

# CONDENSATE AUTO DRAIN

## ***DRAIN MASTER-S/HP***

### Instructions and operation manual

Model : DM-5S, DM-5, DM-5N, DM-15, DM-50,  
 DM-150, DM-500, DM-1500,  
 DM-15HP, DM-50HP, DM-150HP

### PRODUCT RANGE

► Auto Drain Trap (Level-sensor type)

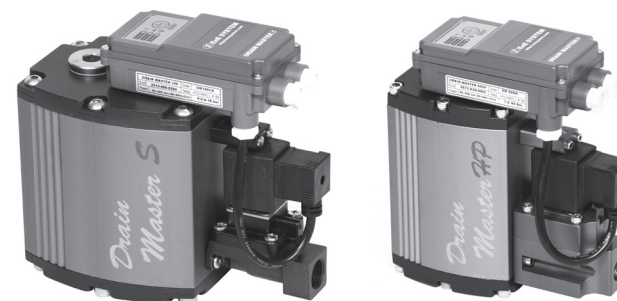
- DRAIN MASTER**
- DRAIN MASTER S Auto Drain Trap (Solenoid valve type)
  - DRAIN MASTER HP Auto Drain Trap for High Pressure (Max 60 bar)
  - DRAIN MASTER B Auto Drain Trap (Ball valve type)
  - DRAIN MASTER V Auto Drain Trap for Vacuum
  - DRAIN MASTER T Auto Drain Trap (Timer type)

► Oil-water Separator

- YUSOO-BREAKER**
- Filter Type Oil-water Separator

► Emulsion Separator

- ENVISOL**
- Chemical Type Oil-water Separator



Subject to technical changes without prior notice, errors not excluded.

Edition : 09.2015

- ◆ Please read this manual before installation of **DRAIN MASTER**
- ◆ Functions of **DRAIN MASTER** are enabled properly only when the instructions herein are observed.

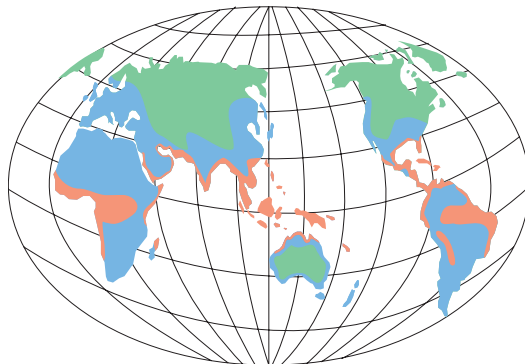
## Table of Contents

1. IMPORTANT INFORMATION.....	2
2. TECHNICAL DATA .....	3
3. DIMENSION .....	4~9
4. FUNCTION .....	10
5. INSTALLATION.....	11
6. ELECTRICAL INSTALLATION & DATA .....	12
7. MAINTENANCE & CONSUMABLES .....	13
8. COMPONENTS .....	14~24

## IMPORTANT INFORMATION

- ▶ Do not apply pressure exceed the max operating pressure.
- ▶ Do not press and hold the Test button.
- ▶ Do not use the Product in dangerous (explosive) areas.
- ▶ Shut the condensate feed line and discharge pressure from the system before installing of DRAIN MASTER S/HP or performing maintenance on the system.
- ▶ Always use materials and components suitable for safety standard.
- ▶ Always use standard tools.
- ▶ Fit an automatic temperature control device (heater) (option) when the Product is installed in areas exposed to freezing.
- ▶ Electrical installation must be performed by qualified technician.
- ▶ DRAIN MASTER S/HP is activated only when it is connected to power.
- ▶ Always use authentic components provided by the Company for replacement to be protected under warranty.

## TECHNICAL DATA



## TECHNICAL DATA

DRAIN MASTER B	Climate zone	Peak Compressor Performance m3/min	Peak Dryer Performance m3/min	Peak Filter Performance m3/min	NRTL	CE	IP 65
					Operating Pressure min / max (bar)	Temperature min / max (°C)	Application (*)
DM-5S	Green	5	10	50	0.8 ~ 16	+1 / 80	A, B
	Blue	4.5	9	45			
	Red	3	6	30			
DM-5	Green	7	14	70			
	Blue	5	10	50			
	Red	4.5	9	45			
DM-5N	Green	8	16	80			
	Blue	7	14	70			
	Red	5	10	50			
DM-15	Green	24	48	240			
	Blue	21	42	210			
	Red	15	30	150			
DM-50	Green	80	160	800			
	Blue	70	140	700			
	Red	50	100	500			
DM-150	Green	170	340	1700			
	Blue	150	300	1500			
	Red	105	210	1050			
DM-500	Green	570	1140	5700			
	Blue	500	1000	5000			
	Red	350	700	350			
DM-1500	Green	1750	3500				
	Blue	1500	3000				
	Red	1050	2100				
DM-15HP	Green	24	48	240	1.2 / 60	+1 / 80	A, B
	Blue	21	42	210			
	Red	15	30	150			
DM-50HP	Green	80	160	800			
	Blue	70	140	700			
	Red	50	100	500			
DM-150HP	Green	170	340	1700			
	Blue	150	300	1500			
	Red	105	210	1050			

▶ Green: Dry and cool climate(such as in Northern Europe,Canada, Northern states of the USA, Central Asia)

▶ Blue: temperate climate(such as in Central and Southern Europe, Central America)...Korea

▶ Red: humid, tropical climate(such as in the coastal regions of South-East Asia, Oceania, Amazon and Congo regions)

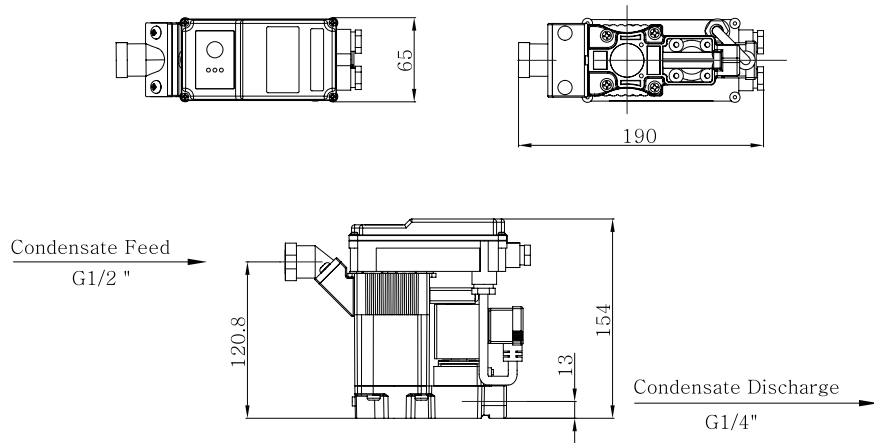
※ Application: A.oil contaminated condensate B.oil free, aggressive condensate

DRAIN MASTER S/HP	DM-5S DM-5N	DM-5 DM-15	DM-50	DM-150	DM-500	DM-1500	DM-15HP	DM-50HP	DM-150HP		
Condensate Feed	1/2"	1/2" x 2		3/4" x 3		1"x1,3/4"x2		1/2" x 2		3/4" x 3	
Condensate Discharge	1/4"	3/8"	1/2"						3/8"		
Voltage	Free voltage 90~240Vac, 24/48Vdc, 24/48Vac										
Housing Material	POM	Aluminium, Hardcoated									
Weight (Kg)	0.92	1.3	1.25	1.65	2.2	3.3	5.3	7.3	1.95	2.5	4.05

▶ Must attach automatic thermostat(option : Heater unit) in freezing area.

