MAX FLOW SERIES
DIAPHRAGM PUMP

M-DDP13PN-01

M-DDP19GN-01

M-DDP25AN-01

M-DDP25SW-014

M-DDP38AN-01

M-DDP50AN-01

M-DDP75AN-01

INSTRUCTION MANUAL

Table of Content :-

WARNING

1. When using compressed gas (hereinafter referred to as "compressed air") to drive this pump, be sure it is one of the following:

- Compressed air supplied from an air compressor (To drive this product, use supply air with a minimum moisture content.)
- Nitrogen (N2) gas The use of compressed air other than those mentioned above may cause air pollution, damage to the pump, or even an explosion.

2. Pressure Ratings are dependent on the liquid temperature variations.
   Please see the "Liquid Temperature Correlation Graph" in the [Performance curves] and check for the allowable operating pressure at the specific temperature of the liquid being pumped. Air pressure and discharge pressure must not exceed the allowable operating pressure. If air pressure and discharge pressure exceed the allowable operating pressure, it may cause liquid leaks, damage to the pump casings or diaphragms and could cause a fatal accident.
3. Before moving this product, make sure that the internal pressure is released. If the pump is moved while under pressure, any shock imparted by knocking or dropping the pump etc. may damage the pump or even cause an explosion.
4. Improper electrical grounding, poor ventilation, or unshielded fire or spark can create a danger of fire or explosion.Therefore, the following precautions are strongly advised.

- All peripheral equipment and piping connected to this product should be properly grounded.
- Whenever you notice any spark while operating this product, immediately stop its operation and Do NOT start using it again unless you are sure of the cause and corrective actions have been taken out.
- Depending upon the type of fluid being pumped, bubbles of flammable gas may be generated. Make sure that ventilation is satisfactory.
- This product itself, its piping and exhaust ports should be kept away from unshielded fire, spark and other causes of ignition. If a diaphragm is damaged, fluid may gush out together with air from the exhaust port.
- Do NOT leave gasoline or solvent etc. that contains waste at the work site.
- Machinery and other equipment near the place of installation of this product should be properly insulated to prevent electrical conduction with each other.
- Do not operate heating devices, open flames, or place heating elements near the pump or its piping.
- If there are flammable gases in the immediate atmosphere while the pump is operating, Do NOT switch electric appliance on and off.
- Do NOT operate gasoline engines around the pump work site.

WARNING

5. Before using this product, be sure you are familiar with the precautions regarding the fluid to be pumped, and verify the corrosion resistance of the parts that will come into contact with the fluid (wetted parts). NEVER use the product with any fluid against which it does not have sufficient corrosion resistance or with a fluid that poses a risk of explosion. If you are unsure of the corrosion resistance, contact your nearest distributor or our company directly. If you use this product with any fluid against which the parts that will come in contact with the fluid do not have sufficient corrosion resistance, it may result in damaging the product or leakage of fluid or pump failure.
6. When using this product, observe local relevant regulatory rules concerning transfer and storage of chemicals, fire prevention, labor safety standards, etc.
7. Hazardous fluids (such as strong acid or alkali, flammable or toxic liquids) or gas bubbles generated by such fluids may cause serious injury or even death if accidentally inhaled or consumed or if they come into contact with the eyes or adhere to the skin. Therefore, the following precautions are strongly advised.

- Ensure you are fully familiar with the properties of the fluid to be pumped and strictly adhere to the operating instructions provided by the fluid suppliers. This includes using appropriate personal protective equipment, such as goggles, gloves, masks, or protective work clothing.
- When storing a hazardous fluid, strictly comply with the regulatory procedures (such as using proper containers, storage conditions, etc.).
- Install the piping and exhaust port of the pump in locations away from areas frequented by humans and animals if there is a risk that the transferred liquids could pose a hazard to health or safety.
- In case of transferring a high temperature fluid, casing and piping heated and may cause burns by touching.

8. Assembly, installation, start-up and maintenance must be carried out by qualified and adequately trained according to all applicable international and local standards, laws, regulations and any other applicable regulatory requirement. The information given in the manual and these instructions must always be observed: failure to observe the instructions on this manual will result in a high risk of accident, failures and explosion.The operator or his agent is responsible for observing any international and local standards, laws, regulations and any other applicable regulatory requirement if required due to operating conditions or place of installation.This applies particularly to the use of easily detachable process connections with flammable media (i.e. gasoline).

   When an equipment fault is detected, the device shall be immediately de-energised and send back to the manufacturer for repair.

WARNING

9. EARTHING/EQUIPOTENTIAL BONDING: The pump must be included in the on-site equipotential bonding system according to relevant standards. Proper earthing and equipotential bonding provisions shall be put in place and properly maintained on the pump and the whole installation, as per any relevant applicable standards. Failure to do so would result in high risk of static sparking and explosion.

10. ELECTROSTATIC CHARGE: In order to avoid ignition hazards due to electrostatic charge, flow meters may not be used in areas with:

- Processes That Generate Strong Charges,
- Mechanical Friction And Cutting Processes,
- Spraying Of Electrons (E.g. In The Vicinity Of Electrostatic Painting Systems)
- Pneumatically Conveyed Dust Is Exposed.

11. Electrostatic charging of the housing surface by friction must be avoided. The devices must not be dry cleaned. If you feel an electric shock while using the meter, stop dispensing immediately. Identify and correct the problem before continuing.

CAUTION:

1. If the diaphragm of this product is damaged, the supplied air may mix with the fluid or the fluid may flow into the main body (air switching portion). If the air supply is inadequate or the pump is contaminated, Do NOT operate the pump.
2. After you shut down the pump and disconnect the piping, some fluid may still be remain inside the pump. Also, if the pump is left unused for a prolonged period, some fluid may remain inside the pump and within the connected piping. Therefore, be sure to purge the system of fluid and clean the pump before prolonged disuse or storage. If the product is left unused for a prolonged period with fluid remaining in the connected piping as well as the pump itself, the fluid may expand, depending on the ambient temperature (because of freezing or heat), which may cause damage to the pump and/or piping and possible leakage of fluid.

3. The Pumps non wetted parts are made from various materials and are not designed to withstand corrosive chemicals.Therefore there is a possibility of damage to the pump's non wetted parts due to leaks, diaphragm breakage, or liquid or gas permeation through the diaphragm material.There is also a possibility of damage due to chemical fumes in the local environment or fumes entering into the air line through the compressor. These components can also be damaged if incorrect lubrication is used. To prevent unnecessary damage, please follow these precautions. Ensure proper ventilation of the surrounding environment. Remove liquids when the pump is not in use for long periods. Keep the switching area of the pump well-ventilated. Clean and flush the pump's air switching section if a leak or diaphragm breakage occurs.
4. For safe transport ensure that no liquid leaks from the pump. It is the end user's responsibility to thoroughly wash and clean the pump's to prevent accidents caused by liquid leaks.
5. Always use genuine parts when replacing components of this product. Do not attempt to modify the components or replace them with anything other than genuine parts.

⚠ CAUTION:

1. After delivery open the product packaging and check to make sure that all included accessories are present and in good condition.
2. Remember that the pump is heavy, so extreme care must be taken when lifting it. When lifting the pump using a chain hoist or crane, be sure to lift the pump by the specified lift point's. Be careful no one passes under the pump while you lift it. It would be very dangerous if the pump were to fall.
3. When installing the accessories, provided pipe sealing tape for each threaded position. Also, take care to ensure that broken or shredded pipe sealing tape does not contaminate the liquid or air inlets. Note that a contaminated airline may cause failure of the pumps air switching unit.
4. Please install the air inlet airline ball valve by referring to Outside view of [Name of parts and materials].
5. Please install Liquid inlet/outlet plugs to discharge and suction ports as required and refer to Outside view of [Name of parts and materials].

MAX FLOW SERIES

DIAPHRAGM PUMP

M-DDP13PN-01

PRODUCT INFORMATION

Model	M-DDP13PN-01
Liquid port	1/2" BSPT (F)
Material・Weight	Figure 1
Operating pressure	0.2～0.7 MPa [30-100 psi]
Max discharge pressure	0.7 MPa [100 psi]
Discharge volume/Cycle	85 mL
Max Discharge	62 L/min [16.4 Gallon/min]
Max air consumption	700 L/min(ANR) [24.72 SCFM]
Max solid size	-
Limitation of viscosity	Self-priming 0.5 Pa・s or less
Ambient temperature	0～70 ℃
Liquid temperature	0～60 ℃
Dimensions	Figure 2
A-Weighted sound pressure level	84dB ※1
A-Weighted sound power level	94dB ※2

- The maximum supply air pressure of the pump depends on the liquid temperature.(Figure 3)

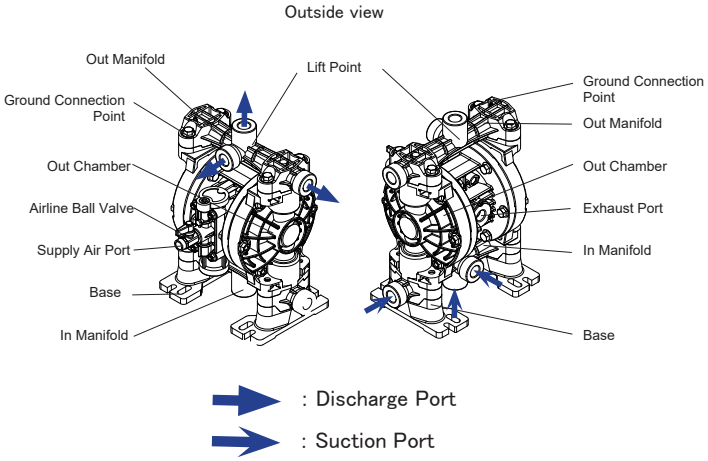
※1 Measurement method of A-weighted sound pressure level is based on ISO 1996.

※2 Measurement method of A-weighted sound power level is based on ISO 3744.

ACCESSORIES INCLUDED WITH THE PUMP

Airline ball valve.....1
Liquid Inlet/Outlet Plug.....4
Pipe Seal tape 1
Hexalobular Tool (T45・T55).....1

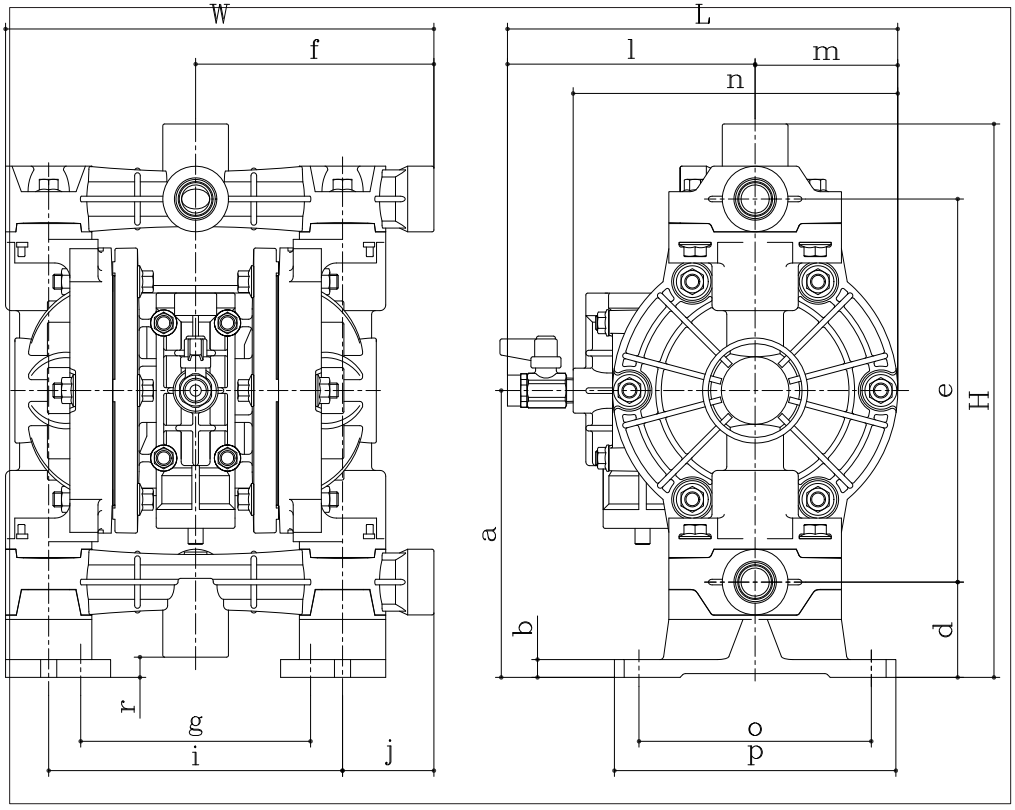
NAMES OF PARTS AND MATERIALS



Material and weight

MODEL	M-DDP13PN-01
Pump Wetted Parts	Polypropylene (PP)
Diaphragm	NBR
Valve Stopper	Polypropylene (PP)
Flat Valve	Polytetrafluoroethylene (PTFE)
Ball Valve	
Valve Seat	Polypropylene (PP)
Center Disk	Polypropylene (PP)
Weight	3.2 kg [7.1lbs]

DIMENSIONS



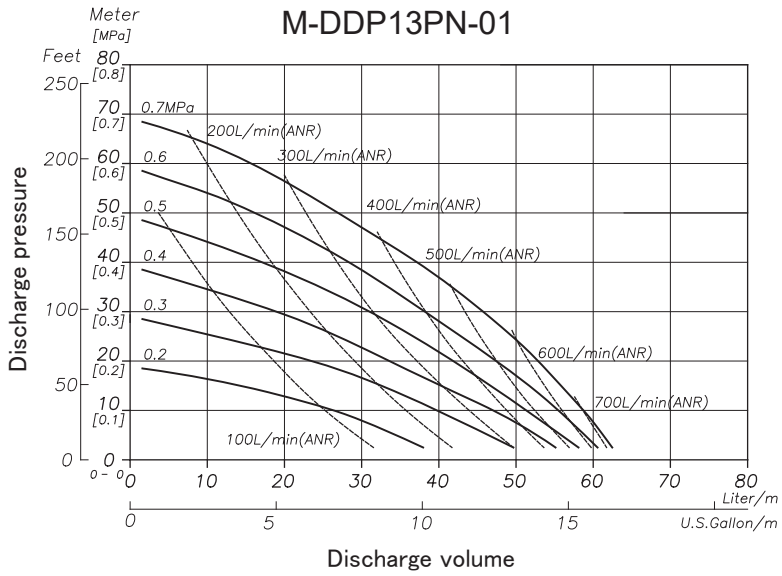
M-DDP13PN-01

MODEL	h	w	l	a	b	d	e	f	g	i	j	l	m	n	o	p	r	air inlet	air exh	liquid in/out
M-DDP13PN-01	295 [11.61]	228 [8.98]	208 [8.19]	153 [6.02]	10 [0.39]	51 [2.01]	204 [8.03]	127 [5.00]	122 [4.80]	156 [6.14]	49 [1.93]	132 [5.20]	76 [2.99]	174 [6.85]	124 [4.88]	150 [5.91]	11 [0.43]	1/4" BSPT	3/8" BSPT	1/2" BSPT (F)

(Measure : mm [inch])

Figure 2

PERFORMANCE CURVES



NOTICE

This is the measurement method used when determining the pumps performance curves. Please refer to the below measurement instruments and testing procedure.

NOTICE

The maximum safe operating pressure of the pump depends on the liquid temperature. Always refer to Specifications and this liquid temperature correlation graph when determining the correct air pressure.

