

Pressurisation/Degassing Combo

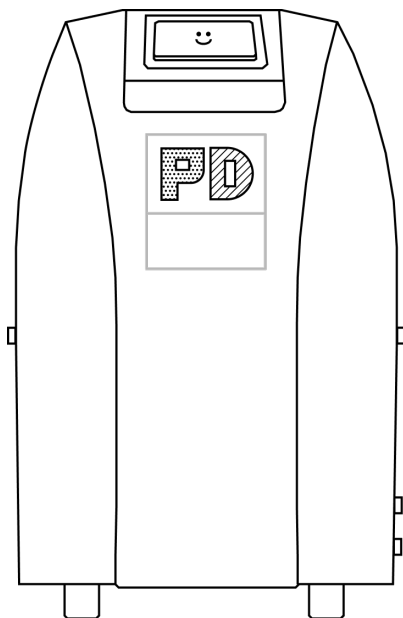
HY-PD

Manual

English

Ver. 260917

Former name: HL Hydraulics PD-X



Support and product feedback

Need help?

You can find guides, frequently asked questions and technical support at hydrun.se/support.

You can also contact us directly:

- support@hydrun.se
- +46 (0)573-21 630

Via your dealer

Our dealers are experienced and knowledgeable about the Hydrun range. They are your closest point of contact for questions regarding installation, operation and spare parts – and have direct access to our support and expertise.

We'd love to hear from you

We develop and manufacture our products here in Töcksfors, Sweden, based on our experience in operation and installation. That's why we'd appreciate it if you could share your views and ideas – big or small. Your feedback helps us make the next generation of Hydrun products even better.

Would you like to contribute directly?

Please feel free to contact our CEO: bl@hydrun.se

1. Quick guide
2. Function
3. Installation
4. Technical Specifications
5. Installation guide
6. Troubleshooting
7. Maintenance
8. Electrical documentation
9. Declaration
10. Machine plate CE
11. Delivery Exceptions and the Buyer's Liability
12. Revisions

1. Quick guide

System components

A complete installation of a combined pressure maintenance and degassing unit must always include an installation kit suitable for: the type of expansion vessel, flexible hoses for connection between the unit and the vessel, two flexible hoses for connection to the system **inlet/outlet**, a magnetite separator and a buffer vessel of at least 50 litres.

The unit can be connected to both open and closed pressureless vessels.

Automatic filling (Autofill) is a separate model; this function cannot be retrofitted.

Operating parameters

Maximum system temperature: 70°C

Installation: 2-metre cable and 230 V, single-phase plug as standard

Recommended operating pressure: 0.7–4 bar

Maximum pressure difference between connections: 0.2 bar

Minimum distance between **inlet** and **outlet**: 500 mm

Installation Dimensions

To ensure a correct installation and proper operation of the unit, it is important to maintain the specified minimum clearances.

A: 1000 mm

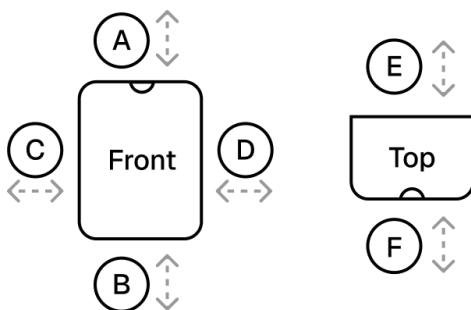
B: floor-mounted

C: 400 mm

D: 400 mm

E: 400 mm

F: 500 mm



Instructions

Check that all components are correctly installed before commissioning.

Always read the manual in full before starting work.

Correct installation in accordance with the above requirements is essential for operation and a long service life.

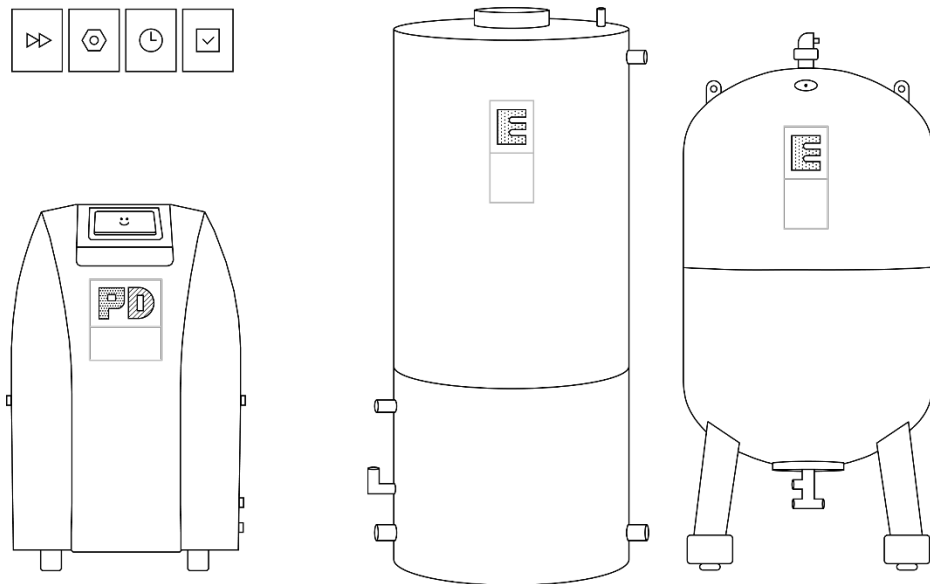
Always ensure that the Hydrun PD is installed level and is not positioned unevenly or unsteadily.

The unit can be installed on the system's pipe connections from the side, from above or from below.

Installation

See the schematic diagram for correct installation.

Hydrun's dirt and magnetite separators and flexible hoses are required during installation for the warranty to apply. A 50-litre buffer tank must be installed on **the expansion/outlet**.



When starting up the HY-PD for the first time, it is normal for there to be air in the pump housing. To remove this, you must carry out a **so-called venting cycle** by manually operating the unit.

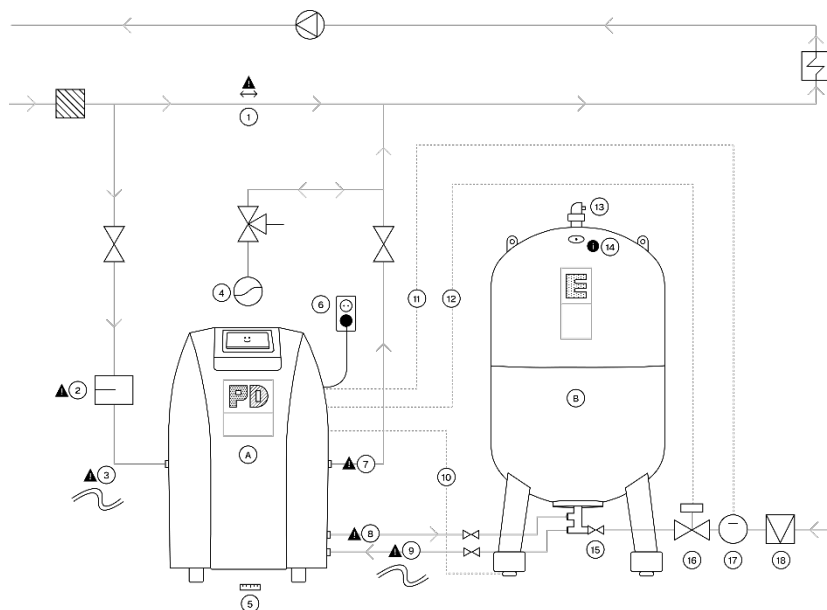
1. Ensure that the system is filled and has the correct system pressure.
 - 1.1 If you have an open, pressureless vessel, you can skip straight to step 2. If you have a closed, pressureless vessel, ensure that it is correctly installed and completely empty of water. You must then tare the vessel (point 14, section 5.2) so that it can measure the level correctly.
2. Go to manual operation and open the motor valve. The symbol for the valve position on the actuator should move anti-clockwise; when the symbol passes the 7 o'clock position, you should start to hear a hissing and bubbling sound – this is air from the unit entering the vessel and being removed via the top vent. Allow the symbol to move to approximately the 5 o'clock position before releasing the 'open motor valve' (MV) button.
3. Once the motor valve has returned to its original position, press and hold P1 (start pump). Check the system pressure and the level in the vessel. Once you have removed air from the unit, the level should drop slightly and the pressure should increase.
4. If you find that the desired pressure cannot be achieved by holding down P1, steps 1–4 must be repeated. Otherwise, proceed to step 5

