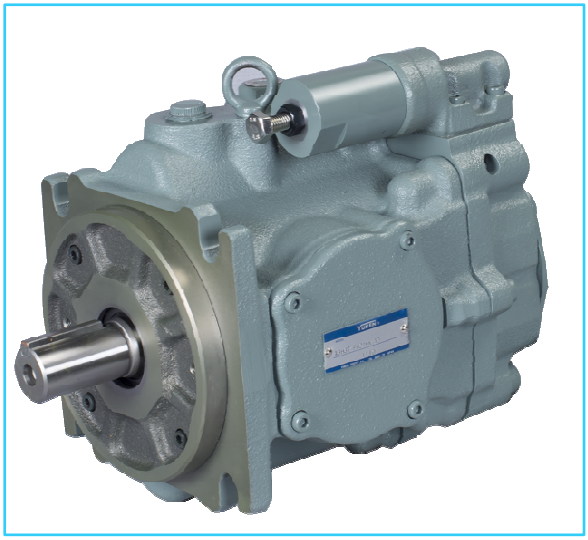
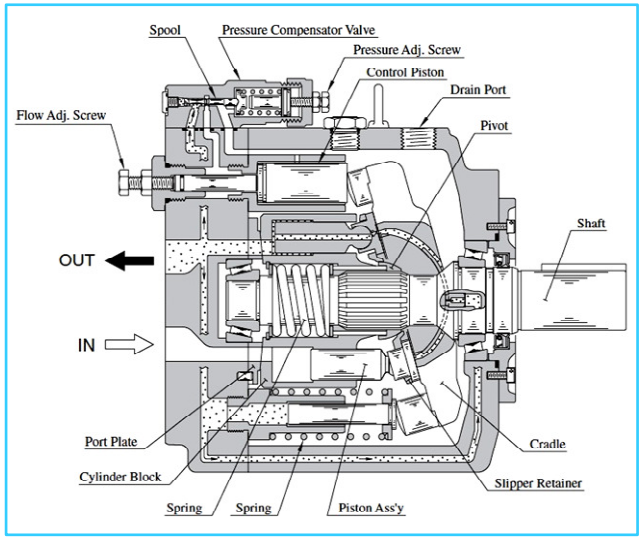
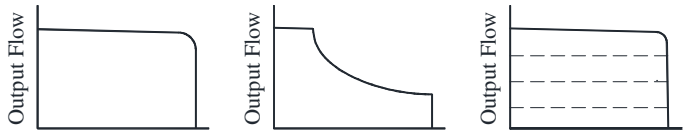
"A3H" Series High Pressure Variable Displacement Piston Pumps





Features

- **01 Control System for Wide Range Application:**



"01 "Pressure Compensator Type

* **"09" Constant Power Control Type**

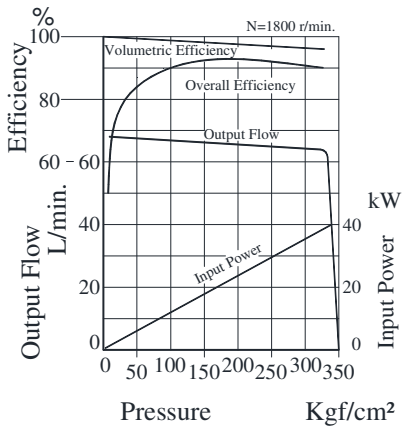
* **"14" Load Sensing Type**

* For these controls system, consult YUKEN for details.

- **Wide range of Delivery Volume**
  7 models from A3H16 to A3H180 meet the wide range of delivery volume from 16.3 to 180.7 cm^3/rev.

- **Compact Size**
  Because of output power Vs. mass ratio is high , A3H - Series pumps could be designed in quite small size.

- High Performance to meet 350 Kgf/cm^2 of max. operating pressure.
  Case for A3H37 under the condition of pressure 350 Kgf/cm^2 and shaft speed 1800 r/min, the volumetric efficiency is 95% (or above) and the overall efficiency is 90% (or above).



Instructions

Hydraulic Fluids.

Use petroleum base oils such as anti-wear type hydraulic oils or R & O (Rust and oxidation inhibitor) type hydraulic oils (ISO VG 32 or 46) with a viscosity range of 20 to 400 cSt at temperature of 0-60^{0}C both to be satisfied.

Control of contamination.

Much care should be taken to maintain control over contamination of the operating oil which can otherwise lead to breakdown and shorten the life of the unit. Please maintain the degree of contamination within NAS Grade 10.

The suction port must be equipped with at least a 100 µm (150 mesh) reservoir type filter and the return line must have a line type filter of under 10 µm.

Mounting.

When installing the pump the filling port should be positioned upwards.

Alignment of Shaft.

Employ a flexible coupling whenever possible, and avoid any stress from bending or thrust.

Maximum permissible misalignment is less than 0.1mm TIR and maximum permissible misangularity is less than 0.2^0.

Suction Pressure.

Permissible suction pressure at suction port of the pump is between -0.16 and +0.5 Kgf/cm^2 (-125 mm Hg~+0.5 Kgf/cm^2). For piping to the suction port, use pipes of the same diameter as that of the specified pipe flange. Make sure that the height of the pump suction port is within one meter from the oil level in the reservoir.

Hints on Piping.

When using steel piping for the suction or discharge ports, excessive load from the piping on the pump generates excessive noise. Whenever there is fear of excessive load, please use rubber hoses.

Suction Piping.

In case the pump is installed above the oil level, the suction piping and suction line filter should be located lower than the pump position to prevent air in the suction line.

Drain Piping.

Install drain piping according to the chart and ensure that pressure within the pump housing should be maintained at a normal Pressure of less than 1 Kgf/cm^2 and surge pressure of less than 5 Kgf/cm^2.

Length of piping should be less than 1m, and the pipe end should be submerged in oil.

Recommended Drain Piping Size.

Model Number	Fitting Size	Inside Dia. of Pipe
A3H16, A3H37	1/2" (Inside dia. 12 mm or more)	12 mm
A3H56, A3H71, A3H100, A3H145, A3H180	3/4" (Inside dia. 16 mm or more)	19 mm

Safety valve

When delivery line is blocked suddenly, surge pressure is occurred so a relief valve should be set in the circuit to eliminate any damage on equipment and piping.

Bleeding Air.

It may be necessary to bleed air from pump case and outlet line to remove causes of vibration.

Starting.

Before starting, first fill the pump case with clean operating oil through the fill port. In order to avoid air blockage when first starting, adjust the control valves so that the discharged oil from the pump is returned directly to the tank or the actuator moves in a free load.

[Volume of Pre-Fill Oil Required]

Model Number	Volume cm^3
A3H16	400
A3H37	700
A3H56	900
A3H71	1300
A3H100	1700
A3H145	2400
A3H180	3200

Setting Discharge Pressure and Delivery

At the time of Despatch, the unit has been preset to the maximum delivery and minimum discharge pressure.
Adjust the preset delivery and pressure to meet your system requirements.

- **Adjustment of Discharge Pressure**
  Turing the adjustment screw clockwise, increases pressure.

[Pressure adjusted by each one turn of the pressure adjustment screw]

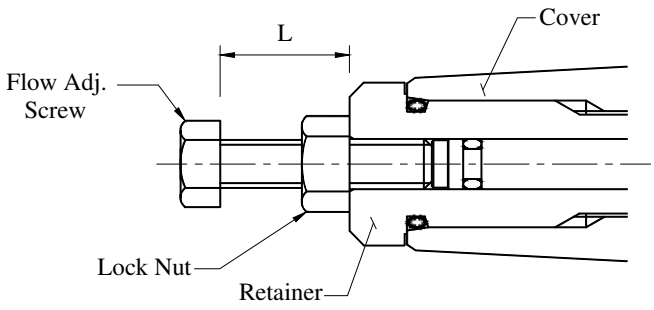
Model Numbers	Adjustment Pressure Kgf/cm^2
A3H16, A3H37, A3H56-01	55
A3H71, A3H100, A3H145-01	63
A3H180-01	57

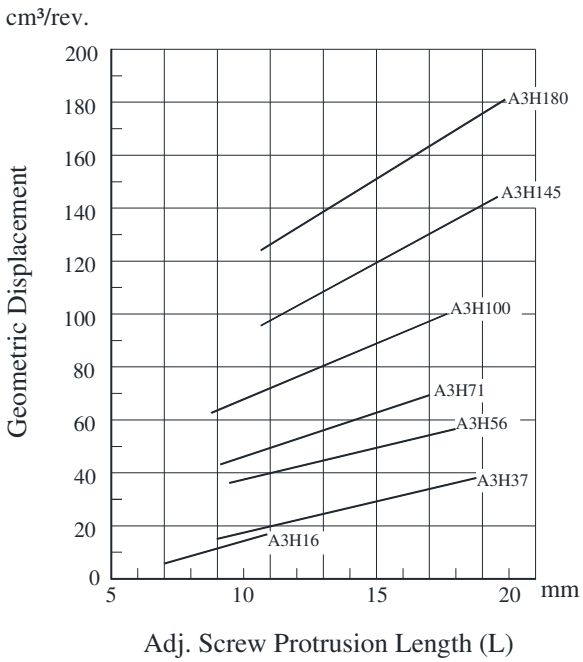
- **Adjustment of Delivery**
  Turning the delivery adjustment screw clockwise, decreases delivery.
  Lock the screw after adjustment.

[The minimum adjustable flow and adjustable volume of each full turn of the delivery adjustment screw]

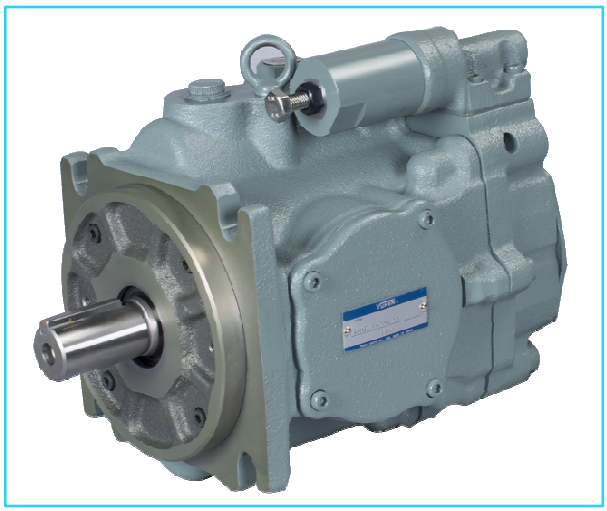
Model Numbers	Adjustable volume with each full turn of the adjustment screw cm^3/rev.	Minimum adjustment flow cm^3/rev.
A3H16	1.4	8
A3H37	3.3	16
A3H56	4.2	35
A3H71	4.9	45
A3H100	6.2	63
A3H145	9.4	95
A3H180	10.3	125

Flow Adj. Screw Protrusion length 'L'Vs Geometric Displacement (Reference)

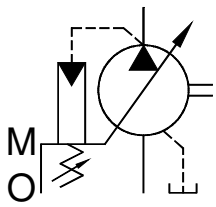




"A3H" Series Variable Displacement Piston Pumps-Single pump, Pressure Compensator type



Graphic Symbol



Specifications

Model Number	Geometric Displacement cm^3/rev.	Min Adj. Flow cm^3/rev.	Operating Pressure Kgf/cm^2		Shaft Speed r/min.		Approx. Mass Kg.	
			Rated *1	Intermittent	Max. *2	Min.	Flange Mounting	Foot Mounting
A3H16-※R01KK-10	16.3	8.0	280	350	3600	600	14.5	23.4
A3H37-※R01KK-10	37.1	16.0			2700	600	19.5	27.0
A3H56-※R01KK-10	56.3	35.0			2500	600	25.7	33.2
A3H71-※R01KK-10	70.7	45.0			2300	600	35.0	42.5
A3H100-※R01KK-10	100.5	63.0			2100	600	44.6	72.6
A3H145-※R01KK-10	145.2	95.0			1800	600	60.0	88.0
A3H180-※R01KK-10	180.7	125.0			1800	600	70.4	98.4

*1 Consult YUKEN when pump is used over rated pressure because, there is a restriction on operating condition.

*2 The Max. shaft speeds shown in the above table are at suction pressure 0 Kgf/cm^2.

*3 The table above shows specifications for using Petroleum based oils.

