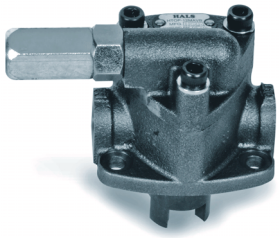
HANSUNG AUTOMATIC LUBRICATION SYSTEM

Rotor PUMP

HALS

Rotor pump series



HTOP-A(VB) series

소형의 내접기어 펌프
COUPLING이 부착되어
구동MOTOR를 연결하여 작동

각종 공작기계
산업용 윤활유 공급용

A compact internal gear pump, attached with a coupling, and is operated by connecting the drive motor.

Various machine tools
For supplying Industrial lubricating oil

Page 7

HTOP-F series

소형의 내접기어 펌프로
회전방향에 상관없이
흡입과 토출이 동일

공작기계
산업기계

A compact internal gear pump that has equal suction and discharge, regardless of rotation direction.

Machine tools
Industrial machines

Page 8

HMTP-3M-MA(VB) series

HTOP-A(VB)와 MOTOR를
결합한 펌프 조립품

사용환경에 따라
다양한 적용이 가능

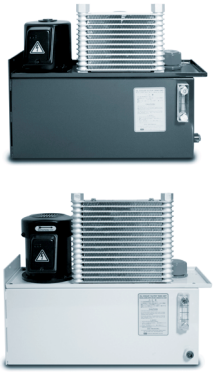
MCT
CNC
기타 선삭 및
절삭 가공 전용기
산업기계

A pump produced by connecting a motor to the HTOP-A(VB) product

Various applications are available according to operational environments

MCT
CNC
Other turning and cutting processing machines
Industrial machines

Page 9



OIL COOLER series

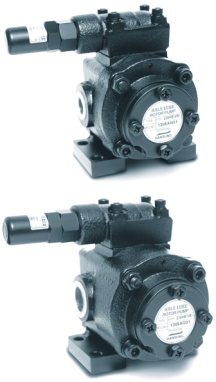
HMTP 3M-□-MA(VB) 펌프를 이용한
OIL COOLER UNIT 제품

각종 공작기계
오일 COOLER 장치

An oil cooler unit that uses the HMTP 3M-□-MA(VB) pump

Various machine tools
OIL COOLER UNIT

Page 11



HTP-(HA/HB)(VB/VD) series

HTOP TYPE에 비하여
다양한 압력과 유량범위를 갖은
내접 기어 펌프

MCT
CNC
기타 선삭 및
절삭 가공 전용기
산업기계

An internal gear pump that has more various pressures and oil quantity range than the HTOP type

MCT
CNC
Other turning and cutting processing machines
Industrial Machines

Page 14

HMTP-3M-HA(VB/VD)-(E) series

HTP-HA(VB)에 MOTOR를
조립한 펌프 완성품

출력에 따른 다양한 압력과
유량범위를 갖고 있음

MCT
CNC
기타 선삭 및
절삭 가공 전용기
산업기계

A product produced by connecting a motor to the HTP-HA(VB) product

It has various pressures and oil quantity range according to output

MCT
CNC
Other turning and cutting processing machines
Industrial Machines

Page 16

HMTP-3M-HAVBF-(E) series

HTP-HA(VB)제품에
Suction Filter를 부착한 제품

Filter 청소가 간단하고
HTP type 전기종에 적용이
가능함

MCT
CNC
기타 선삭 및
절삭 가공 전용기
산업기계

A product produced by attaching the suction filter to the HTP-HA(VB) product

Filter cleaning is simple.
It is possible to apply
in the HTP all type

MCT
CNC
Other turning and cutting processing machines
Industrial Machines

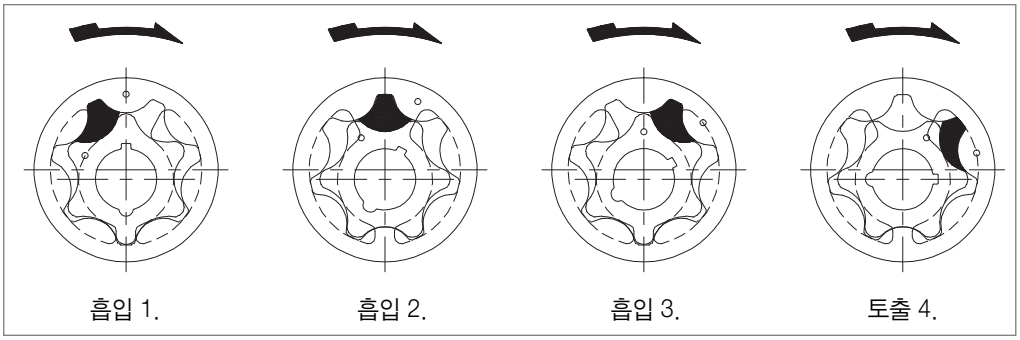
Page 19

ROTOR 작동설명 Rotor Operating Explanation

ROTOR PUMP OUTLINE

Rotor Pump는 한쌍의 내치차와 외치차로 이루어져 있는 내접형 Gear Pump이다. 내치차와 외치차의 기어는 Trochoid곡선상 중심을 갖고 원호의 포물선을 따라 움직인다.

Rotor pump is an internal gear pump consisting of in rotor and outer rotor gear. Internal and external gear operates along a circular trajectory with trochoid curve at the center.



외치차(Out Rotor)는 내치차(In Rotor) 보다 치수가 1매 많아, 동일방향으로 회전하여 상대속도가 매우 적어 치차의 마모나 소음이 적게 발생된다.

An out-rotor is 1 measurement higher than an in-rotor. It spins in the same direction and the relative speed differential is low. Therefore, there is less friction and noises created.

ROTOR PUMP SELECTION

필요한 유량확인 Necessary oil quantity	필요한 압력 Necessary pressure	Relief v/v 설정압력 Relief v/v configuration pressure	적용오일 Applied oil	주위온도 Surrounding temperature
토출량은 사용유 온도와 종류에 따라 달라짐 충분한 여유를 주어서 선택 Discharge quantity varies according to type and temperature of oil used. Give enough time to choose.	최대 적용 가능한 압력과 모터를 초과하여 선택할 수 없다. Cannot choose the quantity exceeding maximum applicable pressure and motor.	안전밸브로 설정압력에 따라 작동됨 설정압력은 펌프최대 압력보다 초과할 수 없다. Operates using safety valve according to configured pressure. Configured pressure cannot exceed the maximum pump pressure.	본 Rotor Pump는 광범위한 Oil사용이 가능하지만 본 Catalog는 ISO VG 46을 기반으로 작성, 다른 오일 사용시 성능과 내구성의 차이가 있을 수 있다. A wide range of oil can be applied to the rotor pump. This catalogue was created using ISO VG 46. There could be differences in performance and durability when using different oil.	Oil 온도 Motor 온도 주위온도 -10~40℃ Oil temperature Motor temperature Surrounding temperature -10~40℃

ROTOR PUMP FEATURE

제품비 Manufacturing cost	타 용적식 펌프에 비하여 저렴하다. Cheap relative to other capacity type pump.
취급성 Handling	내접형 Gear 펌프이므로 다른 펌프에 비하여 동용량의 경우 취급이 편하고 소형 · 경량이다. It is an internal gear pump and therefore handling is easier and is small in size and weight compared to pumps with similar capacity.
용적효율 Capacity efficiency	일반 Gear 펌프에 비하여 용적효율이 유수하다. Compared to general gear pump, capacity efficiency is good.
유지보수 Repair & maintenance	구조가 간단하여 분해 · 점검이 용이하다. It has simple structure and easy to disassemble and inspect.
소음, 진동 Noise and vibration	Gear Pump 및 타 용적식 펌프에 비하여 특유의 내접형 Gear를 사용하여 소음과 진동이 적다. It uses its unique internal gear compared to gear pump and other capacity type pump, causing low noises and vibration.
적용부분 Applicable part	보통 1500~2000rpm에서 사용하지만 300~3000rpm까지 광범위한 회전에서 사용할 수 있고 사용자가 희망하는 용량 · 기종이 다양하며 Pump의 호환성이 높다. It is used on average at 1500-2000 rpm but can also be used in a wide range of revolution such as 300-3000 rpm. It has a variety of capacity ad type for users with various needs and pump compatibility is also excellent.
주요용도 Main use	강제급유, 저유압유 구동, 기름이송용, 여과기 이송용 Forced oil supply, low pressure oil supply, oil transportation, filtration transportation oil.
적용분야 Applicable areas	각종 공작기계, 선박엔진, 농업용 엔진, 기타엔진, 냉각기용, 감속기, 건설기계, 각종 산업기계, 프레스, 인쇄기계, 제지기계, 발전기, 압축기 등 Various machining tools, vessel engine, agricultural engine, other engines, coolants use, decelerator, construction machine, various industrial machine, press, printing machine, paper manufacturing machine, generator and compressor.

OIL 순환 SYSTEM

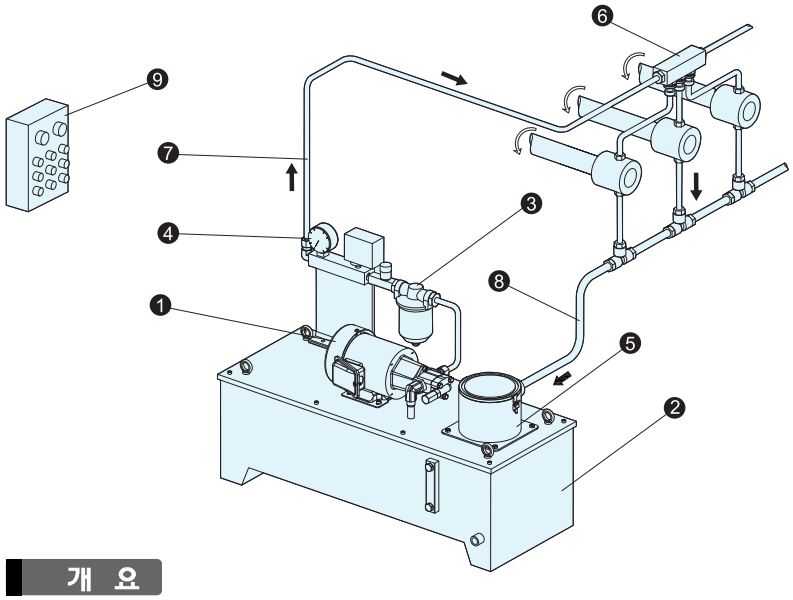
Oil Circulation System

개 요

오일 순환 시스템은 주로 윤활 및 냉각이 필요한 고온의 윤활점에 윤활제를 여과 및 냉각 과정 등을 거쳐 반복 순환하여 사용하는 시스템이다.
시스템의 구성 요소는 탱크, 펌프, 필터, 히팅 및 냉각장치, 오일 압력 및 온도제어 장치, 전기 콘트롤 장치, 밸브 및 피팅 등으로 구성되어지며, 설비의 상황과 조건에 맞게 자동화의 수준이 결정 되어진다.

적 용

기어 BOX, 베어링, 발전기, 대형 송풍기, 내연기관, 정밀 공작기계 등



번호	구성기기
1	순환펌프
2	오일탱크
3	필터
4	압력계
5	드레인필터
6	분배변
7	공급배관
8	회수배관
9	제어반

Number	component
1	circulation pump
2	oil tank
3	filter
4	pressure gauge
5	drain filter
6	distributor
7	supply pipe
8	recovery pipe
9	control board

개 요

The oil circulation system repeatedly circulates lubricating oil that has been filtered and cooled to high-temperature lubricating points that need lubrication and cooling.
The system is comprised of a tank, pump, filter, heating and cooling device, oil pressure and temperature control device, electricity control device, valves and fittings. The level of automation is set according to equipment status and condition.

적 용

gearboxes, bearings, generators, large air blowers, internal combustion engines, and precision machine tools, etc.

펌프 사용유 참고표

Reference table for pump oil

Oil / Model	Industrial Lubricant Oil	Pressure Oil	Gear Oil	Turbin Oil	Engine Oil	Spindle Oil	Silicon Oil	Cooking Oil	Cutting chips (Oil based, Water based)	Light Oil (Gasoline)	Lamp Oil
HTOP-F	○	○	○	○	X	X	X	X	X	X	X
HTOP-A	○	○	○	○	○	X	○	X	X	X	X
HTP-HA	○	○	○	○	○	□	X	X	●	X	X

○: 성능 범위내 사용가능[Possible to use within capacity range], ●: 압력제한 (0.7MPa 이하에서 사용) [Pressure limit (can be used below 0.7MPa),
□ : 압력제한 (0.5MPa 이하에서 사용) [Pressure limit (can be used below 0.5MPa)] , X : 사용불가 [Cannot be used]

펌프선정

PUMP Selection

유량확인

- CATALOG 또는 도면을 참고하여 선정하십시오.
- 사용액체, 온도, 압력에 의해 토출량이 변화 합니다.
- 안전율을 반영하여 선정하여 주십시오.

압력확인

- CATALOG 또는 도면을 참고하여 선정하십시오.
- PUMP의 최대 압력 및 MOTOR의 출력을 초과하지 않도록 선정하십시오.