Liquid Temperature Correlation Graph

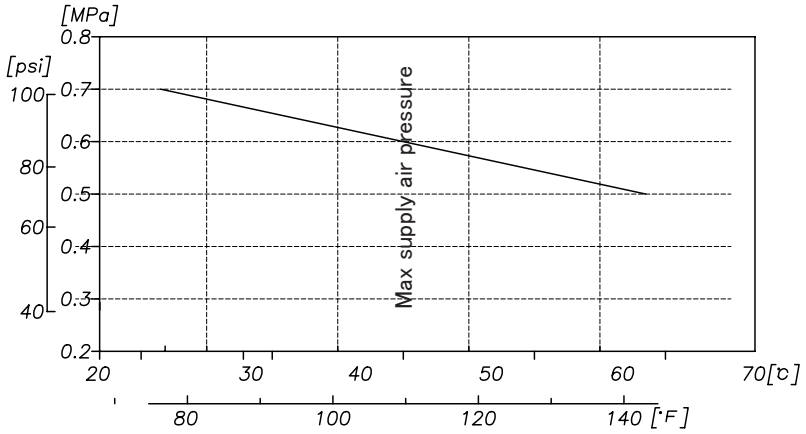
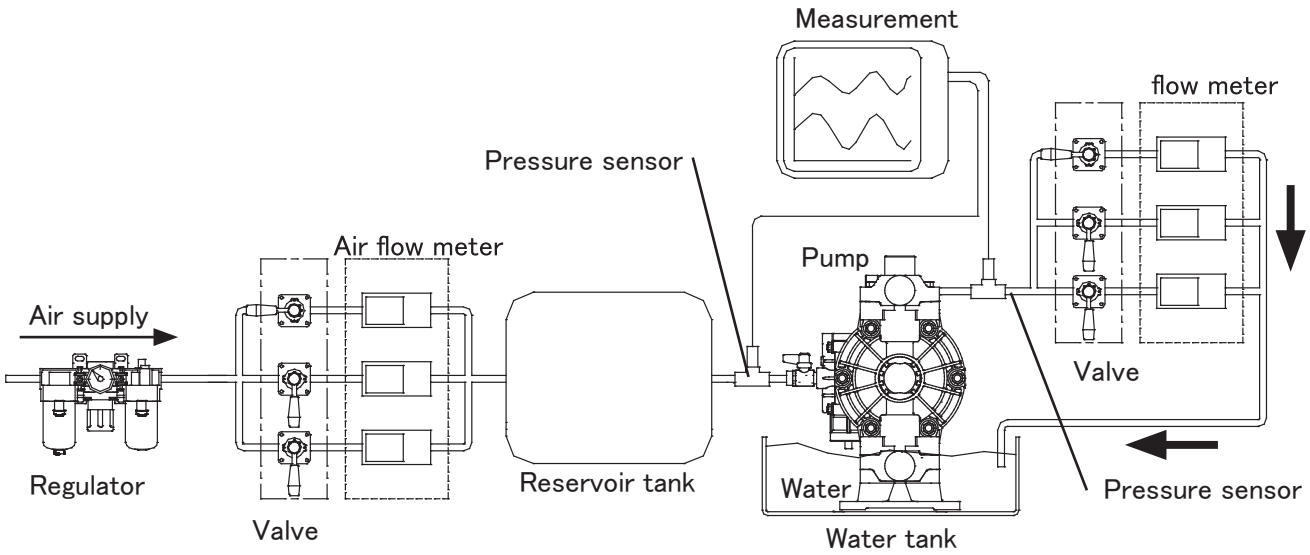


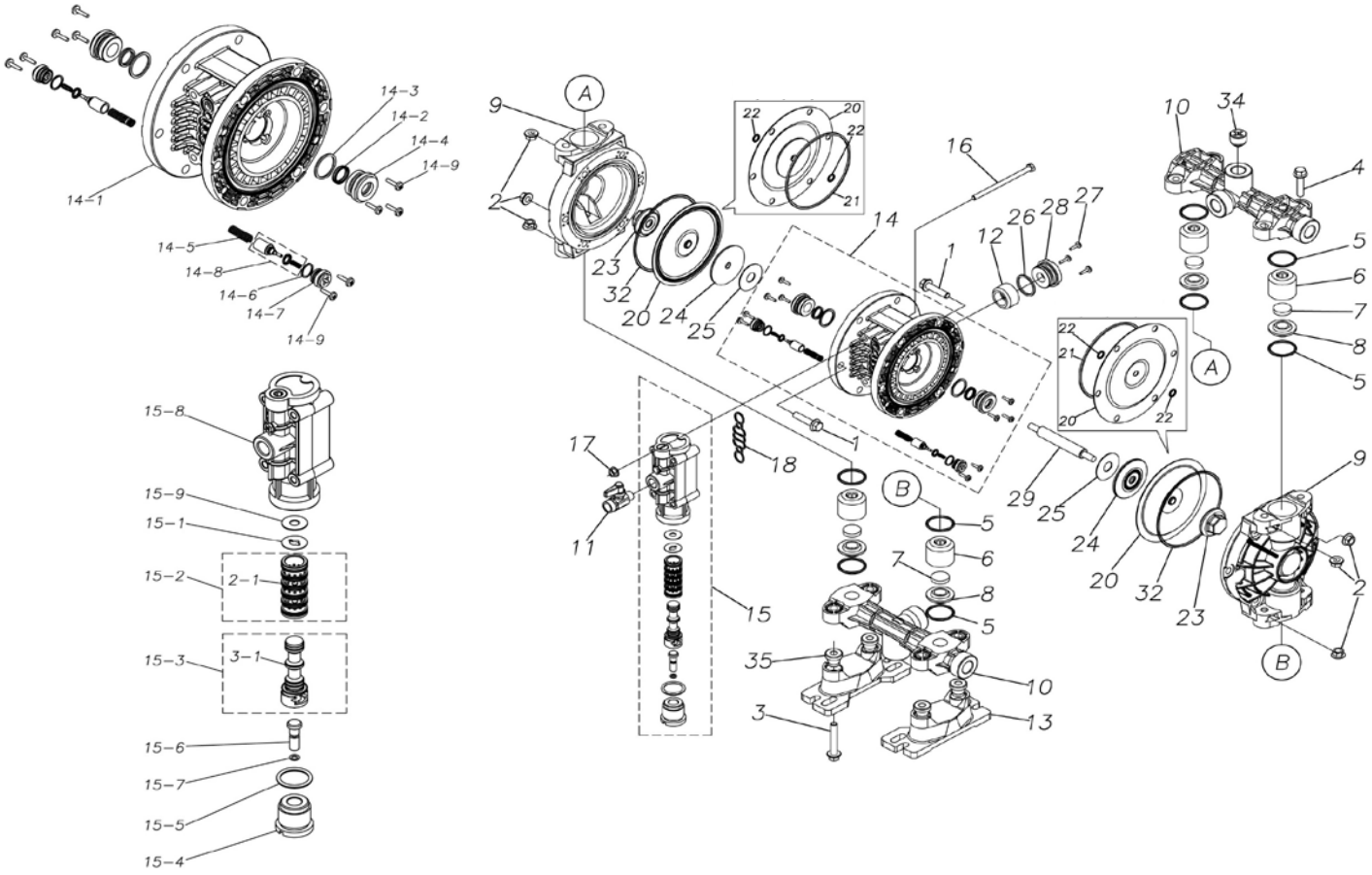
Figure 3



Measurement equipment and piping layout diagram

Note: Liquid pumped: Fresh water, Temperature: Ambient, Condition of suction: Flat suction 0 meter [0 ft] head

DIAPHRAGM PUMP EXPLODED VIEW



LIQUID SIDE SERVICE KIT
(PN: M-DDP13SKWE-N)

Position Reference No	Description	Qty
20	Diaphragm 15N	2
7	Flat Valve 15T	4
32	O Ring	2
5	O Ring	8

AIR MOTOR SERVICE KIT
(PN: M-DDP13SKAM)

Position Reference No	Description	Qty
14-2	V-Packing	2
14-3	O Ring	2
14-4	Throat Bearing	2
14-5	Spring	2
14-6	O Ring	2
14-7	Pilot Valve Seat	2
14-8	Pilot Valve Assembly	2
15-1	Cushion	1
15-2-1	O Ring	6
15-3-1	Seal Ring	5
15-5	O Ring	1
15-7	O Ring	1
15-9	Cushion Support	1
25	Cushion	2
26	O Ring	1
28	Bushing	1

MAX FLOW SERIES

DIAPHRAGM PUMP

M-DDP19GN-01

PRODUCT INFORMATION

Model	M-DDP19GN-01
Liquid port	3/4" BSPT (F)
Material･Weight	Figure 1
Operating pressure	0.2～0.7 MPa [30-100 psi]
Max discharge pressure	0.7 MPa [100 psi]
Discharge volume/Cycle	350 mL
Max Discharge	130 L/min [34.3 Gallon/min]
Max air consumption	1300 L/min(ANR) [45.90 SCFM]
Max solid size	2 mm or less
Limitation of viscosity	Self-priming 3 Pa･s or less Force In 8 Pa･s or less
Ambient temperature	0～70 ℃
Liquid temperature	0～60 ℃
Dimensions	Figure 2
A-Weighted sound pressure level	85dB ※1
A-Weighted sound power level	96dB ※2

- The maximum supply air pressure of the pump depends on the liquid temperature. (Figure 3)
- DIAPHRAGMS. NBR 0 ～ 70℃

※1 Measurement method of A-weighted sound pressure level is based on ISO 1996.

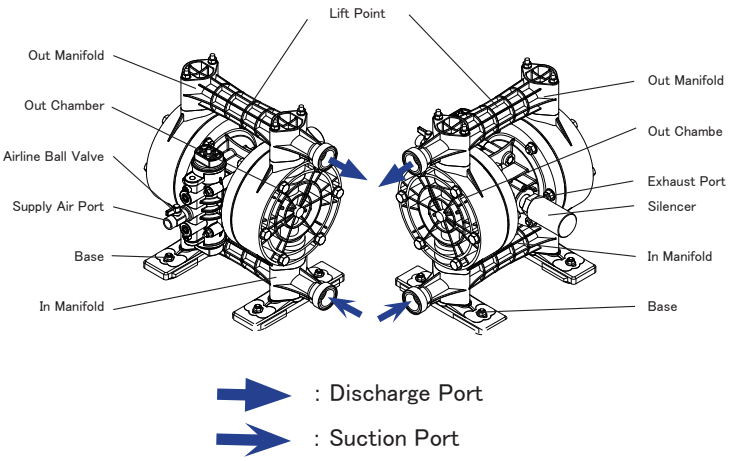
※2 Measurement method of A-weighted sound power level is based on ISO 3744.

ACCESSORIES INCLUDED WITH THE PUMP

- Airline ball valve.....1
- Liquid Inlet/Outlet Plug.....4

NAMES OF PARTS AND MATERIALS

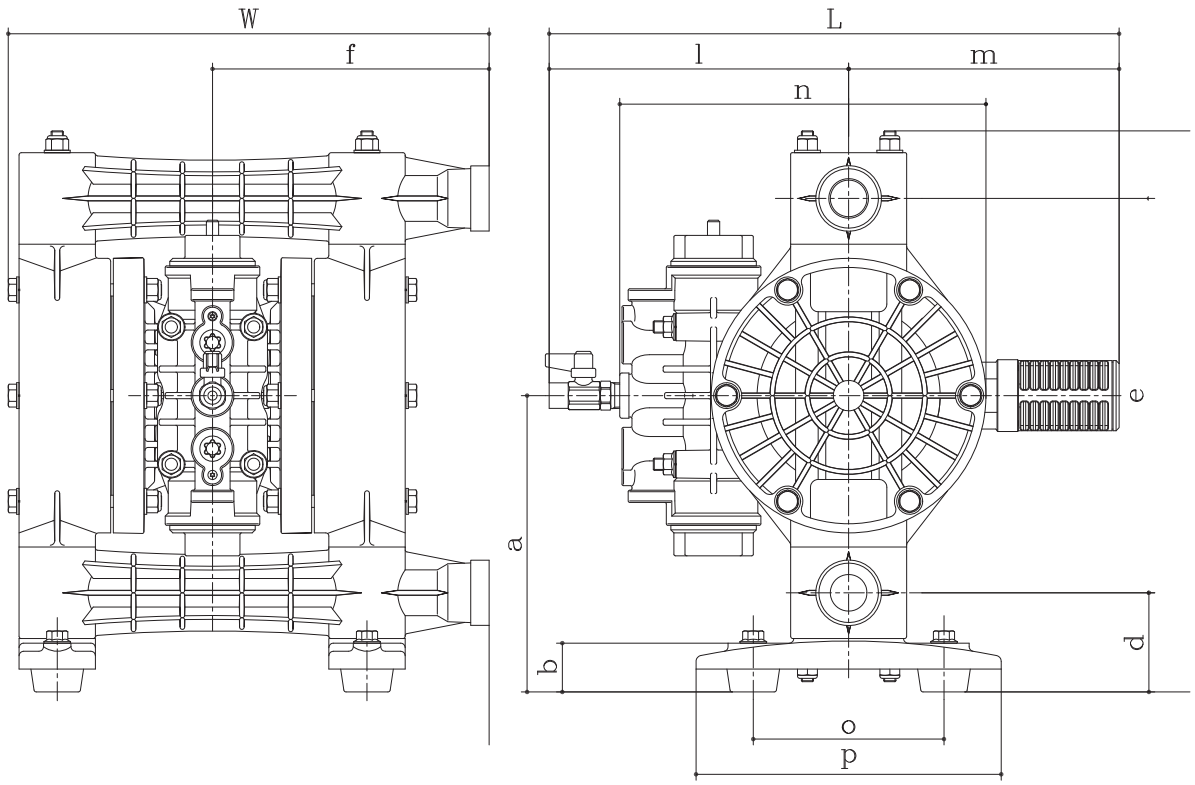
Outside view



Material and weight

MODEL	M-DDP19GN-01
Pump Wetted Parts	Glass-Filled Polypropylene (PPG)
Diaphragm	NBR
Valve Stopper	Glass-Filled Polypropylene (PPG)
Ball Valve	NBR
Valve Seat	Glass-Filled Polypropylene (PPG)
Center Disk	Glass-Filled Polypropylene (PPG)
Weight	3.2 kg [7.1lbs]

DIMENSIONS



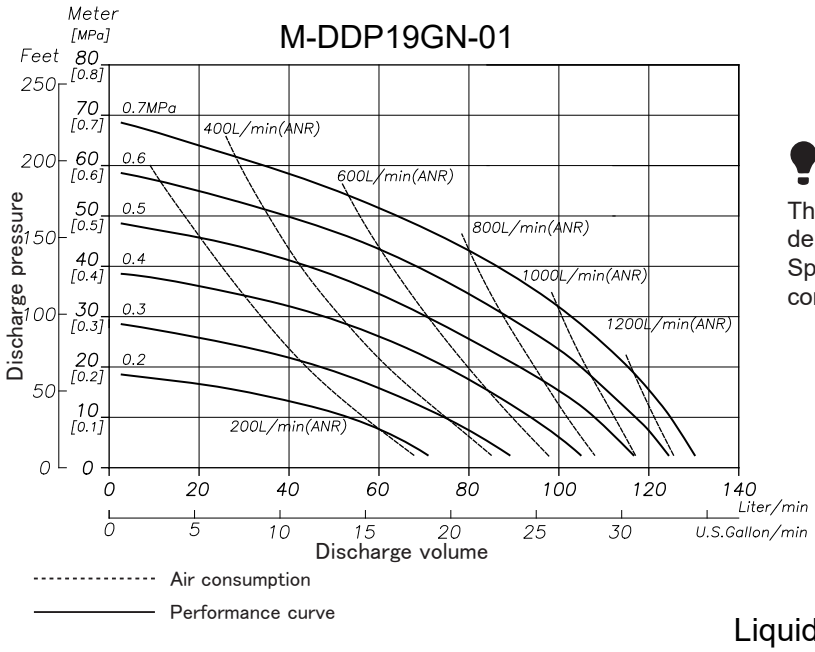
M-DDP19GN-01

MODEL	h	w	l	a	b	d	e	f	i	j	l	m	n	o	p	air inlet	air exh	liquid in/out
M-DDP19GN-01	368 [14.49]	315 [12.40]	373 [14.69]	194 [7.64]	32 [1.26]	65 [2.56]	259 [10.20]	182 [7.17]	203 [7.99]	80 [3.15]	196 [7.72]	177 [6.97]	240 [9.45]	125 [4.92]	200 [7.87]	3/8" BSPT	3/4" BSPT	3/4" BSPT

(Measure : mm [inch])

Figure 2

PERFORMANCE CURVES



NOTICE

The maximum safe operating pressure of the pump depends on the liquid temperature. Always refer to Specifications and this liquid temperature correlation graph when determining the correct air pressure.

NOTICE

This is the measurement method used when determining the pumps performance curves. Please refer to the below measurement instruments and testing procedure.

Liquid Temperature Correlation Graph

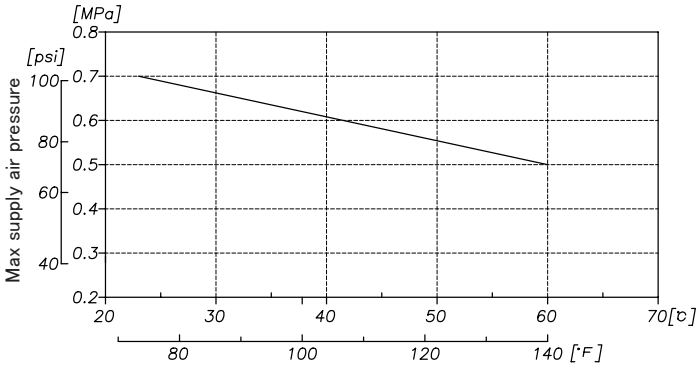
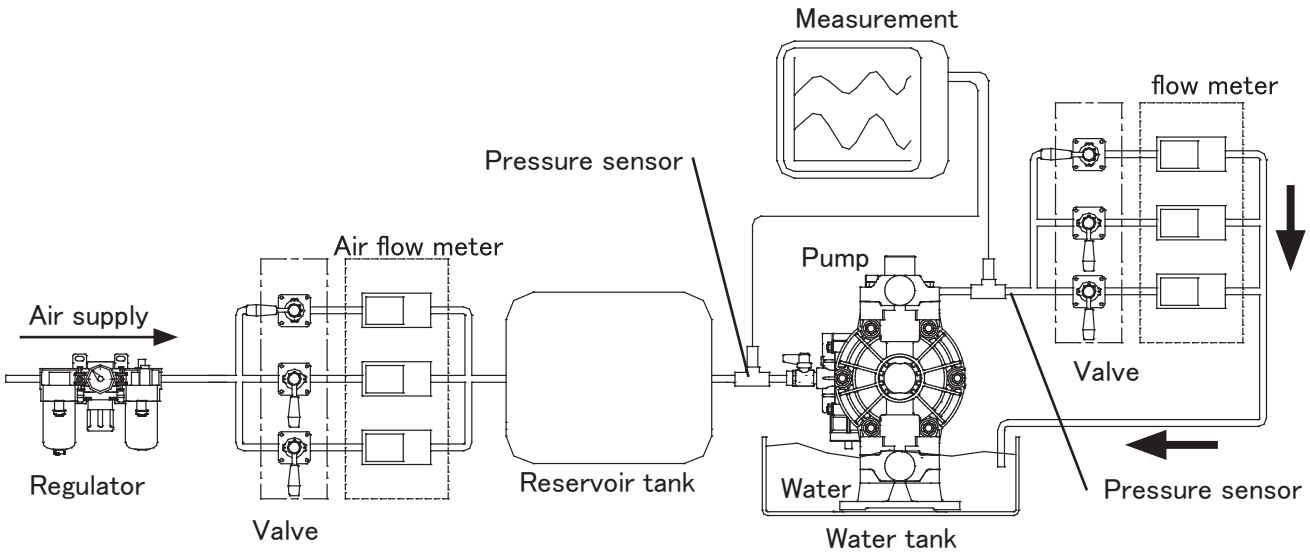


