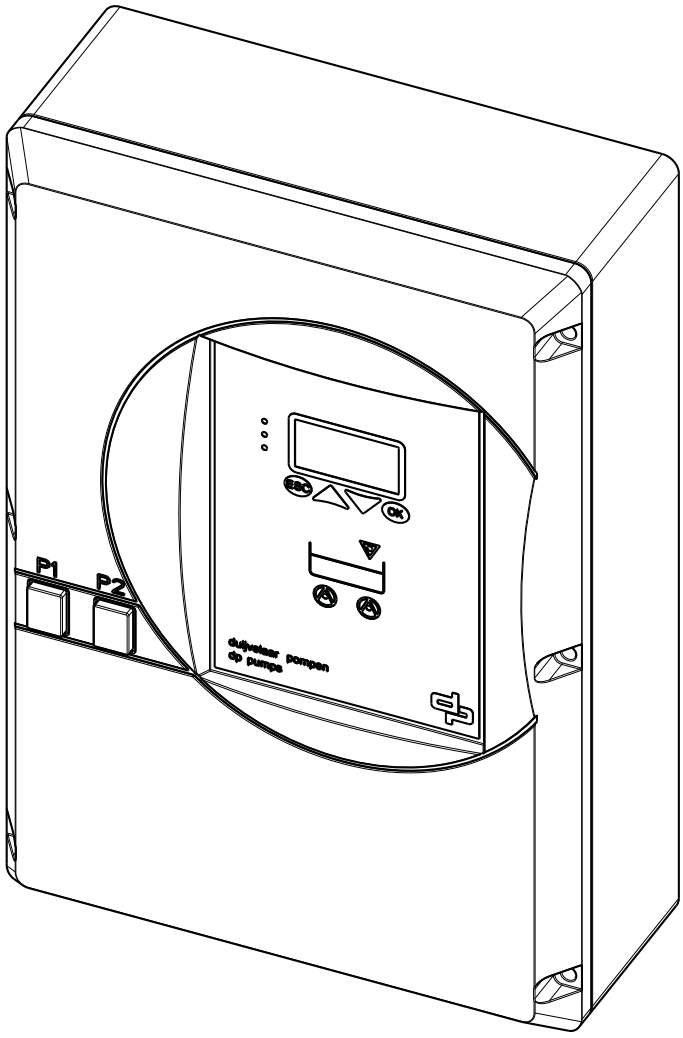
LENNTECH
WATER TREATMENT SOLUTIONS

Control units

Installation and operating instructions
Series: DP-Levelcontrol



LENNTECH
info@lenntech.com Tel. +31-152-610-900
www.lenntech.com Fax. +31-152-616-289

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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 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.

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

2 Identification, service and technical support

2.1 Obtaining data and information DP-Levelcontrol

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 nearest customer service centre.

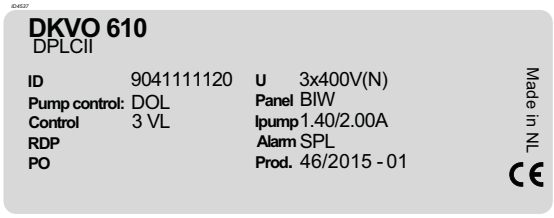

Figure 1: Identification nameplate

Table 1: Description nameplate

Indication	
DKVO 610	Type control panel
DPLCII	DP-Levelcontrol
ID	Article number
Pump control:	Direct on line
Control	3 Floaters
RDP	Run-Dry Protection
PO	Purchase order
U	Rated voltage
Panel	Inside wall
Ipump	Rated current
Alarm	Volt free / dry contact
Prod.	Week/Year of construction

2.2 Identification, service and technical support

The system is identified based on the text “DP-Levelcontrol ” as given on the system sticker.

Table 2: Control unit

Indication	Meaning
DP-Levelcontrol	Type of Control unit

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

Table 3: Address service department

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

2.3 Supplementary documentation

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

Table 4: supplementary documentation

Document	Date/version	Code
General terms of delivery	10-1998	119 / 1998
Documentation		

See also: www.dp-pumps.com

2.4 Software changes

The software has been specially created for this product and thoroughly tested.
It is impermissible to make any changes or additions to the software or parts of the software. Software updates supplied by DP-Pumps are excluded from this rule.
For firmware version see parameter: 4-1-1

Table 5: DP-Levelcontrol versions

Firmware version (see parameter: 4-1-1	Manual version
DP-Levelcontrol V 1.2.4.	01/2016

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 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 Environmental aspects

4.2.1 General

This product of DP-Pumps is designed to function in an environmentally friendly way during their entire life.

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

4.2.2 Dismantling

Dismantle the product and dispose of it in an environmentally friendly way. The owner is responsible for this.

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

ENVIRONMENTAL INSTRUCTION
All components of the DP-Levelcontrol are manufactured in accordance with RoHS II directive 2011/65/EU.

5 Introduction

5.1 General

5.1.1 DP-Levelcontrol

Table 6: Description DP-Levelcontrol

No:	Description
1	Manual-0-automatic switch
2	Control panel

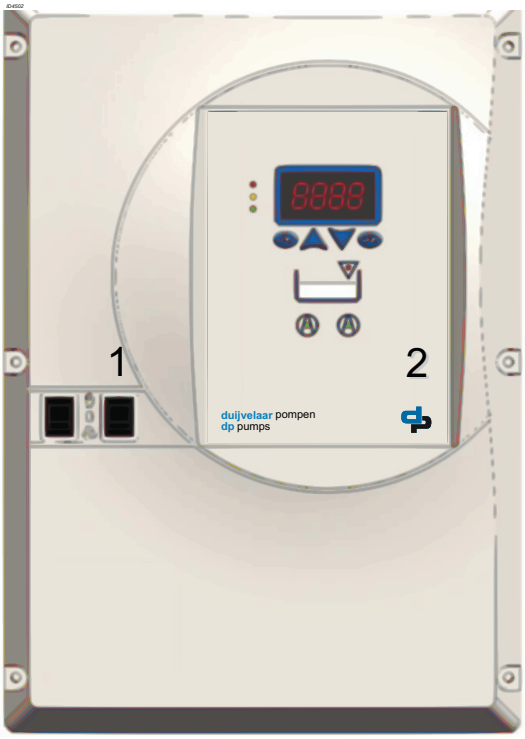

Figure 2: Control units of the type DP-Levelcontrol

4502

- Pump control and monitoring unit in compact plastic housing
- For either one or two pumps
- With display
- Level detection via:
  - Float switch/digital level switch
  - Analog sensor (4...20 mA)
- DOL starting

Control units of the type DP-Levelcontrol are manufactured by DP-Pumps.

5.2 Description

The control unit is a level-dependent pump control and monitoring unit (with display) for either one or two pumps.
The following function is available:

- Tank draining, using float switches, digital level switches or 4...20 mA sensor.

5.3 Intended use

The control unit is suitable for controlling of 1 or 2 pumps within the indicated working range (see “Working range“).

Any other or further use of the control unit is not in conformity with its intended use. DP-Pumps does not accept any liability for any damage or injury resulting from this. The control unit has been produced in accordance with the current standards and guidelines. Use the control unit 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 / information. Always observe the instructions given in the installation and operating instructions. When in doubt the product must be used as becomes evident from its construction, version and function.

