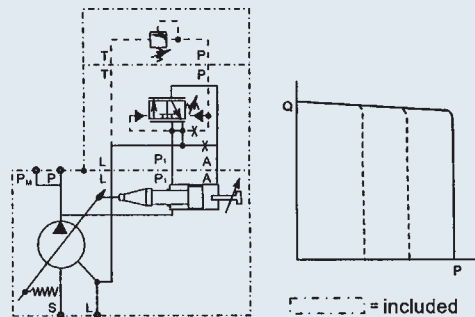
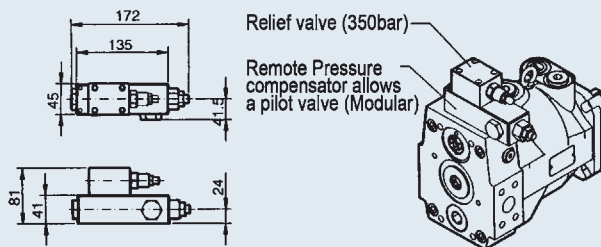
Version GM of remote pressure compensator provides on its top side an interface NG6, DIN24340 (CETOP 03 at RP35H, NFPA D03). This interface allows a direct mounting of a pilot valve. Beside manual or electro hydraulic operated valves it is also possible to mount complete multiple pressure circuits directly on the compensator body. HYDROME

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.

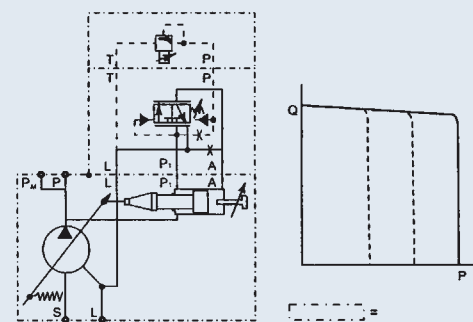
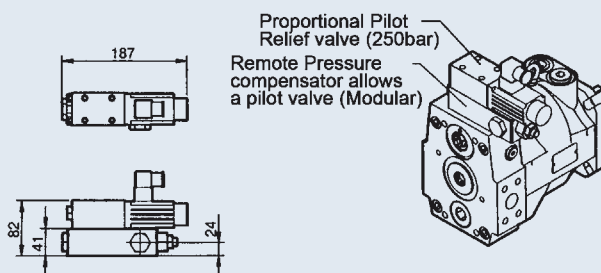
**GM:** Remote Pressure compensator allows a pilot valve



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



**GJ:** Layer Proportional pressure compensator (valve included)



included

# PV SERIES AXIAL PISTON PUMP

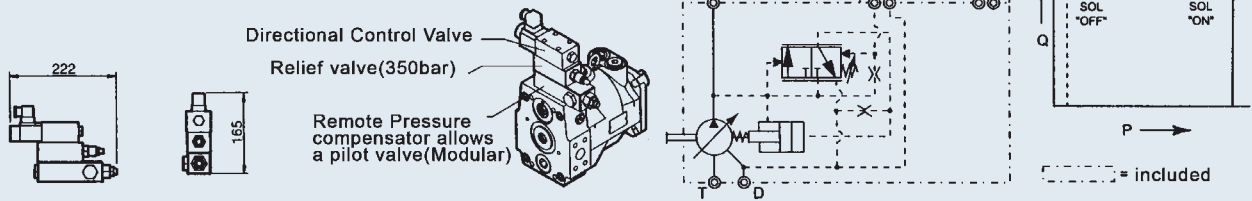
## Compensator

### Electrical Unloading Type

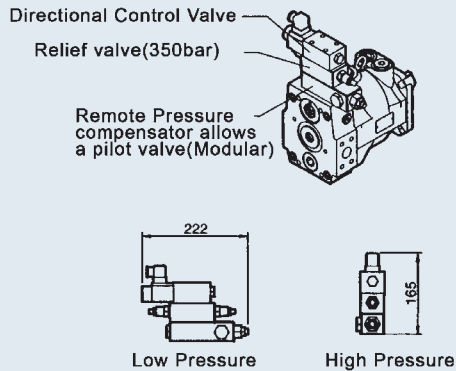
PV pump with fast response remote pressure control, relief valve with 2 pressure stages, electrical pressure selection, nitrile seals, spindle adjustment, 24 VDC solenoid, plug to DIN46350 accessories fitted.

Usable for horsepower control and proportional volume control, too.

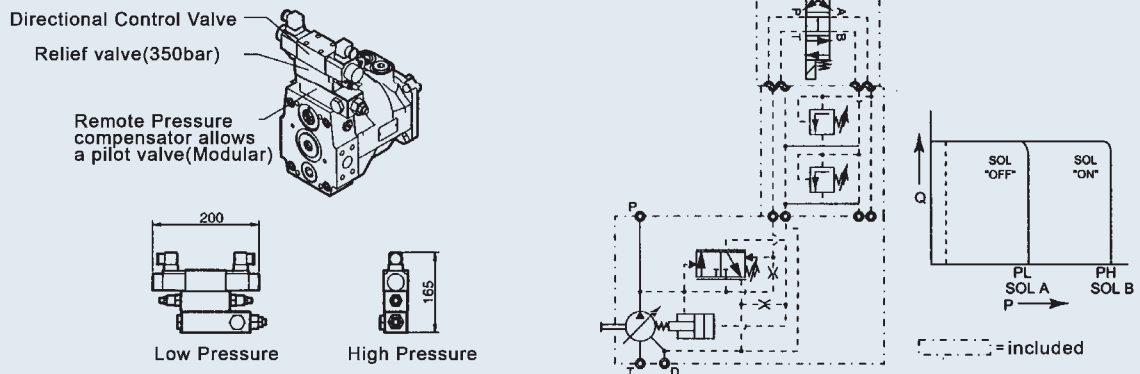
**GR:** Electrical unloading type



**GB:** Dual pressure control



**GC:** Dual pressure + electrical unloading



# PV SERIES AXIAL PISTON PUMP

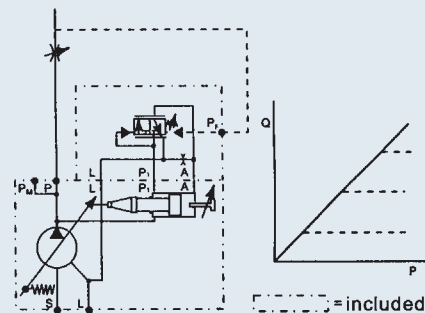
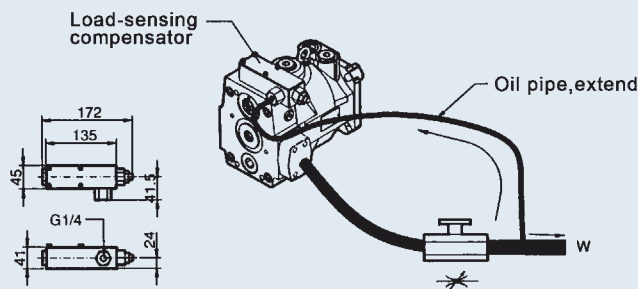
## Compensator

### 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

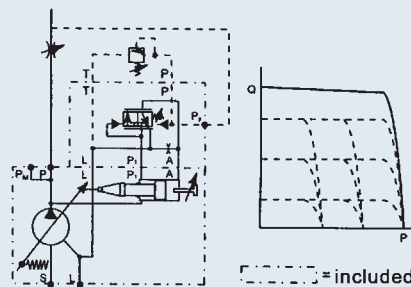
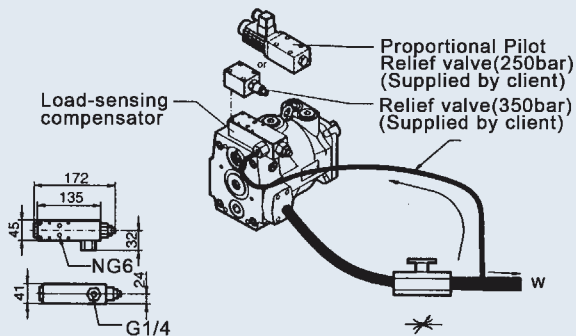
the pressure drop at the main stream resistor constant. A variable input speed or a varying load (pressure) has consequently no influence on the output flow of the pump and speed of the actuator. By adding a pilot orifice ( $\varnothing 0.8\text{mm}$ ) and compensation can be added to the flow control 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

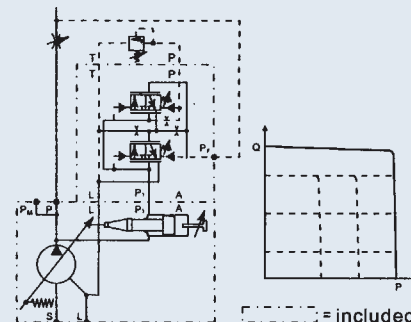
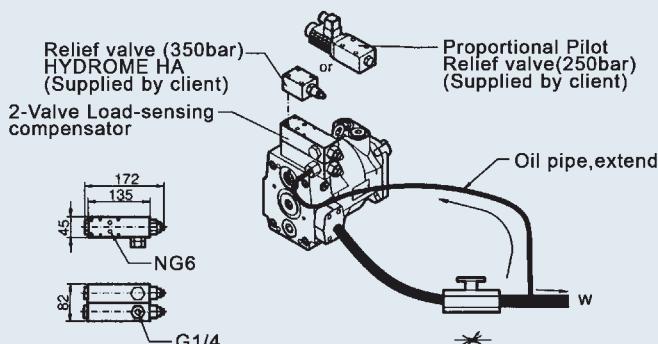
this package has not the "ideal" control characteristic. The deviation is caused by the pilot valves characteristic.



**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

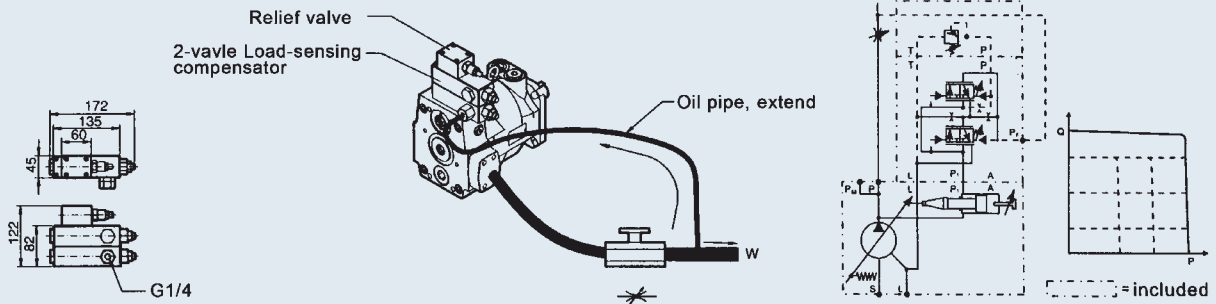
functions is avoided by using two separate control valves for flow and pressure compensation. The 2-valve compensator is equipped with an interface NG6 on the compensators top side.



# PV SERIES AXIAL PISTON PUMP

## Compensator

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



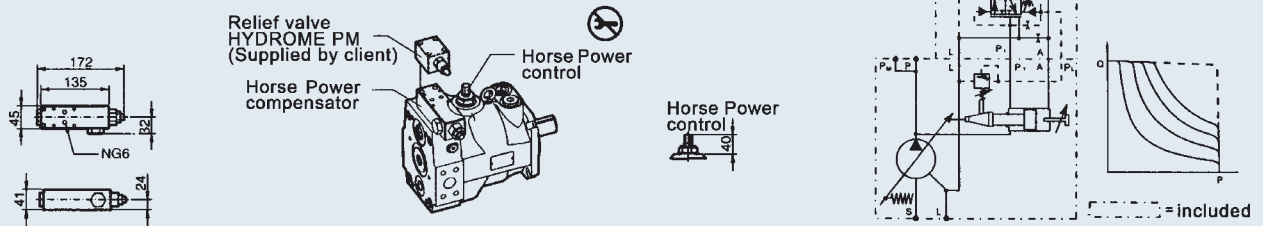
The hydraulic-mechanical horse power compensator consists of a modified remote pressure compensator (Code PG\* \ PM\*) or of a modified load-sensing compensator (Code PH\*) and a pilot valve. This pilot valve is integrated into the pump and is adjusted by a cam sleeve. The cam sleeve has a contour that 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 HYDROME offers 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.

