Internal gear pump product guide

Internal gear pump
Product guide

Revision Vol.2

Fuji Techno Industries Corporation

1A Pump

2A Pump

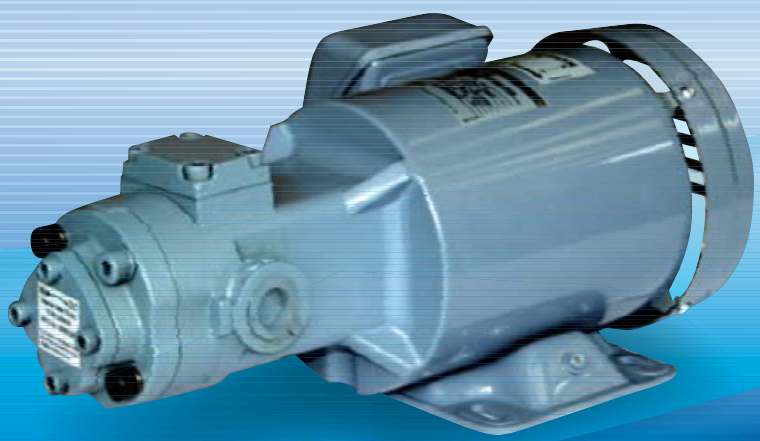
FTP

Internal gear pump

Product lineup for a wide range of applications

Hydraulic **Chemistry** **lubricant** **Fuel**

3H Pump



2MY Motor Pump

Main features

○Competitive-priced products offering excellent cost performances

○Durable performance

Durability would not be deteriorated even in case of pumping liquid difficult to feed such as low viscous liquid.

○Wide variety of products for various applications

There are products for special uses including long life products compatible with water reactive liquids like urethane materials.

○Same mounting dimensions as that similar products from other manufacturers are installed in

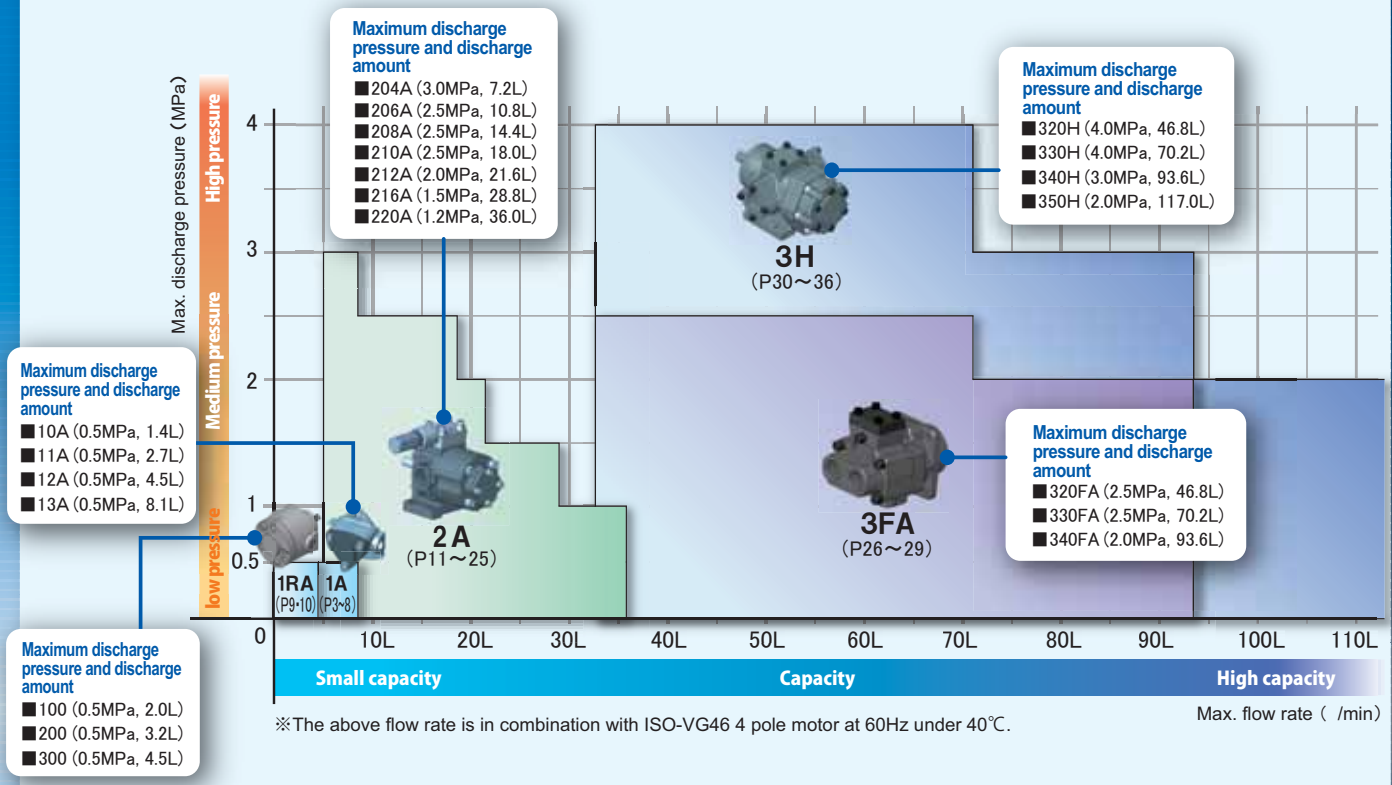
Therefore, switching from other product to a FTP pump can be done without trouble.

<Note> Mounting dimensions are different in some models.

○Motors in compliance with the latest standards are available.

Internal gear pump (Standard ver.) performance distribution map

This is the performance distribution map of FTP pumps.
Please choose the pump you need in terms of the max. discharge pressure and the max. flow rate.
<Note>For the selection of the right pump, you should also refer to “Viscosity table of oils” and “Guide for selection of pump” on page 38.



※The above flow rate is in combination with ISO-VG46 4 pole motor at 60Hz under 40℃.

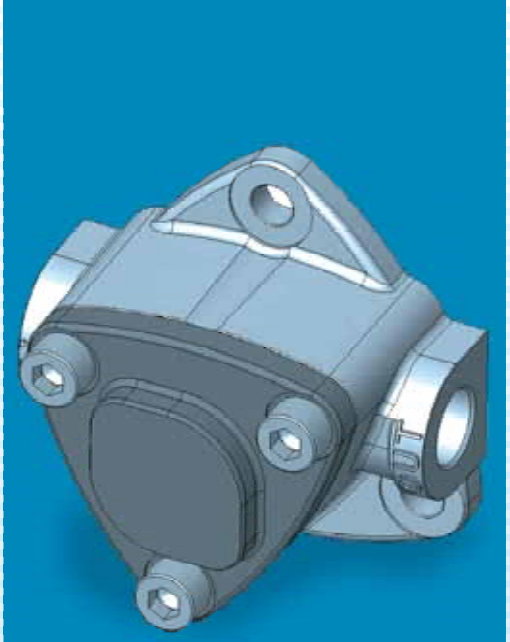
Product configurations and reference pages

Each configuration is classified as a pump alone, a pump integrated with a motor or a base coupling mount type.
Please see the following matrix to find the page numbers of the configuration of your choice.

Product configuration \ Pump model		1A P3～8	1RA P9･10	2A P11～25	3FA P26～29	3H P30～36
Pump alone		P4･5 (WO) P5	P10	P12～14 (WO) P15 (PL) P16	P27･28	P31･32 (WO) P33 (PL) P33
Integrated with motor type	Single phase motor	P6	—	P17･18 (WO) Available (PL) Available	—	—
	3 phase motor	P7	—	P19～21 (WO) P21 (PL) Available	P29	—
	Compliance to standards	P8	—	P22	P28	—
Base coupling mount type		Available at request	—	P23～25	Available at request	P34～36

※ (WO) bunker oil,coolant water (PL) liquid seal

■Tips

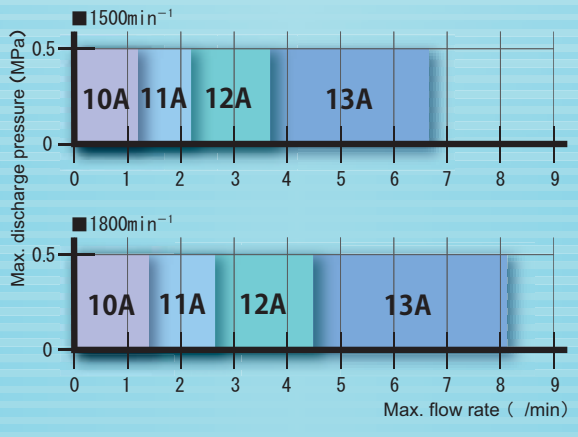


1A

Small capacity / Low pressure

1A	Pump
1AWO	Pump (Bunker oil, Coolant)
1ME−S	Motor Pump (Single-phase motor)
1ME	Motor Pump (Three-phase motor)
1ME	Motor Pump (CCC・CE Standards)

Performance pattern chart



1A Pump

Small capacity／Low pressure

This 1A pump is a light, compact and inexpensive pump. The pump is ideal to transfer hydraulic oil and lubricant oil. The max. flow rate and discharge pressure are 8.1L/min and 0.5MPa, respectively. The max. temp. is as follows.

- The VF version (High Temp.) 120℃
- The WO version (Bunker oil, Coolant Water) 150℃
- The IME version or The IME-S version (Dedicated Motor) 120℃

If the motor is dedicatly running 24 hours please use at 80℃ or less.
The set pressure of the VB (With relief valve) is usually 0.3MPa.
The rotation direction is counter-clockwise as seen from the end of the shaft.

Model

FTP-□A□

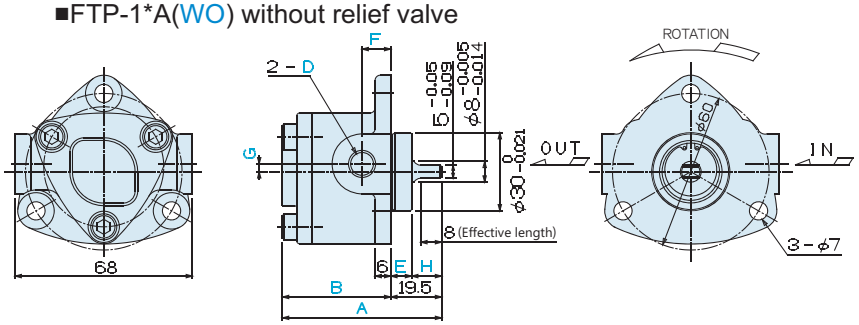
Model No.	Applications	Shaft and shape	Rotation direaction	Seal material	Relief valve
10 11 12 13	No mark : Standard WO : Bunker oil, Coolant water	No mark : standard (Plain shaft) M : Special motor (shaftend with D cut)	※From pump side No mark : standard rotaiton operation (Counterclockwise direction) R : Reverse rotaion operation (Clockwise)	No mark : standard (-5～80℃) V F : Viton (R) for high temp. (120℃)	No mark : without valve V B : with valve ※The relief valve is not available for the inverse rotation operation.

Model examples :
FTP-10AVF (High temp. ver.)
FTP-12A-VB (With relief valve)
FTP-13AM (Dedicated motor ver.)

※There is also a product with a L-shaped foot or a square flange.
Please contact us for more information.

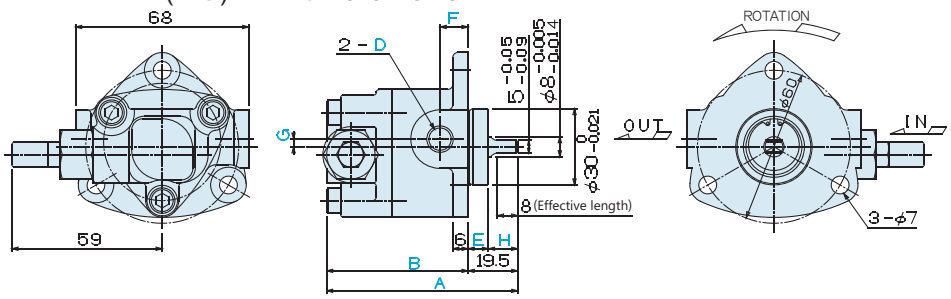
Dimensional diagrams／Standard rotation (mm)

■FTP-1*A(WO) without relief valve



Model	A	B	D	E	F	G	H
10A(WO)	55	35.5	Rc1/8	8	11	3	11.5
11A(WO)	55	35.5	Rc1/8	8	11	3	11.5
12A(WO)	61	41.5	Rc1/4	8	11	3	11.5
13A(WO)	76	56.5	Rc3/8	5	14	5.5	14.5
10A(WO)-VB	69.5	50	Rc1/8	8	11	3	11.5
11A(WO)-VB	69.5	50	Rc1/8	8	11	3	11.5
12A(WO)-VB	75.5	56	Rc1/4	8	11	3	11.5
13A(WO)-VB	90.5	71	Rc3/8	5	14	5.5	14.5

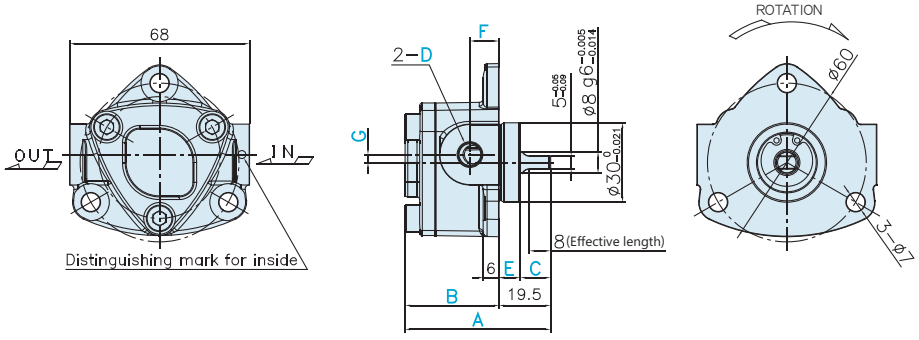
■FTP-1*A(WO)-VB with relief valve



Dimensional diagrams／Reverse rotation (mm)

※Relief valve is not supoort in case of reverse rotaiton.

■FTP-1*A(WO)R without relief valve



Model	A	B	C	D	E	F	G
11A(WO)R	55	35.5	11.5	Rc1/8	8	11	3
12A(WO)R	61	41.5	11.5	Rc1/4	8	11	3

Spec

Model	Flow rate per. rev. (ml/rev)	Theoretical flow rate (L/min)		Max. discharge pressure (MPa)	Max. revolution (min^{-1})	Approx. weight Without valve/With valve (kg)
		1500min^{-1}	1800min^{-1}			
10A (VB)	0.8	1.2	1.4	0.5	3000	0.50/0.68
11A (VB)	1.5	2.2	2.7	0.5	2000	0.51/0.69
12A (VB)	2.5	3.7	4.5	0.5	1800	0.57/0.75
13A (VB)	4.5	6.7	8.1	0.5	1800	0.76/0.94

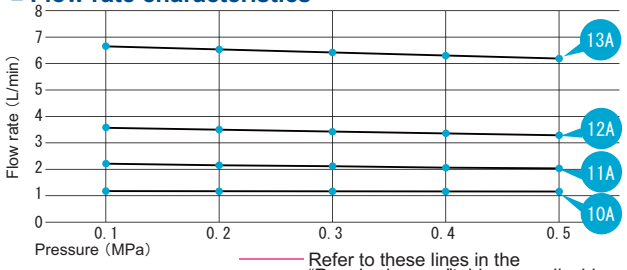
○The above max. discharge pressure and max. revolution are in use of ISO-VG46 at 40℃. The rates vary depending on viscosity and temperature.

Performance

○Test conditions Oil：ISO-VG46 Oil temp：40℃

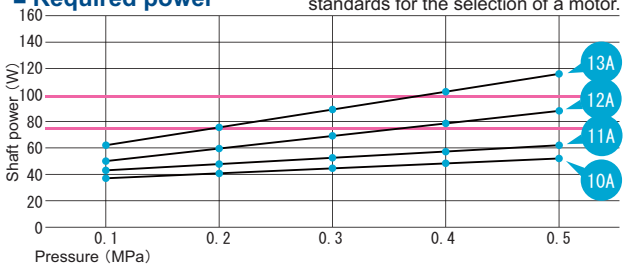
At 1,450 rotations（50Hz）

■ Flow rate characteristics



Refer to these lines in the "Required power"table as applicable standards for the selection of a motor.

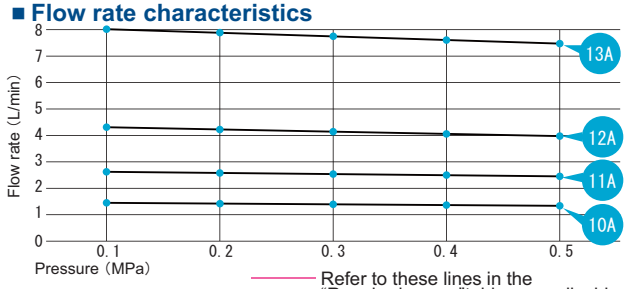
■ Required power



Spec / Model	Flow rate (L/min) Pressure (MPa)					Required power (W) Pressure (MPa)				
	0.1	0.2	0.3	0.4	0.5	0.1	0.2	0.3	0.4	0.5
10A(VB)	1.18	1.17	1.17	1.16	1.16	37	41	45	49	52
11A(VB)	2.21	2.16	2.12	2.07	2.03	43	48	52	57	62
12A(VB)	3.58	3.50	3.43	3.36	3.29	50	59	68	77	88
13A(VB)	6.68	6.55	6.43	6.31	6.19	62	75	89	103	117

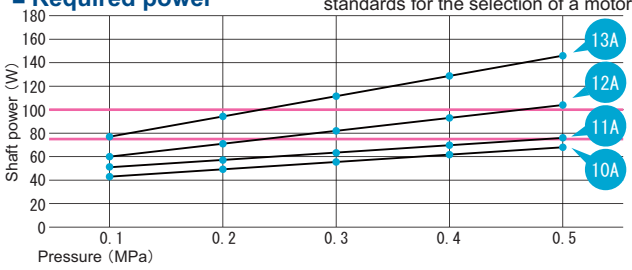
At 1,750 rotations（60Hz）

■ Flow rate characteristics



Refer to these lines in the "Required power"table as applicable standards for the selection of a motor.

■ Required power



Spec / Model	Flow rate (L/min) Pressure (MPa)					Required power (W) Pressure (MPa)				
	0.1	0.2	0.3	0.4	0.5	0.1	0.2	0.3	0.4	0.5
10A(VB)	1.45	1.42	1.40	1.37	1.34	43	51	56	62	68
11A(VB)	2.62	2.58	2.54	2.50	2.46	51	57	63	70	76
12A(VB)	4.31	4.23	4.14	4.06	3.98	60	70	82	93	104
13A(VB)	8.02	7.88	7.75	7.61	7.48	77	94	110	128	146

○The required power varies depending on viscosity, temp. etc.

1AWO Pump (Bunker oil, Coolant)

Small capacity／Low pressure

Special PTFE（Teflon（R））type seals are used in the 1AWO to prevent deterioration of sealing capability due to chemical reaction with coolant water or bunker oil. Regarding the flow rate, as the viscosity of bunker oil and coolant water is relatively low, flow rates of the WO version are approximately 60% of that of the standard pumps with ISO-VG46 at 40℃. Although the maximum temperature of the 1AWO is 150℃, a pump for higher temperatures can be developed. Please consult with Fuji Techno about a WO pump for higher temp.

1ME-S Moter Pump

Small capacity／Low pressure

ME-S is a compact unit consisting of the 1A pump and a dedicated motor. The motor is single phase 100/200V. There is no ultrahigh temp. version（VH） of this pump for temperatures higher than 120℃.
The set pressure of the relief valve is typically 0.3MPa.

Model

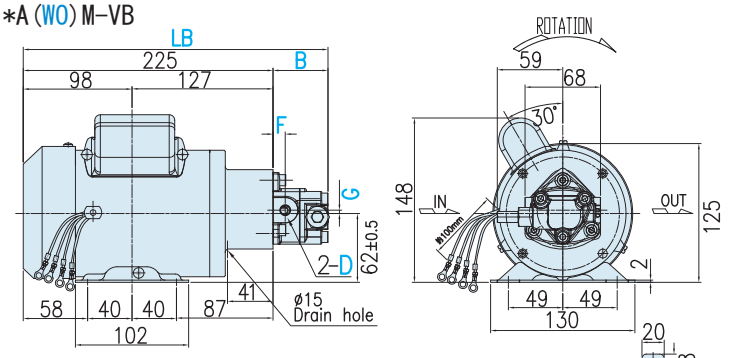
FTP-1ME □S- □A□M □ —

Motor output	Model No.	Applications	Rotation direction	Seal material	Relief valve
75 200	10 11 12 13	No mark：starndard WO：Bunkar oil, Coolant oil	※Look from pump side No mark：standard rotation (Clockwise) R：Reverse rotaion (Counter clockwise)	No mark：Standard (-5～80℃) VF：Viton(R) (high temp) (120℃、24hous continous in case of 80℃)	No mark：No valve VB：With valve

Model examples：FTP-1ME75S-10AMVF
(75W,single-phase,high temp. spec)
FTP-1ME200S-13AM-VB
(200W,single-phase,with relief valve)

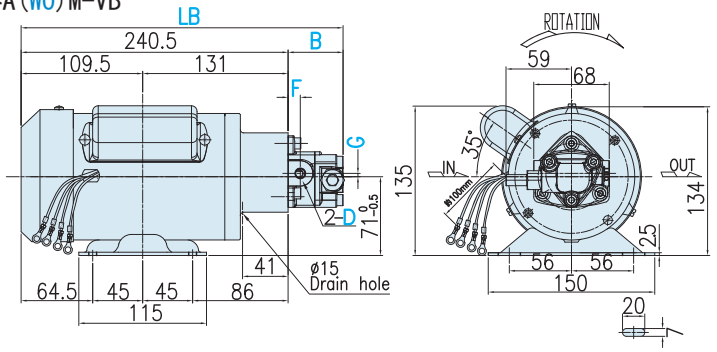
Dimensional diagrams (mm)

■FTP－1ME75S-1∗A(WO)M-VB



Model	LB	B	D	F	G
10A(WO)M-VB	275	50	Rc1/8	11	3
11A(WO)M-VB	275	50			
12A(WO)M-VB	281	56	Rc1/4		

■FTP-1ME200S-1∗A(WO)M-VB



Model	LB	B	D	F	G
10A(WO)M-VB	290.5	50	Rc1/8	11	3
11A(WO)M-VB	290.5	50			
12A(WO)M-VB	296.5	56	Rc1/4		
13A(WO)M-VB	311.5	71	Rc3/8	14	5.5

Spec

Model	No. of motor revolutions 50Hz 1500min^{-1}			No. of motor revolutions 60Hz 1800min^{-1}		
	Theoretical flow rate (L/min)	Max. discharge pressure to motor output (MPa)		Theoretical flow rate (L/min)	Max. discharge pressure to motor output (MPa)	
		75W	200W		75W	200W
10AM(VB)	1.2	0.5	0.5	1.4	0.4	0.5
11AM(VB)	2.2	0.5	0.5	2.7	0.3	0.5
12AM(VB)	3.7	0.2	0.5	4.5	0.1	0.5
13AM(VB)	6.7	—	0.5	8.1	—	0.5

○The above max. discharge pressure are in combination with ISO-VG46 at 40℃. The rates vary depending on viscosity and temperature.