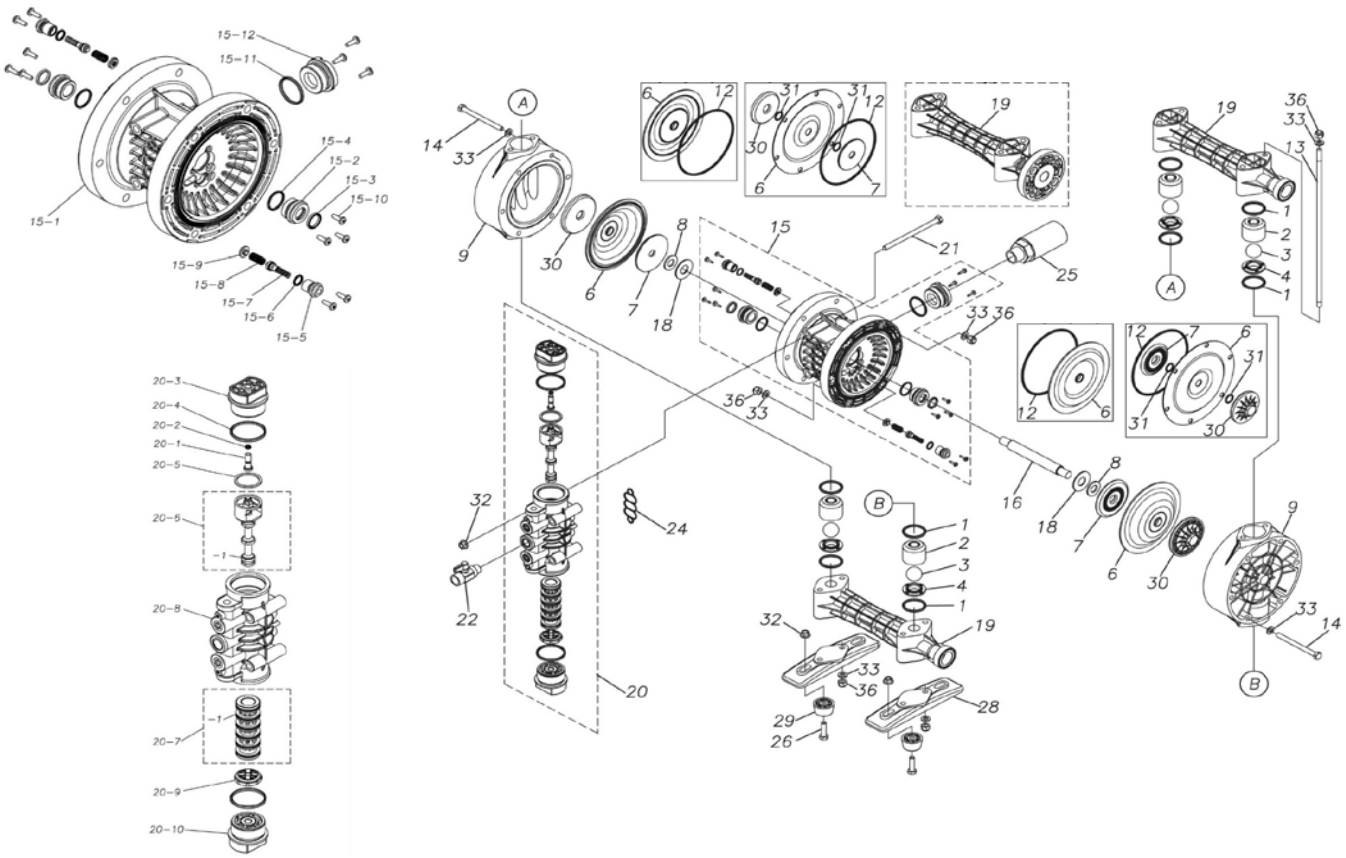
Figure 3



Measurement equipment and piping layout diagram

Note: Liquid pumped: Fresh water, Temperature: Ambient, Condition of suction: Flat suction 0 meter [0 ft] head

DIAPHRAGM PUMP EXPLODED VIEW



LIQUID SIDE SERVICE KIT
(PN: M-DDP19SKWE-N)

Position Reference No	Description	Qty
6	Diaphragm 20N	2
3	Ball 20N	4
1	O Ring	8

AIR MOTOR SERVICE KIT
(PN:M-DDP19SKAM)

Position Reference No	Description	Qty
20-7-1	O Ring NBR	6
20-6-1	Seal Ring	5
20-5	Packing	1
20-4	O'Ring	2
20-2	O'Ring	1
15-2	Throat Bearing	2
15-3	V-Packing	2
15-4	O'Ring	2
15-5	Pilot Valve Seat	2
15-6	O'Ring	2
15-7	Pilot Valve Assembly	2
15-8	Spring	2
15-9	Spring Seat	2
15-11	O'Ring	1
15-12	Bushing	1
18	Cushion	2
20-9	Cushion	1

MAX FLOW SERIES

DIAPHRAGM PUMP

M-DDP25AN-01

PRODUCT INFORMATION

Model	M-DDP25AN-01
Liquid port	1" BSPT (F)
Material･Weight	Figure 1
Operating pressure	0.2～0.7 MPa [30-100 psi]
Max discharge pressure	0.7 MPa [100 psi]
Discharge volume/Cycle	800 mL
Max Discharge	220 L/min [58.1 Gallon/min]
Max air consumption	1800 L/min(ANR)[63.56 SCFM]
Max solid size	6.5 mm or less
Limitation of viscosity	Self-priming 3 Pa･s or less Force In 8 Pa･s or less
Ambient temperature	0～70 ℃
Liquid temperature	0～60 ℃
Dimensions	Figure 2
A-Weighted sound pressure level	81dB ※1
A-Weighted sound power level	92dB ※2

- The maximum supply air pressure of the pump depends on the liquid temperature. (Figure 3)
- DIAPHRAGMS. NBR 0 ～ 70℃

※1 Measurement method of A-weighted sound pressure level is based on ISO 1996.

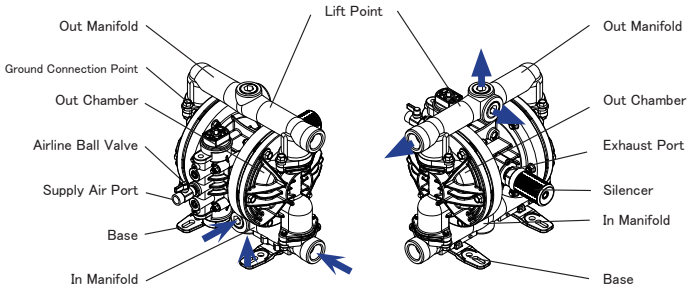
※2 Measurement method of A-weighted sound power level is based on ISO 3744.

ACCESSORIES INCLUDED WITH THE PUMP

- Airline ball valve.....1
- Liquid Inlet/Outlet Plug.....4

NAMES OF PARTS AND MATERIALS

Outside view



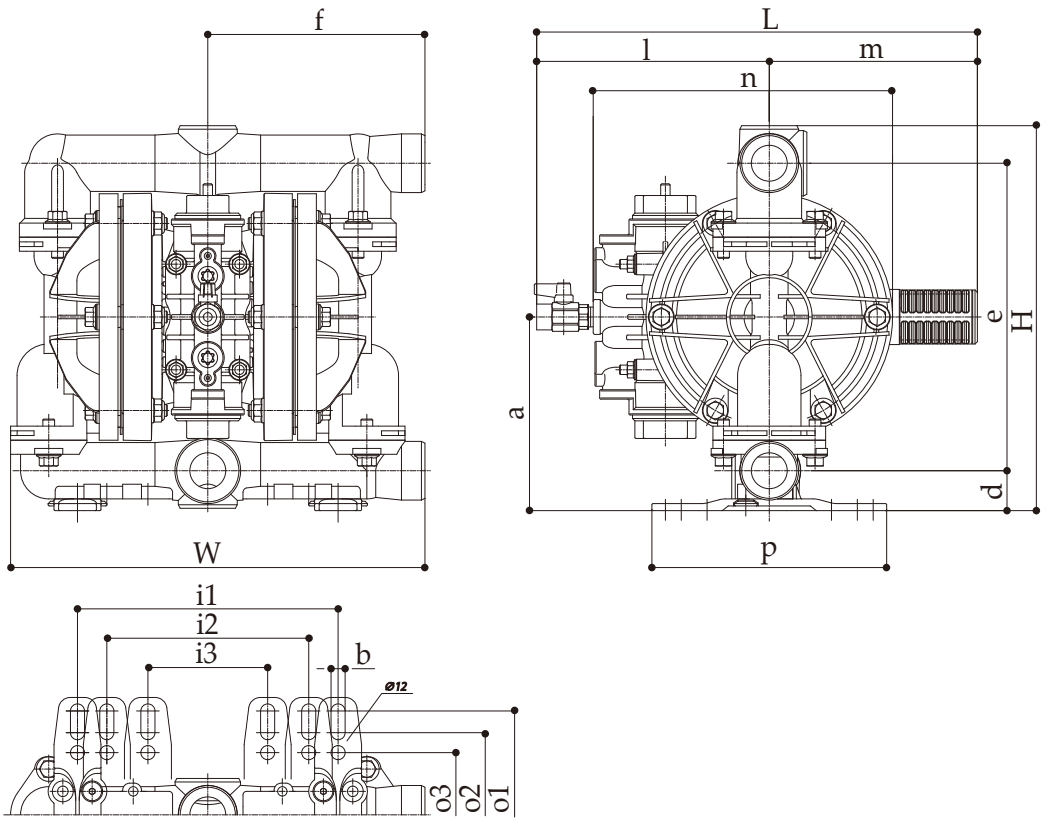
: Discharge Port

: Suction Port

Material and weight

MODEL	M-DDP25AN-01
Pump Wetted Parts	Aluminium
Diaphragm	NBR
Valve Stopper	Stainless Steel
Ball Valve	NBR
Valve Seat	NBR
Center Disk	Stainless Steel
Weight	11.0 kg [24.3 lbs]

DIMENSIONS



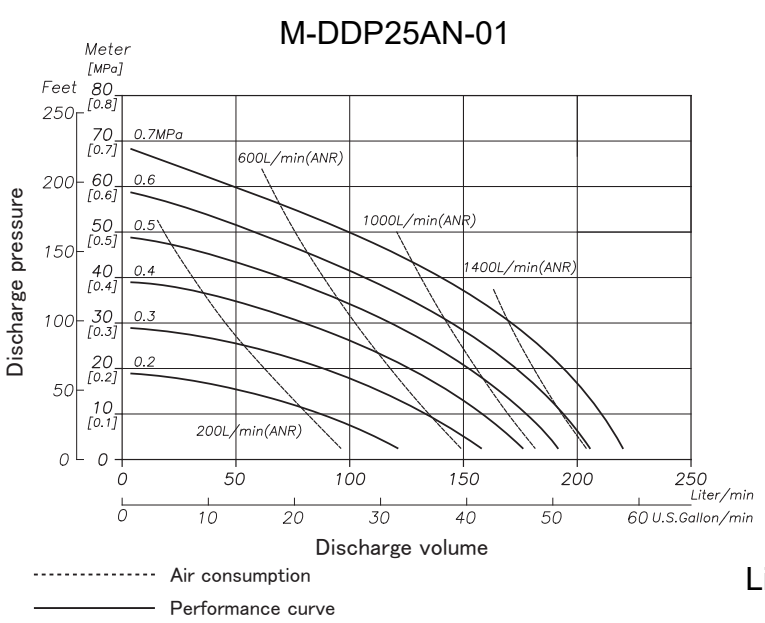
M-DDP25AN-01

MODEL	h	w	l	a	b	d	e	f	i1	i2	i3	l	m	n	o1	o2	o3	p	air inlet	air exh	liquid in/out
M-DDP25AN-01	328 [12.91]	353 [13.90]	375 [14.76]	165 [6.50]	12 [0.47]	34 [1.34]	262 [10.31]	185 [7.28]	222 [8.74]	172 [6.77]	102 [4.02]	198 [7.80]	177 [6.97]	255 [10.04]	177 [6.97]	140 [5.51]	106 [4.17]	200 [7.87]	3/8" BSPT	3/4" BSPT	1" BSPT

(Measure : mm [inch])

Figure 2

PERFORMANCE CURVES



NOTICE

The maximum safe operating pressure of the pump depends on the liquid temperature. Always refer to Specifications and this liquid temperature correlation graph when determining the correct air pressure.

NOTICE

This is the measurement method used when determining the pumps performance curves. Please refer to the below measurement instruments and testing procedure.

Liquid Temperature Correlation Graph

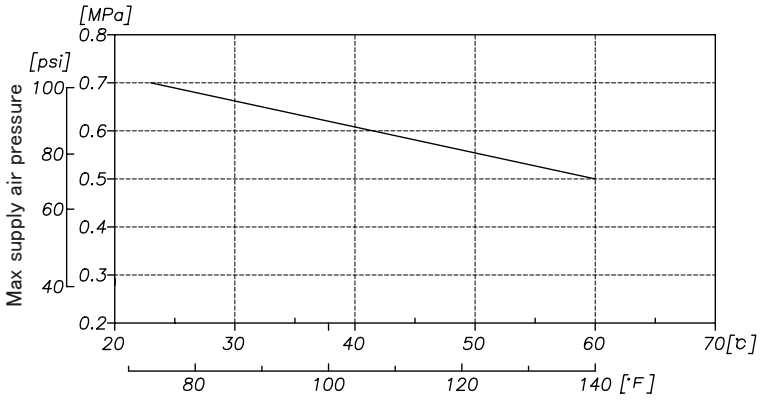
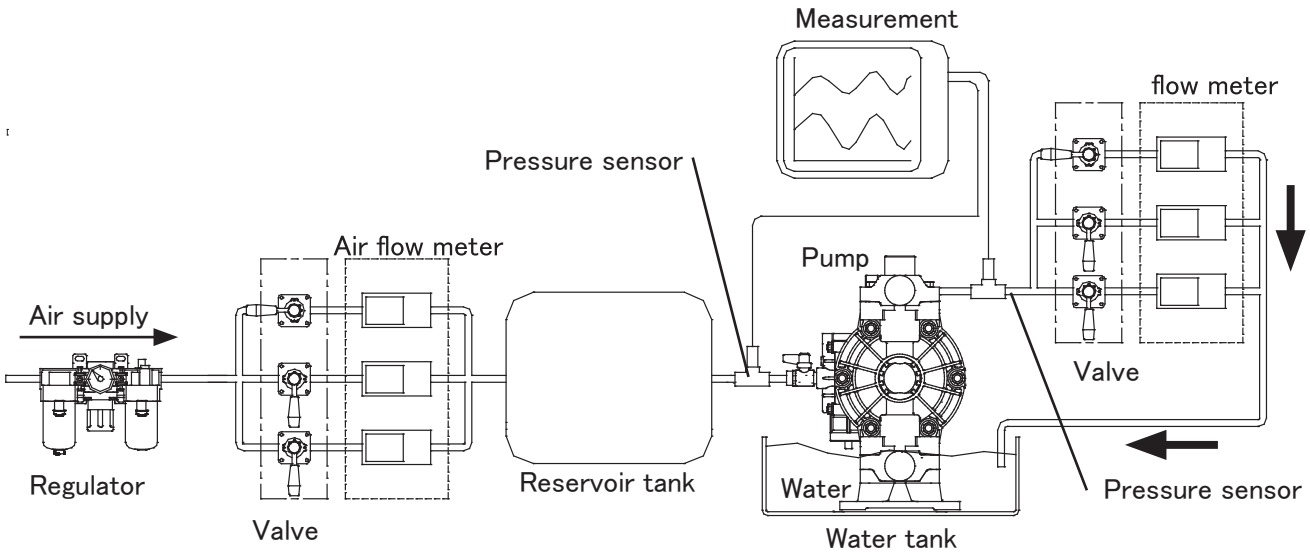


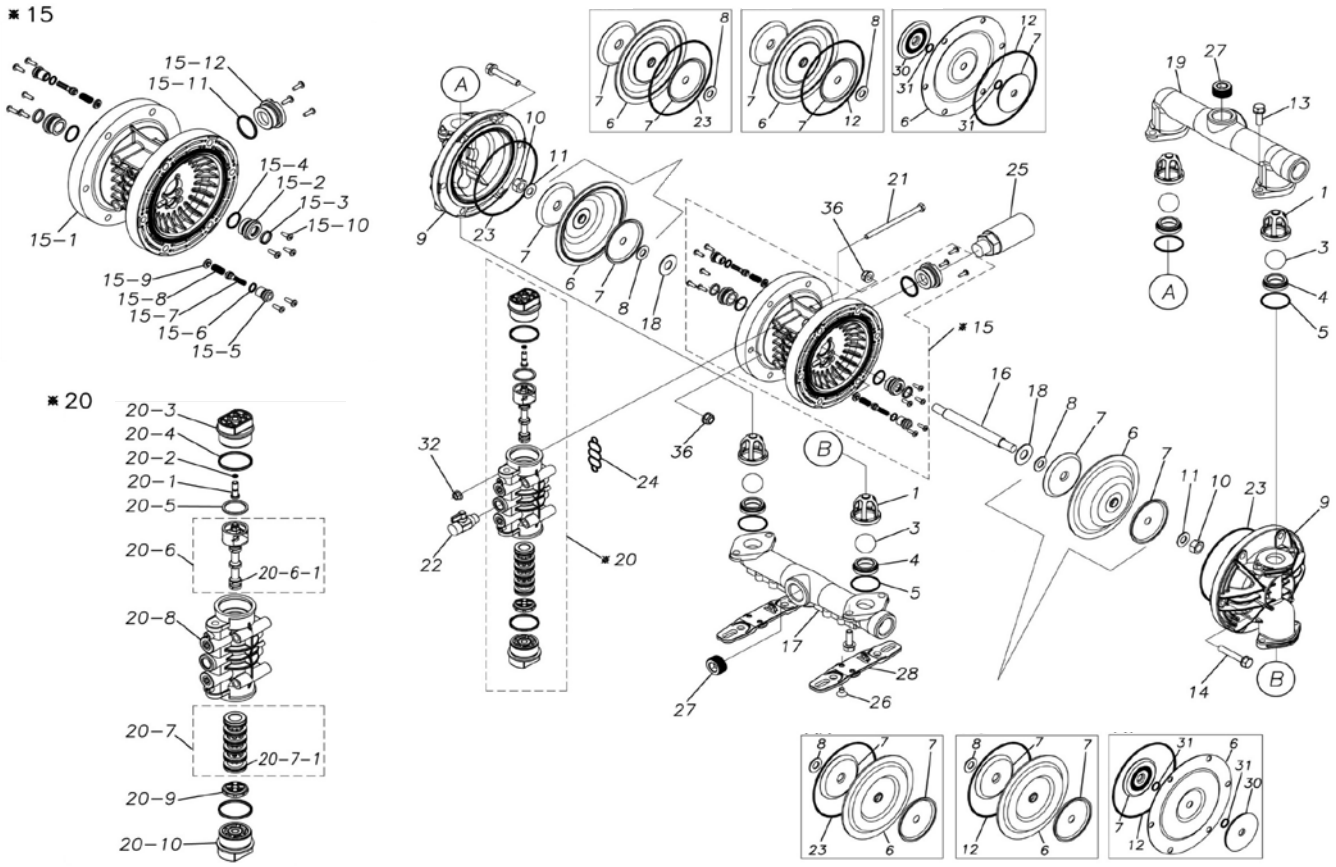
Figure 3



Measurement equipment and piping layout diagram

Note: Liquid pumped: Fresh water, Temperature: Ambient, Condition of suction: Flat suction 0 meter [0 ft] head