HY-PD Manual

5. If the desired pressure can be achieved, go to the main menu and press start (NOTE! Only if you have gone through and corrected the settings for setpoint and alarm limits, etc.

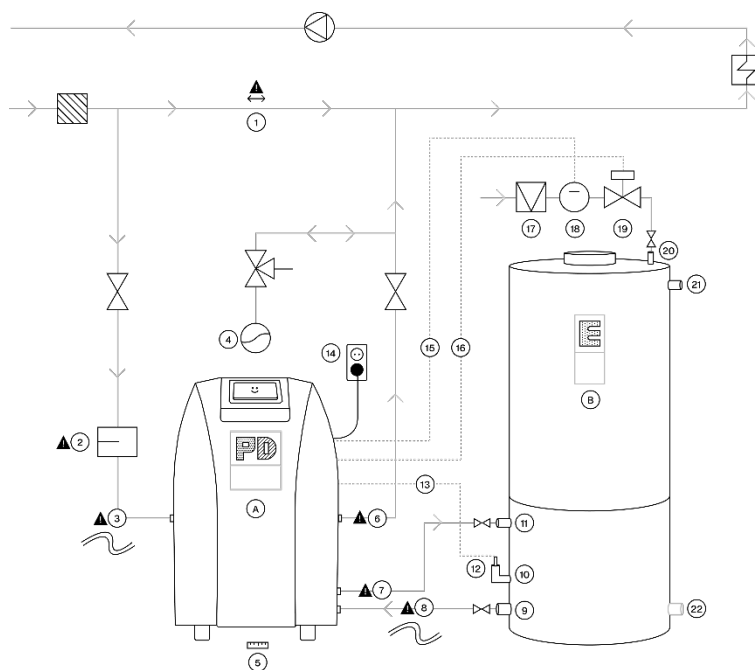
1.1 Quick guide: technical information – closed pressureless vessel

1. Connections for the unit are installed >500 mm apart on the system return.
2. Dirt and magnetite separator (HY-S-DM-20-S or HY-S-DM-25-S).
3. Hydrun's flexible connection hoses are connected to the unit's **inlet** connection.
4. 50-litre buffer tank with service valve.
5. Dimensions W500xD250xH700 mm.
6. 2-metre cable and plug, 230 V, single-phase.
7. Hydrun flexible connection hoses, connected to the unit's **outlet** connection.
8. Flexible hose to **return**. Included in HY-A-KIT-CV
9. Flexible hose to **suction**. Included in HY-A-KIT-CV
10. Sensor cable between load cell and HY-PD.
11. Pre-assembled cable for connection to water meter. L = approx. 0.5 m. (AF model)
12. Pre-assembled cable for solenoid valve. (AF model)
13. Top vent, to be fitted during installation.
14. Hole for pressureless vessel; it is important that this is not covered or plugged.
15. Connection for automatic filling. (AF model)
16. Solenoid valve for auto-fill. (AF model)
17. Water meter with pulse signal. (AF model)
18. Backflow prevention (optional)



1.2 Quick guide: technical information – open, pressureless vessel

1. Connections for the unit must be installed at least 500 mm apart on the system's return pipe.
2. Dirt and magnetite separator (HY-S-DM-20-S or HY-S-DM-25-S).
3. Hydrun's flexible connection hoses, connected to the unit's **inlet** connection.
4. 50-litre buffer tank with service valve.
5. Dimensions W500xD250xH700 mm.
6. Hydrun flexible connection hoses, connected to the unit's **outlet**.
7. Flexible hose to **return**. Included in the connection kit.
8. Flexible hose to **suction**. Included in the connection kit.
9. Tank connection marked '**suction**'.
10. Tank connection marked '**level sensor**'.
11. Tank connection marked '**return**'.
12. Pressure sensor for level measurement, included in connection kit HY-A-KIT-OV-PD.
13. Sensor cable between the unit and the level sensor cable HY-A-KIT-OV-PD.
14. 2-metre cable and plug, 230 V, single-phase.
15. Pre-assembled cable for connection to water meter. L = approx. 0.5 m. (AF model)
16. Pre-assembled cable for solenoid valve. (AF model)
17. Backflow prevention (optional)
18. Water meter with pulse signal. (AF model)
19. Solenoid valve for auto-fill. (AF model)
20. Tank **connection**
21. **Overflow** connection
22. Tank connection to auxiliary tank (available as an option)



2. Function

The HY-PD is a fully automatic vacuum degasser and dynamic pressure maintenance unit, housed in a single chassis.

The unit ensures that heating or cooling systems always maintain the correct system pressure and removes gases from the system fluid.

The pressure maintenance function always takes priority. Once the pressure requirement is met, the unit draws in the system water in a partial flow, removes gases from the fluid and then pumps the fluid back into the system.

This is how pressure maintenance works in practice:

- If the pressure in the system rises too high, the motor valve opens and returns fluid to the tank until the correct pressure is reached.
- If the pressure drops, the soft-start pump starts and fills the system from the reservoir.
- The unit utilises opening and closing delays on the motor valve (factory setting: 2s opening, 0s closing) to prevent overshoot and can be adjusted to suit the system's characteristics.
- The pump has start-up and shut-down delays, which minimise unnecessary starts and keep the pressure within the correct range.

How it works in practice with venting:

- Water is drawn into the degasser in a partial flow
- By creating a vacuum of -0.7 to -0.9 bar, the dissolved gases in the liquid are released.
- The gases are removed from the system by introducing new liquid into the degassing tank.
- The degassed water is returned to the system and can then absorb new gases again.

A well-maintained heating and cooling system:

- Prevents air-related problems and operational disruptions.
- Protects pumps, valves and heat exchangers from wear and tear.
- Contributes to lower energy consumption and smoother operation.

2.1 Automatic refilling

The HY-PD can be supplied with automatic top-up. The function is activated if the pressure in the system falls below a specified limit, at which point refilling takes place up to the upper maximum value. Refilling takes place first into

the vessel to minimise air ingress into the system. Auto-fill is a separate model and provides extra security in

installations with varying volumes or a risk of pressure drops.

3. Installation

Filter

Hydrun's combined unit must always be installed together with a dirt and magnetite filter (HY-S-DM-20-S). The filter separates dirt and magnetite that might otherwise circulate in the system. This protects both the unit and other system components whilst extending their service life.

The filter provides primary protection for the unit and is mandatory for the warranty to apply.

