
ISTRUZIONI PER L'INSTALLAZIONE E LA MANUTENZIONE (IT)
INSTRUCTIONS FOR INSTALLATION AND MAINTENANCE (EN)
INSTRUCTIONS POUR L'INSTALLATION ET LA MAINTENANCE (FR)
INSTALLATIONS- UND WARTUNGSANLEITUNGEN (DE)
INSTRUCTIES VOOR INSTALLATIE EN ONDERHOUD (NL)
INSTRUCCIONES DE INSTALACIÓN Y MANTENIMIENTO (ES)
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تعليمات التركيب والصيانة (العربية)

ngpanel

ITALIANO	Pag.	1
ENGLISH	Pag.	35
FRANÇAIS	Page	69
DEUTSCH	Seite	105
NEDERLANDS	Pag.	141
ESPAÑOL	Pág.	176
РУССКИЙ	Стр.	212
SUOMI	Sivu	248
ROMÂNĂ	Pag.	282
POLSKI	Str.	316
ΕΛΛΗΝΙΚΑ	Σελ.	350
MAGYAR	Oldal	386
ČEŠTINA	Str.	421
УКРАЇНСЬКА	стор.	455
491	ص.	العَرَبِيَّة

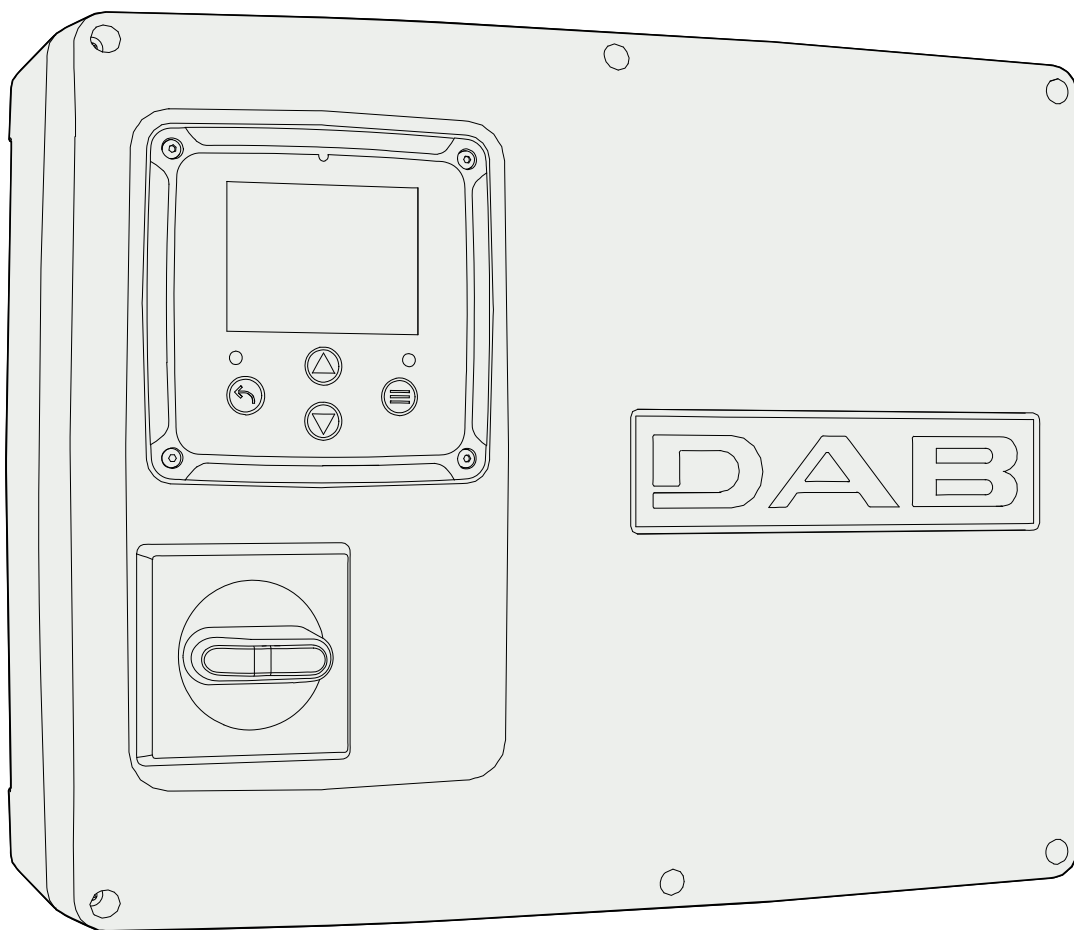


Fig. 1: NGPANEL body

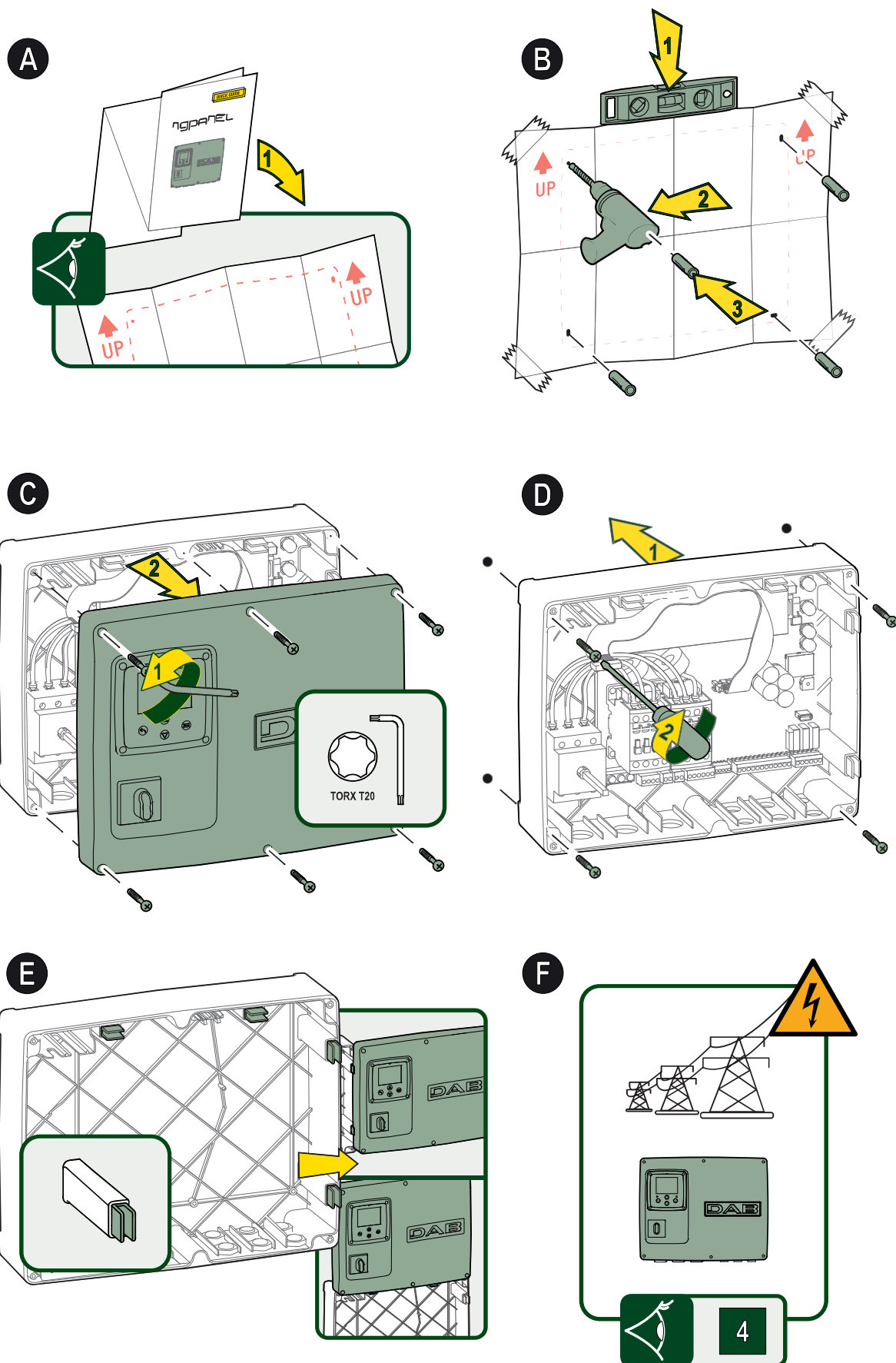


Fig. 2: NGPANEL wall installation



Fig. 3: NGPANEL data label

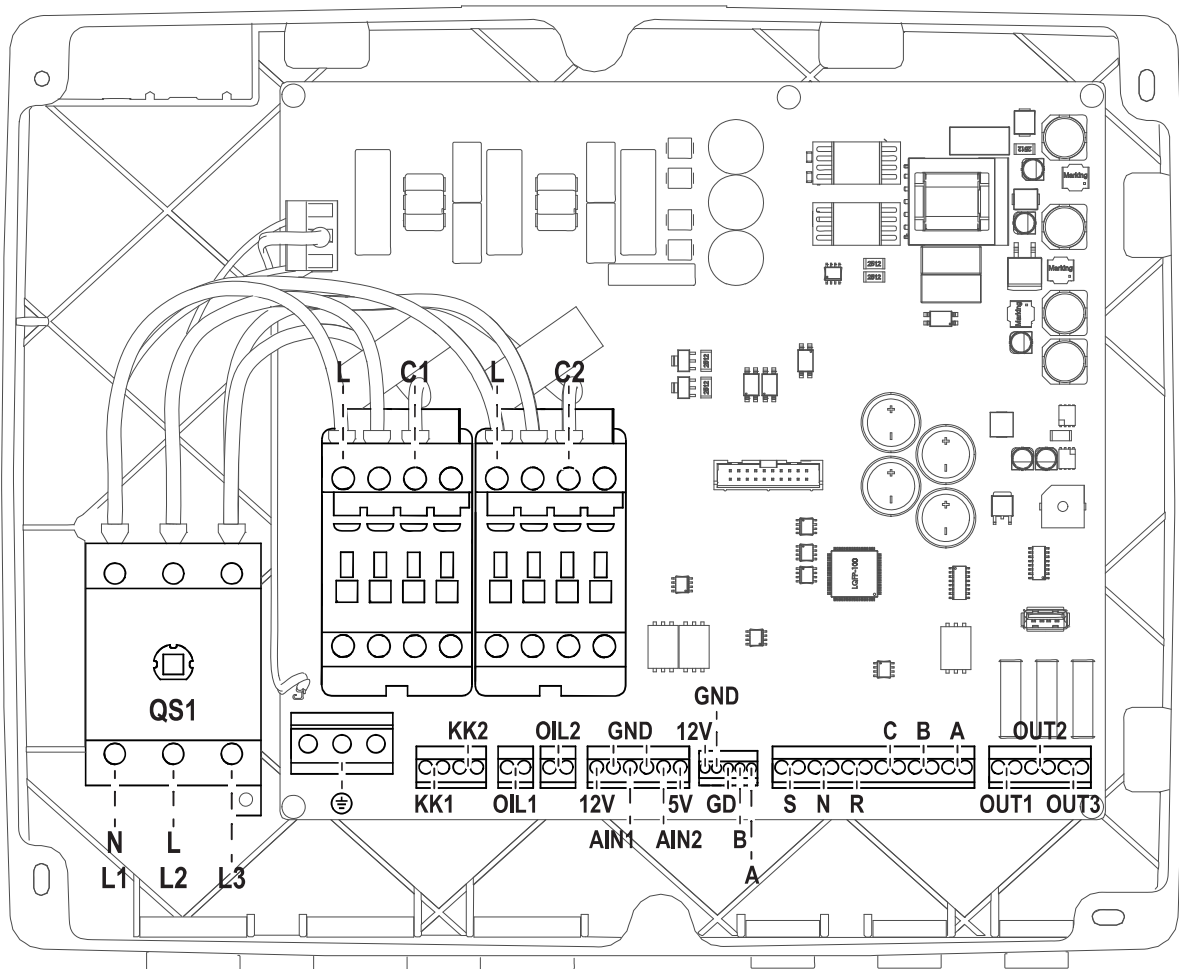


Fig. 4: NGPANEL board

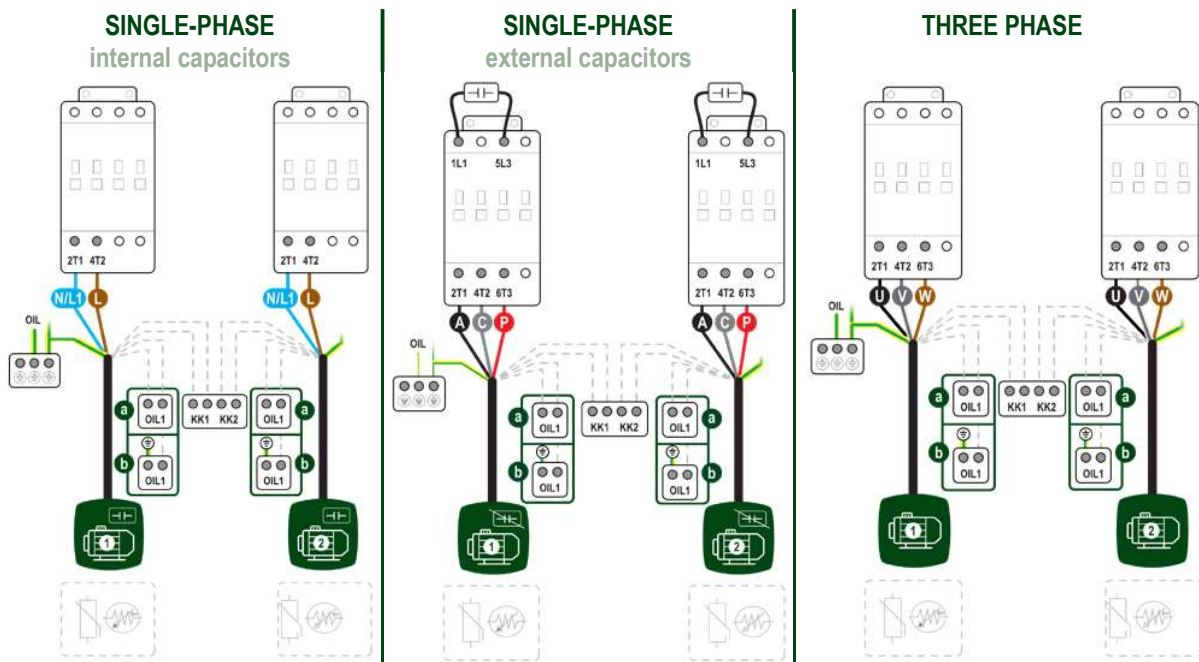


Fig.5: Electrical connection of pumps and external capacitors

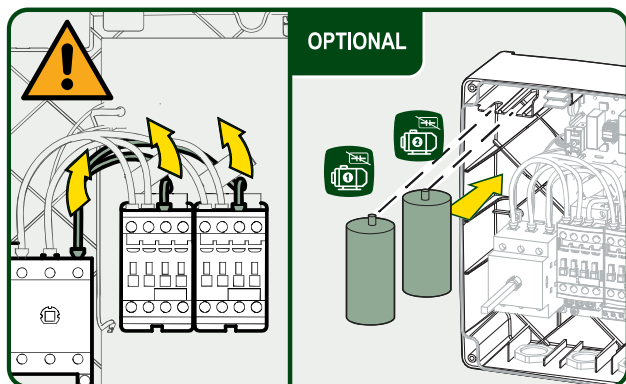


Fig.6: Insertion of pump external capacitors

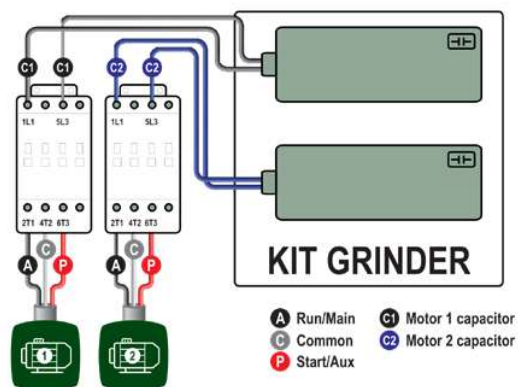
