

Hydro-Unit Premium Line

Installation and operating instructions

series: HU 2/3 DPV(M)E DP-Control

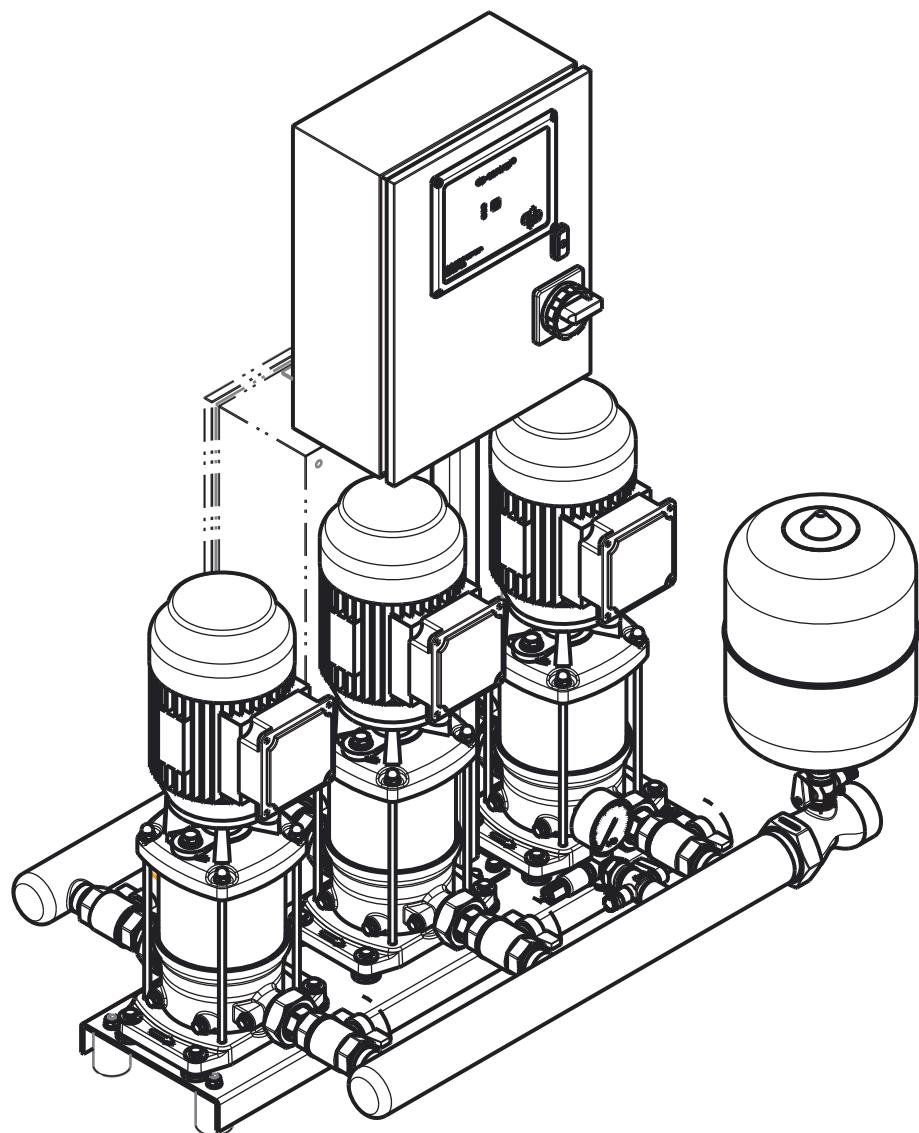


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1 Introduction

1.1 Preface

This manual contains important information for reliable, proper and efficient operation. Compliance with the operating instructions is of vital importance to ensure reliability and a long service life of the product and to avoid any risks.

The first chapters contain information about this manual and safety in general. The following chapters provide information about normal use, installation, maintenance and repairs of the product. The annex contains the declaration(s) of conformity.

- Make yourself familiar with the content.
- Accurately follow the directions and instructions.
- Never change the sequence of the operations to be carried out.
- Keep this manual or a copy of it in a fixed place near the product which can be accessed by all personnel.



READ THE (SUPPLEMENTARY) DOCUMENTATION
Read the user and operating instructions.

1.2 Icons and symbols

In this manual and in all accompanying documentation the following icons and symbols are used.



WARNING
Danger of electric Voltage. Safety sign according to IEC 417 - 5036



WARNING
Operations or procedures, if carried out without caution, may cause personal injury or damage to the product.
General hazard sign according to ISO 7000-0434



ATTENTION
Is used to introduce safety instructions whose non-observance may lead to damage to the product and its functions.



ENVIRONMENTAL INSTRUCTION
Remarks with respect to the environment.

2 Identification, service and technical support

2.1 Identification, service and technical support

The name plate indicates the type series / size, main operating data and identification number. Please quote this information in all queries, repeat orders and particularly when ordering spare parts. If you need any additional information or instructions exceeding the scope of this manual or in case of damage please contact DP-Pumps's nearest customer service centre.

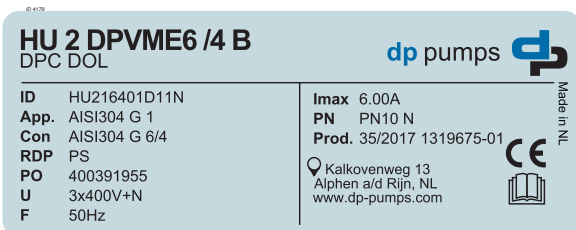


Figure 1: Example: Identification sticker

Table 1: sticker identification

Indication	Meaning
HU 2 DPVME6/4 B	Installation type
DPC DOL	Controller type and start-up method
ID	Article number
App.	Material valve and connection size
Con.	Material and connecting piping size
RDP	Run-dry protection type
PO	Purchase order number
U	Voltage
F	Mains frequency of the installation
Imax	Maximum current consumption of the installation
PN	Pressure class and design
Prod.	Production week/year and number

The following address data are available for service and technical support:

Table 2: Address service department

DP-Pumps	Tel: +31 172 488388 Fax: +31 172 468930
Kalkovenweg 13 2401 LJ Alphen a/d Rijn The Netherlands	Internet: www.dp-pumps.com E-mail: dp@dp-pumps.com

2.2 Supplementary documentation

Apart from this manual, the documentation given below is available as well:

Document	Code
General terms of delivery	119 / 1998
Documentation	
User and operating instructions for pumps	BE00000377
User and operating instructions DP-Control	BE00000342

3 Warranty

3.1 Terms of warranty

The warranty period is settled by the terms of your contract or at least by the general terms and conditions of sales.



ATTENTION

Modifications or alterations of the product supplied are only permitted after consultation with the manufacturer. Original spare parts and accessories authorized by the manufacturer ensure safety. The use of other parts can invalidate any liability of the manufacturer for consequential damage.



ATTENTION

The warranty relating to the operating reliability and safety of the product supplied is only valid if the product is used in accordance with its designated use as described in the following sections of this manual. The limits stated in the data sheet must not be exceeded under any circumstances.

The warranty becomes invalid if one or more of the points below occur.

- The buyer makes modifications himself.
- The buyer carries out repairs himself or has these carried out by a third party.
- The product has been handled or maintained improperly.
- The product has non original DP-Pumps spare parts fitted.

DP-Pumps repairs defects under warranty when:

- They are caused by flaws in the design, the material or the production.
- They are reported within the warranty period.

Other terms of warranty have been included in the general terms of delivery, which are available upon request.

4 Safety and environment

4.1 General

This DP-Pumps product has been developed using state-of-the-art technology and is manufactured with utmost care and is subject to continuous quality control.

DP-Pumps does not accept any liability for damage or injury caused by not following the directions and instructions in this manual or by carelessness during the installation, use or maintenance of the product.