RELIEF VALVE 압력설정

- RELIEF VALVE 압력 설정은 SETTING 압력범위 안에서 조정이 가능합니다.
- VB RELIEF VALVE (내부드레인형) 압력 설정 시 펌프의 운전 중에 조정 할 경우 토출측을 완전히 막은 상태에서 30초 이상 운전하지 마십시오.
- 조절밸브 사용방법은 별도로 기재되어 있고, VB(내부드레인)과 VD(외부드레인)을 사용 환경에 맞게 선정하십시오.

사용유 확인

- ROTOR PUMP는 폭 넓은 용도로 사용되지만 오일용임을 인식 하십시오.
- CATALOG 상 모든 제품은 ISO VG 46 40℃을 기준으로 설계 및 성능이 표시 되었습니다.

온도 확인

- 사용 가능한 주위 온도는 -20℃ ~ 40℃입니다.
- 모터 주위온도는 -10℃ ~ 40℃입니다.
- 사용 액체의 온도 범위는 -5℃~80℃입니다.
- 펌프 온도와 사용하는 오일의 온도차이는 40℃이내야 합니다.

사용 점도범위

- 점도범위는 10~500 mm^2/s입니다.
- 점도가 낮으면 토출량이 적어지고, 점도가 높으면 소요동력이 증가합니다.

모터확인

- 일부기종(HTOP-F)를 제외한 모든 제품은 회전방향과 흡입 · 토출방향이 고정되어 있습니다.
- 회전방향이 반대로 바뀌면 흡입 · 토출의 방향도 바뀌고 오일이 외부로 분출합니다.
- CATALOG를 확인하여 여유있는 동력을 선정하십시오.
- 동력은 압력 · 유량 · 전도에 따라 변화 합니다. 점도가 높을 경우 큰동력이 필요합니다.

Verify oil quantity

- Refer to catalogue or blue prints to make your choice.
- Discharge quantity changes according to liquid, temperature and pressure used.
- Make your selection reflecting safety rate.

Verify pressure

- Refer to catalog and blue print to make your selection.
- Make your selection so that the maximum pressure of the pump does not exceed motor output.

Relief valve pressure configuration

- Configuration of relief valve pressure can be adjusted within the scope of setting pressure range
- When setting for VB relief valve (internal drain type) pressure, if making adjustment during pump operation, do not operate more than 30 seconds while discharge side is completely blocked.
- An instruction on how to use control valve is separately listed. Adjust VB(internal drain) and VD(external drain) appropriately according to user environment.

Check oil used

- Rotor pump is used for wide range of purpose but do not forget that it is for oil.
- Design and performance of all products in the catalogue were described according to ISO VG 46 40℃ standard.

Checking temperature

- Surrounding temperature that can be used is -20℃ to 40℃.
- The surrounding temperature of motor is -10℃ to 40℃.
- The temperature range of used liquid is -5℃ to 80℃.
- The difference between pump temperature and used oil should be within 40℃.

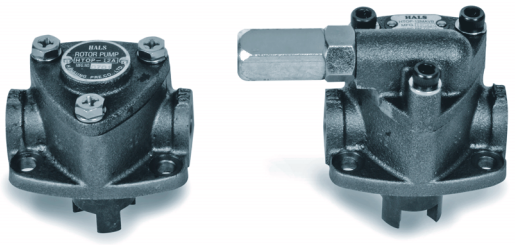
Range of viscosity used

- Range of viscosity used is 10-500 mm^2/s.
- If viscosity is low, discharge decrease. If viscosity is high, consumed motor power increases.

Check the motor

- All products except for some product line (HTOP-F) have fixed spinning and suction/discharge direction.
- If the spinning direction reverses, suction/discharge direction also changes and oil is leaked to outside.
- Check the catalogue to secure sufficient motor power.
- Motor power changes according to pressure, oil quality and conduction. If viscosity is high, higher motor power is required.

HTOP A(VB) series



Model

HTOP - □ □

- A: Without Relief V/V
- AVB: Attach Relief V/V
- Pump Type

Structure

- 내접기어 용적식 펌프로 외접기어펌프에 비하여 소형이며, MOTOR 구동부와 연결하여 펌프 구동을 시킬 수 있음
- An internal gear bulk pump. It is small compared to external gear pumps, and can be connected to motor drive parts to operate the pump.

Feature

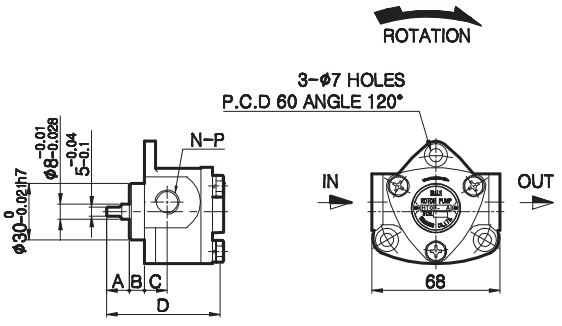
1. 용적식 펌프로 회전수에 따른 정확한 유체이송가능
2. 회전수에 따라 다양한 유량범위를 갖고 있음
3. RELIEF VALVE 부착이 가능하여 압력 조정이 용이

1. A volume pump that allows precise fluid delivery according to the rev counts.
2. It has a wide flow range according to the rev counts.
3. A relief valve can be added to allow easy pressure setting adjustments.

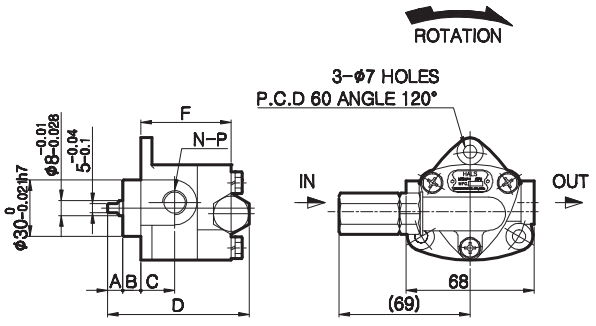
Pump Spec.

Specification / Type	THEORY DISCHARGE AMOUNT(cm³/rev)	DISCHARGE AMOUNT(ℓ/min) 1500rpm	DISCHARGE AMOUNT(ℓ/min) 1800rpm	MAX. PRESSURE (kg/cm²)	MAX. R.P.M	PACKING SIZE (cm)	WEIGHT(kg) PUMP	WEIGHT(kg) PACKING
HTOP-11A	1.5	2.2	2.7	5.0	2000	10(W)x8(L)x9(D)	0.6	0.7
HTOP-12A	2.5	3.7	4.5	5.0	1800			
HTOP-13A	4.5	6.7	8.1	5.0	1800		0.8	0.9
HTOP-11AVB	1.5	2.2	2.7	5.0	2000			
HTOP-12AVB	2.5	3.7	4.5	5.0	1800		0.9	1
HTOP-13AVB	4.5	6.7	8.1	5.0	1800		1	1.1

External Figure



TYPE	A	B	C	D	N-P
HTOP-11A	12	8	12	57	2-PT 1/8″
HTOP-12A	12	8	12	62	2-PT 1/4″
HTOP-13A	14	5	14	76.5	2-PT 3/8″



TYPE	A	B	C	D	F	N-P
HTOP-11AVB	12	8	12	72	43	2-PT 1/8″
HTOP-12AVB	12	8	12	77	48	2-PT 1/4″
HTOP-13AVB	14	5	14	91.5	63.5	2-PT 3/8″

HTOP F series

Model

HTOP - ☐ F

Pump Type

Structure

- MOTOR의 회전방향에 상관없이 동일한 흡입 · 토출이 이루어짐
- 내부의 편심 고정자에 의해 ROTOR를 180°회전

- It is capable of equal suction and discharge regardless of motor rev direction.
- The internal eccentric stator rotates the rotor by 180°

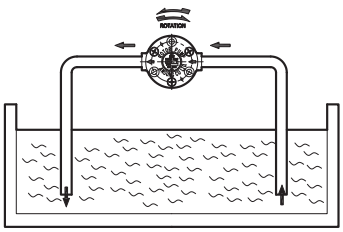
Feature

1. 구조가 간단하고, 설치 보수가 용이함
2. 소형으로 설치공간의 제약이 있는 경우 사용
3. 공작기계,산업기계뿐만 아니라 농업용으로도 활용

1. The simple structure means easy installation and repairs.
2. The compact design reduces installation space limitations.
3. It is used not only in machine tools and industrial machines, but also in agriculture.

Pump Spec.

Specification / Type	THEORY DISCHARGE AMOUNT(cm³/rev)	DISCHARGE AMOUNT(ℓ/min)		MAX. PRESSURE (kg/cm²)	MAX. R.P.M	PACKING SIZE (cm)	WEIGHT(kg)	
		1500rpm	1800rpm				PUMP	PACKING
HTOP-2F	1.80	2.70	3.24	5.0	2000	10(W)x8(L)x9(D)	1	1.1
HTOP-3F	2.50	3.75	4.50	5.0	2000		1.1	1.2



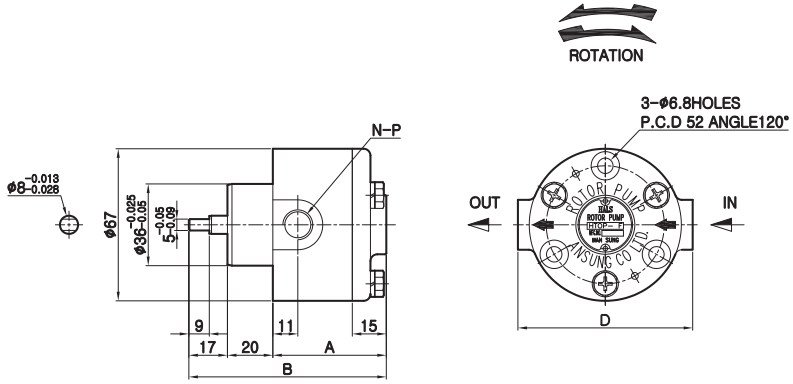
좌, 우 어느 쪽으로 회전시켜도 OIL의 흐름은 항상 한 방향으로 흐름

You can spin left or right, the direction of oil flow is fixed in one way.

GEROTOR의 편심회전을 특수한 링을 사용하여 회전방향으로 향하게 하여 180도 회전을 시킴으로써, 회전방향에 관계없이 OIL의 흐름 방향을 일정하게 하도록 설계

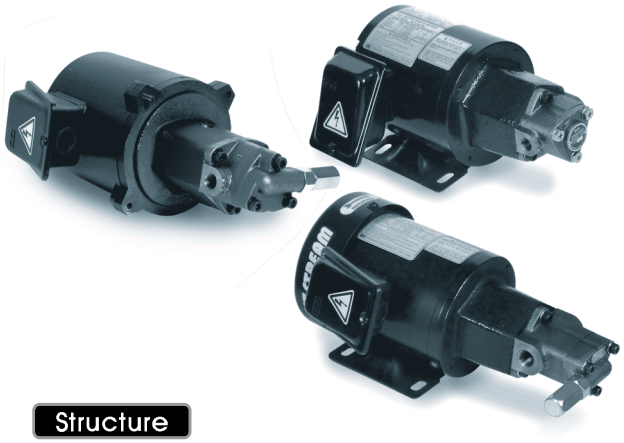
By having the one-sided spinning of GEROTOR spin in 180 degree in the spinning direction using a special ring, it was designed to fixed the direction of oil flow in one direction regardless of the spinning direction.

External Figure



TYPE	A	B	N-P	D
HTOP-2F	32	84	2-PT 1/4″	77
HTOP-3F	35	87	2-PT 1/4″	77

HMTP 3M-MA(VB) series



Structure

- HTOP-A(VB)제품에 MOTOR를 연결한 펌프
- 전기공급만으로 사용이 가능한 제품으로 HORIZONTAL형과 VERTICAL형으로 구분

- A pump produced by connecting a motor to the HTOP-A(VB) product
- It is useable with only a power supply, and is separated into a horizontal type or a vertical type.

Model

HMTP - 3M - □ - □□ - □□ - □□ - □

- Voltage
- Blank: Horizontal Type / V: Vertical Type
- Blank: Without Fan / F: Attach Fan
- MA: Without Relief V/V / MAVB: Attach Relief V/V
- Pump Type
- Motor Output

Feature

1. 동일한 조립형태로 PUMP교체만으로 다양한 성능을 얻을 수 있음
2. 소형으로 설치공간의 제약이 있는 경우 사용
3. 기본형태인 HORIZONTAL 뿐만 아니라, 설치 공간이 협소할 경우 VERTICAL 사용도 가능

1. Identical assembly structure means various performances can be achieved simply by changing the pump.
2. The compact size is useful for use in limited installation spaces.
3. The standard form is the horizontal, but it can also be used in a vertical form if the installation space is limited.

Pump Spec.

