



OPTIVENT VACUUM DEGASSER

MASTERFLOW

WHAT IS OPTIVENT?

In modern systems, heating and cooling systems must offer maximum performance with the possible lowest air in the water system. Air causes too many complaints in the systems such as low efficiency, high noise level, rapid wear and tear.

Some of water is taken into a vacuum and gasses dissolved in the fluid are seperated and removed from the system.

Providing gas free liquid to system allows free air in the system and degassed water to meet. This meeting allows fluid to absorb free air in the circuit again and again. Air-free fluid in the installation assures perfect heat transfer, low commissioning time, low maintainance cost and optimum performance in the system.



WHAT IS A VACUUM DEGASSER?

Vacuum degassing is a technique of removing dissolved gas from a liquid solution by lowering the pressure inside a vessel containing the water and gas mixture.

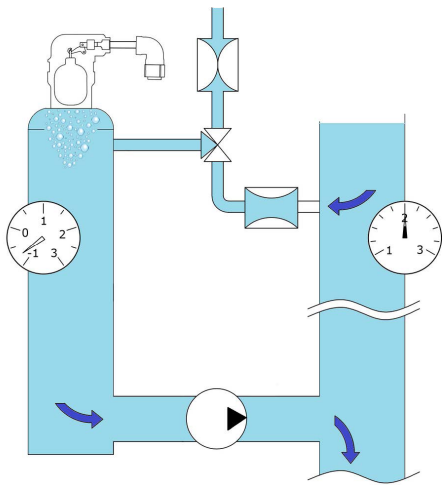
Vacuum degassing is the process of removing dissolved gas from a liquid solution by lowering the pressure inside a vessel containing the solution. The reduced pressure inside the vessel causes the gas to become less soluble and separate from the liquified material. After the vacuum degassing process is complete, the gas is removed from the vessel, and the pressure is returned to normal.

“Gas will dissolve in a liquid until there is a balance between the partial pressure of the gas and the pressure in the liquid.”

~Henry's Law

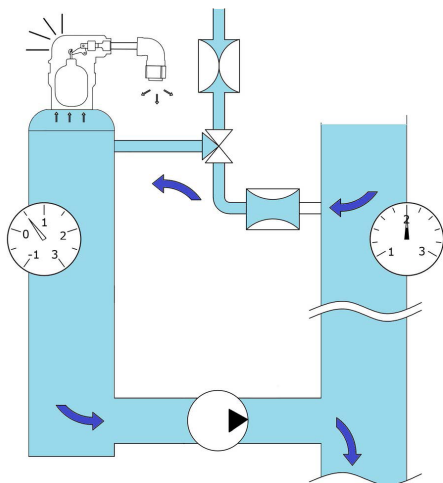
The statement means that as the temperature rises or the pressure drops, the mass of gasses that dissolves in a liquid will be reduced. Therefore, the amount of gas absorbed or dissolved gas emitted will depend on the pressure and the temperature at certain points within the system.

HOW IT WORKS?



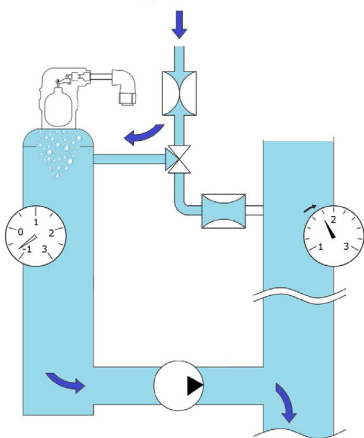
VACUUM FORMING

Since the pump extracts more water from the column than can flow in, a vacuum is created towards the boiling point. Gas is released and collects at the top of deaerator vessel.



