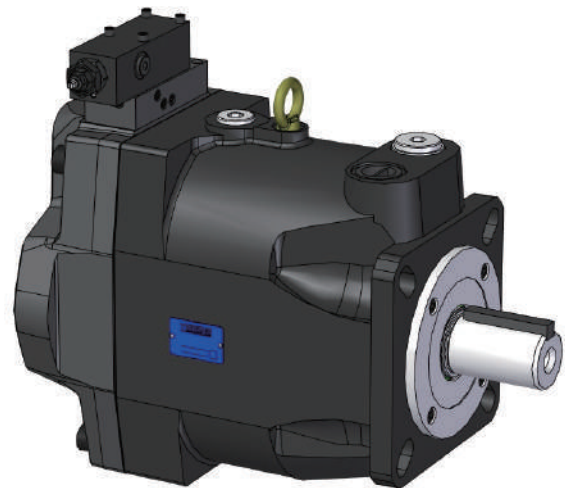




PPV Series

Closed-Circuit Bi-Directional Variable
Displacement Piston Pump



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Efficient Performance
Innovative Technology
Reliable Quality and Service

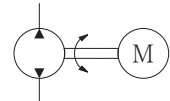
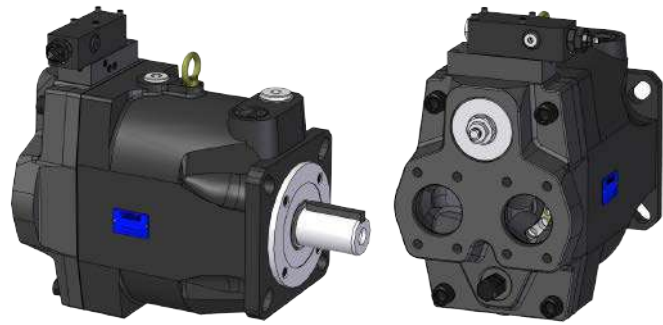
YEOSHE HYDRAULICS CO.,LTD.

PPV Closed-Circuit Bi-Directional Variable Displacement Piston Pump

Product Overview

The PPV closed-circuit bi-directional variable displacement piston pump is a high-efficiency and highly stable hydraulic power component designed for hydraulic systems requiring precise control and energy-saving performance.

With excellent pressure capability and flexible rotation characteristics, it is suitable for a wide range of industrial applications, especially closed-circuit systems requiring bidirectional drive and high dynamic response.



Specifications

Size	Model	Displacement				pressure	MAX. RPM	Weight KG
		Full cm ³ /rev	2nd Stage cm ³ /rev	1500 RPM LPM	1800 RPM LPM			
1	PPV016	16	0~8	24	28.8	Continuous 250	2750	19
	PPV020	20	0~10	30	36			
	PPV023	23	0~11.5	34.5	41.4			
	PPV028	28	0~14	42	50.4			
2	PPV032	32	0~16	48	57.6		2400	30
	PPV040	40	0~20	60	72			
	PPV046	46	0~23	69	82.8			
	PPV056	56	0~28	84	100.8			
	PPV065	65	0~32.5	97.5	117			
3	PPV071	71	0~35.5	106.5	127.8		Peak 280	2100
	PPV080	80	0~40	120	144			
	PPV092	92	0~46	138	165.6			
	PPV110	110	0~55	165	198			
	PPV123	123	0~61.5	184.5	221.4			
※4	PPV140	140	0~70	210	252	2200	90	
	PPV180	180	0~90	270	324			
	PPV210	210	0~105	315	378			
5	PPV270	270	0~135	405	486	1800	172	

* Stock models. Other models are available by custom order.



Product Features

High-efficiency design, strong and stable pressure

Adopts a high-performance axial piston pump structure with excellent volumetric and mechanical efficiency. Maximum working pressure reaches 250 bar, providing stable and powerful hydraulic output.

Bi-directional rotation; inlet/suction ports reversible

The pump structure allows axial rotation direction change. Port A and Port B can be interchanged, making it suitable for forward/reverse bidirectional drive applications and improving system flexibility.