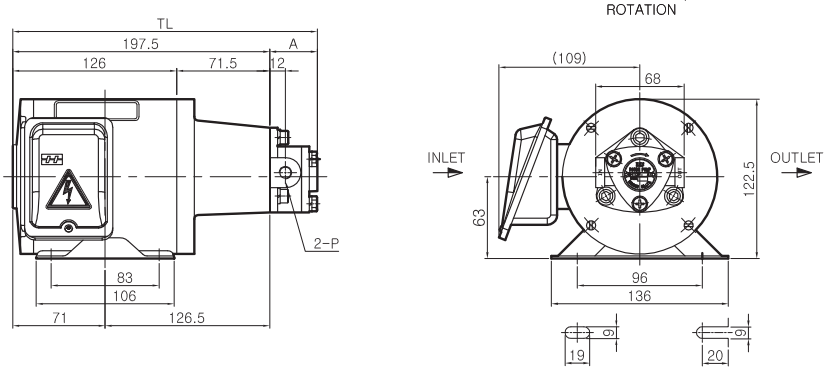
TYPE	50Hz 4P(1500rpm)		60Hz 4P(1800rpm)	
	DISCHARGE AMOUNT(ℓ/min)	PRESSURE (kg/cm²)	DISCHARGE AMOUNT(ℓ/min)	PRESSURE (kg/cm²)
HMTP-11MA(VB)	2.2	5.0	2.7	5.0
HMTP-12MA(VB)	3.7	5.0	4.5	5.0
HMTP-13MA(VB)	6.7	5.0	8.1	5.0

Motor Spec.

OUTPUT (W)	FREQUENCY (Hz)	VOLTAGE (V)	CURRENT (A)	R.P.M	PHASE	POLES	PACKING SIZE (cm)	MOTOR WEIGHT (kg)
75W	50	200	0.56	1390	3	4	34(W)x20(L)x18(D)	8
		380	0.32	1390				
	60	200	0.51	1660				
		220	0.52	1690				
		380	0.28	1690				
100W	50	200	0.65	1430	3	4	34(W)x22(L)x17(D)	
		380	0.4	1430				
	60	200	0.6	1720				
		220	0.6	1730				
		380	0.3	1730				
200W	50	200	1.3	1430	3	4		
		380	0.9	1430				
	60	200	1.1	1690				
		220	1.1	1710				
		380	0.6	1710				

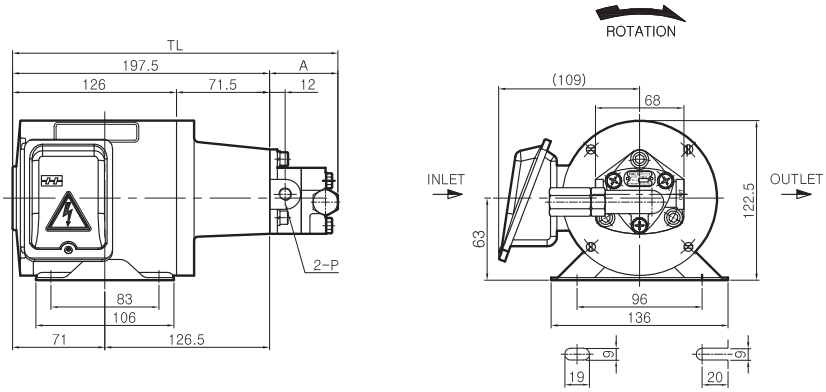
External Figure

MA



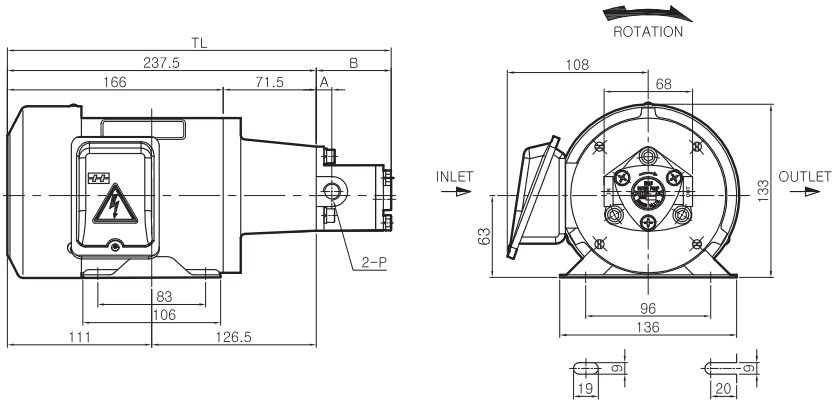
TYPE	A	TL	P
HMTP-11MA	37	234.5	PT1/8″
HMTP-12MA	42	239.5	PT1/4″

MAVB



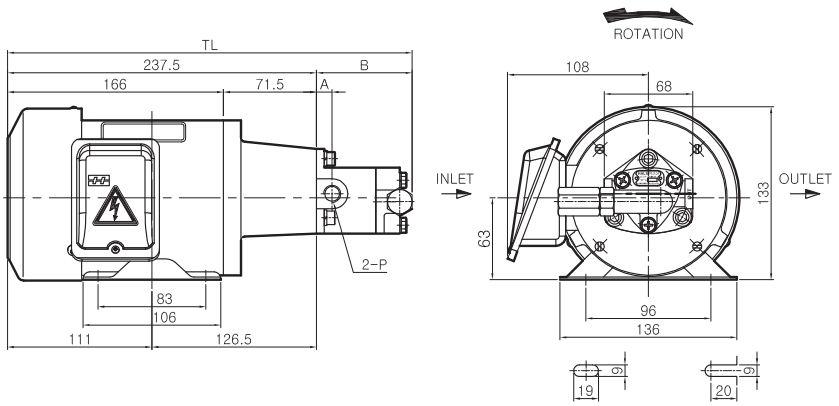
TYPE	A	TL	P
HMTP-11MAVB	52	249.5	PT1/8″
HMTP-12MAVB	57	254.5	PT1/4″

MA-F



TYPE	A	B	TL	P
HMTP-11MA	12	37	274.5	PT1/8″
HMTP-12MA	12	42	279.5	PT1/4″
HMTP-13MA	14	57	294.5	PT3/8″

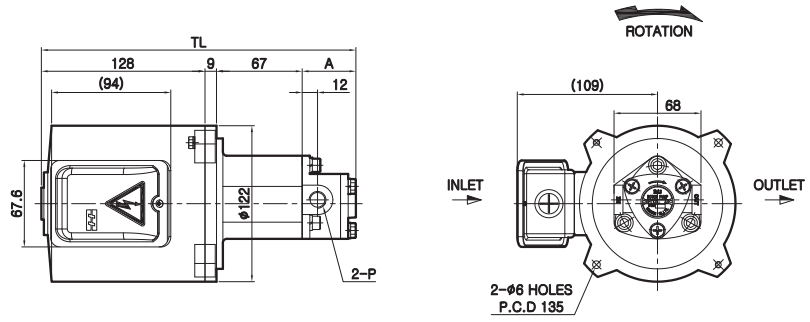
MAVB-F



TYPE	A	B	TL	P
HMTP-11MAVB	12	52	289.5	PT1/8″
HMTP-12MAVB	12	57	294.5	PT1/4″
HMTP-13MAVB	14	73	310.5	PT3/8″

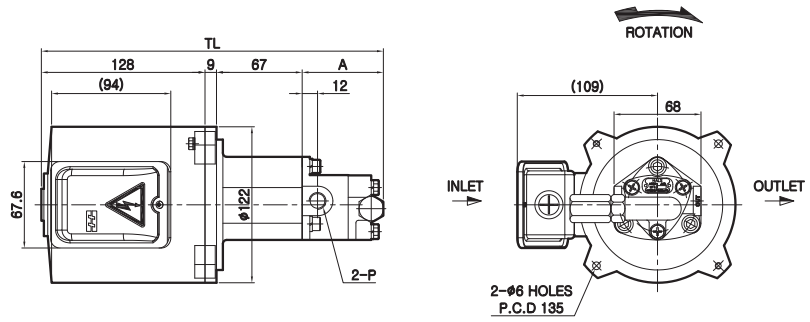
External Figure

MA-V



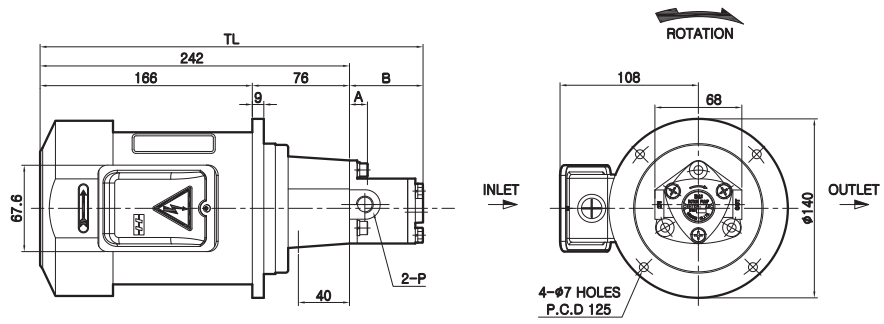
TYPE	A	TL	P
HMTP-11MA	37	234.5	PT1/8″
HMTP-12MA	42	239.5	PT1/4″

MAVB-V



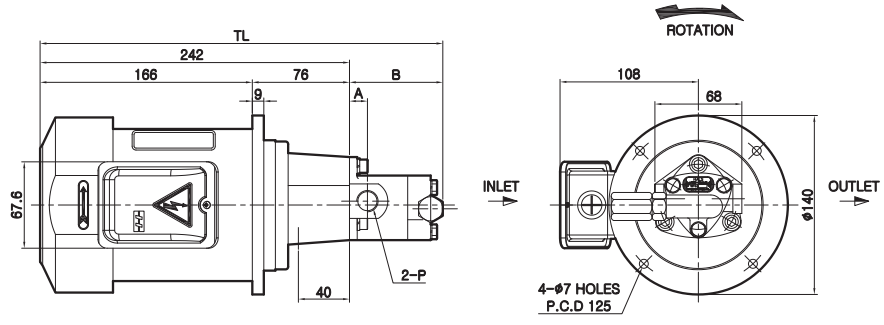
TYPE	A	TL	P
HMTP-11MAVB	52	249.5	PT1/8″
HMTP-12MAVB	57	254.5	PT1/4″

MA-FV



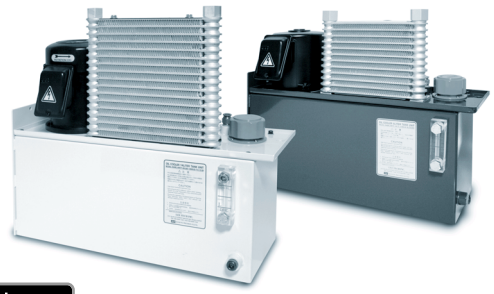
TYPE	A	B	TL	P
HMTP-11MA	12	37	274.5	PT1/8″
HMTP-12MA	12	42	279.5	PT1/4″
HMTP-13MA	14	57	294.5	PT3/8″

MAVB-FV



TYPE	A	B	TL	P
HMTP-11MAVB	12	52	289.5	PT1/8″
HMTP-12MAVB	12	57	294.5	PT1/4″
HMTP-13MAVB	14	73	310.5	PT3/8″

OIL COOLER series



Model

HMTP - 3M- □ - □□ - T □ - □ - □

- Voltage
- S: Small Cooler/ L: Large Cooler
- Tank Capacity
- MA: Without Relief V/V
- MAVB: Attach Relief V/V
- Pump Type
- Motor Output

Structure

- HMTP-3M-□-□MA(VB)펌프와 FAN COOLER를 조합한 COOLER UNIT
- TANK용량에 따라 7,8,14LITER로 구분

- A cooler unit produced by connecting a fan cooler to the HMTP-3M-□-□MA(VB) pump.
- Separated into 7,8,14 liter according to tank capacity.

Feature

1. 소형의 COOLER UNIT로 VERTICAL형 펌프 사용
2. 소형으로 설치공간의 제약이 있는 경우 사용
3. 오일 냉각장치로 설치가 간단하여 소형 공작기계 뿐만 아니라 산업기계 활용이 가능
4. HMTP-3M-MA(VB) 사용하므로 성능에 맞는 PUMP를 선정

1. A compact cooler unit, and uses a vertical type pump.
2. Its compact design allows it to be used in limited installation spaces.
3. An oil cooler unit with a simple method of installation, and can be used not only for small machine tools, but also for industrial machines.
4. Choose a pump appropriate for performance by using HMTP-3M-MA(VB).

Pump Spec.

TYPE	50Hz 4P(1500rpm)		60Hz 4P(1800rpm)	
	DISCHARGE AMOUNT(ℓ/min)	PRESSURE (kg/cm²)	DISCHARGE AMOUNT(ℓ/min)	PRESSURE (kg/cm²)
HMTP-11MA(VB)	2.2	5.0	2.7	5.0
HMTP-12MA(VB)	3.7	5.0	4.5	5.0
HMTP-13MA(VB)	6.7	5.0	8.1	5.0

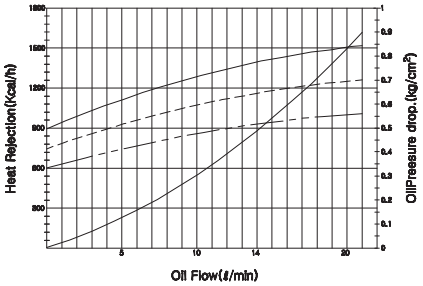
OUTPUT(W)	FREQUENCY(Hz)	VOLTAGE(V)	CURRENT(A)	R.P.M	PHASE	POLES
75W	50	200	0.56	1390	3	4
		380	0.32	1390		
	60	200	0.51	1660		
		220	0.52	1690		
		380	0.28	1690		
100W	50	200	0.65	1430	3	4
		380	0.4	1430		
	60	200	0.6	1720		
		220	0.6	1730		
		380	0.3	1730		
200W	50	200	1.3	1430	3	4
		380	0.9	1430		
	60	200	1.1	1690		
		220	1.1	1710		
		380	0.6	1710		

Fan Spec.