5.4 Working range

The working range of the DP-Levelcontrol can be summarised as follows:

Table 7: Working range DP-Levelcontrol

Type		DP-Levelcontrol
Temperature during operation: [°C]		-10 to +40
Relative humidity		non condensing <85%
Voltage: [V]		1 x 230 (+10% -15%) 3 x 400 (+10% -15%)
Frequency: [Hz]		50/60 (±2%)
Enclosure	230 V	IP54
	400 V	IP54
Rated insulation voltage		500 V AC
Rated current per motor (standard models): [A]		1.0 / 1.6 / 2.5 / 3.2 / 4 / 5 / 6.3 / 10
Altitude above MSL (max.)		1000 m

ATTENTION
Contact the manufacturer if the device is to be used under conditions other than those stated above.

5.5 Functioning

5.5.1 working principle with float switch control

The level in a reservoir is measured with the help of float switches.

If the water level in the reservoir rises as a result of supply of waste water, a pump will be switched on when the “float switch on” level is reached. This pump will then empty the reservoir down to the “float switch off” level.

On reaching the high water level the high water alarm will be activated and the second pump starts (if present).

5.5.2 working principle with hydrostatic pressure sensor

The level in a reservoir is measured and converted to a 4 - 20 mA signal with the help of a hydrostatic pressure sensor.

If the water level in the reservoir rises as a result of supply of waste water, a pump will be switched on when the “float switch on” level is reached. This pump will then empty the reservoir down to the “float switch off” level.

On reaching the high water level the high water alarm will be activated and the second pump starts (if present).

5.5.3 Custom made settings

The DP-Levelcontrol can be programmed through the human machine interface (HMI) operating panel. Limited parameters are available. See 10.1 Setting parameters

Also, the service port provides full 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!

5.6 Thermal circuit breaker

The thermal circuit breaker or bimetal element tripping the pump in the event of excessive heat build-up in the motor is connected to the control unit. When the thermal circuit breaker opens, the control unit trips the pump. As the motor cools down, the thermal circuit breaker closes again. In the monitoring circuit, also called lower circuit, the alert is automatically acknowledged after the motor has cooled down. The pump is operational again. In the limiting circuit, also called upper circuit, the alert must be acknowledged manually.

6 Transport / storage

6.1 Transport

6.1.1 Checking the condition upon delivery

- On transfer of goods, check each packaging unit for damage
- In the event of in-transit damage, assess the exact damage, document it and notify DP-Pumps or the supplying dealer (as applicable) and the insurer about the damage in writing immediately.

6.1.2 Transport

The control unit must be shut down for transport.

Table 8: Ambient conditions for transport

Ambient condition	Value
Relative humidity	< 85% (no condensation)
Ambient temperature	-10 °C to +70 °C

- The control unit must always be transported properly and in its original packaging
- For transport observe the transport instructions on the original packaging.
- Do not throw the control unit.

6.2 Storage

If the ambient conditions for storage are met, the function of the control unit is safe-guarded even after a prolonged period of storage.

Table 9: Ambient conditions for transport

Ambient condition	Value
Relative humidity	< 85% (no condensation)
Ambient temperature	-10 °C to +70 °C

- Store the control unit in dry, vibration-free conditions and, if possible, in its original packaging.
- Store the control unit in a dry room where the atmospheric humidity is as constant as possible.
- Prevent excessive fluctuations in atmospheric humidity (see table Ambient conditions for storage).

If properly stored indoors, the equipment is protected for a maximum of 12 months.

7 Installation

7.1 Checks to be carried out prior to installation

7.1.1 Place of installation

The place of installation must fulfil the following requirements:

- No potentially explosive atmosphere
- Well ventilated
- Level
- Clean
- Sufficient stability
- No direct sunlight
- Protected from weather
- Flood-proof
- Sufficient clearance for ventilation, installation, removal and operation
- Main protective electric fuse max:
  - 16 A by 1 pump
  - 25 A by 2 pumps

7.1.2 Mechanical installation

ATTENTION
Contact the supplier if parts are missing or damaged.

Build in the control unit using suitable fastening material. Consult the annex “Built-in diagram" for the correct overall dimensions.

7.1.3 Electrical installation

WARNING
Only authorized personnel is allowed to connect the control unit electrically in accordance with the local regulations.

WARNING
Unintentional contact with live parts.
Danger of death from electric shock!
- **De-energise the mains connection.**
- **Take steps to ensure that the mains connection cannot be re-energised unintentionally**

Electrical connections
- Make sure that the electric control unit specifications correspond with the power supply to which is connected.
- Consult the annex "Electrical diagram" for a list of all electrical power points.
- Make sure that the seals are properly positioned and tighten the cable glands (strain relief).
- Connect the control unit in accordance with the wiring diagram and in line with the application.

7.2 Commissioning / start-up / shutdown

7.2.1 Preparing commissioning / start-up
- Wire the control unit in accordance the wiring diagram
- Insert the motor protection device or fuses
- Connect the power supply cable
- Connect the sensors

See checklist 11.1 Checklist

7.2.2 Commissioning / start-up

WARNING
Incorrect commissioning / start-up
Damage to property
- **Ensure that all local applicable regulations and directives – particularly the machinery and low-voltage directives – are fulfilled.**
- **Install a line protection device in the supply cable. For the line protection required please refer to the attached logic diagram.**
- **Before commissioning, check all connected cables against the wiring diagram.**

The control unit is properly installed and electrically connected

- Check whether the device variant (see name plate/designation) conforms with requirements.
- 1 pump variant: Set the manual-0-automatic selector switch to “0”.
- 2 pumps variant: Set the manual-0-automatic selector switches for both pumps to "0".
- Switch on the power supply.
- Check the parameters to ensure they are compatible with the required application and functionality. Adjust if necessary.
- 1 pump variant: Set the manual-0-automatic selector switch to "automatic".
- 2 pumps variant: Set the manual-0-automatic selector switches for both pumps to "automatic".

The pump(s) can now be started/stopped by the control unit as required.

7.2.3 Shutdown

7.2.3.1 Short-term shutdown

- Set the manual-0-automatic selector switches for both pumps to "0".
  - The pump(s) is (are) switched off.
  - The control unit remains operational (read measured values, set parameters).

Performing work on the pump(s)

- Switch off the power supply by using the main switch
- Open the control unit
  - For 1 pump 230 V and 400 V variants: Switch off the motor protection switch and secure this so that this cannot be switched on again unintentionally.
  - For 2 pumps 230 V and 400 V variants: Switch off the motor protection switches for both pumps and secure them so that they cannot be switched on again unintentionally.
- Close the control unit again.

7.2.3.2 Long-term shutdown

- Set the manual-0-automatic selector switch(es) for the pump(s) to "0".
- Switch off the power supply.

8 Operation

8.1 General

ATTENTION
This section provides information about a control unit for two pumps. The control unit for one pump is operated in the same way; pump-specific steps shall only be carried out once in this case.