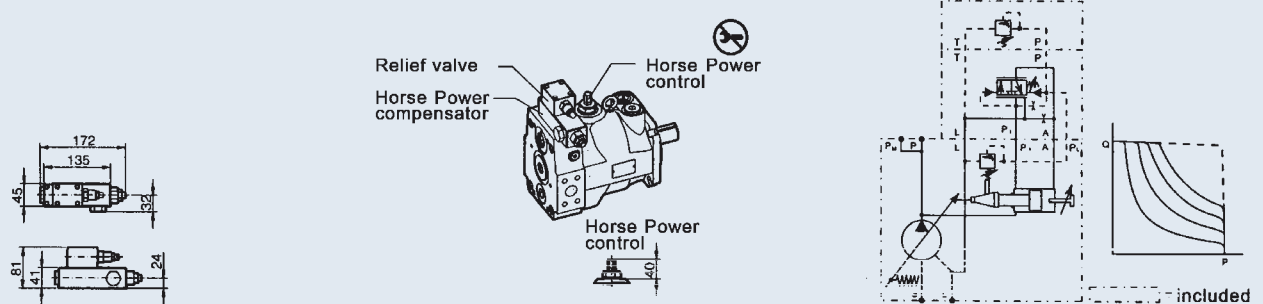
On top of that an adjustment of the horse power setting can be done within certain limits by adjustment the preload of the pilot control cartridge spring.

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



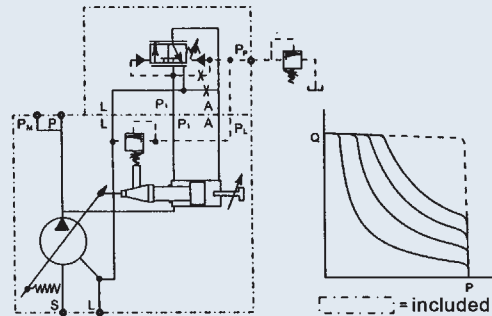
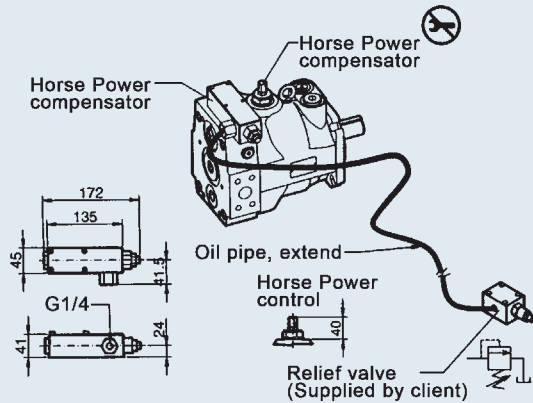
PM: Horse power compensator, pilot flow internal pressure pilot valve included



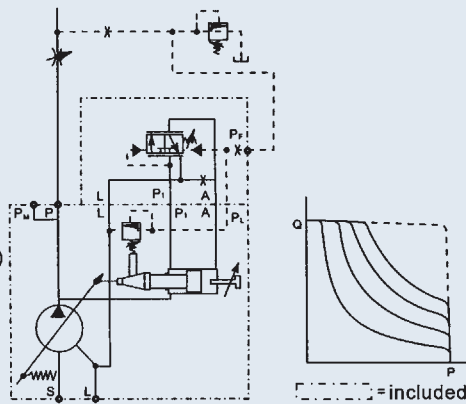
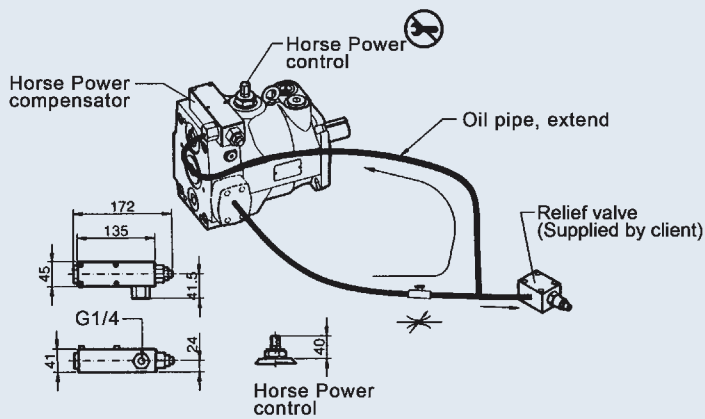
# PV SERIES AXIAL PISTON PUMP

## Compensator

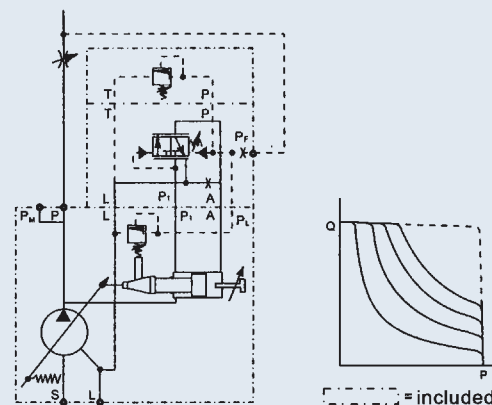
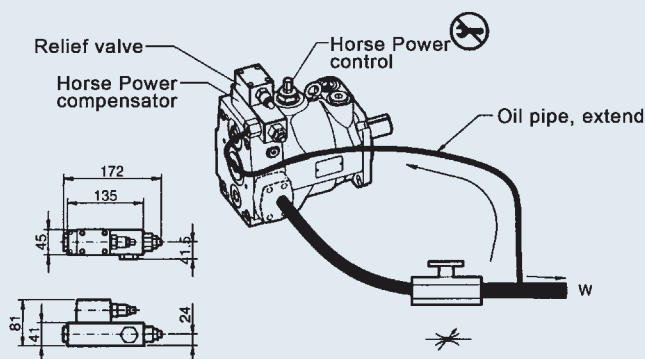
**PG:** Horse power compensator, pilot flow internal



**PL:** Horse power compensator, Load-sensing compensator



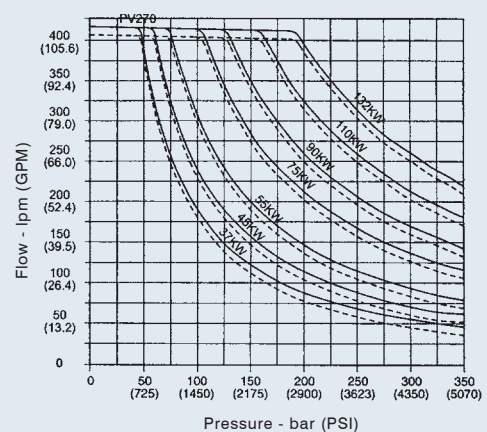
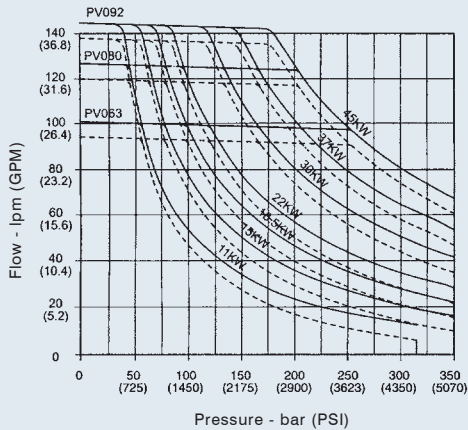
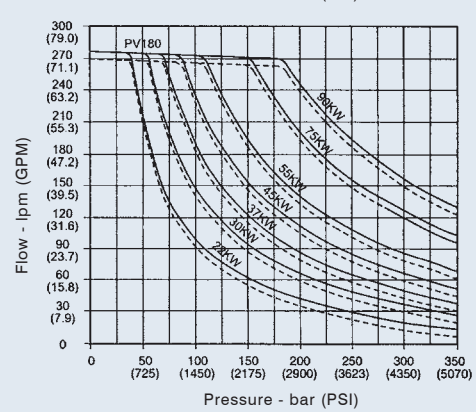
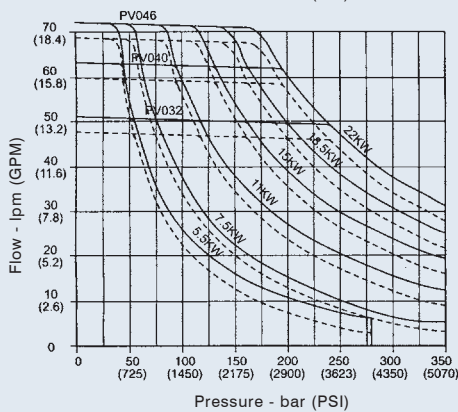
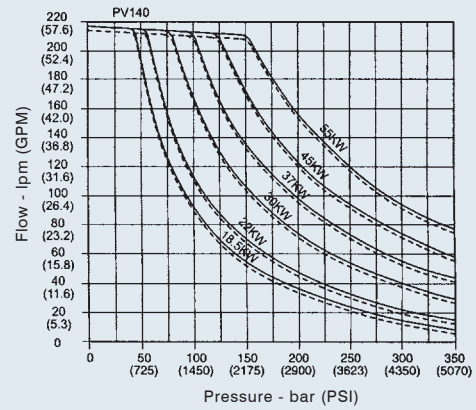
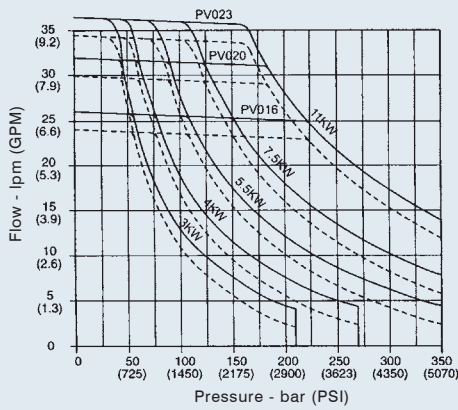
**PH:** Horse power compensator, pilot flow external for load-sensing



# PV SERIES AXIAL PISTON PUMP

## Performance curves

### Horse Power Compensator, diagrams



The diagrams shown 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:  $v=46\text{mm}^2/\text{s}$  at  $40^{\circ}\text{C}$



# PV SERIES AXIAL PISTON PUMP

## Efficiency And Case Drain Flows PV016-PV023

The efficiency and power graphs are measured at an input speed of  $n = 1500 \text{ min}^{-1}$ , a temperature of  $40^\circ\text{C}$  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 valves shown are to be added 1 to 1.2 lpm, if at pilot operated compensator (code G\*, H\* horse power compensator and P/Q-control) the control flow of the pressure pilot valve also goes

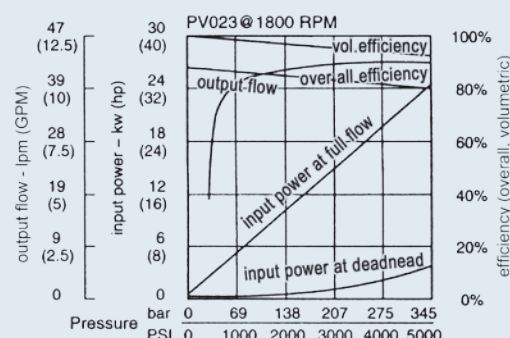
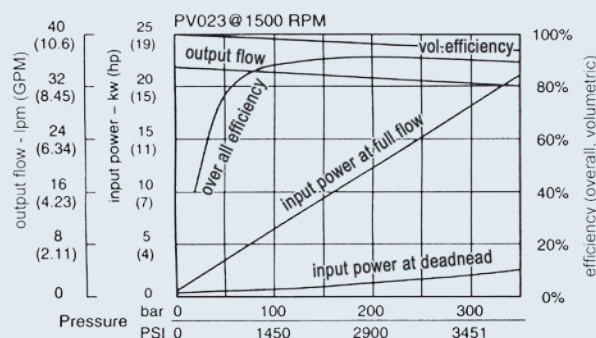
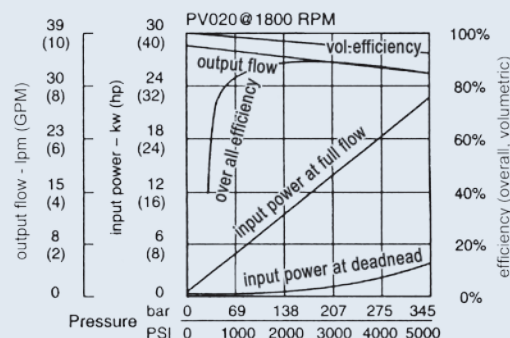
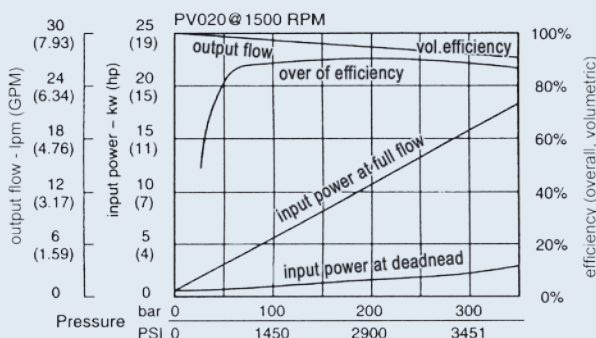
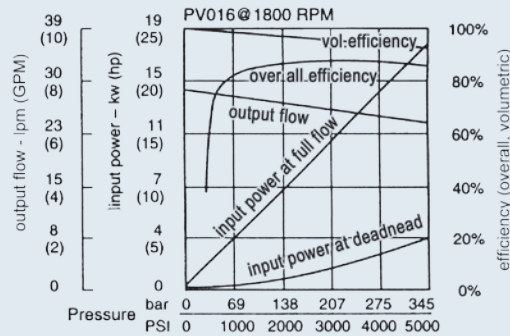
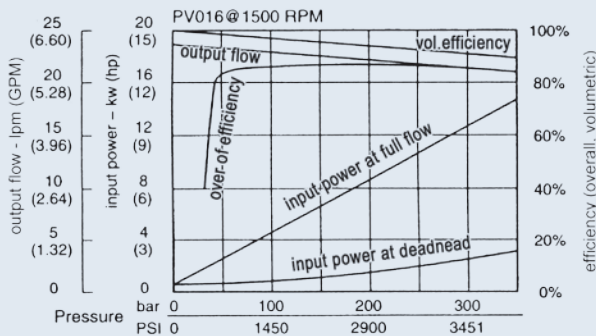
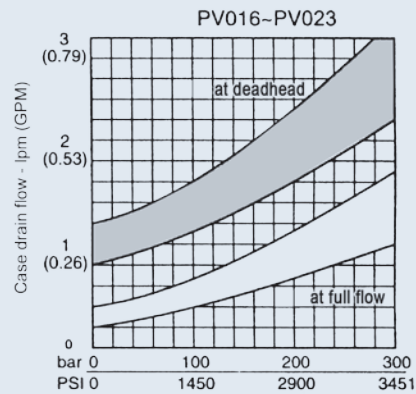
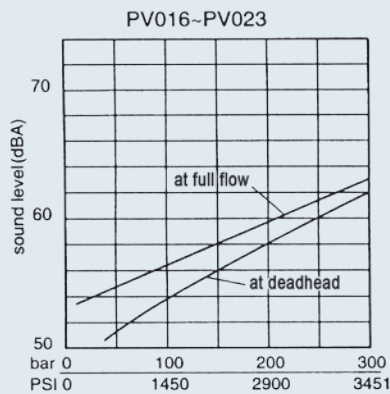
through the pump.