Tip: A correctly positioned filter not only extends the unit's service life but also reduces the risk of malfunctions throughout the system.

Connections

Hydrun's flexible connection hoses must be fitted to the unit's inlet and **outlet**. The hoses are steel-reinforced and supplied in lengths of 1.5 metres. The hoses are diffusion-tight and dampen vibrations between the system and the unit.

Pipe sizing

If the distance between the connection to the main pipe and the exhaust is greater than 1.5 metres, the pipe diameter must be at least 28 mm. For distances greater than 4 metres, the diameter must be at least 32 mm

4. Technical specifications

Pump data		
Product	HY-PD-40	HY-PD-40-A
Maximum pressure at connection point	0.7–4 bar	
Weight	30.3 kg	
Fluid temperature	0–70°C	
Sound level/noise	55 dB(A)	
Ambient temperature	Max 45°C	
Dimensions H x W x D	750 x 500 x 250 mm	
Max. inlet pressure	The actual inlet pressure + the pump pressure against a closed valve must be less than the "maximum operating pressure"	
Permitted fluids	Water, ethylene glycol, propylene glycol, glycol <50%	
Electrical data		
Product	HY-PD-40	HY-PD-40-A
Consumption	5 A	
Power consumption (kW)	0.75	
Supply voltage	230 V earthed plug	
Line voltage	230 V (1 phase)	
Rated current	10 A	
Overcurrent protection	230 V thermal fuse in electric motor/pump, 400 V motor protection	
Trigger conditions	230 V overheated motor, 400 V circuit breaker set for the respective motor power	
IP rating	IP-54	
Connections		
Inlet	1/2" external thread	
Outlet	1/2" external thread	
Automatic filling	N/A	1/2" external thread

5. Installation guide

The HY-PD must be installed on the system's return pipe. This is to ensure a constant, correct operating pressure on the suction side of the circulation pump. Furthermore, the HY-PD must be positioned close to the vessel to achieve the shortest possible **suction line**.

When using an open, pressureless tank

Ensure that overflow water can be directed to a floor drain or via another drainage system. Ensure that the vessel is placed on a level and stable surface.

When using a closed, pressureless vessel

Ensure that overflow water can be drained to a floor drain or via another drainage system. Ensure that the vessel is placed on a level and stable surface.

It is important to tare the load cell before filling the vessel to ensure accurate level measurement; see further information in section 5.2

Pressure equalisation vessel

Installation of the pressure equalisation vessel must be carried out on **the outlet** from the unit.

For the auto-fill model

The solenoid valve and water meter are packed inside the unit for transport. Open the cover and remove these during installation.

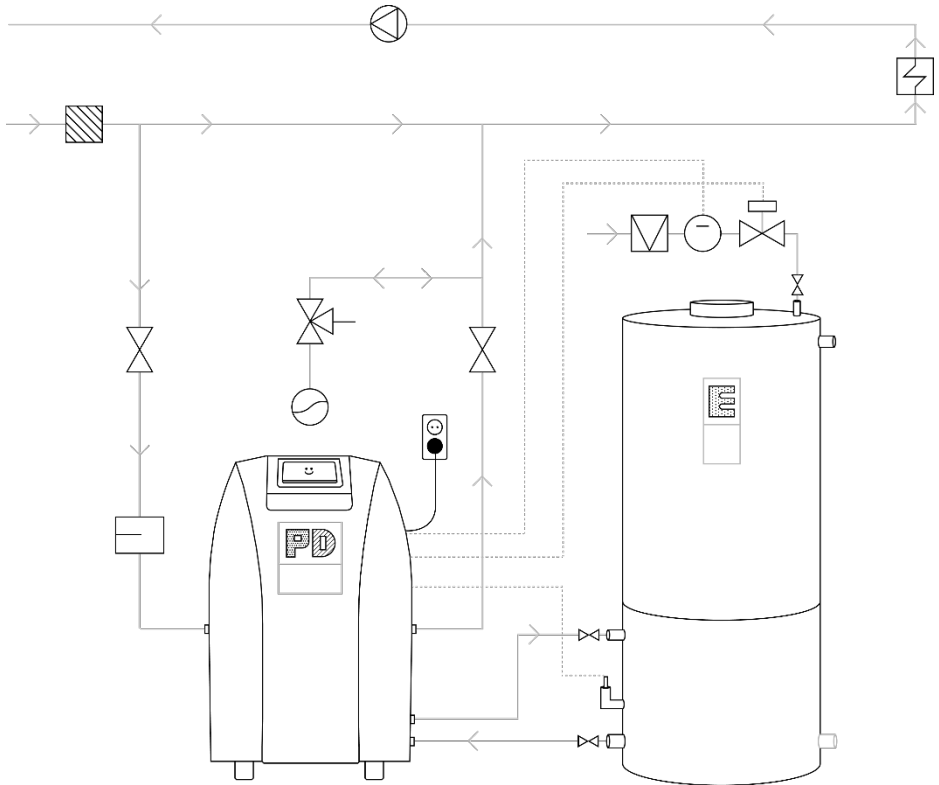
For the auto-fill model, the following instructions apply when connecting the vessel:

- a. Connect the solenoid valve on **the fill connection** to the bottom connection of the vessel.
- b. Connect the water meter to **the fill connection** so that the volume filled can be monitored over time.
- c. Connect the cable to the water meter
- d. Connect **the fill connection** to the tank so that filling takes place into the tank and not the system.
- e. Connect the power cable from the solenoid valve to terminal 8, N and PE.

When sizing a combined unit, it is recommended that the unit's maximum operating pressure exceeds the system's normal desired operating pressure.

5.1 System connection

1. Install the HY-PD in accordance with the schematic diagram below. If the unit is not an auto-fill model, proceed to point 3.
2. The water meter supplied should also be installed on **the fill connection** between the solenoid valve and **the fill connection** on the tank; the white pulse cable is pre-fitted to the water meter and is approximately 0.5 m long.
3. Ensure that all ball valves between the HY-PD and the system are open.
The pump must always be vented during installation; this is done through several so-called venting cycles (see description of the venting cycle in the quick guide, chapter 1). The unit must be stopped for manual operation to be possible.

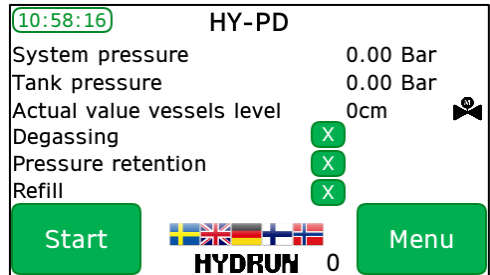


5.2 Control system settings

1. Upon start-up, the main menu appears on the display. This shows the pressure in the system and in the tank; both pressures should be equal if the unit is not active.

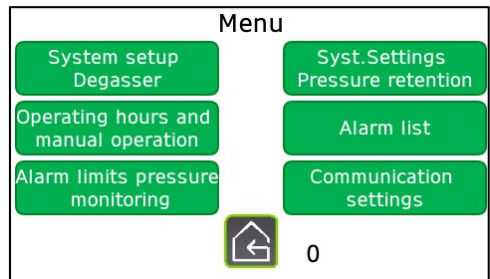
Depending on the tank type, you can also see the level in the tank, shown in either cm or litres, on the start-up screen.

Here you can also see whether Venting and Pressure Maintenance are active or not; if the model is an auto-fill, you can also see Filling, with a tick in the green box indicating that the function is active.