Model Number Designation

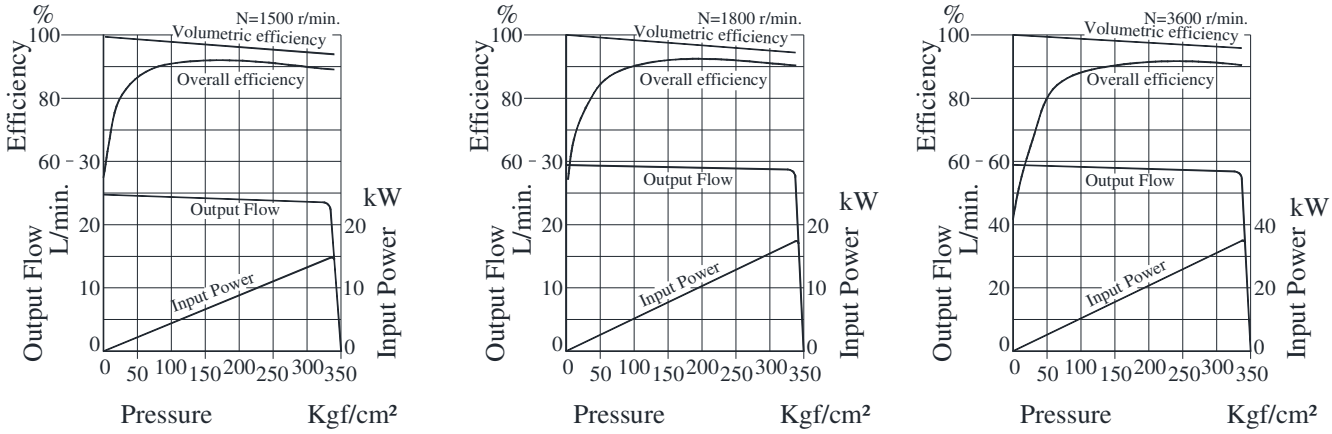
A3H16	-F	R	01	K	K	-10
Series Number	Mounting	Direction of Rotation	Control Type	Pressure Adj. Range Kgf/cm^2	Shaft*2 Extension	Design Number
A3H16 (16.3cm^3/rev.)	**F :** Flange Mounting	(Viewed from Shaft End)	**01 :** Pressure Compensator Type	**K:** 50~350	**K:** Keyed Shaft	**10**
A3H37 (37.1cm^3/rev.)						
A3H56 (56.3cm^3/rev.)						
A3H71 (70.7 cm^3/rev.)						
A3H100 (100.5cm^3/rev.)	**L :** Foot Mounting	**R :** Clockwise*1 (Normal)				
A3H145 (145.2cm^3/rev.)						
A3H180 (180.7cm^3/rev.)						

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

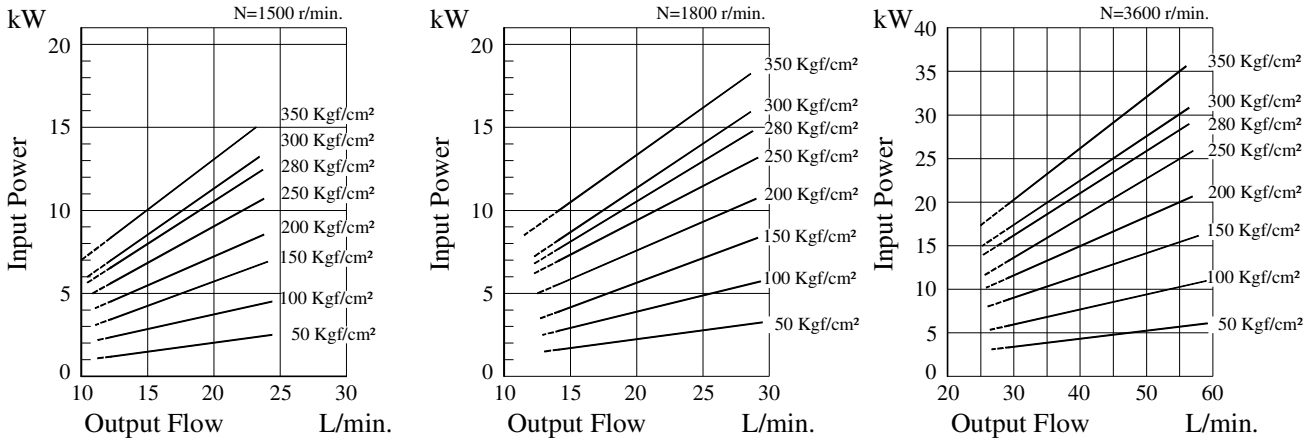
*2 We are also supplying spline-type shaft extension. Consult YUKEN for details.

Typical Performance Characteristics of "A3H16" Oil Viscosity 32 cSt [ISO VG 32, 40°C]

Performance Characteristics Curve

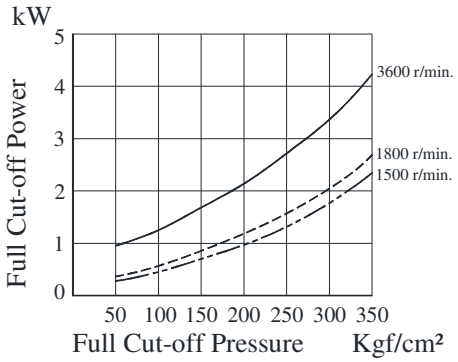


Input Power

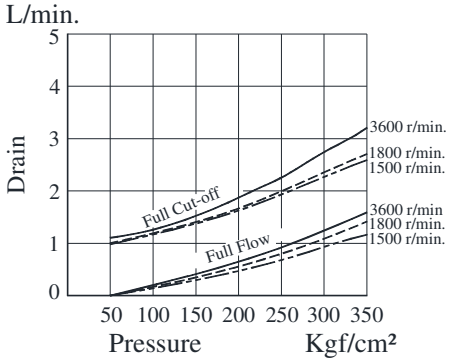


Note: The dotted line in the graph indicates less than minimum adjustable flow.

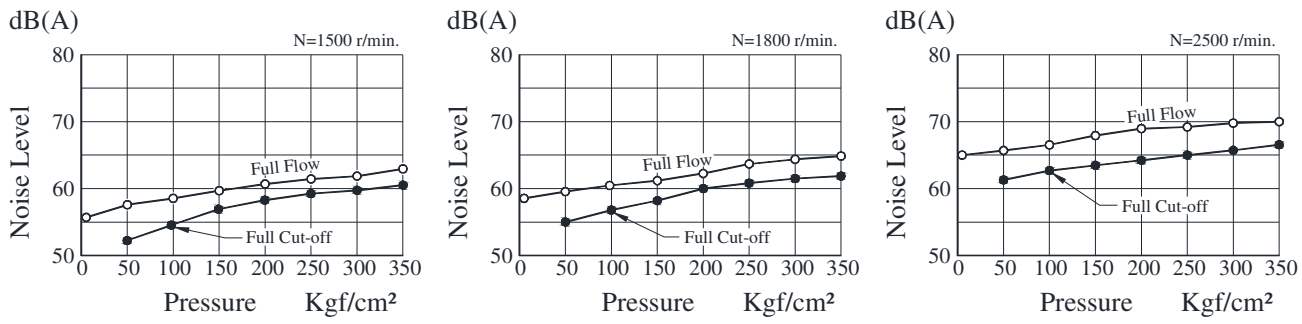
Full Cut-off Power



Drain

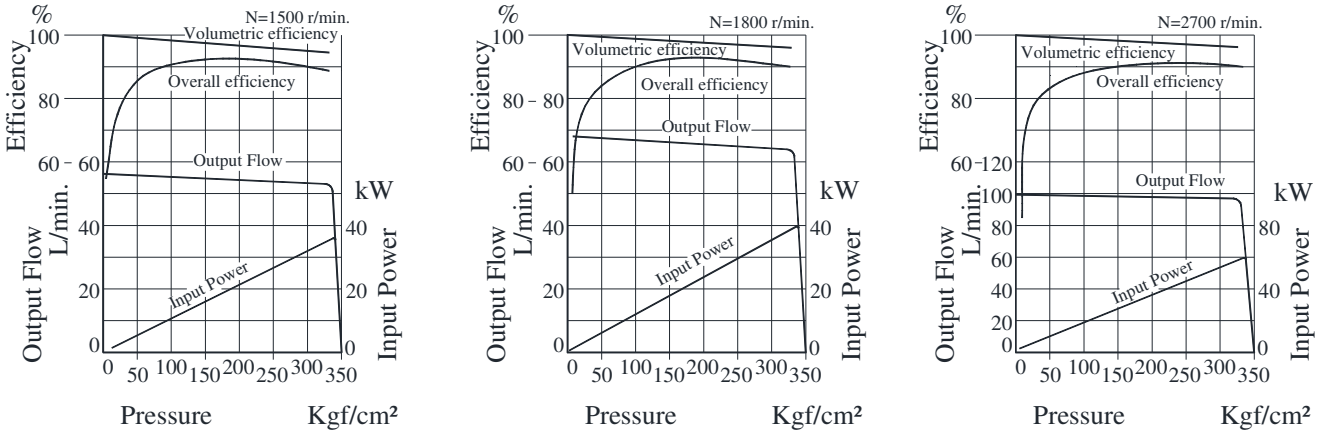


Noise Level (dB): [One meter horizontally away from pump head cover]

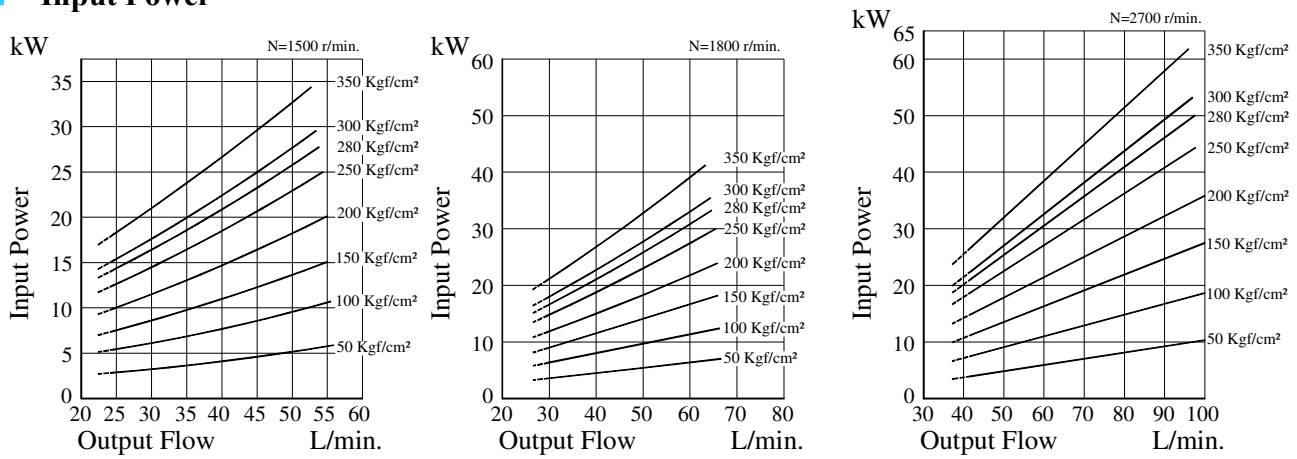


Typical Performance Characteristics of **"A3H37"** Oil Viscosity 32 cSt [ISO VG 32, 40°C]

Performance Characteristic Curve

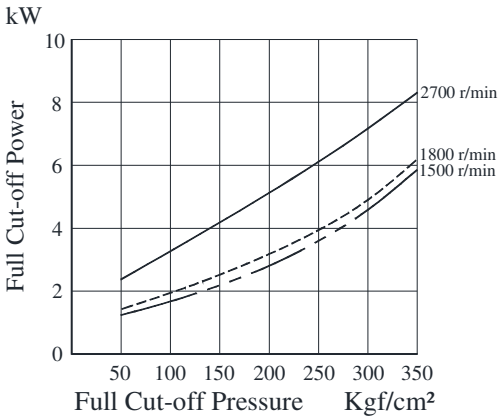


Input Power

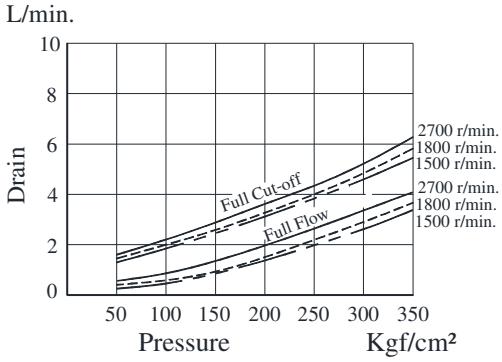


Note: The dotted line in the graph indicates less than minimum adjustable flow.