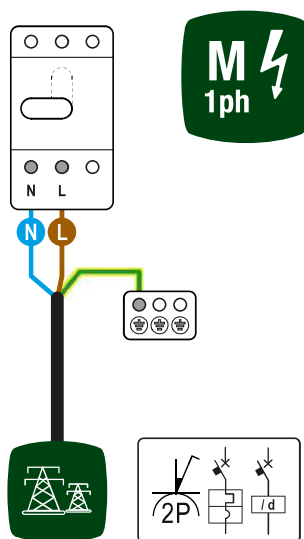


Fig.7: Electrical connection of kit capacitors (available only for American countries)

SINGLE-PHASE



THREE -PHASE

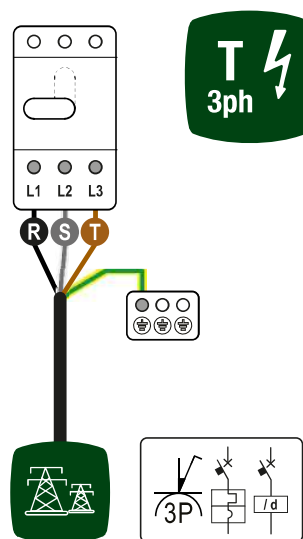


Fig.8: Electrical connection to the supply line

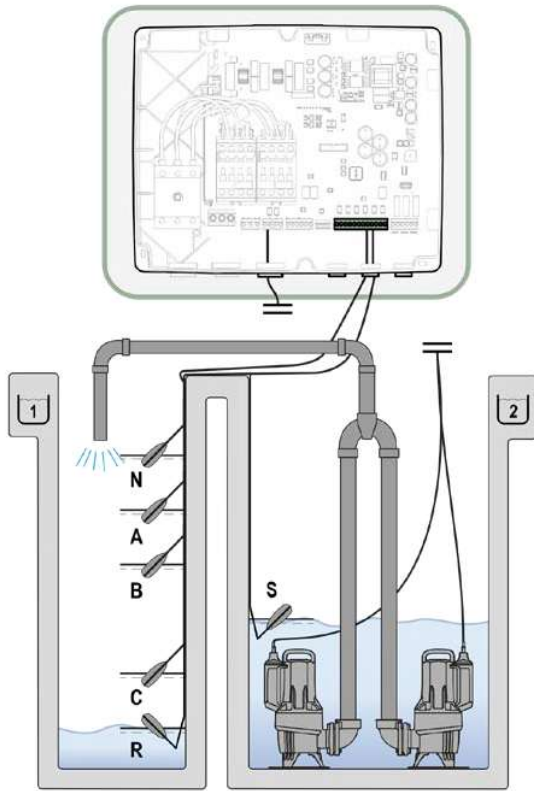


Fig.9: Diagram of filling system inputs (Floats)

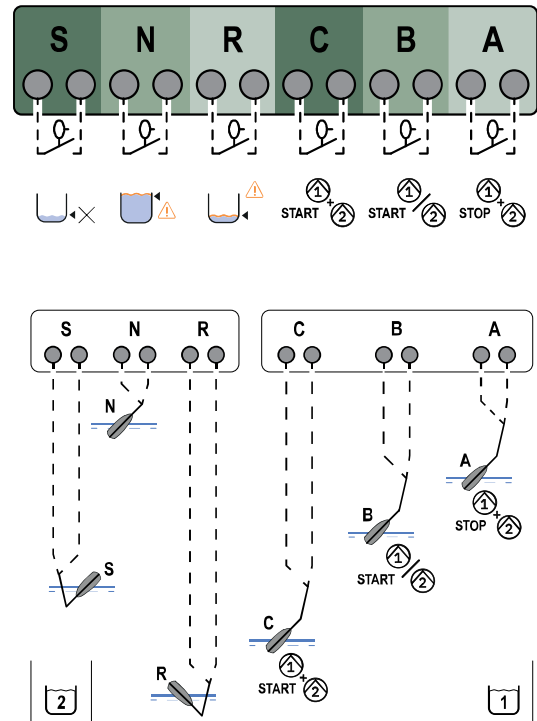


Fig.10: Filling system inputs and protections (Floats)

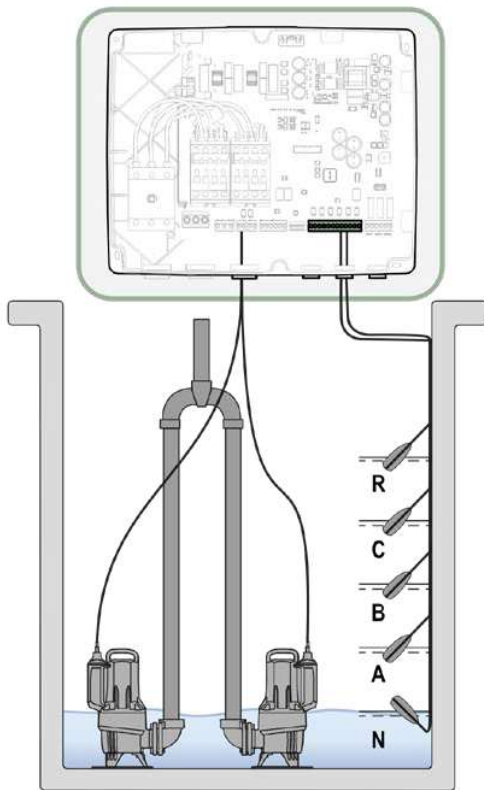


Fig.11: Diagram of drainage system inputs (Floats)

