

Hydro-Unit UTILITY

Installation and operating instructions
series: HU UTILITY MC(MF)

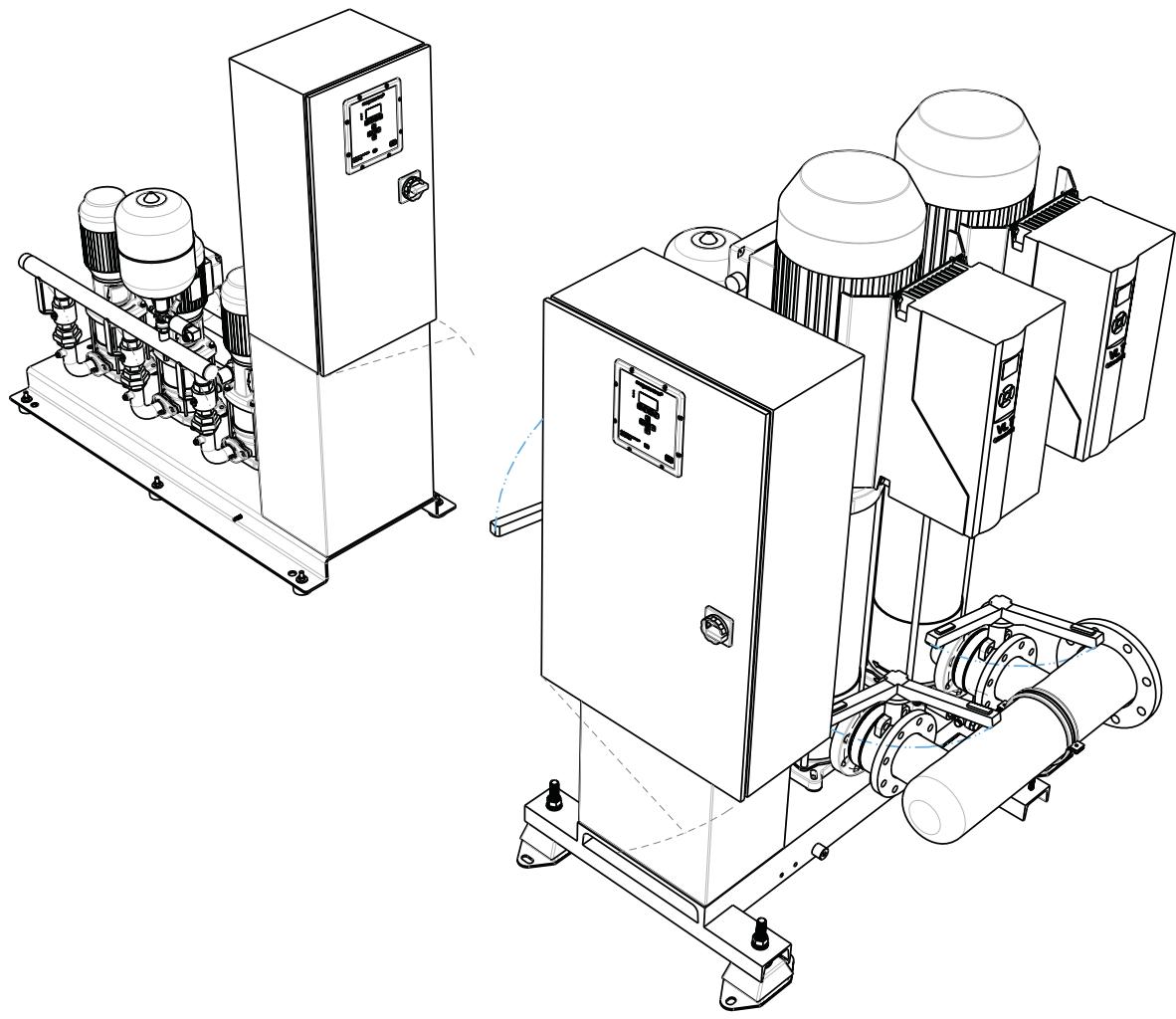


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1 Introduction

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 together with the logbook in a fixed place near the product which can be accessed by all personnel.

1.2 Icons and symbols

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



WARNING

Danger of electric tension. Safety indication for IEC 417 - 5036.



WARNING

Operations or procedures that, if carried out without caution, may lead to personal injury or damage to the product. General hazard indication for ISO 7000-0434.



ATTENTION

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



ENVIRONMENTAL INSTRUCTION

Remarks with respect to the environment.



READ THE (SUPPLEMENTARY) DOCUMENTATION

Read the user and operating instructions.



Look / recognise the product

Visual inspection

Point of attention

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.

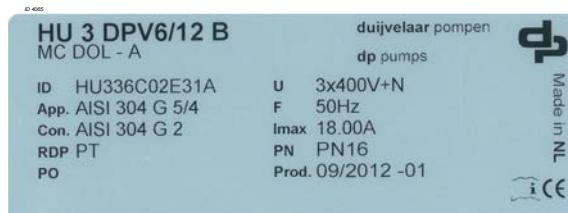


Figure 1: Identification sticker

Table 1: sticker identification

Indication		Meaning
	HU 3 DPV6/12 B	Installation type
	MC	Controller type
	DOL	Boot method
	A	Control panel
ID	HU336C02E31A	Article number
App.	AISI 304	Material
	G 5/4	Connection size
Con.	AISI	Material piping
	G 2	Connection size
RDP	PT	Run-dry protection type
PO	-	Order number
U	3x400V+N	Voltage
F	50Hz	Frequency of the installation
I _{max}	18.00A	Maximum current consumption of the installation
PN	PN16	Pressure class and design
Prod.	09/2012-01	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 Internet: www.dp-pumps.com E-mail: dp@dp-pumps.com
Kalkovenweg 13 2401 LJ Alphen a/d Rijn The Netherlands	

2.1.1 MC(F) version

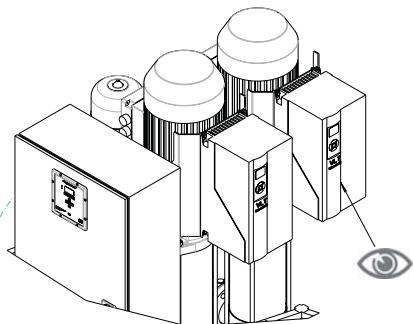
MC(F) DOL, - SFT and - star-delta

The pumps in the unit have a fixed speed

2.1.2 MCMF version

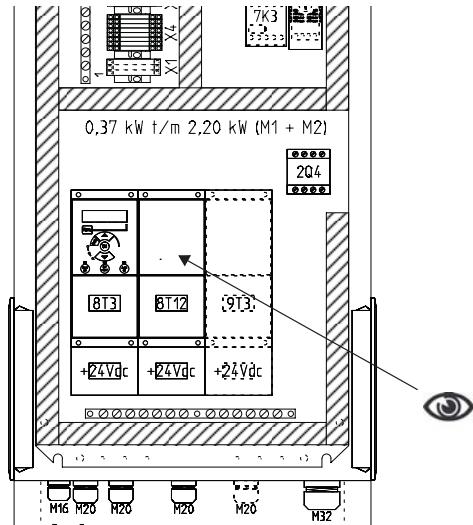
MC FRP

The unit has the frequency converters on the pump.



MC FRK

The frequency inverters are built in the control panel.



2.2 Supplementary documentation

Apart from this manual, the additional documentation given below is also available:

Table 3: Supplementary documentation

Document	Code
General terms of delivery	119 / 1998
Documentation	
Installation and operating instructions pumps	BE00000377
Installation and operating instructions Megacontrol	BE00000347

See also: www.dp-pumps.com

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; it is manufactured with utmost care and subject to continuous quality control. DP-PUMPS does not accept any liability for damage and injury caused by not observing the directions and instructions in this manual, or in cases of carelessness during the installation procedure, use and maintenance of the product.

Non-compliance with 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.

For example, in particular non-compliance can result in:

- failure of important pump/system functions,
- failure of prescribed maintenance and servicing practices,
- injury to persons by electrical, mechanical and chemical effects,
- hazard of the environment due to leakage of hazardous substances,
- explosions.

Depending on specific activities, 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 super visions. If the personnel in question is not already in possession of the required know-how, appropriate training and instruction must be provided. If required, the operator may commission the manufacturer / supplier to take care of such training. In addition, 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.

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 "Commissioning/Start-up" 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 life. Therefore, when applicable, always use biodegradable lubricants for maintenance.

5 Introduction

5.1 General

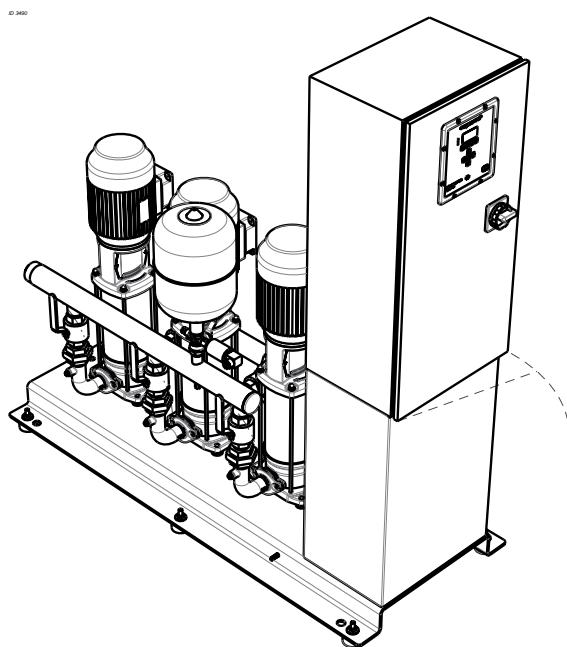


Figure 2: Installations of the type HU MC(MF) Utility line

Installations of the HU MC(MF) Utility line type are produced by DP-PUMPS.

5.2 Intended use

The installation HU MC(MF) Utility line 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 installation is summarised as follows:

Table 4: Specification of the working range

Type	HU MC(MF) Utility line
Ambient temperature [°C]	0 - 30 (should not freeze)
Liquid temperature [°C]	-15 - 70 ¹
Maximum working pressure [kPa]	1.600 Unless indicated otherwise
Supply pressure [kPa]	Non-cavitating ¹ . Minimum: 120 kPa Maximum: supply pressure plus pump pressure together may not exceed 1600 kPa
Maximum height	1000 m above sea level

1. Contact your supplier for more detailed advice.

Table 5: Specific applications

Type	Area of application
HU MC(MF) Utility line	(Drinking) water supply systems, irrigation systems, water treatment systems, car-wash systems, sprinkler systems and discharge of condensed water.
	Inside use Do not use demiwasser ¹

1. Demiwasser can be used by an AISI316 unit

5.4 Functioning

5.4.1 Standard operation

The Megacontrol is an intelligent control unit for different components of pressurization systems consisting out of a maximum of 6 pumps. The required system pressure is sensed by a pressure sensor on the outlet side of the installation.

When as a result of a decreasing water volume the pressure drops below the pressure set point, a pump will be switched on.

When the required system pressure has been reached, the pumps are switched off one at a time. The minimum run time is optimized constantly, which results in a considerable energy saving.