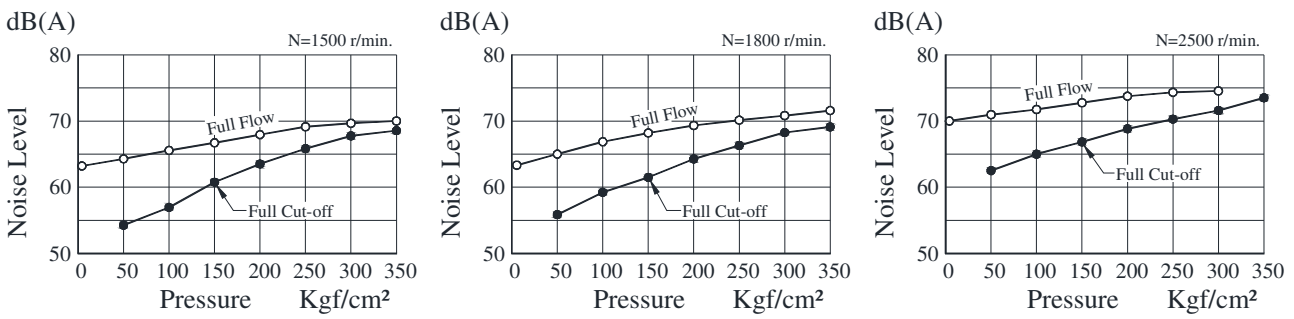
Full Cut-off Power



Drain

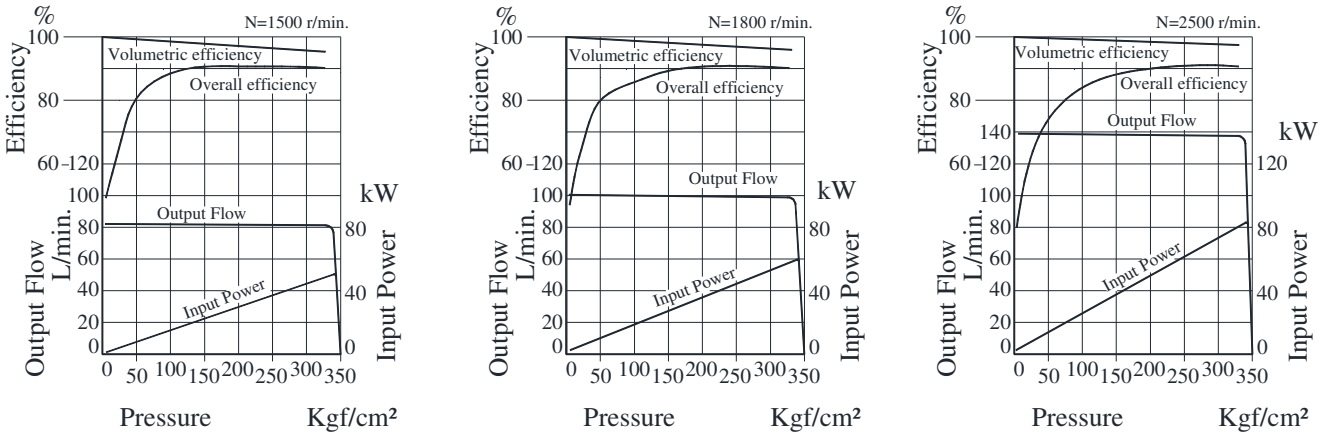


Noise Level (dB): [One meter horizontally away from pump head cover]

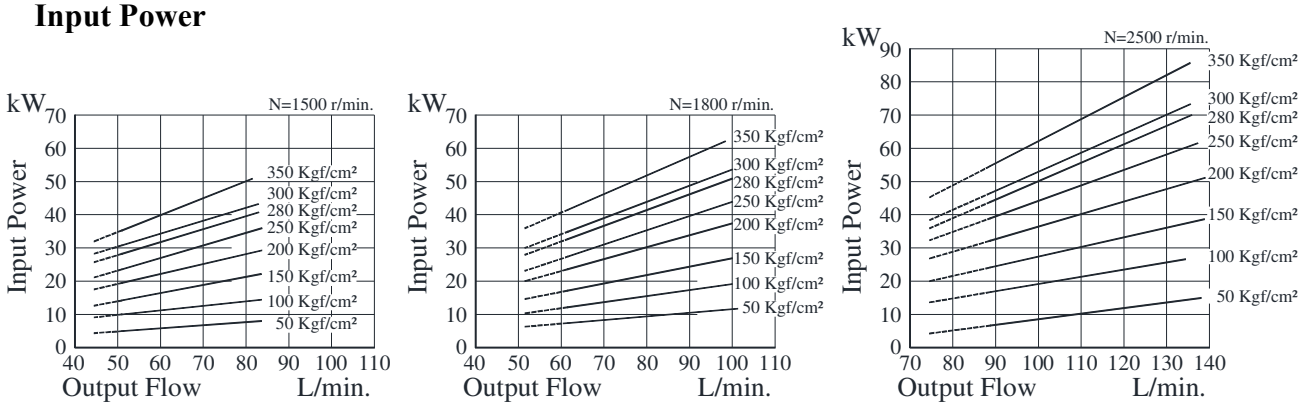


Typical Performance Characteristics of **"A3H56"** Oil Viscosity 32 cSt [ISO VG 32, 40°C]

Performance Characteristic Curve

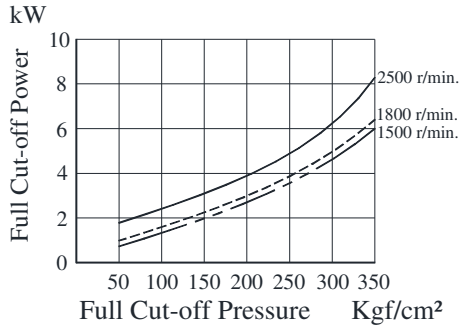


Input Power

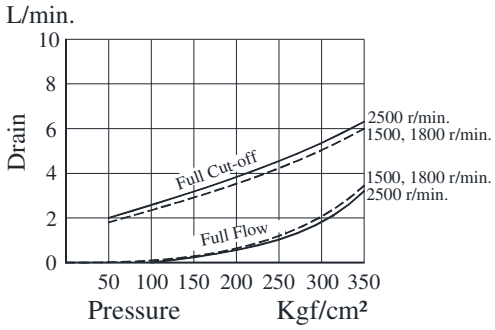


Note: The dotted line in the graph indicates less than minimum adjustable flow.

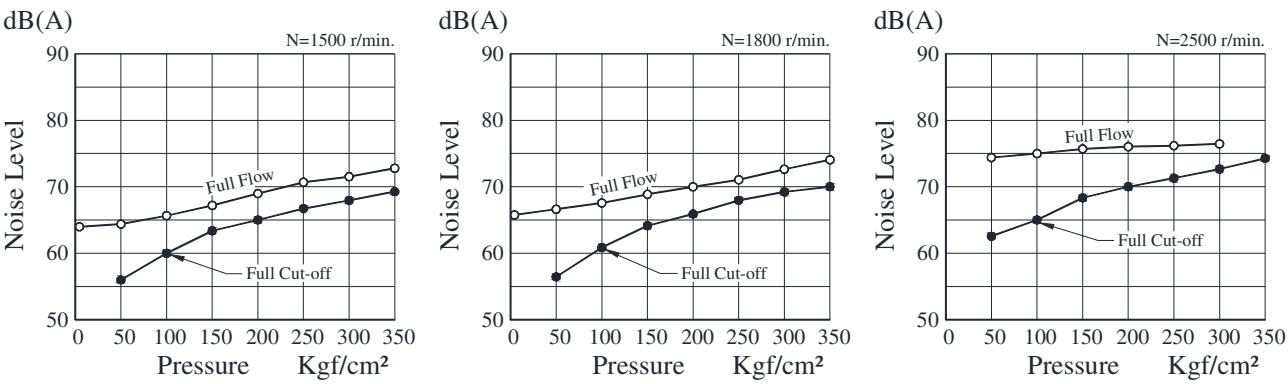
Full Cut-off Power



Drain

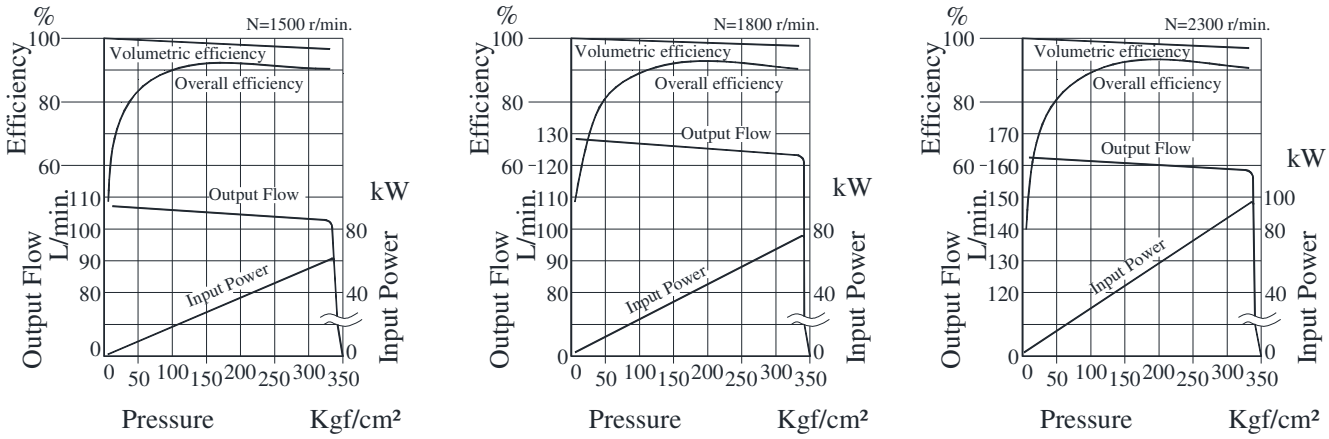


Noise Level (dB): [One meter horizontally away from pump head cover]

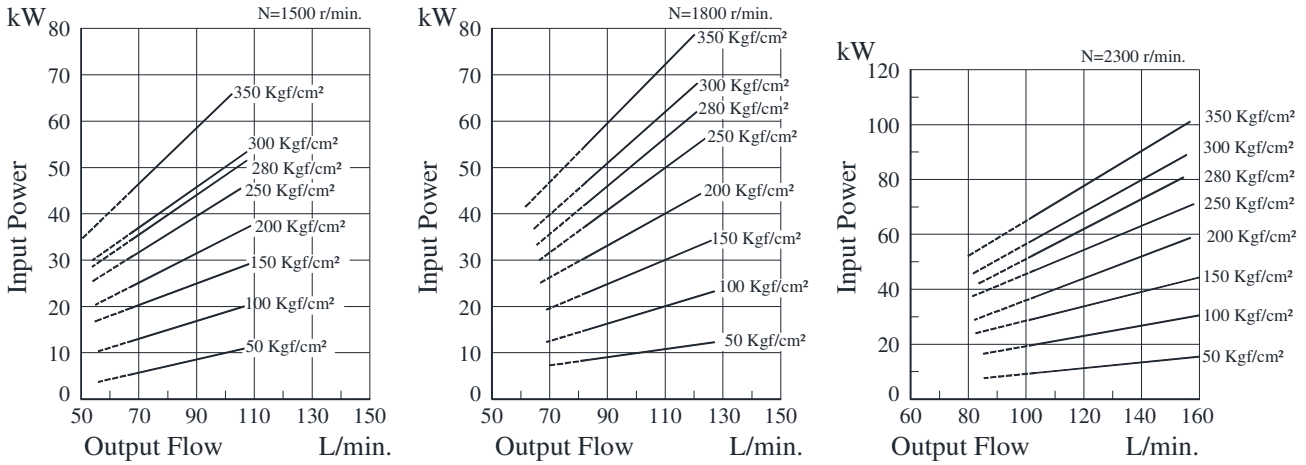


Typical Performance Characteristics of **"A3H71"** Oil Viscosity 32 cSt [ISO VG 32, 40°C]

Performance Characteristic Curve

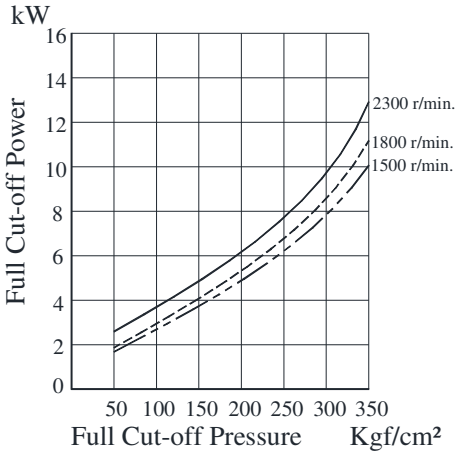


Input Power

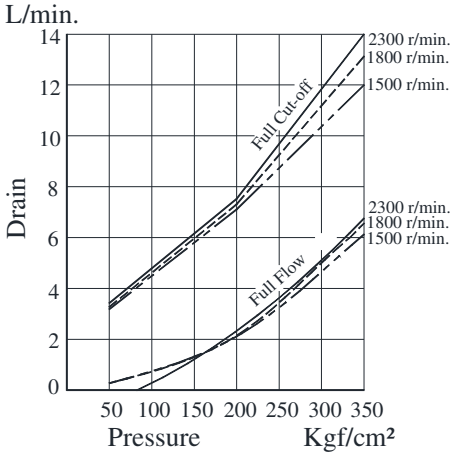


Note: The dotted line in the graph indicates less than minimum adjustable flow.