Tip! CM = open, unpressurised vessel; Litres = closed, unpressurised vessel

2. Check that the button at the bottom left of the display shows that the unit is stopped.



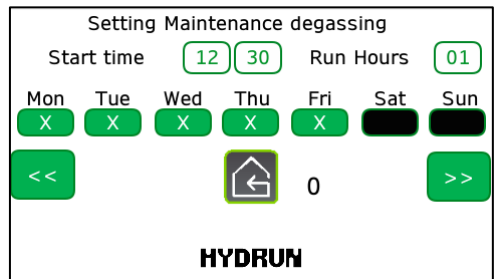
3. Then press **Menu** in the main menu, followed by **System Settings > Exhaust Gas**.

In this menu, you can configure settings for maintenance venting.

Here you can set the days and times when the unit should start and purge the system.

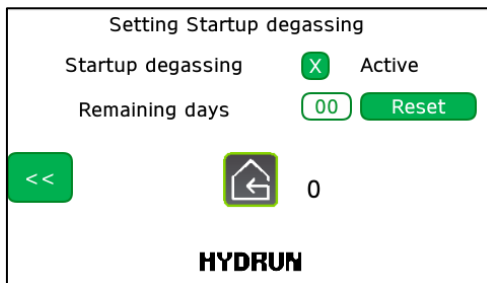
It is also possible to set how long the purger should be in operation; one cycle takes approx. 2 mins.

Please note that this setting is intended for normal operation and does not affect or include start-up purging.



4. Press the right arrow >> to access the start-up purging settings.

In this menu, you can choose to either enable or disable start-up purging by ticking the small box to the right of the text 'Start-up purging'. If the box is ticked, start-up purging is active. Start-up purging lasts for 30 days; it is possible to reset the period by pressing **reset**. Once start-up purging is complete, the system automatically switches to maintenance purging

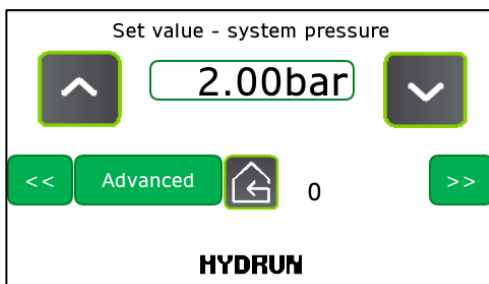


5. Then press the House symbol and go to Menu, select System settings. Pressure hold.

The first setting is setpoint pressure, i.e. the system pressure that the unit is to monitor and remain above.

The maximum permitted pressure in the system is then:

$= \text{setpoint} + 0.4 \text{ bar}$ (according to factory setting)

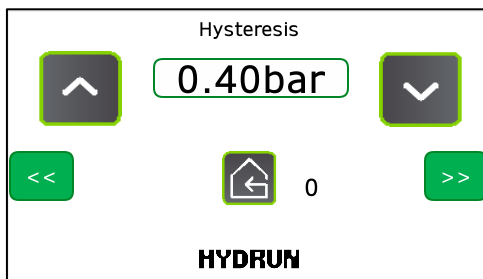


Here, use the increase and decrease keys on the display to set the correct pressure in the system. The settings take effect immediately and are saved automatically.

6. Then press Advanced to access the **Hysteresis** setting.

Hysteresis is the difference between pump start (setpoint pressure) and motor valve opening. The factory setting is 0.4 bar.

To change and set the desired hysteresis, use the increase and decrease keys.

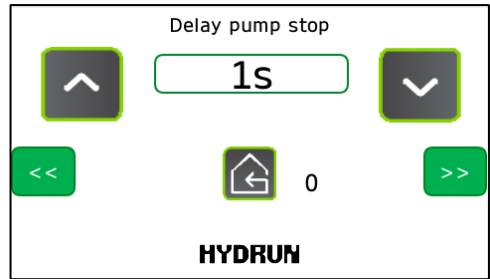


Example: If the setpoint is 2.0 bar and the hysteresis is 0.4 bar, the pump starts when the system pressure falls below 2.0 bar and the motor valve opens when the pressure rises above 2.4 bar. In this way, the system pressure remains stable between 2.0 and 2.4 bar.

7. Press the right arrow >> to access the pump switch-off delay function.

This function controls how long the pump continues to run after it has reached the setpoint.

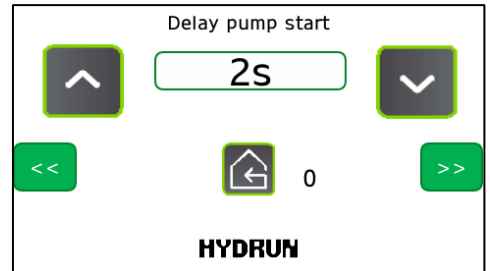
The factory setting is 1 second.



8. Press the right arrow >> to access the start delay function.

This function controls how long the pump should wait before starting after the system pressure has fallen below the setpoint.

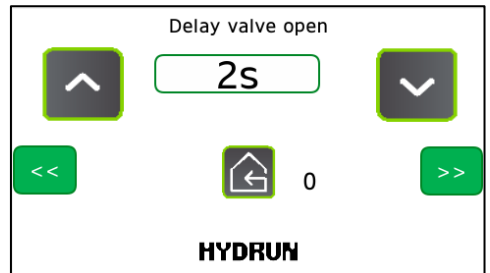
Factory setting: 2 seconds.



9. Press the right arrow >> to access the motor valve opening delay function.

This function controls how long the motor valve waits before opening after the system pressure has risen above the set setpoint + hysteresis.

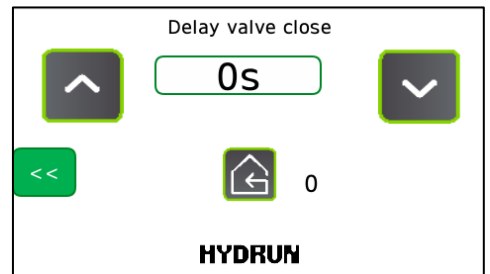
Factory setting: 2 seconds.



10. Press the right arrow >> to access the motor valve closing delay function.

This function controls how long the motor valve waits before closing after the system pressure has fallen back below the set setpoint.

Factory setting: 0 seconds.



11. Press the **house symbol** followed by **Menu**, then **System settings Pressure maintenance**.

Press the right arrow >> until you reach the **level measurement settings** box.

For a closed tank with a load cell on one leg, the switch should be set to **on**.

For PE vessels, the switch should be set to **off**.

Also check that the tank volume is correct; if not, enter the correct volume (only the main tank volume is specified if there are multiple tanks).

Setting level measurement

Load cell level ☒ ON

Tank volume 0 Litres

Empty tank weight 0 Kg

Current level 0 Litres

<< Tare [House Icon] 0 >>

HYDRUN

14. Ensure that the tank is empty of water and positioned in its final location at the installation site.

Then press '**Tare**'; this ensures that any slope in the floor is taken into account when calculating the vessel's level from its current position.

If it is not possible to empty the vessel before taring, you can instead enter the vessel's tare weight; see the table below.

Weight (kg)	Capacity (L)
35.6 kg	200
42.5 kg	300
60.9 kg	500

However, this does not provide the exact setting that the taring would have provided, which may result in the vessel not being used to its full capacity. Can be used for temporary operation, but correct taring must always be carried out for the unit to function as intended.