5.4.2 Custom made settings

The Megacontrol can be programmed through the human machine interface (HMI) operating panel and has been protected against unauthorized use by a password.

Also, the service port provides access to the parameters of the program which can be used to optimize the functionality of the installation, (see: "Parameter list").



WARNING
For access to the parameters of the program using the service port, always use the special service port cable!

The special service port cable (Art. nr. 6147117698) can be ordered separately.

5.4.3 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 fewest 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 have an equal number of operating hours, including the backup pump.

5.4.4 Test run

In order to prevent pumps from standing still for a longer period of time, an automatic test run procedure is provided as a standard.

5.4.5 Functioning Hydro-Unit (option)

In combination with the Megacontrol, the Hydro-Unit can generate a failure message when, during a (adjustable) period of time, insufficient refreshment of the membrane switch vessel occurs.

The failure message is generated when:

- Insufficient refreshment occurs;
- The membrane of the membrane switch vessel is defective;
- There is no air left in the membrane switch vessel;
- The installation is not set / installed correctly.

5.4.6 Temperature-sensor (option)

When the Megacontrol is fitted with a temperature sensor, it can generate a temperature-dependent failure message.

Not Urgent:

- An not urgent alarm is generated when the ambient temperature exceeds the set temperature.

Urgent:

- An urgent alarm is generated when the average temperature of one day, comes above the set temperature.

5.4.7 Monitoring of suction side by:

1. Pressure sensor in supply manifold (option)

A pressure sensor can be installed in the supply manifold. This sensor will register the pre-pressure for:

- The PID control.
- Reading of the display.
- The run-dry protection.

2. (Float) switch in receiver tank or in supply valve.

In the receiver tank (or in the supply line) a pressure switch or float switch can be mounted. This switch records the supply pressure for the run dry protection.

3. Pressure sensor in receiver tank and supply valve (option).

A pressure sensor can be mounted in the receiver tank. The pressure sensor records the water level for:

- High-water alarm.
- Control of the supply valve. The supply valve can optionally be open/closed or proportionally controlled (option).
- Critical water-level indication.
- Run-dry protection.
- Two digital contacts for two extra level reports (option).

4. Flow switch in the supply

A flow switch can be installed in the supply manifold. This switch will register whether there is an actual flow running through the installation. In combination with the delivery pressure, it may be concluded whether the pumps are running dry.

5.4.8 Industry (Optional)

If the industry option is selected, the following components are installed:

Phase net-work monitor:

- this device will check of all three phase are present. When not, the device will give a fault and switch off.

N-O-A switch for each pump

- By using the emergency-0-automatic switch you can always start one or more pumps.
 - HU MC is directly connected to the power supply.
 - HU MCMF started the pump with a fixed speed, this speed is set in the frequency converter.



WARNING

If the pump is started by emergency, the running dry protection is not active, only the thermal protection is active.

Dry contacts:

- The unit dry contact which indicates that the unit operates;
- Each pump has a dry contact for:
 - Pump on duty;
 - Pump failure.

6 Transport

6.1 Transport



WARNING

Lift the installation using a hoist and suitable slings. Attach the slings to the hoisting eyes, where present. Never lift the installation from the manifolds.



WARNING

The installation must be hoisted according to the current hoist guidelines. Only qualified personnel are allowed to hoist the installation.

Always observe the directions as indicated on the installation by means of stickers.



Figure 3: Piping label

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

6.2 Storage

6.2.1 Preparations for storage

1. Fill the installation with glycol to protect it 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.

7 Installation

7.1 Set up the installation

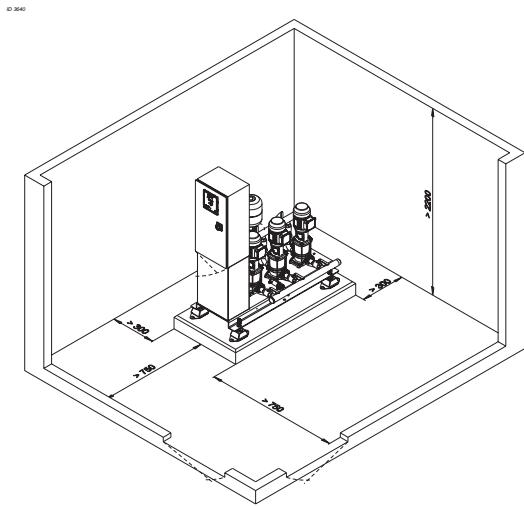


Figure 4: Installation set-up

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, dust-free, frost-free and properly lit.• The surface must be large enough for easy access to the installation.• The height of the installation room must meet the minimum requirements.• 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

The installation area must be in conformity with water-worksheets worksheet 4.3 - chapter 6.

- Connect the suction pipe to the supply pipe (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:

- Support the suction and delivery pipes correctly, e.g. 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, which means that the supply and discharge pipes have to be supported.
- Diameter of the supply pipes sufficiently large.



ATTENTION

Use a run-dry protection. Connection contacts can be found in the switch box.



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 Machine feet

the HU DPV Utility line is provided with 4 or more machine feet for vibration damping and adjustment purposes in case of an uneven floor.

7.1.2 Indicators

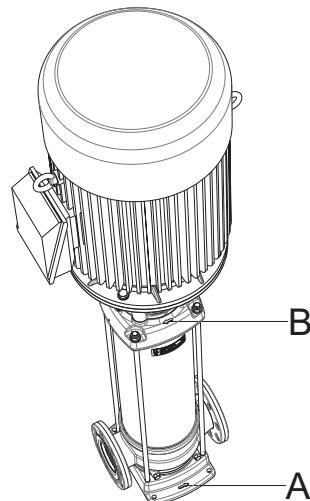


Figure 5: Indicators

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 switch box after having completed the installation.
- Earthing:



WARNING

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



WARNING

In case of installations fitted with a frequency converter, the earthing connection must be connected before installing the power cable.

7.3 Commissioning



WARNING

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

Before commissioning the system:

- Purge the installation in conformity with the water worksheets, worksheet 2.4: Purge and disinfect drinking water installations.

7.3.1 In an open or closed circuit with sufficient supply pressure

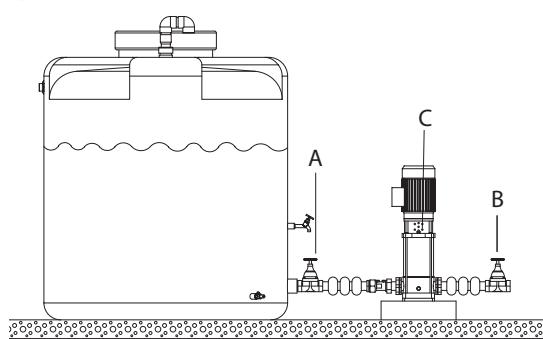


Figure 6: Sufficient supply pressure

1. Switch off the main power.
2. Close the supply shut-off valve (A) and the delivery shut-off valve (B).
3. Remove the plug (C) from the motor stool.
4. Gradually open the supply shut-off valve until the liquid flows from the plug opening.
5. Close the plug opening.
6. Fully open the supply shut-off valve.
7. Check the direction of rotation of the pump.
8. Fully open the delivery shut-off valve.
9. Switch on the main power.

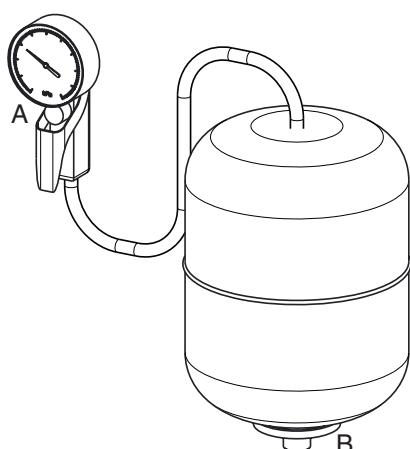


ATTENTION

Seen from the top of the motor the pump must rotate clockwise (B), see figure 7.1.2 Indicators. In case of a 3-phase motor the rotation direction can be changed by exchanging two of the three voltage wires of the main switch.

7.3.2 Pre-pressure of the 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:



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



WARNING

**Before putting the installation into use,
first put the pressure vessel under
pressure. Consult the annexes for the
correct setting.**

8 Operation

8.1 Control panel (HMI)

The control panel comprises a back-light display, function, navigation, and operating keys, LED's, and 2 access points for the service interface. The display shows important information for pump system operation. Data can be displayed in plain text and parameters can be set.

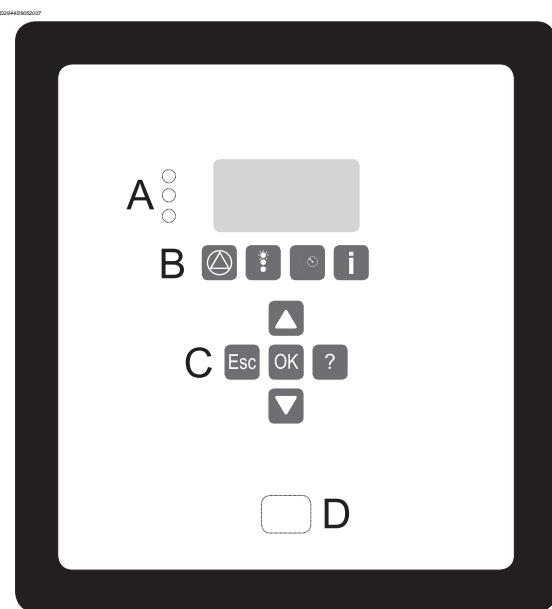


Figure 7: Front Megacontrol

Table 6: Traffic lights

A: LED's

The "traffic light" signals provide information about the pump system's operating status. LED's:

- Red: Alert / urgent alarm is active.
- Amber: Warning / non-urgent alarm is active.
- Green: O.K. / trouble-free operation.

Table 7: Function keys

B: Function keys

You can use the function keys to access the elements at the first menu level directly: Operation, Diagnosis, Settings and Information.

	Operation
	Diagnosis
	Settings
	Information

Table 8: Navigation keys

C: Navigation keys

The navigation keys are used for navigating in the menu and for confirming settings.

	Up or Down <ul style="list-style-type: none">• Move up / down through the root menu (displays the measured values of the system input);• Move up / down through the menu options or;• Increase / decrease a value when you are entering numerals.
	Escape key <ul style="list-style-type: none">• Delete / reset entry (the entry is not saved);• Return to the previous menu level.
	OK key <ul style="list-style-type: none">• Access to the quick menu;• Confirm a setting;• Confirm a menu selection.• Go to the next number when you are entering numerals.
	Help key <ul style="list-style-type: none">• Displays a help text for each selected menu option.

D: Service interface

The service interface allows a PC / Notebook to be connected with use of the special service port cable. The Megicontrol PC software can be used to configure and parameterize the pump system if you do not have access to a control panel. The Megicontrol software can also be updated via this interface. A second service interface is located on the back side of the controller.