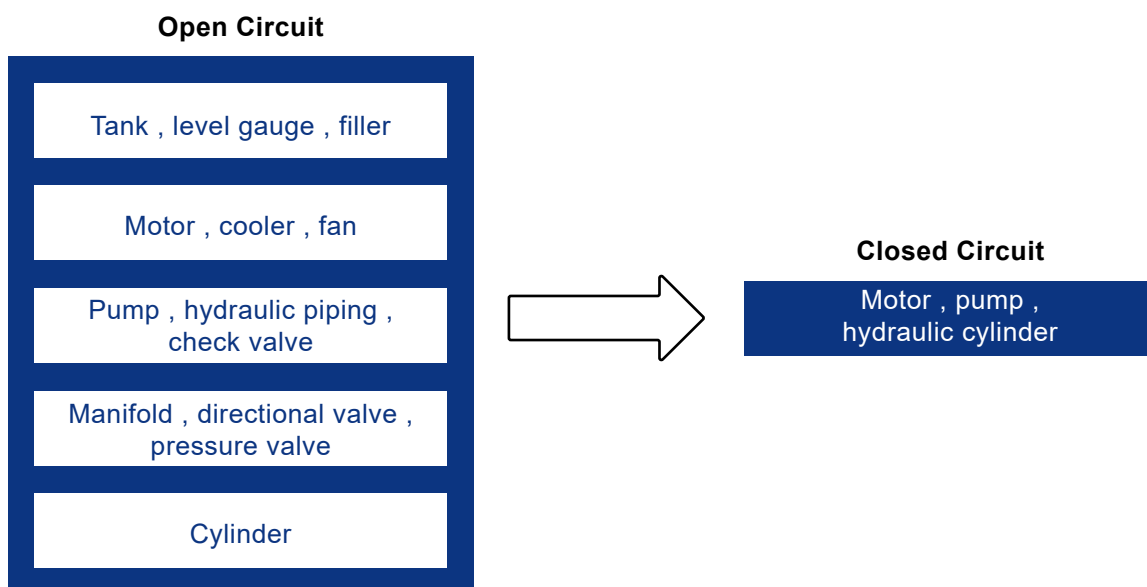
Energy-saving variable displacement swash-plate mechanism

The built-in variable swash-plate design automatically switches to the second-stage displacement according to operating demand : high displacement under low load and low displacement under high load, effectively reducing energy consumption.

Applications

The PPV piston pump is specially designed for closed-circuit hydraulic systems as the main hydraulic power source. This architecture can greatly simplify the hydraulic circuit by eliminating components commonly used in open-circuit systems, such as large oil tanks and directional control valves, reducing system complexity and maintenance cost.

Drive direction can be changed by motor forward/reverse rotation or with a mechanical gear reversing mechanism. The PPV pump supports shaft rotation direction changes while maintaining flexible suction and discharge paths. It is widely applicable to construction machinery, industrial automation equipment, robotic arms, and wheel-drive systems.



Ordering Specifications

Model	Displ. cm ³ /rev	2nd Stage cm ³ /rev	Control Type	Pressure	Thread	Voltage
PPV140 - LS3WM1AFN	140	0~70	LS	250	G (BSPP)	DC24V
PPV140 - LC3WM1A0N	140	0~70	LC	250	G (BSPP)	-

PPV

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Closed-Circuit Bi-Directional Variable Displacement Piston Pump



Model Code Explanation

PPV Closed-Circuit Bi-Directional Variable Displacement Piston Pump

- LN** : Fixed-displacement pump, no regulator
- LS** : Electrically controlled two-stage flow control
- LC** : Self-pressure two-stage flow control (no electric control)

3 : 35~250bar (507~3625 PSI)

0 : No voltage
F : DC24V

1 : BSPP (G)

Series	Displ. Code	Control Method	Pressure Range	Rotation Direction	Mounting Type	Thread	Through-shaft Assembly	Voltage Design No.	Seal	Design number
PPV	140	LS	3	W	M	1	A	F	N	-

- 016** : 16 cm³/rev
- 020** : 20 cm³/rev
- 023** : 23 cm³/rev
- 028** : 28 cm³/rev
- 032** : 32 cm³/rev
- 040** : 40 cm³/rev
- 046** : 46 cm³/rev
- 056** : 56 cm³/rev
- 065** : 65 cm³/rev
- 071** : 71 cm³/rev
- 080** : 80 cm³/rev
- 092** : 92 cm³/rev
- 110** : 110 cm³/rev
- 123** : 123 cm³/rev
- ※ **140** : 140 cm³/rev
- ※ **180** : 180 cm³/rev
- ※ **210** : 210 cm³/rev
- 270** : 270 cm³/rev

W : Forward / reverse rotation

A : Single pump

N : NBR
V : FKM

M : Metric flange , keyed shaft

* Stock specifications. Other specifications are available by custom order.

Product Usage and Control

In a closed-circuit hydraulic system, the PPV closed-circuit bidirectional variable displacement piston pump serves as the main pump and hydraulic power source. Unlike a traditional open-circuit system, it can eliminate hydraulic components such as the tank and control valves.

The motor direction can be switched electrically, or a gear reversing mechanism can be used to actively change the rotation direction. The piston pump accepts shaft rotation direction changes, and Port A and Port B are reversible for reciprocating control of the driving/braking mechanism.

To meet power demand under different working conditions, the PPV pump provides two variable displacement control options for optimal performance and energy use :

- LS electrically controlled two-stage flow control
- LC self-pressure two-stage flow control (no electric control)

Second-stage Flow Adjustment for High Load

The purpose of adjustment is to match the second-stage displacement with the motor power, ensuring that the system will not overload during high-load operation and effectively protecting equipment safety.

The factory default second-stage flow is 5% of maximum flow. Users should first read the maximum working pressure from the pressure gauge according to actual operating requirements, then calculate the appropriate second-stage flow (Q) based on the configured motor power (HP).

P : Maximum working pressure (bar)

Q : Second-stage flow (L/min)

HP : Motor power (horsepower)

$$Q = \frac{HP \times 450}{P}$$

The second-stage flow can also be adjusted by measuring actual current. First refer to the maximum rated current value shown on the motor nameplate, then measure the motor operating current with a meter.