DEAERATING

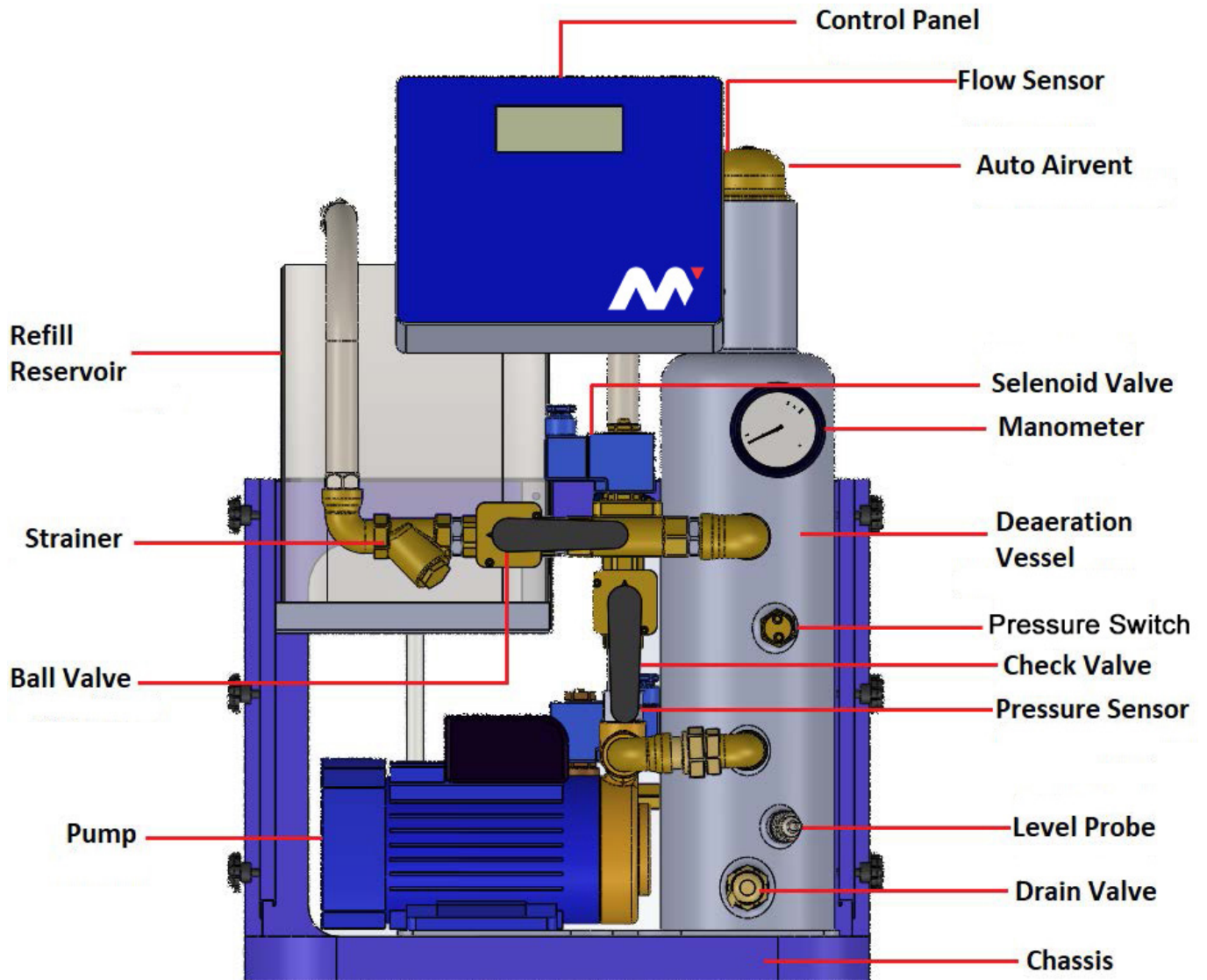
The pressure in the column is increased for a short time by reducing the speed of the pump so that the released gases can be taken into the atmosphere.



REFILL

If the system pressure is too low, deaerated water is added until the correct pressure is reached.

OVERVIEW OF THE UNIT

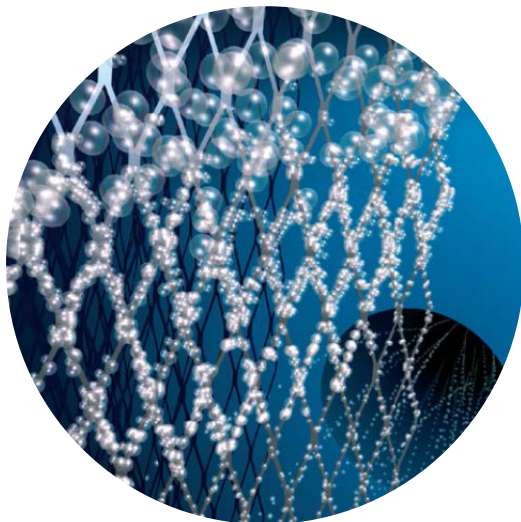


HOW DOES AIR OCCUR IN A SYSTEM?

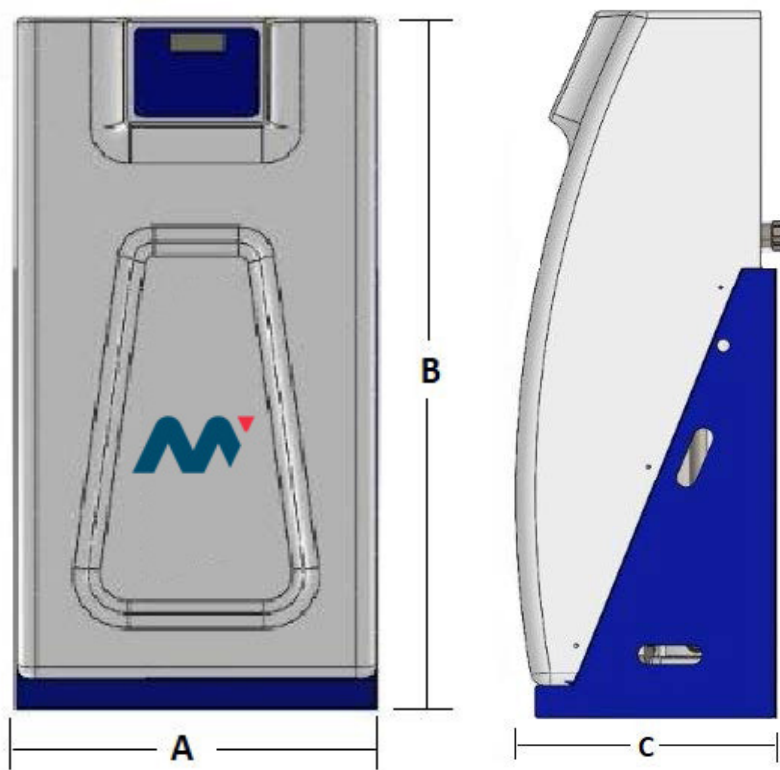
- First filling and Refilling of the system
- Alteration and maintenance Works
- Micro leaks and diffusion through gaskets and pipes
- Open expansion system and cooling towers
- Capacity of liquid to absorb gasses following Henry's Law

The problems caused by air

- Noise in radiators, heat exchangers, pipes and pumps
- Cavitation and rapid wear and tear of heat exchangers, controllers, shut-off valves and pumps
- Insufficient heat emission or cooling efficiency, reduced heat transfer
- Higher maintenance cost
- The biggest problem, Corrosion
- Increase in energy consumption