8.1.1 Display

The 7-row display contains the following information:

020540705007

1-1-1		Level
Parameter / Function		
Parameter name		▼
....		
....		
....		
	MM-YY 00:00	

Table 9: Display rows

Display	Meaning
1-2-3	Displays the selected parameter no.
Level	Operating level: <ul style="list-style-type: none">• All• User• Service• Factory
Parameter / Function	Parameter name, Function key: <ul style="list-style-type: none">• Operation• Diagnosis• Settings• Information
Parameter name	List of selectable parameters
▼	"Scroll bar" within the list of selectable parameters
MM-YY 00:00	Current date and time

The number of the current menu or parameter is displayed in the top left of the screen. This number indicates the path through the menu levels and, therefore, allows you to quickly locate parameters (see "Parameter list").

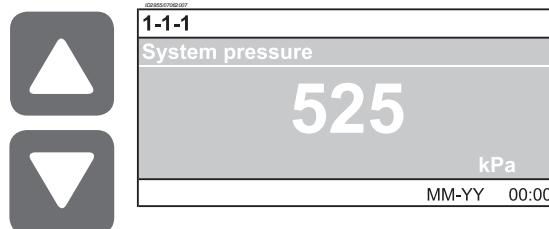
18

The date and time is displayed in the bottom right of the screen. If a fault occurs, this is displayed in the bottom line instead of the date and time.

8.1.2 Continuous display

When in operation the most common values, like the system pressure are shown on the display continuously. By pushing the navigation buttons Up

and Down all selected values are passing by. In Parameter setting 3-10 "Root menu" these values can be selected as pre-set value. The selected values are marked with a "√".



8.1.2.1 Quick menu

Having access to the most used parameters a Quick menu can be entered by pressing the OK key.



8.1.3 Access levels

To prevent accidental or unauthorized access to the Megicontrol parameters, various access levels have been defined.

Table 10: Access levels

Access levels:	Explanation:
Standard	Unless users log on to one of the access levels, they will only have limited access to parameters.
User	Access level for expert users. It enables access to all the parameters required for commissioning. You have to enter a password under 3-2-1 "Log in". The standard password for users is 7353. You can change the password if necessary.
Service	Access level for service technicians. You have to enter a password under 3-2-1 Log in.
Factory	Access level for the manufacturer only.



ATTENTION

If no keys are pressed for ten minutes, the system automatically returns to the default access level.

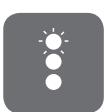
8.1.4 Displaying and changing parameters

The parameter numbers contain the navigation path, which helps you find a particular parameter quickly and easily. The first digit of the parameter number

indicates the first menu level, which can be called up directly via the four function keys. Subsequent steps are carried out via the navigation keys.



1--Operation



2--Diagnosis



3--Settings



4--Info

Example: Parameter 3-5-10 Delta P correction:

First digit of parameter number: 3-5-10

3 Settings 5 Pressure 10 Delta P correction



Press the third function key for Settings. 3-1 appears in the top left of the screen.

Second digit of parameter number: 3-5-10

3 Settings **5 Pressure** 10 Delta P correction



Change the display 3-1 on the screen (top left) to 3-5 by pressing the navigation keys.



To confirm the selection, press OK. 3-5 appears in the top left of the screen.

Third digit of parameter number: 3-5-10

3 Settings **5 Pressure** **10 Delta P correction**



Change the display 3-5-1 on the screen (top left) to 3-5-10 by pressing the navigation keys.



To confirm the selection, press OK. 3-5-10 appears in the top left of the screen.

Example: Parameter 1-2-1 (Pumps) Operation mode:

First digit of parameter number: 1-2-1

1 Operation **2 Pumps** 1 Operation mode



Press the first function key for Operation. 1-1 appears in the top left of the screen.

Second digit of parameter number: 1-2-1

1 Operation **2 Pumps** 1 Operation mode



Change the display 1-1 on the screen (top left) to 1-2 by pressing the navigation keys.



To confirm the selection, press OK. 1-2 appears in the top left of the screen.

Third digit of parameter number: 1-2-1

1 Operation **2 Pumps** **1 Operation mode**



To confirm the selection, press OK. 1-2-1 appears in the top left of the screen.



Select the **pump number** by pressing the navigation keys.



To confirm the selection, press OK.



Select the operation mode **manual (on (10 s))**.



To confirm the selection, press OK.

8.2 Manual operation of the pumps

By pressing the Quick access key “**Operation**”, information like system pressure and pump load can be retrieved. Also, the pump operating mode like **Automatic**, **Manual** and **Disabled** can be alternated / selected. Subsequent steps are carried out by using the navigation keys.

The selected pump will run for a period of 10 seconds and stops. The pump operation mode is changed to **Disabled (off)**. This is to avoid that the pump runs unprotected.

8.2.1 Putting the pump into automatic operation again

The pump has to be put in operation again by selecting the **Automatic mode**.

OK

Stay in the selected parameter **1-2-1 Operation mode** and press OK.



Select the **pump number** again by pressing the navigation keys.

OK

To confirm the selection, press OK.



Select the operation mode **Automatic**.

OK

To confirm the selection, press OK.

9 Maintenance

9.1 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.

9.2 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)

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

Turn the shaft every three months¹. This protects the seals from seizure.

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.

Let inspect the pump(s) or unit, after a storage period of 6 months or longer, before use again.

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



WARNING

See section 7.3 Commissioning.

9.4 Disassembly of a pump from the installation

Check the maximum "end-of-line" pressure if a pump has to build out for service. The suction and discharge valves must be closed. When the pump is removed it will create a "end-of-line" situation. The valve blades must resist the full pressure when the valves are closed. The maximum "end-of-line" pressure is mentioned on the name plate of the valve. The pressure in the system may not supersede this value.

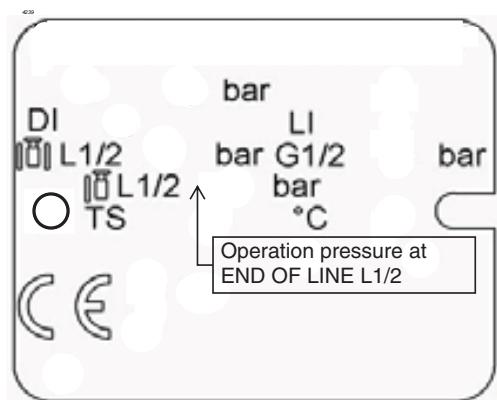


Figure 8: Name plate valve

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10 Hydro-Unit configuration

10.1 Hydro-Unit MC



ATTENTION

See factory settings 3-2-2-1

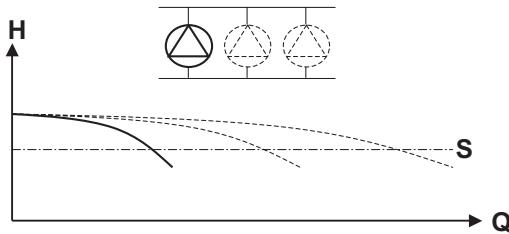


Figure 9: 1 pump operation

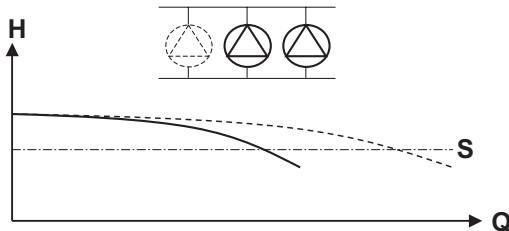


Figure 10: 2 pump operation

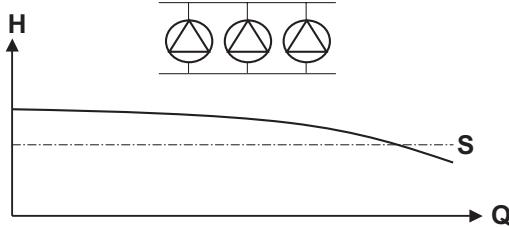


Figure 11: 3 pump operation

When as a result of an increasing water volume the pressure drops below the pressure set point, a pump will be switched on. When the required system pressure has been reached, the pumps are switched off one at a time. The minimum run time related switch-off delay is optimized constantly, which results in a considerable energy saving.

Table 11: Specific parameter settings MC

Parameter		Value
3-3-1	Number of pumps	1 2 3 4 5 6
3-3-2	Inlet	Switch Pressure Level / valve ON-OFF Level / valve prop.
3-3-3	Discharge	Fixed Speed
3-5-1	Set point kPa
3-5-2	Hysteresis	30 kPa
3-6-2	Min. run time	Default 180 s DOL ≤ 2.2 kW 90 s
3-6-3	Min. run time corr.	10 s
3-6-8	Run-dry delay	Default 30 Float/level control 1

10.2 Hydro-Unit MC ++



ATTENTION
See factory settings 3-2-2-1

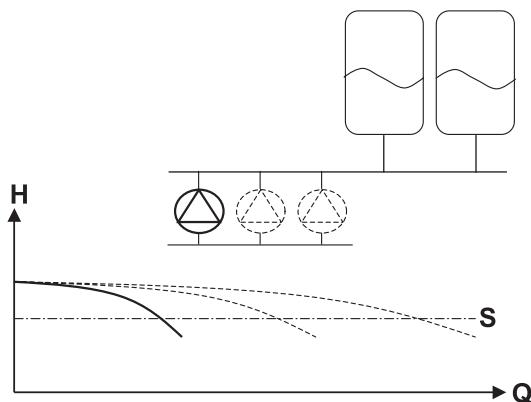


Figure 12: 1 pump operation

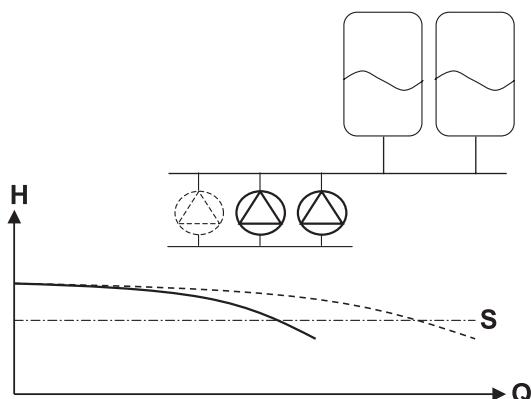


Figure 13: 2 pump operation

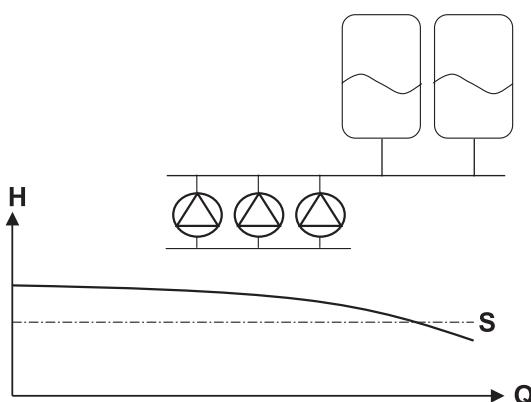


Figure 14: 3 pump operation

When as a result of a increasing water volume the pressure drops below the pressure set point, a pump will be switched on. When the required system

pressure has been reached, the pumps are switched off one at a time. The minimum run time related switch-off delay is optimized constantly, which results in a considerable energy saving.