Motor Spec

Power(W)	Ploe(P)	Rating	Voltage(V)	Frequency(Hz)	Revolutions (min^{-1})	Current(A)	Approx weight(kg)
75	4	S1	100	50/60	1400/1700	1.7/1.4	5
			200	50/60	1400/1700	1/0.8	5
200	4	S1	100	50/60	1400/1700	4/3.2	7
			200	50/60	1400/1700	2.1/1.8	7

○Single-phase induction motor ○Insulation class B ○IP44

1ME Moter Pump

(Three-phase Motor)

Small capacity／Low pressure

1ME-S is a compact unit consisting of the 1A pump and a special dedicated motor.
The standard motor is 3 phase and 200V class. In case of the high temperature specification, please confer with Fuji Techno.
Usually, 0.3 MPa is the set pressure of the relief valve (VB).

Model

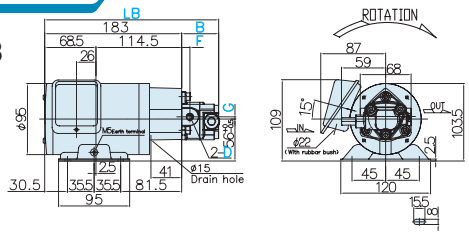
FTP-1ME□ – □ – □A□M □

Motor output	Attachment	Model No.	Applications	Rotation direction	Seal materail	Relief valve
75 100 200	1 or No mark : Horizontal	10 11 12 13	No mark : standard WO : Bunkar oil, coolant oil	※look from pump side No mark : standard (Clockwise) R : Reverse rotation specification (Counter clockwise)	No mark : standard (-5～80℃) VF : Viton (R) for high temp (120℃, In case of 24 hour continous 80℃)	No Mark : no valve VB : with valve

Model examples :
FTP-1ME75-1-10AMVF
(75W, horizontal type, high temp. spec)
FTP-1ME100-13AM-VB
(100W, with relief valve)

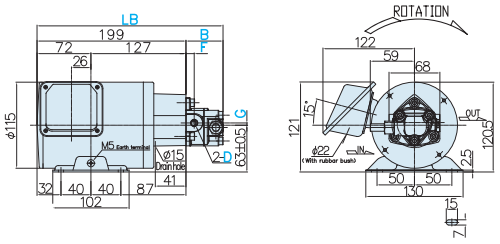
Dimensional diagrams (mm)

■FTP-1ME75-1-1∗A(WO)M-VB



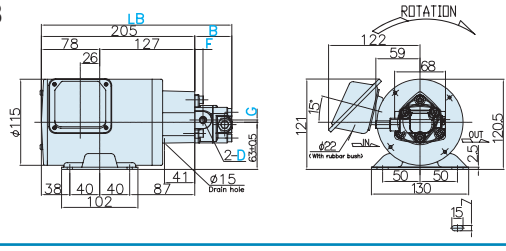
Model	LB	B	D	F	G
10A(WO)M-VB	233	50	Rc1/8	11	3
11A(WO)M-VB	233	50			
12A(WO)M-VB	239	56	Rc1/4		

■FTP-1ME100-1∗A(WO)M-VB



Model	LB	B	D	F	G
10A(WO)M-VB	249	50	Rc1/8	11	3
11A(WO)M-VB	249	50			
12A(WO)M-VB	255	56	Rc1/4		
13A(WO)M-VB	270	71	Rc3/8	14	5.5

■FTP-1ME200-1∗A(WO)M-VB



Model	LB	B	D	F	G
10A(WO)M-VB	255	50	Rc1/8	11	3
11A(WO)M-VB	255	50			
12A(WO)M-VB	261	56	Rc1/4		
13A(WO)M-VB	276	71	Rc3/8	14	5.5

Spec

Model	No. of motor revolutions 50Hz 1500min^{-1}				No. of motor revolutions 60Hz 1800min^{-1}			
	Theoretical flow rate (L/min)	Max. discharge pressure to motor output (MPa)			Theoretical flow rate (L/min)	Max. discharge pressure to motor output (MPa)		
		75W	100W	200W		75W	100W	200W
10AM(VB)	1.2	0.5	0.5	0.5	1.4	0.4	0.5	0.5
11AM(VB)	2.2	0.5	0.5	0.5	2.7	0.3	0.5	0.5
12AM(VB)	3.7	0.2	0.5	0.5	4.5	0.1	0.3	0.5
13AM(VB)	6.7	—	0.2	0.5	8.1	—	0.1	0.5

○ The above max. discharge pressure are in combination with ISO-VG46 at 40℃.
The rates vary depending on viscosity and temperature.

Motor Spec

Power(W)	Ploe(P)	Rating	Voltage(V)	Frequency(Hz)	Revolutions (min^{-1})	Current(A)	Approx weight(kg)
75	4	S1	200/200/220	50/60/60	1405/1665/1695	0.79/0.7/0.72	5.0
100	4	S1	200/200/220	50/60/60	1440/1705/1720	1.16/1.06/1.08	5.0
200	4	S1	200/200/220	50/60/60	1425/1685/1710	1.23/1.15/1.14	6.2

○ Squirrel-cage induction motor ○ Insulation class E ○ Fully closed type ○ IP44
※ 380V/50Hz, 400V/50・60Hz and 440V/60Hz are available.

1ME Moter Pump

(Standards (CCC, CE))

Small capacity／Low pressure

1A dedicated motors complying with numerous regulations and specs.
The set pressure of the relief valve is usually 0.3MPa.

Model

FTP−1ME □ − □ − □A□M □ □ − □

Motor output	Standard	Model No.	Applications	Rotation direction	Seal Material	Relief valve
75 100 200	A : 200V (CCC) B : 380V (CCC) CA : 200V (ENstandard) CB : 400V (ENstandard)	10 11 12 13	No mark : standard WO : Bunkar oil, coolant oil	※Look form pump side No mark : standard (Clockwise) R : reverse roloution (Counter clockwise)	No Mark : Standard (-5～80℃) VF : Viton (R) for high temp. (120℃)	No Mark : No valve VB : with valve

Model examples :
FTP-1ME75-A-10AMVF
(75W, 200V CCC, high temp. spec)
FTP-1ME100-B-10AM-VB
(100W, 400V CCC, with relief valve)

Dimension, pump spec., motor spec.

※ All numbers are the same as for the standard version. (page 7)
※ The protective structure compliance to CCC, EN (CE) is IP54 and the insulation class is B.

Standard

In order to use motors with 1.1kW or less in China, the motors have to be CCC certified.

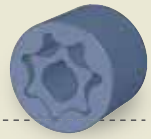
Only motors, which meet EN standard and have CE marks attached, can be used in member nations of EU.

Compliance to standards

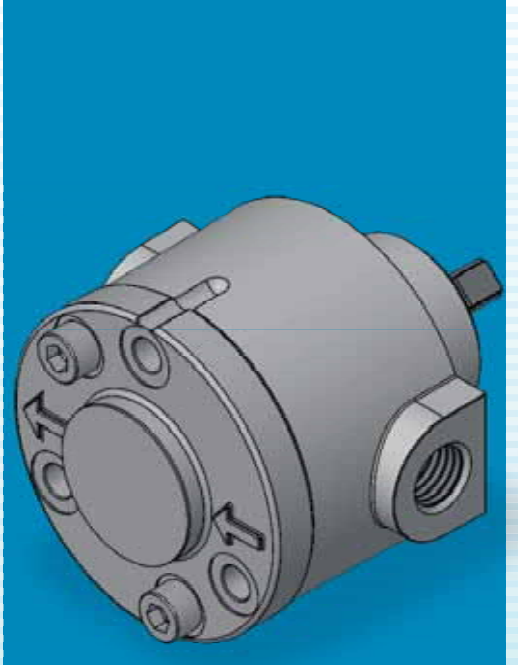
	US・Canada	Korea	Australia	E U	China	Japan
Main Requirments	1HP～200HP (0.75kW～150kW) IE3	0.75kW～37kW IE2	0.73kW～185kW LEVEL 1A、1B	0.75kW～7.5kW IE2	0.75kW～375kW GB3 ～1.1kW CCC	0.75kW～375kW IE3
Suitable situation	standard use ※for 1HP (0.75kW) below	Standard use ※for 0.75kW below	Standard use ※for 0.73kW below	CE Product use ※for 0.75kW below	CCC product use ※for 0.75kW below	standard use ※for 0.75kW below

○ The above is as of May, 2015. Since standards may be revised, please check the latest status of a standard requirement.

Tip 1 Material of FTP (Internal Gear Pump)



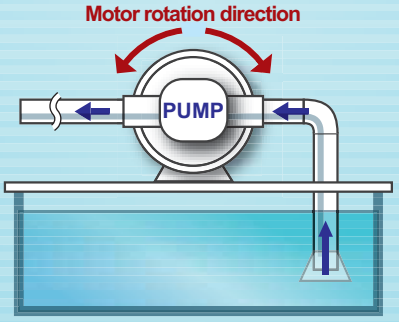
The FTP pump metal components are made of cast iron (FC) or carbon steel (SC) and the seal parts of rubber or resin. Therefore the main liquids that can be fed using the FTP pumps are various kinds of oil. FTP cannot handle corrosive liquids like acid and alkaline. However, since iron type metals are able to bear some chemicals like isocyanate and polyol, both of which are materials of urethane, expensive pumps used in urethane production have been replaced with FTP. If it is requested by customers, Fuji Techno will study the development of stainless or ceramic type pump.



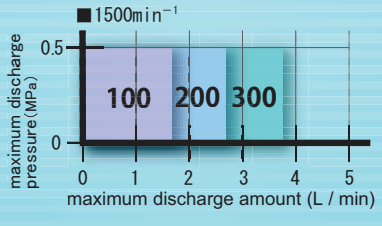
1RA

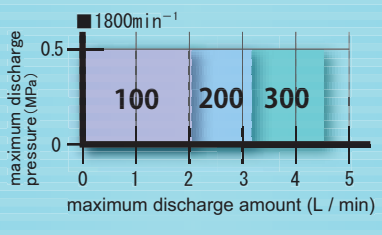
Small Capacity / low pressure

The motor can be rotated clockwise or counter clockwise.
The liquid always flows in one direction.



Performance Pattern Chart





1RA Pump

Small Capacity ／low pressure

The 1RA is anb expensive, light and compact Pump.
This pump is ideal for the transport of hydraulic oil, lubricating oil in use following 4.5L / min 0.5MPa. The pump can rotate clockwise and counter clockwise along with the pump shaft. The pump also has a suction port and a discharge port. Prevention from rotor abnormal postion , using a special kind of O-ring and rotationg 180 degrees in rotation direction.

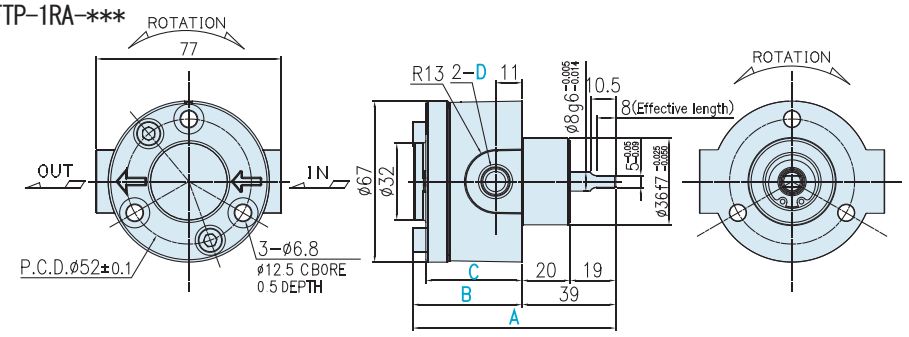
Model

FTP-1RA-□ (Model No.)

100
200
300

Dimensional diagrams (mm)

■FTP-1RA-***



Model	A	B	C	D
100	84.5	45.5	40	Rc1/4
200	88.5	49.5	44	Rc1/4
300	92.5	53.5	48	Rc1/4

Spec

Model	Flow rate per. rev. (ml/rev)	Theoretical flow rate (L/min)		Max. discharge pressure (MPa)	Max. revolution (min^{-1})	Approx. weight (kg)
		1500min^{-1}	1800min^{-1}			
100	1.16	1.74	2.08	0.5	2000	1.1
200	1.80	2.70	3.24	0.5	2000	1.2
300	2.50	3.75	4.5	0.5	2000	1.3

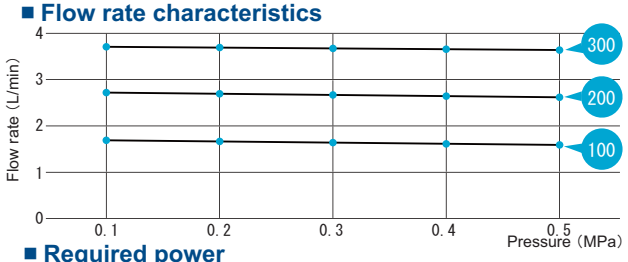
○The above max. discharge pressure and max. revolution are in use of ISO-VG46 at 40℃.
The rates vary depending on viscosity and temperature.

Performance

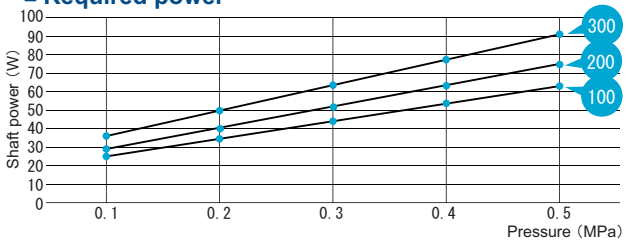
○Test condition Oil：ISO-VG46 oil temp：40℃

At 1,450 rotations（50Hz）

■ Flow rate characteristics



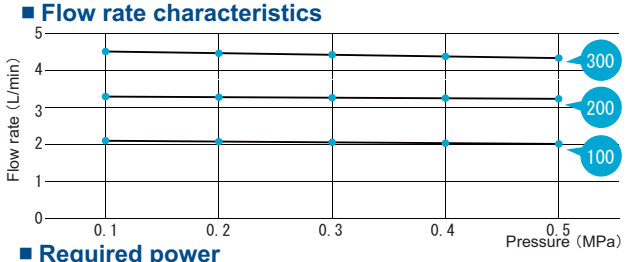
■ Required power



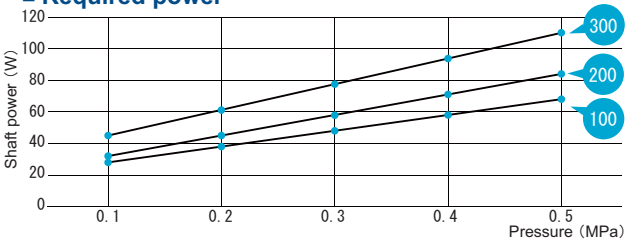
Model \ Spec	Flow rate (L/min) Pressure (MPa)					Required power (W) Pressure (MPa)				
	0.1	0.2	0.3	0.4	0.5	0.1	0.2	0.3	0.4	0.5
100	1.69	1.67	1.64	1.62	1.59	25	34	44	54	63
200	2.72	2.70	2.67	2.65	2.62	29	40	51	63	75
300	3.71	3.69	3.68	3.66	3.64	36	49	63	77	91

At 1,750 rotations（60Hz）

■ Flow rate characteristics

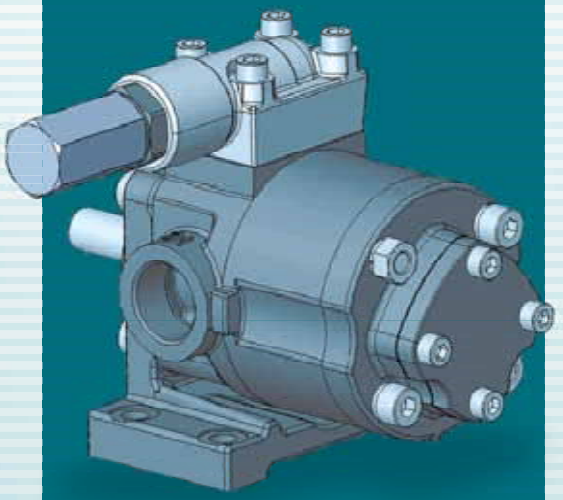


■ Required power



Model \ Spec	Flow rate (L/min) Pressure (MPa)					Required power (W) Pressure (MPa)				
	0.1	0.2	0.3	0.4	0.5	0.1	0.2	0.3	0.4	0.5
100	2.10	2.08	2.06	2.03	2.01	28	37	47	58	68
200	3.29	3.28	3.26	3.25	3.23	32	45	58	71	84
300	4.51	4.47	4.42	4.38	4.33	45	61	77	94	110

○Required power change as per viscosity and temperatue

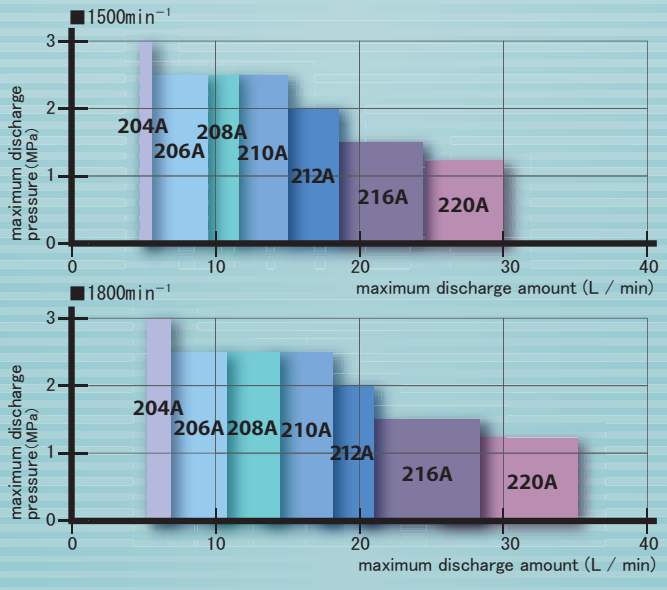


2A

Medium Capacity / Medium pressure

2A	Pump
2AWO	Pump (Bunker oil , Coolant)
2APL	Pump (Liquid seal to cut off outside air)
2ME-S	Motor pump (Single-phase motor)
2MY•2Y	Motor pump (Three-phase motor)
2MY-2AWOM	Motor pump (Bunker oil , Coolant)
2MY	Motor pump integrated (CCC・GB3・CE・IE3 corresponding special motor)
2MBC	Base coupling mounting type

Performance Pattern Chart



2A Pump

Medium Capacity / Medium pressure

The 2A pump is for mid. capacity and mid. pressure. The max. flow rate and discharge pressure are 36L/min or less and 3MPa or less. For the applications of hydraulic pressure, lubrication and cooling, this pump is widely used to feed hydraulic oil and lubrication oil. A high temp. ver. (VF) and an ultra-high temp. ver. (VH) are up to 120℃ and 200℃, respectively. The standard rotation direction of this pump is counter-clockwise.

Model

FTP–□A□□□–□□□

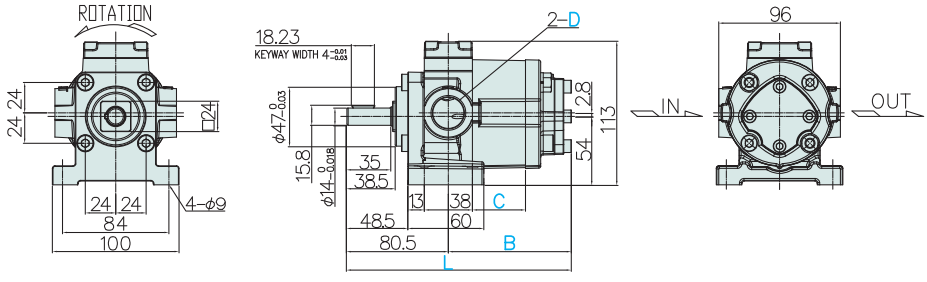
Model No.	Applications	Form	Rotation direction	Seal material	Relief valve	Relief valve set pressure
204	No mark : standard	No mark : standard	※Look from pump shaft side	No mark : Standard (-5～80℃)	No mark : No valve	ex.
206	WO : Bunker oil, Coolant Water	M : Dedicated motor (short shaft)	No mark : Counter clockwise	VF : Viton (R) for high temp. (120℃)	VB : With valve (Internal-return)	0.1 : Set pressure 0.1MPa (Spring No.1L)
208	PL : Liquid seal		R : Clockwise	VH : Ultrahigh temp. (200℃)	VD : With valve (External-return)	0.5 : Set pressure 0.5MPa (Spring No.2L)
210				※In case of the continuous operation of the pump for a long period, please contact Fuji Techno for consultation in advance.		1.0 : Set pressure 1.0MPa (Spring No.3L)
212						2.0 : Set pressure 2.0MPa (Spring No.4L)
216						
220						

Model examples : FTP-203A-VB (With valve (Internal-return)) FTP-204AR (Counter-clockwise as seen from the shaft end)

※There is also a product of the L-shaped with a foot or without any corner flange as a mounting shape. Please contact us for more information.

