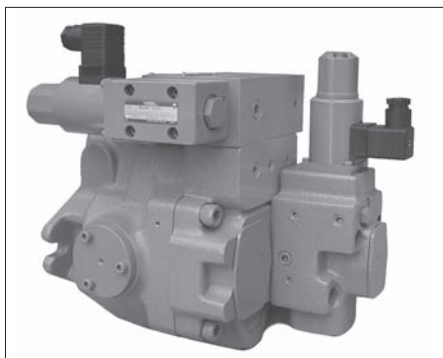
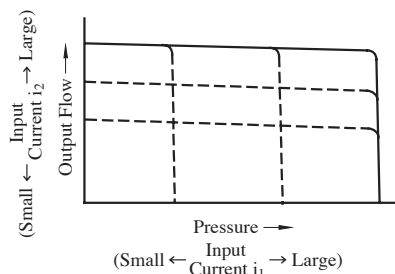


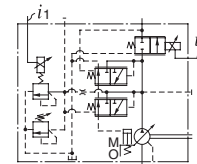
Series Variable Displacement Piston Pumps, Proportional Electro-Hydraulic Load Sensing Type



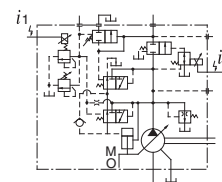
Performance Characteristics



Graphic Symbol



A16/A22/A37/A56



A70/A90/A145

Model Number Designation

A56	-F	-R	-04	-C	-K	-32
Series Number	Mounting	Direction of Rotation	Control Type	Pressure Adj. Range MPa	Shaft Extension	Design Number
A16 (15.8 cm ³ /rev)	F: Flange Mtg. L: Foot Mtg.	(Viewed from) Shaft End R: Clockwise★ ¹	04: Proportional Electro-Hydraulic Load Sensing Type	B: 1.5 - 6.9 (220 - 1000) C: 1.5 - 15.7 (220 - 2280) H: 1.5 - 20.6 (220 - 2990)	K: Keyed Shaft	32
A22 (22.2 cm ³ /rev)				B: 1.5 - 6.9 (220 - 1000) C: 1.5 - 15.7 (220 - 2280)		32
A37 (36.9 cm ³ /rev)				B: 2 - 6.9 (290 - 1000) C: 2 - 15.7 (290 - 2280) H: 2 - 20.6 (290 - 2990)		32
A56 (56.2 cm ³ /rev)				B: 2 - 6.9 (290 - 1000) C: 2 - 15.7 (290 - 2280) H: 2 - 20.6 (290 - 2990)		32

A70	-F	R	04	C	S	-60
Series Number	Mounting	Direction of Rotation	Control Type	Pressure Adj. Range MPa	Port Position	Design Number
A70 (70.0 cm ³ /rev)	F: Flange Mtg. L: Foot Mtg.	(Viewed from) Shaft End R: Clockwise★ ¹	04: Proportional Electro-Hydraulic Load Sensing Type	C: 1.5 - 16 (220 - 2320) H: 1.5 - 21 (220 - 3050)	S: Side Port	60
A90 (91.0 cm ³ /rev)						60
A145 (145 cm ³ /rev)						60

★1. Available to supply pump with anti-clockwise rotation. Consult Yuken for details.

★2. Please inquire for A220 separately.

Pipe Flange Kits

Pipe flange kits are available. When ordering, specify the kit number from the table below.

Pump Model Numbers	Name of Port	Pipe Flange Kit Numbers		
		Threaded Connection	Socket Welding ^{*1}	Butt Welding
A16- *-R-04	Suction	F5-06-A-10	F5-06-B-10	F5-06-C-10
A22- *-R-04	Discharge	— ^{*2}	— ^{*2}	— ^{*2}
A37- *-R-04	Suction	F5-10-A-10	F5-10-B-10	F5-10-C-10
A56- *-R-04	Discharge	F5-06-A-10	F5-06-B-10	F5-06-C-10
A 70- *R04	Suction	F5-12-A-10	F5-12-B-10	F5-12-C-10
	Discharge	F5-10-A-10	F5-10-B-10	F5-10-C-10
A 90- *R04 A145- *R04	Suction	F5-16-A-10	F5-16-B-10	F5-16-C-10
	Discharge	F5-10-A-10	F5-10-B-10	F5-10-C-10

- ★1. In case of using socket welding flanges, there is a case where the operating pressure should be set lower than the normal because of strength of the flanges. Therefore, please pay cautious attention to the operating pressure when the socket welding flanges are used.
- ★2. Discharge port for pump model "A16" and "A22" is available only the threaded connections.

● Details of the pipe flange kits are shown on page 262.

Instructions

Bleeding Air

In order to get steadily controlled pressure and flow, bleed air by loosening the air vent screw and fill solenoid armature with operating oil.

Manual Adjustment Screws

Manual adjustment screws may be used for initial running adjustment or in case of electrical failures in order to adjust pressure and flow temporarily. In case of normal use, put the manual adjustment screws back in their preset positions.

Position of Cable Departure

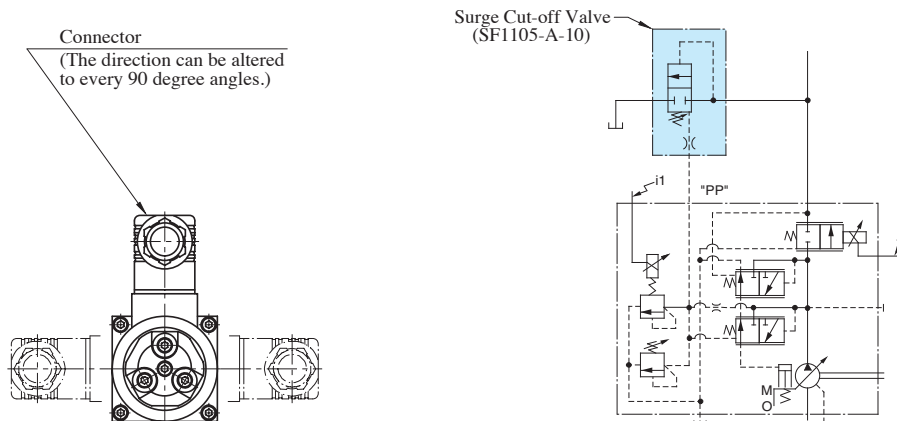
Position of cable departure can be changed. For details, refer to drawing below.

Connection of Surge Cut-off Valve to "A" Series Pump (For A16 to A56 Type)

If using surge cut-off valve (SF1105-A-10), connect between pilot port "PP" of this pump and port "PP" of surge cut-off valve as pilot piping (refer to symbol below).

Inside diameter of pipe should be more than 8 mm.

Consult Yuken of detail of surge cut-off valve.



Specifications

Descriptions		Model Numbers		A16	A22	A37	A56	A70	A90	A145
Geometric Displacement		cm ³ /rev		15.8	22.2	36.9	56.2	70.0	91.0	145
Operating Pressure MPa		Rated ^{★2}		16	16	16	16	21	21	21
		Intermittent ^{★1}		21	16	21	21	21	21	21
Shaft Speed Range r/min		Max.		1800	1800	1800	1800	1800	1800	1800
		Min.		600	600	600	600	600	600	600
Flow Control	Flow Adj. Range	L/min		1 - 28.4	1 - 40	1 - 66	1 - 101	1 - 126	1 - 163	2 - 261
	Min. Pres. Required for Flow Adj.	MPa		1.5	1.5	1.5	2.0	1.0	1.0	1.0
	Differential Pres. (Discharge Pres. - Load Pres.)	MPa		0.37				0.22		
	Step Response ^{★5} (0 → Max. Flow)	ms		70	80	120	125	100	120	210
	Hysteresis			3 % or less ^{★1}						
	Rated Current	mA		900	700	740	790	820	920	920
	Coil Resistance (20°C)			10						
Pres. Control	Pres. Adj. Range	MPa		Refer to Model Number Designation						
	Step Response ms	t ₁ ^{★5}		80	80	50	55	150	150	160
		t ₂ ^{★5}		140	90	80	80	80	120	180
	Hysteresis			2 % or less ^{★1}						
	Rated Current	mA		(Pres. Adj. Range) B: 770, C:880, H:790				C: 860 H: 765	C: 873 H: 765	C: 875 H: 755
Coil Resistance (20°C)	Ω		10							
Applicable Amplifier Model ^{★3}				AME-D2-1010-11						
Approx. Mass kg	Flange Mtg.		32	32	38	45	72.5	88.5	109.5	
	Foot Mtg.		34.2	34.2	43.2	49.3	84.5	109	134.5	

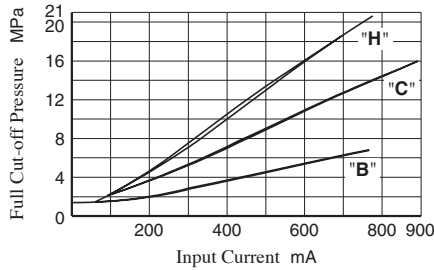
- ★1. Whenever setting pressure, make sure the full cut-off pressure never exceeds the maximum intermittent pressure.
- ★2. When operating the pump exceeding the rated pressure, operating conditions are restricted. Refer to page 31 for the details.
- ★3. Specifications of power amplifiers, consult Yuken for details.
- ★4. The figure mentioned in the above table are those obtained using Yuken's amplifier.
- ★5. Step response depends on circuit and operating conditions. Data shown in the table above is an example based on the condition right.

Model	Pres. Step Response		Loading Volume
	t ₁	t ₂	
A16, A22	1.5 → 16 MPa	16 → 1.5 MPa	High Pressure Hose 3/8" × 2 m
A37, A56	2.0 → 16 MPa	16 → 2.0 MPa	High Pressure Hose 3/4" × 2 m
A70, A90 A145	3.0 → 16 MPa	16 → 3.0 MPa	High Pressure Hose 1-1/4" × 2 m

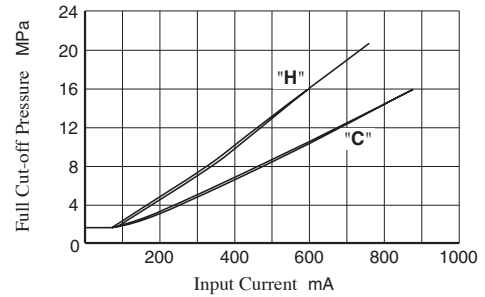
Typical Performance Characteristics at Viscosity 20 mm²/s [ISO VG32 Oils, 50°C]

Full Cut-off Pres. vs. Input Signal

● A16/A22/A37/A56



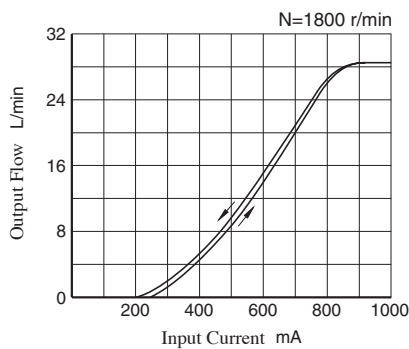
● A70/A90/A145



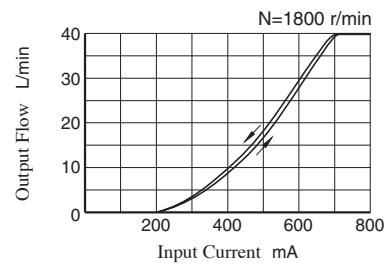
Note: Pressure adjustment range "H" is not available for A22.

Output Flow vs. Input Current

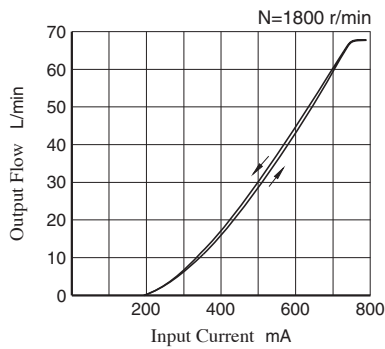
● A16



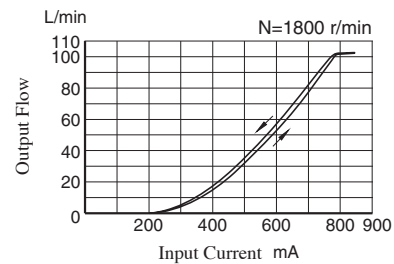
● A22



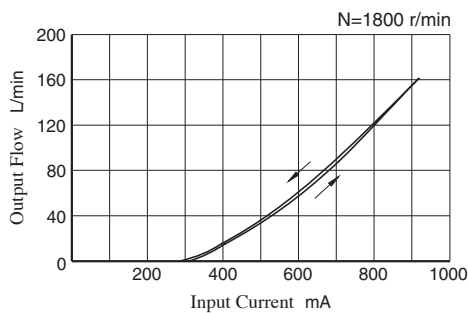
● A37



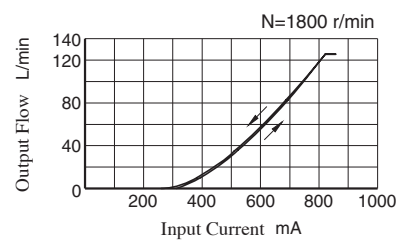
● A56



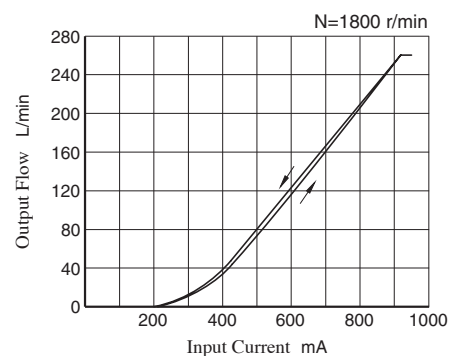
● A90



● A70

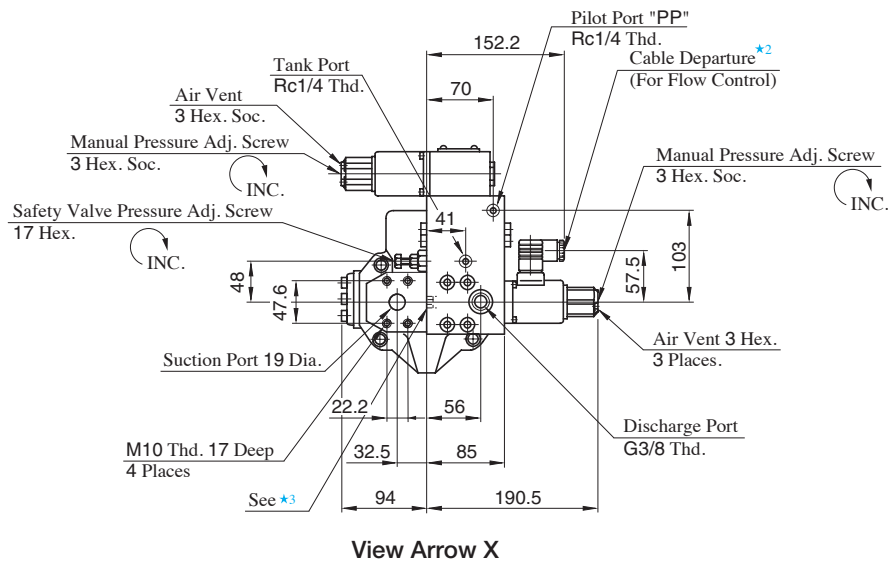
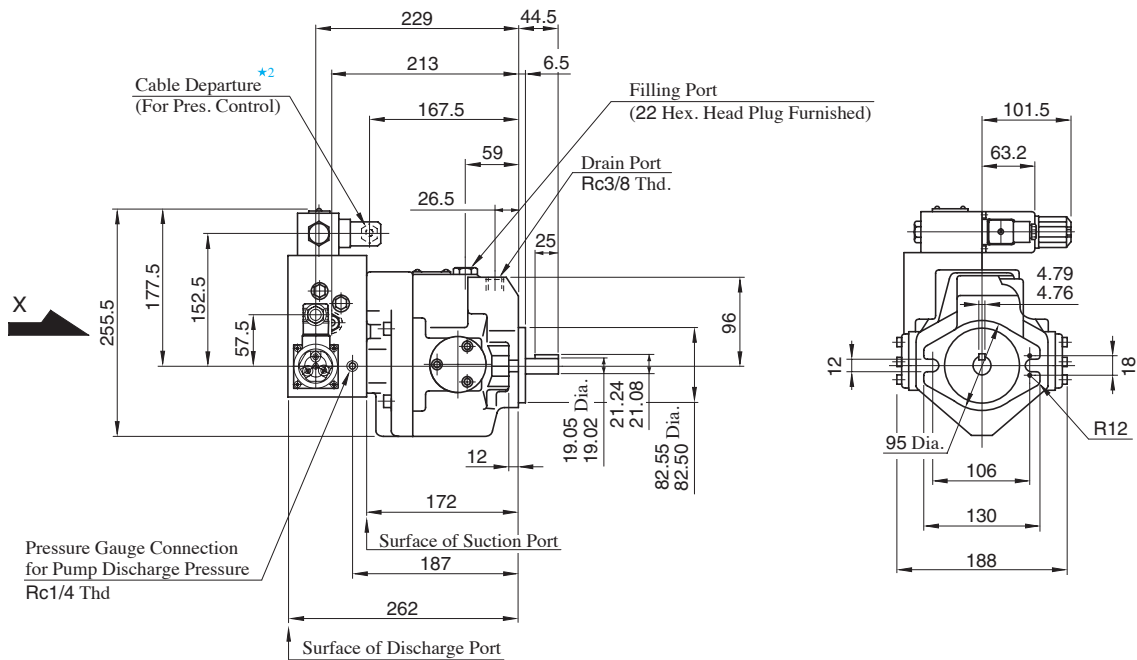


● A145

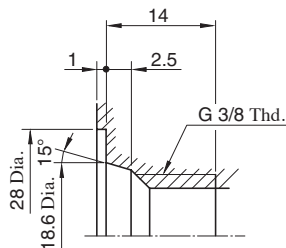


Flange Mtg. : A16-F-R-04 * -K
A22-F-R-04 * -K

DIMENSIONS IN MILLIMETRES



★ 1. Detail of Discharge Port



★ 2. Cable Applicable:

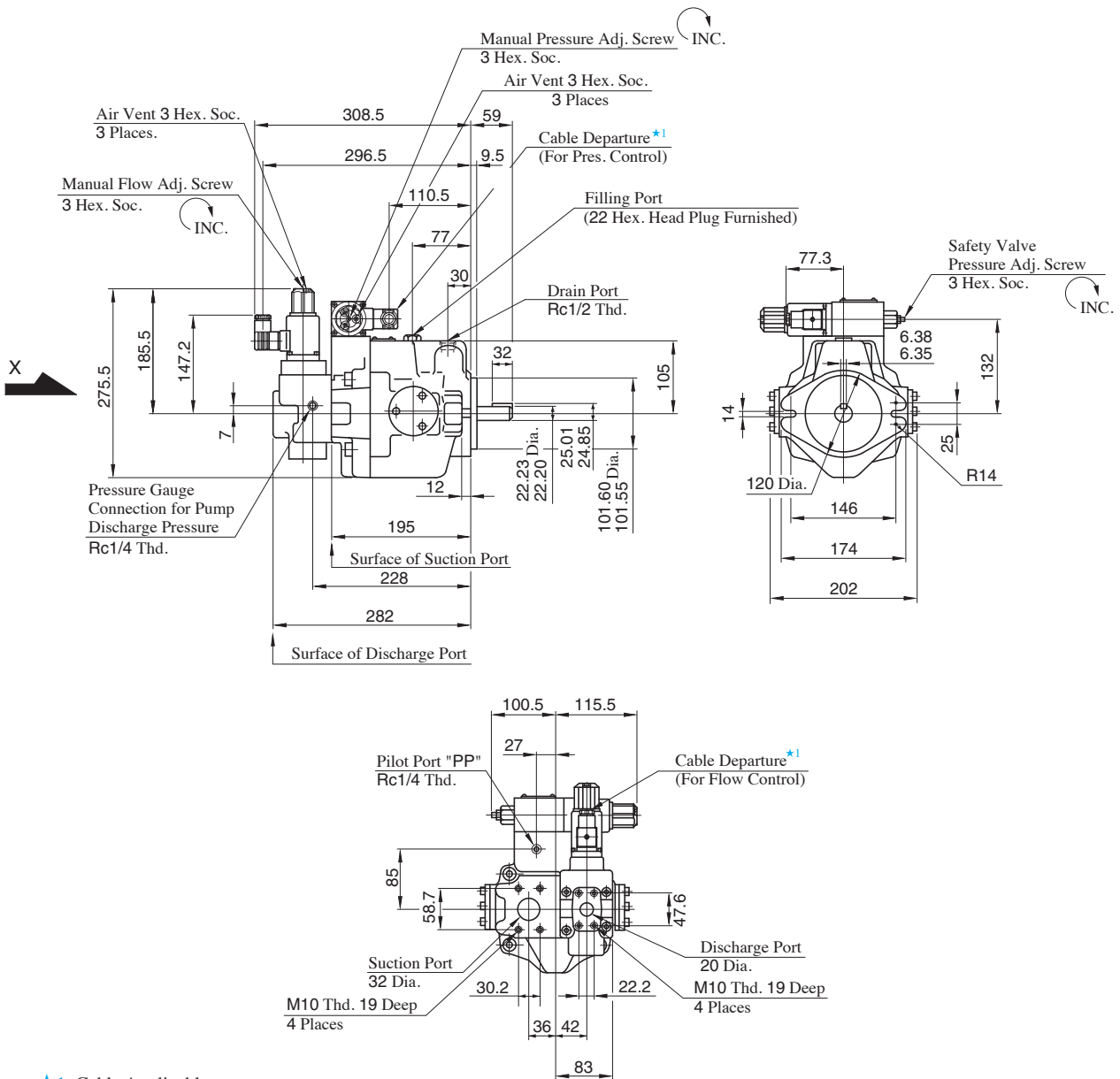
Outside Dia.....8-10 mm
Conductor Area.....Not Exceeding 1.5 mm²

★ 3. Do not touch the screw because it is adjusted at the time of shipment.

● Foot Mounting Type

Mounting bracket is common to that of pressure compensator model.
Refer to page 44 for the dimensions of mounting bracket.

Flange Mtg. : A37-F-R-04 *-K

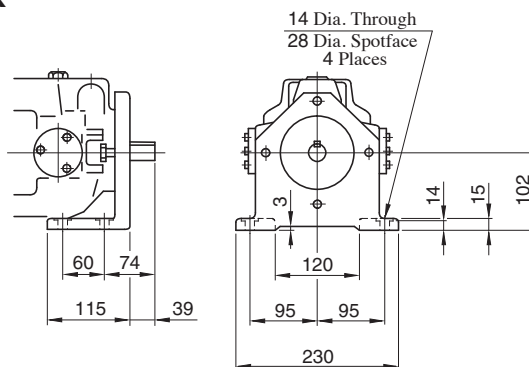


★1. Cable Applicable:
 Outside Dia.....8-10 mm
 Conductor Area.....Not Exceeding 1.5 mm²

View Arrow X

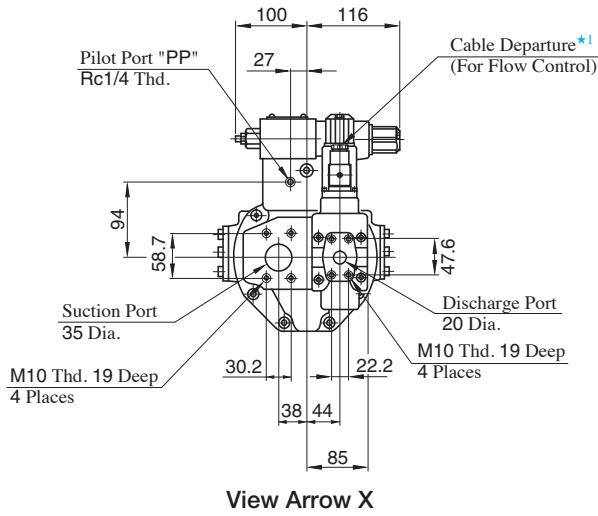
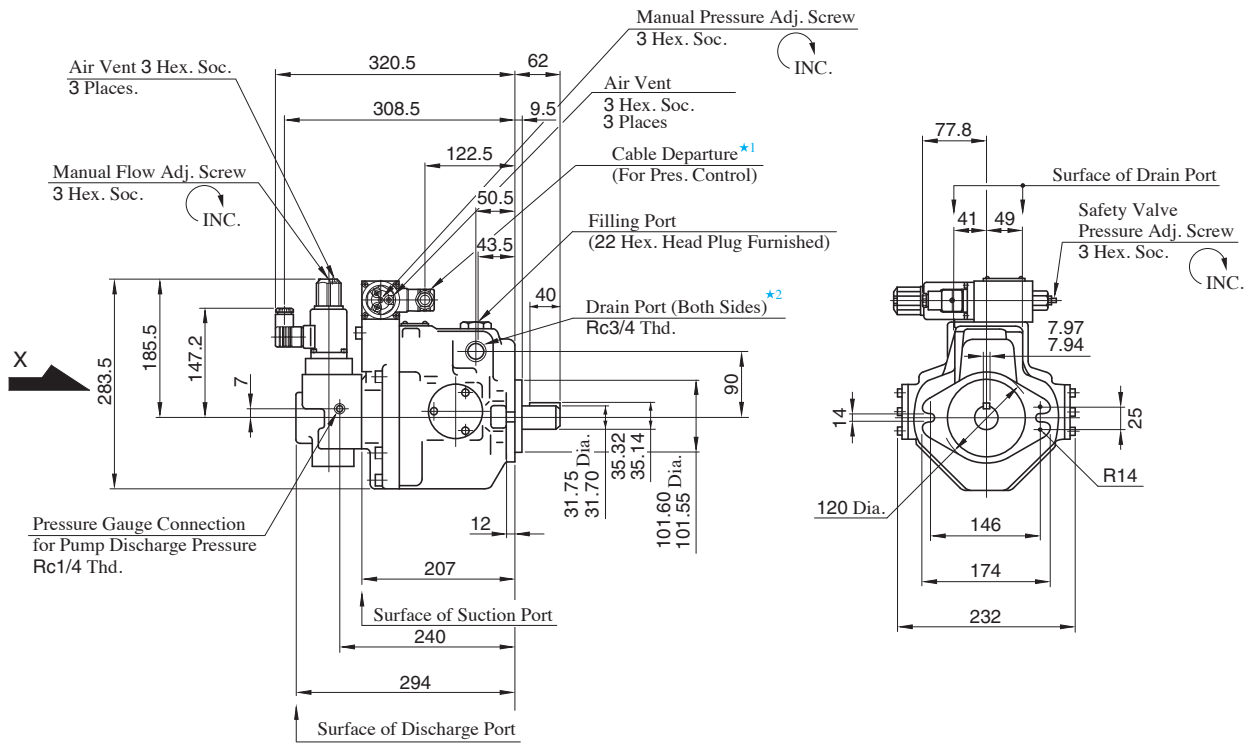
DIMENSIONS IN MILLIMETRES

Foot Mtg. : A37-L-R-04 *-K



● For other dimensions, refer to "Flange Mtg.".