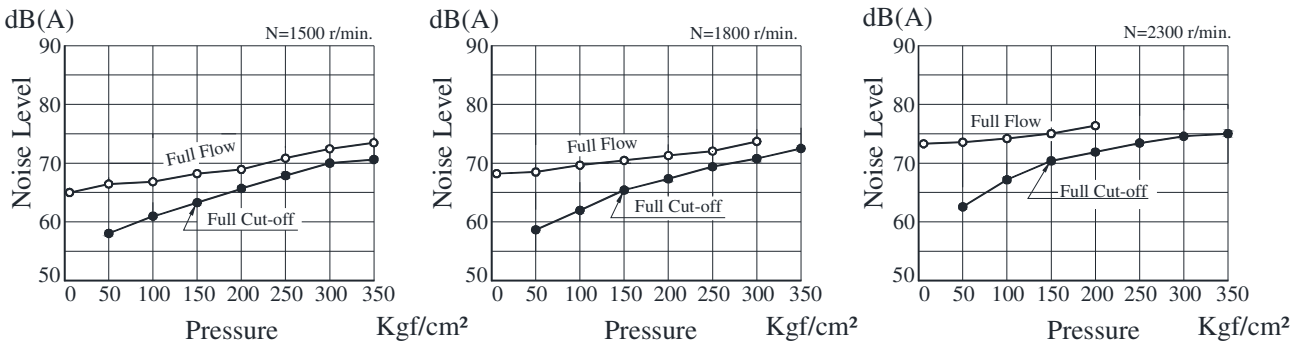
Full Cut-off Power



Drain

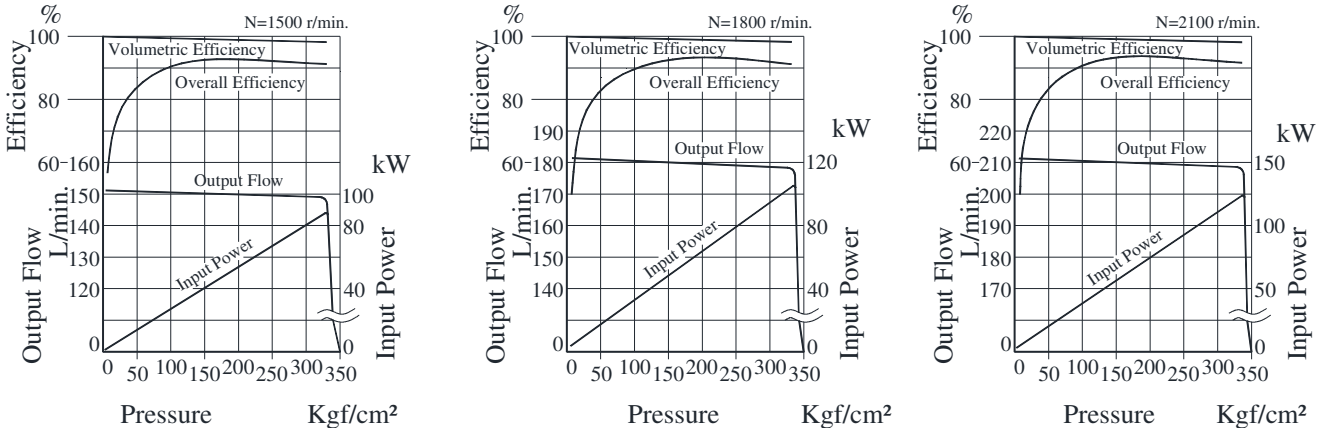


Noise Level (dB): [One meter horizontally away from pump head cover]

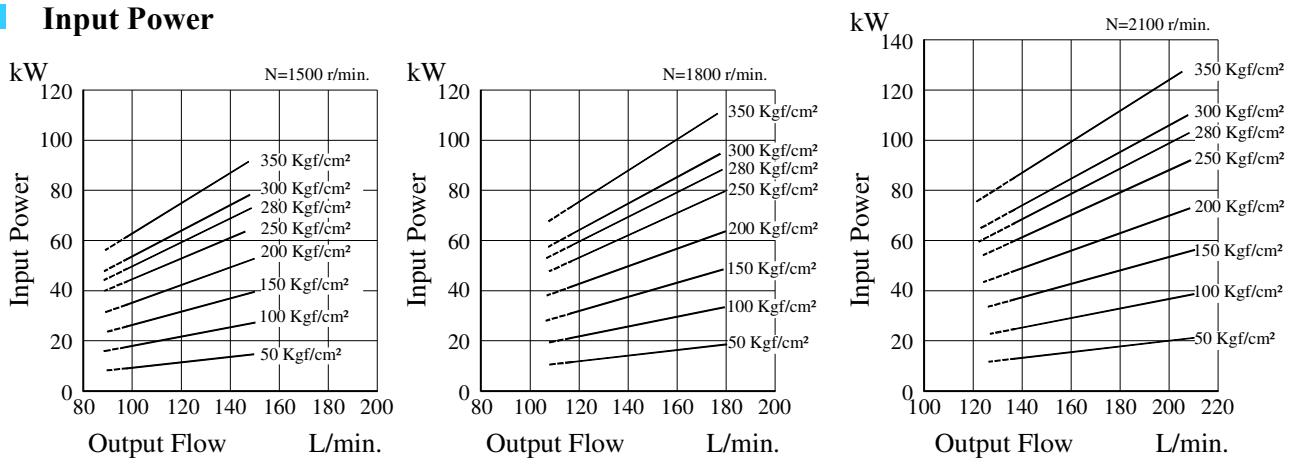


Typical Performance Characteristics of **"A3H100"** Oil Viscosity 32 cSt [ISO VG 32, 40°C]

Performance Characteristic Curve

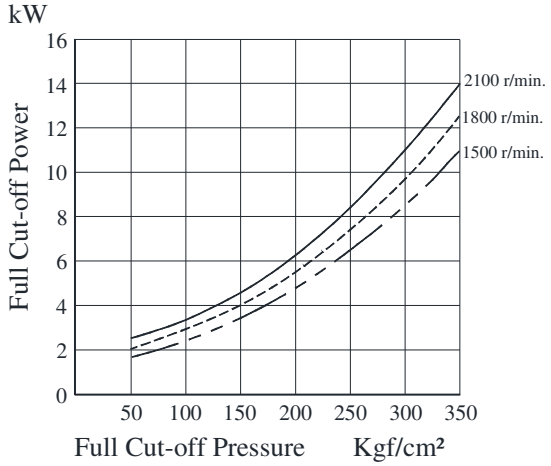


Input Power

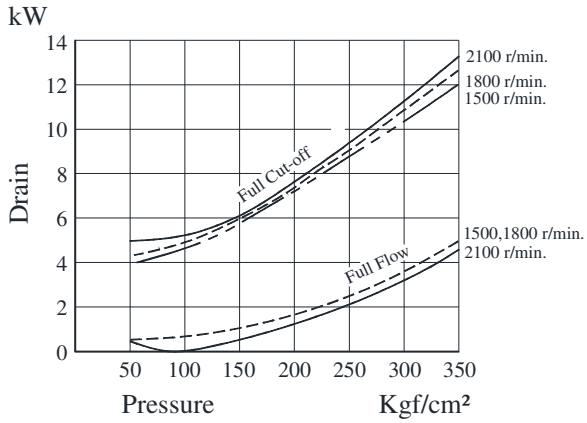


Note: The dotted line in the graph indicates less than minimum adjustable flow.

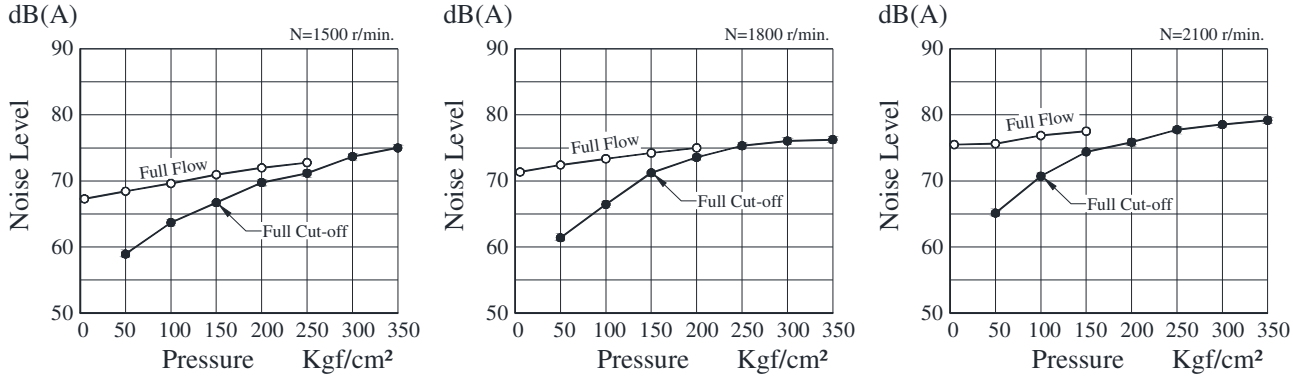
Full Cut-off Power



Drain

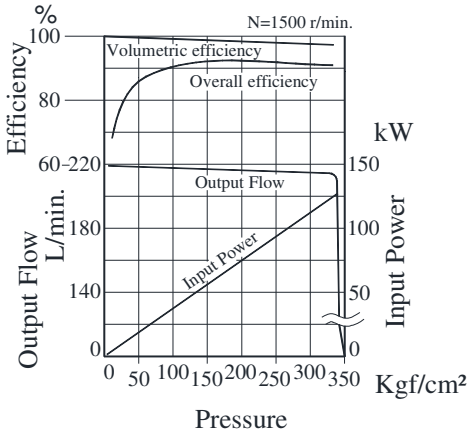


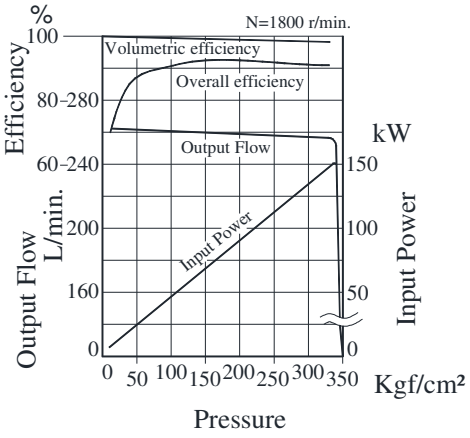
Noise Level (dB): [One meter horizontally away from pump head cover]



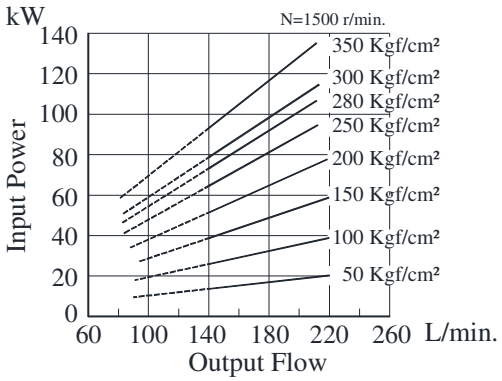
Typical Performance Characteristics of **"A3H145"** Oil Viscosity 32 cSt [ISO VG 32, 40^{0}C]

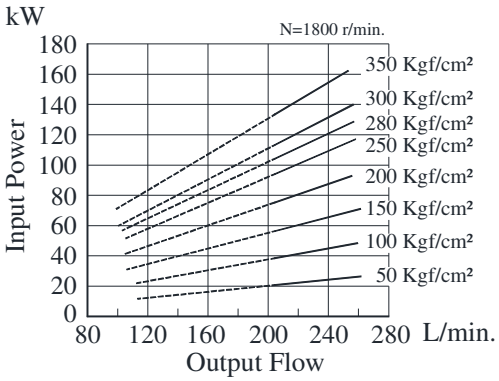
Performance Characteristic Curve





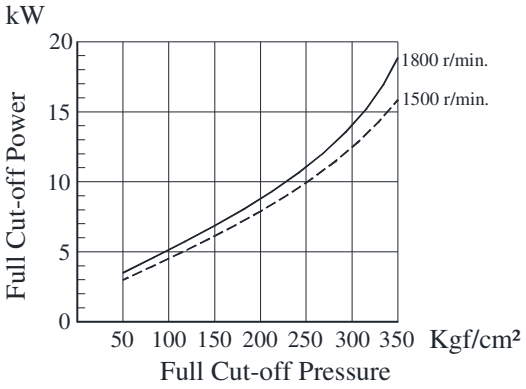
Input Power



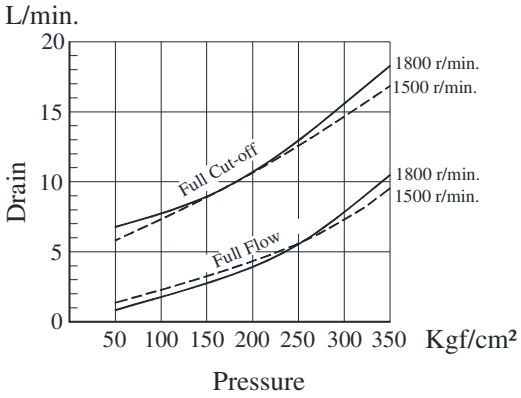


Note: The dotted line in the graph indicates less than minimum adjustable flow.

