

Instructions for installation and operation

Model : DM-150B, DM-500B, DM-1500B
DM-2500B, DM-5000B



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

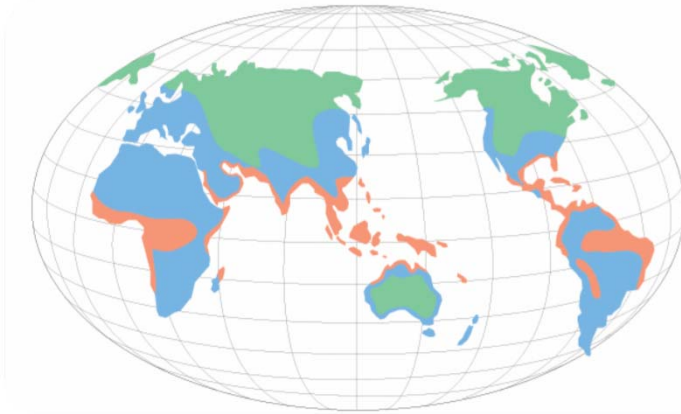
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■ IMPORTANT INFORMATION

- ▶ Do not apply pressure exceed the max operation 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 B 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 B 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



- 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)

DRAIN MASTER <i>B</i>	Climate zone	Peak Compressor Performance m ³ /min	Peak Dryer Performance m ³ /min	Peak Filter Performance m ³ /min	NRTL	CE	IP 65
					Operating Pressure min / max (bar)	Temperature min / max (°C)	Application (*)
DM-150B	Green	170	340	1700	0/16	+ 1 / 80	A.B
	Blue	150	300	1500			
	Red	105	210	1050			
DM-500B	Green	570	1140	5700			
	Blue	500	1000	5000			
	Red	350	700	3500			
DM-1500B	Green	1750	3500				
	Blue	1500	3000				
	Red	1050	2100				
DM-2500B	Green	2900	5800		0/12	+ 1 / 80	A.B
	Blue	2500	5000				
	Red	1750	3500				
DM-5000B	Green	5800					
	Blue	5000					
	Red	3500					

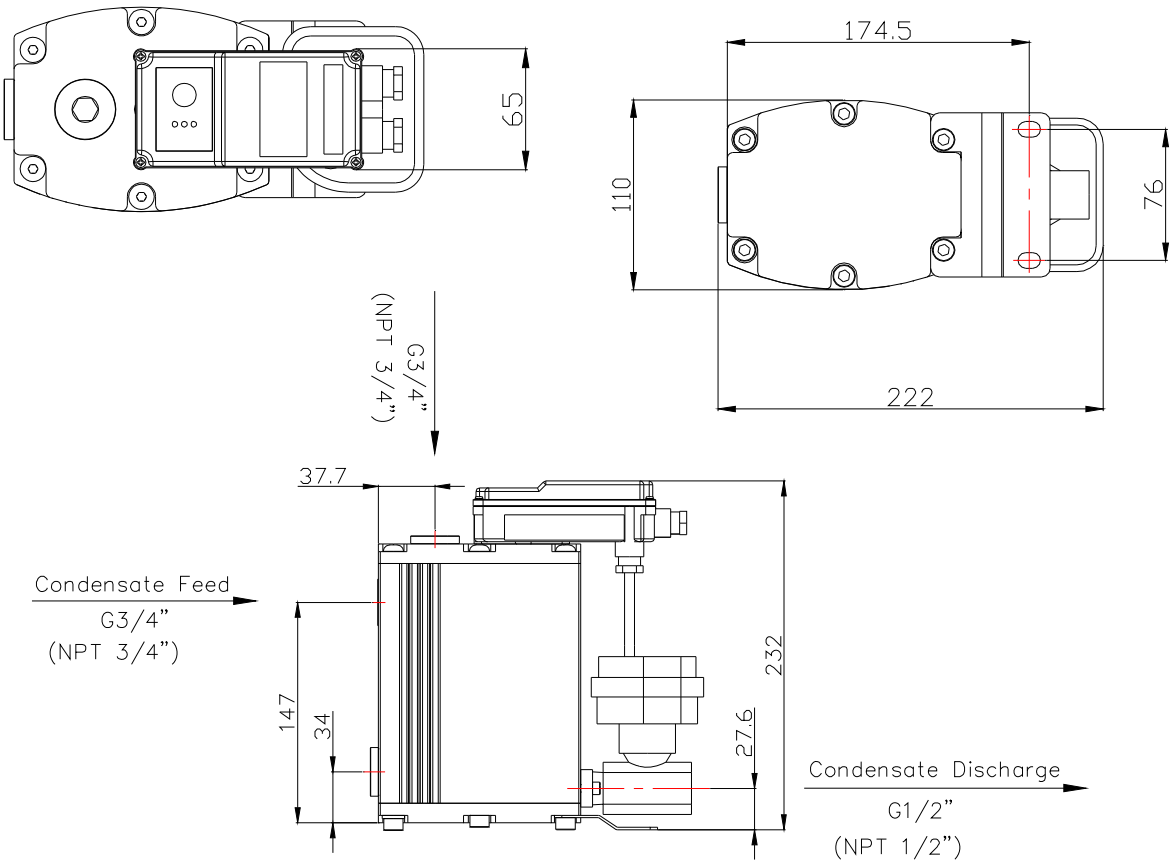
*Application: A.oil contaminated condensate ; B.oil free, aggressive condensate

DRAIN MASTER <i>B</i>	DM-150B	DM-500B	DM-1500B	DM-2500B	DM-5000B
Condensate Feed	3/4" x 3		3/4" x 3, 1" x 1	FL 2" x 1	FL 2" x 1
Condensate Discharge	1/2"			3/4"	1"
Voltage	Free voltage 100~240Vac, 24/48Vdc, 24/48Vac				
Housing Material	Aluminium, Hardcoated			SUS304	
Weight (Kg)	4.0	6.0	7.7	30.0	40.0

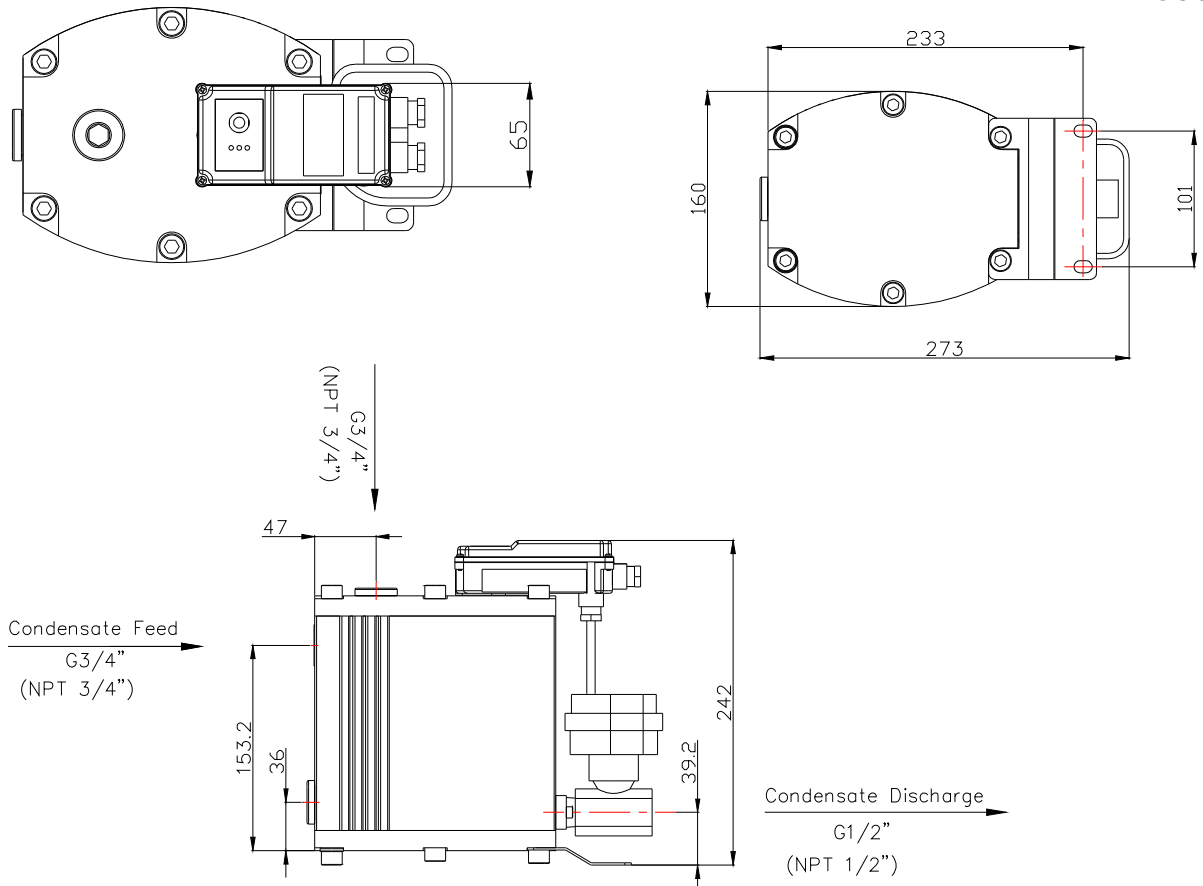
▶ Must attach automatic thermostat(option : Heater unit) in freezing area.