When adjusting the second-stage flow, increase the flow gradually while observing current changes. Do not allow the measured current to exceed the maximum rated value, so that the motor always operates within a safe load range.



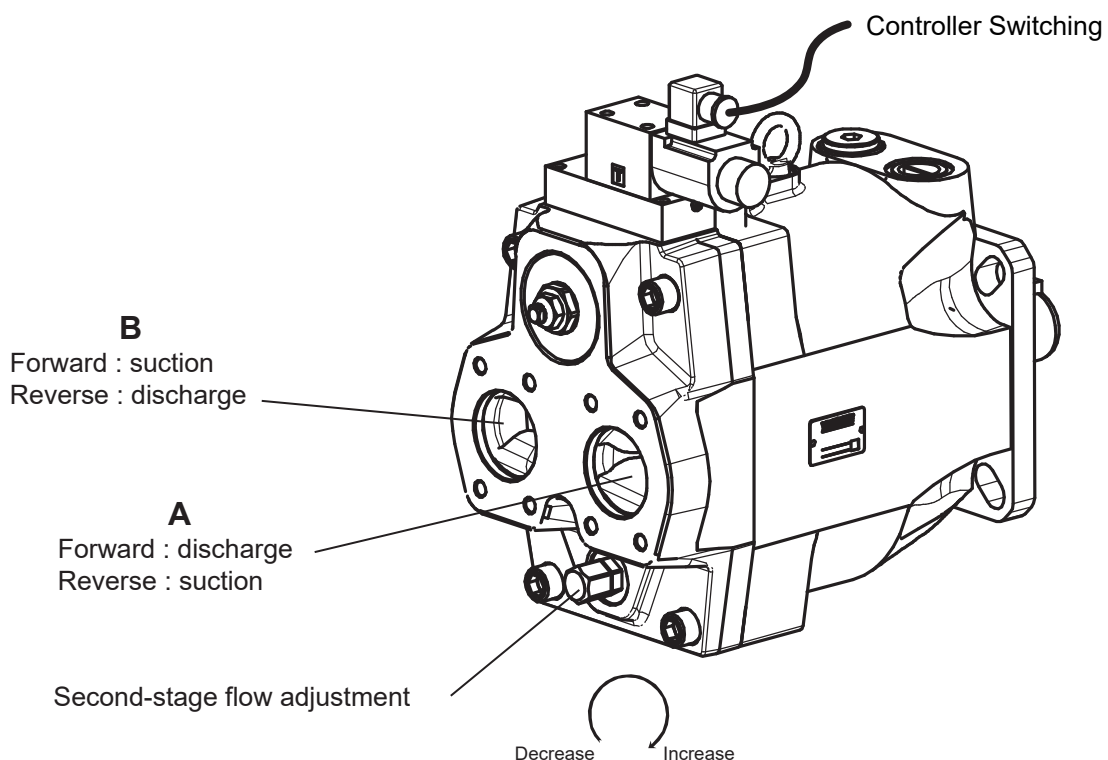
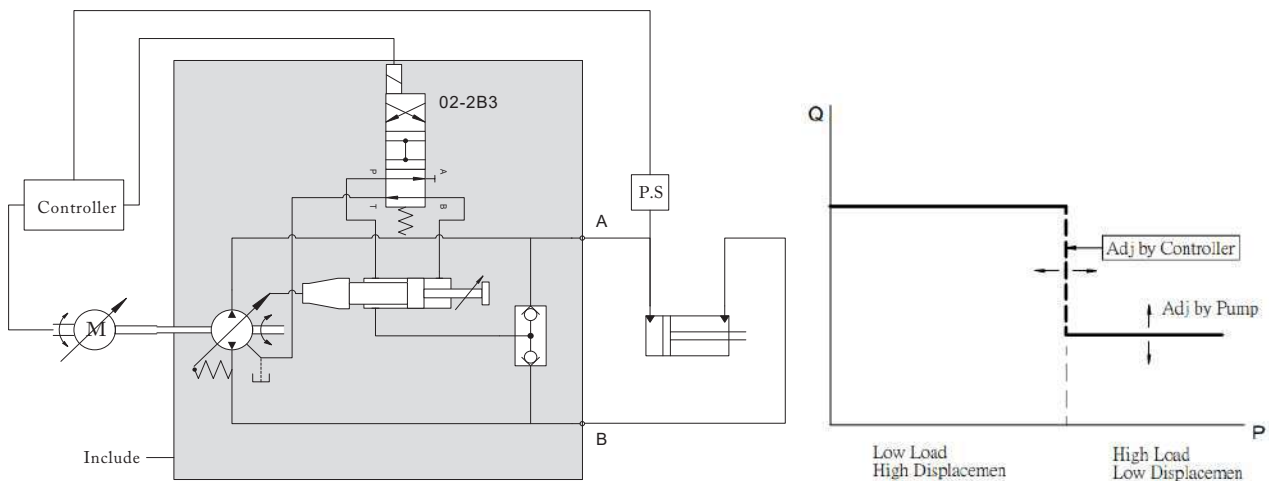
LS Electrically Controlled Two-stage Flow Control

The piston pump accepts shaft rotation direction changes. Port A and Port B are reversible for reciprocating control of the driving/braking mechanism. During start-up and light-load operation, the pump automatically runs in first-stage high-displacement mode to quickly build working pressure. When the load increases, the pressure sensor immediately sends a feedback signal to the controller, driving the solenoid valve to switch to second-stage low-displacement mode. This provides stable power while preventing motor overload and achieving overall energy-saving control.