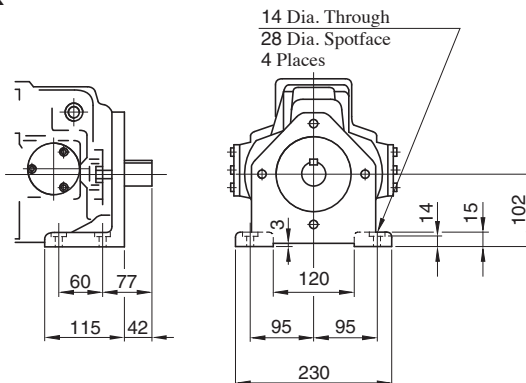
Flange Mtg. : A56-F-R-04 *-K



- ★1. Cable Applicable:
Outside Dia.....8-10 mm
Conductor Area.....Not Exceeding 1.5 mm²
- ★2. Use either port of two drain ports at your option.
Keep the remaining port plugged.

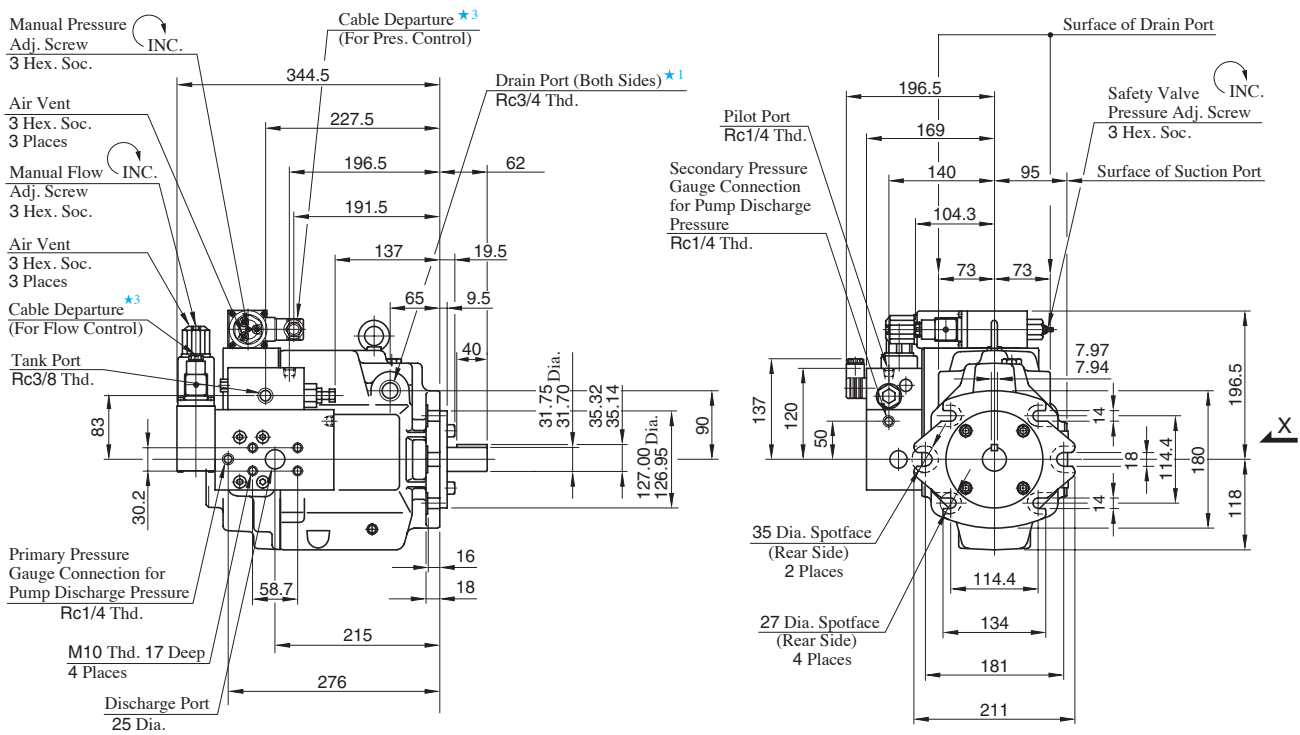
DIMENSIONS IN MILLIMETRES

Foot Mtg. : A56-L-R-04 *-K

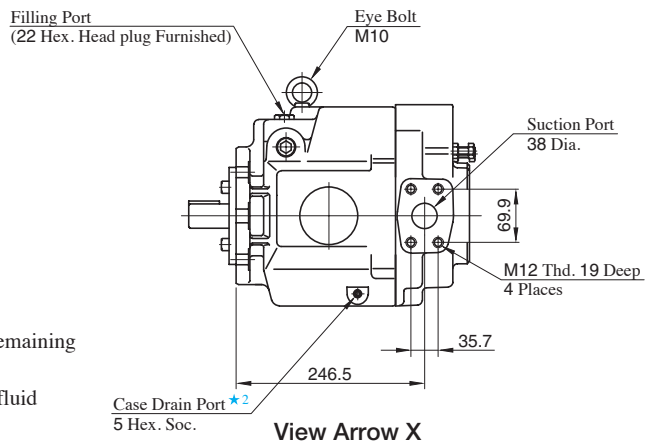


● For other dimensions, refer to "Flange Mtg.".

Flange Mtg. : A70-FR04 * S

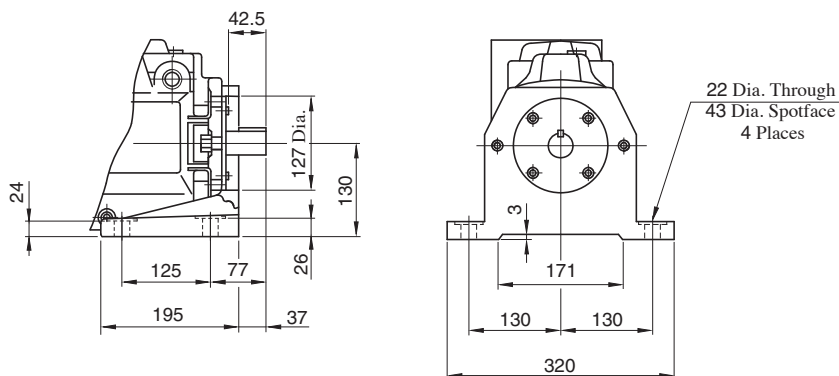


- ★1. Use either port of two drain ports at your option. Keep the remaining port plugged.
- ★2. Case drain port is available for use when draining hydraulic fluid from pump casing.
- ★3. Cable Applicable:
Outside Dia.....8-10 mm
Conductor Area.....Not Exceeding 1.5 mm²



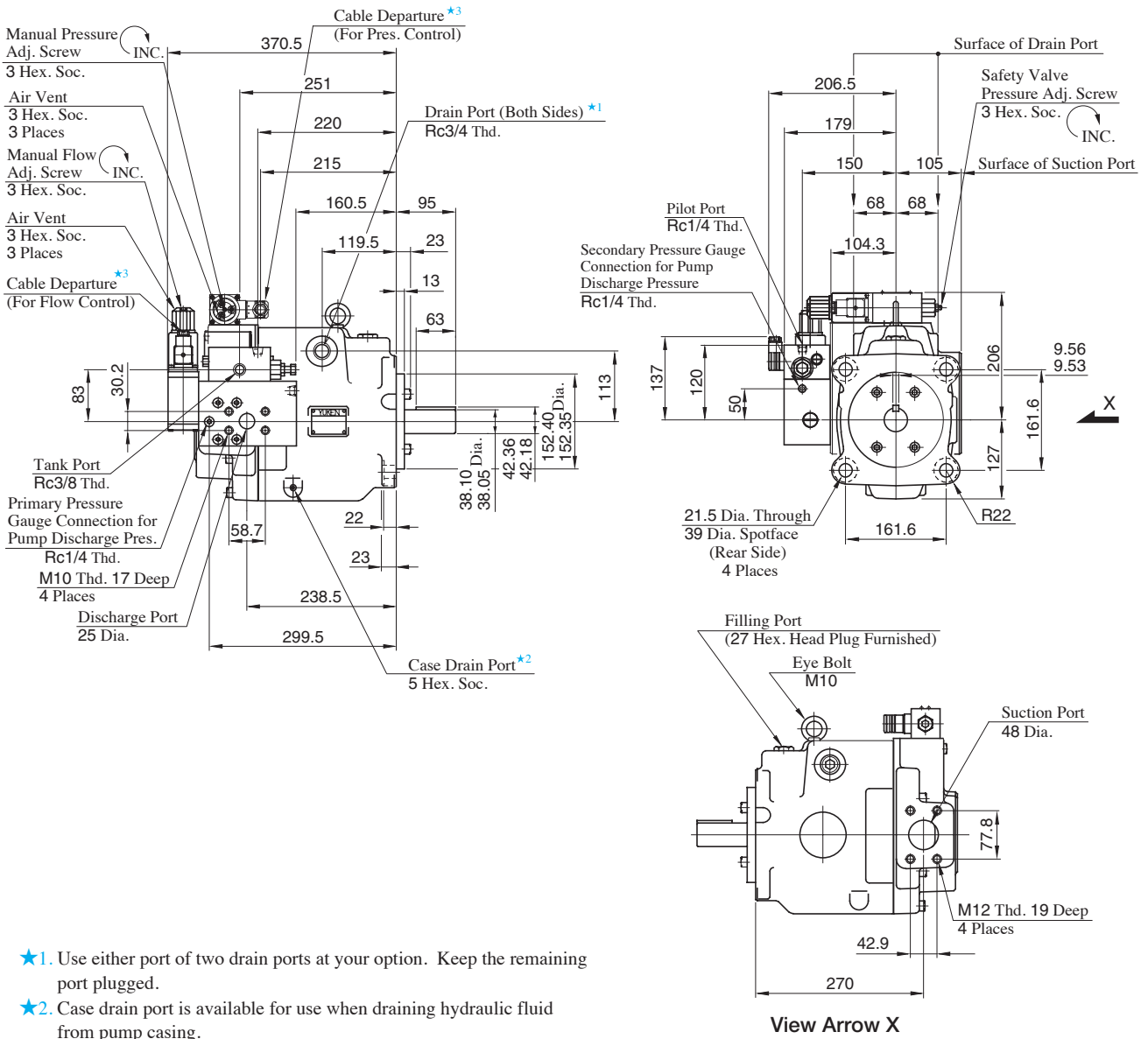
DIMENSIONS IN MILLIMETRES

Foot Mtg. : A70-LR04 * S



● For other dimensions, refer to "Flange Mtg.".

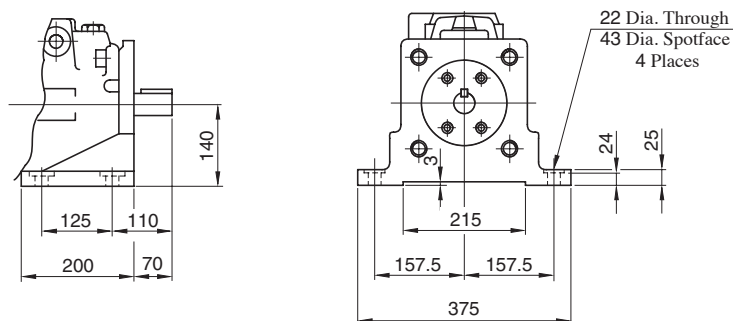
Flange Mtg. : A90-FR04 * S



- ★1. Use either port of two drain ports at your option. Keep the remaining port plugged.
- ★2. Case drain port is available for use when draining hydraulic fluid from pump casing.
- ★3. Cable Applicable:
 Outside Dia.....8-10 mm
 Conductor Area.....Not Exceeding 1.5 mm²

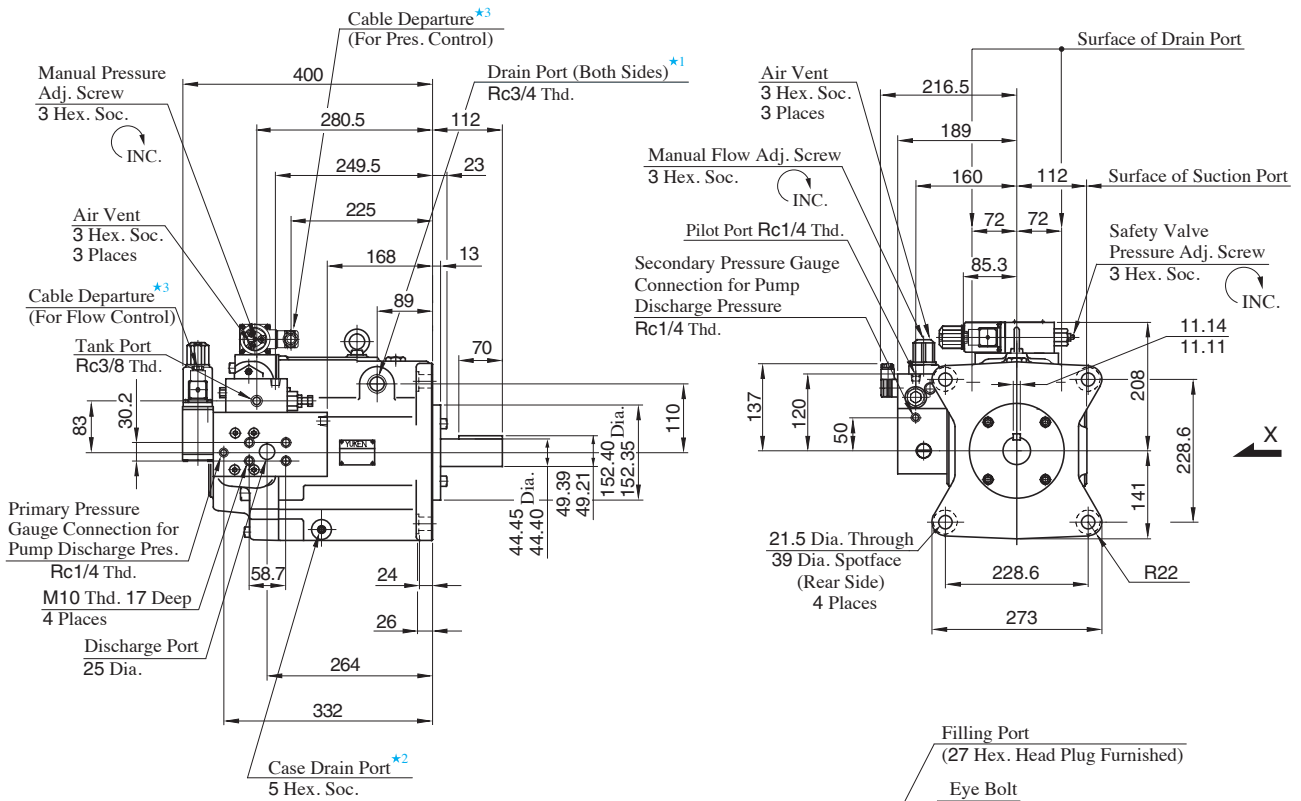
DIMENSIONS IN MILLIMETRES

Foot Mtg. : A90-LR04 * S



● For other dimensions, refer to "Flange Mtg."

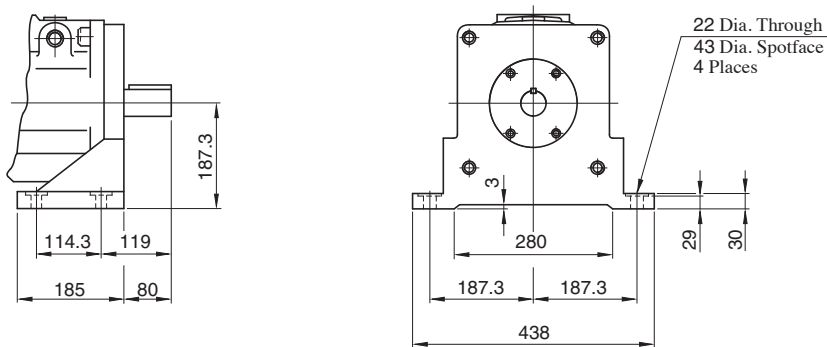
Flange Mtg. : A145-FR04 * S



- ★1. Use either port of two drain ports at your option. Keep the remaining port plugged.
- ★2. Case drain port is available for use when draining hydraulic fluid from pump casing.
- ★3. Cable Applicable:
Outside Dia.....8-10 mm
Conductor Area.....Not Exceeding 1.5 mm²

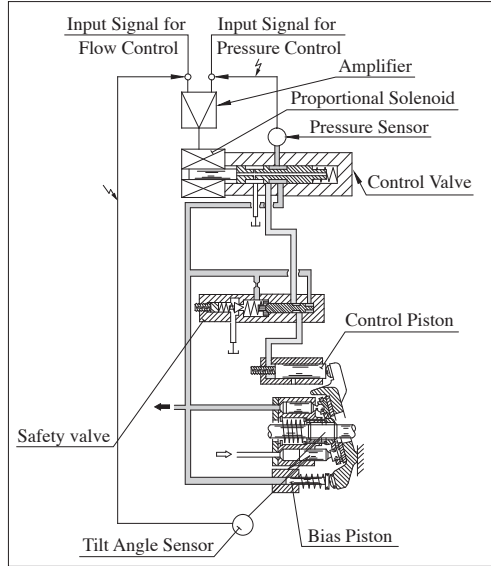
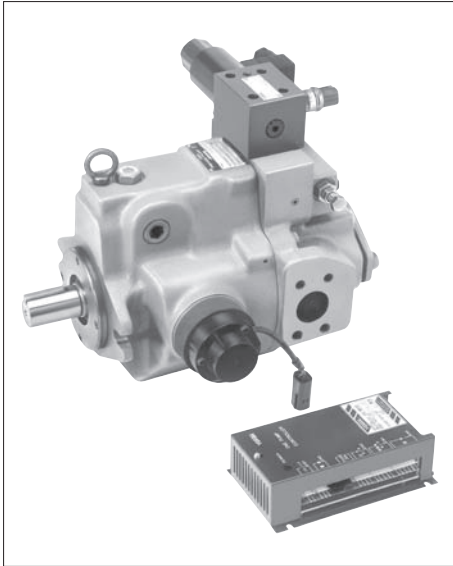
DIMENSIONS IN MILLIMETRES

Foot Mtg. : A145-LR04 * S

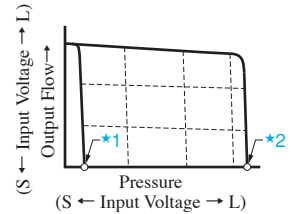


● For other dimensions, refer to "Flange Mtg.".

A Series Variable Displacement Piston Pumps, Electro-Hydraulic Proportional Pressure & Flow Control Type

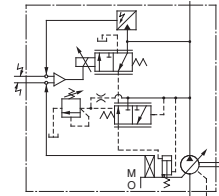


Performance Characteristics

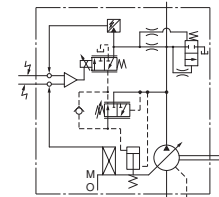


- ★1. Unloading pressure when input signal is 0 V.
- ★2. Safety valve setting pressure

Graphic Symbols



A16/A22/A37/A45/A56



A70/A90/A100/A145

Model Number Designation

Series Number	Mounting	Direction of Rotation	Control Type	Control Pressure at Input Signal is 5 V	Type of Outboard Pump	Port Position	Compensation Number ^{★3}	Design Number
A45 (45.0 cm ³ /rev)	L: Foot Mtg. F: Flange Mtg.	R: Clockwise ^{★1} (Normal)	04E: Proportional Pressure & Flow Control Type	Use the same measure of the control pressure as shown on the right, 6.9 MPa specify within the range of maximum operating pressure	None ^{★2}	None : Axial Port S : Side Port	60	10
A16 (15.8 cm ³ /rev)						—	06	42
A22 (22.2 cm ³ /rev)						—	11	42
A37 (36.9 cm ³ /rev)						—	60	42
A56 (56.2 cm ³ /rev)						—	60	42
A70 (70.0 cm ³ /rev)						—	60	60
A90 (91.0 cm ³ /rev)						—	60	60
A100 (100 cm ³ /rev)						—	60	10
A145 (145 cm ³ /rev)						—	60	60

- ★1. Available to supply pump with anti-clockwise rotation. Consult Yuken for details.
- ★2. These pumps, except A16/A22/A45 types, can be connected to outboard pumps.
 - A37/A56 type (outboard pump connection symbol: **None**): spigot diameter: 82.55 mm (A16, A22, and PV2R1).
 - A70/A90/A100/A145 type (outboard pump connection symbol: **"A"**): spigot diameter: 82.55 mm (A16, A22, and PV2R1).
 - A70/A90/A100/A145 type (outboard pump connection symbol: **"B"**): spigot diameter: 101.6 mm (A37 and PV2R2).
- ★3. Amplifier Compensation Number may differ according to the main machine conditions. Consult Yuken for detail.

Specifications

Descriptions		Model Numbers									
		A16	A22	A37	A45	A56	A70	A90	A100	A145	
Geometric Displacement		cm ³ /rev	15.8	22.2	36.9	45.0	56.2	70.0	91.0	100	145
Operating Pressure	MPa	Rated ^{*2}	16	16	16	16	16	25	25	21	25
		Intermittent ^{*1}	21	16	21	17.2	21	28	28	21	28
Shaft Speed Range		r/min	600 - 1800								
Flow Control	Max. Flow ^{*3}	L/min									
		50 Hz Pin	28.4	40.0	66.4	81.0	101	126	163	180	261
	60 Hz Pin	23.7	33.3	55.4	67.0	84.3	105	136	150	217	
	Min. Pres. Required for Flow Adj. MPa		2								
	Hysteresis		1 % or less								
	Repeatability		1 % or less								
Input Signal		Max. Flow / 5 V DC									
Pressure Control	Min. Adjustment Pressure MPa		0.7								
	Hysteresis		1 % or less								
	Repeatability		1 % or less								
	Input Signal		Specified Control Pressure / 5 V DC								
Coil Resistance		Ω (@20°C)	10								
Input Impedance		Flow Control : 10 kΩ Pressure Control : 10 kΩ									
Supply Electric Power		24 V DC (21 - 28 V Included Ripple)									
Power Input (Max.)		W	30								
Output Signal	Flow		5 V DC / Max. Flow (50 Hz Pin)								
	Pressure		5 V DC / Specified Control Pressure								
Alarm Signal Output (Open Collector)		Voltage : Max. 30 V DC Current : Max. 40 mA									
Ambient Temperature		°C	0 - 50 (With Circulated Air)								
Approx. Mass	kg	Flange Mtg.	20.5	20.5	32	32	39	64	76.5	76.5	96.4
		Foot Mtg.	22.7	22.7	36.3	36.3	43.3	76	97	97	121.4

- ★1. Whenever setting pressure, make sure the full cut-off pressure never exceeds the maximum intermittent pressure.
- ★2. When operating the pump exceeding the rated pressure, operating conditions are restricted.
Refer to page 31 for the details.
- ★3. Maximum flow differs to shaft speed.
The value listed above indicates shaft speed of 1800 r/min.
For other shaft speed calculate by the ratio of shaft speed.

Pipe Flange Kits

Pipe flange kits are available. When ordering, specify the kit number from the table below.

Pump Model Numbers	Name of Port	Pipe Flange Kit Numbers		
		Threaded Connection	Socket Welding [★]	Butt Welding
A 16- *R04E A 22- *R04E	Suction	F5-06-A-10	F5-06-B-10	F5-06-C-10
	Discharge	F5-06-A-10	F5-06-B-10	F5-06-C-10
A 37- *R04E A 45- *R04E A 56- *R04E	Suction	F5-10-A-10	F5-10-B-10	F5-10-C-10
	Discharge	F5-10-A-10	F5-10-B-10	F5-10-C-10
A 70- *R04E	Suction	F5-12-A-10	F5-12-B-10	F5-12-C-10
	Discharge	F5-08-A-10	F5-08-B-10	F5-08-C-10
A 90- *R04E A100- *R04E A145- *R04E	Suction	F5-16-A-10	F5-16-B-10	F5-16-C-10
	Discharge	F5-10-A-10	F5-10-B-10	F5-10-C-10

- ★ In case of using socket welding flanges, there is a case where the operating pressure should be set lower than the normal because of strength of the flanges. Therefore, please pay cautious attention to the operating pressure when the socket welding flanges are used.
- Details of the pipe flange kits are shown on page 262.

Outboard Pumps

A37 to A145 type pumps, except A16/A22/A45, can be used as double pumps, by connecting an outboard pump on the cover side. See the table below for details.

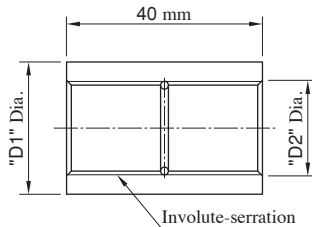
Connectable Outboard Pump

Outboard Pump Connection Symbol		Spigot Diameter for Connecting an Outboard Pump mm	Connectable Pump*
A37/A56	None	82.55	A16, A22, PV2R1
A70/A90/ A100/A145	"A"		
		101.6	A37, PV2R2

★ Connectable pumps shafts are involute-serrated design, not the standard parallel key slot design. For details, including pump dimensions and model numbers, consult Yuken.

Coupling

Please use assembly part number when ordering coupling assemblies for shaft connections to outboard pumps.



Outboard Pump Connection Symbol	Part Number of Coupling Ass'y	Dimensions mm		Serration Size (Nominal Dia. x No. of Teeth x Mojule)
		"D ₁ "	"D ₂ "	
A37/A56	None	27	19.5	18.75x24x0.75
A70/A90/ A100/A145	"A"			
	"B"	36	26	25x24x1

Selecting an Outboard Pump Type

The maximum torque of outboard pumps is limited by shaft and coupling assembly strength. When determining the outboard pump type, the value of the displacement times the pressure for a particular pump should not exceed the value shown in the table below.

Pump Model No.	① Inboard Pump and Outboard Pump (q ₁ × P ₁) + (q ₂ × P ₂)	② Outboard Pump q ₂ × P ₂	
		Outboard pump connection symbol	
		"None"/"A"	"B"
A37	900 and less	519 and less	—
A56	1742 and less		
A70	2408 and less		935 and less
A90/A100	4348 and less		977 and less
A145	4739 and less		951 and less

- q₁, q₂ : Displacement cm³/rev
- P₁, P₂ : Pressure MPa
- For selection of the appropriate pump, both values, ① and ②, should be satisfied.

Attachment

Amplifier

Pump Model Numbers	Amplifier Model Numbers	Control Pressure MPa
A16- *R04E★-06-42	SK1106-★-16-06-10	- 14.7
	SK1106-★-16-06-1001	14.8 - 19.6
	SK1106-★-16-06-1002	19.7 - 21.0
A22- *R04E★-11-42	SK1106-★-22-11-10	- 14.7
	SK1106-★-22-11-1001	14.8 - 16.0
A37- *R04E★-60-42	SK1106-★-37-60-10	- 14.7
	SK1106-★-37-60-1001	14.8 - 19.6
	SK1106-★-37-60-1002	19.7 - 21.0
A45- *R04E★ * -60-10	SK1106-★-45-60-10	- 14.7
	SK1106-★-45-60-1001	14.8 - 17.2
A56- *R04E★-60-42	SK1106-★-56-60-10	- 14.7
	SK1106-★-56-60-1001	14.8 - 19.6
	SK1106-★-56-60-1002	19.7 - 21.0
A70- *R04E★ * -60-60	SK1106-★-70-60-10	- 14.7
	SK1106-★-70-60-1001	14.8 - 19.6
	SK1106-★-70-60-1002	19.7 - 22.6
	SK1106-★-70-60-1003	22.7 -
A90- *R04E★ * -60-60	SK1106-★-91-60-10	- 14.7
	SK1106-★-91-60-1001	14.8 - 19.6
	SK1106-★-91-60-1002	19.7 - 22.6
A100- *R04E★-60-10	SK1106-★-91-60-1003	22.7 -
	SK1106-★-100-60-10	- 14.7
	SK1106-★-100-60-1001	14.8 - 19.6
A145- *R04E★ * -60-60	SK1106-★-100-60-1002	19.7 - 21.0
	SK1106-★-145-60-10	- 14.7
	SK1106-★-145-60-1001	14.8 - 19.6
	SK1106-★-145-60-1002	19.7 - 22.6
	SK1106-★-145-60-1003	22.7 -

- Note 1. The symbol "★", shown with pump and amplifier model numbers, is the control pressure at input signal of 5 V.
 2. Cable for pump-amplifier connection is not included. See Page 81 for details on ordering cables.

