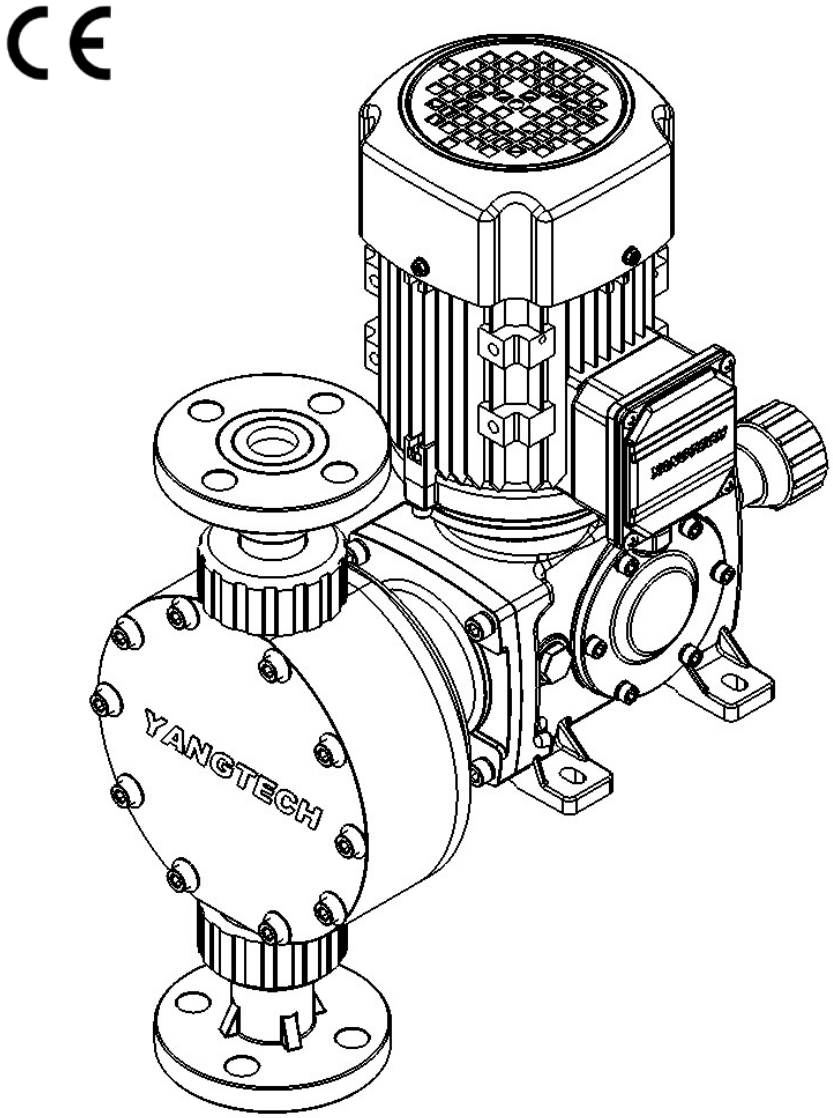
A05G072

ANGTECH (ENGLISH 20/03)

HP - SERIES DIAPHRAGM METERING PUMP
FOR MODEL HP-1315/1330/1715/1730

OPERATION MANUAL



YANGTECH TECHNOLOGY CO., LTD.
(Taiwan)

YANGTECH

HP- SERIES DIAPHRAGM METERING PUMP
HP-1315/1330/1715/1730
OPERATION & MAINTENANCE MANUAL

1. NOTICES

Not in accordance with this manual may cause malfunction of pump or even injury of operator !

- Read this manual thoroughly before installation and operation.
- Install this pump in a place of ventilation(environmental temp. between 5~40°C). Keep away from high temperature / high humidity / corrosive gases.
- Outdoor installation of this pump is allowed (IP55 proof enclosure). But to give a shelter can effectively increase the pump`s life.
- This product is not explosion-proof rating, do not install in a place of potentially gas/dust explosion.
- Confirm both the power source and connection are correct before use.
- If use a inverter as power supply, the frequency variation range should between 30~60Hz. Frequency below 30Hz for a long period of time may cause high temperature damage of driven motor.
- Always drain the pipe before installation. Install pump to a pressured pipe is extremely high dangerous. It may cause a serious injure of operator.
- Always do not operate the pump in a pressure higher than specification , or fluid viscosity >1000 cP or temperature >60°C.
- This unit is not suitable for all kind of fluid. Some solvents, extreme acid, high oxidization high temperature or high viscosity fluid may cause malfunction of pump.
- Wear a chemical protect mask and gloves before repair or maintenance.
- Please do not try to modify the pump or use non-original parts. This damages pump and cause warranty become invalid.