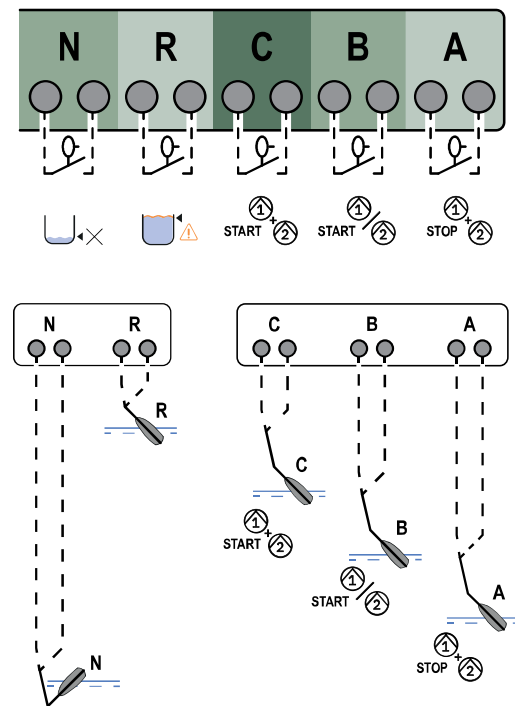


Fig.12: Drainage system inputs and protections (Floats)

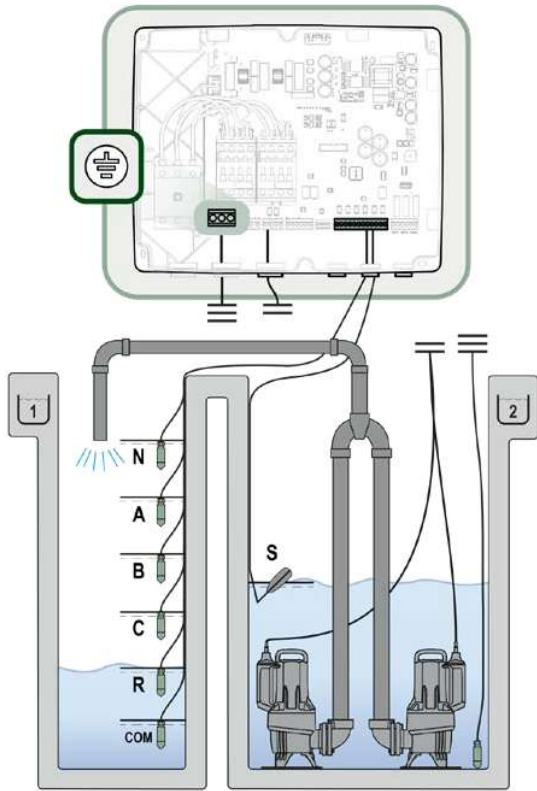


Fig.13: Diagram of filling system inputs (Level probes)

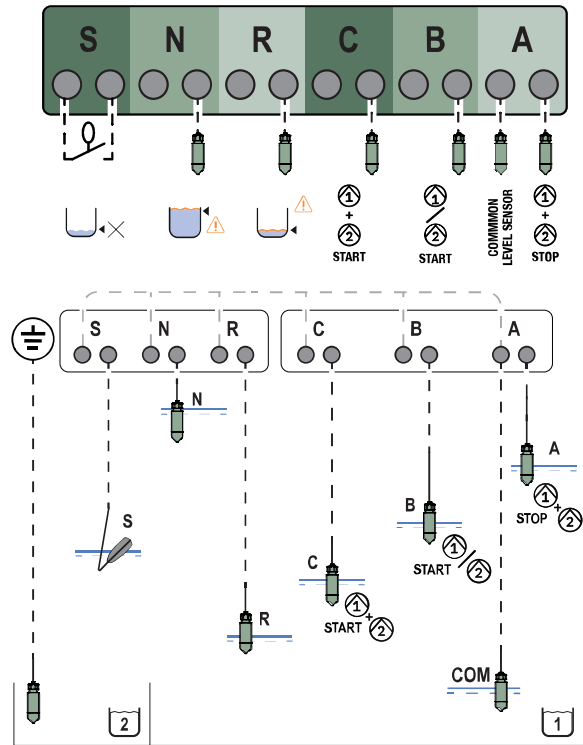


Fig.14: Filling system inputs and protections (Level probes)

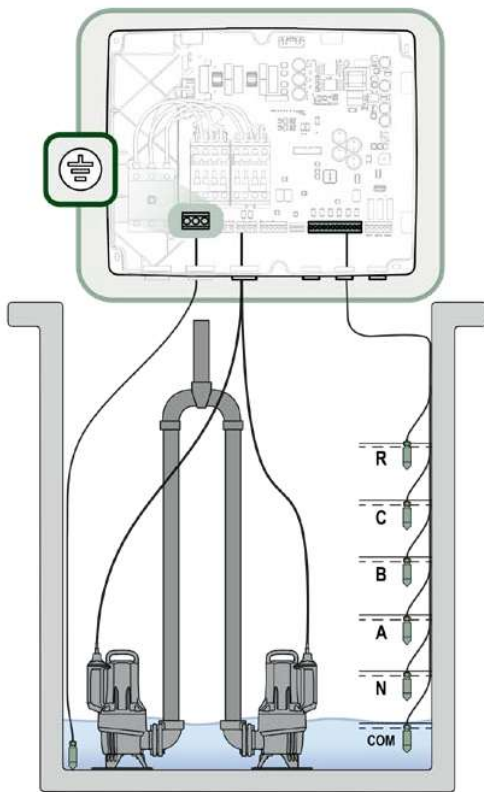


Fig.15: Diagram of drainage system inputs (Level probes)

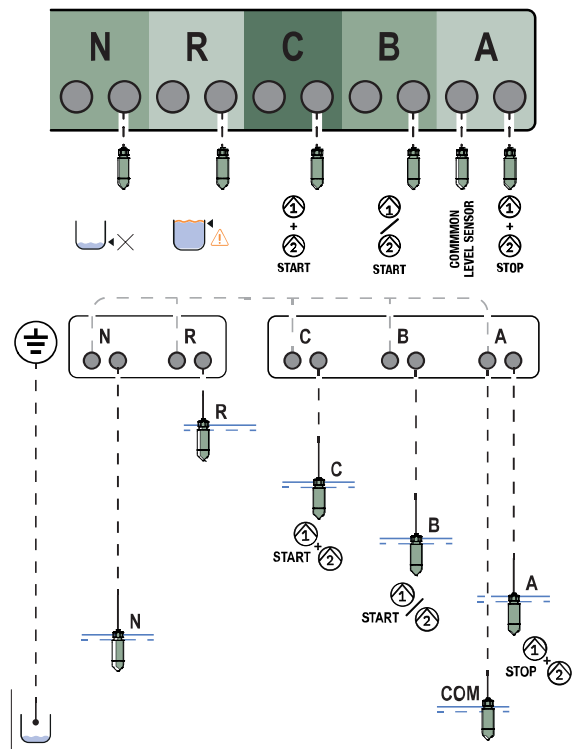


Fig.16: Drainage system inputs and protections (Level probes)