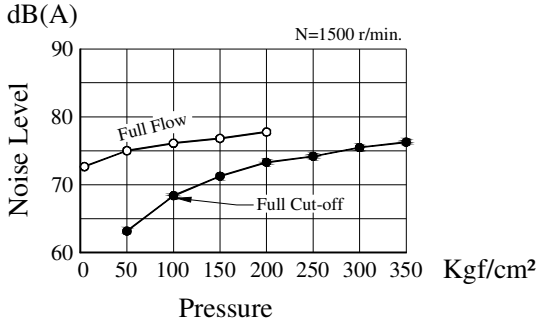
Full Cut-off Power

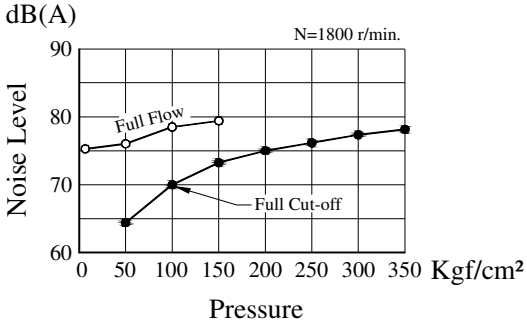


Drain



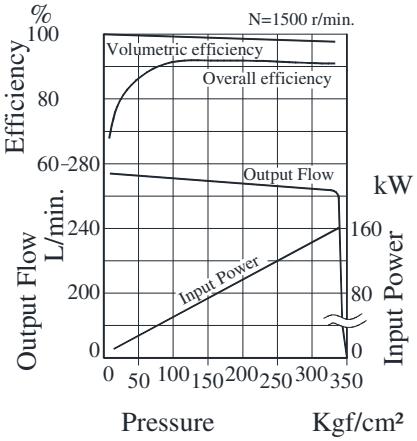
Noise Level (dB): [One meter horizontally away from pump head cover]

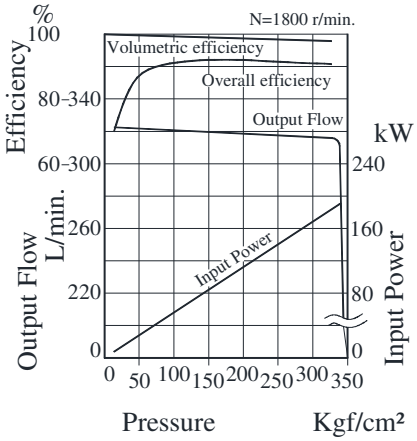




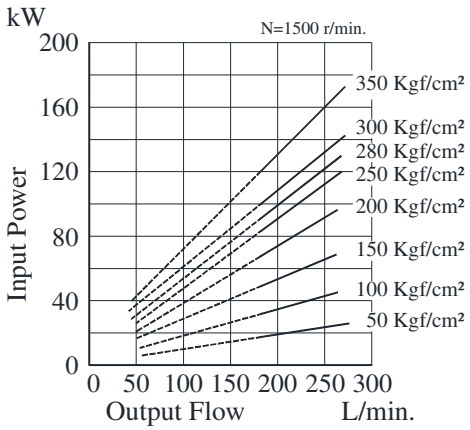
Typical Performance Characteristics of "A3H180" Oil Viscosity 32 cSt [ISO VG 32, 40°C]

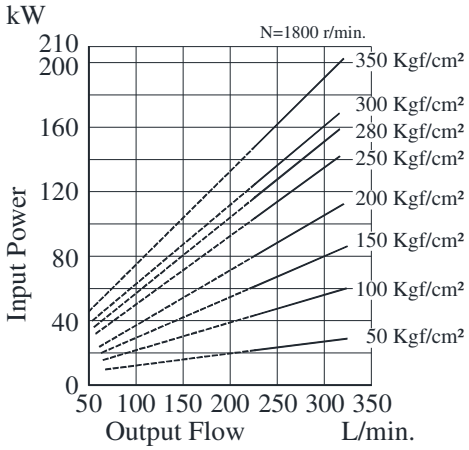
Performance Characteristic Curve





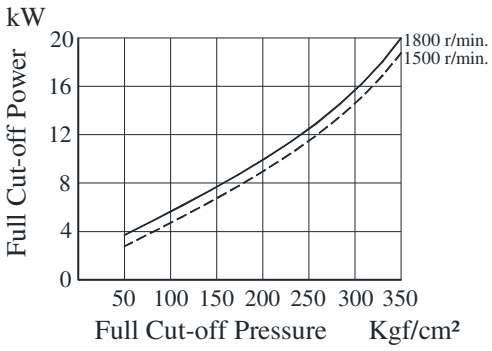
Input Power



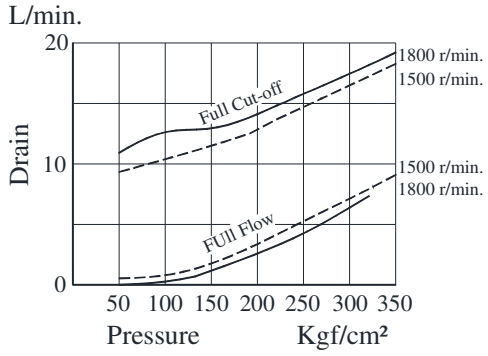


Note: The dotted line in the graph indicates less than minimum adjustable flow.

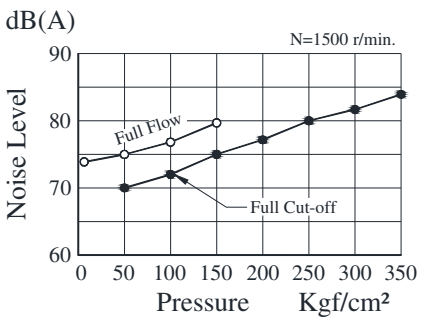
Full Cut-off Power

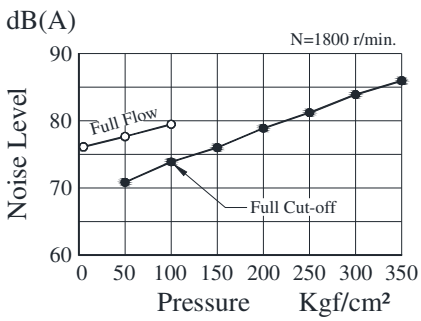


Drain



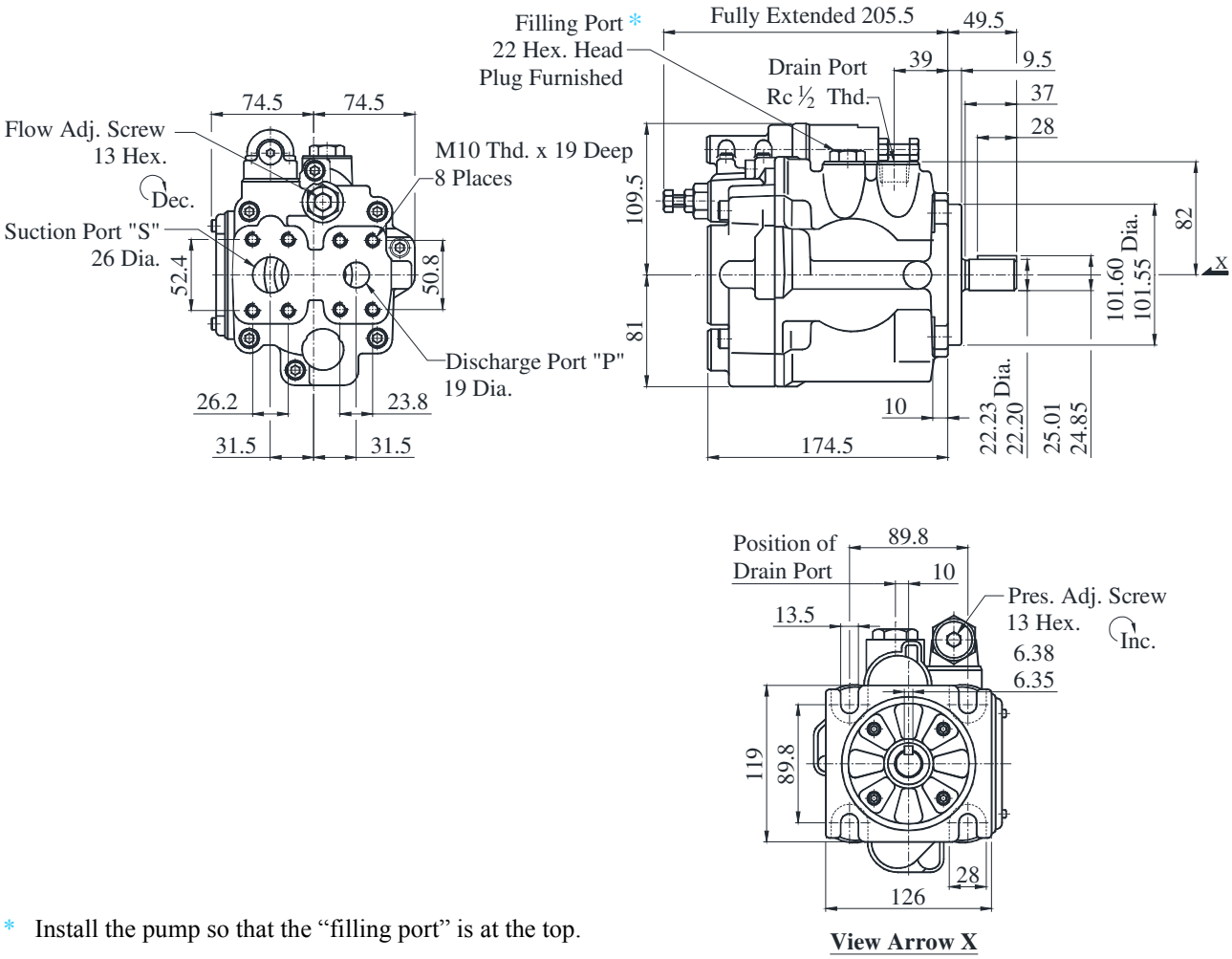
Noise Level (dB): [One meter horizontally away from pump head cover]





A3H16-FR01KK-10

- **Flange Mounting**



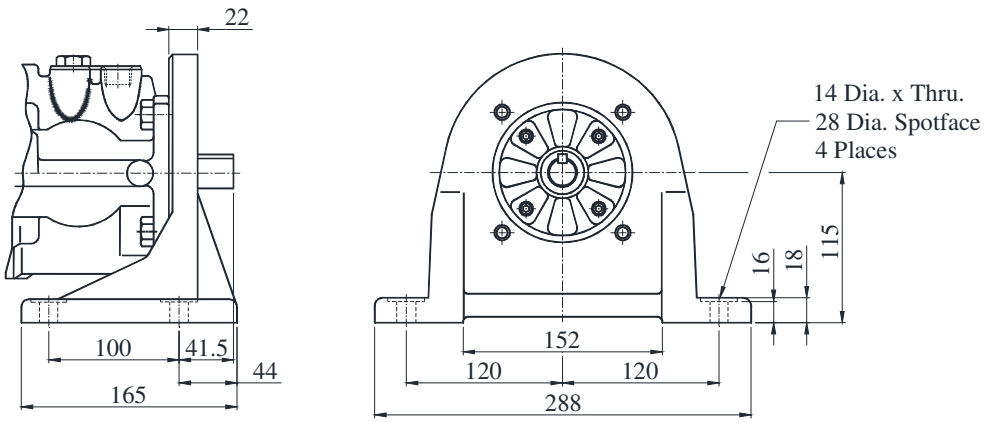
View Arrow X

* Install the pump so that the "filling port" is at the top.