DIMENSIONS



MODEL	A X B X C (MM)	TEMP. RANGE (°C)	OPERATING PRES. (BAR)	MAX. SYSTEM VOLUME (M ³)	WEIGHT (KG)
OVVD-V4	410x620x290	0-90	1-4	25	25
OVVD-V4	410x620x290	0-90	1-4	25	25

TYPE	A X B X C (MM)	TEMP. RANGE (°C)	OPERATING PRES. (BAR)	MAX. SYSTEM VOLUME (M ³)	WEIGHT (KG)
OVVD-V6	410x740x330	0-90	1-6	300	37
OVVD-V6-R	410x740x330	0-90	1-6	300	41

TYPE	A X B X C (MM)	TEMP. RANGE (°C)	OPERATING PRES. (BAR)	MAX. SYSTEM VOLUME (M ³)	WEIGHT (KG)
OVVD-V9	560x1080x380	0-90	5-9	300	76
OVVD-V9-R	560x1080x380	0-90	5-9	300	81

TYPE	A X B X C (MM)	TEMP. RANGE (°C)	OPERATING PRES. (BAR)	MAX. SYSTEM VOLUME (M ³)	WEIGHT (KG)
OVVD-V12	-	0-90	9-12	300	-
OVVD-V12-R	-	0-90	9-12	300	-

ADVANTAGES AND BENEFITS OF OPTIVENT

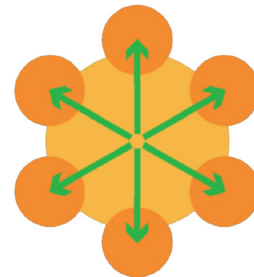
- Greatly reduces commissioning times
- Removes dissolved gasses
- Absorptive fluid also ensures the removal of trapped gas bubbles
- Energy-efficient by Flow Switch
- Automatically degassed refilling and sustained pressure
- Compact, easy to use and reliable design.
- Wall mounted and Floor standing options
- Fully assembled and ready to connect.
- Modbus RTU Protocole compatible