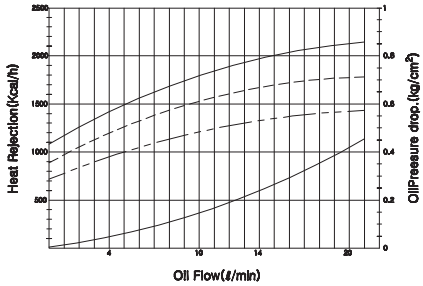
Voltage	FREQUENCY	OUTPUT	CURRENT
200	50	35	0.24
	60	33	0.2

Performance Curve

R-1



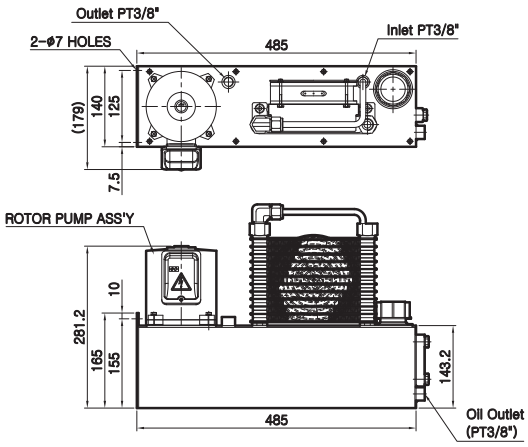
R-2



※ 냉각용량에 따라 두가지 COOLER (R-1, R-2)선택이 가능 [Cooler can be selected according to two kinds of cooling capacity (R1, R2)]

External Figure

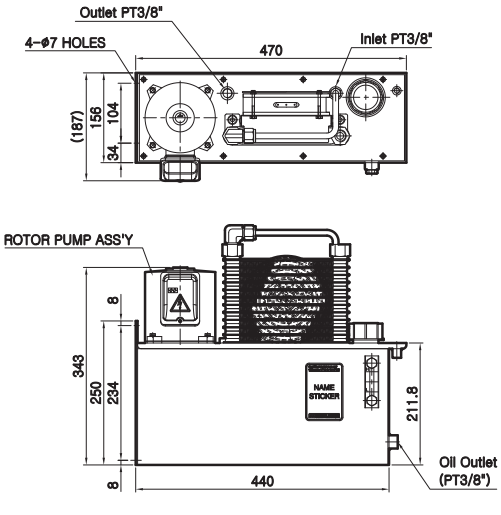
[T 7]



PACKING SIZE(cm)	WEIGHT(kg)	
	TANK	PACKING
53(W) x 21(L) x 40(D)	19	20

COOLER	TL
R1	320
R2	380.4

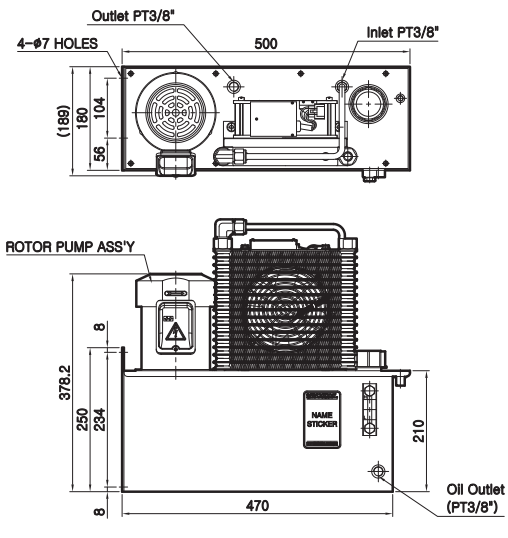
[T 8]



PACKING SIZE(cm)	WEIGHT(kg)	
	TANK	PACKING
51(W) x 23(L) x 47(D)	20	21

COOLER	TL
R1	383
R2	443.4

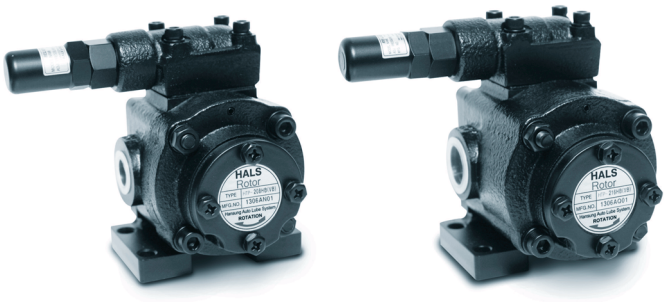
[T 14]



PACKING SIZE(cm)	WEIGHT(kg)	
	TANK	PACKING
51(W) x 23(L) x 47(D)	22	23

COOLER	TL
R1	381.2
R2	441.6

HTP (HA/HB)(VB/VD) series



Model

HTP - □□

- HA: Without Relief V/V
- HAVB: Attach VB Relief V/V
- HAVD: Attach VD Relief V/V
- HBVB: Attach VB Relief V/V+Bracket
- Pump Type

Structure

- 내접기어식 용적형 펌프 구조로 MOTOR 동력원연결을 통하여 펌프 사용이 가능 연결부는 동일하나, 내접기어 형태에 따라 다양한 성능 범위를 갖고 있음
- An internal gear bulk type pump structure that can operate the pump with a motor power supply. The connection section is identical, but it has a wife range of performances according to the shape of the internal gear.

Feature

1. 이중 OIL SEAL 사용으로 누유를 최소화
2. 수용성 절삭유 사용이 가능함
3. 불소 OIL SEAL을 사용하여 고온에서 사용이 가능
4. RELIEF VALVE 부착이 가능하여 압력 조정이 용이
5. VD는 외부드레인 RELIEF VALVE임

1. It uses a double oil seal to minimize oil leaks.
2. Water-soluble cutting fluids can be used.
3. It uses a fluoride oil seal, and can be used at high temperature.
4. A relief valve can be attached for easy pressure control.
5. VD is an external drain relief valve.

Pump Spec.

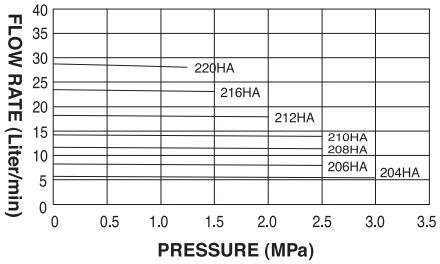
TYPE	50Hz 4P(1500rpm)				60Hz 4P(1800rpm)			
	DISCHARGE AMOUNT (ℓ/min)	MAX. DISCHARGE PRESSURE (kg/cm²)			DISCHARGE AMOUNT (ℓ/min)	MAX. DISCHARGE PRESSURE (kg/cm²)		
		400W	750W	1500W		400W	750W	1500W
HTP-204(HA/HB)(VB/VD)	6.3	21.5	30.0	30.0	7.5	16	30.0	30.0
HTP-206(HA/HB)(VB/VD)	9.0	10.5	25.0	25.0	10.8	7.0	23.5	25.0
HTP-208(HA/HB)(VB/VD)	12.6	7.0	23.0	25.0	15.1	4.0	17.5	25.0
HTP-210(HA/HB)(VB/VD)	15.3	4.5	15.5	25.0	18.3	2.5	11.5	25.0
HTP-212(HA/HB)(VB/VD)	18.0	3.5	13.5	20.0	21.6	-	8.5	20.0
HTP-216(HA/HB)(VB/VD)	24.3	2.0	8.5	20.0	29.1	-	5.5	19.5
HTP-220(HA/HB)(VB/VD)	29.7	-	5.5	15.5	35.6	-	3.5	14.0

Performance Curve

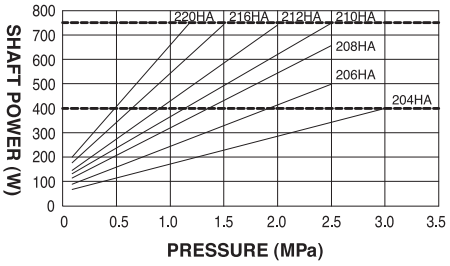
Oil for testing : ISO-VG46, Temperature 40℃

1500rpm

Feature of Flux

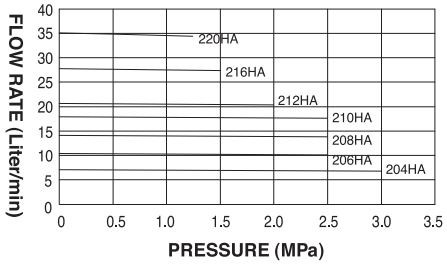


Power Consumed

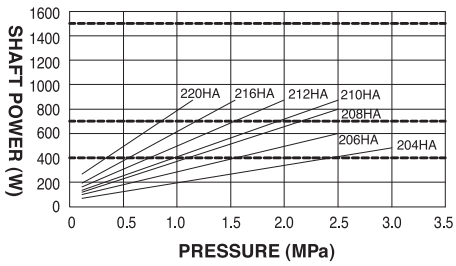


1800rpm

Feature of Flux

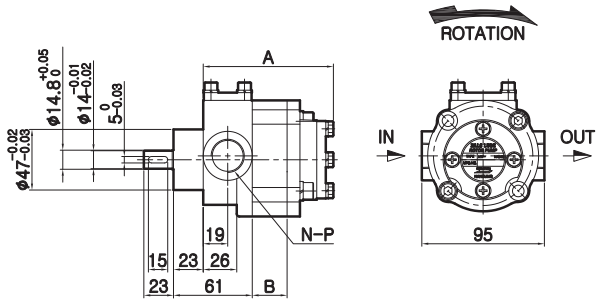


Power Consumed

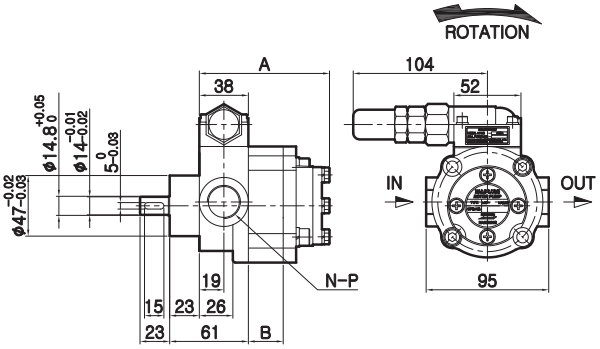


External Figure

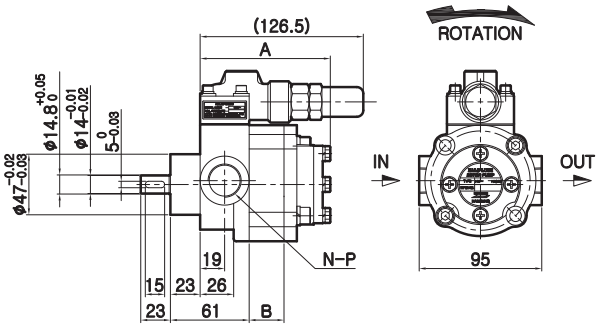
HA



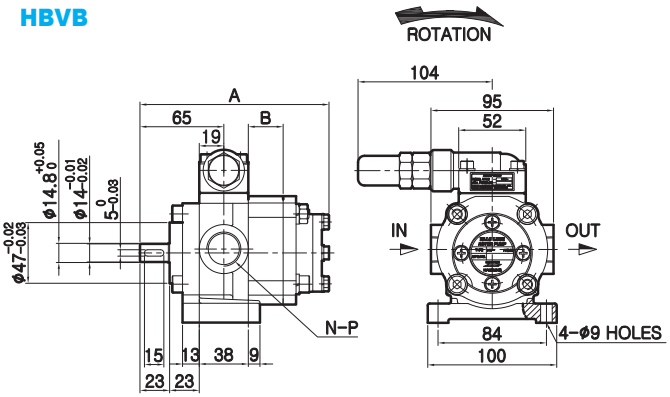
HAVB



HAVD



HBVB



Dimension

TYPE	A	B	N-P(PT)	TYPE	A	B	N-P(PT)
HTP-204HA(VB/VD)	83	7	2-1/2″	**HTP-212HA(VB/VD)**	96	20	2-3/4″
HTP-206HA(VB/VD)	86	10	2-1/2″	**HTP-216HA(VB/VD)**	103	27	2-3/4″
HTP-208HA(VB/VD)	90	14	2-1/2″	**HTP-220HA(VB/VD)**	109	33	2-3/4″
HTP-210HA(VB/VD)	93	17	2-3/4″	-	-	-	-

Dimension

TYPE	A	B	N-P(PT)	TYPE	A	B	N-P(PT)
HTP-204HBVB	126.5	7	2-1/2″	**HTP-212HBVB**	139.5	20	2-3/4″
HTP-206HBVB	129.5	10	2-1/2″	**HTP-216HBVB**	146.5	27	2-3/4″
HTP-208HBVB	133.5	14	2-1/2″	**HTP-220HBVB**	152.5	33	2-3/4″
HTP-210HBVB	136.5	17	2-3/4″	-	-	-	-

HMTP 3M-HA(VB/VD) series

Model

HMTP-3M-□-□□-□-□

- Voltage
  - Blank: General Motor
  - E: High Efficienty Motor
  - P: Premium Motor
- HA: Without Relief V/V
- HAVB: Attach VB Relief V/V
- HAVD: Attach VD Relief V/V
- Pump Type
- Motor Output

Structure

- HTP-HAVB펌프에 MOTOR를 조립한 일체형 펌프
- 별도의 동력원이 필요없음
- MOTOR출력에 따라 다양한 성능범위를 갖음
- A single-unit pump produced by connecting a motor to the HTP-HAVB pump.
- It does not require a separate power source.
- It has a wide range of performances according to motor output.