Please note: The valves shown below are only valid for static operation. Under dynamic conditions and at rapid compensator of the pump the volume displaced by the servo piston also leaves the case drain port.

This dynamic control flow can reach up to 40 lpm.

Therefore the case drain line is to lead to the reservoir at full size and without restrictions at short and direct as possible.

## Performance curves



# PV SERIES AXIAL PISTON PUMP

## Efficiency And Case Drain Flows PV032-PV046

The efficiency and power graphs are measured at an input speed of  $n = 1500 \text{ min}^{-1}$ , a temperature of  $40^\circ\text{C}$  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 valves shown are to be added 1 to 1.2 lpm, if at pilot operated compensator (code G\*, H\* horse power compensator and P/Q-control) the control flow of the pressure pilot valve also goes

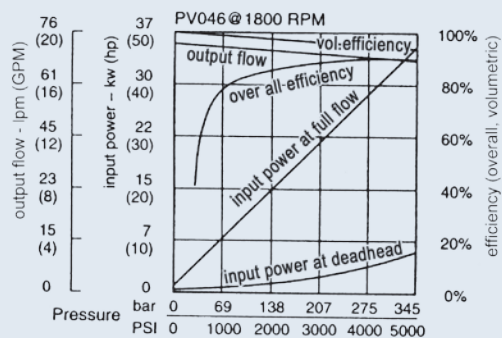
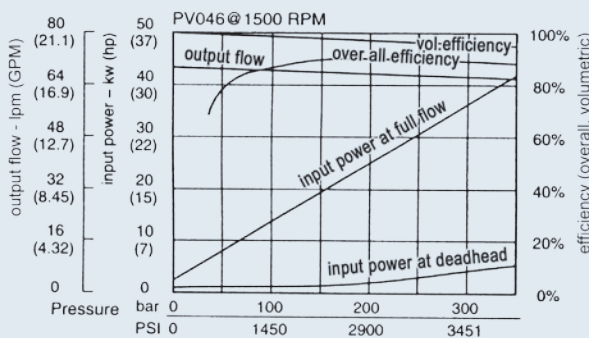
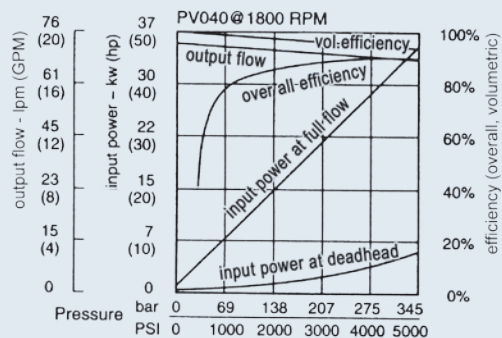
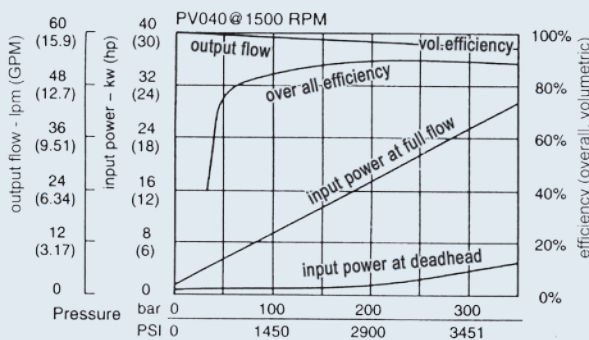
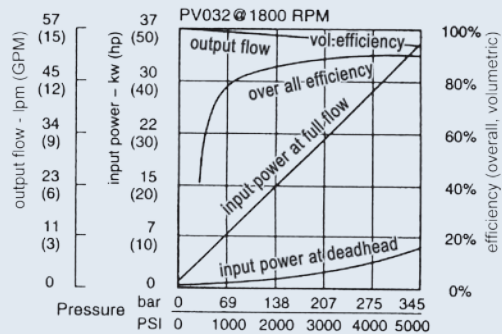
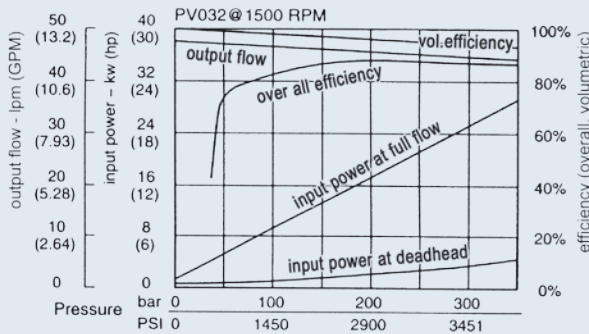
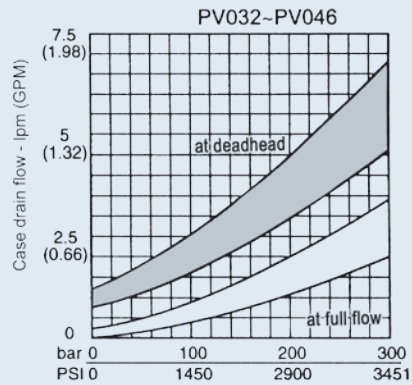
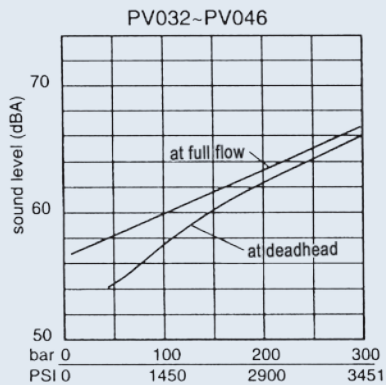
through the pump.

Please note: The valves shown below are only valid for static operation. Under dynamic conditions and at rapid compensator of the pump the volume displaced by the servo piston also leaves the case drain port.

This dynamic control flow can reach up to 60 lpm.

Therefore the case drain line is to lead to the reservoir at full size and without restrictions at short and direct as possible.

## Performance curves



# PV SERIES AXIAL PISTON PUMP

## Efficiency And Case Drain Flows

### PV063, PV080, PV092

The efficiency and power graphs are measured at an input speed of  $n = 1500 \text{ min}^{-1}$ , a temperature of  $40^\circ\text{C}$  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 valves shown are to be added 1 to 1.2 lpm, if at pilot operated compensator (code G\*, H\* horse power compensator and P/Q-control) the control flow of the pressure pilot valve also goes

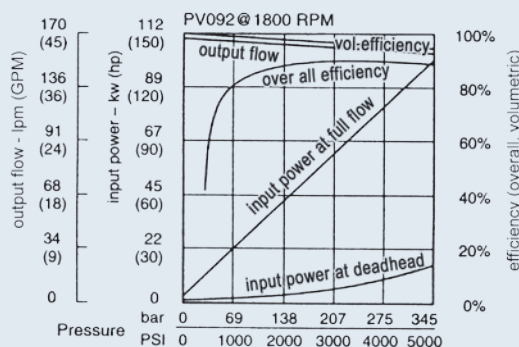
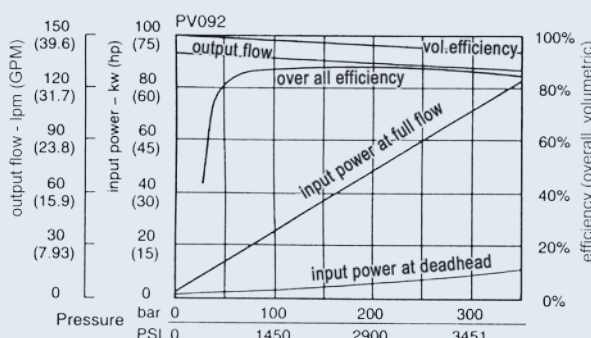
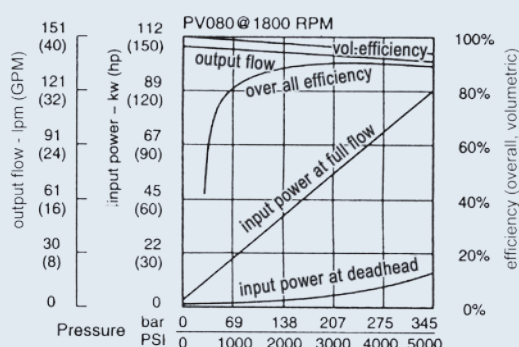
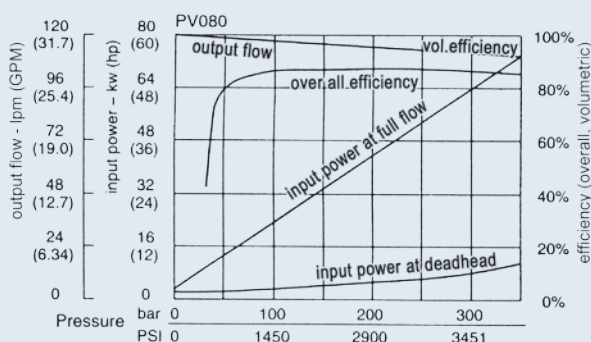
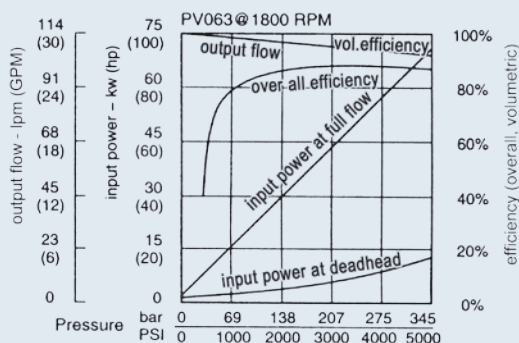
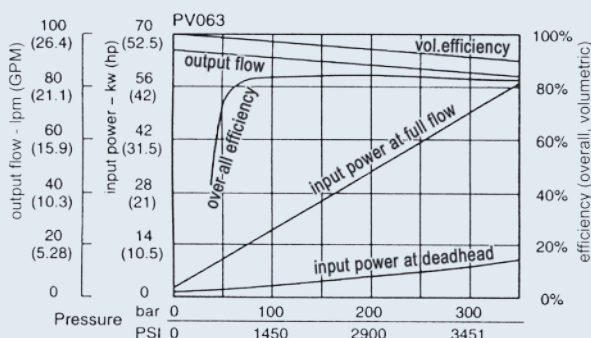
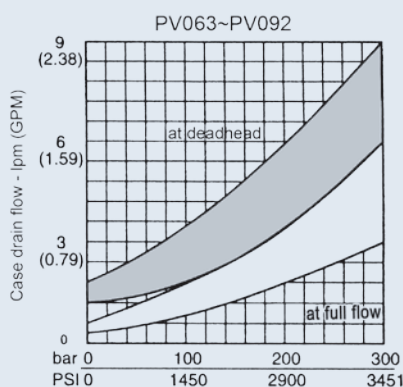
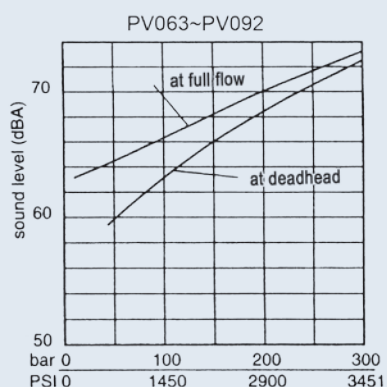
through the pump.