DIMENSIONS IN MILLIMETRES

A3H16-LR01KK-10

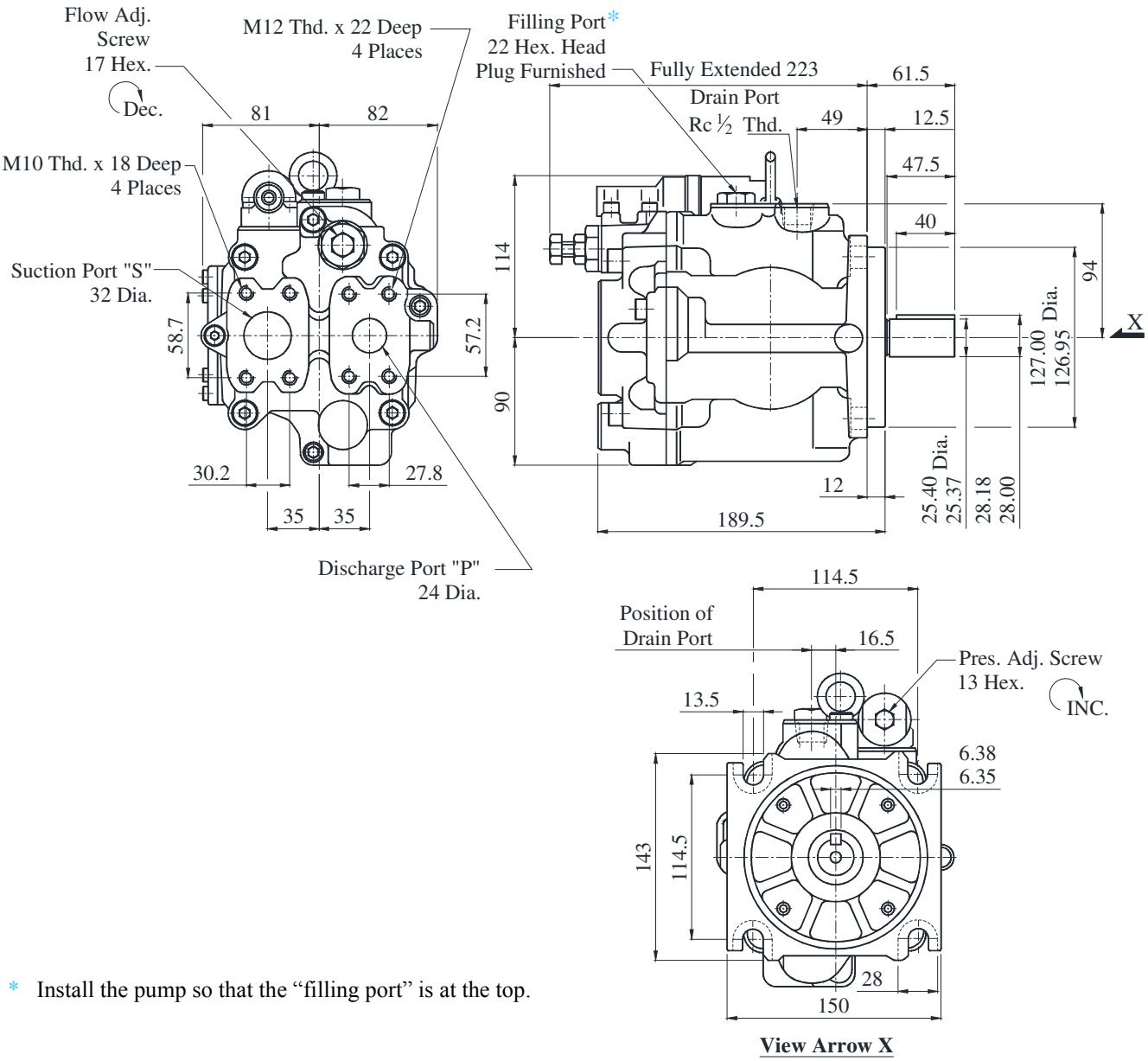
- **Foot Mounting**



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

A3H37-FR01KK-10

- **Flange Mounting**



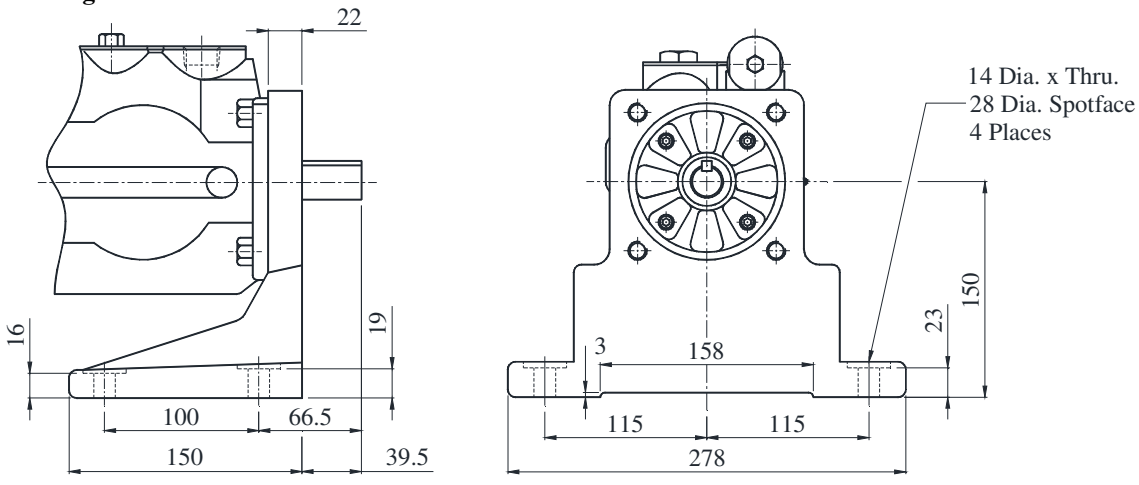
View Arrow X

* Install the pump so that the "filling port" is at the top.

A3H37-LR01KK-10

DIMENSIONS IN MILLIMETRES

- **Foot Mounting**

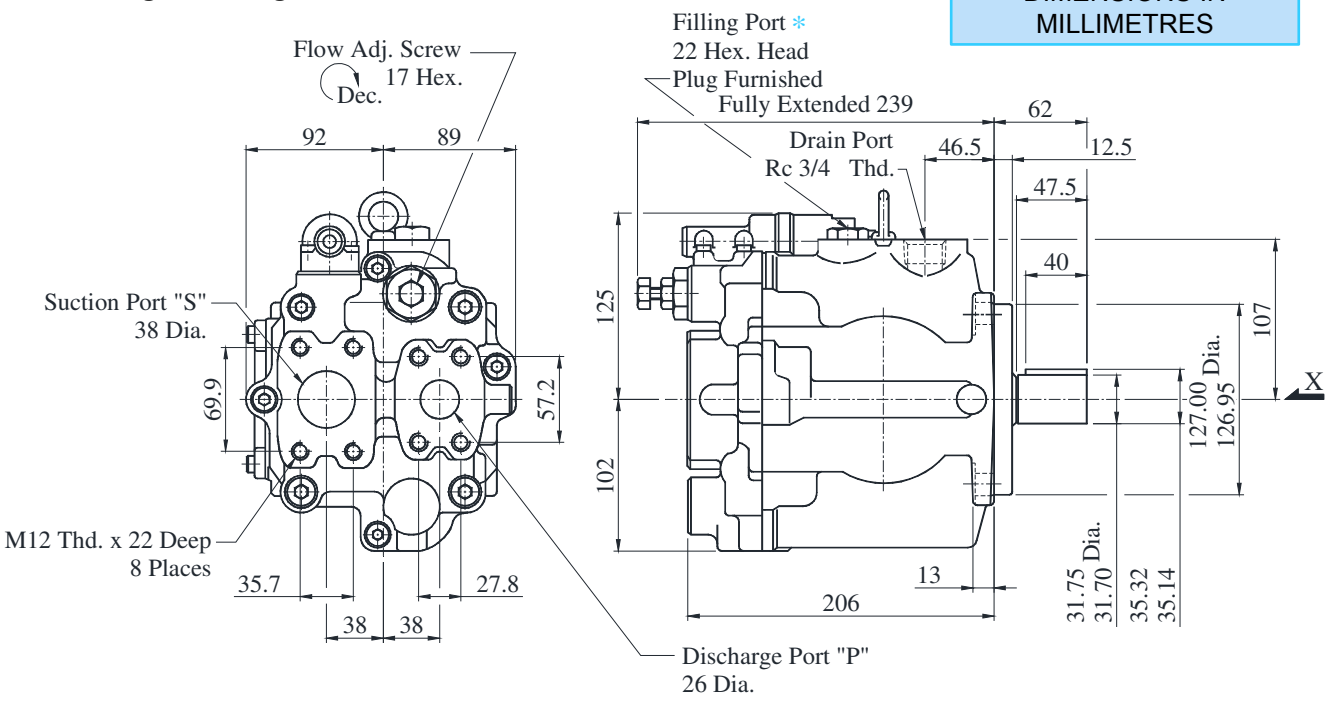


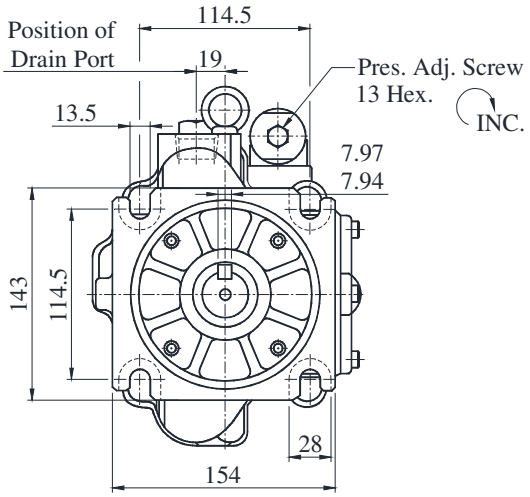
- For other dimensions, refer to "Flange Mtg".

A3H56-FR01KK-10

- **Flange Mounting**

DIMENSIONS IN MILLIMETRES



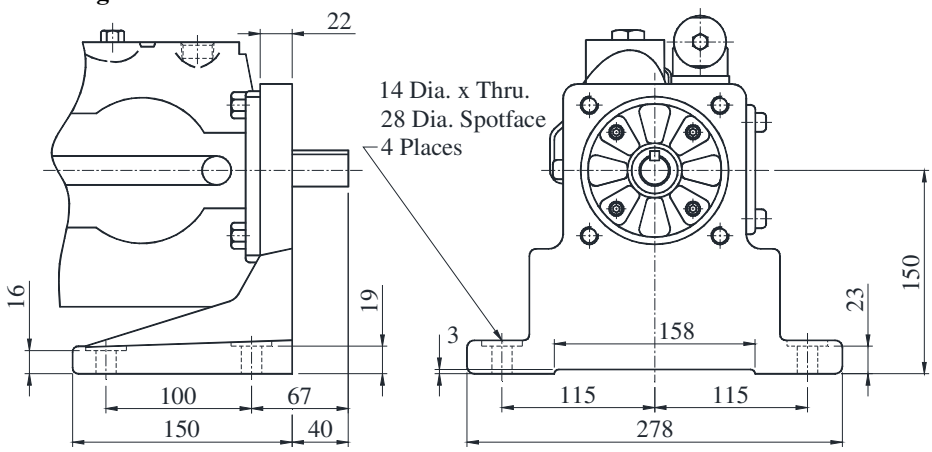


View Arrow X

* Install the pump so that the “filling port” is at the top.