ENERGY SAVING



AUTO RE-FILLING

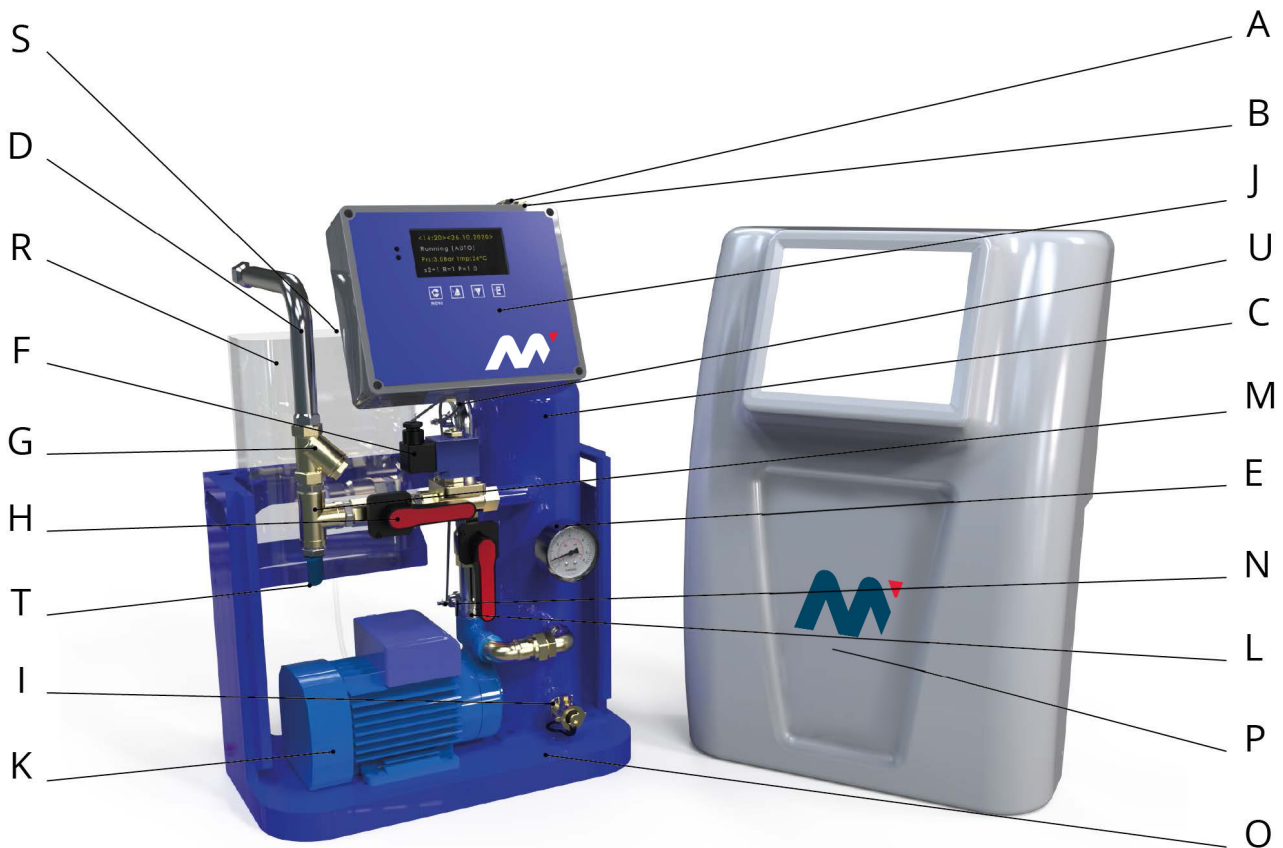


MODBUS CONNECTION



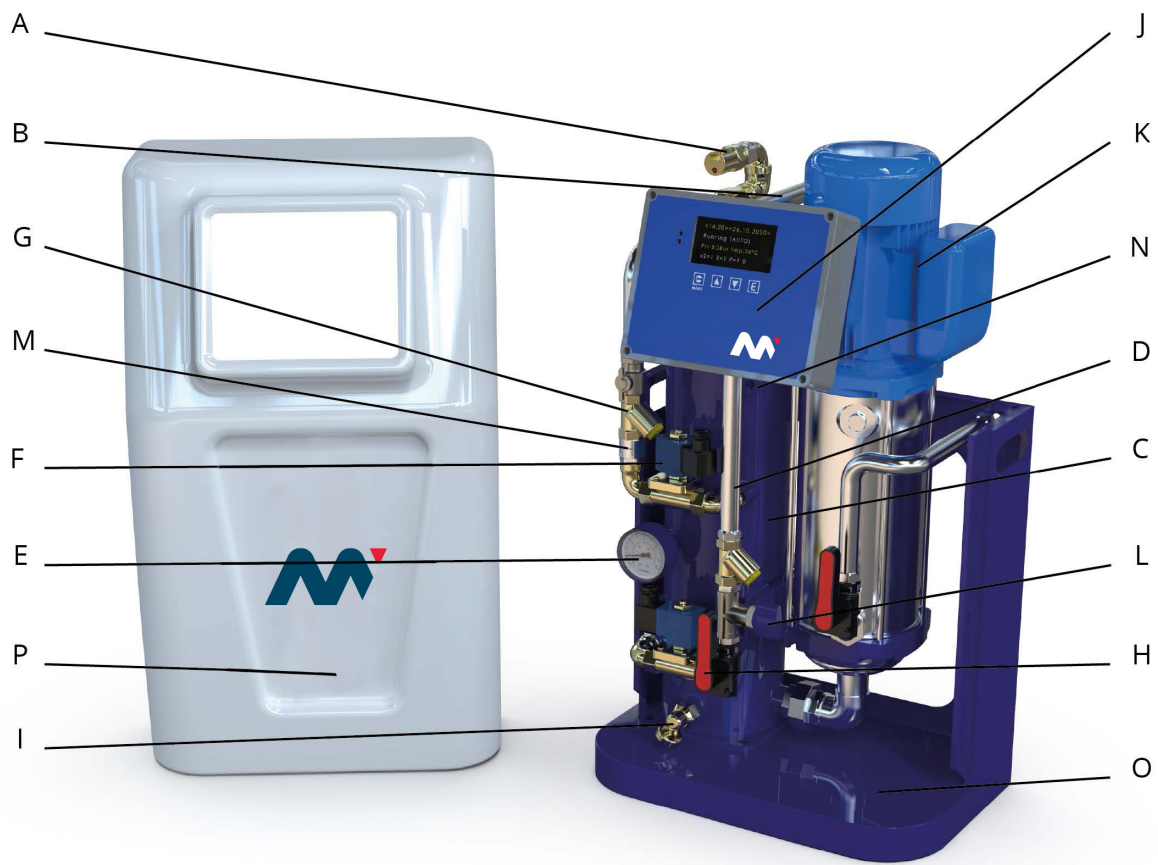
EASY INSTALLING

OVERVIEW OF THE OVVD-V4



A	Flow Sensor	K	Pump
B	Auto Airvent	L	Check Valve
C	Deaeration Vessel	M	Pressure Sensor
D	Flex Hose	N	Level Probe
E	Manometer	O	Chasis
F	Solenoid Valve	P	Cover
G	Strainer	R	Refil Reservoir
H	Ball Valve	S	Float
I	Drain Valve	T	Thin Hose
J	Control Panel	U	Pressure Switch