Dimensional diagrams／Standard rotation (mm)

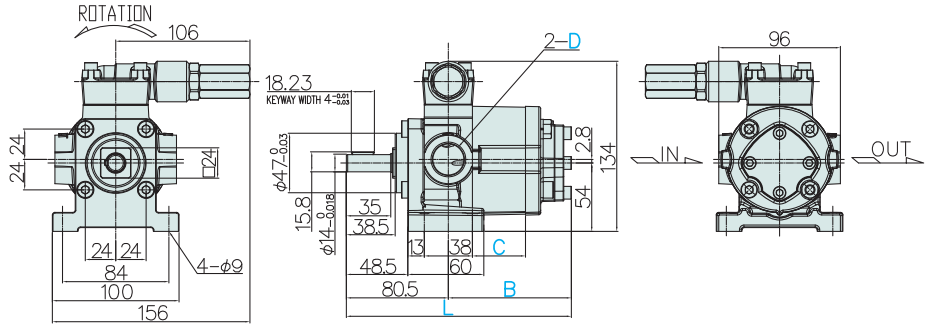
■FTP-2**A (WO、PL) Without valve



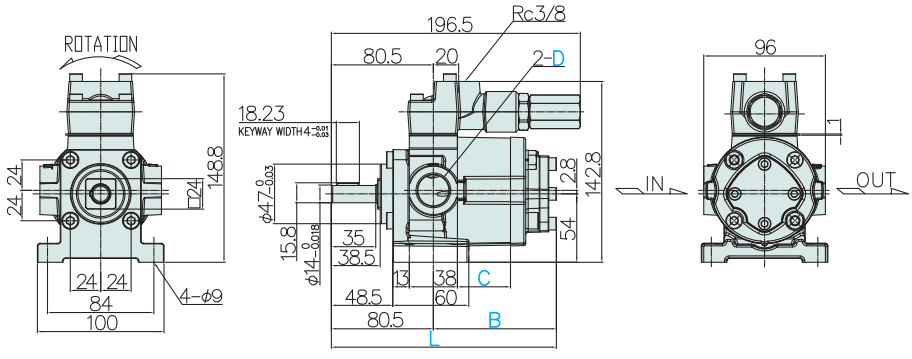
■ Standard and WO/PL type
※Common Drawing

Model	L	B	C	D
204A (WO/PL)	145.7	65.2	10	Rc 1/2
206A (WO/PL)	150.7	70.2	15	
208A (WO/PL)	157.0	76.5	21.3	
210A (WO/PL)	162.2	81.7	26.5	Rc 3/4
212A (WO/PL)	167.4	86.9	31.7	
216A (WO/PL)	177.6	97.1	41.9	
220A (WO/PL)	187.7	107.2	52.0	

■FTP-2**A (WO、PL) -VD With relief valve (External-return) (VD)



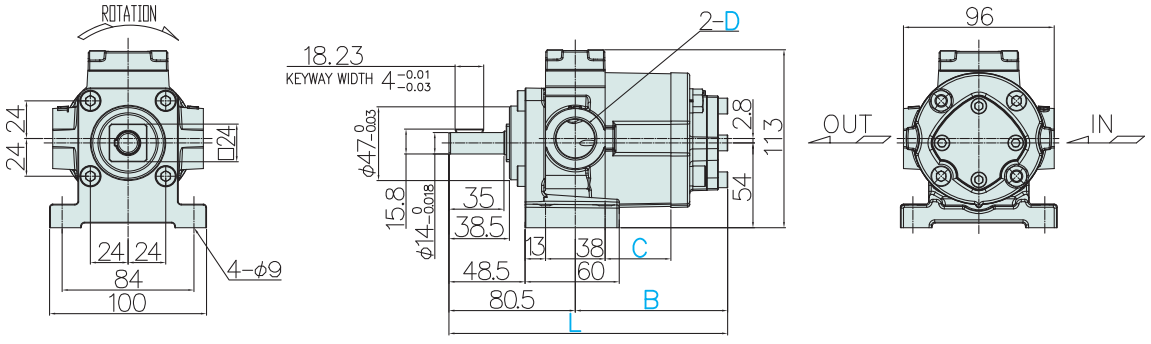
■FTP-2**A (WO、PL) -VD With relief valve (External-return) (VD)



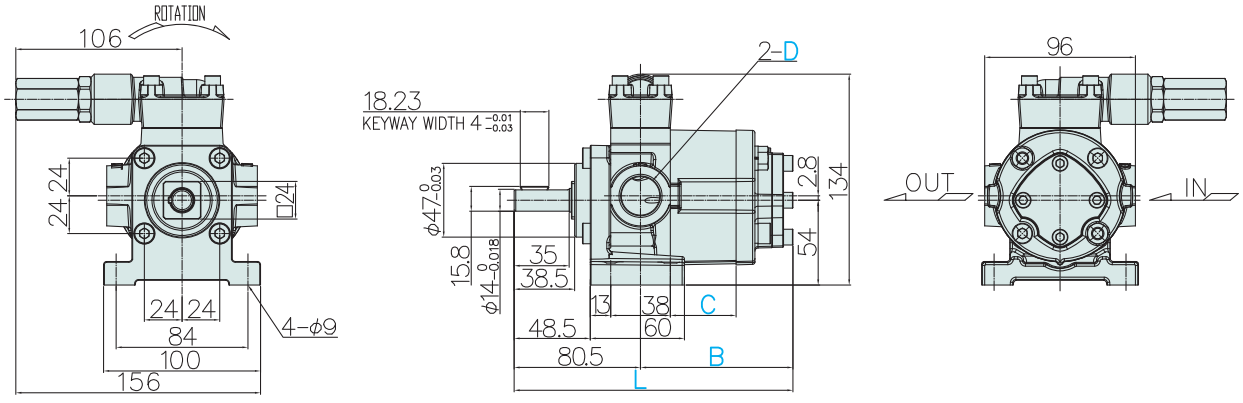
Please read the following page as well.

Dimensional diagrams／Reverse rotation (mm)

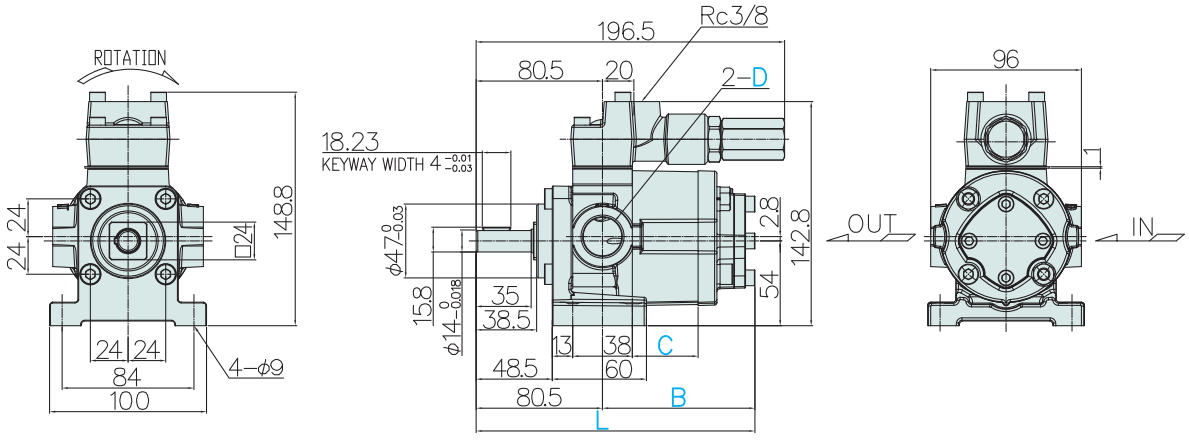
■FTP-2**A (WO、PL) R Without relief valve



■FTP-2**A (WO、PL) R-VB With relief valve (Internal-return) (VB)



■FTP-2**A (WO、PL) R-VD With relief valve (Externall-return) (VD)



■ Standard and WO/PL type ※Common Drawing

Model	L	B	C	D	Model	L	B	C	D
204A (WO、PL) R	145. 7	65. 2	10	Rc 1/2	210A (WO、PL) R	162. 2	81. 7	26. 5	Rc 3/4
206A (WO、PL) R	150. 7	70. 2	15		212A (WO、PL) R	167. 4	86. 9	31. 7	
208A (WO、PL) R	157. 0	76. 5	21. 3		216A (WO、PL) R	177. 6	97. 1	41. 9	
					220A (WO、PL) R	187. 7	107. 2	52. 0	

Spec

Model	Flow rate per. rev. (ml/rev)	Theoretical flow rate (L/min)		Max. discharge pressure (MPa)	Max. revolution (min^{-1})	Approx. weight Without valve/With valve (kg)
		1500min^{-1}	1800min^{-1}			
204A (VB、VD)	4	6.0	7.2	3.0	3000	3.6/4.0
206A (VB、VD)	6	9.0	10.8	2.5	2500	3.8/4.2
208A (VB、VD)	8	12.0	14.4	2.5	2500	4.0/4.4
210A (VB、VD)	10	15.0	18.0	2.5	2500	4.1/4.6
212A (VB、VD)	12	18.0	21.6	2.0	2000	4.3/4.7
216A (VB、VD)	16	24.0	28.8	1.5	1800	4.6/5.1
220A (VB、VD)	20	30.0	36.0	1.2	1800	5.0/5.5

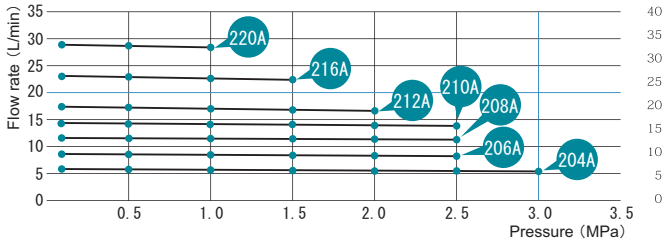
● The above max. discharge pressure and max. revolution are in combination with ISO-VG46 at 40℃. The rates vary depending on viscosity and temperature.

Performance

● Test conditions Oil : ISO-VG46 Oil temp. : 40℃

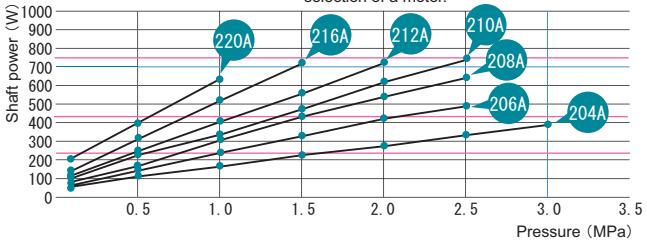
At 1,450 rotations (50Hz)

■ Flow rate characteristics



■ Required power

Refer to these lines in the "Required power" table as applicable standards for the selection of a motor.

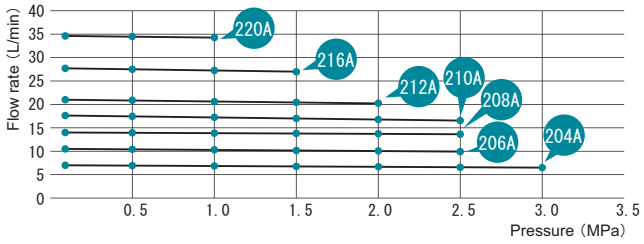


Model \ Spec	Flow rate (L/min) Pressure (MPa)							Required power (W) Pressure (MPa)						
	0.1	0.5	1.0	1.5	2.0	2.5	3.0	0.1	0.5	1.0	1.5	2.0	2.5	3.0
204A	5.8	5.7	5.6	5.6	5.5	5.4	5.3	66	110	169	227	283	340	394
206A	8.7	8.6	8.5	8.4	8.3	8.2	—	86	158	240	329	415	497	—
208A	11.6	11.5	11.5	11.4	11.4	11.3	—	91	186	305	423	543	662	—
210A	14.4	14.4	14.3	14.0	13.9	13.8	—	104	210	345	480	615	749	—
212A	17.4	17.2	17.0	16.8	16.6	—	—	123	250	405	565	730	—	—
216A	23.1	22.9	22.8	22.4	—	—	—	148	308	510	715	—	—	—
220A	28.9	28.7	28.4	—	—	—	—	205	396	633	—	—	—	—

○The required power varies depending on viscosity, temp. etc.

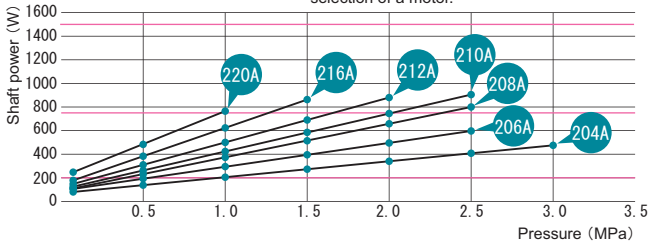
At 1,750 rotations (60Hz)

■ Flow rate characteristics



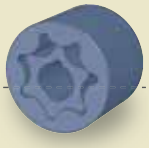
■ Required power

Refer to these lines in the "Required power" table as applicable standards for the selection of a motor.



Model \ Spec	Flow rate (L/min) Pressure (MPa)							Required power (W) Pressure (MPa)						
	0.1	0.5	1.0	1.5	2.0	2.5	3.0	0.1	0.5	1.0	1.5	2.0	2.5	3.0
204A	7.0	6.9	6.8	6.7	6.7	6.6	6.5	80	133	204	274	342	410	476
206A	10.4	10.3	10.2	10.1	10.0	9.9	—	104	188	290	397	500	599	—
208A	14.0	13.9	13.8	13.8	13.8	13.7	—	110	225	368	510	655	800	—
210A	17.6	17.5	17.2	17.0	16.9	16.7	—	125	250	413	575	740	904	—
212A	21.0	20.9	20.6	20.4	20.2	—	—	148	302	488	681	881	—	—
216A	27.8	27.7	27.4	27.0	—	—	—	179	372	616	863	—	—	—
220A	34.8	34.6	34.3	—	—	—	—	248	478	764	—	—	—	—

Tip 2



Risk to pump operation

Foreign particles are a hazard to all kinds of pump. Foreign particles can cause problems, not only to displacement pumps such as FTP which function by differential pressures through its rotation, but also dynamic pumps discharging liquid by giving a direction to liquid. Although the WO type FTP pumps can withstand foreign particles better than others, it is always essential to use a filter to prevent particles from entering into a pump.

2AWO

Pump

(Bunker oil , Coolant)

Medium Capacity / Medium pressure

Special PTFE (Teflon (R)) seals are used to isolate bearings from liquid so that partial wear of the bearings is minimized. Thus, the 2AWO is able to reach a long product life even with spray of waste oil or coolant liquid with slurry.
The 2AWO can take up to the temperature of 150℃. In case that it is required to handle a temperature higher than 150℃ is required, please consult with Fuji Techno.
A suction pressure can be as high as the max. discharge pressure in the 2AWO.
In the meantime, please note that 120℃ is the max. temperature of the motor pump 2MY or 2Y.
If the motor is dedicatly running 24 hours, please use at 80℃ or less.

Spec

Model	Theoretical discharge (ml/rev)	Theoretical flow rate (L/min)		Max. discharge pressure (MPa)	Max. revolution (min^{-1})	Approx. weight Without valve/With valve (kg)
		1500min^{-1}	1800min^{-1}			
204AWO (VB、VD)	4	6.0	7.2	1.5	1800	3.6/4.0
206AWO (VB、VD)	6	9.0	10.8	1.5	1800	3.8/4.2
208AWO (VB、VD)	8	12.0	14.4	1.5	1800	4.0/4.4
210AWO (VB、VD)	10	15.0	18.0	1.5	1800	4.1/4.6
212AWO (VB、VD)	12	18.0	21.6	1.5	1800	4.3/4.7
216AWO (VB、VD)	16	24.0	28.8	1.5	1800	4.6/5.1
220AWO (VB、VD)	20	30.0	36.0	1.2	1800	5.0/5.5

● The above max. discharge pressure and the max. revolution are in combination with ISO-VG2 at 40℃. When ISO-VG46 is used at 40℃, the max. discharge pressure and the max. revolution are the some as that of the standard version. (See page 14)

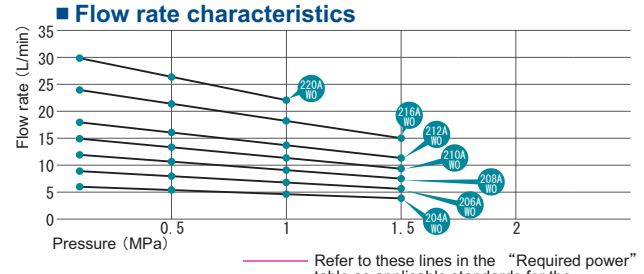
● **In the event that abrasive liquid like kerosene oil is used, a discharge pressure must be 0.7MPa or less.**

Performance

● Test conditions Oil : ISO-VG2 Oil temp. : 40℃

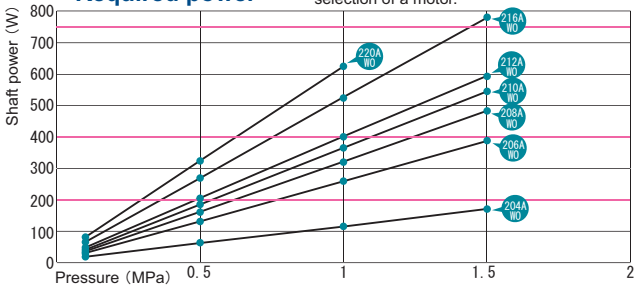
At 1,450 rotations (50Hz)

■ **Flow rate characteristics**



Refer to these lines in the "Required power" table as applicable standards for the selection of a motor.

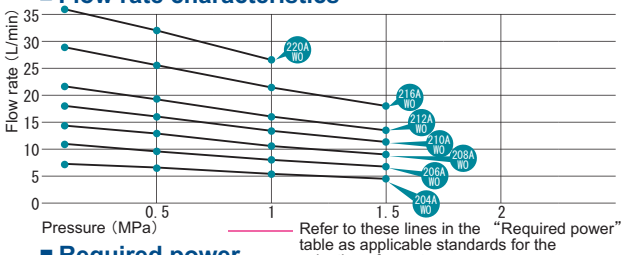
■ **Required power**



Model \ Spec	Flow rate (L/min) Pressure (MPa)				Required power (W) Pressure (MPa)			
	0.1	0.5	1	1.5	0.1	0.5	1	1.5
204AWO	6.0	5.3	4.4	3.8	20	63	117	171
206AWO	8.9	8.0	6.6	5.6	30	132	260	387
208AWO	11.9	10.6	8.8	7.5	34	162	323	483
210AWO	14.9	13.3	11.0	9.4	41	185	366	547
212AWO	17.9	15.9	13.2	11.3	49	205	401	596
216AWO	23.9	21.2	17.6	15	66	269	524	778
220AWO	29.8	26.5	22.0	—	82	324	627	—

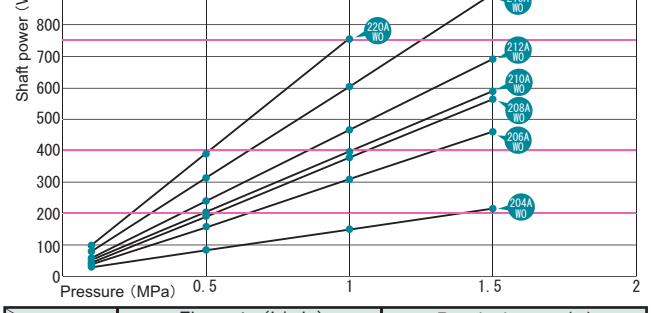
At 1,750 rotations (60Hz)

■ **Flow rate characteristics**



Refer to these lines in the "Required power" table as applicable standards for the selection of a motor.

■ **Required power**



Model \ Spec	Flow rate (L/min) Pressure (MPa)				Required power (W) Pressure (MPa)			
	0.1	0.5	1	1.5	0.1	0.5	1	1.5
204AWO	7.2	6.4	5.3	4.5	30	84	150	217
206AWO	10.8	9.6	8.0	6.8	37	158	309	460
208AWO	14.4	12.8	10.6	9	42	192	378	565
210AWO	18.0	16.0	13.3	11.3	51	205	397	590
212AWO	21.6	19.2	16.0	13.5	58	240	466	693
216AWO	28.8	25.6	21.3	18	80	314	605	897
220AWO	36.0	32.0	26.6	—	99	390	754	—

● The required power varies depending on viscosity temp. etc.

2APL Pump

(Liquid seal to cut off outside air)

Medium Capacity / Medium pressure

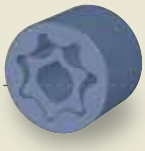
By using special PTFE（Teflon（R））seals to contain liquid between the seals, the liquid is prevented from contacting open air. The 2APL is ideal to transfer air reactive chemicals such as isocyanate.
The max. temperature the 2APL can handle is 120℃.
The max. temperature of the motor pump version is 120℃ as well. If a temperature higher than 120℃ is required, please contact Fuji Techno for consultation.
Because of the use of the seals, a suction pressure can be up to the max. discharge pressure in the 2APL.
If the motor is dedicatly running 24 hours, please use at 80℃ or less.

Spec

Model	Theoretical discharge (ml/rev)	Theoretical flow rate (L/min)		Max. discharge pressure (MPa)	Max. revolution (min^{-1})	Approx. weight Without valve/With valve (kg)
		1500min^{-1}	1800min^{-1}			
204APL(VB、VD)	4	6.0	7.2	1.5	1800	3.6/4.0
206APL(VB、VD)	6	9.0	10.8	1.2	1800	3.8/4.2
208APL(VB、VD)	8	12.0	14.4	1.2	1800	4.0/4.4
210APL(VB、VD)	10	15.0	18.0	1.2	1800	4.1/4.6
212APL(VB、VD)	12	18.0	21.6	1.0	1800	4.3/4.7
216APL(VB、VD)	16	24.0	28.8	0.7	1800	4.6/5.1
220APL(VB、VD)	20	30.0	36.0	0.6	1800	5.0/5.5

● The above max. discharge pressure and max. revolution are in combination with ISO-VG46 at 40℃. The rates vary depending on viscosity and temperature.
● **In the event that abrasive liquid like kerosene oil is used, a discharge pressure must be 0.7MPa or less.**

Tip 3

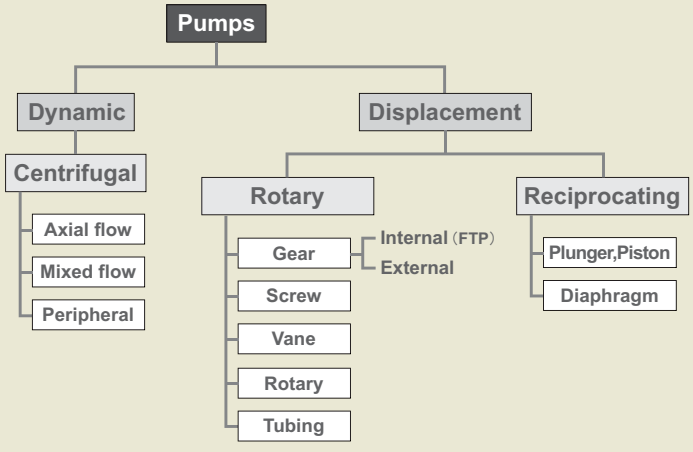


Kinds of pump

There are many different types of pumps. A heart is also a pump, familiar to everyone. A piston pump to draw water from a well has been a common type of pump for many years. Pumps are used to transfer not only liquid but also gas and solids.

