

Piston Pump

Variable Displacement Piston Pump
Fixed Displacement Piston Pump



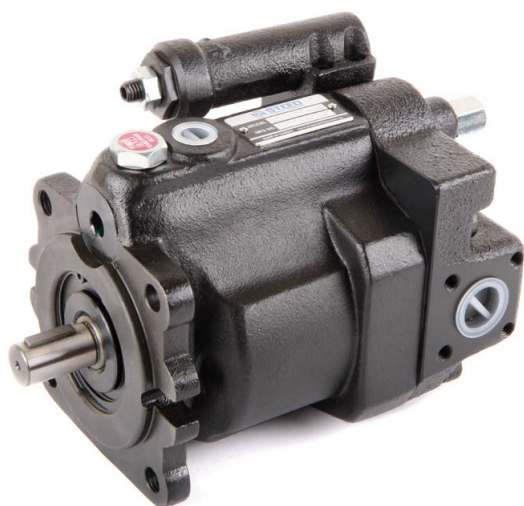
Variable Displacement Piston Pump

VPS	04
A	08
AR	16
P	20

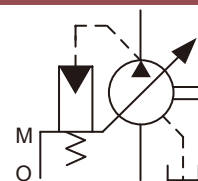
Fixed Displacement Piston Pump

SDL1	28
SDL2	30

VPS



SYMBOLS



ORDER CODES

VPS	-	F	-	10	-	A3	-	AB	-	S
1		2		3		4		5		6

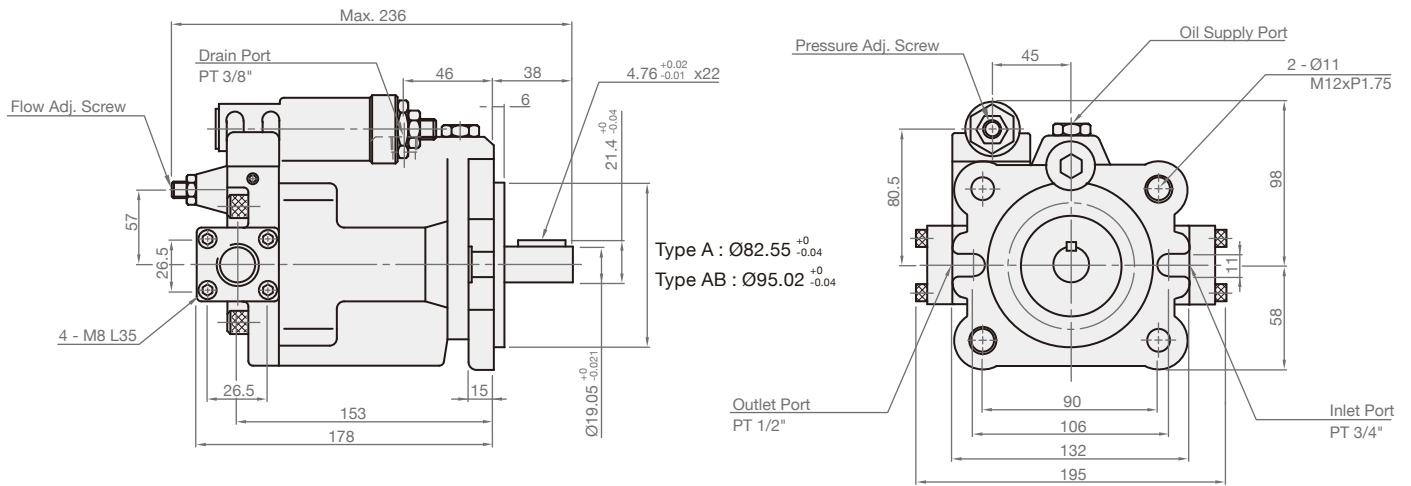
1	Model Name	VPS	
2	Mounting	F	flange type
		L	foot type
3	Delivery	10, 16, 23, 38, 43, 70	
4	Pressure Adj. Range	A3	30~210 kgf/cm ²
5	Flange Mounting Size *	A	Ø82.55
		AB	Ø95.02
6	Shaft Type *	none	straight shaft 19.05
		S	spline shaft 13T

* VPS-10, 16, 23 only

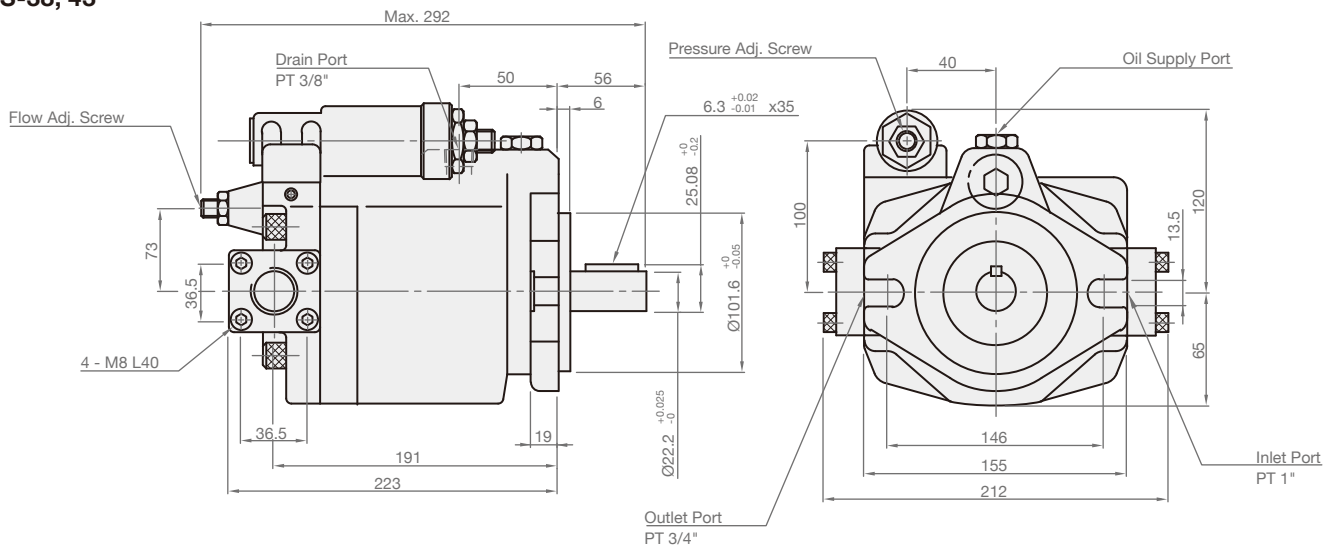
MODEL SPEC.

Model	Max. Pressure (kgf/cm ²)	Rated Pressure (kgf/cm ²)	Max. Output (l/min)	Speed (r.p.m.)		Ports Size (PT)			Weight (kg)
				Min.	Max.	Outlet	Inlet	DR	Flange Type
VPS-10	210	175	18	500	1800	3/4"	3/4"	3/8"	12
VPS-16			29.8			3/4"	3/4"	3/8"	13
VPS-23			40.5			3/4"	3/4"	3/8"	14
VPS-38			68			1"	1 1/4"	1/2"	24
VPS-43			77.4			1"	1 1/4"	1/2"	26
VPS-70			127.8			1 1/2"	1 1/2"	3/4"	48

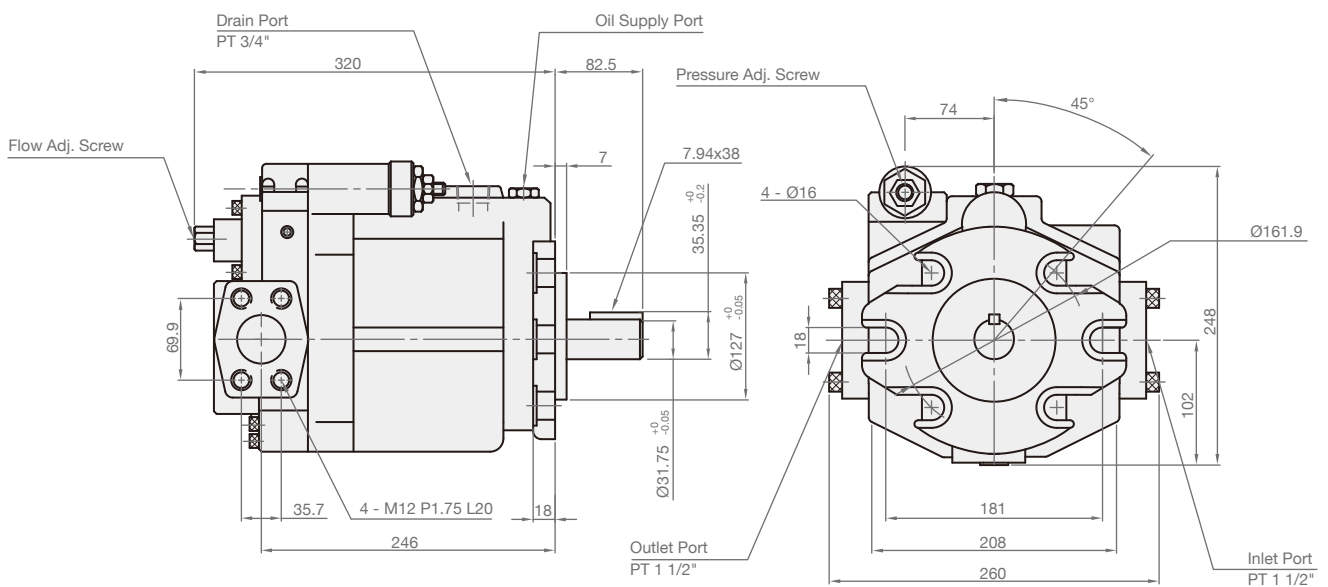
► VPS-10, 16, 23



► VPS-38, 43



► VPS-70



► Noise Characteristics (JIS B 8350, measuring position: 1 m from pump front)

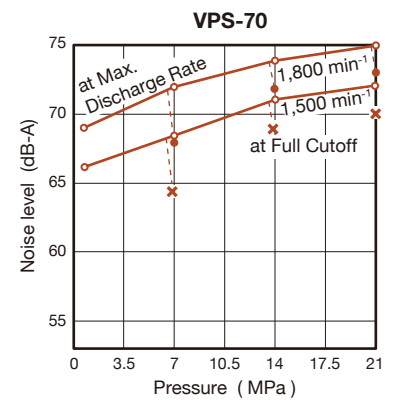
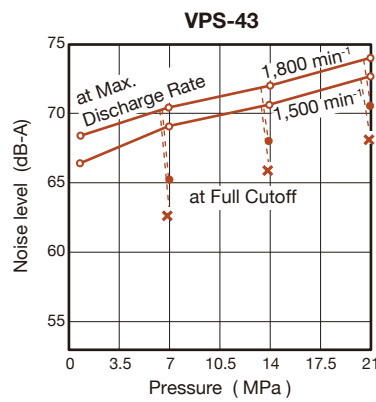
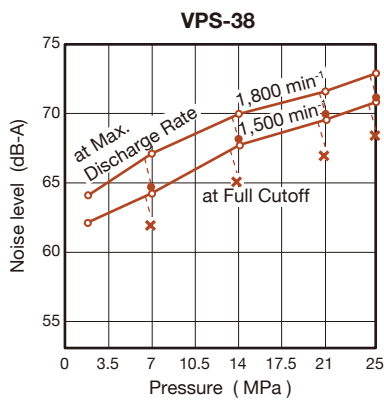
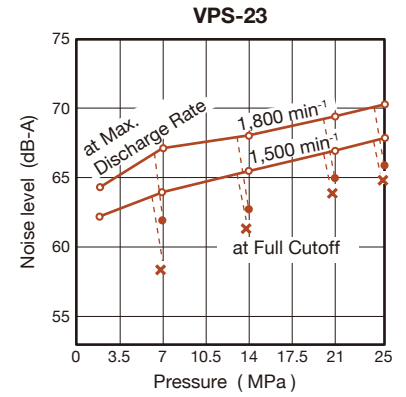
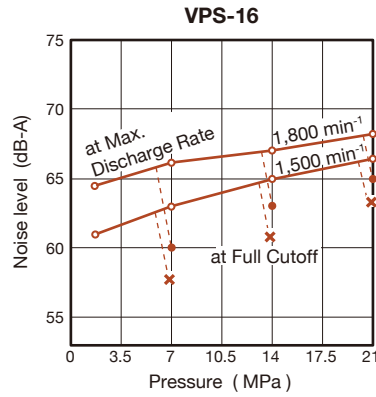
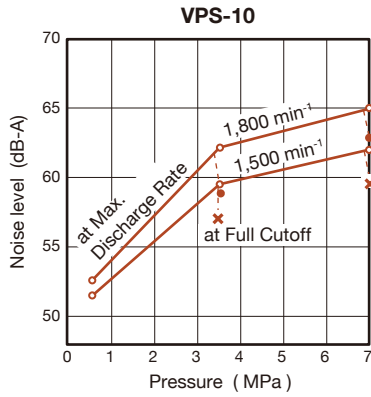
Input rotational speed : 1,800 min⁻¹, 1,500 min⁻¹

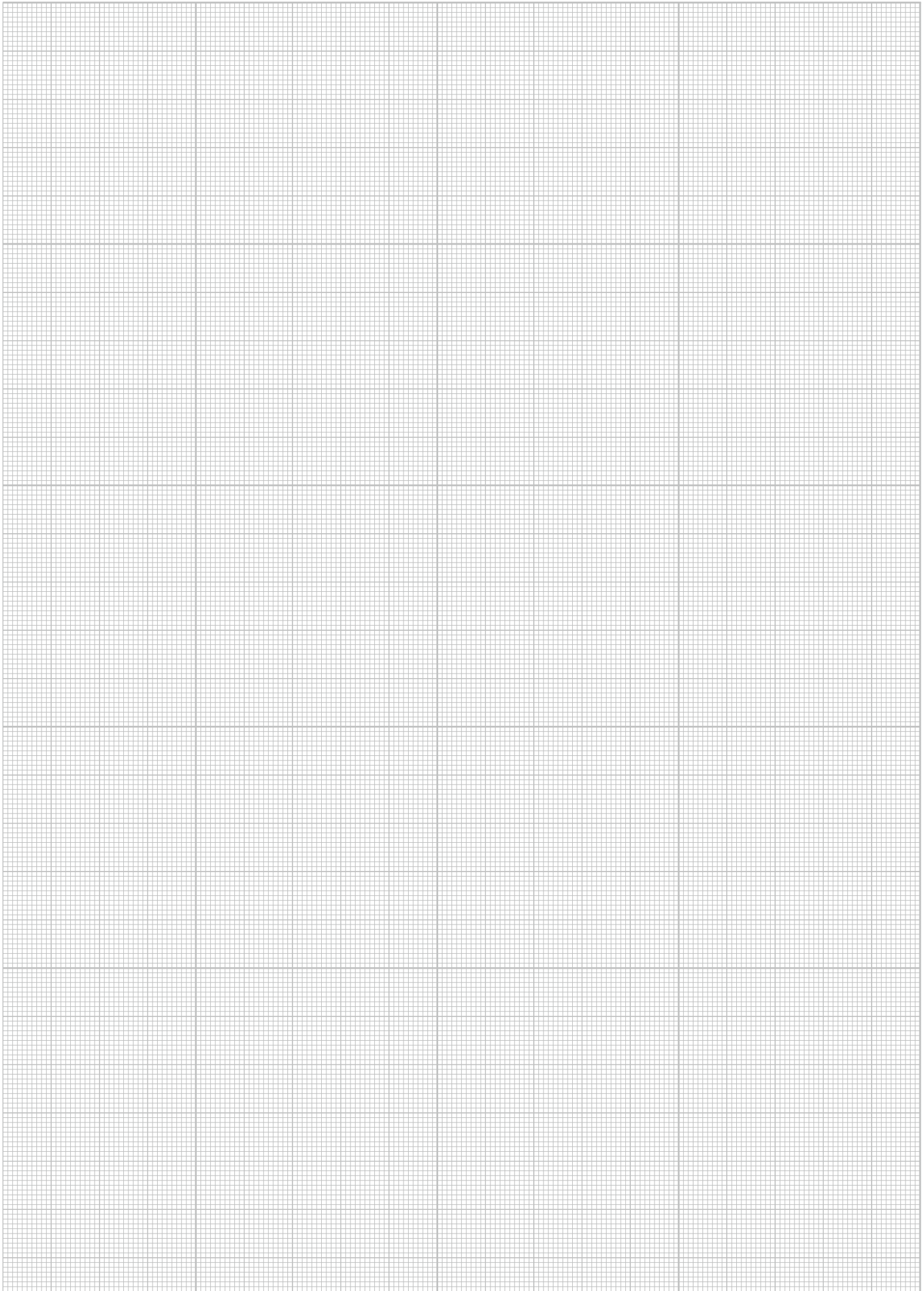
Fluid used : equivalent to ISO VG32

Oil temperature : 50°C

● At full-cutoff at 1,800 min⁻¹

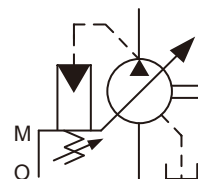
✕ At full-cutoff at 1,500 min⁻¹





A

SYMBOLS



ORDER CODES

A **16** - **F** **R** **01** - **H** - **S** - **K** - **32**

1 2 3 4 5 6 7 8 9

1	Model Name	A
2	Delivery	10, 16, 22, 37, 56
3	Mounting	F flange type
4	Direction of Rotation (Viewed from Shaft Side)	R clockwise direction
5	Control Type	01 pressure compensator type
6	Pressure Adj. Range (MPa)	H A10 : 2.0 ~ 21 A16, A22, A37, A56 : 1.2 ~ 21
		B 1.2 ~ 7
7	Port Position	none axial port
		S side port *
8	Shaft Extension	K keyed shaft
9	Design Number	32

* Only for A37, A56

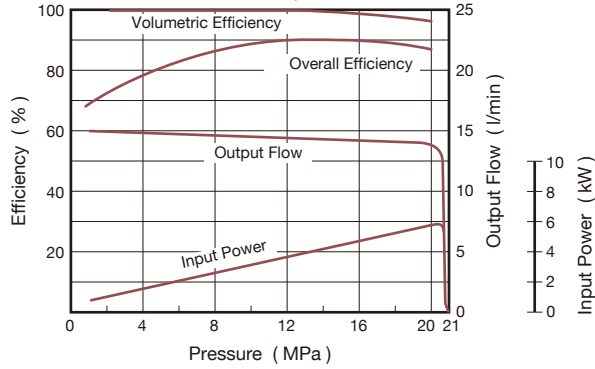
MODEL SPEC.