Feature

1. HMTP-3M-HA(VB/VD)
   - Relief Valve 형태에 따라 다양한 적용 가능
   - Coupling 연결형식으로 유지 · 보수가 간단
   - F Type은 Suction Filter 내장형으로 별도의 흡입부의 Filter 부착이 필요없음
2. HMTP-3M-HA(VB/VD)-E/P
   - HMTP-3M-HA(VB/VD) Type에 고효율 모터(프리미엄모터)를 장착
   - 효율의 극대화로 우수한 절전 및 투자비 회수가 가능한 높은 경제성
   - 낮은 온도상승, 고 절연재료 사용으로 권선수명연장
   - 고효율 에너지 기자재 마크 획득 (IE3)

1. HMTP-3M-HA(VB/VD)
   - Various applications are possible according to relief valve shape.
   - A coupling connection type, and is easy to maintain.
   - The F Type has a built in suction filter, and therefore does not require additional filter attachments.
2. HMTP-3M-HA(VB/VD)-E/P
   - Install high efficiency motor to HMTP-3M-HA(VB/VD) Type.
   - By maximizing efficiency, high economic efficiency is obtained in terms of excellent electricity savings and return on investment.
   - Low temperature increase and use of highly conductive materials increase life-time period.
   - Acquired high efficiency energy materials mark. (IE3)

Pump Spec.

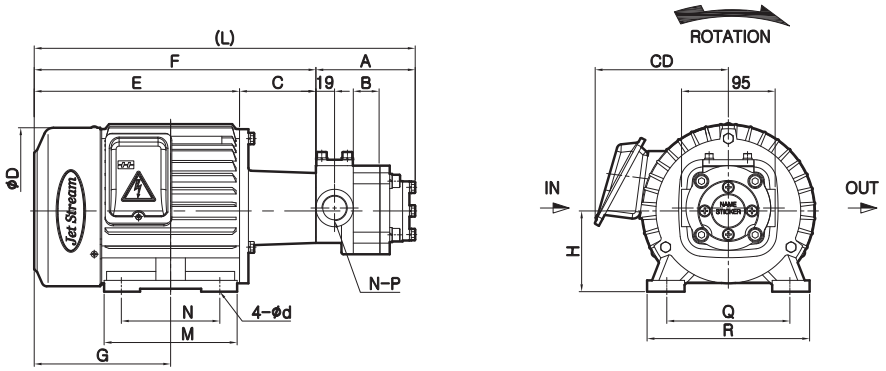
TYPE	50Hz 4P(1500rpm)				60Hz 4P(1800rpm)			
	DISCHARGE AMOUNT (ℓ/min)	MAX. DISCHARGE PRESSURE (kg/cm²)			DISCHARGE AMOUNT (ℓ/min)	MAX. DISCHARGE PRESSURE (kg/cm²)		
		400W	750W	1500W		400W	750W	1500W
HMTP-204HA(VB/VD)	6.3	21.5	30.0	30.0	7.5	16.0	30.0	30.0
HMTP-206HA(VB/VD)	9.0	10.5	25.0	25.0	10.8	7.0	23.5	25.0
HMTP-208HA(VB/VD)	12.6	7.0	23.0	25.0	15.1	4.0	17.5	25.0
HMTP-210HA(VB/VD)	15.3	4.5	15.5	25.0	18.3	2.5	11.5	25.0
HMTP-212HA(VB/VD)	18.0	3.5	13.5	20.0	21.6	-	8.5	20.0
HMTP-216HA(VB/VD)	24.3	2.0	8.5	20.0	29.1	-	5.5	19.5
HMTP-220HA(VB/VD)	29.7	-	5.5	15.5	35.6	-	3.5	14.0

Motor Spec.

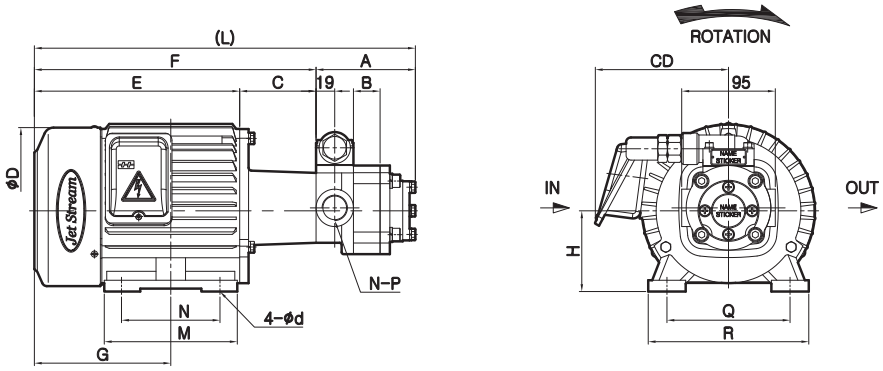
OUTPUT (W)	FREQUENCY (Hz)	VOLTAGE (V)	CURRENT (A)	R.P.M	PHASE	POLES	PACKING SIZE (cm)	MOTOR WEIGHT (kg)
400W	50	200	2.4	1420	3	4	42(W) x 22(L) x 21(D)	8
		380	1.3	1420				
	60	200	2.2	1700				
		220	2.2	1720				
		380	1.2	1720				
750W	50	200	3.5	1430	3	4	45(W) x 25(L) x 22(D)	13
		380	1.9	1440				
	60	200	3.4	1710				
		220	3.4	1730				
		380	1.8	1730				
1500W	50	200	6.9	1430	3	4	46(W) x 27(L) x 24(D)	18
		380	3.4	1430				
	60	200	6.6	1720				
		220	6.6	1730				
		380	3.2	1730				

External Figure

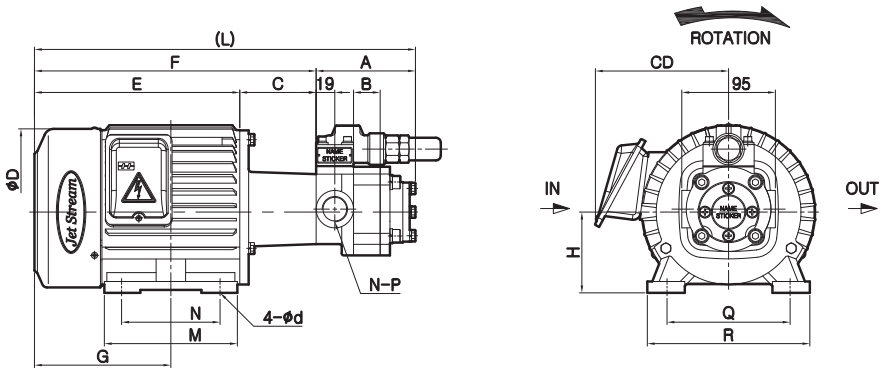
HA



HAVB



HAVD



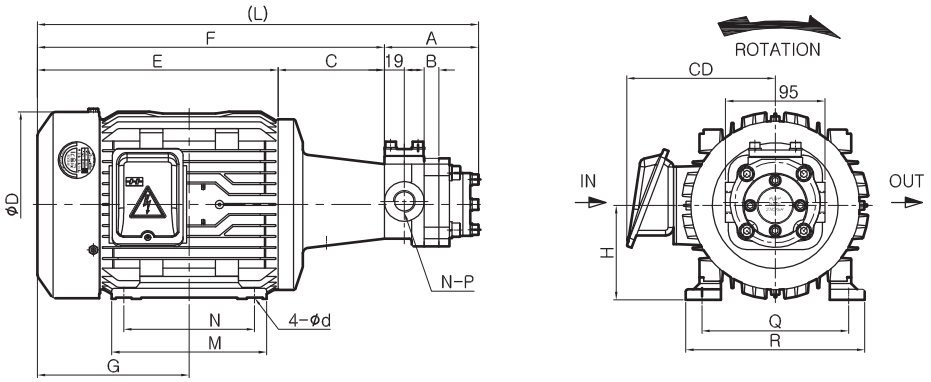
Dimension

	OUTPUT	C	ø D	E	F	G	L	ø d	M	N	Q	R	CD	H
MOTOR	400W	75.5	146	170	245.5	113	F+A	7	112	90	112	142	125	71
	750W	77.5	169	209	286	139	F+A	10	132	100	125	163	135	80
	1500W	85.5	196	234	319.5	153	F+A	10	156	125	140	172	140	90

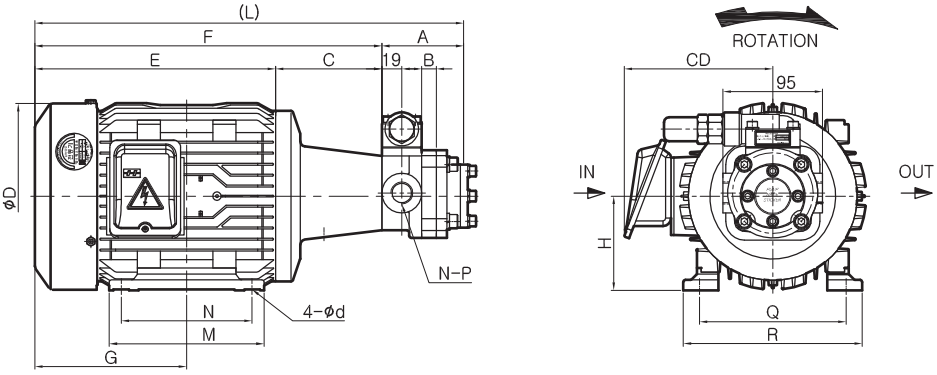
TYPE	A	B	N-P(PT)	TYPE	A	B	N-P(PT)
HMTP-204HA(VB/VD)	83	7	2-1/2″	HMTP-212HA(VB/VD)	96	20	2-3/4″
HMTP-206HA(VB/VD)	86	10	2-1/2″	HMTP-216HA(VB/VD)	103	27	2-3/4″
HMTP-208HA(VB/VD)	90	14	2-1/2″	HMTP-220HA(VB/VD)	109	33	2-3/4″
HMTP-210HA(VB/VD)	93	17	2-3/4″	-	-	-	-

External Figure

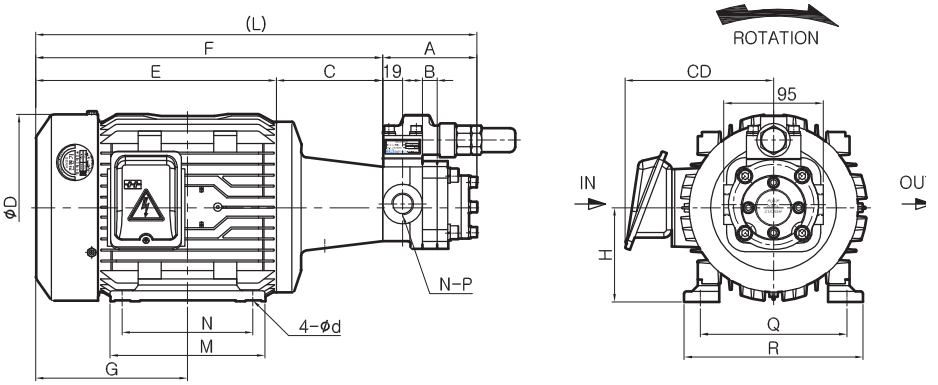
HA-E/P



HAVB-E/P



HAVD-E/P



Dimension

	OUTPUT	C	ØD	E	F	G	L	Ød	M	N	Q	R	CD	H
MOTOR (Efficiency)	750W	86	169	206.5	292.5	136.5	F+A	10	132	100	125	163	135	80
	1500W	90.5	196	236	326.5	155	F+A	10	156	125	140	172	140	90
MOTOR (Premium)	750W	85.5	158	230.5	316	154	F+A	10	120	100	125	150	132	52
	1500W	101.5	178	230	331.5	145	F+A	10	148	125	140	171	142	62

TYPE	A	B	N-P(PT)	TYPE	A	B	N-P(PT)
HMTP-203HA(VB/VD)	81	5	2-1/2″	HMTP-210HA(VB/VD)	93	17	2-3/4″
HMTP-204HA(VB/VD)	83	7	2-1/2″	HMTP-212HA(VB/VD)	144	20	2-3/4″
HMTP-206HA(VB/VD)	86	10	2-1/2″	HMTP-216HA(VB/VD)	151	27	2-3/4″
HMTP-208HA(VB/VD)	90	14	2-1/2″	HMTP-220HA(VB/VD)	145	33	2-3/4″

HMTP 3M-HAVBF series

Model

HMTP-3M-□-□□F-□-□

- Voltage
- Blank: General Motor
- E: High Efficienty Motor
- HA: Without Relief V/V
- HAVB: Attach VB Relief V/V
- Pump Type
- Motor Output

Feature

1. Pump 상단에 설치된 흡입 Filter를 통과한 액체를 흡입하기 때문에 펌프내부에 이물질 유입을 방지
2. Pump에 직접 장착되므로 별도의 배관연결이 불필요
3. Filter의 교환 및 청소가 간단
4. Filter Body에 부착된 진공압력계로 Filter 세척시기를 쉽게 판단이 가능

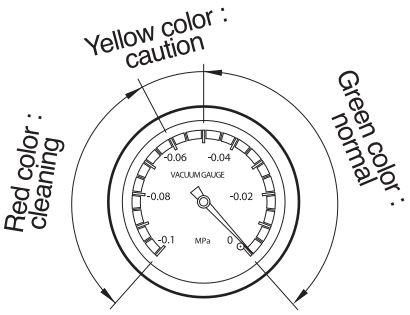
1. It sucks in liquid that penetrates suction filter installed in the upper part of the pump and therefore impure materials cannot enter inside the pump.
2. It is installed directly to pump and therefore no separate wiring connection is necessary.
3. Replacement and cleaning of filter is simple.
4. Vacuum pressure machine installed on filter body is used to determine when to do filter cleaning.

