K

STANDARD HYDRAULIC POWER UNITS/POWER PACKAGES

Type	Model Numbers	Max. Operating Pres. MPa	Reservoir Capacity L (1 2 5 10 20 50 100 200)	Geometric Displacement cm³/rev (1 2 5 10 20 50)	Page
Low Noise & Small Type Hydraulic Power Units **YP Pack**	YP10	7/16			K-3
	YP16	16			
	YP22				
	YP37				
Low Noise Type Hydraulic Power Units **YA Pack**	YA10	7/16			K-13
	YA16				
	YA22				
	YA37	7			
Small Type Hydraulic Power Units **YA-Light Pack**	YAL8	3.5/7			K-32
	YAL16				
Energy-Saving Hydraulic Power Units **YA-e Pack**	E-YA10	7/16			K-43
	E-YA16				
	E-YA22				
	E-YA37	7			
Energy-Saving Control System for Hydraulic Units	AMC-IV	—	——	——	K-48
Power Packages	PMR2	14			K-52
	PPF2	10.5			
IH Servo Drive Pack	YSD1	10.5			K-61
	YSD2	21			
	YSD3				

- Yuken provides various hydraulic units in accordance with the specifications.
- High efficiency energy-saving hydraulic power units equipped with PM motor are also available. For details, please contact us separately.

Hydraulic Fluids

Type of Fluids

Use petroleum base clean oils equivalent to ISO VG 32 or VG 46.

Recommended Viscosity and Oil Temperature

Use hydraulic fluids which satisfy the both recommended viscosity and oil temperature given in the table below.

Type		Viscosity	Oil Temperature
◦ YP Pack ◦ YA Pack ◦ IH Servo Drive Pack		20 - 400 mm^2/s	0 - 60 °C
◦ YA Series L Pack		20 - 400 mm^2/s	5 - 60 °C
◦ YA-e Pack		20 - 220 mm^2/s	5 - 60 °C
◦ Power Packages	PMR2	20 - 400 mm^2/s	0 - 70 °C
	PPF2	10 - 400 mm^2/s	

Control of Contamination

Due caution must be paid to maintaining control over contamination of the hydraulic fluids which may otherwise lead to breakdowns and shorten the life of the equipments. Please maintain the degree of contamination below.

Type	Contamination Degree
YP Pack, YA Pack, YA Series L Pack, YA-e Pack	Within NAS Grade 10
Power Packages (PMR2/PPF2)	Within NAS Grade 12
IH Servo Drive Pack	Within NAS Grade 9

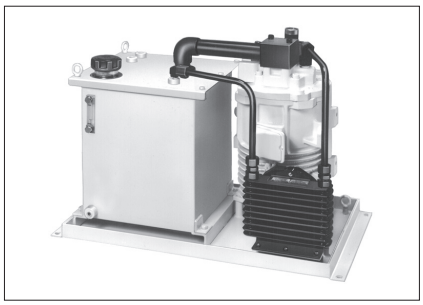
Interchangeability in Installation between Current and New Design

Model change has been made on the following products.

Name	Model Numbers		Mounting Interchangeability	Page	Major Changes
	Current	New			
YP Pack	YP10-＊-＊-＊-22	YP10-＊-＊-＊-23	Yes	K-5	Increase Mass of Pres. Adj. Range “B”
YA Pack	YA10-B-＊-0.75-51 YA10-B-3-1.5-51 YA10-B-4-1.5-51 YA16-B-＊-0.75-50 YA16-B-4-1.5-50	YA10-B-＊-0.75-52 YA10-B-3-1.5-52 YA10-B-4-1.5-52 YA16-B-＊-0.75-52 YA16-B-4-1.5-52	Yes	K-30, K-31	Change The Built-in Motor
YA Series L Pack	YAL＊-＊-＊-＊-10	YAL＊-＊-＊-＊-20	No	K-37, K-38	Change The Built-in Motor [Comply with The Top Runner Criteria]
YA-e Pack	E-YA16-B-2-0.75-50	E-YA16-B-2-0.75-52	Yes	K-47	Change The Built-in Motor
Power Packages	PMR2-＊-＊-＊-＊-＊-35	PMR2-＊-＊-＊-＊-＊-40	Yes	K-59	Bring Built-in M Series Motor into Compliance with The Top Runner Criteria.
IH Servo Drive Pack	YSD1-＊-＊＊＊-＊-＊＊-10	YSD1-＊-＊＊＊-＊-＊＊-20	Yes	K-73 - K-76	Change Servo Motor and Servo Pack
	$YSD\frac{2}{3}$-＊-＊＊-＊-＊＊＊-＊＊-20	$YSD\frac{2}{3}$-＊-＊＊-＊-＊＊＊-＊＊-30			

Low-Noise Compact Type Standard Hydraulic Power Unit YP Pack

YP pack is low-noise & compact unit equipped with PAL pump of excellent performance as power resource. It saves floor space for installation by compact design. And YUKEN has achieved noise level 55 dB(A) comfortable never before.



Low Noise & Low Vibration

Equipped with low-noise PAL pump and drain cooler. Also, low noise and vibration levels have been achieved by effectively arraying the components to control vibration.

Compact Design

YP pack is well designed to be compact by uprighting the PAL pump and reducing the fluid temperature rise ratio added small size reservoir. It saves floor space for installation.

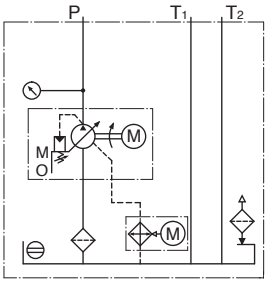
Low Fluid Temperature Rise

Standard equipment, built-in drain cooler and radiator fins of PAL pump, reduce the fluid temperature rise ratio. Good solution for heat distortion of machines.

Wide Range

YP packs offer nine different models in variety. Seven kinds of options are available such as YP pack with control circuit consists of modular & solenoid operated directional valve.

Hydraulic Circuit



Specifications

Model Numbers	Geometric Displacement of Pump cm^3/rev	Max. Operating Pres. MPa	Pres. Adj. Range MPa	Reservoir Capacity L	Electric Motor 50 Hz : 200 V AC 60 Hz : 200 V/220 V AC	Approx. Mass kg (excluding hydraulic fluid)
YP10-B-1-0.75-23	10.0	7	B : 1.2 - 7	10	0.75 kW×4P	63
YP10-✻-1-1.5-23		16	B : 1.2 - 7 C : 2 - 16	10	1.5 kW×4P	B:73 C:68
YP16-✻-1-1.5-22	15.8			10	1.5 kW×4P	80
YP16-✻-1-2.2-22				10	2.2 kW×4P	90
YP16-✻-2-2.2-22				20	2.2 kW×4P	90
YP22-✻-2-2.2-22	22.2			20	2.2 kW×4P	90
YP22-✻-3-3.7-22				30	3.7 kW×4P	110
YP37-✻-3-3.7-22	36.9			30	3.7 kW×4P	150
YP37-✻-3-5.5-22				30	5.5 kW×4P	150

●Drain Cooler Electric Specifications

・50 Hz : 200 V AC (Single Phase), 28W ・60 Hz : 200 V AC (Single Phase), 26 W ・60 Hz : 220 V AC (Single Phase), 31 W

・Lead Wire Length : 3 m

Model Number Designation

YP	16	−B	−1	−2.2	−22
Series Number	Built-in Pump	Pres. Adj. Range MPa	Reservoir Capacity L	Electric Motor	Design Number
YP : Low-Noise Compact Type Standard Hydraulic Power Unit YP Pack	10 : PM10 (10.0 cm^3 /rev)	B : 1.2 - 7	1 : 10	0.75 : 0.75 kW×4P	23
		B : 1.2 - 7 C : 2 - 16	1 : 10	1.5 : 1.5 kW×4P	
	16 : PM16 (15.8 cm^3 /rev)		1 : 10	1.5 : 1.5 kW×4P	22
				2.2 : 2.2 kW×4P	
	22 : PM22 (22.2 cm^3 /rev)		2 : 20	2.2 : 2.2 kW×4P	
			2 : 20	2.2 : 2.2 kW×4P	
			3 : 30	3.7 : 3.7 kW×4P	
	37 : PM37 (36.9 cm^3 /rev)		3 : 30	3.7 : 3.7 kW×4P	
				5.5 : 5.5 kW×4P	

K

YP Pack

Options

❶ Base Plate Embedded：01M＊
Control circuit can be constructed by just stacking up modular valves/ solenoid valve atop the base plate. However, the circuit construction is limited to modular valves and standard solenoid directional control valves. In this case, please, indicate power supply for operation.

❷ Pressure Gauge and Mounting Block Embedded：G2, G3
Use in case that detect the pressure except pump discharge pressure by using reducing valve.
G2 is able to detect one more line pressure, G3 is able to detect two more lines except pump discharge pressure.

❸ Return Filter Embedded：F
Return filter adopt the tank top type those surge pressure of tank line lower generate. The absolute filtration is 20 μm, equipped with visual indicator.

❹ Tank Magnet Embedded：Mg
Installed inside the tank. Attracts and collects fine iron powder. Decreases component wear.

❺ Oil Level Gauge with Thermometer Embedded：Te

❻ Thermostat Embedded：TR

❼ Liquid Level Switch Embedded：Le

❽ External Paint Color Changed：PT
The standard models are painted by Munsell 2.5Y9/2, color code H22-90D. In case if required special paint, please indicate separately by JPMA code or Munsell value.

❾ Water Leak Inspection：RK
YUKEN conduct water leak inspection of tank.

❿ Different Voltage Electric Motor：(＊V×＊Hz)
200 V AC (50Hz) and 200/220/230 V AC (60Hz) are standard. In case if required other voltage, please indicate voltage and frequency. In case of 50Hz, choose from 230/380/400/415 V, in case of 60 Hz, choose from 400/440/460 V.
The drain cooler has no different voltage specifications, so please prepare another power supply of single phase 200 V AC (50Hz) or 200/220 V AC (60Hz) on the machine side.

Applicable Options Table

Available options are indicated with ○ mark.

Option Code	01M＊	G＊	F	Mg	Te	TR	Le	PT	RK	＊V×＊Hz
Option Item / Model	❶ Base Plate Embedded / Number of Base Plate Stations	❷ Pressure Gauge Embedded	❸ Return Filter Embedded	❹ Tank Magnet Embedded	❺ Oil Level Gauge with Thermometer Embedded	❻ Thermostat Embedded	❼ Liquid Level Switch Embedded	❽ External Paint Color Changed	❾ Water Leak Inspection	❿ Different Voltage Electric Motor
YP10-B-1-0.75-23	○ 1 to 3 Stations	○ G2 G3	×	○	○	○	○	○	○	50 Hz：230/380/400/415 V 60 Hz：400/440/460 V
YP10-＊-1-1.5-23			×	○	○	○	○	○	○	
YP16-＊-1-1.5-22			×	○	○	○	○	○	○	
YP16-＊-1-2.2-22			×	○	○	○	○	○	○	
YP16-＊-2-2.2-22			○	○	○	○	○	○	○	
YP22-＊-2-2.2-22			○	○	○	○	○	○	○	
YP22-＊-3-3.7-22			○	○	○	○	○	○	○	
YP37-＊-3-3.7-22			○	○	○	○	○	○	○	
YP37-＊-3-5.5-22			○	○	○	○	○	○	○	

Option Indication Method

When ordering YP Pack with options, please add「OP」at the end of standard YP Pack model number, use the example below for reference and indicate options. For summary of options, please refer to the above table.

【Example of Option Indication】

YP16-B-1-2.2-22-OP

OP -01 M3 G2 F Mg Te TR Le PT RK (380×50)

Option Incl.

Base Plate Embedded ❶
Base Plate Size
01：01 Size (1/8)

Number of Base Plate Stations ❶
M1：1 Station
M2：2 Stations
M3：3 Stations

Pressure Gauge Embedded ❷
G2：Pressure Gauge 2 Pieces
G3：Pressure Gauge 3 Pieces

F：Return Filter Embedded ❸

Mg：Tank Magnet Embedded ❹

Oil Level Gauge with Thermometer Embedded ❺

Thermostat Embedded ❻

Liquid Level Switch Embedded ❼

PT：External Paint Color Changed ❽
Note) Indicate separately by JPMA code or Munsell value.

RK：Water Leak Inspection ❾

Different Voltage Electric Motor ❿
Fill in "Voltage × Frequency"in case if they differ from standard voltage only.

Instructions

Suction/Return Air

Don't put any obstructions at air vent surface of the drain cooler.
Please install unit at the floor with good air flow to avoid heat stuff.

Transportation

Use eye bolts at the time of transportation.

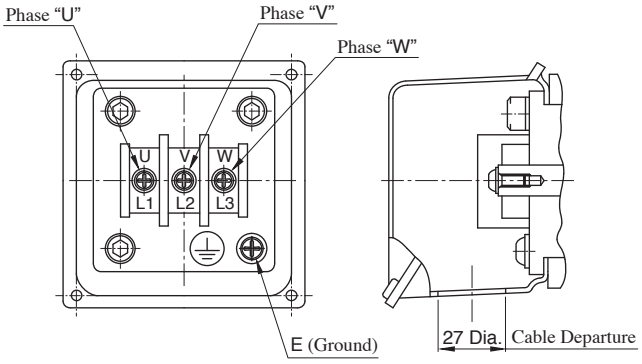
Installation

This unit is stationary type, so please fix it using bolts on the level space with no vibration.

Electrical Wiring

To protect electrical circuit from over current like short and protect motor from overload, we recommend to install no-fuse breaker with earth leakage breaker on the primary power supply.
For electrical wiring, please use crimp terminals of suitable size, and connect certainly to avoid electric leakage for main body and interphase electrical short. Please be sure to ground the earth terminal.

【Terminal Box Detail】



【Connecting Screw Size : 】

Phase "U" "V" "W" M 4

E (Ground) M 6 Motor Side [U — R, V — S, W — T] Power Supply Side

Note for Starting Operation

Before initial operation, please supply ruled mass of hydraulic fluid required from oil tank port, and fill clean hydraulic fluid from filling port of pump. Be sure to confirm that all of hydraulic circuits and electrical circuits have already prepared for starting operation. To avoid air-bound at starting operation, please adjust hydraulic circuit as that pump drain fluid return directly to oil tank, or operate directional valves for actuators no-load moving. When operate pump, also have to operate drain cooler.
There are cases when pressure increasing take time to drain air from pump or pipes. If after five minutes, the pressure does not yet increase, it may possible of motor reverse rotation, please cut off the power and check wiring.

Air Vent

Because air entrainment in pump or pipe may cause to occur vibration, please make air vent completely.

Setting of Pressure and Output Flow

〔Pressure Adjustment〕

At the time of shipping, the pressure set at minimum level, so please adjust the pressure under using conditions. Turn the pressure adjustment screw clockwise, the pressure increase. For adjustment volumes at one rotation of adjustment screw, please refer to the table below. After adjustments, do not forget to tighten the lock nut.

【Adjustment Volumes at One Rotation of Pres. Adj. Screw】

Model Numbers	Adjustment Volumes MPa
YP10/16/22–B	2.9
YP10/16/22–C	5.4
YP37–B	3.5
YP37–C	6.5

〔Output Flow Adjustment〕

Turn the flow adjustment screw clockwise, the output flow decrease. For adjustment volumes at one rotation of adjustment screw, please refer to the table below. After adjustments, do not forget to tighten the lock nut.

【Adjustment Volumes at One Rotation of Discharge Volume Adj. Screw】

Model Numbers	Adjustment Volumes at One Rotation cm^3/rev	Min. Adj. Flow cm^3/rev
YP10	1.1	2
YP16	1.5	6
YP22	2.1	8.5
YP37	2.9	10

Interchangeability between Current and New Models

As of YP 10 type model, the design number has changed from 22 to 23 due to change of built-in pump.

Change Details

Pressure adjustment range "B" mass increased 4kg.

Current		New	
Model Numbers	Mass kg	Model Numbers	Mass kg
YP10-B-1-0.75-22	58	YP10-B-1-0.75-23	63
YP10-B-1-1.5-22	68	YP10-B-1-1.5-23	73

★YP10-C-1.1.5 has no change, but the design number also change to 23.

Interchangeability in Installation

Yes

Specifications / Dimensions / Performance

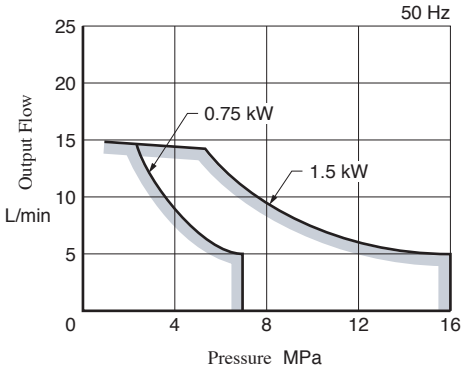
Those of current and new models are same, except for the mass.

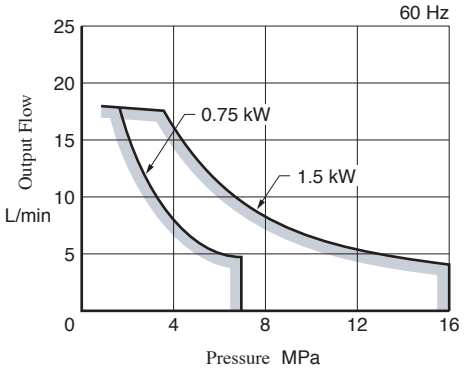
The characteristics below are the typical ones under viscosity 32 mm²/s (ISO VG32 oils, oil temperature 40℃)

■ Selection Graph

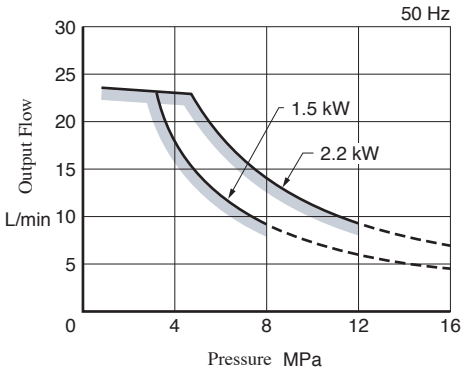
Below ▒▒ portion of the graph is the allowable operating range with regards to rated output of electric motor.
Note) ---- Lines of graphs indicate under minimum adjustment flow rate of pump. If use under minimum adjustment flow rate, please contact us.

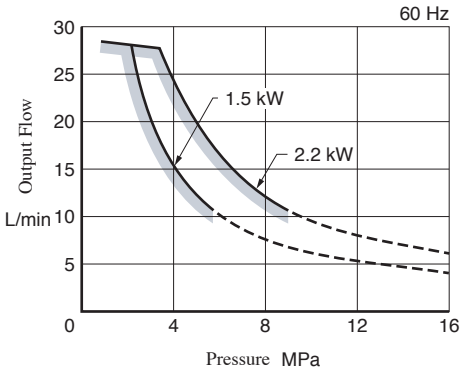
●YP10



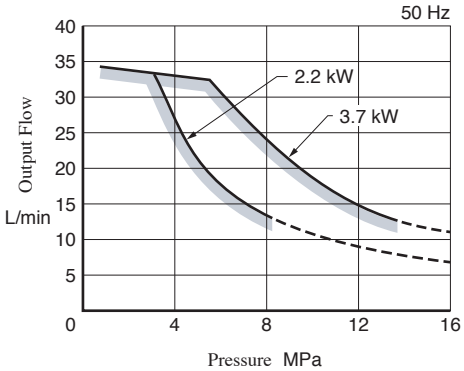


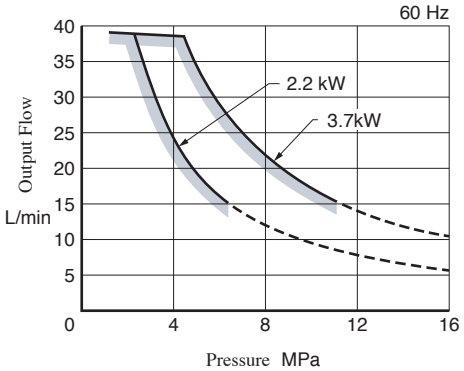
●YP16



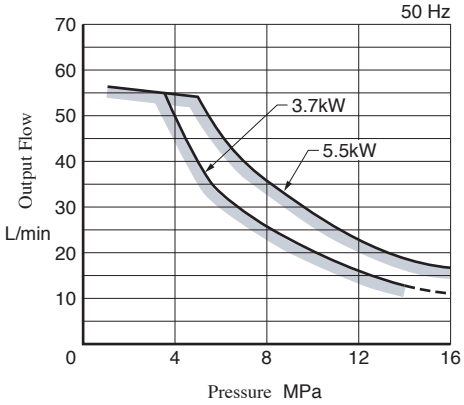


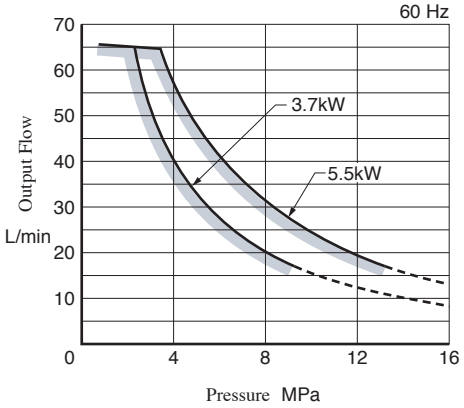
●YP22





●YP37



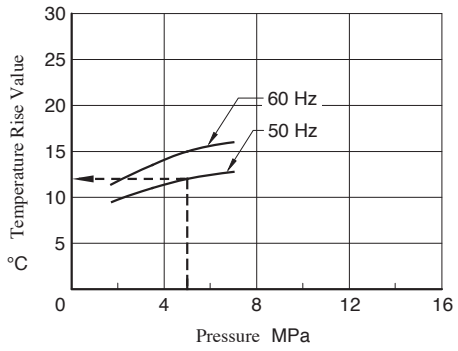


■ Oil Temperature in Reservoir〔full cut-off pressure〕

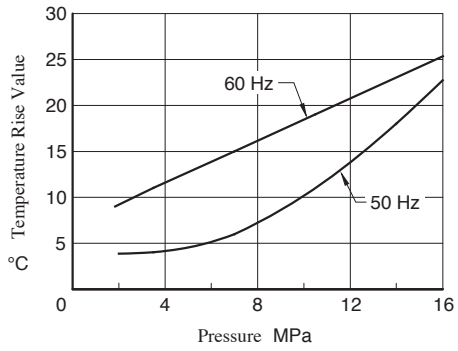
Oil temperature is expressed as (room temperature + temperature rise value). Temperature rise values (full cut-off continuous operation, windless conditions) for each model are shown below, please, check that oil temperature is below 60°C.

Note) When operating YP10-B-1-0.75 continuously (50Hz) at full cut-off pressure 5MPa, temperature rise value is 12°C as shown by broken line in the graph. Assuming that room temperature is 35°C then tank temperature will be 47°C.

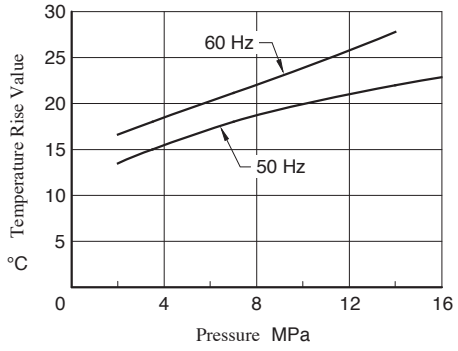
●YP10-B-1-0.75



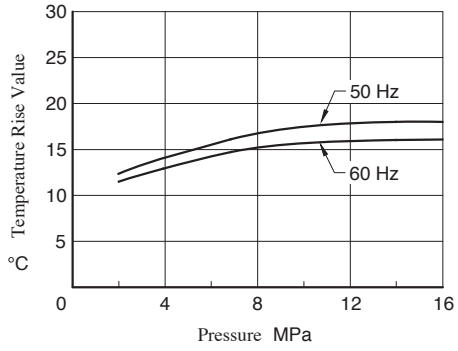
●YP10-C-1-1.5



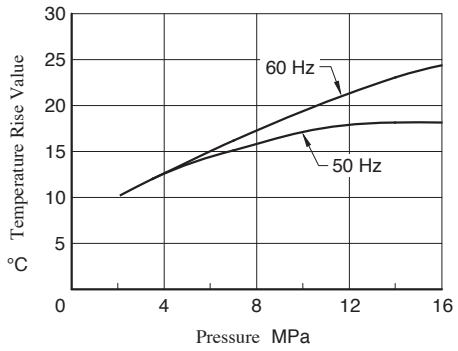
●YP16-＊-1-1.5



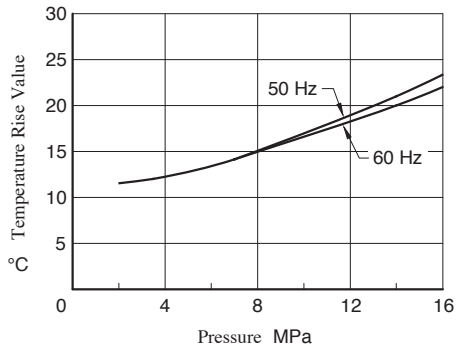
●YP16-＊-1-2.2



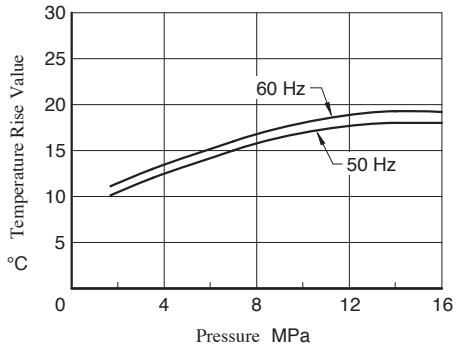
●YP16-＊-2-2.2



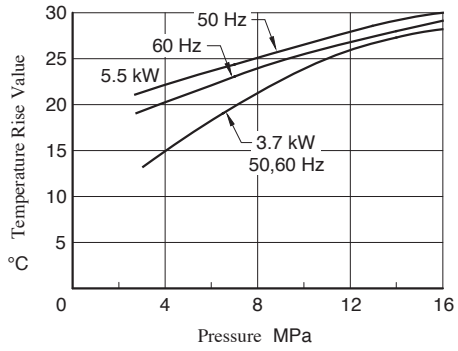
●YP22-＊-2-2.2



●YP22-＊-3-3.7



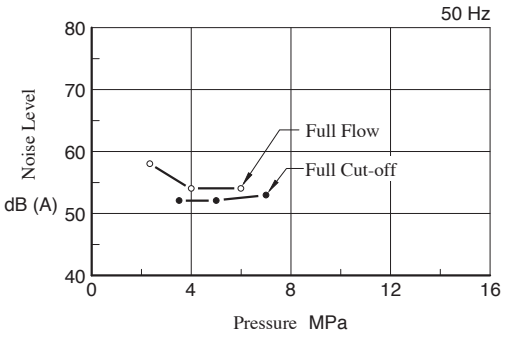
●YP37-＊-3-3.7/5.5

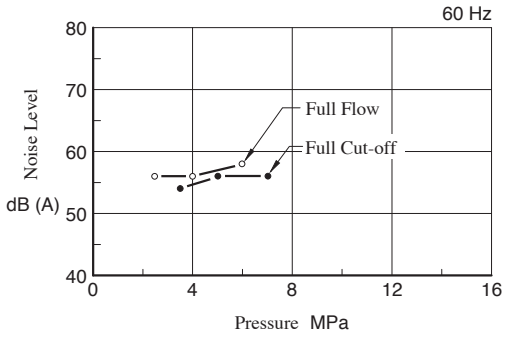


The characteristics below are the typical ones under viscosity 32 mm²/s (ISO VG32 oils, oil temperature 40℃)

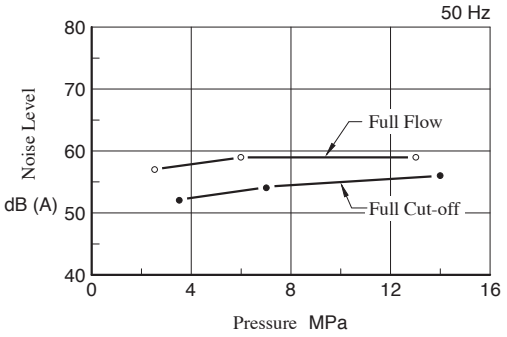
■ Noise Characteristics (Example) 〔Location of Measurement: 1m from the pump〕

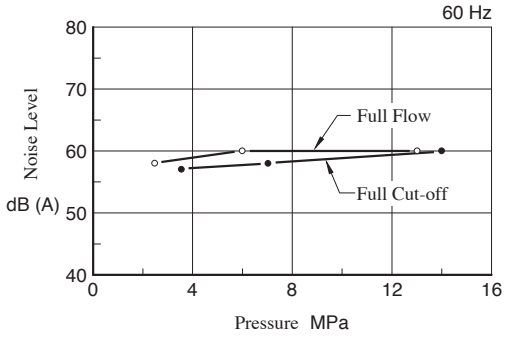
●YP10-B-1-0.75



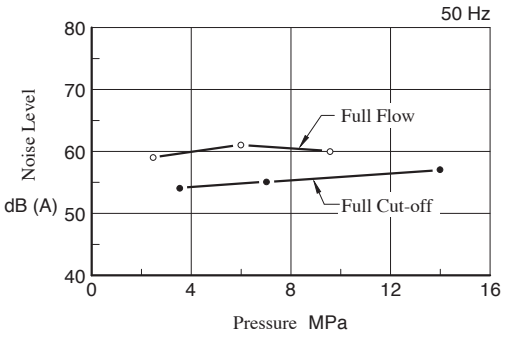


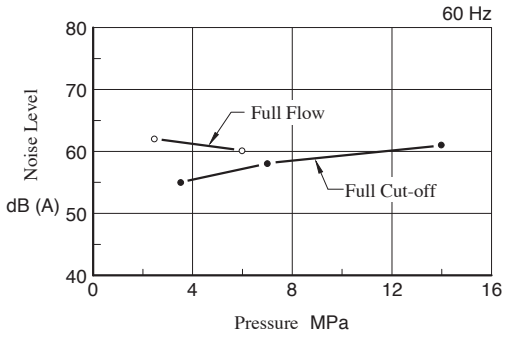
●YP10-＊-1-1.5



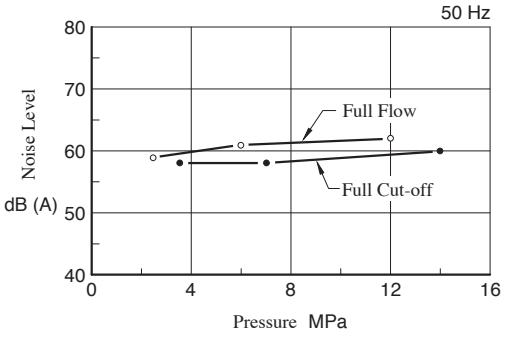


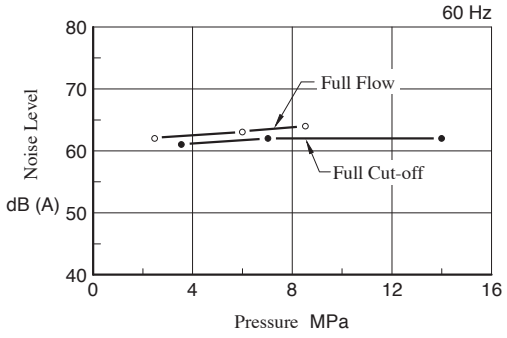
●YP16-＊-1-1.5





●YP16-＊-1-2.2

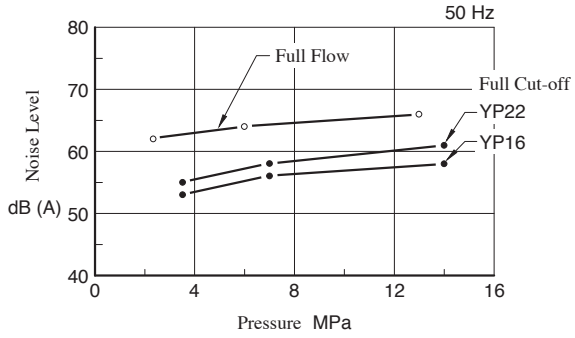


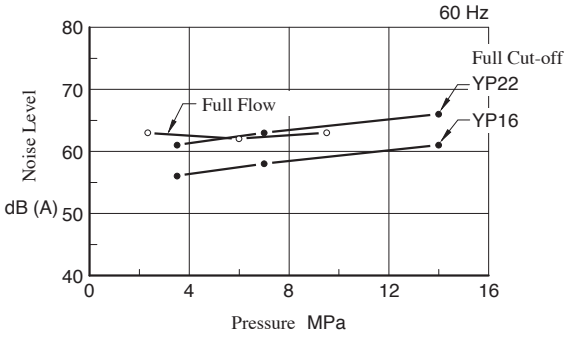


The characteristics below are the typical ones under viscosity 32 mm²/s (ISO VG32 oils, oil temperature 40℃)

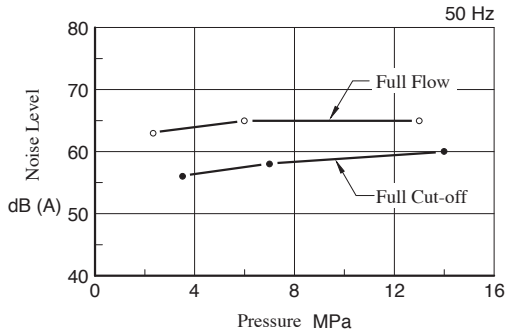
■ Noise Characteristics (Example) 〔Location of Measurement: 1m from the pump〕