Model	Geometric Displacement (cm ³ /rev)	Min. Adj. Flow (cm ³ /rev)	Operating Pressure (MPa)		Shaft Speed Range (r.p.m.)		Weight (kg)
			Rated	Intermittent	Min.	Max.	Flange Type
A10	10	2	16	21	600	1800	8.5
A16	15.8	4	16	21	600	1800	16.5
A22	22.2	6	16	16	600	1800	16.5
A37	36.9	10	16	21	600	1800	28
A56	56.2	12	16	21	600	1800	35

► A10

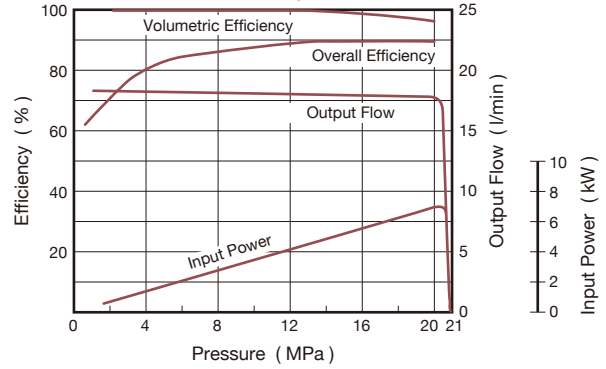
Performance Characteristic Curve

N = 1500 r.p.m.



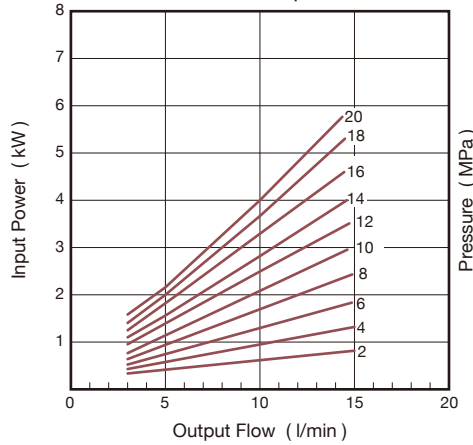
Performance Characteristic Curve

N = 1800 r.p.m.



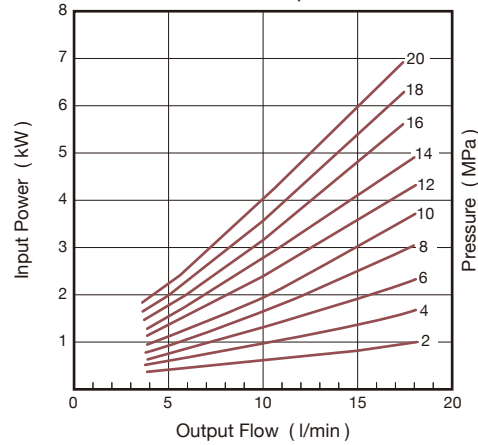
Input Power

N = 1500 r.p.m.

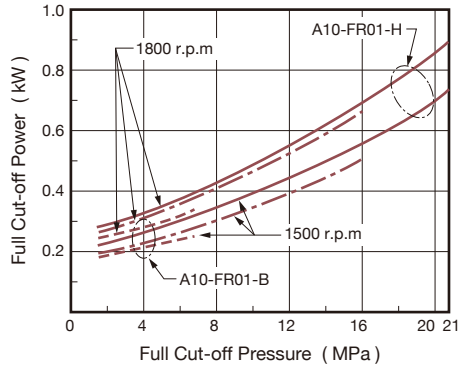


Input Power

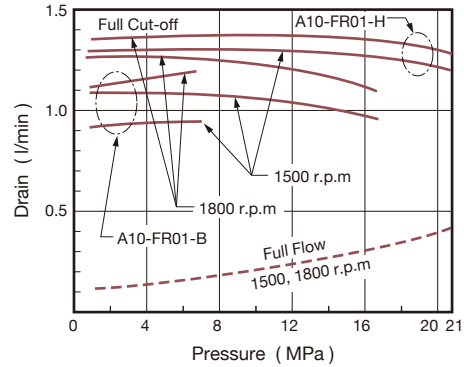
N = 1800 r.p.m.



Full Cut-off Power



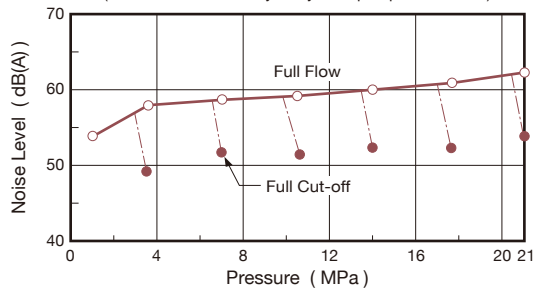
Drain



Noise Level

N = 1500 r.p.m.

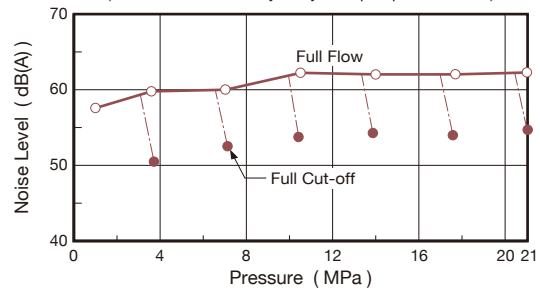
(One metre horizontally away from pump head cover)



Noise Level

N = 1800 r.p.m.

(One metre horizontally away from pump head cover)

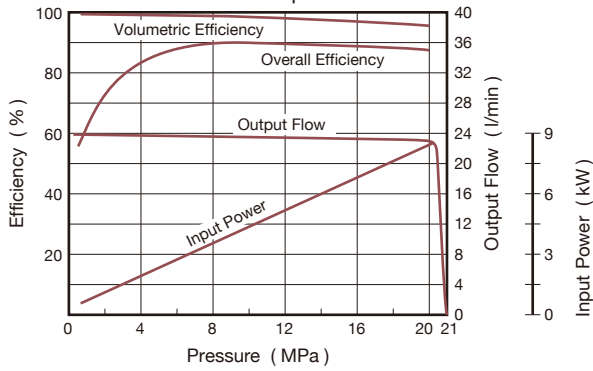


* Hydraulic oil : ISO VG32, oil temperature : 50°C

► A16

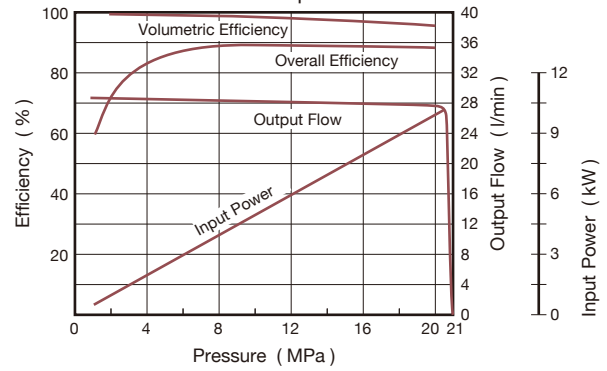
Performance Characteristic Curve

N = 1500 r.p.m.



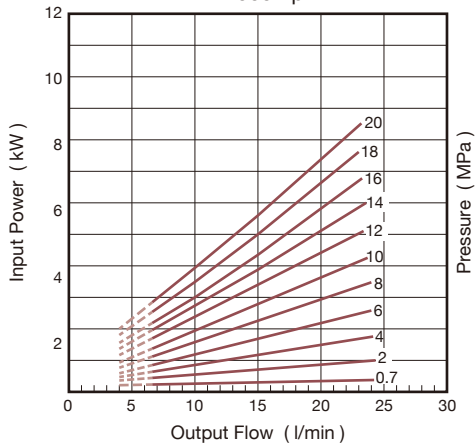
Performance Characteristic Curve

N = 1800 r.p.m.



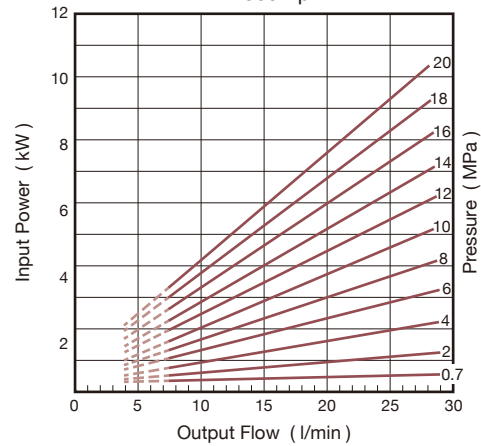
Input Power

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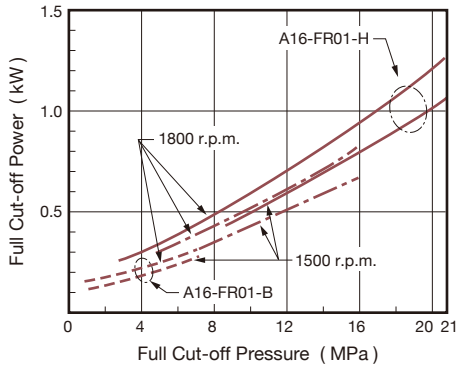


Input Power

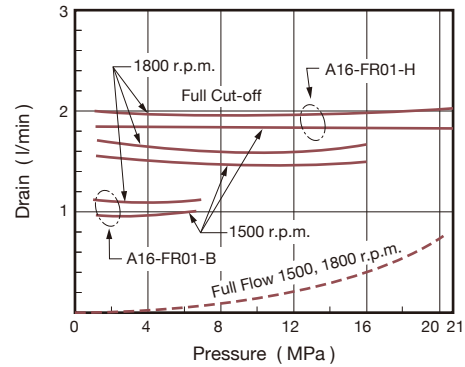
N = 1800 r.p.m.



Full Cut-off Power



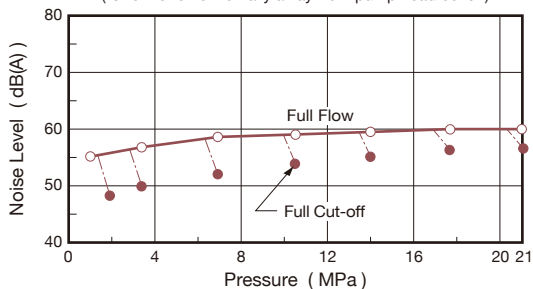
Drain



Noise Level

N = 1500 r.p.m.

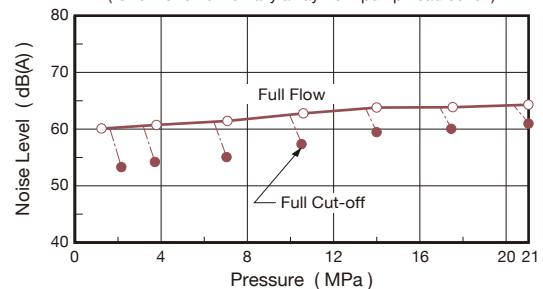
(One metre horizontally away from pump head cover)



Noise Level

N = 1800 r.p.m.

(One metre horizontally away from pump head cover)

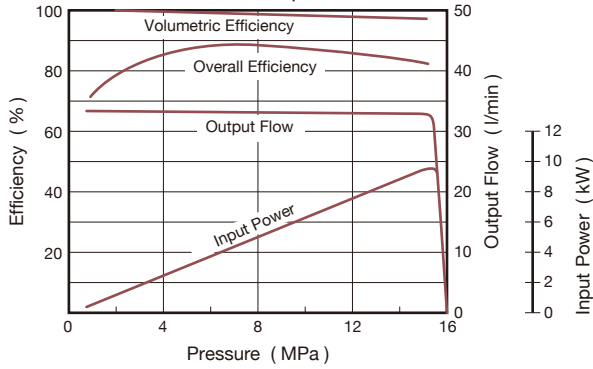


* Hydraulic oil : ISO VG32, oil temperature : 50°C

► A22

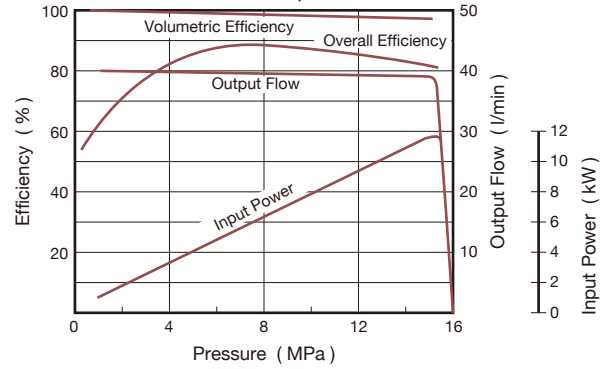
Performance Characteristic Curve

N = 1500 r.p.m.



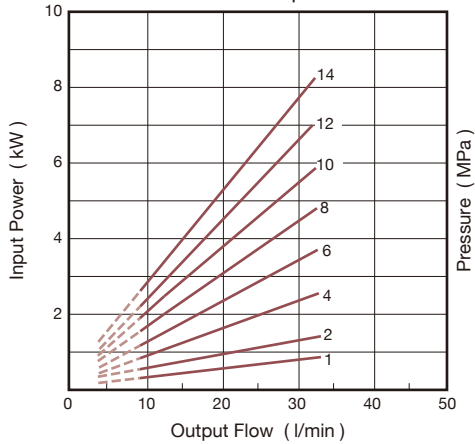
Performance Characteristic Curve

N = 1800 r.p.m.



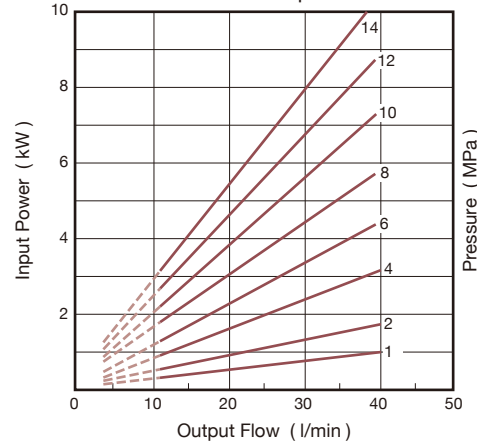
Input Power

N = 1500 r.p.m.