2. MODEL IDENTIFICATION

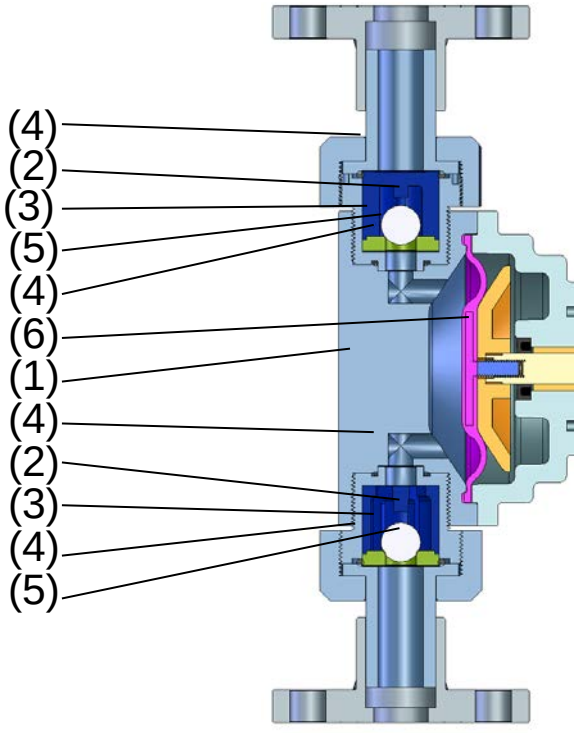
HP-13 15 - AC F-22 3
A B C D E F G

A= Series Code (Pump Series)
B= Diaphragm Diameter (13=φ130mm: 17=φ170mm)
C= Transmission Ratio (15=15:1 / 30=30:1)
D= Material Code (Consult following diagram)
E= Joint Code (U=UnionType / F=FlangeType)
F= Power Code (23=220V,φ3 / 21=220V,φ1/ 33=380V,φ3/ 11=110V,φ1)
G= Special Code (Null =Standard Product / S=Customized Product)

Material Code List

Material Code	AC	AF	BS	VS	SS
Application	Acid	Oxidative Acid	Base	Thick	Solvent
(1) Pump Head	PVC	PTFE	PVC	PVC	SUS304
(2)Valve Ball	Ceramic	Ceramic	SUS316	SUS316	SUS316
(3)Valve Seat	PVC	PTFE	PVC	PVC	SUS316
(4)O-Ring	FKM	FFKM	EPDM	FKM	PTFE
(5)Valve Gasket	FKM	PTFE	EDPM	FKM	PTFE
(6)Diaphragm	PTFE + EPDM + SUS304 + Nylon Fiber				

PVC：Polyvinyl chloride
SUS304/316：Stainless Steel
FKM：Fluoro Rubber FFKM:Full Fluoro Rubber
EPDM：Ethylene Propylene Rubber
PVDF：Polyvinylidene fluoride
Ceramic：Al_2O_3 (Aluminum Oxide)
PTFE：Polytetrafluoro Ethylene



Wet-End Structure

3. PACKING DIMANTIONS AND CONTENTS

●PACKING DIMENSIONS：：

Model	Packing Dimensions	N.W.(Kg)	G.W.(Kg)
HP-1315/1330	L520mm*W250mm*H490mm	17.5	20.5
HP-1715/1730	L520mm*W250mm*H530mm	23	26

●STANDARD CONTENTS：

Item	Contents	Quantity	Unit	Remark
1.	Pump	1	piece	
2.	1.0” 10K Flange (PVC)	2	piece	flange type only
3.	Screw sets (M8-30screw*4、M8 nuts*4,M8 washers*8	1	set	
4.	Operation / Installing manual	1	piece	
5.	P36 Spare O-ring	1	piece	

■ Check all the contents are correct when you receive package of your order.

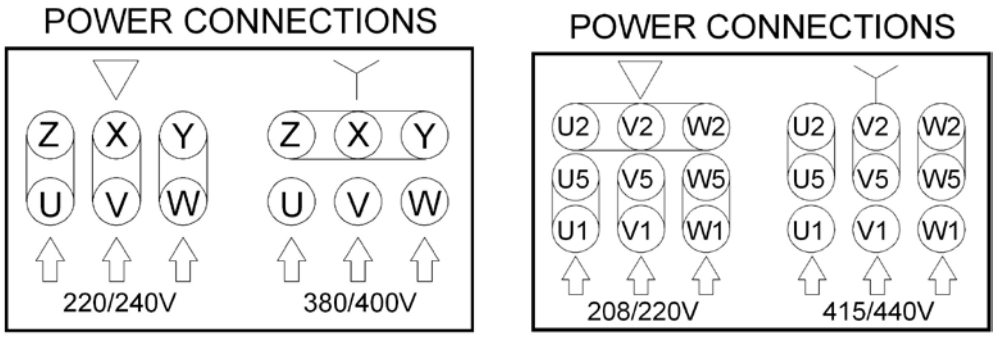
●OPTIONAL：：

Item	Contents	Quantity	Unit	Remark
1.	Floor type installation base HP3-26	1	set	SUS304
2.	Pipe injector (Anti-Siphon include)	1	piece	1.0” PVC/Glue on type

■ If Optional items are necessary, purchase them in the same order.

4. INSTALLATION

- Conform both the power source and connections are correct before use.