15. Press the right arrow >> to access the settings for the start and stop levels for automatic refilling.

Note: This applies to units with automatic refill.

If the unit has an auto-fill function, the first page will display the settings for the fill limits. Here you can easily set the levels in the tank at which filling should start and stop.

Settings limits auto-fill

Start Level 20 Litres

Stop level 30 Litres

<< [Up/Down Arrows] [House Icon] 0 >>

HYDRUN

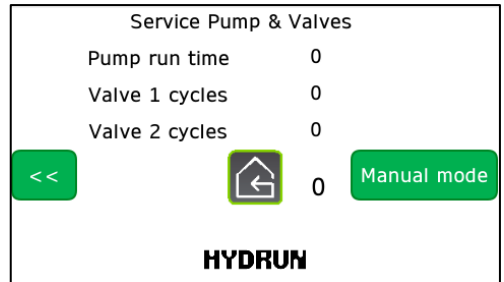
Start level – the level that signals the top-up valve to open.

Stop level – the level in the expansion vessel that signals the refill valve to close

16. Tap the house icon again, then go to **Menu** and select **Operating times and Manual operation**.

First, information for **Service Pump & Valves** appears; here you can see the following:

- a. Total operating time for the pump in hours
- b. Number of cycles for valve 1 (inlet)
- Valve 2 = **suction** pressure maintenance
- Valve 3 = Auto-fill

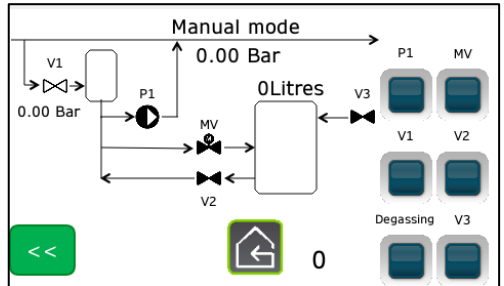


17. Press the right arrow >> to access manual operation.

Manual operation is only possible if the unit is stopped.

V3 is only available if the unit has an auto-fill function.

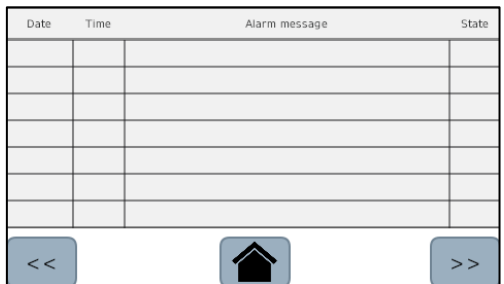
Hold down the respective function button to operate manually; release to stop.



18. Press the home button, then go to **Menu** and then **Alarm List**.

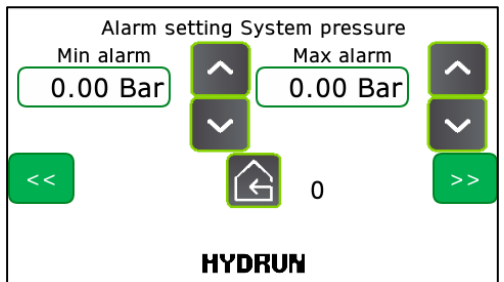
This menu displays all active alarms; press the right arrow >> to view all alarms that have occurred in the past.

If an alarm occurs in the device, a warning triangle will flash in the top right-hand corner of the display.



19. Return to **Menu**, then select **Alarm Limits and Pressure Monitoring**.

Here you set the minimum and maximum permitted system pressures. If the pressure exceeds these limits, an alarm will be triggered. The alarm is not a stop alarm.



20. Press the right arrow >> to access the auto-fill limit settings.

a. Alarm limit litres per set time – here you first specify the volume permitted to be filled into the system. Then, below, you specify the time allowed for this volume to be filled.

In other words, if more than the maximum volume specified is filled within the specified time, an alarm will be triggered and the filling will stop. This view shows how much has been filled during the specified time period. It is possible to reset the volume filled during the alarm period at any time.

If you do not wish this alarm to be active, you can deactivate it by setting the alarm time to 0 hours and 0 days.

b. The total volume alarm limit is shown on the next page; this specifies the total volume that is permitted to be filled into the system before the unit triggers an alarm and stops filling. This alarm limit is independent of time and monitors only the volume filled. This menu displays the volume refilled since the reset; it is possible at any time to reset the volume refilled during the alarm interval.

Settings Fill alarm

Alarm limit, litres per set time 0 Litre

Alarm time, hours 0 days 0

Filled during alarm time 0 Litre

0 hours + 0 days = inactive

Reset

<< >>

HYDRUN

Settings Fill alarm

Alarm limit, own quantity 85 Litre

Filled since reset 0 Litre

Reset

<< >>

HYDRUN

The HY-PD is supplied with fill levels set to 0; with this setting, automatic filling is disabled

21. Press the right arrow >> to go to **the Refill**

Alarm Settings. Here you can set the number of litres per pulse.

10 litres per pulse = factory setting

This should not be changed unless otherwise

specified. Here, it is also possible to view the total

amount filled over time. This meter cannot be reset.

Settings Fill alarm

Water meter, number of litres per pulse 0 Litre

Total filled 0 Litre

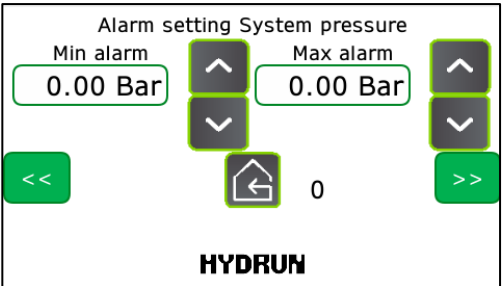
<< >>

HYDRUN

23. Press the right arrow >> to go to **Tank Alarm Level Settings**.

Here you set the minimum and maximum permitted levels in the tank. If the level exceeds these limits, an alarm will be triggered.

Suggested high level: Measure from the centre of the level sensor to approx. 15 cm below the overflow drain connection, then enter this value as the high-level alarm limit for the tank.

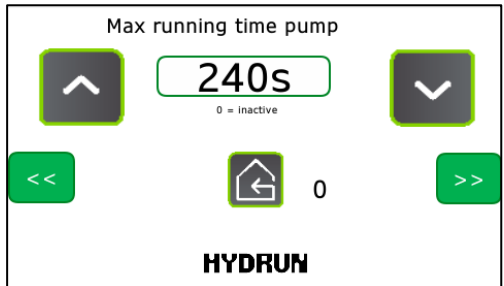


Note! Dry-run protection for the pump is built-in; this alarm limit cannot be adjusted.

24. Press the right arrow >> to go to **Max pump running time**.

This setting determines how long the pump is allowed to run before it stops; this is to prevent the pump from overheating if, for any reason, it is unable to reach the preset pressure.

When the maximum time is reached, the unit stops and an alarm is triggered. A pop-up window also appears on the main menu, which must be acknowledged before it is possible to start the unit and return to normal operation.



25. Return to the main menu and select

Communication.

Here you will find the settings for Modbus RTU and TCP.

For changes to take effect, the unit must be restarted; this is done by disconnecting the power supply to the unit and allowing it to restart.

Settings RS485-2/Ethernet					
RS485-2 Modbus/RTU					
Address	Data Bits	Stop Bits	Parity	Baudrate	
0	8	0	None ▼	9600 ▼	
Ethernet Modbus/TCP + BACnet IP					
IP-Address	0	0	0	0	0
Subnet Mask	0	0	0	0	0
Standard Gateway	0	0	0	0	0
<<				>>	

26. Press the right arrow >> to access the settings for BACnet communication.

If DHCP is required, tick the box.