The controller switches to second-stage displacement when the set pressure is reached. The second-stage flow adjustment range is 0-40% x maximum flow. When the setting approaches 0, a protection function is achieved. When set to 25%, it limits motor power for high-load, low-flow operation. The second-stage flow should be adjusted on site to match motor power (see P5).

When using the PPV pump, the system must be equipped with an additional overall pressure protection device. The internal pressure control of the pump is mainly for switching between high and low displacement, not for pressure protection. Therefore, pressure protection and remote-control elements such as relief valves should be installed on the pump outlet pressure line to ensure safe system operation.

Factory default second-stage flow: 5% x maximum flow. Solenoid voltage : DC24V.



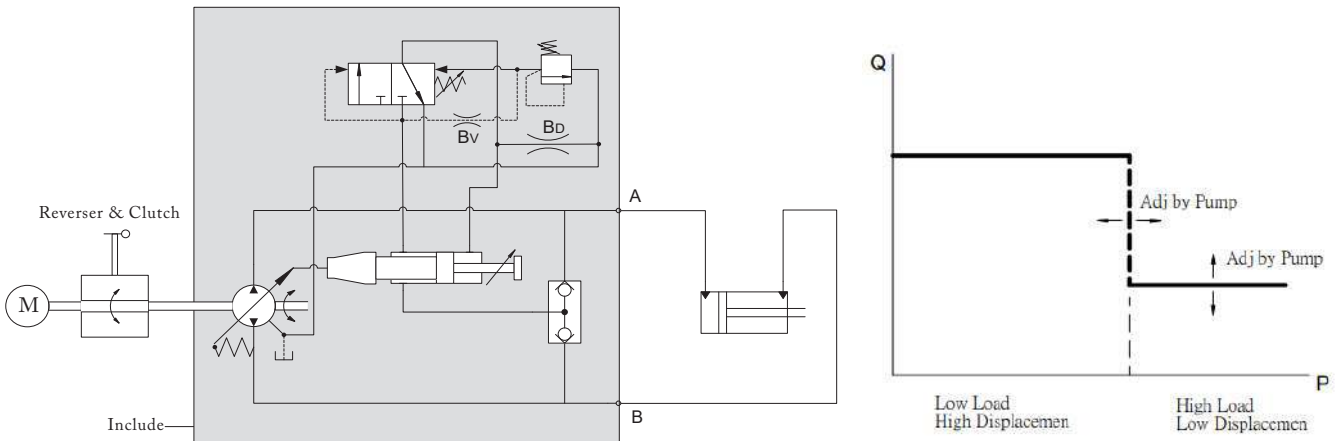
LC Self-pressure Two-stage Flow Control (No Electric Control)

The piston pump accepts shaft rotation direction changes. Port A and Port B are reversible for reciprocating control of the driving/braking mechanism. Without relying on electronic controllers or sensing components, the built-in sequence valve senses pressure changes and switches mechanically. It operates at high displacement under low load, and automatically switches to low displacement when the load rises. This mechanical switching improves system stability and reliability, especially for harsh environments or applications requiring high durability.