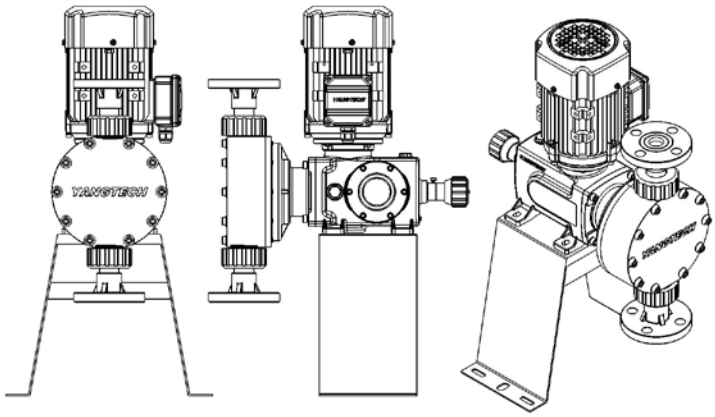


- Use power cable include grounding line and connect to grounding line of motor.
- Pump should installed horizontally on a stable base(on the ground or onto the wall) and conform fixing screws are all tightened, which prevent pump from loosing or falling and ensure safety of operator.

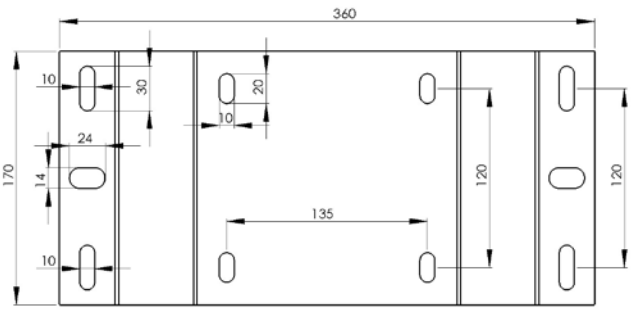
- Install pump that pump-head is lower than the lowest level of pumping fluid. If it is not , a check valve should be installed. The sucking head of this pump is lower than 100cm and which is no guarantee.
- The pressure loss cause by pump pulse should below 1.0 Kgf/cm2, otherwise the pipe start to vibrate. In this case, a pulse reducer can be installed or reduce piping length/elbow or increase pipe diameter.
- Be aware that pressure discrepancy between input output pipe should higher than the inner pressure loss of this pump otherwise, overfeeding even siphon phenomenon may occur. In this case an anti-siphon/backpressure valve(both are optional) should be installed.
- Fluid which is easy to gasify or vaporize(Ex. H2O2, most solvents). Gas in pump head cause variation of flow rate. In this case purge the gas through drain valve.
- Output pipe may install following devices to solve some problems：

Pulse reducer	-To reduce pipe vibration especially pipe is long/thin/plenty of elbows
Pressure gauge	-To monitor output pipe pressure.
Release valve	-To prevent pipe from rupture cause by exceptional high pressure and secure operator against hazard.
Back-pressure valve	-To keep constant pressure of output pipe and improve flow rate stability.
Pipe injector	-To connect hose/pipe to other pipe.
Anti-siphon Valve	- If pumping destination altitude is lower than source tank siphon phenomenon occur. In this case an anti-siphon valve should be installed.

- Pump base dimensions illustrate below:



Front view side view half-side view



base dimensions

Fixing：

Fix pump: screws M8(P1.25)-25 *4+ gaskets M8*8+ nuts M8(P1.25)*4 (Standard)

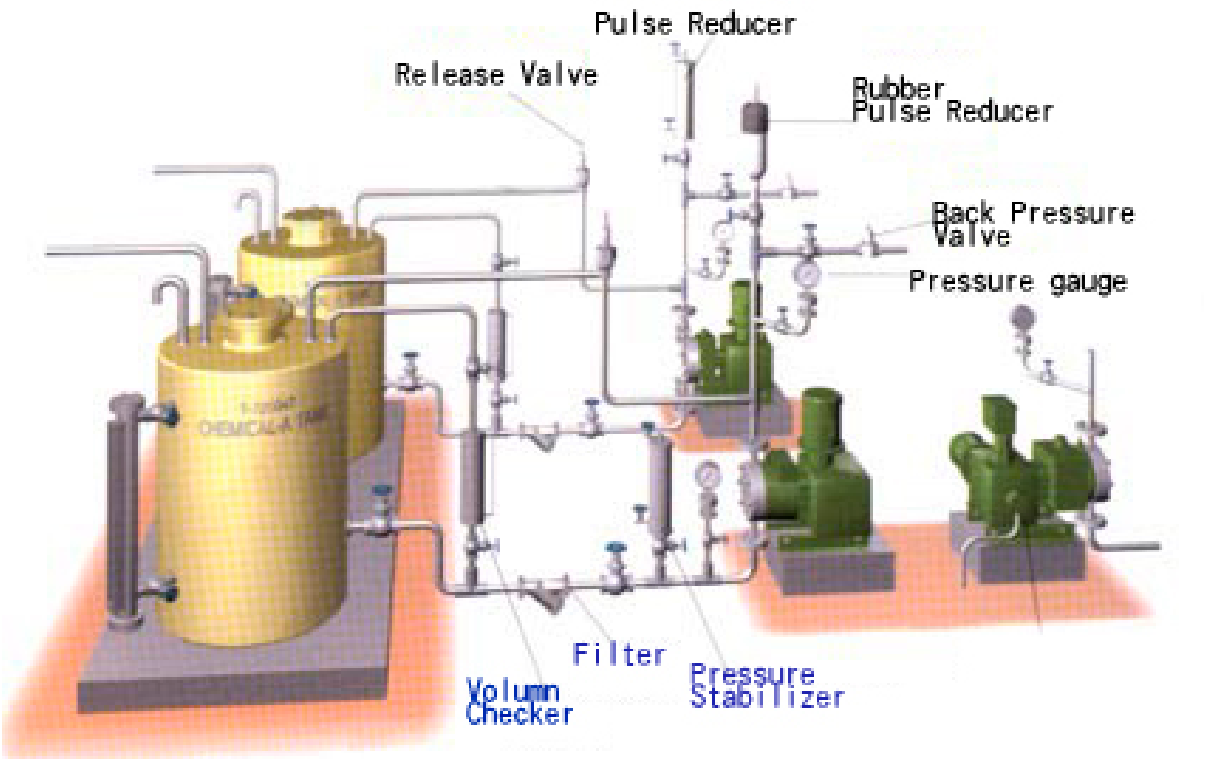
Fix base: foundation screw bolts M8(P1.25)*4 +gaskets M8*4+ nuts M8(P1.25)*4 (optional) or