27. Press the right arrow >> to access the settings for the Sum Alarm; here you can select whether you want NC or NO.

28. Press the home button. If you do not wish to change any further system settings, press start and the unit will start up.

Settings BACnet IP			
BACnet IP		BACnet IP Active	BACnet ID Subnet
		☒	0 0
Ethernet Modbus/TCP + BACnet IP			
IP-Address	0	0	0 0
Subnet Mask	0	0	0 0
Standard Gateway	0	0	0 0
<<			

6. Troubleshooting

Below are the most common faults that may occur, along with their causes and recommended actions.

If you experience other fault symptoms, please contact Hydrun's technical support:

support@hydrun.se

+46 573 21 630

Fault symptom	Cause	Action
Incorrect tank pressure	Ball valve on inlet/outlet forgotten	1. Open the valve 2. Check that there is a difference of > 1.5 bar between the inlet and outlet .
Large amounts of water are coming out of the drain hose attached to the top vent.	The top vent is a wear part and may need replacing. Replacement is expected after 60–100,000 cycles or approximately 2 years under normal operation.	Replace the top vent with a spare part (part no. HY-SP-D-TD)
The pressure on the display does not drop to negative pressure	1. Air in the pump 2. The top vent is not working	1. Switch off the unit and vent the pump manually by manually operating the motor valve (MV), then run the pump -> repeat. 2. Replace the top vent with a spare part (part no. HY-SP-D-TD)
The pressure in the system rises so much during the unit's operating cycles that the SÄV trips	1. No pressure equalisation vessel installed. 2. The pressure equalisation vessel has the wrong pre-pressure. 3. The unit's position in the system	1. Install a pressure equalisation vessel (part no. HY-A-E-PC-50-20) 2. Check the pre-pressure on the pressure equalisation vessel. It should be 70–80% of normal operating pressure. 3. Move the connection point further away from the SÄV.
Unable to communicate with the unit after changing the Modbus settings	The device has not been restarted	Disconnect the unit from the power supply and allow it to restart. The new settings will then take effect.
No values are displayed on the panel where they normally appear; only red frames are visible.	The panel has no communication with the PLC	Check the cable connection at the back of the panel, as well as at the terminal block on the PLC. Black Ethernet cable = communication cable

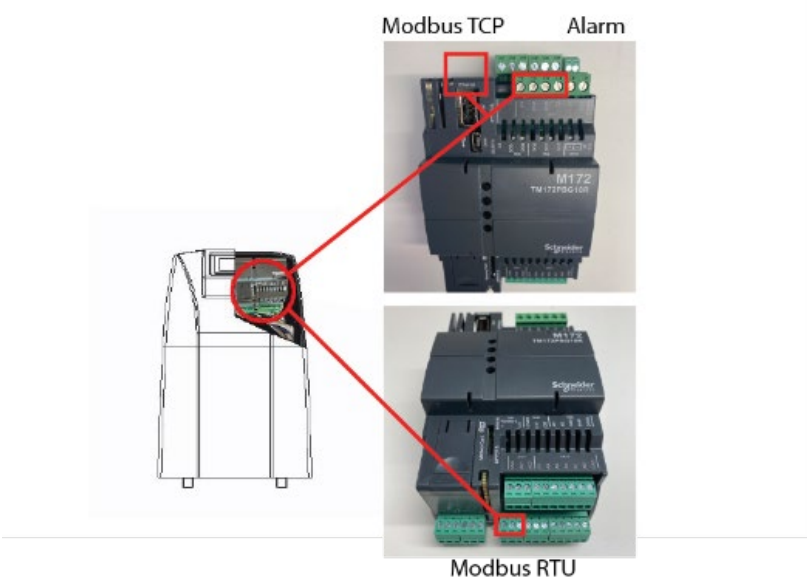
The pump is not reaching the correct pressure	1. There may still be air in the pump. 2. The unit's maximum operating pressure is lower than the desired operating pressure in the system.	1. Manually operate the motor valve (MV) and the pump, and run several venting cycles. Check whether the system has a leak, which may be causing the pump to fail to maintain pressure. 2. Switch to a model with a higher maximum operating pressure, or reduce the desired operating pressure in the system.
The pump is forced to run a very large number of cycles to reach the correct pressure.	Large system (m ³)	Increase the switch-off delay on the pump.
No pressure sensor found on delivery	The pressure sensor is packed inside the connection kit for the unit	Open the connection kit, remove the pressure sensor and fit it; the cable is also included here.
Level measurement shows strange/incorrect value	Incorrect level measurement selected	Go to the menu and select the correct level measurement. Open vessel: weight-based = off Closed vessel: weight-based = on
Incorrect level in the vessel is shown on the display (closed vessel)	The vessel's weight has not been tared when the vessel was empty	1. Empty the vessel and tare the weight 2. Enter the container's tare weight for level measurement settings.

6.1 Alarms

Alarm	Cause	Action
High system pressure alarm	The system pressure exceeds the preset limit	1. Check the cause of the high pressure and rectify it 2. Adjust the alarm limit
Low system pressure alarm	System pressure is below the preset limit	1. Check the cause of the low pressure and rectify it 2. Adjust the alarm limit
High tank level	Level higher than the set value for the high tank level alarm	1. Check the cause of the high level in the vessel and rectify 2. Adjust the alarm limit
Low tank level	Level lower than the set value for the low-level alarm in the vessel	1. Check the cause of the low level in the vessel and rectify 2. Adjust the alarm limit
Pump running dry	The level in the expansion vessel is too low	Fill the vessel and check for leaks. The unit will not start until the level in the vessel is above the dry-running limit.
Tank pressure sensor fault	Faulty connection to the tank pressure sensor	Check the connection/cable. If the connector is loose, ensure it is securely fitted. If the connector/cable is damaged, contact an electrician
System sensor fault	There is a fault with the connection to the system sensor	Check the connector/cable. If the connector is disconnected, ensure it is properly connected. If the connector/cable is damaged, contact an electrician

Incorrect tank pressure	1. The valve on the inlet or outlet is closed 2. The inlet filter is blocked	1. Check that all valves on the inlet and outlet are fully open. 2. Check the filter and clean if necessary
Fill alarm – volume/time exceeded	A larger volume than specified has been added to the system within the time frame specified in the refill settings	Check the reason why the system needed to be refilled. Alternatively, check the alarm limit and adjust it if it is too tight
Refill alarm – total volume exceeded	A larger volume than specified has been added to the system	Check why the system needed to be topped up. Alternatively, check the alarm limit and adjust it if it is too tight
Pump maximum operating time alarm	The pump's maximum permitted operating time has been exceeded	The cause may be air in the pump. Manually operate the motor valve (MV) and valve 2, and run several venting cycles. Check whether the system has a leak, which may cause the pump to be unable to maintain pressure.

6.2 Alarm signals and communication



Modbus RTU default settings

Address	Name	Value
16124	Address	1
16125	Protocol	3=Modbus/RTU
16126	Data bit number	8
16127	Stop bit number	1
16128	Parity protocol	2=Even
16129	Baud rate protocol	2=38400

Modbus TCP:

Connected via Ethernet port, see image.

Modbus RTU:

Connect the cable to terminal block CN1, see image.