DIMENSION

DM-150B

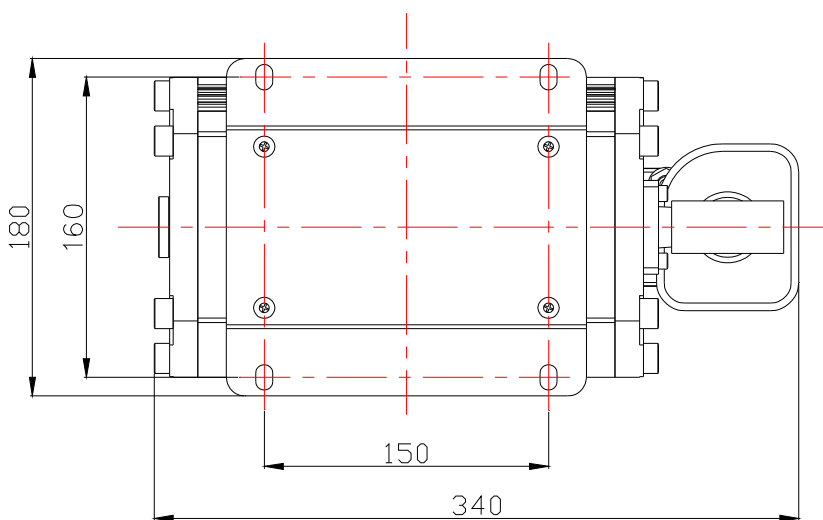
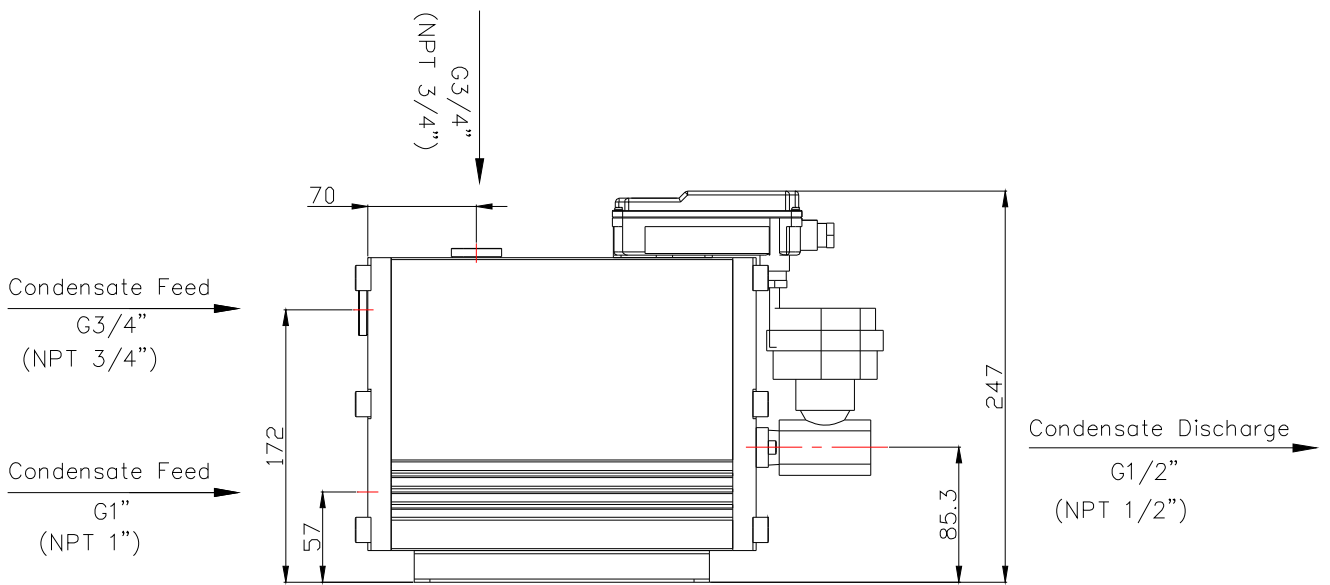
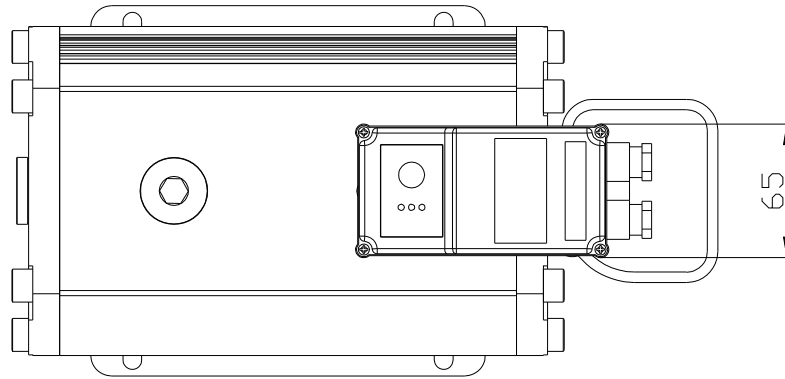