Please note: The valves shown below are only valid for static operation. Under dynamic conditions and at rapid compensator 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 lpm.

Therefore the case drain line is to lead to the reservoir at full size and without restrictions at short and direct as possible.

## Performance curves



# PV SERIES AXIAL PISTON PUMP

## Efficiency And Case Drain Flows PV140, PV180

The efficiency and power graphs are measured at an input speed of  $n = 1500 \text{ min}^{-1}$ , a temperature of  $40^\circ\text{C}$  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 valves shown are to be added 1 to 1.2 lpm, if at pilot operated compensator (code G\*, H\* horse power compensator and P/Q-control) the control flow of the pressure pilot valve also goes

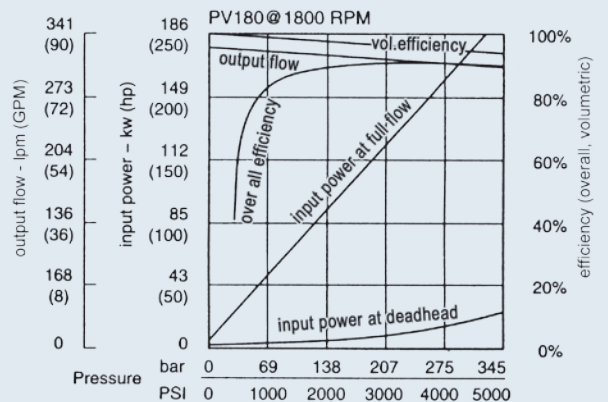
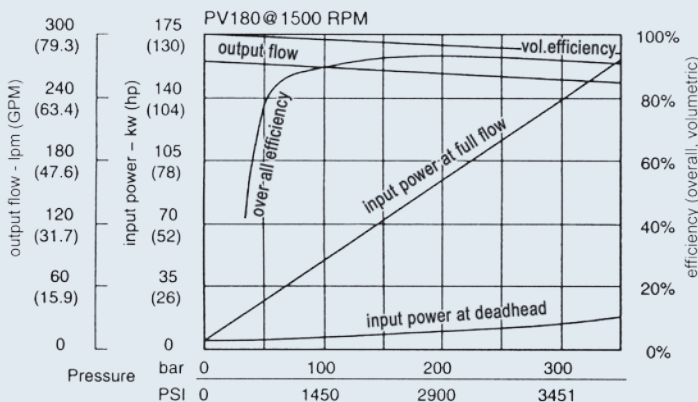
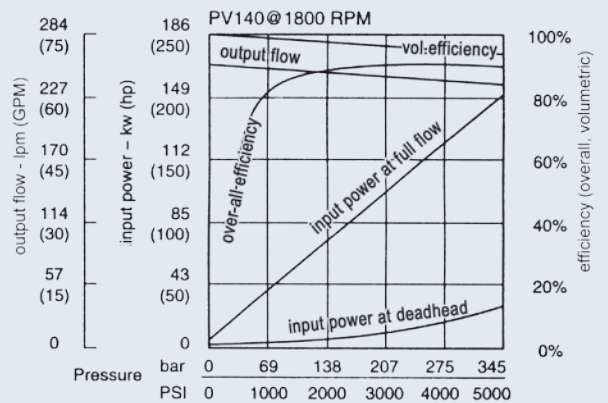
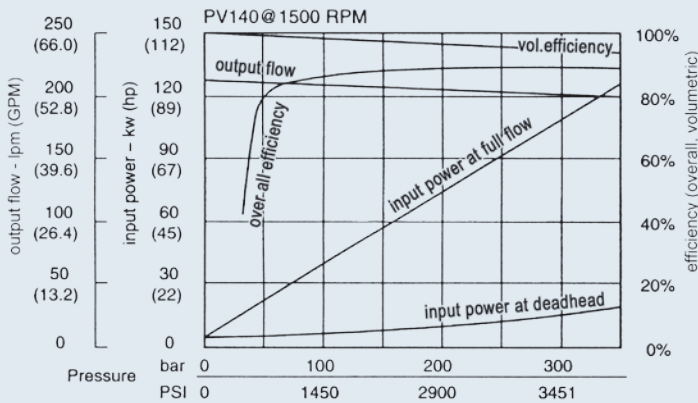
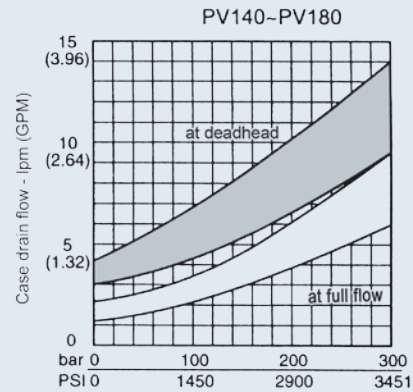
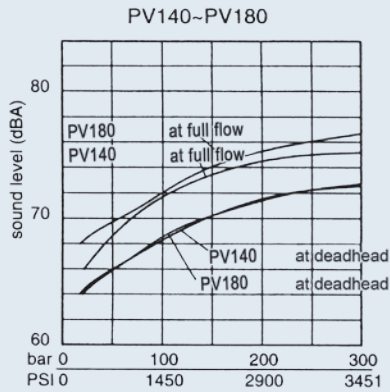
through the pump.

Please note: The valves shown below are only valid for static operation. Under dynamic conditions and at rapid compensator of the pump the volume displaced by the servo piston also leaves the case drain port.

This dynamic control flow can reach up to 120 lpm.

Therefore the case drain line is to lead to the reservoir at full size and without restrictions at short and direct as possible.

## Performance curves



# PV SERIES AXIAL PISTON PUMP

## Efficiency And Case Drain Flows PV270

The efficiency and power graphs are measured at an input speed of  $n = 1500 \text{ min}^{-1}$ , a temperature of  $40^\circ\text{C}$  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 valves shown are to be added 1 to 1.2 lpm, if at pilot operated compensator (code G\*, H\* horse power compensator and P/Q-control) the control flow of the pressure pilot valve also goes

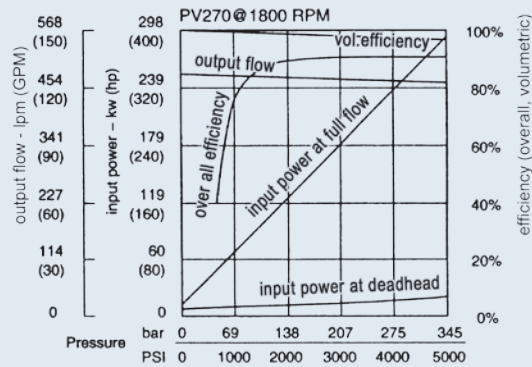
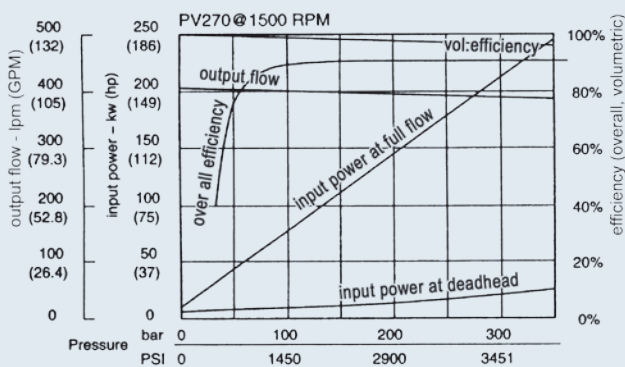
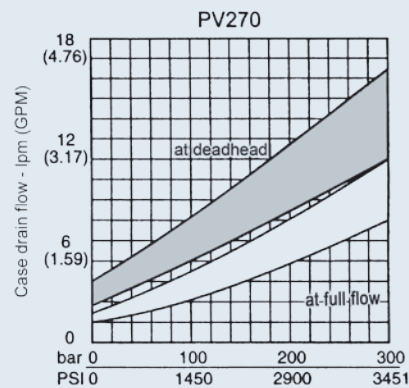
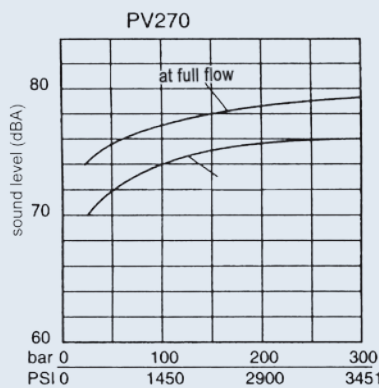
through the pump.

Please note: The valves shown below are only valid for static operation. Under dynamic conditions and at rapid compensator of the pump the volume displaced by the servo piston also leaves the case drain port.

This dynamic control flow can reach up to 120 lpm.

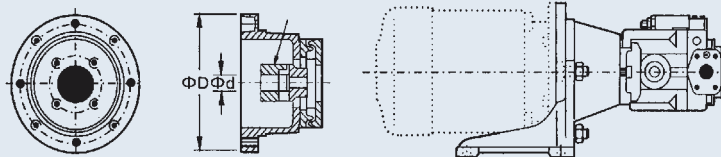
Therefore the case drain line is to lead to the reservoir at full size and without restrictions at short and direct as possible.

## Performance curves

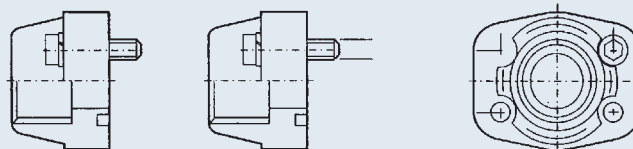


## Pump Accessories

Bell housing, coupling and foot flange

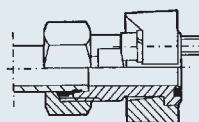
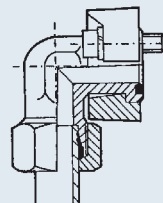


Welding flange, Threaded flange

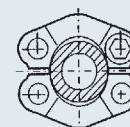


SAE-flange connections, pipe connection in accordance to DIN-2353

Elbow SAE-flange connection WFS



Straight SAE connection GFS



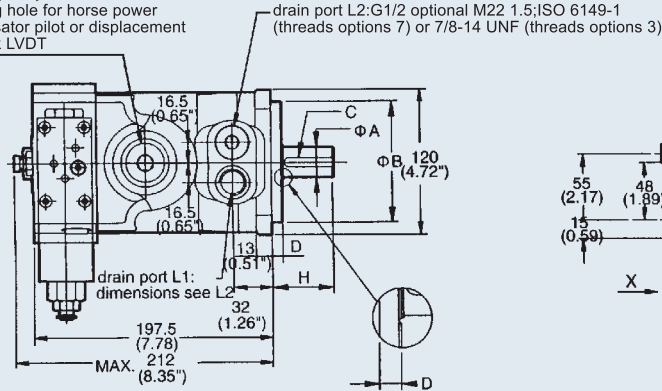
# PV SERIES AXIAL PISTON PUMP

## Dimensions

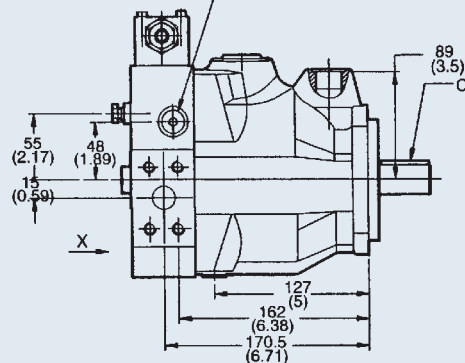
### PV016~PV023

#### Mounting: M,N

mounting hole for horse power compensator pilot or displacement feedback LVDT

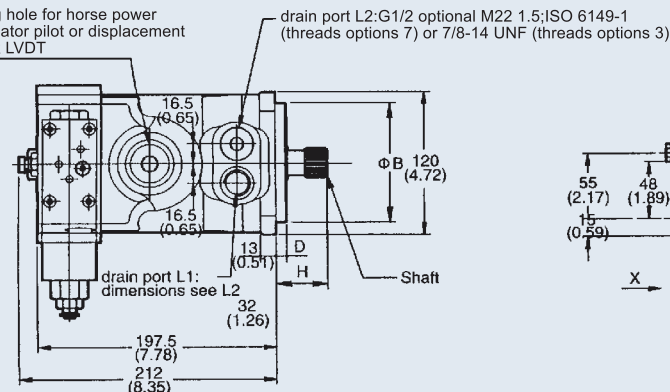


gauge port M: G1/4 optional M12 1.5; ISO 6149-1 (threads options 7) or 7/16-20 UNF (threads options 3)