Total alarm:

Connection between terminals C5-DO5

6.3 Modbus address list

SETTINGS FOR EXHAUST GAS FUNCTION								
Address	Description	Unit	Editable	Scaling	Data type	IEC.type	Description of discrete values	BACnet
8963	System pressure	Bar	No	0.01	Signed 16-bit	INT		OK
8964	Tank pressure	Bar	No	0.01	Signed 16-bit	INT		OK
8972	High pressure alarm		No		Boolean	BOOL	0=Normal; 1=Alarm	OK
8973	Low pressure alarm		No		Boolean	BOOL	0=Normal; 1=Alarm	OK
8974	High pressure alarm setting	Bar	Yes	0.01	Unsigned 16-bit	UINT	Set alarm limit	
8975	Low pressure alarm setting	Bar	Yes	0.01	Unsigned 16-bit	UINT	Set alarm limit	
8960	Start/Stop		Yes		Boolean	BOOL	0=Stop; 1=Start	OK
8961	Start-up degassing mode		Yes		Boolean	BOOL	0=No start-up purge 1=Start-up purge	
8977	Number of days remaining for start-up exhaust	Number of days		1	Unsigned 16-bit	UINT		OK
8962	Automatic refill initiated				Boolean	BOOL	0=Not active; 1=Active	OK
8971	Automatic refill status				Boolean	BOOL	0=No automatic refill 1=Automatic refill	OK
8979	Alarm for large difference between tank pressure and system pressure		No		Boolean	BOOL	0=Normal; 1=Alarm	OK
8980	Alarm for long filling time		No		Boolean	BOOL	0=Normal; 1=Alarm	OK
8982	Alarm: fault in system pressure sensor		No		Boolean	BOOL	0=Normal; 1=Alarm	OK
8983	Alarm: fault with tank pressure sensor		No		Boolean	BOOL	0=Normal; 1=Alarm	OK

HY-PD Manual

8996	Total number of litres refuelled since start	Litres	No	1	Unsigned 32-bit	UDINT		OK
8998	Alarm setting for number of days (quantity per time)	Days	Yes	1	Unsigned 32-bit	UDINT		
9000	Alarm setting for number of hours (quantity per time)	Hours	Yes	1	Unsigned 32-bit	UDINT		
9002	Setting for number of litres per pulse from water meter	Litres	Yes	1	Unsigned 16-bit	UINT		
9003	Alarm quantity per time setting	Litres	Yes	1	Unsigned 16-bit	UINT		
9004	Counter quantity during ongoing alarm time	Litres	No	1	Unsigned 16-bit	UINT		
9005	Volume since last water meter reset	Litres	No	1	Unsigned 16-bit	UINT		
9006	Alarm for quantity per time reached		No		Boolean	BOOL	0=Normal; 1=Alarm	OK
9007	Setting alarm limit for own quantity	Litres	Yes		Unsigned 16-bit	UINT		
9008	Alarm: own quantity reached		No		Boolean	BOOL	0=Normal; 1=Alarm	OK
9009	Reset counter for quantity per time		Yes		Boolean	BOOL	1 pulse = reset	

SETTINGS FOR PRESSURE HOLD FUNCTION								
9012	Tank level	cm/L		1	Signed 16-bit	INT		OK
9015	High tank level alarm				Boolean	BOOL	0=Normal; 1=Alarm	OK
9016	Low tank level alarm				Boolean	BOOL	0=Normal; 1=Tank	OK
9017	Dry run protection alarm				Boolean	BOOL	0=Normal; 1=Tank	OK
9018	Alarm for tank overfilled				Boolean	BOOL	0=Normal; 1=Tank	OK
9021	System pressure setting	Bar	Yes	0.01	Signed 16-bit	INIT	Set alarm limit	OK
9022	High pressure alarm	Bar	Yes	0.01	Signed 16-bit	INT	Set alarm limit	
9023	Low pressure alarm	Bar	Yes	0.01	Signed 16-bit	INT	Set alarm limit	
9024	High-level tank alarm setting	cm	Yes	1	Signed 16-bit	INT	Set alarm limit	
9025	Low tank level alarm setting	cm	Yes	1	Signed 16-bit	INT	Set alarm limit	
9026	High tank volume alarm setting	Litres	Yes	1	Signed 16-bit	INT	Set alarm limit	
9027	Low tank volume alarm setting	Litres	Yes	1	Signed 16-bit	INT	Set alarm limit	
9034	Reset dry-run protection alarm		Yes		Boolean	BOOL	1=reset	
9035	pressure holding unit active				Boolean	BOOL	1=active	
9036	Weight-based level measurement, tank (closed vessel)		Yes		Boolean	BOOL	0=Pressure-based 1= Weight-based	OK
9037	Tare weight in tank		Yes		Boolean	BOOL	1=Tare current weight	

HY-PD Manual

9039	Automatic refill option yes/no		Yes		Boolean	BOOL	0=no; 1=yes	
9040	Hysteresis setting	Bar	Yes	0.01	Signed 16-bit	INT		
9041	Pump stop delay setting	Sec		1	Unsigned 16-bit	UINT		
9042	Pump start delay setting	Sec		1	Unsigned 16-bit	UINT		
9043	Motor valve delay setting opening	Sec		1	Unsigned 16-bit	UINT		
9044	Motor valve delay setting Closing	Sec		1	Unsigned 16-bit	UINT		
9045	Tank refill start level setting	cm		1	Signed 16-bit	INT		
9046	Tank refill stop level setting	cm		1	Signed 16-bit	INT		
9048	Tank tare weight setting	kg		1	Signed 16-bit	INT		
9049	Maximum tank volume setting	Litres		1	Signed 16-bit	INT		
9055	Alarm time for pump operation							OK

SETTINGS MANUAL OPERATION								
9051	Manual operation V1							
9052	Manual operation V2							
9029	Manual run V3							
9028	Manual operation Pump							
9030	Manual operation Solenoid valve (MV)							
9057	Manual operation of degassing cycle							

7. Maintenance

Pump

The pump requires no maintenance during normal operation; if the pump has been used for contaminated liquids, it must be flushed immediately after use.

Pumps that are not used during periods of frost should be drained to prevent damage.

For pump operation and maintenance, please refer to the extract from the Grundfos installation and operating instructions.

Motor valve

Test the motor valve manually by following the instructions in the quick guide, Chapter 1.

Verify that the function is correct.

Filter

Inspect the filter visually. If dirt is visible, close the valves, then remove the filter element and clean it.

Reassemble and check that it is working correctly.

Functional test

The unit should be checked annually with a simple function test.

Checkpoints:

- A negative pressure must be created in the tank during a normal cycle; the negative pressure must be at least -0.5 bar.

- Check the tightness of the top vent by monitoring a cycle and inspecting how much moisture is released at the end of the cycle.

If >1 dl of water is released per cycle, it is time to replace the top vent; this is a wear part that operates every cycle and may therefore need replacing depending on the individually selected degassing frequency. The top vent is therefore not covered by the warranty. Spare parts can be ordered from Hydrun (item no. HY-SP-D-TD). Normal delivery time 1–3 days.

Inspection

During the annual service, open the cover by releasing the clips on either side. Then check the inside of the unit for leaks or water.

Also check the unit for dried water, as this may be an indication of a leak. Tighten connections if necessary.

Check the cables and note any damage found. Check the electrical components; if any component is damaged, hot or has changed colour, please contact the manufacturer for advice.