Table 12: Specific parameter settings MC ++

Parameter	Value
3-3-1	Number of pumps
	1
	2
	3
	4
	5
	6
3-3-2	Inlet
	Switch Pressure Level / valve ON-OFF Level / valve prop.
3-3-3	Discharge
3-5-1	Set point
3-5-2	Hysteresis
3-5-13	Low pressure alarm
3-6-2	Min. run time
3-6-3	Min. run time cor.
3-6-8	Run-dry delay
	Default 30 Float/level control 1

10.3 Hydro-Unit MCMF



ATTENTION
See factory settings 3-2-2-1

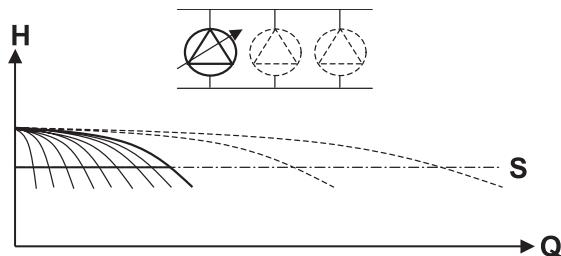


Figure 15: 1 pump operation, 1 pump variable

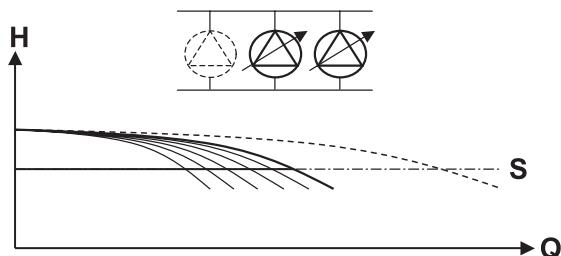


Figure 16: 2 pump operation, 2 pump variable

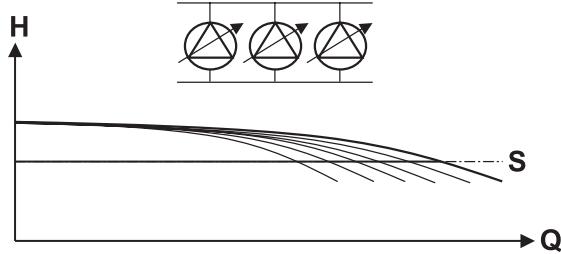


Figure 17: 3 pump operation, 3 pump variable

Table 13: Specific parameter settings MCMF

Parameter	Value
3-3-1	Number of pumps 1 2 3 4 5 6
3-3-2	Inlet Switch Pressure Level / valve ON-OFF Level / valve prop.
3-3-3	Discharge VFD fixed all
3-4-3-1	Communication Analog 4-20mA Danfoss VLT 2800 PumpDrive Danfoss MicroDrive Danfoss AquaDrive
3-4-3-2	Proportional const. 20
3-4-3-3	Integral const. 5
3-4-3-4	Differential const. 1
3-4-3-5-1	No flow detection 0-1000 kPa 0-2500 kPa 20
3-4-3-5-3	No flow step 5
3-4-3-7	VFD Write slave nr. ID
3-4-3-8	Serial com. active. Active
3-5-1	Set point kPa
3-5-3	Bandwidth 10
3-5-4	Accumulation press. 30 kPa
3-5-13	Low pressure alarm 100 kPa
3-6-2	Min. run time 10 s
3-6-3	Min. run time corr. 0 s
3-6-8	Run-dry delay Default 30 Float/level control 1

The Hydro-Unit MCMF is equipped with multiple variable frequency drives. If the Hydro-Unit is rotation-controlled, the required system pressure is sensed by a pressure sensor on the outlet side of the installation. An integrated adjustable PID-controller in the software of the Megacontrol ensures that the system pressure remains constant by successively switching on or off one or more (whether or not) rotation-controlled pumps with delay. A pump is only switched on when 100% or respectively 0% of the speed has been reached.

10.4 Hydro-Unit Level control

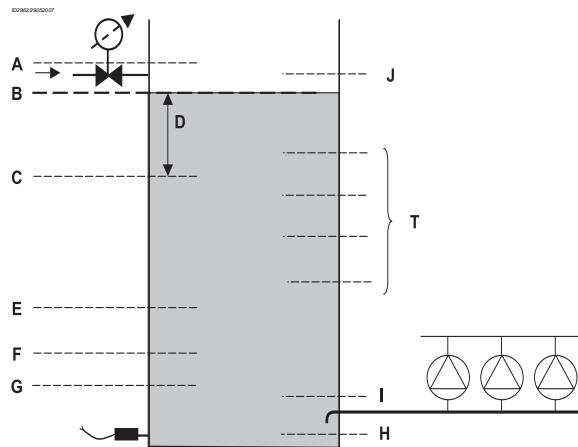


Figure 18: MCIII Level control

Table 14: Parameters supply valve ON/OFF

ID	Parameter	
3-4-1-4-9		Supply valve ON/OFF
A	3-4-1-4-7	High water level
B	3-4-1-4-9-2	Level 1 closed
	3-4-1-4-9-4	Level 1A closed
C	3-4-1-4-9-1	Level 1 open
	3-4-1-4-9-3	Level 1A open
E	3-4-1-4-6	Critical water level
F	3-4-1-4-5	Low level reset
G	3-4-1-4-4	Low level shutdown

Table 15: Parameters supply valve prop.

ID	Parameter	
3-4-1-4-10		Supply valve prop.
A	3-4-1-4-7	High water level
	3-4-1-4-10-1	Level setpoint 1
	3-4-1-4-10-2	Level setpoint 1A
D	3-4-1-4-10-3	Hysteresis
E	3-4-1-4-6	Critical water level
F	3-4-1-4-5	Low level reset
G	3-4-1-4-4	Low level shutdown

Table 16: Parameters general.

ID	Parameter	
H	3-4-1-4-3	Sensor level
I	3-4-1-4-1	0% level
J	3-4-1-4-2	100% level

Table 17: Parameters threshold

ID	Parameter	
3-4-1-4-8		Threshold
T	3-4-1-4-8-1	Threshold 1 ON
	3-4-1-4-8-2	Threshold 1 OFF
	3-4-1-4-8-3	Threshold 2 ON
	3-4-1-4-8-4	Threshold 2 OFF

10.5 Explanation of parameters

10.5.1 Pressure settings set points

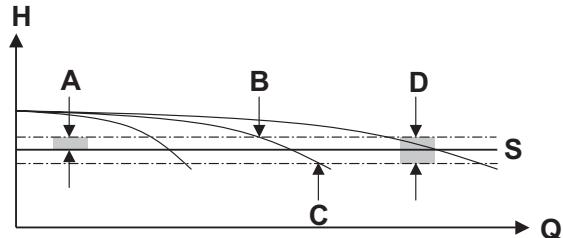


Figure 19: Pressure settings set points fixed speed

Table 18: Pressure settings set points fixed speed

ID	Parameter	
S	3-5-1	Set point
A	3-5-2	Hysteresis
B		Switch-off pressure
C		Switch-on pressure
D		2 x hysteresis

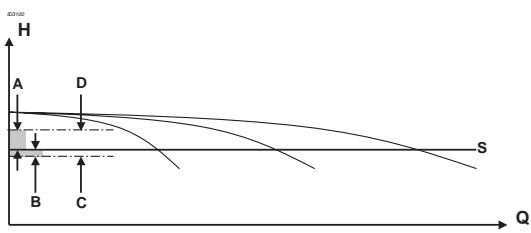


Figure 20: Pressure settings set points variable speed

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Table 19: Pressure settings set points variable speed

ID	Parameter	
A	3-5-4	Accumulation pressure
B	3-5-3	Range
C		Switch-on pressure 1st pump
D		Switch-off pressure last pump
S	3-5-1	Set point

10.5.2 Delta P + correction

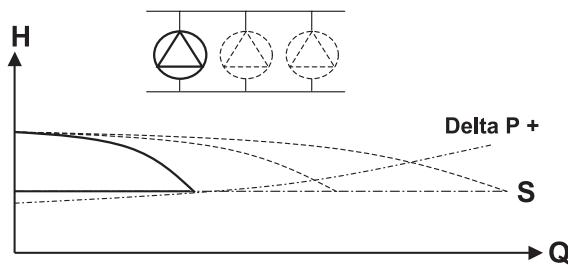


Figure 21: 1-pump operation

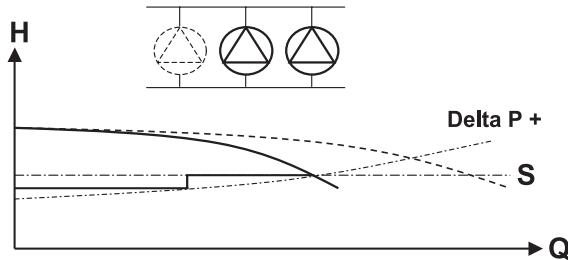


Figure 22: 2-pumps operation

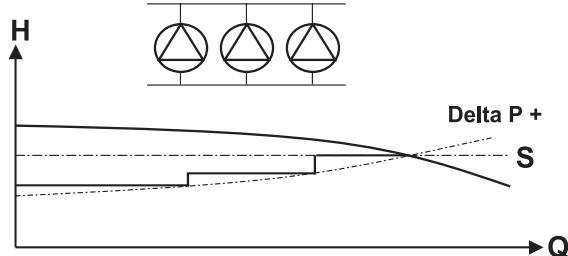


Figure 23: 3-pumps operation

Table 20: Parameters set points

ID	Parameter
S	3-5-1 Set point
+	3-5-10 Delta P

Delta P +

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

10.5.3 Delta P - correction

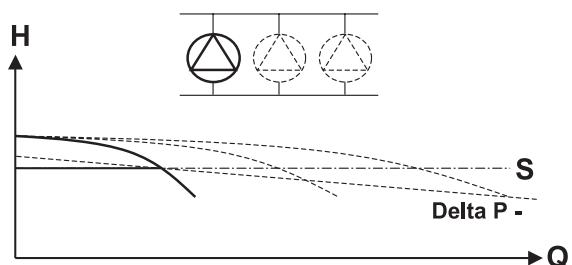


Figure 24: 1-pump operation

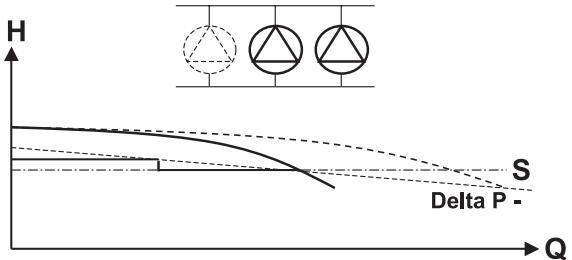


Figure 25: 2-pumps operation

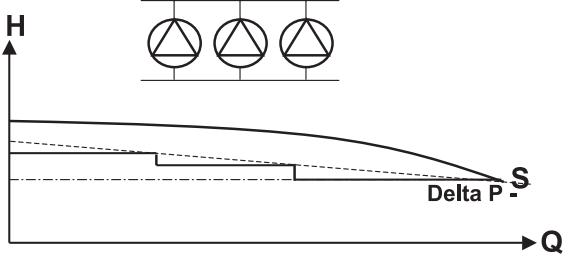


Figure 26: 3-pumps operation

Table 21: Parameters set points

ID	Parameter
S	3-5-1 Set point
-	3-5-10 Delta P

Delta P -

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

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

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

10.5.4 Special inputs

Table 22: Special inputs

Input	
External from (27-29 NC) ¹	The unit can be switched off through an external contact.
Fire Alarm (28-29 NC)	All pumps can be switched on through an external contact.
Test run (6-7)	Only active when WSD parameter 3-3-4 is on 1 (off) or on 8 (temp). The test run of the pump can be started through a contact. See parameter 3-7-7 for the duration of the test run
Change set point (8-9)	Only active when WSD parameter 3-3-4 is not on 3, 4, 6 or 7. The set point can be toggled between parameter 3-5-1 (set point) and 3-5-9 (alternative set point). Parameter 1-1-13 shows the applied set point (Development)
External reset (10-11)	Only active when WSD parameter 3-3-4 is not on 4 or 7. All faults can be acknowledged in one go through a contact.