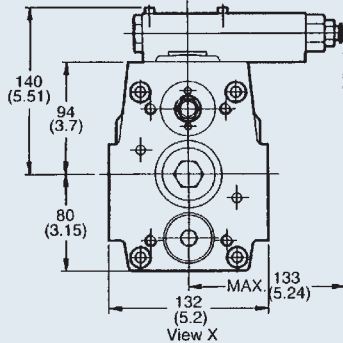
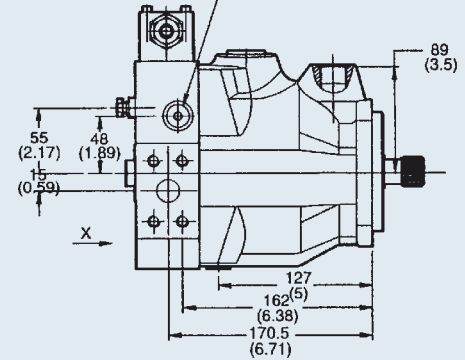


#### Mounting: K,D

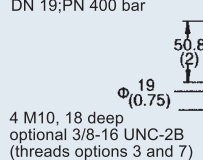
mounting hole for horse power compensator pilot or displacement feedback LVDT



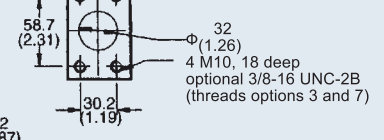
gauge port M: G1/4 optional M12 1.5; ISO 6149-1 (threads options 7) or 7/16-20 UNF (threads options 3)



Outlet: flange according ISO 6162 DN 19; PN 400 bar



Inlet: flange according ISO 6162 DN 32; PN 250 bar



flushing port L3: G 3/8 optional M18 1.5; ISO 6149-1 (threads options 7) or 3/4-16 UNF (threads options 3)

Shown with standard pressure compensator

### PV016~PV023 Dimensions

Mounting		ISO 3019/2 Splined, DIN 5480	øA	øB	C	D	øE	F	H
<b>M (standard)</b>	Metric	ISO 3019/2 Splined, DIN 5480	ø25	ø100 h8	8x7x40	9	125	12	52
<b>N</b>	Inch	ISO3019/2 Cylindric, key	ø25.4 (1")	ø101.6 (4")	6.35x6.35x40 (1/4")	9.4 (0.37")	127 (5")	12 (0.47")	50 (1.97")
Mounting		ISO 3019/2 Cylindric, key	Shaft		øB	D	øE	F	H
<b>K (standard)</b>	Metric	ISO 3019/2 Cylindric, key	Splined W25x1.5x15x8f DIN 5480		ø100 h8	9	125	12	43
<b>D</b>	Inch	ISO 3019/1 Splined, SAE	Splined 15T 16/32 DP, flat root, side fit ANSI B92.1		ø101.6 (4")	9.4 (0.37")	127 (5")	12 (0.47")	46 (1.81")

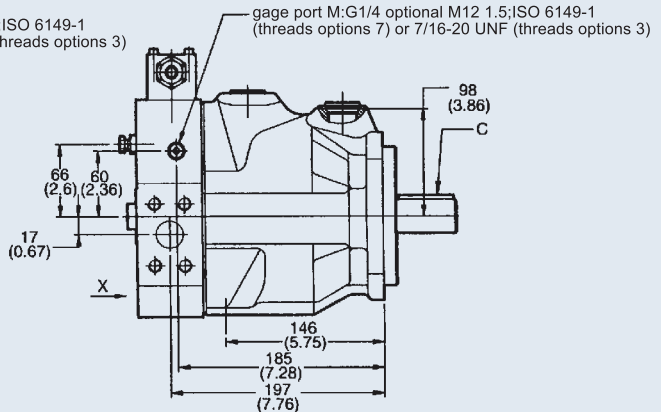
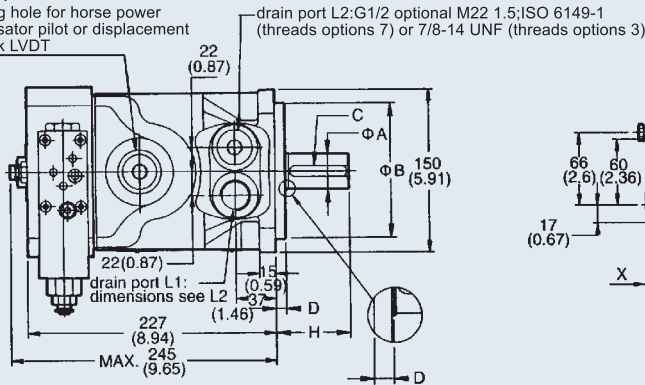
# PV SERIES AXIAL PISTON PUMP

## Dimensions

### PV032~PV046

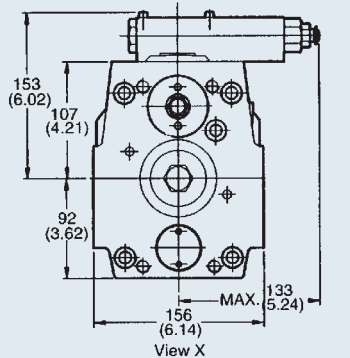
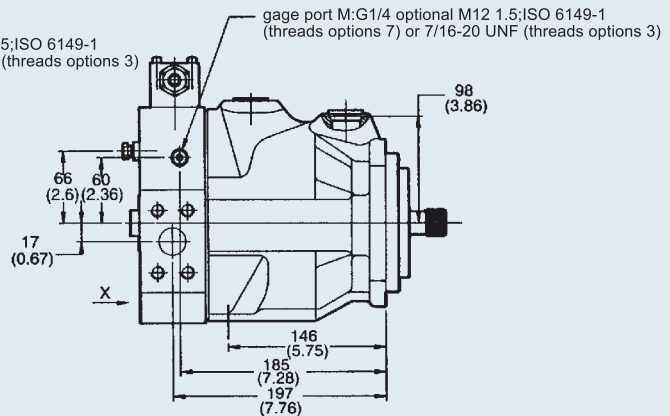
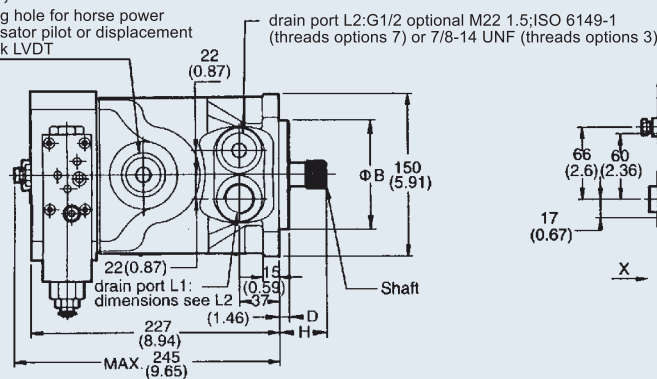
#### Mounting: M,N

mounting hole for horse power compensator pilot or displacement feedback LVDT



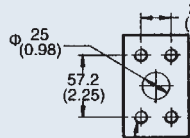
#### Mounting: K,D

mounting hole for horse power compensator pilot or displacement feedback LVDT

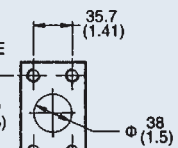


Shown with standard pressure compensator

Outlet: flange according ISO 6162 DN 19; PN 400 bar



Inlet: flange according ISO 6162 DN 32; PN 250 bar



flushing port L3: G 1/2 optional M22 1.5; ISO 6149-1 (threads options 7) or 7/8-14 UNF (threads options 3)

PV032~PV046 Dimensions										
Mounting			øA	øB	C	D	øE	F	H	
M (standard)	Metric	ISO 3019/2 Splined, DIN 5480	ø32	ø125 h8	10x8x56	9	160	14	68	
	Inch	ISO 3019/2 Cylindric, key	ø31.75 (1.25")	ø127 (5")	7.94x7.94x56 (5/16")	12.7 (0.5")	161.93 (6.38")	14 (0.55")	68 (2.68")	
Mounting			Shaft			øB	D	øE	F	H
K (standard)	Metric	ISO 3019/2 Cylindric, key	Splined W32x1.5x20x8f DIN 5480			ø125 h8	9	160	14	47
	Inch	ISO 3019/1 Splined, SAE	Splined 14T 12/24 DP, flat root, side fit ANSI B92.1			ø127 (5")	12.7 (0.5")	161.93 (6.38")	14 (0.55")	56 (2.31")
D1	Inch	ISO 3019/1 Splined, SAE	Splined 15T 16/32 DP, flat root, side fit ANSI B92.1			ø127 (5")	12.7 (0.5")	161.93 (6.38")	14 (0.55")	56 (2.31")

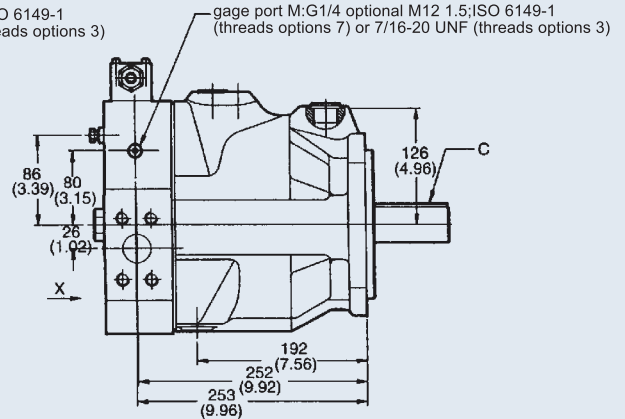
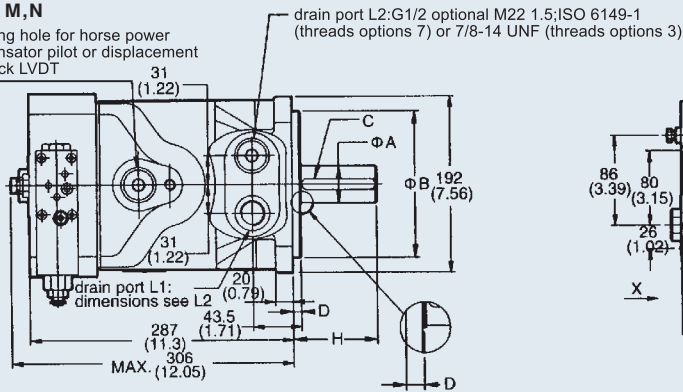
# PV SERIES AXIAL PISTON PUMP

## Dimensions

### PV063~PV092

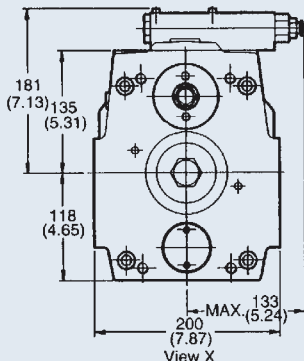
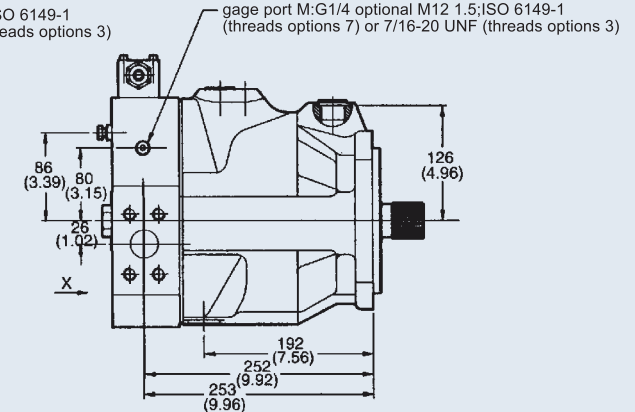
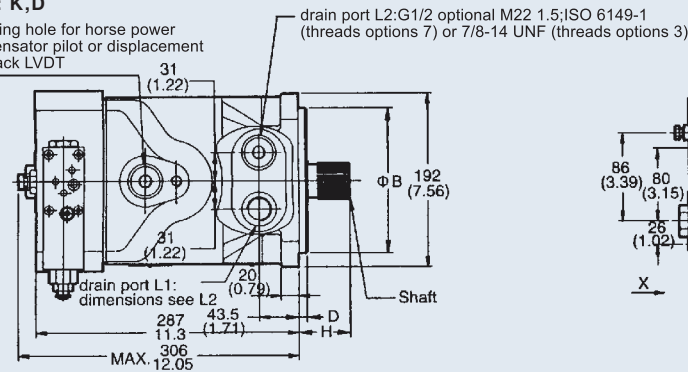
#### Mounting: M,N

mounting hole for horse power compensator pilot or displacement feedback LVDT



#### Mounting: K,D

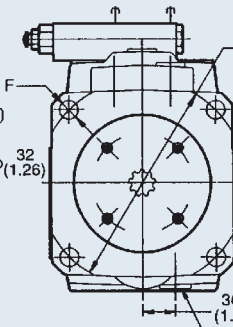
mounting hole for horse power compensator pilot or displacement feedback LVDT