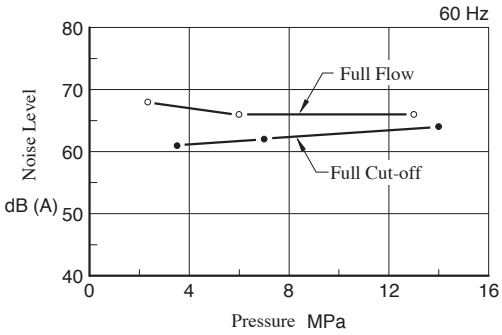
●YP16/22-＊-2-2.2



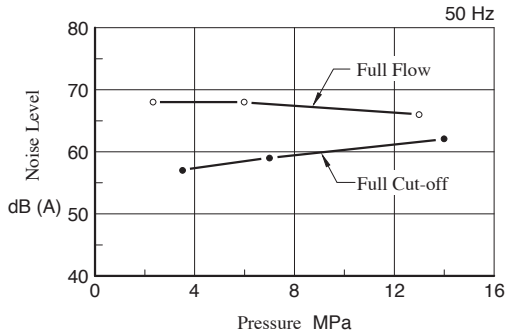


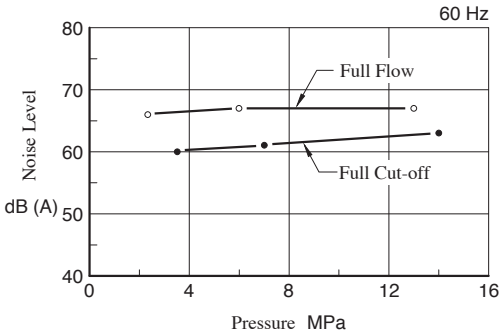
●YP22-＊-3-3.7



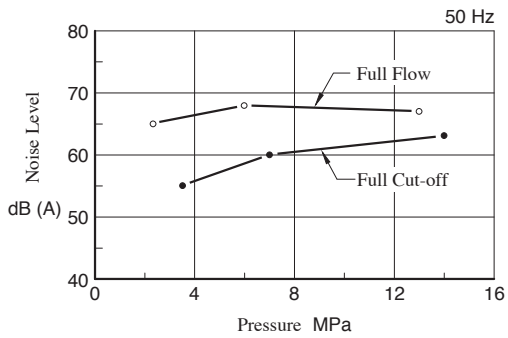


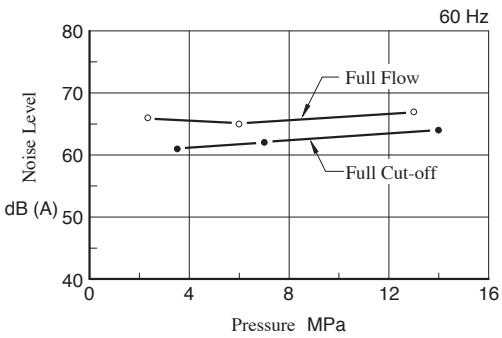
●YP37-＊-3-3.7



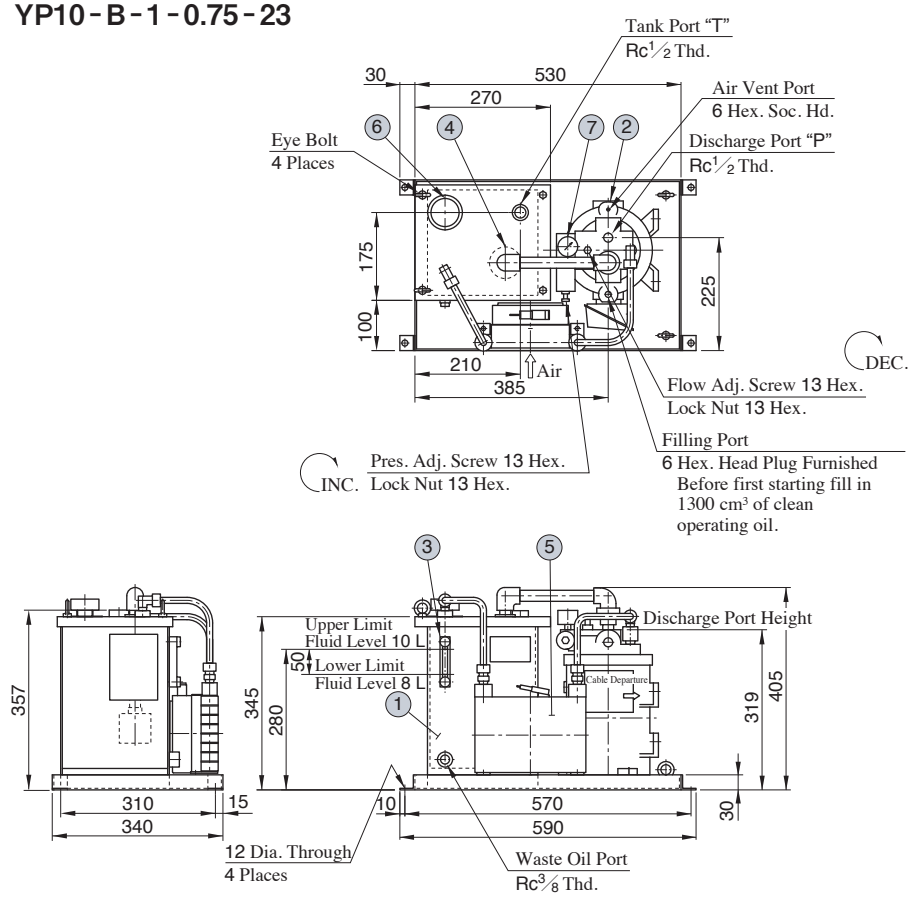


●YP37-＊-3-5.5

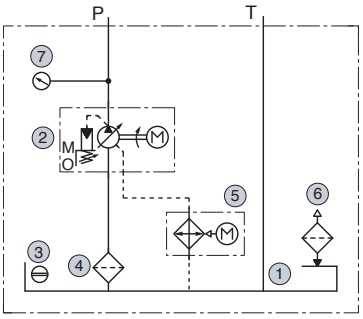




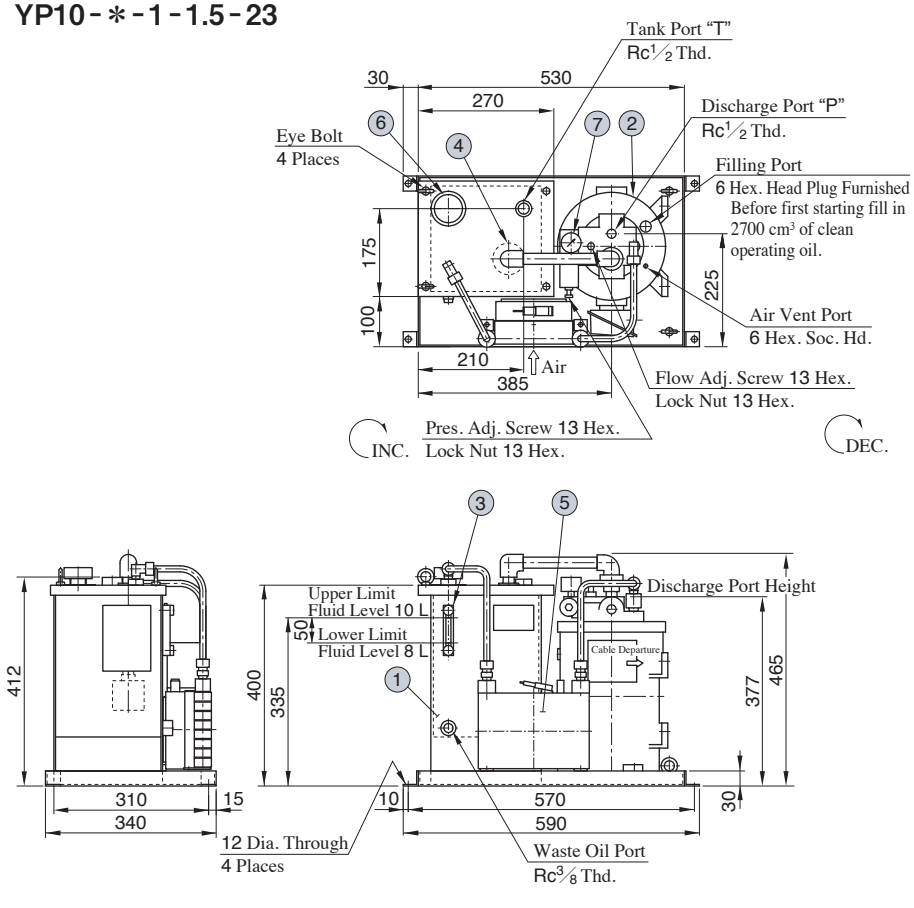
YP10-B-1-0.75-23



Hydraulic Circuit

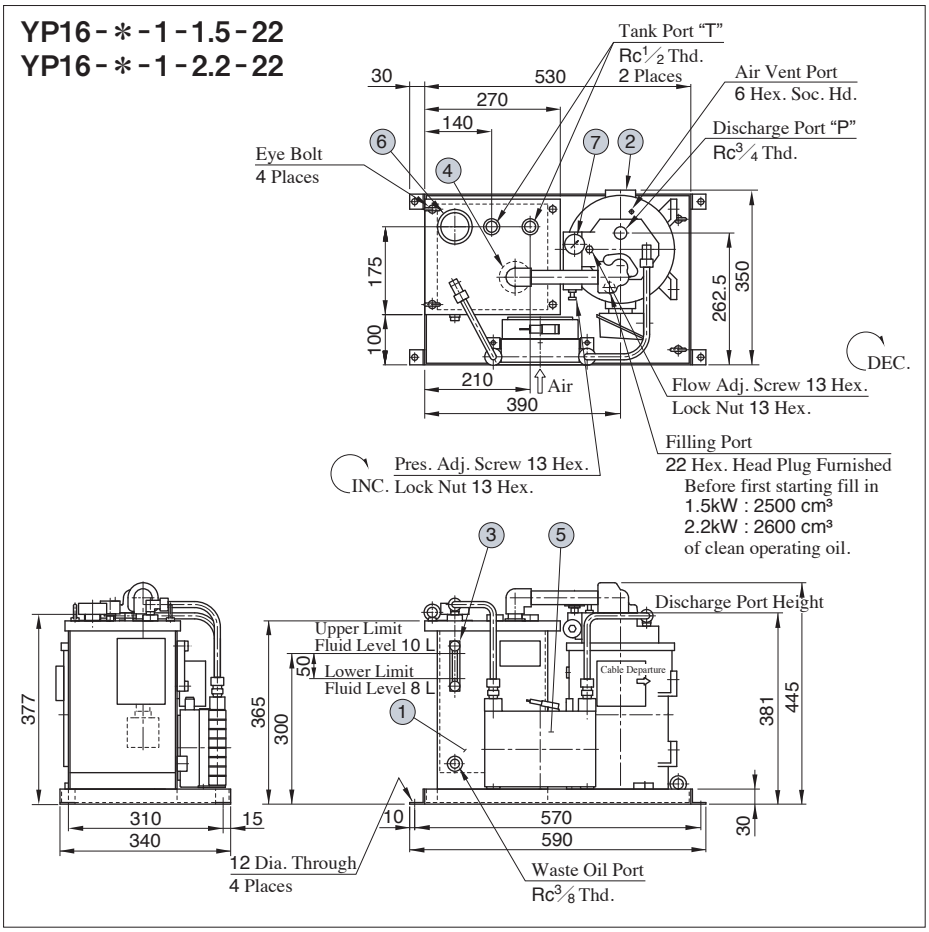


YP10-*-1-1.5-23

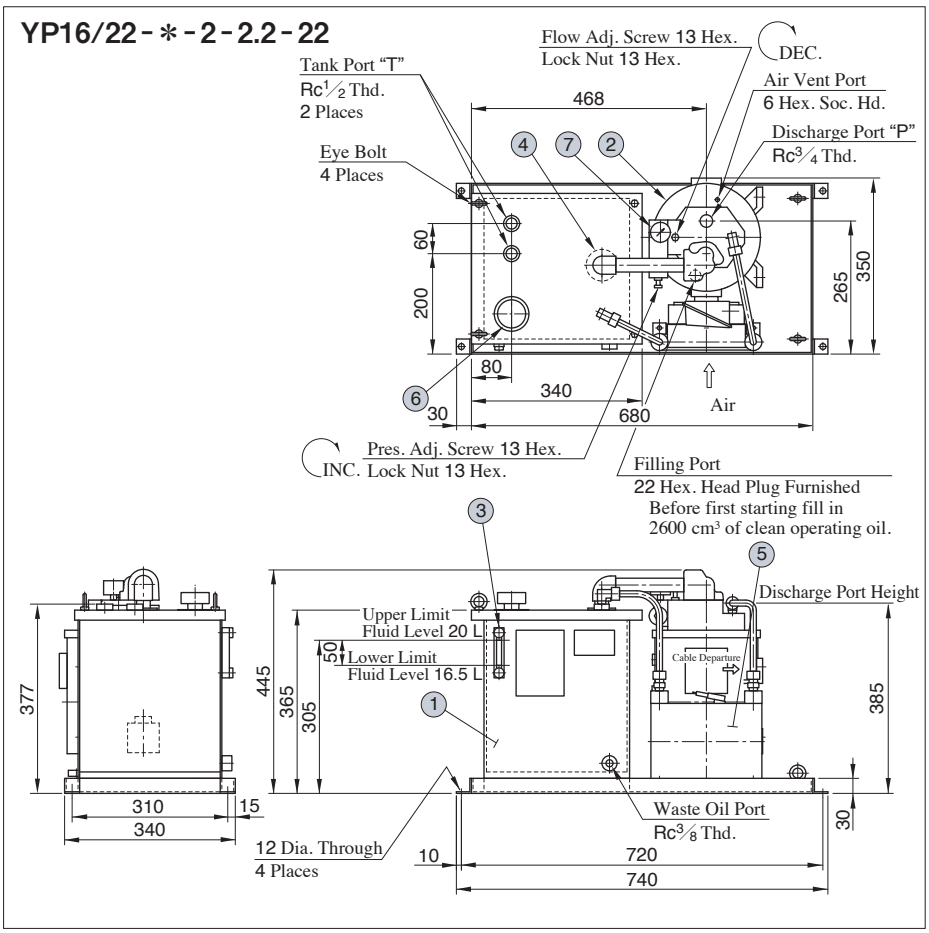


Item	Name
1	Hydraulic Reservoir
2	Pal Pump
3	Oil Level Gauge
4	Suction Strainer
5	Drain Cooler
6	Air Breather with Filling Port
7	Pressure Gauge

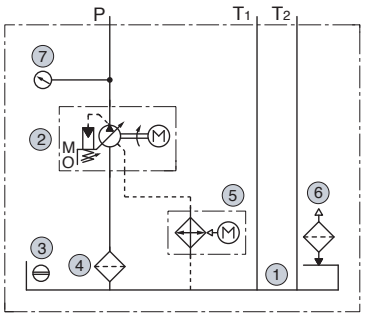
YP16-*-1-1.5-22
YP16-*-1-2.2-22



YP16/22-*-2-2.2-22

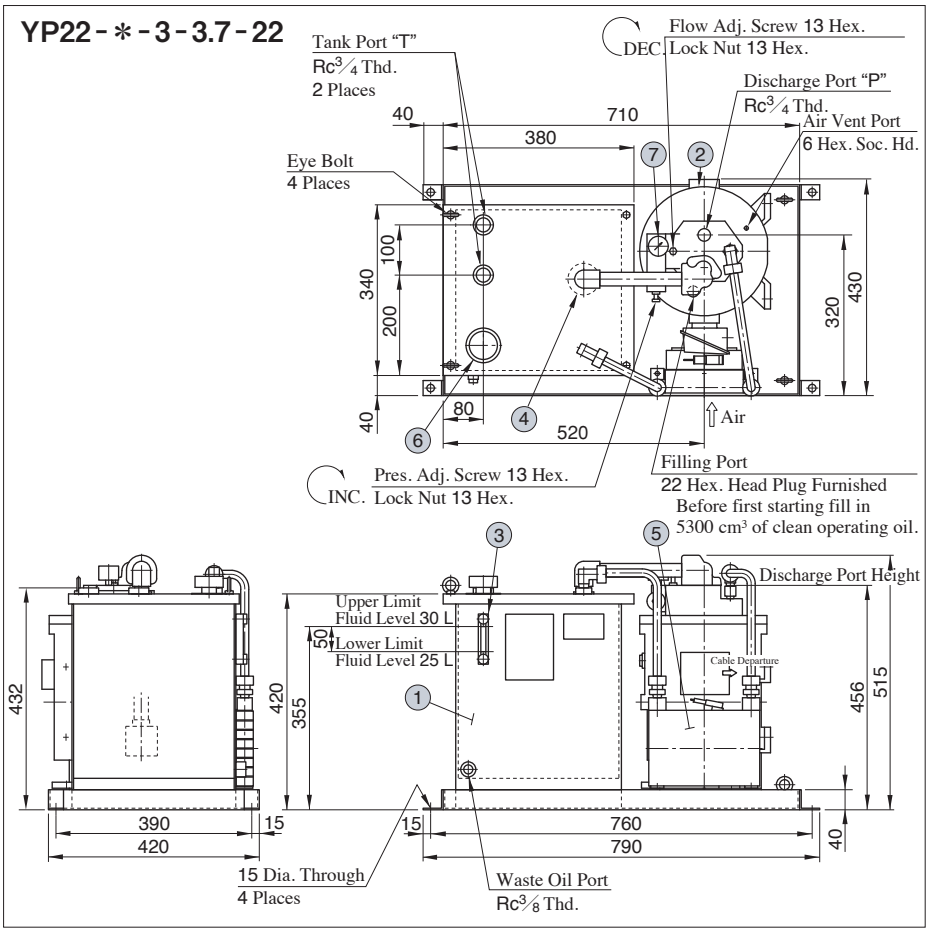


Hydraulic Circuit

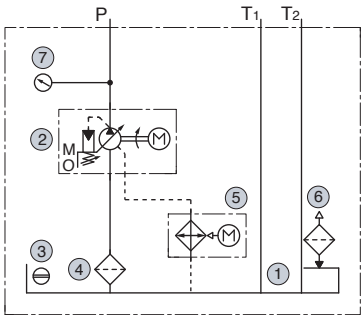


Item	Name
1	Hydraulic Reservoir
2	Pal Pump
3	Oil Level Gauge
4	Suction Strainer
5	Drain Cooler
6	Air Breather with Filling Port
7	Pressure Gauge

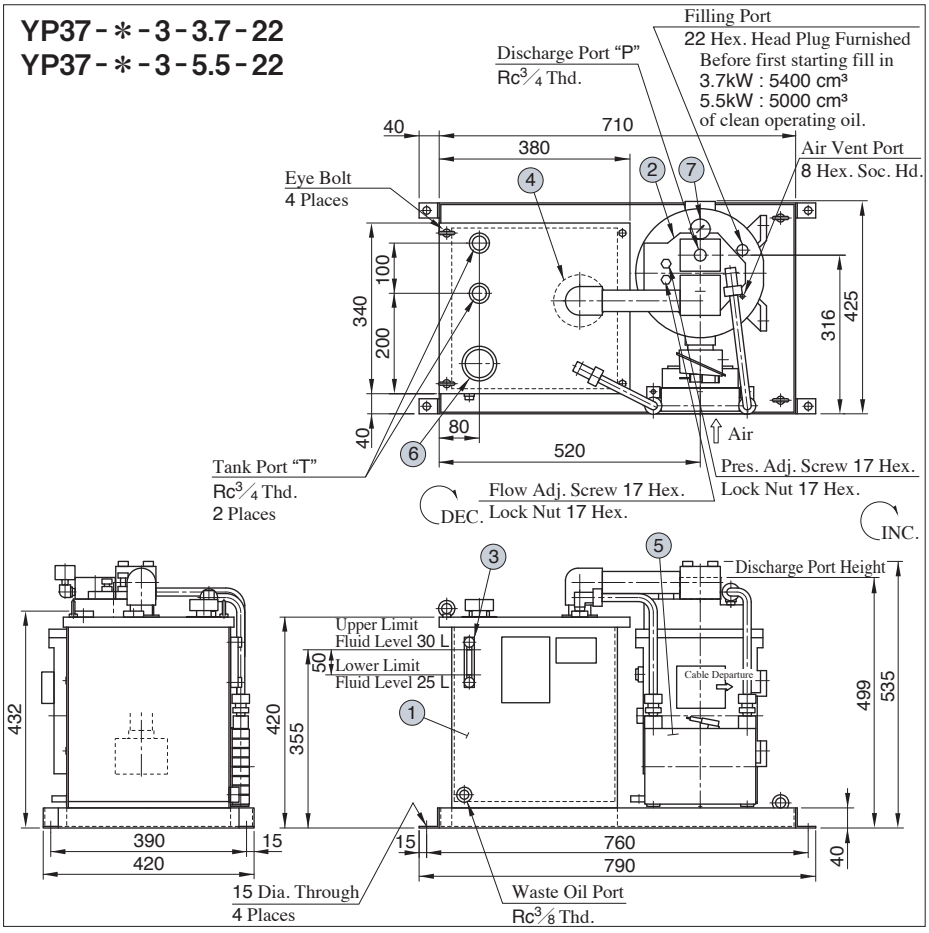
YP22-*-3-3.7-22



Hydraulic Circuit



YP37-*-3-3.7-22
YP37-*-3-5.5-22

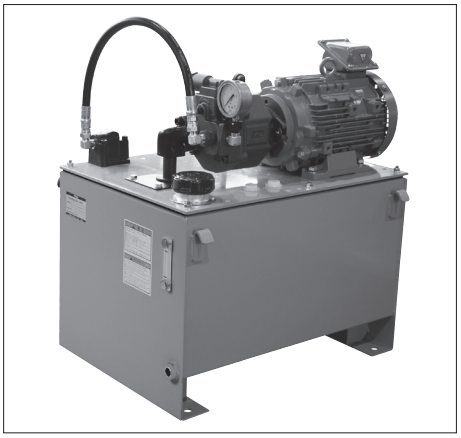


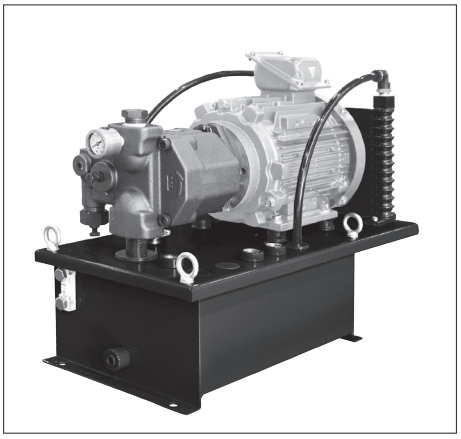
Item	Name
1	Hydraulic Reservoir
2	Pal Pump
3	Oil Level Gauge
4	Suction Strainer
5	Drain Cooler
6	Air Breather with Filling Port
7	Pressure Gauge

Standard Hydraulic Power Unit YA Pack

Yuken standard hydraulic power unit YA Pack is developed with meeting the demand of times like saving resources, saving energy and low noise, etc.

It is achieved easy usability and wide assortment of models are available, so can select models with your requests.





Low Noise

These units equipped with low noise A or AR series variable displacement piston pumps, also concerned for many places like the tank structure or piping construction, therefore the units are achieved low noise level and good sound quality.

Energy-Saving & Low Heat Generation

These units equipped with high efficiency pressure compensation type of variable displacement piston pumps can save power consumption due to reducing power loss.

Wide assortment of models

- A total of 35 models are available according to the combination of the built-in pump, the reservoir capacity, and the motor output, so that the most suitable model can be selected.
- 20 different options (incorporating a base plate, etc.) are available.

All Models Furnished with Output Flow Adj. Screw

All models are furnished with output flow adjustment screw.

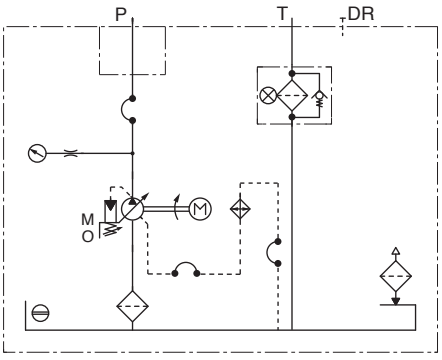
Short Delivery Time

The standardization of hydraulic units make those delivery time short.

Facilitating the configuration of the control circuit

With options that embedded modular valves, a wide variety of control circuits can be easily configured.

Hydraulic Circuit



Specifications

Model Numbers	Geometric Displacement of Pump cm^3/rev	Max. Operating Pres.(Note 1) MPa	Pres. Adj. Range MPa	Reservoir Capacity L	Electric Motor 50 Hz：200 V AC 60 Hz：200/220/230 V AC	Approx. Mass (Excluding Hydraulic oil) kg
YA10-B-2-0.75-52	10.0	7	1.2 - 7	20	0.75 kW×4P	48
YA10-B-3-0.75-52				30	0.75 kW×4P	53
YA10-B-3-1.5-52				30	1.5 kW×4P	56
YA10-B-4-0.75-52				40	0.75 kW×4P	58
YA10-B-4-1.5-52				40	1.5 kW×4P	63
YA10-B-6-1.5-51				60	1.5 kW×4P	73
YA10-B-6-2.2-51				60	2.2 kW×4P	81
YA10-C-6-2.2-51		16	2.0 - 16	60	2.2 kW×4P	82
YA10-C-6-3.7-51				60	3.7 kW×4P	94
YA10-C-10-2.2-51				100	2.2 kW×4P	107
YA10-C-10-3.7-51				100	3.7 kW×4P	116
YA16-B-1-0.75-52	15.8	7	1.2 - 7	10	0.75 kW×4P	42
YA16-B-1-1.5-50					1.5 kW×4P	46
YA16-B-1-2.2-50					2.2 kW×4P	53
YA16-B-2-0.75-52		7	1.2 - 7	18	0.75 kW×4P	44
YA16-B-2-1.5-50					1.5 kW×4P	48
YA16-B-2-2.2-50					2.2 kW×4P	55
YA16-B-4-1.5-52		7	1.2 - 7	40	1.5 kW×4P	64
YA16-B-6-1.5-50		7	1.2 - 7	60	1.5 kW×4P	74
YA16-B-6-2.2-50					2.2 kW×4P	82
YA16-B-6-3.7-50					3.7 kW×4P	94
YA16-C-6-3.7-50		16	2.0 - 16	60	3.7 kW×4P	99
YA16-B-10-2.2-50		7	1.2 - 7	100	2.2 kW×4P	107
YA16-C-10-3.7-50		16	2.0 - 16	100	3.7 kW×4P	121
YA16-C-10-5.5-50					5.5 kW×4P	145
YA16-C-10-7.5-50					7.5 kW×4P	157
YA22-B-6-2.2-50	22.2	7	1.2 - 7	60	2.2 kW×4P	82
YA22-B-6-3.7-50					3.7 kW×4P	94
YA22-B-10-2.2-50		7	1.2 - 7	100	2.2 kW×4P	112
YA22-B-10-3.7-50					3.7 kW×4P	146
YA22-C-10-5.5-50		16	2.0 - 16	100	5.5 kW×4P	145
YA22-C-10-7.5-50					7.5 kW×4P	157
YA37-B-10-3.7-50	36.9	7	1.2 - 7	100	3.7 kW×4P	141
YA37-B-16-5.5-50				160	5.5 kW×4P	175
YA37-B-16-7.5-50					7.5 kW×4P	182

Note 1) Maximum operating pressure is the upper limit of the pressure adjustment range of the pump.
2) The thermal class of the electric motor is type F in all models.
3) YA37-B-16-5.5/7.5 with a pump of two-pressure two-flow control type (control: 05 or 06) is also available as a special option. For details, please contact us.

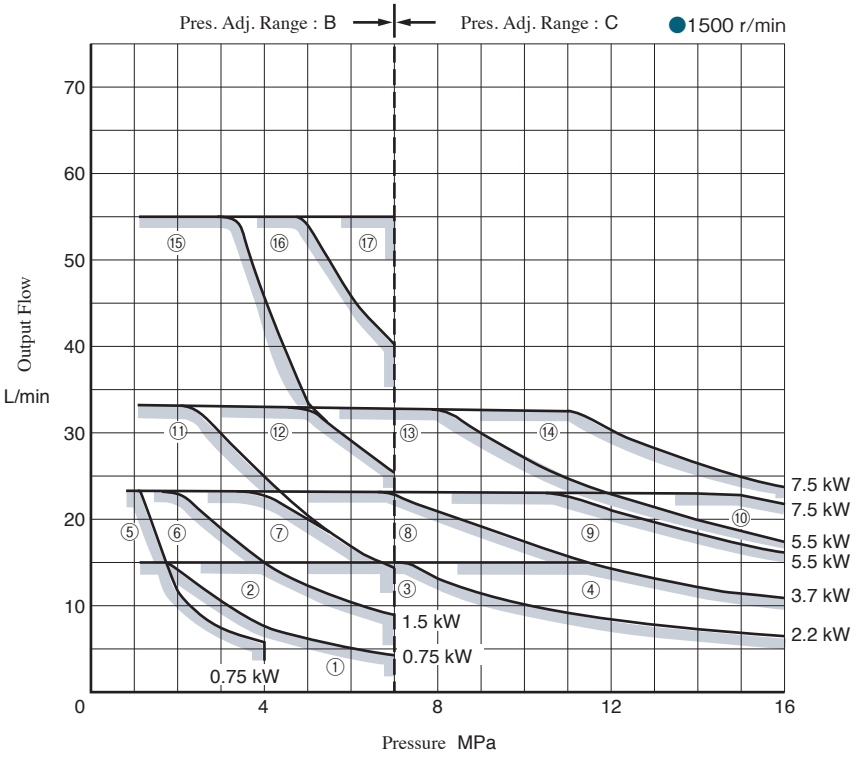
Model Number Designation

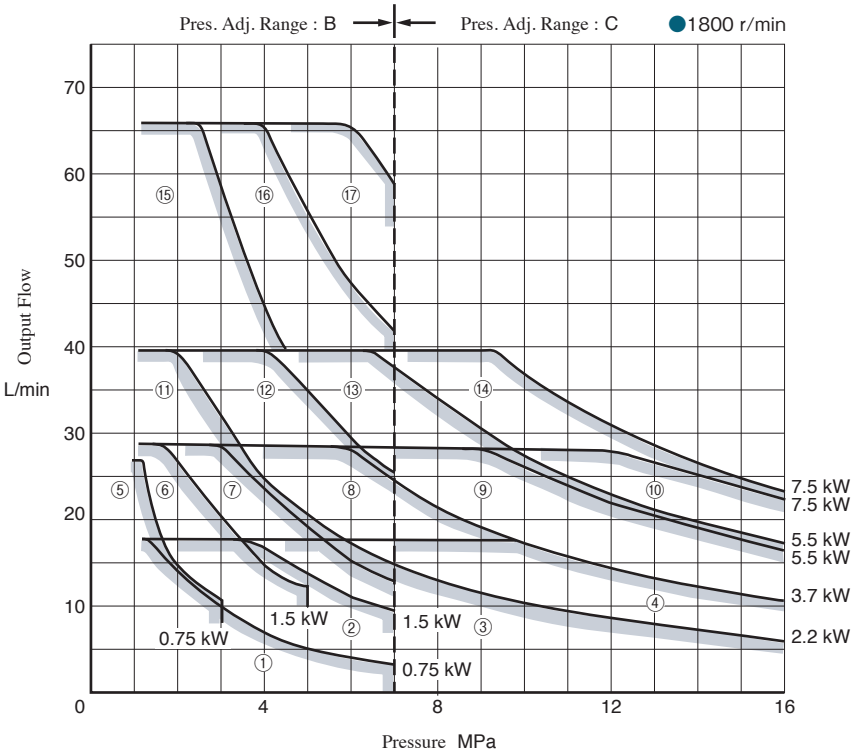
YA	16	−B	−6	−2.2	−50
Series Number	Built-in Pump	Pres. Adj. Range[Note] MPa	Reservoir Capacity L	Electric Motor	Design Number
YA：Low Noise Standard Hydraulic Power Unit YA Pack	10：A10 (10.0 cm³/rev)	B：1.2 - 7	2：20	0.75：0.75 kW×4P	52
			3：30	0.75：0.75 kW×4P	
				1.5：1.5 kW×4P	
			4：40	0.75：0.75 kW×4P	
				1.5：1.5 kW×4P	
		B：1.2 - 7	6：60	1.5：1.5 kW×4P	51
				2.2：2.2 kW×4P	
		C：2.0 - 16	6：60	2.2：2.2 kW×4P	
				3.7：3.7 kW×4P	
		C：2.0 - 16	10：100	2.2：2.2 kW×4P	
				3.7：3.7 kW×4P	
	16：AR16 (15.8 cm³/rev)	B：1.2 - 7	1：10	0.75：0.75 kW×4P	52
				1.5：1.5 kW×4P	50
				2.2：2.2 kW×4P	
		B：1.2 - 7	2：18	0.75：0.75 kW×4P	52
				1.5：1.5 kW×4P	50
				2.2：2.2 kW×4P	
		B：1.2 - 7	4：40	1.5：1.5 kW×4P	52
		B：1.2 - 7	6：60	1.5：1.5 kW×4P	50
				2.2：2.2 kW×4P	
				3.7：3.7 kW×4P	
		C：2.0 - 16	6：60	3.7：3.7 kW×4P	
		B：1.2 - 7	10：100	2.2：2.2 kW×4P	
		C：2.0 - 16	10：100	3.7：3.7 kW×4P	
				5.5：5.5 kW×4P	
				7.5：7.5 kW×4P	
	22：AR22 (22.2 cm³/rev)	B：1.2 - 7	6：60	2.2：2.2 kW×4P	
				3.7：3.7 kW×4P	
		B：1.2 - 7	10：100	2.2：2.2 kW×4P	
				3.7：3.7 kW×4P	
		C：2.0 - 16	10：100	5.5：5.5 kW×4P	
				7.5：7.5 kW×4P	
	37：A37 (36.9 cm³/rev)	B：1.2 - 7	10：100	3.7：3.7 kW×4P	
			16：160	5.5：5.5 kW×4P	
				7.5：7.5 kW×4P	

Note) Pressure adjustment range values shown are those of the pump.

Selection Graph

Below portion of the graph is the allowable operating range with regards to rated output of electric motor.



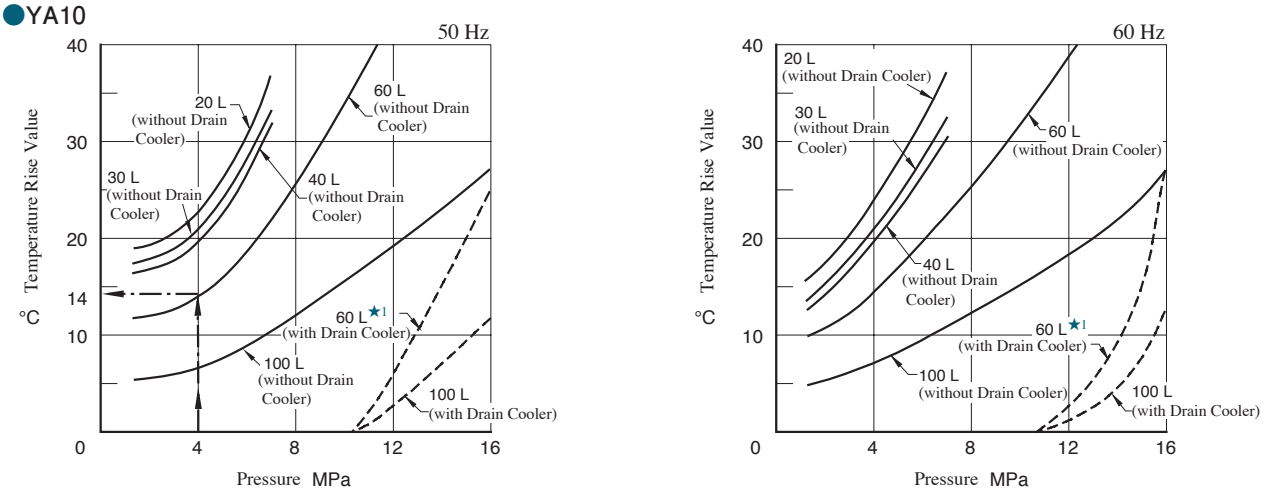


No.	Model Numbers
①	YA10-B-2-0.75 YA10-B-3-0.75 YA10-B-4-0.75
②	YA10-B-3-1.5 YA10-B-4-1.5 YA10-B-6-1.5
③	YA10-B-6-2.2 YA10-C-6-2.2 YA10-C-10-2.2
④	YA10-C-6-3.7 YA10-C-10-3.7
⑤	YA16-B-1-0.75 YA16-B-2-0.75
⑥	YA16-B-1-1.5 YA16-B-2-1.5 YA16-B-4-1.5 YA16-B-6-1.5
⑦	YA16-B-1-2.2 YA16-B-2-2.2 YA16-B-6-2.2 YA16-B-10-2.2
⑧	YA16-B-6-3.7 YA16-C-6-3.7 YA16-C-10-3.7
⑨	YA16-C-10-5.5
⑩	YA16-C-10-7.5
⑪	YA22-B-6-2.2 YA22-B-10-2.2
⑫	YA22-B-6-3.7 YA22-B-10-3.7
⑬	YA22-C-10-5.5
⑭	YA22-C-10-7.5
⑮	YA37-B-10-3.7
⑯	YA37-B-16-5.5
⑰	YA37-B-16-7.5

Oil Temperature in Reservoir

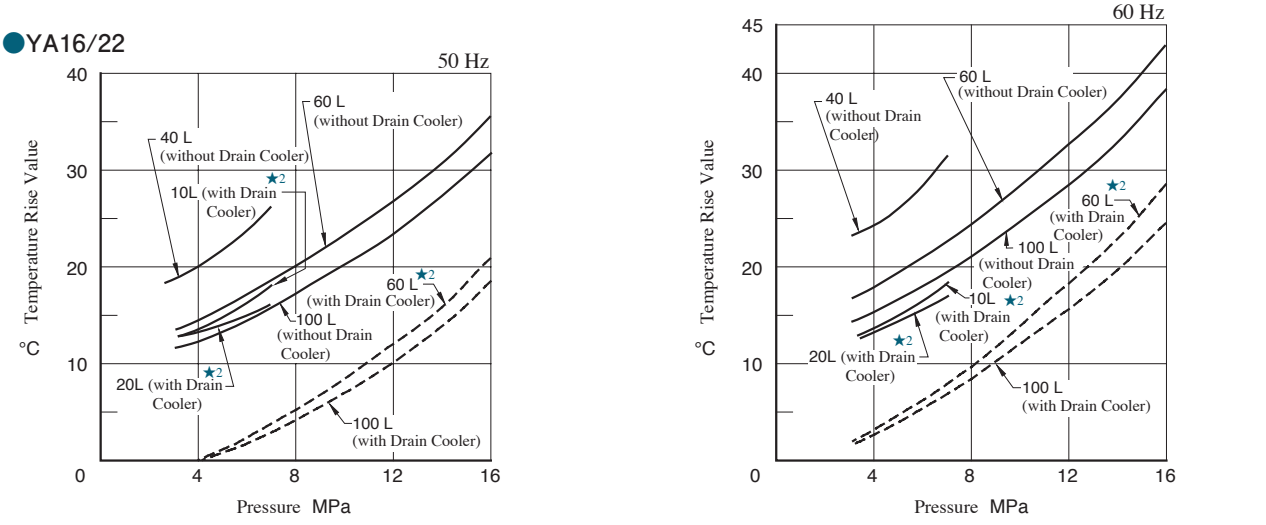
Oil temperature is expressed as (room temperature + temperature rise value).
Temperature rise values (full cut-off continuous operation, windless conditions) for each model are shown below, please check that oil temperature is below 60°C.
Drain cooler is option except for some models.
(Ex.) When operating YA10-B-6-1.5 continuously (50Hz) at full cut-off pressure 4 MPa, temperature rise value is 14°C as shown by broken line in the graph.
Assuming that room temperature is 35°C then tank temperature will be 49°C.

●YA10



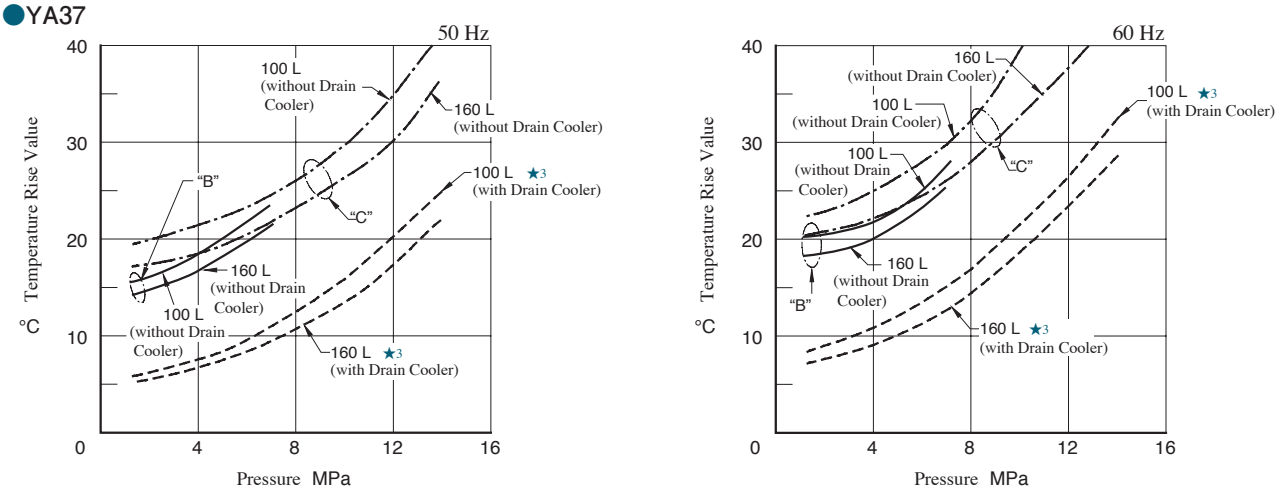
★ 1. Drain cooler is standard equipment only for YA10-C-6-2.2 and YA10-C-6-3.7.

●YA16/22



★ 2. Drain cooler is standard equipment only for YA16-B-1-＊, YA16-B-2-＊ and YA16-C-6-3.7.

●YA37

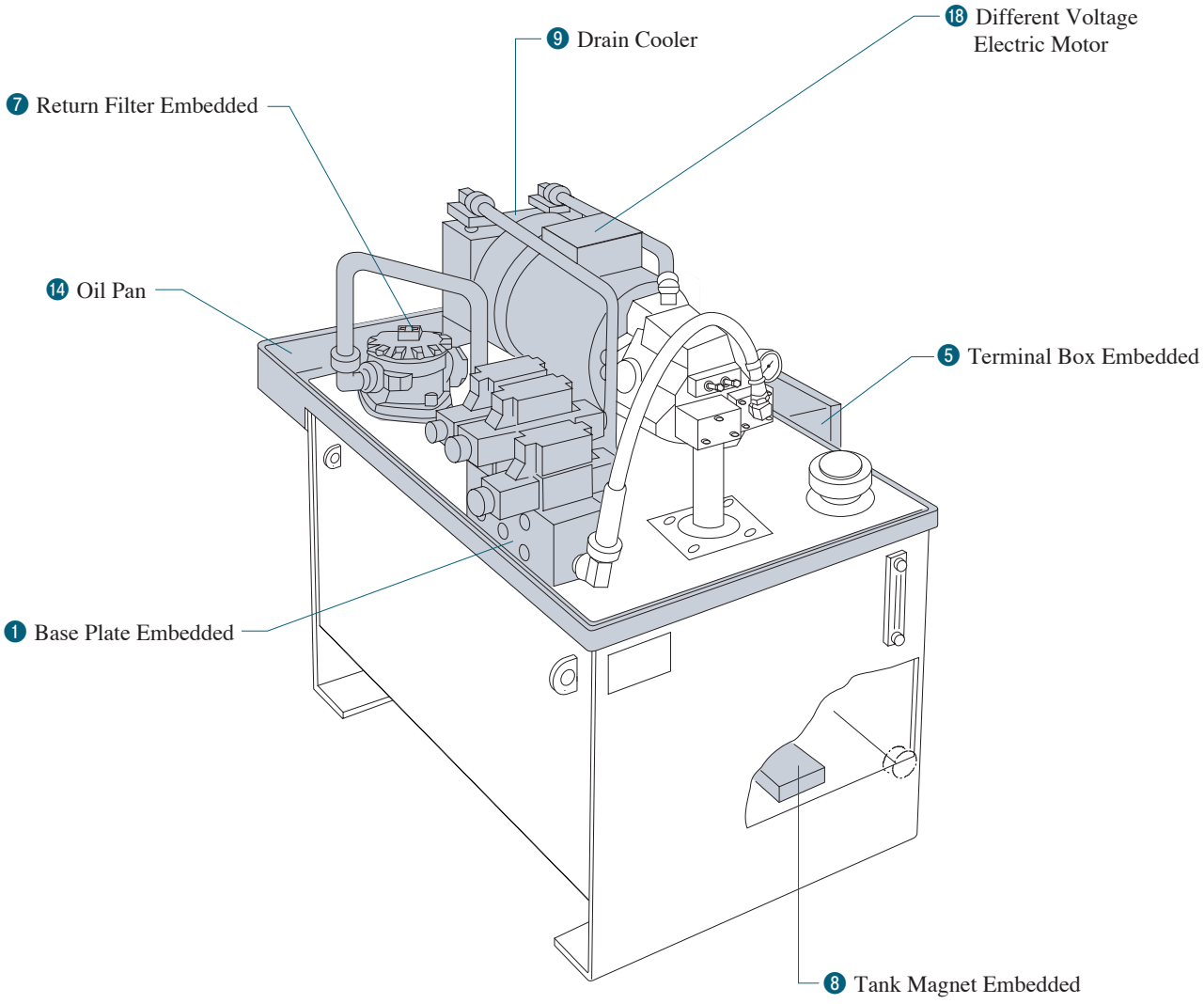


★ 3. Built-in drain cooler is option.

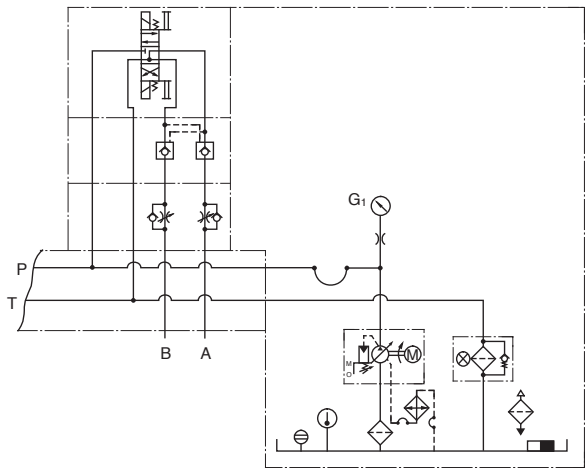
■ Options

● Example of Embedded Options

Various options are available except for standard models. Please select options with the applications. The drawing below is for an example. For details, please refer to the next page.



(Example of Hydraulic Circuit with Options Embedded)



Type and Summary of Options

❶ Base Plate Embedded：01M＊, 03M＊

Control circuit can be constructed by just stacking up modular valves/ solenoid valve atop the base plate. If need control circuit, please contact us. However, the circuit construction is limited to modular valves and standard solenoid directional control valves. In this case, please indicate power supply for operation.

❷ Without Control Circuit：B

This option is available for models with 01M* or 03M* valve. Embed base plate and make piping construction in front and rear of the base plate. Please prepare the components construct the control circuit separately.

❸ Without Port Block：E

Without port block and high pressure resin hose.

❹ Pressure Gauge and Mounting Block Embedded：G2, G3

Use in case that detect the pressure except pump discharge pressure by using reducing valve.
G2 is able to detect one more line pressure, G3 is able to detect two more lines except pump discharge pressure.

❺ Terminal Box Embedded：T1 - T3

The number of terminal is 10P for T1, 20P for T2, 34P for T3 3.7kW, 24P for T3 5.5kW, 20P for T3 7.5kW.

❻ Electric Wiring Unit：V, VT

The electric wiring between terminal box and motor / control valve use the vinyl cabtire cable as standard.
In case of special specifications (VT), please indicate separately.

❼ Return Filter Embedded：F

Return filter adopt the tank top type those surge pressure of tank line lower generate. The absolute filtration is 20 μm, equipped with visual indicator.

❽ Tank Magnet Embedded：Mg

Installed inside the tank. Attracts and collects fine iron powder. Decreases component wear.

❾ Drain Cooler Embedded：C (Radiator)
：Ca (Fan Cooler)

❿ Oil Level Gauge with Thermometer Embedded：Te

⓫ Water Cooler Embedded：Cw

⓬ Thermostat Embedded：TR

⓭ Liquid Level Switch Embedded：Le

⓮ Oil Pan Embedded：P

P：Standard Oil Pan

⓯ External Paint Color Changed：PT

In case if required special paint, please indicate separately by JPMA code or Munsell value.

⓰ Fire Service Act Applied：R

⓱ Water Leak Inspection：Rk

⓲ Different Voltage Electric Motor：(＊V×＊Hz)

200 V AC (50Hz) and 200/220/230 V AC (60Hz) are standard. In case if required other voltage, please indicate voltage and frequency.

⓳ Pressure Range Changed：(B→C)

Pressure Adjustment Range is available to change B to C. However, in case of YA37, maximum operating pressure is limited by 14 MPa.

⓴ P Port Check valve Embedded：D

Install angle type check valve for prevent reverse flow on the port block or base plate.

Attention

For the delivery time of options, please confirm us before ordering.

Options

Available options are indicated with ○ mark.