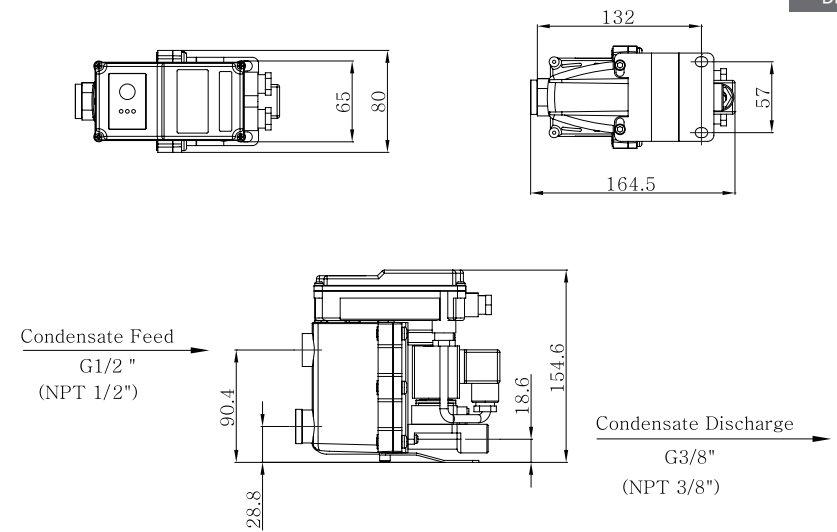
## DIMENSION

DM-5S

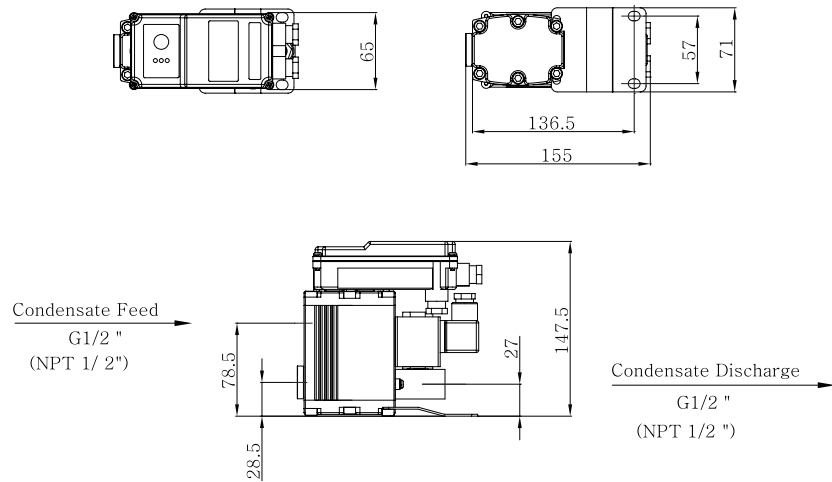


## DIMENSION

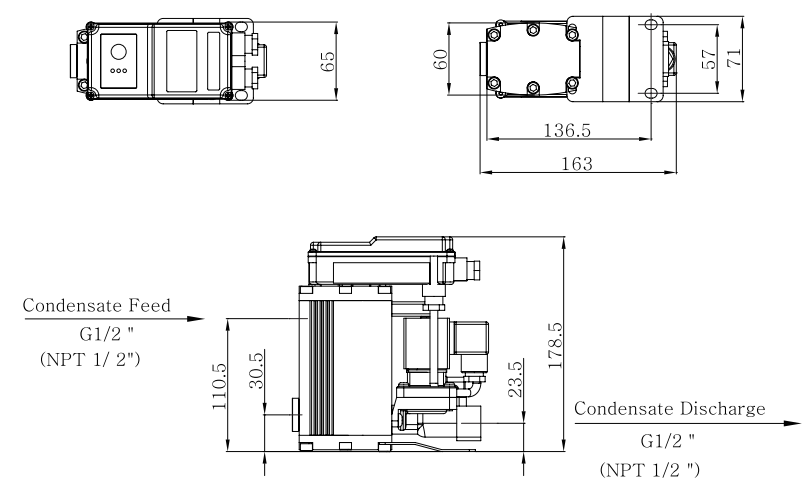
DM-5N



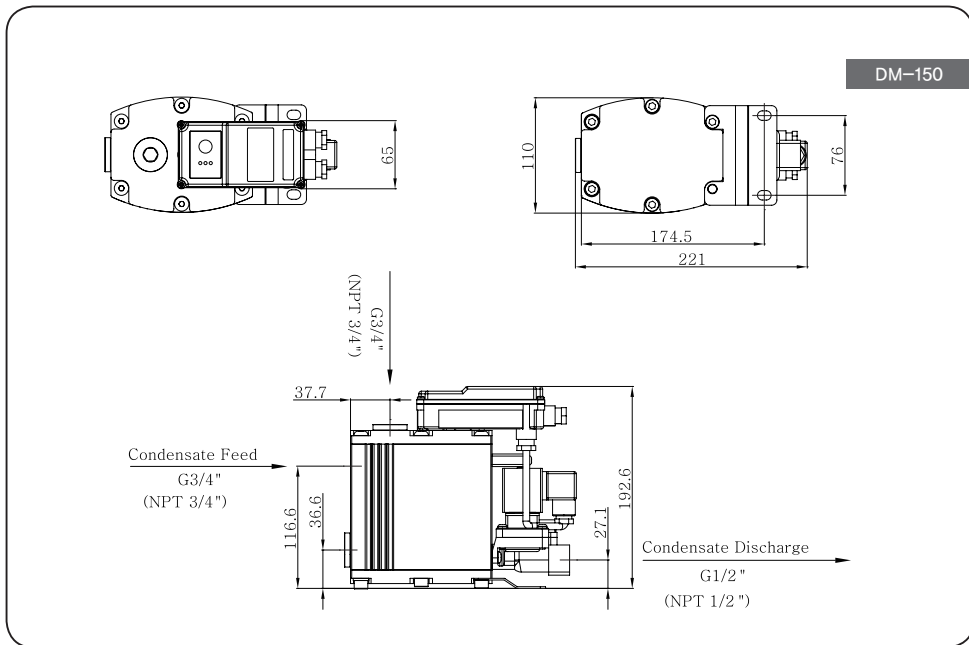
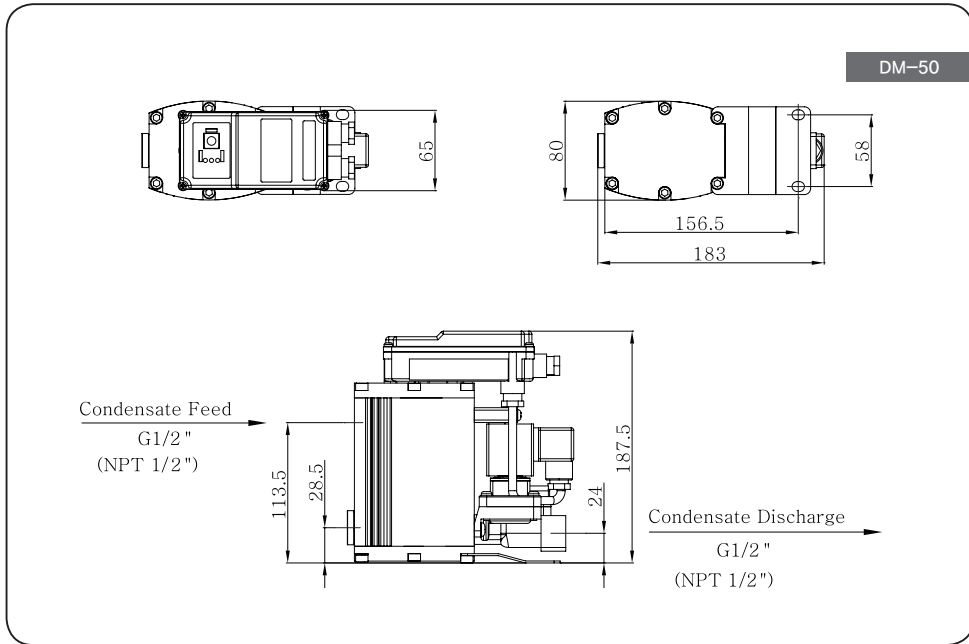
DM-5