Shown with standard pressure compensator

Outlet: flange according ISO 6162 DN 19;PN 400 bar

4 M20, 20 deep optional 1/2-13 UNC-2B (threads options 3 and 7)



Inlet: flange according ISO 6162 DN 32;PN 250 bar

42.9 (1.69)

50 (1.97)

77.8 (3.06)

4 M12, 20 deep optional 1/2-13 UNC-2B (threads options 3 and 7)

flushing port L3: G 1/2 optional M22 1.5;ISO 6149-1 (threads options 7) or 7/8-14 UNF (threads options 3)

### PV063~PV092 Dimensions

Mounting		øA	øB	C	D	øE	F	H
M (standard)	Metric	ISO 3019/2 Splined, DIN 5480	ø40	ø160 h8	12x8x80	9	18	92
	Inch	ISO 3019/2 Cylindric, key	ø44.45 (1.75")	ø152.4 (6")	11.11x11.11x80 (7/16")	12.7 (0.5")	20.6 (0.81")	90 (3.54")
Mounting		Shaft		øB	D	øE	F	H
K (standard)	Metric	ISO 3019/2 Cylindric, key	Splined W40x1.5x25x8f DIN 5480	ø160 h8	9	200	18	56
	Inch	ISO 3019/1 Splined, SAE	Splined 15T 16/32 DP, flat root, side fit ANSI B92.1	ø152.4 (6")	12.7 (0.5")	228.6 (9")	20.6 (0.81")	75 (2.95")



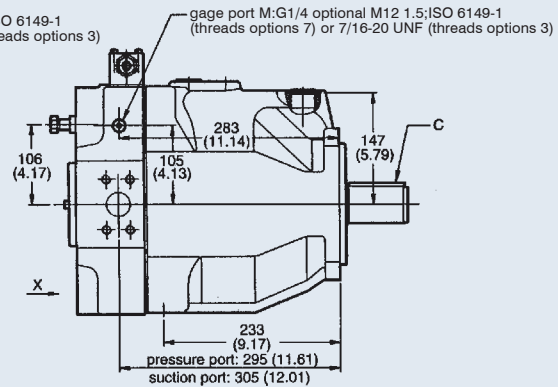
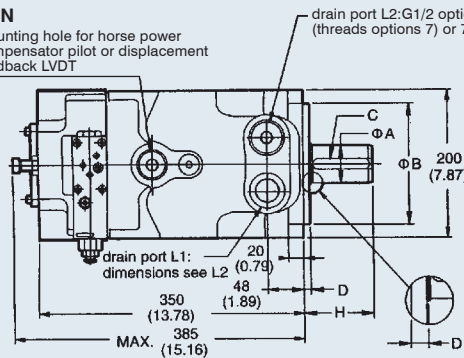
# PV SERIES AXIAL PISTON PUMP

## Dimensions

### PV140~PV180

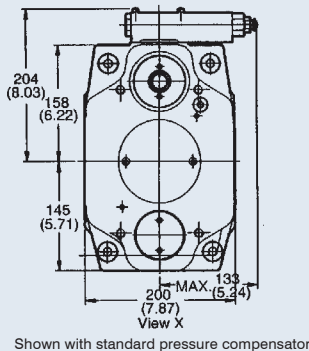
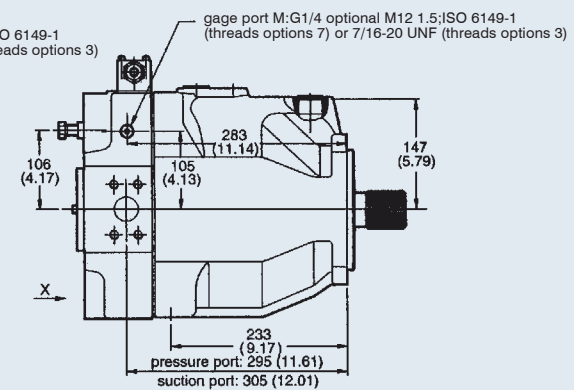
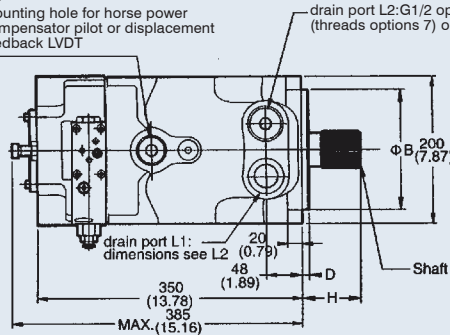
#### Mounting: M,N

mounting hole for horse power compensator pilot or displacement feedback LVDT

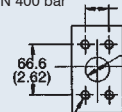


#### Mounting: K,D

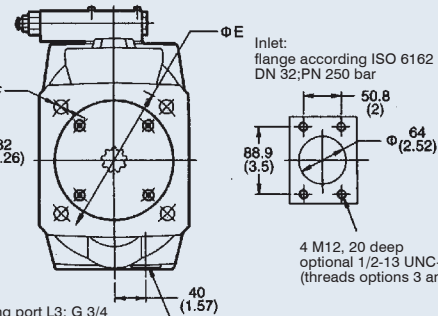
mounting hole for horse power compensator pilot or displacement feedback LVDT



Outlet: flange according ISO 6162 DN 19; PN 400 bar



4 M12, 20 deep optional 1/2-13 UNC-2B (threads options 3 and 7)



Inlet: flange according ISO 6162 DN 32; PN 250 bar

4 M12, 20 deep optional 1/2-13 UNC-2B (threads options 3 and 7)

flushing port L3; G 3/4 optional M27 2; ISO 6149-1 (threads options 7) or 1 1/16-12 UNF (threads options 3)

### PV140~PV180 Dimensions

Mounting			øA	øB	C	D	øE	F	H
M (standard)	Metric	ISO 3019/2 Splined, DIN 5480	ø50	ø160 h8	14x9x75	9	200	18	92
	Inch	ISO 3019/2 Cylindric, key	ø50.8 (2")	ø152.4 (6")	12.7x12.7x75 (1/2")	12.7 (0.5")	228.6 (9")	20.6 (0.81")	99.4 (3.91")
	Inch	ISO 3019/2 Splined, DIN 5480	ø44.45	ø152.4 (6")	11.11x11.11	12.7 (0.5")	228.6 (9")	20.6 (0.81")	75 (2.95")
Mounting			Shaft		øB	D	øE	F	H
H (standard)	Metric	ISO 3019/2 Cylindric, key	Splined W50x2x24x8f DIN 5480		ø160 h8	9	200	18	78
	Inch	ISO 3019/1 Splined, SAE	Splined 15T 8/16 DP, flat root, side fit ANSI B92.1		ø152.4 (6")	12.7 (0.5")	228.6 (9")	20.6 (0.81")	88 (3.46")
	Inch	ISO 3019/1 Splined, SAE	Splined 13T 8/16 DP, flat root, side fit ANSI B92.1		ø152.4 (6")	12.7 (0.5")	228.6 (9")	20.6 (0.81")	75 (2.95")

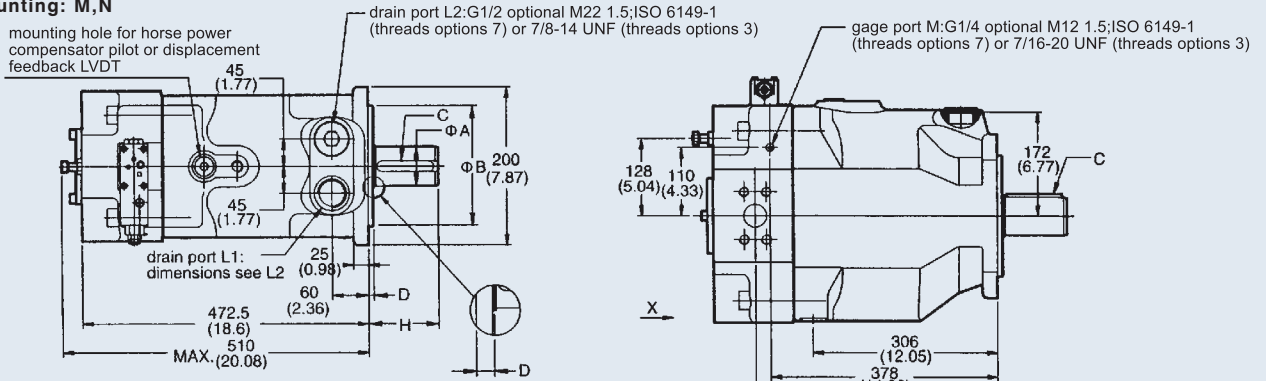
# PV SERIES AXIAL PISTON PUMP

## Dimensions

### PV270

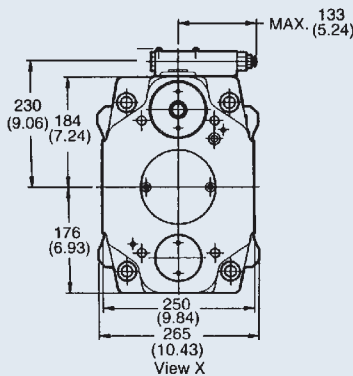
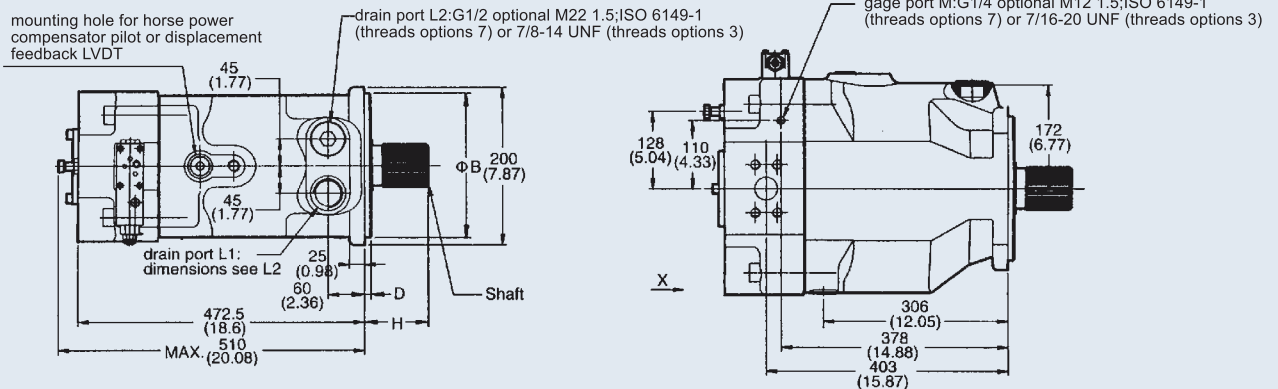
#### Mounting: M,N

mounting hole for horse power compensator pilot or displacement feedback LVDT



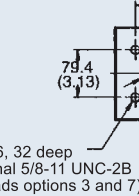
#### Mounting: K,D

mounting hole for horse power compensator pilot or displacement feedback LVDT

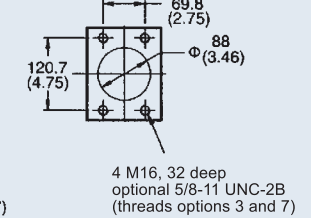


Shown with standard pressure compensator

Outlet: flange according ISO 6162 DN 19; PN 400 bar



Inlet: flange according ISO 6162 DN 32; PN 250 bar



flushing port L3: G 3/4 optional M27 2; ISO 6149-1 (threads options 7) or 1 1/16-12 UNF (threads options 3)

PV270 Dimensions									
	Mounting		øA	øB	C	D	øE	F	H
M (standard)	Metric	ISO 3019/2	ø65	ø200 h8	18x11x98	9	250	22	115
		Splined, DIN 5480							
N	Inch	ISO 3019/2	ø50.8 (2")	ø165.1 (6.5")	12.7x12.7x75 (1/2")	15.9 (0.37")	317.5 (12.5")	20.6 (0.81")	97.5 (3.84")
		Cylindric, key							
	Mounting		Shaft		øB	D	øE	F	H
K (standard)	Metric	ISO 3019/2	Splined W60x2x28x8f		ø200 h8	9	250	22	80
		Cylindric, key	DIN 5480						
D	Inch	ISO 3019/1	Splined 15T 8/16 DP, flat root, side fit ANSI B92.1		ø165.1 (6.5")	15.9 (0.37")	317.5 (12.5")	20.6 (0.81")	88(3.46")
		Splined, SAE							

# PV SERIES AXIAL PISTON PUMP

## Thru drive, shaft load limitations

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

Shaft code	PV16~23	PV32~46	PV63~92	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 (and more) the limit torque could be reached or exceeded.