Expansion screw bolts PF1/8”*4+ gaskets 1/8”*4 + nuts M8(P1.25)*4 (optional) or

Expansion screw bolts PF1/4”*2+ gaskets 1/4”*4 + nuts M8(P1.25)*2 (optional)

- Pipe configuration illustrated below：

System configuration (Example)



5. OPERATIONS

- After correct installation, turn on the power control switch to start the pump. Both direction of the motor are suitable for the pump.
- Make sure all the pipes are connected properly and no leakage before start the pump.
- If source tank fluid level is higher than pump head the fluid should flow into pump head automatically. In this case, start pump then the transporting should begin.
- If pump was installed above the source tank, pump may not be able to suck fluid into pump spontaneously. In this case a check valve should be installed.(Sucking head is not a guarantee.)
- To change the discharge rate, loosen the fix-nut then turn the flow regulator knob while the pump is running.(Do not turn the flow regulator knob when pump is stop). Set the indicator between 0-12mm(clockwise to reduce discharge rate and the opposite to increase). When indicator monitor at “12”, the stroke is at full length, when at “0”, stroke is 0 mm. stroke length. The pump discharge rate is relative to the stroke length proportionally. (See page 7.).
- Turn flow regulator knob for one circle(360 degrees) the knob move 1unit(mm) on the indicator .
- For a precise flow control, after installation user should run a calibration before use.

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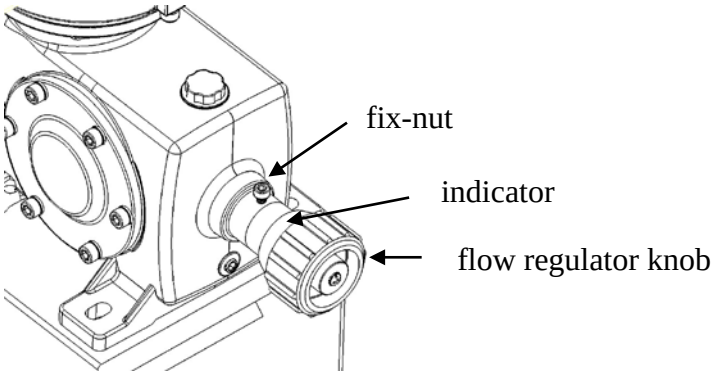
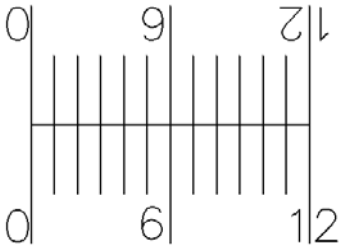
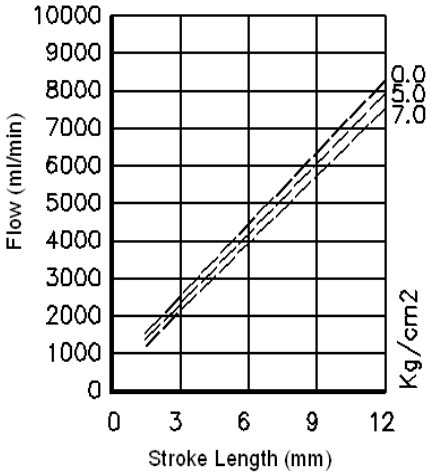




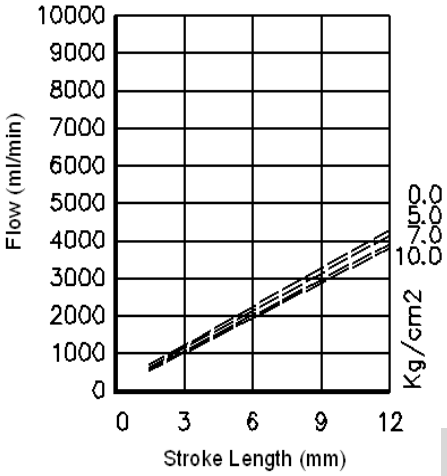
Indicator (unit: mm)