Non-compliance with the safety instructions can jeopardize the safety of personnel, the environment and the product itself. Non-compliance with these safety instructions will also lead to forfeiture of any and all rights to claims for damages.

Non-compliance can result in:

- failure of important pump/system functions,
- failure of prescribed maintenance or service,
- injury caused by electrical, mechanical and chemical effects,
- leakage to the environment of hazardous substances,
- explosions.

Depending on the application, extra safety measures may be required. Contact DP-Pumps if a potential danger arises during use.



ATTENTION

The owner of the product is responsible for compliance with the local safety regulations and internal company guidelines.



ATTENTION

Not only must the general safety instructions laid down in this chapter on "Safety" be complied with, but also the safety instructions outlined under specific headings.

4.2 Users

All personnel involved in the operation, maintenance, inspection and installation of the product must be fully qualified to carry out the work involved and be aware of all applicable responsibilities, authorisations and supervisions. If the personnel in question is not in

possession of the required know-how, appropriate training and instruction must be provided. The operator may require the manufacturer/supplier to provide sufficient training and/or instructions. The operator is responsible for ensuring that the contents of the operating instructions are fully understood by the responsible personnel.

4.3 Safety provisions

The product has been designed with the greatest possible care. Original parts and accessories meet the safety regulations. Modifications in the construction or the use of non-original parts may lead to a safety risk.



ATTENTION

Make sure that the product operates within its working range. Only then the product performance is guaranteed.

4.3.1 Labels on the product

The icons, warnings and instructions applied to the product are part of the safety provisions. The labels may not be removed or covered. Labels must remain legible during the entire life of the product. Replace damaged labels immediately.

4.4 Safety precautions

4.4.1 During normal use

- Contact the local electricity company for questions about the power supply.
- Cover the parts that can become hot, making direct contact impossible.
- When applicable, always place undeformed coupling protection plates to protect the coupling, before putting the pump into use. Make sure that the coupling protection plates are never in contact with the rotating coupling.
- Always close the terminal box of the motor.
- Always close the control panel.

4.4.2 During installation, maintenance and repair

Only authorised personnel may install, maintain and inspect the product and repair electrical components. Observe the local safety regulations.



WARNING
Always disconnect the energy supply to the product first, before installation, maintenance and repairs. Secure this disconnection.



WARNING
Surfaces of a pump can be hot after continuous operation.



WARNING
Make sure that no one can be near rotating components when starting a pump.



WARNING
Handle a pump with dangerous liquids with the utmost care. Avoid danger for persons or the environment when repairing leakages, draining liquids and venting. It is strongly recommended to place a leakage tray under the pump.



WARNING
Immediately following completion of the work, all safety-relevant and protective devices must be re-installed and / or re-activated.



WARNING
Please observe all instructions set out in the chapter 7.3 Commissioning before returning the product to service.



ENVIRONMENTAL INSTRUCTION

Always act according to the laws, by-laws regulations and instructions with respect to health, safety and the environment.

4.5.2 Dismantling

The owner is responsible for the dismantling and environmentally friendly disposal of the product.



ENVIRONMENTAL INSTRUCTION

Ask at the local government about the re-use or the environmentally friendly processing of discarded materials.

4.5 Environmental aspects

4.5.1 General

The products of DP-Pumps are designed to function in an environmentally friendly way during their entire lifetime. Therefore, when applicable, always use biodegradable lubricants for maintenance.

5 Introduction

5.1 General

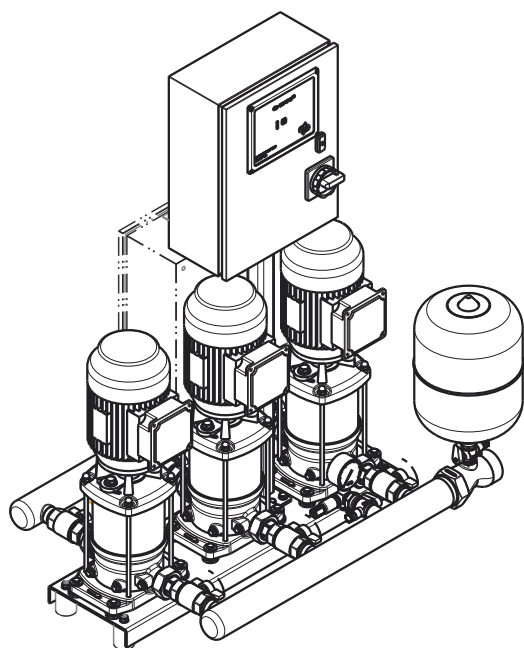


Figure 2: Installations of the type HU 2/3 DP-Control

Installations of the HU 2/3 DP-Control type are produced by DP-Pumps.

5.2 Intended use

The installation HU 2/3 DP-Control is suitable for increasing the pressure in (drinking) water installations and for pumping liquids with a viscosity identical to the viscosity of water, within the indicated working range (see "Working range").

Any other or further use of the installation is not in conformity with its intended use. DP-Pumps does not accept any liability for any damage or injury resulting from this. The installation has been produced in accordance with the actual standards and guidelines. Use the installation exclusively in a perfect technical state, in conformity with the intended use described below.

The *Intended use* as laid down in ISO 12100:2010 is the use for which the technical product is intended according to the specifications of the manufacturer. The use of the product has been described in the available documentation and information. Always observe the instructions as given in the installation and operating instructions. When in doubt the product must be used as becomes evident from its construction, version and function.

5.3 Working range

The working range of the system can be summarised as follows:

Table 3: Specification of the working range

Type	HU 2/3 DP-Control
Maximum ambient temperature [°C]	0 - 30
Liquid temperature [°C]	+4 - 40 ¹
Maximum working pressure [kPa]	1.000 / 1600 Unless indicated otherwise
Inlet pressure (if water inlet is under pressure)	> 110 kPa
Water tank	Position pump below water level
Suction pressure [kPa]	Not cavitating ¹ . Suction pressure plus pump pressure, must never be higher than the maximum working pressure: 1000 kPa (PN10 Installation) 1600 kPa (PN16 installation)
Maximum height	1000 m above sea level

1. Contact your supplier for more detailed advice.

Table 4: Specific applications

type	application area
HU 2/3 DP-Control	(Drinking) water supply systems, irrigation systems, water treatment systems, car-wash systems, sprinkler systems and discharge of condensed water.

5.4 Operation

5.4.1 Standard operation

The system pressure is controlled using a pressure transmitter on the delivery side of the installation.

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When as a result of an increasing water consumption the pressure drops below the target pressure, a pump will be activated. See 'record the target pressure' for recording the target pressure.

The pumps will be switched off again when the target pressure has been reached and the minimum run time has expired. The minimum after-run time is continuously optimised. This results in considerable energy savings.

5.4.2 Number of operating hours per pump

The current number of operating hours of a pump determines which pump will be switched on or off next. The pump with the least operating hours will be switched on first and the pump with the most operating hours will be switched off first. This makes sure that all pumps, including the backup pump, have an equal number of operating hours.

5.4.3 Run-dry protection

In case of a failure in the water supply, the installation is automatically switched off. For this a float or a pressure switch may be used. A float is used in breaker installations. A pressure switch is used in installations connected to the drinking-water system.



ATTENTION

The pressure switch is permanently set on a switch-on pressure of 20 kPa and a switch-off pressure of 110 kPa.

5.4.4 Test run

In order to prevent a pump from standing still for a long period, an automatic test-run function has been included.

5.4.5 Adjustable settings

The service port provides access to the parameters of the programme that may be used to optimise the performance of the installation (see parameter list).



WARNING

Always use the special service port cable for access to the parameters via the service port!