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

**Required: calculated torque factor < torque limit 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 Vg of the pump (in cc/rev)

Pump	Shaft	Torque limit factor
PV016 ~ PV023	N	17700
	D	17700
	M	17700
	K	20130
PV032 ~ PV046	N	32680
	D	36380
	M	33810
	K	40250
PV063 ~ PV092	N	77280
	D	72450
	M	67620
PV140 ~ PV180	K	83720
	N	118400
	D	158760
	F	78750
	G	97650
PV270	M	113400
	K	157500
	N	119000
	D	159700
	M	170100
	K	236250

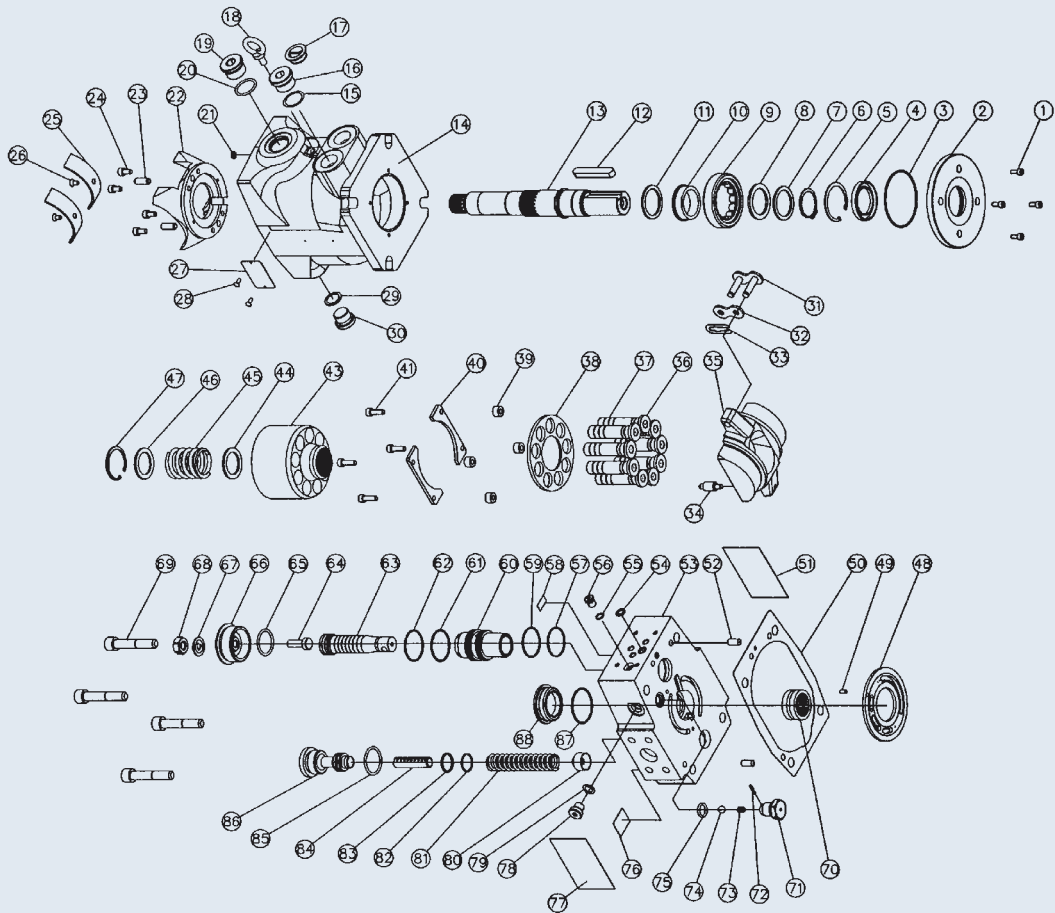
**Total torque factor of the combination = sum of individual torque factors of all pumps**

**Torque factor of any pump = P x Vg  
(Pressure in bar x displacement in cc/rev)**

# PV SERIES AXIAL PISTON PUMP

## Decomposition Chart

B



## List of parts

No.	Description	Quantity	No.	Description	Quantity	No.	Description	Quantity	No.	Description	Quantity
1	Head cap screw	4	23	Pin	2	46	Washer	1	68	Piston nut	1
2	Pilot cover	1	24	Screw	4	47	Snap ring	1	69	Screw	1
3	O-ring	1	25	Trunnion bearing	2	48	Valve plate	1	70	Trunnion bearing	1
4	Shaft seal	1	26	Screw	2	49	Pin	1	71	Plug	1
5	Snap ring	1	27	Name plate	1	50	Seal	1	72	Pin	1
6	Snap ring	1	28	Rivet	2	51	Seal	1	73	Spring	1
7	Washer	1	29	O-ring	1	52	Pin	1	74	Ball	1
8	Washer	1	30	Plug	1	53	Pump body	2	75	O-ring	2
9	Roller bearing	1	31	Chain link	1	54	O-ring	1	76	Label	1
10	Roller bearing	1	32	Chain link	1	55	O-ring	1	77	Seal	1
11	Roller bearing	1	33	Chain link	1	56	Plug	1	78	Plug	1
12	Key	1	34	Connector servo spring	1	57	O-ring	1	79	O-ring	1
13	Shaft	1	35	Swash plate	1	58	Label	1	80	Washer	1
14	Pump body	1	36	Piston	9	59	O-ring	1	81	Spring	1
15	O-ring	1	37	Piston	9	60	Servo piston sleeve	1	82	O-ring	1
16	Plug	1	38	Slipper segment	1	61	O-ring	1	83	O-ring	1
17	Plug	1	39	Washer	4	62	O-ring	1	84	Pin	1
18	Ring	1	40	Retainer segment	2	63	Servo piston	1	85	O-ring	1
19	Plug	1	41	Screw	4	64	Set screw	1	86	Screw	1
20	O-ring	1	43	Cylinder block	1	65	O-ring	1	87	O-ring	1
21	O-ring	1	44	Washer	1	66	Servo spring cover	1	88	Spring cover	1
22	Cradle	1	45	Spring	1	67	Washer	1			

# PV SERIES AXIAL PISTON PUMP

## General installation information

### 1. Fluid recommendations

Premium quality hydraulic mineral oil fluids are recommended, like H-LP oils to DIN 51524, part 2. The viscosity range should be 25 to 50 s mm<sup>2</sup>/(cst) at 50°C. Operating temperatures -10 to +70°C. For other fluids such as phosphoric acid esters or for, other operating conditions consult HYDROME for assistance.

### 2. Seals

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

### 3. Filtration

For maximum pump and system component functionality and life, the system should be protected from contamination by effective filtration. Fluid cleanness 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 x (um):  
General hydraulic systems for satisfactory operation:  
Class 19/15, to ISO 4406. X=25 µm(β10≥75) to ISO 4572
- (2) Hydraulic systems with maximized component life and functionality:  
Class 16/13, to ISO 4406. X=10 µm(β10≥75) to ISO 4572  
It is recommended to use return line or pressure filters. HYDROME 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.

### 4. 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 a 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 to be leadfree, as air in the suction line will cause cavitations, noise, and damage to the pump.

### 5. Shaft rotation and alignment

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

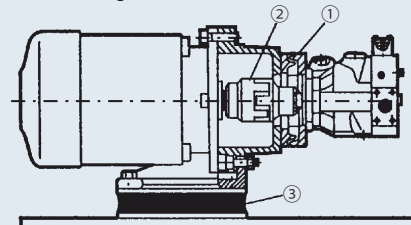
### 6. Start up

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.  
Operating noise of pumps  
The normal operating noise of a pump and consequently the operating 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. Also size, style and installation of the hydraulic tubing have a major influence on the overall noise emitted by a hydraulic system.

#### Noise reduction measures

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

- Bell housing with elastic dampening flange with vulcanized labyrinth ①
- (1) Floating and flexible coupling ②
- (2) Damping rails ③
- (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.



### 7. Drain line

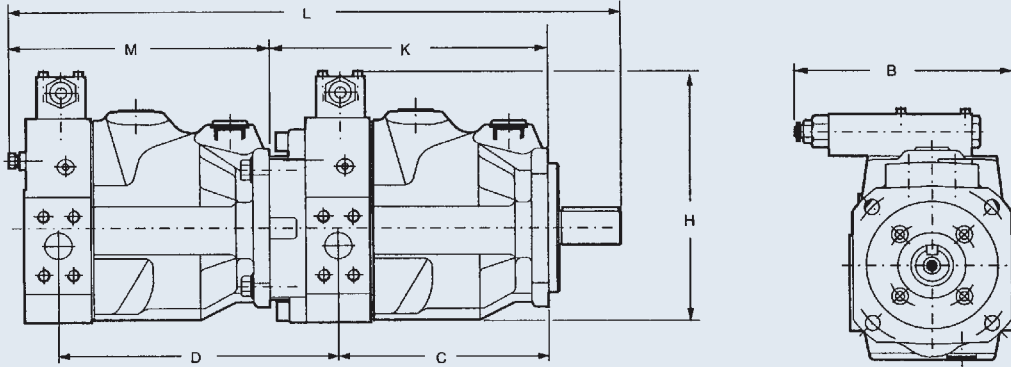
The drain line must lead directly to the reservoir without restriction. The drain line must not be connected to any other return line. The end of the drain line must be below the lowest fluid level in the reservoir and as far away as possible from the pump inlet line. This ensures that the pump does not empty itself when not in operation and that 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 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
<b>Size of pipe joints</b>	3/8 (ø8.5 or more)	1/2 (ø12 or more)	3/4 (ø16 or more)	1 (ø19 or more)	1-1/4 (ø22 or more)
<b>I.D. of pipes</b>	ø12 or more	ø15 or more	ø19 or more	ø25 or more	ø32 or more
<b>Length of drain</b>	Under 1m	Under 1m	Under 1m	Under 1m	Under 1m

# PV SERIES TANDEM AXIAL PISTON PUMP

## Dimensions

### Pump Combination PV



B

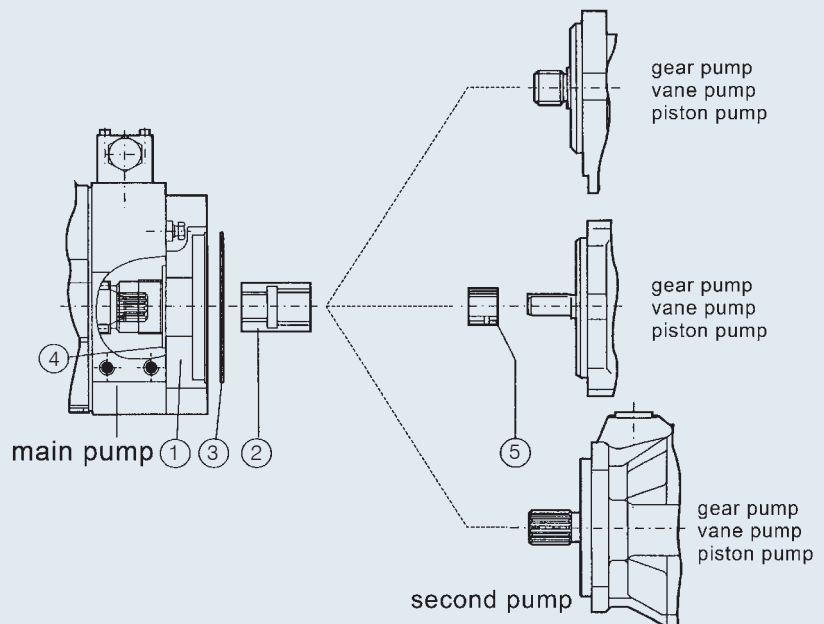
Main pump	Second pump	Interface main pump	L	B	C	D	H	K	M		
<b>PV16, 20, 23</b>	PV16, 20, 23	100 B4 HW	489	196	170.5	225	220	225	212		
<b>PV32, 40, 46</b>	PV16, 20, 23	125 B4 HW	541	208	197	235.5	245	261	212		
	PV32, 40, 46		574		197		261		245	261	245
<b>PV63, 80, 92</b>	PV16, 20, 23	160 B4 HW	630	232	252	244.5	299	326	212		
	PV32, 40, 46		663		252		271		299	326	245
	PV63, 80, 92		724		252		326		299	326	306
<b>PV140, 180</b>	PV16, 20, 23	160 B4 HW	719	230	305	280.5	349	415	212		
	PV32, 40, 46		752		305		307		349	415	245
	PV63, 80, 92		813		305		362		349	415	306
	PV140, 180		878		305		415		349	415	385
<b>PV270</b>	PV16, 20, 23	200 B4 HW	860	255	403	299	406	531.5	212		
	PV32, 40, 46		893		403		325.5		406	531.5	245
	PV63, 80, 92		954		403		380.5		406	531.5	306
	PV140, 180		1033		403		433.5		406	531.5	385
	PV270		1134		403		531.5		406	531.5	510