Pumps are categorized into dynamic and displacement types. In FTP pumps, the gap between the inner rotor and the outer rotor changes as it rotates. When the gap gets larger, a pressure differential occurs between an atmospheric pressure on liquid and a pressure in the gap. Consequently, the gap fills with liquid. As the FTP pump continues to rotate, liquid is discharged.

A displacement pump transfers liquid by changing a space inside like on a FTP type. A rotary type displacement pump changes the internal space by rotation. An internal gear pump is a pump where the gears are mounted on the inner rotor and make contact with the outer rotor.



2ME-S Motor Pump

(Single-phase motor integrated model)

Medium Capacity / Medium pressure

The 2MY-S consists of the 2A pump and a dedicated motor and has a small footprint.
The ultra high temperature version （VH, max. temp. 150℃） is available.

Model

FTP−2ME □S − □A □M □ − □ □ □

Motor output
200
400
750

Model No.
204
206
208
210
212
216
220

Applications
No mark：Standard
WO：Bunker oil, Coolant Water
PL：Liquid seal

Rotation direction
No mark：Clockwise
R：Counter clockwise

Seal material
No mark：Standard（-5～80℃）
VF：Viton（R）for high temp.（120℃, 24hous continous in case of 80℃）
VH：Ultrahigh temp.（150℃, Incase of countinous runing use base coupling）
※ High temp specification（VH, 150℃）Please contact to company

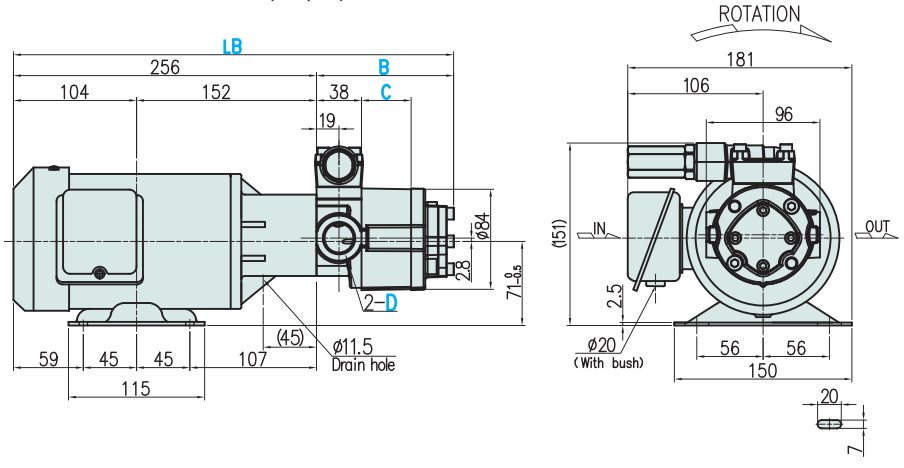
Relief valve
No mark：No valve
VB：With valve（Internal-return）
VD：With valve（External-return）

Relief valve set pressure
ex.
0.1：Set pressure 0.1MPa（Spring No.1L）
0.5：Set pressure 0.5MPa（Spring No.2L）
1.0：Set pressure 1.0MPa（Spring No.3L）
2.0：Set pressure 2.0MPa（Spring No.4L）

Model examples：FTP-2ME200S-204AM-VB1.0 （200W, single-phase, with relief valve 〈set pressure 1.0MPa〉）
FTP-2ME400S-210AMR （400W, single-phase, counter-clockwise as seen from the pump side）
FTP-2ME750S-216AM-VD （750W, single-phase, with relief valve 〈external-return〉）

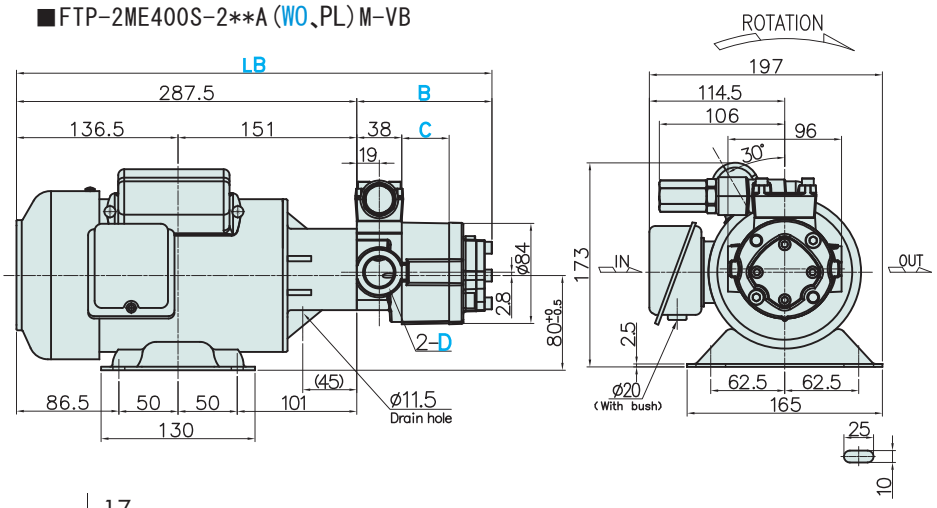
Dimensional diagrams (mm)

■FTP-2ME200S-2**A(WO、PL)M-VB



Model	LB	B	C	D
204A(WO、PL)M	340.2	84.2	10	Rc1/2
206A(WO、PL)M	345.2	89.2	15	
208A(WO、PL)M	351.5	95.5	21.3	
210A(WO、PL)M	356.7	100.7	26.5	Rc3/4
212A(WO、PL)M	361.9	105.9	31.7	
216A(WO、PL)M	372.1	116.1	41.9	

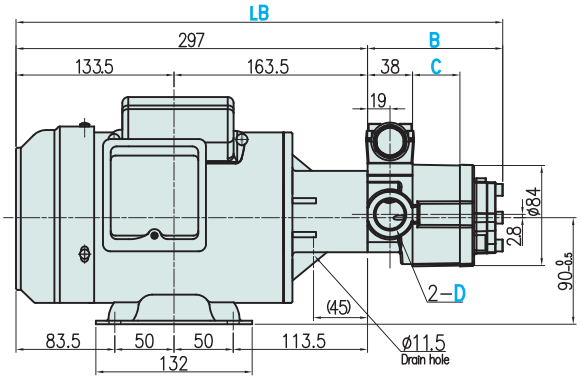
■FTP-2ME400S-2**A(WO、PL)M-VB

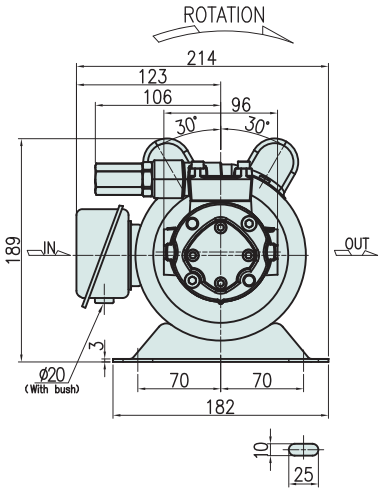


Model	LB	B	C	D
204A(WO、PL)M	371.7	84.2	10	Rc1/2
206A(WO、PL)M	376.7	89.2	15	
208A(WO、PL)M	383.0	95.5	21.3	
210A(WO、PL)M	388.2	100.7	26.5	Rc3/4
212A(WO、PL)M	393.4	105.9	31.7	
216A(WO、PL)M	403.6	116.1	41.9	
220A(WO、PL)M	413.7	126.2	52.0	

Dimensional diagrams (mm)

■FTP-2ME750S-2**A (WO、PL) M-VB



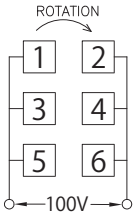


Model	LB	B	C	D
204A(WO、PL)M	381.2	84.2	10	Rc1/2
206A(WO、PL)M	386.2	89.2	15	
208A(WO、PL)M	392.5	95.5	21.3	
210A(WO、PL)M	397.7	100.7	26.5	Rc3/4
212A(WO、PL)M	402.9	105.9	31.7	
216A(WO、PL)M	413.1	116.1	41.9	
220A(WO、PL)M	423.2	126.2	52.0	

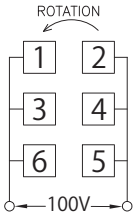
Wiring diagram

■100V (LOW VOLTAGE)

Clockwise as seen from pump side

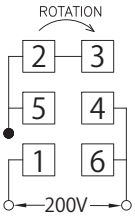


Counter-clockwise as seen from pump side

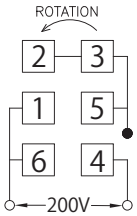


■200V (HIGH VOLTAGE)

Clockwise as seen from pump side



Counter-clockwise as seen from pump side



Spec

Model	No. of motor revolutions 50Hz 1500min-1				No. of motor revolutions 60Hz 1800min-1			
	Theoretical flow rate (L/min)	Max.discharge pressure to motor output (MPa)			Theoretical flow rate (L/min)	Max.discharge pressure to motor output (MPa)		
		200W	400W	750W		200W	400W	750W
204AM (VB、VD)	6.0	1.2	3.0	3.0	7.2	0.9	2.3	3.0
206AM (VB、VD)	9.0	0.7	1.8	2.5	10.8	0.5	1.4	2.5
208AM (VB、VD)	12.0	0.5	1.3	2.5	14.4	0.3	1.0	2.3
210AM (VB、VD)	15.0	0.4	1.1	2.5	18.0	0.3	0.9	2.0
212AM (VB、VD)	18.0	0.3	0.9	2.0	21.6	—	0.7	1.6
216AM (VB、VD)	24.0	0.2	0.7	1.5	28.8	—	0.5	1.2
220AM (VB、VD)	30.0	—	0.4	1.2	36.0	—	0.3	0.9

● The above max. discharge pressures are in combination with ISO-VG46 at 40oC. The max. pressures may be lower depending on viscosity and temperature. Note that for liquids with a higher viscosity than IEO-VG46 at 40 oC, the motor power may be insufficient. Lower viscosity liquids limit the pumps maximum discharge pressure. For handling higher viscosity (>46 mm2/s), The motor capacity has to be increased by 1 or 2 levels. For use of lower viscosity (<10 mm2/s), please refer to the spec. of 2AWO (page 15).

Motor spec

Power (W)	Pole (P)	Rating	Voltage (V)	Frequency (Hz)	Revolutions (min-1)	Current (A)	Approx. Weight (kg)
200	4	S1	100	50 60	1400 1700	4.0 3.2	8
			200	50 60	1400 1700	2.1 1.8	
400	4	S1	100	50 60	1420 1700	9.5 8.5	11
			200	50 60	1420 1700	4.8 4.3	
750	4	S1	100	50 60	1420 1720	11.8 10.3	14
			200	50 60	1420 1720	6.0 5.2	

● Single-phase induction motor ● Insulation class B ● IP44

2MY • 2Y

Motor Pump

(3 phase motor integrated model)

Medium Capacity / Medium pressure

The compact 2MY is the combination of the 2A pump and a dedicated motor. The standard spec. of the motor is 3 phase and 200V.
There is the ultra high temperature version （VH, max. temp. 150℃） in addition to the VF version.

Model

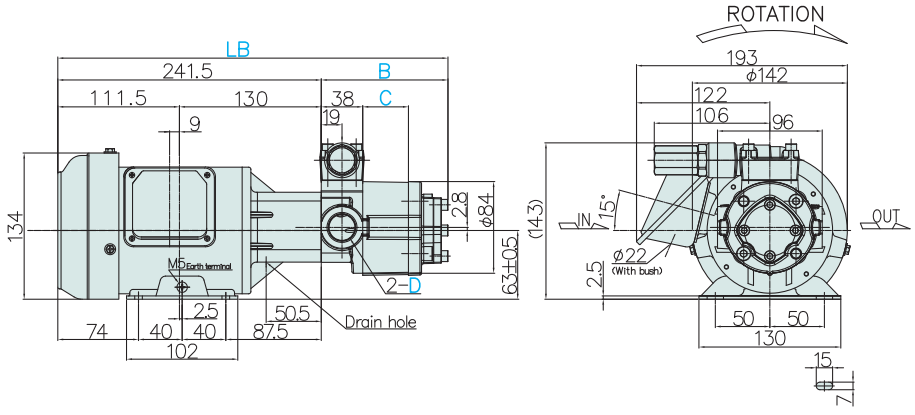
FTP-□ □ – □ – □ A □ M □ □ – □ □ □

Motor No.	Motor output	Motor standard	Model No.	Applications	Rotation direction	Seal material	Relief valve	Relief valve set pressure
2MY： ～700W 2Y： 750W～(IE3)	200 400 700 750 1500	No mark：IE1 EA：200V class （IE3） EB：400V class （IE3）	204 206 208 210 212 216 220	No mark：Standard WO：Bunker oil, Coolant Water PL：Liquid seal	※look form pump side No mark：standard （Clockwise） R：reverse roloution （Counter clockwise）	No mark： Standard（-5～80℃） VF：Viton（R）for high temp. （120℃, 24hous continous in case of 80℃） VH：Ultrahigh temp. （150℃, Incase of countinous runing use base coupling） ※ High temp specification（VH, 150℃）Please contact to company	No mark：No valve VB：With valve （Internal-return） VD：With valve （External-return）	ex. 0.1：Set pressure 0.1MPa（Spring No.1L） 0.5：Set pressure 0.5MPa（Spring No.2L） 1.0：Set pressure 1.0MPa（Spring No.3L） 2.0：Set pressure 2.0MPa（Spring No.4L）

Model examples：FTP-2MY200-204AM-VB1.0 （200W, 3 phase, with relief valve 〈set pressure 1.0MPa〉）
FTP-2MY400-210AMR （400W, 3 phase, counter-clockwise as seen from the pump side）
FTP-2Y750-EA-216AM-VD （750W, 200V, IE3, 3 phase, with relief valve 〈external-return〉）

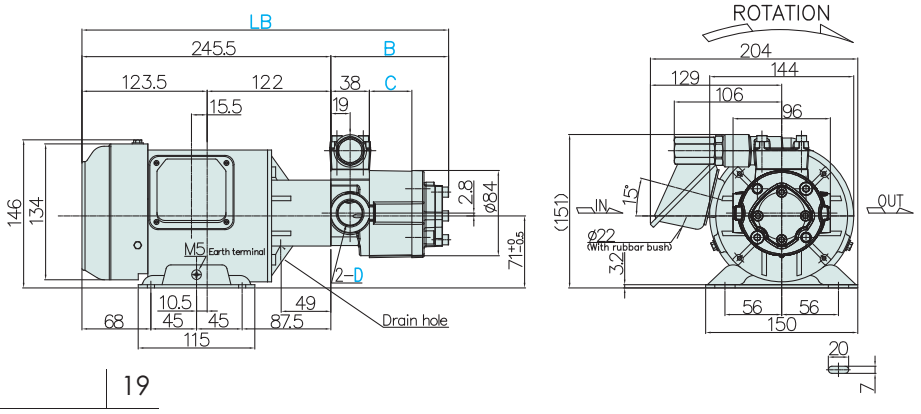
Dimensional diagrams(mm)

■FTP-2MY200-2**A(WO、PL)M-VB



Model	LB	B	C	D
204A(WO、PL)M	325.7	84.2	10	Rc1/2
206A(WO、PL)M	330.7	89.2	15	
208A(WO、PL)M	337.0	95.5	21.3	
210A(WO、PL)M	342.2	100.7	26.5	Rc3/4
212A(WO、PL)M	347.4	105.9	31.7	
216A(WO、PL)M	357.6	116.1	41.9	

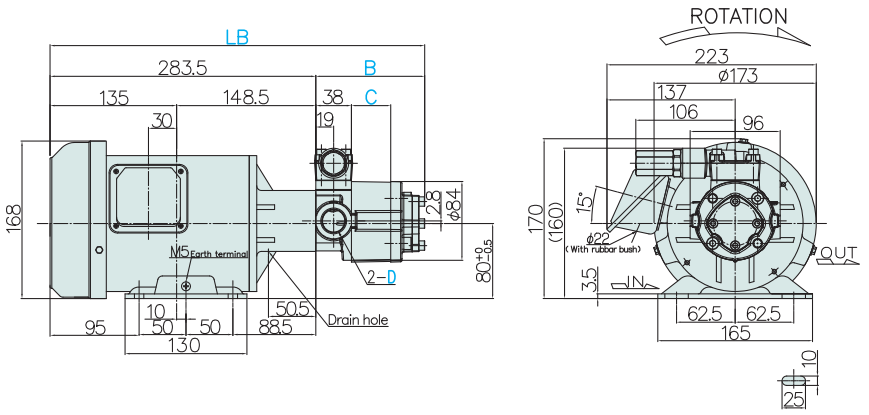
■FTP-2MY400-2**A(WO、PL)M-VB



Model	LB	B	C	D
204A(WO、PL)M	329.7	84.2	10	Rc1/2
206A(WO、PL)M	334.7	89.2	15	
208A(WO、PL)M	341.0	95.5	21.3	
210A(WO、PL)M	346.2	100.7	26.5	Rc3/4
212A(WO、PL)M	351.4	105.9	31.7	
216A(WO、PL)M	361.6	116.1	41.9	
220A(WO、PL)M	371.7	126.2	52.0	

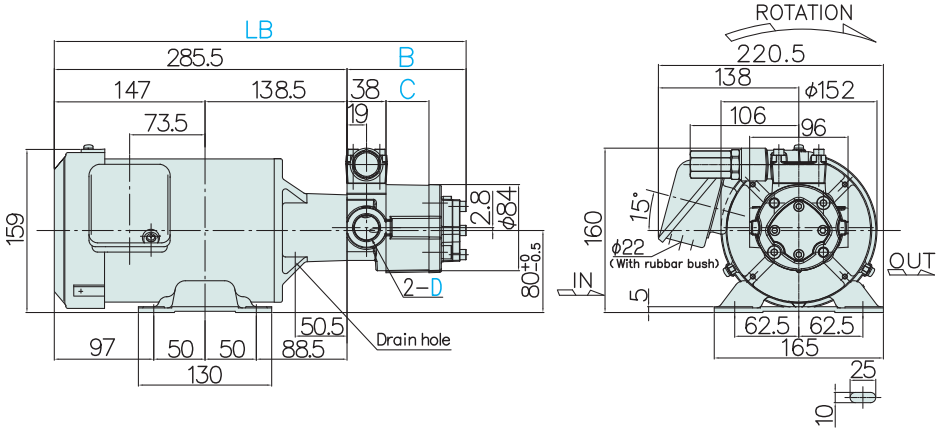
Dimensional diagrams (mm)

■FTP-2MY700-2**A(WO、PL)M-VB



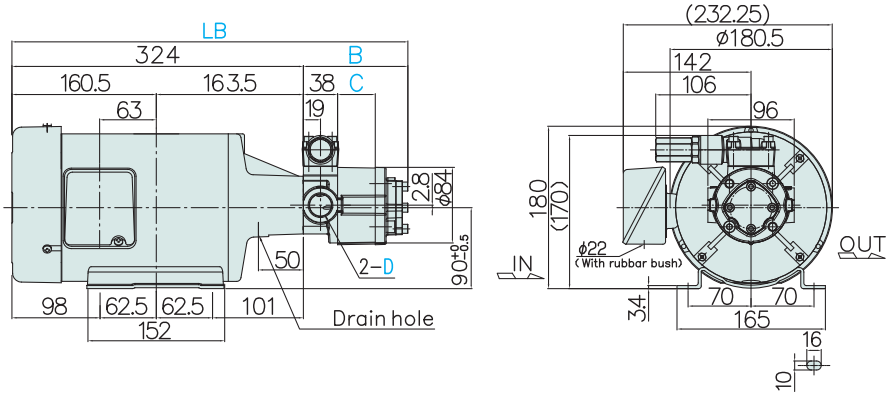
Model	LB	B	C	D
204A(WO、PL)M	367.7	84.2	10	Rc1/2
206A(WO、PL)M	372.7	89.2	15	
208A(WO、PL)M	379.0	95.5	21.3	
210A(WO、PL)M	384.2	100.7	26.5	Rc3/4
212A(WO、PL)M	389.4	105.9	31.7	
216A(WO、PL)M	399.6	116.1	41.9	
220A(WO、PL)M	409.7	126.2	52.0	

■FTP-2Y750-(EA、EB)-2**A(WO、PL)M-VB



Model	LB	B	C	D
204A(WO、PL)M	369.7	84.2	10	Rc1/2
206A(WO、PL)M	374.7	89.2	15	
208A(WO、PL)M	381.0	95.5	21.3	
210A(WO、PL)M	386.2	100.7	26.5	Rc3/4
212A(WO、PL)M	391.4	105.9	31.7	
216A(WO、PL)M	401.6	116.1	41.9	
220A(WO、PL)M	411.7	126.2	52.0	

■FTP-2Y1500-(EA、EB)-2**A(WO、PL)M-VB



Model	LB	B	C	D
204A(WO、PL)M	408.2	84.2	10	Rc1/2
206A(WO、PL)M	413.2	89.2	15	
208A(WO、PL)M	419.5	95.5	21.3	
210A(WO、PL)M	424.7	100.7	26.5	Rc3/4
212A(WO、PL)M	429.9	105.9	31.7	
216A(WO、PL)M	440.1	116.1	41.9	
220A(WO、PL)M	450.2	126.2	52.0	

Please read the following page as well.