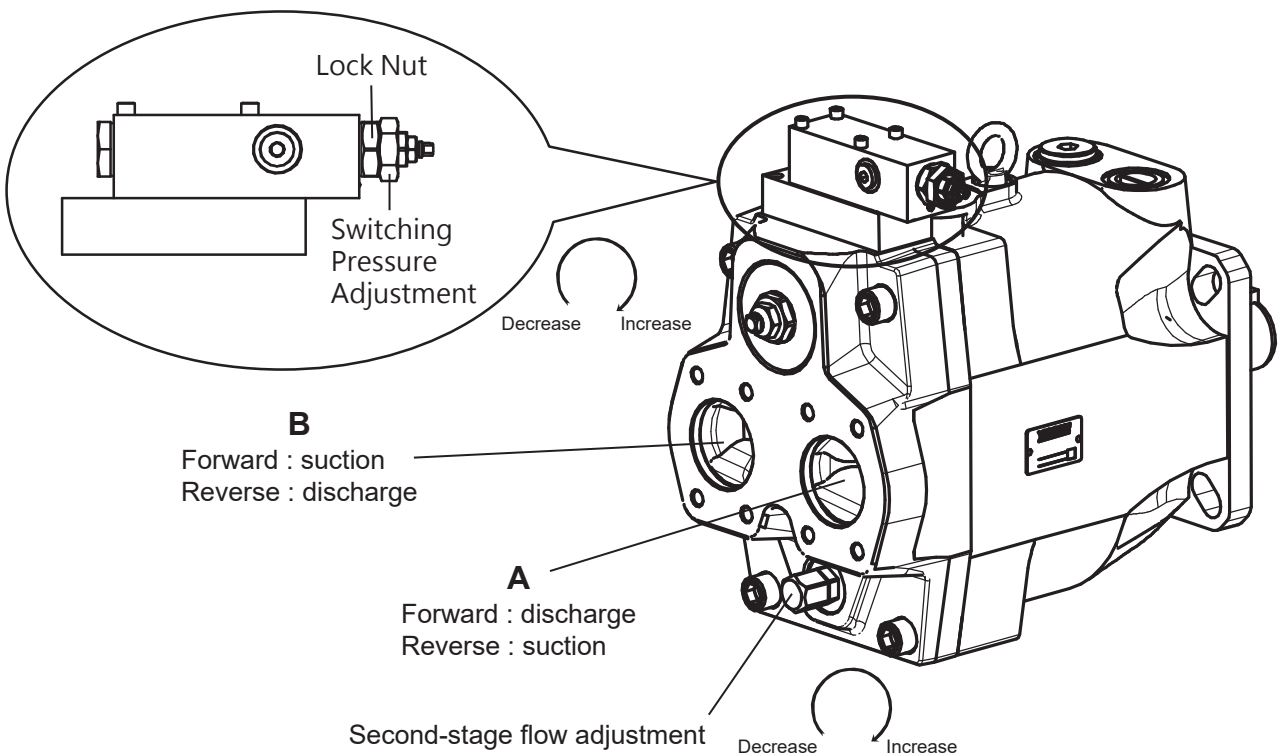
The pump can be set with a switching pressure. When the pressure exceeds the set value, it automatically switches to second-stage displacement. The second-stage flow adjustment range is 0-40% x maximum flow. When the setting approaches 0, a protection function is achieved. When set to 25%, it limits motor power for high-load, low-flow operation. The second-stage flow should be adjusted on site to match motor power (see P5).

When using the PPV pump, the system must be equipped with an additional overall pressure protection device. The internal pressure control is mainly for switching displacement, not pressure protection. Pressure protection and remote-control elements such as relief valves should be installed on the pump outlet pressure line to ensure system safety.

Factory default second-stage flow : 5% x maximum flow.