Instructions

Input Signal

The pump is on unload condition when the pump is operated without input signal voltage.

Electric Source

Always turn off electric source whenever the connector for wash plate tilt angle sensor is removed.

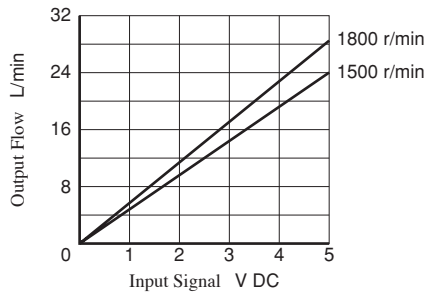
Compensation of Pump Maximum Regulated Flow at Frequency

If the same maximum flow is required at 50 Hz or 60 Hz, connect short plug in the amplifier to 60 Hz at the place where supplied frequency is 60 Hz. At this condition, maximum flow comes to the same value at 50 Hz.

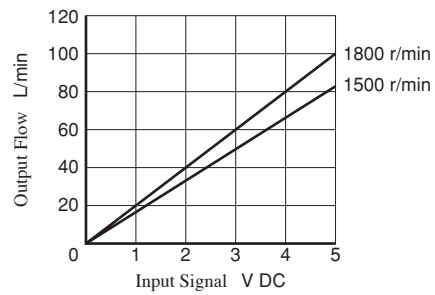
If short plug is used at 60 Hz without making the change, maximum flow increased in proportion to frequency.

Output Flow vs. Input Signal

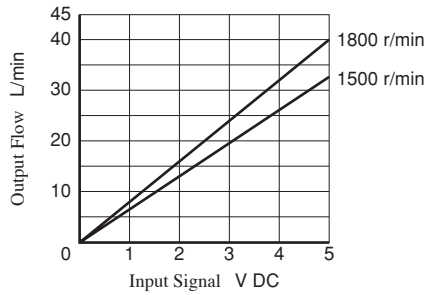
● A16



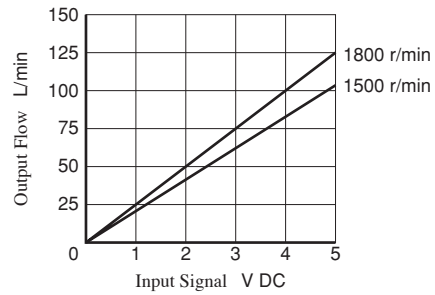
● A56



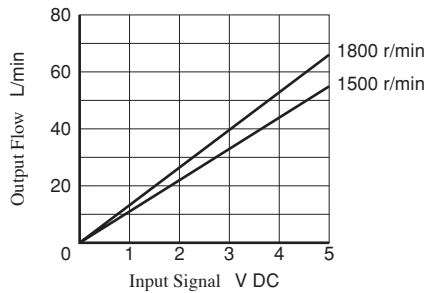
● A22



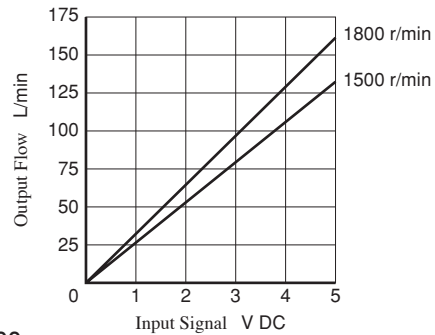
● A70



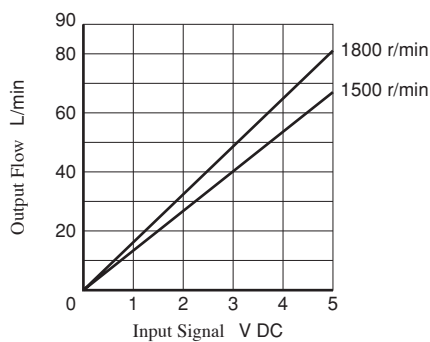
● A37



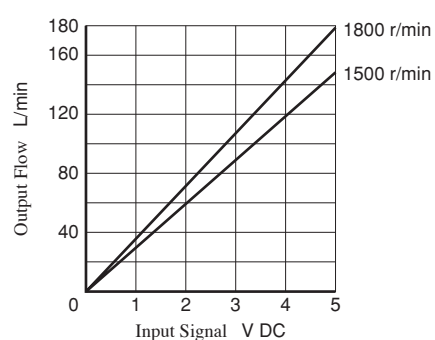
● A90



● A45

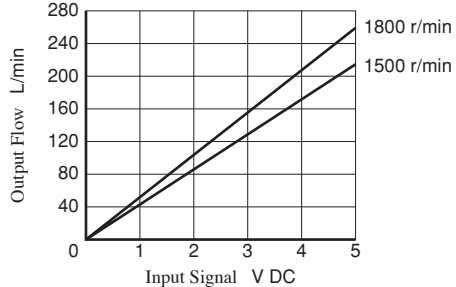


● A100

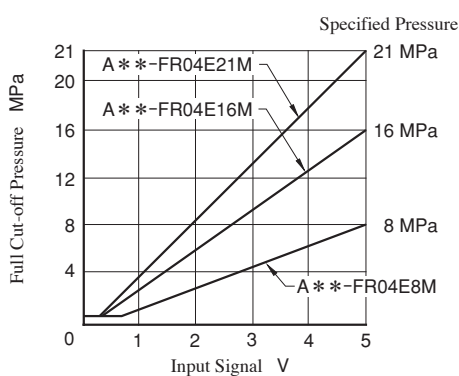


Note: Pump characteristics at 1800 r/min is the same as those at 1500 r/min where frequency is compensated. (Refer to page 74.)

● A145



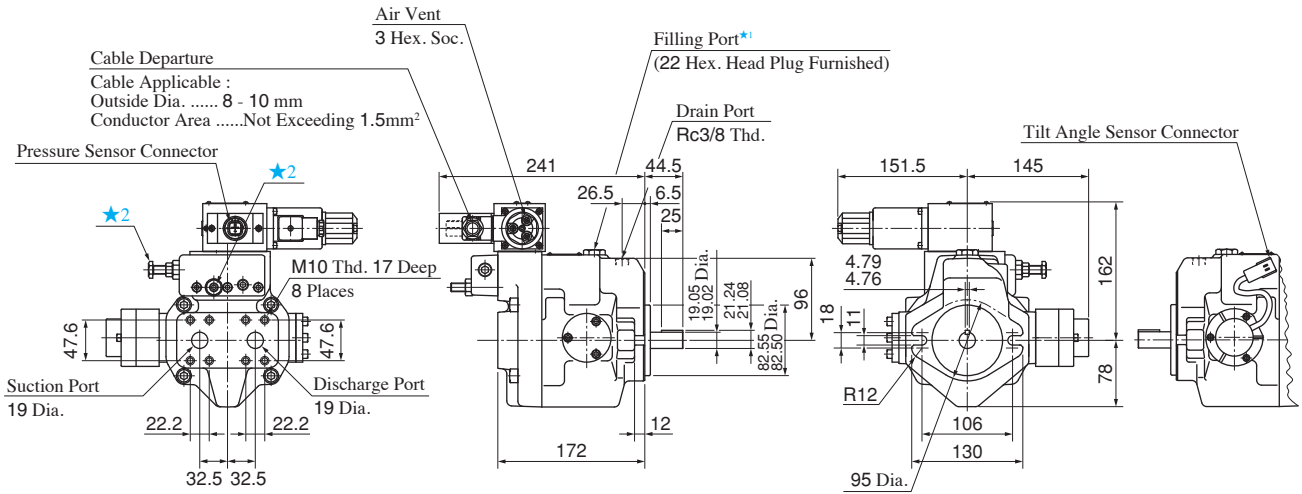
Full Cut-off Pres. vs. Input Signal



Refer to page 35 to 42 for performance characteristics of pressure compensator type excluding characteristics appeared on this catalogue. As for A45, contact us for details.

**Flange Mtg. : A16-FR04E *
A22-FR04E ***

**DIMENSIONS IN
MILLIMETRES**



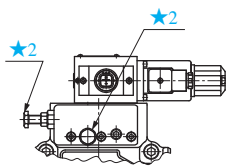
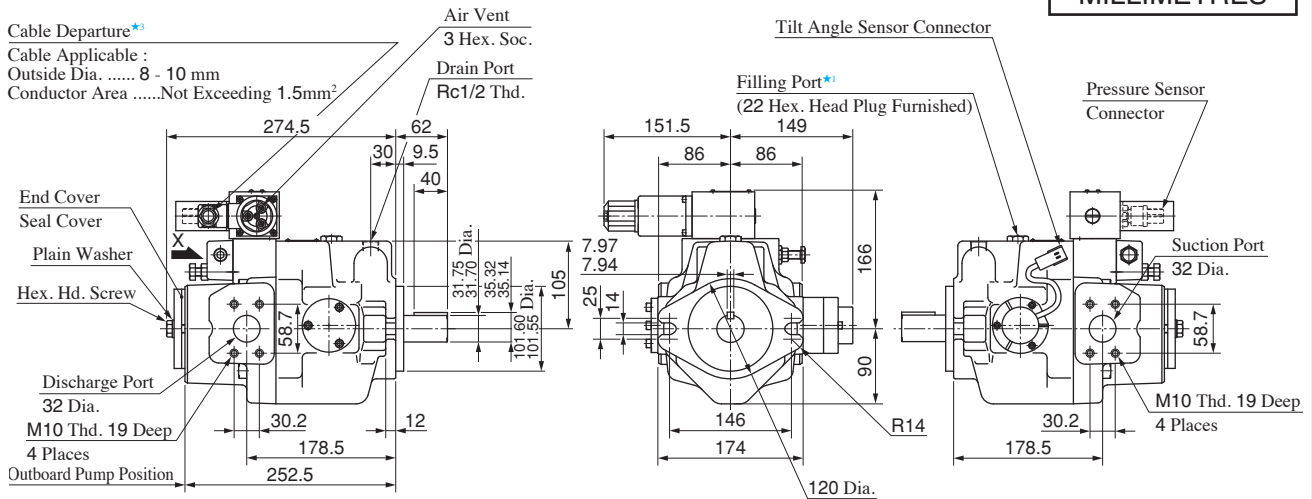
- ★1. Install the pump so that the “Filling Port” is at the top.
- ★2. Do not touch the screw because it is adjusted at the time of shipment.
- ★3. For cable connection with amplifiers, see page 81.

● **Foot Mounting Type**

Mounting bracket is common to that of pressure compensator model.
Refer to page 44 for the dimensions of mounting bracket.

Flange Mtg. : A37-FR04E *

**DIMENSIONS IN
MILLIMETRES**



View Arrow X

- ★1. Install the pump so that the “Filling Port” is at the top.
- ★2. Do not touch the screw because it is adjusted at the time of shipment.
- ★3. For cable connection with amplifiers, see page 81.

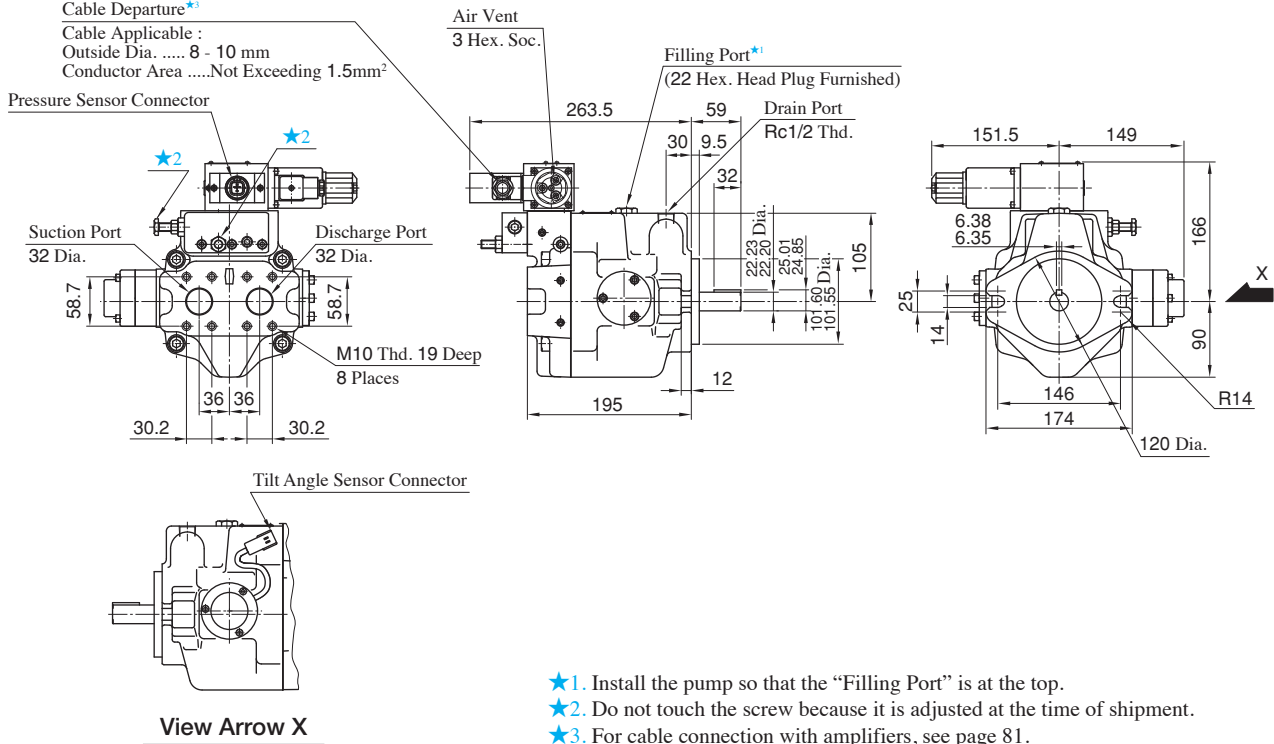
● **Foot Mounting Type**

Mounting bracket is common to that of pressure compensator model.
Refer to page 45 for the dimensions of mounting bracket.

Axial Port Type

Flange Mtg. : A45-FR04E *

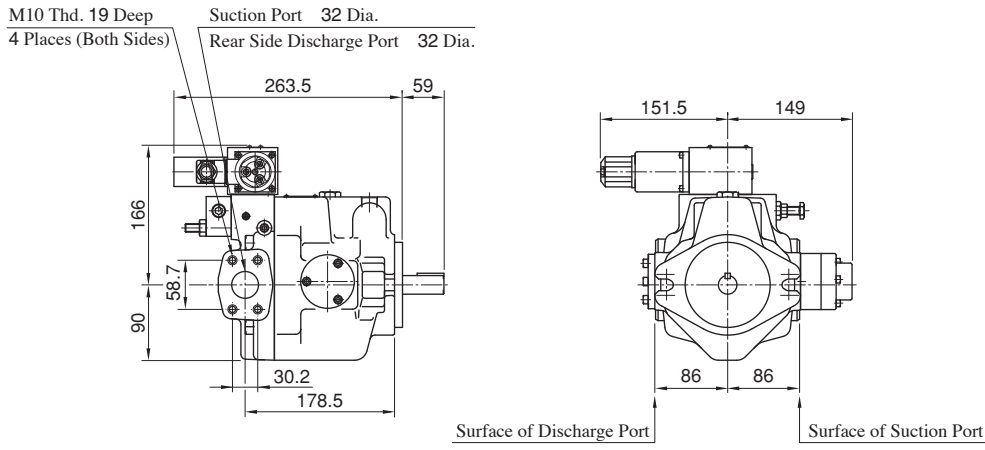
Cable Departure*³
 Cable Applicable :
 Outside Dia. 8 - 10 mm
 Conductor AreaNot Exceeding 1.5mm²



DIMENSIONS IN MILLIMETRES

Side Port Type

Flange Mtg. : A45-FR04E * S

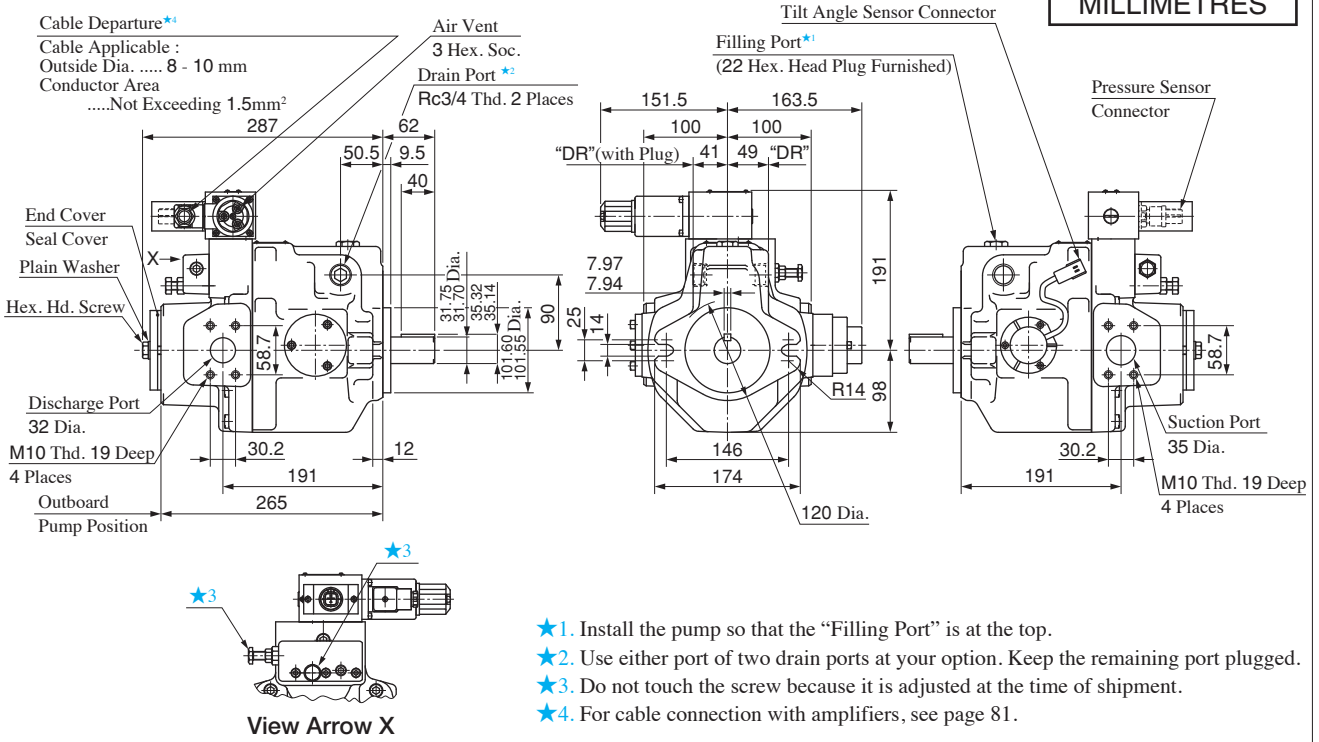


● For other dimensions, refer to "Axial Port Type".

- **Foot Mounting Type**
 Mounting bracket is common to that of pressure compensator model.
 Refer to page 46 for the dimensions of mounting bracket.

Flange Mtg. : A56-FR04E *

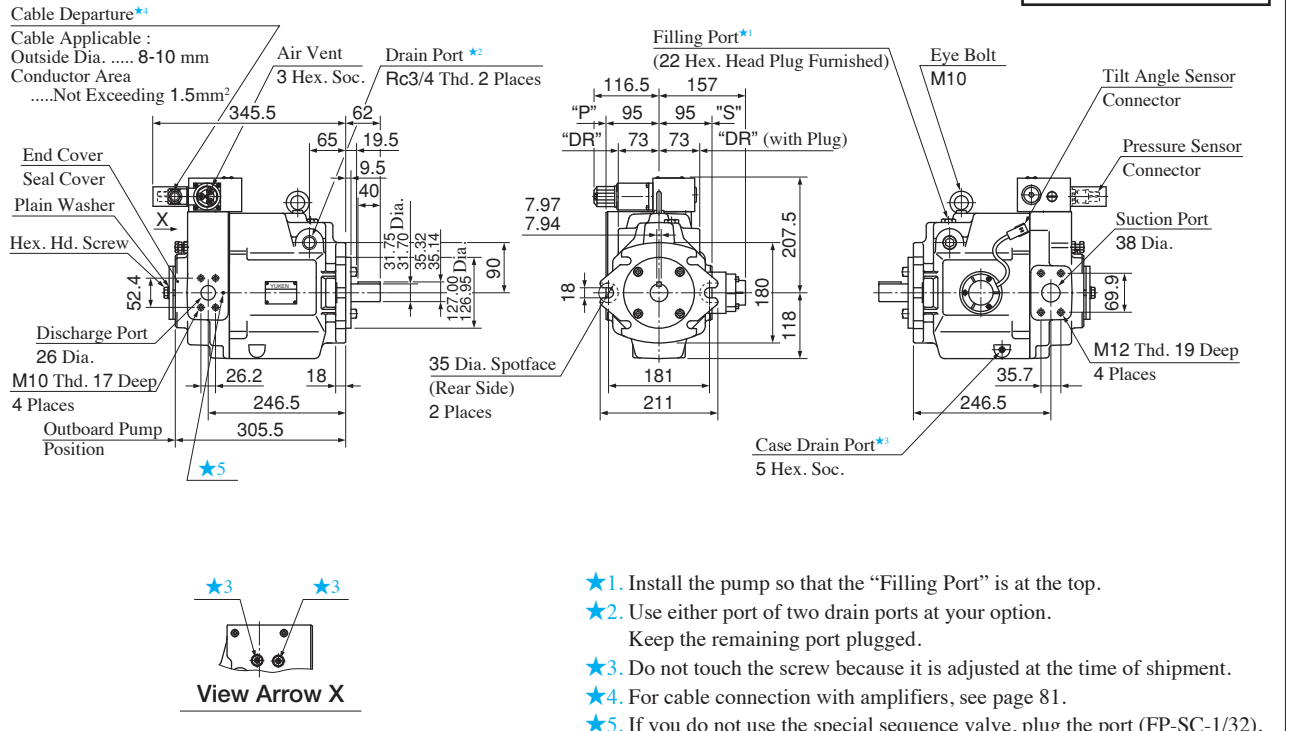
DIMENSIONS IN MILLIMETRES



● **Foot Mounting Type**
Mounting bracket is common to that of pressure compensator model.
Refer to page 46 for the dimensions of mounting bracket.

Flange Mtg. : A70-FR04E *

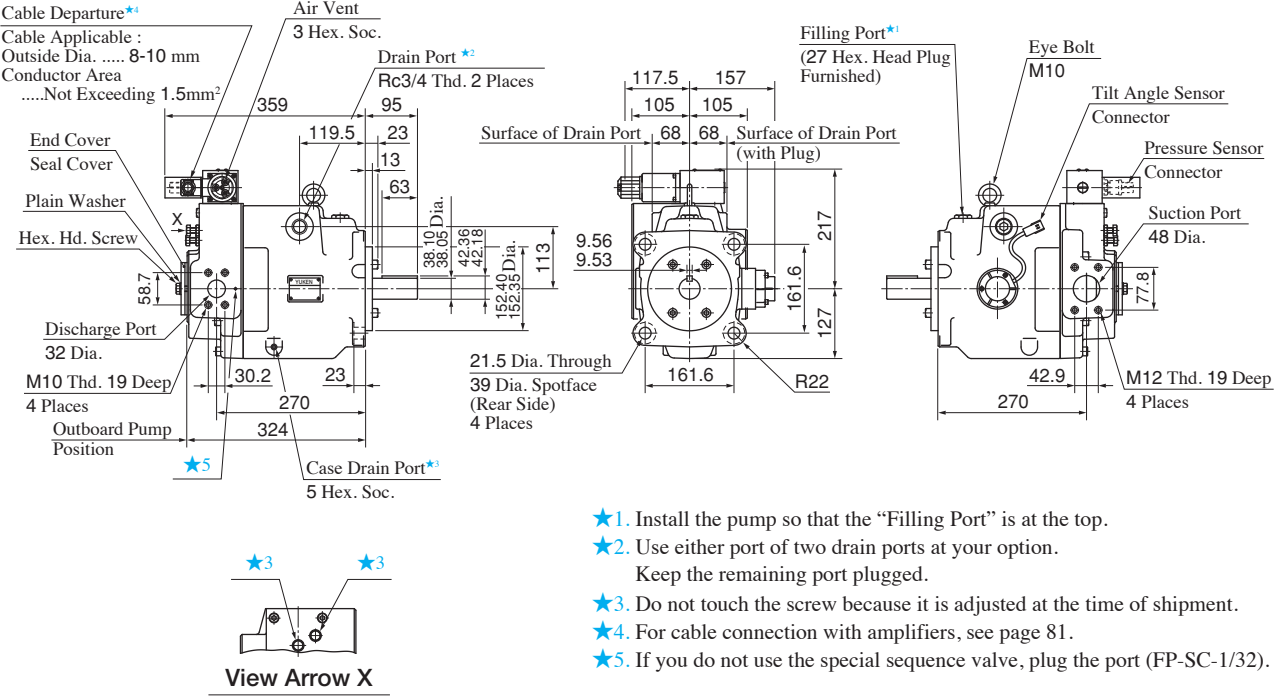
DIMENSIONS IN MILLIMETRES



● **Foot Mounting Type**
Mounting bracket is common to that of pressure compensator model.
Refer to page 47 for the dimensions of mounting bracket.