Option Code / Option Item / Model	01M＊	03M＊	B	E	G＊	T＊	V VT	F	Mg	C	Ca	Te	Cw	TR	Le	P	PT	R	Rk	＊V × ＊H	B ↓ C	D
	❶ Base Plate Embedded Size/Number of Plates		❷ Without Control Circuit	❸ Without Port Block	❹ Pressure Gauge for Control Circuit Embedded	❺ Terminal Box Embedded	❻ Electric Wiring Unit	❼ Return Filter Embedded	❽ Tank Magnet Embedded	❾ Drain Cooler Embedded: Radiator	❾ Drain Cooler Embedded: Fan Cooler Note 2	❿ Oil Level Gauge with Thermometer Embedded	⓫ Water Cooler Embedded	⓬ Thermostat Embedded	⓭ Liquid Level Switch Embedded Note 4	⓮ Oil Pan Embedded	⓯ External Paint Color Changed	⓰ Fire Service Act Applied	⓱ Water Leak Inspection	⓲ Different Voltage Electric Motor	⓳ Pressure Range Changed	⓴ P Port Check valve Embedded
YA16-B-1-＊	○ 1 - 2	×	○	—	○	○ T1	○	×	○	Built-in	×	○	×	○	○	×	○	×	○	○	×	×
YA10-B-2-0.75	×	×	—	—	—	○ T1	○	×	○	○	×	○	×	○	○	○	○	×	○	○	×	×
YA16-B-2-＊	○ 1 - 2	×	○	—	○	○ T1,T2	○	Note 5 ○	○	Built-in	×	○	×	○	○	×	○	×	○	○	×	×
YA10-B-3-＊	×	×	—	—	—	○ T1	○	Note 5 ○	○	○	×	○	×	○	○	○	○	×	○	○	×	×
YA10-B-4-＊	○ 1 - 3	×	○	○	○	○ T1,T2	○	○	○	○	×	○	×	○	○	○	○	○	○	○	×	○
YA16-B-4-1.5	○ 1 - 3	×	○	○	○	○ T1,T2	○	○	○	○	×	○	×	○	○	○	○	○	○	○	×	○
YA10-B-6-＊	○ 1 - 5	×	○	○	○	○ T1,T2,T3	○	○	○	Note 1 ○		○	Note 3 ○	○	○	○	○	○	○	○	○	○
YA10-C-6-＊	○ 1 - 5	×	○	○	○	○ T1,T2,T3	○	Built-in	○	Built-in	×	○	Note 3 ○	○	○	○	○	○	○	○	—	○
YA16-B-6-＊	○ 1 - 5	×	○	○	○	○ T1,T2,T3	○	○	○	Note 1 ○		○	Note 3 ○	○	○	○	○	○	○	○	○	○
YA16-C-6-＊	○ 1 - 5	×	○	○	○	○ T1,T2,T3	○	Built-in	○	Built-in	×	○	Note 3 ○	○	○	○	○	○	○	○	—	○
YA22-B-6-＊	○ 1 - 5	×	○	○	○	○ T1,T2,T3	○	○	○	Note 1 ○		○	Note 3 ○	○	○	○	○	○	○	○	○	○
YA10-C-10-＊	○ 1 - 5	○ 1 - 4	○	○	○	○ T1,T2,T3	○	Built-in	○	Note 1 ○		○	○	○	○	○	○	○	○	○	—	○
YA16-B-10-2.2	○ 1 - 5	○ 1 - 4	○	○	○	○ T1,T2,T3	○		○	Note 1 ○		○	○	○	○	○	○	○	○	○	○	○
YA16-C-10-＊	○ 1 - 5	○ 1 - 4	○	○	○	○ T1,T2,T3	○		○	Note 1 ○		○	○	○	○	○	○	○	○	○	—	○
YA22-B-10-＊	○ 1 - 5	○ 1 - 4	○	○	○	○ T1,T2,T3	○		○	Note 1 ○		○	○	○	○	○	○	○	○	○	○	○
YA22-C-10-＊	○ 1 - 5	○ 1 - 4	○	○	○	○ T1,T2,T3	○		○	Note 1 ○		○	○	○	○	○	○	○	○	○	—	○
YA37-B-10-3.7	×	○ 1 - 4	○	○	○	○ T1,T2,T3	○		○	Note 1 ○		○	○	○	○	○	○	○	○	○	○	○
YA37-B-16-＊	×	○ 1 - 4	○	○	○	○ T1,T2,T3	○		○	Note 1 ○		○	○	○	○	○	○	○	○	○	○	○

Note 1) Choose either Radiator (C) or Fan Cooler (Ca) in ⑨ Drain Cooler embedded.

2) When Fan Cooler (Ca) in ⑨ Drain Cooler embedded or ⑪ Water Cooler embedded is chosen, ① The Number of Base Plates is limited.

Model	Selected Option	Number of Selectable Base Plates	
YA10/16/22-＊-6	Fan Cooler (Ca) embedded.	Up to 2 (Size: 01)	
	Water Cooler (Cw) embedded.	Up to 4 (Size: 01)	
YA10/16/22/37-＊-10	Fan Cooler (Ca) embedded.	Size: 01	Up to 3
		Size: 03	Up to 2
YA37-B-16		Up to 2 (Size: 03)	

When ⑯ Fire Service Act Applied (R) is chosen, a Fan Cooler (Ca) cannot be embedded.

3) Up to 4 base plates can be embedded in ①.

4) Only low limit level can be detected.

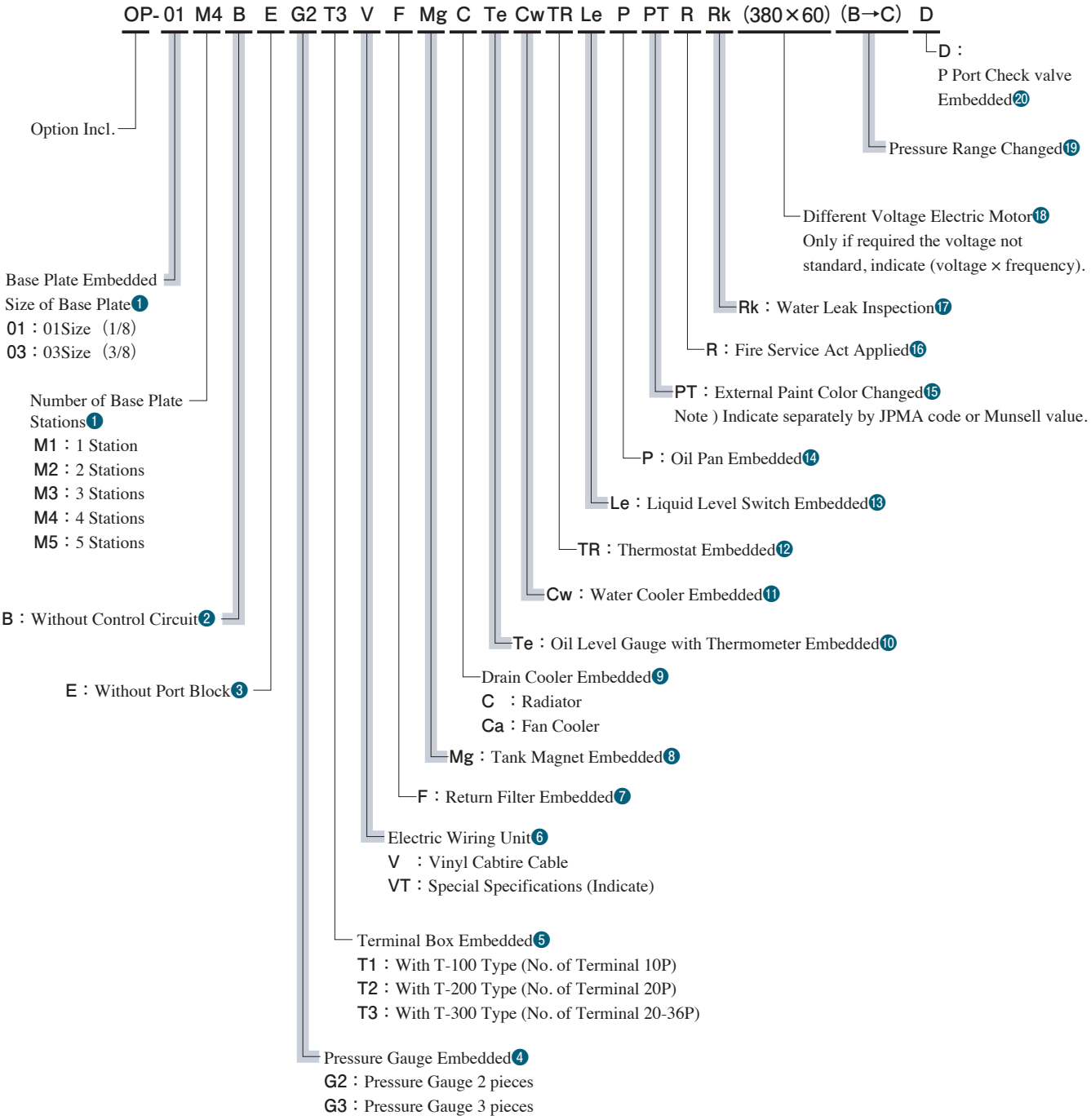
5) Oil-immersed type is available.

Option Indication Method

When ordering YA Pack with options, please add「OP」at the end of standard YA Pack model number, use the example below for reference and indicate options. For summary of options, please refer to page K-19.
About the control circuit constructed by modular valves etc., please contact us separately. For the adaptation between models and options, please refer to the table on page K-20.

【Example of Option Indication】

YA16-B-6-3.7-50-OP



Instructions

Suction/Return Air

Please install unit at the floor with good air flow to avoid heat stuff. Don't put any obstructions at air vent surface of the drain cooler.

Transportation

Use hanging hooks on the oil tank at the time of transportation.

Installation

This unit is stationary type, so please fix it using bolts on the level space with no vibration.

Electrical Wiring

To protect electrical circuit from over current like short and protect motor from overload, we recommend to install no-fuse breaker with earth leakage breaker on the primary power supply.
For electrical wiring, please use crimp terminals of suitable size, and connect certainly to avoid electric leakage for main body and interphase electrical short. Please be sure to ground the earth terminal.

Motor Side [U — R / V — S / W — T] Power Supply Side

Note for Starting Operation

Before initial operation, please supply ruled mass of hydraulic fluid required from oil tank port, and fill clean hydraulic fluid from filling port of pump till the oil full filled in pump housing. To avoid air-bound at starting operation, please adjust hydraulic circuit as that pump drain fluid return directly to oil tank, or operate directional valves for actuators no-load moving. Then start inching operation to confirm no particular, please do running operation.

Air Vent

Because air entrainment in pump or pipe may cause to occur vibration, please make air vent completely.

Setting of Pressure

〔Pressure Adjustment〕

At the time of shipping, the pressure set at minimum level, so please adjust the pressure under using conditions. Turn the pressure adjustment screw clockwise, the pressure increase. For adjustment volumes at one rotation of adjustment screw, please refer to the table below. After adjustments, do not forget to tighten the lock nut.

【Adjustment Volumes at One Rotation of Pres. Adj. Screw】

Model Numbers	Adjustment Volumes MPa
YA10/YA16/YA22-B	2.9
YA37-B	3.5
YA10/YA16/YA22-C	5.4
YA37-C	6.5

Setting of Output Flow

〔Output Flow Adjustment〕

Turn the flow adjustment screw clockwise, the output flow decrease. For adjustment volumes at one rotation of adjustment screw, please refer to the table below. After adjustments, do not forget to tighten the lock nut.

【Adjustment Volumes at One Rotation of Discharge Volume Adj. Screw】

Model Numbers	Adjustment Volumes at One Rotation cm^3/rev	Min. Adj. Flow cm^3/rev
YA10-*	1.1	2
YA16-*	1.5	6
YA22-*	2.1	8.5
YA37-B	2.9	10

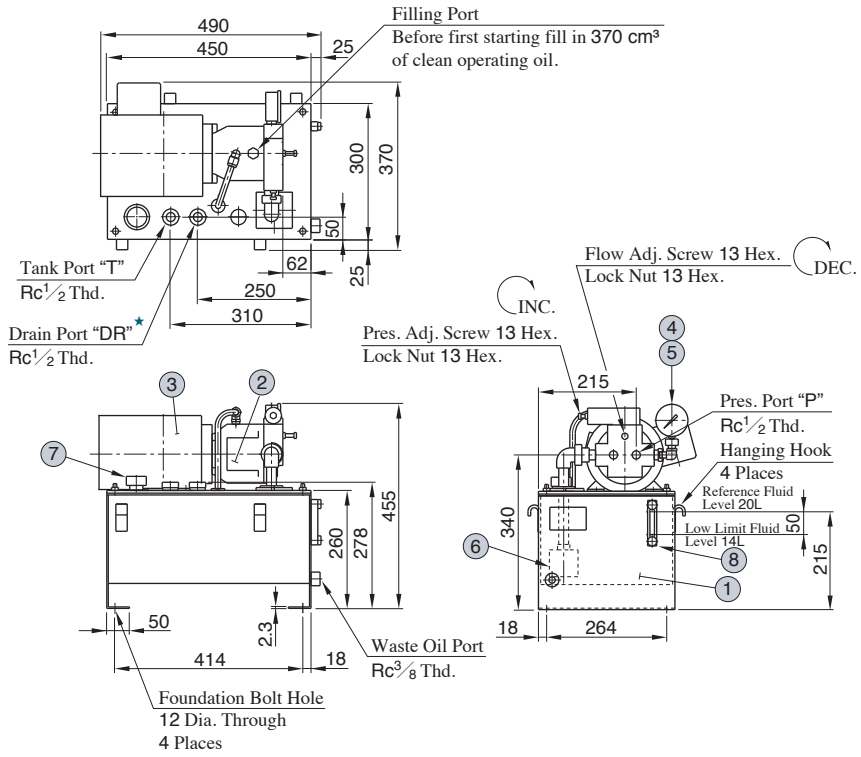
Return Filter

For return filter installation, please refer to the table below. In case if the return filter not built-in, please install the return filter as much as possible due to keep the machine life longer and show good performance for long time.

【Return Filter Installation】

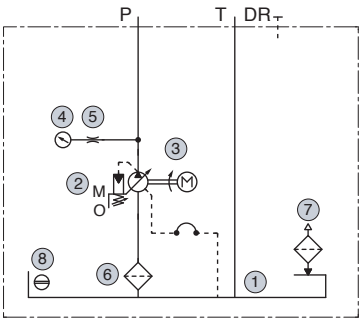
Model Numbers	Return Filter Installation
YA10-B-2 YA16-B-1	Not installed in the unit (Install separately)
YA10-B-3 YA10-B-4 YA10-B-6 YA16-B-2 YA16-B-4 YA16-B-6 YA22-B-6	Not installed in standard models (Can install as option)
Except for above	Built-in

YA10-B-2-0.75-52

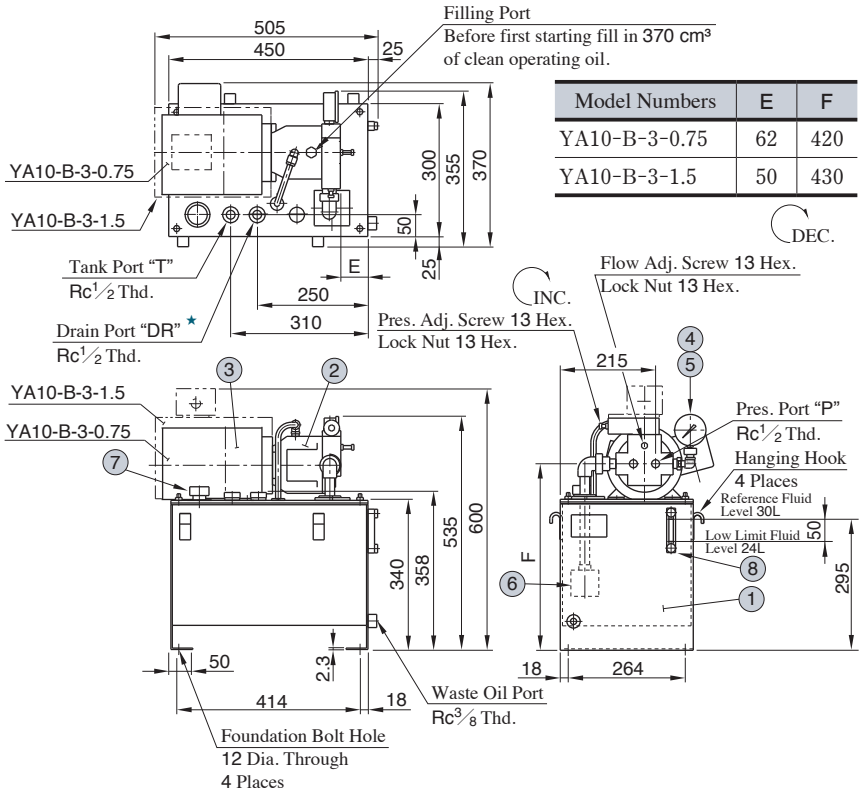


★If Liquid Level Switch Embedded (Le) is chosen as option, it is unable to use this port.

● Hydraulic Circuit



YA10-B-3-0.75-52・YA10-B-3-1.5-52

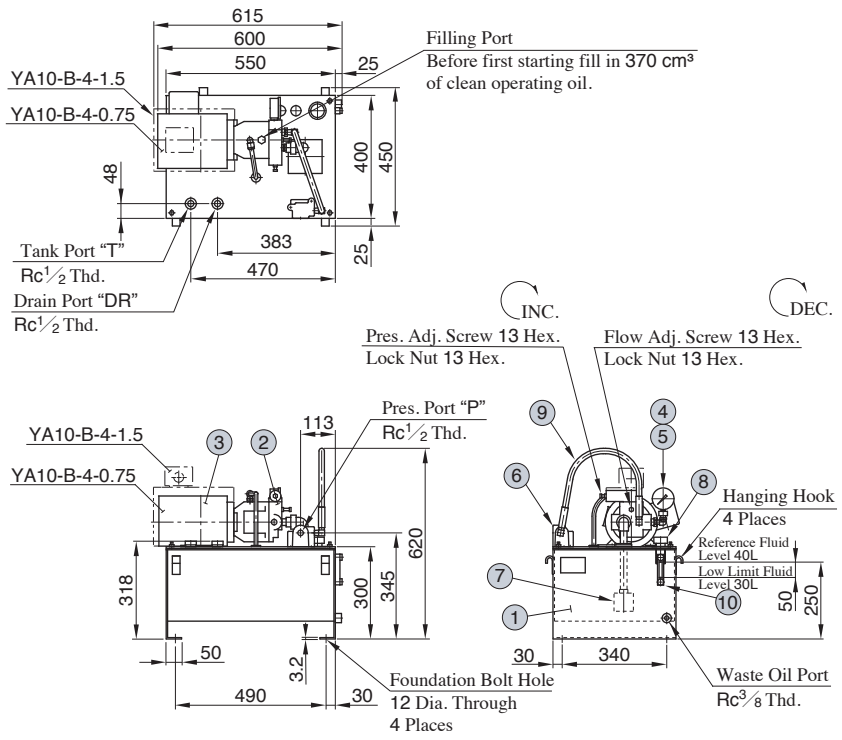


Model Numbers	E	F
YA10-B-3-0.75	62	420
YA10-B-3-1.5	50	430

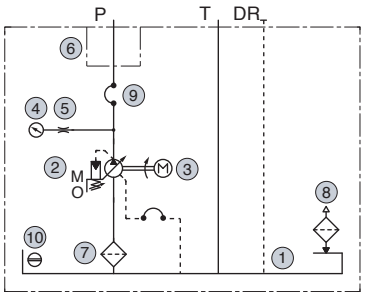
★If Liquid Level Switch Embedded (Le) is chosen as option, it is unable to use this port.

Item	Name
1	Hydraulic Reservoir
2	Pump
3	Electric Motor
4	Pressure Gauge
5	Adapter
6	Suction Strainer
7	Air Breather with Filling Port
8	Oil Level Gauge

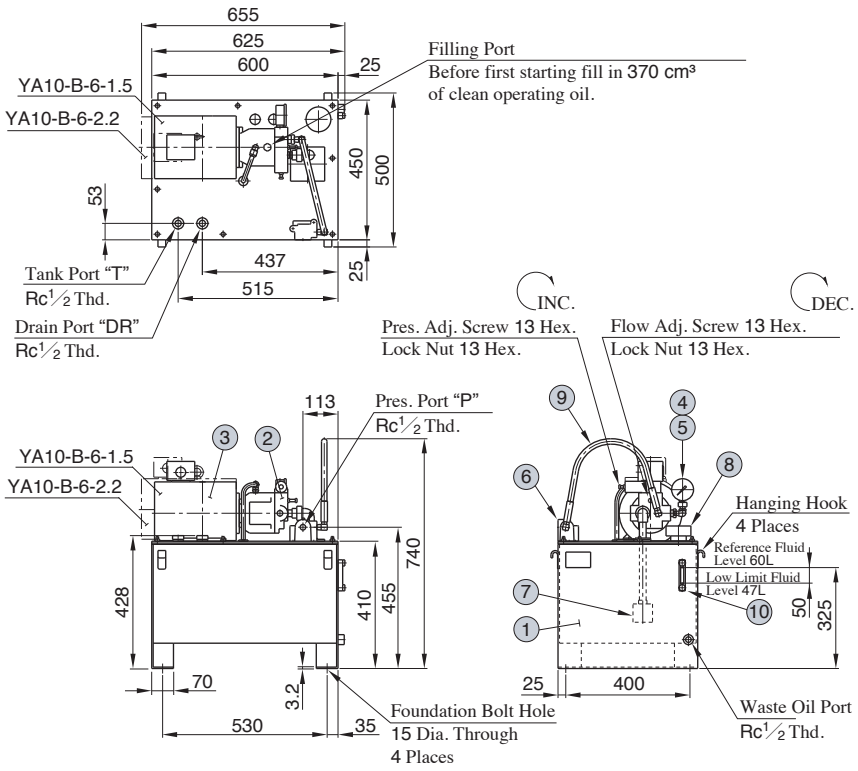
YA10-B-4-0.75-52・YA10-B-4-1.5-52



● Hydraulic Circuit

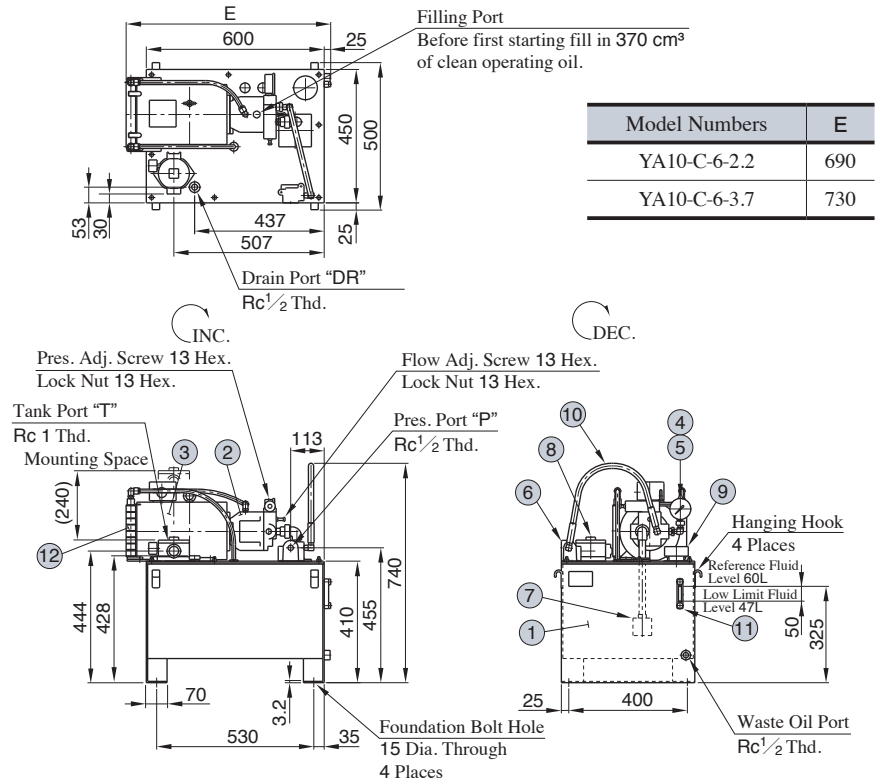


YA10-B-6-1.5-51・YA10-B-6-2.2-51



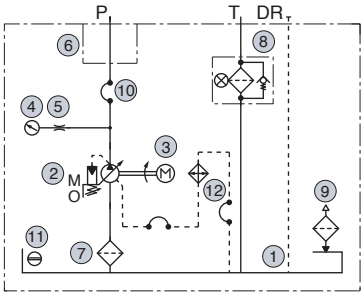
Item	Name
1	Hydraulic Reservoir
2	Pump
3	Electric Motor
4	Pressure Gauge
5	Adapter
6	Port Block
7	Suction Strainer
8	Air Breather with Filling Port
9	High Pressure Resin Hose
10	Oil Level Gauge

YA10-C-6-2.2-51・YA10-C-6-3.7-51



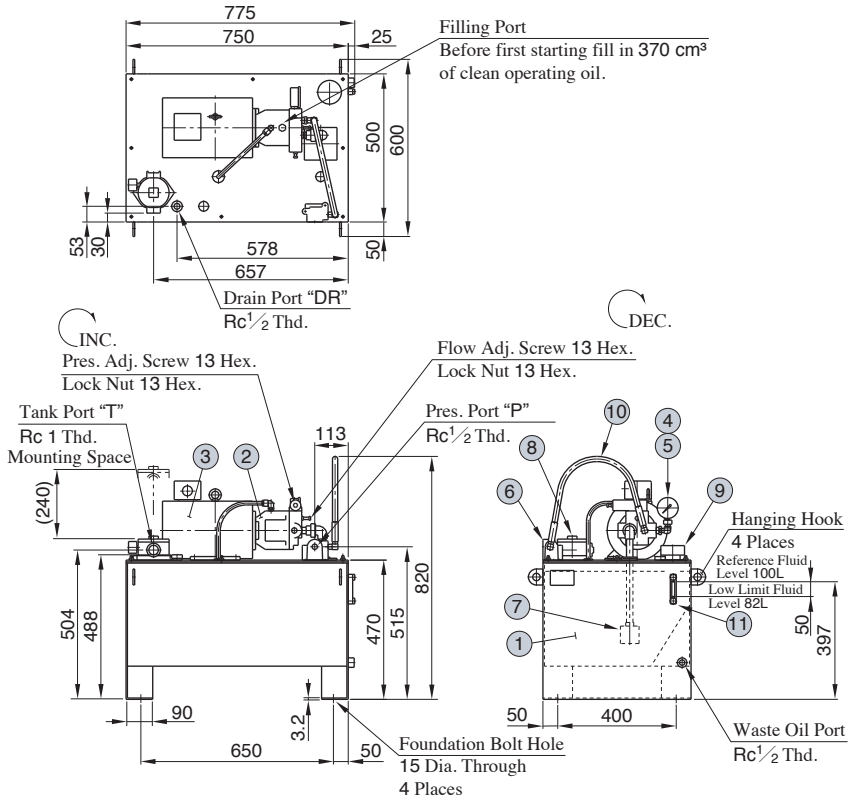
Model Numbers	E
YA10-C-6-2.2	690
YA10-C-6-3.7	730

● Hydraulic Circuit

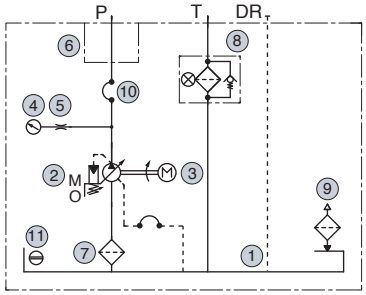


Item	Name
1	Hydraulic Reservoir
2	Pump
3	Electric Motor
4	Pressure Gauge
5	Adapter
6	Port Block
7	Suction Strainer
8	Return Filter
9	Air Breather with Filling Port
10	High Pressure Resin Hose
11	Oil Level Gauge
12	Drain Cooler

YA10-C-10-2.2-51・YA10-C-10-3.7-51



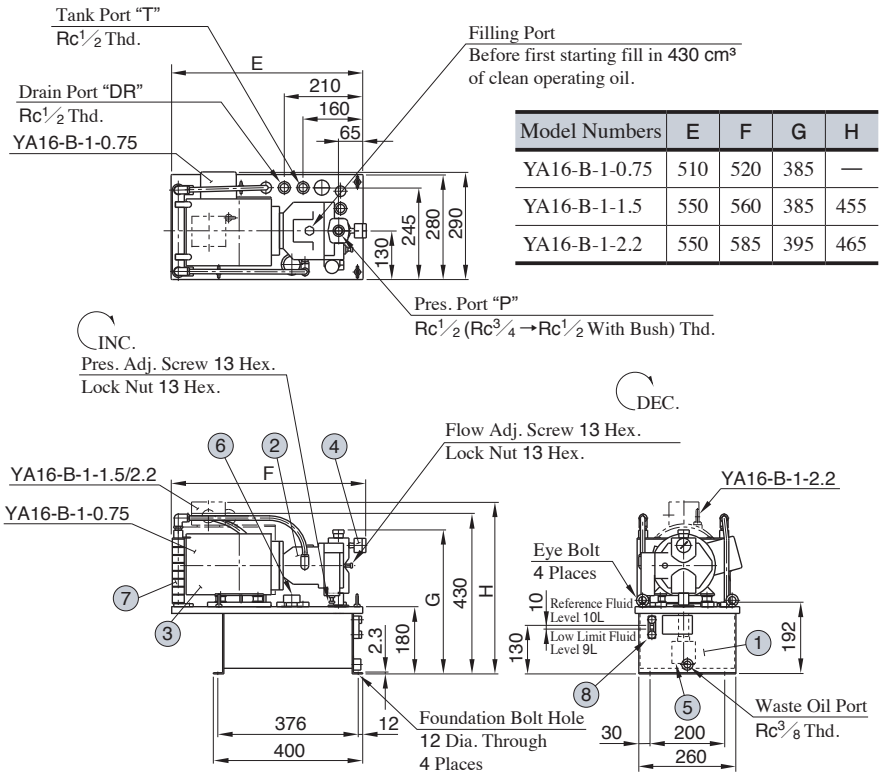
● Hydraulic Circuit



Item	Name
1	Hydraulic Reservoir
2	Pump
3	Electric Motor
4	Pressure Gauge
5	Adapter
6	Port Block
7	Suction Strainer
8	Return Filter
9	Air Breather with Filling Port
10	High Pressure Resin Hose
11	Oil Level Gauge

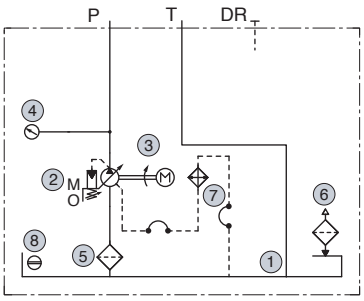
K
YA Pack

YA16-B-1-0.75-52•YA16-B-1-1.5-50•YA16-B-1-2.2-50

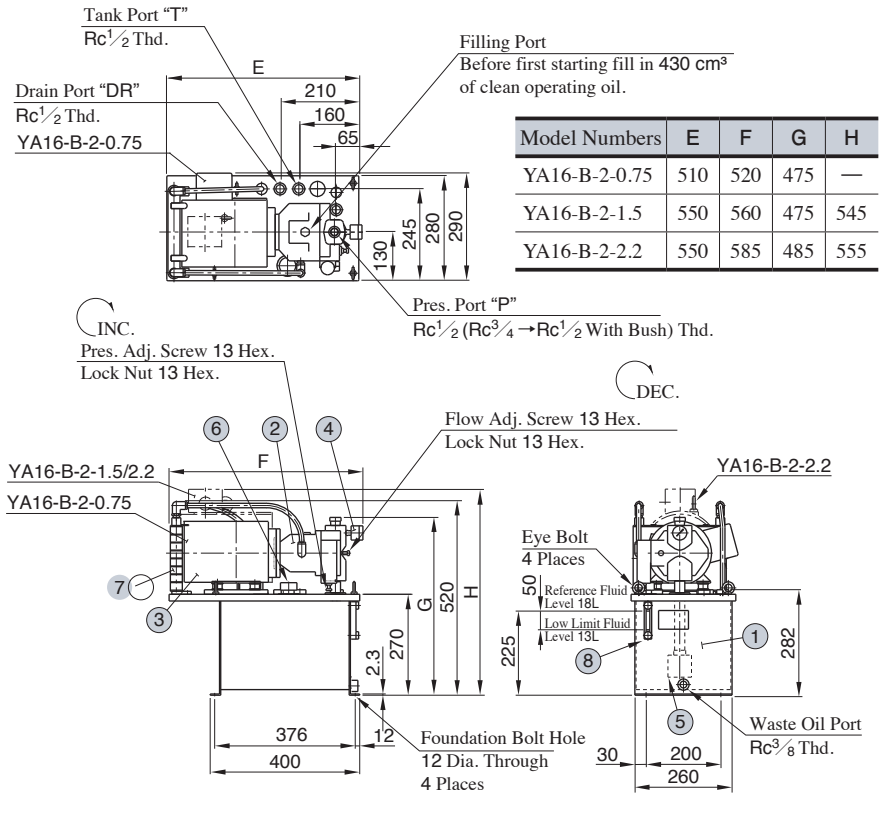


Model Numbers	E	F	G	H
YA16-B-1-0.75	510	520	385	—
YA16-B-1-1.5	550	560	385	455
YA16-B-1-2.2	550	585	395	465

Hydraulic Circuit



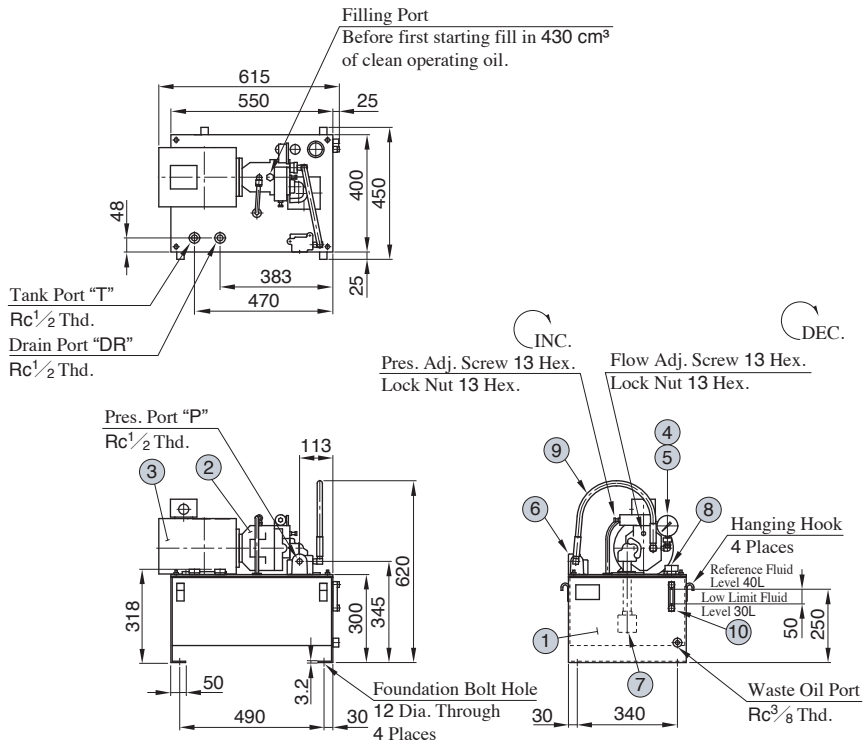
YA16-B-2-0.75-52•YA16-B-2-1.5-50•YA16-B-2-2.2-50



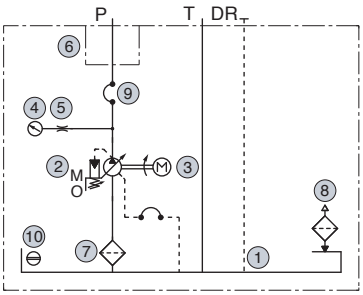
Model Numbers	E	F	G	H
YA16-B-2-0.75	510	520	475	—
YA16-B-2-1.5	550	560	475	545
YA16-B-2-2.2	550	585	485	555

Item	Name
1	Hydraulic Reservoir
2	Pump
3	Electric Motor
4	Pressure Gauge
5	Suction Strainer
6	Air Breather with Filling Port
7	Drain Cooler
8	Oil Level Gauge

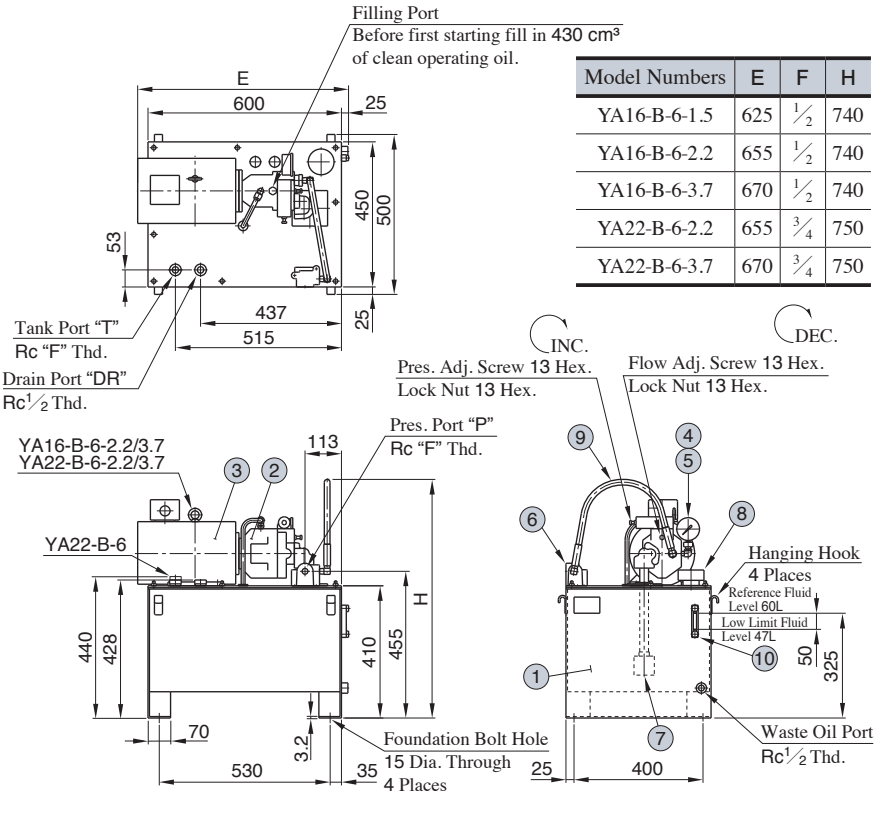
YA16-B-4-1.5-52



Hydraulic Circuit



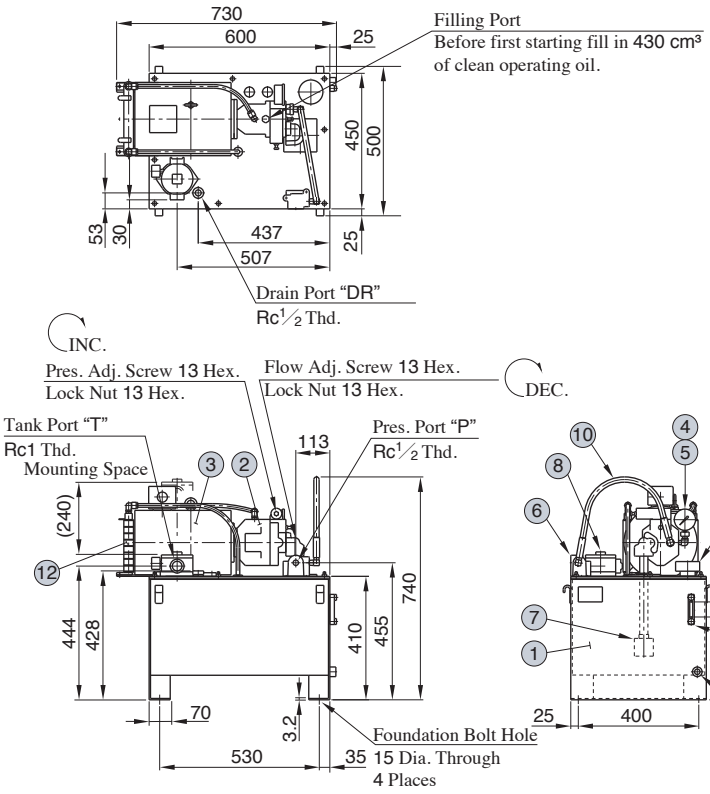
YA16-B-6-1.5-50·YA16-B-6-2.2-50·YA16-B-6-3.7-50
YA22-B-6-2.2-50·YA22-B-6-3.7-50



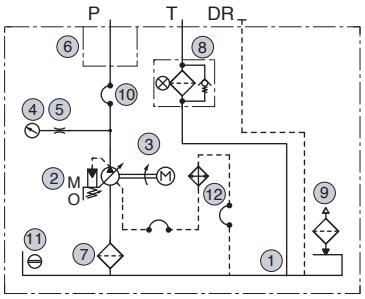
Model Numbers	E	F	H
YA16-B-6-1.5	625	1/2	740
YA16-B-6-2.2	655	1/2	740
YA16-B-6-3.7	670	1/2	740
YA22-B-6-2.2	655	3/4	750
YA22-B-6-3.7	670	3/4	750

Item	Name
1	Hydraulic Reservoir
2	Pump
3	Electric Motor
4	Pressure Gauge
5	Adapter
6	Port Block
7	Suction Strainer
8	Air Breather with Filling Port
9	High Pressure Resin Hose
10	Oil Level Gauge