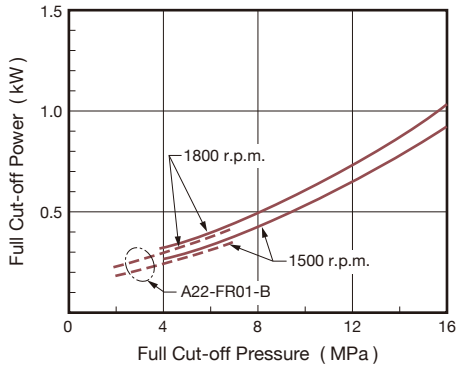


Input Power

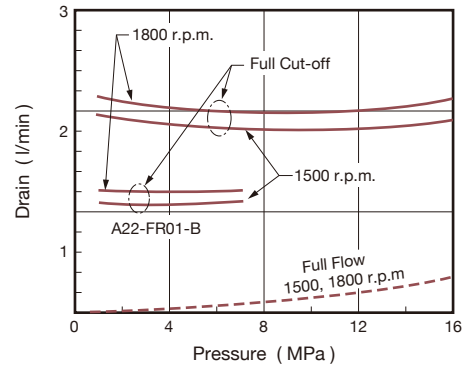
N = 1800 r.p.m.



Full Cut-off Power



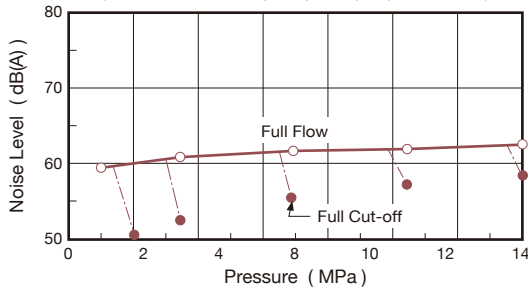
Drain



Noise Level

N = 1500 r.p.m.

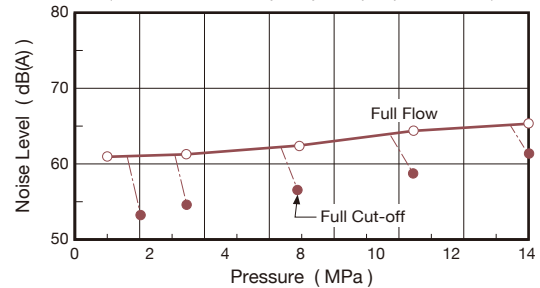
(One metre horizontally away from pump head cover)



Noise Level

N = 1800 r.p.m.

(One metre horizontally away from pump head cover)

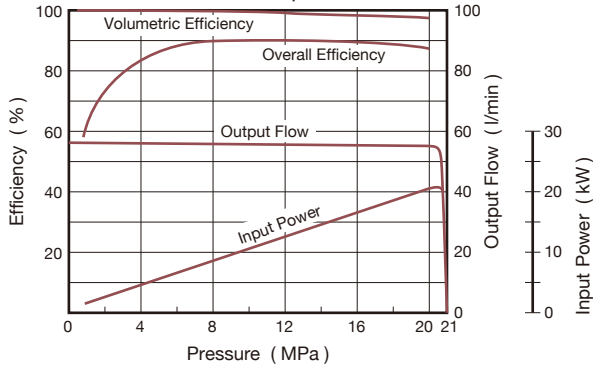


* Hydraulic oil : ISO VG32, oil temperature : 50°C

► A37

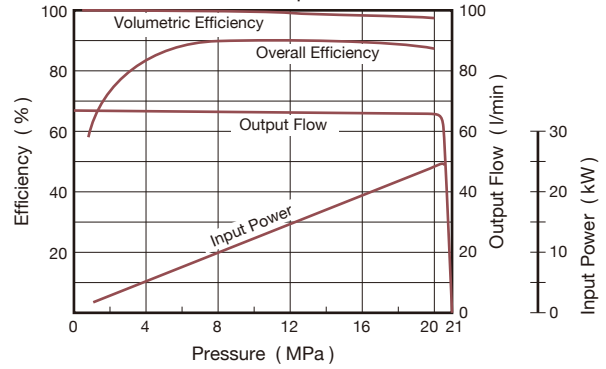
Performance Characteristic Curve

N = 1500 r.p.m.



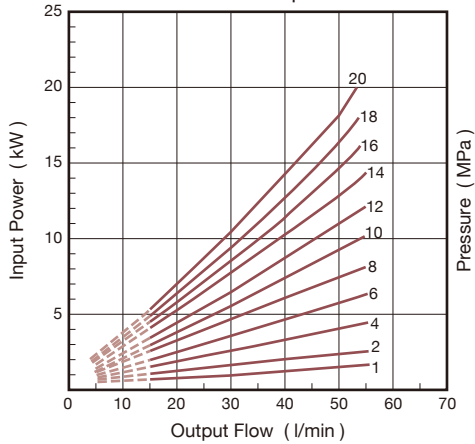
Performance Characteristic Curve

N = 1800 r.p.m.



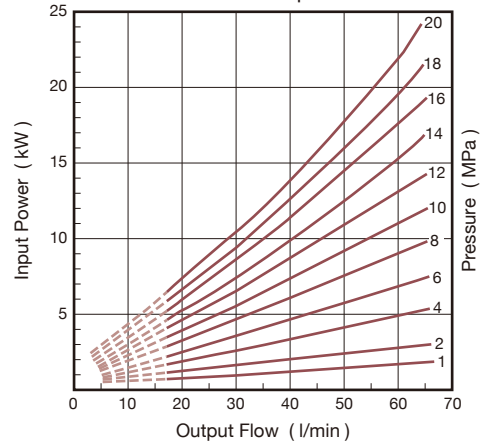
Input Power

N = 1500 r.p.m.

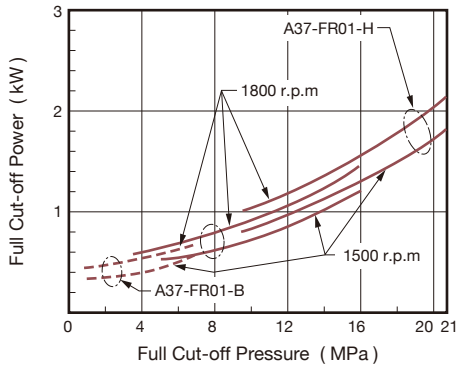


Input Power

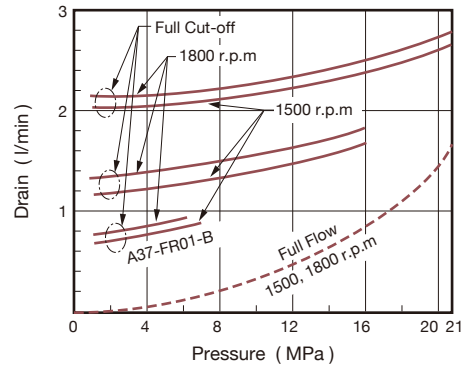
N = 1800 r.p.m.



Full Cut-off Power



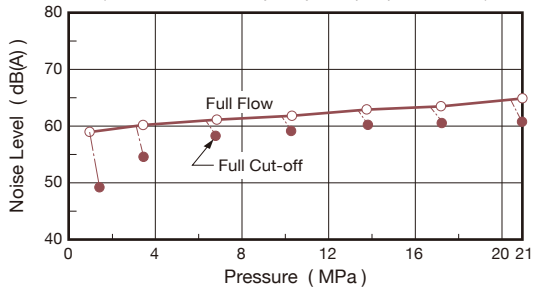
Drain



Noise Level

N = 1500 r.p.m.

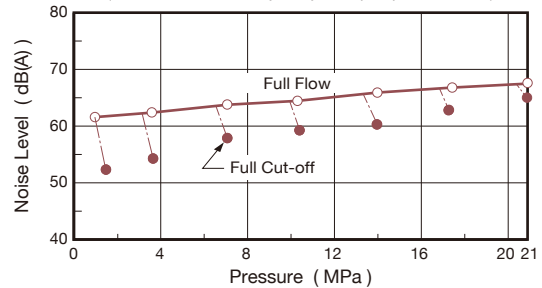
(One metre horizontally away from pump head cover)



Noise Level

N = 1800 r.p.m.

(One metre horizontally away from pump head cover)

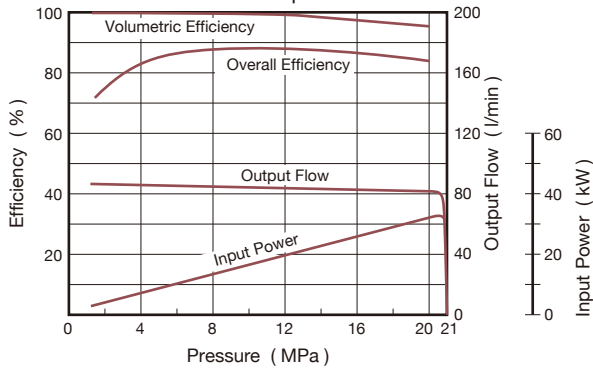


* Hydraulic oil : ISO VG32, oil temperature : 50°C

► A56

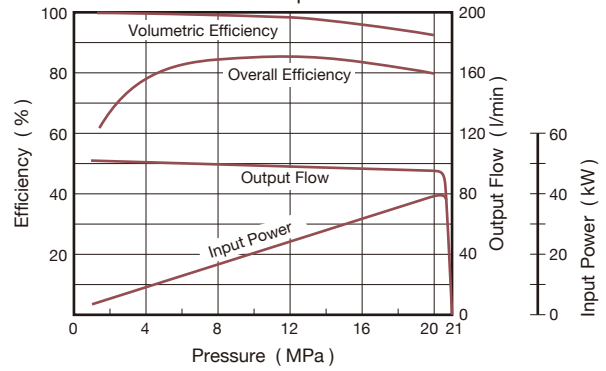
Performance Characteristic Curve

N = 1500 r.p.m.



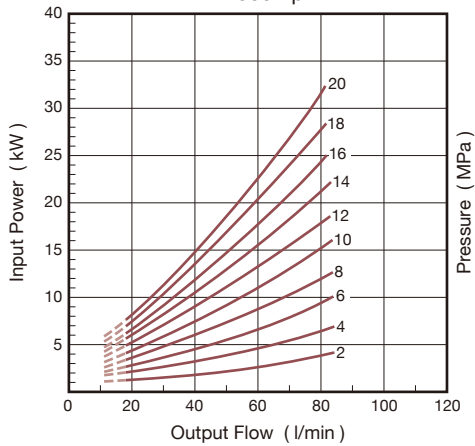
Performance Characteristic Curve

N = 1800 r.p.m.



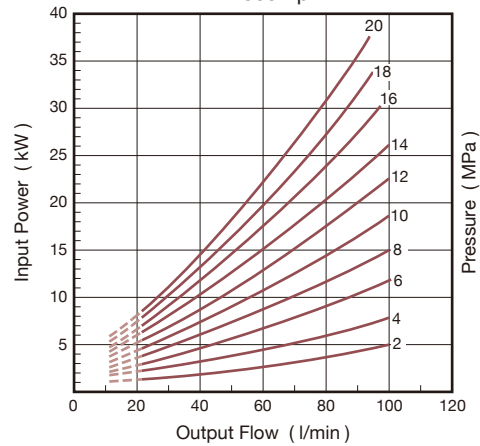
Input Power

N = 1500 r.p.m.

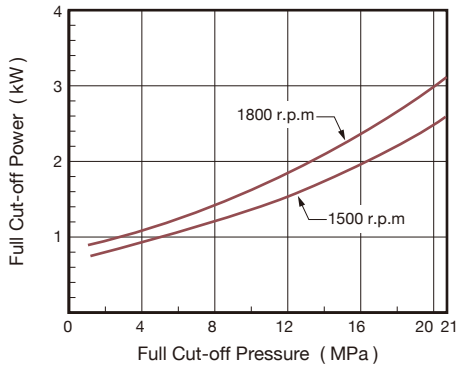


Input Power

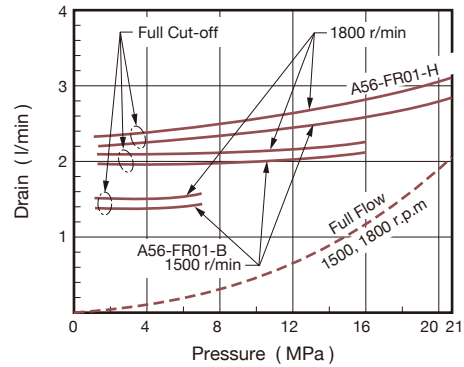
N = 1800 r.p.m.



Full Cut-off Power



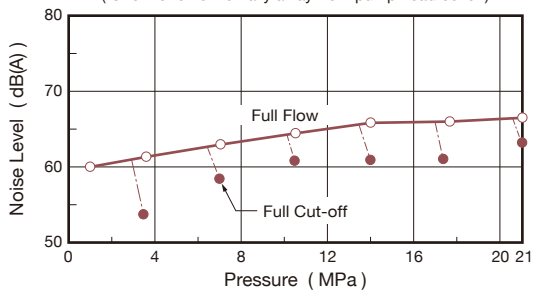
Drain



Noise Level

N = 1500 r.p.m.

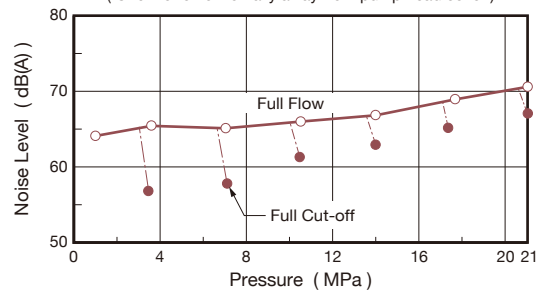
(One metre horizontally away from pump head cover)



Noise Level

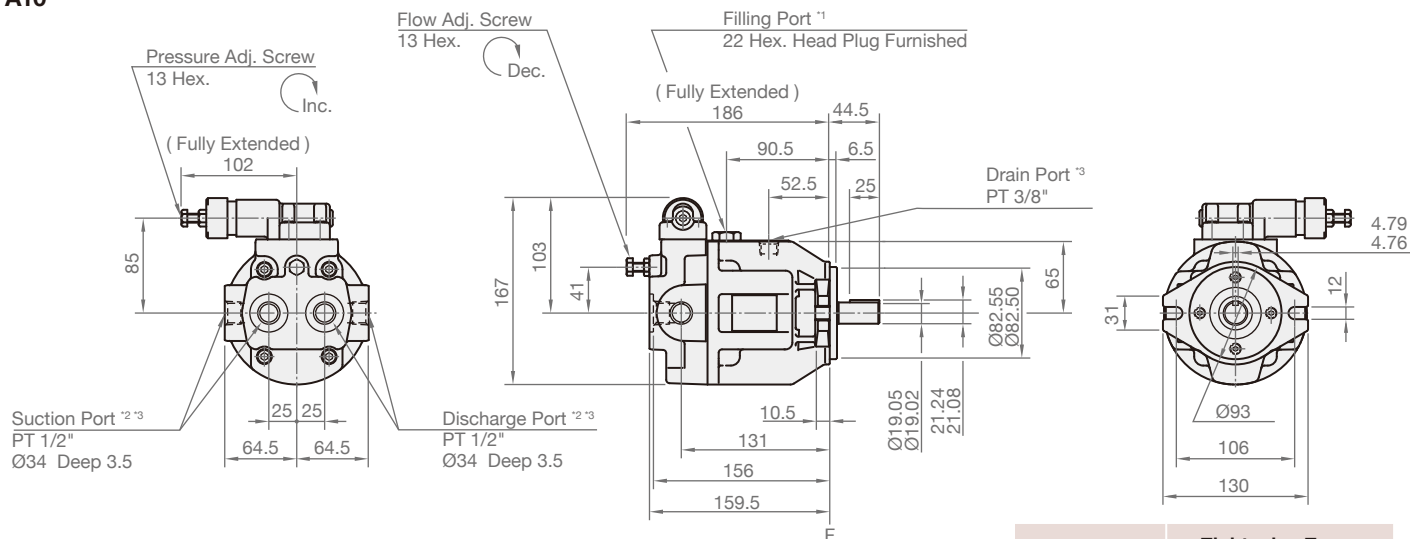
N = 1800 r.p.m.