OVERVIEW OF THE OVVD-V6

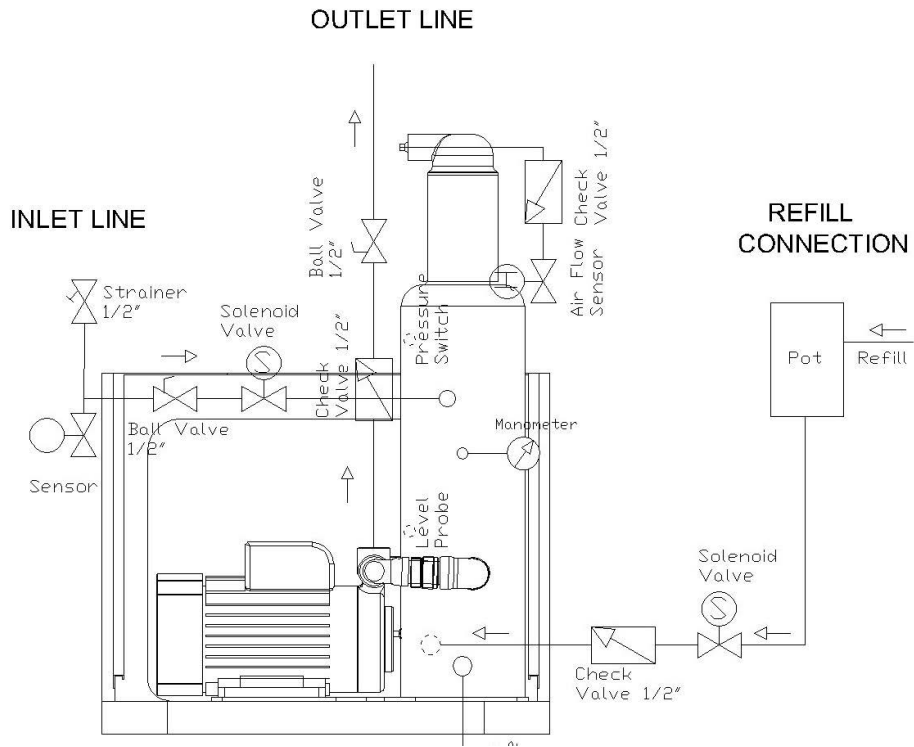


A	Flow Sensor	I	Drain Valve
B	Auto Airvent	J	Control Panel
C	Deaeration Vessel	K	
D	Flex Hose	L	
E	Manometer	M	
F	Solenoid Valve	N	
G	Strainer	O	
H	Ball Valve	P	

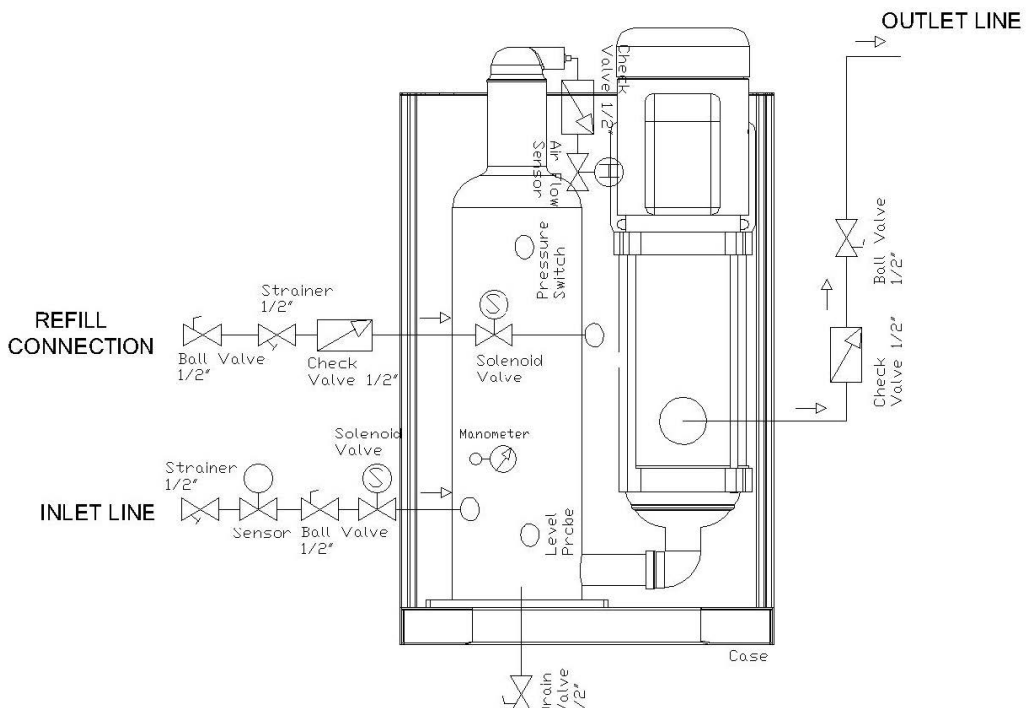
OPERATION

The figures below schematically show the operation of the unit. The drawings indications correspond with the main figure on the previous pages.

OPERATION OF OVVD-V4-R



OPERATION OF OVVD-V6 - R



GENERAL

The figures below schematically show the operation of the unit. The drawings indications correspond with the main figure on the previous pages.

The Optivent is a fully automatic vacuum degasser for installations filled with fluid. Fluids contain dissolved and free gasses. The unit removes these gases from installation. Problems caused by gases in the installation are thus prevented.

The unit starts up a degassing process each day at a time set by the user. The process has two phases:

1. The rinsing phase: The fluid flows from the installation through the solenoid valve (S) into the vessel. The pump continuously pumps the fluid from the vessel into the installation. Here the fluid absorbs gases present in the installation.
2. The vacuum phase: The solenoid valve (S) regularly closes, starting a vacuum phase. The continuously running pump provides underpressure in the vessel. The underpressure causes the release of the gases dissolved in the fluid, which are collected at the top of the vessel.

The gases are removed from the installation through the automatic air vent. The SmartSwich at the automatic air vent makes sure that the stopped as soon as the content of dissolved gases has reached the minimum level. The solenoid valve (S) opens again, at the end of the vacuum phase.

Refilling

The Optivent-R models have an integrated refill function.

A unit with a refill function can control the pressure of the installation. To control the pressure, the unit inserts additional degassed fluid into the installation, if necessary. The unit can also fill the entire installation with degassed fluid.

Operating Conditions

The unit is suitable for use in systems filled with clean water or mixtures of water with maximum of 40% glycol. Use in combination with other fluids may result in irreparable damage.