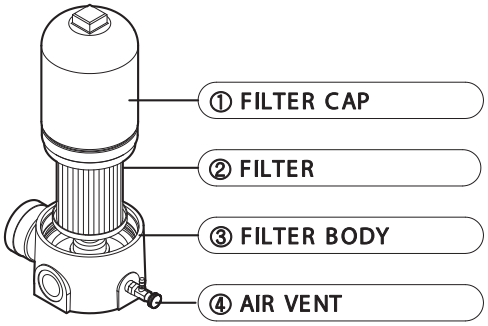
Structure

- 기존 HMTP-3M-HAVB Pump부에 흡입 Filter를 부착하는 형태
- 750, 1500W는 고효율 Motor 사용이 가능

- Suction filter is installed on the existing HMTP-3M-HAVB Pump.
- High efficiency motor can be used for 750, 1500W.

FILTER CLEANING METHOD





1. 청소주기 확인

진공압력계의 눈금이 적색부분 (-0.06MPa) 이상에 위치하게 되면 FILTER 청소주기 이므로 하기의 청소 방법 순서로 FILTER를 세척 후 사용하여야 한다. 만약, 적색부에 눈금이 위치한 상태에서 지속적으로 펌프 구동을 할 경우 펌프 및 모터 소손의 원인이 되므로 주기적인 점검이 꼭 필요하다.

2. 청소 방법

[1] FILTER 내의 오일 제거
AIR VENT④ 및 펌프의 짧은 공회전을 통하여 FILTER② 내 사용유를 제거한다.

[2] FILTER CAP 분해
FILTER CAP①을 스패너를 이용하여 풀어서 분해한다.

[3] FILTER 분해
FILTER BODY③에 고정된 FILTER②를 분해한다.

[4] FILTER 청소
분해한 FILTER②를 압축공기등을 이용하여 FILTER MESH 망에 붙어있는 이물질을 완벽히 제거한다.

[5] 재조립
분해의 역순으로 재조립한다. 또한, 구동 전에 AIR VENT④가 완벽히 잠겨있는지 확인한다. (만약 열려 있다면 펌프내로 AIR혼입이 발생되어 소음발생 및 정상 성능을 만족시킬 수 없다.)

1. Check cleaning period

If the marker in the vacuum pressure machine goes above the red area (-0.006MPa), it is a filter cleaning period. Filter must be cleaned according to the method below and used. If pump operates continuously with the red marker staying in the same location, it becomes a cause for pump or motor damage and therefore period inspection is necessary.

2. Cleaning method

[1] Removing oil inside the filter
Used oil inside the filter is removed using short spinning of the pump and air vent.

[2] Disassembling filter cap
Use a spanner to disassemble filter cap.

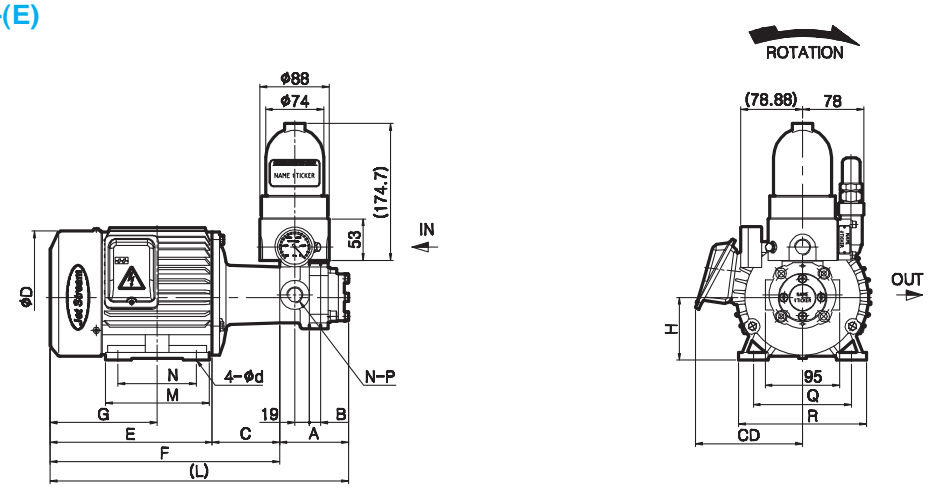
[3] Filter disassembling
Disassemble the filter fixed in the filter body.

[4] Filter cleaning
Use pressuring air to completely remove impure substances attached to the filter mesh in the disassembled filer.

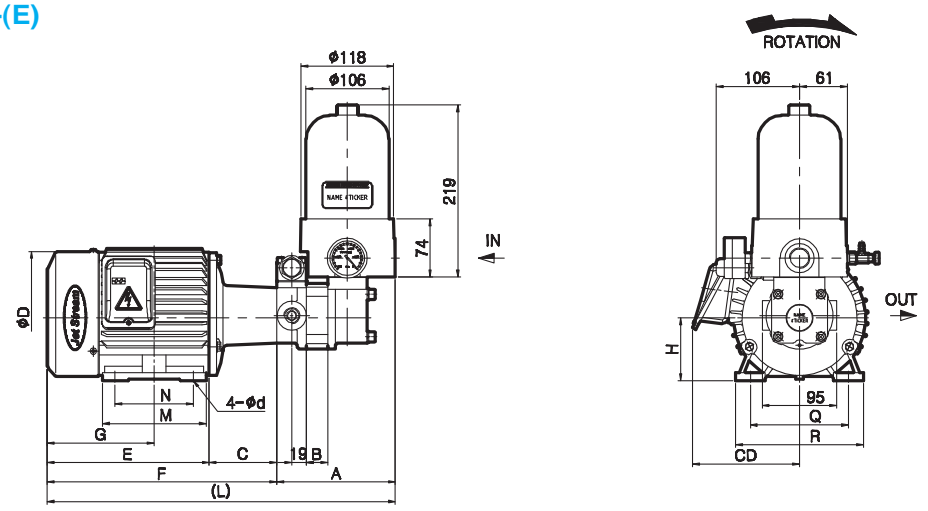
[5] Resassembling
Reassembling occurs in reverse sequence of assembling. In addition, make sure air vent is completely locked before operating. (If it is open, air can come inside the pump and therefore noise creation and normal operation will not done).

External Figure

204~210HAVBF-(E)



212~220HAVBF-(E)



Dimension

HMTP-3M-□ HAVBF

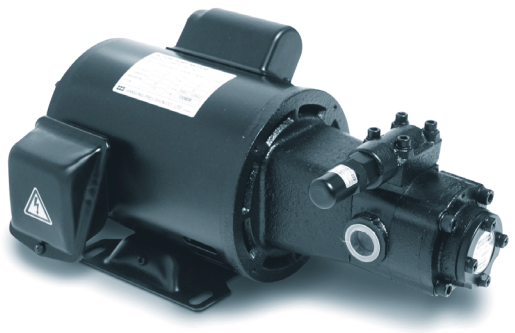
	OUTPUT	C	ø D	E	F	G	L	ø d	M	N	Q	R	CD	H
MOTOR	400W	75.5	146	170	245.5	113	F+A	7	112	90	112	142	125	71
	750W	77.5	169	209	286	139	F+A	10	132	100	125	163	135	80
	1500W	85.5	196	234	319.5	153	F+A	10	156	125	140	172	140	90

HMTP-3M-□ HAVBF-E

	OUTPUT	C	ø D	E	F	G	L	ø d	M	N	Q	R	CD	H
MOTOR	750W	86	169	206.5	292.5	136.5	F+A	10	132	100	125	163	135	80
	1500W	90.5	196	236	326.5	155	F+A	10	156	125	140	172	140	90

TYPE	A	B	N-P(PT)	TYPE	A	B	N-P(PT)
HMTP-204HAVB	83	7	2-1/2″	HMTP-212HAVB	96	20	2-3/4″
HMTP-206HAVB	86	10	2-1/2″	HMTP-216HAVB	103	27	2-3/4″
HMTP-208HAVB	90	14	2-1/2″	HMTP-220HAVB	109	33	2-3/4″
HMTP-210HAVB	93	17	2-3/4″	-	-	-	-

HMTP 1M-HA(VB/VD) series



Model

HMTP-1M - □ - □□ - □

- Voltage
- HA: Without Relief V/V
- HAVB: Attach VB Relief V/V
- HAVD: Attach VD Relief V/V
- Pump Type
- Motor Output

Structure

- HTP-HA(VB/VD) 펌프에 MOTOR를 조합한 일체형 펌프
- MOTOR 출력에 따라 400W, 750W 모터 조립이 가능

- Integrated pump that combined motor to HTP-HA(VB/VD).
- Possible to assemble 400W, 750W motors according to motor output.

Feature

1. 단상 100V/220V 모터 일체형 펌프
2. HMTP-3M-HA(VB/VD)와 동일한 펌프 사용
3. 소 · 중 유량형으로 사용

1. 100V/220V motor one-body pump.
2. Use the pump same as HMTP-3M-HA(VB/VD).
3. Use small to medium oil quantity type.

Pump Spec.

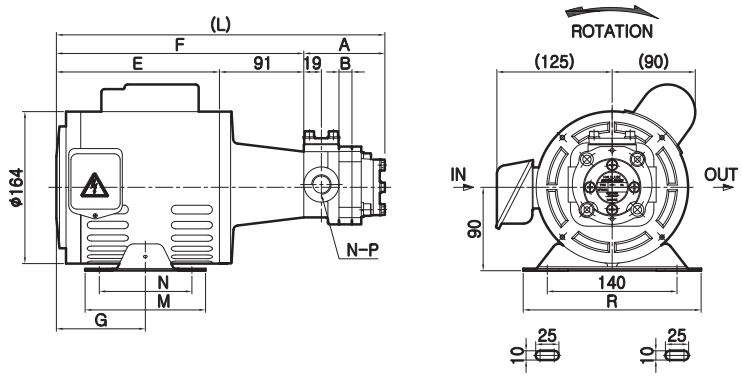
TYPE	50Hz 4P(1500rpm)			60Hz 4P(1800rpm)		
	DISCHARGE AMOUNT(ℓ/min)	Max. Discharge Pressure (kg/cm²)		DISCHARGE AMOUNT(ℓ/min)	Max. Discharge Pressure (kg/cm²)	
		400W	750W		400W	750W
HTP-204HAVB	6.3	21.5	30.0	7.5	16.0	30.0
HTP-206HAVB	9.0	10.5	25.0	10.8	7.0	23.5
HTP-208HAVB	12.6	7.0	23.0	15.1	4.0	17.5
HTP-210HAVB	15.3	4.5	15.5	18.3	2.5	11.5
HTP-212HAVB	18.0	3.5	13.5	21.6	-	8.5
HTP-216HAVB	24.3	2.0	8.5	29.1	-	5.5
HTP-220HAVB	29.7	-	5.5	35.6	-	3.5

Motor Spec.