DM-500B



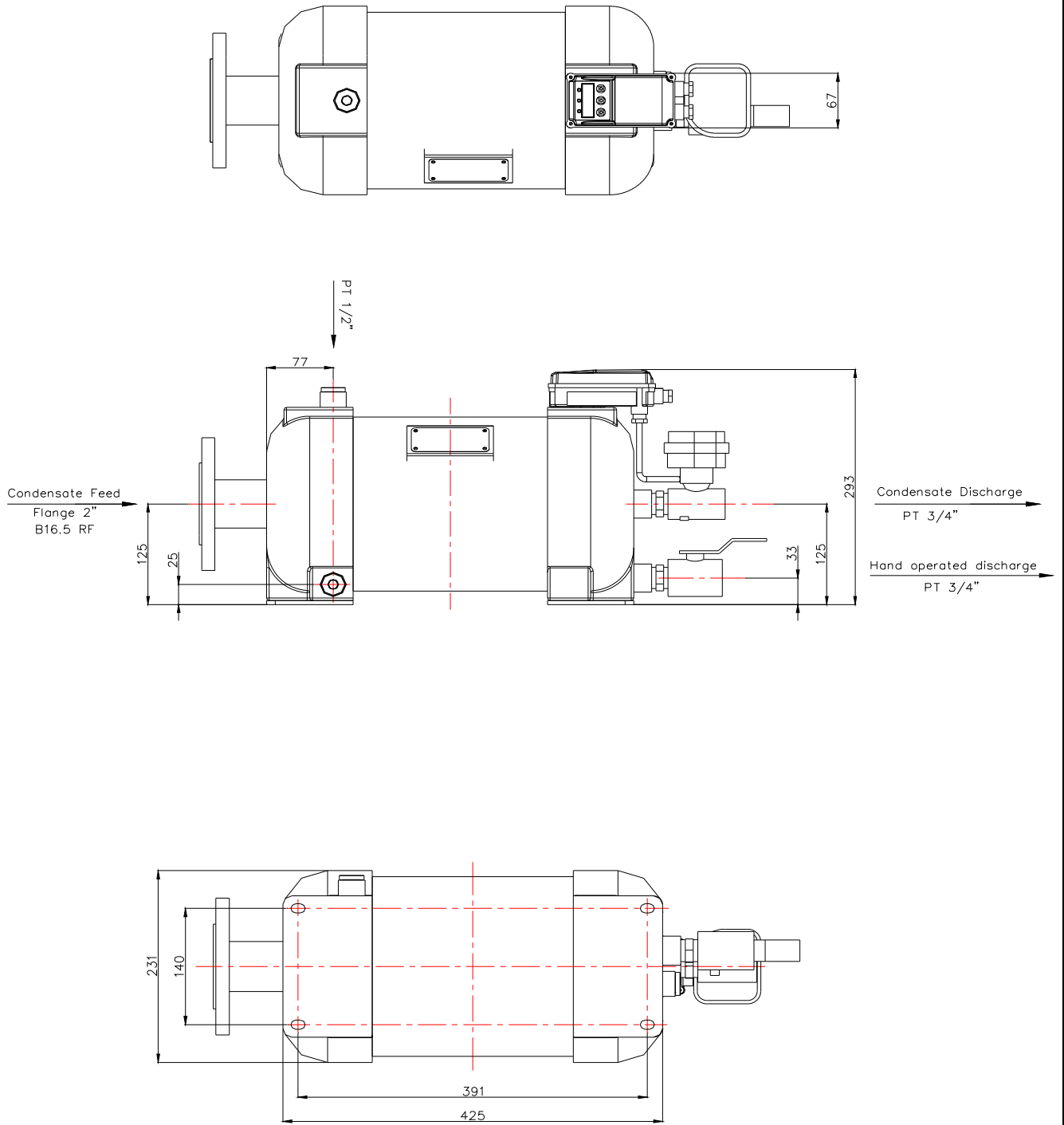
■ DIMENSION

DM-1500B



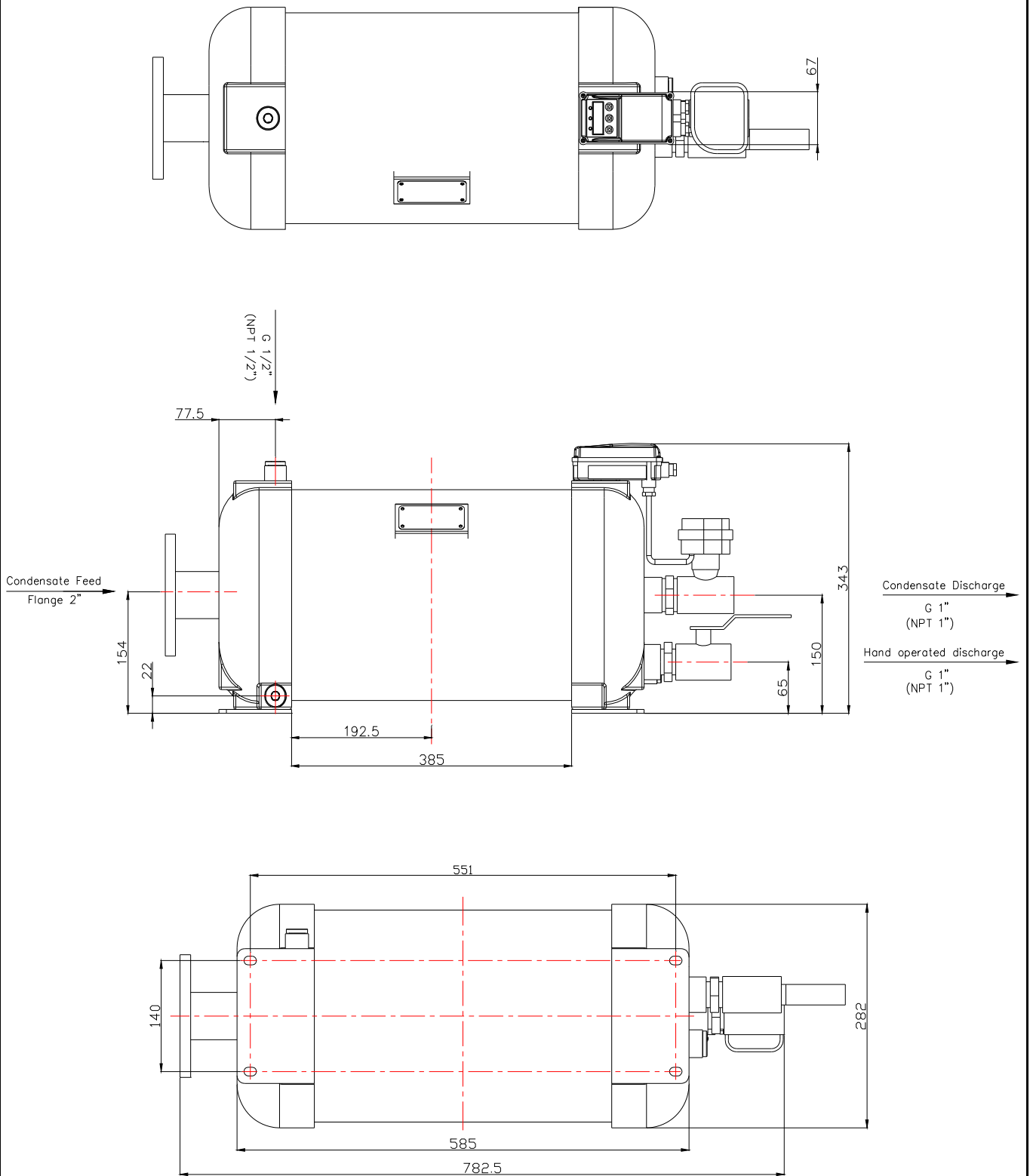
■ DIMENSION

DM-2500B

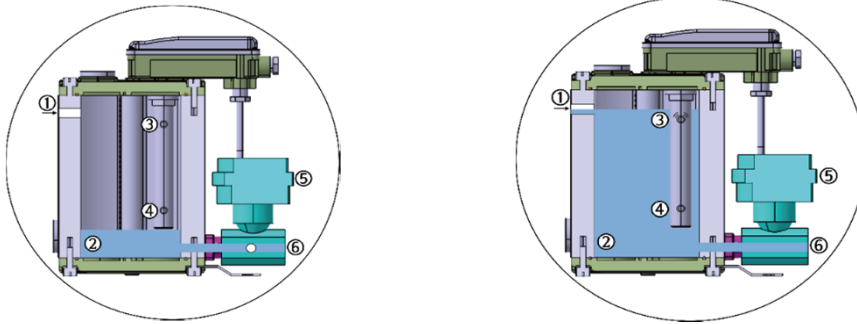


■ DIMENSION

DM-5000B



FUNCTION



- 1) Condensate through the feed line ① is accumulated in the housing ②.
- 2) As the level of condensate rises inside the housing, it is detected by the top dead center of sensor level ③.
- 3) Upon the open signal from the Main Board, the electric ball valve ⑤ is activated, and condensate is discharged through the discharge line ⑥.
- 4) As the level of condensate drops inside the housing, the bottom dead center of ④ and electrical valve ⑤ is closed upon receipt of a close signal.



Normal Mode

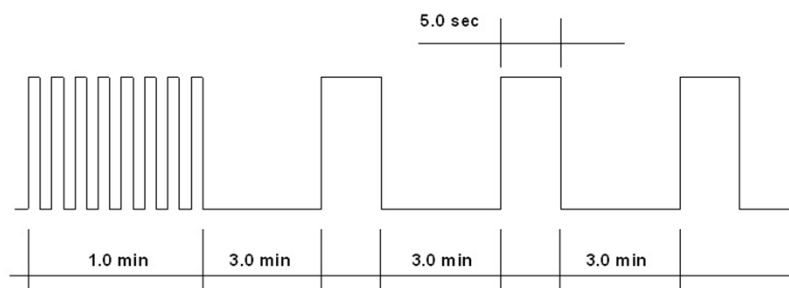
- ▶ Press 'TEST' briefly (for less than 1 second) to check operational status (manual discharge)



Alarm Mode

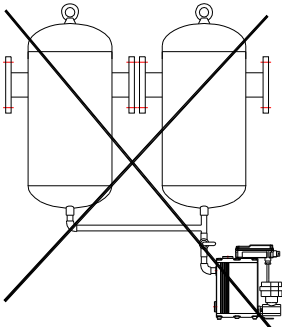
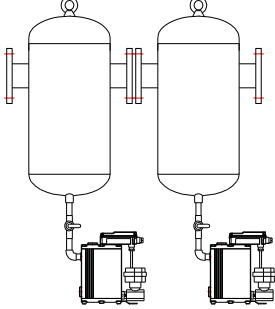
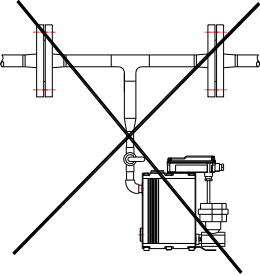
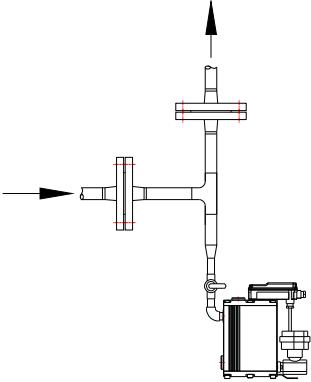
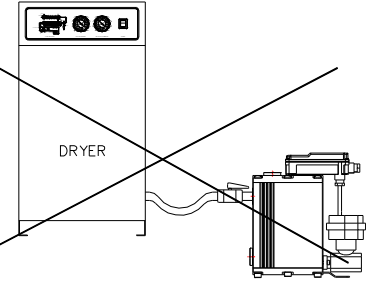
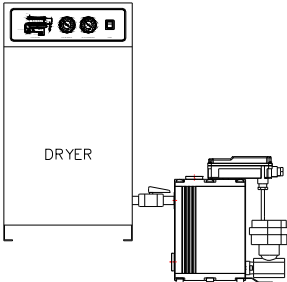
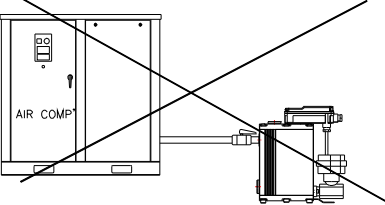
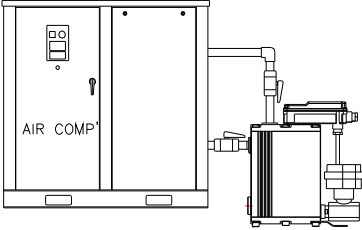
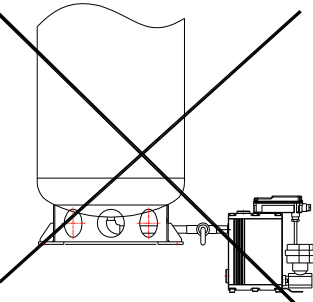
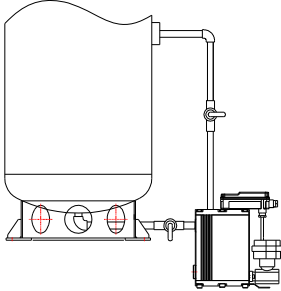
You may experience error in the following cases.

- ▶ 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)