(One metre horizontally away from pump head cover)



* Hydraulic oil : ISO VG32, oil temperature : 50°C

► A10



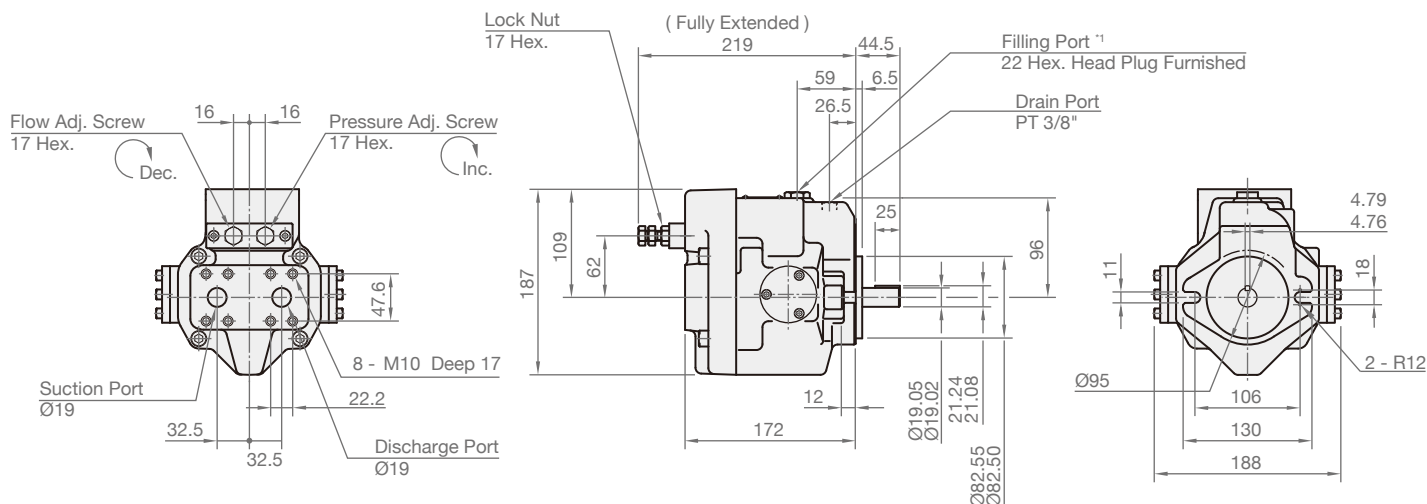
Port	Tightening Torque (Nm)
Suction Discharge	65 ~ 75
Drain	40 ~ 50

*1. Install the pump so that the "Filling Port" is at the top.

*2. Use either port of two suction and discharge ports at your option. Keep the remaining ports plugged.

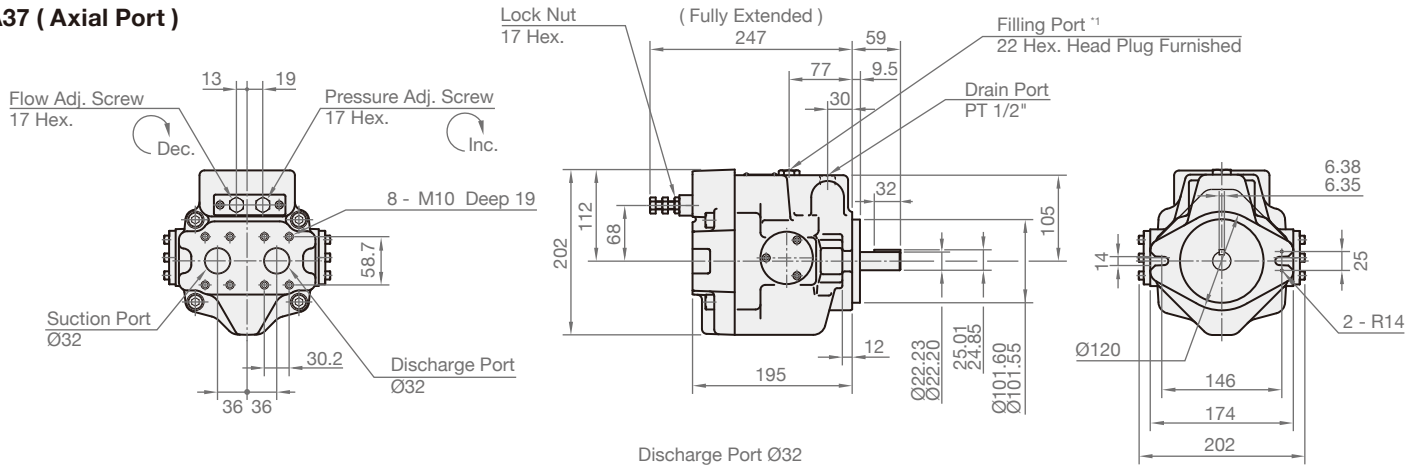
*3. As the tightening torques of suction, discharge and drain port fittings, conform to the below.

► A16, A22

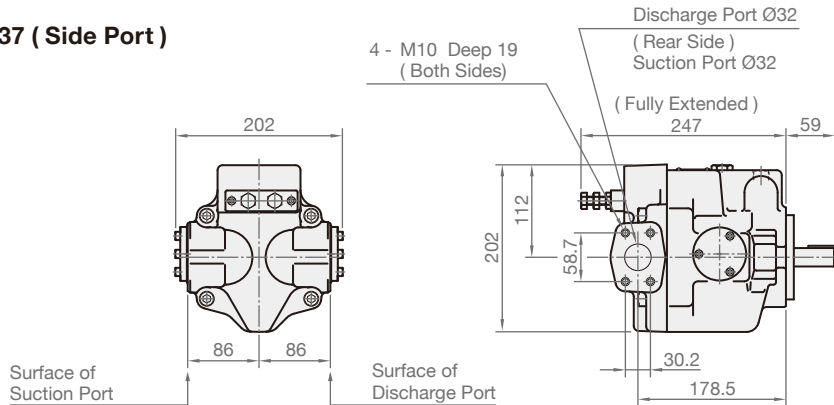


*1. Install the pump so that the "Filling Port" is at the top.

► A37 (Axial Port)

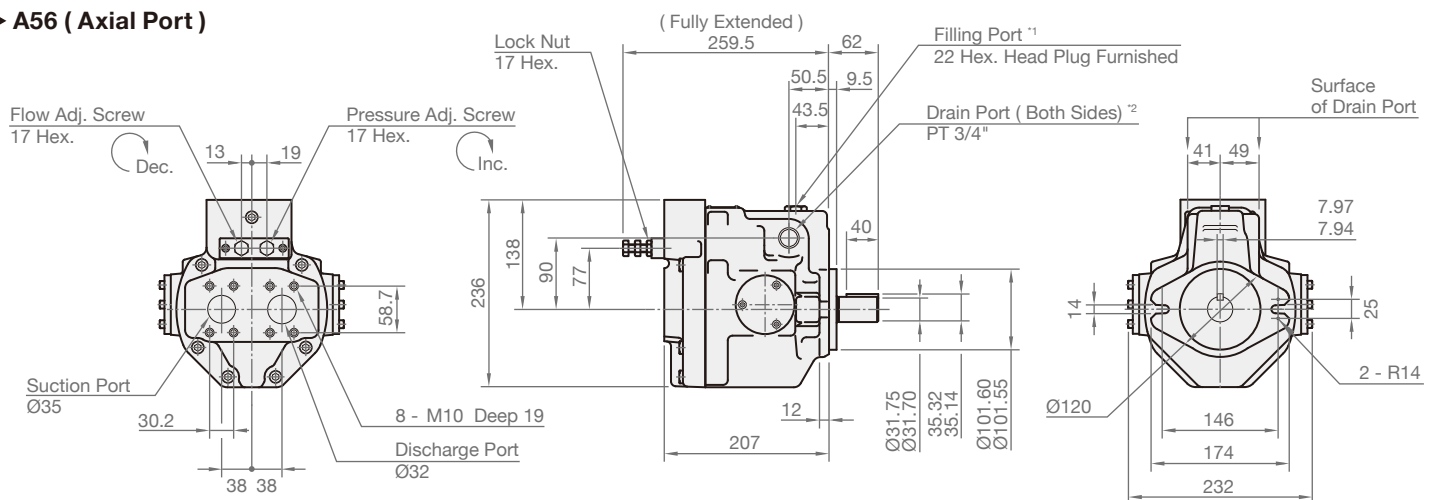


► A37 (Side Port)

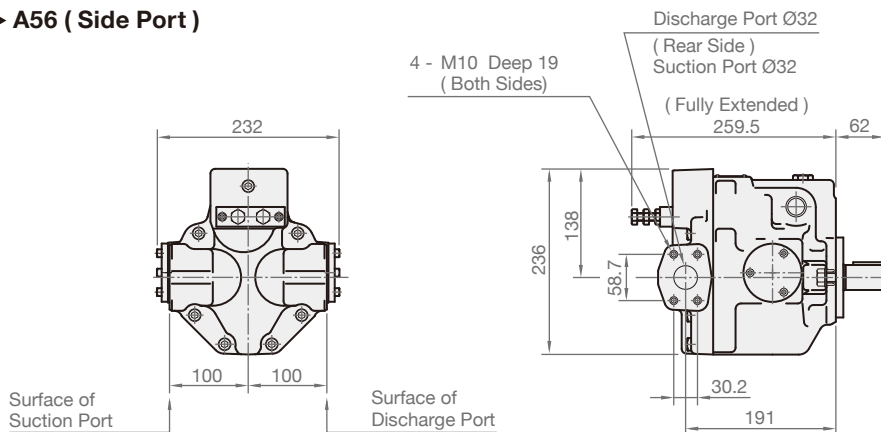


*1. Install the pump so that the "Filling Port" is at the top.

► A56 (Axial Port)



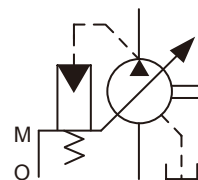
► A56 (Side Port)



*1. Install the pump so that the "Filling Port" is at the top.

AR

SYMBOLS



ORDER CODES

AR	16	-	F	R	01	-	C	S	-	20
1	2		3	4	5		6	7		8

1	Model Name	AR	
2	Delivery	16, 22	
3	Mounting	F	flange type
4	Direction of Rotation (Viewed from Shaft Side)	R	clockwise direction
		L	counter clockwise
5	Control Device	01	
6	Pressure Adj. Range (bar)	B	2 ~ 70
		C	12~210
7	Port Position	none	axial port
		S	side port
8	Design Number	20	

MODEL SPEC.

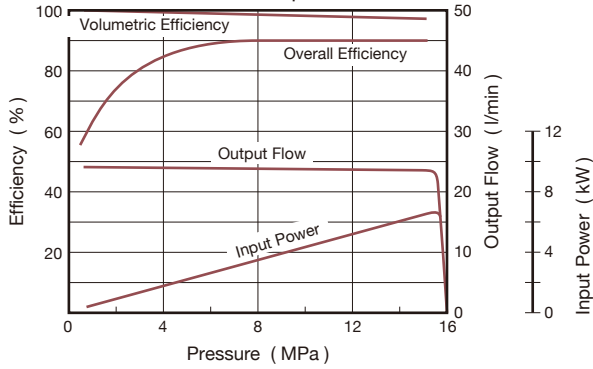
Model	Geometric Displacement (cm ³ /rev)	Min. Adj. Flow (cm ³ /rev)	Operating Pressure (MPa)		Speed (r.p.m.)		Weight (kg)
			Rated	Intermittent *	Min.	Max.	
AR16	15.8	6.0	16	16	600	1800	11.9
AR22	22.2	8.5	16	16	600	1800	12.6

* When setting the pressure, make sure the full cut-off pressure never exceeds the max. intermittent pressure.

► A16

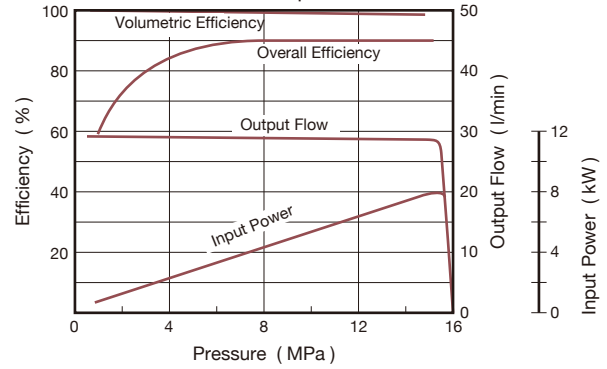
Performance Characteristic Curve

N = 1500 r.p.m.



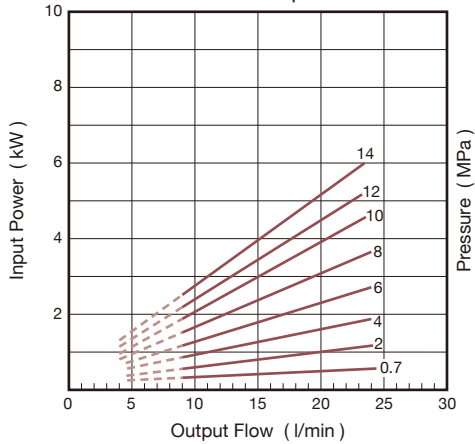
Performance Characteristic Curve

N = 1800 r.p.m.



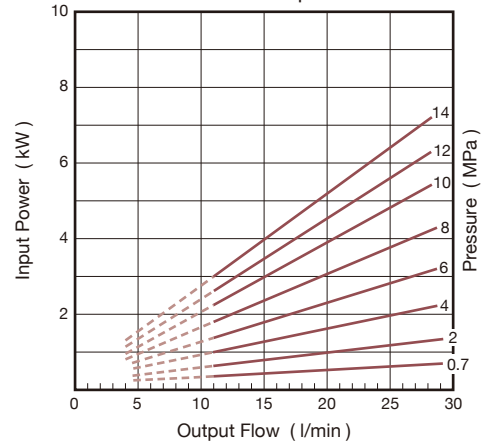
Input Power

N = 1500 r.p.m.

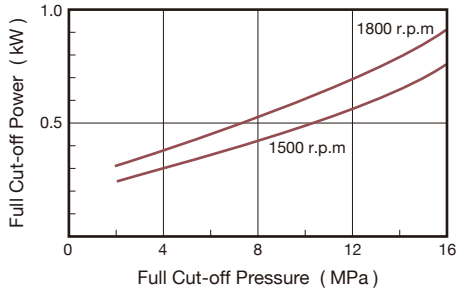


Input Power

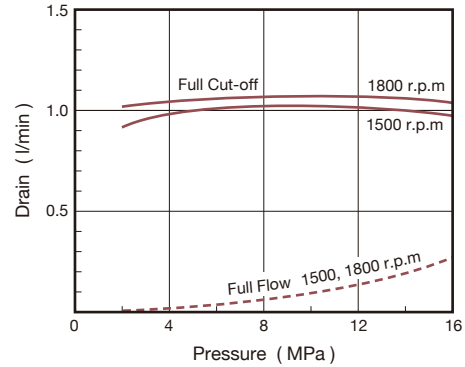
N = 1800 r.p.m.



Full Cut-off Power



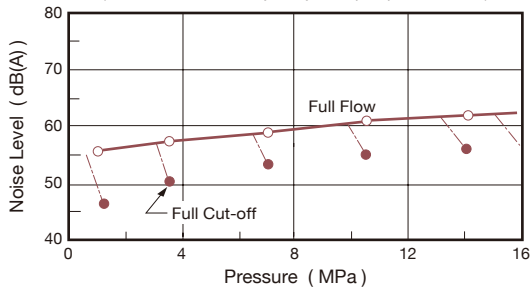
Drain



Noise Level

N = 1500 r.p.m.

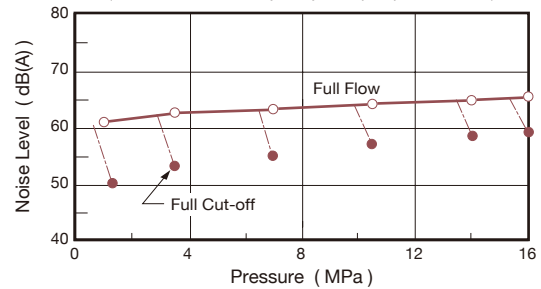
(One metre horizontally away from pump head cover)



Noise Level

N = 1800 r.p.m.