5.4.6 Temperature sensor (option)

When the HU 2/3 DP-Control has been provided with a temperature sensor, it will generate a temperature-dependent alarm if the average daily room temperature, near the pressure vessel, is higher than 25°C. (See 5.5 ISSO publications 55.1 and 55.2)

5.4.7 Pressure vessel

All Premium Line DP-Control units are provided with a flow-through pressure vessel on a flow-through t-piece. This guarantees a good refreshment of the pressure vessel. Even with limited switching on and off of the pumps. The constriction in the t-piece provides a higher flow velocity at the location of the small paddle in the shut off valve. Therefore enough fresh water enters the vessel, even at low flow rates.

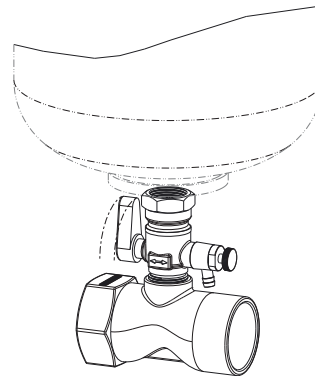


Figure 3: Pressure vessel with shut off valve and flow through t-piece

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5.4.8 HR installations

Premium Line DP-Control HR installations are provided with a large pressure vessel to reduce the amount of switching on and off and to reduce the overall run time of the pumps. In this way a large energy saving is made. The HR pressure vessel too is connected to ensure flow through, to allow for good refreshment and optimal hygiene. The vessel is provided with Membrane Rupture Detection by means of an electrode. When the membrane is punctured a lamp on the switchboard is lighted and the alarm contact will be closed.

The pressure vessel is equipped with a bypass, so the system can continue to operate when maintenance is required.

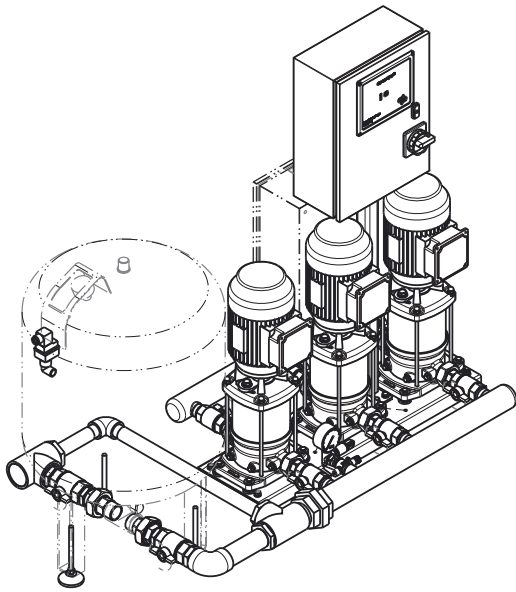


Figure 4: HU3 DPVME 2/4/6 B DPC DOL HR

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Assessment:

Table 5: Average daily

Twenty-four hours' average internal temperatures	≤ 25 °C	> 25 °C
Use	Assessment	Assessment
Sufficient change of the membrane tank (more than 30 switches per day)	0	- (1)
No/insufficient change of the membrane tank (fewer than 30 switches per day)	- (2)	--- (3)

- 1 Slightly negative assessment (-) because of too high temperature.
- 2 Slightly negative assessment (-) because of too few changes.
- 3 Negative assessment (-) because of too high temperature and too few changes.

See ISSO publications 55.1 and 55.2 for installation adjustments with respect to the above assessments.

5.5 ISSO publications 55.1 and 55.2

The ISSO 55.1 and 55.2 state:

Preconditions:

- Avoid heating of the drinking water as a result of too high internal temperatures, maximum requirement 25°C.
- Avoid long-lasting stagnation/standing still of the drinking water in the membrane tank. When the tank is functioning well, a minimum of 30 switches/day is required for sufficient flow-through.

6 Transport

6.1 Transport



WARNING
Lift the installation using a hoisting device.



WARNING
The installation must be hoisted according to the applicable hoisting guidelines. Only qualified personnel is allowed to hoist the installation.

Lifting/hoisting advice

- with a fork-lift truck or pallet truck of sufficient width below the ground plate/pallet.

Always observe the instructions as indicated by the labels on the installation.



Figure 5: piping label

ID 185

1. Transport the installation in the position indicated on the pallet or packaging.
2. Check if the installation is stable.
3. Observe the instructions on the packaging (if present).

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6.2 Storage

6.2.1 Preparations for storage

1. Protect the system against the risk of frost.
2. Store the installation in a frost-free environment.

3. Place the installation in the position as indicated on the packaging.
4. When applicable: Keep the vessel under pressure (1/2 bar).

6.2.2 Inspection during storage

1. Turn a shaft every three months¹. This protects the seals from seizure.
2. After a storage period of six months or longer, inspect the installation before using it again.

-
1. period may vary per application or medium. Please consult your sales representative for application details.

7 Installation

7.1 Setting up the installation

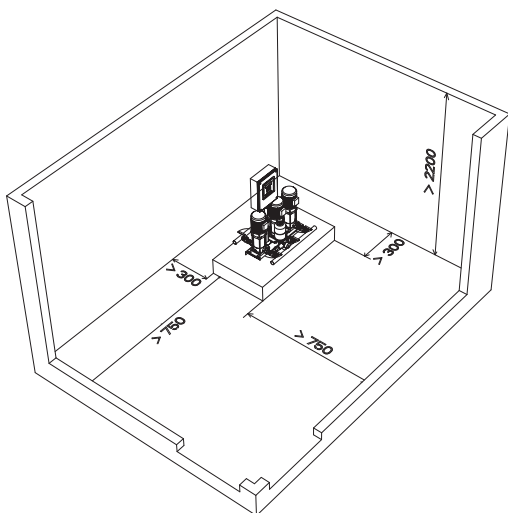


Figure 6: Installation set-up

Preferably set up the installation in an environment with at least the following properties:

Item	Requirements
Room	<ul style="list-style-type: none"> • Clean, dry, frost-free, cool¹ and ventilated, and can be provided with light; • The surface must be large enough for easy access to the installation. • The height of the installation room must meet the minimum requirements of the Buildings Decree. • The layout must be such, that any released water can be discharged without causing inconvenience.
Foundation	<ul style="list-style-type: none"> • The installation must be free from the walls. • The concrete base must be smooth and level. • The foundation must be large enough to carry all support points

1. Cool is defined as a temperature of between 4 °C and 25 °C, and preferably lower than 20 °C.

The installation area must be in conformity with EN 1717 and EN 13077 - chapter 'installation areas'.

- Connect the suction pipe to the supply pipe of the building (indicated with label).
- Connect the delivery pipe to the delivery pipe of the building (indicated with label).

In order to minimise the noise level, proceed as follows:

- Position the installation on silent blocks (option).
- Fix the suction and delivery pipes correctly using a bracket.
- Mount a pipe compensator in the supply and discharge pipes (option).
- In case of contamination, insert a filter in the supply pipe.
- Manifolds must be connected free of tension.
- Ensure proper sizing of suction and delivery pipes that are to be connected to the installation. The maximum flow rate in the pipes must be below 2 m/s.



ATTENTION

Use a run-dry protection. Connection contacts can be found in the control panel.



ATTENTION

Mount a valve in the discharge line. This in order to avoid having to drain the entire pipe in case of a repair.

7.1.1 Change connection side

If necessary, the connection side of one or both of the manifolds can be changed by turning over the manifolds. Proceed as follows:

- 1 Remove the pressure vessel and t-piece (if mounted).
- 2 Undo the couplings on the base of the pumps, hold on to the gaskets²
- 3 Screw the pressure gauge and drain plug from the pressure set, take off the cable of the pressure transmitter/switch.
- 4 Turn the manifold over and use the couplings with gaskets to mount it to the base of the pumps.
- 5 Screw in the pressure gauge on the top of the pressure set and the drain plug on the opposite side, put back the cable of the pressure transmitter/switch, it will fit in one direction.