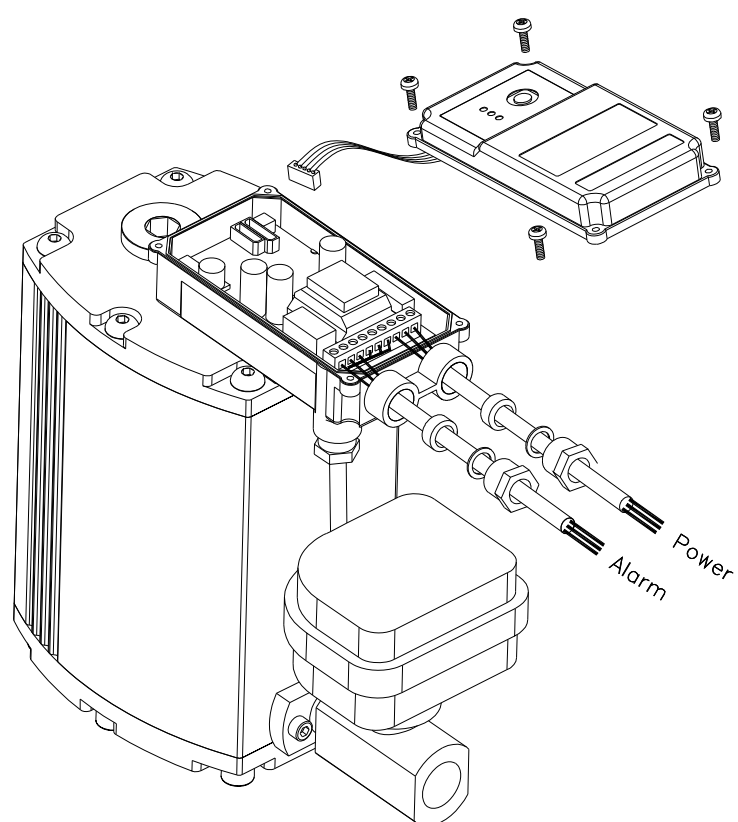
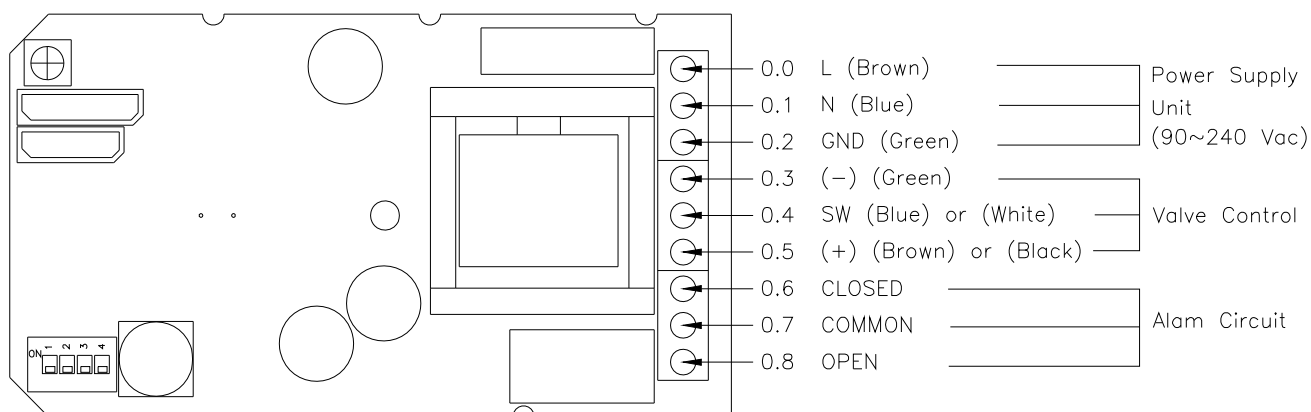


In the error event, the system is switched to the emergency mode turning the alarm signal on and activating the auto recovery function to allow forced open of the valve for 5 seconds every 3 minutes. Upon auto recovery or correction of the error by repair, the alarm signal will flicker and the system will be returned to the normal mode.

■ INSTALLATION

		<p>The condensate line must be installed separately.</p>
		<p>With linear pipe line, arrange the pipe line so that condensate is separated from air.</p>
		<p>The condensate feed line shall not sag to ensure smooth feed.</p>
		<p>With a long condensate feed line, install an air vent line.</p>
		<p>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.)</p>

ELECTRICAL INSTALLATION




L	Phase	Power
N	Neutral	
PE	Ground	
0.3	24 VDC	Valve
0.4		
0.5		
0.6	Normally closed	Alarm
0.7	Common	
0.8	Normally open	

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 ² / 5 x 0.25 mm ²	
	0.5 A	100 mA
Contact loading relay or out	260 Vac - < 1.0 A	

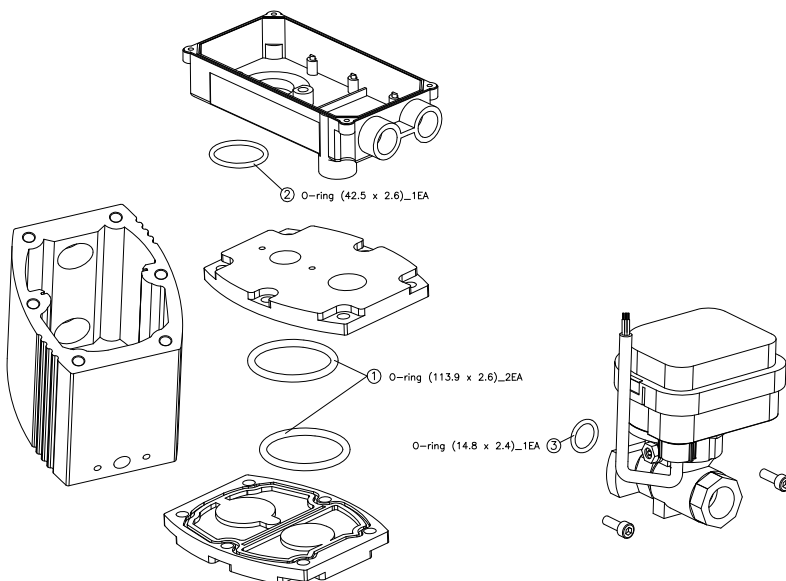
► The emergency relay will be activated when there is no operation pressure (0.8 bar) or with an error signal, switching the system to the alarm mode.

MAINTENANCE

Trouble shooting	Factor	Solution
<p>▶ No discharge of condensate with the Test button</p> 	* The feed line or the discharge line is closed or blocked.	Check these lines.
	* Defective PCB	Replace the PCB.
	* Defective Ball valve	Replace the Ball valve
	* worn parts	Replace the worn parts (Wearing part kits)
	* Pressure is lower than 0bar	Check the operation pressure.
<p>▶ Condensate only discharged when the Test button is pressed and held</p>	* 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
	* Detection disabled by excessive contamination on the sensor tube	Clean the sensor tube.
<p>▶ Power lamp not lit</p>	* Power not connected.	Check the rated voltage. Check the cable connection.
	* Defective PCB	Replace the PCB
<p>▶ Continuous air discharge from the valve</p>	* The lower part of the Ball valve is contaminated by foreign materials (scale etc)	Remove foreign materials.
	* Poor operation due to foreign materials inside the Ball valve	Clean the valve.
	* Worn parts. (Valve, Actuators)	Replace the worn parts.