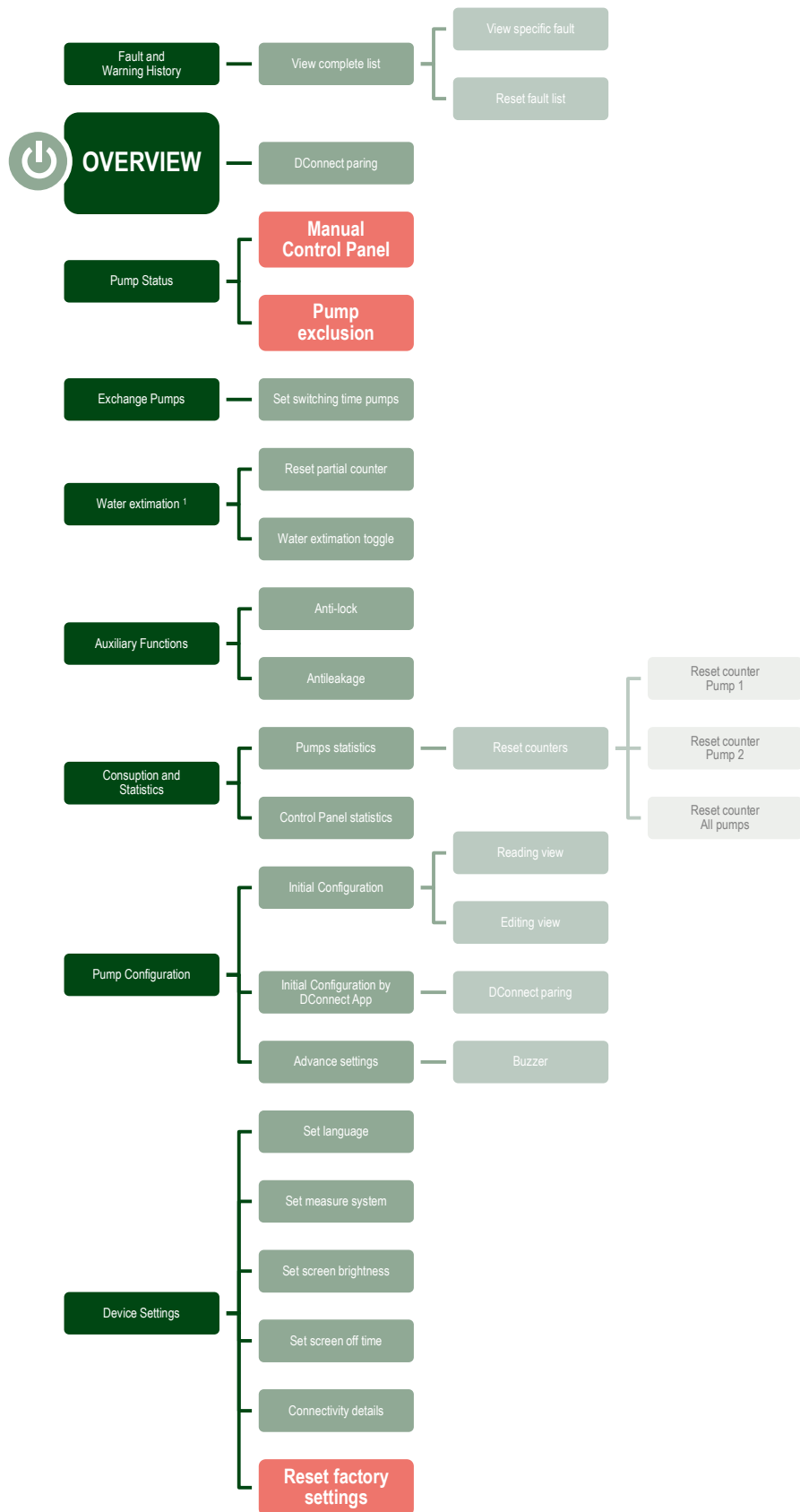


Fig.17: Structure of the menu functions

¹ Available just if "Water estimation" was activated during Filling or Drainage Configuration process.

1	KEY	37
2	GENERAL	37
2.1	Product name	37
2.2	Classification according to European Reg	37
2.3	Description	37
2.4	Specific product references	37
3	WARNINGS	37
3.1	Live parts	37
3.2	Product disposal	37
4	MANAGEMENT	37
4.1	Storage	37
4.2	Transport	37
5	INSTALLATION	37
5.1	Recommended set up	38
5.2	Hydraulic connection	38
5.3	Electrical connection	38
5.3.1	Instrumental checks to be carried out by the installer	38
5.3.2	Boards and connections	38
5.3.3	Power supply electrical connection	39
5.3.4	Electrical connection of the pumps	39
5.3.5	Kit capacitors electrical connection	40
6	DRAINAGE FUNCTION	40
6.1	Connection of additional protection	40
6.2	Outputs connection	41
6.2.1	Floats connection	41
6.2.2	Level probes connection	41
6.2.3	Depth sensor connection	42
6.2.4	USB power port for external hotspot	42
6.3	Configuration of control inputs	42
6.4	Rs485 Modbus RTU connection	42
7	FILLING FUNCTION	42
7.1	Connection of additional protection	42
7.2	Outputs connection	43
7.2.1	Floats connection	43
7.2.2	Level probes connection	43
7.2.3	Depth sensor connection	44
7.2.4	USB power port for external hotspot	44
7.3	Configuration of control inputs	44
7.4	Rs485 Modbus RTU connection	44
8	COMMISSIONING	44
8.1	Start-up	44
9	MAINTENANCE	44
9.1	Periodic checks	44
9.2	Modifications and spare parts	45
9.3	CE marking and minimum instructions for DNA	45
10	DECLARATION OF CONFORMITY	45
11	GUARANTEE	45
12	TECHNICAL DATA	46
13	DESCRIPTION OF CONTROL PANEL	47
13.1	Control panel orientation	47
13.2	Filling system operation	47
13.3	Drainage system operation	47
14	CONTROL PANEL	49
14.1	Initial configuration	49
14.1.1	Initial configuration with DConnect App	50
14.2	Drainage configuration	50
14.2.1	Use with depth sensor	50
14.2.2	Use with floats	51
14.2.3	Use level probes	52
14.2.4	Concluding configuration	52
14.2.5	Enabling water volume estimation	52
14.3	Filling configuration	53
14.3.1	Use with depth sensor	53
14.3.2	Use with floats	54
14.3.3	Use level probes	54
14.3.4	Concluding configuration	54
14.3.5	Enabling water volume estimation	55
14.4	Optional configurations	55
14.4.1	Communication protocol configuration	55
14.4.2	Additional settings	55
14.5	Main menu	56

14.5.1	First installation	56
14.5.2	Menu structure	56
	Error and Alarm Log.....	57
	Pump status	57
	Pump exchange mode	57
	Water volume estimation	58
	Auxiliary functions	58
	Consumption and statistics	58
	Device configuration	58
	System	59
	System settings.....	59
15	GENERAL SYSTEM RESET	60
15.1	Restoring the factory settings	60
16	APP AND DCONNECT CLOUD SYSTEM REQUIREMENTS	60
16.1	App download and installation	60
16.2	DConnect DAB Cloud Registration	61
16.3	Product configuration	61
17	MODBUS COMMUNICATION PROTOCOL	61
17.1	Electrical connection	61
17.2	Modbus Configuration	61
17.3	Modbus RTU registers	62
17.3.1	Type of Modbus messenger	62
18	TROUBLESHOOTING	66

1 KEY

The following symbols have been used in the discussion:



WARNING, GENERAL DANGER.