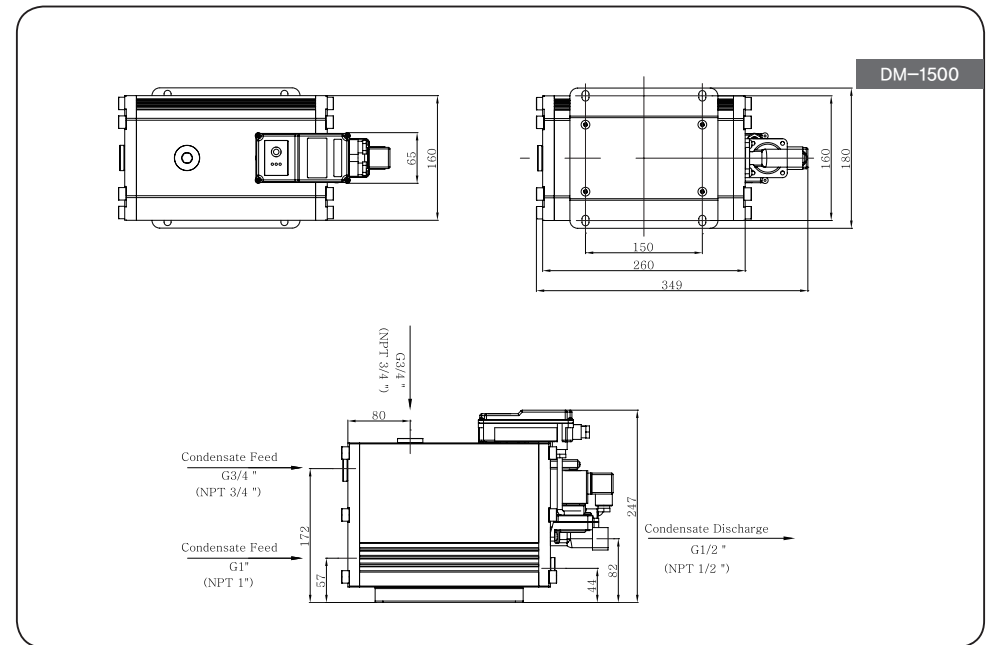
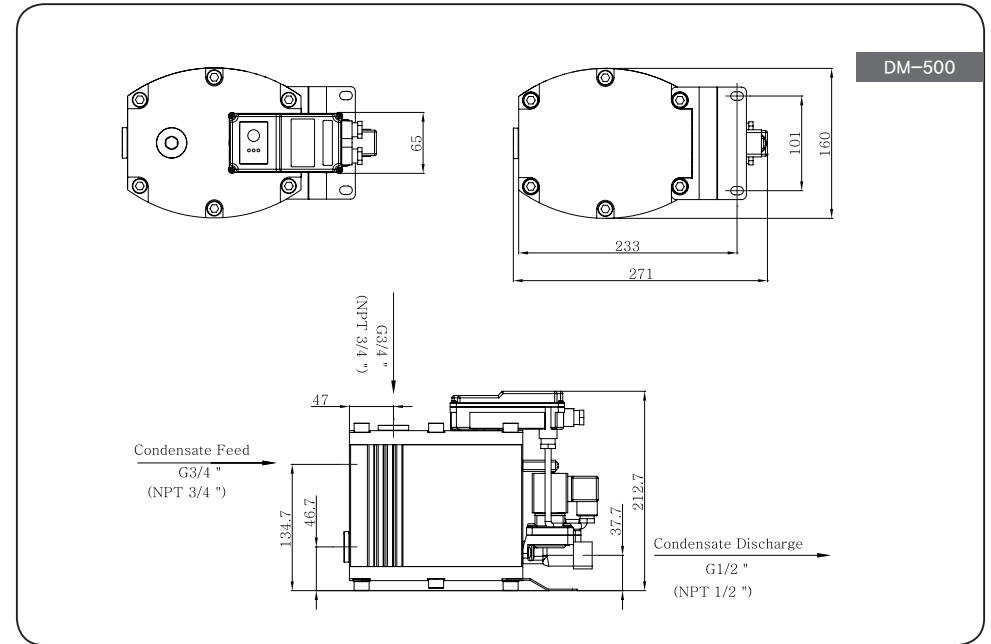
DM-15



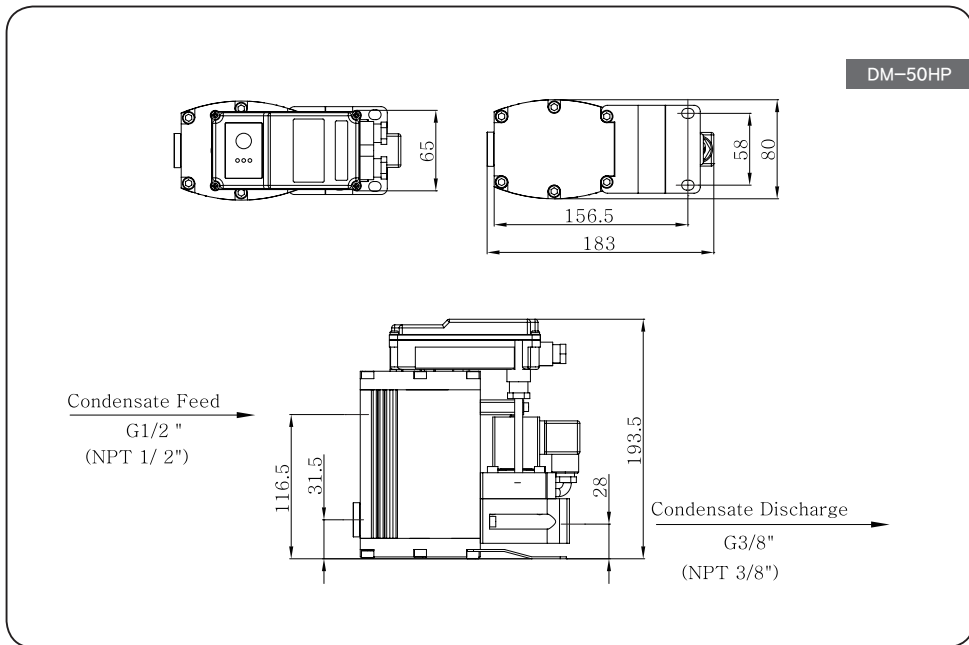
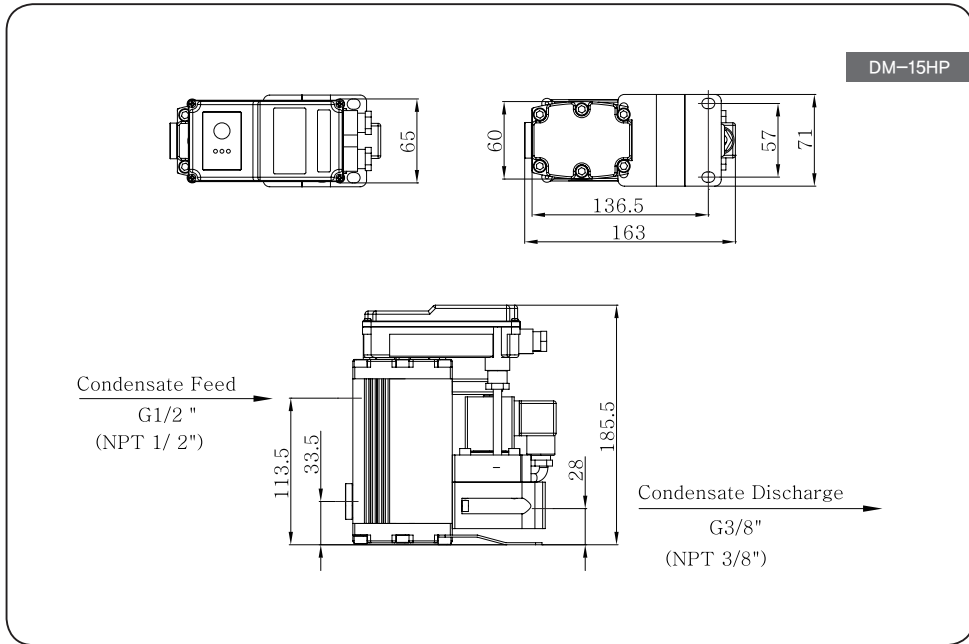
## DIMENSION