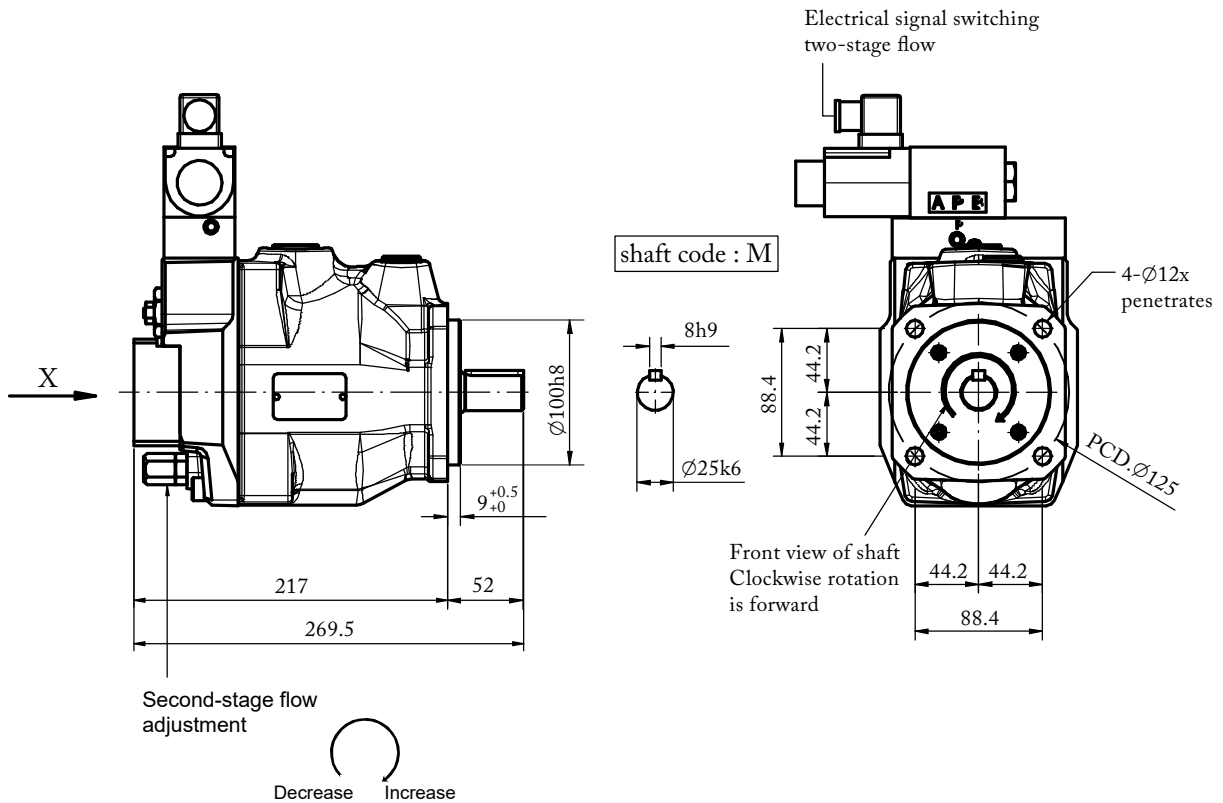
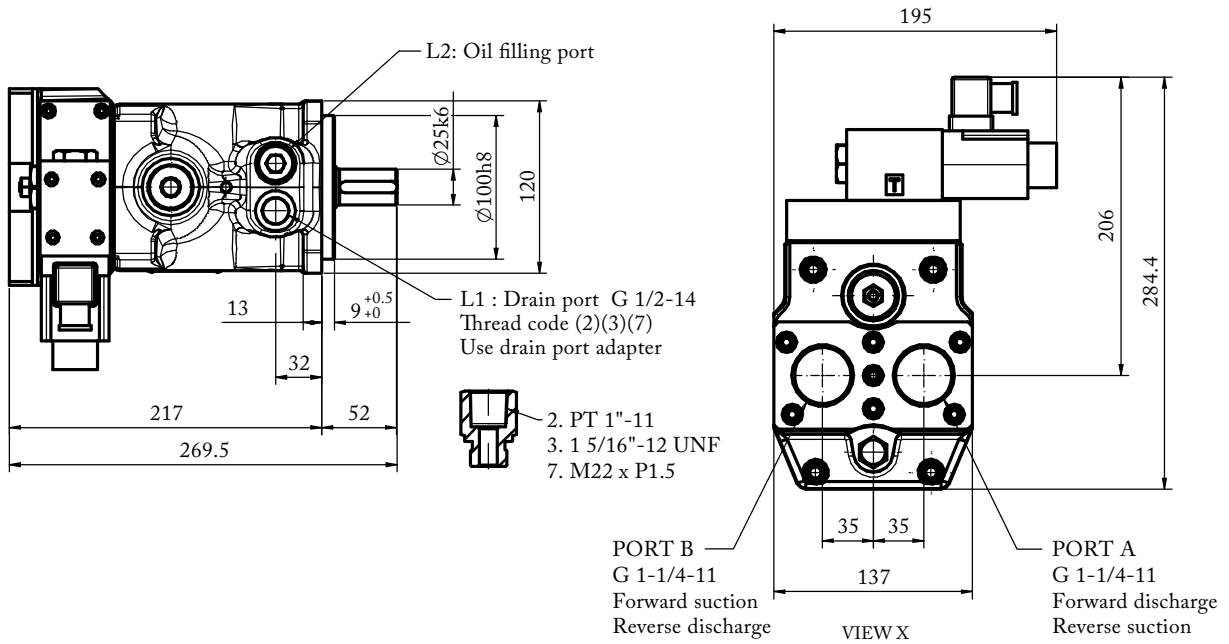