Failure to respect the instructions that follow may cause harm to persons and property.



WARNING, ELECTRICAL DANGER.

Failure to respect the instructions that follow may cause a situation of grave risk for personal safety. Take care not to come into contact with electricity.



Notes and general information. Please read the following instructions carefully before operating and installing the machine.

DAB Pumps makes every reasonable effort to ensure that the contents of this manual (e.g. illustrations, texts and data) are accurate, correct and up-to-date. Nevertheless, they may not be free of errors and may not be complete or up-to-date at any time. The company therefore reserves the right to make technical changes and improvements over time, even without prior notice.

DAB Pumps accepts no liability for the contents of this manual unless subsequently confirmed in writing by the company.

2 GENERAL

2.1 Product name
NGPANEL

2.2 Classification according to European Reg.
CONTROL DEVICE

2.3 Description

The device has been designed and manufactured for the control and protection of sets of max n.2 pumps for draining and filling.

2.4 Specific product references

For technical data, refer to the technical data plate or the dedicated chapter at the end of the manual.

3 WARNINGS



In particular, check that all the internal parts of the panel (components, leads, etc.) are completely free from traces of humidity, oxide or dirt: if necessary, clean accurately and check the efficiency of all the components in the panel. If necessary, replace any parts that are not perfectly efficient.



It is indispensable to check that all the panel leads are correctly tightened in the respective clamps.



In the event of a long period of inactivity (or when any component has been replaced), it is advisable to perform on the panel all the checks indicated by standard EN 60730-1.



Some functions might not be available, depending on the software version.

3.1 Live parts

Refer to the Safety Booklet (code 60183268).

3.2 Product disposal

This product or its parts must be disposed of according to the instructions in the WEEE disposal sheet included in the packaging.

4 MANAGEMENT

4.1 Storage

- The panel is supplied in its original pack in which it must remain until the time of installation.
- The panel must be stored in a dry covered place, far from sources of heat and with possible constant air humidity, free from vibrations and dust.
- It must be perfectly closed and isolated from the outside environment, so as to avoid the entry of insects, humidity and dust which could damage the electrical components, jeopardizing their regular operation.

4.2 Transport

Avoid subjecting the product to needless impacts and collisions.

5 INSTALLATION

Carefully follow the advice in this chapter to carry out correct electrical, hydraulic and mechanical installation.

Before attempting any installation work, make sure that power to the motor and actuator is switched off.

Strictly respect the electric supply values indicated on the electrical data plate.

5.1 Recommended set up

For the wall fixing, follow the instructions below:

- Use a level and the Quick Guide as a template for wall drilling;
- Using the trace on the Quick Guide, drill in the four points indicated in the drawing;
- Insert the plugs into the holes (not supplied with the product);
- Then fix the product to the wall using the four screws;
- Then proceed with the wiring connection.

5.2 Hydraulic connection

Make the most appropriate hydraulic connection based on the application by referring to the general diagrams shown at the beginning of the manual. See Fig.9 for Filling system, see Fig.11 for Drainage system.

5.3 Electrical connection



Attention: always respect the safety regulations!



For every opening or wiring connection, before closing make sure that the gaskets and cable glands are intact.



In the power mains there must be a device that ensures complete disconnection in overvoltage category III conditions.



Make sure that the mains voltage is the same as that on the motor data plate.



Observe the following terminals for connecting the power supply cables:

L1 - L2 - L3 - $\equiv$ for three-phase systems

L - N - $\equiv$ for single-phase systems

→ isolating switch QS1
(terminals 2T1-4T2-6T3 of QS1 switch)

Ensure that all the terminals are fully tightened, **paying particular attention to the electrical ground.**



Refer to the Safety Booklet before making electrical connections (code 60183268).

5.3.1 Instrumental checks to be carried out by the installer

- Continuity of the protection leads and of the main and supplementary equipotential circuits.
- Insulation resistance of the electrical system between the active circuits L1-N (for single-phase systems with switching of the output contacts) and L1-L2-L3 (for three-phase systems with switching of the output contacts) and the equipotential protection circuit.
- Testing the efficiency of the differential protection.
- Testing the voltage applied between the active circuits L1-N (for single-phase systems with switching of the output contacts) and L1-L2-L3 (for three-phase systems with switching of the output contacts) and the equipotential protection circuit.
- Testing operation.

5.3.2 Boards and connections

See Fig. 4, Fig.5.

	Function
QS1	Supply line insulating switch
L1 - L2 - L3	Three-phase power supply line connection
L - N	Single-phase power supply line connection
$\equiv$	Earthing connection
U - V - W	Three-phase electrical connection of the pumps
N - L	Single-phase electrical connection of the pumps
N - L - C	Electrical connection for single-phase pumps with external capacitor
C1 - C2	Electrical connection for external starting capacitor for single-phase pumps with external capacitor.
KK1 - KK2	Thermal protection input for the motor of pumps
A - B - C	Terminals connecting digital inputs for level or pressure control (floats or level probes)
R - N - S	Terminals connecting digital alarm inputs (only floats or level probes)

OIL1 - OIL2	Oil sensor input connection terminal
12V – AIN1	Terminals connecting depth sensor input
GND – AIN2	Terminals connecting flood sensor input
GD – B – A	MODBUS cable connection terminals
OUT1-OUT2-OUT3	Alarm connection terminals

5.3.3 Power supply electrical connection



In the case of single-phase power supply use terminals L - N. In the case of three phase power supply use terminals L1, L2, L3. See Fig.8.

5.3.4 Electrical connection of the pumps



The protection fuses must be sized by the installer of the electrical system to protect the power line according to the local regulations. For America refer to National Electrical Code (NEC), or NFPA 70.



The section, type and laying of the cables for connection to the electropump must be chosen according to the regulations in force. The following tables supply an indication on the section of the cable to be used.