Flange Mtg. : A90-FR04E **
A100-FR04E **

DIMENSIONS IN MILLIMETRES

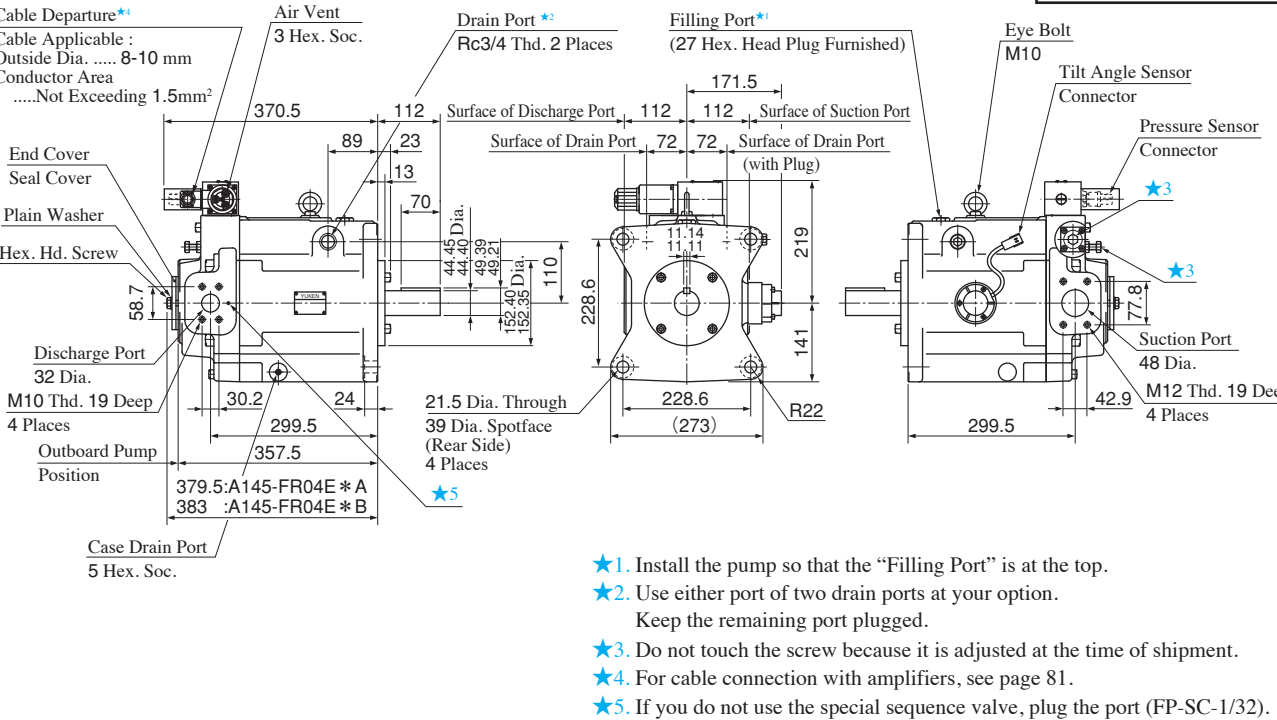


● Foot Mounting Type

Mounting bracket is common to that of pressure compensator model.
Refer to page 48 for the dimensions of mounting bracket.

Flange Mtg. : A145-FR04E **

DIMENSIONS IN MILLIMETRES



● Foot Mounting Type

Mounting bracket is common to that of pressure compensator model.
Refer to page 49 for the dimensions of mounting bracket.

■ Amplifiers for Electro-Hydraulic Proportional Pressure & Flow Control Type Pumps

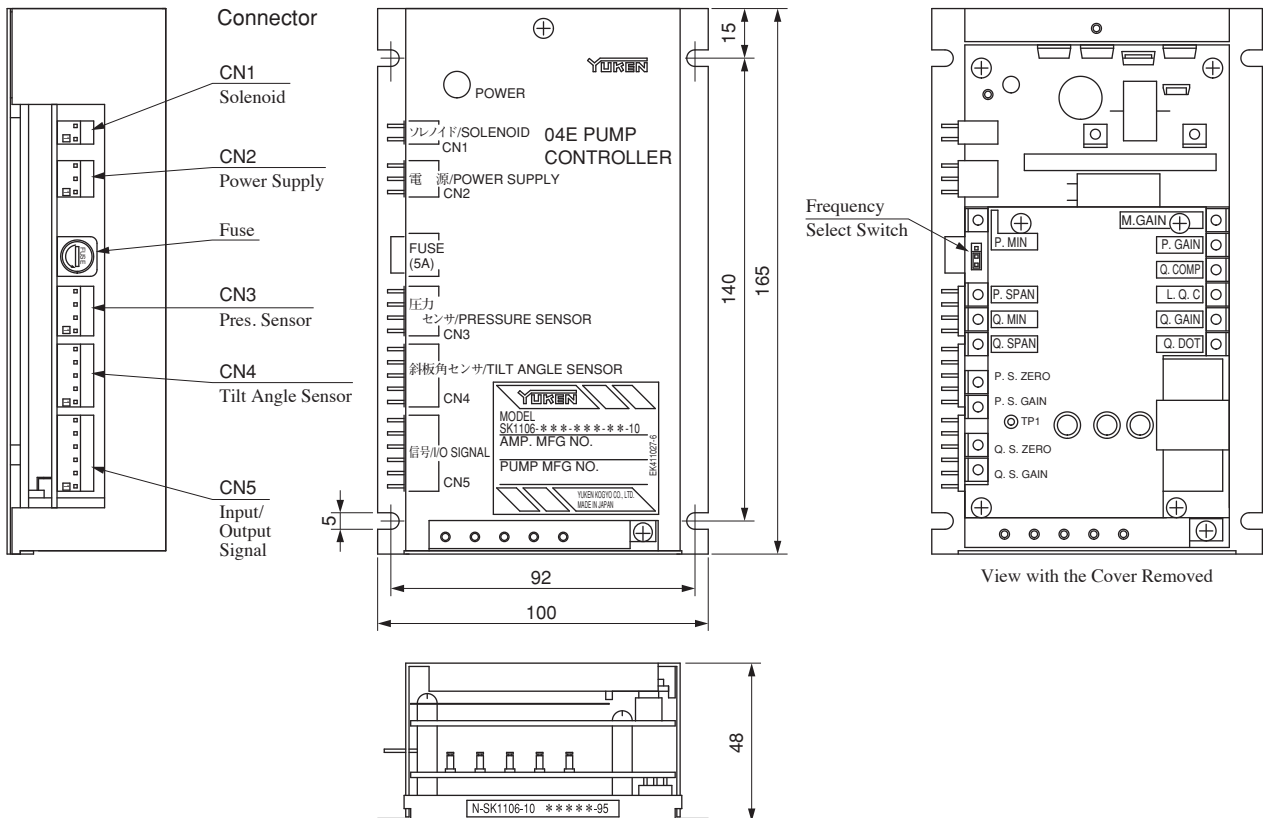
SK1106-★--10****

● Specifications

Model No.	SK1106-★-**-10**
Description	
Applicable Coil Resistance	10 Ω (20°C)
Input Impedance	10 kΩ (PIN, QIN)
Power Supply	24 V DC (21 - 28 V Included Ripple)
Power Input (Max.)	30 W
Input Signal	Max. Flow / 5 V (QIN) Specified Pres. / 5 V (PIN)
Output Signal for Sensor Monitor	5 V / Max. Flow (SMQ) 5 V / Specified Pres. (SMP)
Ambient Temperature	0 - 50 °C
Approx. Mass	450 g

● Detail of Connector

Connector	Name of Signal	
CN1 Solenoid	1	Output to pilot valve solenoid
	2	
CN2 Power Supply	1	0 [V] (0 V)
	2	+24 [V] (24 V)
	3	0 [V]
CN3 Pres. Sensor	1	+5 [V]
	2	0 [V]
	3	Input Signal - Sensor
	4	0 [V]
CN4 Tilt Angle Sensor	1	+8 [V]
	2	0 [V]
	3	Input Signal - Sensor
	4	0 [V]
	5	—
CN5 Input/Output Signal	1	Input Signal - Flow (Qin)
	2	Input Signal - Common (COM)
	3	Input Signal - Pres. (Pin)
	4	Output Signal - Sensor Monitor P (SMP)
	5	Output Signal - Sensor Monitor Q (SMQ)
	6	0 [V]

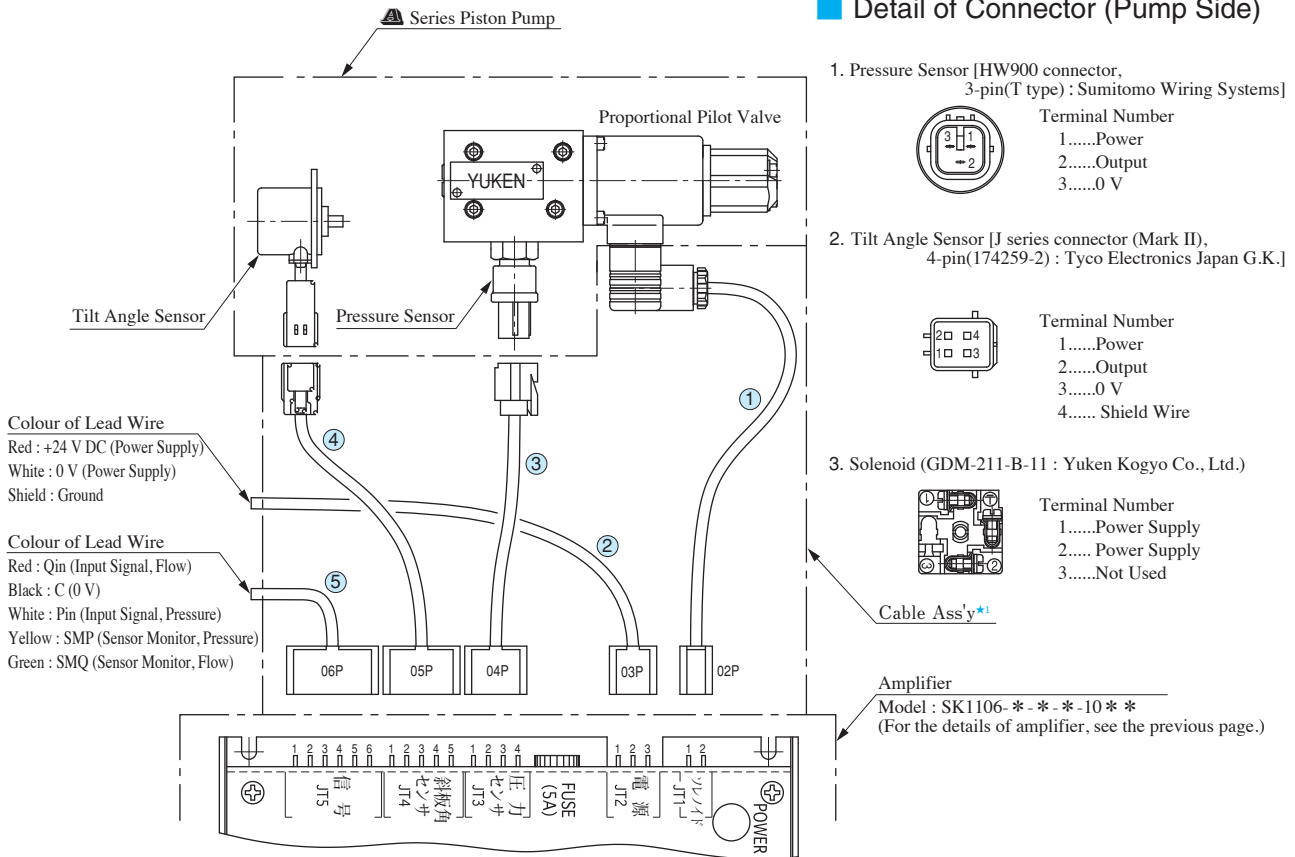


■ Cable Connection Between Pump and Amplifier

The cable connections between the proportional pilot valve and the sensor of the pump and the attached amplifier (SK1106) are shown below.

The cable assemblies are not included in the pump assembly. Purchase separately with model number described in the below table if required.

■ Detail of Connector (Pump Side)



■ Connector for Cable Ass'y

● Amplifier Side

Housing : 5195 - 0 * P (MOLEX)
 Terminal : 5194 (MOLEX)
 Cable
 Core Size : AWG #18 - #24
 Covered Dia. : 1.3 - 3.2 Dia.
 Strip Length : 3.0 - 3.5 mm

● Sensor Side

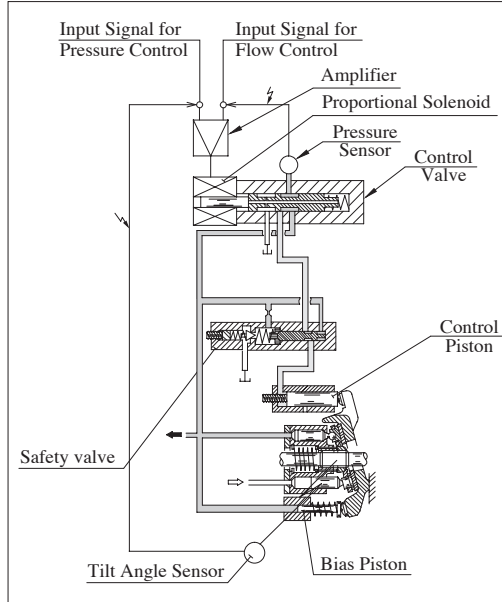
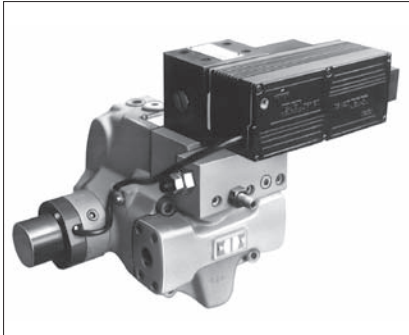
1. Pressure Sensor
 Model : HW090
 Housing : F (6189-0131)
 Retainer : F (6918-0326)
 Terminal : F (1500-0106)
 Wire seal : S (7165-0118)
 (Sumitomo Wiring System)

2. Tilt Angle Sensor
 Model : J series
 Connector(Mark II)
 4-pin(174257-2)
 (Tyco Electronics Japan G.K.)

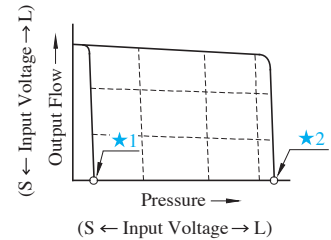
★1. Cable assemblies are available. When ordering, specify the cable ass'y model numbers from the table below.

Name of Cable Ass'y	Cable Ass'y Model Numbers					
	Approx. Length of Cable (mm)					
	2000	5000	10000	15000	20000	25000
① For Solenoid	SK1112-S-2-10	SK1112-S-5-10	SK1112-S-10-10	SK1112-S-15-10	SK1112-S-20-10	SK1112-S-25-10
② For Power Supply	SK1112-V-2-10	SK1112-V-5-10	SK1112-V-10-10	SK1112-V-15-10	SK1112-V-20-10	SK1112-V-25-10
③ For Pressure Sensor	SK1112-P-2-10	SK1112-P-5-10	SK1112-P-10-10	SK1112-P-15-10	SK1112-P-20-10	SK1112-P-25-10
④ For Tilt Angle Sensor	SK1112-Q-2-10	SK1112-Q-5-10	SK1112-Q-10-10	SK1112-Q-15-10	SK1112-Q-20-10	SK1112-Q-25-10
⑤ For Signal	SK1112-C-2-10	SK1112-C-5-10	SK1112-C-10-10	SK1112-C-15-10	SK1112-C-20-10	SK1112-C-25-10

Series Variable Displacement Piston Pumps, "OBE" Type Electro-Hydraulic Proportional Pressure & Flow Control Type

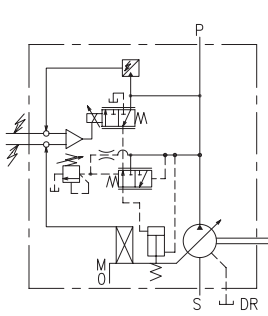


Performance Characteristics

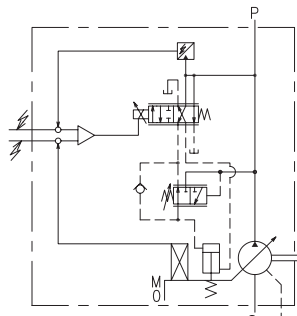


- ★1. Unloading pressure when input signal is 0 V.
- ★2. Safety valve setting pressure

Graphic Symbols



A16/A22/A37/A56



A70/A90/A145

Example of Specified Control Pressure

Control Pressure Symbol (EX.)		Control Pressure at Input Signal is 5 V	
		kgf/cm ²	MPa
70	—	70	6.9
105	—	105	10.3
140	—	140	13.7
175	—	175	17.2
210	—	210	20.6
—	7M	71.4	7
—	16M	163.2	16
—	21M	214.2	21

Model Number Designation

A70	-F	R	04EH	16M	R	S	-60	-61
Series Number	Mounting	Direction of Rotation	Control Type	Pressure Control Level	Amplifier Direction	Port Position	Compensation Number ^{★2}	Design Number
A16 (15.8 cm ³ /rev)	F: Flange Mtg.	(Viewed from Shaft End)	04EH: "OBE" Type Proportional Pressure & Flow Control Type	Control Pressure at Input Signal is 5 V (Refer to above Table)	—	None: Axial Port	06	43
A22 (22.2 cm ³ /rev)							11	43
A37 (36.9 cm ³ /rev)							01	43
A56 (56.2 cm ³ /rev)							02	43
A70 (70.0 cm ³ /rev)	L: Foot Mtg.	R: Clockwise ^{★1} (Normal)			(Viewed from Shaft End) R: Right L: Left	S: Side Port	60	61
A90 (91.0 cm ³ /rev)							60	61
A145 (145 cm ³ /rev)							60	61

★1. Available to supply pump with anti-clockwise rotation. Consult Yuken for details.
 ★2. Amplifier Compensation Number may differ according to the main machine conditions. Consult Yuken for detail.

Specifications

Descriptions		Model Numbers							
		A16	A22	A37	A56	A70	A90	A145	
Geometric Displacement		cm ³ /rev	15.8	22.2	36.9	56.2	70.0	91.0	145.0
Operating Pressure MPa (PSI)		Rated ^{★2}	16	16	16	16	25	25	25
		Intermittent ^{★1}	21	16	21	21	28	28	28
Shaft Speed Range		r/min	600 - 1800						
Flow Control	Max. Flow ^{★2}	L/min	28.4	40.0	66.4	101.2	126.0	163.0	261.0
	Min. Pres. Required for Flow Adj.	MPa	2.0						
	Hysteresis		1 % or less						
	Repeatability		1 % or less						
	Input Signal		Max. Flow / 5 V DC						
Pressure Control	Min. Adjustment Pressure	MPa	0.7						
	Hysteresis		1 % or less						
	Repeatability		1 % or less						
	Input Signal		Specified Control Pressure / 5 V DC						
Coil Resistance		Ω [@ 20°C]	10						
Input Impedance			Flow Control : 10 kΩ Pres. Control : 10 kΩ						
Supply Electric Power			24 V DC (21 - 28 V Included Ripple)						
Power Input (Max.)		W	30						
Output Signal	Flow		5 V DC / Max. Flow						
	Pressure		5 V DC / Specified Control Pressure						
Alarm Signal Output (Open Collector)			Voltage : Max. 30 V DC Current : Max. 40 mA						
Ambient Temperature		°C	0 - 50 (With Circulated Air)						
Mass	Flange Mtg.	kg	20.7	20.7	32.2	39.2	64	76.5	98
	Foot Mtg.		22.9	22.9	36.5	43.5	76	97	123

- ★1. Whenever setting pressure, make sure the full cut-off pressure never exceeds the maximum intermittent pressure.
- ★2. When operating the pump exceeding the rated pressure, operating conditions are restricted.
Refer to page 31 for the details.
- ★3. Maximum flow differs to shaft speed.
The value listed above indicates shaft speed of 1800 r/min.
For other shaft speed calculate by the ratio of shaft speed.

Pipe Flange Kits

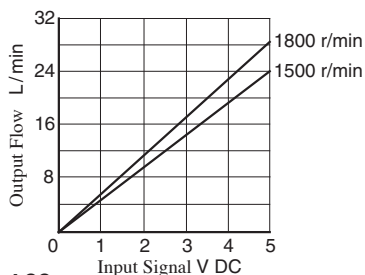
For Pipe flange, refer to form of pressure compensator type on page 32.

Instructions

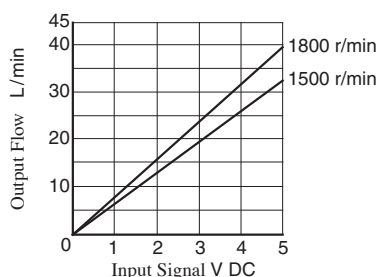
- **Input Signal**
The pump is on unload condition when the pump is operated without input signal voltage.
- **Electric Source**
Always turn off electric source whenever the connector for swash plate tilt angle sensor is removed.
- **Compensation of Pump Maximum Regulated Flow at Frequency**
If the same maximum flow is required at 50 Hz or 60 Hz, connect short plug in the amplifier to 60 Hz at the place where supplied frequency is 60 Hz. At this condition, maximum flow comes to the same value at 50 Hz.
If short plug is used at 60 Hz without making the change, maximum flow increased in proportion to frequency.
- **Painting on Amp. Box and Solenoid**
To maintain suitable radiation effect, the amp. box and the solenoid of the control valve should not be painted.

Output Flow vs. Input Signal

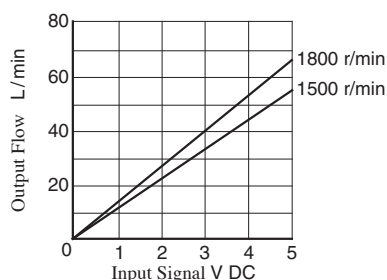
● **A16**



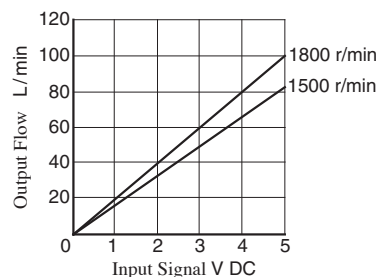
● **A22**



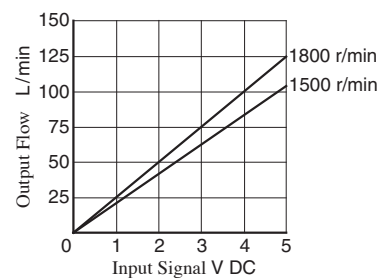
● **A37**



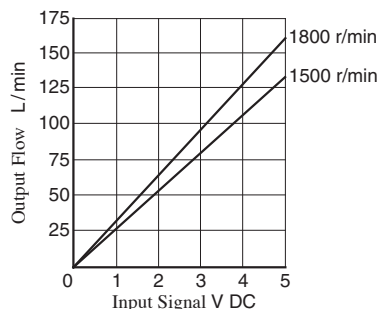
● **A56**



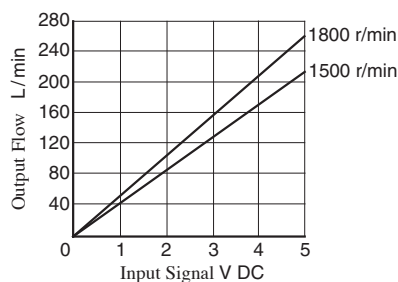
● **A70**



● **A90**

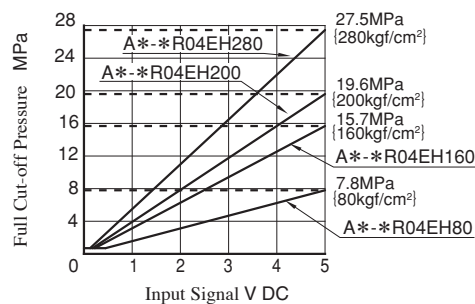
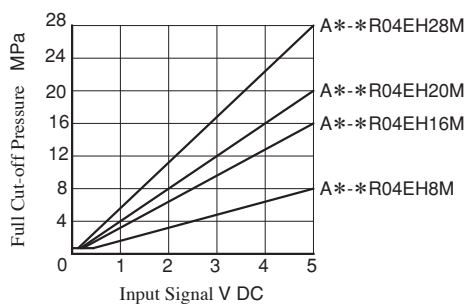


● **A145**



Note: Pump characteristics at 1800 r/min is the same as those at 1500 r/min where frequency is compensated. (Refer to page 74.)

Full Cut-off Pres. vs. Input Signal



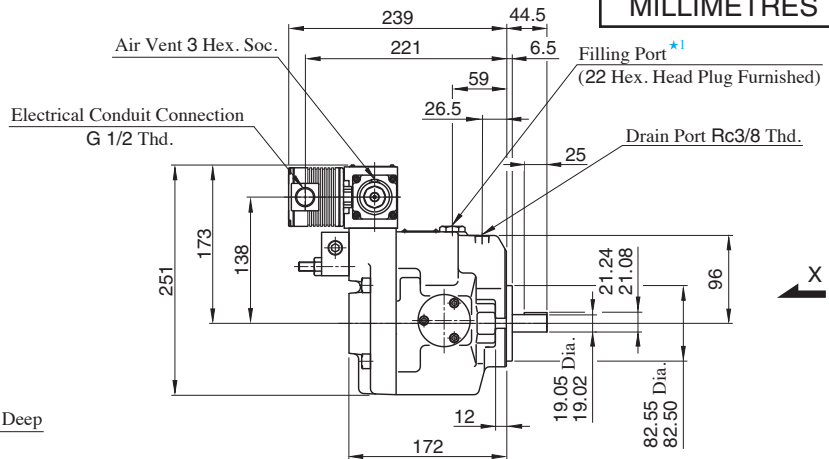
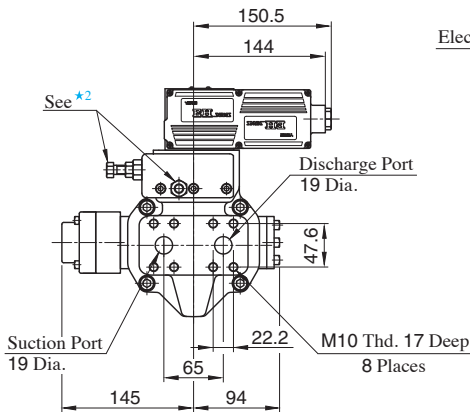
NOTE : {kgf/cm²} is reference only.

Refer to page 35 to 42 for performance characteristics of pressure compensator type excluding characteristics appeared on this catalogue.

Axial Port Type

**Flange Mtg. : A16-FR04EH *
A22-FR04EH ***

DIMENSIONS IN MILLIMETRES



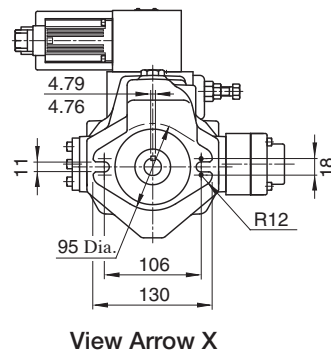
- ★1. Install the pump so that the "Filling Port" is at the top.
- ★2. Do not touch the screw because it is adjusted at the time of shipment.
- ★3. For detail of amplifier, refer to page 90.

● Side Port Type

Port mounting dimensions are the same as those of pressure compensator model. Refer to page 44 for port mounting dimensions.