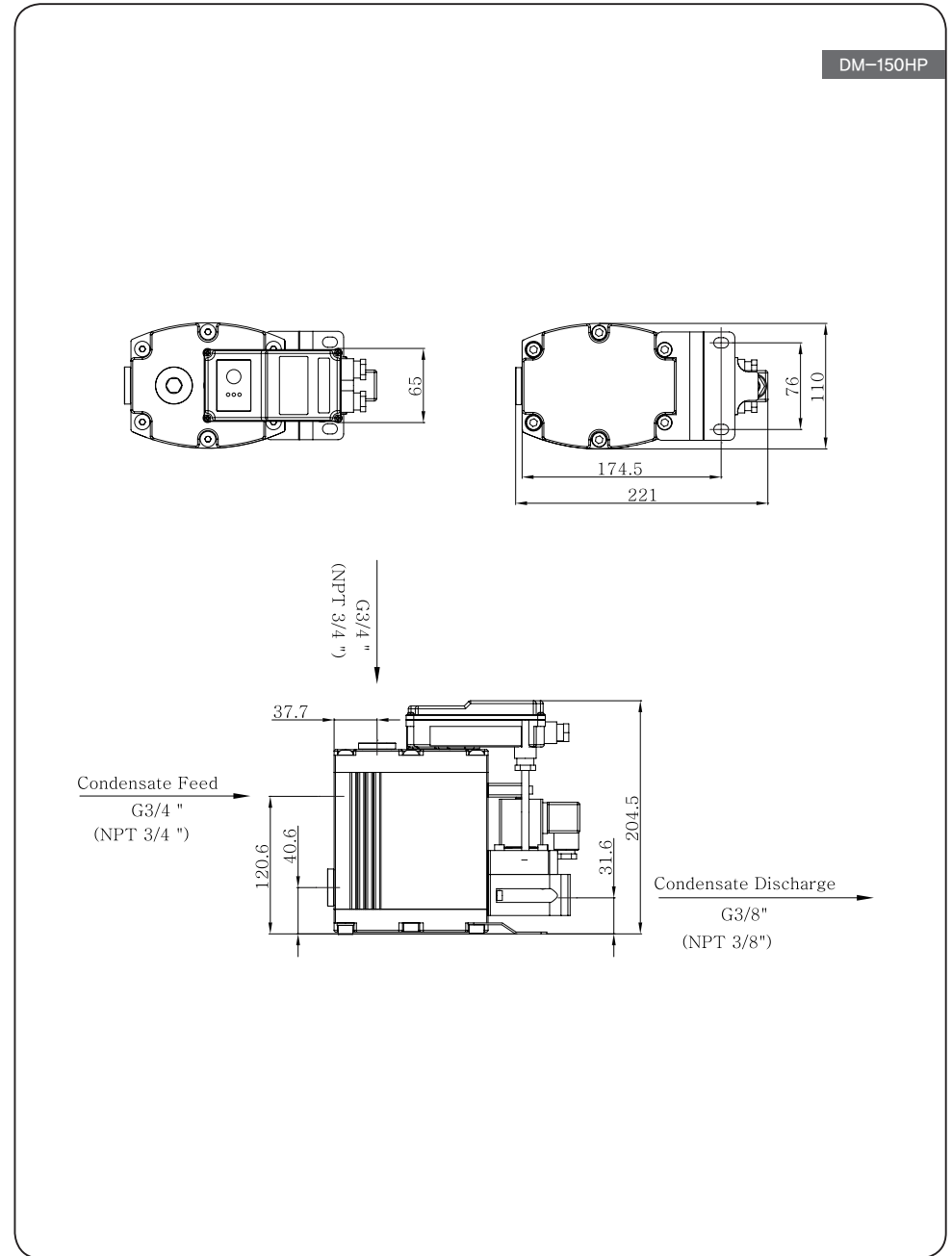
## DIMENSION



## DIMENSION



## DIMENSION



## FUNCTION

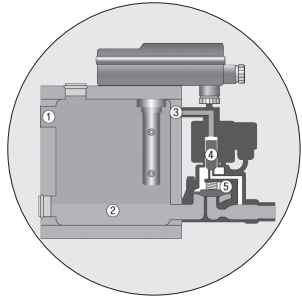


Fig.1

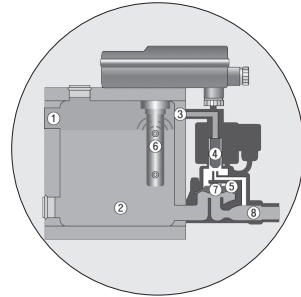


Fig.2

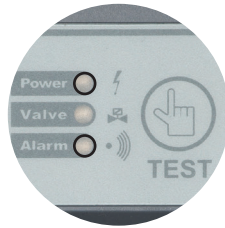
Condensate through the feed line is accumulated in the housing. When the upper flow sensor detects the condensate level and sends a signal with the electronic control device, the valve is activated to open the diaphragm, and the condensate is discharged.

Upon discharge, the lower flow sensor detects the level, stops the valve and closes the diaphragm.



Normal Mode

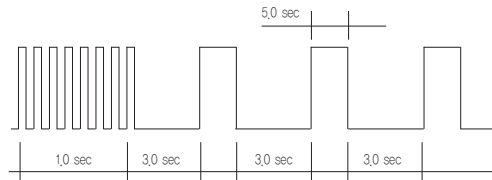
▶ Press 'TEST' briefly (for less than 1 second) to check operational status (manual discharge)



Alarm Mode

You may experience error in the following cases:

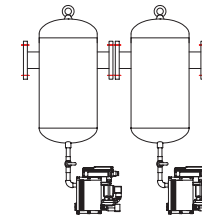
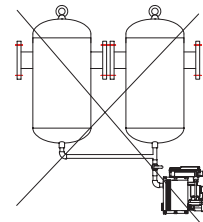
- ▶ Incorrect installation
- ▶ Overload owing to excessive generation of condensate
- ▶ Poor discharge owing to blocked (by foreign materials, freezing etc) discharge line
- ▶ Poor discharge owing to the internal pressure being less than the min discharge pressure (0 bar)



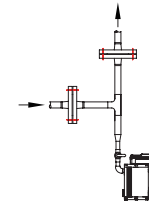
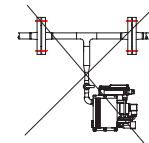
In the error event, the system is switched to the emergency mode turning the alarm signal and activating the auto recovery function to allow forced open of the valve for 5 seconds every 3 minutes.