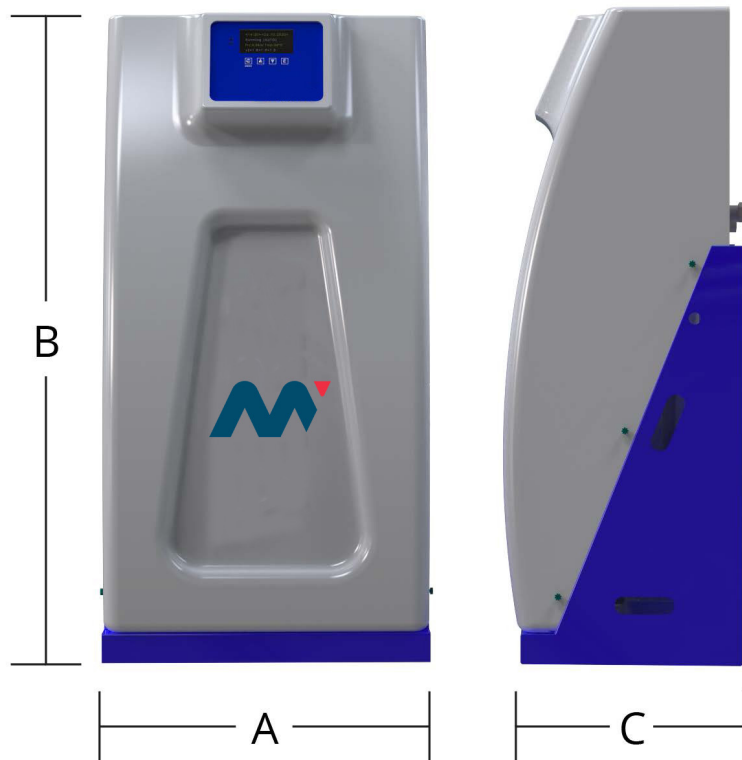
The unit should be used within the limits of the technical specifications as given in chapter 3.



- In case of doubt, always contact the supplier.
- In case of a heavily contaminated system fluid, install a dirt separator or filter in the main return line of installation.

TECHNICAL SPECIFICATIONS

Dimensions



MODEL	A (MM)	B (MM)	C (MM)
OVVD-V4	410	620	290
OVVD-V4-R	410	620	290
OVVD-V6	410	740	330
OVVD-V6-R	410	740	330

GENERAL SPECIFICATIONS

Weight	Kg	36	48	55	57
Noise level	dB(A)	65 (average)		60 (average)	
Volume of degassing vessel	L	3.5		6.6	
Inlet/Outlet connection	inch	1/2"			
Re-fill connection	inch	1/2"			
Supply Voltage		230 V - 50 Hz			
Absorbed power	W	980		1180	
Nominal Current	A	4.9		5.1	
Max. Load of potential free contacts		230 V / 5 A			
System pressure	bar	1 - 4 bar		1 - 6 bar	
Ambient temperature	°C	0 - 40°C			
Fluid temperature	°C	0 - 90°C			
Max. compression pressure	bar	6		6	
Refill flow	l/hr	-	260	-	380
Refill pressure	bar	-	0 - 4	-	0 - 6
Refill fluid temperature	°C	0 - 90 0°C			

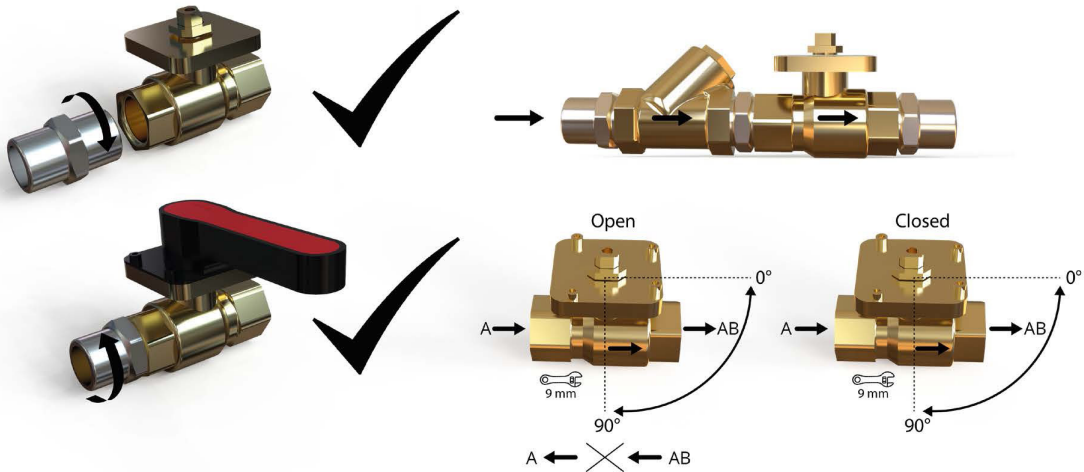
SUGGESTIONS

- Strainer on the Optivent should be cleaned when needed. Min. 2 times in a year.
- Interior of solenoid valve should be controlled every year.
- User should be ensure that each spare part of Optivent works properly.
- To be absolutely sure to have an efficient and reliable operation of Optivent and your system it is recommended to have skilled personnel to check the unit every 2. Year and have necessary service executed.

GENERAL SPECIFICATIONS

Size	1/2" or 3/4"
Body	Forged brass (CW602N)
Ball	Pressed brass, V-shape bore, chrome plated
Ball Seat	Teflon (PTFE) wit O-Ring (EPDM)
Sprindle Sealing	O-ring double EPDM
Operating Temp.	-10°C to 110°C
Nominal Pressure	40 Bar

Valve Montage



Recommended 10 second rule !

The pressure in the vessel during the flushing phase should increase from vacuum up to overpressure within 10 seconds. If it takes longer, turn the adjustment valve at inlet a bit more open, or close the outlet valve some more.