- the entire control keeps functioning, but the pumps will be switched off.

10.5.5 Run-dry protection based on flow

This installation has a flow switch installed on the supply side. Parameter 3-3-2 has been set to 'flow switch'.

	Pres-sure OK	3-5-1 set point 3-5-17 Min. pressure flow Pressure low
Flow	pumps auto	pumps automatic
No flow	pumps auto	pumps OFF, after run-dry delay

11 Parameters

11.1 Parameter list

The parameters of the main menu are related to the standard (default) settings of the installation. The standard (default) settings can be adjusted where necessary and may also be reset whenever required. On the basis of the standard set parameters, an installation will operate as it should. Additional, extra parameters may be used, e.g. those under 'advanced', 'pressure', 'delays' and 'clock'. In order to use these additional parameters, you should activate the corresponding submenus.



ATTENTION

The standard (default) values for the Megacontrol, which occur in the following tables, have been printed in bold. For unit-specific values see: 'Factory settings'.

11.1.1 Operation (Hotkey "pump")

Parameter		Value: (default)	Description:	Level (read)	Level (write)
1	Operation		Pump operational status and information.	All	None
1-1	System		Information about the operational status and measuring values of the whole system.	All	None
1-1-1	System pressure		Current system pressure (delivery side).	All	None
1-1-2	System load		Current load in % of all operational pumps (100% is one pump at maximum speed).	All	None
1-1-3	Run-dry switch	1. Present 2. Not present	Presence of run-dry protection, signal by means of pressure switch or float switch.	All	None
1-1-4	Supply pressure		Current pressure at supply side (suction side).	All	None
1-1-5	Level content %		Current water level of the prefill reservoir in % of the content (storage tank at suction side).	All	None
1-1-6	Level height		Current water-level height in the prefill reservoir (storage tank at suction side).	All	None
1-1-7	Ambient temperature		Current ambient temperature if a temperature sensor is connected.	All	None
1-1-9	Position supply valve	Open Closed	Position of the supply valve. 1 = open 2 = closed	All	None
1-2	Pumps		Information about the operational status and measuring values of the selected pump.	All	None
1-2-1	Operational status		Display of the operational status of the selected pump.	All	None
1-2-1	Pump number	1-6	Selection of the pump for which the operational status has been selected.	All	None
1-2-1	Operational status	Automatic Manual (on 10s) Not operational (off)	Operational status of the selected pump: Automatic (continuously activated), Manual (on), Not operational (off).	All	All
1-2-2	Pump load	1. Number 2. Load	Display of the load of the selected pump.	All	None

Parameter		Value: (default)	Description:	Level (read)	Level (write)
1-2-4	Pump operational hours	1: HHHHHH:MM 2: HHHHHH:MM ... 6: HHHHHH:MM	Display of the operational hours for each pump in HHHHHH:MM	All	None
1-2-5	Number of pump starts	1: #xxx : F#xx 2: #xxx : F#xx ... 6: #xxx : F#xx	Display of the number of pump starts and failures per pump.	Service	None
1-3	Times and statistics		Operational times and statistics.		
1-3-1	Operational hours installation		Operational hours of the installation in: SSSSSS MM.	All	None
1-3-2	Service interval set		Setting the service interval.	All	None
1-3-3	Cur.min. run-time		Reading of the accumulated minimum run-time of the installation in seconds.	All	None

11.1.2 Diagnosis



(Hotkey "traffic light")

Parameter		Value: (default)	Description:	Level (read)	Level (write)
2	Diagnosis		Monitoring and diagnosis.	All	None
2-1	General		General monitoring functions.	All	None
2-1-1	Current notifications		Current error messages and warnings.	All	User
2-1-2	History		History of all error messages and warnings.	All	None
2-1-3	Confirm all		Accept / confirm all error messages and warnings.	All	All

11.1.3 Settings



(Hotkey "tools")

Parameter		Value: (default)	Description:	Level (read)	Level (write)
3	Settings		Settings.	All	None
3-1	Operating equipment		Human Machine Interface (HMI).		
3-1-1	Basic settings		Basic settings of the operating panel.		
3-1-1-1	Language	English Deutsch Nederlands Français	Language settings.	All	All
3-1-1-2	Display lighting		Display lighting settings.		
3-1-1-2-1	Lighting manner	Always ON Time-dependent OFF	Manner of lighting of the display (Note: long-term lighting will shorten life span).	All	All
3-1-1-2-2	Duration	0-999 (600)	Duration for automatic switching off of the display lighting.	All	Service
3-1-1-3	Preference units		Preference settings for the units in which the measuring values are shown in the display.		
3-1-1-3-1	Pressure	kPa bar PSI feet mwc	Unit for pressure.	All	Service
3-1-1-3-2	Height	m cm	Unit of the water-level height in the prefill reservoir (storage tank at suction side)	All	Service

Parameter		Value: (default)	Description:	Level (read)	Level (write)
3-1-1-3-3	Temperature	1. degrees C 2. degrees F	Unit of temperature if using a temperature sensor (WSD function).	All	Service
3-1-2	CAN Config		CAN field bus configuration		None
3-1-2-1	User Id		Device user identification	None	None
3-1-2-2	NMT Master		CAN network master	None	None
3-1-2-3	Bit Rate in kBit/s		CAN bit rate in kBit/s	None	None
3-1-3	Service interface		Settings for the service interface.	Factory	None
3-1-3-1	Bit speed	1. 9600 2. 19200 3. 38400	RS232 bus speed in kBit/s.	Factory	Factory
3-2	Operating module		Equipment-specific settings.	All	None
3-2-1	Signing on		Signing on for access at the desired user level.	All	None
3-2-1-1	PIN		Entry of personal identification number.	All	None
	Access level	User Service Factory	Selection of the access level.		
	PIN	0000	PIN acceptance notification.		
3-2-1-2	Signing on required.	1	Password entry required yes / no.	User	User
	Signing on	Signed on, Incorrect signing on	Signing on.		
3-2-2	Service		Service settings.	User	None
3-2-2-1	Reset standard parameters	Reset OK No set available	Reset of all parameters to standard values.	User	User
3-2-2-2	Reset maintenance interval	OK	Resetting of the maintenance interval.	Service	Service
3-2-2-3	Load local parameters	Reset OK No set available	Load locally stored parameters.	User	User
3-2-2-4	Save local parameters		Storage of the local parameters.	User	User
3-3	Configuration		System configuration.	All	None
3-3-1	Number of pumps ¹	1 2 3 4 5 6	Total number of pumps in the system.	All	Service
3-3-2	Supply ¹	Switch Pressure reader Level / supply valve Level / supply valve prop. Flow switch	Setting of the configuration used on the supply side (suction side of the installation).	All	Service
3-3-3	Delivery side ¹	Fixed speed One jockey Two jockey VFD chang-over VFD fixed one VFD fixed all	Setting of the configuration used on the delivery side (pressure side of the installation).	All	Service
3-3-4	WSD	OFF 1 tank 2 tanks 3 tanks 1 tank + temp. 2 tanks + temp. 3 tanks + temp. Temperature	Setting of the used WSD configuration (membrane tank change and ambient temp.).	All	Service
3-3-5	Leakage detection			All	Service

Parameter		Value: (default)	Description:	Level (read)	Level (write)
3-4	System settings		Setting the system parameters.	All	None
3-4-1	Supply		Settings of the parameters used on the supply side (suction side of the installation).	All	None
3-4-1-1	Pressure at 4 mA	0	Measuring value at 4mA.	All	Service
3-4-1-2	Pressure at 20 mA	1000	Measuring value at 20 mA.	All	Service
3-4-1-3	Reset run-dry protection	0. Manual 1. Automatic	Automatic or manual reset after switching off by run-dry protection (pressure or level).	All	Service
3-4-1-4	Level configuration		Settings of the parameters used for the level operation in the prefill reservoir (supply side).	None	None
3-4-1-4-1	0% level	0	Lowest possible water level where no air is sucked into the suction pipe. In relation to the bottom.	All	Service
3-4-1-4-2	100% level	200	Highest possible water level before tank will overflow. In relation to the bottom.	All	Service
3-4-1-4-3	Sensor height	0	The position of the level sensor in the prefill reservoir. In relation to the bottom.	All	Service
3-4-1-4-4	Switch-off level	10	Low-water level to protect running dry of the pumps (system will switch off).	All	Service
3-4-1-4-5	Reset level	15	Reset level to restart the system after switching off by run-dry protection.	All	Service
3-4-1-4-6	Critical water level	30	Critical water level where tank is almost empty (reserve contents still present).	All	Service
3-4-1-4-7	High water level	105	High water level, whereby tank is nearly full	All	Service
3-4-1-4-8	Switch contacts		Menu with which to switch one or two relay contacts depending on the level.	Factory	None
3-4-1-4-8-1	Switch contact 1 ON	50	Water level whereby relay contact 1 is switched on.	All	Service
3-4-1-4-8-2	Switch contact 1 OFF	50	Water level whereby relay contact 1 is switched off.	All	Service
3-4-1-4-8-3	Switch contact 2 ON	40	Water level whereby relay contact 2 is switched on.	All	Service
3-4-1-4-8-4	Switch contact 2 OFF	40	Water level whereby relay contact 2 is switched off.	All	Service
3-4-1-4-9	Supply valve open/closed		Supply valve (with open/closed switching) with which the prefill reservoir at the supply side is filled.	All	None
3-4-1-4-9-1	Level 1 valve open	70	Water level in the prefill reservoir whereby the supply valve is opened.	All	Service
3-4-1-4-9-2	Level 1 valve closed	90	Water level in the prefill reservoir whereby the supply valve is closed.	All	Service
3-4-1-4-9-3	Level 1A valve open	40	Alternative water level in the prefill reservoir whereby the supply valve is opened (clock-dependent).	All	Service
3-4-1-4-9-4	Level 1A valve closed	60	Alternative water level in the prefill reservoir whereby the supply valve is closed (clock-dependent).	All	Service