The control unit can be operated via:

- Control panel
- Manual-0-automatic selector switch
- Service interface (connector inside device)

8.2 Control panel

Table 10: Control panel

No.:	Description
1	Display (7 segment, 5 character)
2	Traffic light LEDs
3	Navigation keys
4	“High water” LED
5	LED for pump operating status (for each pump)

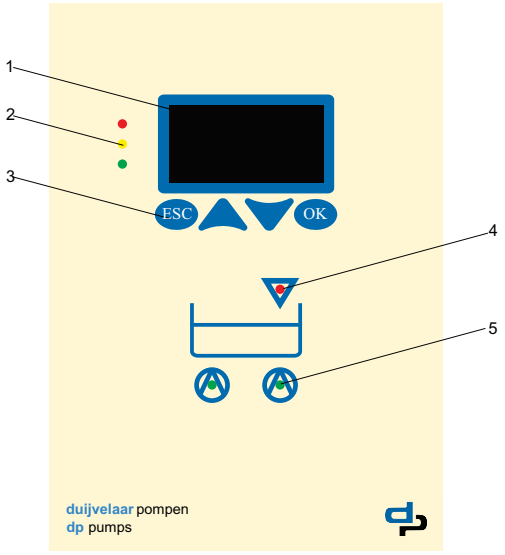

Figure 3: Control panel

4503

8.2.1 Indicators

8.2.1.1 Traffic light LEDs

The “traffic light” LEDs provide information about the operation status of the control unit

Table 11: Traffic light LEDs

LED	Description
Red	Alert (one of more alerts)
Yellow	Warning (one of more warnings)
Green	Readiness for operation

8.2.1.2 LED for pump operating status

This LED indicates the operating status of the pumps:

Table 12: LED for pump operating status

LED	Description
Red	Pump blocked by alert or no enable signal
Flashing yellow	Pump running in manual mode Manual-0-automatic selector switch set to “manual” (non-locking button)
Yellow	Pump OFF (manual-0automatic selector switch set to “0”)
Flashing green	Pump running
Green	Pump ready for operation

8.2.1.3 “High water” LED

If a high water alert is output, the red LED lights up. The pumps are started with high priority. Alerts with a higher priority overwrite the high water alert.

8.2.2 Display

The following information is displayed:

Table 13: Display

Display	Description
	Parameter
	Parameter / measured value
	Alert

8.2.3 Navigation keys

For navigation through the menus and confirming settings:

Table 14: Navigation keys

Key	Description
	Arrow keys (up/down): • Move up/down in the menu options • Increase/decrease a numerical value
	Escape key: • Cancel entry without saving it • When entering numbers: Go to the previous digit • Move up one menu level
	OK key: • Confirm settings • Confirm a menu selection • When entering numbers: Go to the next digit

8.2.4 Manual-0-Automatic switch

Each pump can be operated as follows by means of a manual-0-automatic selector switch:

Table 15: M-0-A switch

Switch position	Function
	Function allowing the pump to be operated manually for a short period.
	Switch locks in place. The pump is switched off.
	Switch locks in place. The pump is started/stopped by the control unit as required.

8.3 Service interface

The "DP-Pumps Service Tool" software can be down loaded from the DP-Pumps web site or obtained as Service CD-Rom. This only on request.

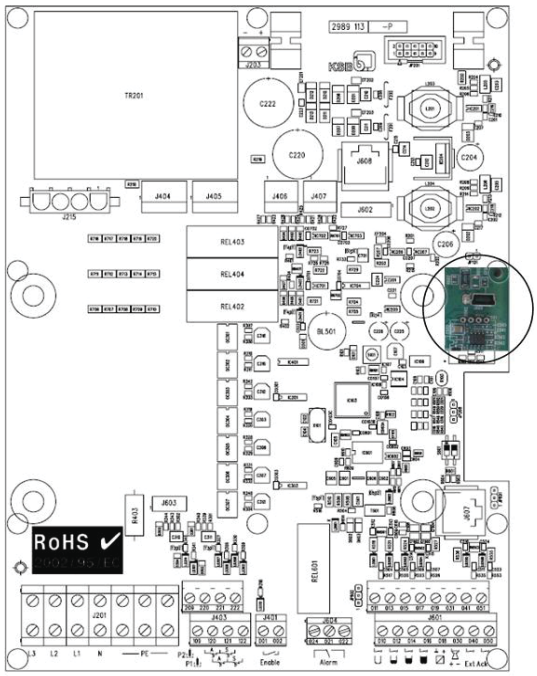

Figure 4: Service interface for DP-Levelcontrol

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WARNING
All components are live, there is a risk of short circuits.

The service interface can only be accessed when the control unit is open.
To operate the device via the service interface, carry out the following steps:

- Connect the computer and device by means of an RS 232 cable.
- Start the Service Tool.

8.4 Control panel

8.4.1 Displaying measured value parameters

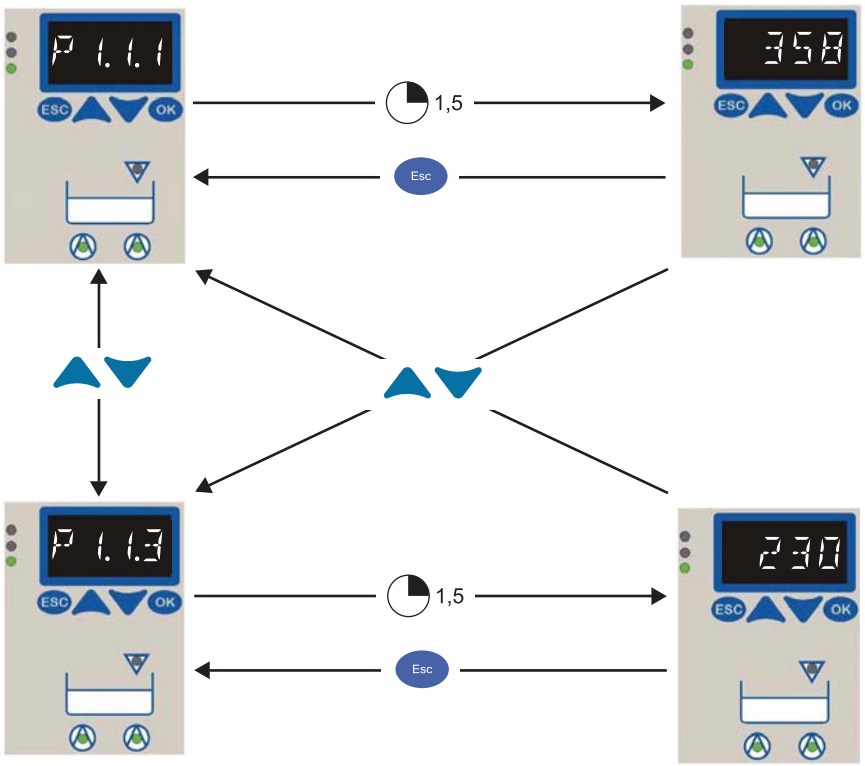

Figure 5: Displaying measured parameter values

4514

- Press ESC (several times, if necessary) to call up the measured value parameters.
- Use the arrow keys to select the required parameter number.
  - The relevant measured value is displayed automatically after 1.5 seconds.
- Use the arrow keys to select the next parameter number.

The following measured value parameters can be displayed:

Table 16: Measured values

Parameter		Description	Single-pump station	Dual-pump station
1-1-1	Level (Analog)	Fill level in millimetres (if analog sensors are used): pneumatic, bubbler system, 4 .. 20 mA	x	x
1-1-2	Level (Digital)	Switching levels if float switches or digital level switches are used	x	x
1-1-3	Line Voltage	Line voltage in volts	x	x
1-2-1	Operating Hours Pump 1	Operating hours of pump 1	x	x
1-2-2	Start Count Pump 1	Number of start-ups of pump 1	x	x
1-3-1	Operating Hours Pump 2	Operating hours of pump 2	-	x
1-3-2	Start Count Pump 2	Number of start-ups of pump 2	-	x
2-1-1	Pending Messages	List of acknowledged alerts	x	x

8.4.2 Digital level indicator

The current level can be read digitally at any time.