YA16-C-6-3.7-50

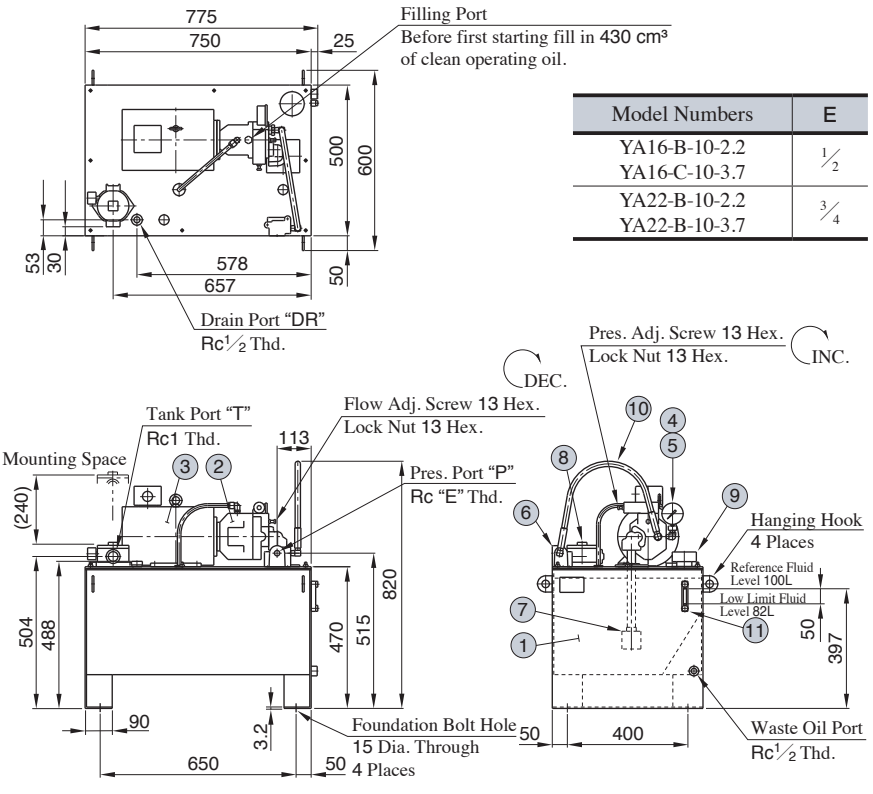


Hydraulic Circuit



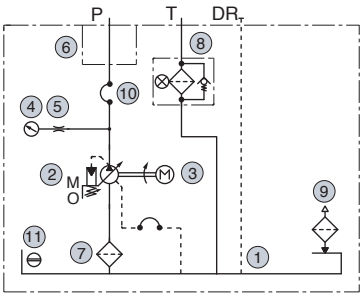
Item	Name
1	Hydraulic Reservoir
2	Pump
3	Electric Motor
4	Pressure Gauge
5	Adapter
6	Port Block
7	Suction Strainer
8	Return Filter
9	Air Breather with Filling Port
10	High Pressure Resin Hose
11	Oil Level Gauge
12	Drain Cooler

YA16-B-10-2.2-50·YA16-C-10-3.7-50
YA22-B-10-2.2-50·YA22-B-10-3.7-50



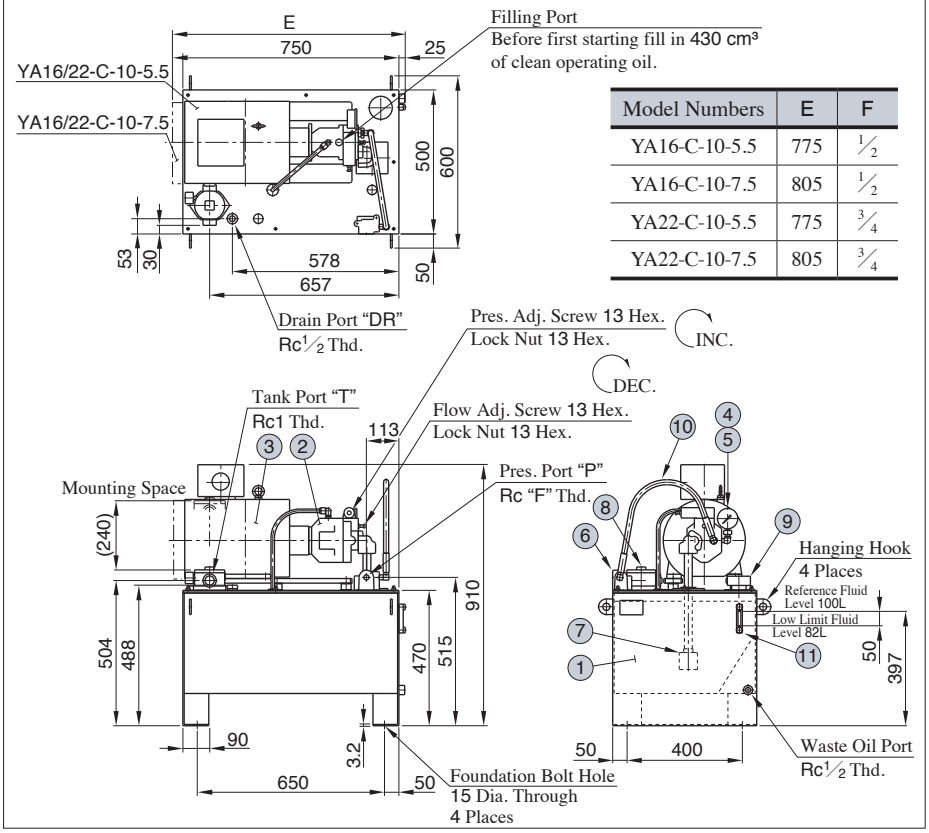
Model Numbers	E
YA16-B-10-2.2 YA16-C-10-3.7	1/2
YA22-B-10-2.2 YA22-B-10-3.7	3/4

Hydraulic Circuit



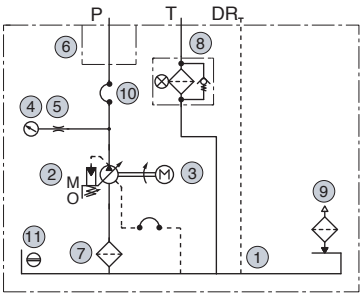
Item	Name
1	Hydraulic Reservoir
2	Pump
3	Electric Motor
4	Pressure Gauge
5	Adapter
6	Port Block
7	Suction Strainer
8	Return Filter
9	Air Breather with Filling Port
10	High Pressure Resin Hose
11	Oil Level Gauge

YA16-C-10-5.5-50·YA16-C-10-7.5-50
YA22-C-10-5.5-50·YA22-C-10-7.5-50

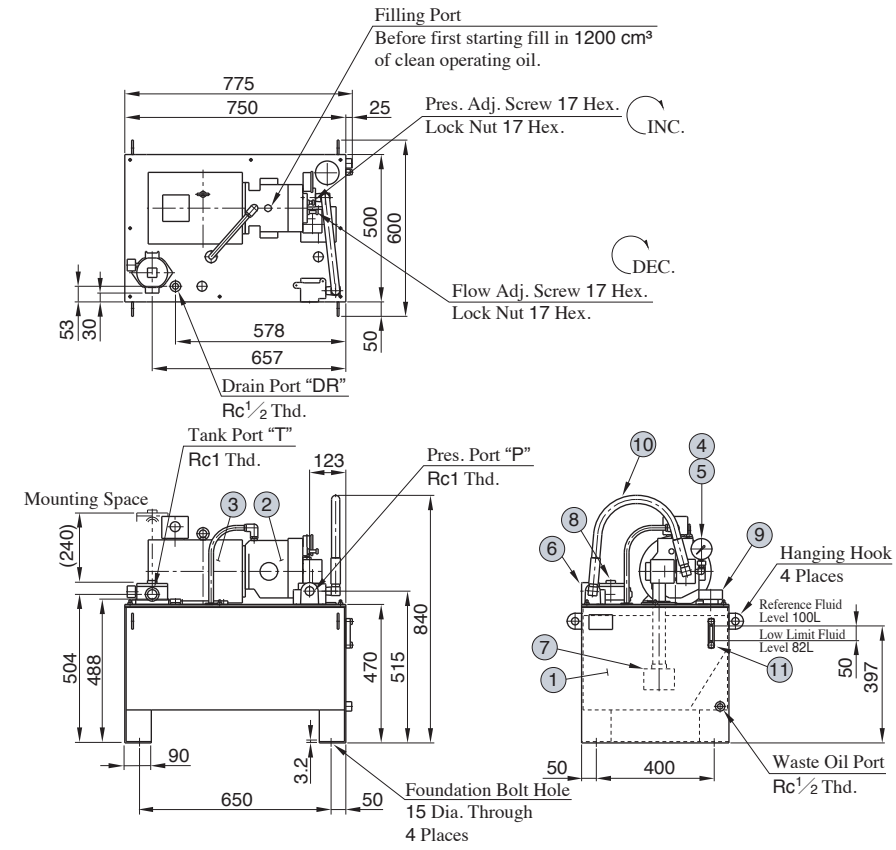


Model Numbers	E	F
YA16-C-10-5.5	775	1/2
YA16-C-10-7.5	805	1/2
YA22-C-10-5.5	775	3/4
YA22-C-10-7.5	805	3/4

Hydraulic Circuit

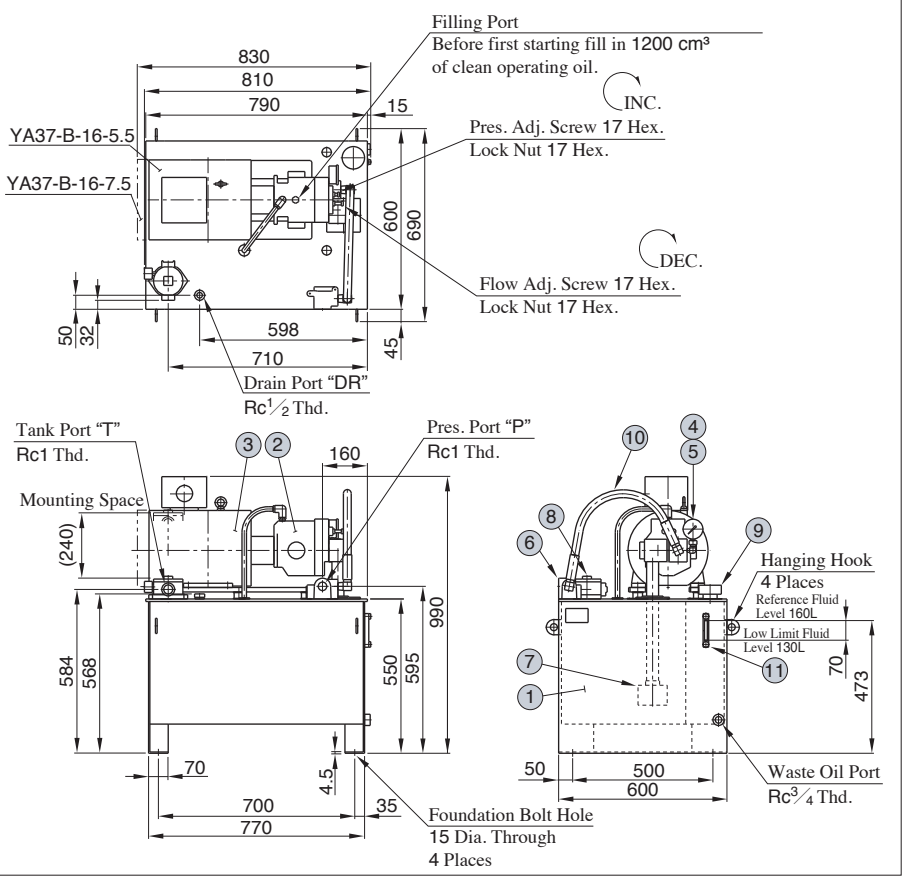


YA37-B-10-3.7-50

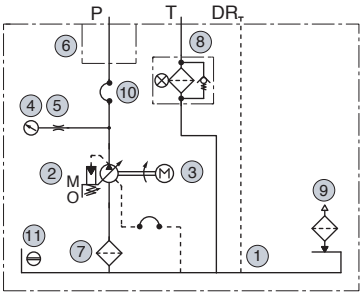


Item	Name
1	Hydraulic Reservoir
2	Pump
3	Electric Motor
4	Pressure Gauge
5	Adapter
6	Port Block
7	Suction Strainer
8	Return Filter
9	Air Breather with Filling Port
10	Resin Hose
11	Oil Level Gauge

YA37-B-16-5.5-50・YA37-B-16-7.5-50



Hydraulic Circuit



Item	Name
1	Hydraulic Reservoir
2	Pump
3	Electric Motor
4	Pressure Gauge
5	Adapter
6	Port Block
7	Suction Strainer
8	Return Filter
9	Air Breather with Filling Port
10	Resin Hose
11	Oil Level Gauge

Interchangeability between Current and New Models

As of YA10 and YA16 type models, the design numbers has changed from 50/51 to 52 due to change of built-in electric motor.

Applicable Models

Current Model Numbers	New Model Numbers
YA10-B-2-0.75-51	YA10-B-2-0.75-52
YA10-B-3-0.75-51	YA10-B-3-0.75-52
YA10-B-3-1.5-51	YA10-B-3-1.5-52
YA10-B-4-0.75-51	YA10-B-4-0.75-52
YA10-B-4-1.5-51	YA10-B-4-1.5-52
YA16-B-1-0.75-50	YA16-B-1-0.75-52
YA16-B-2-0.75-50	YA16-B-2-0.75-52
YA16-B-4-1.5-50	YA16-B-4-1.5-52

Change Details

(1) Change of Built-in Electric Motor 0.75 kW (Design number change to 41)
(2) Change of Tank [Body or Top Plate]
Due to change of electric motor, the position of hanging hooks and eye bolts near electric motor has changed.
★The built-in electric motor 1.5 kW has no changes, but the design number change to 52 with change of shared tank.

Interchangeability in Installation

Yes

Comparison of Current and New Models

(1)Specifications

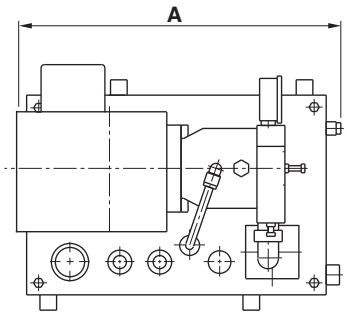
The specifications of current and new models are same except for the mass as below.

Current		New	
Model Numbers	Mass kg	Model Numbers	Mass kg
YA10-B-2-0.75-51	49	YA10-B-2-0.75-52	48
YA10-B-3-0.75-51	54	YA10-B-3-0.75-52	53
YA10-B-4-0.75-51	59	YA10-B-4-0.75-52	58
YA16-B-1-0.75-50	43	YA16-B-1-0.75-52	42
YA16-B-2-0.75-50	45	YA16-B-2-0.75-52	44

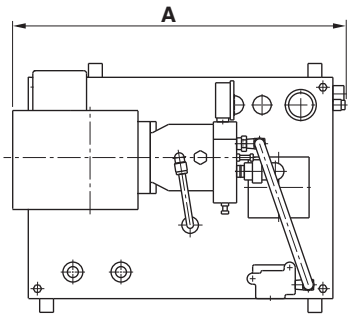
(2)Dimensions

The dimensions of current and new models are same except for below models.

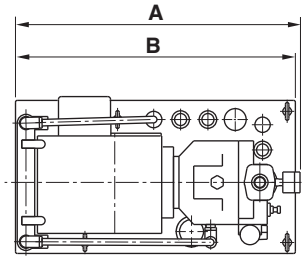
①YA10-B-2-0.75/YA10-B-3-0.75



②YA10-B-4-0.75



③YA16-B-1-0.75/YA16-B-2-0.75

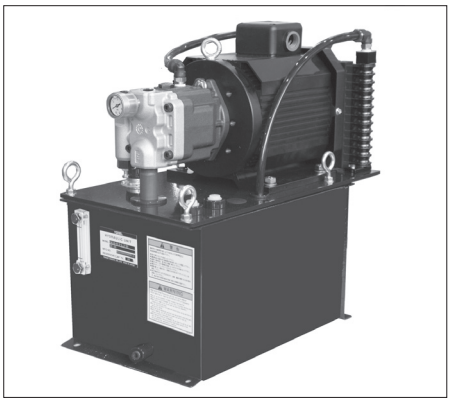


Current Model Numbers	A	B	New Model Numbers	A	B
YA10-B-2-0.75-51	505	—	YA10-B-2-0.75-52	490	—
YA10-B-3-0.75-51	505	—	YA10-B-3-0.75-52	490	—
YA10-B-4-0.75-51	615	—	YA10-B-4-0.75-52	600	—
YA16-B-1-0.75-50	560	550	YA16-B-1-0.75-52	520	510
YA16-B-2-0.75-50	560	550	YA16-B-2-0.75-52	520	510

Standard Hydraulic Power Unit YA Series L Pack <YA-Light>

Smart & Compact

YA-Light is high efficiency, compact and light weight hydraulic unit equipped with ARL1 series piston pump.



Features

High Efficiency

Due to built-in high efficiency motor and piston pump, these units has achieved high efficiency.

Compact / Light Weight

YA-Light is more compact and light weight compared with YA Pack.

Low Noise

These units are equipped with low noise pumps, so that has achieved low noise level and good sound quality.

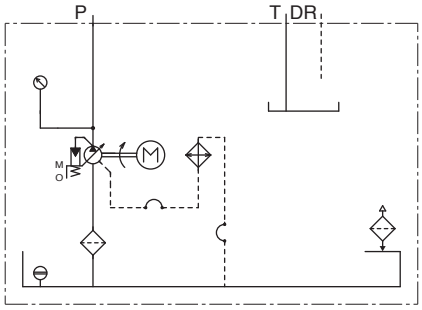
Energy-Saving & Low Heat Generation

These units equipped with piston pumps can reduce power loss and save power consumption. And also achieved low oil temperature rise with high performance drain cooler.

Facilitating the configuration of the control circuit

Due to embedded modular valves, control circuits can be easily configured.

Hydraulic Circuit



★Displacement volume adjustment function is not available.

Model Number Designation

YAL	16	−A	−1	−0.75	−20
Series Number	Built-in Pump Geometric Displacement	Pres. Adj. Range★1 MPa	Reservoir Capacity L	Electric Motor	Design Number
YAL：Piston Pump Equipped Low Noise & Small Type Hydraulic Power Unit	8：8.5 cm^3/rev	A：1.2 - 3.5	1：10	0.75：0.75kW×4P	20
				1.5：1.5kW×4P	
			2：19	0.75：0.75kW×4P	
				1.5：1.5kW×4P	
		B：1.2 - 7.0	2：19	1.5：1.5kW×4P	
	16：16.3 cm^3/rev	A：1.2 - 3.5	1：10	1.5：1.5kW×4P	
		B：1.2 - 7.0	2：19	1.5：1.5kW×4P	
				2.2：2.2kW×4P	

★1. Pressure adjustment range values shown are those of the pump.
★2. We offer auxiliaries / spare parts for pump and electric motor as Ass'y for AML1 Type Motor-Pump.

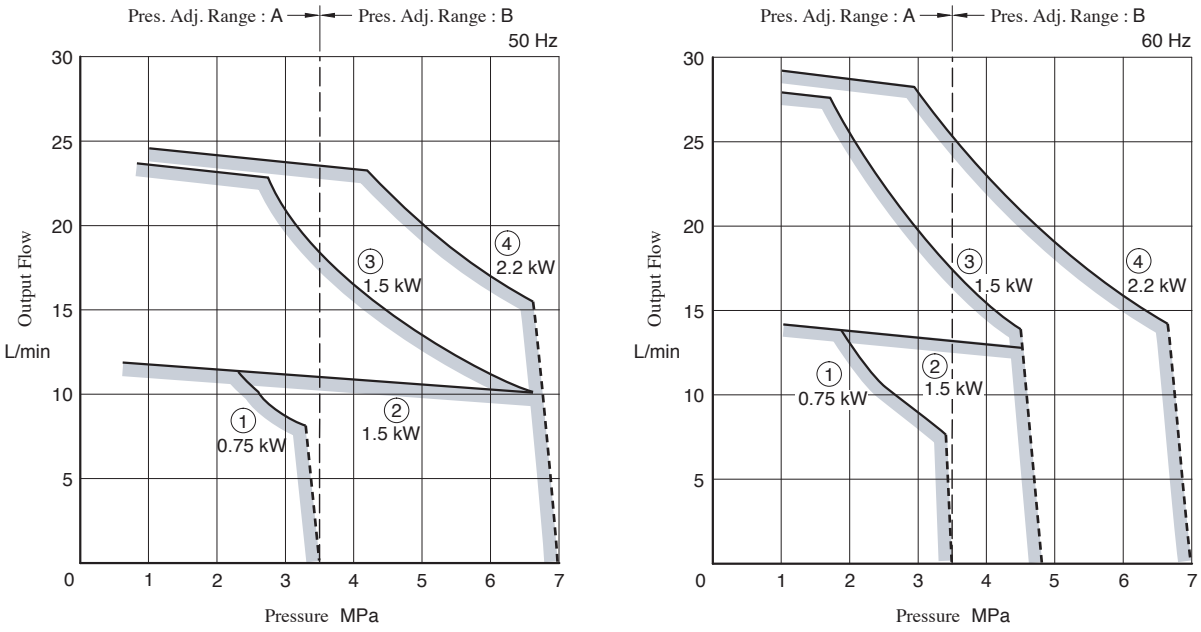
Specifications

Model Numbers	Geometric Displacement cm^3/rev	Max. Operating Pres. MPa	Pres. Adj. Range MPa	Reservoir Capacity L	Electric Motor 50Hz：200V AC 60Hz：200/220V AC	Approx. Mass (Excluding Hydraulic oil) kg
YAL8-A-1-0.75-20	8.5	3.5	1.2 - 3.5	10	0.75 kW×4P	37
YAL8-A-1-1.5-20				10	1.5 kW×4P	40
YAL8-A-2-0.75-20				19	0.75 kW×4P	39
YAL8-A-2-1.5-20				19	1.5 kW×4P	42
YAL8-B-2-1.5-20		7.0	1.2 - 7.0	19	1.5 kW×4P	42
YAL16-A-1-1.5-20	16.3	3.5	1.2 - 3.5	10	1.5 kW×4P	40
YAL16-B-2-1.5-20		7.0	1.2 - 7.0	19	1.5 kW×4P	42
YAL16-B-2-2.2-20				19	2.2 kW×4P	55

★Maximum operating pressure is the upper limit of the pressure adjustment range of the pump. For pressure and output flow operating limits pertaining to electric motor, please refer to “Selection Graph”. For tank oil temperature rise value for each model, please refer to “Oil Temperature in Reservoir”.

Selection Graph

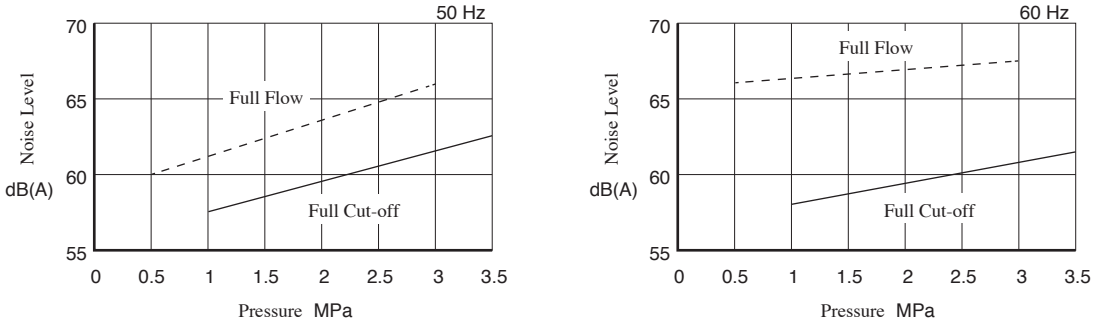
Below portion of the graph is the allowable operating range with regards to rated output of electric motor.



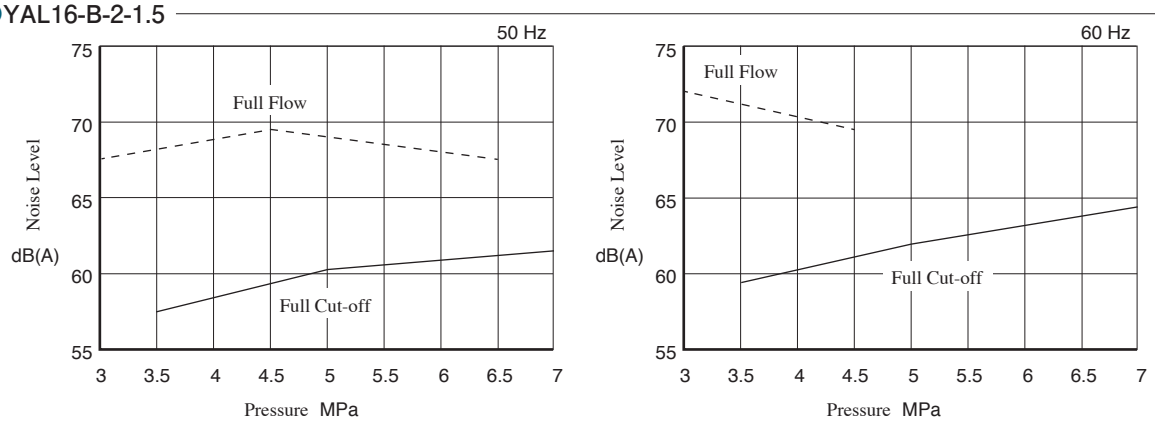
No.	Model Numbers	No.	Model Numbers
①	YAL8-A-＊-0.75	③	YAL16-＊-＊-1.5
②	YAL8-B-＊-1.5	④	YAL16-B-＊-2.2

Noise Characteristics (Example) 〔Location of Measurement: 1m from the unit (average value for 5 directions)〕

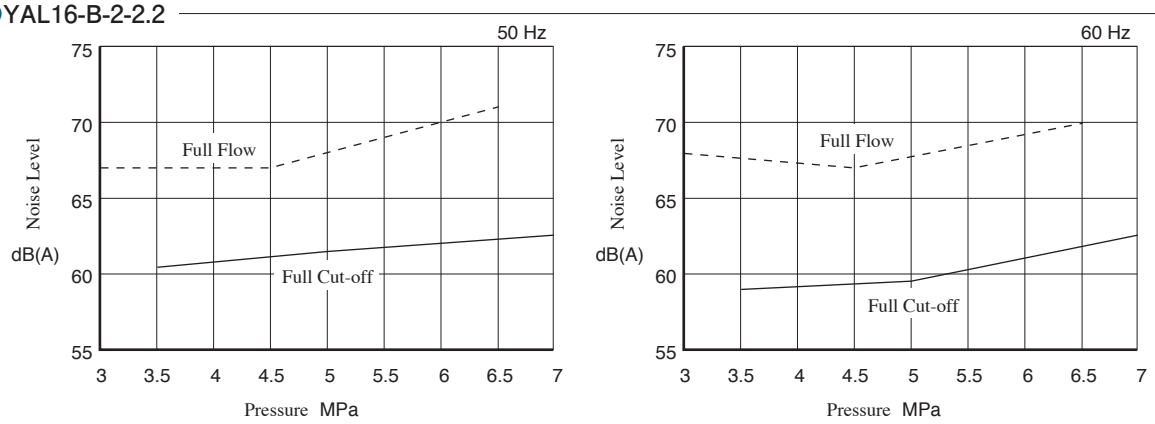
●YAL8-A-1-0.75



●YAL16-B-2-1.5

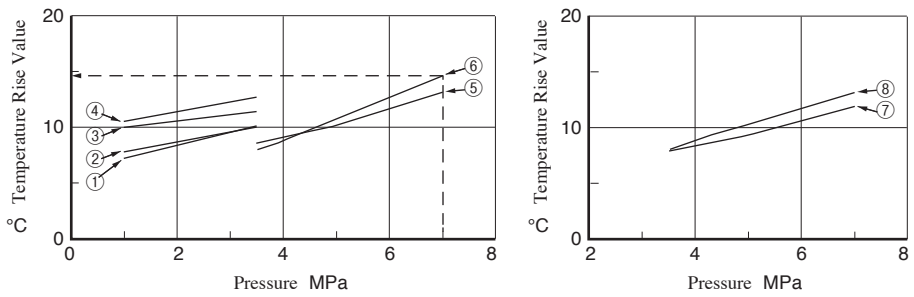


●YAL16-B-2-2.2



Oil Temperature in Reservoir

Oil temperature is expressed as (room temperature + temperature rise value).
Temperature rise values (full cut-off continuous operation, windless conditions) for each model are shown below, please check that oil temperature is below 60°C.
(Ex.) When operating YAL8/16-B-2-1.5 continuously (60Hz) at full cut-off pressure 7 MPa, temperature rise value is 14.6 °C as shown by broken line in the graph.
Assuming that room temperature is 30 °C then tank temperature will be 44.6 °C.



No.	Model Numbers
①	YAL8-A-1-0.75 50Hz
②	YAL8-A-1-0.75 60Hz
③	YAL8-A-2-0.75 50Hz
④	YAL8-A-2-0.75 60Hz
⑤	YAL8/16-B-2-1.5 50Hz
⑥	YAL8/16-B-2-1.5 60Hz
⑦	YAL16-B-2-2.2 50Hz
⑧	YAL16-B-2-2.2 60Hz

Instructions

Suction/Return Air

Don't put any obstructions at air vent surface of the drain cooler.
Please install unit at the floor with good air flow to avoid heat stuff.

Transportation

Use eye bolts at the time of transportation.

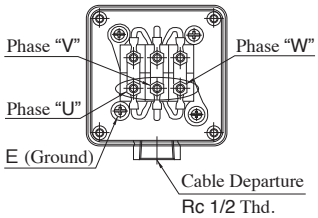
Installation

This unit is stationary type, so please fix it using bolts on the level space with no vibration.

Electrical Wiring

To protect electrical circuit from over current like short and protect motor from overload, we recommend to install no-fuse breaker with earth leakage breaker on the primary power supply,
For electrical wiring, please use crimp terminals of suitable size, and connect certainly to avoid electric leakage for main body and interphase electrical short. Please be sure to ground the earth terminal.

【Terminal Box Detail】



【Connecting Screw Size】

Phase "U" "V" "W" M5
E (Ground) M5

Motor Side [U1－R / V1－S / W1－T] Power Supply Side

Note for Starting Operation

Before initial operation, please supply ruled mass of hydraulic fluid required from oil tank port, and fill clean hydraulic fluid from filling port of pump till the oil full filled in pump housing. To avoid air-bound at starting operation, please adjust hydraulic circuit as that pump drain fluid return directly to oil tank, or operate directional valves for actuators no-load moving. Then start inching operation to confirm no particular, please do running operation.

Air Vent

Because air entrainment in pump or pipe may cause to occur vibration, please make air vent completely.

Setting of Pressure

〔Pressure Adjustment〕

At the time of shipping, the pressure set at minimum level, so please adjust the pressure under using conditions. Turn the pressure adjustment screw clockwise, the pressure increase. For adjustment volumes at one rotation of adjustment screw, please refer to the table below. After adjustments, do not forget to tighten the lock nut.

【Adjustment Volumes at One Rotation of Pres. Adj. Screw】

1.5MPa

Setting of Output Flow

〔Output Flow Adjustment〕

This model is unable to adjust output flow rate.
Please install flow control valves as required.

External Paint Color：

Only the standard models are painted by Munsell N2 (semi gloss).

Options

Base Plate Embedded：01M＊

Control circuit can be constructed by just stacking up modular valves/ solenoid valve atop the base plate. However, the circuit construction is limited to modular valves and standard solenoid directional control valves. In this case, please indicate power supply for operation.

Without Control Circuit：B

Base plate is attached directly to discharge port of the pump and return piping arranged from base plate to the tank only.
Please prepare components to construct control circuit separately. This option is applicable when 01M* is added.

Tank Magnet Embedded：Mg

Installed inside the tank. Attracts and collects fine iron powder. Decreases component wear.

Oil Level Gauge with Thermometer Embedded：Te

Different Voltage Electric Motor：（＊V × ＊Hz）

200 V AC (50Hz) and 200/220 V AC (60Hz) are standard. We can also offer 400 V AC (50Hz) and 400/440 V AC (60Hz).

Option Indication Method

When ordering L Pack with options, please add「OP」at the end of standard L Pack model number, use the example below for reference and indicate options.

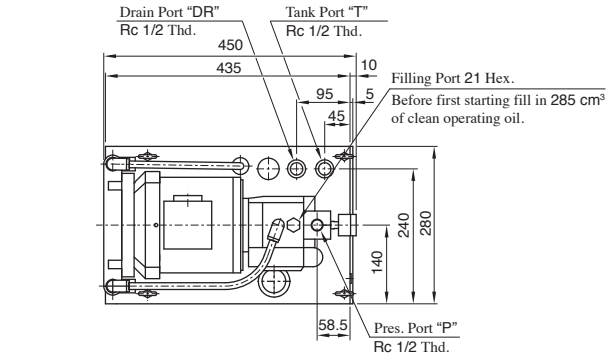
(Example) YAL8-A-1-0.75-20-OP

OP—01 M1 B Mg Te ＊V × ＊Hz

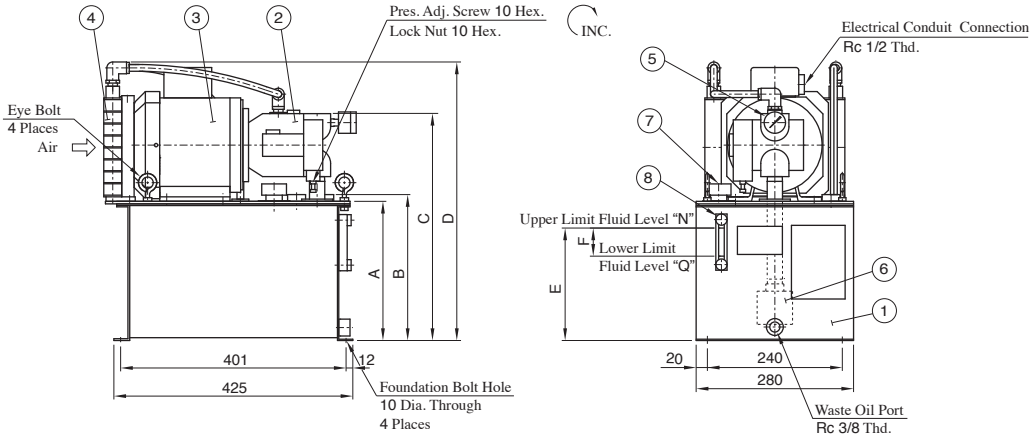
- Option Incl.
- Base Plate Embedded
- Base Plate Size
  - 01 ：01 Size
- Number of Base Plate stations
  - M1 ：1 Station
  - M2 ：2 Stations
- None：With Control Circuit
- B ：Without Control Circuit
- Mg ：Tank Magnet Embedded
- Te ：Oil Level Gauge with Thermometer Embedded
- Different Voltage Electric Motor
  Fill in "Voltage × Frequency"in case if they differ from standard voltage only

K
YA Series L Pack

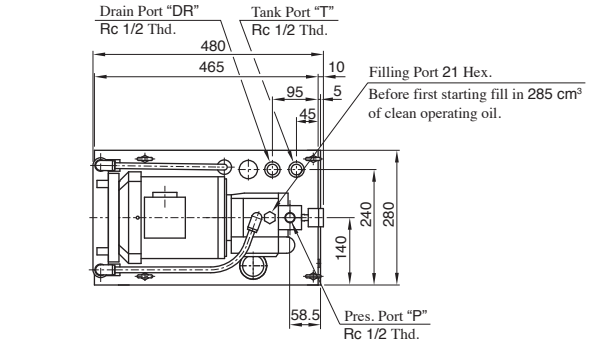
●YAL8-A-＊-0.75



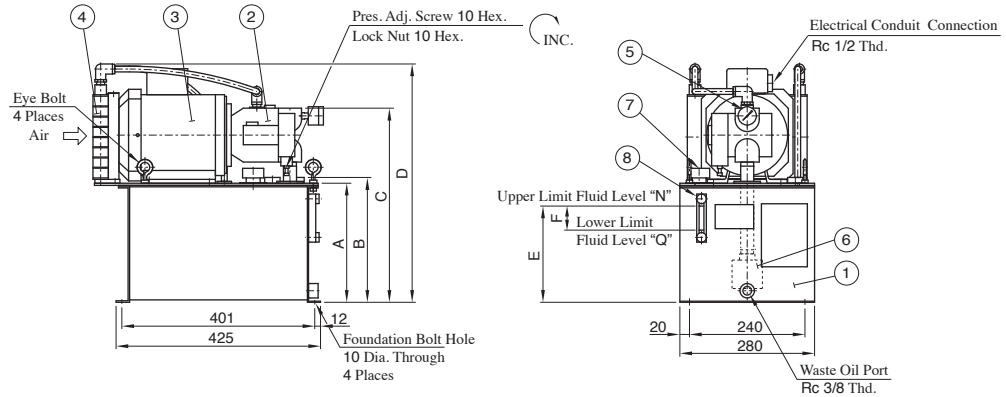
Item	Name
1	Hydraulic Reservoir
2	Pump
3	Electric Motor
4	Drain Cooler
5	Pressure Gauge
6	Suction Strainer
7	Air Breather with Filling Port
8	Oil Level Gauge



●YAL8/16-＊-＊-1.5



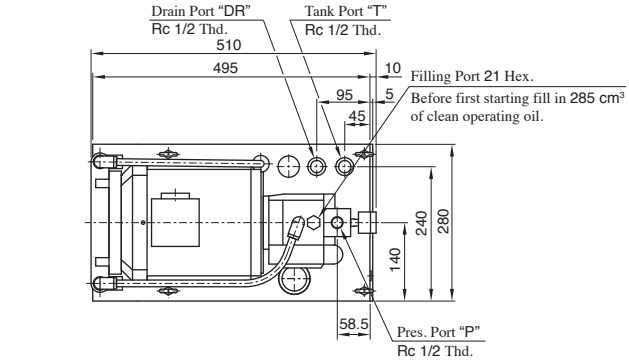
Item	Name
1	Hydraulic Reservoir
2	Pump
3	Electric Motor
4	Drain Cooler
5	Pressure Gauge
6	Suction Strainer
7	Air Breather with Filling Port
8	Oil Level Gauge



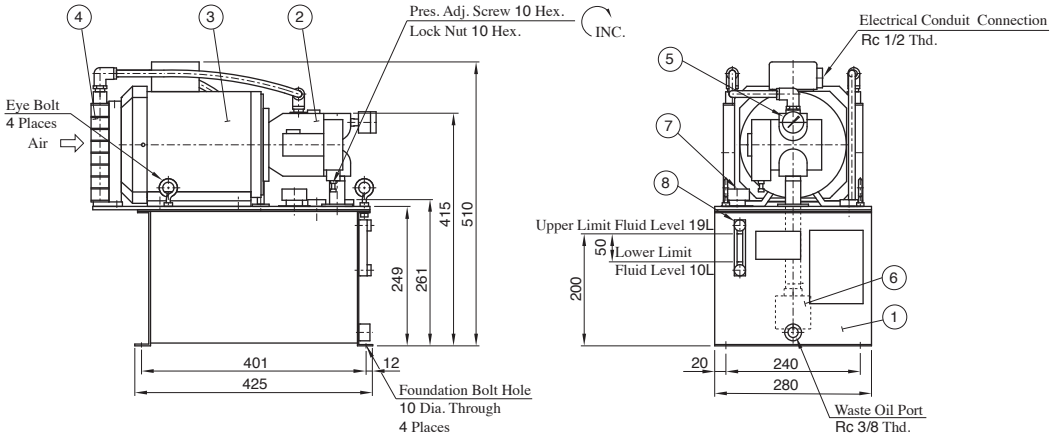
Model Numbers	Reservoir Capacity	Electric Motor Output × Poles	Dimensions						Oil Ammount L	
			A	B	C	D	E	F	N	Q
YAL8-A-1-0.75	10L	0.75kW×4P	157.5	169.5	313.5	410	110	10	10	9
YAL8-A-2-0.75	19L		247.5	259.5	403.5	500	200	50	19	15
YAL8/16-＊-1-1.5	10L	1.5kW×4P	157.5	169.5	313.5	410	110	10	10	9
YAL8/16-＊-2-1.5	19L		247.5	259.5	403.5	500	200	50	19	15

★Pump installed on this unit is not equipped with flow adjustment screw.

●YAL16-B-2-2.2



Item	Name
1	Hydraulic Reservoir
2	Pump
3	Electric Motor
4	Drain Cooler
5	Pressure Gauge
6	Suction Strainer
7	Air Breather with Filling Port
8	Oil Level Gauge



★Pump installed on this unit is not equipped with flow adjustment screw.

■ Interchangeability between Current and New Models

As of YA series L pack, the design number has changed from 10 to 20 due to change of built-in electric motor.

● Comparison of Current and New Specifications

New specifications are the same as current except for those listed below. Mass has been increased in the range of 4 - 14 kg (Mass ratio 111 - 134%)

Mass

Current		New	
Model Numbers	Mass kg	Model Numbers	Mass kg
YAL8-A-1-0.75-10	30	YAL8-A-1-0.75-20	37
YAL8-A-1-1.5-10	35	YAL8-A-1-1.5-20	40
YAL8-A-2-0.75-10	33	YAL8-A-2-0.75-20	39
YAL8-A-2-1.5-10	38	YAL8-A-2-1.5-20	42
YAL8-B-2-1.5-10	38	YAL8-B-2-1.5-20	42
YAL16-A-1-1.5-10	35	YAL16-A-1-1.5-20	40
YAL16-B-2-1.5-10	38	YAL16-B-2-1.5-20	42
YAL16-B-2-2.2-10	41	YAL16-B-2-2.2-20	55

★For comparison of electric motor specifications, please refer to page K-41.