DIAPHRAGM PUMP EXPLODED VIEW



LIQUID SIDE SERVICE KIT
(PN:M-DDP25SKWE-N)

Position Reference No	Description	Qty
6	Diaphragm 25N	2
3	Ball 25N	4
23	O Ring	2
5	O Ring	4

AIR MOTOR SERVICE KIT
(PN:M-DDP25SKAM)

Position Reference No	Description	Qty
20-7-1	O Ring	6
37062	Seal Ring	5
20-5	Packing	1
20-4	O Ring	2
20-2	O Ring	1
15-2	Throat Bearing	2
15-3	V-Packing	2
15-4	O Ring	2
15-5	Pilot Valve Seat	2
15-6	O Ring	2
15-7	Pilot Valve Assembly	2
15-8	Spring	2
15-9	Spring Seat	2
15-11	O Ring	1
15-12	Bushing	1
18	Cushion	2
20-9	Cushion	1

MAX FLOW SERIES

DIAPHRAGM PUMP

M-DDP38AN-01

PRODUCT INFORMATION

Model	M-DDP38AN-01
Liquid port	1 1/2" DIN
Material･Weight	Figure 1
Operating pressure	0.2 ～ 0.85 MPa [29-125 psi]
Max discharge pressure	0.85 MPa [125 psi]
Discharge volume/Cycle	2800 mL
Max Discharge	600 L/min [158.5 Gallon/min]
Max air consumption	5000 L/min(ANR) [176.55 SCFM]
Max solid size	8 mm or less
Limitation of viscosity	Self-priming 3 Pa･s or less Force In 8 Pa･s or less
Ambient temperature	0～70 ℃
Liquid temperature	0～70 ℃
Dimensions	Figure 2
A-Weighted sound pressure level	97dB ※1
A-Weighted sound power level	105dB ※2

- The maximum supply air pressure of the pump depends on the liquid temperature. (Figure 3)
- DIAPHRAGMS. NBR 0 ～ 70℃

※1 Measurement method of A-weighted sound pressure level is based on ISO 1996.

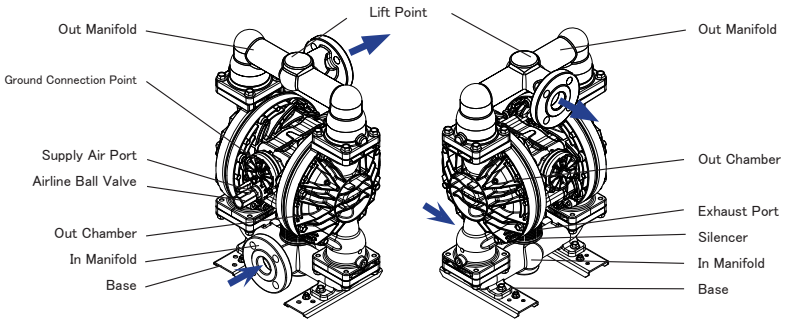
※2 Measurement method of A-weighted sound power level is based on ISO 3744.

ACCESSORIES INCLUDED WITH THE PUMP

- Airline ball valve.....1
- Liquid Inlet/Outlet Plug.....4

NAMES OF PARTS AND MATERIALS

Outside view



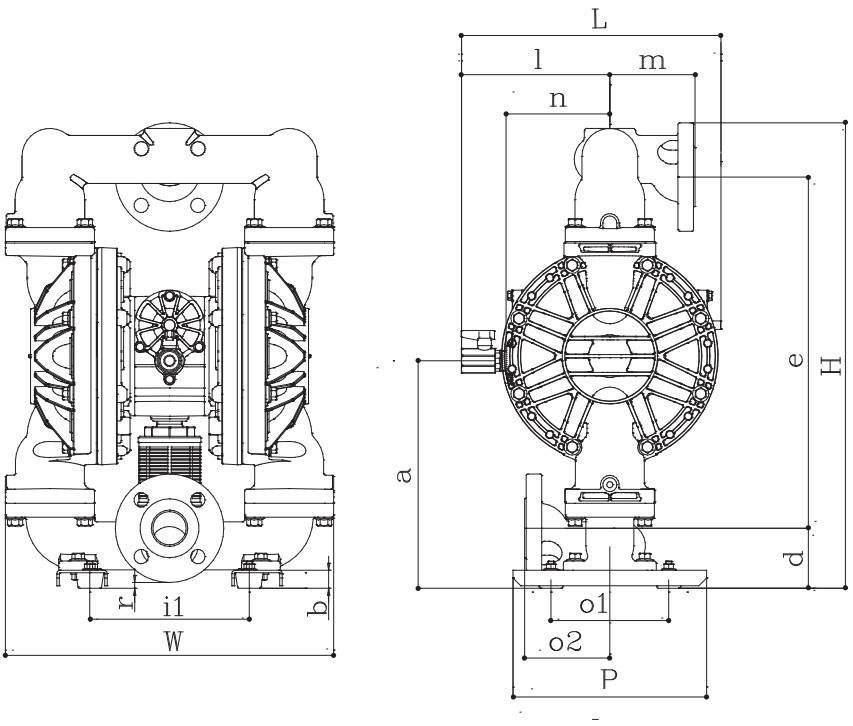
: Discharge Port

: Suction Port

Material and weight

MODEL	M-DDP38AN-01
Pump Wetted Parts	Aluminium
Diaphragm	NBR
Valve Stopper	Stainless Steel
Ball Valve	NBR
Valve Seat	NBR
Center Disk	A5056
Weight	30.0 kg [66.2 lbs]

DIMENSIONS



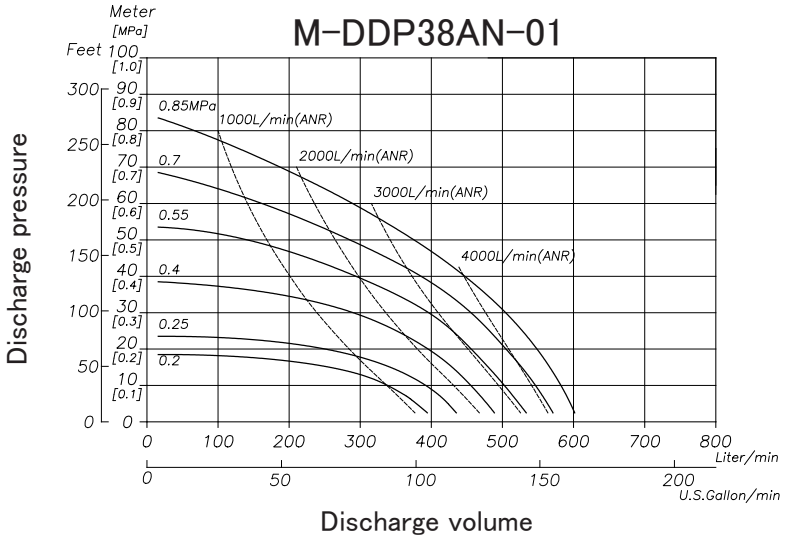
M-DDP38AN-01

MODEL	h	w	l	a	b	d	e	i (i1)	i2	l	m	n	o1	o2	p	r	air inlet	air exh	liquid in/out
M-DDP38AN-01	601 [23.66]	424 [16.69]	335 [13.19]	294 [11.57]	23 [0.91]	77 [3.03]	453 [17.83]	206 [8.11]		191 [7.52]	110 [4.33]	134 [5.28]	152 [5.98]	110 [4.33]	250 [9.84]	7 [0.28]	3/4" BSPT	1" BSPT	2" DIN

(Measure : mm [inch])

Figure 2

PERFORMANCE CURVES



Air consumption

Performance curve

NOTICE

The maximum safe operating pressure of the pump depends on the liquid temperature. Always refer to Specifications and this liquid temperature correlation graph when determining the correct air pressure.

NOTICE

This is the measurement method used when determining the pumps performance curves. Please refer to the below measurement instruments and testing procedure.

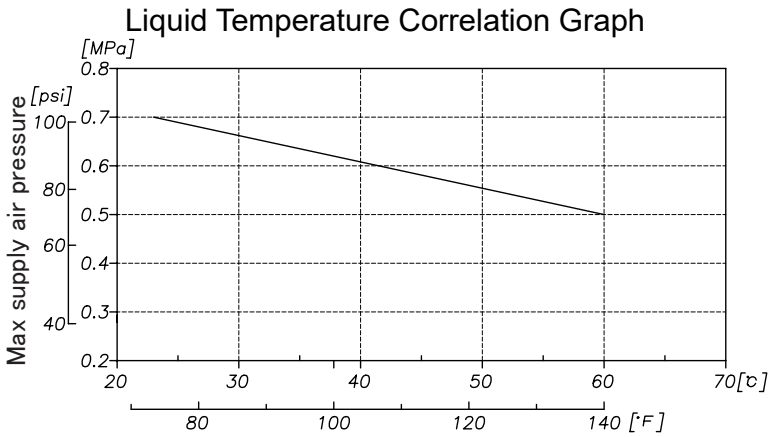
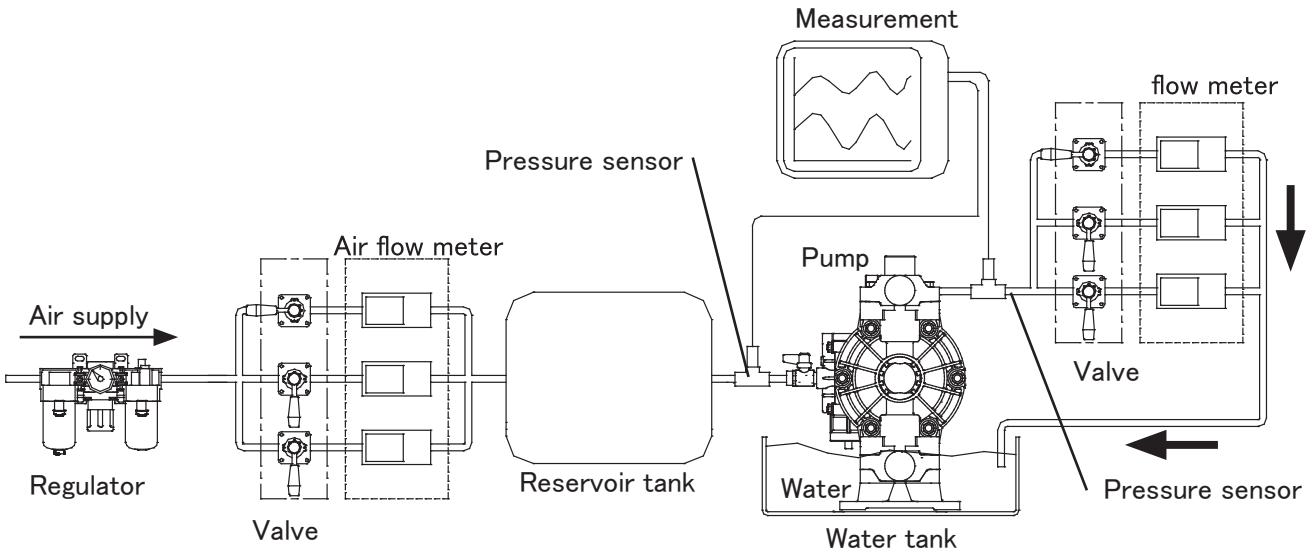


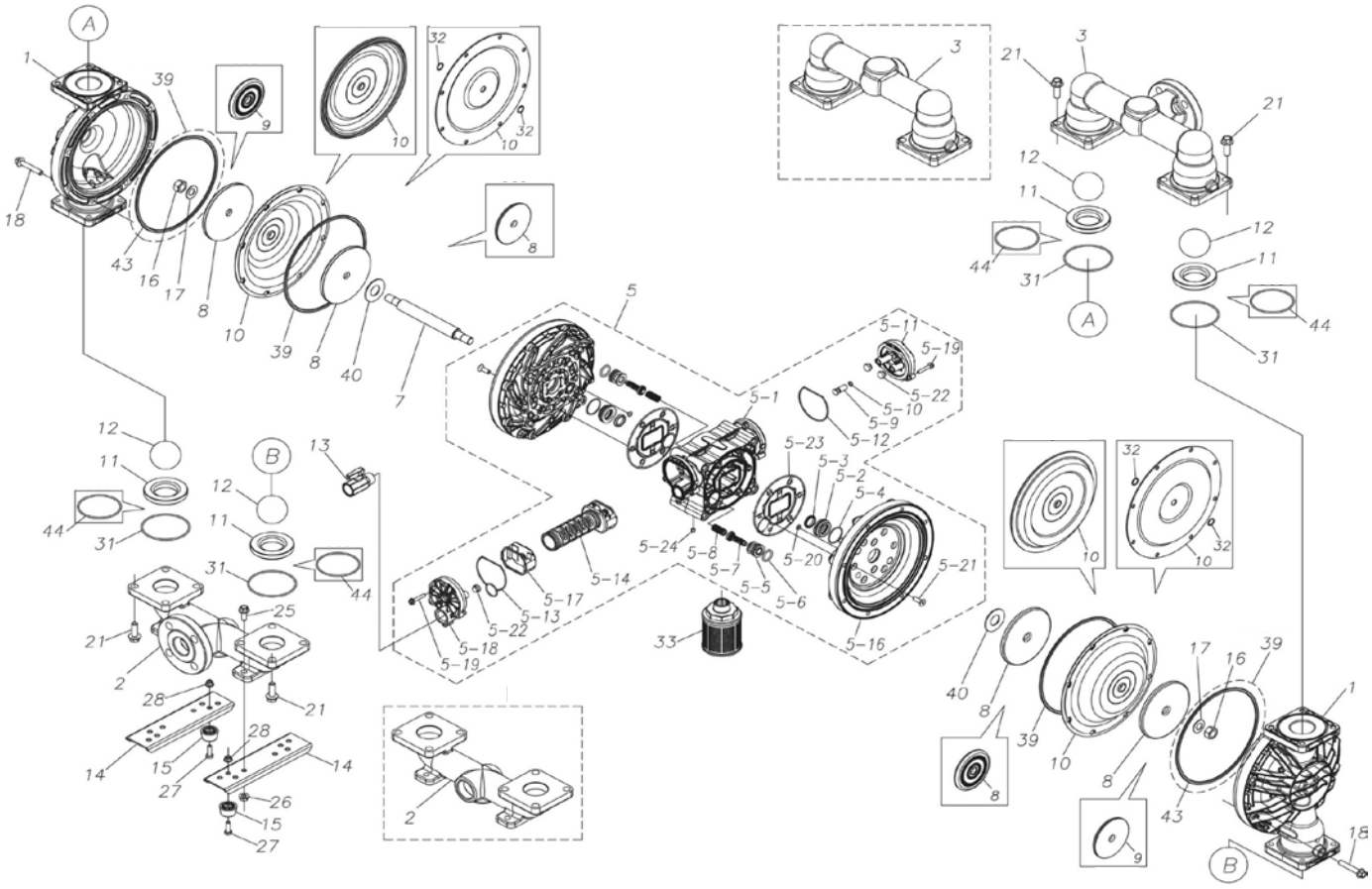
Figure 3



Measurement equipment and piping layout diagram

Note: Liquid pumped: Fresh water, Temperature: Ambient, Condition of suction: Flat suction 0 meter [0 ft] head.

DIAPHRAGM PUMP EXPLODED VIEW



LIQUID SIDE SERVICE KIT
(PN:M-DDP38SKWE-N)

Position Reference No	Description	Qty
10	Diaphragm 40N	2
12	Ball 40N	4
31	O Ring	4
11	Valve Seat 40N	4

AIR MOTOR SERVICE KIT
(PN:M-DDP38SKAM)

Position Reference No	Description	Qty
5-6	O-RING	2
5-4	O-RING	2
5-3	V Packing	2
5-8	Pilot Valve Spring	2
5-13	Packing Cap In	1
5-12	Packing Cap	1
5-5	Pilot Valve Seat	2
5-23	Gasket	2
5-2	Throat Bearing	2
5-7	Pilot Valve	2
5-14	Looped C Spool Valve Assembly	1

MAX FLOW SERIES

DIAPHRAGM PUMP

M-DDP50AN-01

PRODUCT INFORMATION

Model	M-DDP50AN-01
Liquid port	2" BSPT (F)
Material･Weight	Figure 1
Operating pressure	0.2 ～ 0.85 MPa [29-125 psi]
Max discharge pressure	0.85 MPa [125 psi]
Discharge volume/Cycle	3500 mL
Max Discharge	800 L/min [211.4 Gallon/min]
Max air consumption	5800 L/min(ANR)[204.80 SCFM]
Max solid size	8 mm or less
Limitation of viscosity	Self-priming 3 Pa･s or less Force In 8 Pa･s or less
Ambient temperature	0～70 ℃
Liquid temperature	0～70 ℃
Dimensions	Figure 2
A-Weighted sound pressure level	96dB ※1
A-Weighted sound power level	105dB ※2

- The maximum supply air pressure of the pump depends on the liquid temperature. (Figure 3)
- DIAPHRAGMS. NBR 0 ～ 70℃

※1 Measurement method of A-weighted sound pressure level is based on ISO 1996.