● Foot Mounting Type

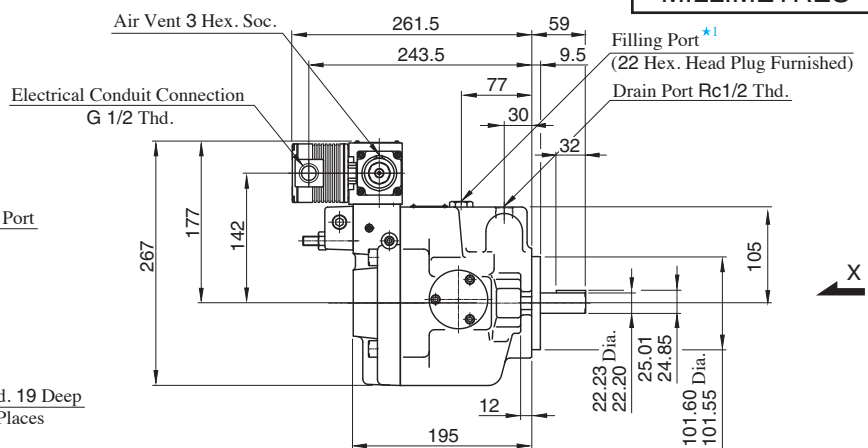
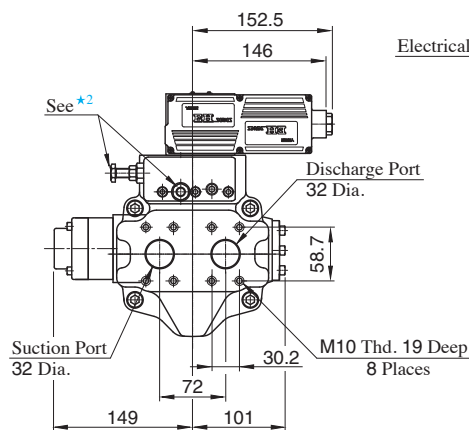
Mounting bracket is common to that of pressure compensator model. Refer to page 44 for the dimensions of mounting bracket.



Axial Port Type

Flange Mtg. : A37-FR04EH *

DIMENSIONS IN MILLIMETRES



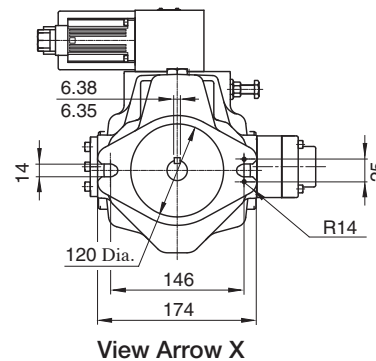
- ★1. Install the pump so that the "Filling Port" is at the top.
- ★2. Do not touch the screw because it is adjusted at the time of shipment.
- ★3. For detail of amplifier, refer to page 90.

● Side Port Type

Port mounting dimensions are the same as those of pressure compensator model. Refer to page 45 for port mounting dimensions.

● Foot Mounting Type

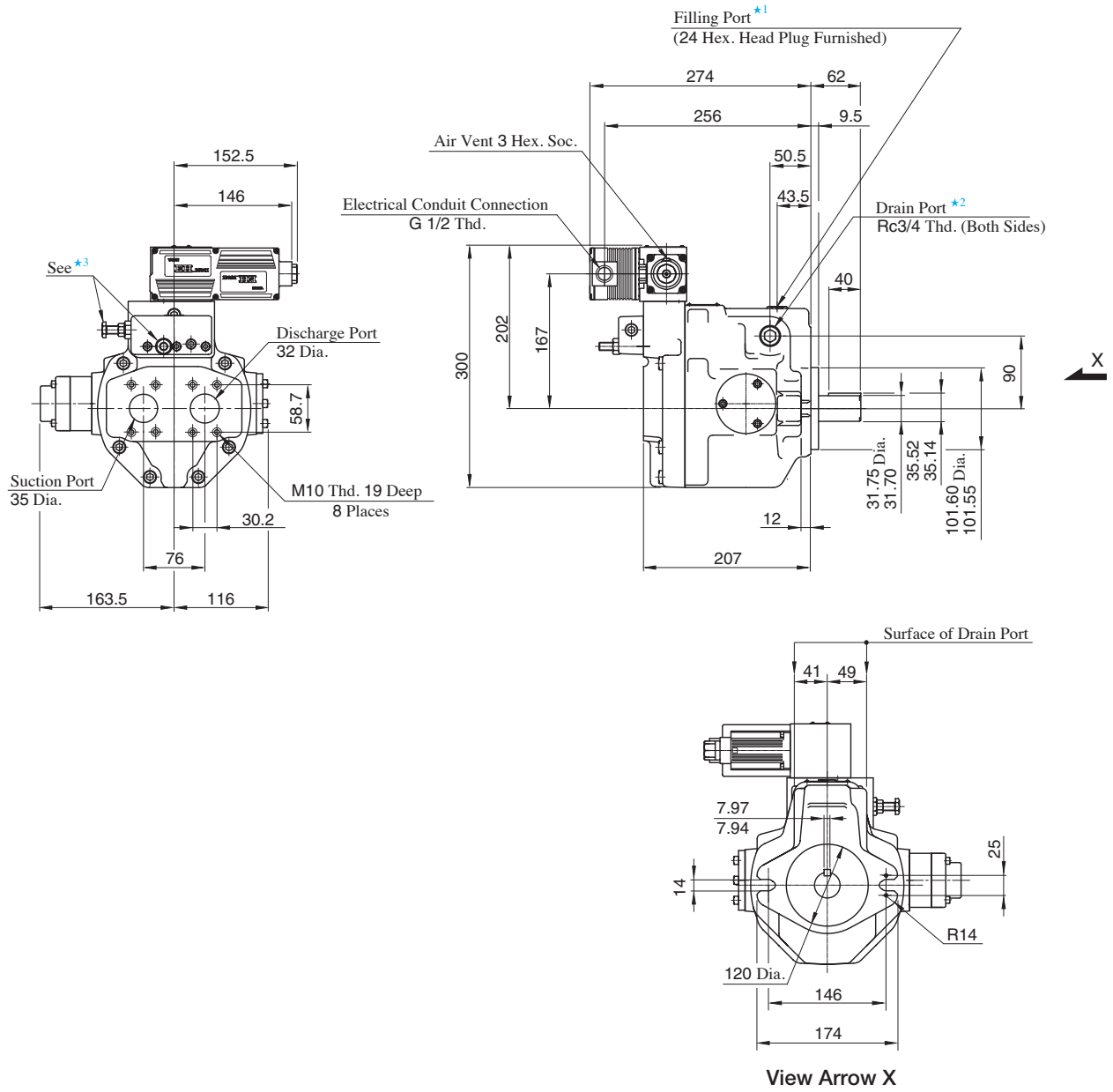
Mounting bracket is common to that of pressure compensator model. Refer to page 45 for the dimensions of mounting bracket.



Axial Port Type

Flange Mtg. : A56-FR04EH *

DIMENSIONS IN MILLIMETRES



- ★1. Install the pump so that the "Filling Port" is at the top.
- ★2. Use either port of two drain ports at your option. Keep the remaining port plugged.
- ★3. Do not touch the screw because it is adjusted at the time of shipment.
- ★4. For detail of amplifier, refer to page 90.

● **Side Port Type**

Port mounting dimensions are the same as those of pressure compensator model. Refer to page 46 for port mounting dimensions.

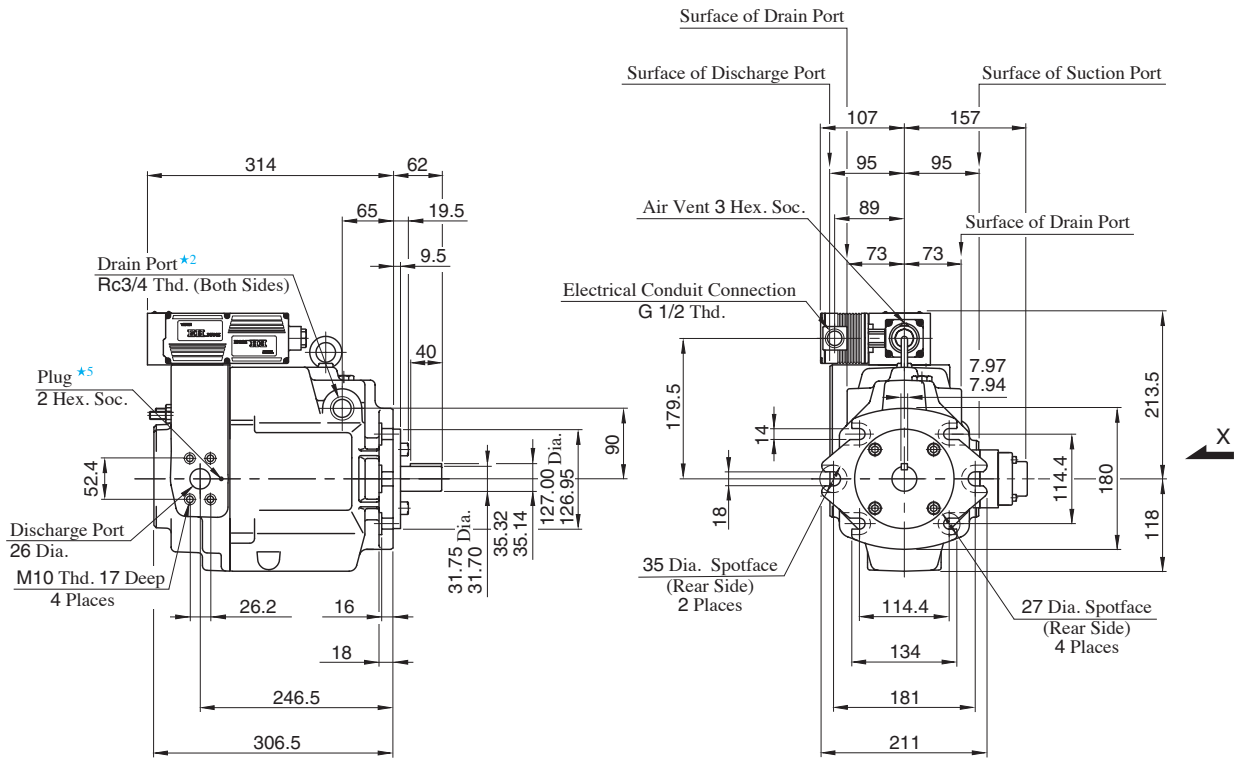
● **Foot Mounting Type**

Mounting bracket is common to that of pressure compensator model. Refer to page 46 for the dimensions of mounting bracket.

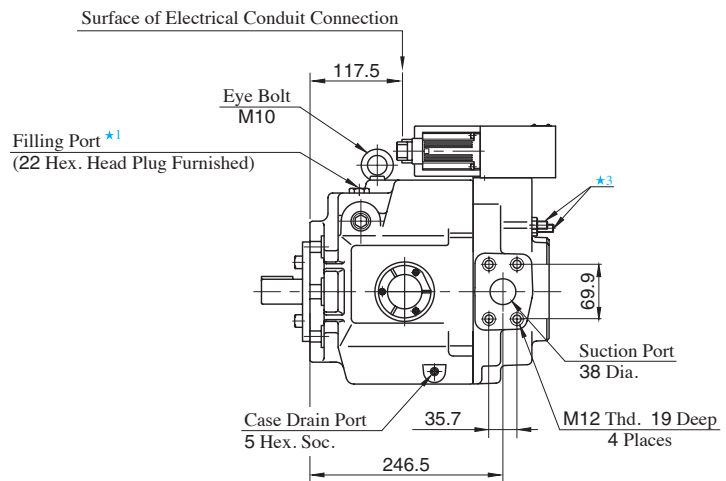
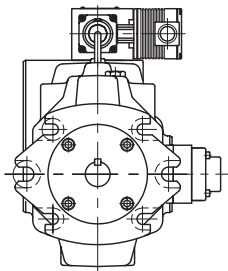
Flange Mtg.

● Amplifier Direction "L" : A70-FR04EH * LS

DIMENSIONS IN MILLIMETRES



● Amplifier Direction "R": A70-FR04EH * RS



View Arrow X

- ★1. Install the pump so that the "Filling Port" is at the top.
- ★2. Use either port of two drain ports at your option. Keep the remaining port plugged.
- ★3. Do not touch the screw because it is adjusted at the time of shipment.
- ★4. For detail of amplifier, refer to page 90.
- ★5. If you use the special sequence valve, remove the plug.

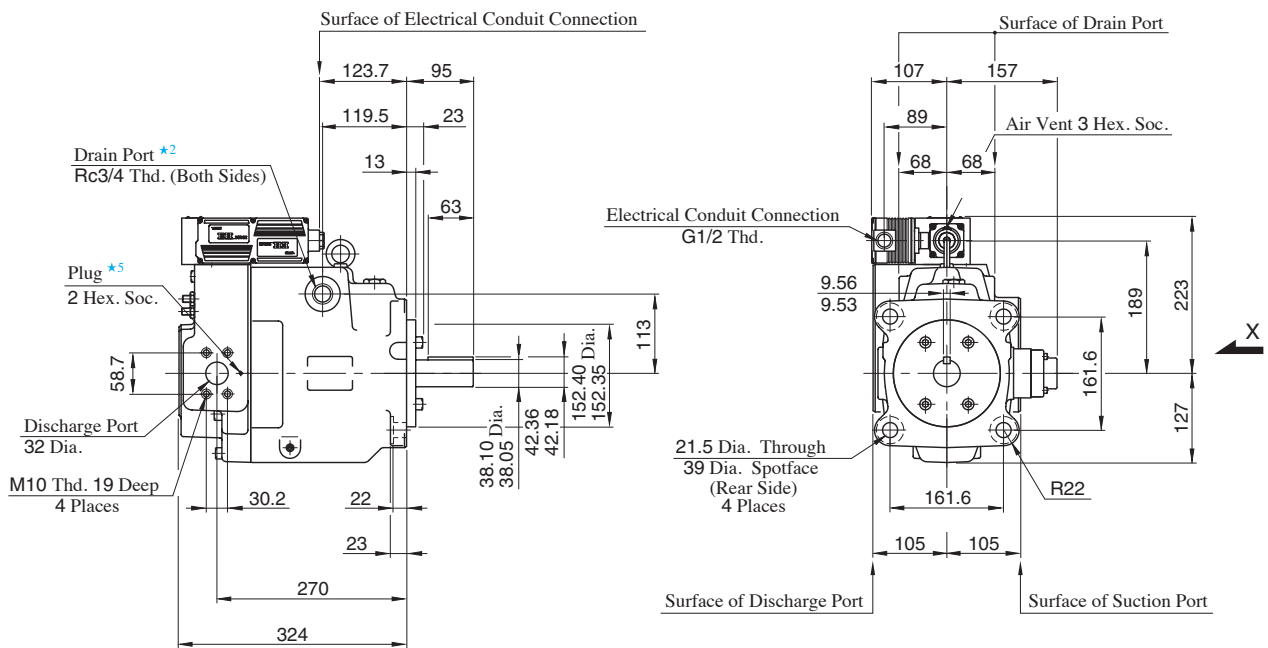
● Foot Mounting Type

Mounting bracket is common to that of pressure compensator model.
Refer to page 47 for the dimensions of mounting bracket.

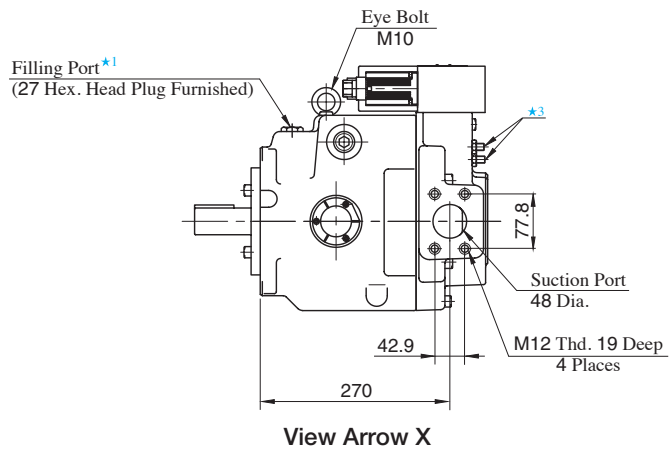
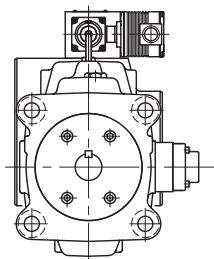
Flange Mtg.

- Amplifier Direction "L" : A90-FR04EH *LS

DIMENSIONS IN MILLIMETRES



- Amplifier Direction "R": A90-FR04EH *RS



- ★1. Install the pump so that the "Filling Port" is at the top.
- ★2. Use either port of two drain ports at your option. Keep the remaining port plugged.
- ★3. Do not touch the screw because it is adjusted at the time of shipment.
- ★4. For detail of amplifier, refer to page 90.
- ★5. If you use the special sequence valve, remove the plug.

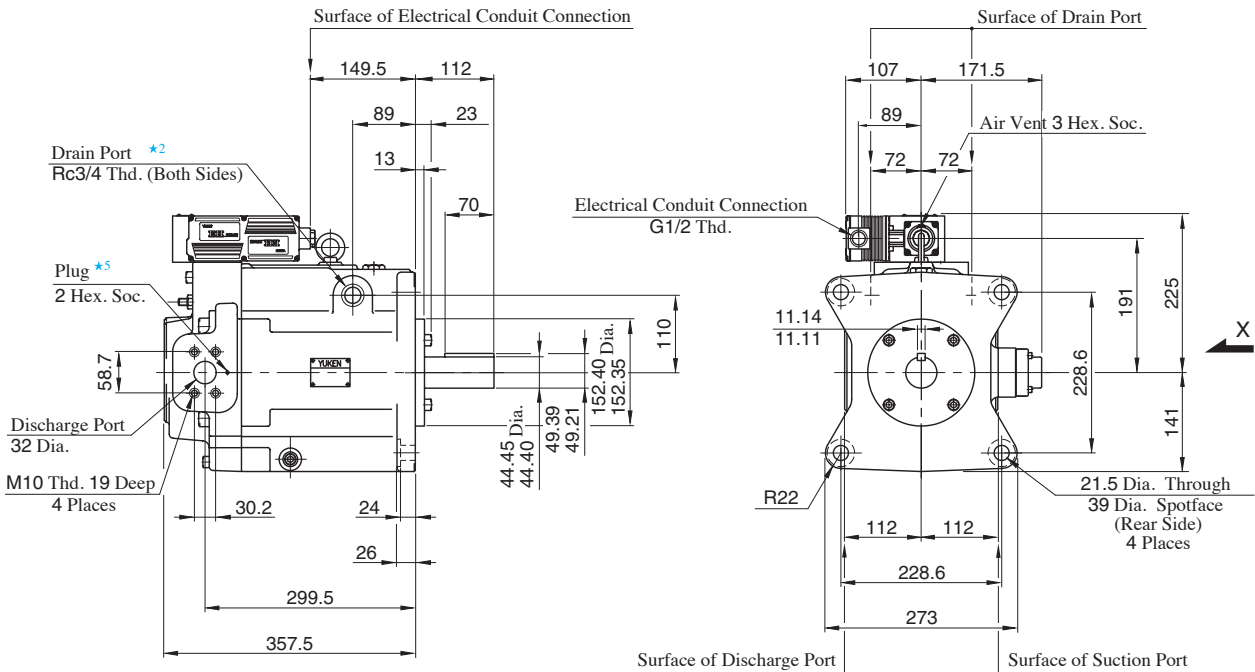
- Foot Mounting Type

Mounting bracket is common to that of pressure compensator model.
Refer to page 48 for the dimensions of mounting bracket.

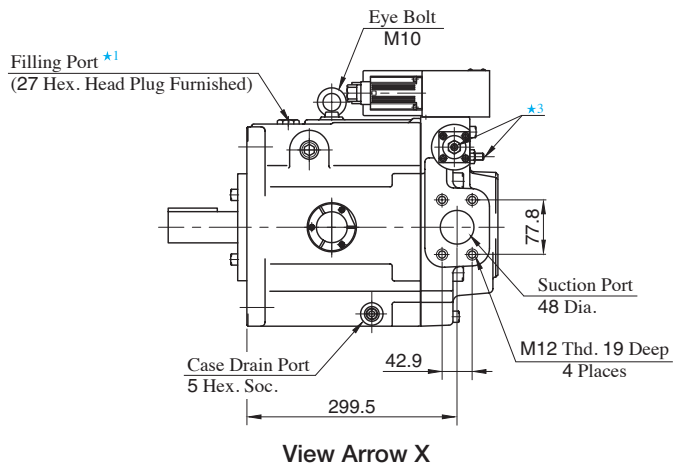
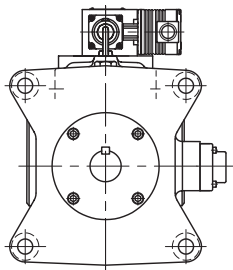
Flange Mtg.

● Amplifier Direction "L" : A145-FR04EH * LS

DIMENSIONS IN MILLIMETRES



● Amplifier Direction "R": A145-FR04EH * RS



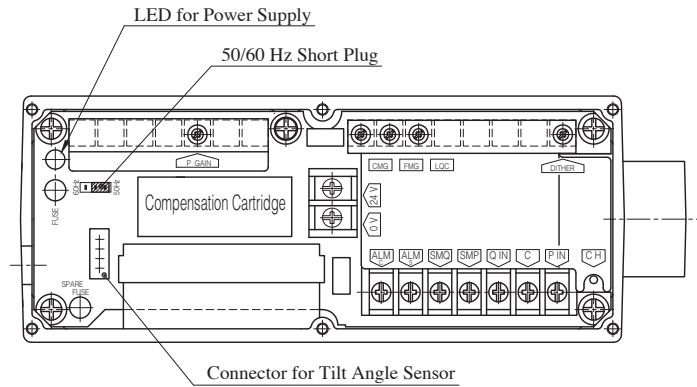
- ★1. Install the pump so that the "Filling Port" is at the top.
- ★2. Use either port of two drain ports at your option. Keep the remaining port plugged.
- ★3. Do not touch the screw because it is adjusted at the time of shipment.
- ★4. For detail of amplifier, refer to page 90.
- ★5. If you use the special sequence valve, remove the plug.

● Foot Mounting Type

Mounting bracket is common to that of pressure compensator model.
Refer to page 49 for the dimensions of mounting bracket.

■ Detail of Amplifier

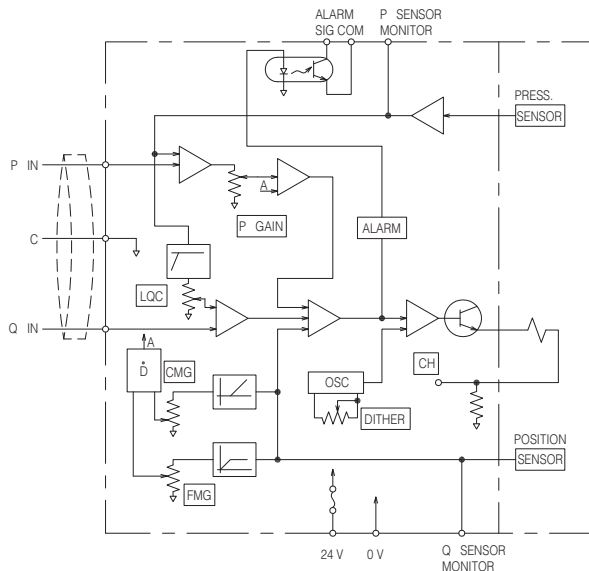
● Connecting Terminal



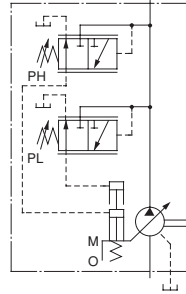
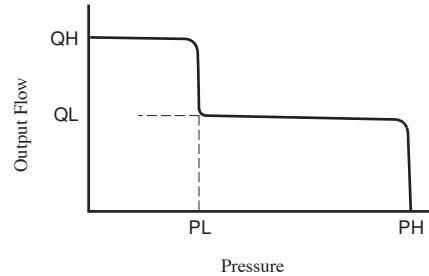
Terminal	Name
P IN	Input Signal, Pressure (+)
C	Input Signal (COM)
Q IN	Input Signal, Flow (+)
SMP	Sensor Monitor Output, Pressure
SMQ	Sensor Monitor Output, Tilt Angle
0 V	Power Supply
24 V	
ALM S	Alarm Output
ALM C	Alarm Output (COM)
CH	Output Current Check (to COM)

- Note 1. For "SENSOR MONITOR" terminal, external instruments should have input impedance of more than 10 kΩ.
 2. For "CH" terminal, external instruments should have input impedance of more than 10 kΩ.
 3. Volume adjustment of "DITHER", "GAIN", "CMG", "FMG" and "LQC" is made at the time of shipment. Adjustment at the customer is not required.
 4. Use shielded cable for "Input" connection. The ground of the shielded cable must be connected to input signal side.

● Circuit Schematic



A Series Variable Displacement Piston Pumps, Two-Pressure Two-Flow Control Type By System Pressure

Graphic Symbol

Performance Characteristics

Specifications

Model Numbers	Geometric Displacement cm ³ /rev	Delivery Volume Adj. Range cm ³ /rev		Operating Pressure MPa		Shaft Speed Range r/min	
		Large Displacement (QH)	Small Displacement (QL)	Rated	Intermittent	Max.	Min.
A16- *-R-05- *- *-S-K-32	15.8	2.6-15.8	2.6-11.1	16	21	1800	600
A37- *-R-05- *- *-S-K-32	36.9	4.1-36.9	4.1-20.1	16	21		
A56- *-R-05- *- *-S-K-32	56.2	3.4-56.2	3.4-25.1	16	21		

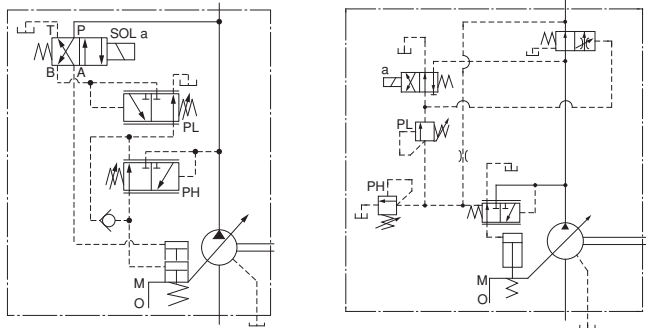
Model Number Designation

A16	-F	-R	-05	-B	C	-S	-K	-32
Series Number	Mounting	Direction of Rotation	Control Type	Pres. Adj. Range for High Pressure MPa	Pres. Adj. Range for Low Pressure MPa	Port Position	Shaft Extension	Design Number
A16 (15.8 cm ³ /rev)	F: Flange Mtg.	(Viewed from Shaft End)	05: Two Pressure Two Flow Control Type by System Pressure	B: 2.5 - 7 C: 2.5 - 16 H: 2.5 - 21	B: 2.5 - 7 C: 2.5 - 16 H: 2.5 - 21	None: Axial Port S: Side Port	K: Keyed Shaft	32
A37 (36.9 cm ³ /rev)								L: Foot Mtg.
A56 (56.2 cm ³ /rev)								32

Consult Yuken when detailed such as dimensions figures is required.