● Major Changes

(1) Mass has been increased in the range of 4 - 14 kg (Mass ratio 111 - 134%)
(2) The body has become larger in general. Foundation mounting bolts thread pitch has not changed.
(3) Built-in electric motor efficiency class has changed to IE3. Motor specifications have been upgraded in general. For electric motor specifications, please refer to page K-39.

● Interchangeability in Installation

No interchangeability. The following dimensions are different.

Non-interchangeable Element Description	Non-interchangeable Element Dimension
Distance from tank edge to drain (DR) port	Page K-38 Dimension D
Distance from tank edge to tank (T) port	Page K-38 Dimension E
Distance from tank edge to pressure (P) port	Page K-38 Dimension F
Drain (DR) Port and Tank (T) Port Height	Page K-38 Dimension H
Pressure (P) Port Height	Page K-38 Dimension J

Comparison of Current and New Performance Characteristics

(1) Selection Graph
New is the same as current.

(2) Noise Characteristics and Tank Oil Temperature Rise
Have changed for all models.

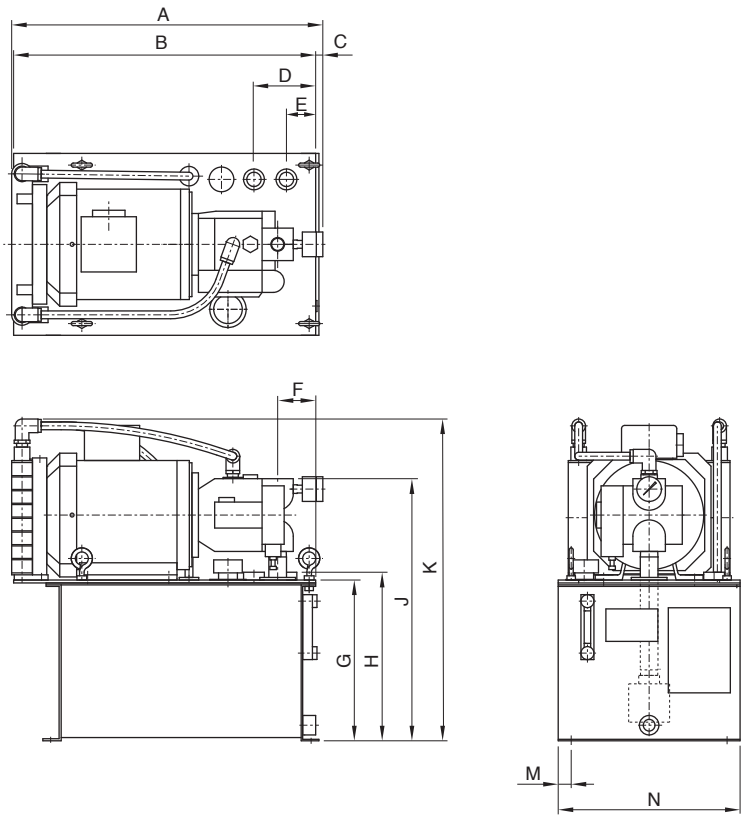
Comparison of Options

(1) Change of Exterior Paint Color : PT has been disbanded.
Standard color is black, same as that of small type YA Pack (Munsell N2［semi gloss］).

(2) Oil Level Gauge with Thermometer Embedded : Te has been added.

Comparison of Current and New Dimensions

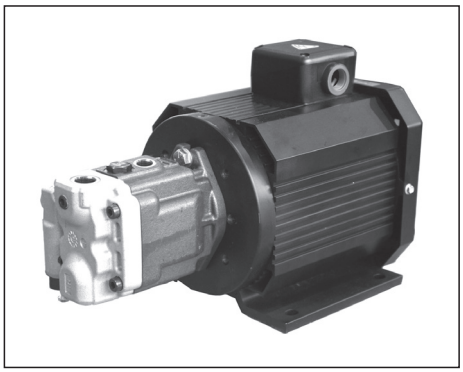
New dimensions are the same as current except for those in the chart below.



	Model Numbers	A	B	C	D	E	F	G	H	J	K	M	N
Current	YAL8-A-1-0.75-10	426	—	—	100	50	65	154	166	304	395	15	270
	YAL8/16-＊-1-1.5-10	457	—	—	100	50	65	154	166	304	395	15	270
	YAL8-A-2-0.75-10	426	—	—	100	50	65	244	256	394	485	15	270
	YAL8/16-＊-2-1.5-10	457	—	—	100	50	65	244	256	394	485	15	270
	YAL16-B-2-2.2-10	486	—	—	100	50	65	244	256	394	485	15	270
New	YAL8-A-1-0.75-20	450	435	10	95	45	58.5	157.5	169.5	313.5	410	20	280
	YAL8/16-＊-1-1.5-20	480	465	10	95	45	58.5	157.5	169.5	313.5	410	20	280
	YAL8-A-2-0.75-20	450	435	10	95	45	58.5	247.5	259.5	403.5	500	20	280
	YAL8/16-＊-2-1.5-20	480	465	10	95	45	58.5	247.5	259.5	403.5	500	20	280
	YAL16-B-2-2.2-20	510	495	10	95	45	58.5	249	261	415	510	20	280

AML1 Type Motor-Pumps

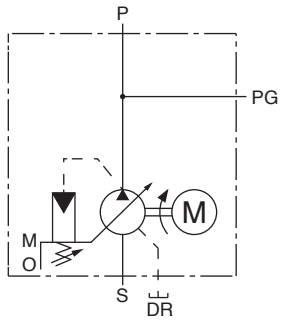
This motor-pump is ARL1 series piston pump integrated with electric motor.
Use as auxiliaries / spare parts for YA-Light, make it compact by applicable design of motor-pumps.



Specifications

Model Numbers	Geometric Displacement cm^3/rev	Max. Operating Pres. Rated Pres.	Electric Motor	Mass kg
AML1-6＊-＊-20	6.2	7 MPa Differ by operating conditions, please contact us separately for details.	0.75 kW×4P	23
			1.5 kW×4P	26.3
			2.2 kW×4P	37
AML1-8＊-＊-20	8.5		0.75 kW×4P	23
			1.5 kW×4P	26.3
			2.2 kW×4P	37
AML1-12＊-＊-20	12.3		1.5 kW×4P	26.3
			2.2 kW×4P	37
AML1-16＊-＊-20	16.3		1.5 kW×4P	26.3
			2.2 kW×4P	37

Graphic Symbol



★Displacement volume adjustment function is not available.

Electric Motor Specifications

Output × Poles	Insulation Type	Voltage - Frequency V Hz	Rated Current A	Rotation Speed r/min	Inrush Current A	Coating Structure / Surrounding Environment
0.75 kW×4P	F	200-50	3.50	1460	21.8	●Coating Structure Dust & Splash Proof / Coating Surface Self Cooling Type (IP54 IC411, IEC60034-1) ●Surrounding Environment Location：Indoor Temperature：-20 - +40°C Humidity：Relative Humidity below 80%, No Condensation Elavation：Below 1000 m Corrosive Gas / Explosive Gas / Steam not exist
		200-60	3.45	1750	19.6	
		220-60	3.30	1760	21.9	
1.5 kW×4P		200-50	6.40	1450	39.8	
		200-60	6.60	1760	37.0	
		220-60	5.90	1756	39.0	
2.2 kW×4P		200-50	9.50	1450	64.0	
		200-60	9.00	1740	56.0	
		220-60	8.50	1750	64.0	

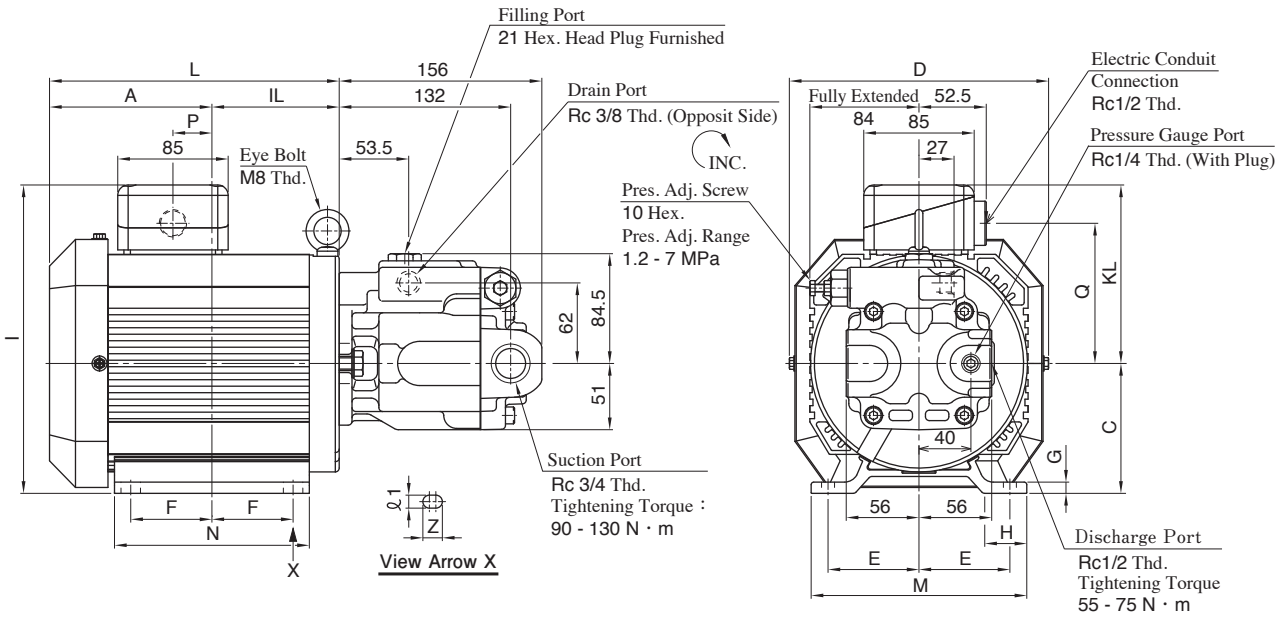
Model Number Designation

AML1	−16	A	−1.5	−20
Series Number	Geometric Displacement	Mounting Type	Electric Motor	Design Number
AML1： AML1 Type Motor-Pumps	6：6.2 cm^3/rev 8：8.5 cm^3/rev	S：Side Port (Standard) A：Suction Port Position: Downwards (For Standard L Pack)	0.75：0.75 kW×4P 1.5：1.5 kW×4P 2.2：2.2 kW×4P	20
	12：12.3 cm^3/rev 16：16.3 cm^3/rev		1.5：1.5 kW×4P 2.2：2.2 kW×4P	

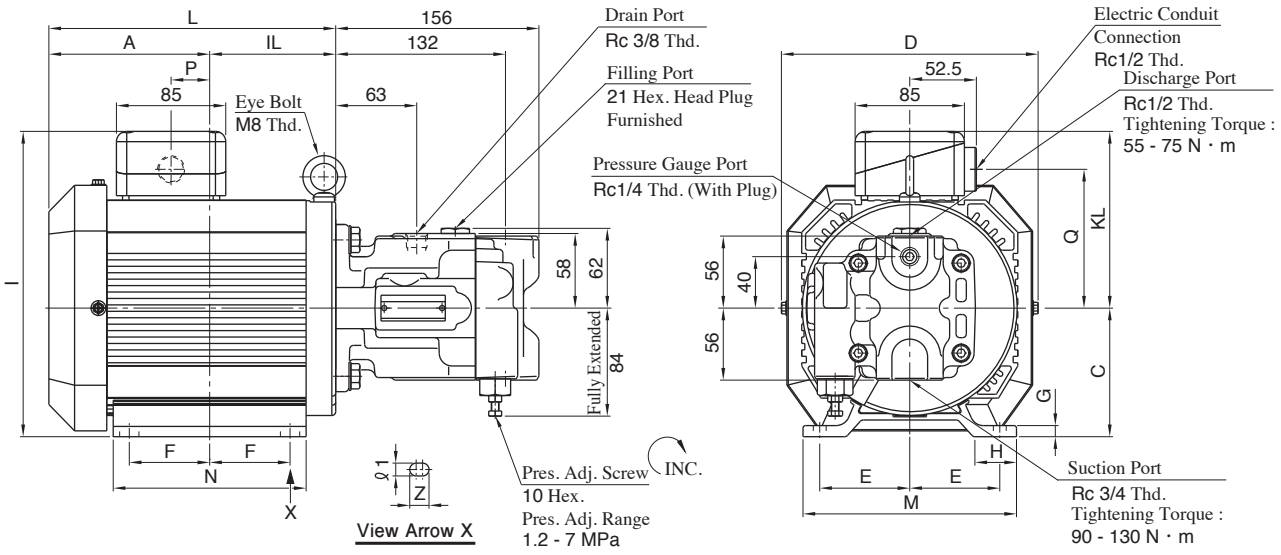
Pump Characteristics

For pump characteristics, please refer to those of ARL1 series piston pump on [“A Piston Pump”Catalog].

AML1-＊S（Side Port）



AML1-＊A（Suction Port Downwards）



Model Numbers	Electric Motor Output × Poles	A	IL	C	D	E	F	G	H	I	M
AML1-＊＊-0.75	0.75 kW×4P	108	85.5	100	200	70	50	8.7	32.4	234	166
AML1-＊＊-1.5	1.5 kW×4P	125.5	98	100	200	70	62.5	8.7	32.4	234	166
AML1-＊＊-2.2	2.2 kW×4P	139	114.5	110	218	95	70	10.7	59	254	220

Model Numbers	Electric Motor Output × Poles	N	KL	Q	Z	ℓ1	L	P
AML1-＊＊-0.75	0.75 kW×4P	125	134	108	15	10	193.5	12.5
AML1-＊＊-1.5	1.5 kW×4P	150	134	108	15	10	223.5	30
AML1-＊＊-2.2	2.2 kW×4P	185	144	118	15	12	253.5	42.5

★Electric motor for this motor-pump is not available for single sale. If spare parts required, please order as motor-pumps.

Interchangeability between Current and New Models

As of AML1 type motor pump, the design number has changed from 10 to 20 due to change of built-in electric motor.

Major Changes

(1) Mass has been increased in the range of 1.5 - 9.7 kg (Mass ratio 106 - 136%)
(2) The body has become larger in general.
(3) Built-in electric motor efficiency class has changed to IE3. Motor specifications have been upgraded in general.

Interchangeability in Installation

No interchangeability. The following dimensions are different.

Non-interchangeable Element Description	Non-interchangeable Element Dimension
Distance from pump position to center of electric motor	Next Page Dimension IL
Pump Center Height	Next Page Dimension C
Mounting Position of Electric Motor	Next Page Dimension E, F, ℓ 1 [Only for AML1-＊＊-2.2]

Comparison of Current and New Specifications

New specifications are the same as current except for those listed below. Mass has been increased in the range of 1.5 - 9.7 kg (Mass ratio 106 - 136%)

①Mass

Model Numbers	Mass kg
AML1-＊＊-0.75	23 (19.8)
AML1-＊＊-1.5	26.3 (24.8)
AML1-＊＊-2.2	37 (27.3)

★The values without parentheses represent the mass of new 20 design, those in parentheses represent the mass of current 10 design.

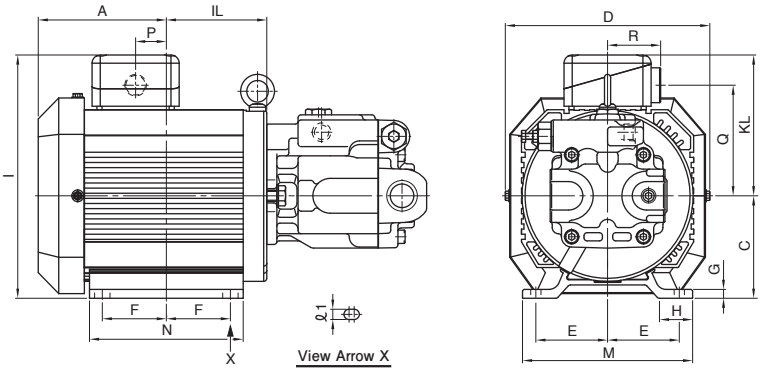
②Electric Motor

Output × Poles	Voltage - Frequency V Hz	Rated Current A	Rotation Speed r/min	Inrush Current A
0.75 kW×4P	200-50	3.50 (3.70)	1460 (1410)	21.8 (17.0)
	200-60	3.45 (3.40)	1750 (1700)	19.6 (15.5)
	220-60	3.30 (3.35)	1760 (1720)	21.9 (17.5)
1.5 kW×4P	200-50	6.40 (6.30)	1450 (1410)	39.8 (34.5)
	200-60	6.60 (6.00)	1760 (1700)	37.0 (30.0)
	220-60	5.90 (5.60)	1756 (1720)	39.0 (33.6)
2.2 kW×4P	200-50	9.50 (9.60)	1450 (1410)	64.0 (49.5)
	200-60	—	1740 (1700)	56.0 (44.5)
	220-60	—	1750 (1720)	64.0 (50.2)

★The values without parentheses represent the specifications of new 20 design, in parentheses represent those of current 10 design.

Comparison of Current and New Dimensions

New dimensions are the same as current except for those in the chart below.

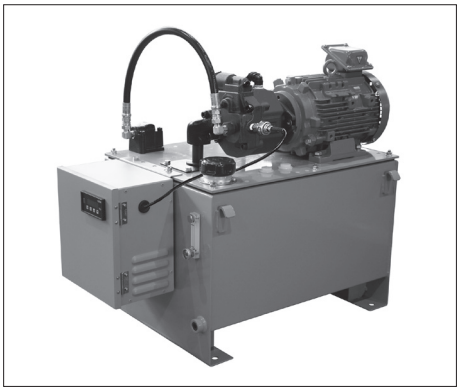


	Model Numbers	A	IL	C	D	E	F	G	H	I	M
Current	AML1-＊＊-0.75-10	128.5	65	90	192			8	—	228	
	AML1-＊＊-1.5-10	146.2	77.5	90	192			8	—	228	
	AML1-＊＊-2.2-10	176	77.5	90	192	70	62.5	8	—	228	166
New	AML1-＊＊-0.75-20	108	85.5	100	200			8.7	32.4	234	
	AML1-＊＊-1.5-20	125.5	98	100	200			8.7	32.4	234	
	AML1-＊＊-2.2-20	139	114.5	110	218	95	70	10.7	59	254	220

	Model Numbers	N	KL	Q	ℓ1	P	R
Current	AML1-＊＊-0.75-10		138	105		18	51.5
	AML1-＊＊-1.5-10		138	105		35.5	51.5
	AML1-＊＊-2.2-10	150	138	105	10	65.5	51.5
New	AML1-＊＊-0.75-20		134	108		12.5	52.5
	AML1-＊＊-1.5-20		134	108		30	52.5
	AML1-＊＊-2.2-20	185	144	118	12	42.5	52.5

Energy-Saving Standard Hydraulic Power Unit YA-e Pack

YA-e pack has obtained extensive energy-saving effect by combination of the variable displacement piston pump which can hold pressure and the personal inverter controller which controls rotational frequency by detecting a load pressure.



● Significant Reduction of Power Consumption

E-YA37 type of this power unit, compared to current YA pack, has reduced max. 70% of power consumption at full cut-off pressure.

● Low Heat Generation

E-YA37 type of this power unit, compared to current YA pack, has reduced more than 20°C of the fluid temperature increase at full cut-off pressure.

● Low Noise

By decreasing the motor speed at full cut-off pressure, it is possible to reduce the noise level extensively.

● Discharge volume can be set to a certain volume at 50/60 Hz.

YA-e pack can set the rotation speed at the maximum output flow less than 1800 r/min, regardless the power supply frequency.
(The minimum rotation speed is 300 r/min with the suction capacity of pump)

● Easy to configure the control circuit

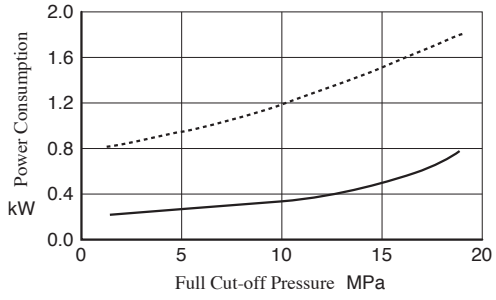
The control circuit with modular valve is available, so it is possible to configure the control circuit compactly.

● Continuous operation is possible even at breakdown of the pressure sensor or the inverter

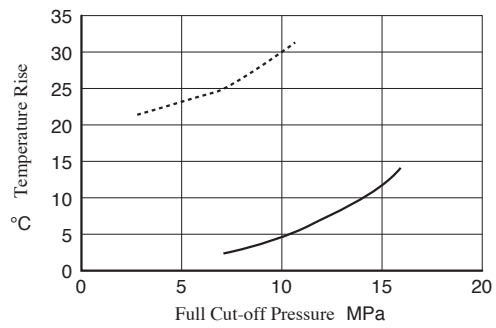
Operation at a certain rotation speed is possible even without receiving a signal from the pressure sensor due to breaking of wire or malfunction of the pressure sensor. In case of malfunction of the inverter itself, the same operation mentioned above is possible by reconnecting of the primary power supply to the motor.

■ Characteristics Comparison with Standard Type

● Power Consumption at Full Cut-off Pressure

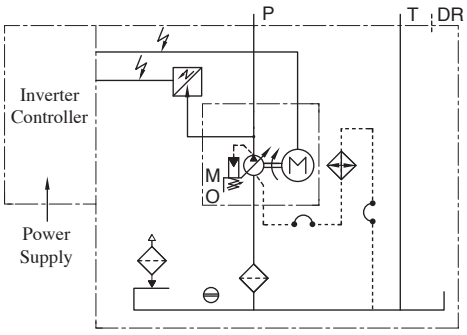


● Oil Temperature Increase in the Reservoir

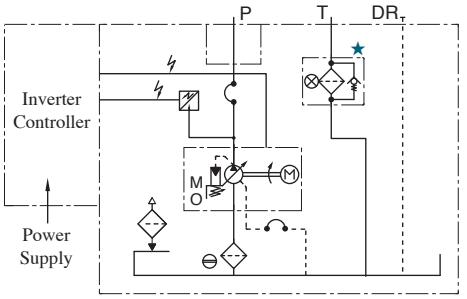


Standard Type <YA37, 3.7 kW, 1800 r/min>
Energy-Saving Type <E-YA37, 3.7 kW, 300 r/min>

Hydraulic Circuit



E-YA16-B-2



E-YA∗-∗-6/10

★ 60L (E-YA∗-∗-6) is option embedded.

K
YA-e Pack

Specifications

Model Numbers	Geometric Displacement of Pump cm^3/rev	Max. Operating Pres. MPa	Pres. Adj. Range MPa	Reservoir Capacity L	Electric Motor 50 Hz：200 V AC 60 Hz：200/220/230 V AC	Mass (excluding hydraulic fluid) kg
E-YA10-B-6-2.2-51	10.0	7	1.2 - 7	60	2.2 kW×4P	89
E-YA10-C-10-2.2-51		16	2.0 - 16	100		115
E-YA10-C-10-3.7-51					3.7 kW×4P	126
E-YA16-B-2-0.75-52	15.8	7	1.2 - 7	18	0.75 kW×4P	47
E-YA16-B-2-1.5-50				18	1.5 kW×4P	51
E-YA16-B-2-2.2-50					2.2 kW×4P	58
E-YA16-B-6-2.2-50				60		90
E-YA16-B-6-3.7-50					3.7 kW×4P	104
E-YA16-B-10-2.2-50				100	2.2 kW×4P	115
E-YA16-C-10-3.7-50		16	2.0 - 16		3.7 kW×4P	131
E-YA16-C-10-5.5-50					5.5 kW×4P	159
E-YA16-C-10-7.5-50					7.5 kW×4P	172
E-YA22-B-6-2.2-50	22.2	7	1.2 - 7	60	2.2 kW×4P	90
E-YA22-B-6-3.7-50					3.7 kW×4P	104
E-YA22-B-10-2.2-50				100	2.2 kW×4P	120
E-YA22-B-10-3.7-50					3.7 kW×4P	156
E-YA22-C-10-5.5-50		16	2.0 - 16		5.5 kW×4P	159
E-YA22-C-10-7.5-50					7.5 kW×4P	172
E-YA37-B-10-3.7-50	36.9	7	1.2 - 7	100	3.7 kW×4P	151
E-YA37-B-16-5.5-50				160	5.5 kW×4P	189
E-YA37-B-16-7.5-50					7.5 kW×4P	197

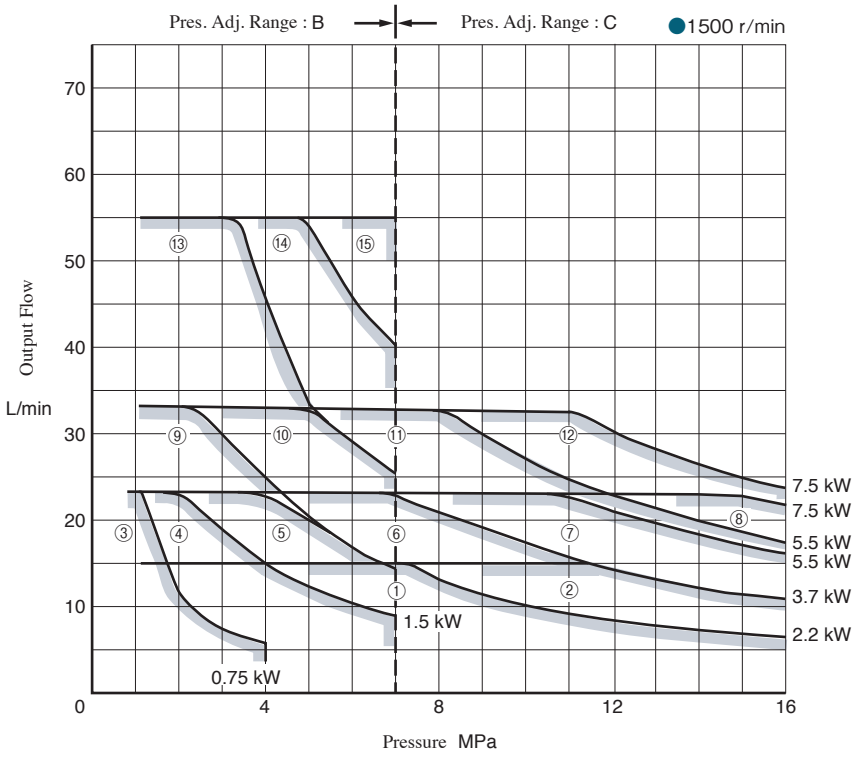
Model Number Designation

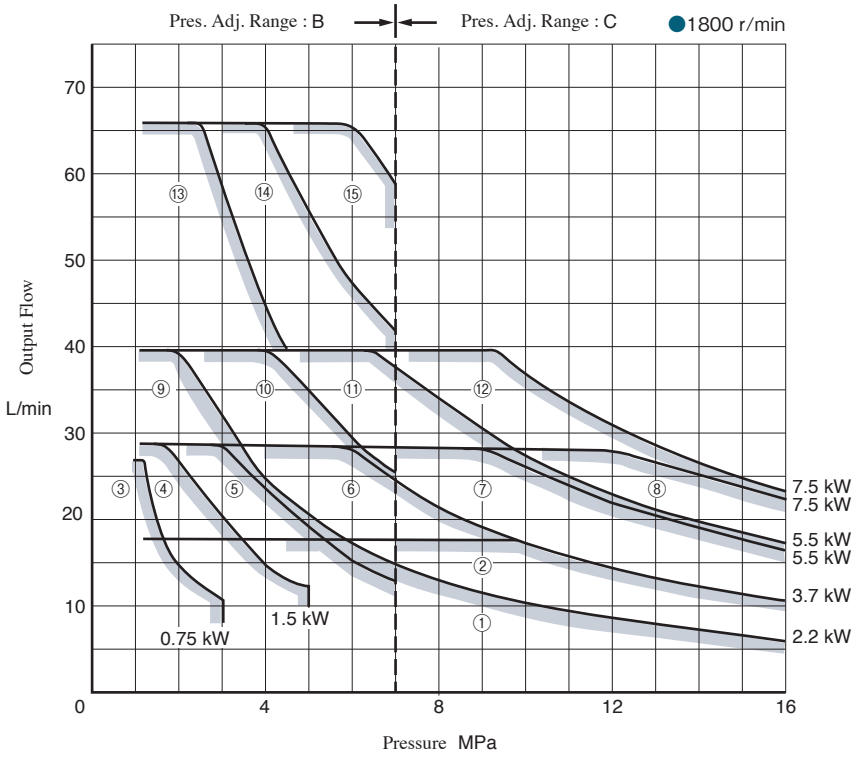
E-YA	16	−B	−6	−2.2	−50
Series Number	Built-in Pump	Pres. Adj. Range ★1 MPa	Reservoir Capacity L	Electric Motor	Design Number
E-YA： Energy-Saving Hydraulic Power Unit YA-e Pack	10：A10 (10.0 cm^3/rev)	B：1.2 - 7	6：60	2.2：2.2 kW×4P	51
		C：2.0 - 16	10：100	2.2：2.2 kW×4P	
				3.7：3.7 kW×4P	
	16：AR16 (15.8 cm^3/rev)	B：1.2 - 7	2：18	0.75：0.75 kW×4P	52
				1.5：1.5 kW×4P	50
				2.2：2.2 kW×4P	
		B：1.2 - 7	6：60	2.2：2.2 kW×4P	
				3.7：3.7 kW×4P	
		B：1.2 - 7	10：100	2.2：2.2 kW×4P	
		C：2.0 - 16	10：100	3.7：3.7 kW×4P	
				5.5：5.5 kW×4P	
				7.5：7.5 kW×4P	
	22：AR22 (22.2 cm^3/rev)	B：1.2 - 7	6：60	2.2：2.2 kW×4P	
				3.7：3.7 kW×4P	
		B：1.2 - 7	10：100	2.2：2.2 kW×4P	
				3.7：3.7 kW×4P	
		C：2.0 - 16	10：100	5.5：5.5 kW×4P	
				7.5：7.5 kW×4P	
	37：A37 (36.9 cm^3/rev)	B：1.2 - 7	10：100	3.7：3.7 kW×4P	
			16：160	5.5：5.5 kW×4P	
				7.5：7.5 kW×4P	

★1. Pressure adjustment range values shown are those of the pump.

Selection Graph

Below portion of the graph is the allowable operating range with regards to rated output of electric motor.

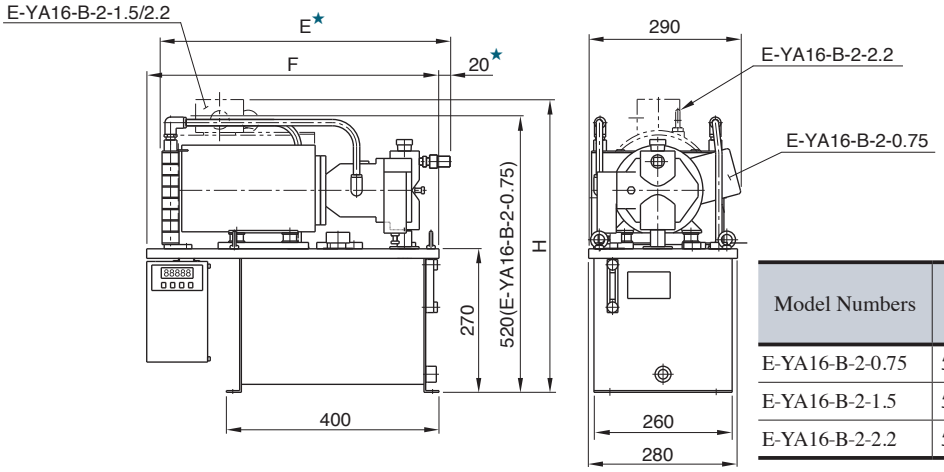




No.	Model Numbers
①	E-YA10-B-6-2.2 E-YA10-C-10-2.2
②	E-YA10-C-10-3.7
③	E-YA16-B-2-0.75
④	E-YA16-B-2-1.5
⑤	E-YA16-B-2-2.2 E-YA16-B-6-2.2 E-YA16-B-10-2.2
⑥	E-YA16-B-6-3.7 E-YA16-C-10-3.7
⑦	E-YA16-C-10-5.5
⑧	E-YA16-C-10-7.5
⑨	E-YA22-B-6-2.2 E-YA22-B-10-2.2
⑩	E-YA22-B-6-3.7 E-YA22-B-10-3.7
⑪	E-YA22-C-10-5.5
⑫	E-YA22-C-10-7.5
⑬	E-YA37-B-10-3.7
⑭	E-YA37-B-16-5.5
⑮	E-YA37-B-16-7.5

Dimensions

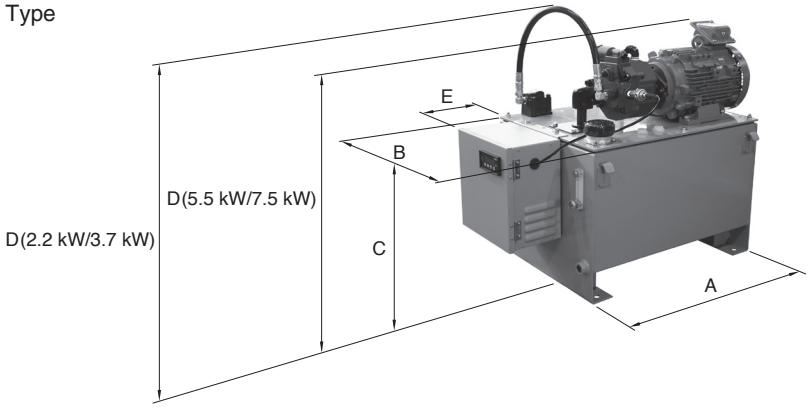
18L Tank Type



Model Numbers	E	F	H	Reservoir Capacity L	Electric Motor
E-YA16-B-2-0.75	530	510	—	18	0.75kW×4P
E-YA16-B-2-1.5	570	550	545		1.5kW×4P
E-YA16-B-2-2.2	595	550	555		2.2kW×4P

Note) The dimensions of hydraulic power unit except ★ part are same as the standard type YA pack, please refer to page K-26.

60L/100L/160L Tank Type



Model Numbers	Dimensions mm					Reservoir Capacity L	Electric Motor
	A	B	C	D	E		
E-YA10-B-6-2.2	600	450	410	740	175	60	2.2 kW×4P
E-YA10-C-10-2.2	750	500	470	820	175	100	2.2 kW×4P
E-YA10-C-10-3.7							3.7 kW×4P
E-YA16-B-6-2.2	600	450	410	740	175	60	2.2 kW×4P
E-YA16-B-6-3.7							3.7 kW×4P
E-YA16-B-10-2.2	750	500	470	820	175	100	2.2 kW×4P
E-YA16-C-10-3.7	750	500	470	820	175		3.7 kW×4P
E-YA16-C-10-5.5				910	200		5.5 kW×4P
E-YA16-C-10-7.5							7.5 kW×4P
E-YA22-B-6-2.2	600	450	410	750	175	60	2.2 kW×4P
E-YA22-B-6-3.7							3.7 kW×4P
E-YA22-B-10-2.2	750	500	470	820	175	100	2.2 kW×4P
E-YA22-B-10-3.7							3.7 kW×4P
E-YA22-C-10-5.5				910	200		5.5 kW×4P
E-YA22-C-10-7.5							7.5 kW×4P
E-YA37-B-10-3.7	750	500	470	840	175	100	3.7 kW×4P
E-YA37-B-16-5.5	790	600	550	990	200	160	5.5 kW×4P
E-YA37-B-16-7.5							7.5 kW×4P

Note) The dimensions of hydraulic power unit except ★ part are same as the standard type YA pack, please refer to pages K-24, K-25 and K-27 - K-30.
In case of some models, the electric motor or the drain cooler could overhang the tank.

Interchangeability between Current and New Models

As of E-YA16 type, the design number of some models has changed from 50 to 52 due to change of built-in electric motor.

Changes

Mass

Current		New	
Model Numbers	Mass kg	Model Numbers	Mass kg
E-YA16-B-2-0.75-50	48	E-YA16-B-2-0.75-52	47

Interchangeability in Installation

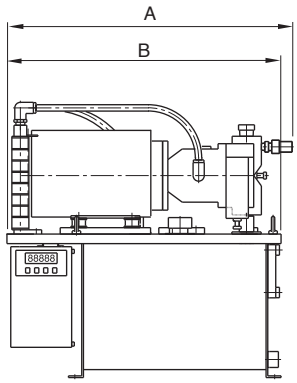
Yes

Specifications / Characteristics

Those of current and new models are same except for the mass.

Dimensions

New dimensions are the same as current except for those in the chart below.



Current or New	A	B
Current	570	550
New	530	510

Energy-Saving Control System for Hydraulic Units

Energy-saving effect can be obtained by adding this system to an existing unit and carrying out simple adjustments.

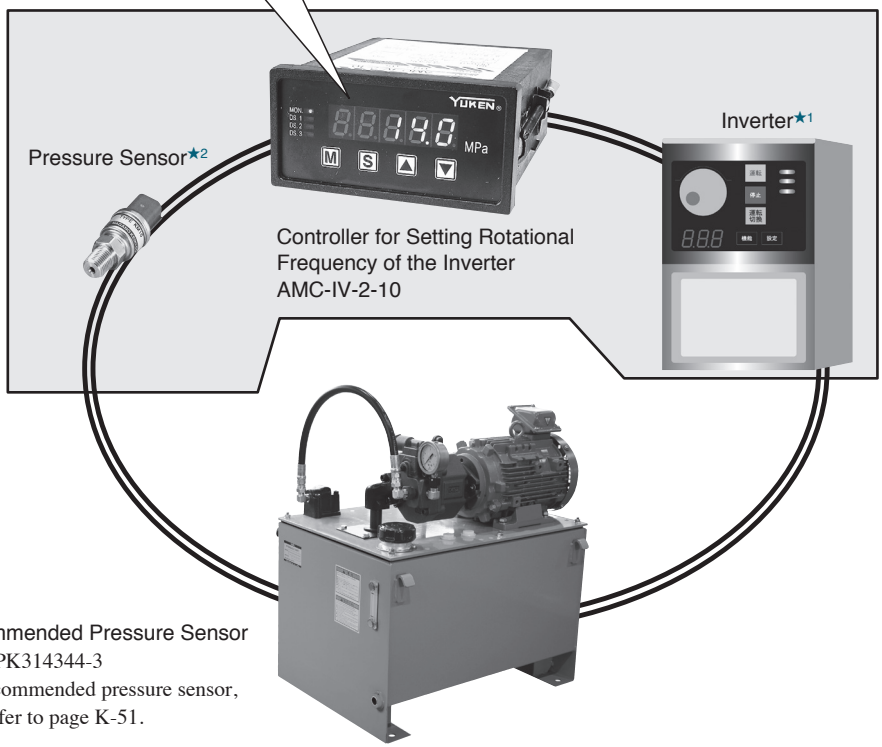
System Configuration

Use the hydraulic pump and electric motor of the current equipment, add the controller for setting rotational frequency of the inverter, the pressure sensor, and the inverter, and only carry out simple adjustments.

Due to adopt the select indication system, it is possible to indicate the five descriptions below.

①Input for pressure sensor (indicate pressure)
②Output for inverter
③Simple power calculation value
④Sequence input/output code
⑤Alarm output code

★1. Recommended Inverter
A product which performance higher than the sensorless vector control type should be used.



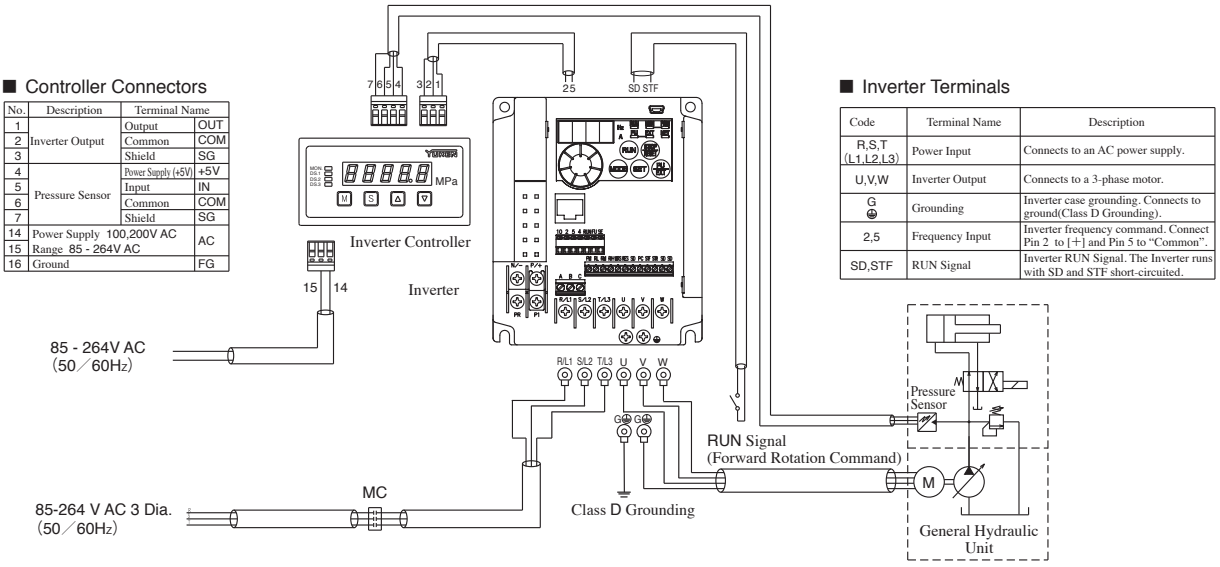
★2. Recommended Pressure Sensor
・1501-PK314344-3
As of recommended pressure sensor, please refer to page K-51.