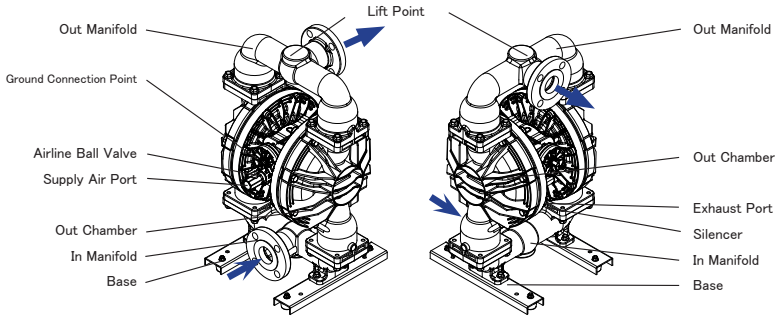
※2 Measurement method of A-weighted sound power level is based on ISO 3744.

ACCESSORIES INCLUDED WITH THE PUMP

- Airline ball valve.....1
- Liquid Inlet/Outlet Plug.....4

NAMES OF PARTS AND MATERIALS

Outside view



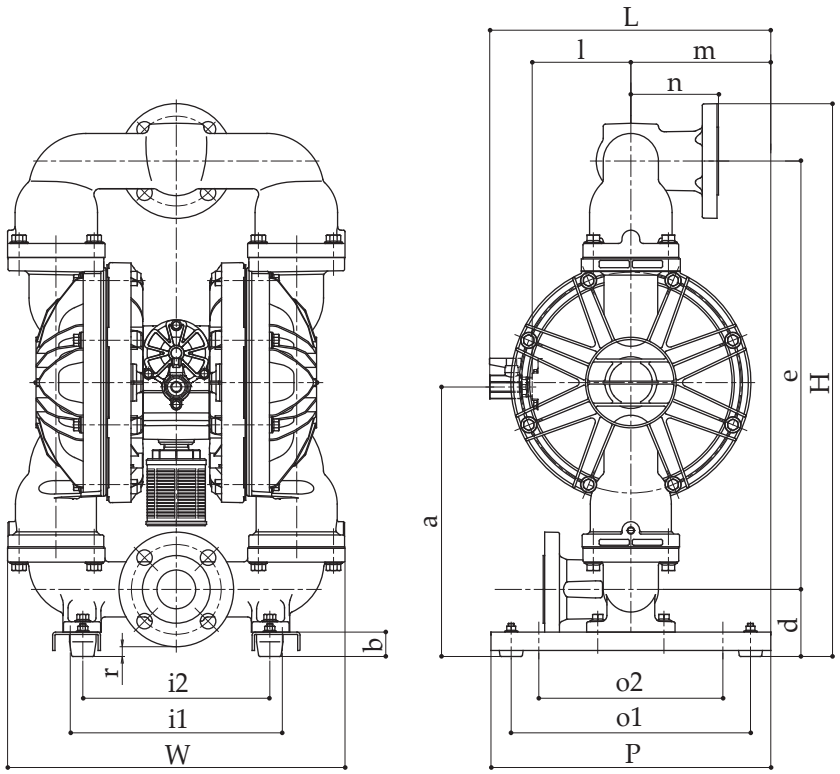
: Discharge Port

: Suction Port

Material and weight

MODEL	M-DDP50AN-01
Pump Wetted Parts	Aluminium
Diaphragm	NBR
Ball Valve	NBR
Valve Seat	NBR
Center Disk	A5056
Weight	39.4 kg [86.9 lbs]

DIMENSIONS



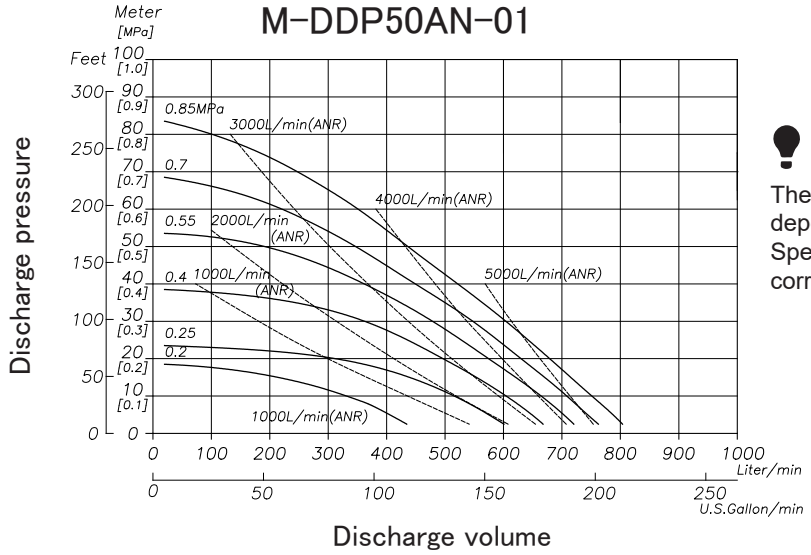
M-DDP50AN-01

MODEL	h	w	l	a	b	d	e	i1	i2	l	m	n	o1	o2	P	r	air inlet	air exh	liquid in/out
M-DDP50AN-01	751 [29.57]	458 [18.03]	382 [15.04]	366 [14.41]	33 [1.30]	91 [3.58]	582 [22.91]	288 [11.34]	254 [10.00]	134 [5.28]	190 [7.48]	119 [4.69]	325 [12.80]	250 [9.84]	380 [14.96]	13 [0.51]	3/4″ BSPT	1″ BSPT	2″ DIN

(Measure : mm [inch])

Figure 2

PERFORMANCE CURVES



Air consumption

Performance curve

NOTICE

The maximum safe operating pressure of the pump depends on the liquid temperature. Always refer to Specifications and this liquid temperature correlation graph when determining the correct air pressure.

Liquid Temperature Correlation Graph

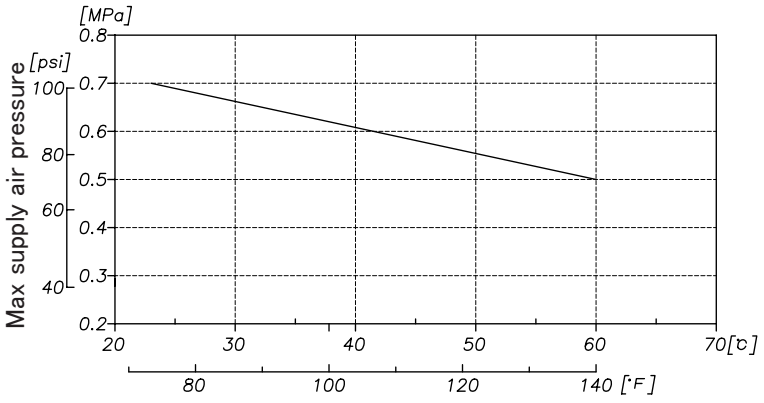
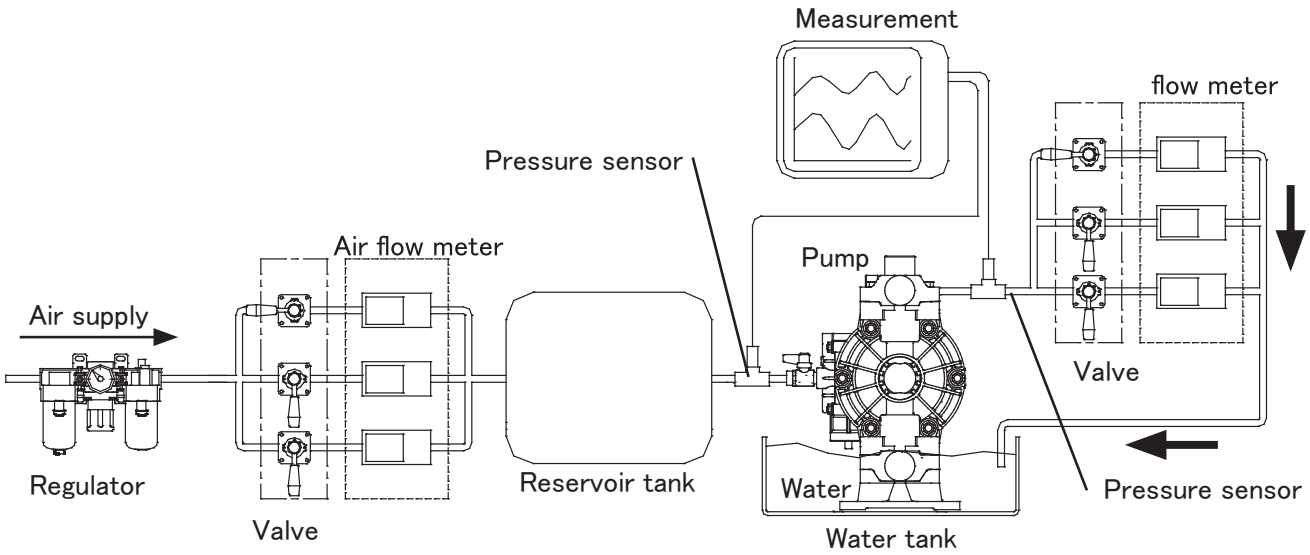


Figure 3

NOTICE

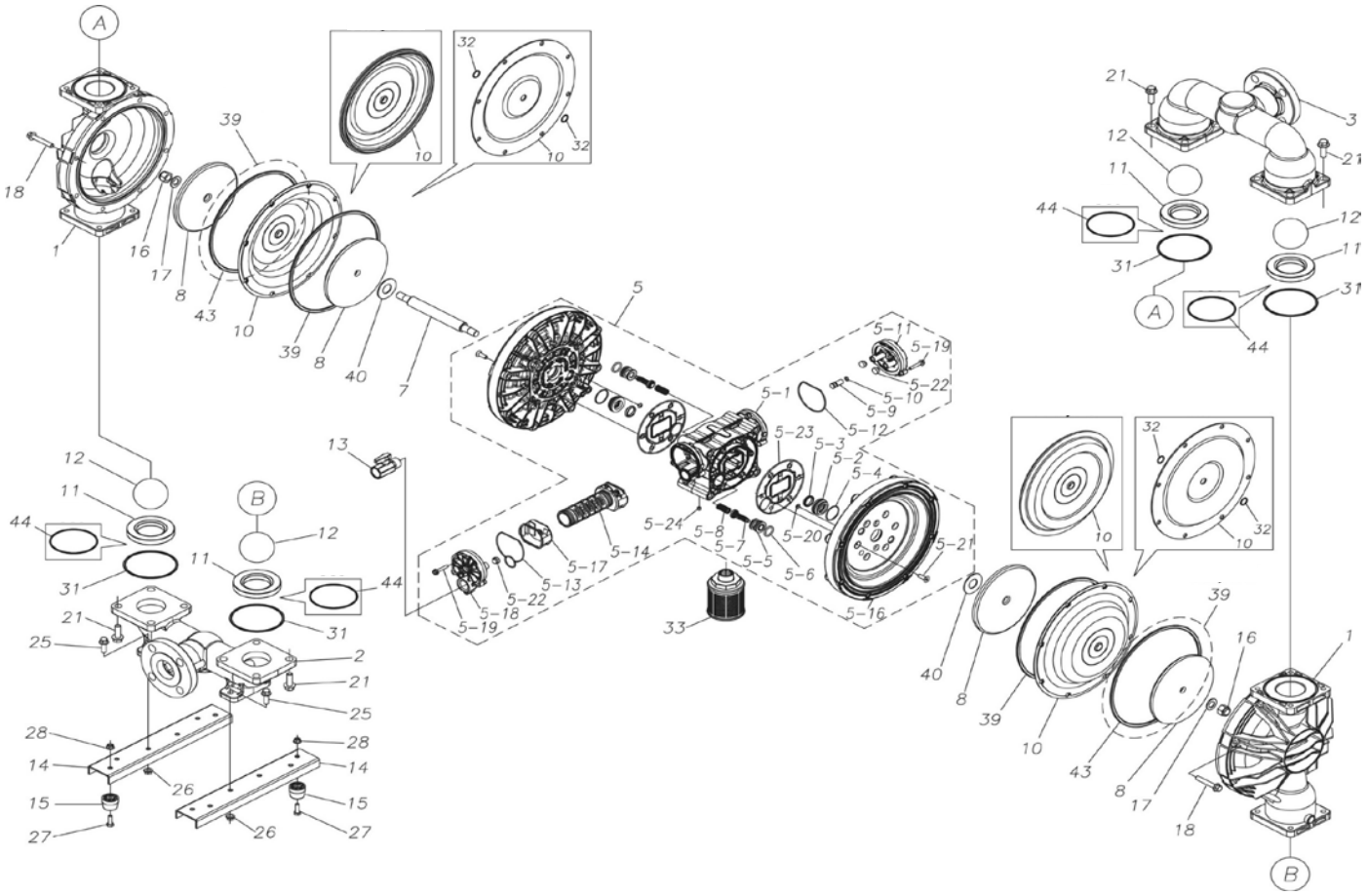
This is the measurement method used when determining the pumps performance curves. Please refer to the below measurement instruments and testing procedure.



Measurement equipment and piping layout diagram

Note: Liquid pumped: Fresh water, Temperature: Ambient, Condition of suction: Flat suction 0 meter [0 ft] head

DIAPHRAGM PUMP EXPLODED VIEW



LIQUID SIDE SERVICE KIT
(PN:M-DDP50SKWE-N)

Position Reference No	Description	Qty
10	Diaphragm 50N	2
12	Ball 50N	4
31	O Ring	4
11	Valve Seat 50N	4

AIR MOTOR SERVICE KIT
(PN:M-DDP50SKAM)

Position Reference No	Description	Qty
5-6	O-RING	2
5-4	O-RING	2
5-3	V Packing	2
5-8	Pilot Valve Spring	2
5-13	Packing Cap In	1
5-12	Packing Cap	1
5-5	Pilot Valve Seat	2
5-23	Gasket	2
5-2	Throat Bearing	2
5-7	Pilot Valve	2
5-14	Looped C Spool Valve Assembly	1

MAX FLOW SERIES

DIAPHRAGM PUMP

M-DDP75AN-01

PRODUCT INFORMATION

Model	M-DDP75AN-01
Liquid port	3" DIN
Material･Weight	Figure 1
Operating pressure	0.2 ～ 0.85 MPa [29-125 psi]
Max discharge pressure	0.85 MPa [125 psi]
Discharge volume/Cycle	6800 mL
Max Discharge	1050 L/min [277.4 Gallon/min]
Max air consumption	7000 L/min(ANR) [247.17 SCFM]
Max solid size	10 mm or less
Limitation of viscosity	Self-priming 3 Pa･s or less Force In 8 Pa･s or less
Ambient temperature	0～70 ℃
Liquid temperature	0～70 ℃
Dimensions	Figure 2
A-Weighted sound pressure level	90dB ※1
A-Weighted sound power level	99dB ※2

- The maximum supply air pressure of the pump depends on the liquid temperature. (Figure 3)
- DIAPHRAGMS. NBR 0～70℃

※1 Measurement method of A-weighted sound pressure level is based on ISO 1996.

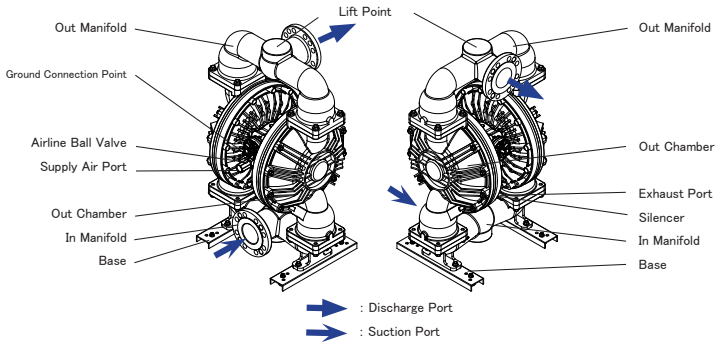
※2 Measurement method of A-weighted sound power level is based on ISO 3744.