Parameter		Value: (default)	Description:	Level (read)	Level (write)
3-4-1-4-10	Supply valve proportional		Supply valve (proportionally opening) with which the prefill reservoir at the supply side is filled.	All	None
3-4-1-4-10-1	Level setpoint 1	80	Maximum level in the prefill reservoir whereby the proportional valve is fully opened.	All	Service
3-4-1-4-10-2	Level setpoint 1A	40	Alternative maximum water level (clock-dependent) whereby the proportional valve is fully opened.	All	Service
3-4-1-4-10-3	Hysteresis	15	Level difference in the prefill reservoir whereby the proportional valve is fully opened.	All	Service
3-4-1-4-10-4	Sample time	10	Time between level measurements to determine the position of the proportional valve.	All	Service
3-4-2	System pressure		System-pressure settings		
3-4-2-1	Pressure at 4 mA	0	Measuring value at 4 mA.	All	Service
3-4-2-2	Pressure at 20 mA	1000	Measuring value at 20 mA.	All	Service
3-4-2-3	Pumps ON measuring fault	0	Number of pumps that is started when a measuring fault is detected at the pressure reader.	All	Service
3-4-2-4	Max. system load	Number of pumps x 100%	Limitation of the maximum system load (1 pump is 100%).	All	Service
3-4-3	Frequency converter		Configuration of the frequency converter.	All	None
3-4-3-1	Communication	Analog 0-20mA Danfoss VLT 2800 RS485 Lenze PumpDrive Danfoss MicroDrive Danfoss AquaDrive	Configuration of the communication protocol of the frequency converter.	All	Service
3-4-3-2	Prop. amplification.	60	Proportional amplification factor of the system pressure.	All	Service
3-4-3-3	Int. amplification.	40	Speed with which the deviation of the system pressure is corrected.	All	Service
3-4-3-4	Diff. amplification.	0	Damping factor to level off the adjustments in system pressure.	All	Service
3-4-3-5	Consumption detection.		Accuracy with which the minimum water consumption is detected. (switching off of the system).	All	Service
3-4-3-5-1	Range reduction det.	6	Detection of the range reduction in %	Service	Service
3-4-3-5-2	Time reduction detection	16	Time reduction detection in s, while the pressure should remain within the range	Service	Service
3-4-3-5-3	Run-down in step size	10	The step in % with which the speed is run down for the reduction detection.	Service	Service
3-4-3-7	FO assign ID no.		ID assignment (slave address) of the frequency converter. The values should be "not active" again after assignment.	All	Service
	ID ²	500=Danfoss VLT2800 8-31=MicroDrive FC51 8-31=AquaDrive FC200	ID = setting the ID no. (slave address) for the serial communication with the frequency converter.		
3-4-3-8	Activate ser. comm.	Active Not active	Setting the serial communication with the frequency converter. active/not active.	All	Service
3-4-3-9	Ramp-up freq. conv.	3.0	Setting the "ramp-up" of the frequency converter.	All	Service

Parameter		Value: (default)	Description:	Level (read)	Level (write)
3-4-3-10	Ramp-down freq. conv.	3.0	Setting the "ramp-down" of the frequency converter.	All	Service
3-4-3-11	Minimum frequency	30.0	Minimum frequency of the converter.	All	Service
3-4-3-12	Maximum frequency	50.0	Maximum frequency of the converter.	All	Service
3-4-3-14	U nominal of VFD	400	Nominal voltage of the frequency converter.	All	Service
3-4-3-15	F nominal of VFD	50.0	Nominal frequency of the converter.	All	Service
3-4-3-16	I nominal of VFD	4.40	nominal current of the VFD	All	Service
3-4-4	WSD settings		WSD function settings.	All	None
3-4-4-1	Number of changes	30	Number of changes of the membrane tank. (water flowing in).	All	Service
3-4-4-2	Time span change.	24	Time span of the number of changes.	All	Service
3-4-4-3	Avg. ambient temp.	25.0	Average (pump) room temperature.	All	Service
3-4-4-4	Time span temp.	24	Time span of the average (pump) room temperature.	All	Service
3-5	Pressure settings		System-pressure settings.	All	None
3-5-1	Set point	400	System pressure set point	All	User
3-5-2	Hysteresis	30	Pressure difference above and below the target value at which the pumps switch on and off respectively.	All	User
3-5-3	Bandwidth	5	A dead area within which the speed of the converter remains constant, despite pressure fluctuations.	All	User
3-5-4	Accumulation of pressure.	30	Membrane tank (water) pressure accumulation before the system is switched off.	All	User
3-5-5	Max.set point		Upper limit for the setpoint value to be set by the customer	All	User
3-5-6	Maximum pump pressure	400	Maximum pump pressure at Q = 0 (no reduction).	All	Service
3-5-7	Supply pressure ref.	0	Deviations regarding this supply pressure are compensated in the target value of the system pressure.	All	Service
3-5-8	Average inlet press.	250	Average value to compensate the inlet pressure deviation by using a pressure switch	All	All
3-5-9	Adapt. setpoint	400	Alternative setpoint alternating by clock settings.	All	User
3-5-10	Delta p	0	Quadratic (+) or linear (-) function to correct the setpoint when a pump is switching on or off	All	User
3-5-11	High pressure alarm.	1000	Upper limit value for the system pressure to shut down or notification only (signal)	All	User
3-5-12	High pressure action	signal	Selection parameter to define the action at system over-pressure (shut down or signal only)	All	User
3-5-13	Low pressure alarm	0	Under limit value for the system pressure to shut down or notification only (signal)	All	User
3-5-14	Low pressure action	signal	Selection parameter to define the action at system under-pressure (shut down or signal only)	All	User



Parameter		Value: (default)	Description:	Level (read)	Level (write)
3-5-15	Shut down RDP	20	Low inlet pressure or level to protect the pumps for dry running. (system shut down)	All	All
3-5-16	Reset RDP	80	Reset pressure or level to reset the system after run dry protection shut down	All	All
3-5-17	Press. Flow Control	100	Failure no water available gets active if setpoint - adjusted pressure is exceeded	All	Service
3-6	Timer Settings		Timer parameter configuration	All	None
3-6-1	Opt. pump starts / hour	10	The optimum nrs of pump starts per hour. The minimum run time will be automatically corrected.	All	Service
3-6-2	Min. run-time	180	The minimum time of the pump to run. (the run time correction will not drop below this value)	All	User
3-6-3	Min. run-time corr.	10	Adapting the Minimum run time to optimize the required number of pump starts per hour.	All	Service
3-6-4	Max. run-time	86400	Maximum continuous run time of the pump. After this time the pump will be forced to change over.	All	Service
3-6-5	Start delay	1.0	Start delay to switch the pumps on when pressure remains low	All	Service
3-6-6	Stop delay	1.0	Stop delay to switch the pumps off when pressure remains high.	All	Service
3-6-8	RDP delay	10	Delay time after run-dry protection to shut down the system	All	Service
3-6-9	High/low alarm delay	60	Permitted time of setpoint pressure deviation > too high or too low system pressure.	All	Service
3-6-10	WSD 1 pulse length	0 0s = 30 L 4s ≥ 30 L	Length in time of the water flow detection device (flow position) digital input 1	All	Service
3-6-11	WSD 2 pulse length	4 0s = 30 L 4s ≥ 30 L	Length in time of the water flow detection device (flow position) digital input 2	All	Service
3-6-12	WSD 3 pulse length	4 0s = 30 L 4s ≥ 30 L	Length in time of the water flow detection device (flow position) digital input 3	All	Service
3-6-13	Sys. start up delay	10	Delay time for starting up system	Service	Service
3-7	Time/date		Date and time.	All	None
3-7-1	Date		Setting the date.	All	User
	Year	2007	Setting the date.		
	Month	1	Setting the date.		
	Day	1	Setting the date.		
3-7-2	Time	0	Setting the time HH:MM:SS	All	User
3-7-3	Check run mode	OFF Fixed interval Time of the day Time of the week	Select how and when a checkrun should be performed. (check run only on pumps which did not run)	All	User
3-7-4	Check run interval	86400	The interval between the check runs Applicable for pumps not operation for 24h.	All	Service

Parameter		Value: (default)	Description:	Level (read)	Level (write)
3-7-5	Check run at		Setting the clock when a check run is required. Applicable for pumps not operation for 24h.	All	User
	Hours	0-23	Setting the hours of the check run clock		
	Minutes	0-59	Setting the minutes of the check run clock		
3-7-6	Check run at		Setting the date and clock when a check run is required. Applicable for pumps not operation for 24h.	All	User
	Hours	0-23	Setting the hours of the clock. Fixed time of the week for testing the pumps.		
	Minutes	0-59	Setting the minutes of the clock. Fixed time of the week for testing the pumps.		
	Day	Sunday Monday Tuesday Wednesday Thursday Friday Saturday	Setting the day of the check run clock		
3-7-7	Check run duration	30	The check-run time per pump. (one at the time and alternating)	All	Service
3-7-8	Clock adapt setp.		Alternative setpoint which will be active on clock settings	All	None
3-7-8-1	Adaptatation mode	OFF Adapt ON/OFF ev. day Adapt.ON/OFF per day	Each day = same switch-over time every day. Per day = different switch-over time for each day of the week.	All	User
3-7-8-2	Change on/off times		The alternation to an alternative set-point becomes active/ will be undo at the selected time.	All	User
	Hours adapt setp.ON	0	Setting the hours at which the alternation to a alternative setpoint becomes active		
	Min adapt setp.ON	0	Setting the minutes at which the alternation to a alternative setpoint becomes active		
	Hours adapt setp.OFF	0	Setting the hours at which the alternation to a alternative setpoint will be undo		
	Min adapt setp.OFF	0	Setting the minutes at which the alternation to a alternative setpoint will be undo		
3-7-8-3	Select day of week	Sunday Monday Tuesday Wednesday Thursday Friday Saturday	Setting the day at which the alternation to a alternative setpoint becomes active	All	User



Parameter		Value: (default)	Description:	Level (read)	Level (write)
3-7-8-4	Change on/off times		The setpoint alternation becomes active/ will be undo at the selected time of the selected day's)	All	User
	Hours adapt setp.ON	0	Setting the hours at which the alternation to a alternative setpoint becomes active		
	Min adapt setp.ON	0	Setting the minutes at which the alternation to a alternative setpoint becomes active		
	Hours adapt setp.OFF	0	Setting the hours at which the alternation to a alternative setpoint will be undo		
	Min adapt setp.OFF	0	helpText="Setting the minutes at which the alternation to a alternative setpoint will be undo"		
3-7-9	Date adapt level On	1. Month 2. Day	The alternative level in the prefill reservoir is activated on the day and month entered.	All	User
	Month adapt level On	Off January February March ... December	The level setpoint alternation becomes active at the selected Month's		
	Day adapt level On	1-31	The level setpoint alternation becomes active at the selected day of the selected Month's)		
3-7-10	Date adapt level Off	1. Month 2. Day	The level setpoint alternation will be undo at the selected Month's	All	User
	Month adapt lev Off	Off January February March ... December	The level setpoint alternation will be undo at the selected Month's		
	Day adapt level Off	1-31	The level setpoint alternation will be undo at the selected day of the selected Month's)		
3-8	Definable I/O		Parameterizing of the relay outlets.	Factory	Factory
3-8-1	Threshold function	No threshold relay 1 threshold relay 2 threshold relay	1 = 3 or 6 pumps no threshold 2 = 2 or 5 pumps no 1 threshold 3 = 1 or 4 pumps no 2 threshold	Factory	Factory
3-10	Root menu		Settings of Root Menu	User	None
	1-1-1		System pressure	All	All
	1-1-2		System load	All	All
	1-1-3		RDP switch	All	All
	1-1-4		Inlet pressure	All	All
	1-1-5		Level content in %	All	All
	1-1-6		Level height	All	All
	1-1-7		Ambient temperature (WSD)	All	All
	1-1-9		Position supply valve	All	All
	1-3-1		Act runtime Op hours	All	All
	1-3-3		Act Minimum Runtime	All	All