Existing Hydraulic Unit
Equipped with Variable Displacement Piston Pump and Induction Motor：0.75 - 7.5 kW

Inverter Connection Example

■ Controller Connectors

No.	Description	Terminal Name	
1	Inverter Output	Output	OUT
2		Common	COM
3		Shield	SG
4	Pressure Sensor	Power Supply (+5V)	+5V
5		Input	IN
6		Common	COM
7		Shield	SG
14	Power Supply 100,200V AC Range 85 - 264V AC		AC
15			
16	Ground		FG



■ Inverter Terminals

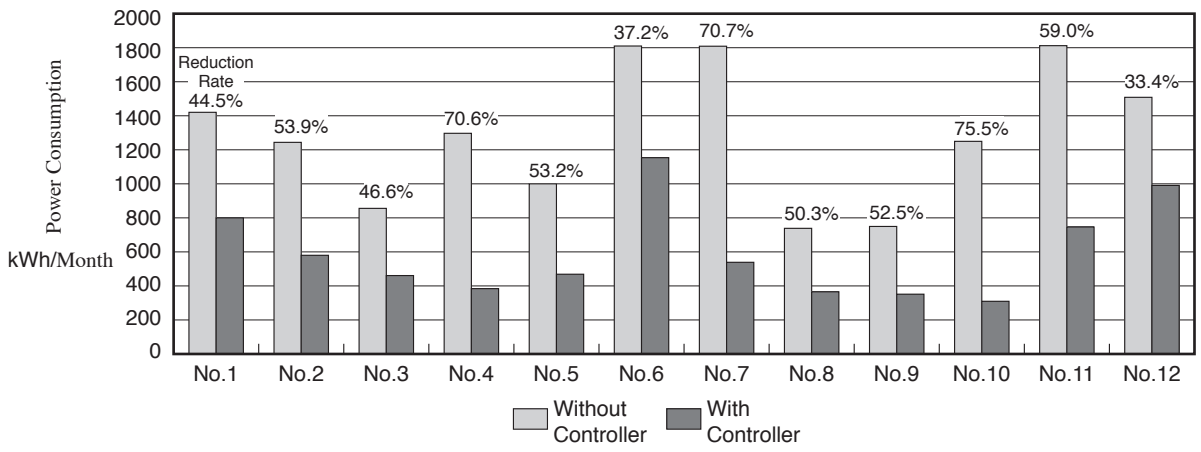
Code	Terminal Name	Description
R,S,T (L1,L2,L3)	Power Input	Connects to an AC power supply.
U,V,W	Inverter Output	Connects to a 3-phase motor.
G	Grounding	Inverter case grounding. Connects to ground(Class D Grounding).
2,5	Frequency Input	Inverter frequency command. Connect Pin 2 to [+] and Pin 5 to "Common".
SD,STF	RUN Signal	Inverter RUN Signal. The Inverter runs with SD and STF short-circuited.

Example of Reduction Rate of Power Consumption

Machining Line for Automobile Parts

Operating Condition ①Operating Time / Day：24 h Operating Days / Month：22Days Total Operating Time / Month：528 h
②Operating Time / Day：18 h Operating Days / Month：22Days Total Operating Time / Month：396 h

NO.	Name of Machines	Hydraulic Pump			Electric Motor kW	Operating Condition	Cycle Time S	Power Consumption kWh/Month		Reduction Power kWh/Month	Reduction Rate %
		Type	Geometric Displacement of Pump cm^3/rev	Pressure Setting MPa				Without Controller	With Controller		
1	Transfer Machine	Vane	100	3.5	7.5	①	76	1,424	790	634	44.5
2	Transfer Machine	Vane	100	3.6	7.5	①	76	1,243	573	670	53.9
3	Transfer Machine	Vane	100	2.6	7.5	②	77	849	453	396	46.6
4	Transfer Machine	Vane	75	3.4	5.5	①	77	1,300	382	918	70.6
5	Transfer Machine	Vane	75	3.2	5.5	②	59	999	468	531	53.2
6	Washing Machine	Vane	100	3.5	7.5	①	58	1,809	1,136	673	37.2
7	Gear Cutting Machine	Piston	63	4.0	5.5	①	16	1,811	530	1,281	70.7
8	Gear Cutting Machine	Piston	36.9	4.0	5.5	②	32	723	359	364	50.3
9	Gear Cutting Machine	Piston	36.9	4.0	5.5	②	42	735	349	386	52.5
10	Gear Cutting Machine	Vane	30	5.5	5.5	①	22	1,250	306	944	75.5
11	Gear Cutting Machine	Piston	36.9	5.2	5.5	①	46	1,811	742	1,069	59.0
12	Gear Cutting Machine	Vane	31.8	4.0	7.5	①	34	1,498	997	501	33.4
Total								15,452	7,085	8,367	54.1



K
Energy-Saving Control System

■ Controller for Setting Rotational Frequency of the Inverter

● Specifications

Descriptions \ Model Numbers	AMC–IV–2–10
Output Voltage for Inverter	3 Ranges Selectable (0 - +5 V, +1 - +5 V, +0.5 - +4.5 V)
Input Voltage for Pressure Sensor	3 Ranges Selectable (0 - +5 V, +1 - +5 V, +0.5 - +4.5 V)
Power Supply for Pressure Sensor	+5 V Max. 0.5 W
Sequence Input Signal	AC Photocoupler Input Resistance to limit the Current 3.3 kΩ Name: IN1 / IN2 / INC Description: RUN / Alarm Reset / Input Common
Sequence Output Signal	Open Collector Output (Photocoupler Insulated) Max. Supply Voltage 35 V・50 mA Name: OUT1 / IN2 / OUTC Description: Low Rotational Frequency / Alarm / Output Common
Voltage for Power Supply	85 - 264 V AC 50/60 Hz
Power Consumption	Less than 6 VA
Ambient Temperature	0 - 50°C
Mass	0.3 kg

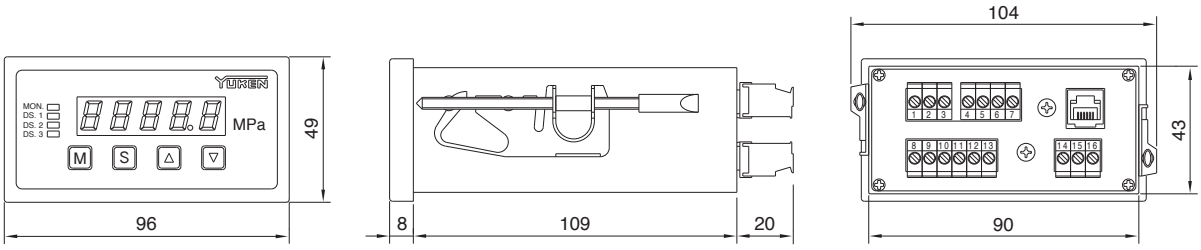
● Model Number Designation

AMC−IV	−2	−10
Series Number	Function Category	Design Number
AMC-IV：Controller for Setting Rotational Frequency of the Inverter	2：High-Function Type	10

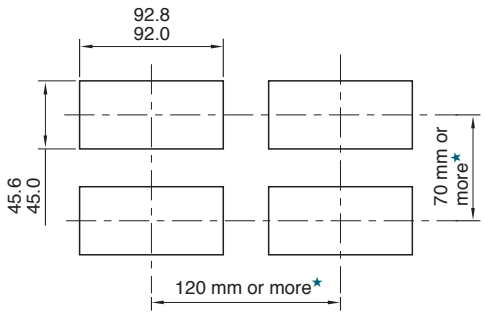
★1. This energy-saving system has no model numbers as for system itself, so when ordering this system, please indicate the model numbers of the controller for setting rotational frequency of the inverter and those of the pressure sensor.

★2. Also available with the simple model (with auto-tuning function) that is easy to set up. For details, please contact us separately.

AMC-IV-2-10



Panel Cutout Dimensions



★The value for using several controllers.

Detail of Terminal Block

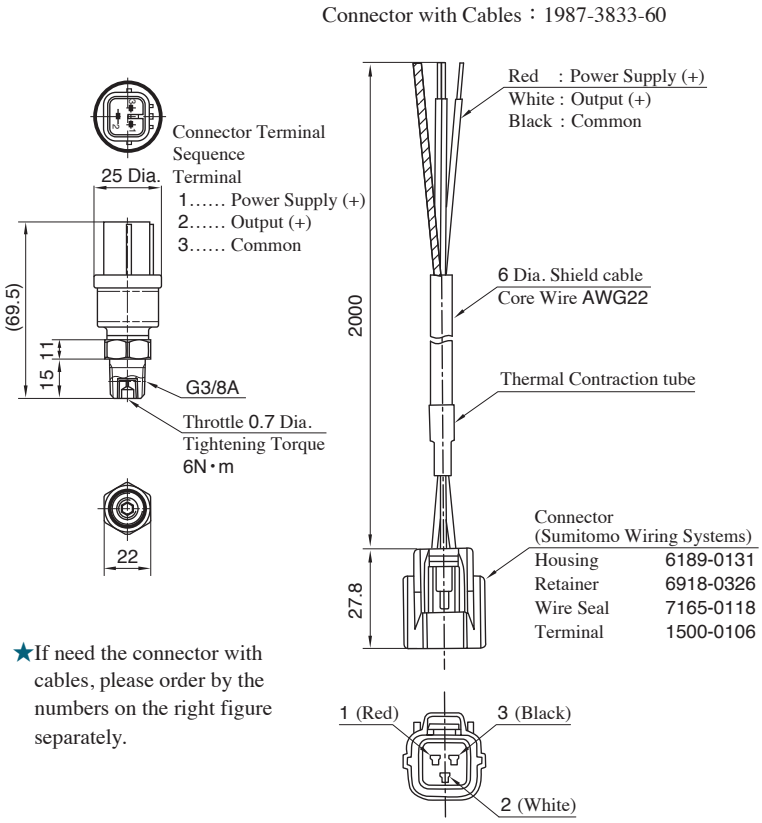
No.	Terminal Name			No.	Terminal Name		
1	Inverter Output	Output	OUT	11	Sequence Output	Low Inverter Frequency Signal	OUT1
2		Common	COM	12		Alarm	OUT2
3		Shield	SG	13		Output Common	OUTC
4	Pressure Sensor	Power Supply	+5V	14	Power Supply Range 85 - 264 [V] AC		AC
5		Input	IN	15	Power Supply 100·200 [V] AC		
6		Common	COM	16	Ground		FG
7		Shield	SG				
8	Sequence Input	RUN	IN1				
9		Alarm Reset	IN2				
10		Input Common	INC				

Pressure Sensor

1501-PK314344-3

Specifications

Model Numbers / Descriptions	1501-PK314344-3
Rated Pressure Range	0 - 35 MPa
Allowable Max. Pres.	52.5 MPa
Output Range	0.5 - 4.5 V (Supply Voltage 5.00 V)
Supply Voltage	5.0±0.5 V DC (Output is proportional to supply voltage.)
Current Consumption	10 mA or less
Load Resistance	10 kΩ or more
Load Capacity	1000 pF or less
Output Impedance	10 Ω or less
Insultation Resistance	100 MΩor more (50 V DC)
Voltage Resistance	150 V AC (1 min)
Precision	±1.0 % F.S. (23±2°C) ±3.0 % F.S. (Temperature Compensated Range)
Response Time	1 ms or less
Operating Temperature Range	–40 - +120°C
Temperature Compensated Range	–30 - +120°C
Vibration-Proof	147 m/s^2 (33.3 - 200 Hz)
Shock-Proof	490 m/s^2 (11 ms or less)
Dust-Proof / Water-Proof	IP 65
Approx. Mass	80 g

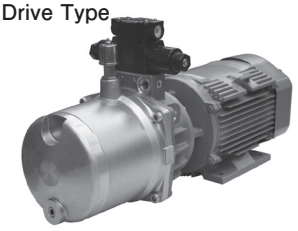


★If need the connector with cables, please order by the numbers on the right figure separately.

Power Packages

YUKEN's Power Packages have compactly integrated with compact high pressure vane pump, relief valve and oil tank etc., also be able to built-in 01 series solenoid operated directional valve (or manually operated directional valve) and modular valve.
It is easy to construct hydraulic circuit only by stacking solenoid operated valves and modular valves, so widely applicable as for compact hydraulic unit. There are two types of drive system, one is the pulley drive type with flow adjustment and another is the motor drive type(motor built-in type).

Motor Drive Type

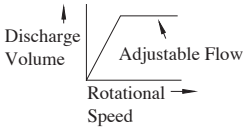


Pulley Drive Type with Flow Adjustment

Features

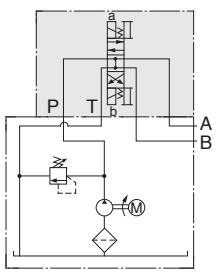
- Because of using YUKEN vane pumps with good reputation, so that achieved good performance and long life.
- Only by adding or changing modular valves stacked on the power package, it is able to add or change hydraulic circuit easily and quickly.
- Can use immediately after hydraulic piping between the power package and actuators.

Specifications

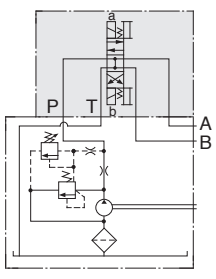
Type	Descriptions	Model Numbers	Geometric Displacement of Pump cm^3/rev	Max. Operating Pres. MPa	Rotational Speed r/min Max.	Rotational Speed r/min Min.	Reservoir Capacity L	Mass★2 kg
Motor Drive Type	This power package is driven at the voltage of 200/220 V AC. Suitable for using on cargo handling machine or general industrial machine, etc.	PMR2- 6	5.8	14	(Motor) 1.5 kW× 6 P 2.2 kW× 4 P 200 V AC, 50 Hz 220 V AC, 60 Hz		3.4	(1.5 kW×6P) 50 (2.2 kW×4P) 51.5
		PMR2- 8	8.0					
		PMR2-10	9.4					
		PMR2-12	12.2					
		PMR2-14	13.7					
		PMR2-17	16.6					
Pulley Drive Type with Flow Adjustment	This type is equipped with flow adjustment system that can keep discharge volume of the package stable regardless of increase or decrease of engine rotational speed, so that is suitable for using as power steering pump. 	PPF2- 6	5.8	10.5	4000	500 (1000)★1	3.4	(With V1S Type Pulley) 11.4 (With V1 Type Pulley) 11.8
		PPF2- 8	8.0					
		PPF2-10	9.4		3000			
		PPF2-12	12.2					
		PPF2-14	13.7		2800			
		PPF2-17	16.6		2500			

★1. Please set the minimum rotational speed on starting at the value in parenthesis.
★2. The values of mass are including hydraulic fluids in case of without control valves (circuit symbol “00”). In case of the mass with control valves, please add the additional mass of “standard circuit”on pages K-54 and K-55.

Graphic Symbols



PMR2 Type



PPF2 Type

Note) The graphic symbols of stacked solenoid operated directional valve (or manually operated directional valve) and modular valve are filled in the shaded parts of the graphic symbols left. The 15 kinds of circuit are available as standard. For details, refer to the standard circuit on pages K-54 and K-55.

Model Number Designation

PMR2	−6	——	−70	——	−A	−01	−A200	——	——	−40
PPF2	−6	−3	−70	−R	——	−01	−A200	−V1	−F	−35
Series Number	Geometric Displacement of Pump cm^3/rev	Adj. Flow L/min	Relief Valve Setting Pressure	Direction of Pump Rotation	Electric Motor Code	Circuit Symbol ★2	Directional Valve Type ★3	Pulley Type	Mounting Type	Design Number
PMR2 : Motor Drive Type		——	Please specify at ★1 the range of 3.5 - 14 MPa.	(Clockwise Viewed from the Motor Fan)	A : 1.5 kW×6 P B : 2.2 kW×4 P 200/220V AC N : Without Motor	00 01 02 03 04 05 06 07 08	M : Manually Operated Directional Valve Solenoid Operated Directional Valve : Coil Type (DC) D12, D24 (AC) A100, A200 Circuit Symbol "00" or "08" : None	——	——	40
PPF2 : Pulley Drive Type with Flow Adjustment	★4 6 : 5.8 8 : 8.0 10 : 9.4 12 : 12.2 14 : 13.7 17 : 16.6	★4 2, 3, 4 7, 8, 9 10, 12 15, 20 25	Please specify at ★1 the range of 3.5 - 10.5 MPa.	(Viewed from the Shaft End) R : Clockwise L : Anti-Clockwise	——			N : Without Pulley V1S : JIS 5 V Type 158.4 Dia. Single Pulley V1 : JIS 5 V Type 208.4 Dia. Single Pulley	F : Flange Mtg. Type L : Foot Mtg. Type	35

★ 1. Please specify the controlled pressure as of MPa×10.
(Ex.) ●In Case of 3.5 MPa…… Please specify as of 35.

★ 2. For details of circuit symbol, please refer to the standard circuit on pages K-54 and K-55. In case of "00", no control valves embedded.

★ 3. As for solenoid operated directional valves, we use the DSG-01 series solenoid operated directional valves. For details of coil type, please refer to page K-76. As for manually operated directional valves, we use the DMG-01 models.

★ 4. For the combination possibility between the geometric displacement of pump and the adjustment flow, see the table below.

Geometric Displacement of Pump	Adj. Flow L/min										
	2	3	4	7	8	9	10	12	15	20	25
6	○	○	○	○	○	○					
8	○	○	○	○	○	○	○	○			
10	○	○	○	○	○	○	○	○	○		
12			○	○	○	○	○	○	○	○	
14				○	○	○	○	○	○	○	○
17						○	○	○	○	○	○

Instructions

● Exchange Period of Hydraulic Fluid

Please exchange after having operated 100 hours at the first time.
After then, please exchange every 500 hours or one year of operation.

● Fluid Supply and Oil Level Change

Please supply oil after the air breather removed.
Confirm the amount of supplied oil by the oil gauge attached on the air breather.
Please keep oil level between low limit and high limit mark at the range of 3.2 - 3.4 L. (Avoid over fluid supply that will cause the external oil leakage from the air breather with the oil level change.)
The low limit fluid level is on the center axial line (2.1 L), so use within approx. 1.3 L of the oil level change by the actuator operation.
If use as like as inclined oil level condition, please consult us separately because of the restriction of oil level change amount.

● Mounting Position

As for mounting, please mount horizontally with the air breather upward.
(Avoid vertical mounting with the tank upward or downward.)

● Axial Load (Pulley Drive Type with Flow Adjustment)

As for the axial load, please keep less than 1000 N for radial load and less than 100 N for thrust load.

● Notice on Starting

On starting, please perform intermittent operation under unloaded condition.

● Please avoid long time operation under whole amount relieving condition that will waste energy and cause oil temperature rise.

● Relief Valve Setting Pressure

The discharge pressure on shipping is set by the "Relief Valve Setting Pressure"in the above table "Model Number Designation".
Regardless of the designation, the relief valve setting pressure is able to adjust at the range of 3.5 - 14 MPa (3.5 - 10.5 MPa only for PPF2 type).
When pressure increasing, please pay enough attention to the motor/engine overload by power requirement increase.

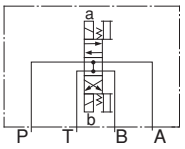
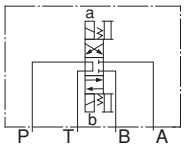
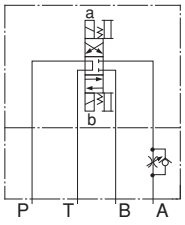
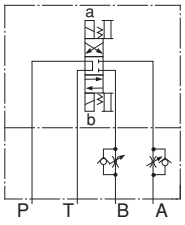
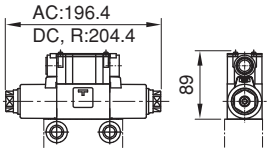
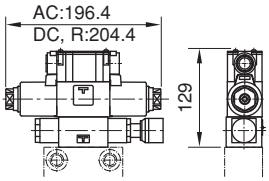
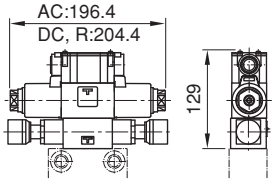
Standard Circuit

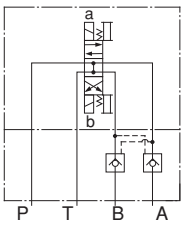
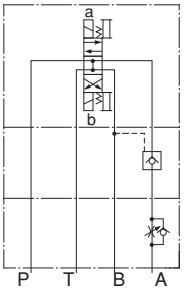
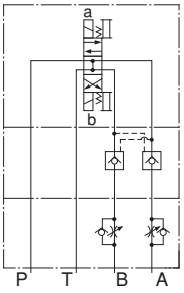
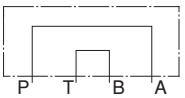
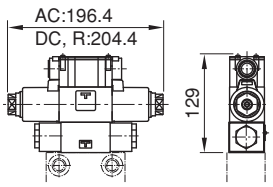
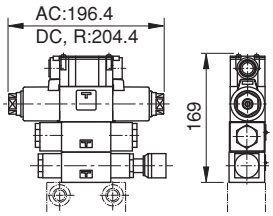
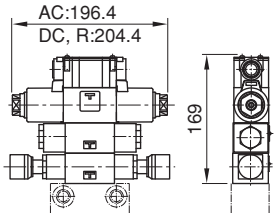
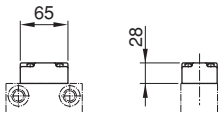
The hydraulic circuit configuration is easy only by stacking DSG-01 series solenoid operated directional valve or manually operated directional valve and modular valves on this power package.

There are 15 types of standard circuits for power package as the chart below. If need non-standard circuits, please specify the power package with no control valves (circuit symbol "00") and order DSG-01 series solenoid operated directional valve or manually operated directional valve and modular valves separately.

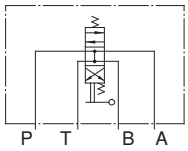
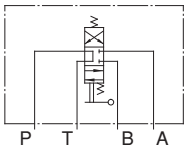
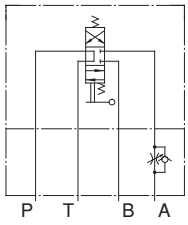
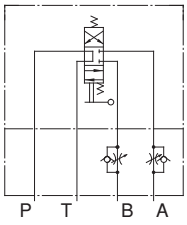
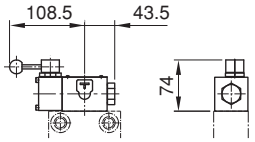
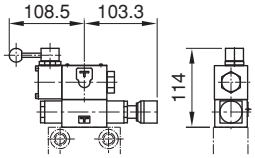
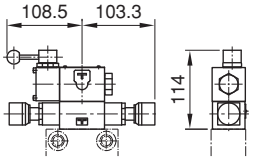
For details of DSG-01 series solenoid operated directional valve, manually operated directional valve and modular valves, please refer to the applicable pages on catalog of "E: DIRECTIONAL CONTROLS" and "F: MODULAR VALVES".

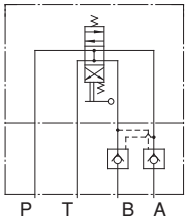
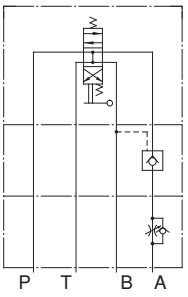
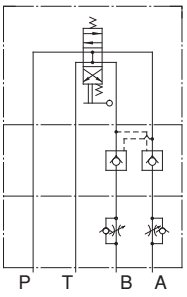
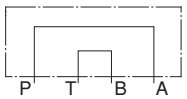
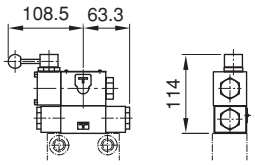
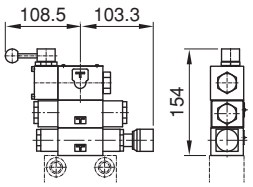
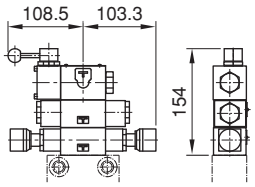
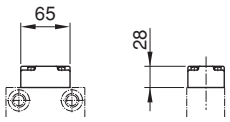
With Solenoid Operated Directional Valve

Circuit Symbols	01	02	03	04
Graphic Symbols				
Dimensions				
Additional Mass	1.9 kg		3.3 kg	3.5 kg

Circuit Symbols	05	06	07	08
Graphic Symbols				
Dimensions				
Additional Mass	3.2 kg	4.5 kg	4.7 kg	0.6 kg

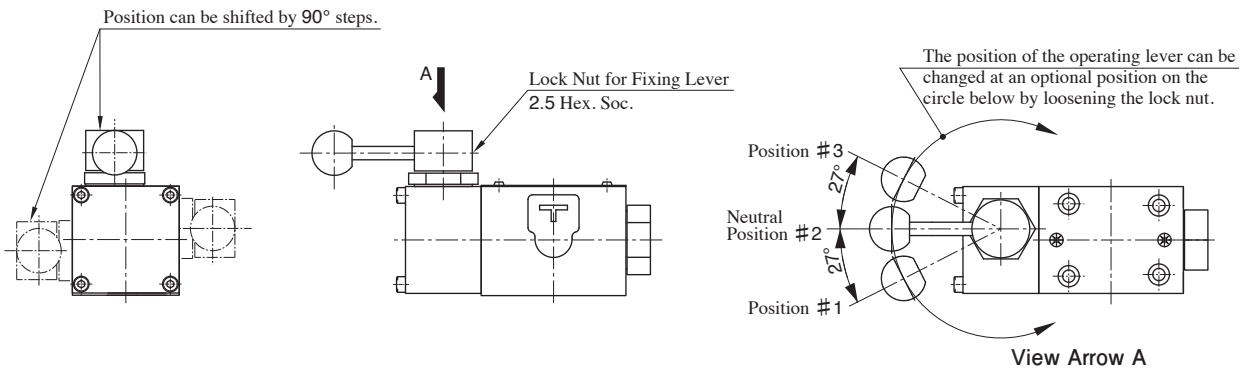
With Manually Operated Directional Valve

Circuit Symbols	01	02	03	04
Graphic Symbols				
Dimensions				
Additional Mass	1.8 kg		3.2 kg	3.4 kg

Circuit Symbols	05	06	07	08
Graphic Symbols				
Dimensions				
Additional Mass	3.1 kg	4.4 kg	4.6 kg	0.6 kg

Note) The lever position of manually operated directional valve can be changed. (See the drawing below)

Change The Lever Position of Manually Operated Directional Valve

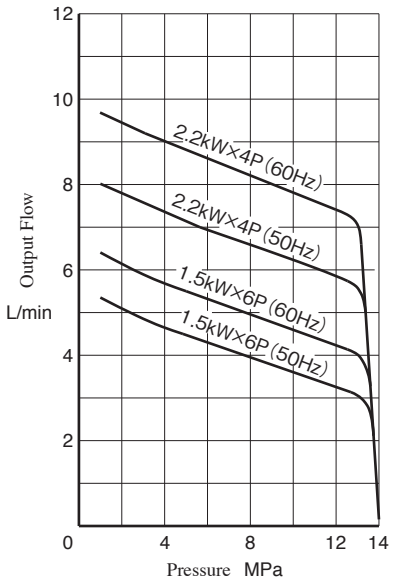


Characteristics of PMR2 Type

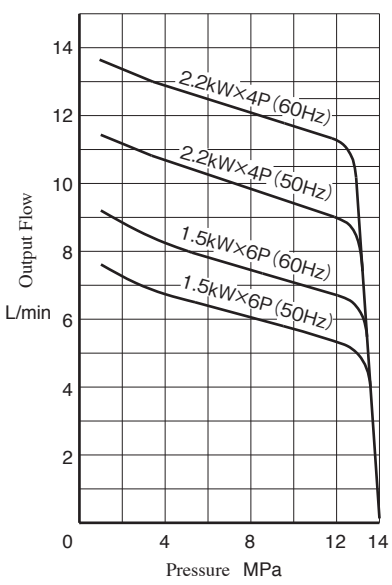
The below charts show the representative characteristics of viscosity 20 mm²/s.

Pressure vs. Output Flow

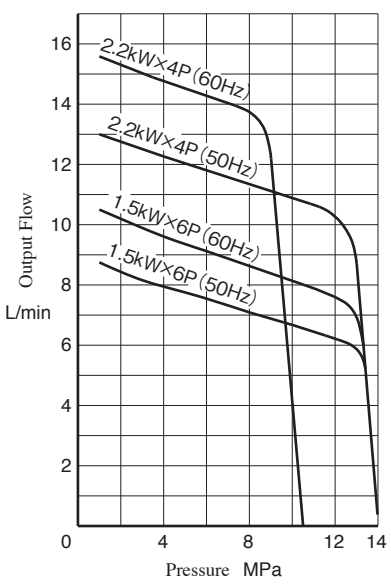
PMR2-6



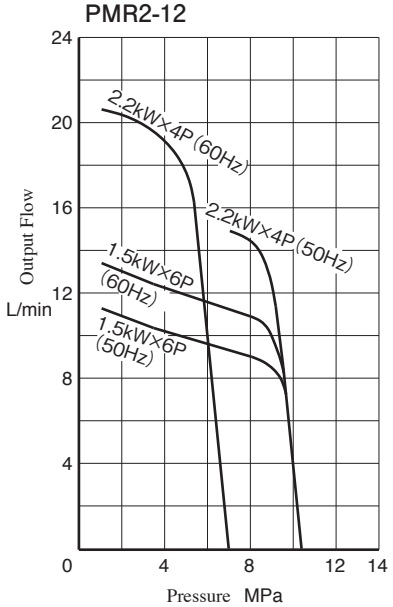
PMR2-8



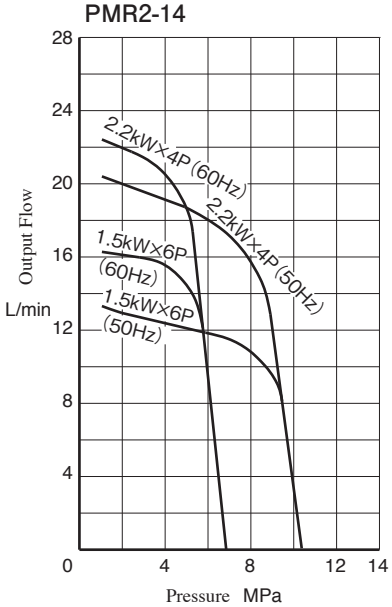
PMR2-10



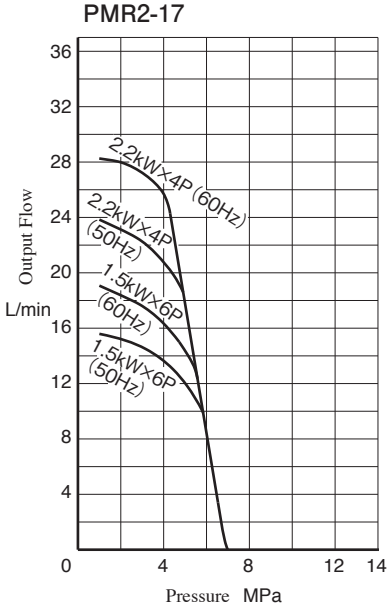
PMR2-12



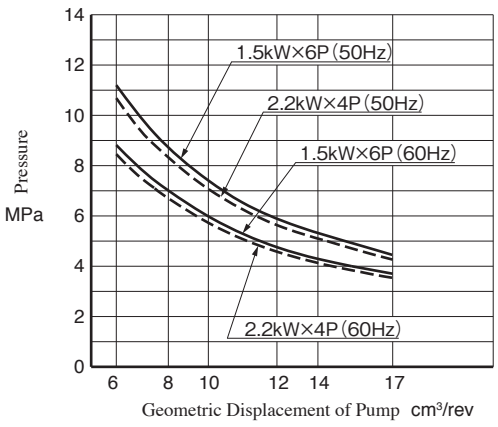
PMR2-14



PMR2-17



Max. Operating Pressure at Rated Motor Power



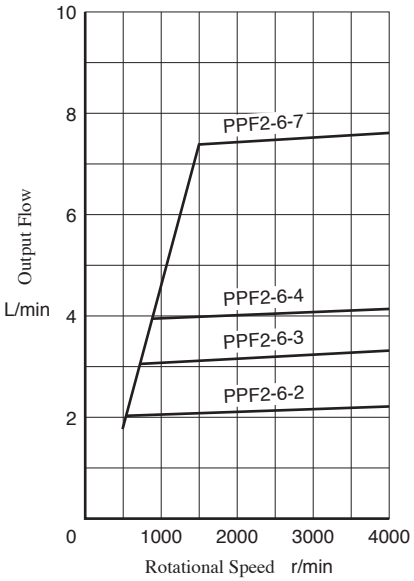
Note) The characteristics of pressure vs. output flow above indicate at the range of rated motor power 200% or less.
For the max. operating pressure at rated motor power, see the left chart.

Characteristics of PPF2 Type

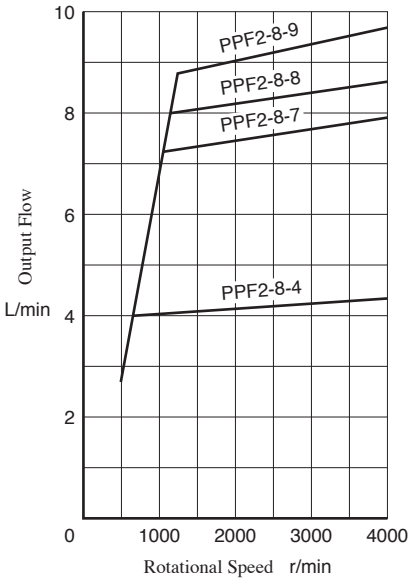
The below charts show the representative characteristics of viscosity 20 mm²/s.

Rotational Speed vs. Output Flow (Pressure 6 MPa)

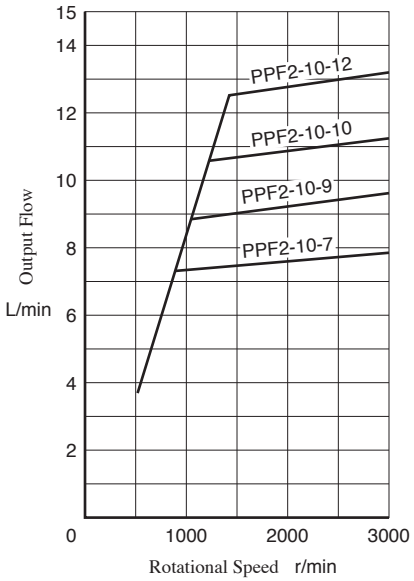
PPF2-6-＊



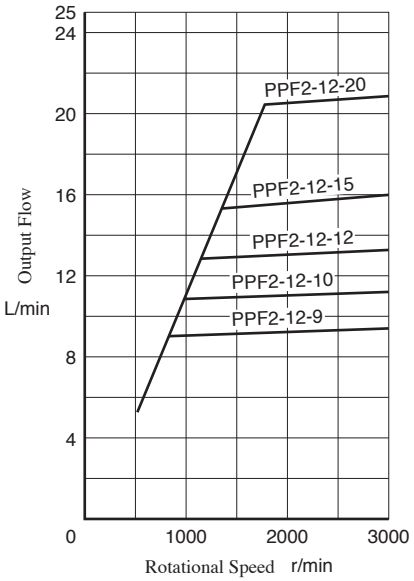
PPF2-8-＊



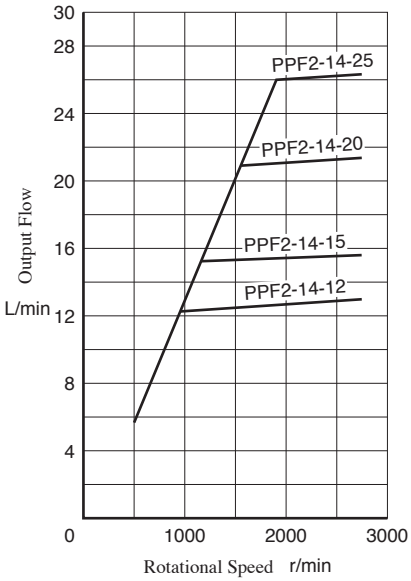
PPF2-10-＊



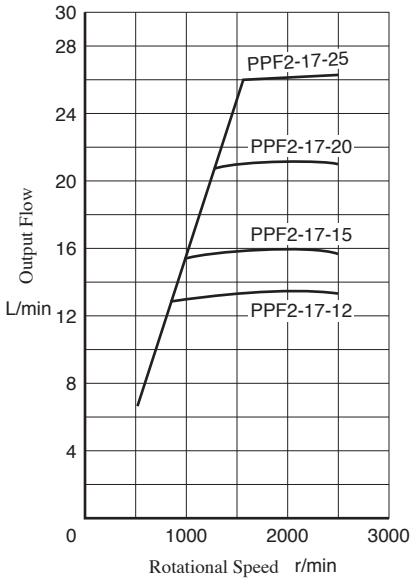
PPF2-12-＊



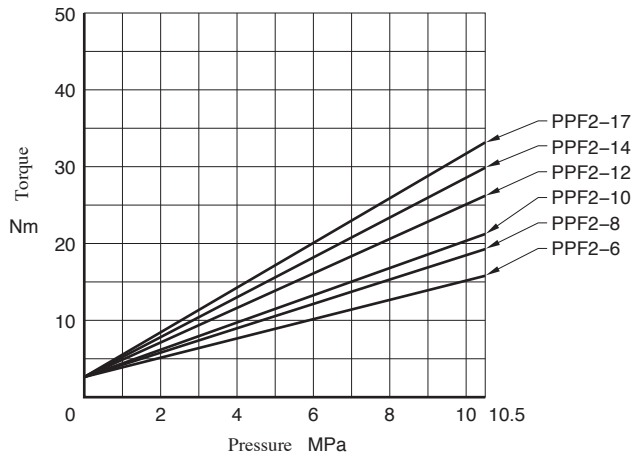
PPF2-14-＊



PPF2-17-＊



Pressure vs. Torque



Axial Input

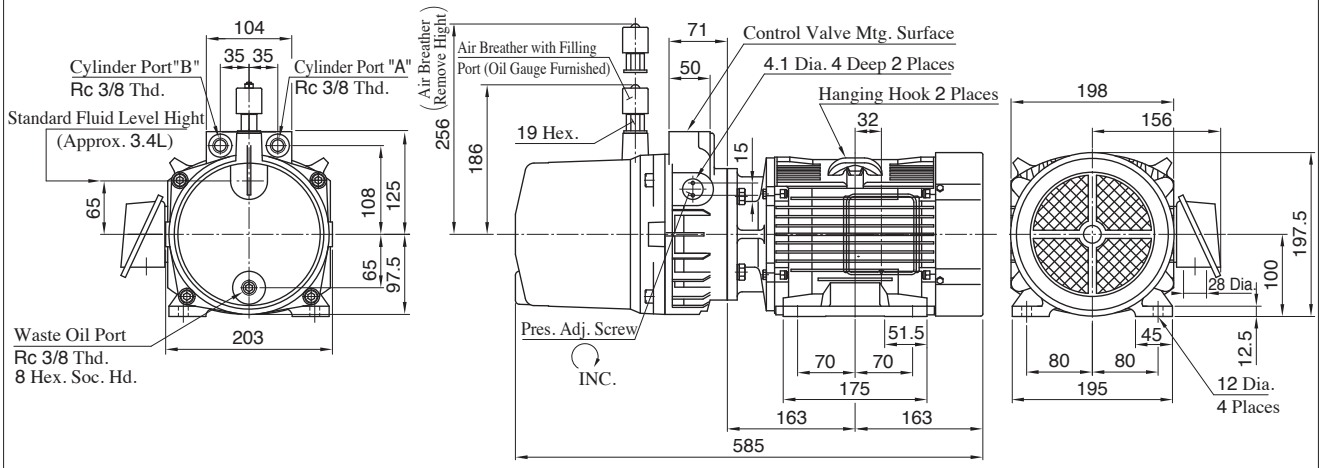
The requirement torque is determined by geometric displacement of pump and pressure regardless of the rotational speed.
The axial input is calculated from the formula below.

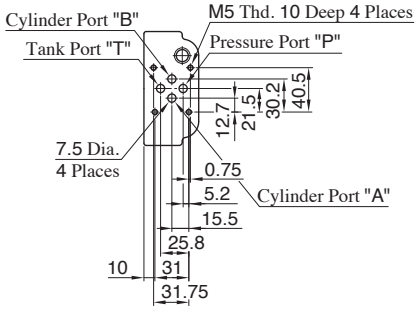
$$Li = \frac{2\pi TN}{60000}$$

Li : Axial Input kW
T : Requirement Torque Nm
N : Rotational Speed r/min

K
Power Packages

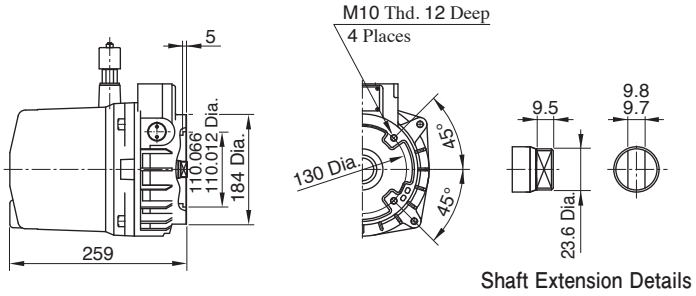
PMR2-＊-＊-$\frac{A}{B}$-00





Dimensions of Control Valve Mtg. Surface
(ISO 4401-03-02-0-94)

PMR2-＊-＊-N-00

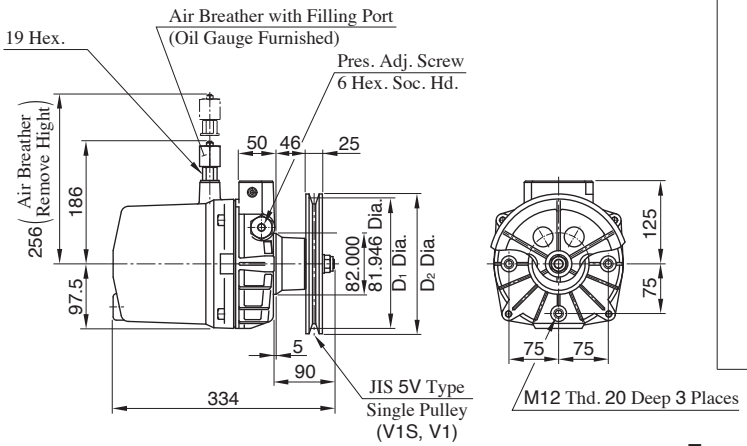


Shaft Extension Details

For other dimensions, refer to the drawing above.