Upon auto recovery or correction of the error by repair, the alarm signal will flicker and the system will be returned to the normal mode.

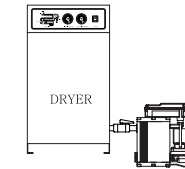
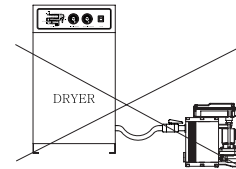
## INSTALLATION



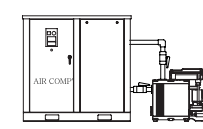
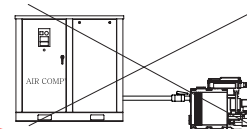
The condensate line must be installed separately.



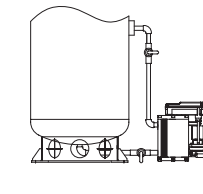
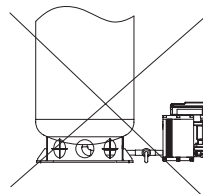
With linear pipe line, arrange the pipe line so that condensate is separated from air.



The condensate feed line shall not sag to ensure smooth feed.

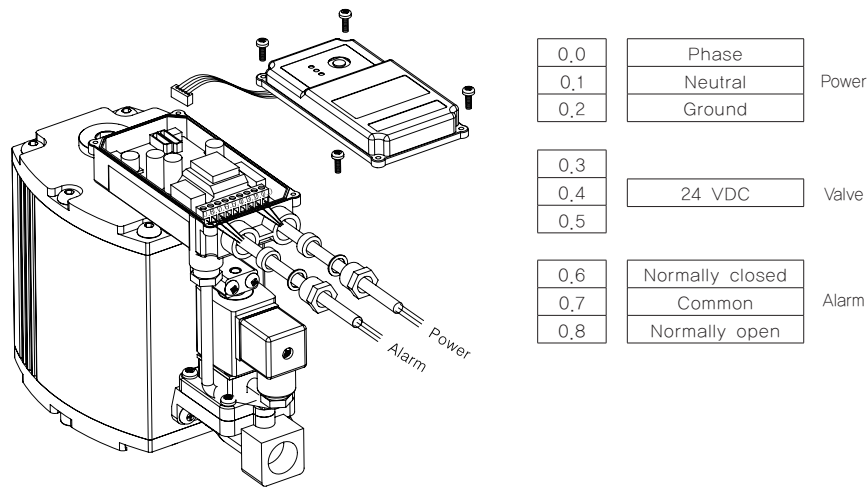
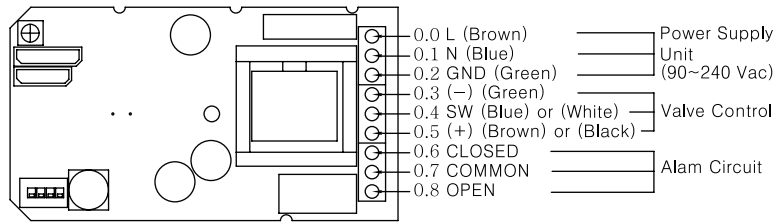


With a long condensate feed line, install an air vent line.



With a parallel piping to a tank, install a vent line to the pressure gauge. (Condensate may not flow due to pressure when the housing is filled with air.)

## ELECTRICAL INSTALLATION




## ELECTRICAL DATA

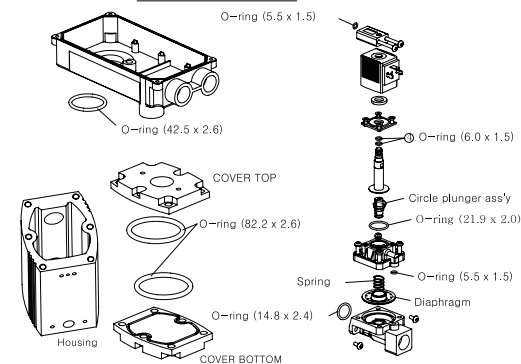
Power Voltage	90 ~ 240/ 24/ 48 Vac	24 / 48 Vdc
Max. Power input	P < 2,0 VA	P < 2,0 W
Recommended cable jacket diameter	Ø 5,8 ~ 8,0 mm	
Cable cross-section and fuse protection	3 x 0,75 mm <sup>2</sup> / 5 x 0,25 mm <sup>2</sup>	
	0,5 A	100 mA
Contact loading relay or out	260 Vac - < 1,0 A	

► The emergency relay will be activated when there is no operation pressure (0.8 bar) or with an error signal, switching the system to the alarm mode

## MAINTENANCE

Trouble shooting	Factor	Solution
► No discharge of condensate with the Test button 	※ The feed line or the discharge line is closed or blocked.	Check these lines.
	※ Defective PCB	Replace the PCB.
	※ Defective solenoid valve	Replace the solenoid valve.
	※ Worn parts	Replace the worn parts (Wearing part kits)
	※ Pressure is lower than 0,8 bar	Check the operation pressure.
► Condensate only discharged when the Test button is pressed and held	※ Insufficient pipe slope with the feed line	Add slop to the feed line, or install a vent line.
	※ The pipe length for feed line is too long	Install an air vent line (see Installation Method)
	※ Overload due to excessive condensate	Select a correct model for the volume of condensate.
► Power lamp not lit	※ Detection disabled by excessive contamination on the sensor tube	Clean the sensor tube.
	※ Power not connected.	Check the rated voltage. Check the cable connection.
► Continuous air discharge from the valve	※ Defective PCB	Replace the PCB
	※ The lower part of the diaphragm is contaminated by foreign materials (scale etc)	Remove foreign materials.
	※ The 'control air line' is blocked.	Remove foreign materials.
	※ Poor operation due to foreign materials inside the solenoid valve	Clean the valve.
	※ Worn parts, (Diaphragm, Plunger etc)	Replace the worn parts.

### Wearing Part kits

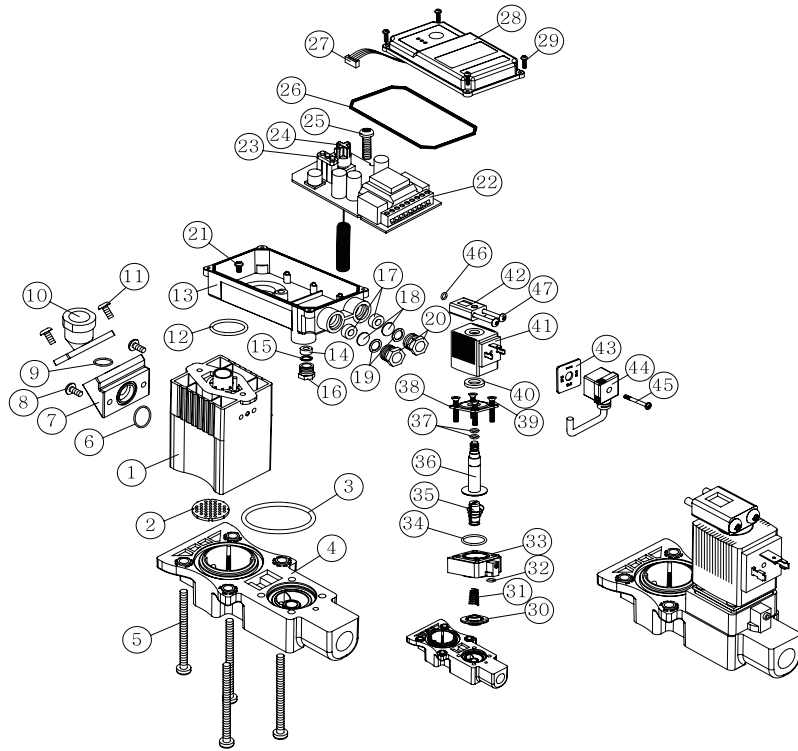


► Clean the housing and valves 1-2 times a year.  
► Check wearing parts once a year.  
► Wearing parts