Series Variable Displacement Piston Pumps, Two-Pressure Two-Flow Control Type By Solenoid Valve

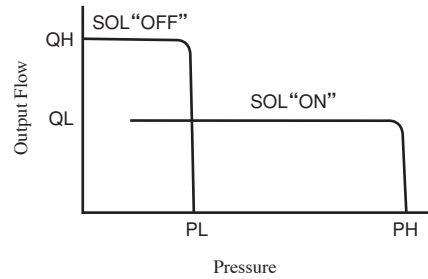
Graphic Symbol



A16/A22/A37/A56

A70/A90/A145

Performance Characteristics



Specifications

Model Numbers	Geometric Displacement cm ³ /rev	Delivery Volume Adj. Range cm ³ /rev		Operating Pressure MPa		Shaft Speed Range r/min	
		Large Displacement (QH)	Small Displacement (QL)	Rated	Intermittent	Max.	Min.
A16- *R-06- * *-S-K- *-33	15.8	2.6 - 15.8	2.6 - 11.1	16	21	1800	600
A22- *R-06- * *-S-K- *-33	22.2	3.7 - 22.2	3.7 - 15.5	16	16		
A37- *R-06- * *-S-K- *-33	36.9	4.1 - 36.9	4.1 - 20.1	16	21		
A56- *R-06- * *-S-K- *-33	56.2	3.4 - 56.2	3.4 - 25.1	16	21		
A70- *R06S * -60	70.0	36 - 70.0	3 - 70.0	25	25		
A90- *R06S * -60	91.0	56 - 91.0	3 - 70.0	25	25		
A145- *R06S * -60	145	83 - 145	3 - 145	25	25		

Model Number Designation

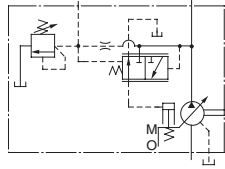
A16	-F	-R	-06	-B	C	-S	-K	A200	-33
Series Number	Mounting	Direction of Rotation	Control Type	Pres. Adj. Range for High Pressure MPa	Pres. Adj. Range for Low Pressure MPa	Port Position	Shaft Extension	Coil Type of Solenoid Valve	Design Number
A16 (15.8 cm ³ /rev)	F: Flange Mtg. L: Foot Mtg.	(Viewed from Shaft End) R: Clockwise (Normal)	06: Two-Pressure Two-Flow Control Type by Solenoid Valve	B: 2.5 - 7 C: 2.5 - 16 H: 2.5 - 21	B: 2.5 - 7 C: 2.5 - 16 H: 2.5 - 21	S: Side Port	K: Keyed Shaft	AC A100, A120 A200, A240 DC D12, D24 D48 R(AC→DC Rectifild) R100, R200	33
A22 (22.2 cm ³ /rev)									33
A37 (36.9 cm ³ /rev)									33
A56 (56.2 cm ³ /rev)									33

A70	-F	R	06	S	A200	-60
Series Number	Mounting	Direction of Rotation	Control Type	Port Position	Coil Type of Solenoid Valve	Design Number
A70 (70.0 cm ³ /rev)	F: Flange Mtg. L: Foot Mtg.	(Viewed from Shaft End) R: Clockwise (Normal)	06: Two-Pressure Two-Flow Control Type by Solenoid Valve	S: Side Port	AC A100, A120 A200, A240 DC D12, D24 D48 R(AC→DC Rectifild) R100, R200	60
A90 (91.0 cm ³ /rev)						60
A145 (145 cm ³ /rev)						60

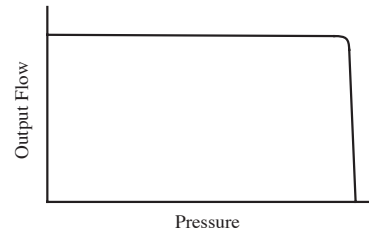
Consult Yuken when detailed such as dimensions figures is required.

Series Variable Displacement Piston Pumps, Pilot Pressure Control Type Pressure Compensator

Graphic Symbol



Performance Characteristics



Specifications

Model Numbers	Geometric Displacement cm ³ /rev	Minimum Adj. Flow cm ³ /rev	Operating Pressure MPa		Minimum Adj. Pres. MPa	Shaft Speed Range r/min		Approx. Mass kg	
			Rated ^{★2}	Intermittent ^{★1}		Max.	Min.	Flange Mtg.	Foot Mtg.
A10-FR07-12	10.0	2	16	21	2.0	1800	600	8.5	10.7
A16-*R-07-*K-32	15.8	4	16	21	1.2	1800	600	21	23.2
A22-*R-07-*K-32	22.2	6	16	16	1.2	1800	600	21	23.2
A37-*R-07-*K-32	36.9	10	16	21	1.2	1800	600	29	33.3
A56-*R-07-*K-32	56.2	12	16	21	1.2	1800	600	36	40.3
A70-*R07S-60	70.0	36	25	25	2	1800	600	60.3	72.3
A90-*R07S-60	91.0	56	25	25	2	1800	600	77.5	98
A145-*R07S-60	145	83	25	25	2	1800	600	94	119

- ★1. Whenever setting pressure, make sure the full cut-off pressure never exceeds the maximum intermittent pressure.
- ★2. When operating the pump exceeding the rated pressure, operating conditions are restricted.
Refer to page 31 for the details.

Model Number Designation

A16	-F	-R	-07	-S	-K	-32
Series Number	Mounting	Direction of Rotation	Control Type	Port Position	Shaft Extension	Design Number
A16 (15.8 cm ³ /rev)	F: Flange Mtg. L: Foot Mtg.	(Viewed from) Shaft End R: Clockwise ^{★1} (Normal)	07: Pilot Pressure Control Type Pressure Compensator	None: Axial Port S: Side Port	K: Keyed Shaft	32
A22 (22.2 cm ³ /rev)						32
A37 (36.9 cm ³ /rev)						32
A56 (56.2 cm ³ /rev)						32

A70	-F	R	07	S	-60
Series Number	Mounting	Direction of Rotation	Control Type	Port Position	Design Number
A10 (10.0 cm ³ /rev)	F: Flange Mtg. ^{★2}	(Viewed from) Shaft End R: Clockwise ^{★1} (Normal)	07: Pilot Pressure Control Type Pressure Compensator	—	12
A70 (70.0 cm ³ /rev)	F: Flange Mtg.			S: Side Port	60
A90 (91.0 cm ³ /rev)	L: Foot Mtg.			60	
A145 (145 cm ³ /rev)	L: Foot Mtg.			60	

- ★1. Available to supply pump with anti-clockwise rotation. Consult Yuken for details.
- ★2. When A10 pump is used as the foot Mtg., order the Mtg. Bracket kit shown below separately.
Refer to page 20 for dimensions of the Mtg. bracket.
- ★3. Please inquire for A220 separately.

Mtg. Bracket Kit Numbers	Approx. Mass kg
LP-1A-10	2.2

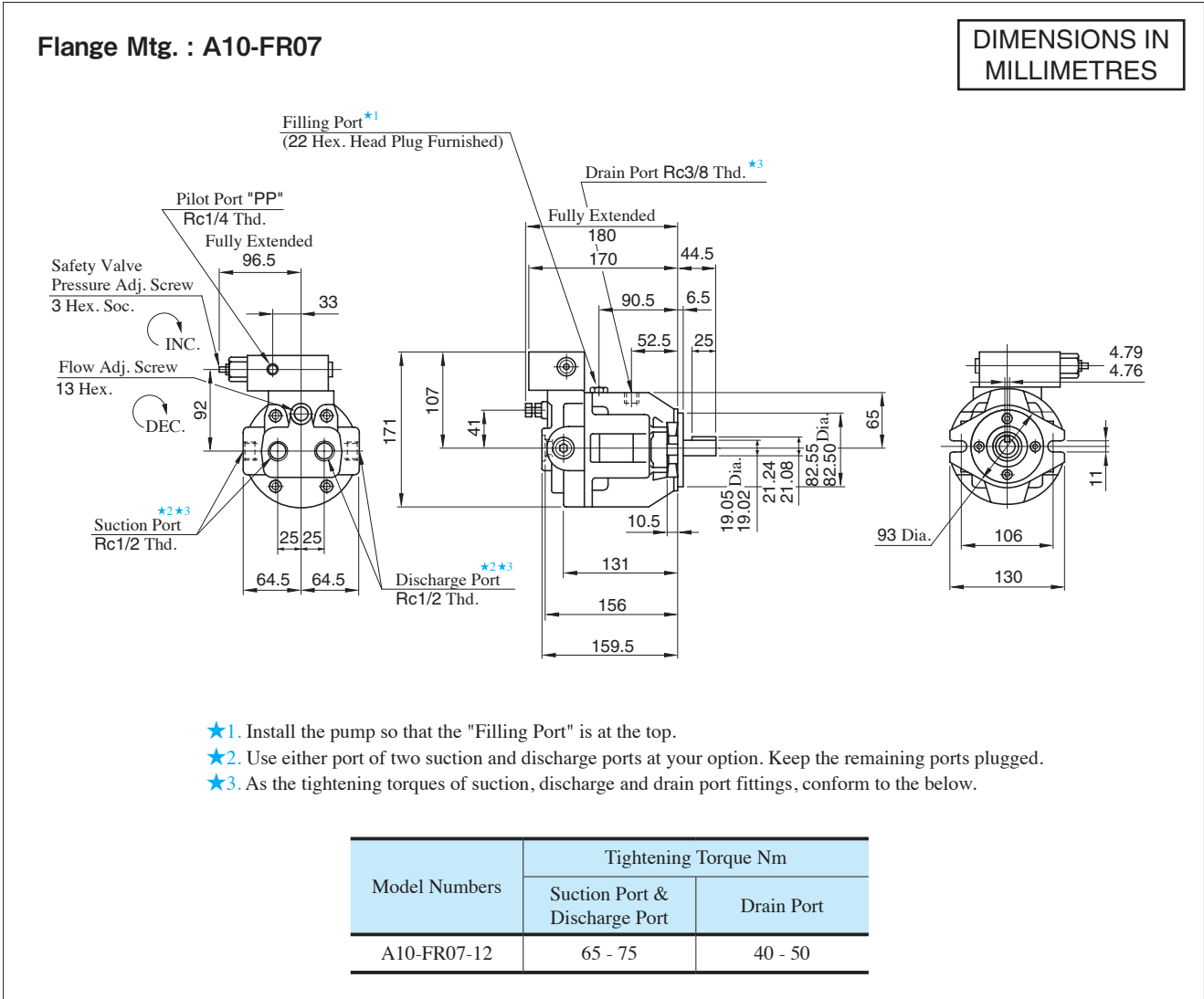
Note: The mounting bracket kit consists of a mounting bracket, 2 hex. bolts and 2 plain washer.

Performance Characteristics

For performance characteristics, refer to models of pressure compensator type on page 34 to 42.

Pipe Flange Kit

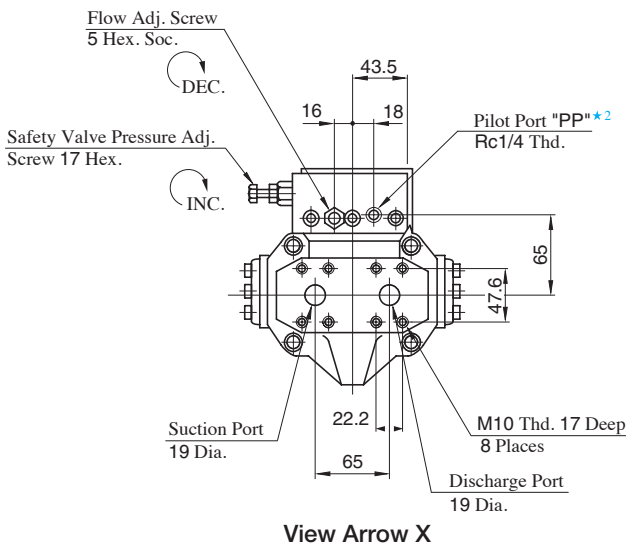
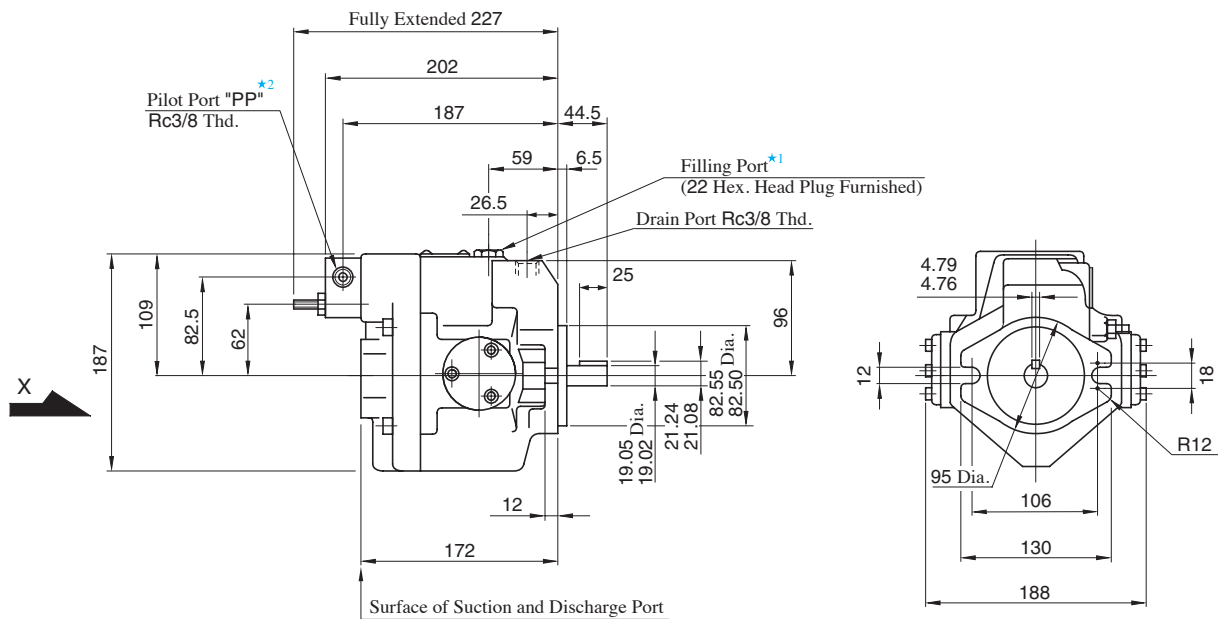
For pipe flange, refer to form of pressure compensator type on page 32.



Axial Port Type

Flange Mtg. : A16-F-R-07-K
A22-F-R-07-K

DIMENSIONS IN
MILLIMETRES



- ★1. Install the pump so that the "Filling Port" is at the top.
- ★2. Use either port of two pilot ports at your option. Keep the remaining port plugged.

● Axial Port Type

Port mounting dimensions are the same as those of pressure compensator model. Refer to page 44 for port mounting dimensions.

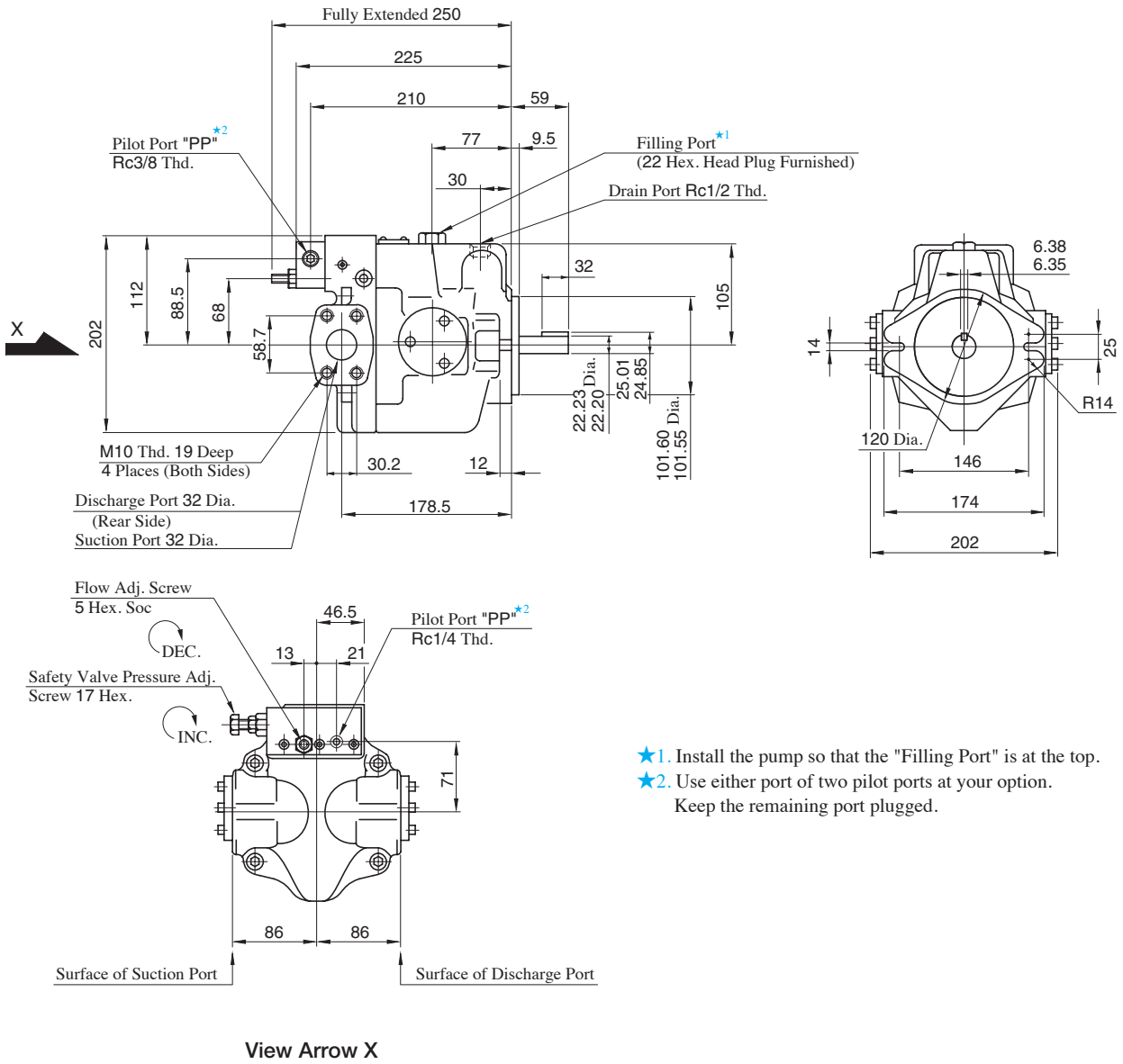
● Foot Mounting Type

Mounting bracket is common to that of pressure compensator model. Refer to page 44 for the dimensions of mounting bracket.

Side Port Type

Flange Mtg. : A37-F-R-07-S-K

DIMENSIONS IN MILLIMETRES



- ★1. Install the pump so that the "Filling Port" is at the top.
- ★2. Use either port of two pilot ports at your option.
Keep the remaining port plugged.

● **Axial Port Type**

Port mounting dimensions are the same as those of pressure compensator model. Refer to page 46 for port mounting dimensions.

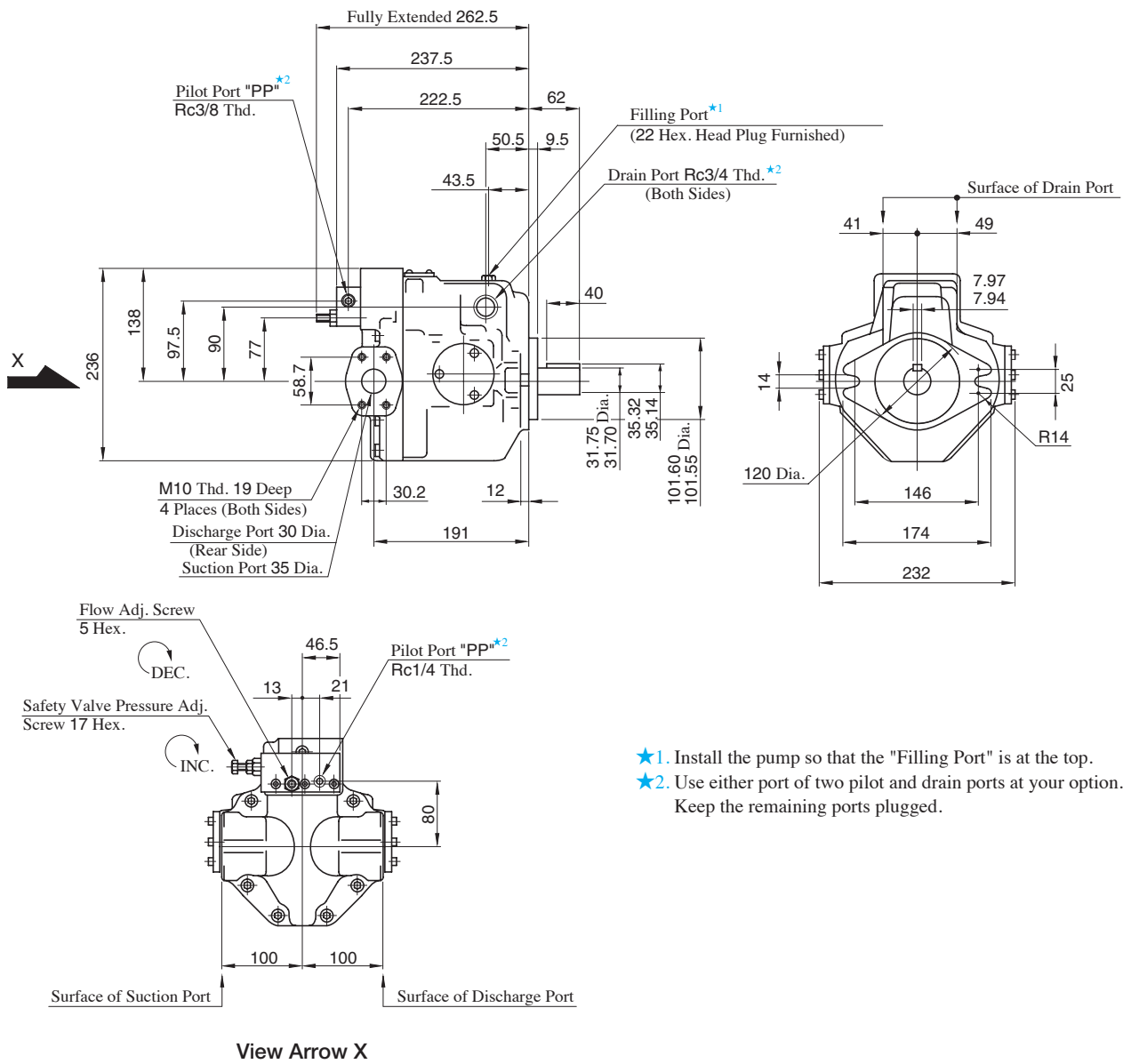
● **Foot Mounting Type**

Mounting bracket is common to that of pressure compensator model. Refer to page 46 for the dimensions of mounting bracket.

Side Port Type

Flange Mtg. : A56-F-R-07-S-K

DIMENSIONS IN
MILLIMETRES



- ★1. Install the pump so that the "Filling Port" is at the top.
- ★2. Use either port of two pilot and drain ports at your option. Keep the remaining ports plugged.

● Axial Port Type

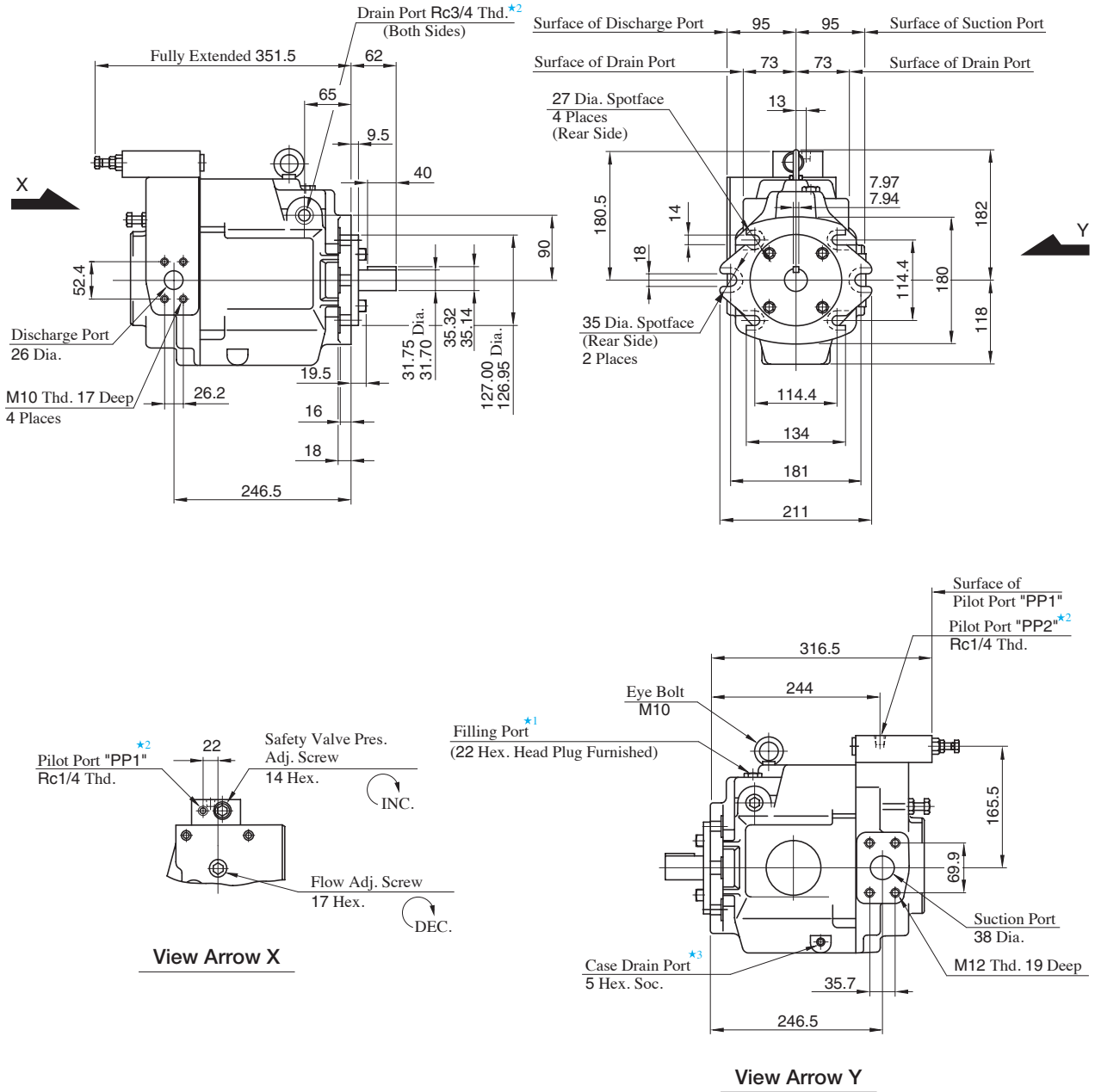
Port mounting dimensions are the same as those of pressure compensator model. Refer to page 47 for port mounting dimensions.

● Foot Mounting Type

Mounting bracket is common to that of pressure compensator model. Refer to page 47 for the dimensions of mounting bracket.