Table 17: Overview: digital level indicator

Display	Digital level	Action
	Very low	Pump OFF
	Medium	Before base load pump is started
	High	Base load pump ON
	Very high	Peak load pump ON
	High water	High water alert and both pumps ON

8.4.3 Acknowledging alerts and warnings

ATTENTION
Alerts with a higher priority prevail over alerts with a lower priority. For instance, alert A1 has a higher priority than alert A2.

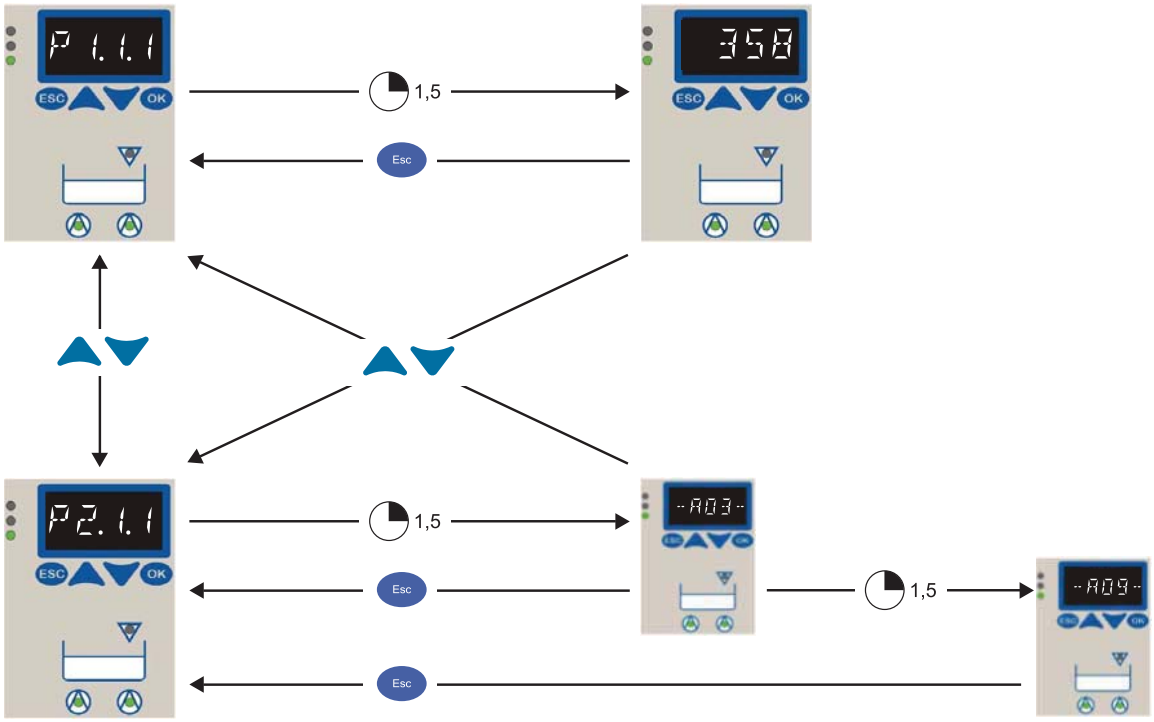

Figure 6: Acknowledging alerts and warnings

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Alert indications:

- On the display (e.g. -A09-)
  As long as a parameter value is displayed, this will not be overwritten by an alert. This allows you to complete parameterisation.
- The red traffic light LED (alert) or yellow LED (warning) lights up.
- Horn/buzzer is activated.

If more than one alert is present, the alert with the highest priority will be displayed.

Alerts with auto-acknowledgement are deactivated and acknowledged automatically as soon as the cause of the alert has been rectified. Such alerts (incl. horn/buzzer) can also be acknowledged manually.

Alerts with manual acknowledgement must be acknowledged at the control panel or via the remote acknowledgement input.

Esc 1 If necessary, exit the screen for setting parameters by pressing ESC.
- The alert with the highest priority is displayed.

OK 2 Acknowledge the alert with OK:
- Horn/buzzer is deactivated.
- If the alert is still present, it is entered in the alerts list (2-1-1).
- The next alert (if any) is displayed.

OK 3 Rectify the cause of the fault:
- If necessary, call up the parameter settings by pressing **OK** or **ESC**.

Esc

See table 26 Alerts and warnings for the codes.

8.4.4 Displaying the alerts list

Alerts that have been acknowledged but are still present are stored in the alerts list (2-1-1) and can be called up.

- If no measured value number (P 1-X-X) is displayed, press ESC (more than once if necessary).
- Select with the alerts list (P 2-1-1).
  - The most recent entry is displayed automatically after 1.5 seconds. The next entry is displayed after another 1.5 seconds.
- To return to the screen in which you can select a measured value, press ESC.

Process outputs

- 1 Volt-free signalling output change over contact (250 V, 1A, NO/NC contact)
- 1 Signalling output (12.6 V to 13.2 V max. 200 mA), e.g. for connection a horn, alarm combination or alarm strobe light (12 V)

See also 13.1.2 Technical specification for sensors

8.4.5 Inserting/replacing the rechargeable battery

ATTENTION
The rechargeable batteries must be replaced every five years to ensure that the device operates reliably in battery mode.
Use original dp-pumps spare parts only.

- Switch off the power supply
- Open the control unit
- Disconnect the battery
- Undo the battery clamp
- Replace the batteries
- Reattach the battery clamp
- Re-establish the connections for the battery
- Close the device properly
- Reconnect the power supply

ATTENTION
When retrofitting the control unit with the rechargeable battery installation option, it is not sufficient to insert the rechargeable battery/batteries only. A rechargeable battery retrofit kit is required, which not only comprises the rechargeable battery/batteries but also an electronic recharging unit as well as some fastening material.

9 Application examples

9.1 Draining via 2 float switches

9.1.1 Single-pump station: Draining with 2 float switches

Table 18: Parameter settings: Single-pump and 2 float switches

Parameter	Value	Note
3-3-3	0=draining	Draining/filling
3-4-2	0=float switch	Measurement method

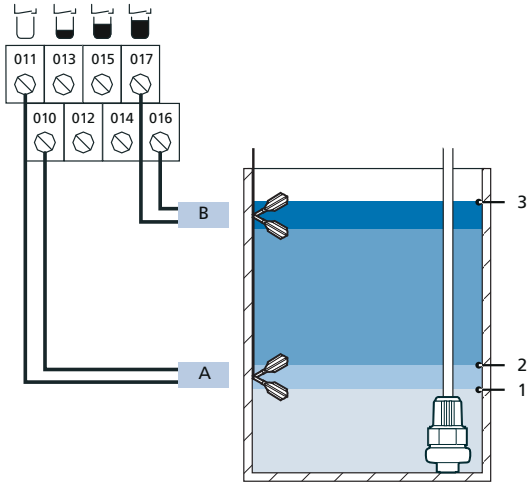


Figure 7: Single-pump station: Draining via 2 float switches

4518

A	Float switch base load
B	Float switch high water
1	Pump OFF
2	Pump ON
3	High water alert

9.1.2 Dual-pump station. One pump is stand-by pump: Draining via 2 float switches

Table 19: Parameter settings: Dual-pumps station as stand-by pump: Draining via 2 float switches