DM-5S	SP DM5S 101
DM-5	SP DM5 101
DM-5N	SP DM5N 101
DM-15	SP DM15 101
DM-50	SP DM50 101
DM-150	SP DM150 101
DM-500	SP DM500 101
DM-1500	SP DM1500 101
DM-15HP	SP DM15H 101
DM-50HP	SP DM50H 101
DM-150HP	SP DM150H 101

## COMPONENTS

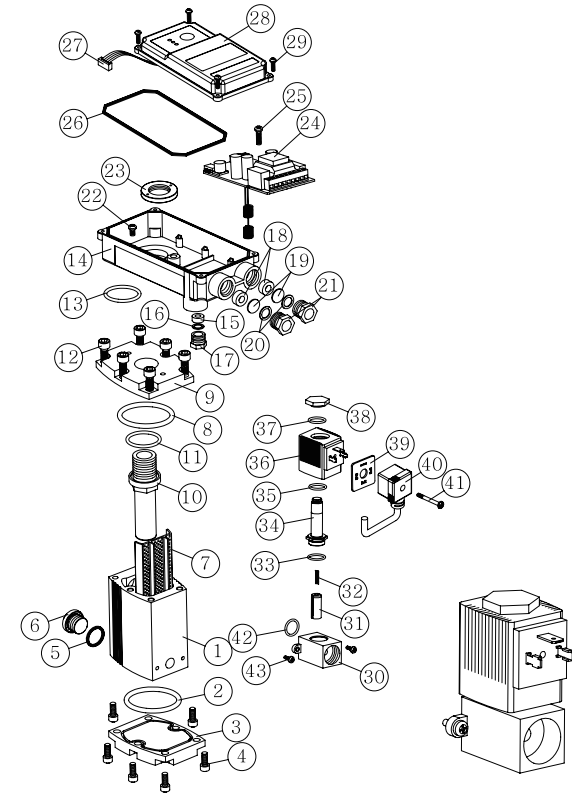
DM-5S



Wearing part kits	SP DM5S 101	3, 6, 9, 12, 30, 31, 32, 34, 35, 37, 46
Housing	SP DM5S 103	1
Sensor board	SP DM5S 105	22, 23, 24, 25
Diaphragms(3pcs)	SP DM5S 106	30, 31
Solenoid valve	SP DM5S 107	4, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 46, 47
PCB case	SP DM00 201	12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 26, 28, 29

## COMPONENTS

DM-5

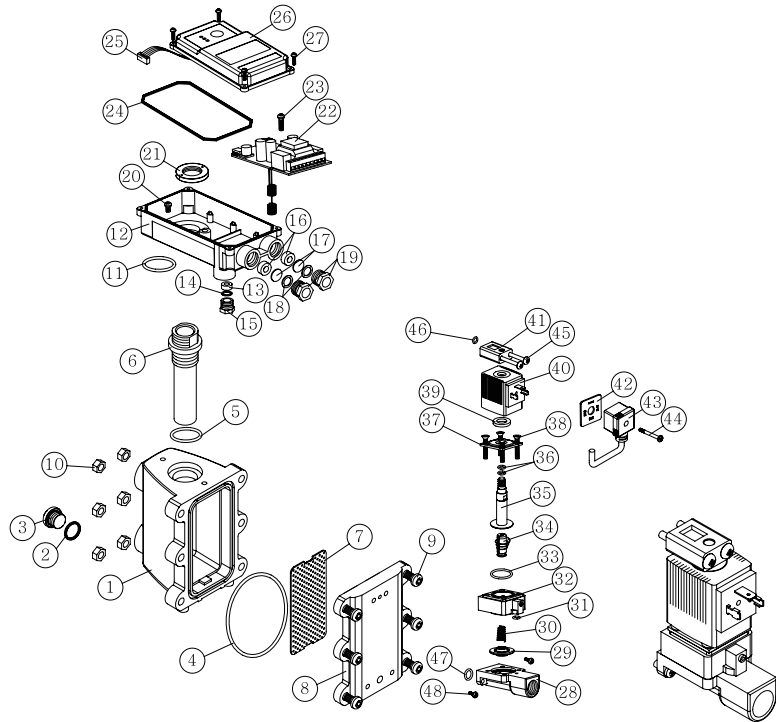


Wearing part kits	SP DM5 101	2, 8, 13, 31, 32, 33, 35, 37, 42
Housing	SP DM5 102	1, 2, 5, 6, 8
Cover Top	SP DM5 103	8, 9, 10, 11
Cover Bottom	SP DM5 104	2, 3, 4
Sensor board	SP DM5 105	24, 25
Solenoid valve	SP DM5 107	30, 31, 32, 33, 34, 35, 36, 37, 38, 42, 43
PCB case	SP DM00 201	13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 26, 28, 29



## COMPONENTS

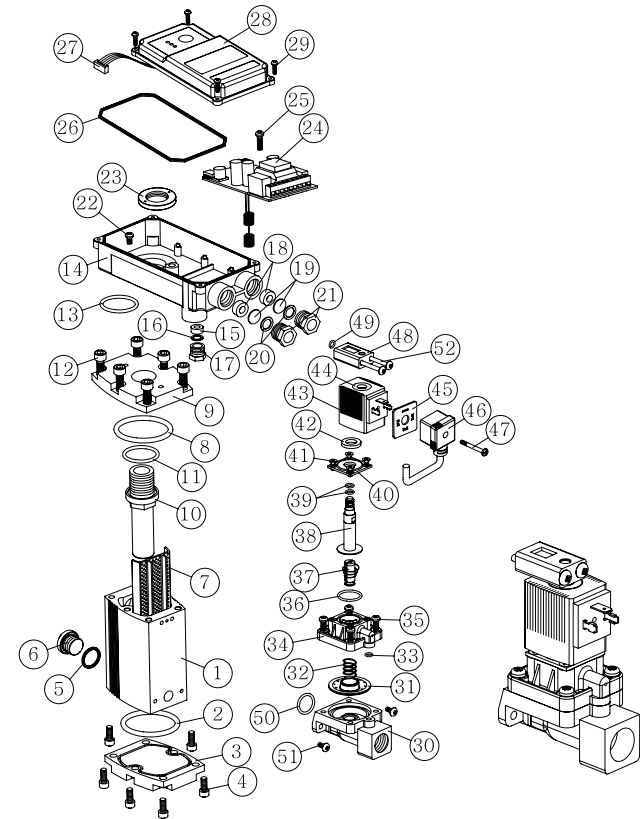
DM-5N



Wearing part kits	SP DM5N 101	4, 11, 29, 30, 31, 33, 34, 36, 46, 47
Housing Upper cover	SP DM5N 103	1, 2, 3, 4, 5, 6
Bottom cover	SP DM5N 104	8, 9
Sensor board	SP DM5N 105	22, 23
Diaphragms(3pcs)	SP DM5N 106	29, 30
Solenoid valve	SP DM5N 107	28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 45, 46, 47, 48
PCB case	SP DM00 201	11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 24, 26, 27