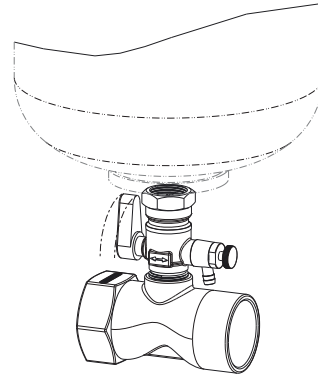


Figure 8: Mounting instruction t-piece with shut off valve. Premium Line DP-Control.

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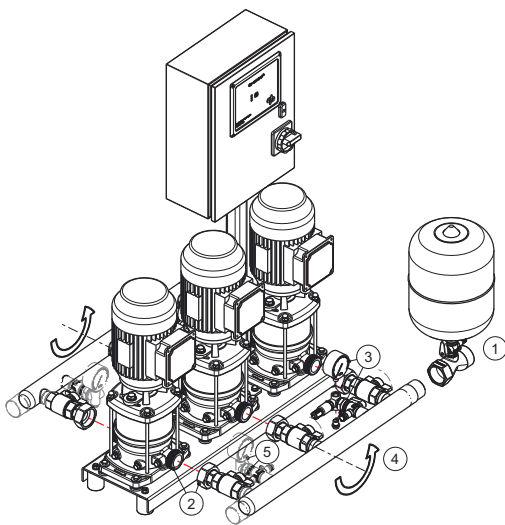


Figure 7: Changing connection side

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7.1.2 Connecting the pressure vessel on standard installations

With the Premium Line DP-Control installations a separate pressure vessel is included. For a proper operation of the installation it is necessary to mount the pressure vessel on the discharge side of the unit. This can be done directly on the manifold, or further down the main discharge pipe. Mount the t-piece with shut off valve on an accessible place and screw the pressure vessel therein. There is an o-ring in the shut off valve, so it is not required to use a thread sealant.

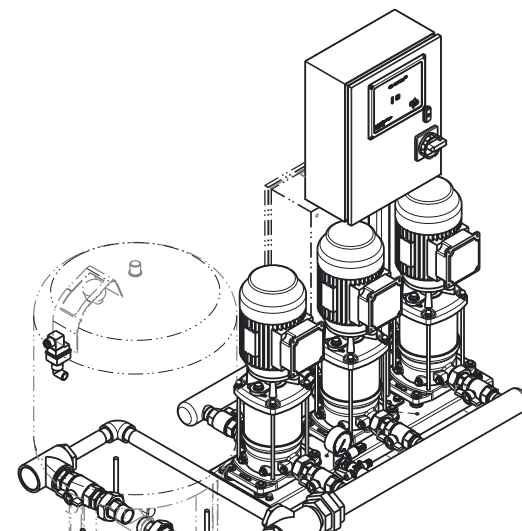


Figure 9: Premium Line DP-Control HR

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2. If the unit has been in use, we recommend replacing the gaskets.

7.1.4 HU 2/3 DP-Control with DPV(M)E

While installing the HU 2/3 DP-Control with DPV(M)E, the control panel is to be folded up first, before continuing the electrical installation.

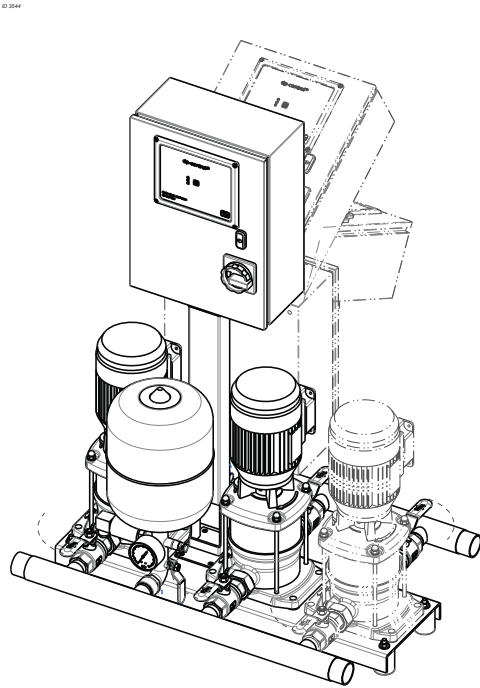


Figure 10: Flip-over control panel

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7.1.5 Indicators

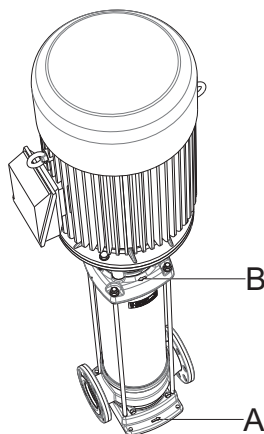


Figure 11: Indicators

The arrow (A) on the pump foot indicates the flow direction of the liquid. The arrow (B) on the head piece indicates the rotating direction of the motor.

7.2 Electrical installation



WARNING

Only authorised personnel is allowed to perform the electrical connection of the installation in accordance with the local regulations.

Electrical connections

- Make sure that the electrical specifications correspond with the voltage the installation is connected to. Consult 'Electrical circuit diagrams' in the annexes for the correct connection diagram.
- Connect the installation using an interruptible connection (separator).
- Close the door of the control panel after having completed the installation.
- Grounding:



WARNING

The base plate of the Hydro-Unit Premium Line has been equipped with a grounding connection. This grounding connection must be directly corrected to the central grounding point of the building. The grounding connection requires periodic checking and protection against corrosion with an electrically conductive agent, e.g. MOLYKOTE® HSC PLUS.

7.3 Commissioning



WARNING

Never switch on the installation when it does not contain any liquid.

Before you run the system:

- Flush the installation with potable water, disinfect the system if necessary.

7.3.1 In a open or closed circuit with sufficient supply pressure (see figure 12 Closed circuit)

Proceed as follows:

1. Turn off the main power.
2. Close the supply valve (C) and the discharge valve (A).
3. Remove the plug (B) from the motor stool.
4. Gradually open the supply valve (C) until the liquid flows from the plug opening.
5. Close the plug (B) opening.
6. Fully open the supply (C) valve.

7. Turn on the main power
8. Check the direction of rotation of the pump.
9. Fully open the discharge valve (A).

1. Measure the pressure (A) in the vessel when there is no pressure on the water side (B).
2. Fill the vessel with nitrogen or air. Preferably use nitrogen.

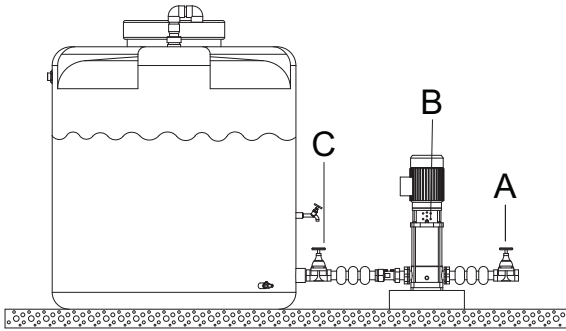


Figure 12: Closed circuit



ATTENTION

Seen from the top of the motor the pump must rotate clockwise. In case of a 3-phase motor the rotating direction can be changed by switching two of the three contact wires.



WARNING

Turn off the main from the central control panel

7.3.2 Pre-pressure pressure vessel

For a correct functioning of the installation, the pre-pressure in the pressure vessel must be 50 kPa lower than the switch-on pressure. Proceed as follows to determine the pre-pressure:

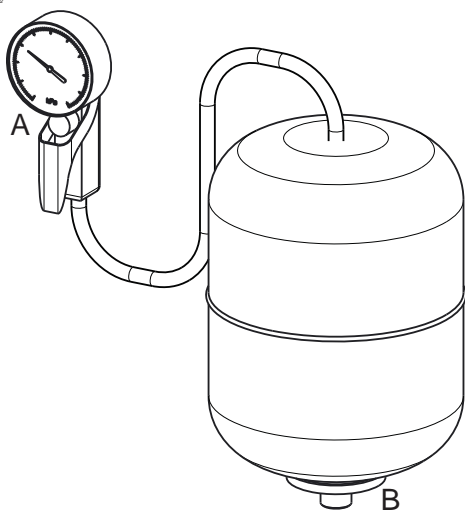



Figure 13: Set the pre-pressure

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8 Operation

8.1 Basic operation

The basic operation of the Premium Line DP-Control is controlled by one multi functional button . The status traffic light (three vertical LED lights) gives the actual operation- and failure information.