ACCESSORIES INCLUDED WITH THE PUMP

- Airline ball valve.....1
- Liquid Inlet/Outlet Plug.....4

NAMES OF PARTS AND MATERIALS

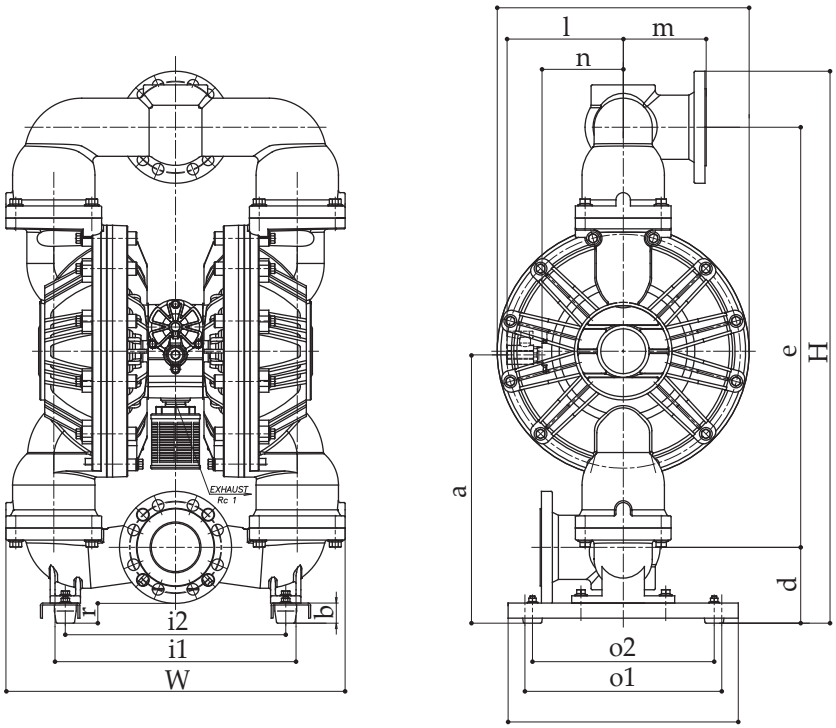
Outside view



Material and weight

MODEL	M-DDP75AN-01
Pump Wetted Parts	Aluminium
Diaphragm	NBR
Ball Valve	NBR
Valve Seat	NBR
Center Disk	A5056
Weight	68.5 kg [151.0 lbs]

DIMENSIONS



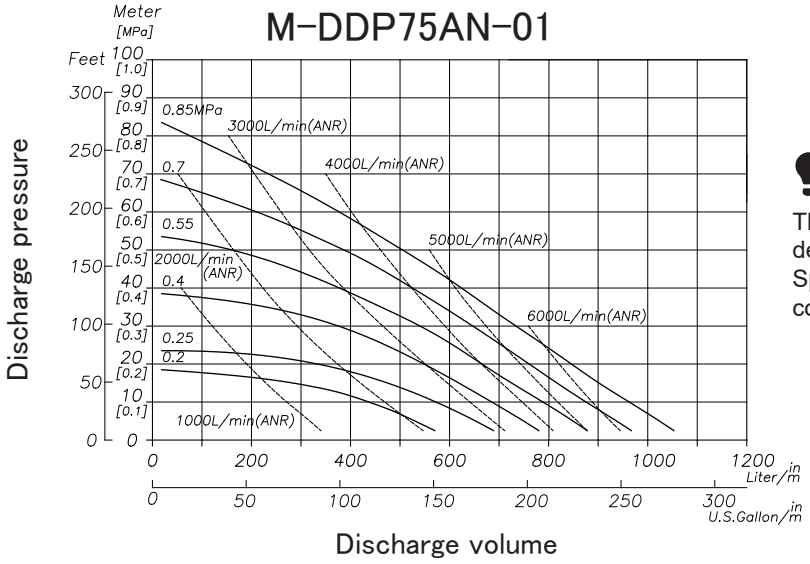
M-DDP75AN-01

MODEL	h	w	l	a	b	d	e	i (i1)	i2	l	m	n	o1	o2	p	r	air inlet	air exh	liquid in/out
M-DDP50AN-01	912 [35.91]	560 [22.05]	416 [16.38]	443 [17.44]	33 [1.30]	125 [4.92]	694 [27.32]	398 [15.67]	364 [14.33]	192 [7.56]	137 [5.39]	134 [5.28]	325 [12.80]	300 [11.81]	380 [14.96]	33 [1.30]	3/4″ BSPT	1″ BSPT	3″ DIN

(Measure : mm [inch])

Figure 2

PERFORMANCE CURVES



---------- Air consumption

———————— Performance curve

NOTICE

The maximum safe operating pressure of the pump depends on the liquid temperature. Always refer to Specifications and this liquid temperature correlation graph when determining the correct air pressure.

NOTICE

This is the measurement method used when determining the pumps performance curves. Please refer to the below measurement instruments and testing procedure.

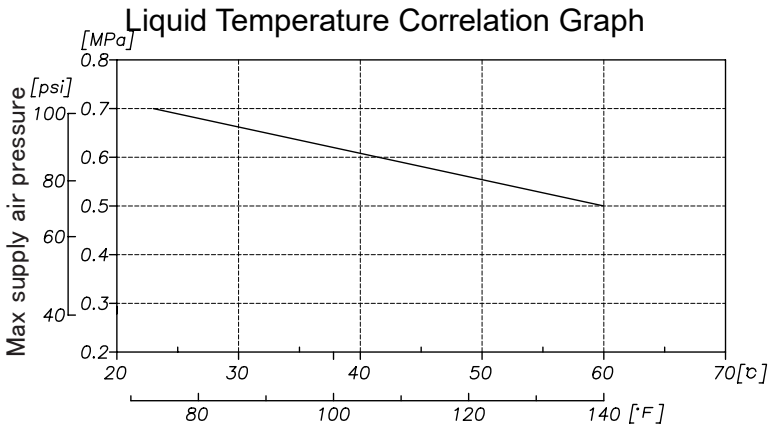
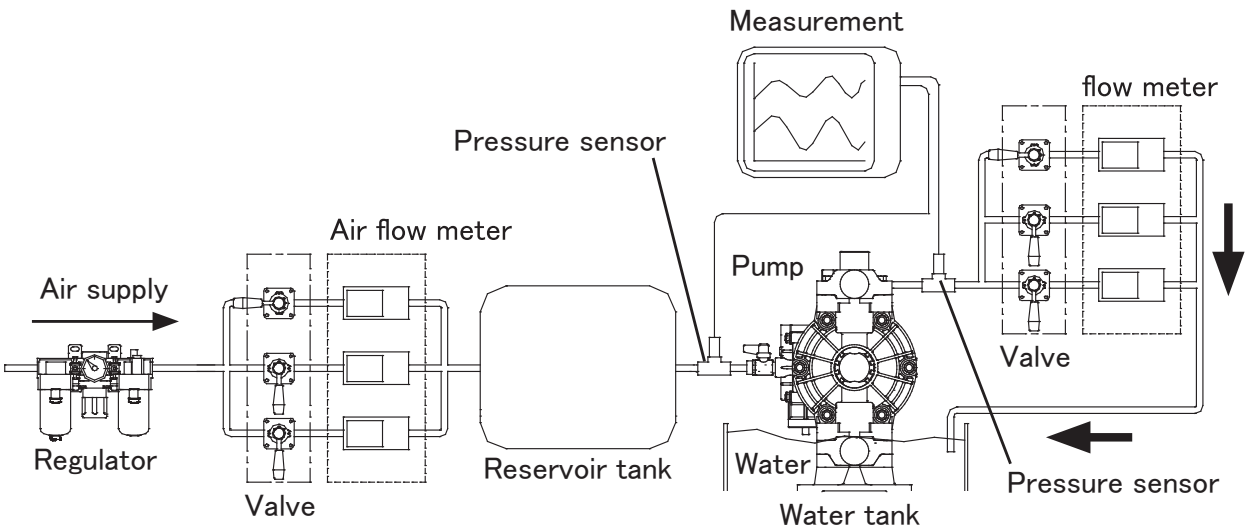


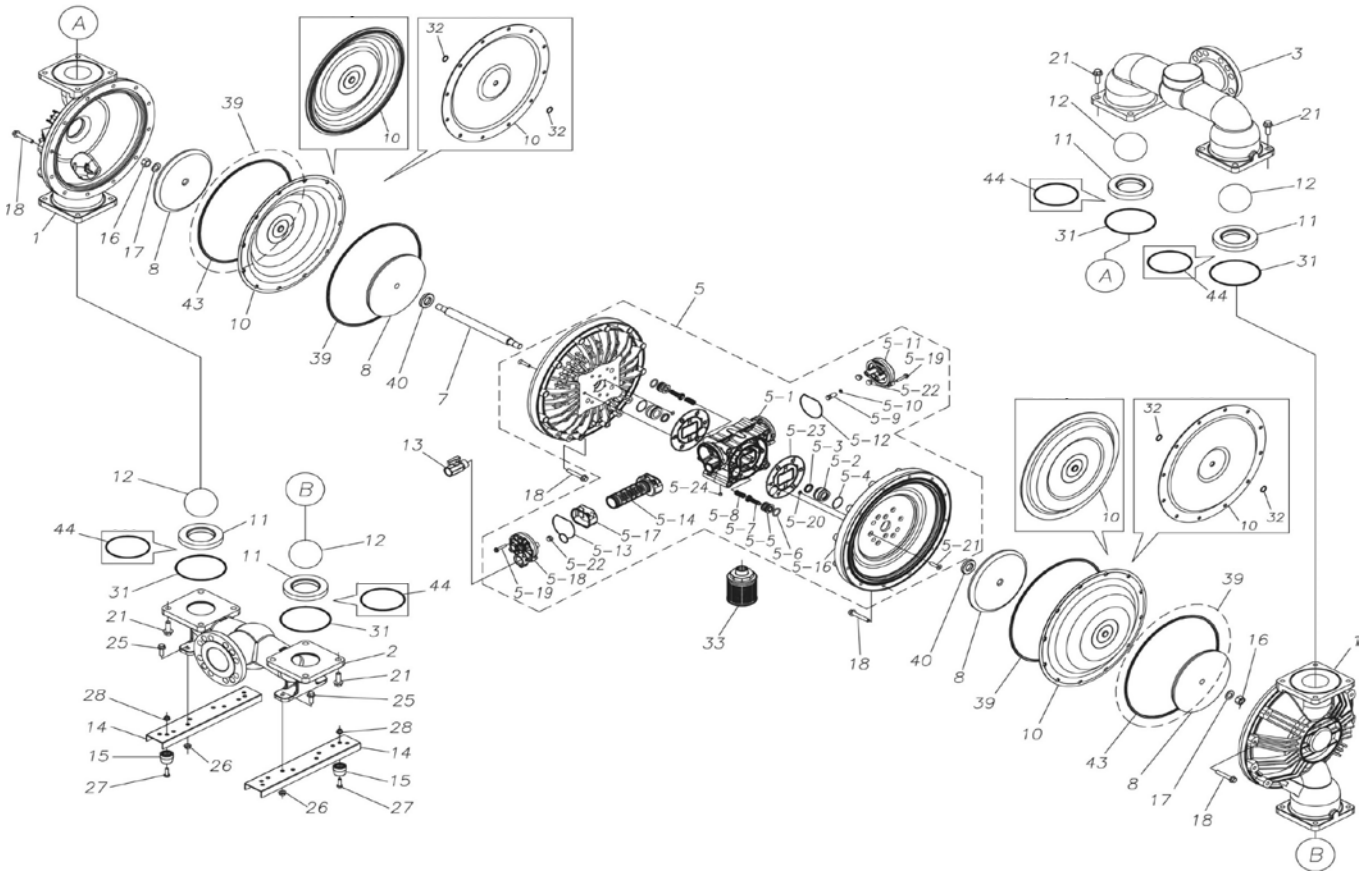
Figure 3



Measurement equipment and piping layout diagram

Note: Liquid pumped: Fresh water, Temperature: Ambient, Condition of suction: Flat suction 0 meter [0 ft] head.

DIAPHRAGM PUMP EXPLODED VIEW



LIQUID SIDE SERVICE KIT
(PN:M-DDP75SKWE-N)

Position Reference No	Description	Qty
10	Diaphragm 80N	2
12	Ball 80N	4
31	O Ring	4
11	Valve Seat 80N	4

AIR MOTOR SERVICE KIT
(PN:M-DDP75SKAM)

Position Reference No	Description	Qty
5-6	O-RING	2
5-4	O-RING	2
5-3	V Packing	2
5-8	Pilot Valve Spring	2
5-13	Packing Cap In	1
5-12	Packing Cap	1
5-5	Pilot Valve Seat	2
5-23	Gasket	2
5-2	Throat Bearing	2
5-7	Pilot Valve	2
5-14	Looped C Spool Valve Assembly	1

MAX FLOW SERIES

DIAPHRAGM PUMP

M-DDP25SW-014

PRODUCT INFORMATION

Model	M-DDP25SW-014
Liquid port	Equivalent to Ferrule 1.5S
Material･Weight	Figure 1
Operating pressure	0.2 ～ 0.7 MPa [29-100 psi]
Max discharge pressure	0.7 MPa [100 psi]
Discharge volume/Cycle	600 mL
Max Discharge	180 L/min [47.6 Gallon/min]
Max air consumption	1600 L/min (ANR) [56.5 SCFM]
Max solid size	8 mm or less
Limitation of viscosity	Self-priming 3 Pa･s or less Force In 8 Pa･s or less
Ambient temperature	0～70 ℃
Liquid temperature	0 ～ 100 ℃
Dimensions	Figure 2
A-Weighted sound pressure level	83dB ※1
A-Weighted sound power level	94dB ※2

- The maximum supply air pressure of the pump depends on the liquid temperature.(Figure 3)

※1 Measurement method of A-weighted sound pressure level is based on ISO 1996.

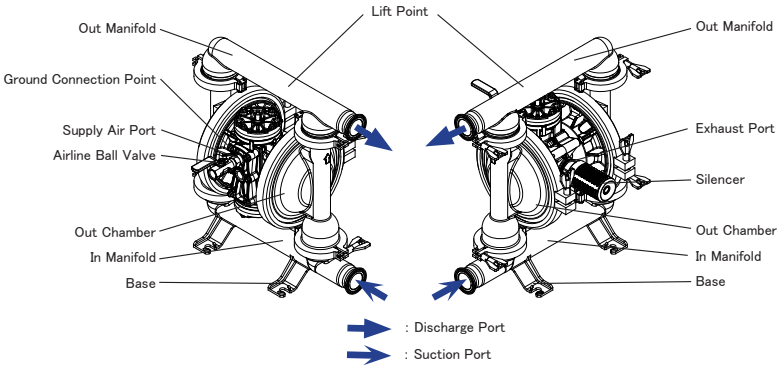
※2 Measurement method of A-weighted sound power level is based on ISO 3744.

ACCESSORIES INCLUDED WITH THE PUMP

- Airline ball valve.....1
- Liquid Inlet/Outlet Plug.....4

NAMES OF PARTS AND MATERIALS

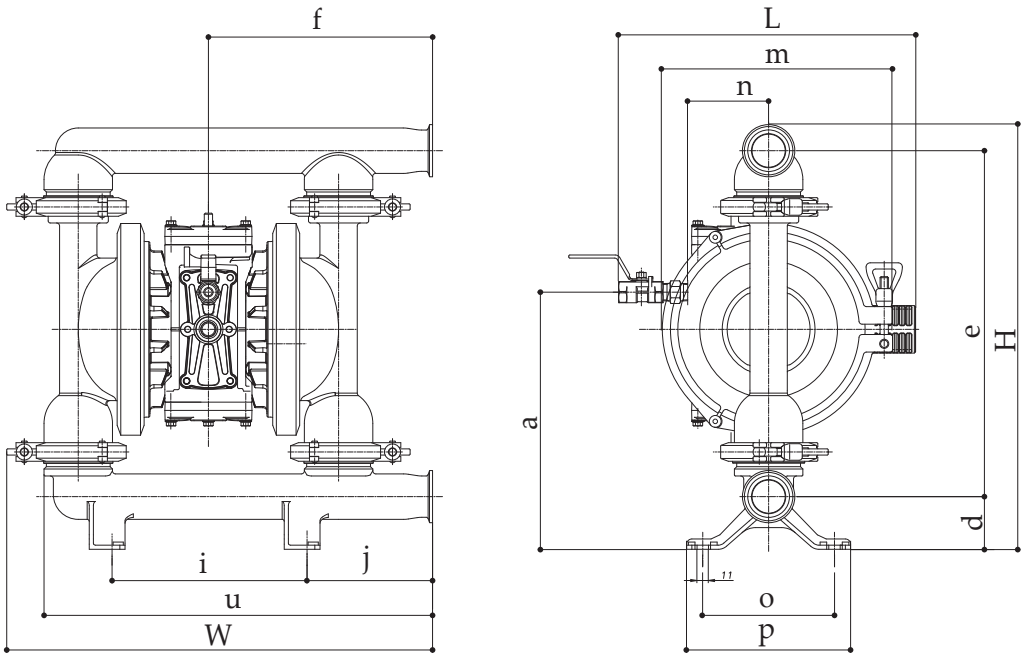
Outside view



Material and weight

MODEL	M-DDP25SW-014
Pump Wetted Parts	Stainless Steel
Diaphragm	PTFE･EPDM
Ball Valve	PTFE
Packing	PTFE
Weight	19.5 kg [43.0 lbs]

DIMENSIONS



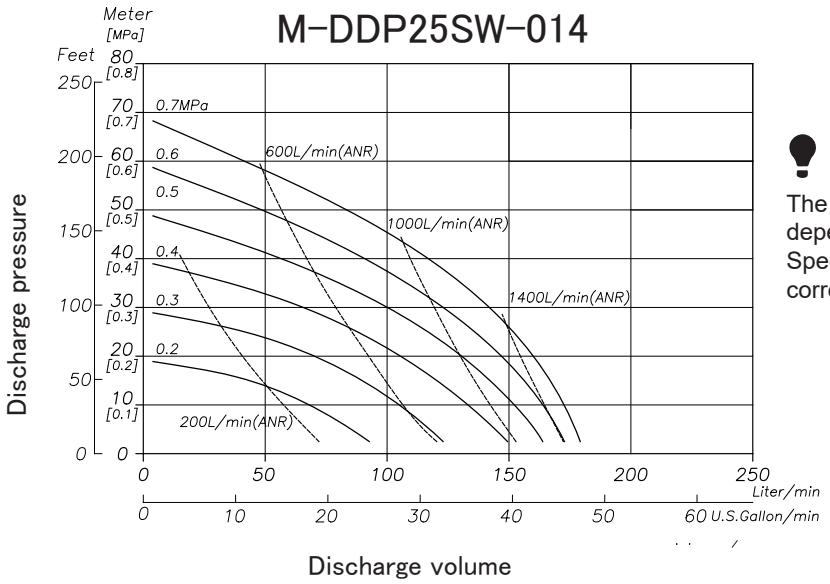
M-DDP25SW-014

MODEL	h	w	l	a	d	e	f	i	j	m	n	o	p	u	air inlet	air exh	liquid in/out
M-DDP25SW-014	411 [16.18]	411 [16.18]	286 [11.26]	249 [9.80]	51 [2.01]	335 [13.19]	216 [8.50]	188 [7.40]	121 [4.76]	222 [8.74]	78 [3.07]	127 [5.00]	158 [6.22]	375 [14.76]	3/8″ BSPT	3/4″ BSPT	Ferrule 1.5S

(Measure : mm [inch])

Figure 2

PERFORMANCE CURVES



Air consumption

Performance curve

NOTICE

The maximum safe operating pressure of the pump depends on the liquid temperature. Always refer to Specifications and this liquid temperature correlation graph when determining the correct air pressure.