Annual inspection of sealed vessels

The following points must be checked during the annual service inspection:

1. Check all connections for leaks
2. Ensure that the top vent is open and can release air from the vessel.
3. Check that the vent hole is unobstructed and can allow air to enter/exit during changes in volume within the vessel.

Annual inspection of open vessels

During the annual service inspection, the following points must be checked:

1. Check all connections for leaks
2. Open the tank lid. Check the condition of the interior; if there is a build-up of dirt, clean the walls and base of the PE tank.
3. Check that the overflow is open and thus functions correctly if the tank becomes full.
4. Check the filling connection
 - a. For manual filling, test filling the tank to verify operation by opening and closing the ball valve.
 - b. For automatic filling, manually operate the solenoid valve for filling and verify that it is working.

8. Electrical documentation

General information on electrical safety.

When carrying out service work involving high-voltage current in the machine, always use the local safety switch to disconnect the power supply. From the service location, you must also have a clear view of the safety switch to ensure that it is not accidentally activated by another person.

Where there is no local safety switch, or where the safety switch is not visible, the main switch on the electrical cabinet connected to the power source must always be switched off.

Where the main switch is used, it must, without exception, always be secured with a padlock, and a warning sign must be affixed to the electrical cabinet to indicate that maintenance work is in progress.

If fuses are removed, they must be replaced with disconnectors fitted using special tools.

Work on high-voltage systems must only be carried out by a suitably qualified person.

Electrical hazards and power disconnection

In this context, a 'layperson' refers to the machine operator (a person who is not a qualified electrician or has not received specific training); such a person must not carry out work inside the electrical cabinet, as it is live.

Work on the machine, other than brief tasks, must not be carried out without first switching off the main switch on the incoming power supply and ensuring the system is de-energised.

When carrying out electrical work on the machine, call in a qualified or trained person.

Contact the manufacturer for more detailed information regarding the electrical connection of the pump/motor. Upon delivery from Hydrun, this is normally pre-connected.

9. Declaration

EU Declaration of Conformity

In accordance with of European Parliament and Council Decision No 768/2008/EC ANNEX III

1. *Product model/product:*

Product Combined degasser and dynamic pressurization unit
Model/type PD-X
Serial nos 123456

2. *Manufacturer*

HL Hydronics AB

Address Bögatan 40, 67241, Töcksfors

3. *This declaration is issued under sole responsibility of the manufacturer.*

4. *Object of declaration:*

Product Machine for reducing oxygen concentration and maintaining pressure and handling expansion in closed heating and cooling systems.

5. *The object of the declaration described above is in conformity with relevant Union*

Harmonisation legislation:

2006/42/EC The Machinery Directive
2014/30/EU The Electromagnetic Compatibility Directive (EMC)
2014/35/EU The Low Voltage Directive (LVD)
2011/65/EU The use of certain hazardous substances in electrical and electronic equipment (RoHS 2)
2015/863 The use of certain hazardous substances in electrical and electronic equipment (RoHS 3)

6. *References to the relevant harmonised standards used or references to the other technical specifications in relation to which conformity is declared:*

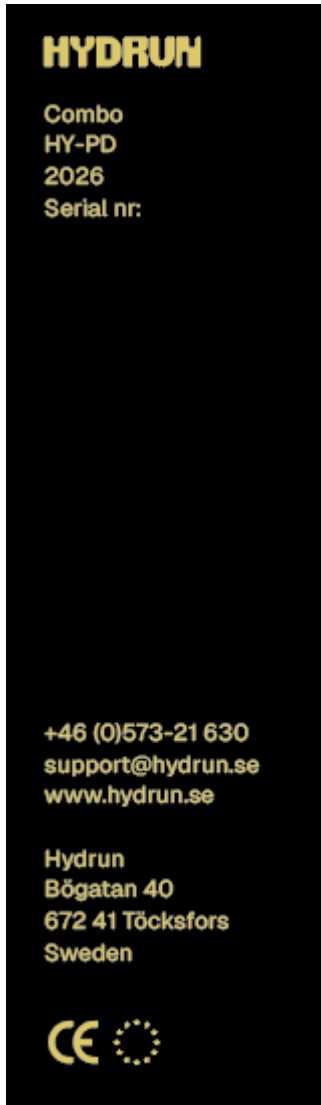
LVD: Reference & Date EN 61010-1:2010	Title Safety requirements for electrical equipment for measurement, control, and laboratory use
EMC: Reference & Date EN 55014-1:2016+A1:2009 +A2:2011 EN 55014-2:2015 EN 61000-6-2:2005+C1:2005 EN 61000-3-2:2014 EN 61000-3-3:2013	Title Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus. Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus. Electromagnetic compatibility - Generic standards, Immunity for industrial environments. Electromagnetic compatibility - Limits for harmonic current emission (equipment input current = 16 A per phase) Electromagnetic compatibility - Limits, Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipments with rated current = 16 A per phase and not subject to conditional connection.

7. *The technical file is available from the manufacturer at the address above*

Signed for and behalf of: HL Hydronics
Place of issue: Töcksfors, Sweden
Date of issue: 20th February 2024
Name: Björn Lennartsson
Position: Chief Executive Officer (CEO)
Signature:



10. Machine CE marking



The machinery is fitted with a legible and durable marking in accordance with the provisions of Annex 1, point 1.7.3 of the Machinery Directive.

The manufacturer's plate contains the following information:

- Type
- Year of manufacture
- Serial number
- Contact details
- CE marking

11. Delivery exceptions and the buyer's responsibility

PLEASE NOTE! Upon delivery, always check that the product is complete and undamaged. In the event of any transport damage, report this immediately to the carrier.

The customer/consumer is responsible for the necessary electrical and plumbing connections, as well as ensuring that the necessary drainage is available in the installation area.

General and safety instructions

The HY-PD is designed for stationary operation in a non-mobile installation.

Installation and commissioning of the HY-PD must only be carried out by specially trained personnel/qualified professionals.

The HY-PD must only be used in systems with media permitted in accordance with the technical data.

During any type of maintenance or repair of the HY-PD, it must be disconnected from the power supply.

Information regarding the manufacturer, year of manufacture and serial number can be found on the manufacturer's plate located on the right-hand side of the HY-PD chassis.

Take measures to ensure temperature and pressure safety in the system so that the specified, permitted maximum and minimum operating parameters are not exceeded or fallen short of.

The HY-PD has been tested and approved for water and glycol mixtures up to 50% (propylene and ethylene).

For systems using ethanol, a special model must be used. Contact your sales representative for further information. Please also refer to the contents of this user manual.

12. Revisions

If a machine undergoes changes that affect its essential health and safety requirements as per the CE marking, the original declaration of conformity ceases to be valid.

All significant design changes or modifications that affect function, performance or risk profile must be documented and risk assessed.

If the change is deemed to affect the machine's compliance with the requirements of the directives, a new CE marking and declaration may be required. As a rule, however, it is sufficient to supplement the existing documentation (technical file and user manual).

Nordic health and safety authorities have agreed that new CE certification is required only in the event of significant changes affecting the safety concept, design, risks or capacity. The replacement of parts that do not alter function or performance does not require new marking.

All major modifications must be risk assessed and documented, even if CE marking is not affected. The assessment determines whether the original declaration of conformity remains valid. Hydrun is responsible for the machine's CE marking and technical documentation, including future modifications and safety aspects.

If you have any questions or uncertainties regarding changes that may affect health and safety requirements in the design or operating instructions, please contact Hydrun.