1. After changing a parameter, the controller will be reset.
 2. ID = setting the ID-nr (slave address) for the serial communication between the frequency converter

11.1.4 Information (Hotkey "info")

Parameter		Value: (default)	Description:	Level (read)	Level (write)
4	Info		Information.	All	None
4-1	Device		Device control module	All	None
4-1-1	Serial number		Serial number of the control module	All	None
4-1-2	Product Id	MCIII-3PMCIII-6P	Material number.	Factory	None
4-1-3	FW Version		Firmware version of the operating module.	All	None
4-1-4	Parameter Set		HMI parameter set version	All	None
4-1-5	HW Version		Hardware version of the control module	All	None
4-1-6	Fieldbus FW ¹ Version		Fieldbus Firmware Version	All	None
4-1-7	FW Revision		Revision of the current Firmware	All	None

1. FW = Firm Ware

11.1.5 Hotkey menu (Hotkey "OK")

Parameter		Value: (default)	Description:	Level (read)	Level (write)
3-2-1-1	Pin		Enter access level and personal identification number	All	None
3-4-1-4-8-1	Threshold 1 ON	50	Water level at which the relays output becomes ""high""	All	Service
3-4-1-4-8-2	Threshold 1 OFF	50	Water level at which the relays output becomes ""low""	All	Service
3-4-1-4-8-3	Threshold 2 ON	40	Water level at which the relays output becomes ""high""	All	Service
3-4-1-4-8-4	Threshold 2 OFF	40	Water level at which the relays output becomes ""low""	All	Service
3-4-1-4-9-1	Level 1 open	70	Level in the receiver tank at which the supply valve is opened	All	Service
3-4-1-4-9-2	Level 1 closed	90	Level in the receiver tank at which the supply valve is closed	All	Service
3-4-1-4-10-1	Level setpoint 1	80	Maximum level in the receiver tank at which the proportional valve is fully opened	All	Service
3-4-1-4-10-3	Hysteresis	15	Differential level in the receiver tank at which the proportional valve is fully opened	All	Service
3-4-1-4-10-4	Sample time	10	Time between the level measurements controlling the proportional valve position	All	Service
3-4-3-2	Proportional const.	60	Proportional amplification factor the system pressure is controlled with	All	Service
3-4-3-3	Integral const.	40	Speed with which the deviation of the required system pressure is adjusted	All	Service
3-4-3-4	Differential const.	0	The level of damping with which the deviation of the required system pressure is controlled	All	Service
3-4-3-5	No flow detection		Accuracy of which the minimum water demand ""no-flow"" is detected (System switch-off procedure)	All	Service
3-4-3-5-1	No flow bandwidth	6	Bandwidth of the no flow detection in %	Service	Service
3-4-3-5-2	No flow time	16	Time of the no flow detection in s	Service	Service
3-4-3-9	VFD Ramp-Up	1	Setting of the ramp-up of the VFD	All	Service



Parameter		Value: (default)	Description:	Level (read)	Level (write)
3-4-3-10	VFD Ramp-Down	1	Setting of the ramp-down of the VFD	All	Service
3-5-1	Set point	400	System pressure set point	All	User
3-5-2	Hysteresis	30	Pressure differential above and below the set pressure at which the pump's) are respectively switched off and on.	All	User
3-5-3	Bandwidth	5	A dead area in which the power to the VFD remains constant independent from pressure fluctuations.	All	User
3-5-4	Accumulation press.	30	Membrane tank (water) pressure accumulation prior to the system switch-off	All	User
3-5-10	Delta p	0	Quadratic (+) or linear (-) function to correct the setpoint when a pump is switching on or off	All	User
3-5-11	High pressure alarm	1000	Upper limit value for the system pressure to shut down or notification only (signal)	All	User
3-5-12	High pressure action	OFF	Selection parameter to define the action at system over-pressure (shut down or signal only)	All	User
3-5-13	Low pressure alarm	0	Under limit value for the system pressure to shut down or notification only (signal)	All	User
3-5-14	Low pressure action		Selection parameter to define the action at system under-pressure (shut down or signal only)	All	User
3-5-15	Shut down RDP		Low inlet pressure or level to protect the pumps for dry running. (system shut down)	All	All
3-5-16	Reset RDP		Reset pressure or level to reset the system after run dry protection shut down	All	All
3-5-17	Press. Flow Control		Failure no water available gets active if setpoint - adjusted pressure is exceeded	All	Service
3-6-2	Min. run time	180	The minimum time of the pump to run. (the run time correction will not drop below this value)	All	User
3-6-5	Start delay	5	Start delay to switch the pumps on when pressure remains low	All	Service
3-6-6	Stop delay	2	Stop delay to switch the pumps off when pressure remains high.	All	Service
3-6-8	RDP delay	10	Delay time after run-dry protection to shut down the system	All	Service
3-6-9	High/low alarm delay	60	Permitted time of setpoint pressure deviation > too high or too low system pressure.	All	Service

11.1.6 Pump control

Table 23: Pump control 1-3 pumps

1-3 pumps	number of thresholds	statVFD2	statVFD3
1 pump	2	x	x
2 pumps	1		x
3 pumps	0		

Table 24: Pump control 1-6 pumps

1-6 pumps	number of thresholds	statVFD2	statVFD3	statVFD5	statVFD6
2 pumps	2			x	x
3 pumps	2			x	x
4 pumps	2			x	x
5 pumps	1				x
6 pumps	0				

12 Failures

12.1 Failure messages Megacontrol

Table 25: Faults list MCIII

Failure message:	Explanation:	Failure output:
Failure PT. Dis.	Failure Pressure Transmitter discharge side (value >20mA) replace PT and reset system	Urgent
Sys. press.to low	System pressure too long under minimum value (3-5-13)	Urgent ¹
Sys press.to high	System pressure too long above maximum value (3-5-11)	Urgent ¹
Sys. press.to low	System pressure too long under minimum value (3-5-13)	Non urgent ²
Sys press.to high	System pressure too long above maximum value (3-5-11)	Non urgent ²
No water	No sufficient water or -pressure available at suction side	Urgent ¹
No water	No sufficient water or -pressure available at suction side	Non urgent ²
Maintenance req.	Maintenance is required	Non urgent
More pumps fail	More than two pumps out of order	Urgent
No refresh tank #	No water refreshm in tank # (sensed by the flow detector) check precharged air pressure	Urgent
Aver temp to high	Average room temperature to high (sensed by the temperature sensor)	Urgent
Curr temp to high	Current room temperature to high (sensed by the temperature sensor)	Non urgent
Failure Pump #	Failure pump #. Solve problem and reset the system	Non urgent
P# out of order	Pump # purposely put out of order. Deactivate by putting the pump in automatic mode	Non urgent
Failure valve	Failure supply valve. Solve problem and reset the system	Urgent
Inlet sensor fail	Failure inlet Sensor for level or pressure. (signal out of range) replace Sensor and reset system.	Urgent
High water level	Water level in receiver tank too high	Non urgent
Crit. water level	Water level in receiver tank critical (near to empty)	Non urgent
Low water level	Water level in receiver tank too low (system shut down for run dry protection)	Urgent ¹
Low water level	Water level in receiver tank too low (system shut down for run dry protection)	Non urgent ²
Spurious data	Receiving unfamiliar data from variable frequency drive	Non urgent
Serial Framing	Communication to variable frequency drive is "framing"	Non urgent
Serial parity	Communication with variable frequency drive is "parity"	Non urgent
Serial time out	Communication to variable frequency drive is	Non urgent
Unrequest message	Receiving unrequested message from variable frequency drive	Non urgent
Buffer overrun	Receiving	Non urgent
Failure FC #	general failure variable frequency drive #	Non urgent
Incor. check sum	Incorrect check sum within the protocol	Non urgent
Temp. sensor fail	Failure Room Temperature Sensor. replace R.T.S. and reset system	Non urgent
24V out of range	Failure message due to internal 24V supply out of range	Non urgent
5V out of range	failure message due to internal 5V supply out of range	Non urgent
3V out of range	Failure message due to internal 3V supply out of range	Non urgent
External off	Failure message due to an external off command	Urgent
Fire alarm	Failure message due to an external fire alarm command	Urgent
Failure VFD	Failure of the VFD drive at discharge mode VFD change-over or VFD fixed one	Urgent
Br. Wire Sens.dis	Failure Pressure Transmitter discharge side (value lower then 4mA) connect or replace Pressure Transmitter and reset system	Urgent
Br. Wire Sens.Inl	Failure inlet Sensor for level or pressure. (wire break detection) Replace Sensor and reset system.	Urgent
Fail. several FCs	Failure for more than one FC occurs	Urgent
Leakage	There is a leakage in the unit. Solve problem and reset the system	Urgent
Eeprom HW Error	The Eeprom data was not saved due to HW problem	Urgent

1. Manual alarm reset = Urgent.
 2. Automatic alarm reset = Non urgent.

12.2 Failure messages Danfoss VFD



ATTENTION

The error codes are displayed in the error log of the Megacontrol. For specific information about the error codes please consult the (technical) documentation of the VFD concerned.