Closed-Circuit Bi-Directional Variable Displacement Piston Pump



Outline Dimensions

PPV016, 020, 023, 028
LS Electrically Controlled Two-stage Flow Control



Outline Dimensions

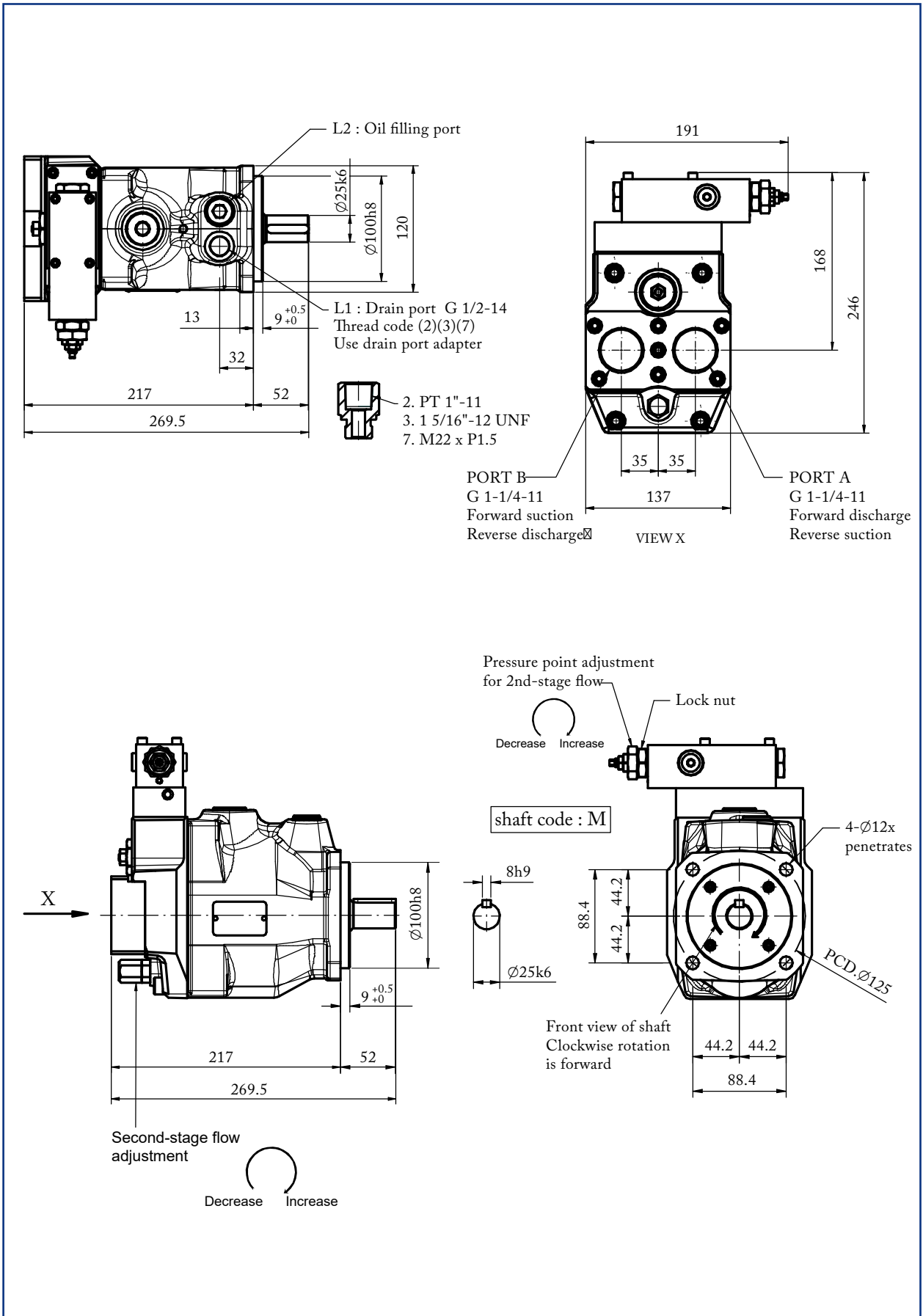
PPV016, 020, 023, 028

LC Self-pressure Two-stage Flow Control (No Electric Control)

PPV

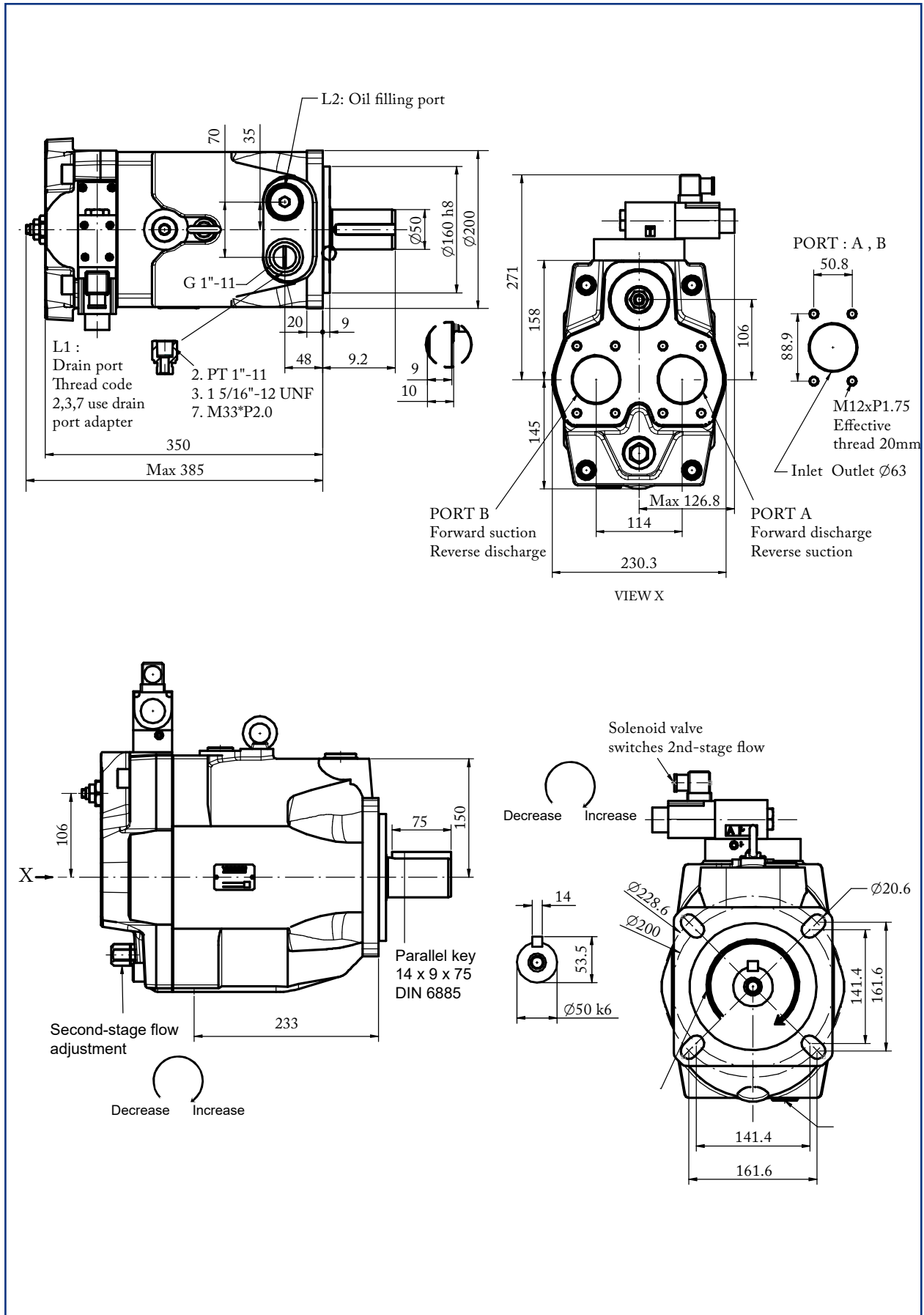
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Closed-Circuit Bi-Directional Variable Displacement Piston Pump