Spec

Model	No. of motor revolutions 50Hz 1500min-1						No. of motor revolutions 60Hz 1800min-1					
	Theoretical flow rate (L/min)	Max. discharge pressure to motor output (MPa)					Theoretical flow rate (L/min)	Max. discharge pressure to motor output (MPa)				
		200W	400W	700W	750W	1500W		200W	400W	700W	750W	1500W
204AM(VB、VD)	6.0	1.2	3.0	3.0	3.0	3.0	7.2	0.9	2.3	3.0	3.0	3.0
206AM(VB、VD)	9.0	0.7	1.8	2.5	2.5	2.5	10.8	0.5	1.4	2.5	2.5	2.5
208AM(VB、VD)	12.0	0.5	1.3	2.5	2.5	2.5	14.4	0.3	1.0	2.1	2.3	2.5
210AM(VB、VD)	15.0	0.4	1.1	2.3	2.5	2.5	18.0	0.3	0.9	1.8	2.0	2.5
212AM(VB、VD)	18.0	0.3	0.9	1.8	2.0	2.0	21.6	—	0.7	1.5	1.6	2.0
216AM(VB、VD)	24.0	0.2	0.7	1.4	1.5	1.5	28.8	—	0.5	1.1	1.2	1.5
220AM(VB、VD)	30.0	—	0.4	1.1	1.2	1.2	36.0	—	0.3	0.8	0.9	1.2

○ The above max. discharge pressures are in combination with ISO-VG46 at 40℃. The max. pressures may be lower depending on viscosity and temperature. Note that for liquids with a higher viscosity than IEO-VG46 at 40℃, the motor power may be insufficient. Lower viscosity liquids limit the pumps maximum discharge pressure. For handling higher viscosity (>46 mm2/s), The motor capacity has to be increased by 1 or 2 levels. For use of lower viscosity (<10 mm2/s), please refer to the spec. of 2MY-2AWO M (page 21).

Motor spec

Power (W)	Pole (P)	Rating	Voltage (V)	Frequency (Hz)	Revolutions (min-1)	Current (A)	Approx. weight(kg)
200	4	S1	200/200/220	50/60/60	1425/1685/1710	1.23/1.15/1.14	10
400	4	S1	200/200/220	50/60/60	1425/1710/1725	2.4/2.1/2.1	9.7
700	4	S1	200/200/220/220/230	50/60/50/60/60	1429/1715/1441/1732/1739	3.8/3.4/4.4/3.3/3.4	13
750	4	CONT	200/200/220	50/60/60	1440/1720/1740	3.3/3.1/3.0	14
1500	4	CONT	200/200/220	50/60/60	1450/1740/1750	6.9/6.2/6.0	22

○ Squirrel-cage induction motor ○ Insulation class E (750/1500F) ○ Totally-enclosed and fan cooled type ○ IP44

※380V/50Hz、400V/50・60Hz、440V/60Hz are semi-standard versions. ((IE3) 400V/50・60Hz、440V/60Hz)

2MY-2AWOM Motor Pump (Bunker oil , Coolant)

Medium Capacity / Medium pressure

The 2MY-2AWOM consists of a dedicated motor and the 2AWO pump suitable for feeding coolant water and bunker oil such as waste oil. This unit has a small footprint. In case the ultra high temperature version (VH, max. 150℃) is required, please consult with Fuji Techno.

Model examples：FTP-2Y750-EA-220AWOM-VB0.7（750W, 200V, IE3, 3 phase, with relief valve〈set pressure 0.7MPa〉）

Spec

Model	No. of motor revolutions 50Hz 1500min-1						No. of motor revolutions 60Hz 1800min-1					
	Theoretical flow rate (L/min)	Max. discharge pressure to motor output (MPa)					Theoretical flow rate (L/min)	Max. discharge pressure to motor output (MPa)				
		200W	400W	700W	750W	1500W		200W	400W	700W	750W	1500W
204AWOM(VB、VD)	6.0	1.2	1.5	1.5	1.5	1.5	7.2	1.0	1.5	1.5	1.5	1.5
206AWOM(VB、VD)	9.0	0.7	1.5	1.5	1.5	1.5	10.8	0.6	1.2	1.5	1.5	1.5
208AWOM(VB、VD)	12.0	0.6	1.2	1.5	1.5	1.5	14.4	0.4	1.0	1.5	1.5	1.5
210AWOM(VB、VD)	15.0	0.4	1.0	1.5	1.5	1.5	18.0	0.3	1.0	1.5	1.5	1.5
212AWOM(VB、VD)	18.0	0.3	0.9	1.5	1.5	1.5	21.6	—	0.8	1.5	1.5	1.5
216AWOM(VB、VD)	24.0	0.2	0.7	1.3	1.4	1.5	28.8	—	0.6	1.1	1.2	1.5
220AWOM(VB、VD)	30.0	—	0.6	1.1	1.2	1.2	36.0	—	0.5	0.9	0.9	1.2

○ The above max. discharge pressure are in use of ISO-VG2 at 40℃.

○ **In the event that abrasive liquid like kerosene oil is used, a discharge pressure must be 0.7MPa or less.**

2MY Motor Pump

Standards (CCC, GB3, CE, IE3)

Medium Capacity / Medium pressure

In case of the exportation of the pump with the motor, it is necessary to comply with concerned standard of a country, to which the pump is exported.
Fuji Techno has set up a system to supply motors complying with the latest standards.
It is required to meet the IE3 standard in Japan starting 2015.

Model

FTP−2MY □ − □ − □A □M □ □ − □ □ □

Motor output
200
400
700
750
1500

Standard
No mark : Standard
A : 200V class
(200, 400／CCC / 750／CCC, GB3 / 1500／GB3)
B : 380V class
(200, 400／CCC / 750／CCC, GB3 / 1500／GB3)
CA : 200V class (EN standard)
CB : 400V class (EN standard)

Model No.
204
206
208
210
212
216
220

Applications
No mark : Standard
WO : Bunker oil, Coolant Water
PL : Liquid seal

Rotation direction
No mark : Clockwise
R : Counter clockwise

Seal material
No mark : Standard (-5～80℃)
VF:Viton (R) for high temp. (120℃)
VH:Ultrahigh temp. (150℃、Incase of countinous runing use base coupling)
※ High temp specification (VH・150℃) Please contact to company

Relief valve
No mark : No valve
VB : With valve (Internal-return)
VD : With valve (External-return)

Relief valve set pressure
ex.
0.1 : Set Pressure 0.1MPa (Spring No.1L)
0.5 : Set Pressure 0.5MPa (Spring No.2L)
1.0 : Set Pressure 1.0MPa (Spring No.3L)
2.0 : Set Pressure 2.0MPa (Spring No.4L)

Model examples : FTP-2MY750-B-204AM (750W, 3 phase, 380V/50Hz, CCC certified, GB2)

※ Special versions such is outdoor type are described in the following.

Dimension, pump spec., motor spec.

※ All numbers are the same as for the standard version.
※ The protective structure compliance to CCC, GB3 and EN (CE) are IP54 and the insulation class is B.

Standard

In order to use motors with 1.1kW or less in China,
the motors have to be CCC certified.
Also motors with 750W or higher must have GB3 to be used in China.

GB3 is equivalent to IE2 of IEC.

Only motors, which meet EN standard and have CE marks attached,
can be used in member nations of EU.

Compliance to standards

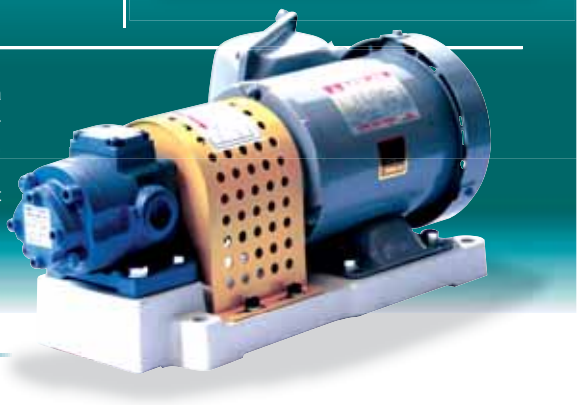
	U.S.A.／Canada	Korea	Australia	E U	China	Japan
Required standard	1HP～200HP (0.75kW～150kW) IE3	0.75kW～37kW IE2	0.73kW～185kW LEVEL 1A、1B	0.75kW～7.5kW IE2	0.75kW～375kW GB3 / ～1.1kW CCC	0.75kW～375kW IE3
Compliant product	○ The regular 2MY200 and 2MY400 and 2MY700 can be used. ○ Products with other specifications are prepared now.	○ The regular 2MY200 and 2MY400 and 2MY700 can be used. ○ For other products, CE certified motors can be used.	○ The regular 2MY200 and 2MY400 and 2MY700 can be used. ○ For other products, CE certified motors can be used.	○ CE Product 2MY200 and 2MY400 and 2MY700 can be used. ○ IE2 Product 2MY750 and 2MY1500 can be used.	○ CE Product 2MY200 and 2MY400 and 2MY700 can be used. ○ IE2 Product 2MY750 and 2MY1500 can be used.	Standard product

○ The above is as of June, 2016. Since standards may be revised, please check the latest status of a standard of your interest.

2MBC Base coupling mount type

Medium Capacity / Medium pressure

The 2MBC product combines the 2A pump and a dedicated motor are connected by a coupling and mounted on a base. The standard motor for the 2MBC is a 3 phase, 4 pole and 200V motor. Other motors can be used. (e.g. outdoor type, explosion-proof, high efficiency, 6 pole, different voltage inverter).
A continuous operation at 200℃ (VH version) can be conducted. Please contact Fuji Techno for this operation.



Model

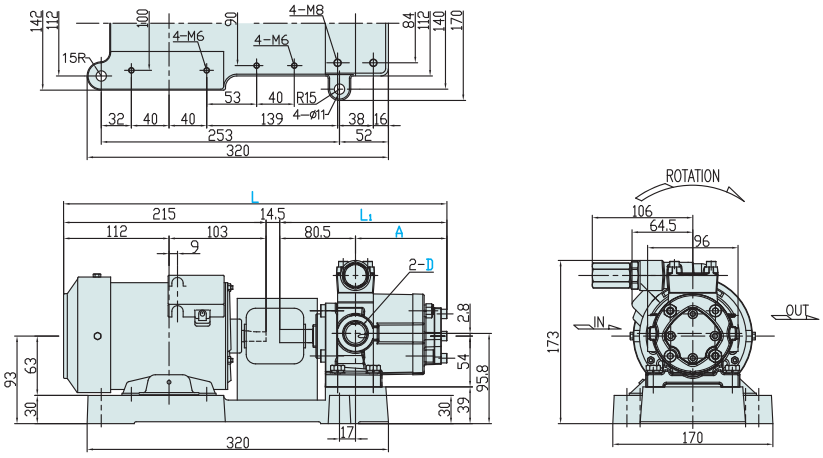
FTP−2MBC □ □ − □ A □ □ □ − □ □ □

Motor output	Motor pole	Model No.	Applications	Rotation direction	Seal material	Relief valve	Relief valve set pressure
200	No mark : 4 poles	204	No mark : Standard	No mark : Clockwise	No mark : Standard (-5～80℃)	No mark : No valve	ex.
400	×2P : 2 poles	206	WO : Bunker oil, Coolant Water	R : Counter clockwise	VF : Viton(R)for high temp. (120℃)	VB : With valve (Internal-return)	0.1 : Set Pressure 0.1MPa(Spring No.1L)
750	×6P : 6 poles	208	PL : Liquid seal		VH : Ultrahigh temp. (200℃)	VD : With valve (External-return)	0.5 : Set Pressure 0.5MPa(Spring No.2L)
1500	×8P : 8 poles	210			※In case of the continuous operation of the pump for a long period, please contact Fuji Techno for consultation in advance.		1.0 : Set Pressure 1.0MPa(Spring No.3L)
2200		212					2.0 : Set Pressure 2.0MPa(Spring No.4L)
		216					
		220					

Model examples : FTP-2MBC750X6P-220AVF-VB1.0 (750W, 6 pole, high temp. version, with relief valve (set pressure 1.0MPa))

Dimensional diagrams (mm)

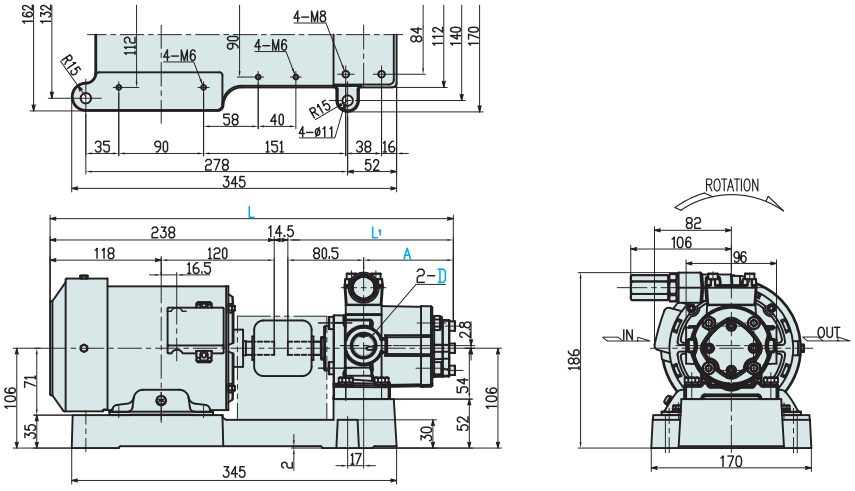
■FTP-2MBC200-2**A(WO、PL)-VB



Model	L	L1	A	D
204A(WO、PL)	375.2	145.7	65.2	Rc 1/2
206A(WO、PL)	380.2	150.7	70.2	
208A(WO、PL)	386.5	157.0	76.5	
210A(WO、PL)	391.7	162.2	81.7	Rc 3/4
212A(WO、PL)	396.9	167.4	86.9	
216A(WO、PL)	407.1	177.6	97.1	

○ The above are numbers in case that a Mitsubishi motor is used.

■FTP-2MBC400(200×6P)-2**A(WO、PL)-VB

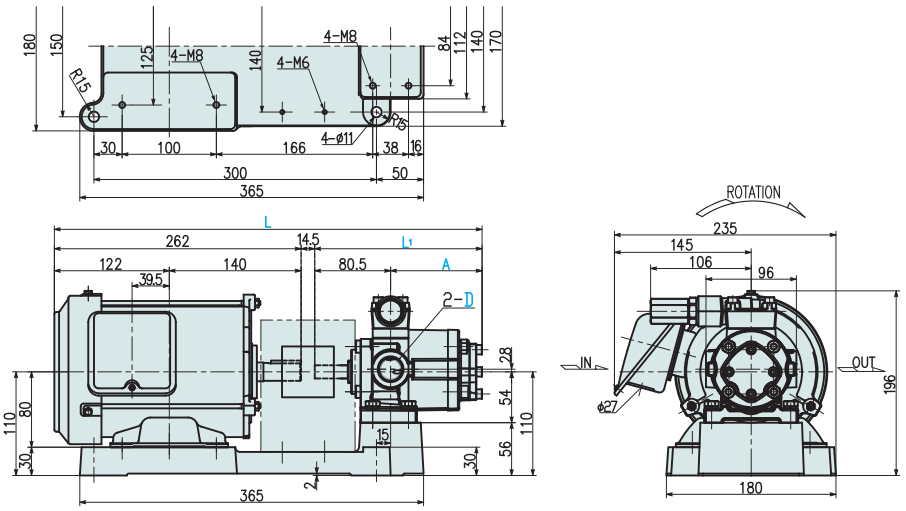


Model	L	L1	A	D
204A(WO、PL)	398.2	145.7	65.2	Rc 1/2
206A(WO、PL)	403.2	150.7	70.2	
208A(WO、PL)	409.5	157.0	76.5	
210A(WO、PL)	414.7	162.2	81.7	Rc 3/4
212A(WO、PL)	419.9	167.4	86.9	
216A(WO、PL)	430.1	177.6	97.1	
220A(WO、PL)	440.2	187.7	107.2	

○ The above are numbers in case that a Mitsubishi motor is used.

Dimensional diagrams (mm)

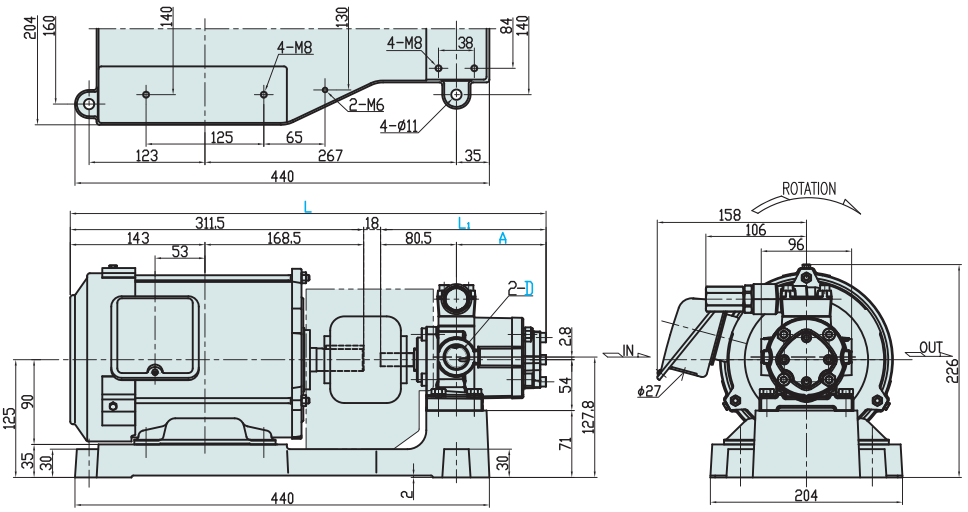
■FTP-2MBC750-2**A(WO、PL)-VB



Model	L	L1	A	D
204A(WO、PL)	422.2	145.7	65.2	Rc 1/2
206A(WO、PL)	427.2	150.7	70.2	
208A(WO、PL)	433.5	157.0	76.5	
210A(WO、PL)	438.7	162.2	81.7	Rc 3/4
212A(WO、PL)	443.9	167.4	86.9	
216A(WO、PL)	454.1	177.6	97.1	
220A(WO、PL)	464.2	187.7	107.2	

○ The above are numbers in case that a Mitsubishi motor is used.

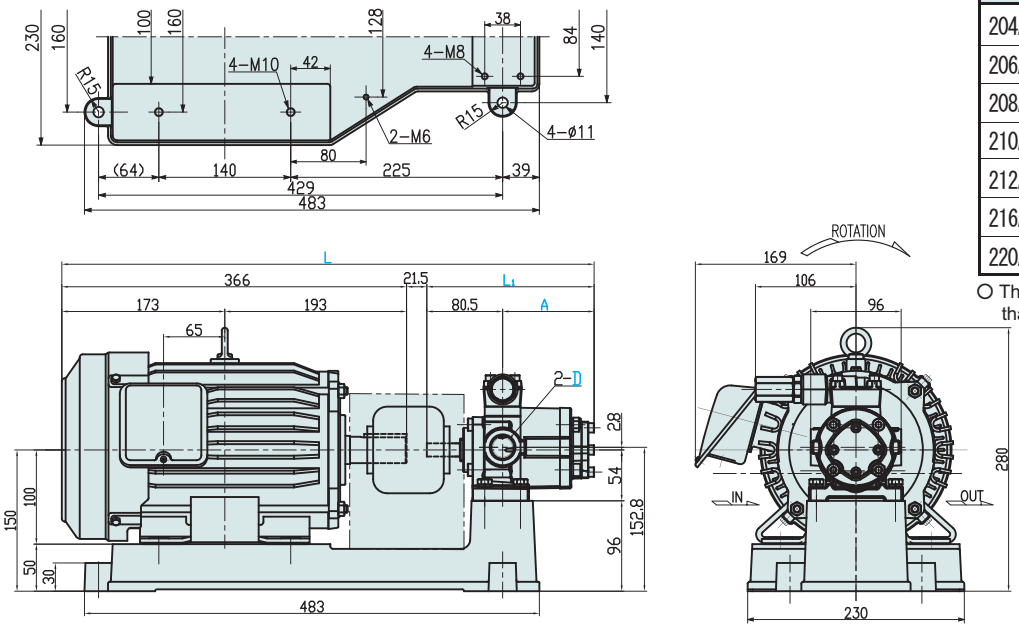
■FTP-2MBC1500(750×6P)-2**A(WO、PL)-VB



Model	L	L1	A	D
204A(WO、PL)	475.2	145.7	65.2	Rc 1/2
206A(WO、PL)	480.2	150.7	70.2	
208A(WO、PL)	486.5	157.0	76.5	
210A(WO、PL)	491.7	162.2	81.7	Rc 3/4
212A(WO、PL)	496.9	167.4	86.9	
216A(WO、PL)	507.1	177.6	97.1	
220A(WO、PL)	517.2	187.7	107.2	

○ The above are numbers in case that a Mitsubishi motor is used.

■FTP-2MBC2200(1500×6P)-2**A(WO、PL)-VB



Model	L	L1	A	D
204A(WO、PL)	533.2	145.7	65.2	Rc 1/2
206A(WO、PL)	538.2	150.7	70.2	
208A(WO、PL)	544.5	157.0	76.5	
210A(WO、PL)	549.7	162.2	81.7	Rc 3/4
212A(WO、PL)	554.9	167.4	86.9	
216A(WO、PL)	565.1	177.6	97.1	
220A(WO、PL)	575.2	187.7	107.2	

○ The above are numbers in case that a Mitsubishi motor is used.

Please read the following page as well.

Spec

■ **Standards**

Model	No. of motor revolutions 50Hz 1500min^{-1}						No. of motor revolutions 60Hz 1800min^{-1}					
	Theoretical flow rate (L/min)	Max. discharge pressure to motor output (MPa)					Theoretical flow rate (L/min)	Max. discharge pressure to motor output (MPa)				
		200W	400W	750W	1500W	2200W		200W	400W	750W	1500W	2200W
204A (VB、VD)	6.0	1.2	3.0	3.0	3.0	3.0	7.2	0.9	2.3	3.0	3.0	3.0
206A (VB、VD)	9.0	0.7	1.8	2.5	2.5	2.5	10.8	0.5	1.4	2.5	2.5	2.5
208A (VB、VD)	12.0	0.5	1.3	2.5	2.5	2.5	14.4	0.3	1.0	2.3	2.5	2.5
210A (VB、VD)	15.0	0.4	1.1	2.5	2.5	2.5	18.0	0.3	0.9	2.0	2.5	2.5
212A (VB、VD)	18.0	0.3	0.9	2.0	2.0	2.0	21.6	—	0.7	1.6	2.0	2.0
216A (VB、VD)	24.0	0.2	0.7	1.5	1.5	1.5	28.8	—	0.5	1.2	1.5	1.5
220A (VB、VD)	30.0	—	0.4	1.2	1.2	1.2	36.0	—	0.3	0.9	1.2	1.2

○ The above max. discharge pressure are in combination with ISO-VG46 at 40℃. The rates vary depending on viscosity and temperature.