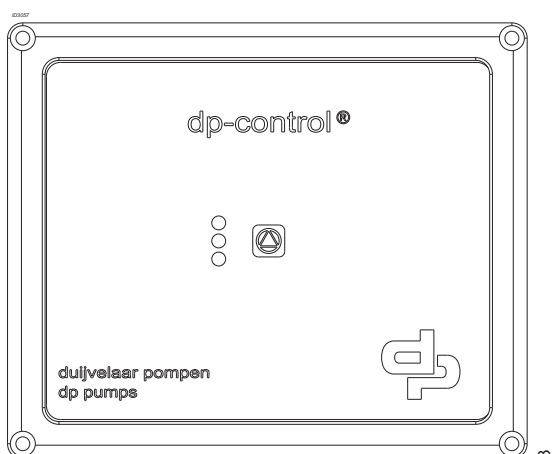


Figure 14: Front HU 2/3 DP-Control

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WARNING

When the installation is switched on using the main switch, all LED's will simultaneously light up for 2 seconds (LED test).

8.1.1 Multi functional button

- Manual operation of the pumps.
- Acknowledgement of pending failures.
- Fixing the pressure set point.

8.1.2 Status traffic light



The status traffic light shows the operating status:

- Red, for urgent alarms.
- Orange, for non urgent alarms.
- Green, for normal operation.

The LED's will blink several times to indicate the operating status or failure type.


For explanation of the blinking pattern see "Failure table".

8.2 Manual operation of the pumps


Pump 1, 2 and 3 can be started manually by pushing button  1, 2, or 3 times and to keep button  pressed. The pump will run as long as the button is pressed. The green LED is blinking respectively 1, 2 or 3 times during manual operation.

This function is only active when the green operation light is on continuously (panel alive / no failures).

8.3 Record the pressure set point

When the main power supply is switched on and the multi functional button  is pressed simultaneously, the actual pressure in the system will be set as pressure set point.

To set or change the pressure set point (S) proceed in the following sequence:

- Start a pump manually until the system pressure is above the required set point (read from the pressure gauge)
- Isolate the pressure sensor and gauge from the main header by closing the shut-off valve located between the sensor and the header.
- Drain-off some water until the required set point is reached (read from the pressure gauge).
- Switch-off the main power supply.
- Push the multi functional button  and switch-on the main power supply simultaneously.
- The pressure set point is now programmed.

8.3.1 Pressure set points

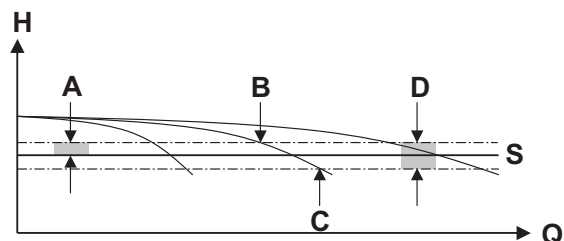



Figure 15: bandwidth

Table 6: Pressure set points

ID	Parameters
S	Set point
A	Hysteresis ¹ (see: "Factory default settings")
B	Cut-out
C	Cut-in
D	Pressure differential

1. Bandwidth

8.4 Acknowledgement of pending failures

When a failure occurs the multi functional button  can be pressed to acknowledge the pending failure, and to deactivate the failure output. When the failure is not solved the LED will still light-up until the failure is resolved completely.

8.5 Failure outputs

Optionally the control panel can be equipped with two potential free contacts for the failure messages "urgent" and "Non Urgent". The red (urgent) or orange (Non Urgent) failure LED will light up at each failure message. For details see "Failure table".

9 Hydro-Unit configuration

9.1 Default configuration

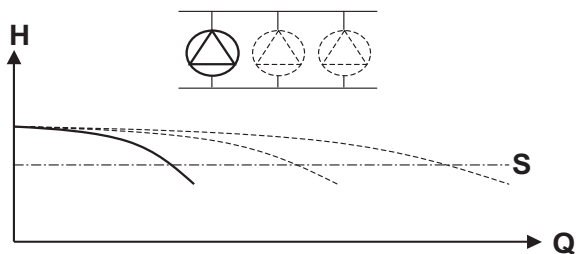


Figure 16: 1 pump in operation

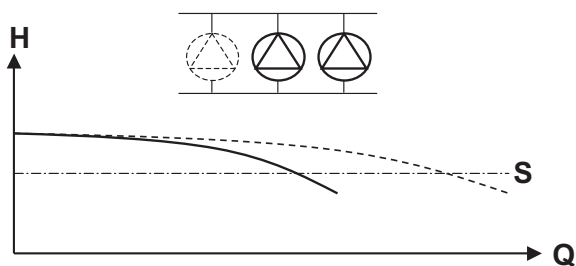


Figure 17: 2 pumps in operation

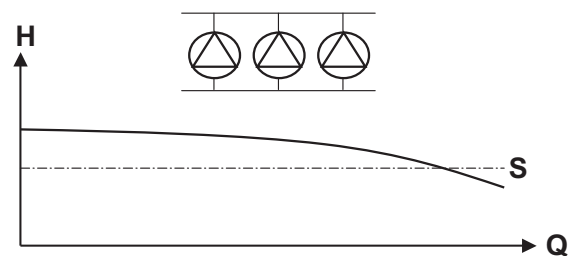


Figure 18: 3 pumps in operation

9.2 Explanation parameters

9.2.1 Pressure set points

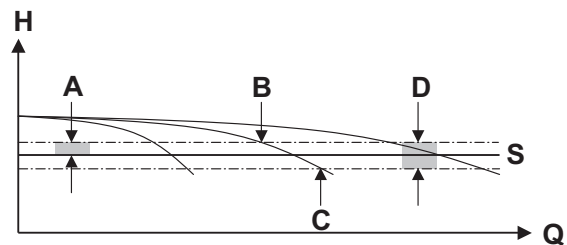


Figure 19: Pressure set points

Table 7: Parameters pressure set points

ID	Parameter
S	Set point
A	Bandwidth
B	Switch-off pressure
C	Switch-on pressure
D	2 x bandwidth

9.2.2 Delta P + correction

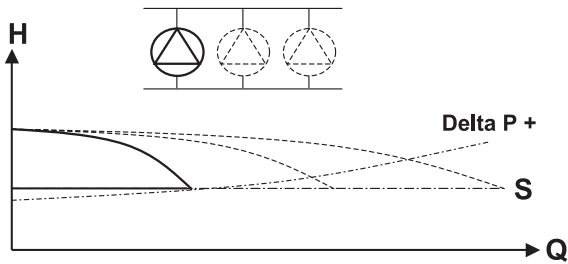


Figure 20: 1 pump operation

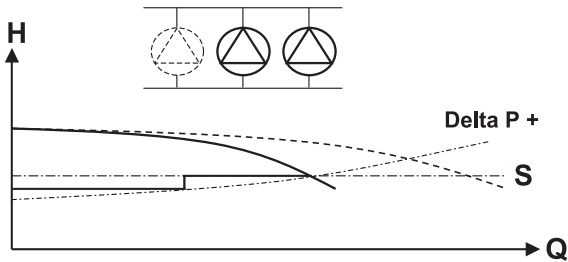


Figure 21: 2 pump operation

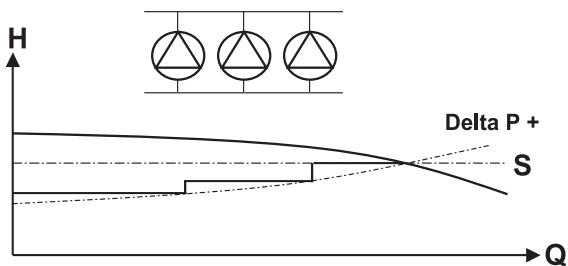


Figure 22: 3 pump operation

Table 8: Parameters pressure set points

ID	Parameter
S	Set point
+	Delta P

$$y = \frac{\Delta p}{(n^2-1)} x^2 + SP - \frac{\Delta p}{(n^2-1)}$$

Figure 23: Delta P+

- SP = Set point
- y = New set point
- Δp = Delta P (always positive)
- n = Total number of pumps of the installation
- x = Number of pumps switched on