Outline Dimensions

PPV140, 180, 210
LS Electrically Controlled Two-stage Flow Control



Outline Dimensions

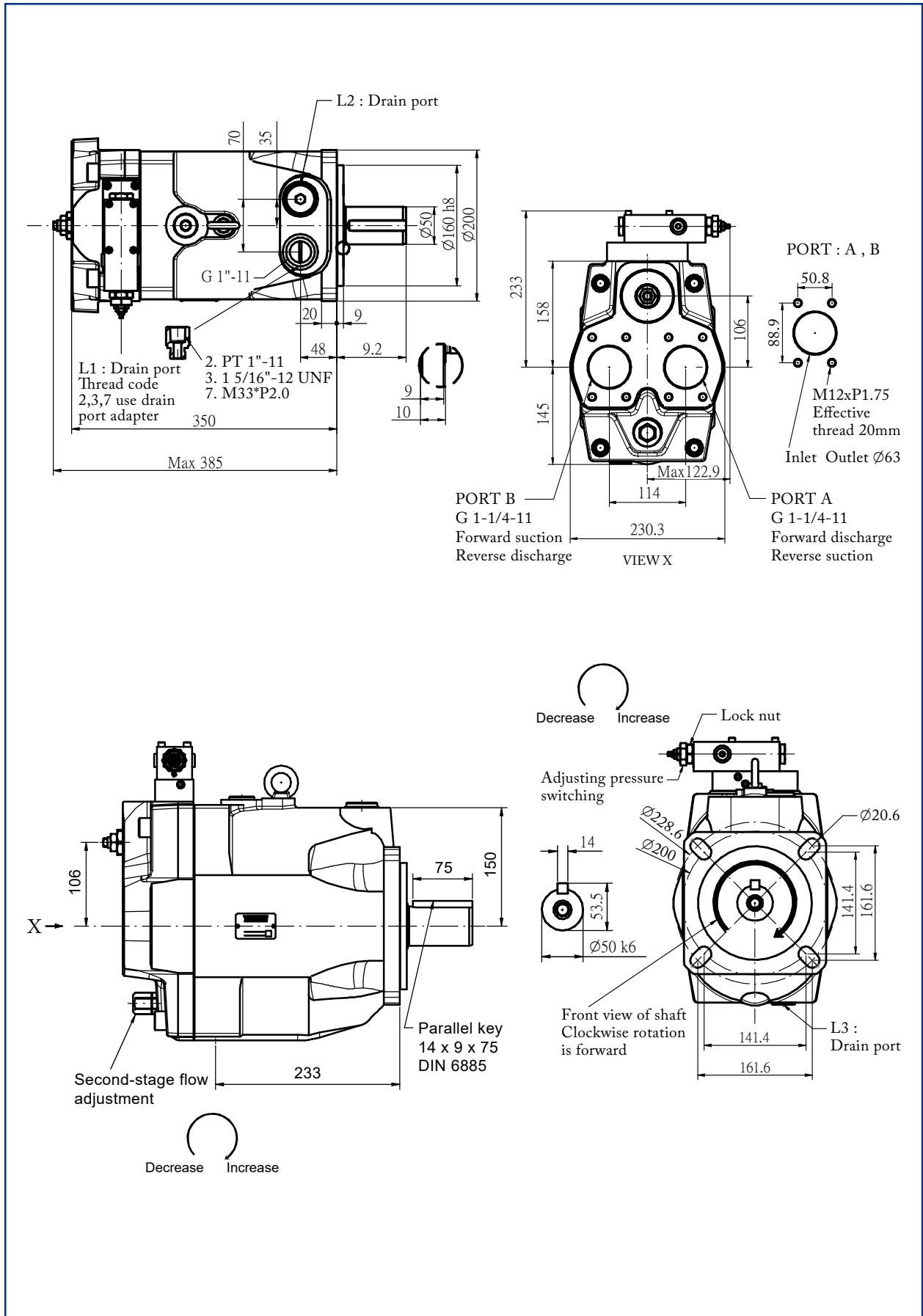
PPV140, 180, 210

LC Self-pressure Two-stage Flow Control (No Electric Control)

PPV

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Closed-Circuit Bi-Directional Variable Displacement Piston Pump



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Efficient Performance
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