A3H56-LR01KK-10

- **Foot Mounting**

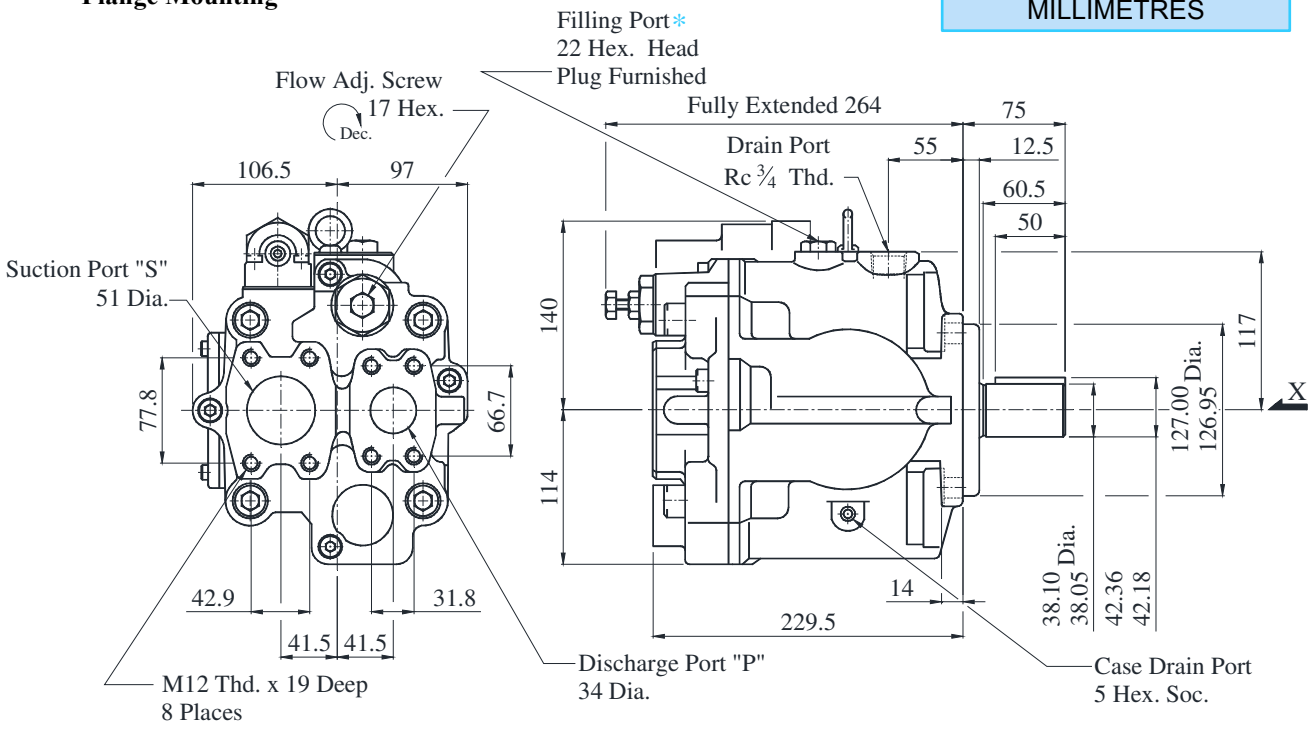


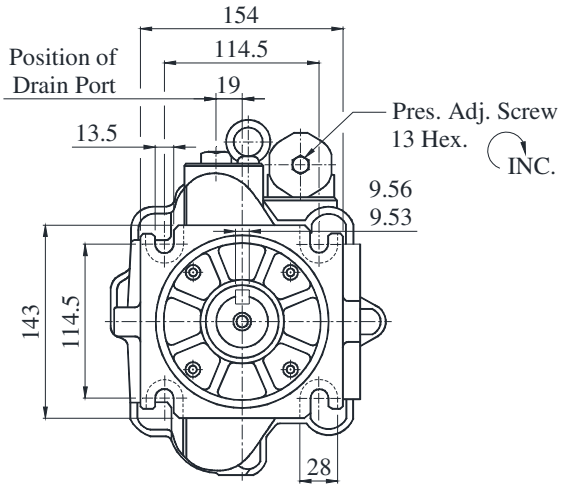
- For other dimensions, refer to “Flange Mtg”.

A3H71-FR01KK-10

DIMENSIONS IN MILLIMETRES

- **Flange Mounting**



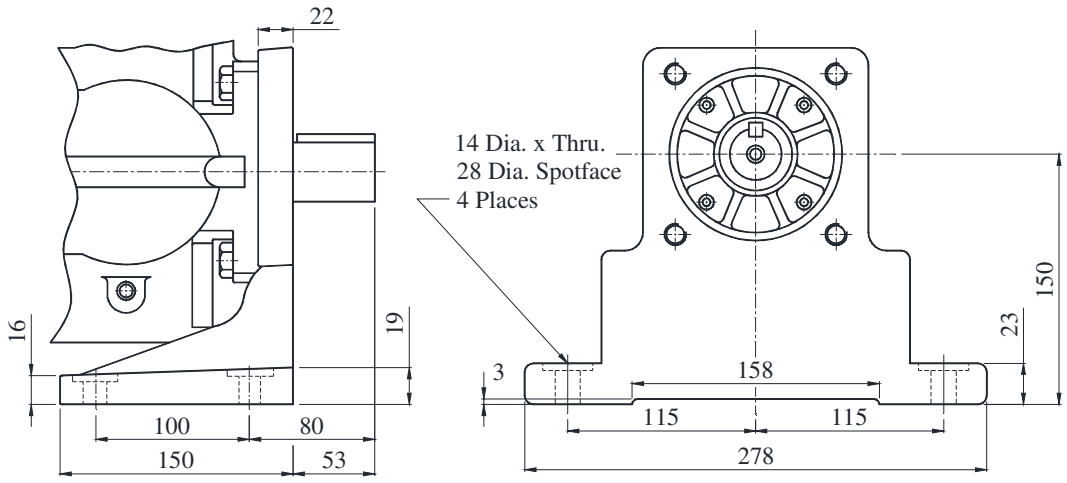


View Arrow X

* Install the pump so that the "filling port" is at the top.

A3H71-LR01KK-10

- **Foot Mounting**

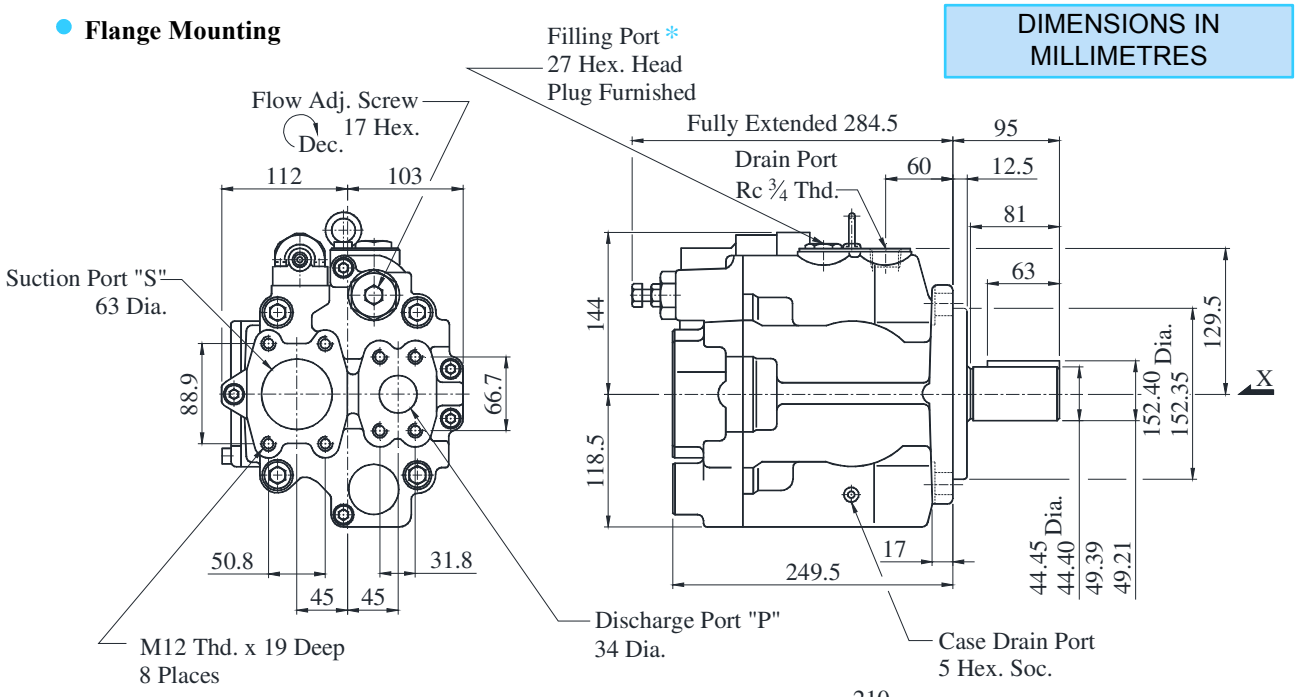


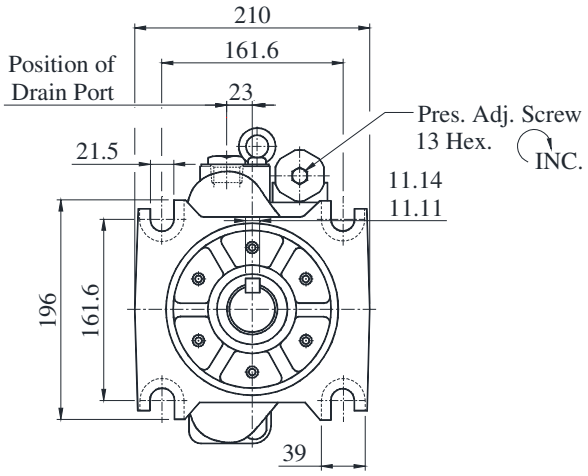
- For other dimensions, refer to "Flange Mtg".

A3H100-FR01KK-10

- **Flange Mounting**

DIMENSIONS IN MILLIMETRES



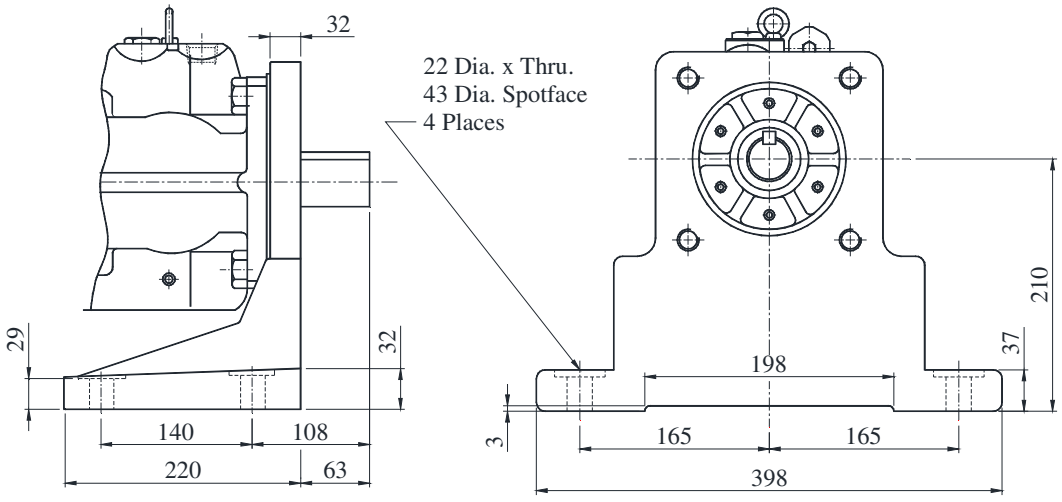


View Arrow X

* Install the pump so that the “filling port” is at the top.