■ **For bunker oil and coolant water**

Model	No. of motor revolutions 50Hz 1500min^{-1}						No. of motor revolutions 60Hz 1800min^{-1}					
	Theoretical flow rate (L/min)	Max. discharge pressure to motor output (MPa)					Theoretical flow rate (L/min)	Max. discharge pressure to motor output (MPa)				
		200W	400W	750W	1500W	2200W		200W	400W	750W	1500W	2200W
204AWO (VB、VD)	6.0	1.2	1.5	1.5	1.5	1.5	7.2	1.0	1.5	1.5	1.5	1.5
206AWO (VB、VD)	9.0	0.7	1.5	1.5	1.5	1.5	10.8	0.6	1.2	1.5	1.5	1.5
208AWO (VB、VD)	12.0	0.6	1.2	1.5	1.5	1.5	14.4	0.4	1.0	1.5	1.5	1.5
210AWO (VB、VD)	15.0	0.4	1.0	1.5	1.5	1.5	18.0	0.3	1.0	1.5	1.5	1.5
212AWO (VB、VD)	18.0	0.3	0.9	1.5	1.5	1.5	21.6	—	0.8	1.5	1.5	1.5
216AWO (VB、VD)	24.0	0.2	0.7	1.4	1.5	1.5	28.8	—	0.6	1.2	1.5	1.5
220AWO (VB、VD)	30.0	—	0.6	1.2	1.2	1.2	36.0	—	0.5	0.9	1.2	1.2

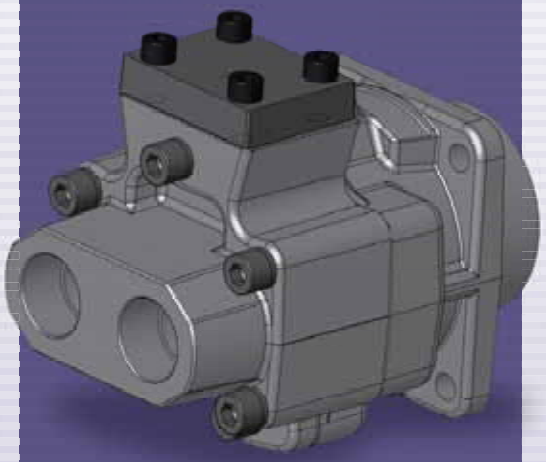
○ The above max. discharge pressure are in combination with ISO-VG2 at 40℃.

○ **In the event that abrasive liquid like kerosene oil is used, a discharge pressure must be 0.7MPa or less.**

Compliance to standards

	U.S.A.／Canada	Korea	Australia	E U	China	Japan
Required standard	1HP～200HP (0.75kW～150kW) IE3	0.75kW～37kW IE2	0.73kW～185kW LEVEL 1A、1B	0.75kW～7.5kW IE2	0.75kW～375kW GB3 ～1.1kW CCC	0.75kW～375kW IE3
Compliant product	Special motor available	Special motor available	● The regular products can be used for 400W or lower. ● above 750W	Special motor available	Special motor available	Standard product

○ The above is as of June, 2016. Since standards may be revised, please check the latest status of a standard of your interest.

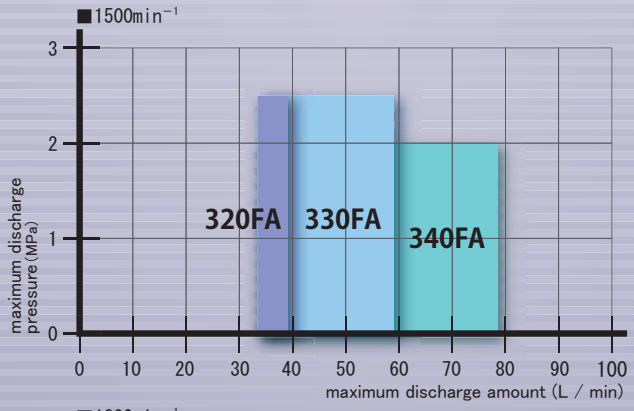


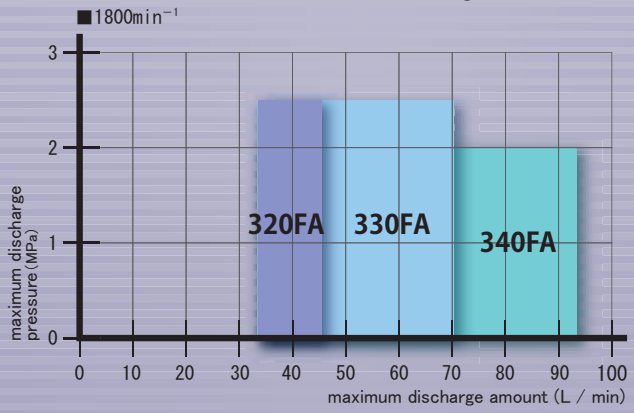
3FA

High capacity / Medium pressure

3FA	Pump
3MF	Motor pump integrated (CCC・GB3・CE・IE3 corresponding special motor)
3F	Motor pump (Three-phase motor)

Performance Pattern Chart





3FA Pump

High capacity / Medium pressure

The 3FA pump is for large capacity and mid. Pressure. The max. flow rates and discharge pressures are 93.6 L/min or less and 2.5 MPa or less, respectively. The pump is used for hydraulic and lubrication applications. The dedicated motor is often used with the 3FA pump. Since this pump is relatively small, there are many cases that the pump is integrated into a machine. The rotation direction is clockwise, which is opposite to that of 1A, 1HG and 2A.

Model

FTP- □ FA □ □ – □ □

Model No.
320
330
340

Form
No mark : Standard
M : Dedicated motor (short shaft)

Seal material
No mark : Standard (-5～80℃)
VF : Viton(R) for high temp. (120℃)
TN : Low viscosity, Coolant liquid

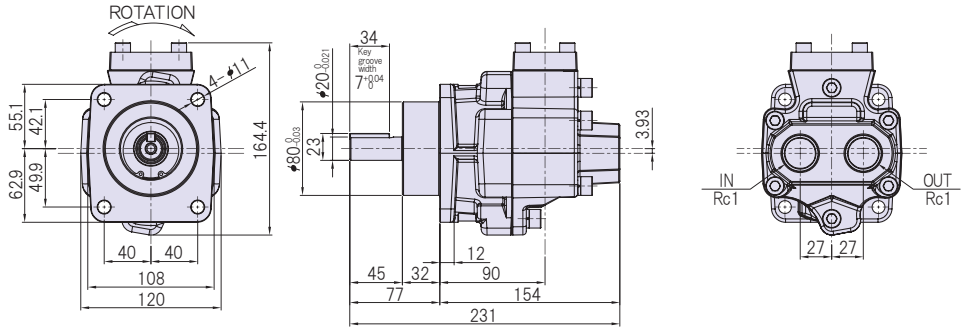
Relief valve
No mark : No valve
VB : With valve (Internal-return)

Relief valve set pressure
ex.
0.1 : Set Pressure 0.1MPa (Spring No.1L)
0.5 : Set Pressure 0.5MPa (Spring No.2L)
1.0 : Set Pressure 1.0MPa (Spring No.3L)
1.5 : Set Pressure 1.5MPa (Spring No.4L)
2.0 : Set Pressure 2.0MPa (Spring No.5L)
2.5 : Set Pressure 2.5MPa (Spring No.6L)

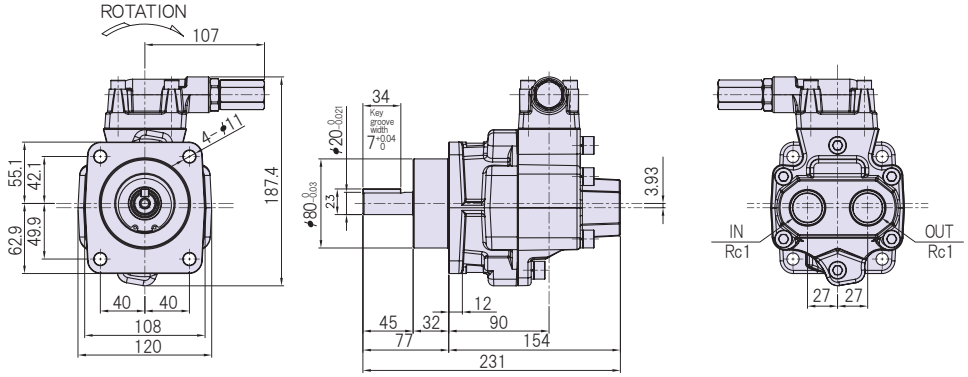
Model examples : FTP-320FAM-VB1.0 (With relief valve 〈set pressure 1.0MPa〉, exclusive motor)

Dimensional diagrams (mm)

■FTP-3**FA



■FTP-3**FA-VB



Spec

Spec / Model	Flow rate per. rev. (ml/rev)	Theoretical flow rate (L/min)		Max. discharge pressure (MPa)	Max. revolution (min^{-1})	Approx. weight (kg)
		1500min^{-1}	1800min^{-1}			
320FA (VB)	26	39.0	46.8	2.5	1800	10.7/11.3
330FA (VB)	39	58.5	70.2	2.5	1800	10.6/11.2
340FA (VB)	52	78.0	93.6	2.0	1800	10.5/11.1

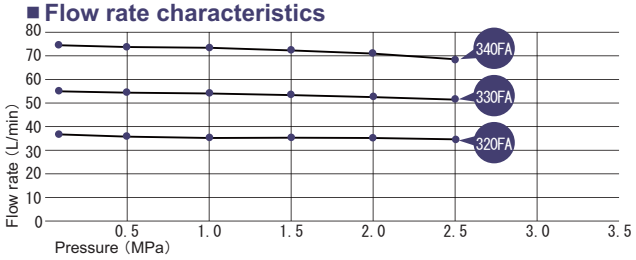
○ The above max. discharge pressure and max. revolution are in combination with SO-VG46 at 40℃. The rates vary depending on viscosity and temperature.

Performance

○ Test conditions　Oil：ISO-VG46　Oil temp.：40℃

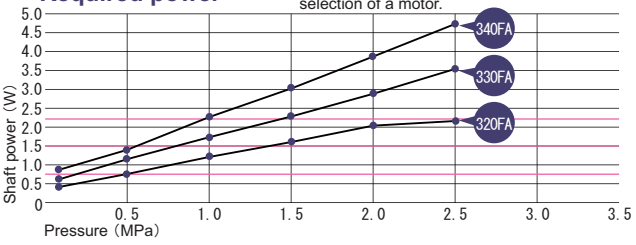
At 1,450 rotations（50Hz）

■ Flow rate characteristics



■ Required power

Refer to these lines in the "Required power" table as applicable standards for the selection of a motor.

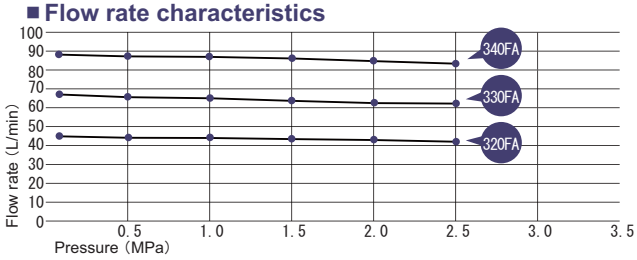


Spec / Model	Flow rate (L/min) Pressure (MPa) 0.1	0.5	1.0	1.5	2.0	2.5	Required power (W) Pressure (MPa) 0.1	0.5	1.0	1.5	2.0	2.5
320FA	37.2	36.9	36.5	36.1	35.7	35	0.45	0.78	1.20	1.60	2.02	2.22
330FA	55.5	54.9	54.0	53.2	52.3	51.5	0.64	1.12	1.72	2.31	2.91	3.52
340FA	74.6	73.9	73.0	72.1	71.2	68.5	0.80	1.45	2.25	3.10	3.90	4.72

○The required power varies depending on viscosity, temp. etc.

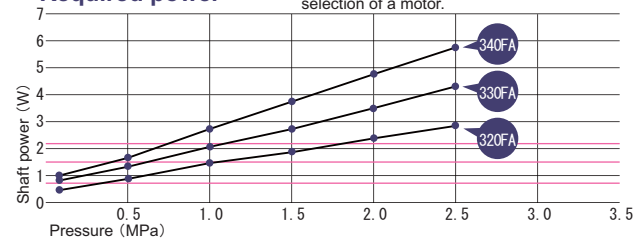
At 1,750 rotations（60Hz）

■ Flow rate characteristics



■ Required power

Refer to these lines in the "Required power" table as applicable standards for the selection of a motor.



Spec / Model	Flow rate (L/min) Pressure (MPa) 0.1	0.5	1.0	1.5	2.0	2.5	Required power (W) Pressure (MPa) 0.1	0.5	1.0	1.5	2.0	2.5
320FA	44.9	44.6	44.1	43.6	43.1	42.5	0.55	0.98	1.45	1.95	2.44	2.92
330FA	67.3	66.5	65.5	64.4	63.3	62.3	0.78	1.34	2.05	2.80	3.51	4.24
340FA	89.2	88.5	87.5	86.6	85.6	84.6	1.00	1.81	2.84	3.84	4.82	5.80

3MF Motor Pump

Standards（CCC, GB3, CE, IE3）

High capacity / Medium pressure

Dimension, pump spec., motor spec.

※ All numbers are the same as for the standard version.（P29）

※ The protective structure compliance to CCC, GB3 and EN（CE） are IP54 and the insulation class is B.

Motor standard

In order to use motors with 1.1kW or less in China,
the motors have to be CCC certified.
Also motors with 750W or higher must have GB3 to be used in China.

GB3 is equivalent to IE2 of IEC.

Only motors, which meet EN standard
and have CE marks attached,
can be used in member nations of EU.

Compliance to standards

	U.S.A.／Canada	Korea	Australia	E U	China	Japan
Required standard	1HP～200HP (0.75kW～150kW) IE3	0.75kW～37kW IE2	0.73kW～185kW LEVEL1A, 1B	0.75kW～7.5kW IE2	0.75kW～375kW GB3 / ～1.1kW CCC	0.75kW～375kW IE3
Compliant product	In preparation	—	—	IE2, CE certified product	GB3 certified product	Standard product

○ The above is as of June, 2016. Since standards may be revised, please check the latest status of a standard of your interest.

3F Motor Pump
(Three-phase motor)

High capacity / Medium pressure

This motor pump is the combination of the 3FAM pump and a dedicated motor and has a small footprint. 3 phase and 200V are the standard of the dedicated motor. A 6 pole motor can be used. As to high temperature, the VF version (max. 120℃) is available.

Model

FTP-3F □ (Motor output) □ (Motor pole) – □ (Motor standard) – □ (Model No.) FAM □ (Seal material) – □ (Relief valve) □ (Relief valve set pressure)

Motor output
1500

※750×6P available
Please contact Fuji Techno for consultation in advance.

Motor pole
×4P : 4 poles

Motor standard
No mark : Standard
A : 200V class 750→CCC,GB3／1500→GB3
B : 400V class 750→CCC,GB3／1500→GB3
CA : 200V class (EN)
CB : 400V class (EN)
EA : 200V class (IE3)
EB : 400V class (IE3)

Model No.
320
330
340

Seal material
No mark : Standard (-5～80℃)
VF : Viton(R) for high temp.
(120℃, 24hous continous in case of 80℃)
TN : Low viscosity, Coolant liquid

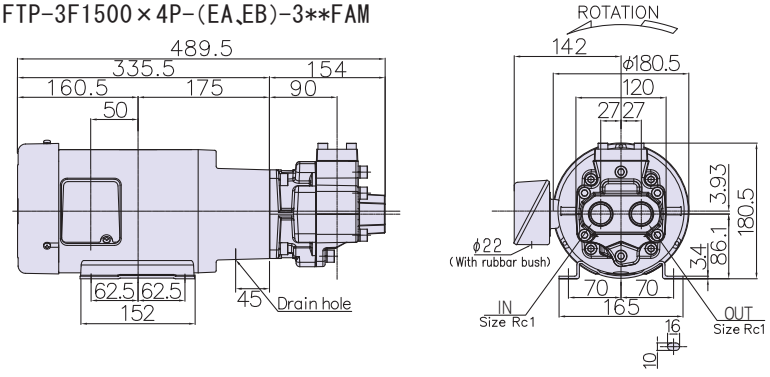
Relief valve
No mark : No valve
VB : With valve

Relief valve set pressure
ex.
0.1 : Set Pressure 0.1MPa (Spring No.1L)
0.5 : Set Pressure 0.5MPa (Spring No.2L)
1.0 : Set Pressure 1.0MPa (Spring No.3L)
1.5 : Set Pressure 1.5MPa (Spring No.4L)
2.0 : Set Pressure 2.0MPa (Spring No.5L)
2.5 : Set Pressure 2.5MPa (Spring No.6L)

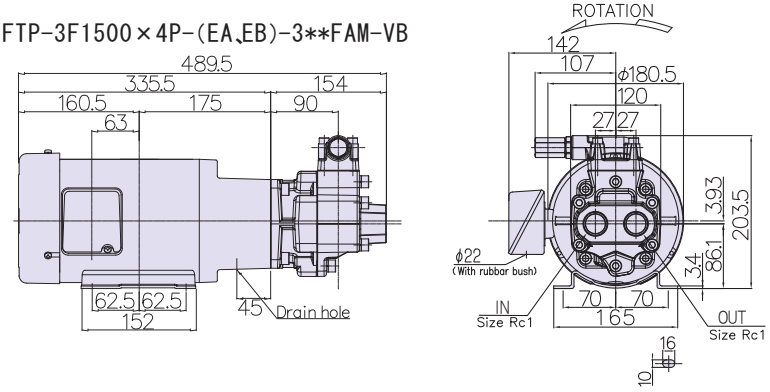
Model examples : FTP-3F1500×4P-EA-320FAMVF-VB0.1 (750W, 200V IE3, 4 pole, high temp. version, with relief valve 〈set pressure 1.0MPa〉)

Dimensional diagrams (mm)

■FTP-3F1500×4P-(EA、EB)-3**FAM



■FTP-3F1500×4P-(EA、EB)-3**FAM-VB



Spec

Spec / Model	No. of motor revolutions 50Hz 1500min^{-1}		No. of motor revolutions 60Hz 1800min^{-1}	
	Theoretical flow rate (L/min)	Max. discharge pressure to motor output (MPa)	Theoretical flow rate (L/min)	Max. discharge pressure to motor output (MPa)
		1500W		1500W
320FAM(VB)	39.0	1.3	46.8	1.0
330FAM(VB)	58.5	0.8	70.2	0.6
340FAM(VB)	78.0	0.5	93.6	0.3

○ The above max. discharge pressures are in combination with ISO-VG46 at 40℃. The rates vary depending on viscosity and temperature.

Motor spec

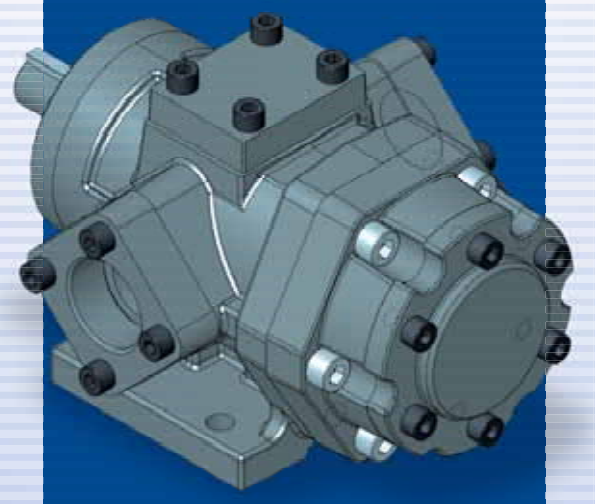
■200V 220V (200V class)

Power (W)	Pole (P)	Rating	Voltage (V)	Frequency (Hz)	Revolutions (min^{-1})	Current (A)	Approx. weight (kg)
1500	4	CONT	200/200/220	50/60/60	1450/1740/1750	6.9/6.2/6.0	24

■380V 400V 440V (400V class)

Power (W)	Pole (P)	Rating	Voltage (V)	Frequency (Hz)	Revolutions (min^{-1})	Current (A)	Approx. weight (kg)
1500	4	CONT	400/400/440	50/60/60	1450/1740/1750	3.4/3.1/3.0	24

○ Squirrel-cage induction motor ○ Totally-enclosed and fan cooled type ○ Insulation class F ○ IP44

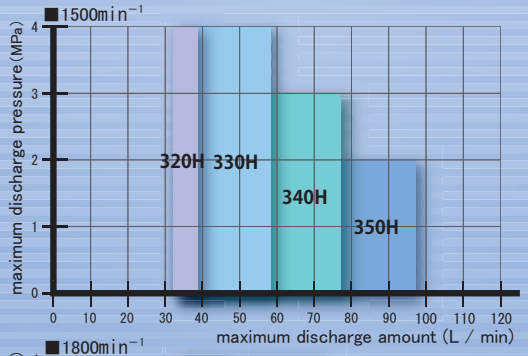


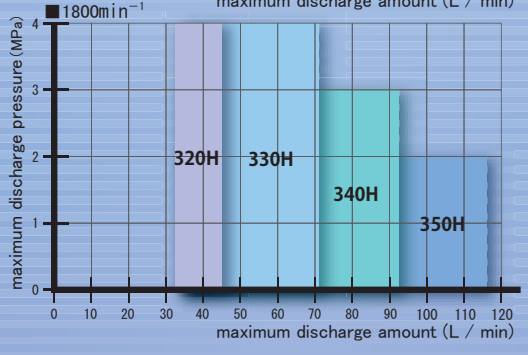
3H

High Capacity / High pressure, Medium pressure

3H	**Pump**
3HWO	**Pump (Bunker oil , Coolant)**
3HPL	**Pump (Liquid seal to cut off outside air)**
3MBC	**Base coupling mounting type**

Performance Pattern Chart





3H Pump

High Capacity / High pressure, Medium pressure

The 3H pump is a large capacity pump for high pressure. The max. flow rates and discharge pressures are 117L/min or less and 4 MPa or less, respectively.
This pump are widely used in hydraulic, lubrication and cooling applications. By operation in low rotations, the pump can feed liquid in viscosity exceeding 10,000 mm2/s. There are 4 models and many combinations of the rotation direction, the seal, the relief valve and the temperature range including the VH version.The rotation direction is clockwise, which is reverse of that of 1A and 2A.