Table 26: VLT 2800

Error code:	Explanation:	Warning:	Alarm:	Trip lock:
2	Live zero error (LIVE ZERO ERROR)	x	x	x
4	Mains phase loss (MAINS PHASE LOSS)	x	x	x
5	Voltage warning high (DC LINK VOLTAGE HIGH)	x		
6	Voltage warning low (DC LINK VOLTAGE LOW)	x		
7	Ovvoltage (DC LINK OVERVOLTAGE)	x	x	x
8	Undervoltage (DC LINK UNDERVOLT)	x	x	x
9	Inverter overload (INVERTER TIME)	x	x	
10	Motor overloaded (MOTOR TIME)	x	x	
11	Motor thermistor (MOTOR THERMISTOR)	x	x	
12	Current limit (CURRENT LIMIT)	x	x	
13	Ovvcurrent (OVERCURRENT)	x	x	x
14	Earth fault (EARTH FAULT)		x	x
15	Switch mode fault (SWITCH MODE FAULT)		x	x
16	Short-circuit (CURR. SHORT CIRCUIT)		x	x
17	Serial communication timeout (STD BUS TIMEOUT)	x	x	
18	HPFB bus timeout (HPFB TIMEOUT)	x	x	
33	Out of frequency range (OUT FREQ RNG/ROT LIM)	x		
34	HPFB communication fault (PROFIBUS OPT. FAULT)	x	x	
35	Inrush fault (INRUSH FAULT)		x	x
36	Overtemperature (OVERTEMPERATURE)	x	x	
37-45	Internal fault (INTERNAL FAULT)		x	x
50	AMT not possible		x	
51	AMT fault re. nameplate data (AMT TYPE. DATA FAULT)		x	
54	AMT wrong motor (AMT WRONG MOTOR)		x	
55	AMT timeout (AMT TIMEOUT)		x	
56	AMT warning during AMT (AMT WARN. DURING AMT)		x	
99	Locked (LOCKED)	x		

Table 27: VLT Aquadribe FC200

Error code:	Explanation:	Warning:	Alarm/Trip:	Alarm/Trip Lock:
1	10 Volts low	X		
2	Live zero error	(X)	(X)	
3	No motor	(X)		
4	Mains phase loss		X	
5	DC link voltage high	X		
6	DC link voltage low	X		
7	DC over voltage	X	X	
8	DC under voltage	X	X	
9	Inverter overloaded	X	X	
10	Motor overload temperature	(X)	(X)	
11	Motor thermistor over temperature	(X)	(X)	
12	Torque limit	X	X	
13	Over Current	X	X	x
14	Earth fault	X	X	x
15	Hardware mismatch		X	X



Error code:	Explanation:	Warning:	Alarm/Trip:	Alarm/Trip Lock:
16	Short Circuit		X	X
17	Control word time out	(X)	(X)	
23	Internal fan fault	X		
24	External fan fault	X		
25	Brake resistor short-circuit	X		
26	Brake resistor power limit	(X)	(X)	
27	Brake chopper fault	X	X	
28	Brake check failed	(X)	(X)	
29	Heatsink temp	X	X	X
30	Motor phase U missing	(X)	(X)	(X)
31	Motor phase V missing	(X)	(X)	(X)
30	Motor phase W missing	(X)	(X)	(X)
33	Inrush fault		X	X
34	Field bus communication fault	X	X	
35	Out of frequency range	X	X	
36	Mains failure	X	X	
37	Phase imbalance	X	X	
38	Internal fault			
39	Heatsink sensor		X	X
40	Overload of digital output terminal 27	(X)		
41	Overload of Digital Output Terminal 29	(X)		
42	Overload of Digital Output On X30/6 or overload of digital output on X30/7	(X)		
46	Power card supply		X	X
47	24 V supply low	X	X	X
48	1.8 V supply low		X	X
49	Speed limit	X		
50	AMA calibration failed		X	
51	AMA check U_{nom} and I_{nom}		X	
52	AMA low I_{nom}		X	
53	AMA motor too big		X	
54	AMA motor too small		X	
55	AMA parameter out of range		X	
56	AMA interrupted by user		X	
57	AMA time out		X	
58	AMA internal fault	X	X	
59	Current limit	X		
60	External interlock	X		
62	Output frequency at maximum limit	X		
64	Voltage limit	X		
65	Control Board Over-temperature	X	X	X
66	Heat sink Temperature Low	X		
67	Option Configuration has Changed		X	
68	Safe Stop Activated		X ¹	
69	Power Card Temp		X	X
70	Illegal FC configuration			X
71	PTC 1 safe stop	X	X ¹	
72	Dangerous Failure			X ¹
73	Safe Stop Auto Restart			
76	Power unit setup	X		
79	Illegal PS config		X	X
80	Drive Initialised to Default Value		X	
91	Analog input 54 wrong settings			X
92	No flow	X	X	
93	Dry pump	X	X	

Error code:	Explanation:	Warning:	Alarm/Trip:	Alarm/Trip Lock:
94	End of curve	X	X	
95	Broken belt	X	X	
96	Start delayed	X		
97	Stop delayed	X		
98	Clock fault	X		
220	Overload trip		X	
243	Brake IGBT	X	X	
244	Heatsink temp	X	X	X
245	Heatsink sensor		X	X
246	Power card supply		X	X
247	Power card temp		X	X
248	Illegal PS config		X	X
250	New spare part			X
251	New Type Code		X	X

1. Can not be Auto reset via par. 14-20 Reset Mode

A trip is the action when an alarm has appeared. The trip will coast the motor and can be reset by pressing the reset button or make a reset by a digital input (parameter group 5-1* (See Danfoss manual). The origin event that caused an alarm cannot damage the frequency converter or connected parts. A Trip Lock situation can only be reset by a power cycling.

Table 28: VLT Microdrive FC 51

Error code:	Explanation:	Warning:	Alarm:	Trip lock:	Error
2	Live zero error	X	X		
4	Mains phase loss ¹	X	X	X	
7	DC over voltage ¹	X	X		
8	DC under voltage ¹	X	X		
9	Inverter overloaded	X	X		
10	Motor ETR over temperature	X	X		
11	Motor thermistor over temperature	X	X		
12	Torque limit	X			
13	Over Current	X	X	X	
14	Earth fault		X	X	
16	Short Circuit		X	X	
17	Control word time out	X	X		
25	Brake resistor short-circuited		X	X	
27	Brake chopper short-circuit		X	X	
28	Brake check		X		
29	Power board over temp	X	X	X	
30	Motor phase U missing		X	X	
31	Motor phase V missing		X	X	
32	Motor phase W missing		X	X	
38	Internal fault		X	X	
44	Earth fault		X	X	
47	Control Voltage Fault		X	X	
51	AMT check U_{nom} and I_{nom}		X		
52	AMT low I_{nom}		X		
59	Current limit	X			
63	Mechanical Brake Low		X		
80	Drive Initialised to Default Value		X		
84	The connection between drive and LCP is lost				X
85	Button disabled				X
86	Copy fail				X
87	LCP data invalid				X
88	LCP data not compatible				X
89	Parameter read only				X



Error code:	Explanation:	Warning:	Alarm:	Trip lock:	Error
90	Parameter database busy				X
91	Parameter value is not valid in this mode				X
92	Parameter value exceeds the min/max limits				X
nw run	Not While RUNning				X
Err.	A wrong password was entered				X

1. These faults may be caused by mains distortions. Installing Danfoss Line Filter may rectify this problem.

12.3 Failure table Hydro-Unit



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 dirt.
	Pump has been operated without water.	Replace the shaft seal.	
Pump is vibrating and makes 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 watersupply. 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.	
	Outlet and/or inlet 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.	Membrane switch vessel(s) leaky or incorrect pressure.	Have your supplier check the installation.	

12.4 Failure table Hydro-Unit in combination with membrane switch vessel (option)



WARNING

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

Problem	Possible cause	Possible solution	Checkpoints
There is no input signal when a pump is started.	Shut-off valve to the Hydro-Unit is closed.	Open the shut-off valve.	Shut-off valve should always be opened.
	Pump is operating against the maximum pressure of the unit and does not deliver.	Adjust the switch-on pressure of the pump to at least 80 kPa below the maximum pressure of the unit.	Adjust the pressure set point.
	Pressure in the membrane switch vessel(s) is too high.	Adjust the air pressure.	Make sure maintenance is performed regularly.
	Pressure in the membrane switch vessel(s) is too low, or there is no pressure at all.	Adjust the air pressure.	Check if the membrane switch vessel is not leaking, if so, replace the membrane switch vessel.
	Reed contact on the Hydro-Unit defective.	Replace the reed contact.	Adjust the reed contact.
Input signal remains active.	Magnet in the Hydro-Unit is stuck.	Replace / clean the interior of the Hydro-Unit.	Deposits / dirt.
	Short circuit on the input signal.		Check the wiring.
	Reed contact defective.	Replace the Reed contact.	
Nothing responds	There is no voltage on the HU MC(MF) Utility line.	Fuse defective.	Check the correct voltage.

13 Annexes

13.1 P&ID Schedule

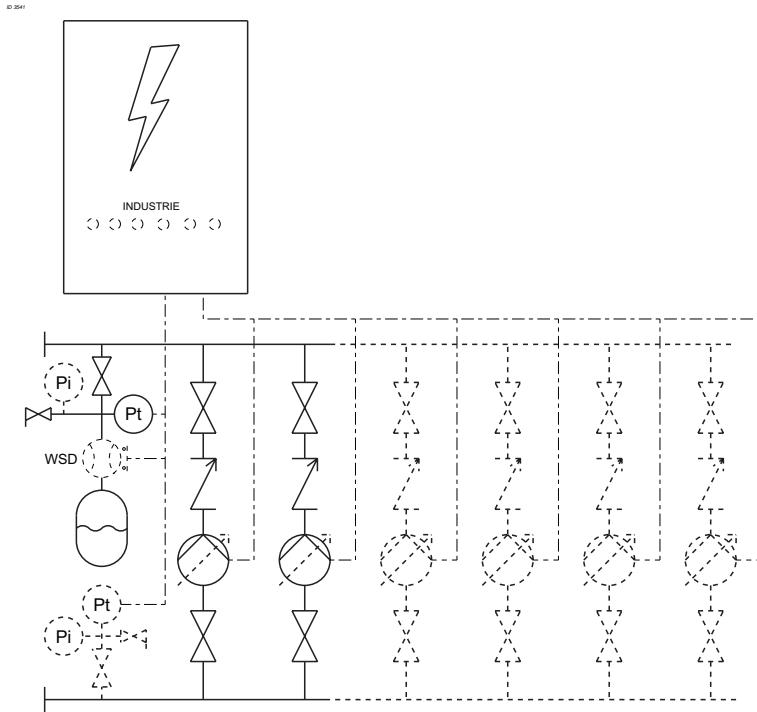


Figure 27: HU MCMF P&ID

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13.2 Connections

See diagram. Note pin 1 & 2.

13.2.1 Terminal strip

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ATTENTION

If a pressure reader is used on the supply side (3-4), connect contacts 1 and 2 through!



ATTENTION

The alarm contacts are closed when the installation is voltageless or in case of a fault.

13.3 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: HU MC(MF) Utility line

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

- EN 809/A1
- EN ISO 12100:2010
- IEC 60204-1:2005
- IEC 61000-6-1
- IEC 61000-6-3
- IEC 61000-3-2

according to the stipulations of:

Machinery directive 2006/42/EG
EMC directive 2004/108/EG

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

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



Unit sticker area

Alphen aan den Rijn, 06/11/2012

Responsible person:
W. Ouwehand, technical director



13.4 CE conformity marking

The product is CE-marked and fulfils the requirements specified in the European Electromagnetic Compatibility Directive 2004/108/EC dated 15 December 2004, Annex I. Compliance with the provisions of the directive is certified by a Declaration of Conformity. In accordance with the EN 61000-6-1 standard, the product meets Class B requirements (limits to EN 55011). The integrated frequency inverter fulfils the requirements of the EN 61800-3 product standard.

Table 29: Classification by category

Category	C1	C2	C3	C4
Mode of sales distribution	Unrestricted distribution	Restricted distribution	Restricted distribution	Restricted distribution
Environment	1ste environment	1ste or 2nd environment (operator's decision)	2nd environment	2nd environment
Voltage/current	$\leq 1000 \text{ V}$			$> 1000 \text{ V}$ $I_n > 400 \text{ A}$ Connection to IT network
EMC competence	No special requirement	Installation and commissioning by personnel suitably trained in EMC applications		EMC plan required
Limit to EN 55011	Class B	Class A1 (+warning)	Class A2 (+warning)	Value exceed class A2 limits

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Can be changed without prior notice
Original instructions