6. PERFORMANCE DIAGRAM

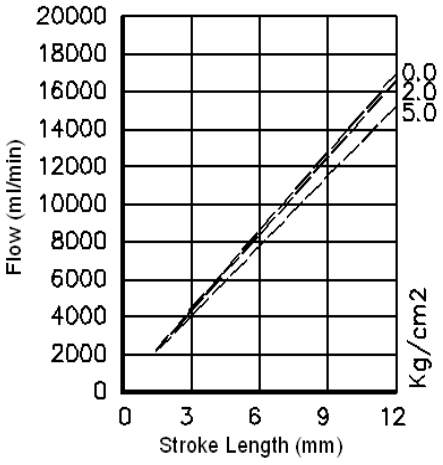
HP-1315



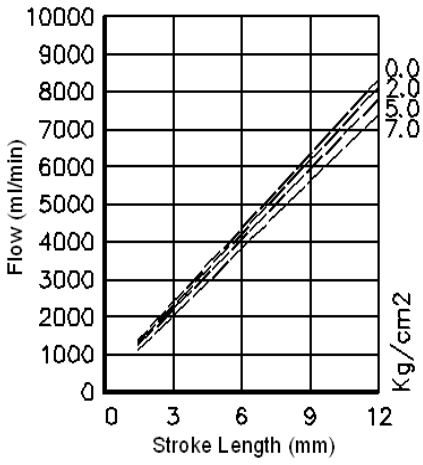
HP-1330



HP-1715



HP-1730



Test Fluid：H_2O
Temperature：25℃
Power Source：220V/φ3/60Hz
Stroke length：100% (12mm)
Pulse rate： 200 Pulses/min
Pressure unit：kg/cm^2

Note：

1. Pipe altitude/length/number of valves/liquid viscosity/pressure, all these factors change discharge rate.
2. For best accuracy, calibrate discharge rate before normally use.

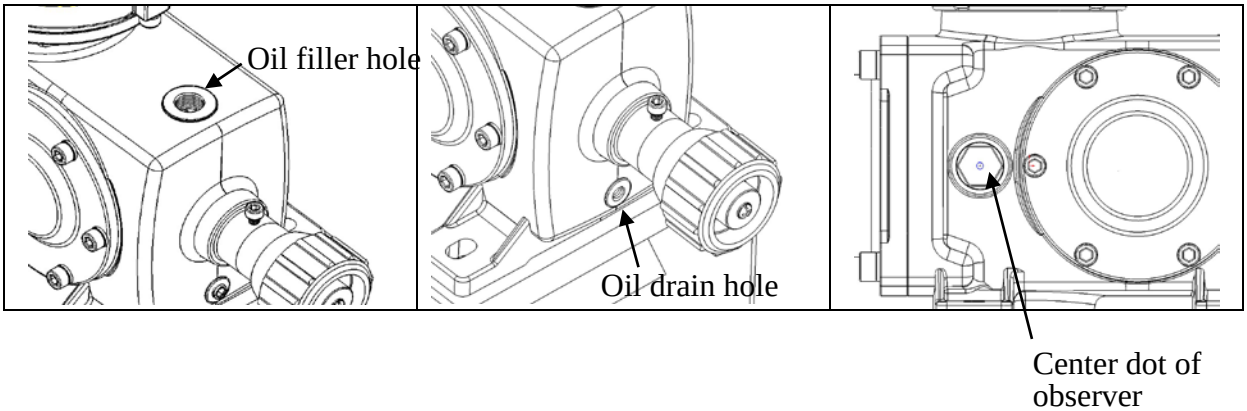
7. COMMON ABNORMAL SITUATIONS AND SOLUTIONS

ITEM	SITUATIONS	POSSIBLE CAUSES	SOLUTIONS
1.	Pump stop or pump can`t start	No power or incorrect power	Supply power or correct power source
		Magnetic switch damaged	Replace a new one
		Fuse/current protector action	Reset or change fuse
		Motor coil fail / damaged	Replace a new one
		Power cable loosing	Check and reconnect
2.	High temp. (Motor temp.>75℃)	High viscosity of fluid	Reduce the fluid viscosity
		High pressure output	Check reason and correct it
		Capacity of inverter too much or insufficient	Change a suitable one
		Frequency of inverter too high or too low	Set frequency variation range between 30~60Hz
		Output line block or valve closed	Clear block or open valve
		Incorrect power source	Change to a correct one
		The motor coil insulation is bad	Replace a new motor
		Abrasion of bearing or the bad lubricity	Renew the bearing or improve the lubricity
		High environmental temperature or bad ventilation	Improve temperature and ventilation of the environment
3.	No fluid output	Motor is stop	Check with ITEM 1.
		Blocking of the inlet pipe (or foot valve)	Eliminate from blocking
		Damage of the diaphragm	Replace with a new one
		Flow regulator was set too low (stroke <1.0mm)	Adjust to proper setting
		Drive mechanism malfunction	Renew the drive mechanism (Return to factory)
4.	Flow rate reduce obviously	Blocking of the inlet pipe (or foot valve)	Eliminate from blocking
		Fluid viscosity become high	Reduce fluid viscosity
		Leakage of the pipe	Patch up the leakage
		Drain valve not close	Close drain valve
		Gas accumulates in pump head	Purge gas through drain valve
5.	Abnormal noise or vibration	Power source problem (incorrect or disconnection of power or lack of a phase)	Check and reinstall power source
		Abrasion of bearing or the bad lubricity	Renew the bearing (Return to factory)or improve the lubricity
		Abrasion of gears of the reducer	Replace with a new reducer (Return to factory)
		Eccentric mechanism bearing failure	Replace with a new one (Return to factory)
6.		Looseness of fix-screws	Fix the loosen screws