Sample

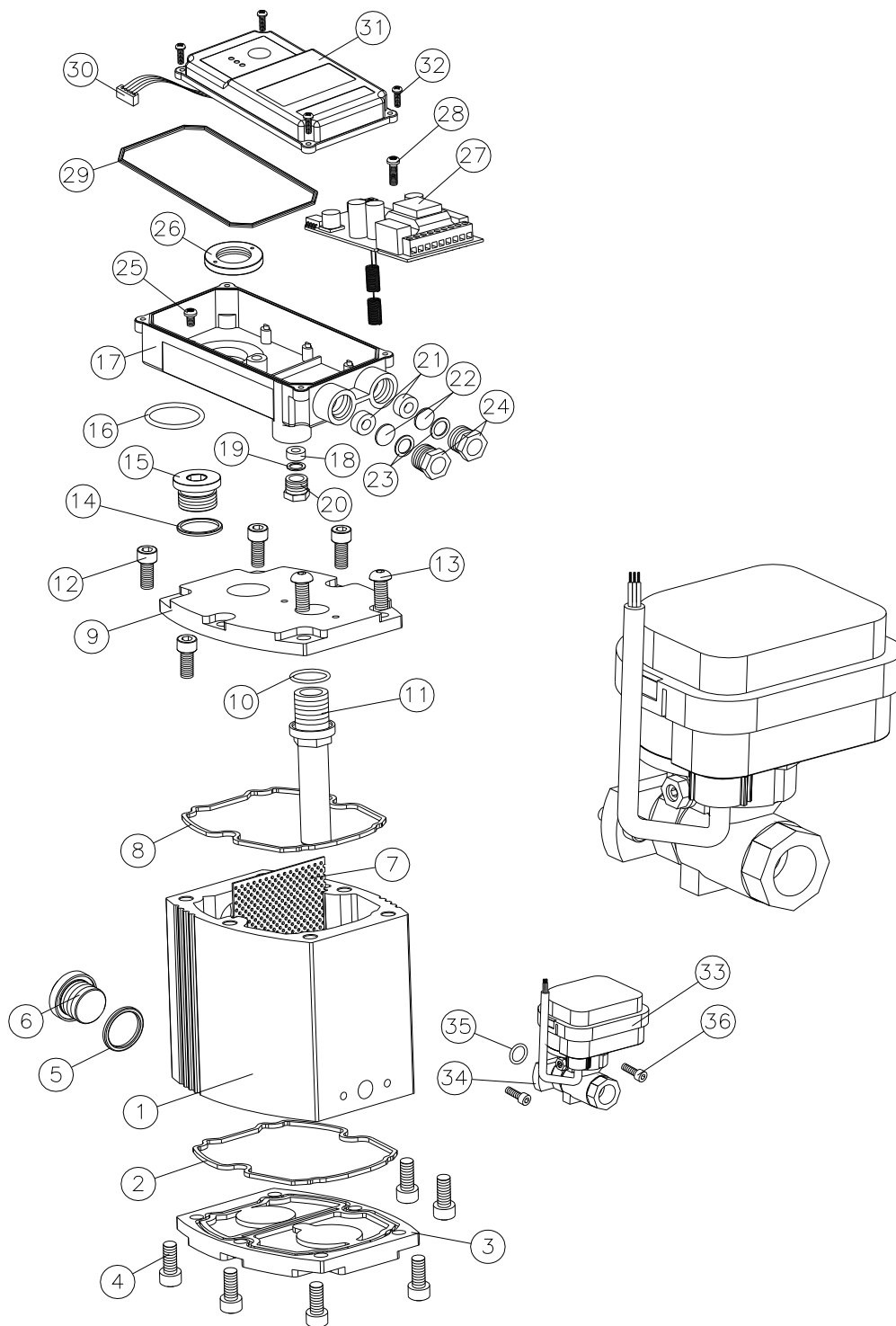
Wearing Part kits



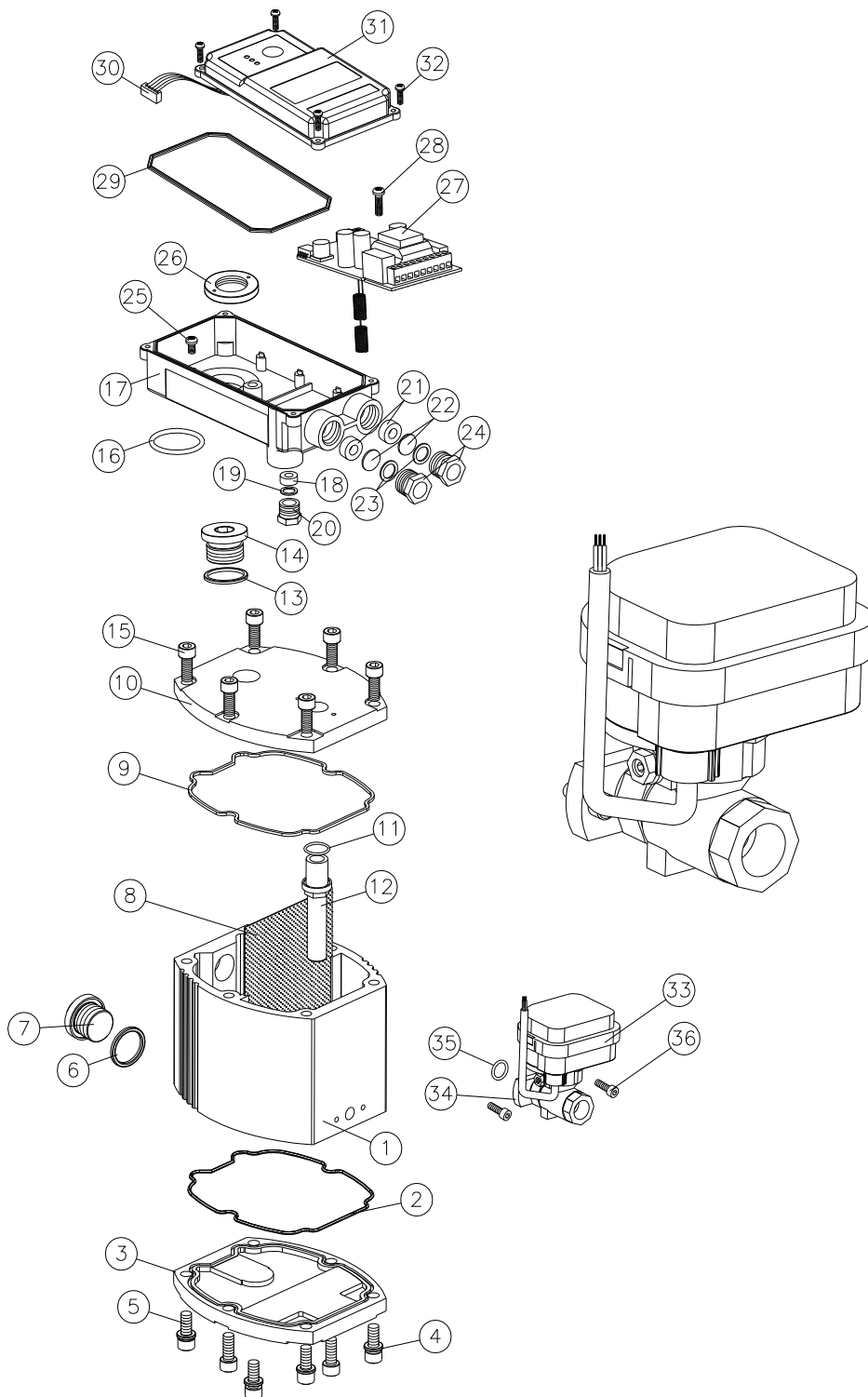
- ▶ Clean the housing and valves 1-2 times a year.
- ▶ Check wearing parts once a year.

▶ Wearing parts

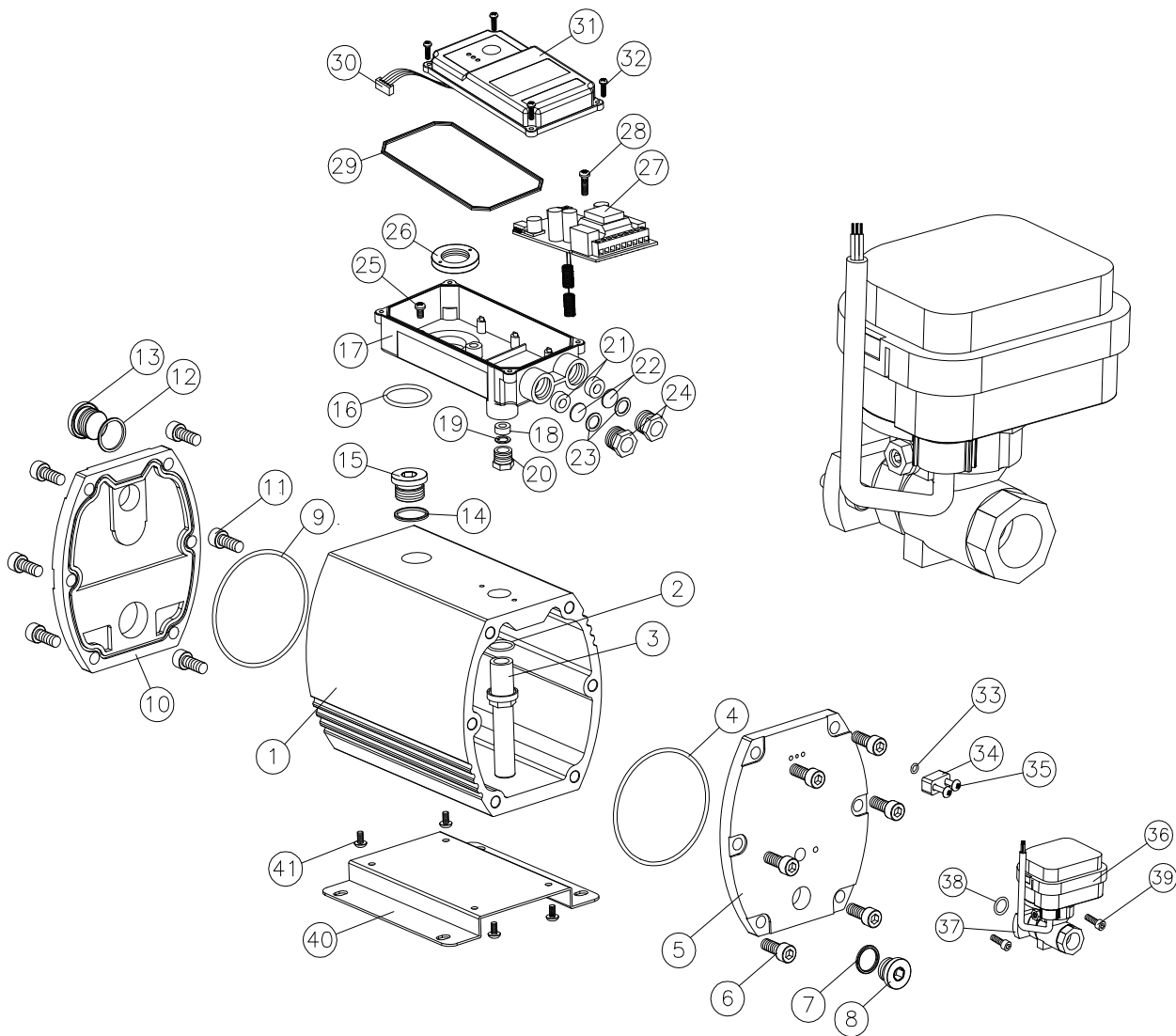
– DM-150B	:	SP B150 101
– DM-500B	:	SP B500 101
– DM-1500B	:	SP B1500 101
– DM-2500B	:	SP B2500 101
– DM-5000B	:	SP DM500 101