Model

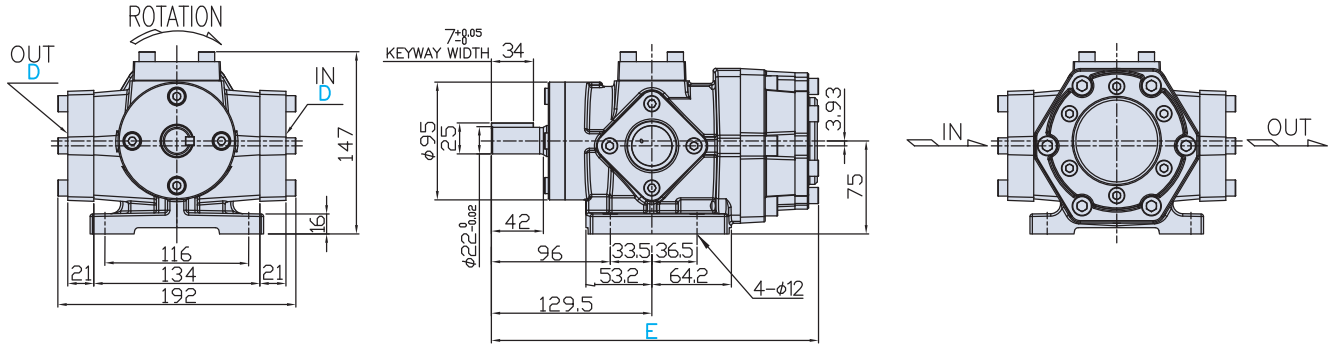
FTP– □H □ □ □ – □ □

Model No.	Applications	Rotation direction	Seal material	Relief valve	Relief valve set pressure
320	No mark : Standard	No mark : Clockwise	No mark : Standard (-5~80℃)	No mark : No valve	ex.
330	WO : Waste oil	L : Counter clockwise	VF : Viton(R) for high temp. (120℃)	VB : With valve (Internal-return)	0.1 : Set Pressure 0.1MPa(Spring No.1L)
340	PL : Liquid seal		VH : Ultrahigh temp. (200℃)		0.5 : Set Pressure 0.5MPa(Spring No.2L)
350	TN : Low viscosity, Coolant liquid		※In case of the continuous operation of the pump for a long period, please contact Fuji Techno for consultation in advance.		1.0 : Set Pressure 1.0MPa(Spring No.3L)
					1.5 : Set Pressure 1.5MPa(Spring No.4L)
					2.0 : Set Pressure 2.0MPa(Spring No.5L)
					2.5 : Set Pressure 2.5MPa(Spring No.6L)

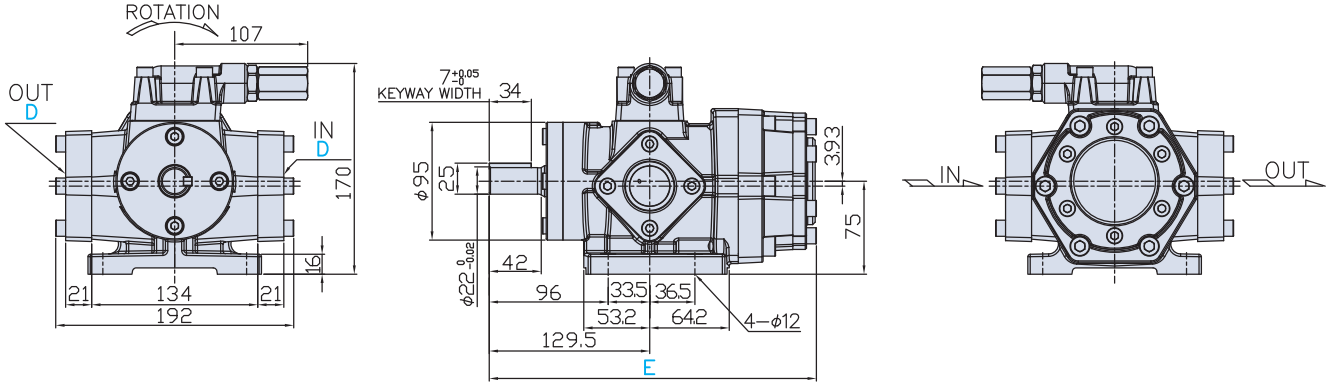
Model examples : FTP-330HL-VB0.1 (With relief valve (set pressure 0.1MPa) , exclusive motor)

Dimensional diagrams (mm)

■FTP-3H(WO、PL、TN) Without relief valve**



■FTP-3H-VB (WO、PL、TN)With relief valve (VB)**



■ Standard and PL type

Model	D		E
	In	Out	
320H(PL)	Rc1	Rc1	264
330H(PL)	Rc1 1/4	Rc1	264
340H(PL)	Rc1 1/4	Rc1	264
350H(PL)	Rc1 1/4	Rc1	274

※Common Drawing

■ WO and TN type

Model	D		E
	In	Out	
320H(WO、TN)	Rc1 1/4	Rc1	264
330H(WO、TN)	Rc1 1/4	Rc1	264
340H(WO、TN)	Rc1 1/4	Rc1 1/4	264
350H(WO、TN)	Rc1 1/4	Rc1 1/4	274

※Common Drawing

Spec

Model \ Spec	Flow rate per. rev. (ml/rev)	Theoretical flow rate (L/min)		Max. discharge pressure (MPa)	Max. revolution (min^{-1})	Approx.weight Without valve/With valve (kg)
		$1500min^{-1}$	$1800min^{-1}$			
320H (VB)	26	39.0	46.8	4.0	1800	16.9/17.7
330H (VB)	39	58.5	70.2	4.0	1800	17.0/17.8
340H (VB)	52	78.0	93.6	3.0	1800	17.0/17.8
350H (VB)	65	97.5	117.0	2.0	1800	18.0/18.8

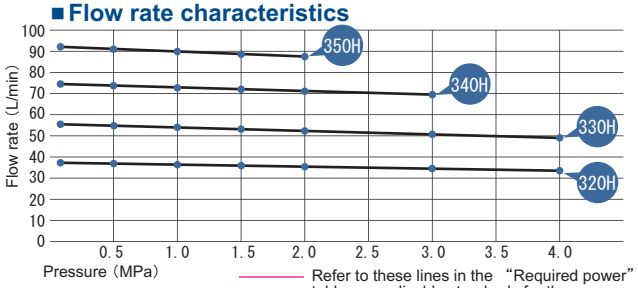
○ The above max. discharge pressure and max. revolution are in combination with ISO-VG46 at 40℃. The rates vary depending on viscosity and temperature.

Performance

○ Test conditions Oil : ISO-VG46 Oil temp. : 40℃

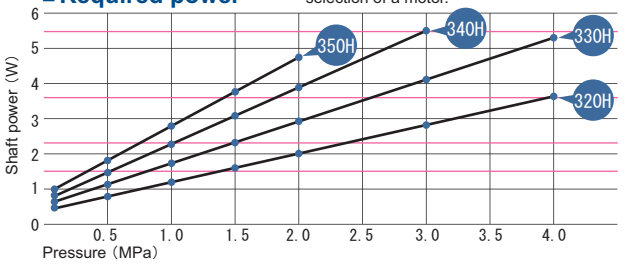
At 1,450 rotations (50Hz)

■ Flow rate characteristics



Refer to these lines in the "Required power" table as applicable standards for the selection of a motor.

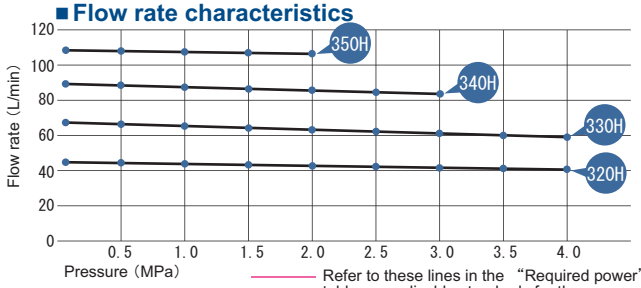
■ Required power



Model \ Spec	Flow rate (L/min) Pressure (MPa)							Required power (W) Pressure (MPa)						
	0.1	0.5	1.0	1.5	2.0	3.0	4.0	0.1	0.5	1.0	1.5	2.0	3.0	4.0
320H	37.2	36.9	36.5	36.2	35.7	34.9	33.5	0.45	0.78	1.20	1.60	2.02	2.83	3.64
330H	55.5	55.1	54.3	53.2	52.2	50.6	49.0	0.64	1.12	1.72	2.31	2.91	4.10	5.30
340H	74.6	73.9	73.0	72.1	71.2	69.5	—	0.80	1.45	2.25	3.10	3.90	5.50	—
350H	92.1	91.2	90.0	88.8	87.6	—	—	1.00	1.77	2.78	3.79	4.74	—	—

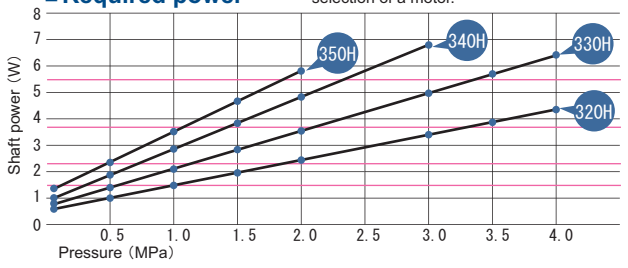
At 1,750 rotations (60Hz)

■ Flow rate characteristics



Refer to these lines in the "Required power" table as applicable standards for the selection of a motor.

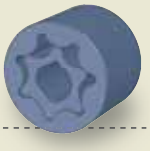
■ Required power



Model \ Spec	Flow rate (L/min) Pressure (MPa)							Required power (W) Pressure (MPa)						
	0.1	0.5	1.0	1.5	2.0	3.0	4.0	0.1	0.5	1.0	1.5	2.0	3.0	4.0
320H	44.9	44.6	44.1	43.6	43.1	42.0	40.6	0.59	0.96	1.45	1.95	2.44	3.40	4.35
330H	67.3	66.5	65.5	64.4	63.3	61.2	59.0	0.78	1.34	2.05	2.80	3.51	4.93	6.40
340H	89.2	88.5	87.5	86.6	85.6	83.6	—	1.00	1.80	2.84	3.84	4.80	6.80	—
350H	108.4	108.0	107.4	106.8	106.3	—	—	1.35	2.28	3.48	4.65	5.83	—	—

○ The required power varies depending on viscosity, temp. etc.

Tip 4



Selection of proper filter

It is preferable to have a filter with a very large filtration volume and fine mesh. However, since a space for a filter is not unlimited, the size of the filter is determined by the available space.. Then, the next step is to select a proper mesh. A filter with 60 mesh or rougher allows particles large enough to cause blockage of FTP pump. In consideration of FTP's applications, 150 -250 mesh are appropriate. Lastly, liquid viscosity and passing flow rate are bases to determine a filtration volume. Usually, a filter manufacturer provides a user with a recommendation and information about the size of a filter based on a specification. Roughly speaking, it is essential to select the size of a filter, which is as large as possible and larger than an inlet diameter of a pump. If possible, place a vacuum gauge in a suction side to prevent any vacuum. Also, it is important to monitor a pump for any unusual sounds. Before the installation of a filter, make sure that there are no particles like iron powder or sealant tape in the plumbing between a pump and a filter location.

3HWO

Pump
(Bunker oil , Coolant)

High Capacity / High pressure, Medium pressure

Special PTFE (Teflon (R)) seals are used to isolate bearings from liquid so that wear of the bearings is minimized. Thus, the 3HWO is able to reach a long product life even with spray of waste oil or coolant liquid with slurry.
The 3HWO can handle liquids up to the temperature of 150℃. In case that it is required to handle temperatures higher than 150℃ is required, please consult with Fuji Techno.
The suction pressure can be as high as the max. discharge pressure in the 3HWO.

Spec

Spec / Model	Flow rate per. rev. (ml/rev)	Theoretical flow rate (L/min)		Max. discharge pressure (MPa)	Max. revolution (min^{-1})	Approx. weight Without valve/With valve (kg)
		1500min^{-1}	1800min^{-1}			
320HWO (VB)	26	39.0	46.8	1.0	1800	16.9/17.7
330HWO (VB)	39	58.5	70.2	1.0	1800	17.0/17.8
340HWO (VB)	52	78.0	93.6	0.8	1800	17.0/17.8
350HWO (VB)	65	97.5	117.0	0.7	1800	18.0/18.8

○ The above max. discharge pressure and max. revolution are in combination with ISO-VG2 at 40℃.
With ISO-VG46 at 40℃, the max. pressure and the max. revolution are the same as that of the standard version. (see page 31)
○ **In the event that abrasive liquid like kerosene oil is used, a discharge pressure must be 0.7MPa or less.**

3HPL

Pump
(Liquid seal to cut off outside air)

High Capacity / High pressure, Medium pressure

By using special PTFE (Teflon (R)) seals to confine liquid between the seals, the liquid is prevented from contacting open air. The 3HPL is ideal to transfer air reactive chemicals such as isocyanate.
The max. temperature the 3HPL can bear is 120℃. If a temperature higher than 120℃ is required, please contact Fuji Techno for consultation.
Because of the use of the seals, a suction pressure can be up to the max. discharge pressure in the 3HPL.

Spec

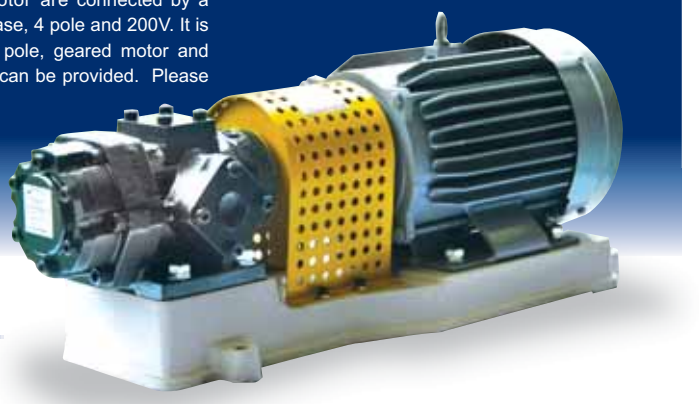
Spec / Model	Flow rate per. rev. (ml/rev)	Theoretical flow rate (L/min)		Max. discharge pressure (MPa)	Max. revolution (min^{-1})	Approx. weight Without valve/With valve (kg)
		1500min^{-1}	1800min^{-1}			
320HPL (VB)	26	39.0	46.8	2.0	1800	16.9/17.7
330HPL (VB)	39	58.5	70.2	2.0	1800	17.0/17.8
340HPL (VB)	52	78.0	93.6	1.0	1800	17.0/17.8
350HPL (VB)	65	97.5	117.0	1.0	1800	18.0/18.8

○ The above max. discharge pressure and max. revolution are in combination with ISO-VG46 at 40℃. The rates vary depending on viscosity and temperature.
○ **In the event that abrasive liquid like kerosene oil is used, a discharge pressure must be 0.7MPa or less.**

3MBC Base coupling mount type

High Capacity / High pressure, Medium pressure

The 3MBC product combines the 3H pump and a non-dedicated motor are connected by a coupling and mounted on a base. The standard spec. of the motor is 3 phase, 4 pole and 200V. It is possible to use other motors such as outdoor type, explosion-proof, 6 pole, geared motor and different voltage motor. A continuous operation at 200℃ (VH version) can be provided. Please contact Fuji Techno for this operation.



Model

FTP−3MBC □ kW □ − □ H □ □ − □ □ □

Motor output
0.75
1.5
2.2
3.7
5.5

Motor pole, reduction ratio
No mark : 4 poles
×4P : 4 poles
×6P : 6 poles
×8P:8 poles
1/3 : Ratio 1/3
1/5 : Ratio 1/5
1/10 : Ratio 1/10

Model No.
320
330
340
350

Applications
No mark : Standard
WO : Waste oil
PL : Liquid seal
TN : Low viscosity, Coolant liquid

Rotation direction
No mark : Counter clockwise
L : Clockwise

Seal material
No mark : Standard (-5～80℃)
VF : Viton(R) for high temp. (120℃)
VH : Ultrahigh temp. (200℃)
※In case of the continuous operation of the pump for a long period, please contact Fuji Techno for consultation in advance.

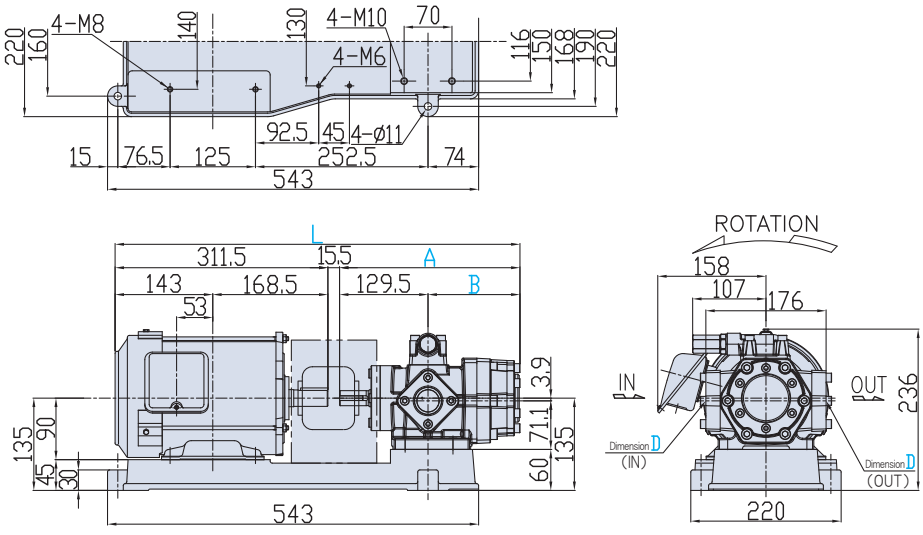
Relief valve
No mark : No valve
VB : With valve (Internal-return)

Relief valve set pressure
ex.
0.1 : Set Pressure 0.1MPa(Spring No.1L)
0.5 : Set Pressure 0.5MPa(Spring No.2L)
1.0 : Set Pressure 1.0MPa(Spring No.3L)
1.5 : Set Pressure 1.5MPa(Spring No.4L)
2.0 : Set Pressure 2.0MPa(Spring No.5L)
2.5 : Set Pressure 2.5MPa(Spring No.6L)

Model examples : FTP-3MBC1.5kW×6P-320HPL-VB1.0 (1.5kW, 6 pole, liquid seal specifications, with relief valve 〈Set pressure 1.0MPa〉)

Dimensional diagrams (mm)

■FTP-3MBC1.5kW×4P(0.75kW×6P)-3**H(WO、PL、TN)-VB



■ Standard and PL type

Model	L	A	B	D In	D Out
320H(PL)	591	264	134.5	Rc1	Rc1
330H(PL)				Rc1 1/4	
340H(PL)					
350H(PL)	601	274	144.5		

■ WO type and TN type

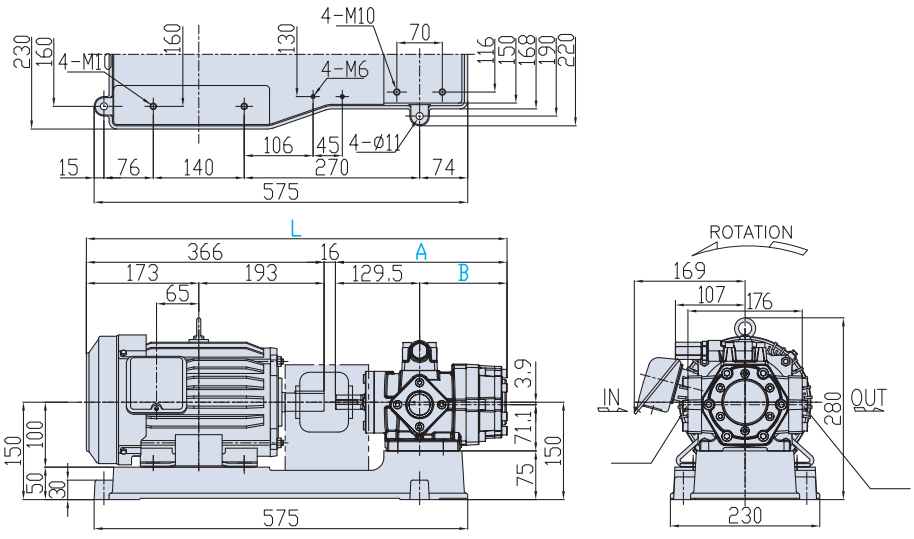
Model	L	A	B	D In	D Out
320H(WO、TN)	591	264	134.5	Rc1 1/4	Rc1
330H(WO、TN)					
340H(WO、TN)					Rc1 1/4
350H(WO、TN)	601	274	144.5		

○ The above are numbers in case that a Mitsubishi motor is used.

Please read the following page as well.

Dimensional diagrams (mm)

■FTP-3MBC2.2kW×4P(1.5kW×6P)-3**H(WO、PL、TN)-VB



■ Standard and PL type

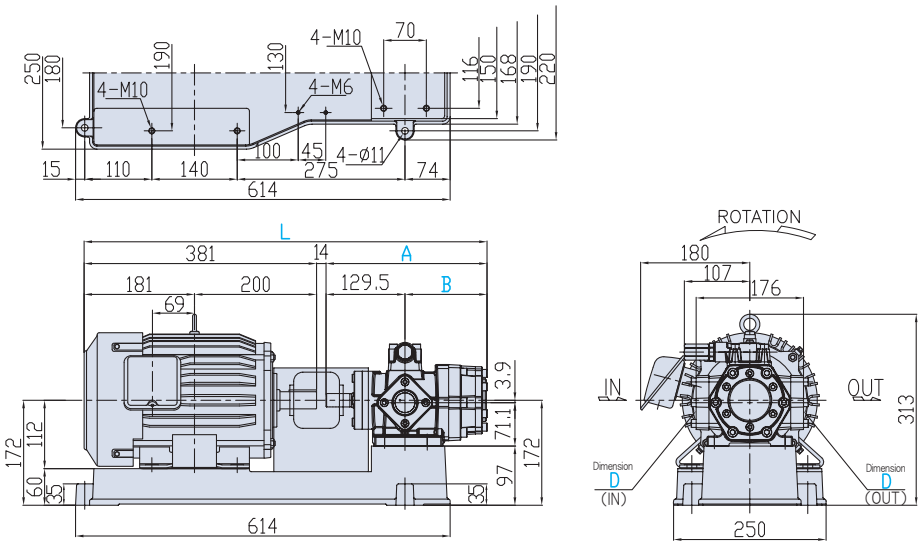
Model	L	A	B	D In	D Out
320H(PL)	646	264	134.5	Rc1	Rc1
330H(PL)				Rc1 1/4	
340H(PL)					
350H(PL)	656	274	144.5		

■ WO type and TN type

Model	L	A	B	D In	D Out
320H(WO、TN)	646	264	134.5	Rc1 1/4	Rc1
330H(WO、TN)					
340H(WO、TN)					Rc1 1/4
350H(WO、TN)	656	274	144.5		

○ The above are numbers in case that a Mitsubishi motor is used.