Flange Mtg. : A70-FR07S

DIMENSIONS IN MILLIMETRES

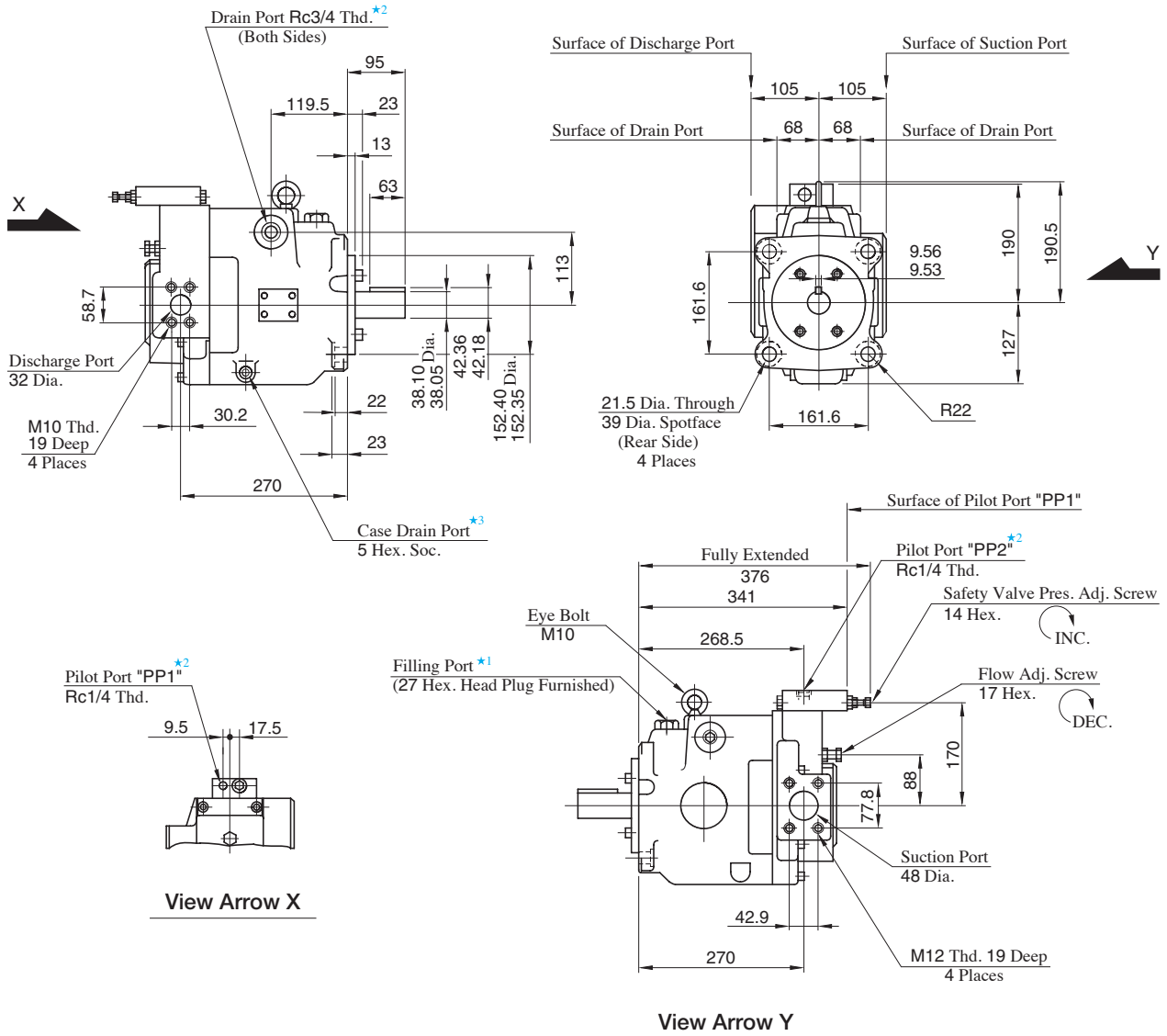


- ★1. Install the pump so that the "Filling Port" is at the top.
- ★2. Use either port of two pilot and drain ports at your option. Keep the remaining ports plugged.
- ★3. Case drain port is available for use when draining hydraulic fluid from pump casing.

● **Foot Mounting Type**
 Mounting bracket is common to that of pressure compensator model.
 Refer to page 48 for the dimensions of mounting bracket.

Flange Mtg. : A90-FR07S

DIMENSIONS IN MILLIMETRES



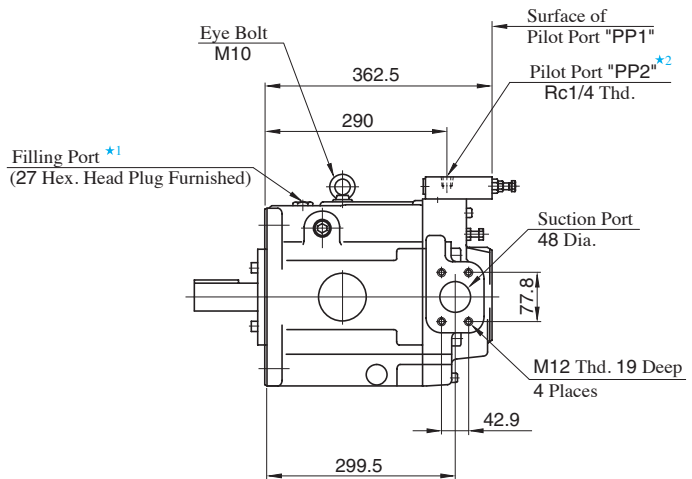
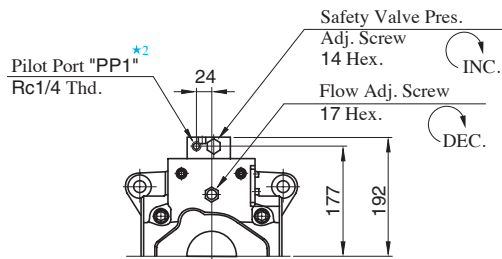
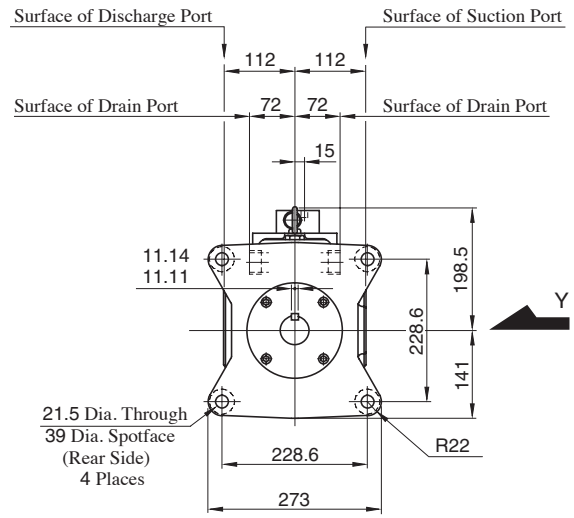
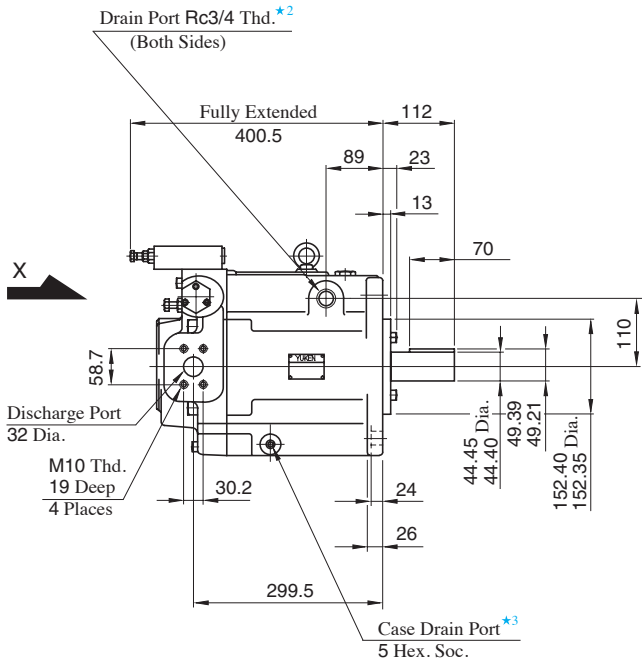
- ★1. Install the pump so that the "Filling Port" is at the top.
- ★2. Use either port of two pilot and drain ports at your option. Keep the remaining ports plugged.
- ★3. Case drain port is available for use when draining hydraulic fluid from pump casing.

● **Foot Mounting Type**

Mounting bracket is common to that of pressure compensator model.
Refer to page 49 for the dimensions of mounting bracket.

Flange Mtg. : A145-FR07S

DIMENSIONS IN MILLIMETRES

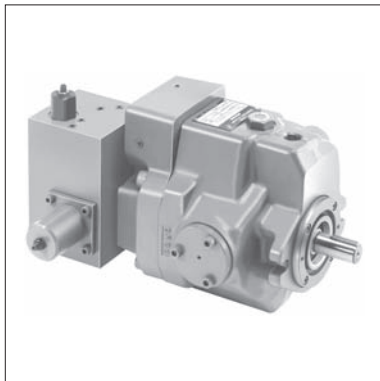


- ★1. Install the pump so that the "Filling Port" is at the top.
- ★2. Use either port of two pilot and drain ports at your option. Keep the remaining ports plugged.
- ★3. Case drain port is available for use when draining hydraulic fluid from pump casing.

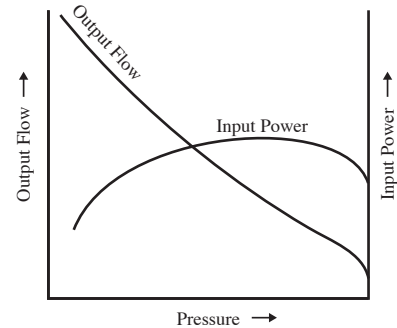
● Foot Mounting Type

Mounting bracket is common to that of pressure compensator model.
Refer to page 50 for the dimensions of mounting bracket.

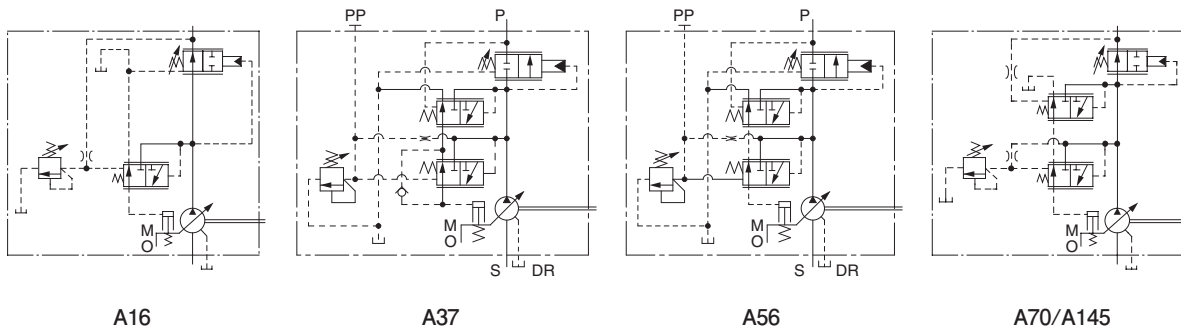
Series Variable Displacement Piston Pumps, Constant Power Control Type



Performance Characteristics



Graphic Symbol



Specifications

Model Numbers	Geometric Displacement cm ³ /rev	Minimum Adj. Flow cm ³ /rev	Operating Pres. MPa	Shaft Speed Range r/min		Approx. Mass kg	
			Max.	Max.	Min.	Flange Mtg.	Foot Mtg.
A16- * -R-09- * - * -K-32	15.8	—	21 ^{★1}	1800	600	29.0	31.2
A37- * -R-09- * - * -K-32	36.9	—	21 ^{★1}	1800	600	37.0	41.3
A56- * -R-09- * - * -K-32	56.2	—	21 ^{★1}	1800	44.0	44.0	48.3
A70- *R09* S-60	70.0	36	25	1800	600	72.8	84.8
A145- *R09* S-60	145	83	25	1800	600	110	135

★1. Maximum Operating Pressure of A16/A37/A56 varies according to Input Power Setting. See Model Number Designation for details.

★2. Minimum Adjustment Flow of A70/A145 is absolutely minimum flow that can be adjusted with Flow Adjustment Screw.

A90 type pump (91 cm³/rev) is available. Ask Yuken for Details.

Model Number Designation

A16/A37/A56

A16	-F	-R	-09	-A		-16M	-K	-32
Series Number	Mounting	Direction of Rotation	Control Type	Input Power Setting		Specify Control Pres.	Shaft Extension	Design Number
A16 (15.8 cm ³ /rev)	F: Flange Mtg.	(Viewed from Shaft End)	09: Constant Power Control Type	A : 3.7 kW	E : 2.2 kW	7M : 7 Pa 10.5M : 10.5 Pa 14M : 14 Pa 16M : 16 Pa 17.5M : 17.5 Pa 21M : 21 Pa	K: Keyed Shaft	32
A37 (36.9 cm ³ /rev)				B : 5.5 kW	F : 1.5 kW			
A56 (56.2 cm ³ /rev)	L: Foot Mtg.	R: Clockwise* ¹ (Normal)		A : 3.7 kW	E : 15 kW			
				B : 5.5 kW	F : 18.5 kW			
				C : 7.5 kW	G : 22 kW			
				D : 11 kW				

A70/A145

A70	-F	R	09	-A		S	-60
Series Number	Mounting	Direction of Rotation	Control Type	Input Power Setting		Direction of Port	Design Number
A70 (70 cm ³ /rev)	F: Flange Mtg.	(Viewed from Shaft End)	09: Constant Power Control Type	A : 15 kW	C : 22 kW	S: Side Port	60
A145 (145 cm ³ /rev)	L: Foot Mtg.	R: Clockwise* ¹ (Normal)		B : 18.5 kW	D : 30 kW		
				A : 15 kW	E : 37 kW		60
				B : 18.5 kW	F : 45 kW		
				C : 22 kW	G : 55 kW		
				D : 30 kW	H : 75 kW		

*1. Available to supply pump with anti-clockwise rotation. Consult Yuken for details.

*2. Specify control pressure of A16/A37/A56 with lower than Maximum Operating Pressure depending on Input Power Setting

Model	Maximum Operating Pressure MPa								
	1.5 kW	2.2 kW	3.7 kW	5.5 kW	7.5 kW	11 kW	15 kW	18.5 kW	22 kW
A16	10.5	16	21	21	—	—	—	—	—
A37	—	—	16	21	21	21	—	—	—
A56	—	—	10.5	14	17.5	21	21	21	21

Pipe Flange Kits

Pipe flange kits are available. When ordering, specify the kit number from the table below.

Pump Model Numbers	Name of Port	Pipe Flange Kit Numbers		
		Threaded Connection	Socket Welding* ¹	Butt Welding
A16- *-R-09	Suction	F5-06-A-10	F5-06-B-10	F5-06-C-10
	Discharge	—* ²	—* ²	—* ²
A37- *-R-09	Suction	F5-10-A-10	F5-10-B-10	F5-10-C-10
A56- *-R-09	Discharge	F5-06-A-10	F5-06-B-10	F5-06-C-10
A70- *-R-09	Suction	F5-12-A-10	F5-12-B-10	F5-12-C-10
	Discharge	F5-08-A-10	F5-08-B-10	F5-08-C-10
A145- *-R-09	Suction	F5-16-A-10	F5-16-B-10	F5-16-C-10
	Discharge	F5-10-A-10	F5-10-B-10	F5-10-C-10

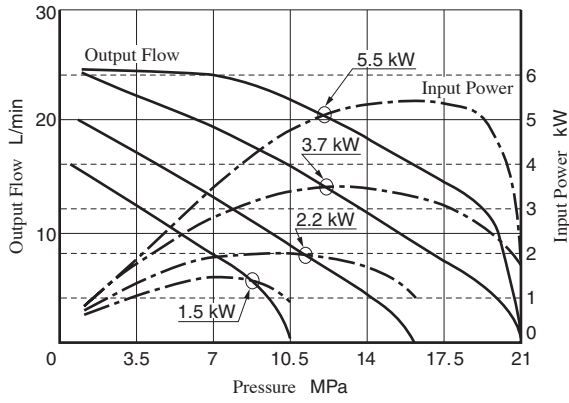
*1. In case of using socket welding flanges, there is a case where the operating pressure should be set lower than the normal because of strength of hat flanges. Therefore, please pay cautious attention to the operating pressure when the socket welding flanges are used.

*2. Discharge port for pump model "A16" is available only the threaded connections.

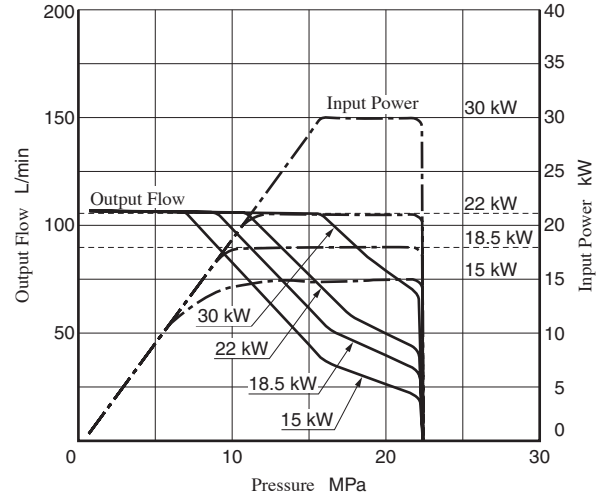
● Detail of the pipe flange kits are shown on page 262.

Typical Performance Characteristics at 1500 r/min

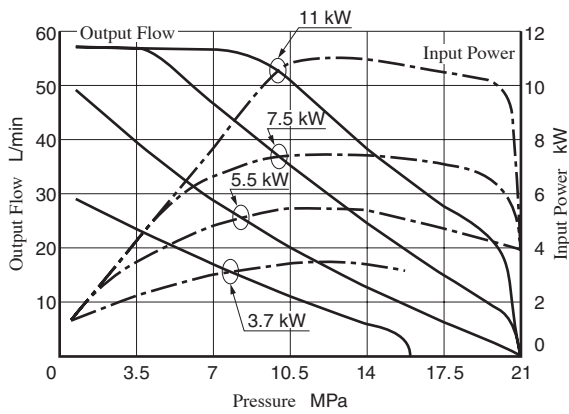
● A16



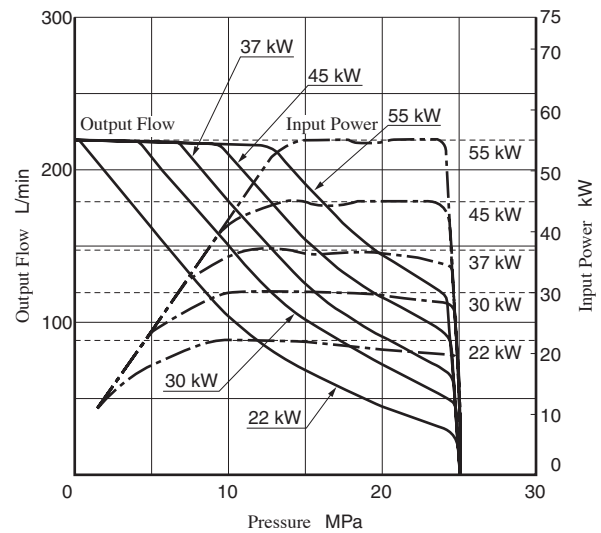
● A70



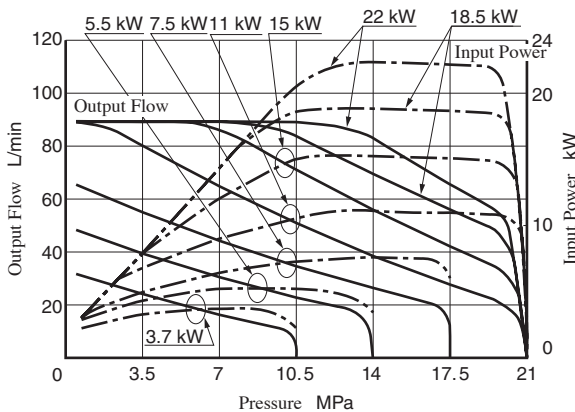
● A37



● A145

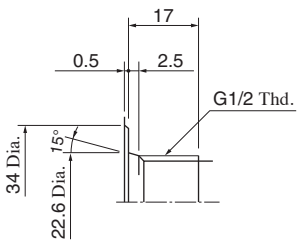
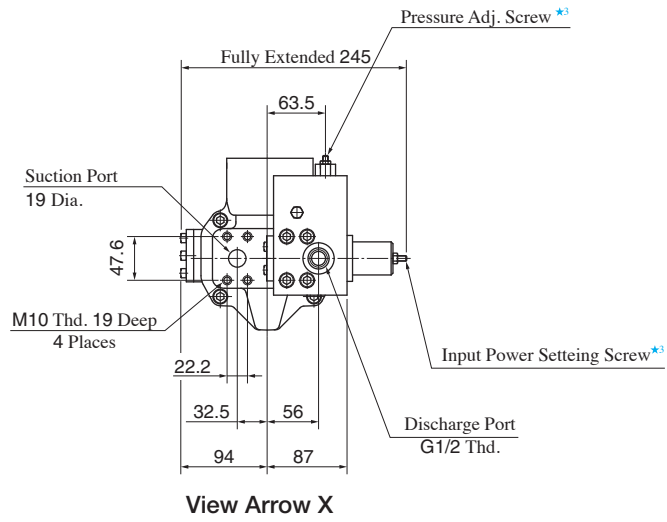
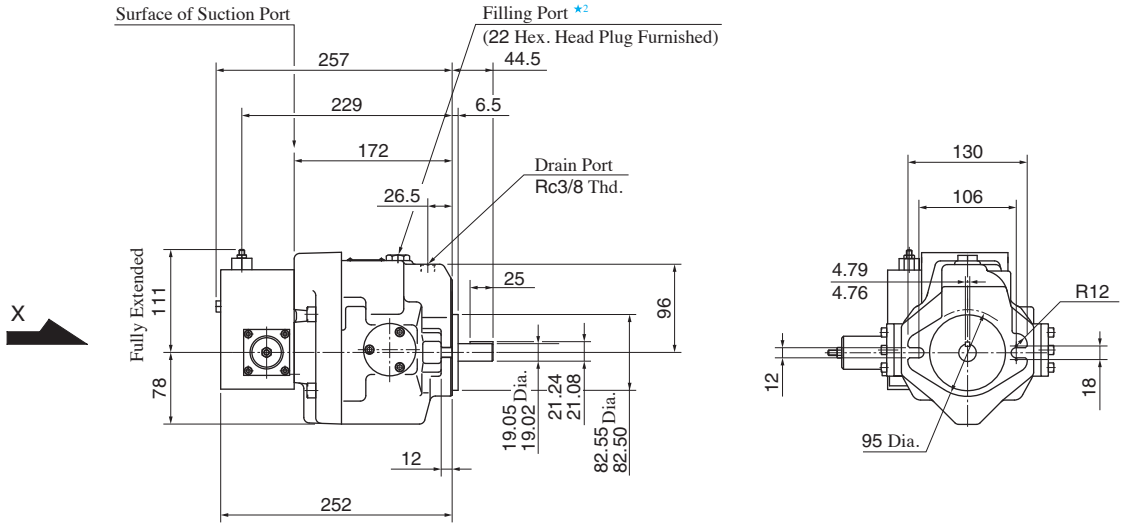


● A56



Flange Mtg. : A16-F-R-09- * -K

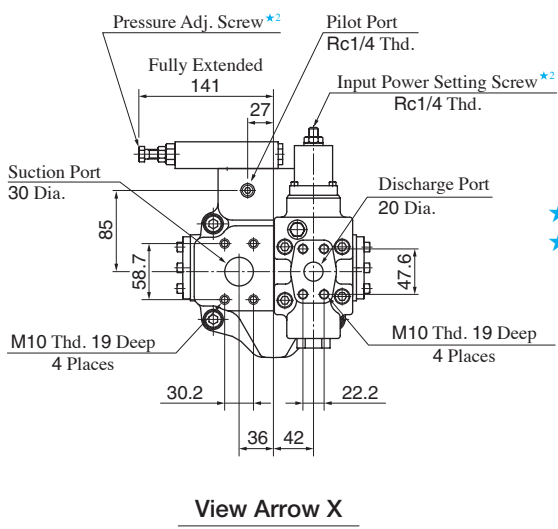
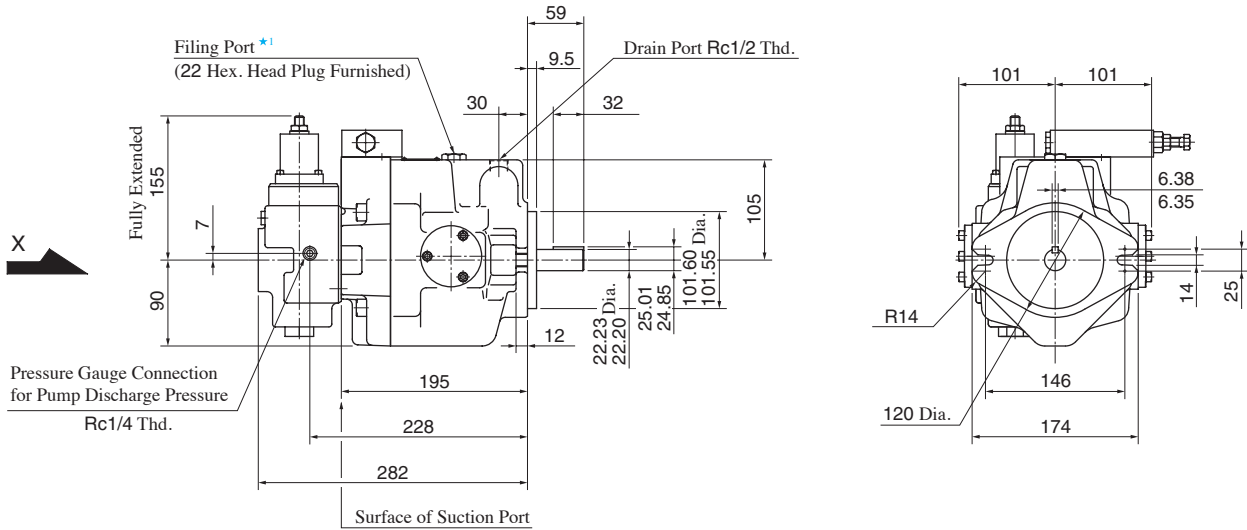
DIMENSIONS IN MILLIMETRES



- ★1. Detail of Discharge Port
- ★2. Install the pump so that the "Filling Port" is at the top.
- ★3. Do not touch the screw because it is adjusted at the time of shipment.

● **Foot Mounting Type**
 Mounting bracket is common to that of pressure compensator model.
 Refer to page 44 for the dimensions of mounting bracket.

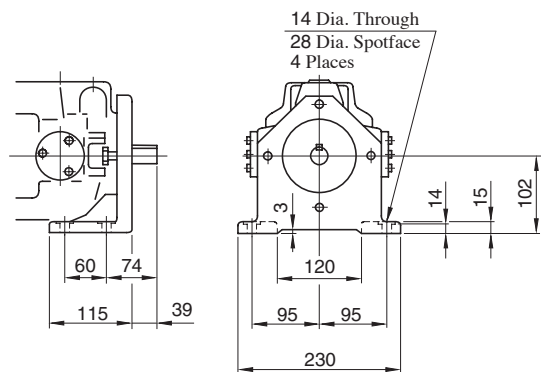
Flange Mtg. : A37-F-R-09- * -K



- ★1. Install the pump so that the "Filling Port" is at the top.
- ★2. Do not touch the screw because it is adjusted at the time of shipment.