A3H100-LR01KK-10

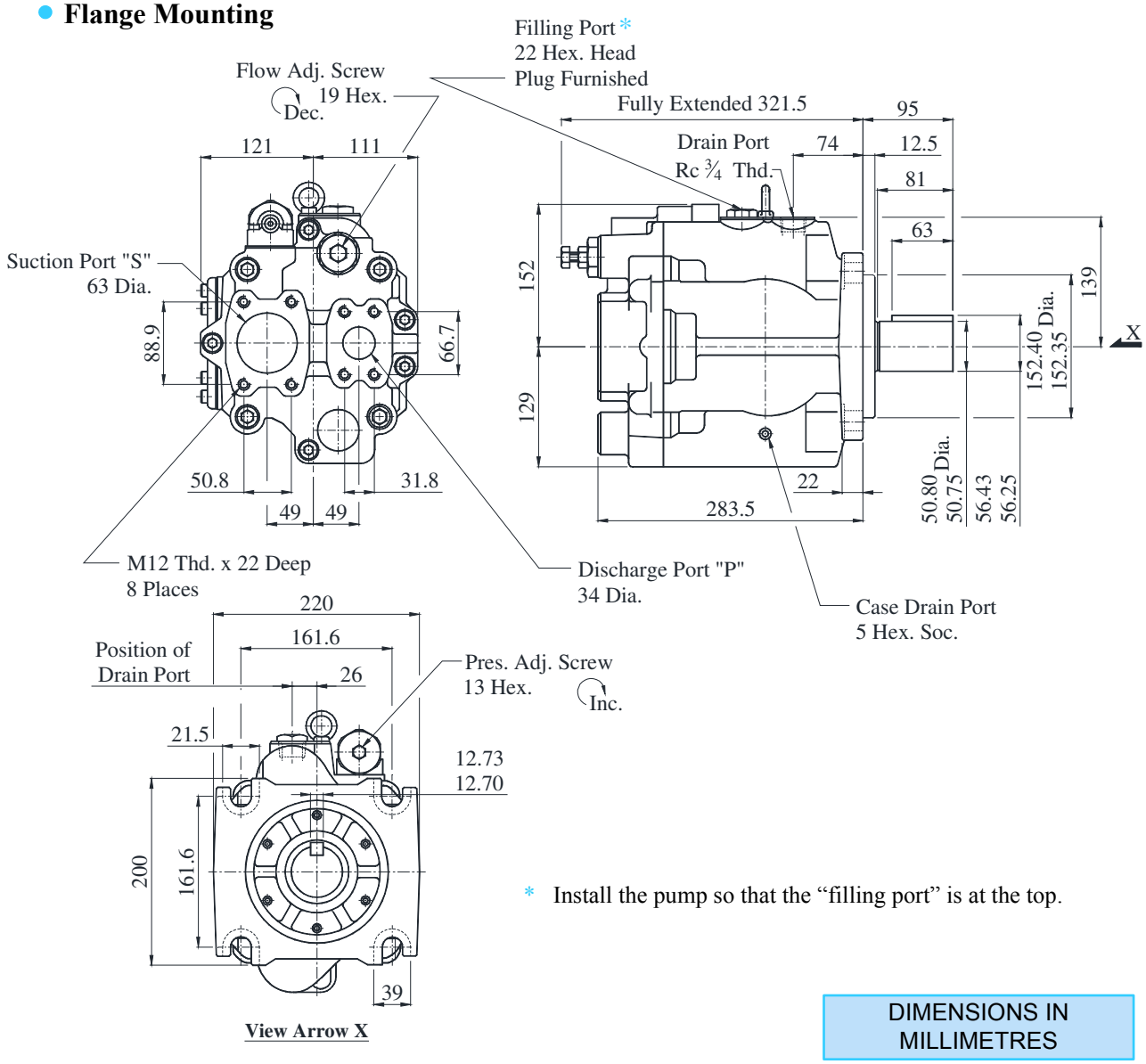
- **Foot Mounting**



- For other dimensions, refer to “Flange Mtg”.

A3H145-FR01KK-10

Flange Mounting



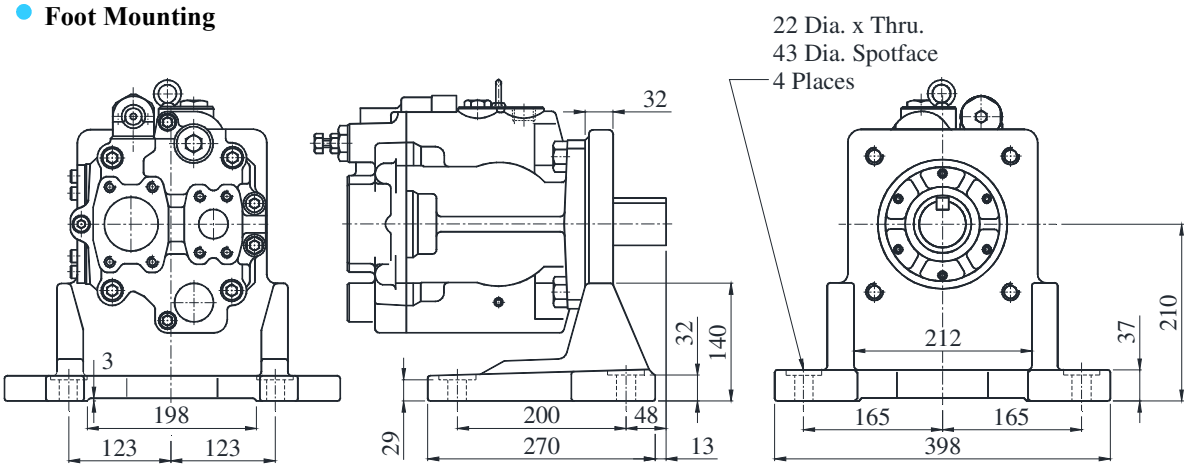
View Arrow X

* Install the pump so that the "filling port" is at the top.

DIMENSIONS IN MILLIMETRES

A3H145-LR01KK-10

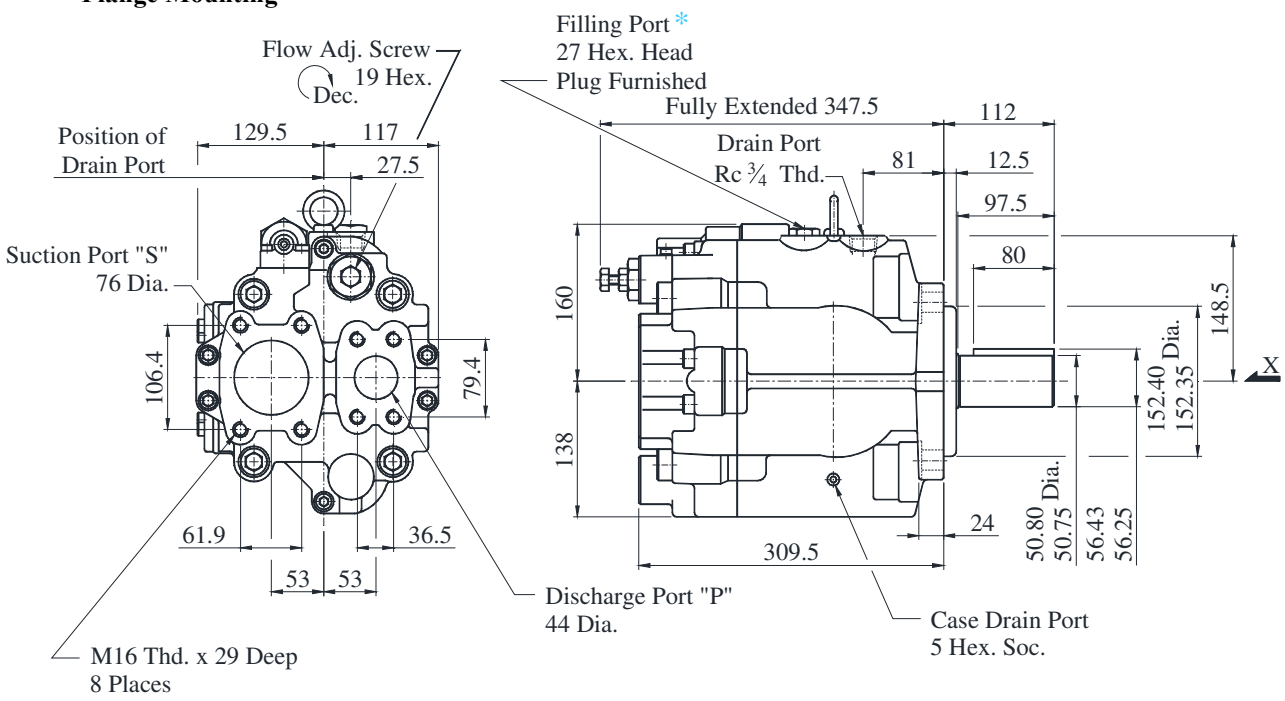
Foot Mounting

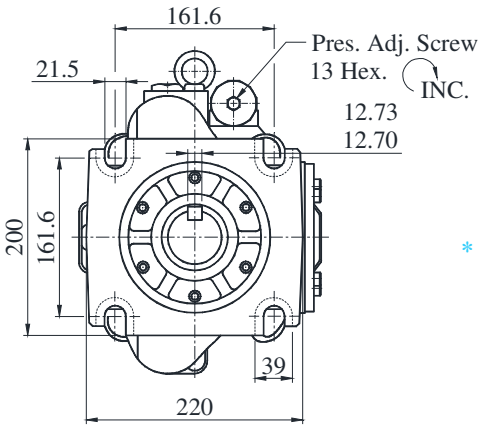


- For other dimensions, refer to "Flange Mtg".

A3H180-FR01KK-10

- **Flange Mounting**





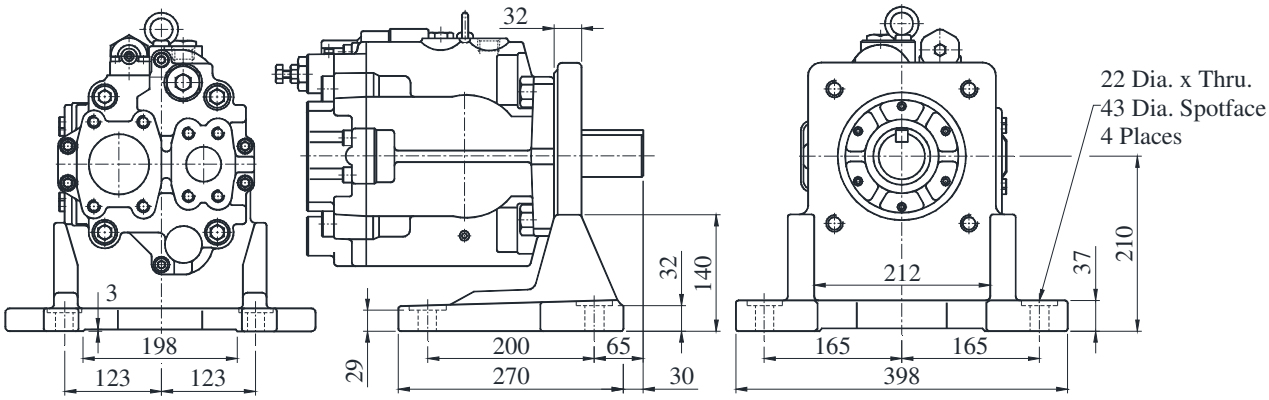
View Arrow X

* Install the pump so that the “filling port” is at the top.

DIMENSIONS IN MILLIMETRES

A3H180-LR01KK-10

- **Foot Mounting**



- For other dimensions, refer to “Flange Mtg”.

Spare Parts List

List of Seals

Sl. No.	Name of Parts	Part Numbers			Qty.
		A3H16	A3H37	A3H56	
1	Gasket	2270-PK313655-3	2271-PK313518-3	2272-PK313433-5	1
2	Back Up Ring	1310E-PK412440-0			1
3	Oil Seal	TCN254511 (FKM)	TCN284811 (FKM)	TCN355511 (FKM)	1
4	O-Ring	S65 (NBR, Hs70)	S85(NBR,Hs70)	S95(NBR,Hs70)	1
5	O-Ring	SO-NA-G60	SO-NA-G60	S71(NBR,Hs70)	1
6	O-Ring	S0-NB-P14	S0-NB-P18	S0-NB-P21	1
7	O-Ring	S0-NB-P14			1
8	O-Ring	S0-NB-P9			4
9	O-Ring	S0-NB-P6	S0-NB-P8	S0-NB-P9	1
10	O-Ring	SO-NA-A018			1
11	O-Ring	SO-NB-P26			1

Note: When ordering seals, please specify the seal kit number from the table below.

List of Seal Kit

Model Number	Seal Kit Numbers
A3H16-※R01KK-10	KS-A3H16-01-10
A3H37-※R01KK-10	KS-A3H37-01-10
A3H56-※R01KK-10	KS-A3H56-01-10

List of Seals

Sl. No.	Name of Parts	Part Numbers				Qty.
		A3H71	A3H100	A3H145	A3H180	
1	Gasket	2273-PK212356-0	2274-PK212368-5	2275-PK212382-6	2276-PK212301-6	1
2	Back Up Ring	1310E-PK412440-0				1
3	Oil Seal	TCN426512(FKM)	TCN507212(FKM)	TCN557812(FKM)		1
4	O-Ring	S100 (NBR, Hs70)	S110 (NRB, Hs70)	S125 (NBR, Hs70)	S130 (NBR, Hs70)	1
5	O-Ring	SO-NA-G80	SO-NA-G95	SO-NA-G95	SO-NA-G105	1
6	O-Ring	SO-NB-P24		SO-NB-P26		1
7	O-Ring	SO-NB-P14	SO-NB-P18	SO-NB-P18		1
8	O-Ring	SO-NB-P9		SO-NB-P10A		1
9	O-Ring	SO-NB-P9				4
10	O-Ring	SO-NA-A021				1
11	O-Ring	SO-NB-P32				1

Note: When ordering seals, please specify the seal kit number from the table below.

List of Seal Kit

Model Number	Seal Kit Numbers
A3H71-※R01KK-10	KS-A3H71-01-10
A3H100-※R01KK-10	KS-A3H100-01-10
A3H145-※R01KK-10	KS-A3H145-01-10
A3H180-※R01KK-10	KS-A3H180-01-10