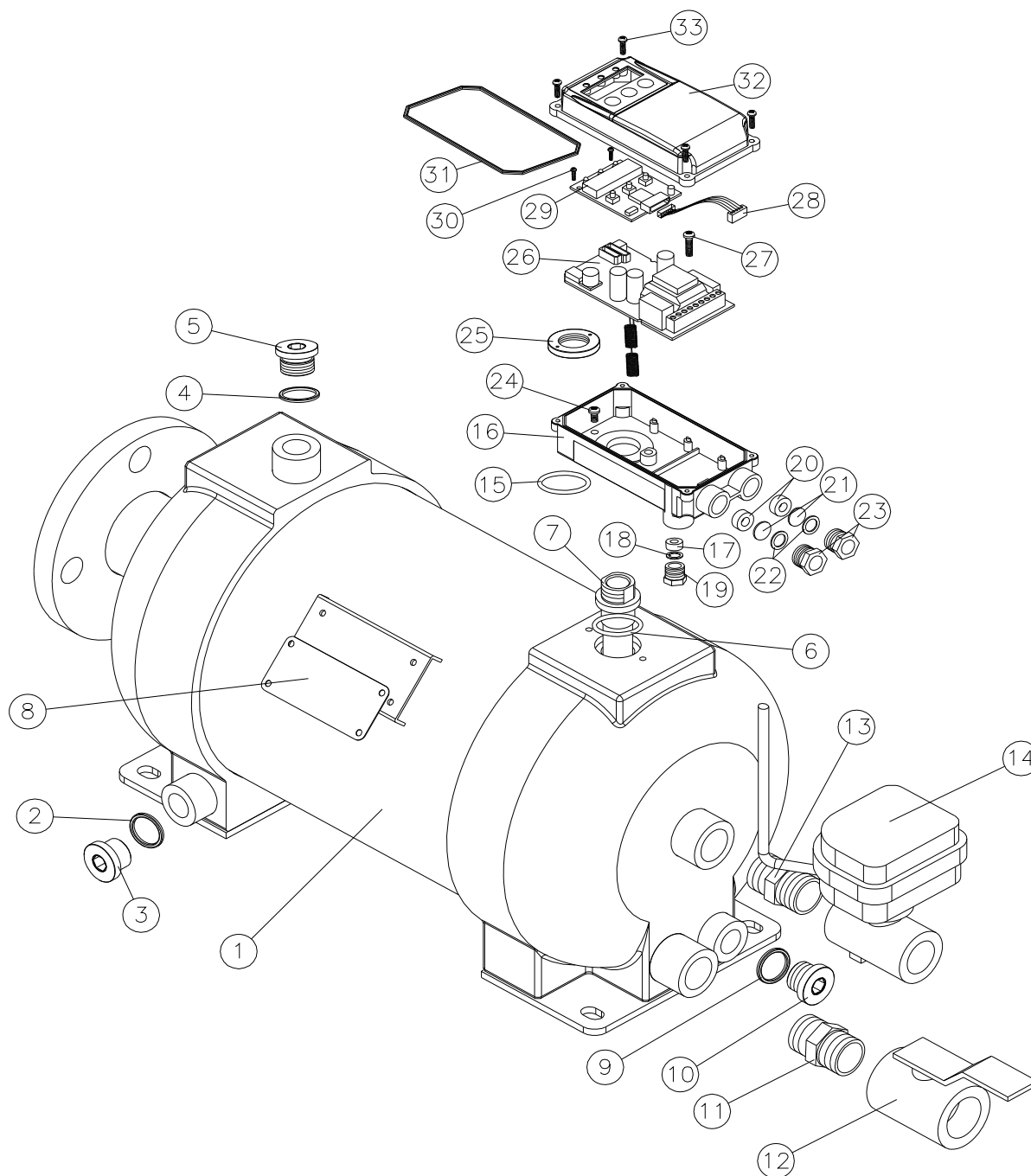
Wearing part kits	SP B150 101	2, 8, 16, 35
Housing	SP B150 102	1, 5, 6
Upper cover	SP B150 103	8, 9, 10, 11, 12, 13, 14, 15
Bottom cover	SP B150 104	2, 3, 4
Sensor board	SP B150 105	27, 28
Electric actuator Ball Valve	SP B150 106	33, 34, 35, 36
PCB case	SP DM00 201	16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 29, 31, 32



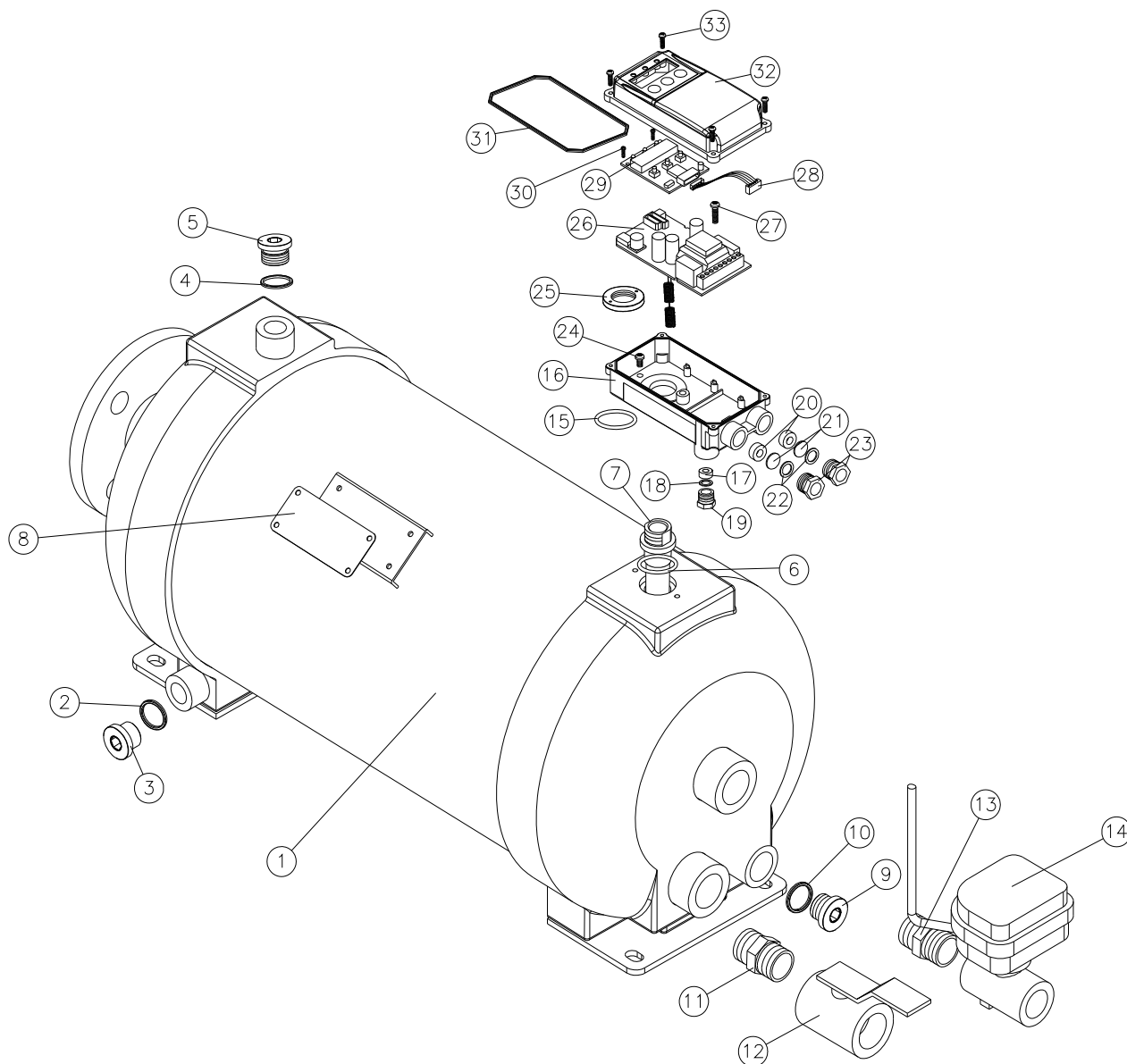
Wearing part kits	SP B500 101	2, 9, 16, 35
Housing	SP B500 102	1, 6, 7
Upper cover	SP B500 103	9, 10, 11, 12, 13, 14, 15
Bottom cover	SP B500 104	2, 3, 4, 5
Sensor board	SP B500 105	27, 28
Electric actuator Ball Valve	SP B500 106	33, 34, 35, 36
Pcb case	SP DM00 201	16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 29, 31, 32



Wearing part kits	SP B1500 101	4, 9, 16, 38
Housing	SP B1500 102	1, 2, 3, 14, 15
Upper cover	SP B1500 103	9, 10, 11, 12, 13
Bottom cover	SP B1500 104	4, 5, 6, 7, 8
Sensor board	SP B1500 105	27, 28
Electric actuator Ball Valve	SP B1500 106	36, 37, 38, 39
Pcb case	SP DM00 201	16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 29, 31, 32



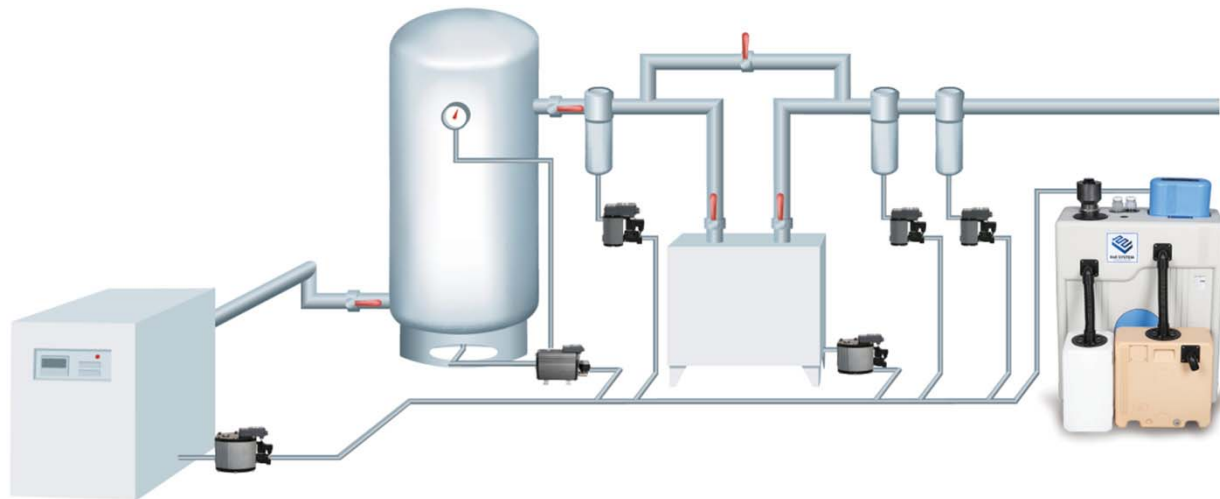
Wearing part kits	SP B2500 101	15
Housing	SP B2500 102	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
Sensor board	SP B2500 105	26, 27
Electric actuator Ball Valve	SP B2500 106	13, 14
Pcb case	SP DM00 201	15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 31, 32, 33
Module Pcb	SP DM00 202	28, 29, 30, 31, 32, 33



Wearing part kits	SP B5000 101	15
Housing	SP B5000 102	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
Sensor board	SP B5000 105	26, 27
Electric actuator Ball Valve	SP B5000 106	13, 14
Pcb case	SP DM00 201	15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 31, 32, 33
Module Pcb	SP DM00 202	28, 29, 30, 31, 32, 33

Condensate auto drain

DRAIN MASTER *B*



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

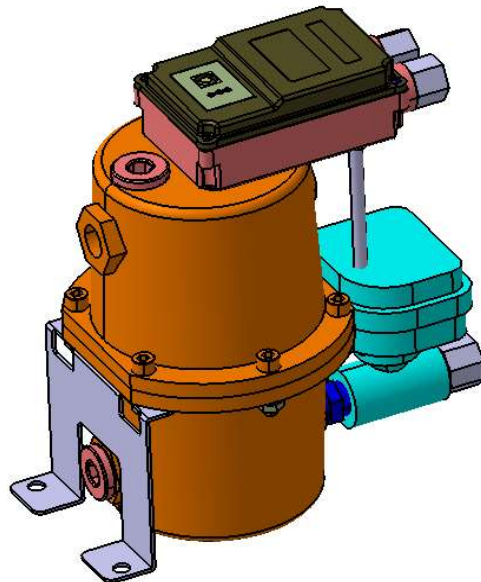
ENVISOL

- Chemical Type Oil-water Separator



Instructions and operation manual

Model : DM-150BS



- Please read this manual before installation of DM-150BS .
- Functions of DM-150BS are enabled properly only when the instructions herein are observed .