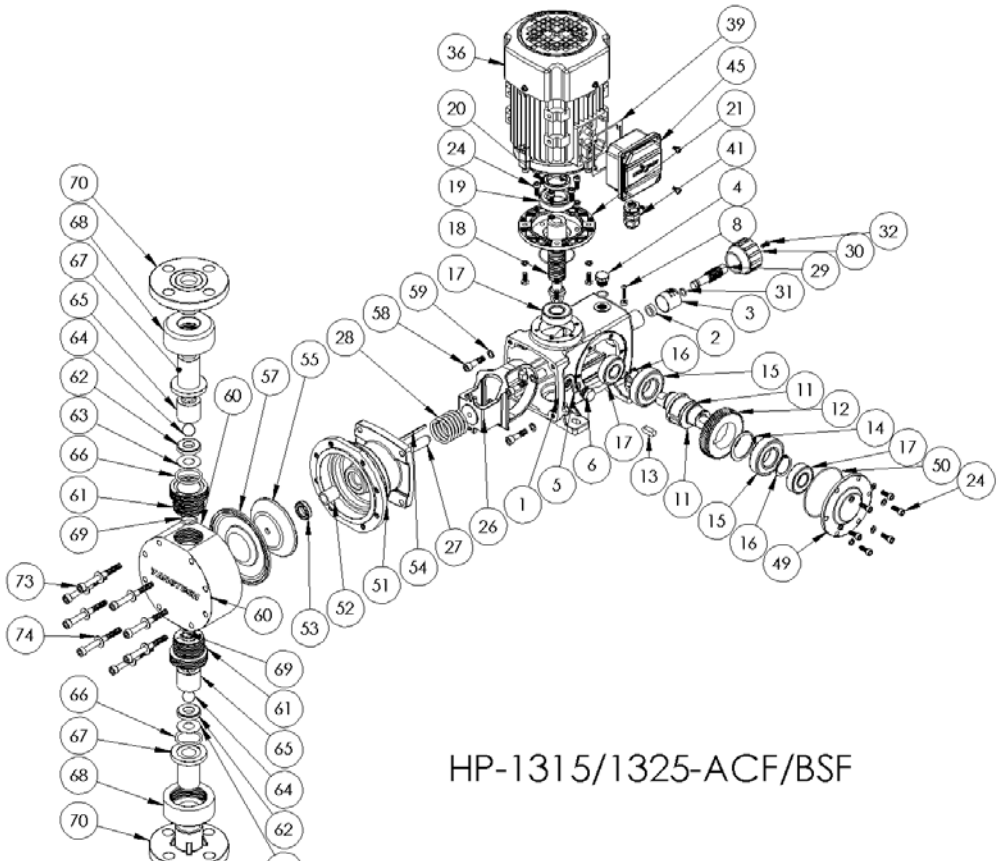
	Leakage of fluid	O-ring / seal gasket is broken or deformed	Replace with a new one
		Lack of O-ring / seal gasket or incorrect installation	Supply new one or reinstall correctly
		Pump head fixing screws loose	Tighten screws of pump head
		Rift of the diaphragm (Fluid draining from bottom hole of pump)	Replace with a new one

8. MAINTENANCE

- Keep low temperature and good ventilation of the operating environment
- If blocking happens, disassemble the connector/foot-valve/pipe then clean up and reassemble the parts according to the illustrations at P.10-11.
- Check the power cable is normal and connectors are clean and tight regularly.
- Avoid the chemical splash on the pump. If do, wash off immediately.
- Check for abnormal noise/temperature (higher then 70℃)/leakage regularly. Solve them according to the “COMMON ABNORMAL SITUATIONS AND SOLUTIONS” at page8.-9.
- Check and tighten screws of the pump regularly.
- Every 5,000 operation hours the gear oil should be changed. The gear oil should MIL-L-2105B and API GL-5 classification standards certified, the viscosity about 80W140.
- Stop the pump, open upper oil filler cap then turn counterclockwise to open bottom oil drain cap. Drain out all gear oil then recover oil drain cap. Add new gear oil from upper filler hole for about 385ml (The oil level reach the center dot of observer) then recover the oil filler cap.