PPF2-＊-＊-＊-＊-00

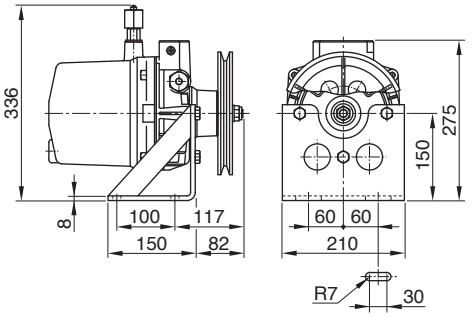
Flange Mtg. Type



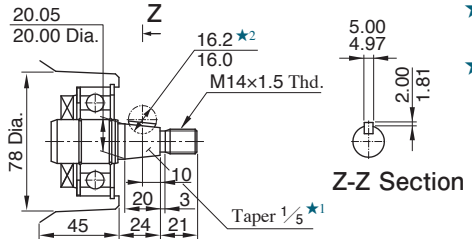
Pulley Type	D_1	D_2
V1S	158.4	161
V1	208.4	211

●For other dimensions, refer to the PMR2 type above.

Foot Mtg. Type



For other dimensions, refer to the flange mtg. type.



Z-Z Section

Shaft Extension Details

★1. Taper Angle Tolerance: : JIS B 0614 AT6
★2. Semilunar Key: : JIS B 1301 WA 5×16

Interchangeability between Current and New Models

PMR2,35 Design → 40 Design

Major Changes

To conform to The Motor Top Runner Criteria, we changed the motor drive type power package PMR2 model.

・Motor efficiency class is changed to IE3, so the motor specifications improved generally.

・The sizes of the current and new motor are almost same, the mass increased (mass ratio 139,145%).

Comparison of Motor Specifications

Output×Number of Poles	Voltage－Frequency V Hz	Rated Current A	Inrush Current A	Rotational Speed r/min	Insulation Class
1.5 kW×6P	200－50	8.0 (7.5)	63.9 (35.5)	965 (948)	F (E)
	200－60	7.0 (6.8)	53.3 (32.5)	1160 (1134)	
	220－60	7.0 (6.6)	58.6 (35.8)	1170 (1147)	
2.2 kW×4P	200－50	9.8 (9.9)	93.2 (58.0)	1460 (1448)	F (E)
	200－60	8.8 (8.9)	79.1 (53.0)	1755 (1730)	
	220－60	8.6 (8.6)	87.0 (58.5)	1765 (1744)	

Note 1) The difference between current and new design indicates in the parenthesis.
Without Parenthesis: New 40 Design, Within Parenthesis: Current 35 Design

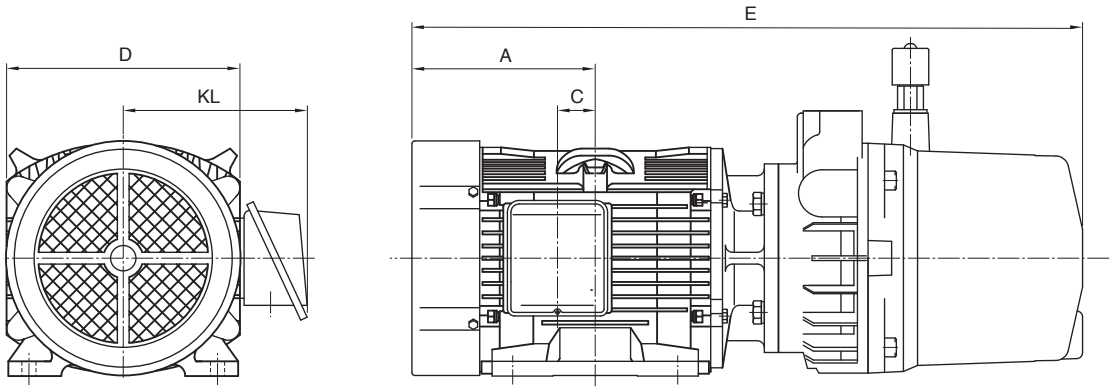
2) The starting current of new 40 design is larger in comparison with current 35 design. Please pay attention to the power distribution design.

3) The rotational speed of new 40 design is faster in comparison with current 35 design by the improvement of slip down.
By the operating conditions, "Output Increase"or "Over Flow"is possible, so please pay attention.
＊Because of the improvement in the flow rate characteristics of power package, actually the output increase.

Interchangeability in Installation

There is interchangeability in installation, but the dimension from the center of motor to the end of terminal box (KL) is slightly longer.

Comparison of Dimensions

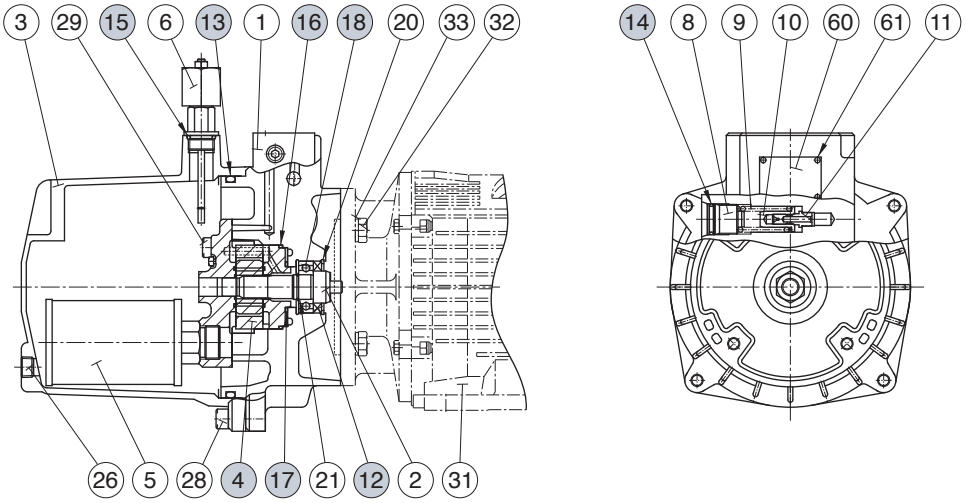


Model Numbers	Dimensions mm					Mass kg
	A	C	D	E	KL	
Current PMR2-＊-＊-A-＊-＊-35	163.5	46	199	585.5	153	36
New PMR2-＊-＊-A-＊-＊-40	163	32	198	585	156	50
Current PMR2-＊-＊-B-＊-＊-35	163.5	46	199	585.5	153	35.5
New PMR2-＊-＊-B-＊-＊-40	163	32	198	585	156	51.5

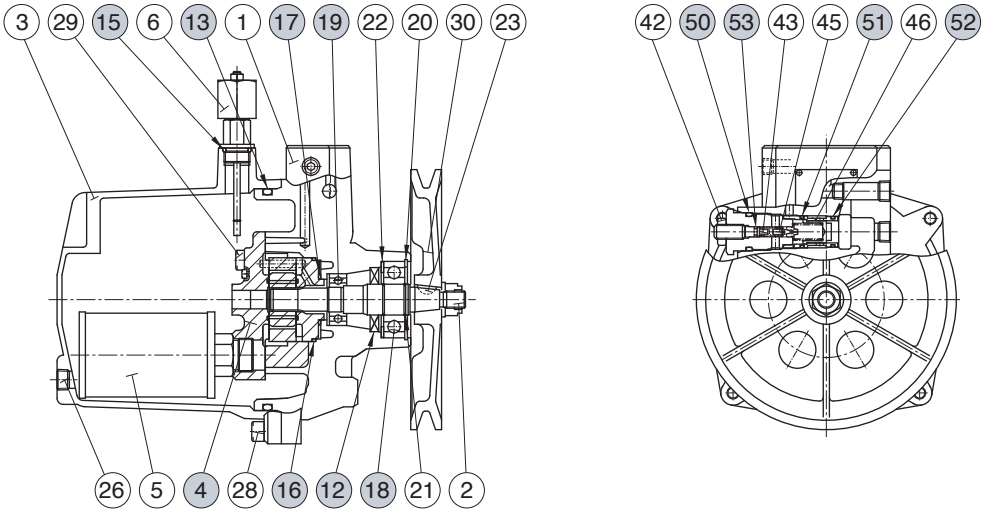
Note) The other dimensions are same, please refer to the drawing of dimensions.

List of Cartridge Kits, Seals and Bearings

PMR2



PPF2



List of Seals and Bearings

Item	Name of Parts	Part Numbers		Qty.
		PMR2	PPF2	
12	Oil Seal	ISD 26428	SC 25528	1
13	O-Ring	OR NBR-70-1 G170-N	OR NBR-70-1 G170-N	1
14	O-Ring	OR NBR-90 P21-N	—	1
15	O-Ring	OR NBR-90 P18-N	OR NBR-90 P18-N	1
16	O-Ring	AS568-144 (FKM-90)		(1)
17	O-Ring	AS568-125 (FKM-90)		(1)
50	O-Ring	—	OR NBR-90 P25-N	1
51	O-Ring	—	OR NBR-90 P22-N	1
52	O-Ring	—	OR NBR-90 P21-N	1
53	O-Ring	—	OR NBR-70-1 P5-N	1
18	Bearing	6004	6305DDU-D4M-K	1
19	Bearing	—	6004	1

Note) O-Rings of item ⑯ and ⑰ are included in the cartridge kit ④.

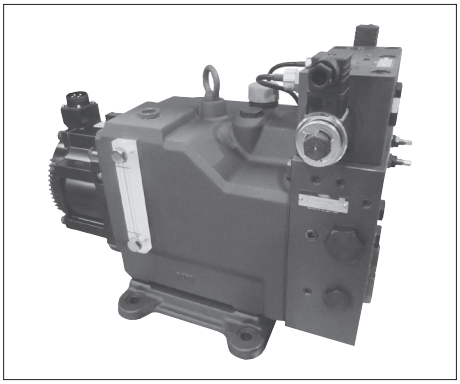
List of Cartridge Kits

Model Numbers	④ Cartridge Kit Numbers
PMR2-★	CP2-★-R-40
PPF2-★-＊-＊-R	CP2-★-R-40
PPF2-★-＊-＊-L	CP2-★-L-40

Note) ★ parts in the chart above are filled by the geometric displacement of pump.
(Refer to the model number designation on page K-53)

Intelligent Hydraulic Servo Drive Pack

The IH (intelligent hydraulic) servo drive pack is a compact energy-saving and low-noise hydraulic device which is combined as one with the AC servo motor, bidirectional rotation piston pump, reservoir and hydraulic control circuit. This combination can control the number of revolutions of the servo motor and adjust the discharge and pressure of the pump. This device can be combined with the sensor – equipped cylinder and dedicated controller to facilitate the configuration of a position, speed and pressure control system.



Energy Saving

The operation at the number of revolutions meeting the machine requirements (flow rate and pressure) reduces useless power losses and provides energy savings.
Furthermore, by using bidirectional rotation pump, need no directional control valves, so can minimize pressure loss.

Low Noise

During pressure control, the pump rotation compensating for the internal leakage of oil pressure provides low revolutions with almost no noise.
During flow control, the number of revolutions meeting the machine requirements ensures lower noise generation than conventional devices.

Compact

A substantial reduction in heat generation enables the operation with a minimum amount of fluid oil for cylinder operation in addition something extra oil. This results in a combination of the servo motor, piston pump, reservoir and hydraulic control circuit in one, providing energy savings.
Incorporation into an integral part of the machine is also possible.

Digital Control

Software control of the dedicated controller allows a system to have a great deal of versatility.
Digital control parameter setting facilitates to operate the system and its maintenance, furthermore the analog input/output ports provide as standard for user interface.

Optional Circuit Support

As for the option of tare load circuit, it is possible to built-in counterbalance valve and shut-off valve. (only for YSD2 type and YSD3 type)

Specifications

Model Numbers	Geometric Displacement of Pump cm^3/rev	Max. Rotational Speed r/min	Thrust Output and Cylinder Bore	Reservoir Capacity cm^3	Oil Level Variations cm^3
YSD1-✻-09/13	6、10	2000★	20 - 30 kN (Cylinder Bore 63)	2500	1500
YSD2-✻-24/29/44	6、10、16		50 - 60 kN (Cylinder Bore 80)	4200	2500
YSD3-✻-55/75	10、16、30		100 kN (Cylinder Bore 100)	5800	3500

★There are cases when the max. rotational speed is limited by operating pressure and motor output.

Instructions

Transportation

Use the hanging hook embedded with this pack for transportation. Don't hang a kind of wires for lifting at the place except for that of hanging hook.

Piping

When use steel pipes, please be careful not to apply excessive force by piping on this pack.

Oil Supply

The oil gauge is embedded with this pack. Before operation, please supply specified hydraulic fluid oil from reservoir filling port to the standard level of oil gauge.

First Operation

At the first operation after installation, start-up with the pressure signal set near by unload pressure and confirm the fluid suctioned normally.

Air Vent

The air mixing inside the equipment or pipe may occur some vibrations, so please vent air completely.
As of YSD2/YSD3 type, air vent valves embedded on two places of rod side and head side, please operate under the condition that the applicable ports of each air vent valve are set on discharge side.(Never operate under the condition set on suction side.)

In Operation

In operation, the temperatures of AC servo motor and body surface are high, so please prevent hands or body from touching the pack.

Area Difference between Cap Side and Rod Side of Cylinder

If the area difference between cap side and rod side of cylinder is small, please contact us separately.

Exchange Period of Hydraulic Fluid

After first operation, please exchange the hydraulic fluid after three months or operating 500 hours later. After the first exchange, please exchange about every two years or total 5000 hours operation, whichever is earlier.
If the contamination level or characteristic of hydraulic fluid is outside of specified values, please exchange the hydraulic fluid regardless of the period above.

Model Number Designation

N−	YSD3	−F	−55	A	55★1	−10	−H	R	−B	A★2	B★2	R	−30
Sub Ass'y Code	Series Number	Mtg. Type	Servo Motor Output kW	Direction of servo Motor Connection (Viewed from the Motor End)	Servo Pack kW	Geometric Displacement of Pump cm³/rev	Relief Valve Setting Pres. MPa	Pressure Sensor	Option Related				
									Counterbalance Valve	Pres. Adj. Range of Head Side Counterbalance Valve MPa	Pres. Adj. Range of Rod Side Counterbalance Valve MPa	Shut-off Valve	Design Number
N : Pump Motor Sub Ass'y (Omit if not required)	YSD1	F : Flange Mtg. Type B : Blacket Mtg. Type	N1 : Without Servo Motor (For 0.85kW) N2 : Without Servo Motor (For 1.3kW) 09 : 0.85 13 : 1.3	A : Upward B : Downward R : Right L : Left	N : None 09 : 0.85 13 : 1.3	6 : 6 10 : 10	B : 9.5 C : 18.5	H : Head Side R : Rod Side B : Both Side N : Without Pressure Sensor	—	—	—	—	20
	YSD2		N : Without Servo Motor 24 : 2.4 29 : 2.9 44 : 4.4		N : None 24 : 2.4 29 : 2.9 44 : 4.4	6 : 6 10 : 10 16 : 16	B : 9.5 C : 18.5 H : 23.5		H : Head Side R : Rod Side B : Both Side None : Without Counterbalance Valve	B : ★3 - 7		H : Head Side R : Rod Side B : Both Side None : Without Shut-off Valve	30
	YSD3		N : Without Servo Motor 55 : 5.5 75 : 7.5		N : None 55 : 5.5 75 : 7.5	10 : 10 16 : 16 30 : 30				N : ★3 - 1.8 A : 1.8 - 3.5 B : 3.5 - 7			

★1. If pump motor sub ass'y is selected, no need to fill in this item (Not selectable).
★2. If select those of without counterbalance valves, this item is none.
★3. Please refer to the "Minimum Adj. Pres. Characteristics"(Pages K-66 and K-67).

System Configuration

■Confirm of User Specifications

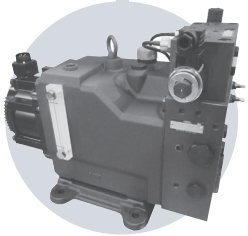
Control Details:
Position/Pressure/Speed Control

Electrical Interface:
Command Input: Analog ±10 V etc.
Monitor Output: As Above
Sequence I/O

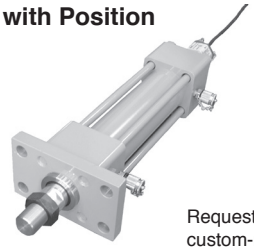
IH Controller
Model Numbers : SK1114-11

Servo Pack Applicable for AC Servo Motor

N-YSD



Cylinder with Position Sensor

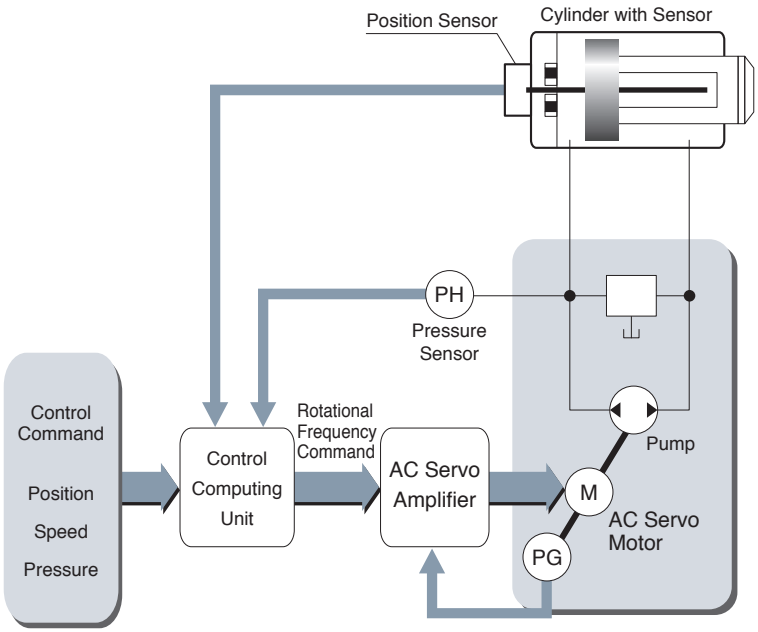


Request us for your custom-made.

Note) Model number《YSD＊》does not include IH Controller: SK1114-11 and Cylinder with Position Sensor.
If use those equipments, please order separately.

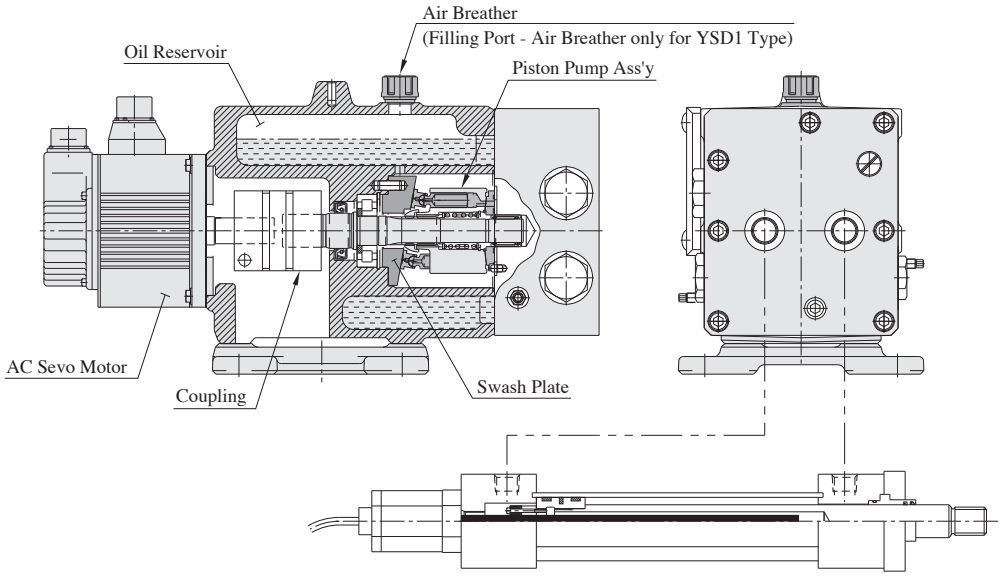
Operation

The bidirectional revolution piston pump is driven by AC servo motor and supply pressured oil to normal or reverse directions. So this is a simple hydraulic circuit only to connect the load cylinder on both output ports. The fluid suction of pump is operated by supplying from cylinder back line and compensation by self-suction valve for excess/efficiency of oil quantity. As of control, provide the control deviation output between upper signal and sensor signal to servo driver (AC servo amplifier), and construct the feedback loop by driving AC servo motor.

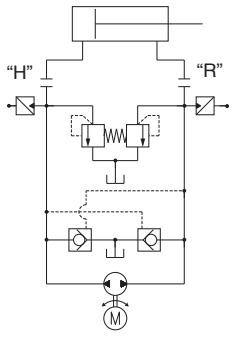


Structure / Hydraulic Circuit

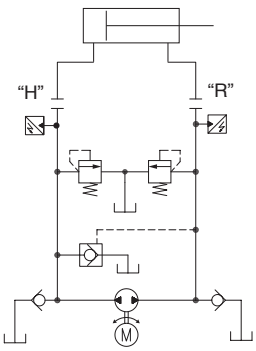
The IH servo drive pack pump is a bidirectional revolution piston pump which offers high performance in a wide range of very low to high revolution. The hydraulic control circuit simply consists of safety valves and self priming valve, without a control valve in the pump discharge line and the series line between cylinders. The reservoir is made compact by using space around the pump. With the oil supply port of hydraulic fluid doubling as an air breather and the side-mounted oil level gauge, the pump is well equipped as a hydraulic driving force.



Hydraulic Circuit



YSD1



YSD2/YSD3

Energy Saving Hydraulic System by Rotational Frequency Control

Energy saving on hydraulic control is achieved by sensing load pressure and control to avoid excess fluid discharge for the required (Output) = (Pressure) × (Flow). Piston pump generally discharge required flow by changing swash plate degree and control geometric displacement.
On the other hand, the rotational frequency control achieves by control rotational speed of motor. That is, (Flow) = (Rotational Speed) × (Geometric Displacement of Pump). In this case, sensing load pressure by pressure sensor and construct energy saving system by electric feedback control.
As the conventional way with the pump of high speed fixed rotation, there are some power losses from internal hydraulic drain and low efficiency of induction motor at low load operation. As the rotational frequency control system, the motor rotate on requirement and supply flow, so that is excellent as for energy saving system.

Example of Standard System Control

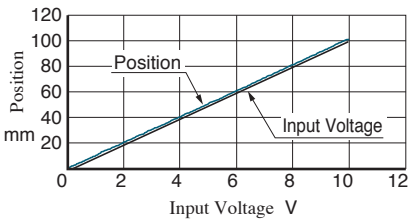
● Characteristics Example of The Position and Pressure Control System with IH Servo Drive Pack.

(Note: Control characteristics is different by system, please contact us separately.

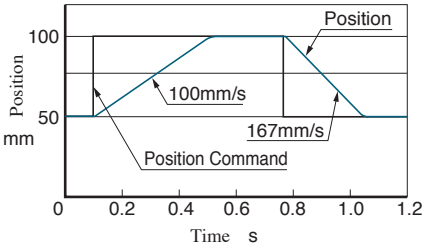
Structure Example : Cylinder 80 Dia.×45×250st Use YSD2-F-44A44-16

Characteristics Example of Position Control

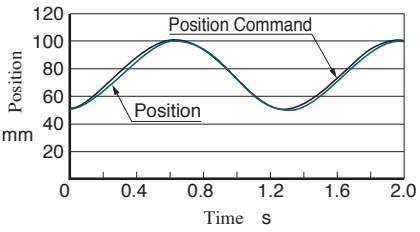
Input Voltage—Position



Step Response of Position

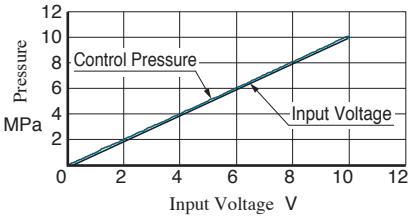


Sine Wave Input Tracking

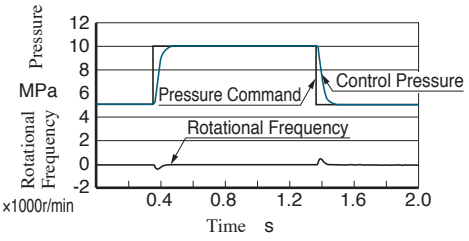


Characteristics Example of Pressure Control

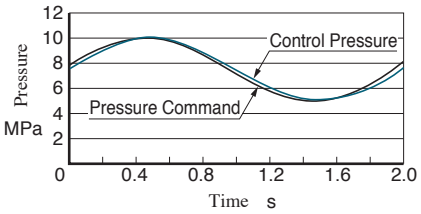
Input Voltage—Pressure



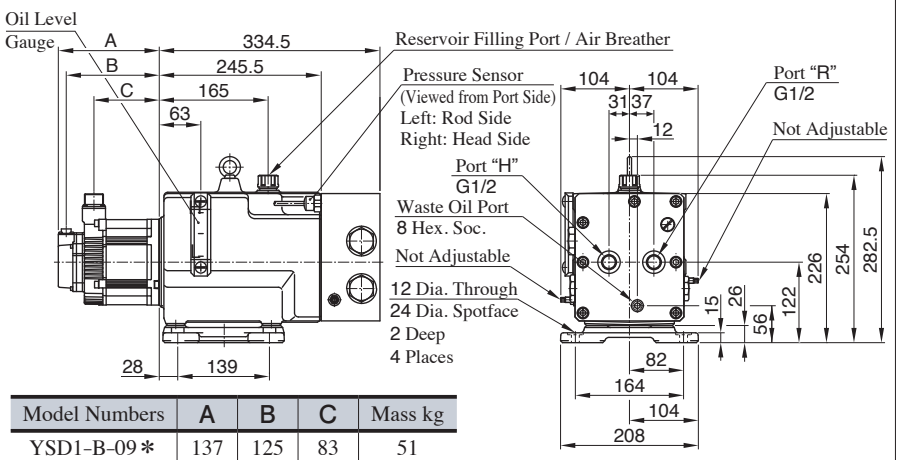
Step Response of Pressure



Sine Wave Input Tracking

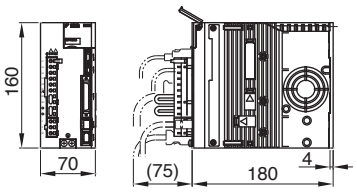


YSD1-B-$^{09}_{13}$＊＊-＊-＊＊＊-20 (Bracket Mtg. type)



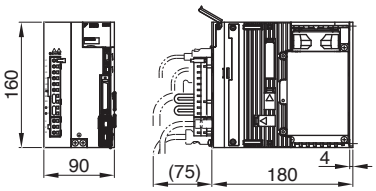
Model Numbers	A	B	C	Mass kg
YSD1-B-09＊	137	125	83	51
YSD1-B-13＊	153	141	99	52

●Servo Pack



For YSD1-＊-09

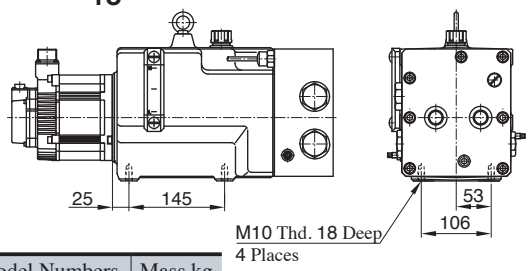
Mass : 1.5 kg



For YSD1-＊-13

Mass : 2.4 kg

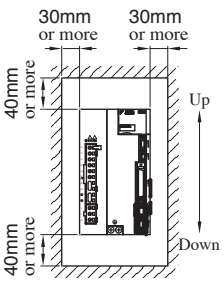
YSD1-F-$^{09}_{13}$＊＊-＊-＊＊＊-20 (Flange Mtg. type)



Model Numbers	Mass kg
YSD1-F-09＊	48
YSD1-F-13＊	49

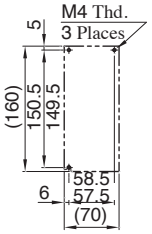
●For other dimensions, refer to the "Bracket Mtg. Type" above.

Mtg. Standard

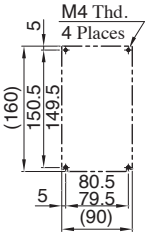


Dimension of Mtg. Hole

For YSD1-＊-09

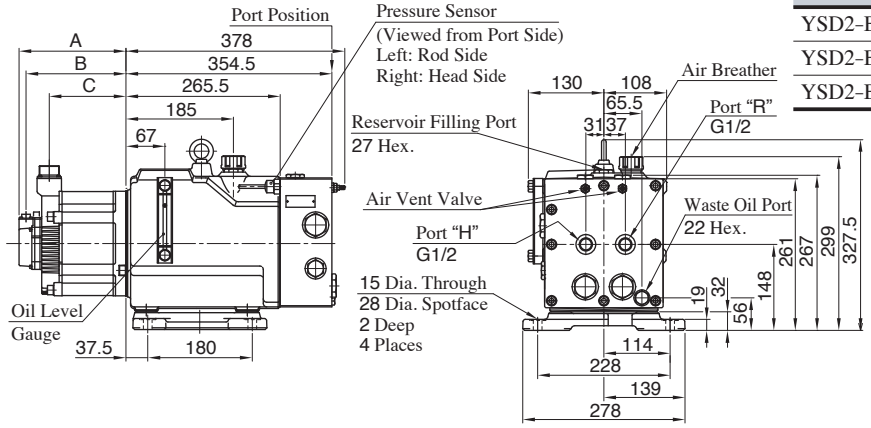


For YSD1-＊-13



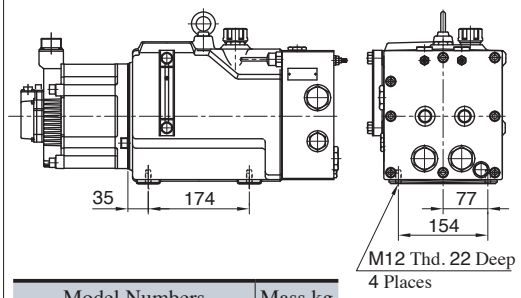
★If set the servo amplifiers in a row, please contact us separately.

YSD2-B-＊＊＊-＊-＊＊＊-30 (Bracket Mtg. type)



Model Numbers	A	B	C	Mass kg
YSD2-B-24＊＊-＊-＊＊＊-	160	148	108	84
YSD2-B-29＊＊-＊-＊＊＊-				
YSD2-B-44＊＊-＊-＊＊＊-	184	172	132	88

YSD2-F-＊＊＊-＊-＊＊＊-30 (Flange Mtg. type)



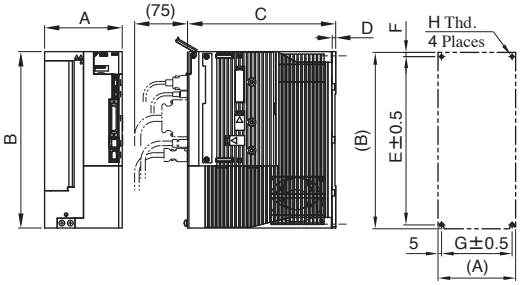
Model Numbers	Mass kg
YSD2-F-24＊＊-＊-＊＊＊-	78
YSD2-F-29＊＊-＊-＊＊＊-	
YSD2-F-44＊＊-＊-＊＊＊-	82

●For other dimensions, refer to the "Bracket Mtg. Type" above.

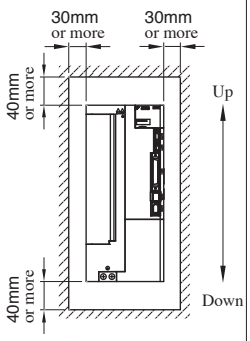
●Servo Pack

For YSD2-＊-24
For YSD2-＊-29/44

Dimension of Mtg. Hole



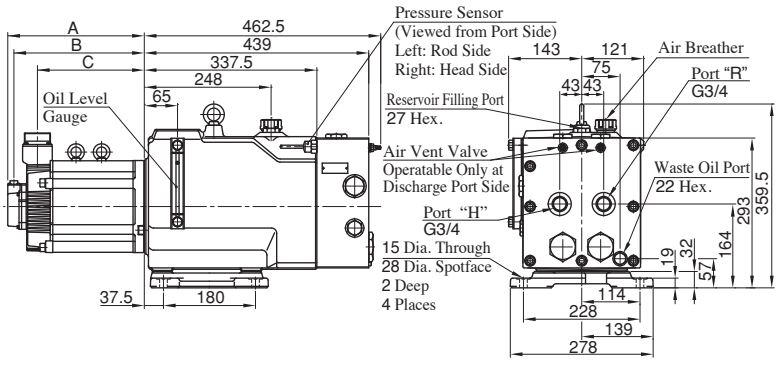
Mtg. Standard



Type	A	B	C	D	E	F	G	H	Mass kg
For YSD2-＊-24	100	180	180	4	170	5	90	M4	2.8
For YSD2-＊-29/44	110	250	210	5	238.5	6	100	M5	4.6

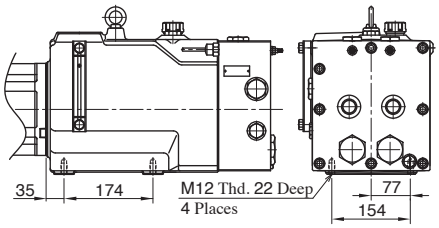
★If set the servo amplifiers in a row, please contact us separately.

YSD3-B-$\frac{55}{75}$＊＊-＊-＊＊＊-30 (Bracket Mtg. type)



Model Numbers	A	B	C	Mass kg
YSD3-B-55＊＊-＊-＊＊＊-	221	209	163	122
YSD3-B-75＊＊-＊-＊＊＊-	267	255	209	130

YSD3-F-$\frac{55}{75}$＊＊-＊-＊＊＊-30 (Flange Mtg. type)



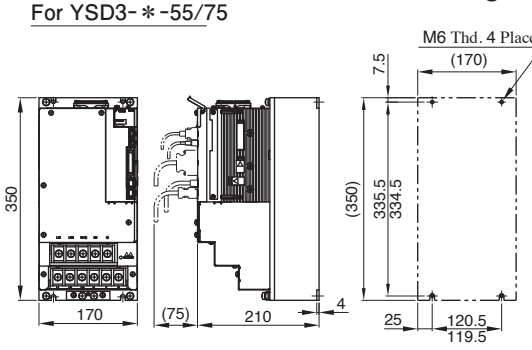
Model Numbers	Mass kg
YSD3-F-55＊＊-＊-＊＊＊-	116
YSD3-F-75＊＊-＊-＊＊＊-	124

●For other dimensions, refer to the "Bracket Mtg. Type" above.

●Servo Pack

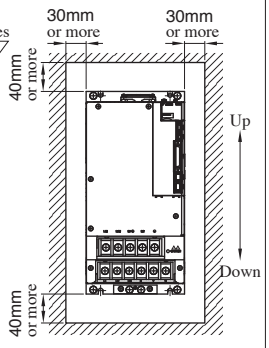
For YSD3-＊-55/75

Dimension of Mtg. Hole



Mass : 10.2 kg

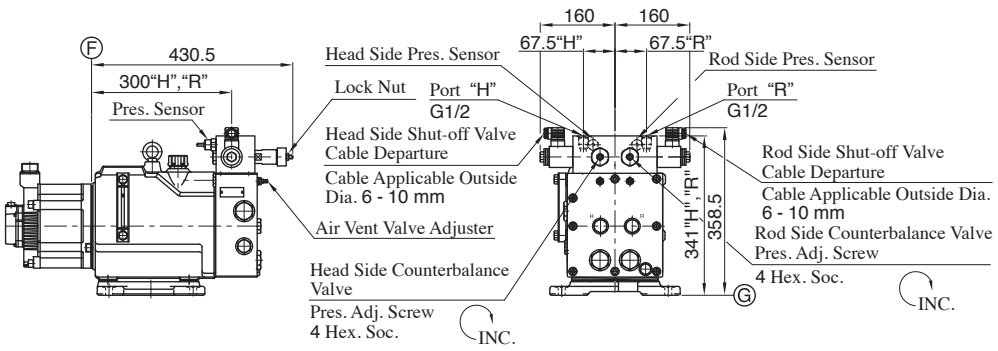
Mtg. Standard



★If set the servo amplifiers in a row, please contact us separately.

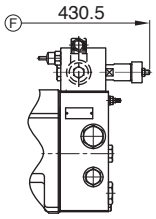
Options

YSD2-∗-∗∗∗-∗-∗∗-BBBB
(Counterbalance Valves / Shut-off Valves : With Both Sides)

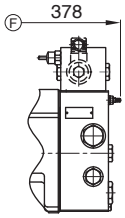


●For other dimensions, refer to "Standard"on the previous page.

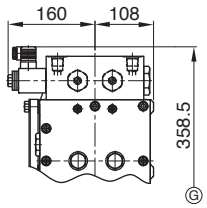
Counterbalance Valves : With Head Side or Rod Side



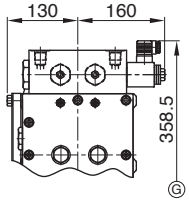
Counterbalance Valves : None



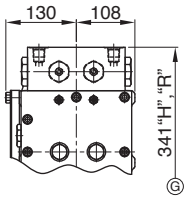
Shut-off Valves : With Head Side



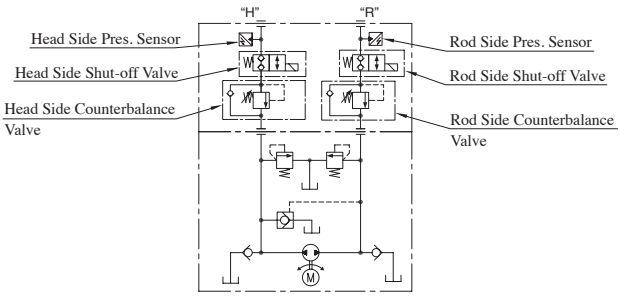
Shut-off Valves : With Rod Side



Shut-off Valves : None



Graphic Symbol



● Additional Mass with Options

With options, add the additional mass below on that of "Standard"on the previous page.

Embedded Position of Option Valves		Additional Mass kg
Counterbalance Valves	Shut-off Valves	
Both Sides	Both Sides	10
	Head Side or Rod Side	
Head Side or Rod Side	Both Sides	
Combination Other Than The Above		9

■ Specifications/Characteristics of Option Valves

Counterbalance Valves

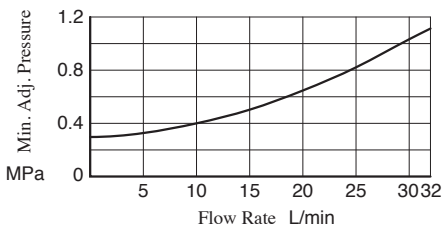
● Specifications

Pres. Adj. Range …… ★ - 7 MPa

★Please refer to the Min. Adj. Pressure below. If the model embedded with shut-off valves, that minimum adjustment pressure is the below value added pressure drop of shut-off valves.

● Min. Adj. Pressure

Viscosity 35 mm²/s Gravity 0.850



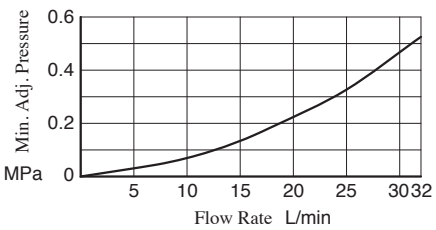
Shut-off Valves

● Solenoid Ratings

Power Supply	Voltage (V)		Current/Power at Power Supply Rated	
	Power Supply Rated	Range of Use	Holding Current (A)	Power (W)
DC	24	21.6 - 25.2	1.36	32.7

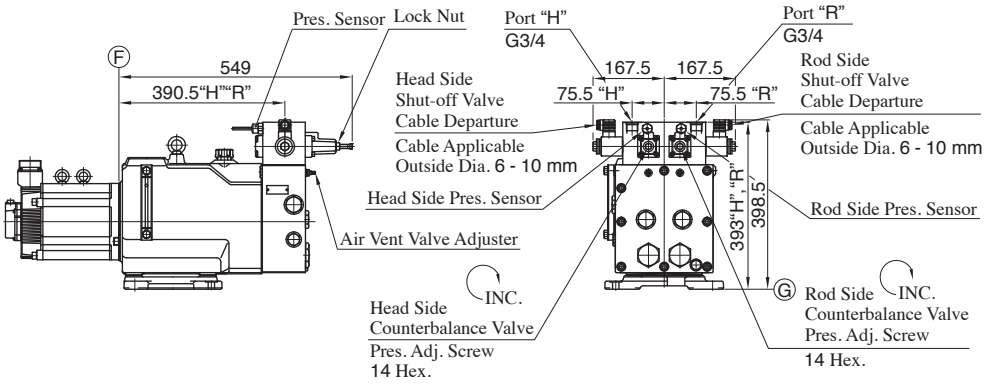
● Pressure Drop

Viscosity 35 mm²/s Gravity 0.850



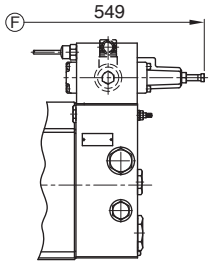
Options

YSD3-*-****-*-***-BBBB
(Counterbalance Valves / Shut-off Valves : With Both Sides)

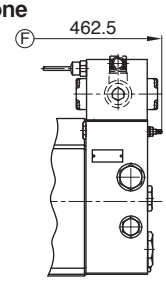


●For other dimensions, refer to "Standard"on page K-65.