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- * MAINTENANCE --- 8
- * COMPONENTS ---9

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 DM-150BS 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.
- ▶ DM-150BS 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



- 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

DRAIN MASTER <i>BS</i>	Climate zone	Peak Compressor Performance m ³ /min	Peak Dryer Performance m ³ /min	Peak Filter Performance m ³ /min	NRTL	CE	IP 65
					Operating Pressure min / max (bar)	Temperature min / max (°C)	Application (*)
DM-150BS	Green	170	340	1700	0/16	+ 1 / 80	A.B
	Blue	150	300	1500			
	Red	105	210	1050			

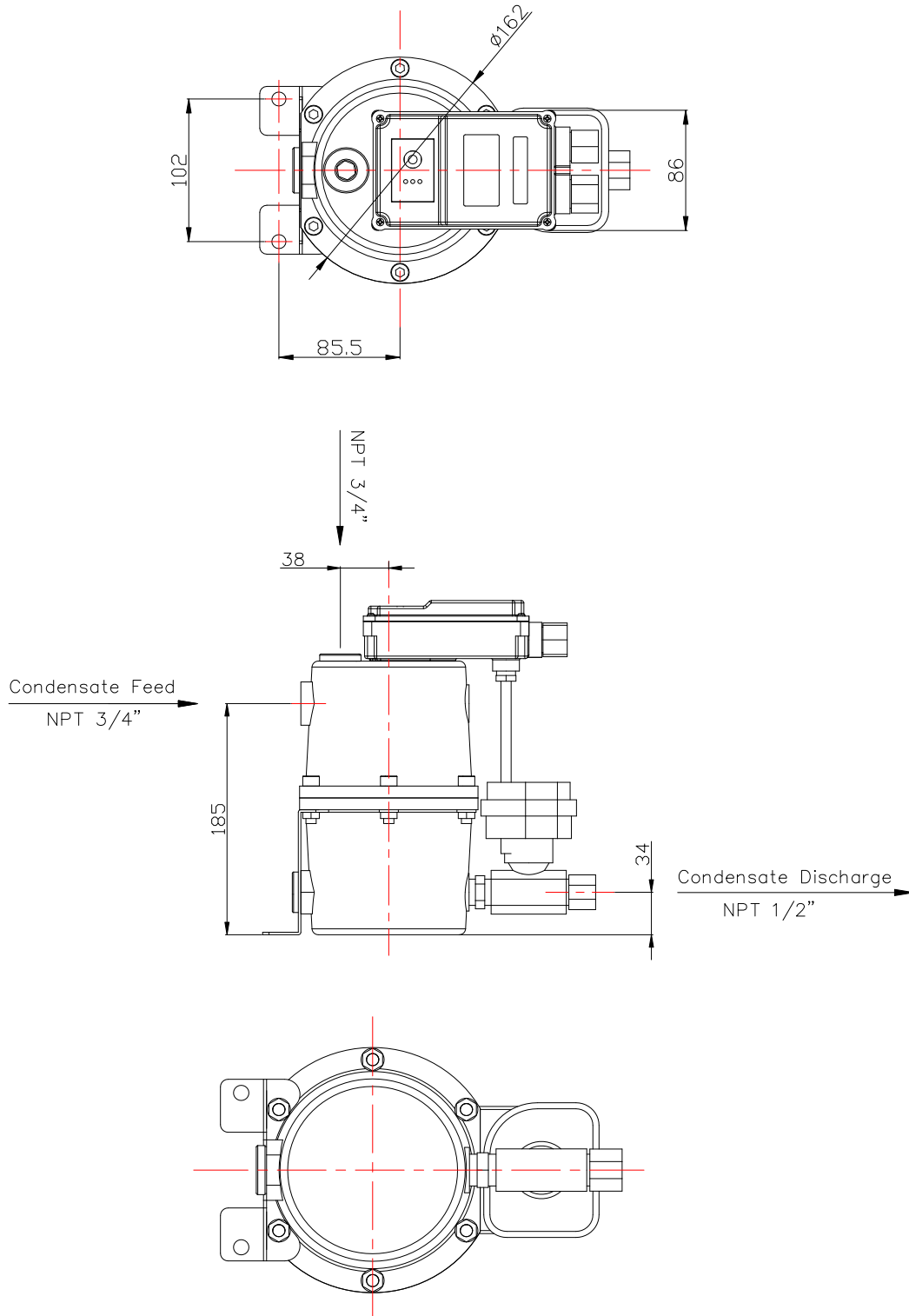
*Application: A.oil contaminated condensate ; B.oil free, aggressive condensate

DM-150BS	
Condensate Feed	3/4" NPT
Condensate Discharge	1/2" NPT
Voltage	24Vdc
Housing Material	SUS304
Weight (Kg)	8.2

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

■ DIMENSION

DM-150BS



■ FUNCTION

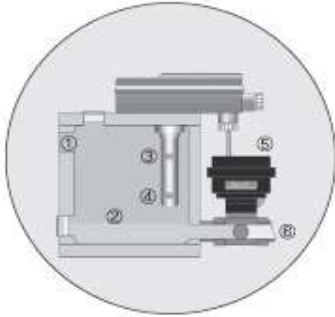


Fig.1

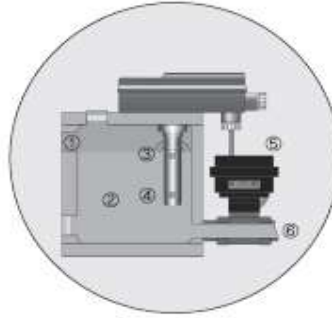


Fig.2

1) Condensate through the feed line ① is accumulated in the housing ②.
 2) As the level of condensate rises inside the housing, it is detected by the top dead center of sensor level ③..3) Upon the open signal from the Main Board, the electric ball valve ⑤ is activated, and condensate is discharged through the discharge line ⑥.4) As the level of condensate drops inside the housing, the bottom dead center of ④ and



Normal Mode

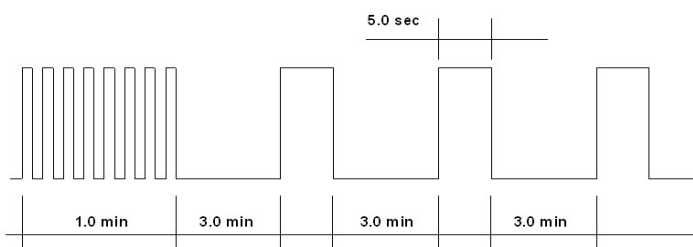
▶ Press 'TEST' briefly (for less than 1 second) to check operational status (manual discharge)



Alarm Mode

You may experience error in the following cases

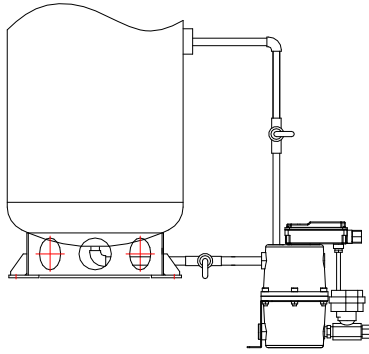
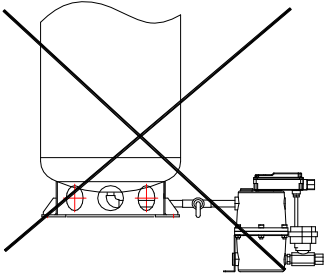
- ▶ Incorrect installation.
- ▶ Overload owing to excessive generation of condensate
- ▶ Poor discharge owing to blocked (by foreign materials, freezing etc) discharge line



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 minutes.