NOTICE

This is the measurement method used when determining the pumps performance curves. Please refer to the below measurement instruments and testing procedure.

Liquid Temperature Correlation Graph

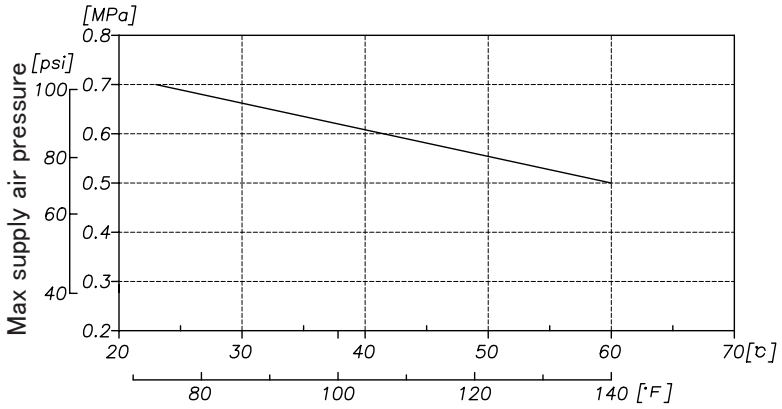
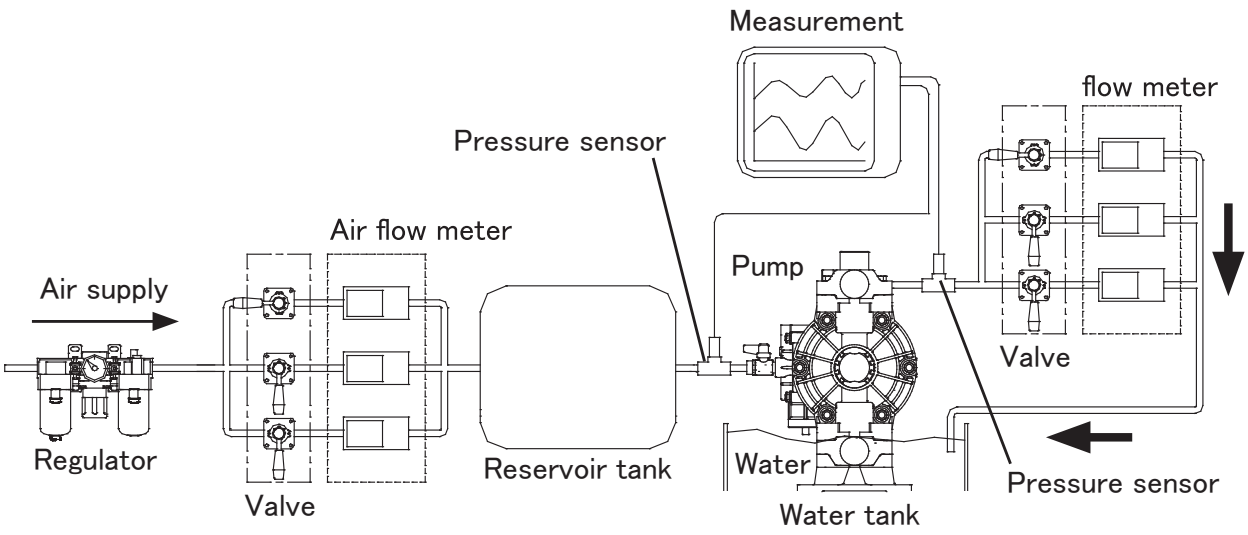


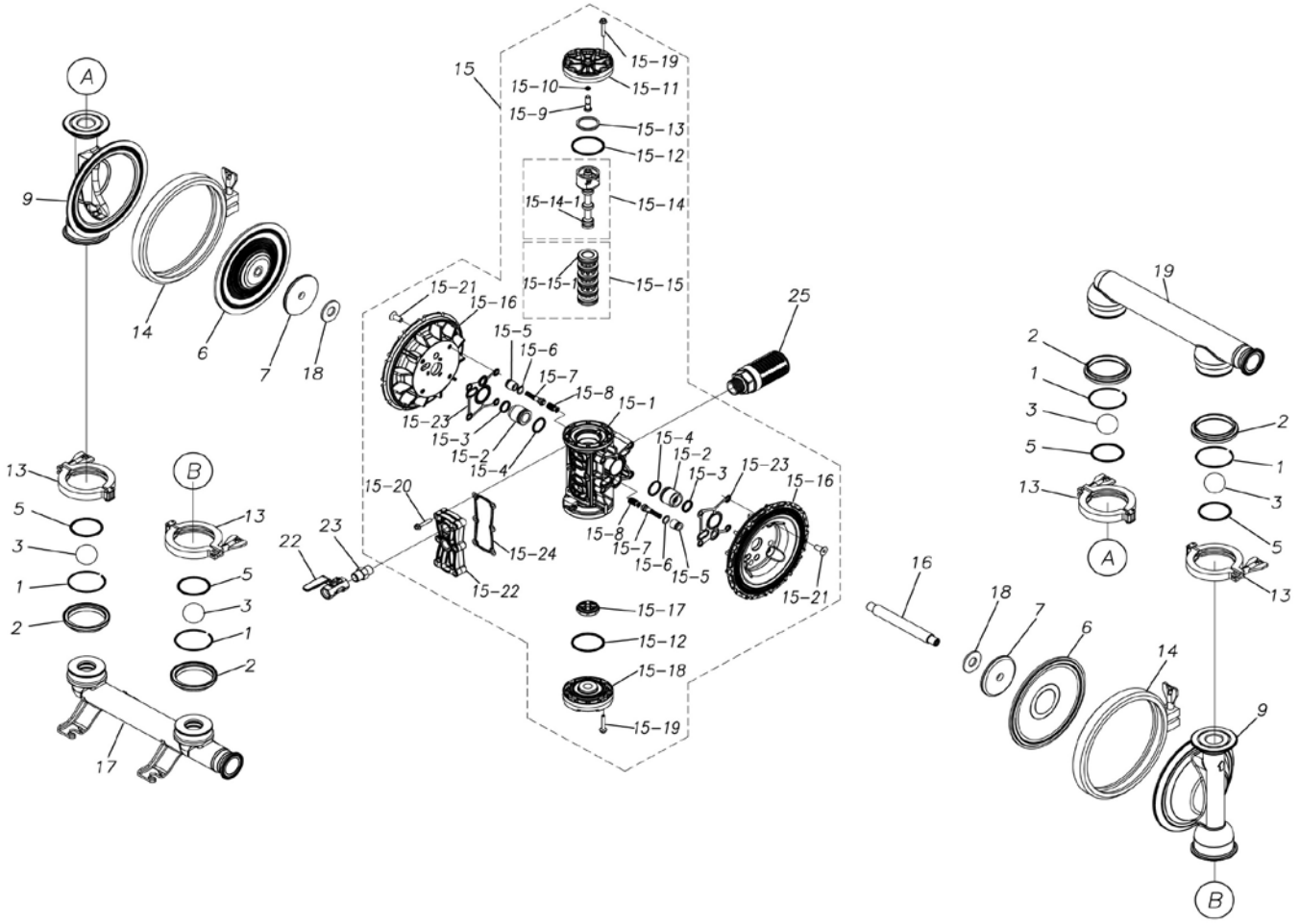
Figure 3



Measurement equipment and piping layout diagram

Note: Liquid pumped: Fresh water, Temperature: Ambient, Condition of suction: Flat suction 0 meter [0 ft] head.

DIAPHRAGM PUMP EXPLODED VIEW



LIQUID SIDE SERVICE KIT
(PN:M-DDP25SWWE)

Position Reference No	Description	Qty
6	Diaphragm 25T/E	2
3	Ball 25T	4
5	O Ring	4

AIR MOTOR SERVICE KIT
(PN:M-DDP25SWAM)

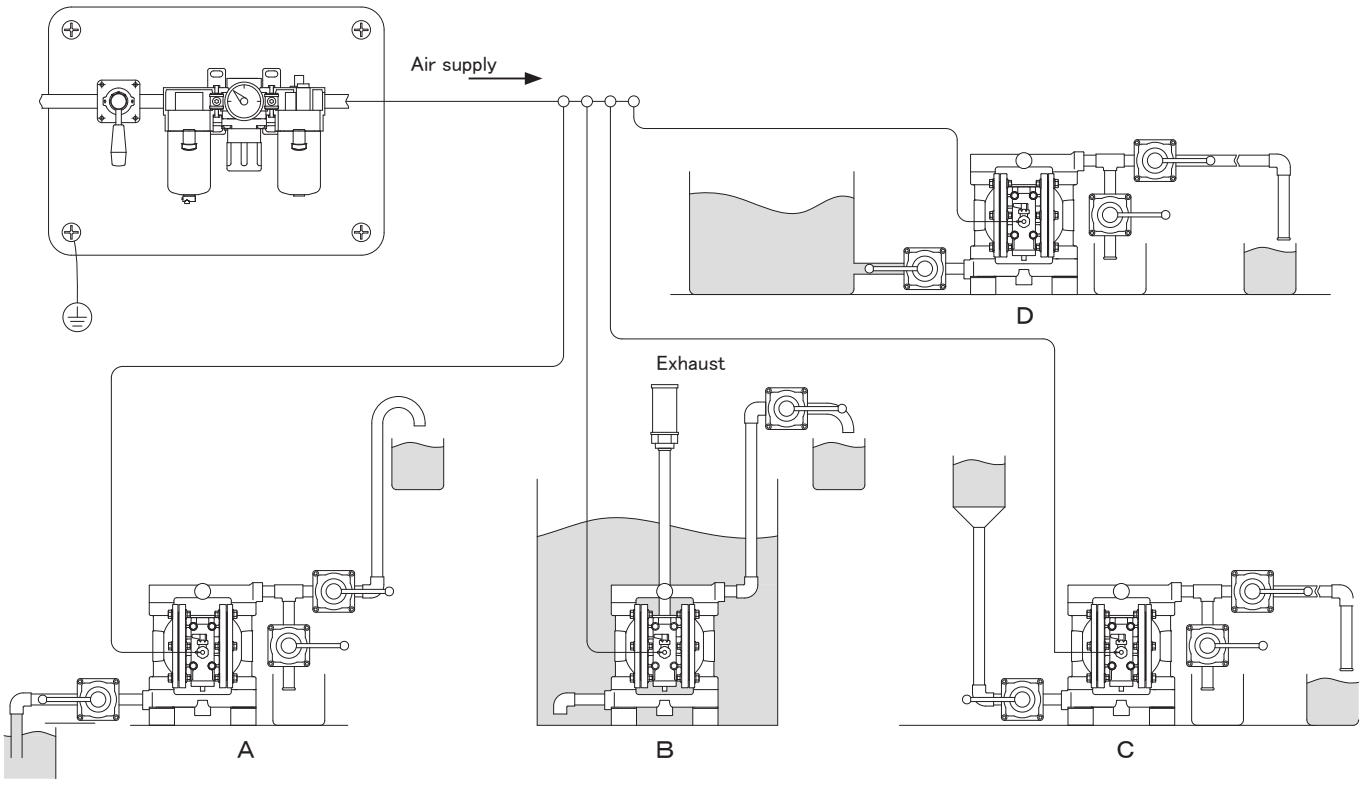
Position Reference No	Description	Qty
15-15-1	O Ring	6
15-14-1	Seal Ring	5
15-13	Packing	1
15-12	O Ring	2
15-10	O Ring	1
15-2	Throat Bearing	2
15-3	V-Packing	2
15-4	O Ring	2
15-5	Pilot Valve Seat	2
15-6	O Ring	2
15-7	Pilot Valve Assembly	2
15-8	Spring	2
18	Cushion	2
15-17	Cushion	1
15-23	Gasket	2

INSTALLATION

1.INSTALLING AND CONNECTING THE PUMP

- Decide where the pump should be installed and secure a suitable space (see Examples of installations A to D).

Examples of pump installations



- For optimal performance, try to keep the suction lift as short as possible.
- To protect the diaphragms from abnormal damage or breakage, the inlet pressure must be kept below the following values:
  ※ NBR Diaphragms：0.1MPa [14 psi] (height 10 m [32.8ft])
  ※ PTFE, EPDM Diaphragms：0.2MPa [29 psi] (height 20 m [65.6ft])
- (The above values are when transferring fresh water under ambient temperature. Depending on the liquid, these values may change.)
- When installing the pump with enclosed rubber feet, please use a method that allows it to absorb vibrations and prevents the base from making direct contact with the ground. Use the optional vibration proof rubber depending on vibration intensity.

⚠ CAUTION:

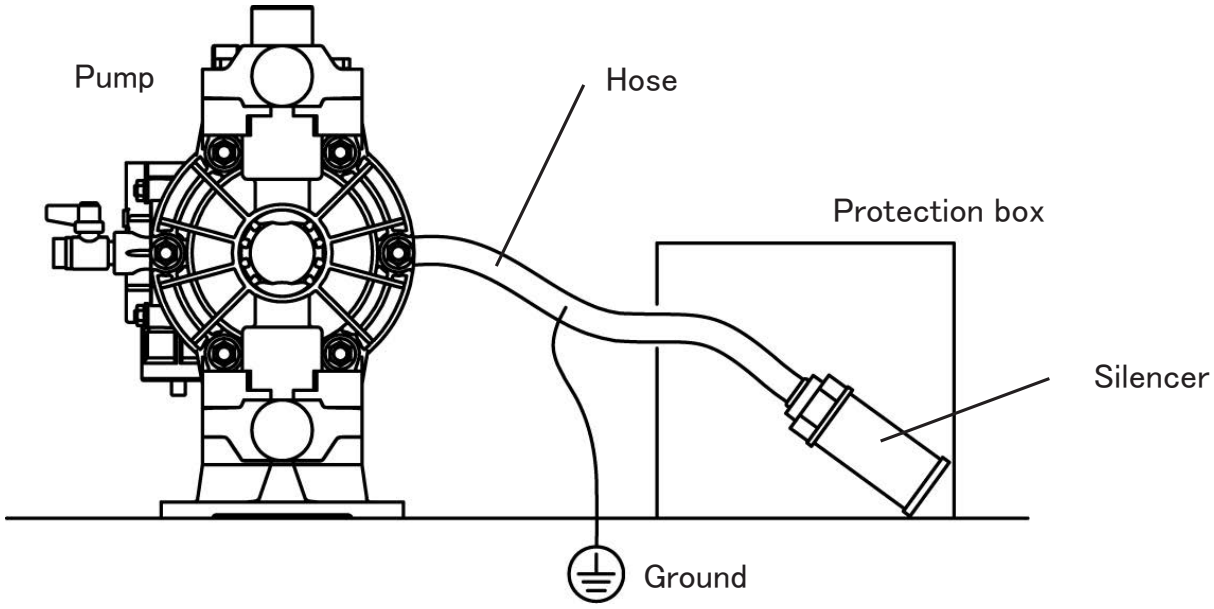
- If the pump is to be submerged in the liquid during operation, follow the steps below:
- Verify the corrosion resistance of each component of the pump, and Do NOT expose the pump to any fluid for which it does not have proper corrosion resistance.
- The exhaust should be redirected outside, not into the fluid in which the pump is submerged. For information on arranging the exhaust,see [Arranging outside exhaust] below.
- When operating the pump, operational noise will be generated, and the level will depend upon the following conditions of use (type of fluid being pumped, the supply air pressure and liquid discharge pressure). If specific regulatory sound level rules that apply to your country or region, implement appropriate acoustic counter measures. (For the noise levels of this product, see Product Information.)
- When airline operation is controlled by a solenoid valve, then a three way type valve is recommended. A three-way solenoid valve allows any trapped air to bleed off, in turn improving pump performance.
- Use a flexible hose that has grounding wires to absorb the vibration of the pump.In particular, make sure that the pump is not subjected to external force at each connection due to the weight and vibration of the hose and piping.
- Use a hose that has larger diameter than the pump's connection size. A smaller diameter may degrade performance and cause the pump to malfunction.
- When moving the pump, make sure that the pump will not fall. NEVER try to move the pump by pulling the hoses connected to the pump. Either the hose or the pump may be damaged.
- The tightening torque of bolts on this product may decrease over time. Ensure that the bolts are retightened.
- If you use the pump intermittently it will not require lubrication. However lubrication is recommended if the pump is run continuously for long periods or using very dry air or high temperatures. This will ensure the longevity of the pump's seals. If you decide to use a lubricator, use only turbine oil, Class 1(equivalent to ISO VG32).

NOTICE :-

- High temperature operation: When transferring liquids with temperature exceeds 70℃ [158℉]
- Continuous operation: When the pump operates continuously for more than 1 hour and is stops for less than 15 minutes.
- Lubrication: Use only turbine oil Class 1(equivalent to ISO VG 32), under the following conditions;
  Oil concentration at 50mg/m³, Absolute pressure at 0.1MPa [14psi].
  Maximum temperature of 20℃ [68℉] and Humidity at 65%.
- Operation condition at 70℃ or above fluid temperature might cause an early degradation of performance and required to change the material of air motor seal parts (except clamped pump).