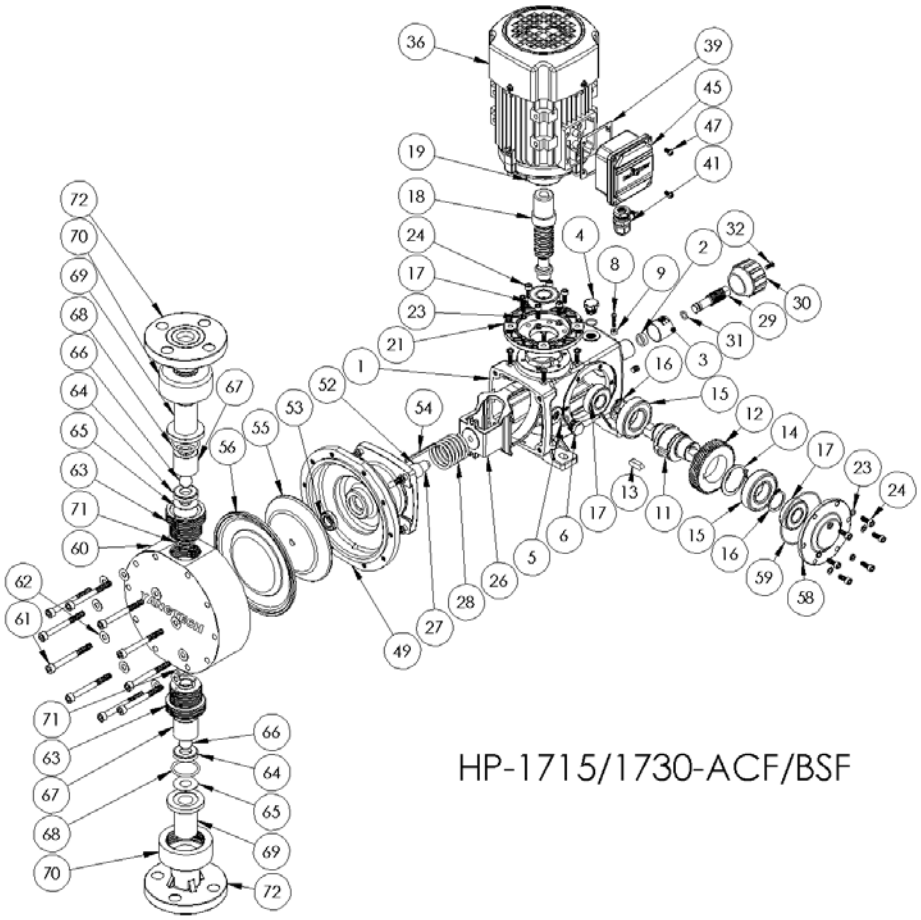


9. CONNECTOR DISASSEMBLE ILLUSTRATION



Parts List:

ITEM	PARTS CODE / NAME	Qty.
1	HP5-02A Drive base	1
2	HP5-16B Bushing SPB131906	1
3	HP5-11A Stroke length indicator	1
4	HP5-02B Oil hole cover	1
5	HP5-02G O-ring	2
6	HP5-02F Oil level monitor	1
8	Screw M4-20	1
11	HP5-10A Eccentric shaft	1
12	HP5-10E Gear	1
13	HP5-10F Pin	1
14	HP5-10G Buckle rim type-C S45	1
15	HP5-10C Bearing 6206	2
16	HP5-10B Buckle rim type-C S30	2
17	HP5-10D Bearing 6204	3
18	HP5-18A Worm gear shaft	1
19	HP5-18B Bearing 6006	1
20	HP5-18D Oil seal SC30428	1
21	HP5-03A Flange	1
24	HP5-03B Screw M6-15	12
26	HP5-16A Drive fram	1
27	HP5-09A Main drive shaft	1
28	HP5-09C Spring	1
29	HP5-12A Flow rate adjust shaft	1
30	HP5-13A Flow rate adjust knob	1
31	HP3-12B O-ring P10 NBR	1
32	Screw M5-10	1
36	HP5-01G Motor	1
39	HP5-01N1 Gasket	1
41	MP3-20E Power cable holder MG16A	1
49	HP5-07A Drive base side cover	1
50	HP5-07D O-ring	1
51	HP3-02A Drive base front flange	1
52	HP5-09E Bushing SPB152125	1
53	HP5-09D 主 Oil seal	1
54	HP5-09B Anit-turnning pin	1
55	HP3-08 Diaphragm seat	1
57	HP3-06 Diaphragm	1
58	Screw M8-15	4
59	M8 Spring washer	4
60	HP3-05A Pump head	1
61	HP5-17A In/outlet connector	2
62	HP5-15C Cheak ball seat	2
63	HP3-15D_D1 Check ball seat gasket	2
64	HP5-15B Check ball	2
65	HP5-15A Check ball guide	2
66	HP5-17E O-ring P36 FKM	2
67	HP5-17C Union head 1.0"	2
68	HP5-17D Union head fix nut	2
69	HP5-17B O-ring P22 FKM	2
70	HP3-19A Flange 10K,1.0"	2
73	HP5-05B Screw M8-80	8
74	HP5-05C Flate washer M8	8