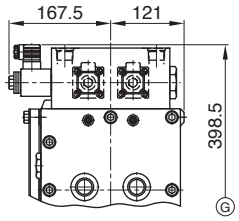
Counterbalance Valves : With Head Side or Rod Side



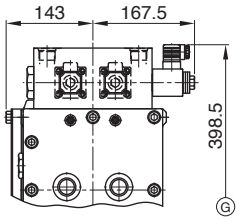
Counterbalance Valves : None



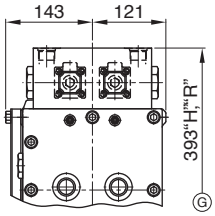
Shut-off Valves : With Head Side



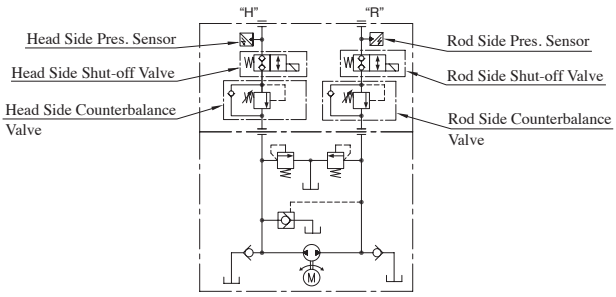
Shut-off Valves : With Rod Side



Shut-off Valves : None



Graphic Symbol



● Additional Mass with Options

With options, add the additional mass below on that of "Standard"on page K-65.

Embedded Position of Option Valves		Additional Mass kg
Counterbalance Valves	Shut-off Valves	
Both Sides	Both Sides	16
	Head Side or Rod Side	
Head Side or Rod Side	Both Sides	
Combination Other Than The Above		15

■ Specifications/Characteristics of Option Valves

Counterbalance Valves

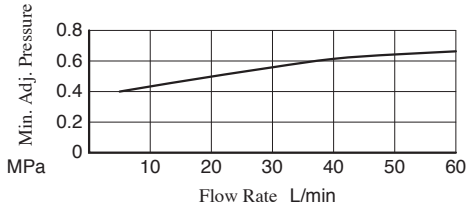
● Specifications

Code of Pres. Adj. Range	Pres. Adj. Range MPa
N	★ - 1.8
A	1.8 - 3.5
B	3.5 - 7

★Please refer to the Min. Adj. Pressure below. If the model embedded with shut-off valves, that minimum adjustment pressure is the below value added pressure drop of shut-off valves.

● Min. Adj. Pressure

Viscosity 35 mm²/s Gravity 0.850



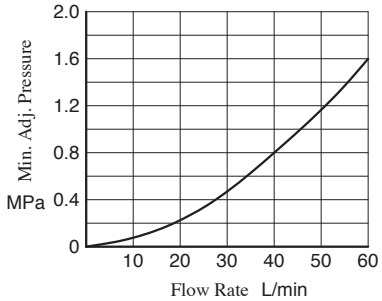
Shut-off Valves

● Solenoid Ratings

Power Supply	Voltage (V)		Current/Power at Power Supply Rated	
	Power Supply Rated	Range of Use	Holding Current (A)	Power (W)
DC	24	21.6 - 25.2	1.36	32.7

● Pressure Drop

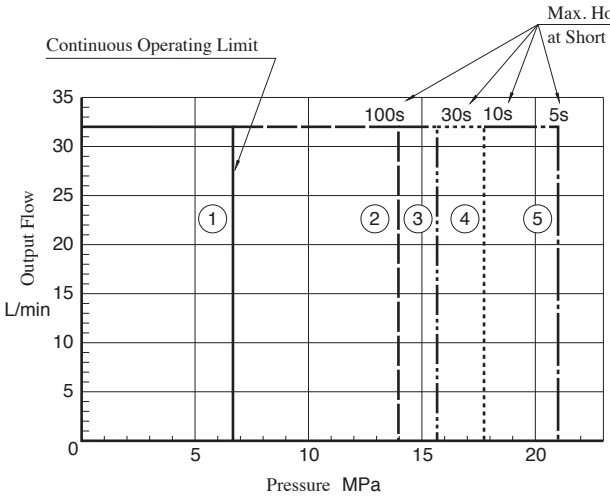
Viscosity 35 mm²/s Gravity 0.850



Pressure vs. Output Flow Characteristics

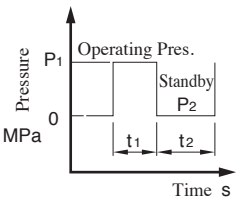
The characteristics charts below show the operating limits of “Pressure”and “Output Flow”calculated with AC servo motor specifications.
For the characteristics charts, see the descriptions below.

Description of Characteristics Chart



Standby Time after Short Time Operating

Operating Pres. P_1 MPa	Operating time t_1 s	Standby Time t_2 s (P_2=0 MPa)
21	5	72
18	10	101
16	30	229
14	100	588

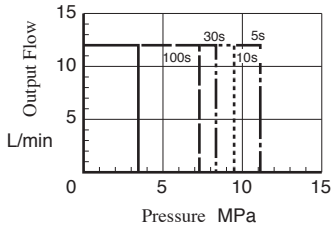


① ——— Continuous Operating Area: The area can pressurizing continuously.

② - ⑤ Short Time Operating Area: The area can use only at the time limited on the characteristics chart. After operating, need a fixed standby time shown on the chart. The standby time on chart is the value at 0 MPa of the standby pressure. If the standby pressure higher than 0 MPa, the standby time is longer. For details, please contact us separately.

YSD1 Type

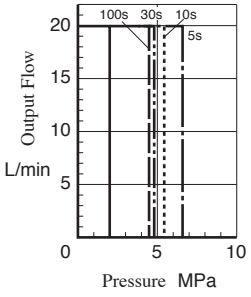
●YSD1-＊-09＊09-6-＊＊-20



Standby Time after Short Time Operating

Operating Pres. P_1 MPa	Operating time t_1 s	Standby Time t_2 s
11.1	5	86
9	10	105
8	30	238
7	100	607

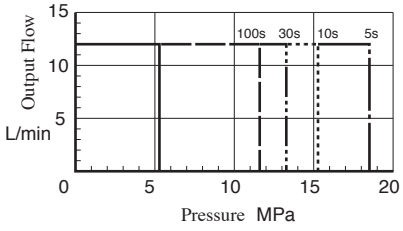
●YSD1-＊-09＊09-10-＊＊-20



Standby Time after Short Time Operating

Operating Pres. P_1 MPa	Operating time t_1 s	Standby Time t_2 s
6.6	5	86
5.4	10	105
4.9	30	238
4.3	100	607

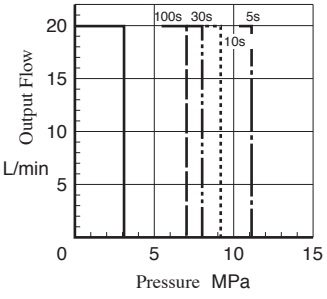
●YSD1-＊-13＊13-6-＊＊-20



Standby Time after Short Time Operating

Operating Pres. P_1 MPa	Operating time t_1 s	Standby Time t_2 s
18.5	5	120
15	10	123
13	30	275
11.8	100	688

●YSD1-＊-13＊13-10-＊＊-20

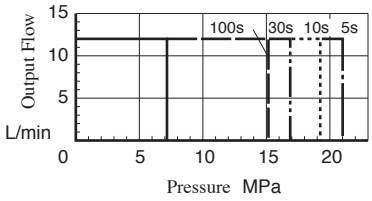


Standby Time after Short Time Operating

Operating Pres. P_1 MPa	Operating time t_1 s	Standby Time t_2 s
11.1	5	103
9	10	123
8	30	275
7	100	688

YSD2 Type

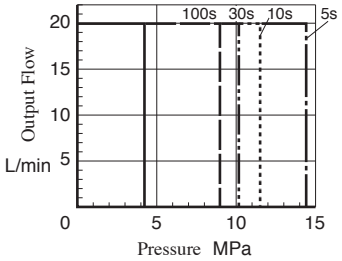
●YSD2-＊-24＊24-6-＊＊-30



Standby Time after Short Time Operating

Operating Pres. P_1 MPa	Operating time t_1 s	Standby Time t_2 s
21	5	61
19	10	100
16.9	30	228
15	100	585

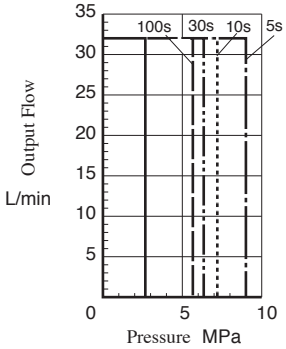
●YSD2-＊-24＊24-10-＊＊-30



Standby Time after Short Time Operating

Operating Pres. P_1 MPa	Operating time t_1 s	Standby Time t_2 s
14	5	82
11.5	10	100
10	30	228
9	100	585

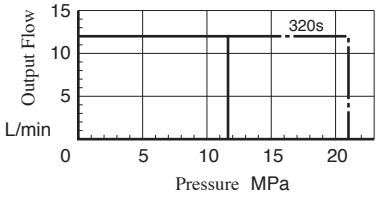
●YSD2-＊-24＊24-16-＊＊-30



Standby Time after Short Time Operating

Operating Pres. P_1 MPa	Operating time t_1 s	Standby Time t_2 s
9	5	82
7	10	100
6	30	228
5.7	100	585

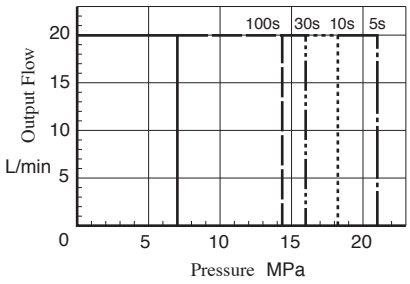
●YSD2-＊-29＊29-6-＊＊-30



Standby Time after Short Time Operating

Operating Pres. P_1 MPa	Operating time t_1 s	Standby Time t_2 s
21	320	1294

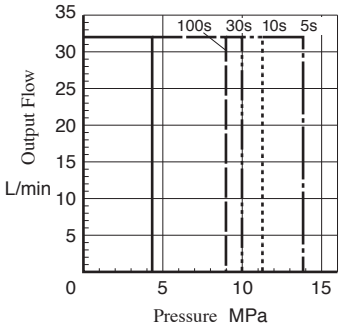
●YSD2-＊-29＊29-10-＊＊-30



Standby Time after Short Time Operating

Operating Pres. P_1 MPa	Operating time t_1 s	Standby Time t_2 s
21	5	65
18	10	95
16	30	218
14	100	562

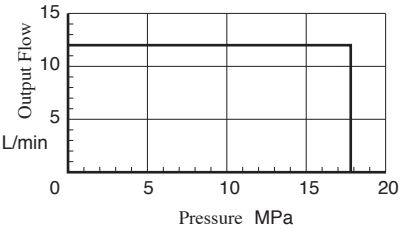
●YSD2-＊-29＊29-16-＊＊-30



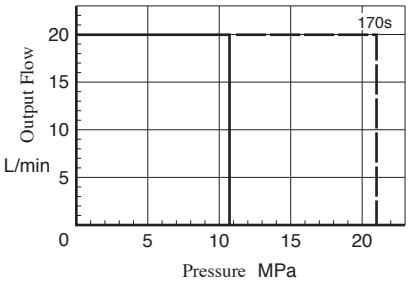
Standby Time after Short Time Operating

Operating Pres. P_1 MPa	Operating time t_1 s	Standby Time t_2 s
13.9	5	77
11	10	95
10	30	218
9	100	562

●YSD2-＊-44＊44-6-＊＊-30



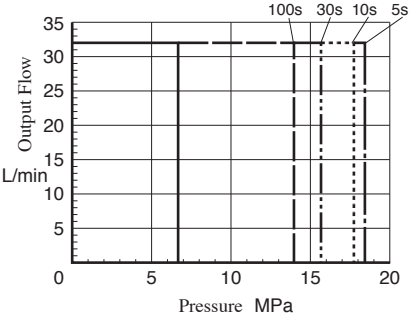
●YSD2-＊-44＊44-10-＊＊-30



Standby Time after Short Time Operating

Operating Pres. P_1 MPa	Operating time t_1 s	Standby Time t_2 s
21	170	852

●YSD2-＊-44＊44-16-＊＊-30



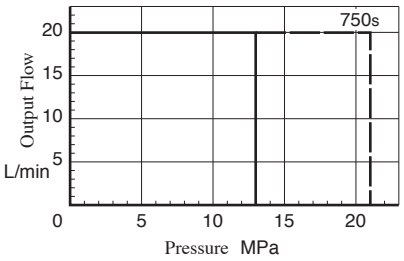
Standby Time after Short Time Operating

Operating Pres. P_1 MPa	Operating time t_1 s	Standby Time t_2 s
18.3	5	72
17.8	10	101
15.7	30	229
14	100	588

★For the description of characteristics chart, refer to page K-68.

YSD3 Type

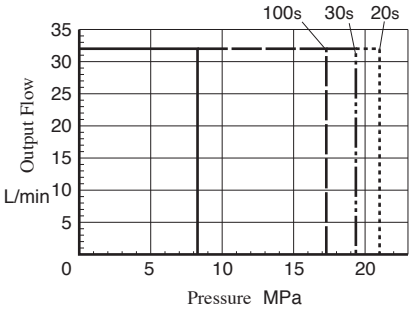
●YSD3-＊-55＊55-10-＊＊-30



Standby Time after Short Time Operating

Operating Pres. P_1 MPa	Operating time t_1 s	Standby Time t_2 s
21	750	2218

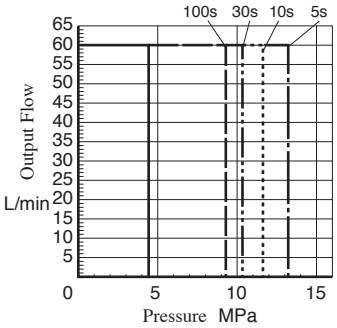
●YSD3-＊-55＊55-16-＊＊-30



Standby Time after Short Time Operating

Operating Pres. P_1 MPa	Operating time t_1 s	Standby Time t_2 s
21	20	183
19	30	229
17	100	588

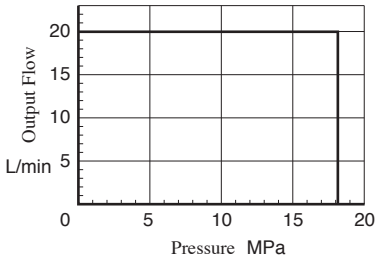
●YSD3-＊-55＊55-30-＊＊-30



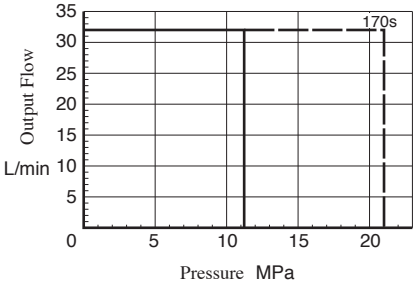
Standby Time after Short Time Operating

Operating Pres. P_1 MPa	Operating time t_1 s	Standby Time t_2 s
13.2	5	82
11.7	10	101
10	30	229
9	100	588

●YSD3-＊-75＊75-10-＊＊-30



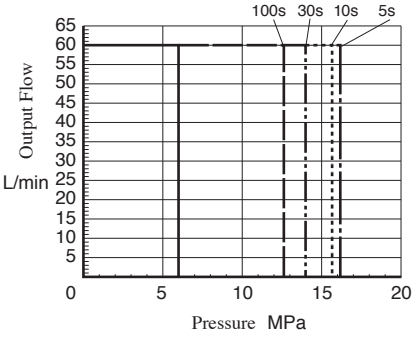
●YSD3-＊-75＊75-16-＊＊-30



Standby Time after Short Time Operating

Operating Pres. P_1 MPa	Operating time t_1 s	Standby Time t_2 s
21	170	746

●YSD3-＊-75＊75-30-＊＊-30

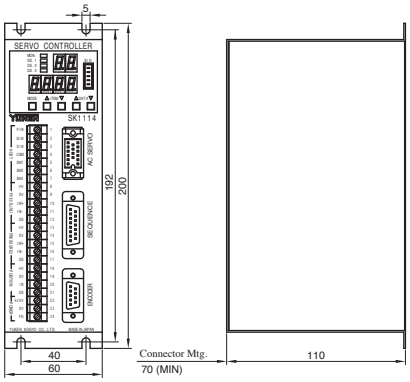


Standby Time after Short Time Operating

Operating Pres. P_1 MPa	Operating time t_1 s	Standby Time t_2 s
16.1	5	80
15.7	10	99
14	30	226
12.7	100	580

★For the description of characteristics chart, refer to page K-68.

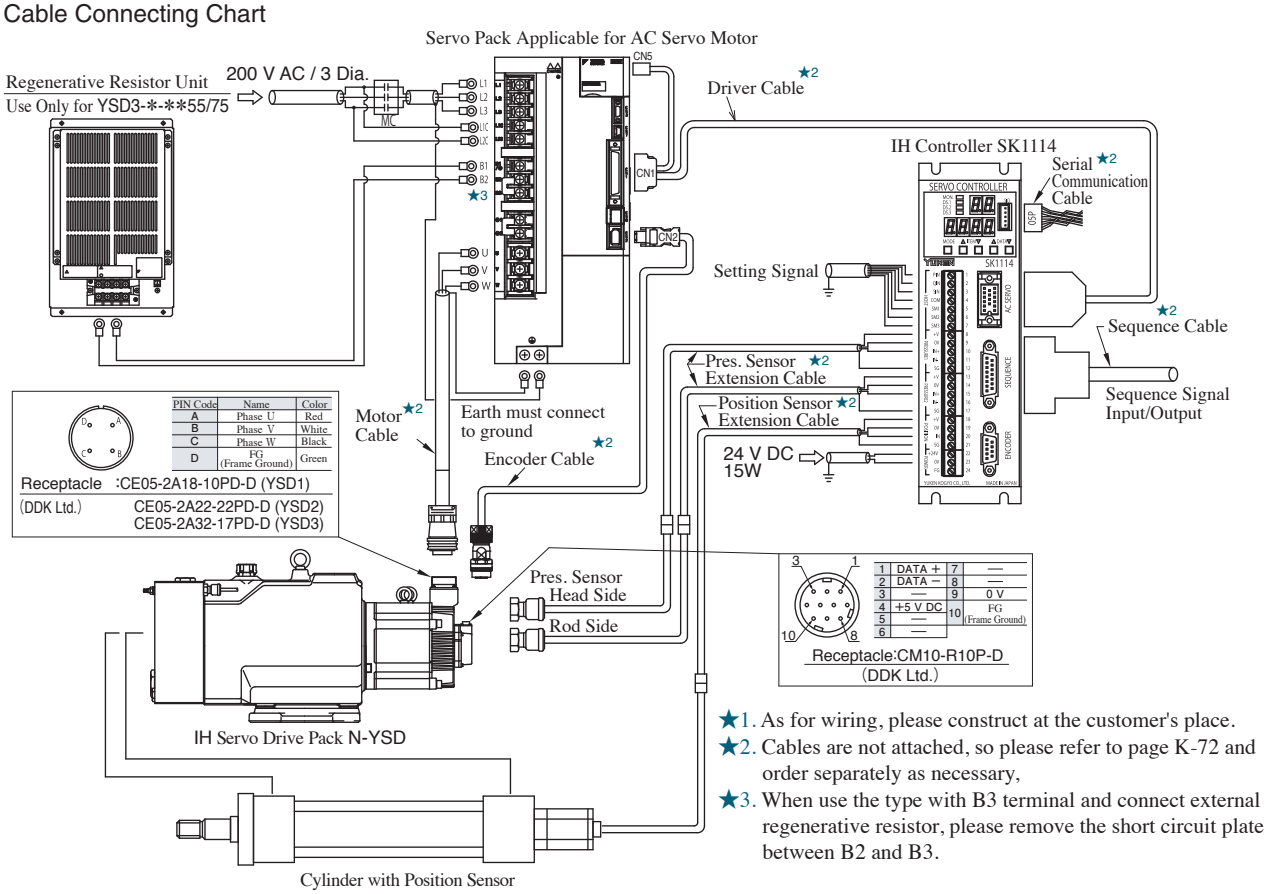
IH Controller：SK1114-11



Specifications

AC Servo Input	±5 V
Input Impedance	10 kΩ (PIN, QIN, SIN)
Power Supply Voltage	24 V DC (21 - 28VIncluding Ripple)
Max. Power Consumption	10 W
Input Signal	Rated／5 V (PIN, QIN, SIN)
Signal for Sensor Monitor	±5 V (SM∗)
Ambient Temperature	0 - 50 °C
Mass	0.5 kg
ENCODER Imput	Option

Cable Connecting Chart



★1. As for wiring, please construct at the customer's place.
★2. Cables are not attached, so please refer to page K-72 and order separately as necessary,
★3. When use the type with B3 terminal and connect external regenerative resistor, please remove the short circuit plate between B2 and B3.

Terminal Details

SK1114

Terminal Name	No.	Signal		Wire Color
HOST (Setting Signal Input/Output)	1	PIN	Pres. Input Signal	–
	2	QIN	Flow Input Signal	
	3	SIN	Position Input Signal	
	4	COM	Signal Common	
	5	SM1	General Monitor Output 1	
	6	SM2	General Monitor Output 2	
	7	SM3	General Monitor Output 3	
PRESSURE1 (Head Side Pres. Sensor)	8	+V	Sensor Power Supply (+4V)	Red
	9	0V		White
	10	IN+	Sensor Input Signal	Green
	11	IN−		Blue
	12	SG	Shield Wire	–
PRESSURE2 (Head Side Pres. Sensor)	13	+V	Sensor Power Supply (+4V)	Red
	14	0V		White
	15	IN+	Sensor Input Signal	Green
	16	IN−		Blue
	17	SG	Shield Wire	–
POSITION (Position Sensor)	18	+V	Sensor Power Supply (+24V)	Brown
	19	0V		Blue/Gray
	20	IN	Sensor Input Signal	Green
	21	SG	Shield Wire	
POWER (Power Supply)	22	+24V	+24 [V]	–
	23	0V	0 [V]	
	24	FG	Ground	

Connector Details

AC SERVO
(Driver Cable Connect)

No.	Signal		
1	Speed Command	Output	V-REF
2	Common		SG
3	Torque Monitor		TRQ-M
4	Speed Monitor	Input	VTG-M
5	Common		SG
6			ALO1
7	Alarm Code	Input	ALO2
8			ALO3
9	Common		SG
10	Servo ON		SV-ON
11	Alarm OFF	Output	ALM-RST
12	+24V [V]		+24V
13	Servo Standby		S-RDY+
14		Input	S-RDY−
15	Alarm		ALM+
16			ALM−

SIO
(Serial Communication Cable Connect)

No.	Signal		
1	TxD	Send Data	Output
2	RxD	Receive Data	Input
3	RTS	Send Require	Output
4	CTS	Send Ready	Input
5	GND	Common	

Upper Communication：RS-2323C

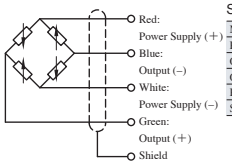
SEQUENCE
(Sequence Cable Connect)

No.	Signal		
1	COM	Input Common	Input
2	IN1	Code Input (BIN) x0 - x7	
3	IN2		
4	IN3		
5	IN4	Select Control Mode	
6	IN5	Select Control Direction	
7	IN6	Standby	
8	IN7	Alarm Reset	
9	IN8	Servo ON	
	Internal Circuit	3.3kΩ IN COM	
10	OUT1	Code Change Recognition	Output
11	OUT2	Standby	
12	OUT3	Coincidence	
13	OUT4	Alarm	
14	COM	Output Common	
	Internal Circuit	OUT COM	
15	Unused		

Cable Connector and Wire

	Sequence Cable	Driver Cable	Serial Communication Cable
Housing	DA-15P (JAE)	MR-16M (HONDA)	XHP-5 (JST)
Terminal	——	——	SXH-00IT-P0.6 (JST)
Case	DA-C4-J10 (JAE)	MR-16L (HONDA)	——
Applicable Wire: Core Wire Size	AWG # 20	AWG # 24 - 28	AWG # 22 - 28
Applicable Wire: Coated Outside Dia.	2.9 Dia.	1.2 - 1.5 Dia.	0.9 - 1.9 Dia.
Applicable Wire: Strip Length	2.0 - 2.5mm	2.0 - 2.5mm	1.2 - 2.6mm

Pressure Sensor



Specifications

Model	KH17 (NAGANO KEIKI)
Range	0 - 35MPa
Output	70±25mV DC
Operating Voltage	5V DC
Precision	±0.5 % F.S.
Standard Cable Length	2m

Position Sensor

Model	BTL5-A11-∗ (BALLUFF)
Standard Cable Length	5m

Cables

Cables are not attached for IH servo drive pack, so please refer to the table below and order separately as necessary.
The cables except for motor cable are common to each model.

Motor Cable

IH Servo Drive Pack Model Numbers	Cable Model Numbers	Notes
YSD1-＊-09＊-	YSDC-M1-09-☆-★-10	☆：Plug Type S：Straight Type　L：L Type ★：Cable Length 03：3m　05：5m　10：10m　15：15m　20：20m N：Plug and Cable Clamp Only
YSD1-＊-13＊-	YSDC-M1-13-☆-★-10	
YSD2-＊-24＊-	YSDC-M1-29-☆-★-10	
YSD2-＊-29＊-	YSDC-M1-29-☆-★-10	
YSD2-＊-44＊-	YSDC-M1-44-☆-★-10	
YSD3-＊-55＊-	YSDC-M1-55-☆-★-10	
YSD3-＊-75＊-	YSDC-M1-75-☆-★-10	

Sequence Cable / Driver Cable

Cable Type	Cable Model Numbers	Notes
Sequence Cable	YSDC-S1-00-★-10	★：Cable Length 03：3m　05：5m　10：10m　15：15m　20：20m
Driver Cable	YSDC-D1-★-10	★：Cable Length 01：1m　02：2m　03：3m

Encoder Cable / Pres. Sensor Extension Cable / Position Sensor Extension Cable

Cable Type	Cable Model Numbers	Notes
Encoder Cable	YSDC-E8-☆-★-10	☆：Plug Type S：Straight Type　L：L Type ★：Cable Length R03：0.3m　03：3m　05：5m　10：10m　15：15m　20：20m
Pres. Sensor Extension Cable	YSDC-P1-01-★-10	★：Cable Length 03：3m　05：5m　10：10m　15：15m　20：20m　50：50m
Position Sensor Extension Cable	YSDC-L1-01-★-10	★：Cable Length 03：3m　05：5m　10：10m　15：15m　20：20m

Serial Communication Cable

Cable Type	Cable Model Numbers	Notes
Serial Communication Cable	YSDC-T2-☆-★-10	☆：Cable End Type 02：Dsub-9pin ★：Cable Length 03：3m　05：5m　10：10m

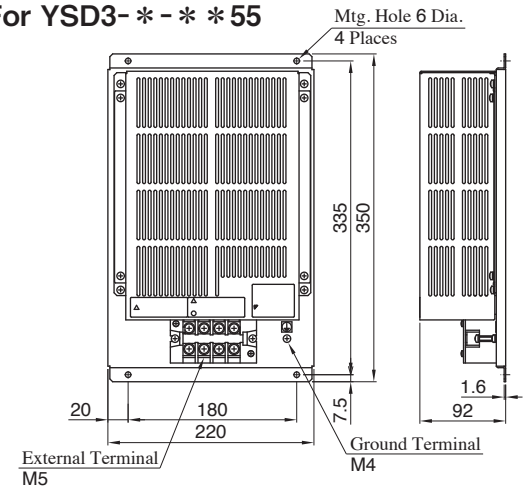
Regenerative Resistor Unit

Specifications

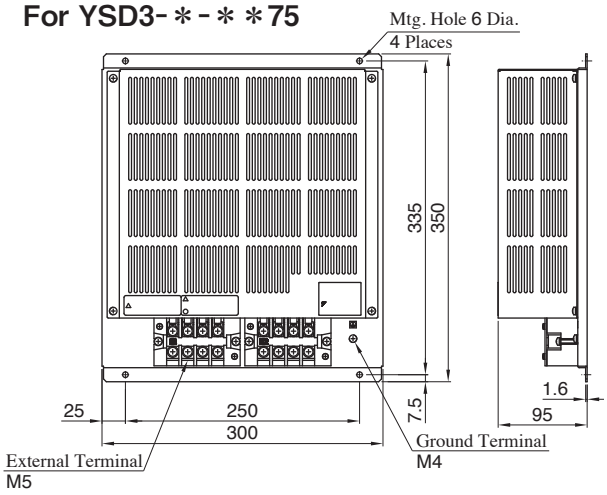
IH Servo Drive Pack Model Numbers	YASKAWA ELECTRIC Model	Resistance Value	Power	Approx. Mass kg
YSD3-＊-＊＊55-	JUSP-RA04-E	6.25Ω (25Ω×4Parallel Connected)	880W (220W×4)	4.2
YSD3-＊-＊＊75-	JUSP-RA05-E	3.13Ω (25Ω×8Parallel Connected)	1760W (220W×8)	6.6

★Regenerative resistor may reach to high temperature. Please use heat-resistant fireproof wires and avoid to contact the regenerative resistor on wiring.

For YSD3-＊-＊＊55



For YSD3-＊-＊＊75



Interchangeability between Current and New Models

Because the motor manufacturer stopped production of the built-in servo motor, so IH servo drive pack has changed models as below.

Major Changes

①Totally Change of Servo Motor and Servo Pack.
②1.8 kW embedded model changes to 2.4 kW embedded model same as above.
③Change The Connector Type of Encorder Cable.

Design Number

Series	Change of Design Number
YSD1	10→20 Design
YSD2/YSD3	20→30 Design

Interchangeability in Installation

There is interchangeability between current and new pumps with no changes.
As for servo motor, servo pack and encoder cable, there is no interchangeability between current and new models, so these parts of current design have to exchange as a set.

Interchangeability	Name	No Interchangeability / Differences	No Interchangeability / Details
Yes	Pump	———	———
No	Servo Motor	Distance from Pump Mtg. Surface to Cable Connecting Position	Page K-74
No	Servo Pack	Mtg. Hole Dimensions	Page K-75
		Connector Insert Direction for YSD3	
Yes	Motor Cable Sequence Cable Driver Cable Pres. Sensor Extension Cable Position Sensor Extension Cable	———	———
No	Serial Communication Cable	Cable End Type : Delete Some Parts	Page K-76
No	Encoder Cable	Cable Length, Connector type	Pages K-73, K-75
Yes★	Regenerative Resistor Unit	———	———

★The model numbers are changed (see the table below).

Model Numbers

①IH Servo Drive Pack

Current Model Numbers	New Model Numbers
YSD2-＊-18A18-＊-＊＊-＊＊＊＊＊-20	YSD2-＊-24A24-＊-＊＊-＊＊＊＊＊-30

②Encoder Cable / Regenerative Resistor Unit

Current Model Numbers		New Model Numbers	
Encoder Cable	Regenerative Resistor Unit	Encoder Cable	Regenerative Resistor Unit
YSDC-E1-☆-★-10 ★ : Cable Length 03 : 3m 05 : 5m 10 : 10m 15 : 15m 20 : 20m 50 : 50m	JUSP-RA04	YSDC-E8-☆-★-10 ★ : Cable Length R3 : 0.3m 03 : 3m 05 : 5m 10 : 10m 15 : 15m 20 : 20m	JUSP-RA04-E
	JUSP-RA05		JUSP-RA05-E

Specifications

Current and new models are same except below.

1. Servo Motor Output / Servo Pack type

Current			New		
Model Numbers	Servo Motor Output	Servo Pack type	Model Numbers	Servo Motor Output	Servo Pack type
YSD2-＊-18A18	1.8 kW	For 1.8 kW Motor	YSD2-＊-24A24	2.4 kW	For 2.4 kW Motor

2. Mass

①Pump / Motor

Current			New		
Model Numbers	Mass Flange Mtg. Type	Mass Foot Mtg. Type	Model Numbers	Mass Flange Mtg. Type	Mass Foot Mtg. Type
YSD1-＊-09A09-＊-＊＊-10	50 kg	53 kg	YSD1-＊-09A09-＊-＊＊-20	48 kg	51 kg
YSD1-＊-13A13-＊-＊＊-10	52 kg	55 kg	YSD1-＊-13A13-＊-＊＊-20	49 kg	52 kg
YSD2-＊-29A29-＊-＊＊-20	82 kg	88 kg	YSD2-＊-29A29-＊-＊＊-30	78 kg	84 kg
YSD2-＊-44A44-＊-＊＊-20	87 kg	93 kg	YSD2-＊-44A44-＊-＊＊-30	82 kg	88 kg
YSD3-＊-55A55-＊-＊＊-20	124 kg	130 kg	YSD3-＊-55A55-＊-＊＊-30	116 kg	122 kg
YSD3-＊-75A75-＊-＊＊-20	134 kg	140 kg	YSD3-＊-75A75-＊-＊＊-30	124 kg	130 kg

②Servo Pack

Current		New	
Type	Mass	Type	Mass
For YSD1-＊-09	1.7 kg	For YSD1-＊-09	1.5 kg
For YSD1-＊-13	2.8 kg	For YSD1-＊-13	2.4 kg
For YSD2-＊-18/29	3.8 kg	For YSD2-＊-24	2.8 kg
For YSD2-＊-44	5.5 kg	For YSD2-＊-29/44	4.6 kg
For YSD3-＊-55/75	14.6 kg	For YSD3-＊-55/75	10.2 kg

Characteristics

Pressure vs. Output Flow Characteristics are changed as below.

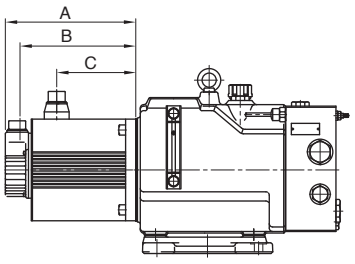
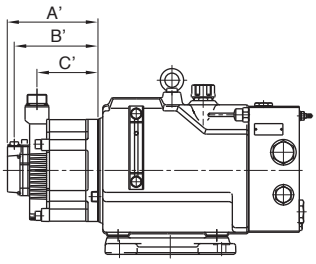
①Operating pressure at short time operating is changed a part.

②Delete the forced air cooling area at continuous and short time operating.

Dimensions

①Pump / Mootor

Current				New			
Model Numbers	A	B	C	Model Numbers	A’	B’	C’
YSD1-＊-09A09-＊-＊＊-10	161	140	88	YSD1-＊-09A09-＊-＊＊-20	137	125	83
YSD1-＊-13A13-＊-＊＊-10	185	164	112	YSD1-＊-13A13-＊-＊＊-20	153	141	99
YSD2-＊-18A18-＊-＊＊-20	166	144	89	YSD2-＊-24A24-＊-＊＊-30	160	148	108
YSD2-＊-29A29-＊-＊＊-20	192	170	115	YSD2-＊-29A29-＊-＊＊-30	160	148	108
YSD2-＊-44A44-＊-＊＊-20	226	204	149	YSD2-＊-44A44-＊-＊＊-30	184	172	132
YSD3-＊-55A55-＊-＊＊-20	260	238	174	YSD3-＊-55A55-＊-＊＊-30	221	209	163
YSD3-＊-75A75-＊-＊＊-20	334	312	248	YSD3-＊-75A75-＊-＊＊-30	267	255	209

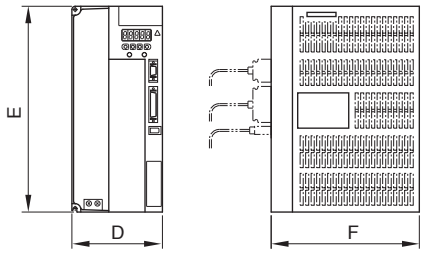
Current	New
	

②Servo Pack

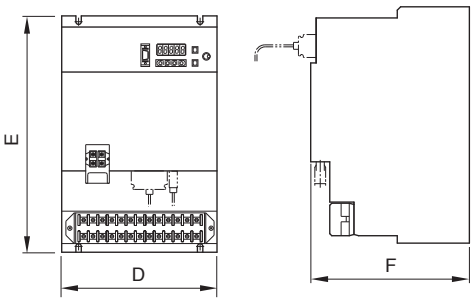
Current							New						
Type	D	E	F	G	H	J	Type	D'	E'	F'	G'	H'	J'
For YSD1-∗-09	90	160	180	27	149.5	5	For YSD1-∗-09	70	160	180	58	150	(5)
For YSD1-∗-13	110	160	180	100	149.5	5	For YSD1-∗-13	90	160	180	80	150	(5)
For YSD2-∗-18/29	110	250	180	100	238.5	6	For YSD2-∗-24	100	180	180	90	170	(5)
For YSD2-∗-44	135	250	230	125	238.5	5.7	For YSD2-∗-29/44	110	250	210	100	238.5	(6)
For YSD3-∗-55/75	230	350	235	180	335	7	For YSD3-∗-55/75	170	350	210	120	335	(7)

Current

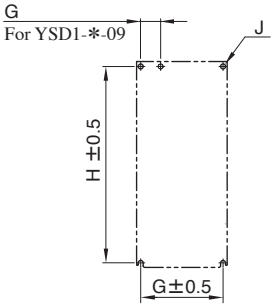
For YSD1/YSD2



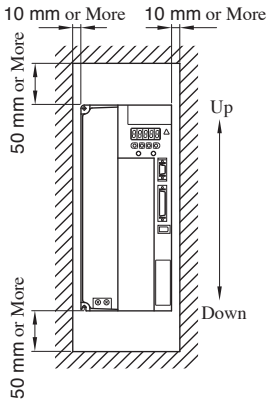
For YSD3



Mtg. Hole Dimensions

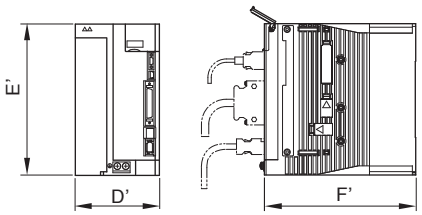


Installation Standard

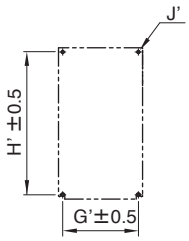


New

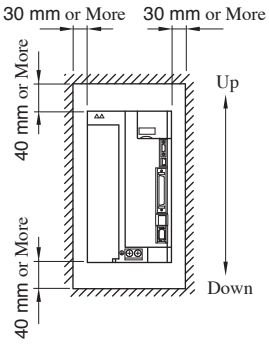
For YSD1/YSD2/YSD3



Mtg. Hole Dimensions

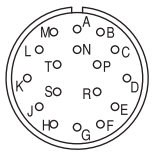


Installation Standard



③Encoder Cable

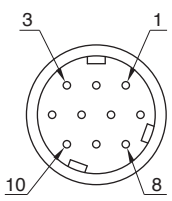
Current



Receptacle
MS3102A20-29P
DDK Ltd.

PIN Code	Name	PIN Code	Name
A	—	K	—
B	—	L	—
C	DATA +	M	—
D	DATA −	N	—
E	—	P	—
F	—	R	—
G	0 V	S	—
H	+ 5V DC	T	—
J	FG (Frame Ground)		—

New



Receptacle
CM10-R10P-D
DDK Ltd.

PIN Code	Name
1	DATA +
2	DATA −
3	—
4	+5 V DC
5	—
6	—
7	—
8	—
9	0 V
10	FG (Frame Ground)

④Serial Communication Cable

Descriptions	Current	New
Cable Model Numbers	YSDC-T1-☆-★-10	YSDC-T2-☆-★-10
Cable End Type	01：Dsub-25pin 02：Dsub-9pin	02：Dsub-9pin

Solenoid Ratings

Type	Power Supply	Coil Type★3	Frequency (Hz)	Voltage (V)		Current/Power at Rated Power Supply Voltage		
				Power Supply Rated	Range of Use	Inrush Current★2 (A)	Holding Current (A)	Power (W)
Standard Type	AC★1	A 100	50	100	80 - 110	2.42	0.51	—
			60	100	90 - 120	2.14	0.37	
				110		2.35	0.44	
		A 120	50	120	96 - 132	2.02	0.42	
			60		108 - 144	1.78	0.31	
		A 200	50	200	160 - 220	1.21	0.25	
			60	200	180 - 240	1.07	0.19	
				220		1.18	0.22	
		A 240	50	240	192 - 264	1.01	0.21	
			60		216 - 288	0.89	0.15	
Shockless Type	DC (K Series)	D 12	—	12	10.8 - 13.2	—	2.45	29
		D 24		24	21.6 - 26.4		1.23	
		D 48		48	43.2 - 52.8		0.61	
	R (AC→DC)	R 100	50/60	100	90 - 110	—	0.33	29
		R 200		200	180 - 220		0.16	

★1. AC Solenoid
AC Solenoid (A＊) is not available for the shockless type. If need shockless type of power supply, please order R type solenoid (R＊).

★2. Inrush Current
The inrush current value indicates the rms value at max. stroke.

★3. The coil types other than the above are also available. For details, please contact us separately.

The coil types highlighted with shade represent the optional extras. If use, please confirm the time of delivery with us befor ordering.