WARNING:

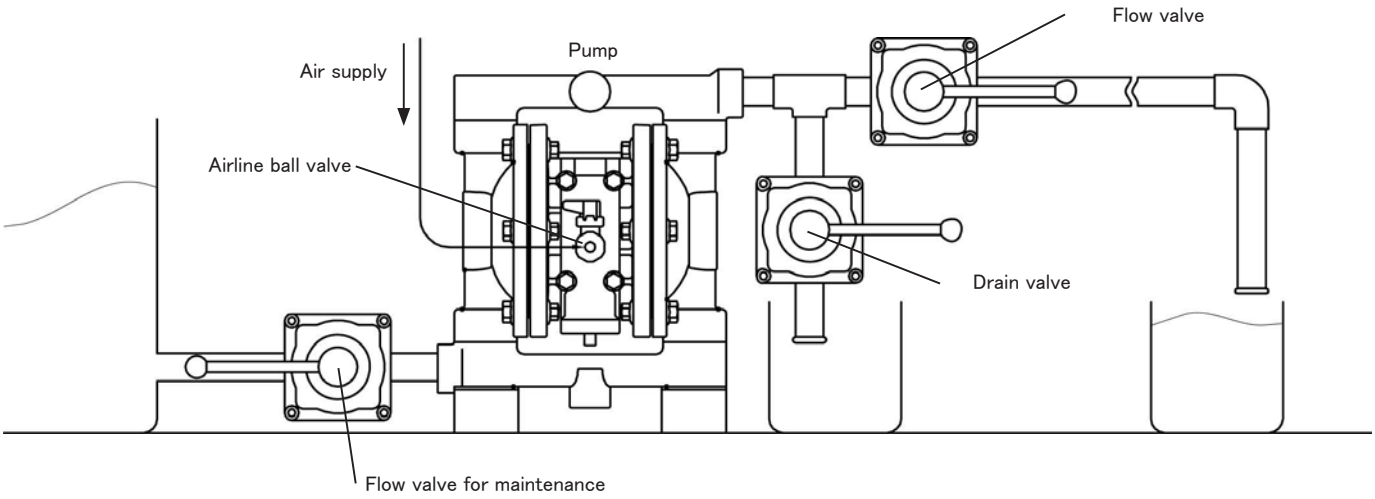
- If a diaphragm is damaged, fluid may be expelled along with the air from the exhaust port. In cases where the pump is positioned below the liquid so that hydraulic pressure is acting on the pump, pushing the diaphragms etc, if a diaphragm fails, fluid may flow out of the pump due to gravity. Please carry out protective measures, for example, place the pump in a pit, or enclose it in a protective box, use liquid detection with a spill sensor, etc, and at the same time, provide visible warnings signs around the pump.
- The Pump exhaust should be directed to a safe place, away from people, animals and food if there is a risk that The transferred liquids may be harmful to humans.
- Connect a hose with an electrical grounded wire to the pump's exhaust port, and attach the silencer to the end of the hose.
- Use a hose of the same diameter as the exhaust port. (If the hose is longer than 5 meters [16.4 feet] , consult your local distributor or our company directly.) Place the exhaust outlet in apit,or a protection box, etc.



Arranging outside exhaust

2.RECOMMENDED LIQUID PIPING CONNECTION DIAGRAM

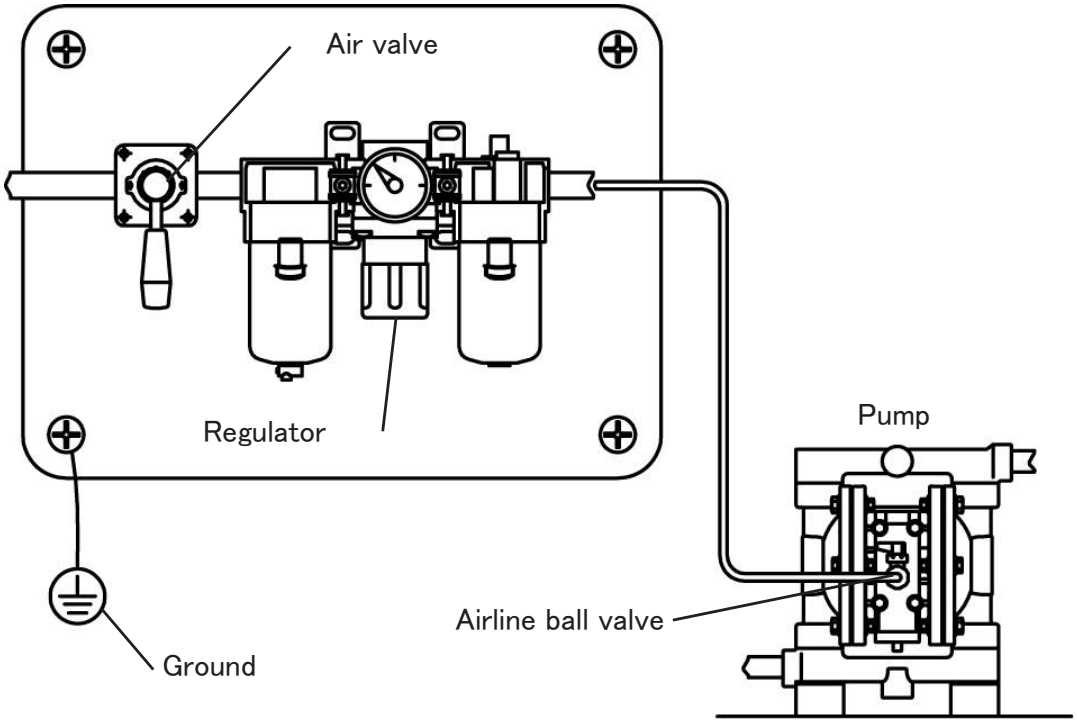
- Connect a flow valve and a drain valve to the liquid discharge side (outlet) of the pump.
- Connect a flow valve to the suction side (inlet) of the pump for maintenance purposes.
- Connect hoses to both the suction side and the discharge side of the pump and attach them to the respective vessels.



- When fitting liquid hoses to the pump, make sure to use a sturdy hose that will not collapse under strong suction pressure from the pump. Also make sure the hose has a sufficient pressure rating to cope with the required discharge pressure.
- When pumping a fluid that contains slurry, verify that the particle size is below the Max solid size (see Product Information). If it exceeds slurry size limitation indicated in the main specifications, attach a strainer to the pump to stop larger particles.
- Otherwise, such particles may cause a malfunction.
- Depending on changes in pumping conditions such as expanding liquids or changes in liquid temperature the pressure inside the pump could change drastically. In such cases install a relief valve on the liquid discharge side, to bring the pressure down below the maximum permissible value.
- When testing piping for leakage, Do NOT apply pressure to the pump's inlet and outlet sides with compressed air from outside. It may cause abnormal breakage to the diaphragm or the switching portion.
- When installing a standby pump or two pumps in parallel, be sure to provide a flow valve on each of the IN and OUT liquid material manifolds and perform pump switchovers by first shutting off both pumps and separating them through the liquid material valves. If a liquid line valve of the stopped pump remains open, the diaphragms could be inverted or stretched and possibly broken by the discharge pressure produced by the operating pump, thus resulting in damage in an early stage.

3. RECOMMENDED AIR PIPING CONNECTION DIAGRAM

- Connect an air valve, air filter, regulator and if necessary a lubricator (Make sure they are rated to provide sufficient air volume passage as require to run the pump correctly) Connect hoses to the pump and the compressor.



⚠ CAUTION:

- The piping and the peripheral equipment may become clogged with foreign matter such as dust the dirt or sludge. Clean the inside of the piping for 10 to 20 seconds before connecting it to the pump.

OPERATION

1. PUMP START UP

- Open the air valve in front of each piece of peripheral equipment, and adjust the supply air pressure with a regulator to within the permissible range.
- Open the flow valve on the discharge side.
- Press the RESET BUTTON, and then slowly open the air valve of the pump.
- Before allowing the pump to run at full pressure, first verify that the pump is primed and fluid is flowing inside the piping and it being pumped to the discharge side, and then fully open the air valve.

WARNING:

- If air pressure and discharge pressure exceed the allowable operating pressure, it may cause liquid leaks, damag to pump casings or diaphragms and which cause a fatal accident.

2. LIQUID FLOW ADJUSTMENTS

- Adjust the flow valve on the discharge side. To see the relationship between the flow rate, supply air pressure and discharge pressure, see [Performance curves].
- As you start closing the liquid discharge flow valve, the supplied air pressure may rise. Make sure that the pressure is kept within the normal operating range.
- Depending on the viscosity and specific gravity of the fluid, the suction stroke and other conditions, the permissible suction flow rate of fluid into the pump will vary; however, if the pump rate increases significantly, cavitation could occur, and this will not only reduce pump performance, but it may cause a malfunction. To prevent cavitation adjust the supply air pressure as well as the discharge flow valve.
- If fluid is not discharged after you start the pump, or if you hear an abnormal noise or notice any irregularity, shut down the pump immediately (see [Troubleshooting]).
- The pump may stall if operated at less than 20 cycles per minute. Please press the reset button restart the pump.

3. STOPPING THE PUMP

- Close the air valve of the pump and shut off the supplied air.

CAUTION:

- It is permissible to shut down the pump by closing the liquid discharge flow valve even while air is still being supplied to the pump. However, if this condition continues for an extended period without supervision, the pump may start running if there is a leak from the pump or piping, and therefore fluid may continue flowing out of the position of leakage.

CAUTION:

- When the pump is shut down while pumping liquids containing slurry, particulate slurry matter contained in the liquid can settle and become deposited inside the bottom of the liquid chambers. If the pump is started again in this condition, the diaphragm may be damaged or the center disk may be overloaded, and this may cause damage such as bending or breaking of the center disk or center rod. As a countermeasure, after completing operation, it is recommended to purge the pump of any remaining fluid and slurry particulates.

4. RELEASING PRESSURE

- Make sure that the air line ball valve of the pump is closed.
- Close the valve on the air-supply side of the peripheral equipment.
- Close the flow valve on the discharge side, slowly open the drain valve, and discharge the pressurized fluid.
- Open the airline ball valve of the pump, and run the pump until all the remaining pressurized air and liquid inside the pump is expelled.

CAUTION:

- Fluid under pressure will gush out as soon as you open the valve, so take extreme care.

5. METHOD OF CLEANING THE PUMP

WARNING:

- Before starting operation, make sure that the pump is not pressurized.
- Be careful when removing any piping from the pump as any remaining fluid may gush out.

- Remove the inlet hose from the suction side of the pump.
- Close the flow valve on the discharge side, open the drain valve, and then operate the pump by opening the air pressure valve for a while to discharge any fluid remaining inside the pump.
- Remove the outlet hose from the discharge side, and attach different hoses to the suction side and the discharge side for cleaning purposes.
- Prepare a vessel with cleaning solution, select a cleaning solution that i appropriate for the type of fluid being pumped, and then connect the suction-side and the discharge-side hoses to the pump.
- Operate the pump by starting the air pressure slowly, and let the cleaning solution circulate for a sufficient period to thoroughly clean the pump. (Finally, flush the pump with clean water.)
- Remove the hose from the suction side of the pump, then run the pump for a while to purge all remaining fluid
- After flushing with clean water, turn the pump upside-down to drain out any remaining water remaining in the pump.

MAINTENANCE

Daily maintenance checks

- Make sure the air filter drain is empty and working correctly.
- When using a lubricator, verify that the quantity of lubricating oil is sufficient.
- Make sure that there is no leakage of fluid from any hose connections or the pump body.
- Check each bolt of the pump and retighten as necessary.
- Make sure that there are no cracks in the pump casing or piping.
- Make sure that the pipe connections are not loose.

TROUBLESHOOTING

Problem	Probable Cause	Actions to be taken
The pump is not running	The exhaust port (silencer) of pump is clogged with Dirt or sludge.	Check and clean the exhaust port or replace the silencer
	Air is not supplied	Start the compressor, open the airline ball valve and air Regulator. Check functionality of solenoid valves (if fitted).
	The supplied air pressure is too low	Raise the supplied air pressure to the pump. Check the compressor and regulator settings and check that the configuration of the air piping is correct.
		Increase the supplied air volume to the pump. Check the compressor size, fittings & air piping inner diameter and air regulators are of sufficient size. Make sure air is not being syphoned off used to power other pumps or equipment.
	The spool stopped in neutral position	Press the RESET button.
	The discharge line is closed or blocked	Open the discharge valve. Check functionality of solenoid valves (if fitted). Check for blockage caused by slurry etc. Check that the liquid line back pressure is not higher than the supplied air pressure.
	Air motor section is corroded or damaged	Check for liquid contamination, chemical attack or corrosion to the moving components inside the air motor section. Clean or replace as necessary

TROUBLESHOOTING

Problem	Probable Cause	Actions to be taken
Pump runs, but fluid does not discharge, or flow decreases or stops.	The suction lift or discharge head is too long	Confirm the piping configuration and shorten the length
	Supply tank is empty or inlet valve is closed or piping is crimped	Change or refill tank, check that inlet valves are fully open.
	Air leak on (inlet) suction side	Check that inlet hose or hose fittings are not loose or broken and pump manifold torque values are correct. Check the Inlet Manifold O-rings are not damaged or missing.
	The suction-side fluid piping (including the strainer) is clogged with slurry or sludge	Check and clean the fluid piping and filters (if fitted).
	The supply air pressure is low	Raise the supplied air pressure to the pump. Check the compressor and regulator settings and check that the configuration of the air piping is correct.
	Cavitation occurs	Adjust the correlation between supply air pressure inlet and discharge flow or pressure, or shorten the suction lift length.
	Chattering occurs (ball valves not seating properly)	Check and adjust the correlation between supplied air pressure and inlet pressureand discharge pressure or flow. Decrease the inlet flow rate or increase the back pressure by slightly closing the discharge valve. Check the ball valve material is sufficiently heavy compared to the liquid being pumped.
	Icing on air-switching portion	Check that the air filter and exhaust are clean and not blocked or restricted. Check and adjust the air flow rate and the correlation between the liquid flow rates. Fit a speed control muffler. Manually remove ice from airswitching valve before restarting.
	The exhaust port (silencer) of pump is clogged with sludge. Or the air filter is blocked	Check and clean the exhaust port or replace the silencer. Check and replace the air filter as necessary.
	Air valve seals or sleeve or sleeve O-rings worn out or damaged	Inspect air valve and sleeve and replace components as necessary.

TROUBLESHOOTING

Problem	Probable Cause	Actions to be taken
Liquid leakage from exhaust port (silencer)	The diaphragm is damaged	Disassemble and check the pump and replace the diaphragm.
	The fastening nuts for the center disk are loose	Disassemble and check the pump. Tighten the nuts.
Air is mixed into the liquid	The center disk O-rings are damaged or missing	Disassemble and check the pump. Replace the O-rings if necessary.
	Excessive airline moisture or oil lubrication	Check and repair the compressor. Fit or empty an airline moisture drainer. Reduce or remove the oil lubrication.
	The diaphragm is perforated cut or torn	Disassemble and check the pump check and replace the diaphragms as necessary
	The diaphragm is not seated correctly within the chambers or the O-ring is missing	Check the positioning of the diaphragm is correct, and check the diaphragm is not deformed due to under torque of the chamber bolts. Check the O-ring is not missing or damaged and replace as necessary. Re-Torque the chamber bolts t the correct value
	Air leak on (inlet) suction side	Check that inlet hose or hose fittings are not loose or broken and the pump manifold torque values are correct. Check the Inlet manifold O-rings are not damaged or missing.
Irregular noise	The supply air pressure is too high	Lower the supply air pressure to the pump. (Check the compressor and the configuration of air piping.)
	The spool oscillates and ball chattering occurs	Adjust the supply air pressure and discharge pressure. Reduce inlet flow valve to adjusting liquid pressure and volume.
	The pump is clogged with sludge with particles of larger than the permissible diameter	Disassemble the casing, check and clean.
	Pilot valve(s) are faulty or damaged	Inspect and replace pilots, seals or bushings as necessary
	Exhaust (muffler) is missing or broken	Inspect replace or fit a new muffler.

TROUBLESHOOTING

Problem	Probable Cause	Actions to be taken
Irregular vibration	The supply air pressure is too high	Lower the supply air pressure to the pump. (Check the compressor and the configuration of air piping.)
	The spool oscillates, and Occur ball chattering	Adjust the supply air pressure and discharge pressure. Reduce inlet flow valve to adjusting liquid pressure and volume.
	Connection parts and pump mounting are loose	Check each connection part and tighten the bolts.
	Piping is loose or vibrating due to the pump action or from water hammer etc	Secure piping to a mounting and or fit flexible connections between pump and piping.
Bent or broken centre shaft	Pumping slurry with excessive solids content	Reduce solids content to specified values.
	Slurry settling when pump is not in use	Flush or clean slurry from pump before use. Or start pump very slowly until settled solids are dissipated.
	Loose center disk	Make to torque center rod bolts correctly. Always torque both bolts at the same time.
Premature diaphragm failure	Chemical attack (misapplied diaphragm)	Make sure to match chemical to diaphragm material.
	Temperature damage (too hot/too cold)	Use a diaphragm material better suited to high/low temperature applications.
	Over & Under Torque	Make sure to check and keep the correct chamber torque values.
	Excessive suction (vacuum) pressure (liquid inlet side)	Keep suction pressure to within specified limits. Change to a thermoplastic elastomer diaphragm if possible.
	Excessive liquid inlet pressure	Keep inlet pressure to within specified limits. Change to a thermoplastic elastomer diaphragm if possible. Start & run pump slowly until it is primed fully.
	Excessive abrasion damage cut or worn	Change diaphragm to an elastomer with higher abrasion resistance if possible.
	Over pressurization air side / excess airline pressure	Keep air pressure within allowable limits. Use a thermo plastic elastomer diaphragm if possible.
	Misassembled center disks / Backwards	Make sure to follow the correct assembly procedure outlined within the pump manual.

Macnaught Pty Limited
ABN 66 000 075 785

41-49 Henderson Street

Turrella NSW 2205 Sydney Australia Postal
Address PO Box 90
Arncliffe NSW 2205 Sydney Australia

T: +61 2 9567 0401

F: +61 2 9597 7773

W: www.macnaught.com.au

Note:
This product should be disposed of according to all applicable local and national government environment regulations and guidelines.

For Warranty Terms and Conditions see macnaught.com.au
For a list of Australian Service Centres see macnaught.com.au