Recommended Valve Adjustments for High Efficiency :

PRESSURE	OVD MODEL	INLET VALVE	OUTLET VALVE
1 bar	V4 / V4-R	5	2
2 bar	V4 / V4-R	8	3
3 bar	V4 / V4-R	10	4
4 bar	V4 / V4-R	5	4


PRESSURE	OVD MODEL	INLET VALVE	OUTLET VALVE
1 bar	V6 / V6-R	10	2
2 bar	V6 / V6-R	6	3
3 bar	V6 / V6-R	6	4
4 bar	V6 / V6-R	10	6
5 bar	V6 / V6-R	7	6
6 bar	V6 / V6-R	5	6

INSTALLATION CONDITIONS

- Install the unit on a frost-free, well-ventilated place.
- Connect the unit to a 230 V / 50-60 Hz power supply.
- Make sure that the expansion system has the proper dimensions. The water displacement in the unit can be cause pressure variations in the installation.
- Take into account an extra net expansion volume of at least 8 litres.

INSTALLATION AND MOUNTING



- Install the unit in accordance with the local guidelines and rules.
 - Install the unit as bypass to a main line of installation.
 - Preferably install the unit as close as possible to the expansion system.
 - Preferably install the unit at the point in the installation with the lowest temperature. Here the most dissolved gases are found in the fluid.
- 
- Install the unit close to the expansion system to minimise pressure fluctuations caused by the intake of water by the system.
 - Make sure that the operating panel is always easily accessible.
 - Make sure that you maintain at least the distance for service and repair as indicated.

WALL MOUNTING

- Mount the unit on the wall by using the holes (A).
- Make sure that the mounting can support the filled unit.



MECHANICAL

- Make two branch lines 3/4" (A) on the side of the main transport line. The distance pay attention to A and C connection distance should be at least 500 mm.
- Insert a valve (A and C line) in each branch. With these valves the unit can be isolated.



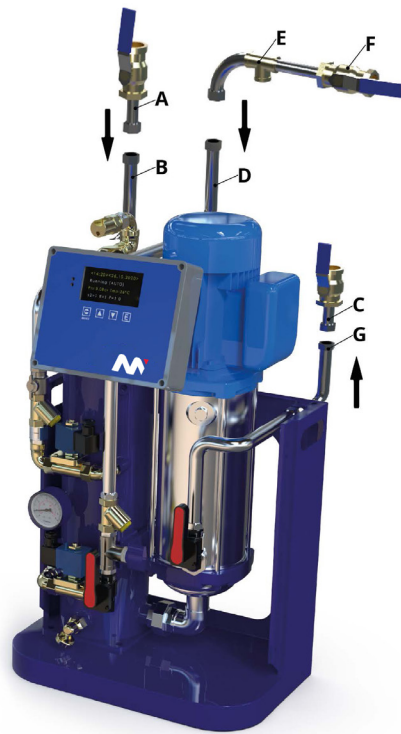
- Make sure that the valves are opened before putting the unit into operation.
- As seen the direction of the volume flow, the first branch