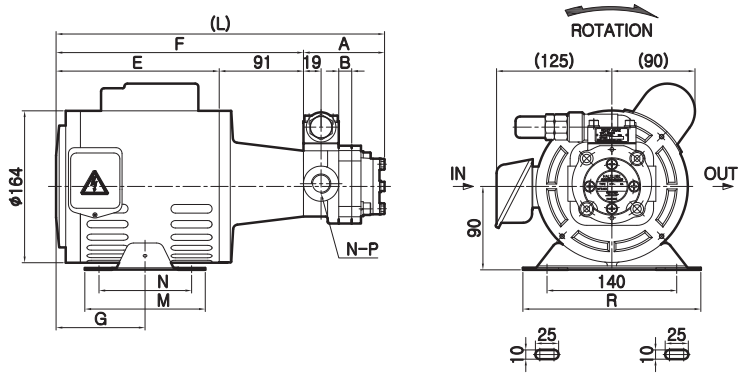
OUTPUT (W)	FREQUENCY (Hz)	VOLTAGE (V)	CURRENT (A)	R.P.M	PHASE	POLES	PACKING SIZE (cm)	MOTOR WEIGHT (kg)
400W	50	100	8.4	1420	1	4	45(W) x 25(L) x 22(D)	8
		200	7.6	1710				
	60	100	4.2	1420				
		200	3.8	1710				
750W	50	100	11.2	1450			46(W) x 27(L) x 24(D)	13
		200	9.6	1740				
	60	100	5.7	1450				
		200	4.9	1740				

External Figure

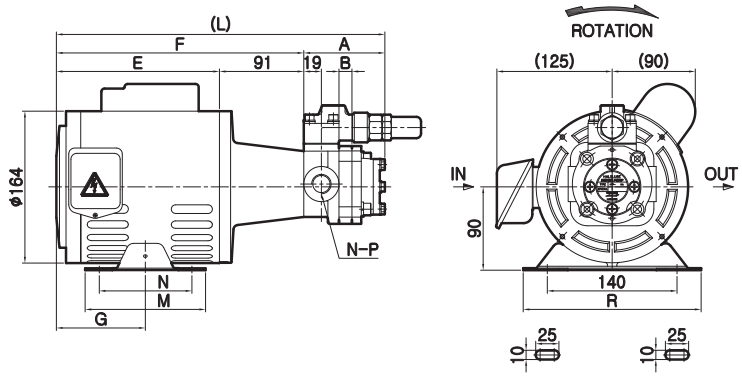
HA



HAVB



HAVD



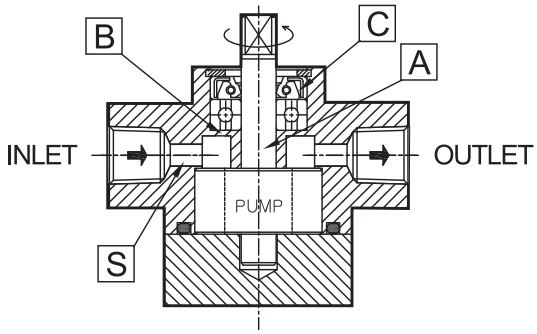
Dimension

	OUTPUT	E	F	G	L	M	N	R
MOTOR	400W	176	267	96	F+A	130	100	192
	750W	216	307	123	F+A	150	125	175

TYPE	A	B	N-P(PT)	TYPE	A	B	N-P(PT)
HMTP-204HAVB	83	7	2-1/2″	HMTP-212HAVB	96	20	2-3/4″
HMTP-206HAVB	86	10	2-1/2″	HMTP-216HAVB	103	27	2-3/4″
HMTP-208HAVB	90	14	2-1/2″	HMTP-220HAVB	109	33	2-3/4″
HMTP-210HAVB	93	17	2-3/4″	-	-	-	-

제품 설치 방법

Method of Product Installation



1 회전방향

화살표 방향으로 회전을 하여야 하며, 만일 역회전을 하였을 경우에는 OIL SEAL이 파괴될 수 있는 위험이 있습니다. 현재의 ROTOR PUMP는 왼쪽 그림과 같이 토출되어지지만 압력에 의하여 OIL이 SHAFT를 통하여(A)안쪽 OIL SEAL 부위로 들어가게 되고(C) DRAIN HOLE을 통하여(B) 흡입부로 돌아오는(S)형식으로 설계 되어 있습니다.
하지만 펌프가 역회전을 하였을 시 흡입과 이송이 바뀌게 되어서 OIL이 DRAIN HOLE을 통하여 OIL SEAL 내에 머무르게 되고 OIL SEAL의 파손의 원인이 되고 OIL을 반대로 밀어내는 현상이 발생합니다.

2 흡입부 배관

흡입관경은 1.5m/sec의 속도를 얻을 수 있도록 설계를 하여야 하고 가능한 짧은 흡입관을 설치할 수 있도록 펌프 위치를 설정하여야 합니다. 왜냐하면 원활한 OIL의 흡입을 위해서는 파이프의 전장 및 곡관부를 최소화 하는 것이 필요하기 때문입니다. 또한 높은 점도의 OIL을 사용할시에는 반드시 구경이 큰 배관을 사용하여야 하며 OIL 점도에 따라서 마찰력 증가를 고려하여야 합니다.

3 흡입 압력

ROTOR PUMP는 가압시 일반적으로 720mmHg 이상의 흡입압력을 나타내고, 이것은 보통의 GEAR PUMP에 비하여 진공도가 높다고 할 수 있습니다. 그러나 안전을 위하여 흡입압력이 -0.5kg/cm² 이상이 되지 않도록 배관을 설계하여야 합니다.

4 흡입시의 OIL FILTER사용

펌프 구동시 FILTER에서 이상음 또는 높은 소음이 발생한다면 반드시 펌프를 멈추고 PUMP와 FILTER 와의 용량을 확인하여야 한다. FILTER 통과유량은 PUMP의 토출량의 두배보다 많은 양을 필요로 합니다.

5 배관

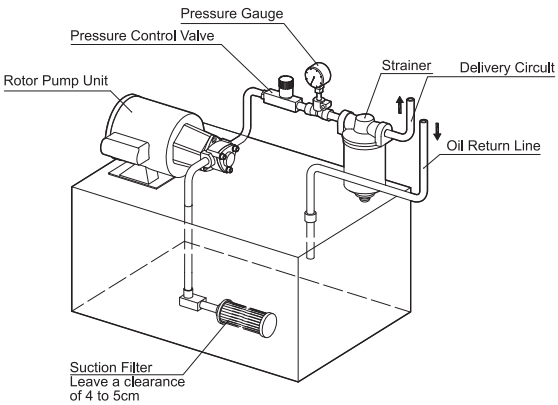
배관의 적당한 지름은 속도가 적어도 3m/sec를 유지할 수 있도록 선택하여야 합니다. 토출배관쪽은 흡입배관과 달리 파이프 지름은 작아야만 하고 배관 마찰에 의한 손실압력은 부하압력으로 더해지며, 펌프에 반대로 적용되지 않습니다. 따라서 손실을 고려하여 유속 범위 내의 배관 지름을 올바르게 선택하여야 하며, 만약 배관 및 밸브의 통과되는 OIL 량이 적다면 유속은 높아지고 혼란한 OIL 흐름이 원인이 됩니다.

6 PUMP SPEED와의 관계

보통, 회전펌프는 속도 증대에 의하여 OIL 량도 증가합니다. 빠른 속도는 경제적으로 펌프를 사용할 수 있지만, 유량의 증가는 소음 발생의 원인이 되므로, 저소음 및 경제적인 구동의 구체적인 설정을 위하여 양과 속도가 조화 되어야 합니다.

7 고점도 오일의 속도

고점도의 경우 빠른 속도에서는 적은 유량 토출 되고 저속은 반대입니다. 따라서 고점도의 OIL의 경우 소음 등을 고려하여 저속구동이 필요합니다.

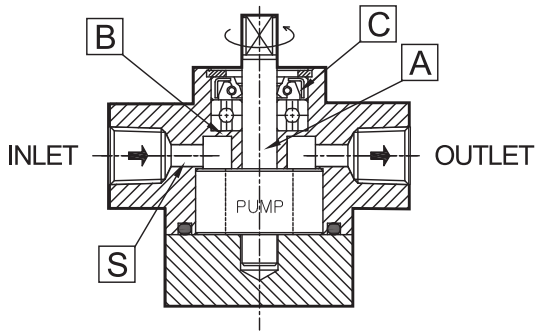


8 PUMP 설치

사용액이 튀지 않고, 통풍이 잘되는 곳에 설치하여야 합니다. 또한 보수점검이 용이한 곳에 설치하여야 하고, PUMP는 사용유의 유면보다 약간 위에 설치하여야 합니다.

9 탱크 크기

탱크안의 OIL의 알맞은 량은 펌프의 분당 유량의 3-4배 정도입니다. 장소의 절감을 위하여 작은 탱크를 제작한다면 오일의 공급이 불충분하여 펌프 흡입의 불안정의 원인이 될 수도 있고, 사용 탱크로의 빠른 OIL 회수가 보장되더라고 불안정한 탱크의 오일상태로 인하여 유온은 상승하고 오일 오염의 원인이 됩니다. 흡입하는 부의 오일온도가 적어도 55℃ 이하를 유지하여야 합니다.



1. Direction of rotation

It should rotate as the arrow direction. If backlash happens, oil seal could be destroyed. Rotor pump discharges like the drawing in normal condition. It is designed for pressure to send oil to oil seal part through the shaft and then return it into suction part through the drain hole. However, if the pump backlash, suction and delivery go into reverse so that oil stays in oil seal through drain hole resulting in damage in the oil seal and adverse oil flow.

2. Suction pipe

The suction pipe diameter needs to be designed to achieve a peed of 1.5m/sec, and the pump location needs to be set to allow the installation of the shortest suction pipe.
This is because in order to achieve smooth oil suction, the pipe's total length and curves need to be minimized.
Also, when using highly-viscous oil, you have to use a pipe with a large circumference, and take friction increase into consideration according to oil viscosity.

3. Suction pressure

Rotor pump shows high suction pressure at 720mmHg or higher in general if pressured. This figure means this pump has high vacuum rates. For the safety matter, piping design must be aimed at maintaining the suction pressure at lower than-0.5kg/cm^2.

4. Using oil filter during suction

If strange or loud noises come from the filter during pump operation, immediately stop operation and check the pump and filter quantities.
The oil quantity that passes through the filter requires more than twice the amount of discharge.

5. Piping

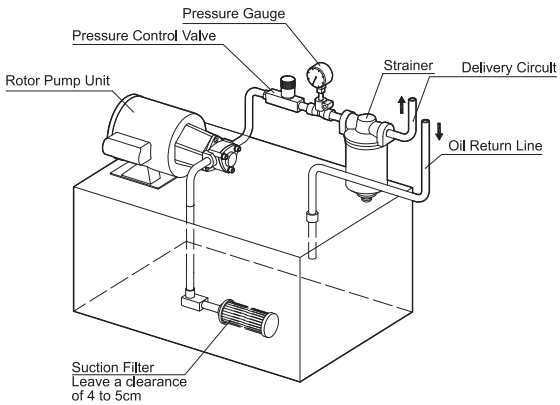
The most suitable pipe diameter is one that can maintain a speed of at least 3m/sec.
The discharge pipe, as opposed to the suction pie, needs to have a small pipe diameter. Pressure loss caused by pipe friction is added to the downward pressure, and is not applied to the pump.
Hence, you have to choose the right pipe diameter within the oil speed range by taking the loss into consideration, and if the quantity of oil passing through the pipes and the valves is small, oil speed will increase and cause chaotic oil flow.

6. Relation with Pump speed

For high-viscosity, small quantities of oil are discharged at high speeds, and veice versa.
Hence, for high-viscosity oil, operation should be slow, taking factors such as noise into consideration.

7. Speed for oil with high viscosity

In the case of oil with high viscosity, the amount of oil flow decreases at high speed and vice versa. Oil with high viscosity is desirable for low speed drive in order for low noise.



8. Installation of Pump

It must be installed in the place with good ventilation and beyond the reach of splash of the liquid and easy access to check and repair. Pump must be installed a little bit higher than the surface of the water.

9. Installation of Pump

The adequate amount of oil inside the tank is 3~4 times the pump's per minute oil quantity.
If a small tank is produced to reduce space usage, the oil supply may become insufficient, and cause unstable pump suction. Even with fast oil recovery to the tank, the unstable oil condition will raise oil temperature and cause oil contamination.
The oil temperature at the suction section needs to be maintained at below 55℃

제품 설치 방법

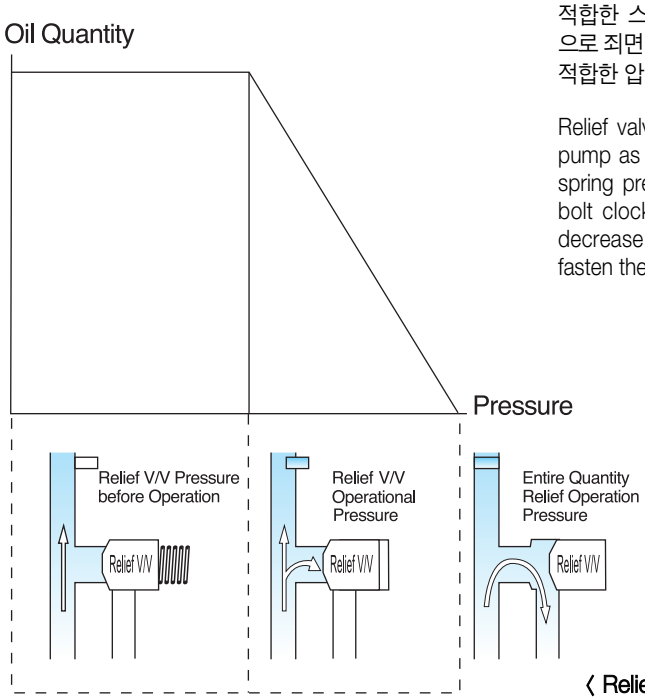
Method of Product Installation

RELIEF VALVE 작동

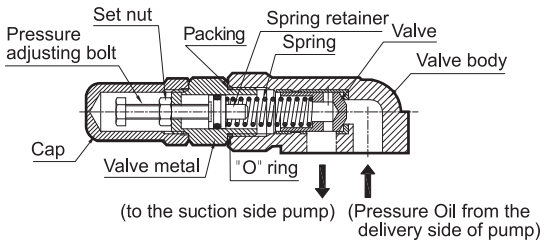
Operating Relife Valve

ROTOR PUMP의 RELIEF VALVE는 아래의 그림과 같이 펌프 상측에 직접 연결이 되어있고 압력은 적합한 스프링형 압력으로 조절되어 있습니다.
적합한 스프링의 조절방법은 처음에 CAP을 제거하고, 볼트를 시계방향으로 죄면 설정압이 증가하고 반시계방향은 설정압이 줄어듭니다.
적합한 압력을 조절한 후 조임NUT를 조이고 CAP을 단단하게 잠급니다.