9.2.3 Delta P - correction

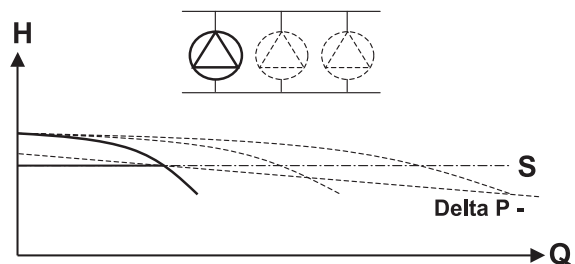


Figure 24: 1 pump operation

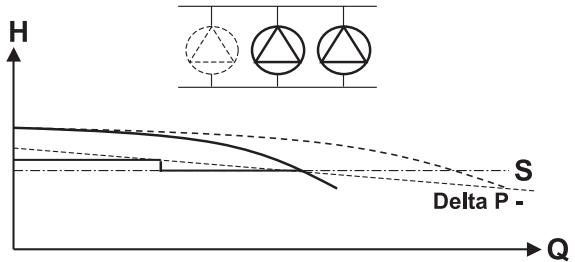


Figure 25: 2 pump operation

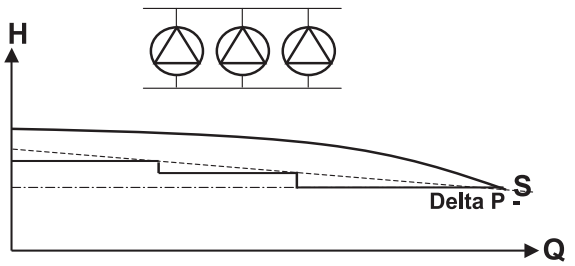


Figure 26: 3 pump operation

Table 9: Parameters pressure set points

ID	Parameter
S	Set point
-	Delta P

$$y = \frac{\Delta p}{(1-n)} x + SP - \frac{\Delta p}{(1-n)}$$

Figure 27: Delta P-

- SP = Set point
- y = New set point
- Δp = Delta P (always positive)
- n = Total number of pumps of the installation
- x = Number of pumps switched on

10 Maintenance

10.1 Introduction



WARNING

Observe the general safety precautions for installation, maintenance and repair.

Regular maintenance is necessary for correct operation of the installation. For maintenance of the installation, please contact your supplier. A draft maintenance contract is available upon request.

10.2 Checking points

Check the following points at least annually.

- pumps
- non-return valves
- shut-off valves
- switching material
- pressure vessel(s)
- pressure gauges

10.3 Lubrication

The standard motors, with a maximum electrical power of 7.5 kW, have been provided with closed bearings that need no specific maintenance.

Motors with lubricating nipples must be lubricated annually. If the installation works under extreme conditions, such as vibrations and high temperatures, the motors must be lubricated more often.

Use a lithium based -30 °C / 160°C bearing lubricant (about 15 grams)

10.4 Maintaining the pump for an extended period of non-operation

Turn the shaft every three months³. This protects the seals from seizure.

3. period may vary per application or medium. Please consult your sales representative for application details.

Protect the pump if there is a risk of frost. Proceed as follows:

1. Close all pump valves.
2. Drain each pump and/or the system.
3. Remove all plugs from the pump.
4. Open the shut-off and fill/air vent plug, if present.

10.5 Cleaning instruction

The HU 2/3 DP-Control and DP-Control can be cleaned with a dry rag.



WARNING

The installation must be turned off first.



WARNING

The pump can be hot.

11 Faults

11.1 Failure table Hydro-Unit Premium Line



WARNING
Observe the general safety precautions for installation, maintenance and repair.

Problem	Possible cause	Possible solution	Checkpoints
Leakage along the shaft.	Shaft seal worn.	Replace the shaft seal.	Check the pump for fouling.
	Pump has been operated without water.	Replace the shaft seal.	
Pump is vibrating and produces a lot of noise.	There is no water in the pump.	Fill and de-aerate the pump.	
	No water supply.	Restore the water supply.	Check if the supply pipes are not clogged.
	Bearings of pump and/or motor defective.	Have the bearings replaced by a certified company.	
	Hydraulic assembly defective.	Replace the hydraulic assembly.	
Installation / pump does not start.	No voltage on the connecting clamps.	Check the power supply.	<ul style="list-style-type: none"> • Circuit • Main switch • Fuses
	Thermal motor safety switch triggered	Reset the thermal motor safety. Contact the supplier, if this problem occurs more often	
	Run-dry protection triggered.	Restore the water supply. Reset the installation.	
	Pressure set point incorrect.	Adjust the pressure set-point.	
Installation / pump supplies insufficient capacity and/or pressure.	There is air in the pump.	Vent the pump.	
	Capacity of water meter in the supply line is too small.	Increase the capacity of the water meter.	
	Discharge and/or suction shut-off valve is closed.	Open both shut-off valves.	
	System resistance too high.	Adjust the set points	
Let the supplier check the system			
Pumps continuously start and stop.	Pressure vessel(s) leaky or incorrect pre-pressure.	Have your supplier check the installation.	

11.2 Failure table Premium Line DP-Control

Description of the failure	Pulses / continuous	Failure output
Start-up / LED test	All LED's short ON	
Red LED		
Pump(s) thermal failure (no stand-by pump left).	Continuous ON	Urgent
No refreshment on WSD channel 1	1 pulse, 2 s OFF	Urgent
No refreshment on WSD channel 2.	2 pulses, 2 s OFF	Urgent
No refreshment on WSD channel 3.	3 pulses, 2 s OFF	Urgent
No water supply (manual reset required).	4 pulses, 2 s OFF	Urgent
Average room temperature too high.	5 pulses, 2 s OFF	Urgent
Sensor failure discharge side out of range.	6 pulses, 2 s OFF	Urgent
System pressure. too high (system shut down).	7 pulses, 2 s OFF	Urgent
System pressure. too low (system shut down).	8 pulses, 2 s OFF	Urgent
Broken wire sensor discharge	9 pulses, 2 s OFF	Urgent
Other failure.	ON, short OFF, ON	Urgent
Orange LED		
Pump 1 thermal failure (stand-by pump left).	1 pulse, 2 s OFF	Non Urgent
Pump 2 thermal failure (stand-by pump left).	2 pulses, 2 s OFF	Non Urgent
Pump 3 thermal failure (stand-by pump left).	3 pulses, 2 s OFF	Non Urgent
Current room temperature too high.	5 pulses, 2 s OFF	Non Urgent
Temperature sensor failure.	6 pulses, 2 s OFF	Non Urgent
System pressure. too high (warning only).	7 pulses, 2 s OFF	Non Urgent
System pressure. too low (warning only).	8 pulses, 2 s OFF	Non Urgent
Inspection required.	Continuous pulses	Non Urgent
Green LED		
Panel alive / no failures	Continuous ON	
Pump 1 manual operation / Check-run	1 pulse, 2 s OFF	
Pump 2 manual operation / Check-run	2 pulses, 2 s OFF	
Pump 3 manual operation / Check-run	3 pulses, 2 s OFF	
Panel alive / no failures (refreshment tank 1)	1 pulse, 2 s OFF, then normal operation	
Panel alive / no failures (refreshment tank 2)	2 pulses, 2 s OFF, then normal operation	
Panel alive / no failures (refreshment tank 3)	3 pulses, 2 s OFF, then normal operation	
Panel alive / no failures (refreshment tank 1+2)	1 pulse, 2 s OFF, 2 pulses, 2 s OFF, then normal operation	
Panel alive / no failures (refreshment tank 2+3)	2 pulses, 2 s OFF, 3 pulses, 2 s OFF, then normal operation	
Panel alive / no failures (refreshment tank 1+3)	1 pulse, 2 s OFF, 3 pulses, 2 s OFF, then normal operation	
Panel alive / no failures (refreshment tank 1, 2 + 3)	1 pulse, 2 s OFF, 2 pulses, 2 s OFF, 3 pulses, then normal operation	