Parameter	Value	Note
3-3-2	1=stand-by pump, 1pp HW	Stand-by pump operation, 1 pump for high water
3-3-3	0=draining	Draining/filling
3-4-2	0=float switch	Measurement method

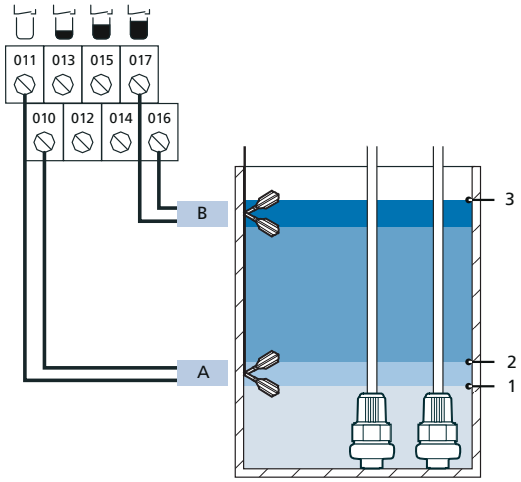


Figure 8: Dual-pump station as stand-by pump: Draining via 2 float switches

4520

A	Float switch base load
B	Float switch high water
1	Both pumps OFF
2	Base load pump ON
3	High water alert • 3-3-2 = 1 base load pump ON

The second pump is operated as a stand-by pump in case the first pump fails (redundant system). The pumps are alternated after each pumping cycle

9.2 Draining via 3 float switches

9.2.1 Single-pump station: Draining via 3 float switches

Table 20: Parameter settings: Dual-pumps 3 float switches

Parameter	Value	Note
3-3-3	0=draining	Draining/filling
3-4-2	1=float switch	Measurement method

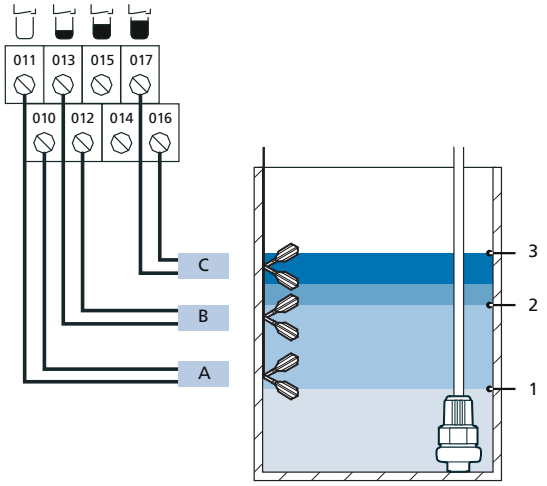


Figure 9: Single-pump station: Draining via 3 float switches

4538

A	Float switch OFF
B	Float switch base load
C	Float switch high water
1	Pump OFF
2	Base load pump ON
3	High water alert and pump ON

9.2.2 Dual-pump station: Draining via 3 float switches

Table 21: Parameter settings: Dual-pumps 3 float switches

Parameter	Value	Note
3-3-2	2 = spare pump, 2PP HW	Spare pump operation, 2 pumps for high water
3-3-3	0=draining	Draining/filling
3-4-2	1=float	Measurement method

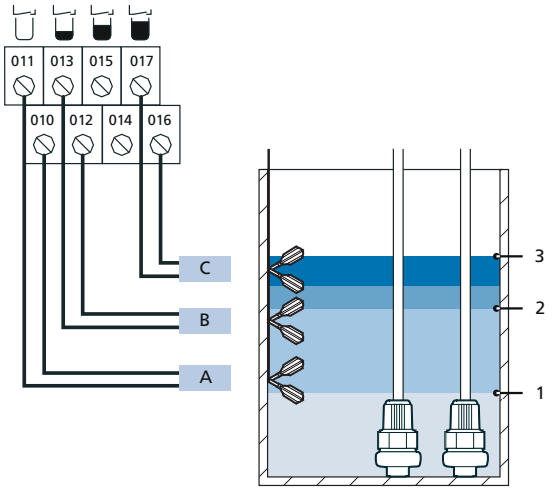


Figure 10: Dual-pump station: Draining via 3 float switches

4539

A	Float switch OFF
B	Float switch base load
C	Float switch high water
1	Both pumps OFF
2	Base load pump ON
3	High water alert • 3-3-2 = 2 both pumps on

The pump that is started up first is the base load pump.The pumps are alternated after each pumping cycle to ensure even distribution of operating hours.

9.3 Draining via analog measurement 4 ... 20 mA

9.3.1 Single-pump station: Draining via analog measurement 4 ... 20 mA

Table 22: Parameter settings: Single-pump and 1 float switch

Parameter	Parameter name	Value
3-3-3	Draining/Filling	0 = draining
3-4-2	Measurement method	2 = 4 ... 20 mA
3-3-4-1	Level pumps OFF	e.g. “250” mm
3-3-4-2	Level base load ON	e.g. “400” mm
3-3-4-4	Level high water	e.g. “600” mm
3-4-3-1	Level at 4 mA	e.g. “200” mm
3-4-3-2	Level at 20 mA	e.g. “1000” mm

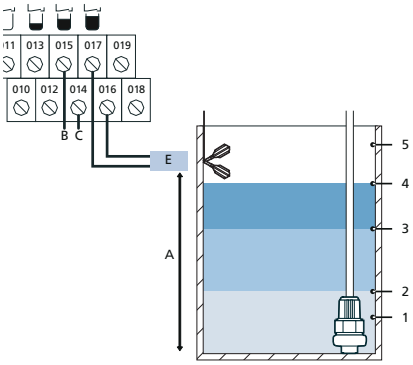


Figure 11: Single-pump station: Draining via analog measurement 4 ... 20 mA

4540

A	User defined (in mm)
B	Analog IN (4 ... 20 mA)
C	+24 V
E	Redundant high water float
1	Level at 4 mA
2	Level pump OFF
3	Level pump ON
4	Level high water
5	Level at 20 mA

9.3.2 Dual-pump station: Draining via analog measurement 4 ... 20 mA

Table 23: Parameter settings: Dual-pump and 1 float switch

Parameter	Parameter name	Value
3-3-3	Draining/Filling	0 = draining
3-4-2	Measurement method	2 = 4 ... 20 mA
3-3-4-1	Level pumps OFF	e.g. “250” mm
3-3-4-2	Level base load ON	e.g. “400” mm
3-3-4-3	Level peak load ON	e.g. “500” mm
3-3-4-4	Level high water	e.g. “600” mm
3-4-3-1	Level at 4 mA	e.g. “200” mm
3-4-3-2	Level at 20 mA	e.g. “1000” mm

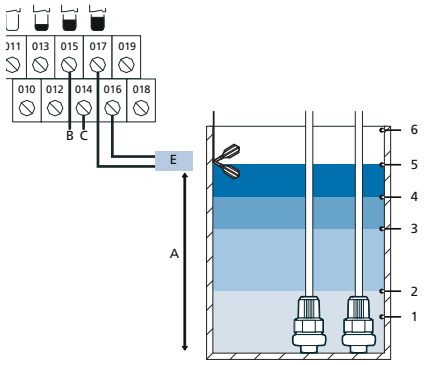


Figure 12: Dual-pump station: Draining via analog measurement 4 ... 20 mA

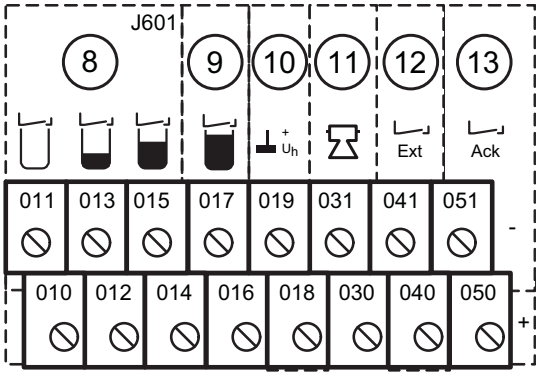
4521

A	User defined (in mm)
B	Analog IN (4 ... 20 mA
C	+24 V
E	Redundant high water float
1	Level at 4 mA
2	Level pump OFF
3	Level pump ON
4	Level peak load pump ON
5	Level high water
6	Level at 20 mA

The pump that is started up first is the base load pump. The pumps are alternated after each pumping cycle to ensure even distribution of operating hours.