(One metre horizontally away from pump head cover)

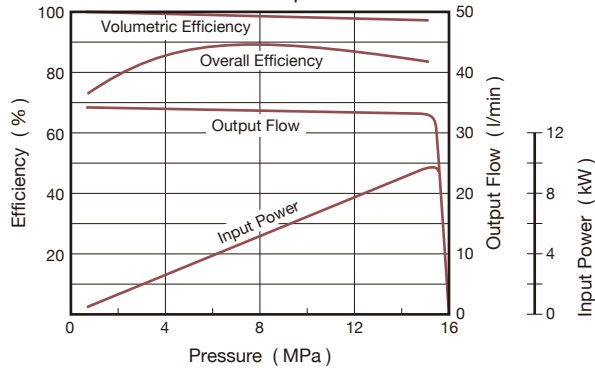


* Hydraulic oil : ISO VG32, oil temperature : 50°C

► A22

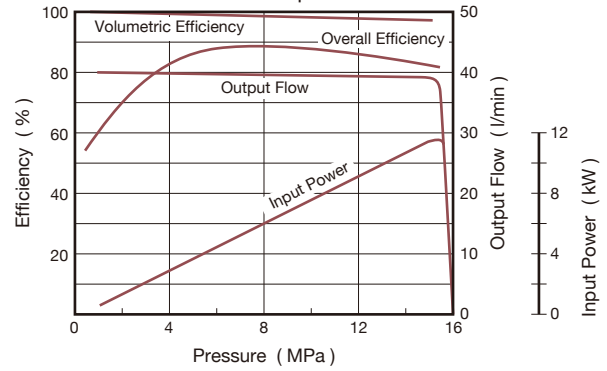
Performance Characteristic Curve

N = 1500 r.p.m.



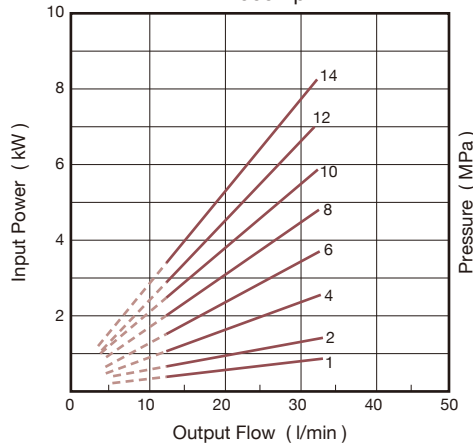
Performance Characteristic Curve

N = 1800 r.p.m.



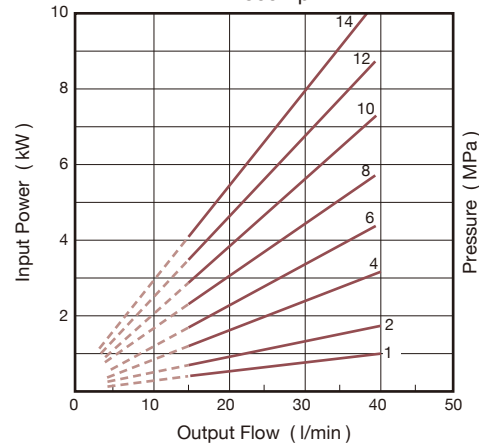
Input Power

N = 1500 r.p.m.

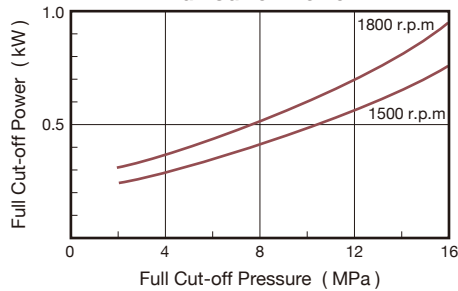


Input Power

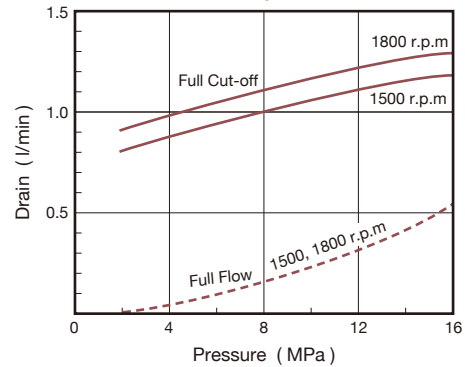
N = 1800 r.p.m.



Full Cut-off Power



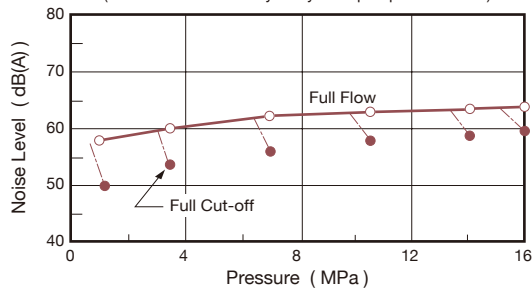
Drain



Noise Level

N = 1500 r.p.m.

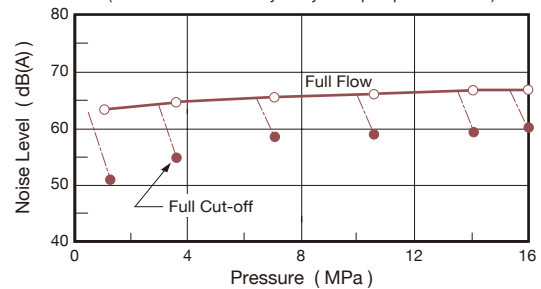
(One metre horizontally away from pump head cover)



Noise Level

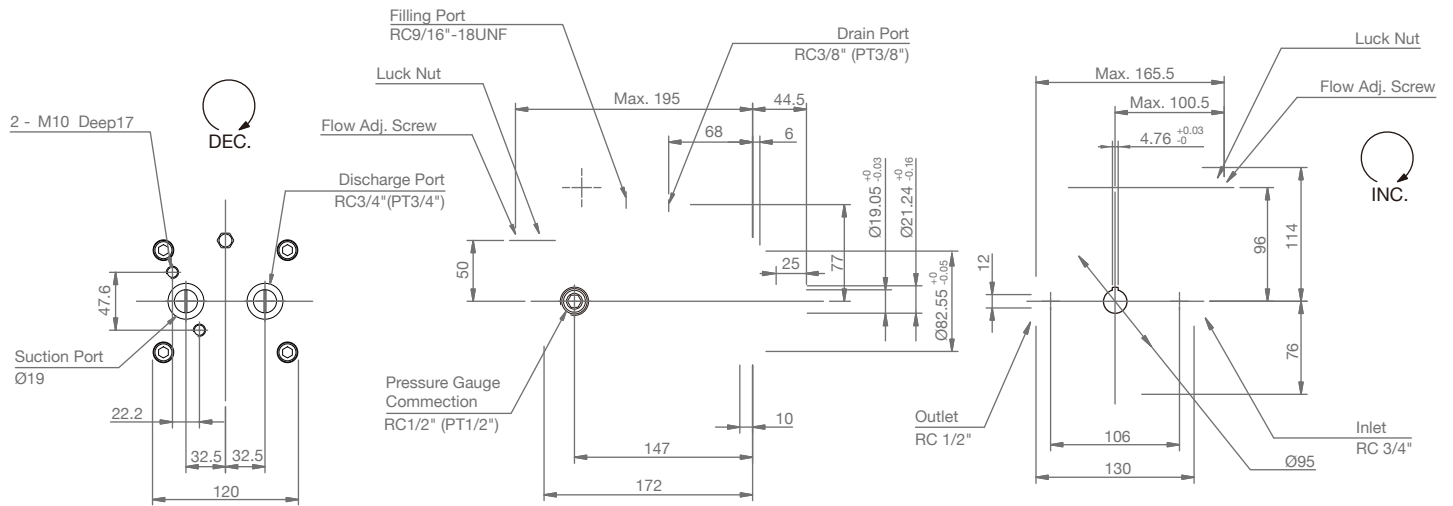
N = 1800 r.p.m.

(One metre horizontally away from pump head cover)

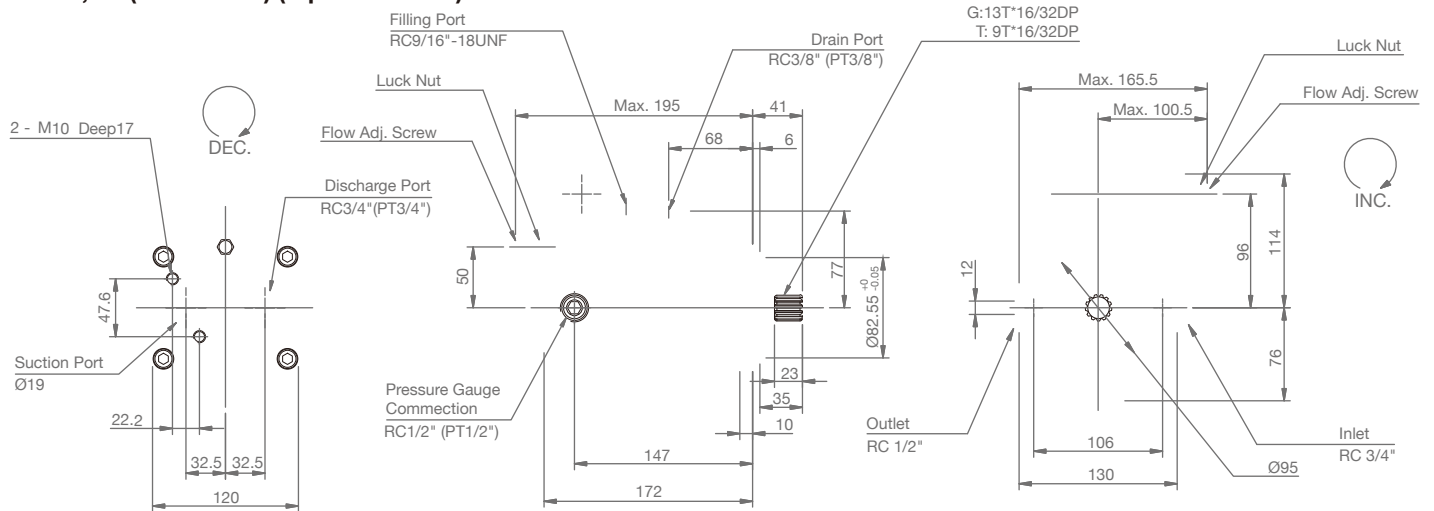


* Hydraulic oil : ISO VG32, oil temperature : 50°C

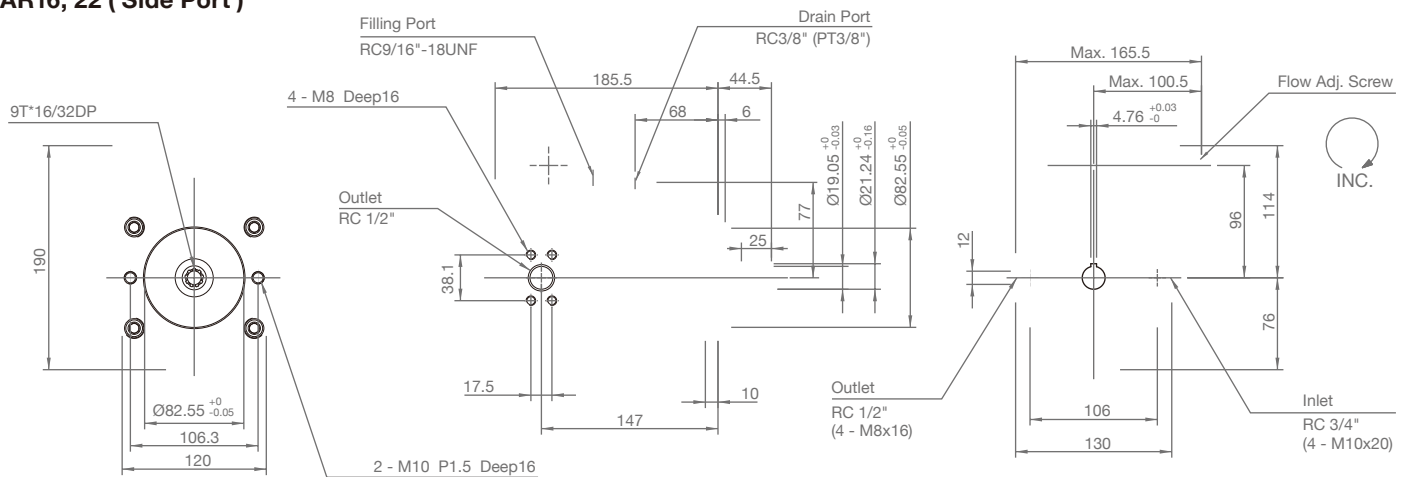
► AR16, 22 (Axial Port)



► AR16, 22 (Axial Port) (Splined Shaft)



► AR16, 22 (Side Port)

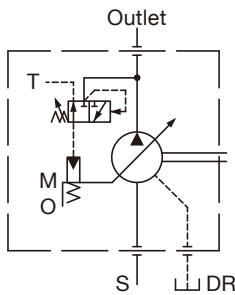


P

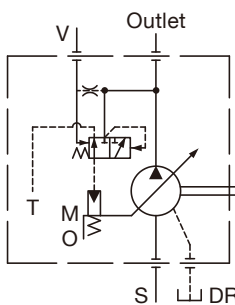


SYMBOLS

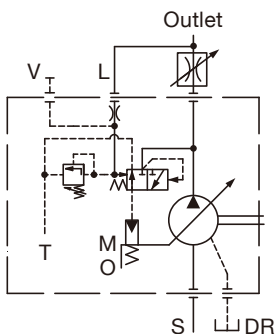
A : pressure compensating type



B : remote pressure control type



HL : load sensing control type



ORDER CODES

P	16	-	A	3	-	ED	-	F	-	R	-	S	-	01
1	2		3	4		5		6		7		8		9

1	Model Name	P	
2	Delivery	08, 10, 13, 16, 22, 36, 46, 70, 100	
3	Control Type	A	pressure compensating type
		B	remote pressure control type
		HL	load sensing control type
4	Pressure (bar)	0	15 ~ 45 (for P08-P46)
		1	20 ~ 75
		2	25 ~ 145
		3	30 ~ 215
		4	30 ~ 280 (for P70-P100)
5	Control Type (Additional) * Only for HL Type	EDG	electro-hydraulic proportional control type
		EDPV (EDPFC)	Pressure, flow proportional control type
6	Mounting Flange	F	SAEJ 744
7	Direction of Rotation (Viewed from Shaft Side)	R	clockwise direction
		L	counter clockwise
8	Drive Shaft	none	standard
		S	spline
9	Thread for P08-P70	01	PT
		20	SAE
		30	BSPP
		40	NPT
9	Thread for P100	02	PT
		20	SAE
		32	BSPP
		42	NPT

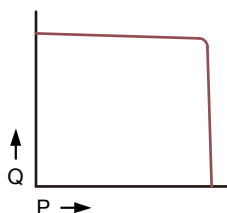
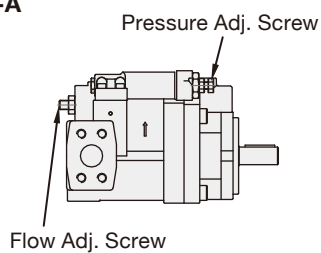
MODEL SPEC.