12 Annexes

12.1 DP-Control

Table 10: Technical data

Item	Value
Type of control	DP-Control
Article number	77870040
Dimensions HxWxD [mm]	157 x 187 x 51
Connecting voltage [V]	1 x 230 ± 10%
Frequency [Hz]	50 - 60 ± 5%
Relay outputs [A]	5 max.
Protection class ¹	IP55
Ambient temperature [°C]	50 max.
Atmospheric humidity [%]	20 - 90 (no condensation)
Maximum height	1000 m above sea level
Fuse [mA]	500 (250V)

1. When build into a IP55 control panel.

12.2 P&ID

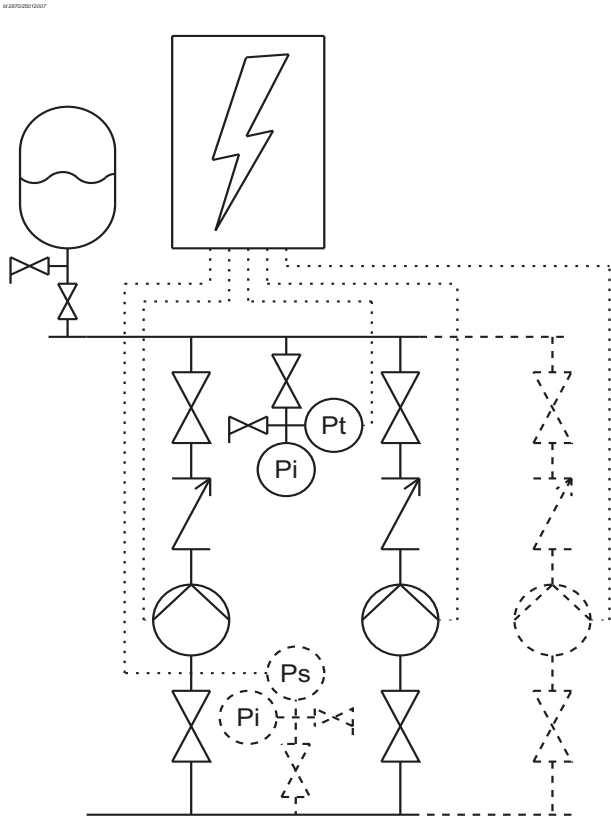


Figure 28: HU 2/3 DP-Control P&ID

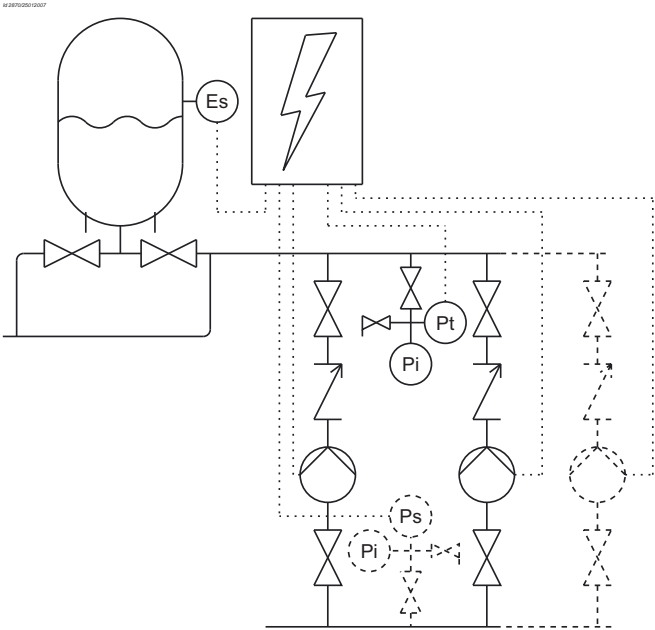


Figure 29: HU 2/3 DP-Control HR P&ID

20131390-A

20131391



12.3 Connections

12.3.1 Layout Premium Line DP-Control

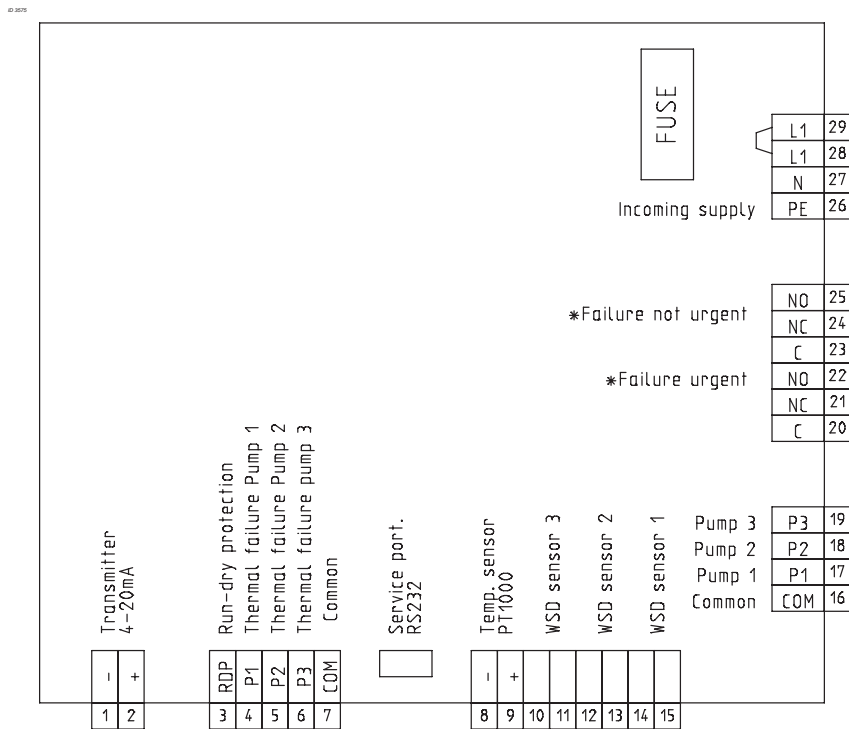


Figure 30: Layout Premium Line DP-Control

EA1C30CE

12.3.2 Terminal strip pumps

Terminal strip pumps	
Directly on relay pump 1	U1 Pump 1
	V1 Pump 1
	W1 Pump 1
Directly on relay pump 2	U1 Pump 2
	V1 Pump 2
	W1 Pump 2
Directly on relay pump 3	U1 Pump 3
	V1 Pump 3
	W1 Pump 3

26



ATTENTION

Pump cables are connected directly to the corresponding relay

12.3.3 Terminal strip for external wiring



ATTENTION

See included wiring diagram for external wiring connection.



ATTENTION

The alarm contact is closed when the installations are voltage less or in case of a fault.

12.4 Parameter list



ATTENTION

The parameters below are only visible and/or can be adjusted using the DP-Control service tool.



ATTENTION

Standard (default) values of the DP-Control are given in bold in the tables below. For unit-specific values see: 'Factory settings'.