9.4 Additional connections

9.4.1 Additional connections J601



4523

Figure 13: Additional connections

Auxiliary voltage for lifting unit

- Terminal assignments
  - 18 and 19
- Function
  - This auxiliary voltage for the analog float cannot be used with the present device variant.

Signalling output

- Terminal assignments
  - 30 and 31
- Function
  - For connecting external alarm equipment (e.g. horn, alarm strobe light, or alarm combination).
  - Voltage of 12.6 .. 13.2 V DC.
  - Max. capacity: 200 mA.
  - If a battery is used, this will continue to supply the output in the event of a power failure. The connected alarm equipment then operates independently of the mains supply.

External alarm

ATTENTION
Same as on alarm switch gears, the signalling output is only activated in the event of high water and sensor fault. This setting can be changed using the DP Service tool.

ATTENTION
Parameters for the external alarm can only be changed using the DP Service tool.

- Terminal assignments
  - 40 and 41
- Alarm transmitter
  If the Ext. alarm input is used for dry running protection, a NC float switch (circuit open in upper float position) must be used, to stop the pumps in the event of dry running.
  - Dry-running protection via float switch or sensor.
- Function

ATTENTION
In the factory setting, the pumps are stopped when the contact closes. This setting can be changed using the DP Service tool.

  - Depending on the setting, the pumps either start or stop.
  - The high water alert has priority over an external alarm. The pumps may be started up as a result of a high water alert.

Remote acknowledgement

- Terminal assignments
  - 50 and 51
- Function
  - The "Ack" input is used to acknowledge alerts remotely.

9.4.2 Additional connections J403

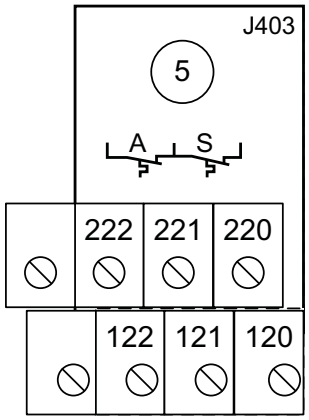


Figure 14: Additional connections

4523

Table 24: Switch description

Sign	Description	Alert P1	Alert P2
A	Alarm	A01	A02
S	Only external signal	A03	A04

- Terminal assignments
  - 121 and 120
- Function
  - Thermal circuit breaker first pump (NC) will cause alarm A03
- Terminal assignments
  - 122 and 121
- Function
  - Thermal circuit breaker first pump (NC) will cause alarm A01
- Terminal assignments
  - 221 and 220
- Function
  - Thermal circuit breaker second pump (NC) will cause alarm A04
- Terminal assignments
  - 222 and 221
- Function
  - Thermal circuit breaker second pump (NC) will cause alarm A02

ATTENTION
If these contacts are not available at the pump, the contacts must be bridged. See also the electrical drawing.

9.5 Enable input

- Terminal assignments
  - 001 and 002
- Function
  - If this input is not bridged, pump control will be disabled. For this reason, the Enable input is fitted with a wire jumper at the factory.

ATTENTION
If cables longer than 15 metres are to be connected to the Enable input, a coupling relay must be fitted in the control unit and the cable must be connected to the Enable input via the coupling relay. This prevents excessive cable losses and ensures the correct function of the control unit.

10 Parameters / Alerts

10.1 Setting parameters

ATTENTION
The parameters that you can call up depend on the operating mode and measurement method. Only parameters that are relevant to the current operating mode and measurement method are displayed.

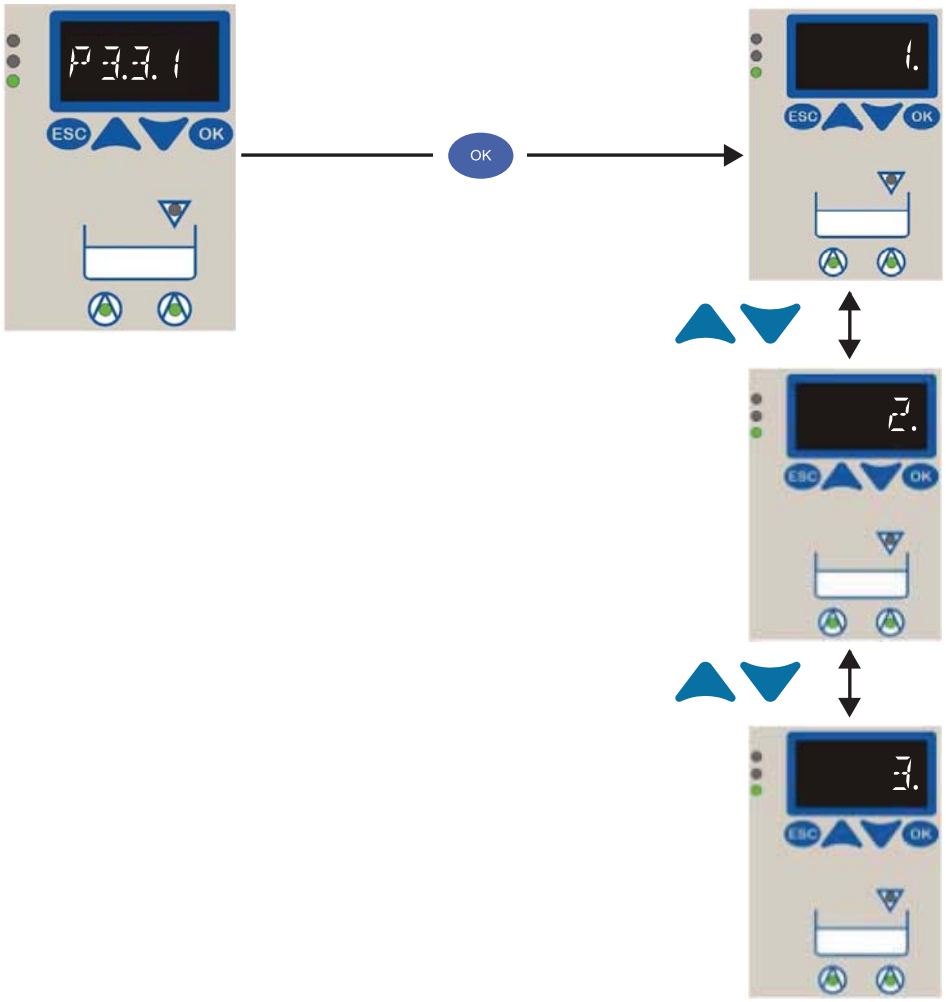


Figure 15: Setting parameters

WARNING
Incorrect operation
Damage to property

- **To protect the device, the parameter settings can only be changed from float switch/digital level switch to 4 .. 20 mA if the peak load switching point has not responded.**
- **Drain the tank in manual mode, if necessary.**

1 Press and hold the ESC key and press OK.
- The first parameter number (P 3-3-2) is displayed.

2 Use the arrow keys to select the required parameter number.

3 Confirm the parameter number with OK.
- The parameter value is displayed immediately.

4 Set the parameter value using the arrow keys:
- In multi-digit entries, the digit to be entered flashes.

- To move one digit to the right or left, press OK or ESC and make the required entry.