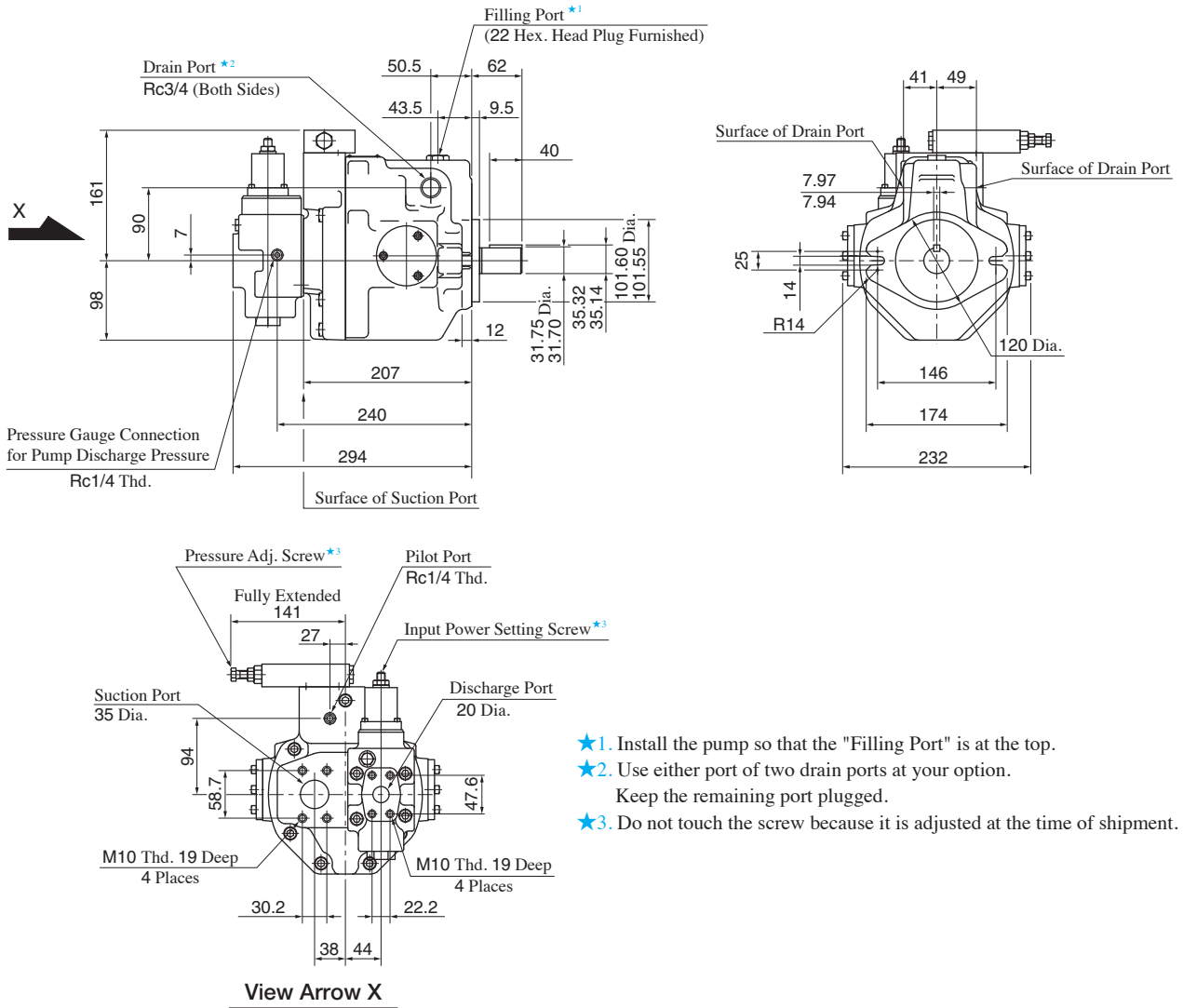
DIMENSIONS IN MILLIMETRES

Foot Mtg. : A37-L-R-09- * -K



● For other dimensions, refer to "Flange Mtg.".

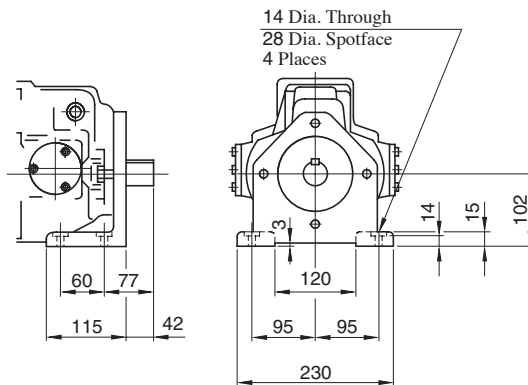
Flange Mtg. : A56-F-R-09- * -K



- ★1. Install the pump so that the "Filling Port" is at the top.
- ★2. Use either port of two drain ports at your option.
Keep the remaining port plugged.
- ★3. Do not touch the screw because it is adjusted at the time of shipment.

DIMENSIONS IN MILLIMETRES

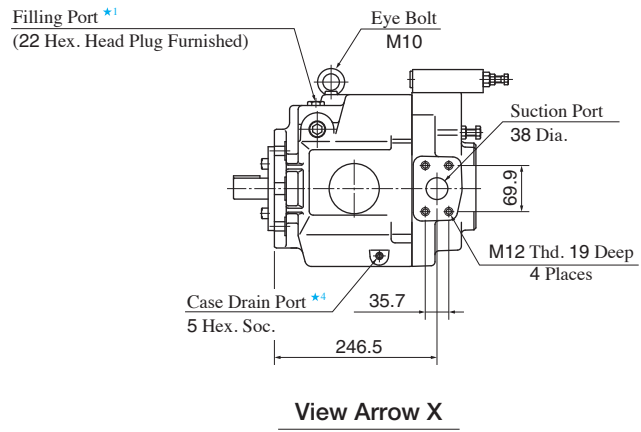
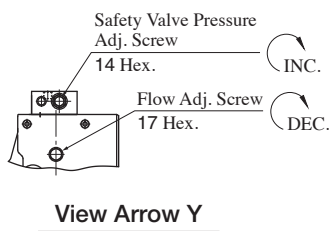
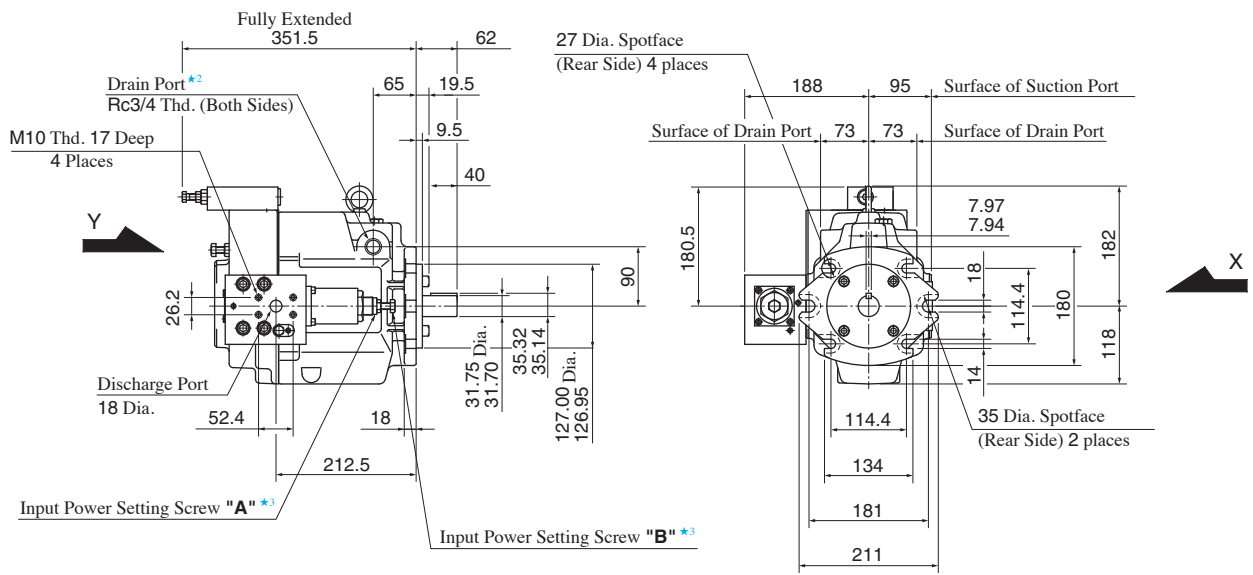
Foot Mtg. : A56-L-R-09- * -K-32



● For other dimensions, refer to "Flange Mtg.".

Flange Mtg. : A70-FR09 * S

DIMENSIONS IN MILLIMETRES



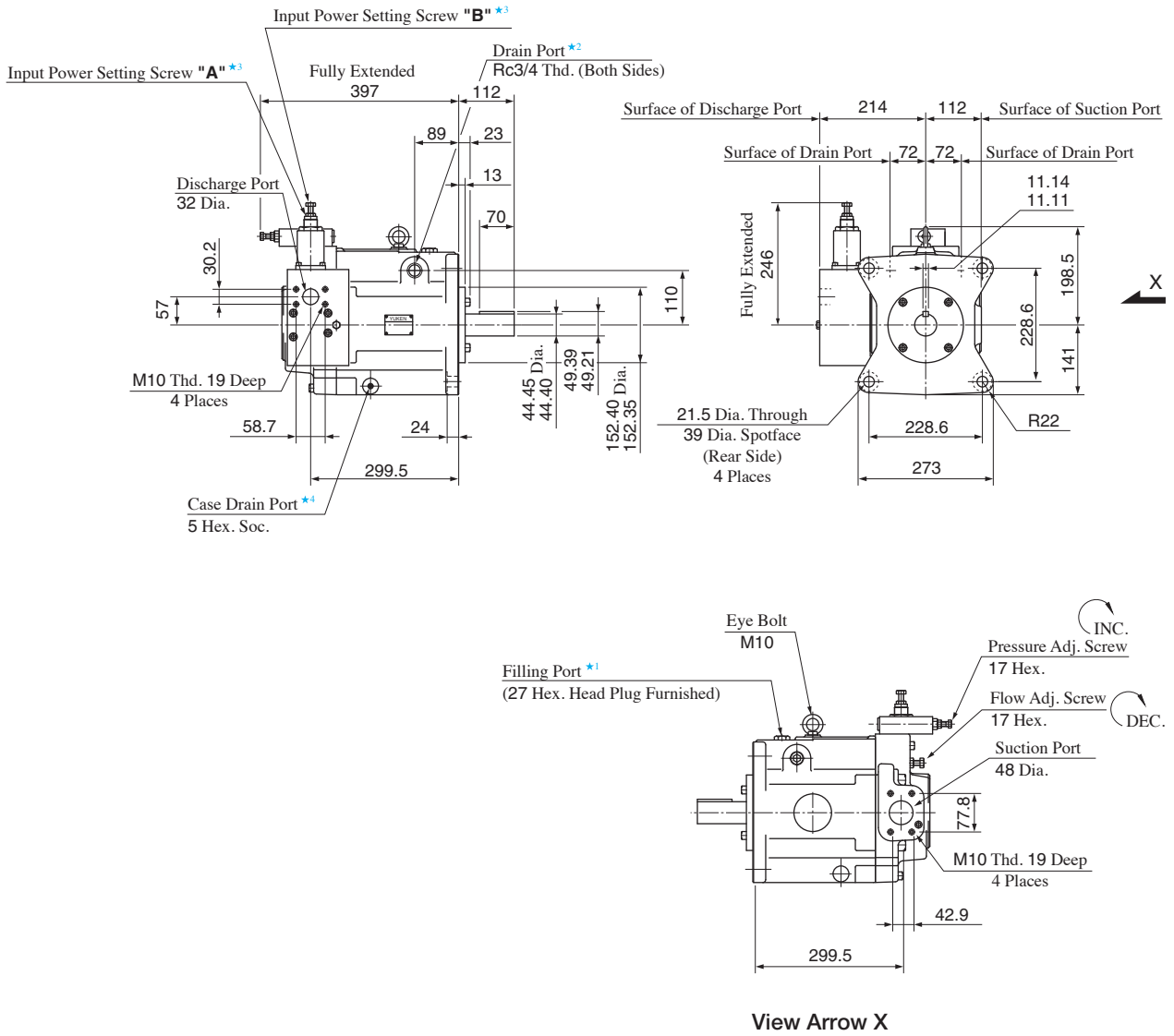
- ★1. Install the pump so that the "Filling Port" is at the top.
- ★2. Use either port of two drain ports at your option. Keep the remaining port plugged.
- ★3. Do not touch the screw because it is adjusted at the time of shipment.
- ★4. Case drain port is available for use when draining hydraulic fluid from pump casing.

● Foot Mounting Type

Mounting bracket is common to that of pressure compensator model.
Refer to page 47 for the dimensions of mounting bracket.

Flange Mtg. : A145-FR09 * S

DIMENSIONS IN MILLIMETRES



- ★1. Install the pump so that the "Filling Port" is at the top.
- ★2. Use either port of two drain ports at your option. Keep the remaining port plugged.
- ★3. Do not touch the screw because it is adjusted at the time of shipment.
- ★4. Case drain port is available for use when draining hydraulic fluid from pump casing.

● **Foot Mounting Type**

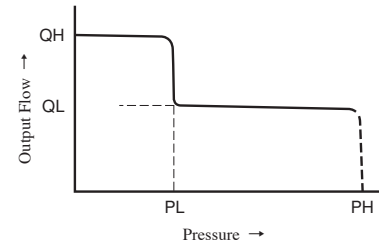
Mounting bracket is common to that of pressure compensator model.
Refer to page 49 for the dimensions of mounting bracket.

Series Variable Displacement Piston Pumps - Single Pump, Simple Two-Pressure Two-Flow Control Type

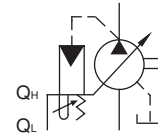
Specifications

Model Numbers	Geometric Displacement cm ³ /rev	Output Flow Adj. Range cm ³ /rev		Operating Pressure MPa		Shaft Speed Range r/min
		Large Displacement (QH)	Small Displacement (QL)	Rated	Intermittent	
A16- *-R-00-H-K-32500	15.8	4-15.8	3-10	16	21	600-1800
A37- *-R-00-H-K-32500	36.9	7-36.9	3-18	16	21	
A56- *-R-00-H-K-32500	56.2	9-56.2	3-27.7	16	21	
A70- *R00HS-60500	70.0	36-70.0	★-24	21	21	
A90- *R00HS-60500	91	56-91.0	★-45	21	21	
A145- *R00HS-60500	145	83-145	★-70	21	21	

Performance Characteristics



Graphic Symbol



Note) ★: Minimum adjustment flow of relief valve, which is for setting with PH pressure. (Relief valve is external set.)

Instruction

As the pump does not have Full-Cut off function, setting relief valve of PH pressure (Maximum Pressure on circuit) for pump discharge line is absolutely required.

Model Number Designation

● A16-A56

A16	-F	-R	-00	-H	-K	-32500
Series Number	Mounting	Direction of Rotation	Control Type	Pres. Adj. Range MPa	Shaft Extension	Design Number
A16 (15.8 cm ³ /rev)	F : Flange Mtg. L : Foot Mtg.	(Viewed from Shaft End) R : Clockwise★ (Normal)	00 : Special Control Type	H : 1.2-21	K : Keyed Shaft	32500
A37 (36.9 cm ³ /rev)						32500
A56 (56.2 cm ³ /rev)						32500

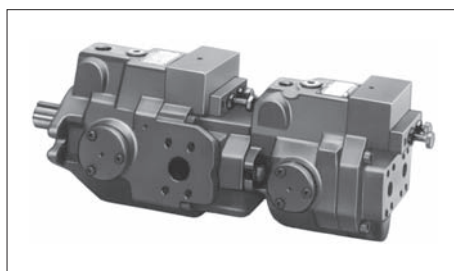
● A70-A145

A70	-F	R	00	H	S	-60500
Series Number	Mounting	Direction of Rotation	Control Type	Pres. Adj. Range MPa	Port Position	Design Number
A70 (70.0 cm ³ /rev)	F : Flange Mtg. L : Foot Mtg.	(Viewed from Shaft End) R : Clockwise★ (Normal)	00 : Special Control Type	H : 2-21	S : Side Port	60500
A90 (91.0 cm ³ /rev)						
A145 (145 cm ³ /rev)						

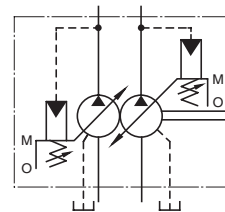
★ Available to supply pump with anti-clockwise rotation. Consult Yuken for details.

Consult Yuken when detailed material such as dimensions figures is required.

Series Variable Displacement Piston Pumps – Double Pumps, Pressure Compensator Type



Graphic Symbol



Specifications

Model Numbers		Geometric Displacement cm ³ /rev	Min. Adj. Flow cm ³ /rev	Operating Pressure MPa		Shaft Speed Range r/min		Approx. Mass kg	
				Rated	Intermittent	Max.	Min.	Flange Mtg.	Foot Mtg.
A1616- *R01 *01 * * K-32	Outboard Pump	15.8	4	16	21	1800	600	35.5	37.7
	Inboard Pump	15.8	4	16	21				
A1622- *R01 *01 * * K-32	Outboard Pump	15.8	4	16	21	1800	600	35.5	37.7
	Inboard Pump	22.2	6	16	16				
A2222- *R01 *01 * * K-32	Outboard Pump	22.2	6	16	16	1800	600	35.5	37.7
	Inboard Pump	22.2	6	16	16				
A1637- *R01 *01 * * K-32	Outboard Pump	15.8	4	16	21	1800	600	50	54.3
	Inboard Pump	36.9	10	16	21				
A2237- *R01 *01 * * K-32	Outboard Pump	22.2	6	16	16	1800	600	50	54.3
	Inboard Pump	36.9	10	16	21				
A1656- *R01 *01 * * K-32	Outboard Pump	15.8	4	16	21	1800	600	54.5	58.8
	Inboard Pump	56.2	12	16	21				
A2256- *R01 *01 * * K-32	Outboard Pump	22.2	6	16	16	1800	600	54.5	58.8
	Inboard Pump	56.2	12	16	21				
A1670- *R01 *01 * * -60	Outboard Pump	15.8	4	16	21	1800	600	77.5	89.5
	Inboard Pump	70.0	36	25	28				
A2270- *R01 *01 * * -60	Outboard Pump	22.2	6	16	16	1800	600	77.5	89.5
	Inboard Pump	70.0	36	25	28				
A3770- *R01 *01 * * -60	Outboard Pump	36.9	10	16	21	1800	600	86.5	98.5
	Inboard Pump	70.0	36	25	28				
A1690- *R01 *01 * * -60	Outboard Pump	15.8	4	16	21	1800	600	88	108.5
	Inboard Pump	91.0	56	25	28				
A2290- *R01 *01 * * -60	Outboard Pump	22.2	6	16	16	1800	600	88	108.5
	Inboard Pump	91.0	56	25	28				
A3790- *R01 *01 * * -60	Outboard Pump	36.9	10	16	21	1800	600	100.5	121
	Inboard Pump	91.0	56	25	28				
A5690- *R01 *01 * * -60	Outboard Pump	56.2	12	16	21	1800	600	107.5	128
	Inboard Pump	91.0	56	25	28				
A16145- *R01 *01 * * -60	Outboard Pump	15.8	4	16	21	1800	600	109	134
	Inboard Pump	145	83	25	28				
A22145- *R01 *01 * * -60	Outboard Pump	22.2	6	16	16	1800	600	109	134
	Inboard Pump	145	83	25	28				
A37145- *R01 *01 * * -60	Outboard Pump	36.9	10	16	21	1800	600	121.5	146.5
	Inboard Pump	145	83	25	28				
A56145- *R01 *01 * * -60	Outboard Pump	56.2	12	16	21	1800	600	128.5	153.5
	Inboard Pump	145	83	25	28				

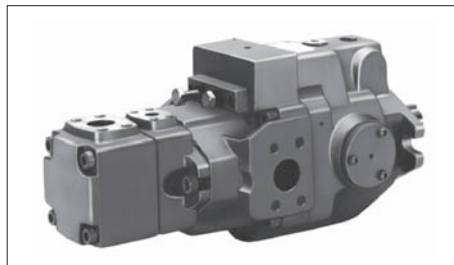
Consult Yuken when detailed material such as dimensions figures is required.

Model Number Designation

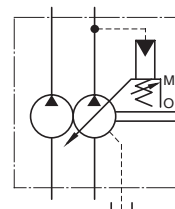
A1637	-F	-R	Outboard Pump		Inboard Pump (Driven End)		S	K	-32	
			01	C	01	C				
Series Number	Mounting	Direction of Rotation	Control Type	Pres. Adj. Range MPa	Control Type	Pres. Adj. Range MPa	Port Position of Outboard Pump	Shaft Extension	Design Number	
A1616 (15.8/15.8 cm ³ /rev)	F: Flange Mtg.	(Viewed from Shaft End)	01: Pressure Compensator Type	B : 1.2- 7 C : 1.2-16 D : 1.2-21	01: Pressure Compensator Type	B : 1.2- 7 C : 1.2-16 D : 1.2-21	S: Side Port	K: Keyed Shaft	32	
A1622 (15.8/22.2 cm ³ /rev)				B : 1.2- 7 C : 1.2-16		32				
A2222 (22.2/22.2 cm ³ /rev)				B : 1.2- 7 C : 1.2-16		32				
A1637 (15.8/36.9 cm ³ /rev)				B : 1.2- 7 C : 1.2-16 H : 1.2-21		None: Axial Port			32	
A2237 (22.2/36.9 cm ³ /rev)				B : 1.2- 7 C : 1.2-16					32	
A1656 (15.8/56.2 cm ³ /rev)				B : 1.2- 7 C : 1.2-16 H : 1.2-21					32	
A2256 (22.2/56.2 cm ³ /rev)				B : 1.2- 7 C : 1.2-16					32	
A1670 (15.8/70.0 cm ³ /rev)				B : 1.2- 7 C : 1.2-16 H : 1.2-21					None: Keyed Shaft	60
A2270 (22.2/70.0 cm ³ /rev)				B : 1.2- 7 C : 1.2-16						60
A3770 (36.2/70.0 cm ³ /rev)				B : 1.2- 7 C : 1.2-16 H : 1.2-21						60
A1690 (15.8/91.0 cm ³ /rev)				B : 1.2- 7 C : 1.2-16 H : 1.2-21						60
A2290 (22.2/91.0 cm ³ /rev)				B : 1.2- 7 C : 1.2-16						60
A3790 (36.9/91.0 cm ³ /rev)				B : 1.2- 7 C : 1.5-16 H : 1.8-21 K : 2.0-28						60
A5690 (56.2/91.0 cm ³ /rev)				B : 1.2- 7 C : 1.2-16 H : 1.2-21						60
A16145 (15.8/145 cm ³ /rev)		60								
A22145 (22.2/145 cm ³ /rev)	B : 1.2- 7 C : 1.2-16	60								
A37145 (36.9/145 cm ³ /rev)	B : 1.2- 7 C : 1.2-16 H : 1.2-21	60								
A56145 (56.2/145 cm ³ /rev)		60								

★1. Available to supply pump with anti-clockwise rotation. Consult Yuken for details.

Series Piston Pumps – Variable / Fixed Double Pumps



Graphic Symbol



Model Number Designation

A1637	-F	-R	Inboard Pump (Driven End)		Outboard Pump			K	-32
			01	C	-23	A	A		
Series Number	Mounting	Direction of Rotation	Control Type	Pres. Adj. Range MPa	Nominal Displacement cm ³ /rev	Discharge Port Position	Suction Port Position	Shaft Extension	Design Number
A16R1	F: Flange Mtg. L: Foot Mtg.	(Viewed from Shaft End) R: Clockwise*1 (Normal)	01: Pressure Compensator Type	B: 1.2- 7 C: 1.2-16 D: 1.2-21	6, 8 10, 12 14, 17 19, 23 25, 31	(Viewed from Shaft End) A: Up	A: Up	K: Keyed Shaft	32
A22R1				B: 1.2- 7 C: 1.2-16					32
A37R1				B: 1.2- 7 C: 1.2-16 D: 1.2-21					32
A56R1				B: 1.2- 7 C: 1.2-16 D: 1.2-21					32
A70R1				B: 1.2- 7 C: 1.5-16 H: 1.8-21 K: 2.0-28					60
A90R1				B: 1.2- 7 C: 1.5-16 H: 1.8-21 K: 2.0-28					60
A145R1				B: 1.2- 7 C: 1.5-16 H: 1.8-21 K: 2.0-28					60
A70R2				B: 1.2- 7 C: 1.5-16 H: 1.8-21 K: 2.0-28					60
A90R2				B: 1.2- 7 C: 1.5-16 H: 1.8-21 K: 2.0-28					60
A145R2				B: 1.2- 7 C: 1.5-16 H: 1.8-21 K: 2.0-28					60

*1. Available to supply pump with anti-clockwise rotation. Consult Yuken for details.

Consult Yuken when detailed material such as dimensions figures is required.

Specifications

Model Numbers	Geometric Displacement cm ³ /rev	Operating Pressure MPa		Shaft Speed Range r/min		Approx. Mass kg		
		Rated	Intermittent	Max.	Min.	Flange Mtg.	Foot Mtg.	
A16R1- *R01 *-AAK-32	Outboard Pump	Refer to the following table			1800	750	28.8	31.0
	Inboard Pump	15.8	16	21				
A22R1- *R01 *-AAK-32	Outboard Pump	Refer to the following table			1800	750	28.8	31.0
	Inboard Pump	22.2	16	16				
A37R1- *R01 *-AAK-32	Outboard Pump	Refer to the following table			1800	750	39	43.3
	Inboard Pump	36.9	16	21				
A56R1- *R01 *-AAK-32	Outboard Pump	Refer to the following table			1800	750	47	51.3
	Inboard Pump	56.2	16	21				
A70R1- *R01 *-AA-60	Outboard Pump	Refer to the following table			1800	750	66	78
	Inboard Pump	70.0	25	28				
A90R1- *R01 *-AA-60	Outboard Pump	Refer to the following table			1800	750	82	105
	Inboard Pump	91.0	25	28				
A145R1- *R01 *-AA-60	Outboard Pump	Refer to the following table			1800	750	102	129
	Inboard Pump	145	25	28				
A70R2- *R01 *- *AA-60	Outboard Pump	Refer to the following table			1800	600	72.5	84.5
	Inboard Pump	70.0	25	28				
A90R2- *R01 *- *AA-60	Outboard Pump	Refer to the following table			1800	600	91.5	112
	Inboard Pump	91.0	25	28				
A145R2- *R01 *- *AA-60	Outboard Pump	Refer to the following table			1800	600	112	137
	Inboard Pump	145	25	28				

Geometric Displacement and Max. Pressure of Outboard Pump

Model Numbers	Geometric Displacement cm ³ /rev	Max Pres. MPa		
		Anti-Wear Type	R & O Type	
A *R1- *R01 *-6	5.8	21	16	
A *R1- *R01 *-8	8.0			
A *R1- *R01 *-10	9.4			
A *R1- *R01 *-12	12.2			
A *R1- *R01 *-14	13.7			
A *R1- *R01 *-17	16.6			
A *R1- *R01 *-19	18.6			
A *R1- *R01 *-23	22.7	17.5		
A *R1- *R01 *-25	25.3	15	15	
A *R1- *R01 *-31	31.0	12	12	
A *R2- *R01 *-26	26.6	21	14	
A *R2- *R01 *-33	33.3			
A *R2- *R01 *-41	41.3			
A *R2- *R01 *-47	47.2			20
A *R2- *R01 *-53	52.5			18
A *R2- *R01 *-59	58.2			16
A *R2- *R01 *-65	64.7			14