Combination PV140/180+PV140/180 and PV270+PV270 only with splined shaft on main pump due to high torque

### PV pump with thru drive

#### List of parts

No.	Description
1	Connector
2	Coupling
3	Seal
4	Seal
5	Coupling





# PVS, PZS SERIES VARIABLE VOLUME PISTON PUMP

## Control Types

Type	External View	JIS Symbols	Characteristics	Description
N				<b>Pressure Compensating Type (Manual)</b> <ol style="list-style-type: none"> <li>When the pressure reaches the value set with the compensator, the flow is reduced automatically and the set pressure is maintained.</li> <li>The pressure and flow are controlled manually.</li> </ol>
P				<b>Remote Pressure Control Type</b> <ol style="list-style-type: none"> <li>The pressure can be controlled according to the pilot pressure.</li> <li>The flow can be controlled manually.</li> </ol>
NQ				<b>Two Pressure-Two Flow Control Type</b> <ol style="list-style-type: none"> <li>By means of the sequence valve, two stage flow rate can be obtained and each flow rate has the different pressure eventually enabling energy savings.</li> </ol>
RS (RA)				<b>Solenoid Cut-Off Control Type</b> <ol style="list-style-type: none"> <li>An unloading solenoid valve is used to minimize the lost energy when the pump output is not required.</li> <li>Heat generated is very small.</li> </ol>
WS (WA)				<b>Two Pressure Cut-Off Control Type</b> <ol style="list-style-type: none"> <li>By means of "ON" "OFF" control of solenoid valves, two different pressure compensating types can be obtained.</li> </ol>
HL				<b>Load Sensing Control</b> <ol style="list-style-type: none"> <li>The "HL" compensator is used for load sensing circuits and is a true load sensor. This is the "P" compensator with a pin in the compensator spool. The pin prevents pilot flow from entering the circuit which will eliminate creeping of the load.</li> <li>The "HL" compensator will let the pump deliver a constant flow rate to the circuit by providing an adjustable <math>\Delta P</math> across the customers orifice or valve. The pump will operate at 17.2~27.5 bar (250-400 psi) above "Load pressure".</li> </ol>

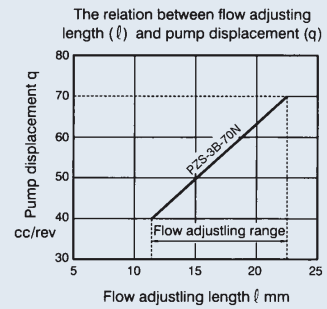
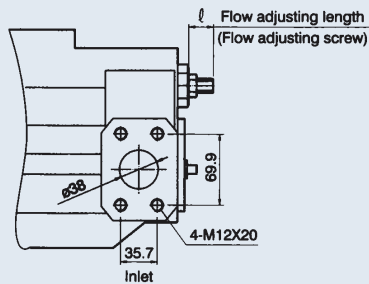
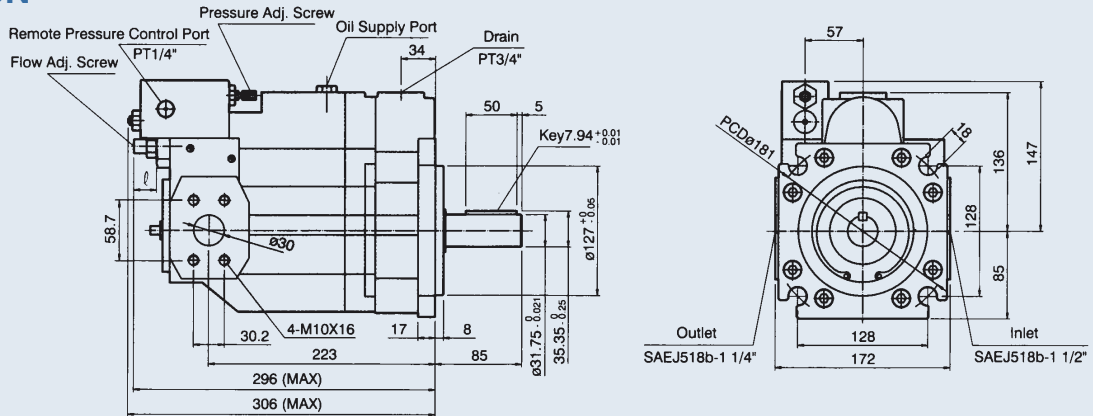




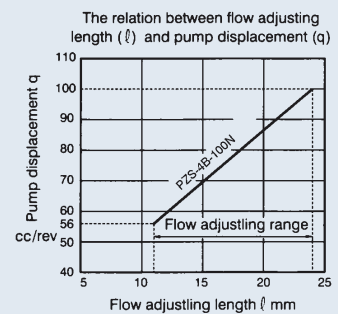
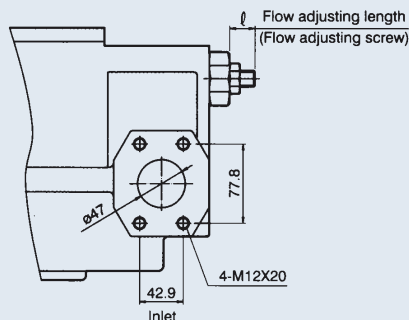
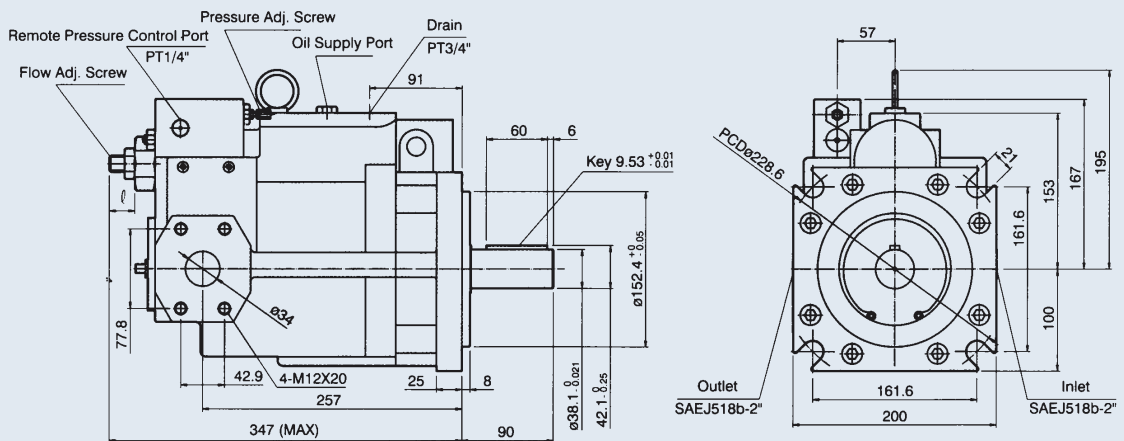
# PVS, PZS SERIES VARIABLE VOLUME PISTON PUMP

## Dimensions

### PZS-3B-70N

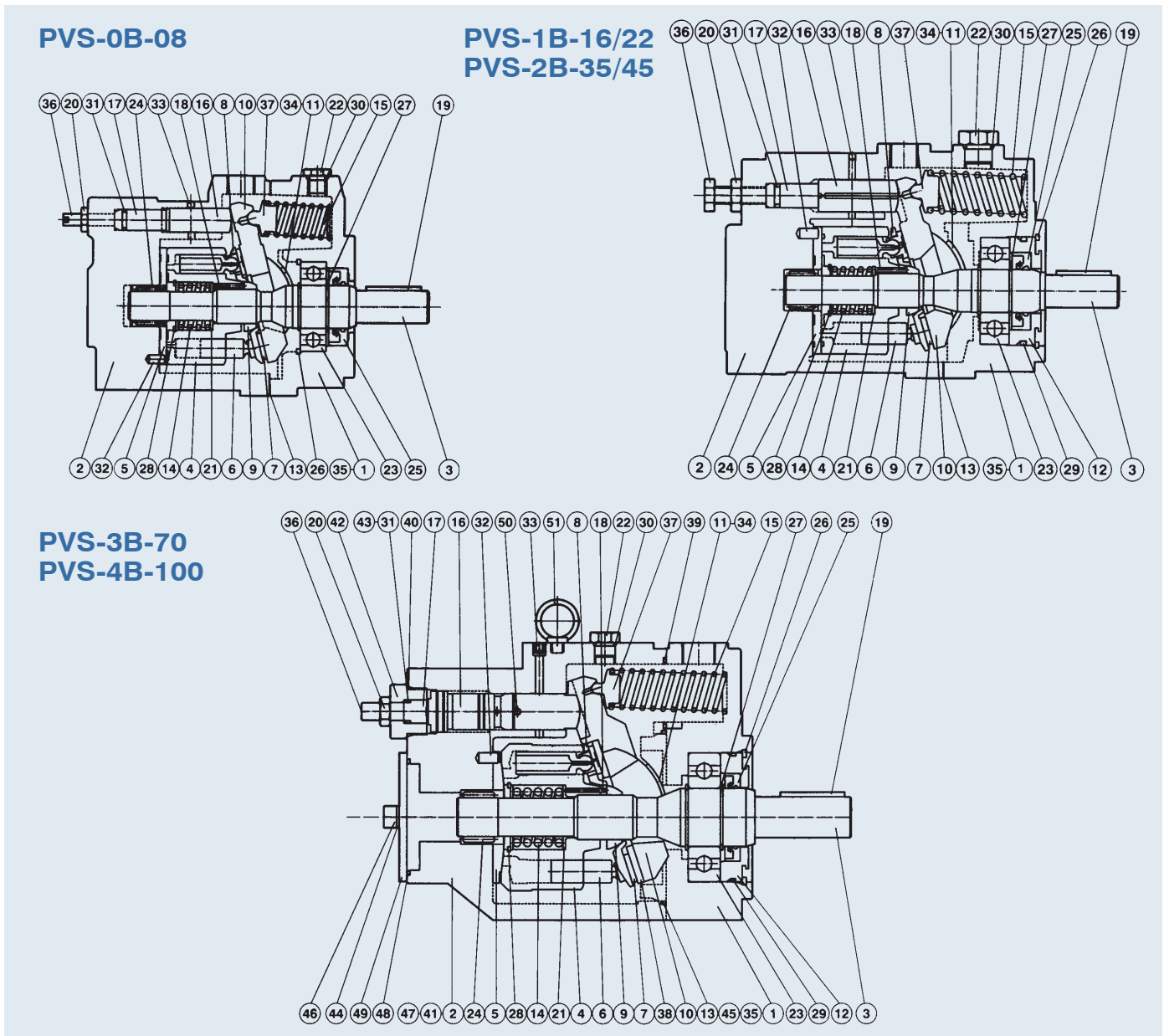


### PZS-4B-100N



# PVS, PZS SERIES VARIABLE VOLUME PISTON PUMP

## Cross section drawing



## Parts list

N0.	Part Name	N0.	Part Name	N0.	Part Name	N0.	Part Name	N0.	Part Name
1	Body	9	Barrel holder	17	Guide	25	Oil seal	33	Expander plug
2	Case	10	Swash plate	18	Needle	26	Snap ring	34	Machine screw
3	Shaft	11	Thrust bush	19	Key	27	Snap ring	35	Machine screw
4	Cylinder barrel	12	Seal holder	20	Nut	28	Snap ring	36	Flow adj. screw
5	Valve plate	13	Gasket	21	Retainer	29	O-ring	37	Spring Holder
6	Piston	14	Spring	22	Plug	30	O-ring		
7	Shoe	15	Spring	23	Ball bearing	31	O-ring		
8	Shoe holder	16	Control Piston	24	Needle bearing	32	Pin		