5 Confirm your entries with OK: The parameter value is saved.
- The parameter number is displayed.

6 Abort the input with ESC: The parameter value remains unchanged.
- The parameter number is displayed.

7 Return to the measured values by pressing ESC.

Table 25: Variant with float, digital switches, 4...20 mA

Parameter		Description	Values	Single-pump station	Dual-pump station
3-3-2	Stand-by Pump	Switch over between dual-pump and stand-by mode	0 = dual-pump station with peak-load operation (factory setting) 1 = stand-by pump, one pump ON at high water 2 = stand-by pump, two pumps ON at high water	-	x
3-3-3	Draining/Filling	Switch over between draining and filling (if float switches or digital level switches are used)	0 = draining (factory setting) 1 = filling	x	x
3-3-4-1	Level Pumps OFF	Stop level of pumps in millimetres with pneumatic, bubbler, 4 .. 20 mA	250 mm (factory setting)	4 .. 20 mA	4 .. 20 mA
3-3-4-2	Level Base Load ON	Start level of base load pump in millimetres with pneumatic, bubbler, 4 .. 20 mA	400 mm (factory setting)	4 .. 20 mA	4 .. 20 mA
3-3-4-3	Level Peak Load ON	Start level of peak load pump in millimetres with pneumatic, bubbler, 4 .. 20 mA	500 mm (factory setting)	-	4 .. 20 mA
3-3-4-4	Level High Water	Level for high water alert in millimetres with pneumatic, bubbler, 4 .. 20 mA	600 mm (factory setting)	4 .. 20 mA	4 .. 20 mA

Parameter		Description	Values	Single-pump station	Dual-pump station
3-3-5-3	Stop Delay	Stop delay of base load pump in seconds	0 s (factory setting)	x	x
3-4-2	Measurement Method	Float switches, digital level switches, or 4 .. 20 mA	0 = float switch (with hysteresis; factory setting) 1 = digital level switch (without hysteresis) 2 = 4..20 mA sensor	x	x
3-4-3-1	Level at 4 mA	Measured value at 4 mA in millimetres	200 mm (factory setting)	4 .. 20 mA	4 .. 20 mA
3-4-3-2	Level at 20 mA	Measured value at 20 mA in millimetres	1000 mm (factory setting)	4 .. 20 mA	4 .. 20 mA
3-7-1	Check Run ON/ OFF	Functional check run OFF or ON (time-dependent)	0 = functional check OFF (factory setting) 1 = functional check per- formed after idle period of one week	x	x
3-8-1	Factory Reset	Restores the factory settings	1 = load factory settings	x	x
4-1-1	Firmware Version	Firmware version	-	x	x

10.2 Alerts and warnings

ATTENTION
Alerts with a higher priority prevail over alerts with a lower priority. For instance, alert A1 has a higher priority than alert A2.

Table 26: Alerts and warnings

No.	Prio.	Type	Acknowledgement	Description	Action
A1	1	Alert	Manual mode	Motor protection pump 1	Pump 1 OFF
A2	2	Alert	Manual mode	Motor protection pump 2	Pump 2 OFF
A3	3	Alert	Auto	Motor 1 temperature too high	Pump 1 OFF
A4	4	Alert	Auto	Motor 2 temperature too high	Pump 2 OFF
A5	5	Alert	Auto	Power supply failure	Both pumps OFF
A6	6	Alert	Auto	Phase error (phase failure)	Both pumps OFF
A7	7	Alert	Manual mode	Leakage motor 1	Pump 1 OFF
A8	8	Alert	Manual mode	Leakage motor 2	Pump 2 OFF
A9	9	Alert	Auto	High water alert	Both pumps ON
A10	10	Alert	Auto	External alarm	Both pumps OFF (can be changed via Service Tool)
A11	11	Alert	Auto	Sensor fault	No changes
A12	12	Warning	Auto	Incorrect rotary field of mains supply (phase sequence)	No changes
A13	13	Warning	Auto	Under voltage (- 15 % of rated volt- age 230 V or 400 V)	No changes
A14	14	Warning	Auto	Over voltage (+ 15 % of rated voltage 230 V or 400 V)	No changes
A15	15	Warning	Auto	Flat battery	No changes
A16	16	Warning	Auto	Service interval system (deactivated by default)	No changes

ATTENTION
The service interval is deactivated by default and can be set via the Service Tool.

11 Checklist for Commissioning / Inspection and Maintenance

11.1 Checklist

Table 27: Checklist

Read the operating instructions.	C	M
Check the power supply. Compare the actual data against the name plate data.	C	M
Check the earth conductor to ensure that it functions properly (to EN 60 439).	C	M
Check the connection of the temperature switches (thermal circuit breaker). No reversal vis-à-vis pump (note alert and warning).	C	M
Check winding resistance		M
Check insulation resistance.		M
Re-tighten the terminals of: Motor(s) Control unit Level transmitter	C	M
Check the switching mechanism. Remove the level sensor; check for jamming/incrustations; clean, if necessary.	C	M
Check the switch over time from star to delta (required = approx. 3 seconds; not applicable to DOL starting)	C	M
Check the fuses. Size, characteristics, 3-pole, mechanically interlocked (3 ~ only)	C	M
Replace fuses after two years of operation (cartridges).	C	M
Check the settings on the motor protection switch	C	M
Check the direction of rotation of the pump.	C	M
Check the pump/motor to ensure that it runs smoothly.	C	M
Check automatic switching functionality: Manual-0-automatic selector switch Additional start-up of stand-by pump at peak load (dual-pump station only) Switch over to stand-by pump if the duty pump fails (dual-pump station only) Set manual switch to "automatic" again.		M
Check the tank coding/parameter settings (see parameter 3-1-2; miniCompacta/Compacta version only).	C	M
Test-run for several start/stop cycles.	C	M
Check the alarm device to ensure that it functions properly.	C	M
If applicable: reset service alert.		M
Determine the spare parts requirements, if any.		M
Provide support and/or training for operating personnel.	C	M
Provide new operating manual if necessary.	C	M

C = Commissioning / Inspection

M = Maintenance

12 Faults

12.1 Trouble shooting

WARNING
Carrying out work on a running pump
Risk of injury: limbs can be pulled into or crushed by machinery
- **Disconnect the motor from the power supply.**
- **Take steps to ensure that the motor cannot be switched on again unintentionally.**

WARNING
The pump set may still be pressurised
Danger from escaping fluid!
- **Release the pump pressure before carrying out maintenance work on the pump set.**
- **Disconnect the pump set from the power supply.**