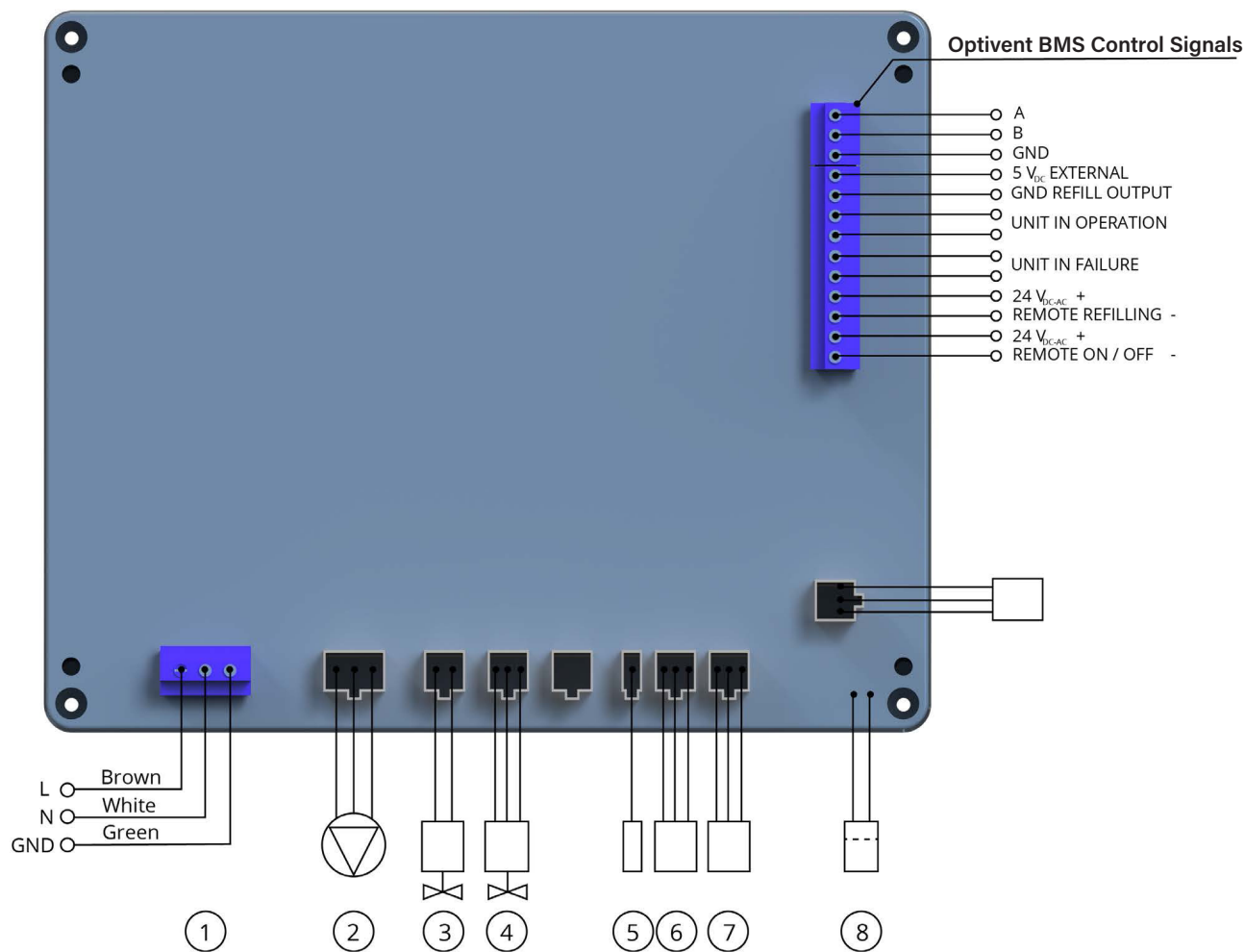


- Connect the line (A) to the flexible outlet line (B)
- Connect the line (C) to the flexible outlet line (G)

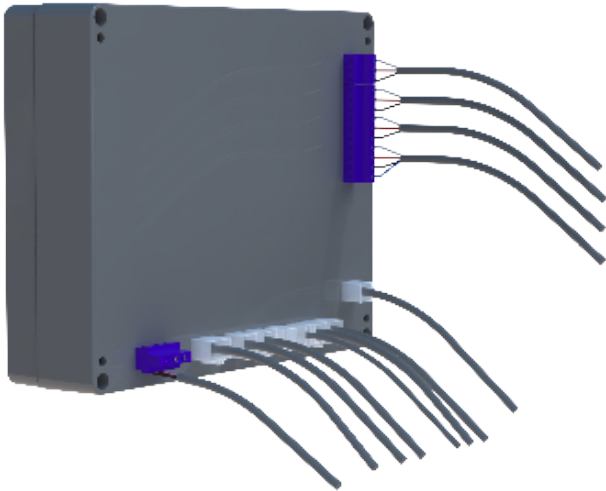


- Only applicable to unites with the refill functionality ;
- Insert a valve (F) and a backflow protection (E) in the refill fluid supply line.
- Use locally approved backflow protection. A backflow protection can also be supplied as an option with the unit.
- Make sure that the pressure of the feedwater is below the system pressure.
- Make sure that the lines leave the unit at the rear.
- Connect the make up water to the refill connection (D) of the unit.





- 1. Mains Electricity (230V/50Hz)
L : Line , N : Neutral ,GND: Ground
- 2. Pump
- 3. System Solenoid Valve
- 4. Refill Solenoid Valve
- 5. P.SW : Pressure Switch
- 6. Air S : Airflow Switch
- 7. P/T S: Pressure and Temperature Sensor
- 8. Water Level Sensor
- 9. Refill Remote
- 10. On/Off Remote
- 11. Unit in Failure
- 12. Unit in Operation
- 13. External Refill



- There are cable connections on the control panel. These connection points are only used to fix the cables.
- Please do not try to pull cable out.



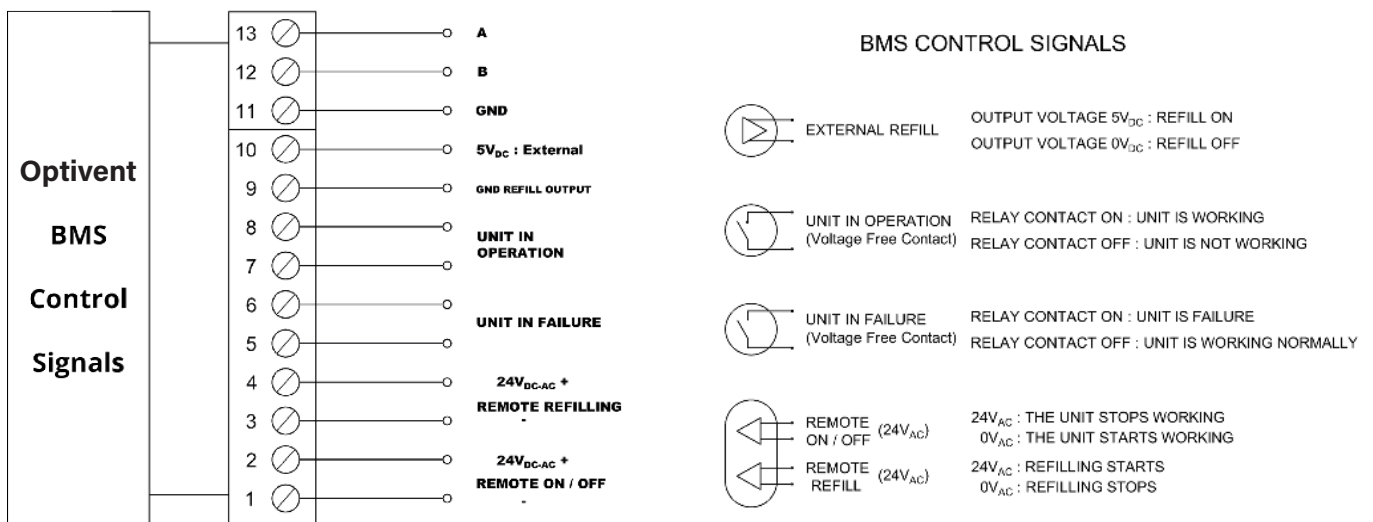
- Please check chapter 8 to remove the controller.

BUILDING MANAGEMENT SYSTEM

The unit is provided with auxiliary contacts for communication with a BMS or other external system.

The BMS must offer a 24Vac voltage.

The failure signal must not be used as a boiler interlock.





MASTERFLOW

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