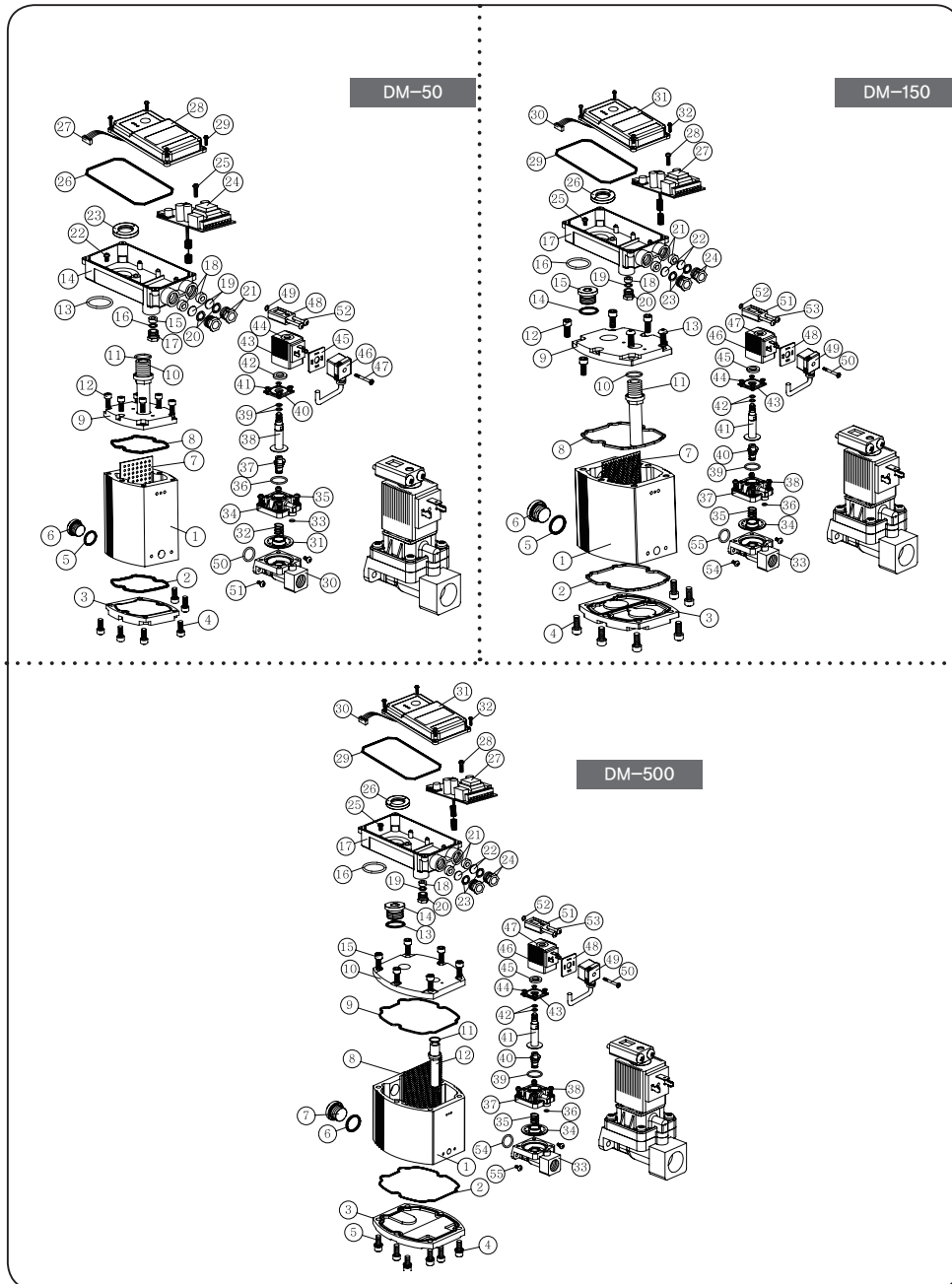
## COMPONENTS

DM-15



Wearing part kits	SP DM15 101	2, 8, 13, 31, 32, 33, 36, 37, 39, 49, 50
Housing	SP DM15 102	1, 2, 5, 6, 8
Cover Top	SP DM15 103	8, 9, 10, 11, 12
Cover Bottom	SP DM15 104	2, 3, 4
Sensor board	SP DM15 105	24, 25
Diaphragms(3pcs)	SP DM15 106	31, 32
Solenoid valve	SP DM15 107	30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 48, 49, 50, 51, 52
Pcb case	SP DM00 201	13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 26, 28, 29

## COMPONENTS



## COMPONENTS

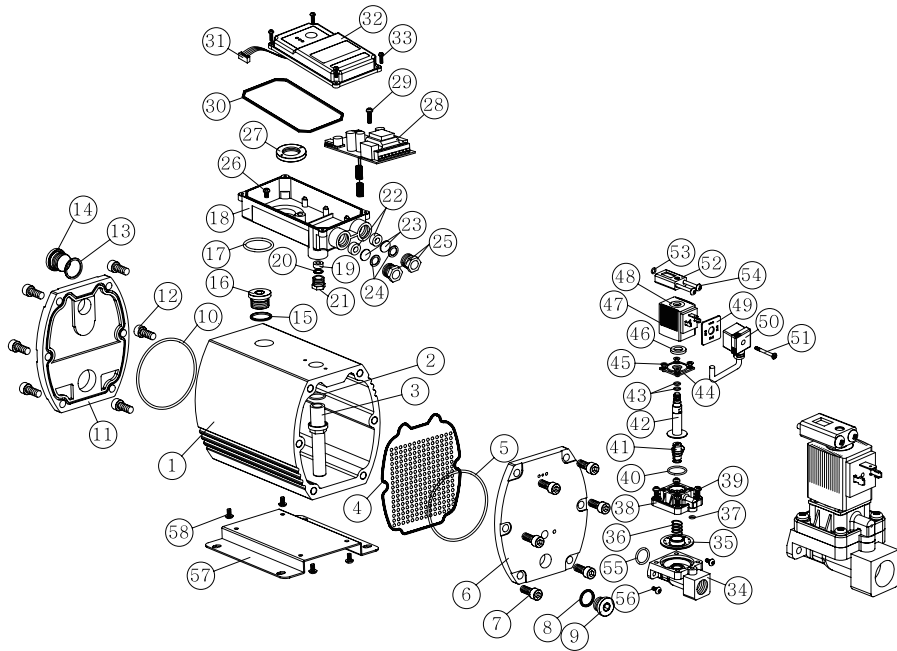
DM-50		
Wearing part kits	SP DM50 101	2, 8, 13, 31, 32, 33, 36, 37, 39, 49, 50
Housing	SP DM50 102	1, 2, 5, 6, 8
Cover Top	SP DM50 103	8, 9, 10, 11, 12
Cover Bottom	SP DM50 104	2, 3, 4
Sensor board	SP DM50 105	24, 25
Diaphragms(3pcs)	SP DM15 106	31, 32
Solenoid valve	SP DM50 107	30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 48, 49, 50, 51, 52
Pcb case	SP DM00 201	13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 26, 28, 29

DM-150		
Wearing part kits	SP DM150 101	2, 8, 16, 34, 35, 36, 39, 40, 42, 52, 55
Housing	SP DM150 102	1, 2, 5, 6, 8
Cover Top	SP DM150 103	8, 9, 10, 11, 12, 13, 14, 15
Cover Bottom	SP DM150 104	2, 3, 4
Sensor board	SP DM150 105	27, 28
Diaphragms(3pcs)	SP DM15 106	34, 35
Solenoid valve	SP DM150 107	33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 51, 52, 53, 54, 55
Pcb case	SP DM00 201	16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 29, 31, 32

DM-500		
Wearing part kits	SP DM500 101	2, 9, 16, 34, 35, 36, 39, 40, 42, 52, 54
Housing	SP DM500 102	1, 2, 6, 7, 9
Upper cover	SP DM500 103	9, 10, 11, 12, 13, 14, 15
Bottom cover	SP DM500 104	2, 3, 4, 5
Sensor board	SP DM500 105	27, 28
Diaphragms(3pcs)	SP DM15 106	34, 35
Solenoid valve	SP DM500 107	33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 51, 52, 53, 54, 55
Pcb case	SP DM00 201	16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 29, 31, 32