■FTP-3MBC3.7kW×4P(2.2kW×6P)-3**H(WO、PL、TN)-VB



■ Standard and PL type

Model	L	A	B	D In	D Out
320H(PL)	659	264	134.5	Rc1	Rc1
330H(PL)				Rc1 1/4	
340H(PL)					
350H(PL)	669	274	144.5		

■ WO type and TN type

Model	L	A	B	D In	D Out
320H(WO、TN)	659	264	134.5	Rc1 1/4	Rc1
330H(WO、TN)					
340H(WO、TN)					Rc1 1/4
350H(WO、TN)	669	274	144.5		

○ The above are numbers in case that a Mitsubishi motor is used.

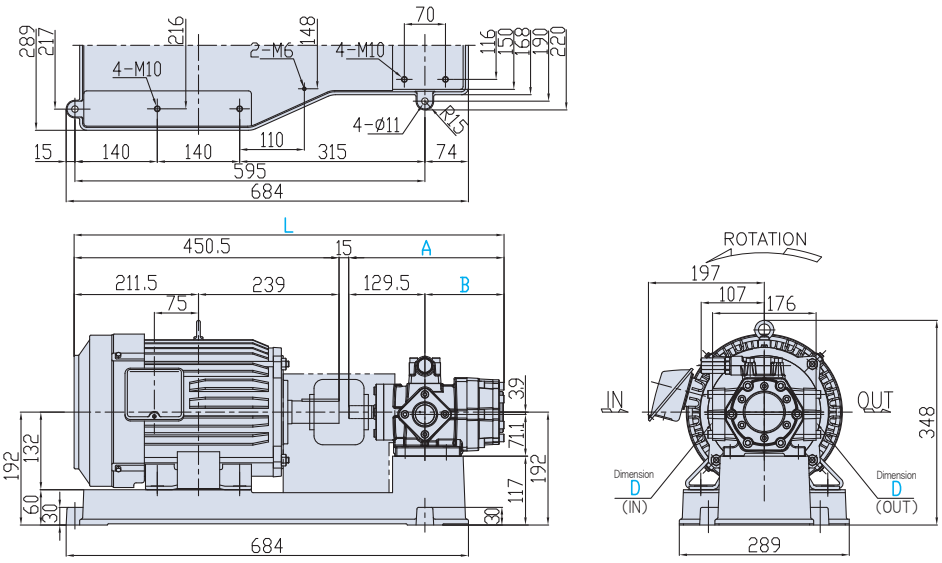
Compliance to standards

	U.S.A./Canada	Korea	Australia	E U	China	Japan
Required standard	1HP～200HP (0.75kW～150kW) IE3	0.75kW～37kW IE2	0.73kW～185kW LEVEL1A、1B	0.75kW～7.5kW IE2	0.75kW～375kW GB3 / ～1.1kW CCC	0.75kW～375kW IE3
Compliant product	Special motor available	Special motor available	—	Available	Special motor available	Standard product

○ The above is as of June, 2016. Since standards may be revised, please check the latest status of a standard of your interest.

Dimensional diagrams (mm)

■FTP-3MBC5.5kW×4P(3.7kW×6P)-3**H(WO、PL、TN)-VB



■ Standard and PL type

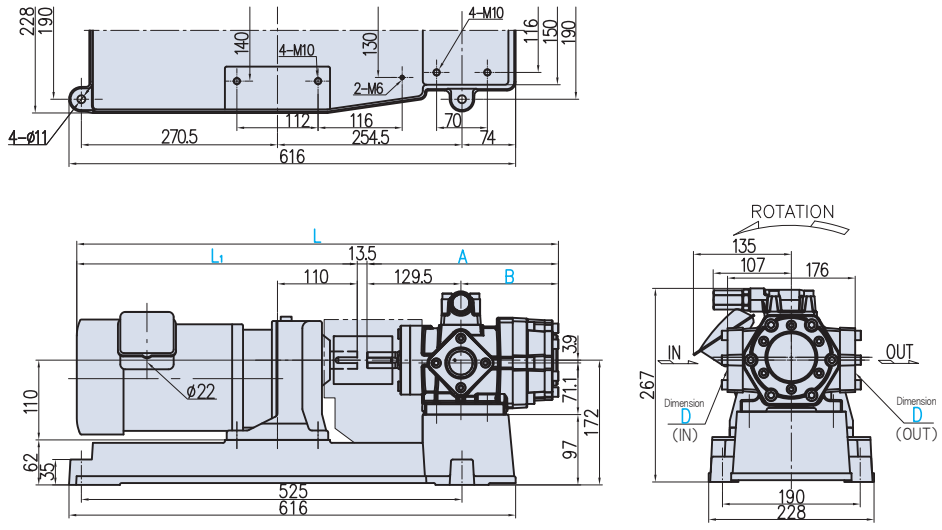
Model	L	A	B	D	
				In	Out
320H(PL)	729.5	264	134.5	Rc1	Rc1
330H(PL)				Rc1 1/4	
340H(PL)					
350H(PL)	739.5	274	144.5		

■ WO type and TN type

Model	L	A	B	D	
				In	Out
320H(WO、TN)	729.5	264	134.5	Rc1 1/4	Rc1
330H(WO、TN)					
340H(WO、TN)					Rc1 1/4
350H(WO、TN)	739.5	274	144.5		

○ The above are numbers in case that a Mitsubishi motor is used.

■FTP-3MBC0.75kW×4P×1/10(1/5)-3**H(WO、PL、TN)-VB



■ Standard and PL type

Model	L 1/5 1/10	L1 1/5 1/10	A	B	D	
					In	Out
320H(PL)	664.3	386.8	264	134.5	Rc1	Rc1
330H(PL)					Rc1 1/4	
340H(PL)						
350H(PL)	674.3		274	144.5		

■ WO type and TN type

Model	L 1/5 1/10	L1 1/5 1/10	A	B	D	
					In	Out
320H(WO、TN)	664.3	386.8	264	134.5	Rc1 1/4	Rc1
330H(WO、TN)						
340H(WO、TN)						Rc1 1/4
350H(WO、TN)	674.3		274	144.5		

○ The above are numbers in case that a Mitsubishi motor is used.

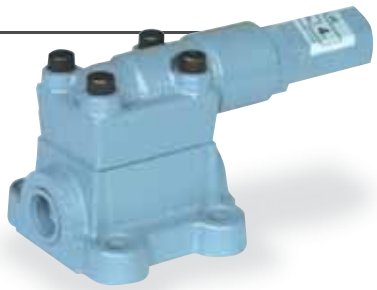
Spec

Model	No. of motor revolutions 50Hz 1500min^{-1}					No. of motor revolutions 60Hz 1800min^{-1}				
	Theoretical flow rate (L/min)	Max. discharge pressure to motor output (MPa)				Theoretical flow rate (L/min)	Max. discharge pressure to motor output (MPa)			
		1500W	2200W	3700W	5500W		1500W	2200W	3700W	5500W
320H(VB)	39.0	1.3	2.2	4.0	4.0	46.8	1.0	1.7	3.2	4.0
330H(VB)	58.5	0.8	1.4	2.6	4.0	70.2	0.5	1.0	2.1	3.3
340H(VB)	78.0	0.5	0.9	1.8	3.0	93.6	0.3	0.6	1.4	2.3
350H(VB)	97.5	0.3	0.7	1.4	2.0	117.0	0.1	0.4	1.0	1.8

○ The above max. discharge pressure and max. revolution are in combination with ISO-VG46 at 40℃. The rates vary depending on viscosity and temperature.

Relief valve for internal gear pump

This valve is for the protection of a pump and a motor.
There are 2 types of the valve, namely the internal-return type (VB) and the external-return type (VD).



Model

FTP– □

Model No.
2VB (2 internal-return)
2VD (2 external-return)
3VB (3 internal-return)

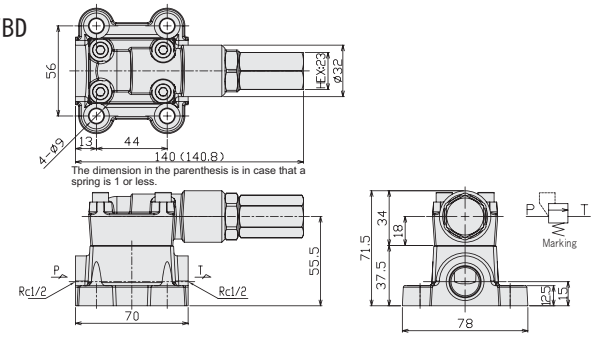
Seal material
No mark : Standard
VF : Viton(R) for high temp.

Installation
No mark : Installed in pump
D : Installed in plumbing

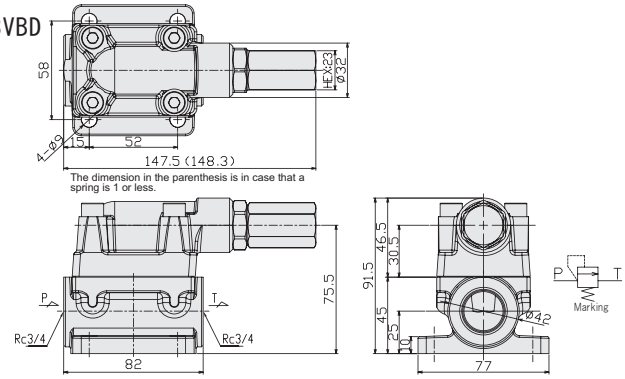
※The set pressure of the relief valve is a cracking pressure, not a full relief pressure.

Dimensional diagrams (mm)

■FTP-2VBD



■FTP-3VBD



■ Dimension table

Item / Spring No.	Wire φ diameter (mm)	Outer φ diameter (mm)	Number of active coils	Natural length (mm)	Standard set pressure (MPa)	Adjustable range of pressure Cracking pressure (MPa)	Use of parts: O-ring P-10A	Use of parts: Packing
(0L)	1.4	13	12.0	54.5		0.04~0.08	No	Yes
1L	1.7	13	13.0	54.0	0.1	0.08~0.25		
2L	1.8	13	13.5	60.5	0.5	0.26~0.50	Yes	No
3L	2.2	13	12.0	57.5	1.0	0.51~1.19		
4L	2.9	13	13.0	54.5	2.0	1.20~2.50		
(NR2)	2.9	13	13.0	57		2.00~2.80		

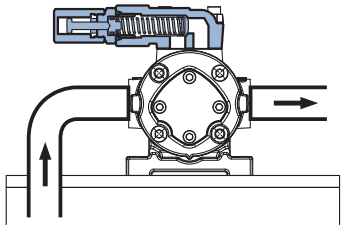
※(0L) and (NR2) are special versions.

■ Dimension table

Item / Spring No.	Wire φ diameter (mm)	Outer φ diameter (mm)	Number of active coils	Natural length (mm)	Standard set pressure (MPa)	Adjustable range of pressure Cracking pressure	Use of parts: O-ring P-10A	Use of parts: Packing
1L	1.8	14	7	52	0.1	0.08~0.25	No	Yes
2L	2.0	14	7	52	0.5	0.26~0.55		
3L	2.6	14	12	55	0.7	0.56~1.30		
4L	2.5	14	10	60	1.5	1.31~1.70	Yes	No
5L	3.0	14	9	54	2.0	1.71~2.49		
6L	3.2	14	9	51	2.5	2.50~3.00		

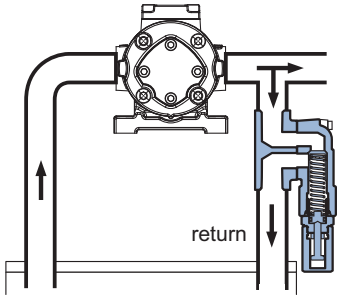
Instructions

■Internal-return (VB type)



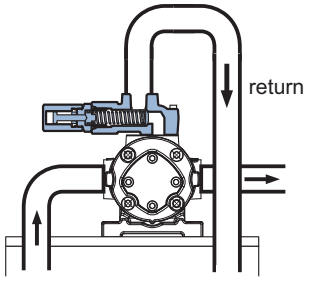
This valve is installed on the pump directly and used to alleviate an instantaneous pressure increase of oil during the transportation of oil. If the valve is in operation or an inlet and an outlet are fully opened for a long period, an adverse effect takes place such as noise, air bubbles or a temperature increase of oil. To avoid the adverse effect, please use an external-return type.

■External-return (VBD type)



This valve is mainly used as a regulating valve for an oil pressure. A sub-plate is attached to the valve and the valve is installed in the bypass circuit of plumbing. The way this valve is used is the most suitable as relief valve. Please use this valve for doing full bypass for a long time or pressure regulation at all times.

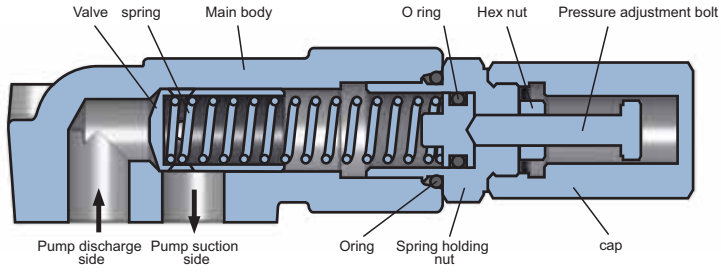
■External-return (2VD type)



The purpose to use this valve is the same as the VBD type but this valve can be installed directly on the type 2 pump. When the 2 VD valve is installed, please make sure that a plate is attached to cover a suction side and that plumbing for return is connected to an oil tank.

Internal structure and pressure adjustment method

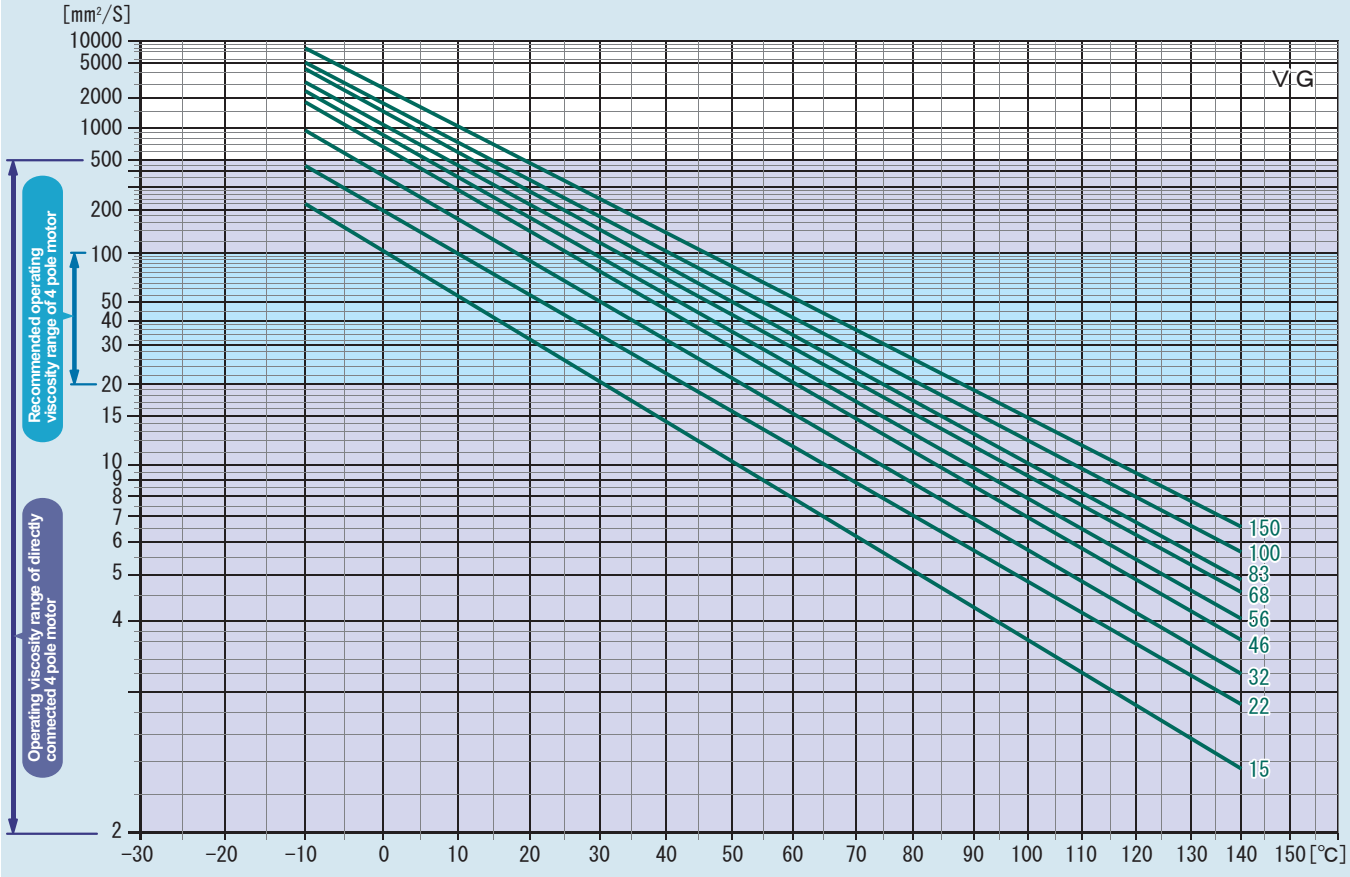
■ Internal structure



■ Pressure adjustment method

1. Please remove the cap.
2. Pleae loosen the hexaon nut.
3. Please turn the pressure adjustment bolt to the right when you to increase pressure setting.
   Please turn the pressure adjustment bolt to the left when you to low the pressure setting.
4. Please tighten the hexagon nut to fix the pressure adjustment bolt.
5. Please close the cap.

Viscosity table of oils

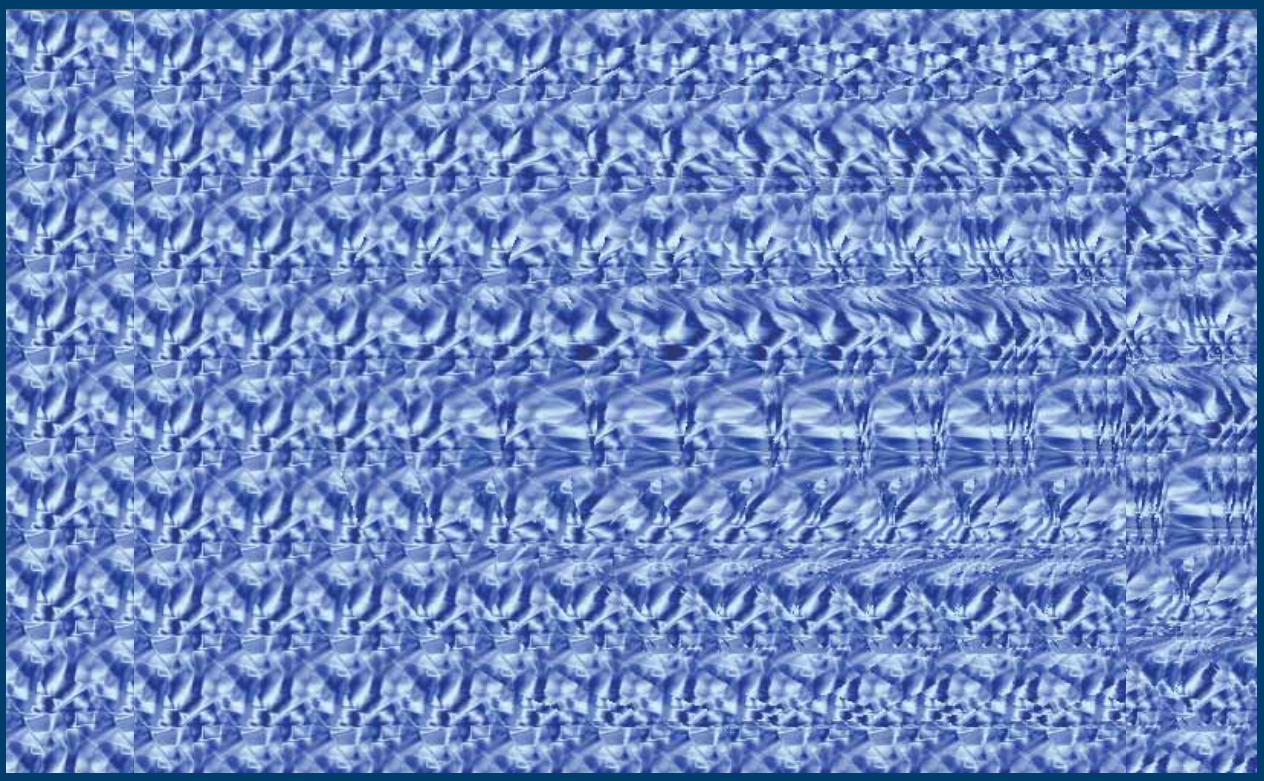


Guide for selection of pump

1. FTP pumps are typically used for oil. For requirements using the FTP pump with other types of liquid, or under special conditions,
2. A filter must be installed in the suction side.
3. Plumbing needs to be as short as possible and should not have any acute bends..
4. Resistance of a suction side has to be 0.03MPa or less. (A pressure in the suction side must be - 0.03MPa or less.)
5. Except the WO and the PL versions, where the suction pressure needs to be 0.2MPa or less.
6. Please avoid rapid heat up or cool down. The temperature difference has to be 40oC or less and change gradually a temperature.
7. When plumbing in the pump, please pay maximum attention to the tightening torque. The allowable tightening torque is as follows.

Diameter R c	1／8	1／4	3／8	1／2	3／4	1	1-1／4	1-1／2
Torque N・m	10	20	20	25	30	70	80	90

Stereogram



Please look at the left circle and the right circle in your left and right eyes, respectively. When the circles will overlap each other, take a look at the pattern in below. You will see the characters.

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