Table 28: Trouble-shooting

Pump is running but does not deliver	Insufficient discharge head	Excessive current/power consumption	Vibrations and noise during pump operation	Lifting unit frequently switches to fault mode	Possible cause	Possible solution
	X	X			Operating voltage is too low.	Check mains voltage. Check cable connections.
				X	Motor/pump not running due to lack of voltage.	Check electrical installation (and fuses). Fuse (230 V) or motor protection switch (400 V) tripped.
X	X	X	X		Wrong direction of rotation (three-phase units).	Reverse two phases of power cable or motor supply cable.
X			X	X	Motor is running on two phases only (three-phase units).	Check conductor voltages. If necessary, replace defective fuse. Check cable connections.
X				X	Manual-0-automatic switch set to "0".	Set manual-0-automatic switch to "automatic".
X				X	Motor winding or electric cable are defective.	Replace by new original DP-Pumps parts or contact DP-Pumps.
			X		Water level in tank/sump too low during operation.	Check level sensor. Check parameters. If necessary, repeat parameterisation.
				X	Temperature sensor in the winding has tripped the pump because of an excessive temperature rise in the winding.	The motor will restart automatically once the unit has cooled down. If storing thermal circuit breaker alert tripped, acknowledge with OK. Check pump.
X	X			X	Defective level sensor.	Check level sensor. Clean or replace as necessary.
X	X	X	X	X	Control unit does not function properly.	Check parameters. Check control unit and replace if necessary.
X	X	X	X	X	Control unit does not function as expected; incorrect parameterisation.	Verify parameterisation of control unit.

13 Annexes

13.1 DP-Levelcontrol

13.1.1 Technical specifications general

Table 29: Technical specifications general

Item	Value
Type of control	DP-Levelcontrol
Art. number DP-Levelcontrol 1 pump	See Unit sticker
Art. number DP-Levelcontrol 2 pumps	See Unit sticker
Dimensions HxWxD [mm]	400 x 281 x 135

13.1.2 Technical specification for sensors

4 .. 20 mA

- Two-wire and three-wire connection
- Input resistance ≤ 300 ohms

Motor protection sensors

- Max. 2 bimetal switches (thermal circuit breaker) for each pump, 24 V, motor monitoring
- From 5.5 kW star/delta starting: PTC motor monitoring for each pump (optionally available for < 5.5 kW)

Process inputs

- 1 external alarm input, 24 V
- 1 remote acknowledgement, 24 V

Process outputs

- 1 volt-free signalling output changeover contact (250 V, 1 A, NO/NC contact)
- 1 signalling output (12.6 to 13.2 V, max. 200 mA), e.g. for connecting a horn, alarm combination or alarm strobe light,12 V

Rechargeable battery (option)

Connection for rechargeable battery, for mains-independent power supply of:

- Electronics
- Sensors
- Alarm equipment

Battery life/charging time

Battery life:

- Approx. 10 hours when supplying the integrated piezo buzzer 85 dB(A), electronics, and sensors
- Approx. 4 hours when supplying external alarm equipment (e.g. horn, alarm combination, or alarm strobe light)

Charging time:

- Approx. 11 hours (if battery is fully discharged)

13.2 Dimensions DP-Levelcontrol

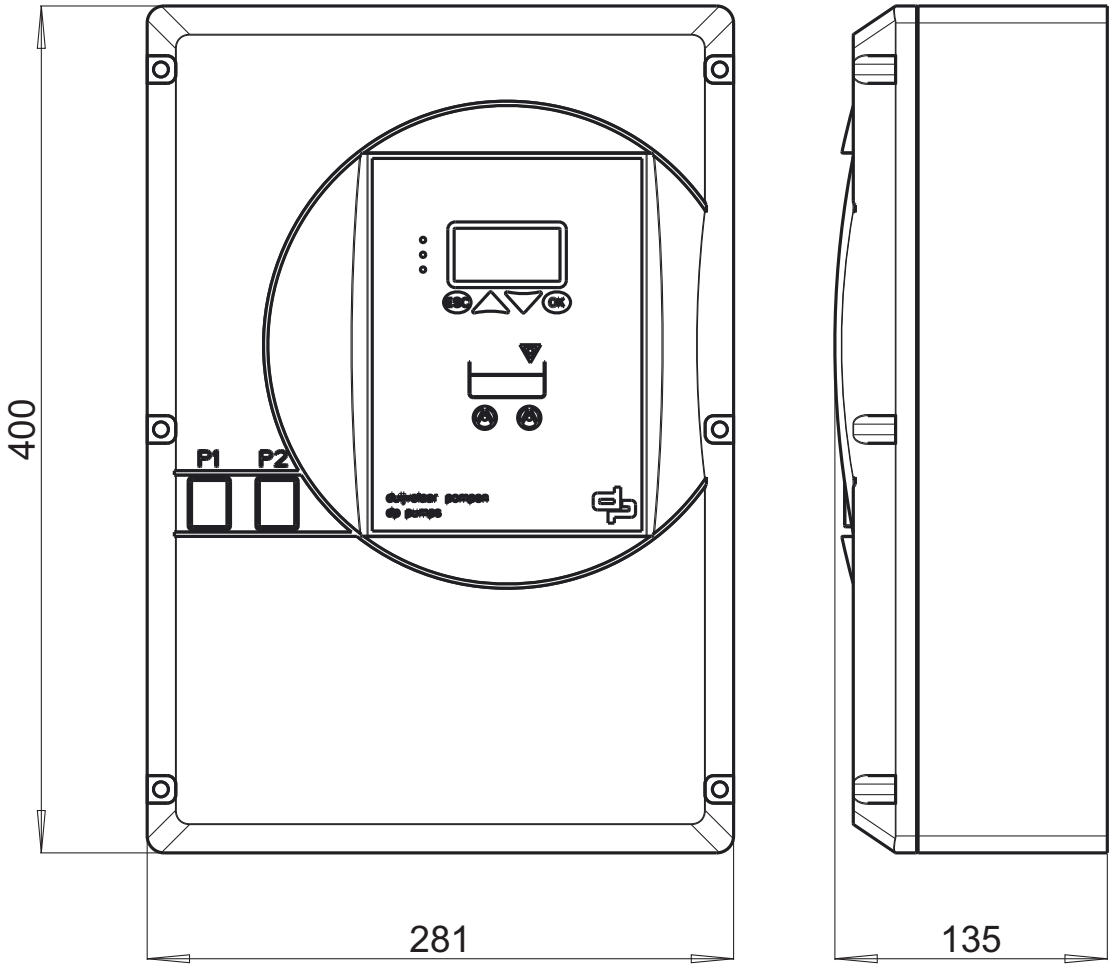


Figure 16: Dimensions DP-Levelcontrol

4671

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 entirely on his own responsibility, that the product(s):

Product: Control unit
Type: DP-Levelcontrol Basic 2

to which this declaration refers, is in accordance with the following standards:

- EN 61000-6-2
- EN 61000-6-3
- EN 60204-1
- EN 50178

according to the provisions of (when applicable):

- Low voltage directive 2014/35/EU
- EMC directive 2014/30/EU

If the control unit is used as a stand-alone product, it is subject to this declaration of conformity.

If the control unit is built in an appliance or is assembled together with other equipment in certain installations, then it should not be put into operation until a declaration has been given with respect to the appliance concerned that it complies with the directives listed above.

Alphen aan den Rijn,
03/10/2016

Responsible person:
W. Ouwehand, technical director

dp pumps

LENNTECH
info@lenntech.com Tel. +31-152-610-900
www.lenntech.com Fax. +31-152-616-289

10/2016

BE00000592-C / EN

Original instructions

Can be changed without prior notice