Model	Displacement (cm ³ /rev)	Pressure (MPa)		Speed (r.p.m.)		Weight (kg)
		Max.	Rated	Min.	Max.	
P08	8	210	255	300	2000	9
P10	10	210	255	300	2000	9
P13	13.5	210	255	300	2000	9
P16	16.5	210	255	300	2000	13
P22	22	210	255	300	2000	13
P36	36	210	255	300	2000	22
P46	46	210	255	300	2000	22
P70	70	280	280	300	1800	43
P100	100	280	280	300	1800	62

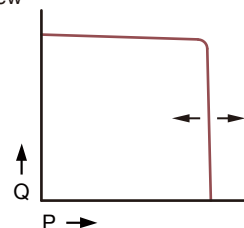
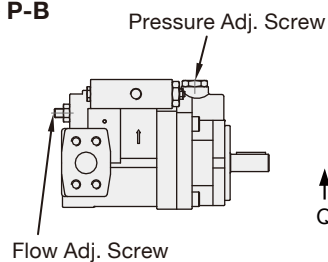
Pressure at Suction Port (Inlet)	Recommended Viscosity	Temperature Range	Degree of Fluid Contamination
-0.3 ~ +0.3 bar	20 ~ 50 mm ² /s	5 ~ 60 °c	21/19/16 ISO 4406 Class 10 (NAS 1638)

EXTERNAL VIEW & PERFORMANCE CURVES

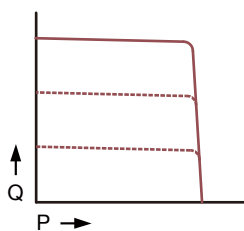
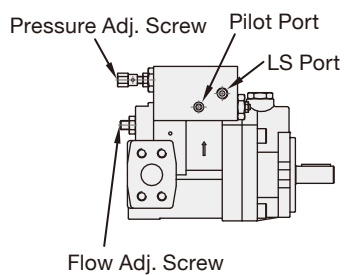
► P-A

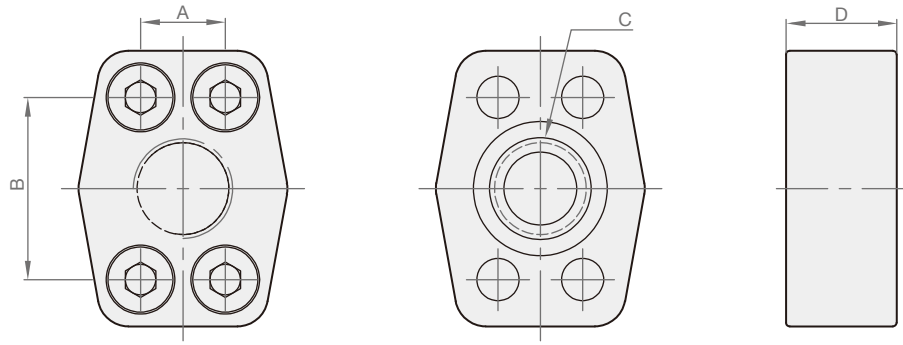


► P-B



► P-HL



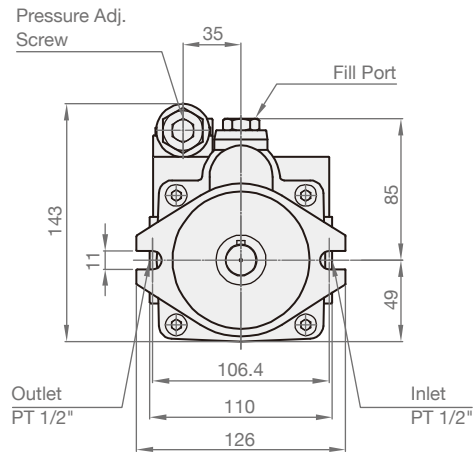
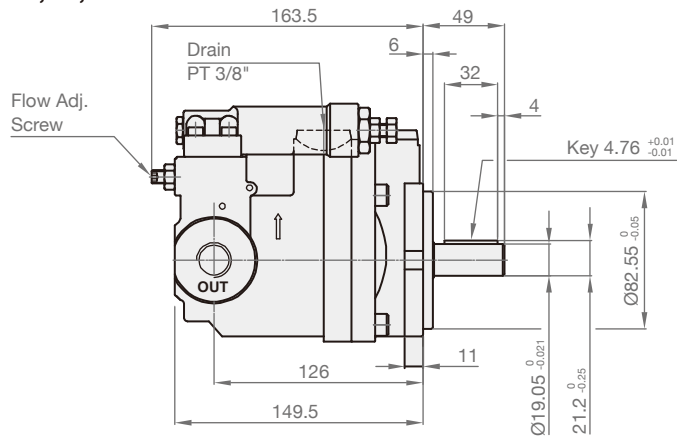


Model	P16		P22		P36	
	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet
A	26.2	22.2	26.2	22.2	30.2	26.2
B	52.4	47.6	52.4	47.6	58.7	52.4
C	NBR-G35	NBR-G30	NBR-G35	NBR-G30	NBR-G40	NBR-G35
D	30	30	30	30	31	30
Bolt	M10	M10	M10	M10	M10	M10
Pipe	Rc 3/4"	Rc 3/4"	Rc 1"	Rc 3/4"	Rc 1-1/4"	Rc 1"
Part Number	M00021	M00020	M00030	M00020	M00040	M00030

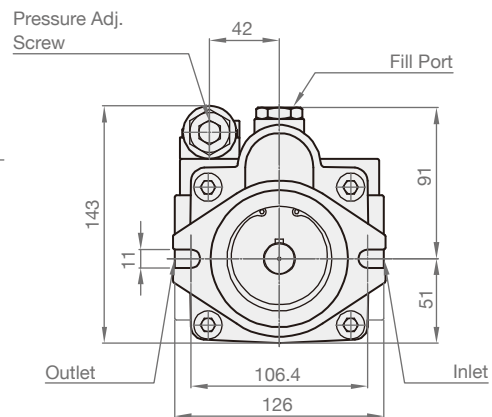
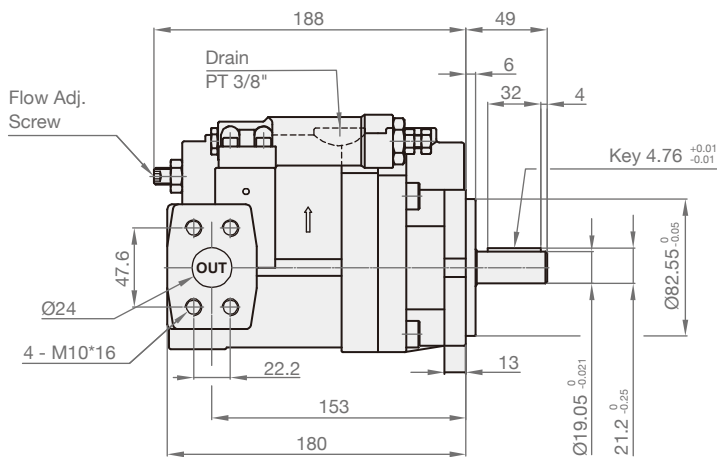
Model	P46		P70		P100	
	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet
A	30.2	26.2	35.7	30.2	42.9	31.8
B	58.7	52.4	69.9	58.7	77.8	66.7
C	NBR-G40	NBR-G35	NBR-G50	NBR-G40	NBR-G65	NBR-G45
D	31	30	31	31	31	31
Bolt	M10	M10	M12	M10	M12	M14
Pipe	Rc 1-1/4"	Rc 1"	Rc 1-1/2"	Rc 1-1/4"	Rc 2"	Rc 1-1/4"
Part Number	M00040	M00030	M00050	M00040	M00060	M00041

Note : The pipe flange type is not applicable to P08.

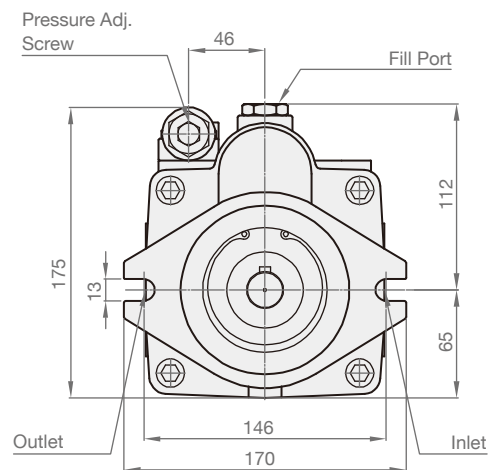
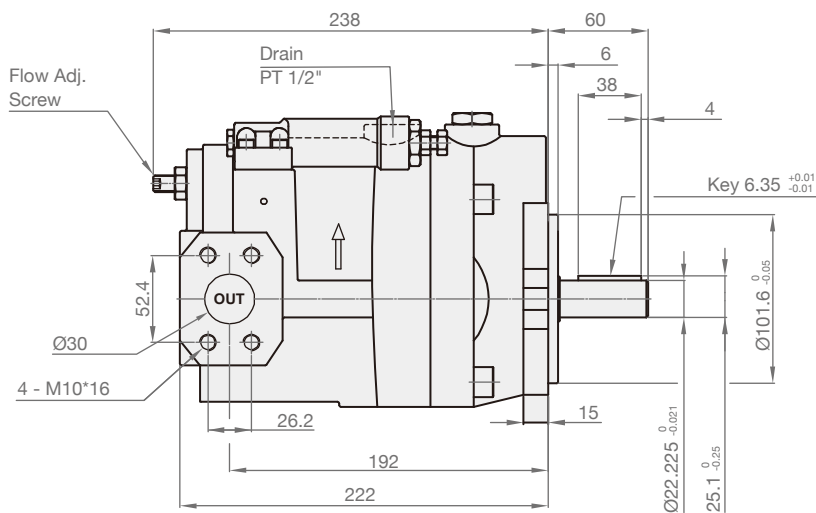
► P08, 10, 13-A