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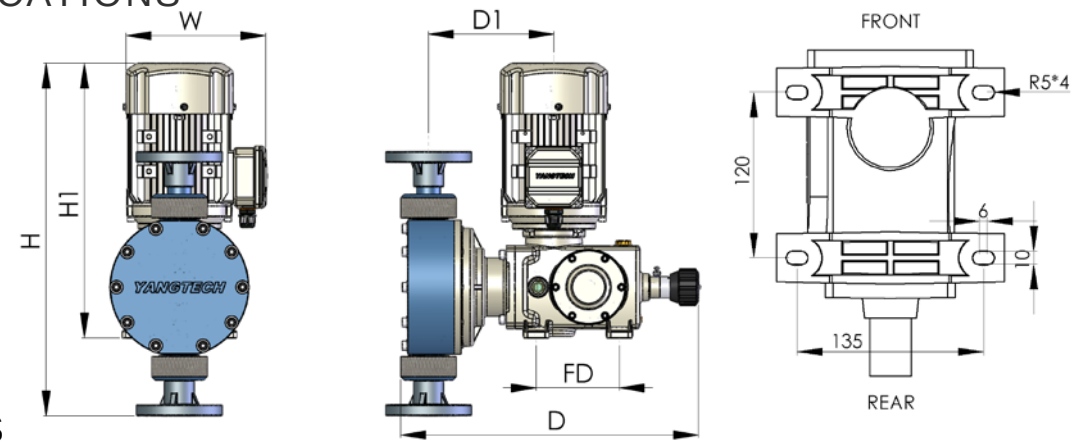
ITEM	PARTS CODE / NAME	Qty.
1	HP5-02A Drive base	1
2	HP5-16B Bushing SPB131906	1
3	HP5-11A Stroke length indicator	1
4	HP5-02B Oil hole cover	1
5	HP5-02G O-ring	2
6	HP5-02F Oil leael monitor	1
8	Screw M4-20	1
9	SMP5-12C Fixing nut	1
11	HP5-10A Eccentric shaft	1
12	HP5-10E Gear	1
13	HP5-10F Pin	1
14	HP5-10G Buckle rim type-C S45	1
15	HP5-10C Bearing 6206	2
16	HP5-10B Buckle rim type-C S30	2
17	HP5-10D Bearing 6204	3
18	HP5-18A Worm gear shaft	1
19	HP5-18B Bearing 6006	1
21	HP5-03A Flange	1
23	HP5-03C M6 Spring washer	24
24	HP5-03B Screw M6-15	12
26	HP5-16A Drive frame	1
27	HP5-09A Main drive shaft	1
28	HP5-09C Spring	1
29	HP5-12A Flow rate adjust shaft	1
30	HP5-13A Flow rate adjust knob	1
31	HP3-12B O-ring P10 NBR	1
32	Screw M5-10	1
36	HP5-01G Motor	1
39	HP5-01N1 Power box gasket	1
41	MP3-20E Power cable holder MG16A	1
45	HP5-01O Power box cover	1
47	Screw M5-10	4
48	HP5-01E2 M6 Screw nut	7
49	HP5-04A Drive base front flange	1
50	Screw M8-15	4
51	M8 Spring washer	4
52	HP5-09E BUshing SPB152125	1
53	HP5-09D Oil seal	1
54	HP5-09B Anti-turing pin	1
55	HP5-08 Diaphragm seat	1
56	HP5-06A Diaphragm	1
58	HP5-07A Drive base side cover	1
59	HP5-07D O-ring	1
60	HP5-05A Pimp head	1
61	HP5-05B Screw M8-80	10
62	HP5-05C M8 Flate washer	10
63	HP5-17A In/outlet connector	2
64	HP5-15C Check ball seat	2
65	HP3-15D_D1 Check ball seat gasket	2
66	HP5-15B Check ball	2
67	HP5-15A Cheak ball guide	2
68	HP5-17E O-ring P36 FKM	2
69	HP5-17C Union head 1.0"	2
70	HP5-17D Union head fix nut	2
71	HP5-17B O-ring P22 FKM	2
72	HP3-19A Flange 10K,1.0"	2

10. SPECIFICATIONS



DIMENSIONS

Model	H	W	D	H1	FW	FD	D1
HP-1315 HP-1330	476	202	432	395	135	120	177
HP-1715 HP-1730	513	217	448	396	135	120	177

SPECIFICATIONS

Item \ Model\ Frequency			HP-1315		HP-1330		HP-1715		HP-1730	
			60	50	60	50	60	50	60	50
1. Capacity. (L/min) (H_2O at 25℃)	0.0	Kg / cm^2	8.4	7.0	4.2	3.5	16.5	13.8	8.2	6.8
	2.0		8.3	7.0	4.1	3.5	16.3	13.6	8.1	6.7
	5.0		7.9	6.6	3.9	3.3	15.7	13.1	7.8	6.5
	7.0		7.6	6.3	3.8	3.2	-	-	7.3	6.1
	10.0		-	-	3.5	2.9	-	-	-	-
2. Pressure Max. (kg/cm^2)	PVC/PVDF		7.0		10.0		5.0		7.0	
	SUS				12.0					
3. Stroke Length (mm)			0.0~12.0							
4. Pulse Rate (pulse/min)			116	97	58	48	116	97	58	48
5. Diaphragm Diameter (mm)			130				170			
6. Joints			1.0” PVC Union O.D. 34mm							
			1.0” 10K Flange							
7. Motor			220V/ φ 1/50,60Hz/0.5Hp 220V/380V/ φ 3/50,60Hz/4P/0.5Hp 380V/440V/ φ 3/50,60Hz/4P/0.5Hp				220V/ φ 1/50,60Hz/1.0Hp 220V/380V/ φ 3/50,60Hz/4P/1.0Hp 220V/440V/ φ 3/50,60Hz/4P/1.0Hp			
8. Net Weight (Kg)	PVC/PVDF		17.5				23			
	SUS316		21				27			

■The above specifications are subject to change without prior notice.

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