Cable section in mm²															
	10 m	20 m	30 m	40 m	50 m	60 m	70 m	80 m	90 m	100 m	120 m	140 m	160 m	180 m	200 m
4 A	1,5	1,5	1,5	1,5	2,5	2,5	2,5	2,5	4	4	4	6	6	6	10
8 A	1,5	1,5	2,5	2,5	4	4	6	6	6	10	10	10	10	16	16
12 A	1,5	2,5	4	4	6	6	10	10	10	10	16	16	16		
16 A	2,5	2,5	4	6	10	10	10	10	16	16	16				
20 A	4	4	6	10	10	10	16	16	16	16					
24 A	4	4	6	10	10	16	16	16							
28 A	6	6	10	10	16	16	16								

Table valid for 3-core PVC cables (phase + neutral + earth) at 230V

Cable section in mm²															
	10 m	20 m	30 m	40 m	50 m	60 m	70 m	80 m	90 m	100 m	120 m	140 m	160 m	180 m	200 m
4 A	1,5	1,5	1,5	1,5	2,5	2,5	2,5	2,5	4	4	4	6	6	6	10
8 A	1,5	1,5	2,5	2,5	4	4	6	6	6	10	10	10	10	16	16
12 A	1,5	2,5	4	4	6	6	10	10	10	10	16	16	16	16	16
16 A	2,5	2,5	4	6	10	10	10	10	16	16	16	16	16	16	16
20 A	2,5	4	6	10	10	10	16	16	16	16	16	16	16	16	16
24 A	4	4	6	10	10	16	16	16	16	16	16	16	16	16	16
28 A	6	6	10	10	16	16	16	16	16	16	16	16	16	16	16
32 A	6	6	10	10	16	16	16	16	16	16	16	16	16	16	16

Table valid for PVC cables with 4 leads (3 phases + earth) at 230V

Cable section in mm²																
	10 m	20 m	30 m	40 m	50 m	60 m	70 m	80 m	90 m	100 m	120 m	140 m	160 m		180 m	200 m
4 A	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	2,5	2,5	2,5	2,5	4	4	4	
8 A	1,5	1,5	1,5	1,5	2,5	2,5	2,5	4	4	4	6	6	6	10	10	
12 A	1,5	1,5	2,5	2,5	4	4	4	6	6	6	10	10	10	10	16	
16 A	2,5	2,5	2,5	4	4	6	6	6	10	10	10	10	16	16	16	
20 A	2,5	2,5	4	4	6	6	10	10	10	10	16	16	16	16	16	
24 A	4	4	4	6	6	10	10	10	10	16	16	16	16	16	16	
28 A	6	6	6	6	10	10	10	10	16	16	16	16	16	16	16	
32 A	6	6	6	6	10	10	10	16	16	16	16	16	16	16	16	
36 A	10	10	10	10	10	10	16	16	16	16	16	16	16	16	16	
40 A	10	10	10	10	10	16	16	16	16	16	16	16	16	16	16	
44 A	10	10	10	10	10	16	16	16	16	16	16	16	16	16	16	
48 A	10	10	10	10	16	16	16	16	16	16	16	16	16	16	16	
52 A	16	16	16	16	16	16	16	16	16	16	16	16	16		16	16
56 A	16	16	16	16	16	16	16	16	16	16	16	16	16		16	16
60 A	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	

Table valid for PVC cables with 4 leads (3 phases + earth) at 400V



- The supply voltage of the device must be the same as that of the pumps used. For example, if the device is fed with a supply voltage of 3~400V the pumps must be at 3~400V. For example, if the device is fed with a supply voltage of 1~230V the pumps must be at 1~230V.
- **Connect the earth cables of the pumps to the earth terminals in the device!**
- If the single-phase pump needs an external capacitor, it can be placed inside the device (See Fig.6 and Fig.7).
- If more than one pump are used, they must be identical.
- Attention, an incorrect electrical connection could damage the device.

Connection of three-phase pumps: see Fig.5.



The pumps must be connected to the contactors as shown in the figure. The correct sequence of phases U, V and W must be respected so that they turn in the correct direction. Then check the correct direction of rotation.

Connection of single-phase pumps with internal capacitor: see Fig.5.



The pumps must be connected to the contactors as shown in the figure. The neutral wire must be connected to the terminal N, the phase wire must be connected to the terminal L.

Connection of single-phase pumps with external capacitor: see Fig.5.



The pumps with an external capacitor must be connected to the two contactors as shown in the figure. Particular care must be taken to observe the correspondence between the screen-printing and the names of the pump wires. The pump cable marked C (Run) should be connected to terminal 6T3. The same should be done for cables A (Start) to terminal 4T2 and P (Common) to terminal 2T1.

The pump capacitor/s can be placed inside the device, only if it allows by the metal brackets (to verify if they are provided, refer to the figures in the booklet and the Quick Guide). Pay attention that in the device the capacitors share the same contactor as the pump. See Fig.5 and Fig.6.

The capacitors features depend on the pump connected to the device. It is recommended to choose the voltage and capacity of the capacitors referring to the motor used in the pump. Also, ensure that the capacitors keep an operating temperature between -25 and 85°C, and a safety class of S2.

5.3.5 Kit capacitors electrical connection



Any additional capacitor kit must be connected to the terminals as shown in Fig.7. Particular attention must be paid to respecting the correspondence between the terminals and the names of the wires of the capacitor kit: the cables marked with C1 must be connected to terminals 1L1 and 5L3 of contactor 1, and the cables C2 to terminals 1L1 and 5L3 of contactor 2.

6 DRAINAGE FUNCTION

The device can be used as a control and protection tool for drainage systems. Both floats, level probes and depth sensors can be used as control inputs. For the general diagram see Fig.11. Particular care must be taken:

- Level probes can only be used with clear, clean water.
- If the depth sensor is being used, the maximum level and minimum level alarms can be generated by floats or by level probes, or by thresholds of the value read by the sensor itself.

6.1 Connection of additional protection

It is possible, but not necessary, to use the alarm inputs to the device so that the pumps stop in case of water shortage or too high motor temperature. In the case of an alarm, the pumps stop, the buzzer sounds, the corresponding alarm outputs are activated.



If too high a level is reached, the pumps are activated. The buzzer sounds, the corresponding alarm outputs are activated (OUT3)

If the display is present, in all cases the type of alarm is indicated.

When the alarm conditions no longer exist, the device resumes normal operation.

- **Maximum level alarm:** the signal for this alarm may come from a float, a level probe or from the depth sensor. The level probe or float must be connected to terminal R of the device and positioned in the tank in the highest point that the liquid can safely reach.



Note: if this alarm is not used, the terminal R must be jumpered unless normally open floats or level probes are used. In the latter case, it is possible to instruct the system not to use input R, following the instructions given on the display in the chapter 14.2 Drainage configuration

If the depth sensor is used to obtain this alarm, the parameter must be calibrated according to the instructions given on the display in the chapter 14.2.1 Use with depth sensor > Configurazione con livelli di protezione.



Note: if this alarm is active, the pumps start automatically.

- **Minimum level alarm:** the signal for this alarm may come from a float, a level probe or from the depth sensor. The level probe or float must be connected to terminal N of the device and positioned in the tank in the lowest point that the liquid can safely reach. If the depth sensor is used to obtain this alarm, the parameter must be calibrated according to the instructions given on the display in the chapter 14.2.1 Use with depth sensor > Configurazione con livelli di protezione.



Note: in case of an alarm, the pumps stop.

Note: if this alarm is not used, the input N must be jumpered unless normally open floats or level probes are used. In the latter case, it is possible to instruct the system not to use input N, following the instructions given on the display in the chapter 14.2 Drainage configuration

For inputs and protections see Fig.12.