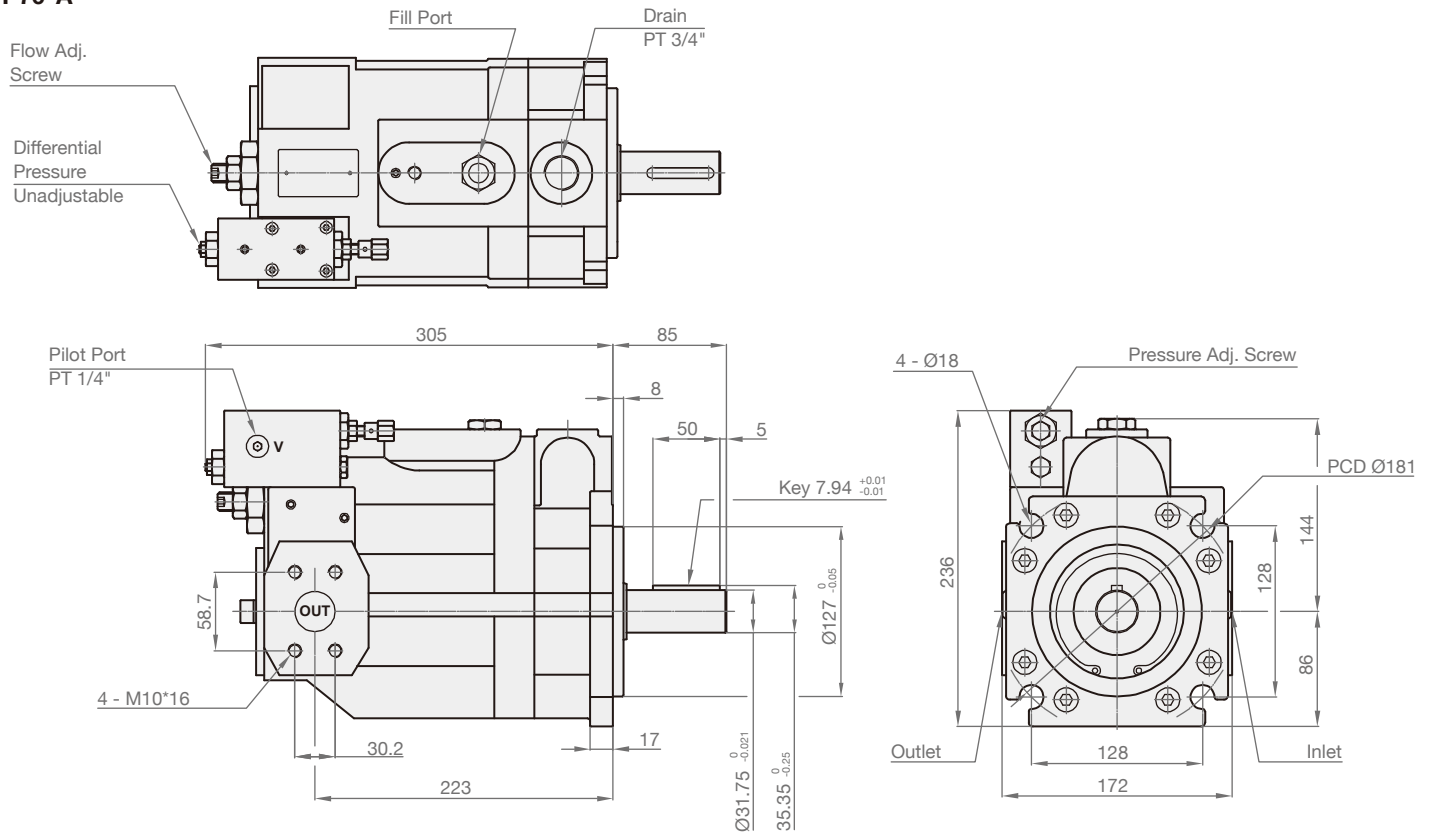
► P16, 22-A



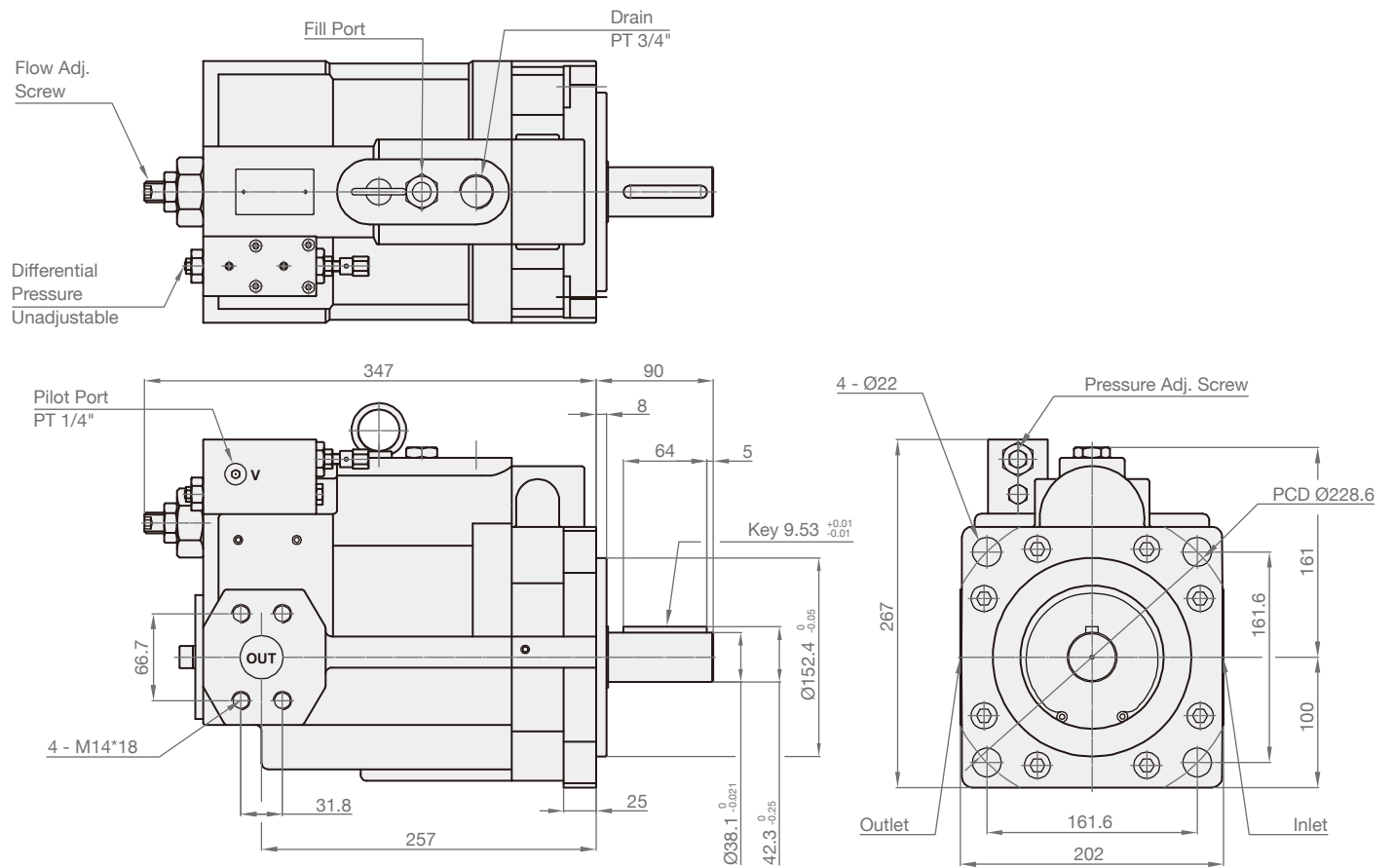
► P36, 46-A



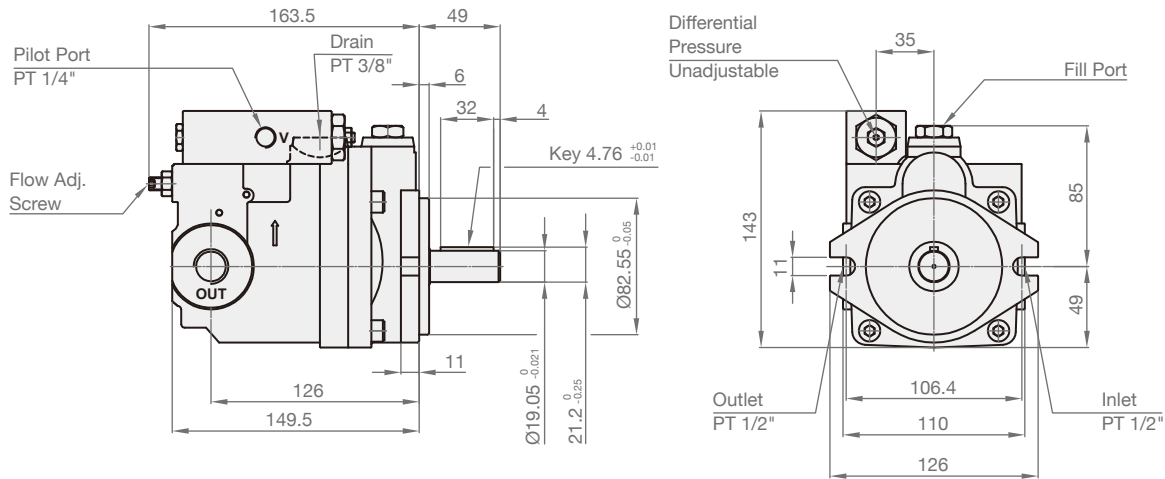
► P70-A



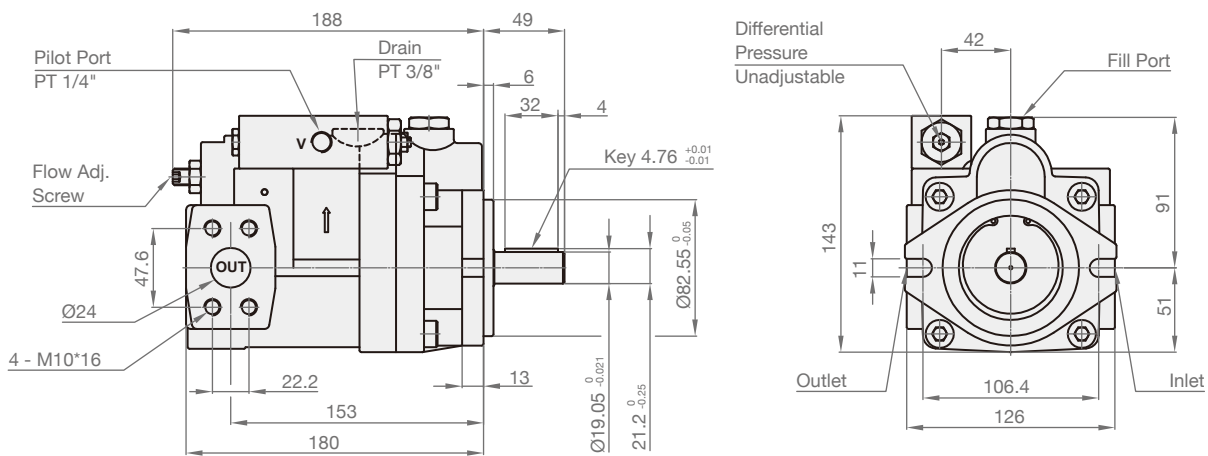
► P100-A



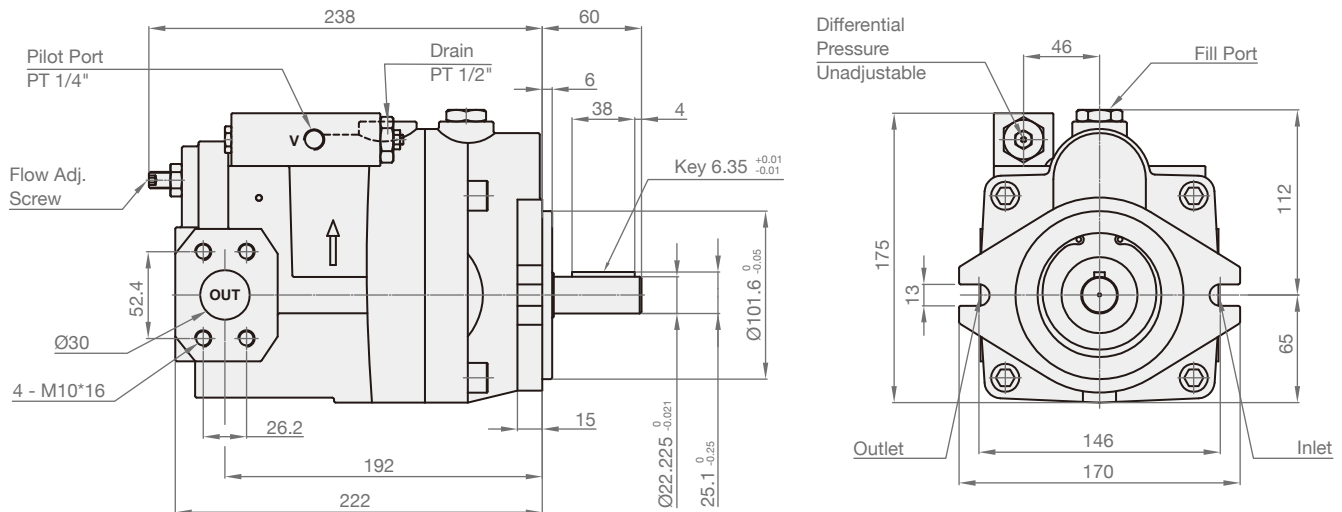
► **P08, 10, 13-B**



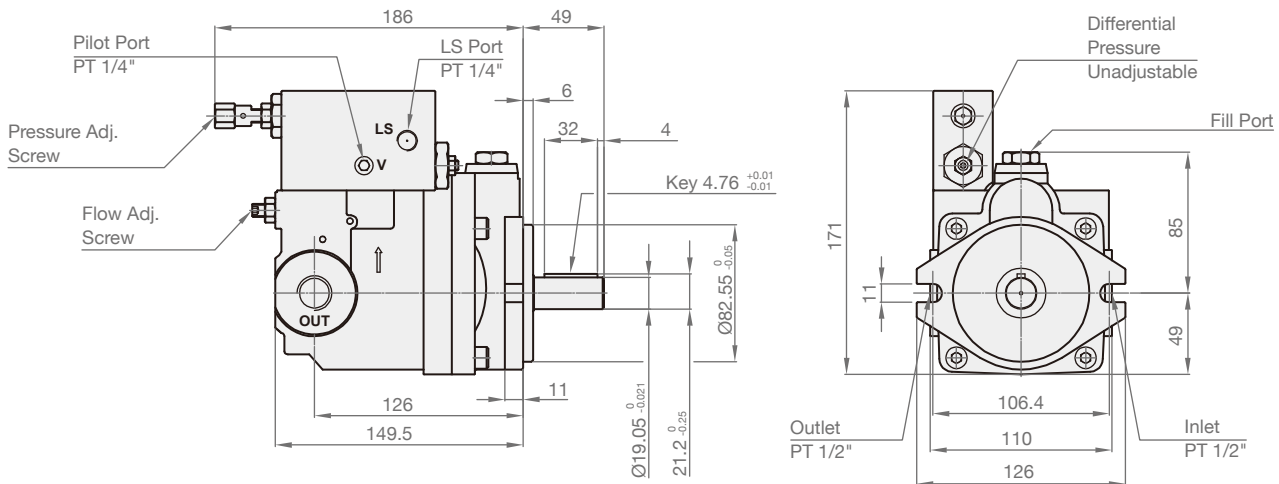
► **P16, 22-B**



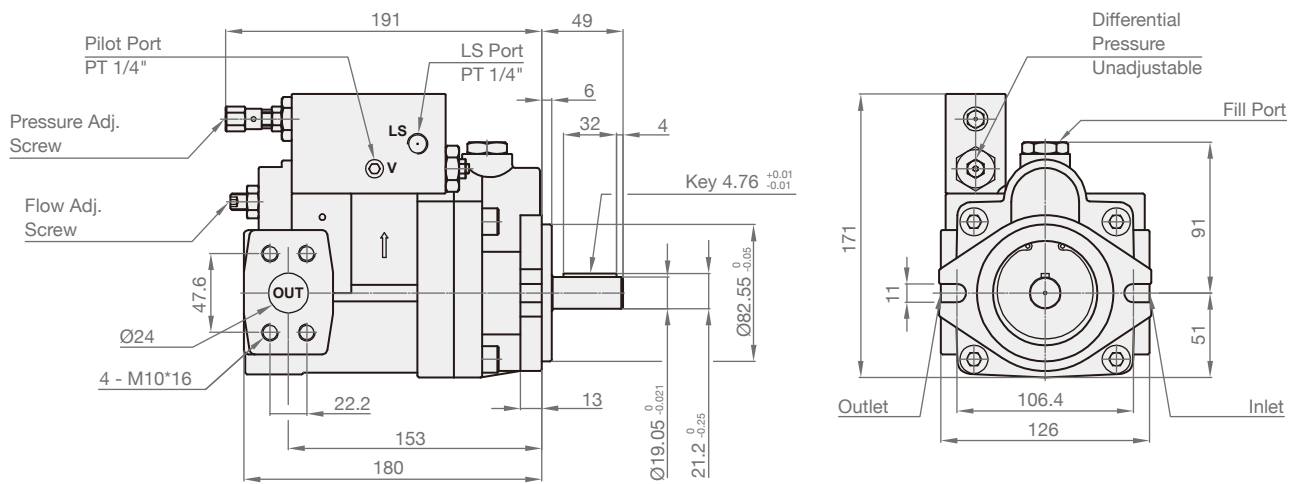
► **P36, 46-B**



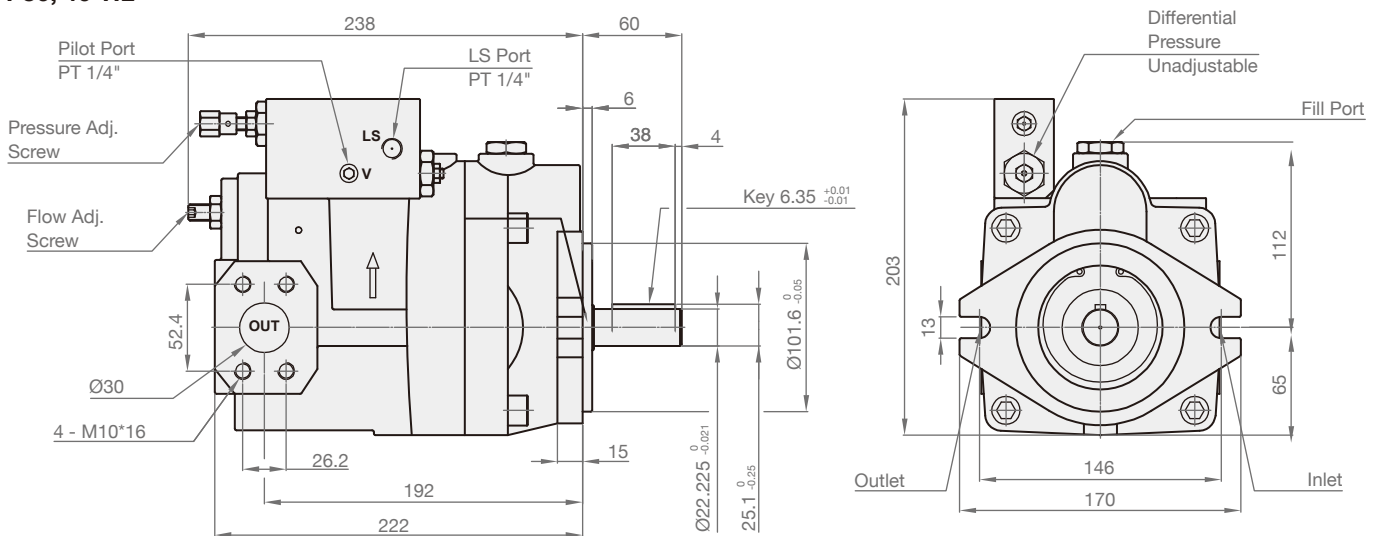
► **P08, 10, 13-HL**



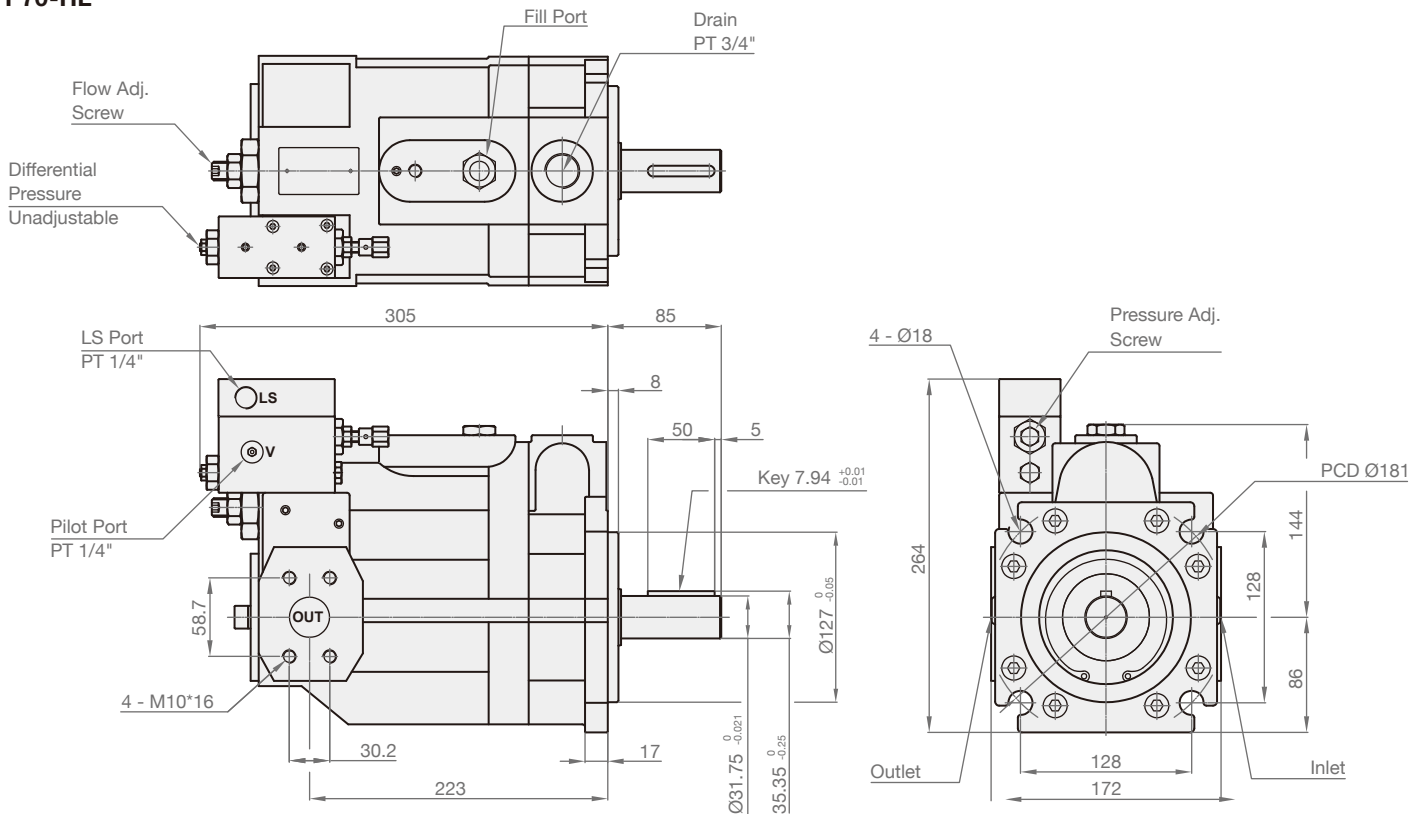
► **P16, 22-HL**



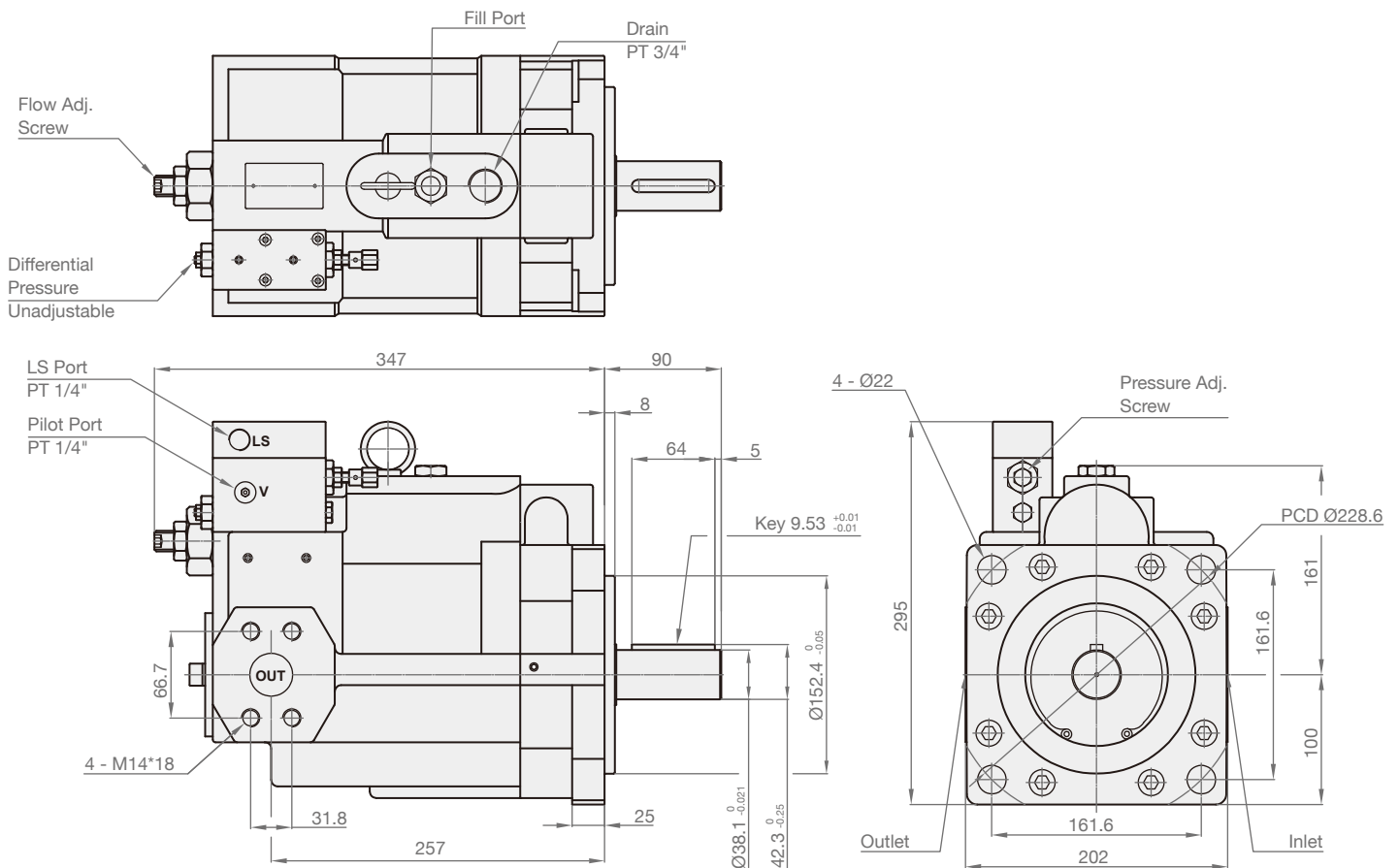
► **P36, 46-HL**



► P70-HL



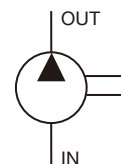
► P100-HL



SDL1



SYMBOLS



ORDER CODES

SDL1 - 35 - 1 5E

1

2

3

4

1	Model Name	SDL1	
2	Displacement	21, 28, 35, 42, 48, 52, 55, 60	
3	Thread	1	PF (BSPP, G)
4	Mounting & Shaft Type	2C	DIN 5462 (8*32*36)
		5E	SAE B - 13T

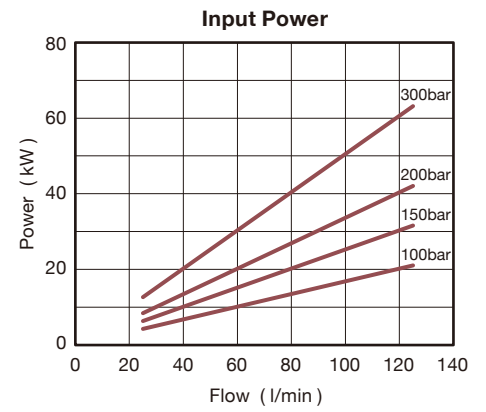
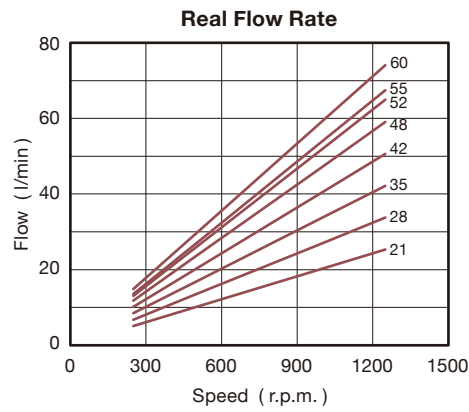
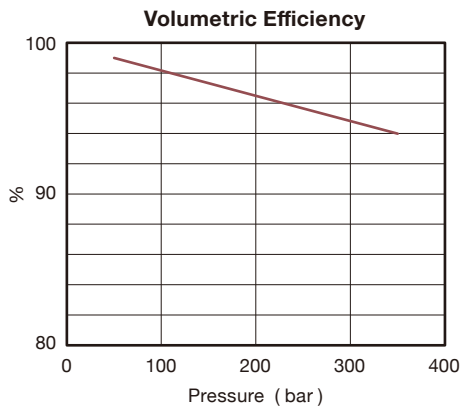
MODEL SPEC.

Model	Displacement (cm ³ /rev)	Operating Pressure (bar)	Max. Pressure (bar)	Max. Speed (r.p.m.)	
SDL1-21	20.25	350	400	1800	
SDL1-28	27.00				
SDL1-35	33.75				
SDL1-42	40.50				
SDL1-48	47.25				
SDL1-52	51.97	300	350	1500	
SDL1-55	54.00				
SDL1-60	59.30				
Direction of Rotation	Suction Port Pressure (bar)	Viscosity (mm ² /s)	Operating Temperature	Filtration Fineness	Weight (kg)
Bi-Direction	0.85 ~ 2	10 ~ 100	-15 ~ 100°C (5 ~ 212°F)	>200 bar : 10 um <200 bar : 25 um	13.5