## COMPONENTS

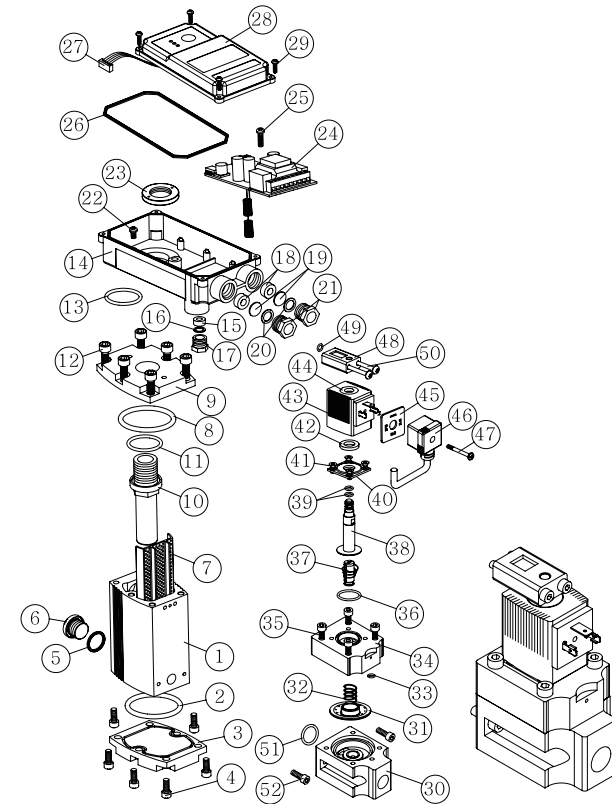
DM-1500



Wearing part kits	SP DM1500 101	5, 10, 17, 35, 36, 37, 40, 41, 43, 53, 55
Housing	SP DM1500 102	1, 5, 10, 15, 16
Upper cover	SP DM1500 103	10, 11, 12, 13, 14
Bottom cover	SP DM1500 104	5, 6, 7, 8, 9
Sensor board	SP DM1500 105	28, 29
Diaphragms(3pcs)	SP DM15 106	35, 36
Solenoid valve	SP DM1500 107	34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 52, 53, 54, 55, 56
Pcb case	SP DM00 201	17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 30, 32, 33

## COMPONENTS

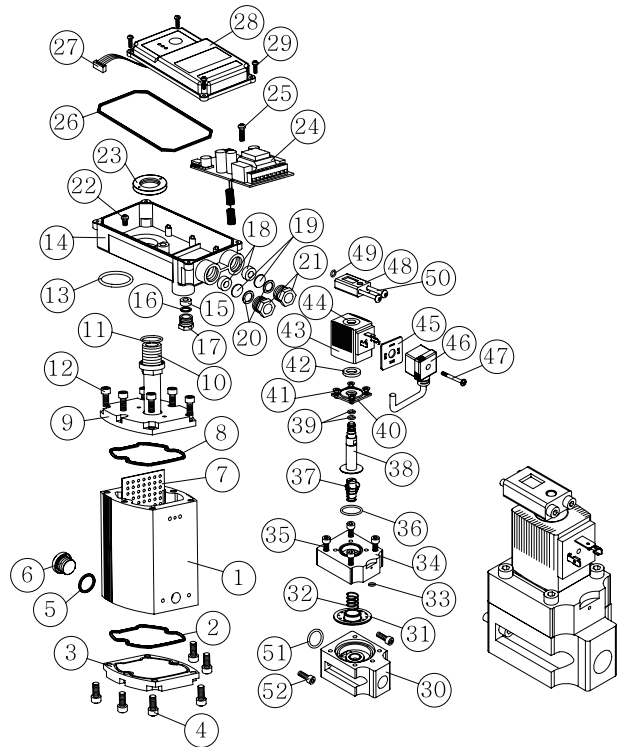
DM-15HP



Wearing part kits	SP DM15 101	2, 8, 13, 31, 32, 33, 36, 37, 39, 49, 51
Housing	SP DM15 102	1, 2, 5, 6, 8
Upper cover	SP DM15H 103	8, 9, 10, 11, 12
Bottom cover	SP DM15H 104	2, 3, 4
Sensor board	SP DM15H 105	24, 25
Diaphragms(3pcs)	SP DM15 106	31, 32
Solenoid valve	SP DM15H 107	30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 48, 49, 50, 51, 52
Pcb case	SP DM00 201	13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 26, 28, 29

## COMPONENTS

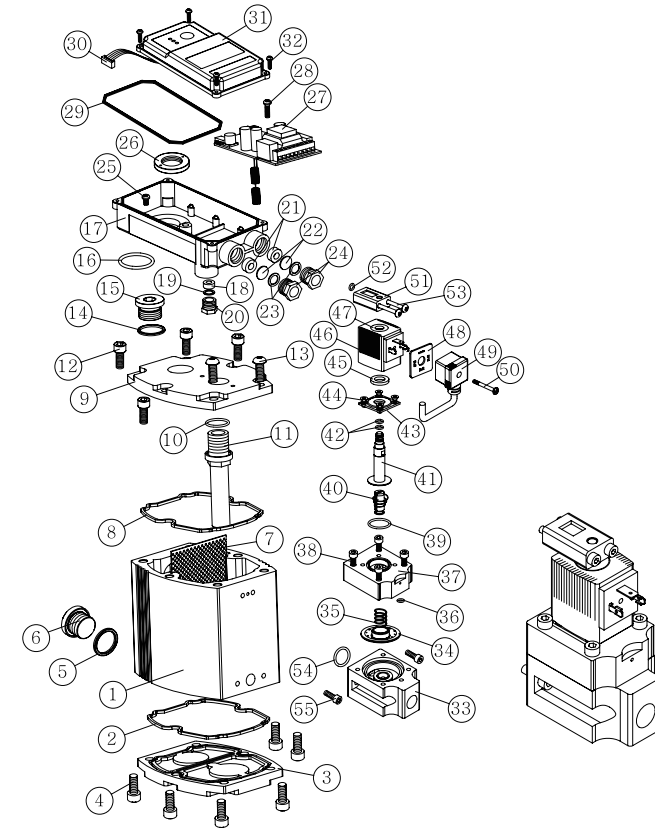
DM-50HP



Wearing part kits	SP DM50 101	2, 8, 13, 31, 32, 33, 36, 37, 39, 49, 51
Housing	SP DM50 102	1, 2, 5, 6, 8
Upper cover	SP DM50H 103	8, 9, 10, 11, 12
Bottom cover	SP DM50H 104	2, 3, 4
Sensor board	SP DM50H 105	24, 25
Diaphragms(3pcs)	SP DM15 106	31, 32
Solenoid valve	SP DM50H 107	30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 48, 49, 50, 51, 52
Pcb case	SP DM00 201	13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 26, 28, 29

## COMPONENTS

DM-150HP



Wearing part kits	SP DM150 101	2, 8, 16, 34, 35, 36, 39, 40, 42, 52, 54
Housing	SP DM150 102	1, 5, 6
Upper cover	SP DM150H 103	8, 9, 10, 11, 12, 13, 14, 15
Bottom cover	SP DM150H 104	2, 3, 4
Sensor board	SP DM150H 105	27, 28
Diaphragms(3pcs)	SP DM15 106	34, 35
Solenoid valve	SP DM150H 107	33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 51, 52, 53, 54, 55
Pcb case	SP DM00 201	16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 29, 31, 32