Relief valve of the rotor pump is connected directly to the top of the pump as illustrated below, and the pressure is controlled via a suitable spring pressure. To adjust the spring, remove the cap, and rotate the bolt clockwise to increase the pressure setting and anticlockwise to decrease the pressure setting. After setting the pressure as needed, fasten the tightening nut and close the cap firmly.



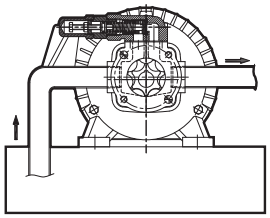
〈 Relief Valve Operation Order 〉



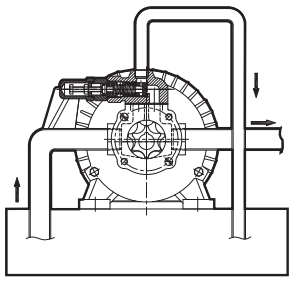
RELIEF VALVE 종류

Relife Valve Type

VB type



VD type



■ VB type RELIEF VALVE

펌프 토출 압력을 안전하게 보내는 안전 VALVE로 사용됩니다.
본 밸브는 펌프 상측에 바로 연결되어 보통의 상태에서는 작동하지 않지만, 펌프의 압력이 미리 설정된 압력보다 높아지면 밸브가 개방되어 토출부의 일부의 OIL이 흡입쪽으로 되돌아가게됩니다.
본 밸브는 펌프 뿐만 아니라 모터의 과부하도 막을 수 있는 안전밸브입니다.
만약 본 밸브가 항상 활발히 움직이거나 오랜시간 동안 밸브가 개방되어 사용하게 되면 기포나 소음발생 그리고 온도 상승과 같은 현상이 발생합니다. 따라서 이런 경우에는 다른 형태의 밸브를 선택하여야 합니다.

It is used as a safety valve to send the pump discharge pressure safely.
This valve is connected directly to the top of the pump, and does not operate under normal conditions. When the pump's pressure exceeds the preset pressure, the valve opens, and some oil from the discharge section flows back into the suction section.
This valve is a safety valve that can motor overload as well as pump overloads. If this valve is always moving or is left open for prolonged periods of time, it can cause bubbles, noise, and temperature increases. Therefore, in such cases, a different valve needs to be used.

■ VD type RELIEF VALVE

위의 사용법과 동일한 구조로 되어있으나, 드레인 되어진 오일을 탱크내로 보내주게 되므로 VB type에 비하여 펌프내 과부하를 막을 수 있는 밸브입니다.

It has the same structure as the above method of use, but the drained oil is sent inside the tank, and therefore it can prevent overload inside the pump compared to the VB type.

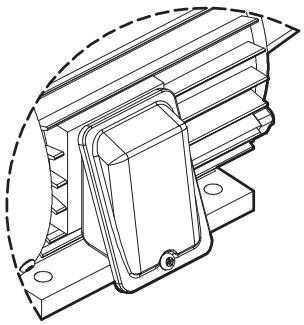
펌프 고장 및 대책

Cause & Remedy of Trouble

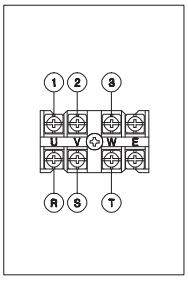
고장내용 Description of defects	현상 또는 예상원인 Symptom and expected cause	점검사항 · 방법 Inspection list and method	처치 · 대책 Treatment and solution
- 토출량이 부족 **- 흡입하지 않음** **- 압력이 올라가지 않는다.** - Insufficient discharge amount - Does not perform suction - Pressure does not go up.	● OIL이 나오는데 양이 적다. ● OIL이 나오지 않는다. ● Oil is discharged but in small quantity. ● Oil is not discharged at all.	● 진공 게이지 흡입압력 측정 ● -0.03MPa 이상을 표시하면 캐비테이션 ● Measuring vacuum gauge suction pressure ● Cavitation if -0.03MPa is marked	● 사용유의 점도를 낮춘다 ● Lower viscosity of the used oil
		● 흡입 배관의 막힘 ● 석션 필터의 오염상태를 확인 ● Blockage of suction pipe ● Check pollution level of suction filter	● 석션 필터 청소 ● Cleaning suction filter
		● 탱크의 유량 부족 ● 유면계 또는 육안으로 확인 ● Insufficient tank oil quantity ● Inspect using the oil gauge or with eyes	● 기름을 규정량까지 보충한다. ● 기준은 펌프1분간의 토출량의 3~4배에 해당하는 양이 필요합니다. ● Supplement the oil to the maximum quantity allowed. ● The standard the quantity that is equivalent to the quantity 3-4 times greater than the discharge capability of pump per 1 minuite.
		● 배관의 이음매에서 공기를 흡입하고 있을 가능성이 없는가? ● Is there a possibility to suck in air in the connecting join of the pipe system?	● 배관을 조인다. ● Make pipe system tight.
		● 사용 압력에 대해 유체의 점도가 낮은가? ● Is the viscosity of liquid low compared to the pressure used?	● 펌프에 적합한 점도의 유체를 사용한다. ● Use the liquid with viscosity appropriate to the pump.
		● 압력계를 보면서 릴리프 밸브의 압력 조정 ● 나사를 조여본다. ● 결과: 압력이 올라가지 않는다. ● Control the relief valve while watching the pressure meter. ● Tighten the bolt. ● Result: the pressure does not increase.	● 릴리프 밸브에 이물질 걸림이 예상되므로 릴리프밸브를 세척하여 이물질을 제거한다. ● Impure materials are expected to be caught in the relief valve and therefore remove the impure materials by cleaning the relief valve.
		● 압력계를 보면서 릴리프 밸브의 압력 조정 ● 나사를 조여본다. ● 결과: 압력이 상승한다. ● Adjust the relief valve pressure while watching the pressure gauge. ● Tighten the screw. ● Result: pressure goes up.	● 릴리프 밸브가 제대로 작동하고 있는 상태이므로 설정 압력을 증가시킨다. ● Relief valve is properly working and therefore set-up pressure must increase.
		● 펌프의 회전 방향 차이 ● 육안으로 회전 방향을 확인 ● The difference between spinning direction of pump. ● Inspect spinning direction with eyes.	● 펌프에 표기된 회전 방향으로 수정 ● Change it to the spinning direction indicated in the pump.
		● 흡입측 및 토출측의 유로가 차단되어 있지 않은가? ● Is oil channel in suction or discharge side blocked?	● 흡입측 및 토출측 유로를 개방한다. ● Open the oil channel in suction or discharge side.
			● 흡입측 및 토출측 유로를 넓힌다. ● Widen the oil channel in suction or discharge side.
- 오일 누유 - Oil leakage	● 오일실에서 누유 ● Oil leakage from oil seal.	● 펌프의 회전방향이 틀리지는 않았는가? ● Is spinning direction of pump incorrect?	● 펌프 수리 또는 교체 ● Pump repair or replacement
		● 흡입 배관에 압력이 걸려 있지는 않는가? ● Is there pressure on suction pipe?	● 펌프는 유면높이 1m이내에 설치 ● 오일실의 내압은 Max. 0.03MPa ● Pump is installed within 1m height of oil surface. ● The internal pressure of oil seal is Max. 0.03MPa
		● 유온이 오일실의 내구성 온도보다 높다. ● Oil temperature is higher than that of oil seal.	● 특수 재질의 오일 실사용 (당사문의) ● Oil seal with special materials was used. (Please contact us).
		● 유체의 종류가 오일실 재질에 부적합 ● The type of liquid is not appropriate for oil sea materials.	● 오일실 교환 또는 펌프 교체 ● Oil seal or pump replacement.

고장내용 Description of defects	현상 또는 예상원인 Symptom and expected cause	점검사항 · 방법 Inspection list and method	처치 · 대책 Treatment and solution
- 기름이 나오지 않는다. **- 차단기가 작동 한다.** - Oil does not leak. - Stopper machine operates.	● 모터가 회전하지 않는다. ● Motor does not rotate.	● 정전 또는 전압 저하 ● Black-out or voltage decrease.	● 전원 설비 확인 ● Verify electric power installation.
		● 전자 개폐기, 차단기가 작동하지는 않았는가? ● Did electronic opener and stopper work?	● 전자 개폐기, 차단기를 리셋 ● Reset electronic opener and stopper.
		● 전원 코드의 단선 또는 연결 불량 ● Disconnection of connection defect of power cord	● 전원 코드를 교환 또는 연결을 다시 한다. ● Replace power cord or reconnect
	● 오버로드 ● Overload	● 소요 동력은 적정하지 않는가? ● Is consumed power appropriate?	● 모터출력을 높이거나 펌프의 크기를 낮춘다. ● 모르는 경우는 오일의점도, 사용압력, 배관상태를 확인하신 후 당사에 연락하십시오. ● Increase motor output or lower the pump size ● If you do not now, please check viscosity of oil, pressured used and pipe condition and contact us.
	● 펌프를 손으로 돌려도 회전하지 않는다. ● 회전이 무겁다. ● Even if you spin the pump with hand, it does not spin. ● Rotation is heavy.	● 사용유의 점성이나 윤활성은 적당한가? ● Is viscosity and fluidity of oil appropriate?	● 로터가 닳아있거나 이물질이 끼여 있을 가능성이 있기 때문에 수리한다. ● Rotor could have been worn out or there could be impure materials. Therefore, it should be repaired.
		● 사용유가 오염되어있지는 않은가? ● Is oil used polluted?	● 펌프 교체 또는 수리 ● Pump replacement and repair.
- 소리가 크다 **- 이상한 소리가 난다** - The noise is big. - It makes weird noises.	● 흡입측의 저항이큼 (캐비테이션) ● 흡입측 배관이 너무 가늘다 ● 흡입측 배관이 너무 길다 ● 펌프 회전이 너무 빠르다 ● 석션필터가 저항이 있다 ● 오일의 점도가 너무높다 ● 흡입 높이가 너무 높다 ● Resistance is big on suction side (cavitation). ● Pipe on the suction side is too thin. ● Pipe on the suction side is too long. ● Pump revolution is too fast. ● Suction filter has resistance. ● Viscosity of oil is too high. ● Suction height is too high.	● 진공 게이지 흡입 압력 측정 ● -0.03MPa 이상을 표시하면 캐비테이션 ● Measure vacuum gauge' s suction pressure. ● If it is greater than -0.03MPa, it is caviatation.	● 흡입압력-0.03MPa이내(대기압에가까운쪽)으로 조정한다. ● 배관을 굵게한다 ● 배관을 짧게한다 ● 펌프 회전을 느리게한다 ● 필터의 저항이 적은것으로 교체한다 ● 오일의 점도를 낮춘다 ● 흡입 높이를 낮춘다 ● Adjust it within suction pressure of -0.03MPa (close to atmospheric pressure). ● Make pipe thick. ● Make pipe short. ● Make pump revolution slow. ● Replace the one with lower filter resistance. ● Lower the viscosity of oil. ● Lower the suction height.
	● 공기를 함께 흡입한다 (에어레이션) ● Suck in the air with it (aeration).	● 탱크 내에 기포는 없습니까? ● 배관이 느슨하게 조여지지는 않았습니까? ● Are there vapors inside the tank? ● Are pipes too loosely tightened?	● 탱크, 배관, 펌프 내에 공기 침입이 없도록 조정 ● Adjust it so that air does not penetrate inside the tank, pipe system and pump.
		● 리턴 배관이 Oil 안에 들어가 있는지 확인 하십시오. ● Make sure return pipe is inside oil.	● 리턴 배관을 Oil 안으로 위치시킨다. ● Locate return pipe above inside oil.
	● 커플링의 동심도 불량 ● Concentricity of the couple ring is also defective.	● 두 커플링의 동심도가 넘어가 있는지 확인 ● Make sure concentricity of two couple rings is right.	● 커플링의 규격 값 이내로 수정 ● Adjust it within the standard measurement of couple rings.

TERMINAL BOX CONNECTION

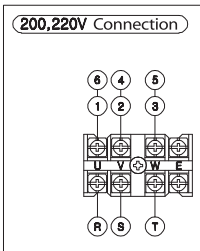


Sole Conection

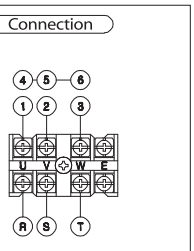


220V/380V Connection

200,220V Connection

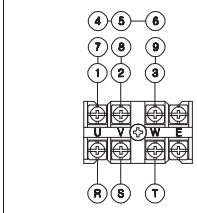


380V Connection

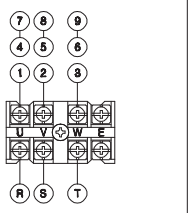


220V/440V Connection

200,220V Connection



440V Connection



Model

- HMTP-3M-MA(VB)
- OIL COOLER
- HMTP-3M-HA(VB/VD)
- HMTP-3M-HA(VB/VD)E
- HMTP-3M-HAVBF-P
- HMTP-3M-HA(VB/VD)-P
- HMTP-3M-HAVBF-E
- HMTP-3M-HAVBF