* Verify that pump is at least 100 under the min. level of the tank. Bleed the air before starting the pump.

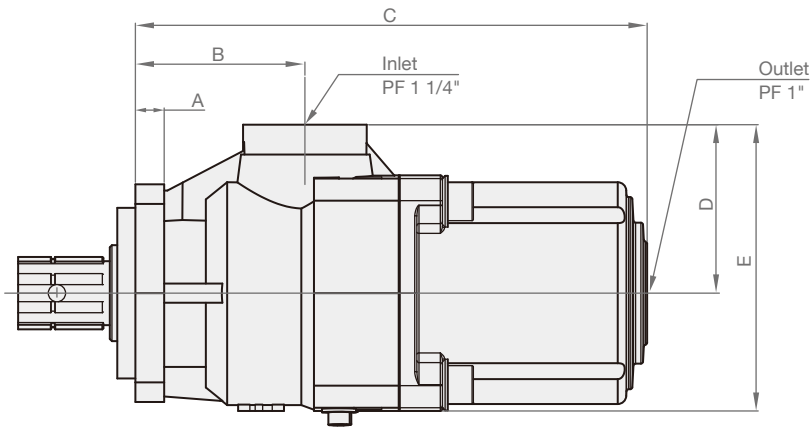
CURVE

(UNIT : mm)



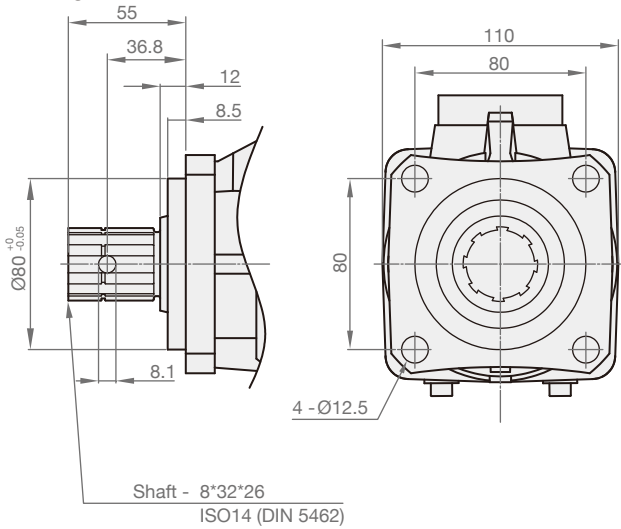
DIMENSION

(UNIT : mm)

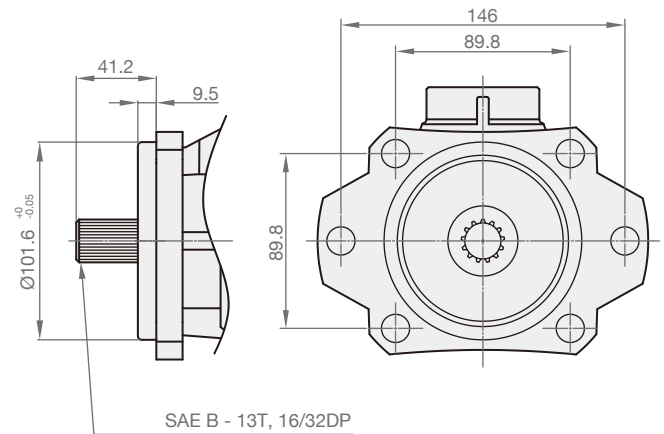


Model	A	B	C	D	E
SDL1-2C	13.5	79.5	240	80	135
SDL1-5E	15	84	249	80	135

► SDL1-2C



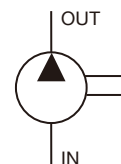
► SDL1-5E



SDL2



SYMBOLS



ORDER CODES

SDL2 - **80** - **1** **2C**

1 2 3 4

1	Model Name	SDL2	
2	Displacement	70, 80, 90, 100	
3	Thread	1	PF (BSPP, G)
4	Mounting & Shaft Type	2C	DIN 5462 (8*32*36)

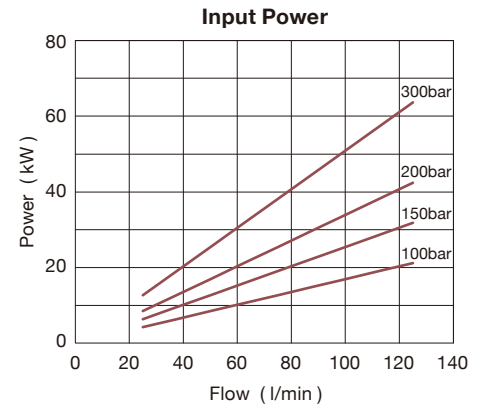
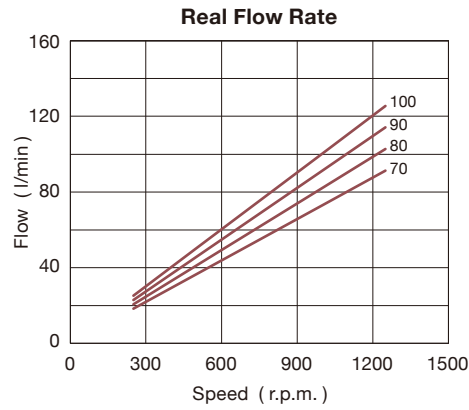
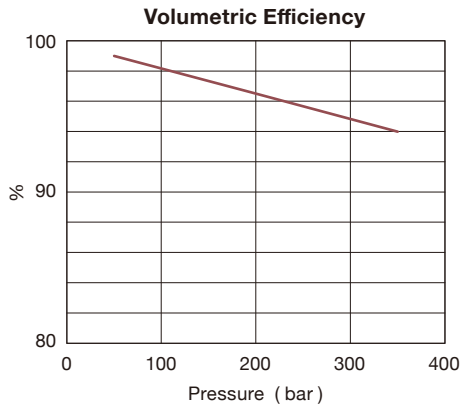
MODEL SPEC.

Model	Displacement (cm³/rev)	Operating Pressure (bar)	Max. Pressure (bar)	Max. Speed (r.p.m.)	
SDL2-70	73.0	300	350	1500	
SDL2-80	82.2				
SDL2-90	91.4				
SDL2-100	100.4				
Direction of Rotation	Suction Port Pressure (bar)	Viscosity (mm²/s)	Operating Temperature	Filtration Fineness	Weight (kg)
Bi-Direction	0.85 ~ 2	10 ~ 100	-15 ~ 100°C (5 ~ 212°F)	>200 bar : 10 um <200 bar : 25 um	22

* Verify that pump is at least 100 under the min. level of the tank. Bleed the air before starting the pump.

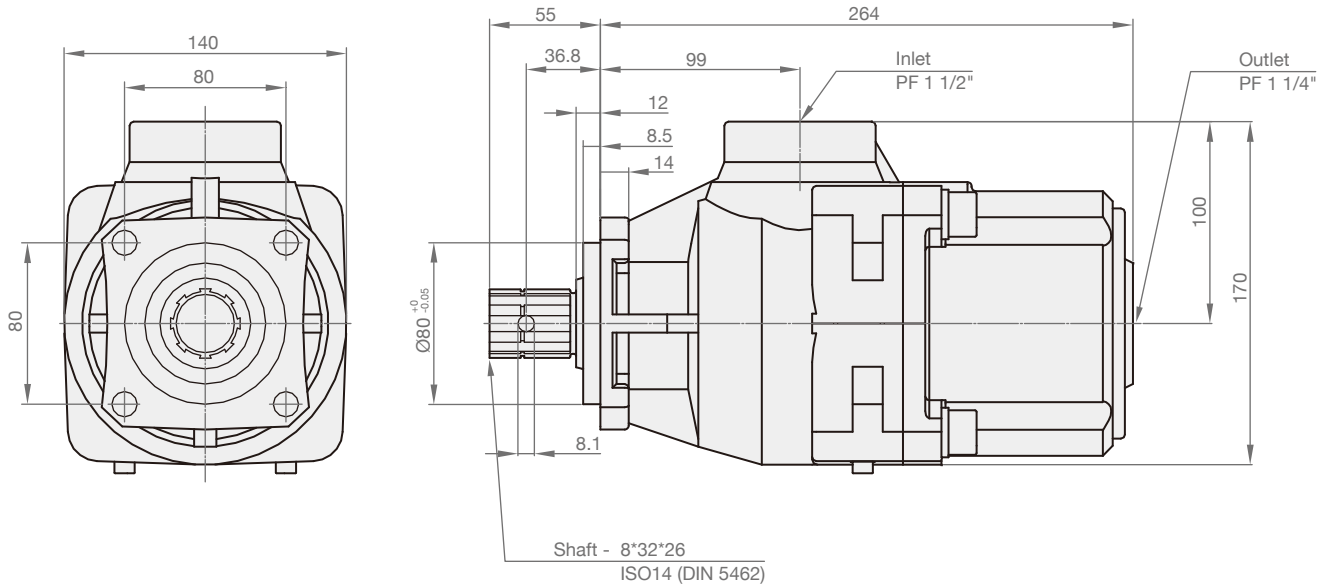
CURVE

(UNIT : mm)



DIMENSION

(UNIT : mm)



Steed Machinery Co., Ltd.

No. 28, Ruiguang St., South Dist.,
Taichung City 402006,
Taiwan
Tel : +886-4-2285-4867
Fax : +886-4-2285-2848
Email : info@steedmachinery.com.tw

more information
www.steedmachinery.com.tw