12.4.1 Settings

Parameter	Value: (default)	Description:	Level (read)	Level (write)
Configuration				
Number of pumps	1. 1 Pump 2. 2 Pumps 3. 3 Pumps	Total number of pumps in the system.	All	Service
Inlet	1. Switch 2. Flow switch	Setting of the configuration used on the supply side (suction side of the installation).	All	Service
Discharge	1. Fixed speed	Setting of the applicable configuration at the discharge connection (pressure side of the system)	All	Service
WSD	1. OFF 2. 1 tank 3. 2 tanks 4. 3 tanks 5. 1 tank + temp. 6. 2 tanks + temp. 7. 3 tanks + temp. 8. Temperature	Setting of the applicable configuration of the WSD: (membrane tank refreshments and ambient temp.)	All	Service
System settings				
Automatic RDP reset	0. Manual 1. Automatic	Automatic or manual reset after run-dry protection shut down (pressure or level)	All	User
System pressure				
Sensor press. 4 mA	0	Measured value at 4 mA	All	Service
Sensor press. 20 mA	1000	Measured value at 20 mA	All	Service
Pumps ON sensor fail	0	Number of pumps that is started in case of a failure of the pressure sensor on the discharge side.	All	Service

Parameter	Value: (default)	Description:	Level (read)	Level (write)
Max power	300	Limitation of the maximum power / maximum system load (1 pump is 100%)	All	Service
WSD settings				
Nbr of refreshments	30	Numbers of refreshments of the membrane tank. (water entering the tank)	All	Service
Refresh time span	24	Time span of the numbers of refreshments	All	Service
Average room temp.	25.0	Average (pump) room temperature.	All	Service
Room temp. time span	24	Time span of the average (pump) room temperature.	All	Service
Pressure settings				
Set point	400	System pressure set point	All	User
Hysteresis ¹	30	Pressure differential above and below the set pressure at which the pump's are respectively switched off and on.	All	User
Max.set point	1000	Upper limit for the setpoint value to be set by the customer	All	Service
High pressure alarm.	1000	Selection parameter to define the action at system over-pressure (shut down or signal only)	All	User
High pressure action	1. Pumps switched off 2. Notification only	Selection parameter to define the action at system over-pressure (shut down or signal only)	All	User
Low pressure alarm	0	Under limit value for the system pressure to shut down or notification only (signal)	All	User
Low pressure action	1. Pumps switched off 2. Notification only	Selection parameter to define the action at system under-pressure (shut down or signal only)	All	User
Press. Flow Control	100	Failure no water available gets active if setpoint - adjusted pressure is exceeded	All	Service
Time settings				
Opt. pump starts /h	10	The optimum nrs of pump starts per hour. The minimum run time will be automatically corrected.	All	Service
Min. run time	180	The minimum time of the pump to run. (the run time correction will not drop below this value)	All	Service
Min. run-time corr.	10	Adapting the Minimum run time to optimize the required number of pump starts per hour.	All	Service
Max. run-time	21600	Maximum continuous run time of the pump. After this time the pump will be forced to change over.	All	Service
Start delay	1.0	Start delay to switch the pumps on when pressure remains low	All	Service
Stop delay	1.0	Stop delay to switch the pumps off when pressure remains high.	All	Service
RDP delay	10	Delay time after run-dry protection to shut down the system	All	Service
High/low alarm delay	60	Permitted time of setpoint pressure deviation > too high or too low system pressure.	All	User
WSD 1 puls length	0	Length in time of the water flow detection device (flow position) digital input 1	All	Service
WSD 2 pulse length	2	Length in time of the water flow detection device (flow position) digital input 2	All	Service
WSD 3 pulse length	2	Length in time of the water flow detection device (flow position) digital input 3	All	Service

Parameter	Value: (default)	Description:	Level (read)	Level (write)
Date and time				
Check run mode	1. OFF 2. Interval based	Select how and when a checkrun should be performed. (check run only on pumps which did not run)	All	User
Check run interval	604800	The interval between the check runs Applicable for pumps not operation for 24h.	All	User
Check run duration	30	The check-run time per pump. (one at the time and alternating)	None	None
Maintenance interval	0	Setting the service / maintenance intervals for the system hours, minutes, seconds	All	Service

1. Bandwidth

12.5 Factory default settings

Table 11: Factory settings

Installation type	Parameter												
	Number of pumps	WSD mode	Pumps ON sensor fail	Max. power	Set point	Bandwidth	Opt. pump starts / h	Min. run time	Min. run time corr.	RDP delay	WSD 1 pulse length	Check run interval	Maintenance note in hours
HU2	2	1	1	200	380	30	10	90	10	30		86400	13140
HU3	3	1	2	300	380	30	10	90	10	30		86400	13140
HU2 PLUS/HR	2	1	1	200	380	50	30	1	1	30		86400	13140
HU3 PLUS/HR	3	1	2	300	380	50	30	1	1	30		86400	13140
HU2 + 1 WSD + TEMP	2	5	1	200	380	30	10	90	10	30	0	86400	13140
HU3 + 1 WSD + TEMP	3	5	2	300	380	30	10	90	10	30	0	86400	13140
HU2 PLUS + 3 WSD + TEMP	2	7	1	200	380	50	30	1	1	30	0	86400	13140
HU3 PLUS + 3 WSD + TEMP	3	7	2	300	380	50	30	1	1	30	0	86400	13140
HU2 + 1 WSD	2	2	1	200	380	30	10	90	10	30	0	86400	13140
HU3 + 1 WSD	3	2	2	300	380	30	10	90	10	30	0	86400	13140
HU2 PLUS + 3 WSD	2	4	1	200	380	50	30	1	1	30	0	86400	13140
HU3 PLUS + 3 WSD	3	4	2	300	380	50	30	1	1	30	0	86400	13140
HU2 + TEMP	2	8	1	200	380	30	10	90	10	30		86400	13140
HU3 + TEMP	3	8	2	300	380	30	10	90	10	30		86400	13140
HU2 PLUS/HR + TEMP	2	8	1	200	380	50	30	1	1	30		86400	13140
HU3 PLUS/HR + TEMP	3	8	2	300	380	50	30	1	1	30		86400	13140
HU2 HR + 1 WSD + TEMP	2	5	1	200	380	50	30	1	1	30	4	86400	13140
HU3 HR + 1 WSD + TEMP	3	5	2	300	380	50	30	1	1	30	4	86400	13140
HU2 HR + 1 WSD	2	2	1	200	380	50	30	1	1	30	4	86400	13140
HU3 HR + 1 WSD	3	2	2	300	380	50	30	1	1	30	4	86400	13140
mo-iw-536 07012016													



12.6 EC declaration of conformity

Undersigned:

DP-Pumps
Kalkovenweg 13
2401 LJ Alphen aan den Rijn, The Netherlands
Tel: (+31)(0)-172-48 83 88

Declares as manufacturer in his own responsibility, that the products:

Product: Hydro-Unit
Type: Premium Line DP-Control

Serial number: 01/2015 1000000-01 [...] 52/2018 9999999-99

to which this declaration relates, are constructed in conformity with the following harmonized international standards:

- EN 809/A1/C1:2010
- EN ISO 12100:2010
- IEC 60204-1:2006
- IEC 61000-6-1:2007
- IEC 61000-6-3/A1:2011

in accordance with the provisions of:

- Machinery directive 2006/42/EC
- EMC directive 2014/30/EU

The Hydro-Unit is subject to this declaration of conformity as a stand alone product.

Make sure the appliance or installation in which the Hydro-Unit is built in, has got a declaration of compliance with the directives listed above, for its complete assembly.



Alphen aan den Rijn, 08/09/2016

Responsible person:
W. Ouwehand, technical director



dp pumps

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10/2017

BE00000546-C / EN

Original instructions

Can be changed without prior notice