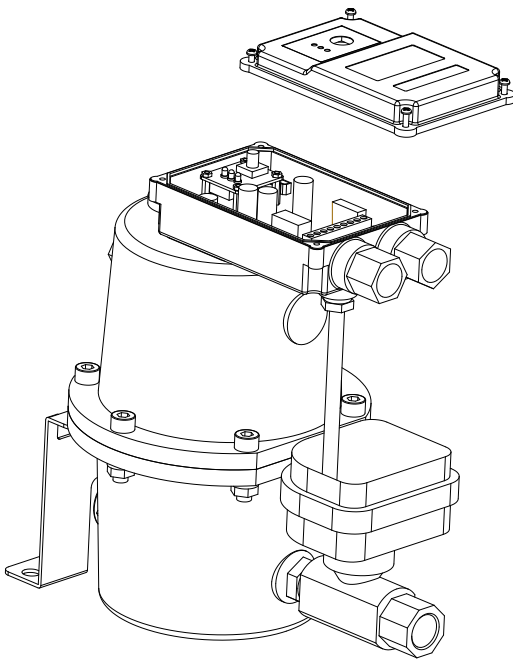
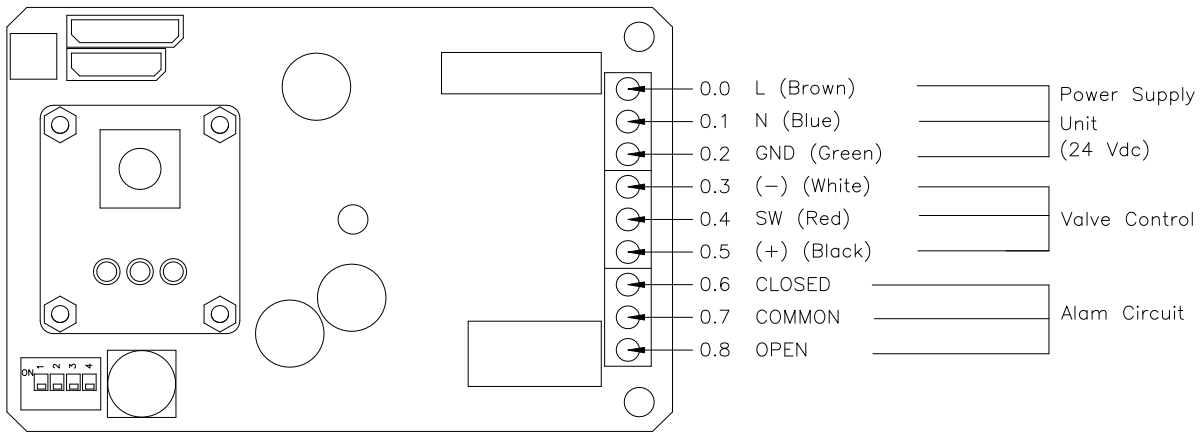
Upon auto recovery or correction of the error by repair, the alarm signal will flicker and the

■ INSTALLATION



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

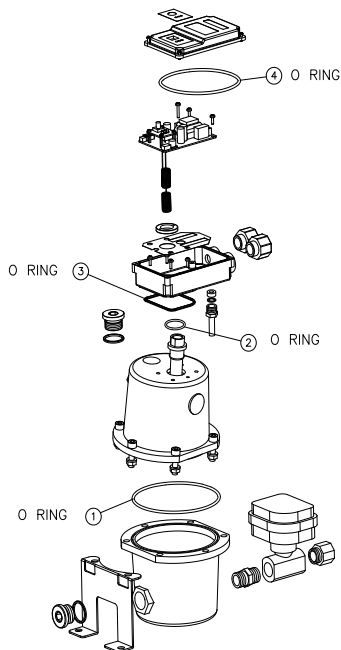
Power Voltage	24 Vdc
Max, Power input	P < 2.0 VA
Recommended cable jacket diameter	Ø 5.8 ~ 8.0 mm
Cable cross-section and fuse protection	3 x 0.75 mm ² / 5 x 0.25 mm ² 0.5 A
Contact loading relay or out	0.5 A

► The emergency relay will be activated when there is no operation pressure (0 bar) or with an error signal, , switching the system to the alarm mode.

■ MAINTENANCE

Trouble shooting	Cause	Solution
<p>▶ No discharge of condensate with the Test button</p> 	※ The feed line or the discharge line is closed or blocked	–Check these lines.
	※ Defective PCB	–Replace the PCB
	※ Defective Ball valve	–Replace the Ball valve
	※ Worn parts	–Replace the worn parts. (Wearing part kits)
	※ Pressure is lower than 0 bar	–Check the operation pressure
<p>▶ Condensate only discharged when the Test button is pressed and held</p>	※ 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.
	※ Detection disabled by excessive contamination on the sensor tube.	–Clean the sensor tube.
<p>▶ Power lamp not lit</p>	※ Power not connected.	–Check the rated voltage. –Check the cable connection.
	※ Defective PCB	–Replace the PCB
<p>▶ Continuous air discharge from the valve.</p>	※ The lower part of the Ball valve is contaminated by foreign materials (scale etc)	–Remove foreign materials.
	※ Poor operation due to foreign materials inside the Ball valve.	–Clean the valve.
	※ Worn parts. (Valve , Actuators)	–Replace the worn parts

Sample

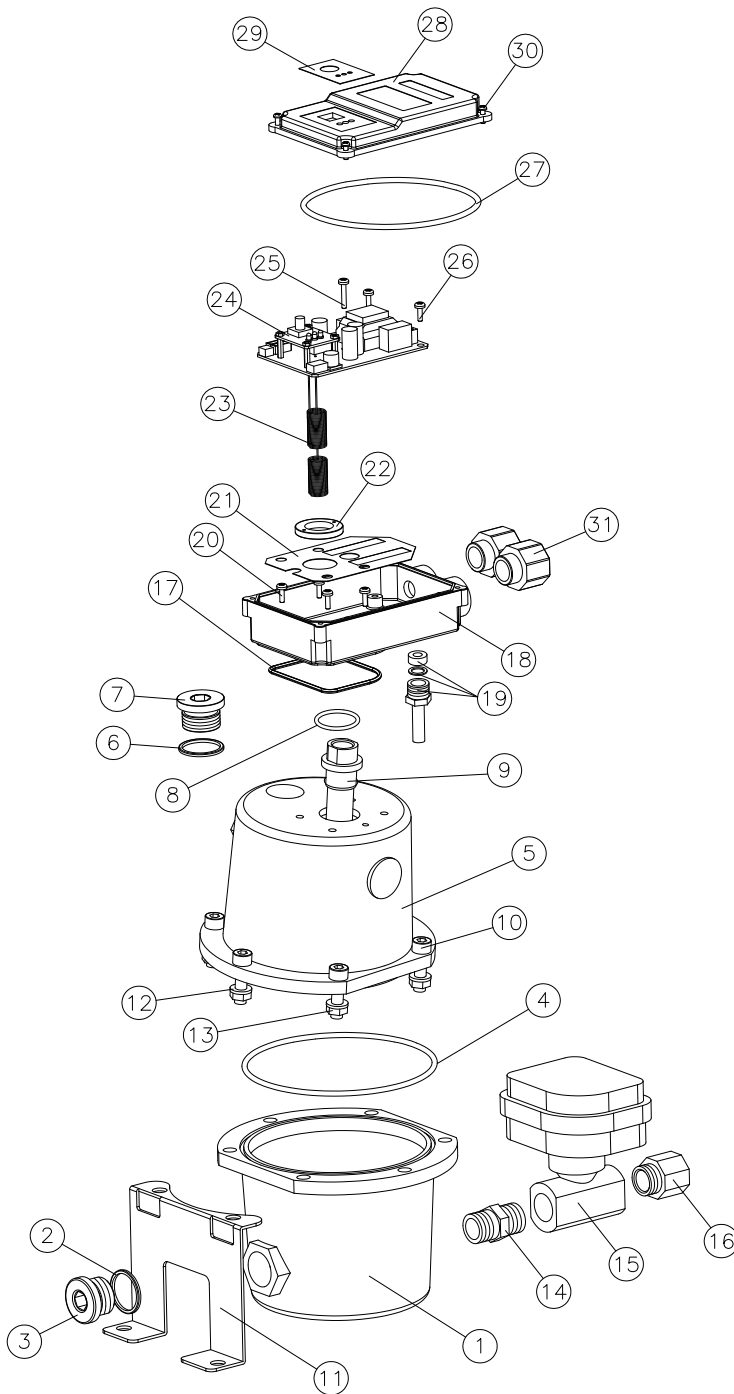


▶ Clean the housing and valves
1-2 times a year.

▶ Check wearing parts once a year

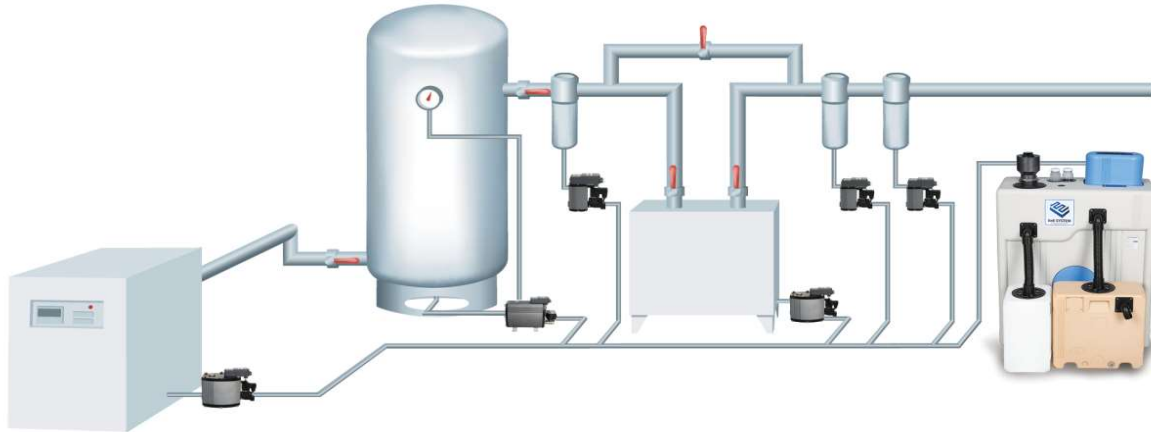
▶ Wearing parts

– DM-150BS : SP BS150 101



Wearing part kits	SP BS150 101	4, 8, 17, 27
Housing Top Cover ASSY	SP BS150 103	5, 6, 7, 8, 9
Housing Bottom Cover ASSY	SP BS150 104	1, 2, 3
Sensor board	SP BS150 105	23, 24, 25, 26
Electric actuator Ball Valve	SP BS150 106	14, 15, 16

Condensate auto drain
DRAIN MASTER *BS*



OUR 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.

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