- **Motor thermal protection:** the device has an input for the thermal protection of each motor. If the motor used is provided with thermal protection, this protection can be connected to the terminals KK. If the protection is not present in the motor, the terminals must be jumpered, unless they are already bridged by the factory. The terminals are visible in Fig.5.
- **Oil probe protection:** the device has an optional input for the protection of the oil chambers of each motor. You can connect the oil probe cables to the corresponding inputs (OIL1 for pump 1 and OIL2 for pump 2). If there is water in the oil chamber, the device generates an alarm, closes the relay corresponding to the pump (OUT1 for pump 1 and OUT2 for pump 2) and, activates the internal buzzer, just if it is enabled. In case of alarm and if the device has a display, is possible to view the error message, and the connected pumps will continue their normal operation.

6.2 Outputs connection

If alarms occur, this is indicated by the device in three ways:

- By the buzzer which can be activated and deactivated from the control panel, see chapter 14.4 Optional configurations.
- By the outputs OUT1, OUT2, OUT3 by switching of the output contacts. The alarm operating logic is the following: OUT1 closes following malfunctions of pump 1, OUT2 of pump 2 and OUT3 for general errors.
- The current alarm log can also be viewed via the indications on the display, and also access the alarm history.

If connected externally they can control an alarm.

6.2.1 Floats connection

2 or 3 control inputs can be used which must be connected as follows:

- **System with 2 floats:** in this case inputs B and C are used (A must not be used, and must be jumpered in the case of normally closed floats). The floats in the tank must be positioned as in Fig.11. For electrical installation, see Fig.12.



If normally closed floats are used, it is important to jumper input A. Otherwise the pumps will not stop.

- **System with 3 floats:** in this case inputs A, B and C are used. The floats in the tank must be positioned as in Fig.11. For electrical installation see Fig.12.

6.2.2 Level probes connection

2 or 3 control inputs can be used which must be connected as follows:

- **System with 2 level probes:** in this case inputs B and C are used (A must not be used, and must be jumpered in Drainage function). The level probes in the tank must be positioned as in Fig.11. For electrical installation, see Fig.12.



It is important to jumper input A. Otherwise the pumps will not stop.

- **System with 3 level probes:** in this case inputs A, B and C are used. The level probes must be positioned as in Fig.11. For electrical installation, see Fig.12.



Common contact of the inputs A, B, C, R, N (See Fig.11). There is only one common contact for all the inputs and it is connected to the odd terminals (starting from left from 1 to 11). So, if level probes or electric probes are used, the common contact for the inputs: A, B, C, R, N must be connected to the terminals with odd numbers: 1, 3, 5, 7, 9, 11.
Level probes: can only be used with clear, clean water.

6.2.3 Depth sensor connection

The device may use a depth sensor as a control device. The maximum or minimum level alarms can be generated with the information from the depth sensor. So it is not necessary to connect floats or level probes to the inputs R or N. If maximum reliability is desired, as well as the depth sensor 2 floats or level probes can also be used, for the alarms R and N. The system allows selection of both alarms, none, or only one of the two.

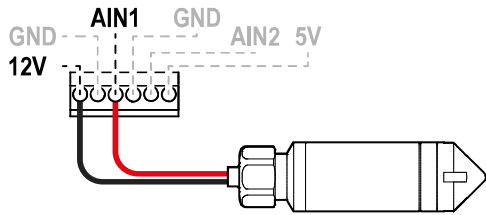


Fig.18: Depth sensor connection

Depth sensor connections 4 – 20mA	
Signal	Sensor
AIN1	- OUT / GND
12V	+Vs

The depth sensor must be positioned near the bottom of the tank, ensuring that it is above any solid residue or impurities, present or future.



ATTENTION: incorrect wiring of the sensor can damage the appliance and the sensor.

6.2.4 USB power port for external hotspot

The panel is equipped with a USB port that can power an auxiliary device (DAB kit-wifi modem) to be placed directly inside the panel, and can generate a wifi hotspot to be used to connect the device even if there is no pre-existing wifi network.

6.3 Configuration of control inputs

For configuration of drainage with floats, level probes or depth sensor follow the instructions given on the display, in the chapters 14.2.2 Use with floats, 14.2.3 Use level probes e 14.2.1 Use with depth sensor.

6.4 Rs485 Modbus RTU connection

For information on electrical connections and Modbus registers that can be consulted and/or edited, refer to chapter 17 MODBUS COMMUNICATION PROTOCOL.

7 FILLING FUNCTION

The device can be used as a control and protection tool for filling systems. Both floats, level probes and depth sensors can be used as control inputs. For the general diagram see Fig.9. Particular care must be taken:

- Level probes can only be used with clear, clean water
- If the depth sensor is being used, the maximum level and minimum level alarms can be generated by floats or by level probes, or by thresholds of the value read by the sensor itself.

7.1 Connection of additional protection

It is possible, but not necessary, to use the alarm inputs to the device so that the pumps stop in in case of water shortage or too high motor temperature. In the case of an alarm, the pumps stop, the buzzer sounds, the corresponding alarm outputs are activated.



If the minimum level is reached, the pumps are activated. The buzzer sounds, the corresponding alarm outputs are activated (OUT3)

If the display is present, in all cases the type of alarm is indicated.

When the alarm conditions no longer exist, the device resumes normal operation.

- **Maximum level alarm:** the signal for this alarm may come from a float, a level probe or from the depth sensor. The level probe or float must be connected to terminal N of the device and positioned in the tank in the highest point that the liquid can safely reach.



Note: if this alarm is not used, the terminal N must be jumpered unless normally open floats or level probes are used. In the latter case, it is possible to instruct the system not to use input N, following the instructions given on the display in the chapter 14.3 Filling configuration.

If the depth sensor is used to obtain this alarm, the parameter must be calibrated according to the instructions given on the display in the chapter 14.3.1 Use with depth sensor > Configuration with protection levels.

- **Minimum level alarm:** the signal for this alarm may come from a float, a level probe or from the depth sensor. The level probe or float must be connected to terminal R of the device and positioned in the tank in the lowest point that the liquid can safely reach. If the depth sensor is used to obtain this alarm, the parameter must be calibrated according to the instructions given on the display in the chapter 14.3.1 Use with depth sensor > Configuration with protection levels.



Note: in case of an alarm, the pumps stop.

Nota: if this alarm is not used, the input R must leave open unless normally open floats or level probes are used. In the latter case, it is possible to instruct the system not to use input R, following the instructions given on the display in the chapter 14.3 Filling configuration.

For inputs and protections see Fig.10

- **Protection against dry operation:** the device has an input for protection against dry operation, signalled by a float immersed in the tank of the pumps controlled by the panel. The device must be connected to the S contact of the device, and positioned in the tank at a level that ensures that the pumps are not damaged by dry operation (*see the installation and operating instructions of the pumps used*).
- **Motor thermal protection:** the device has an input for the thermal protection of each motor. If the motor used is provided with thermal protection, this protection can be connected to the terminals KK. If the protection is not present in the motor, the terminals must be jumpered, unless they are already bridged by the factory. The terminals are visible in Fig.5.
- **Oil probe protection:** the device has an optional input for the protection of the oil chambers of each motor. You can connect the oil probe cables to the corresponding inputs (OIL1 for pump 1 and OIL2 for pump 2). If there is water in the oil chamber, the device generates an alarm, closes the relay corresponding to the pump (OUT1 for pump 1 and OUT2 for pump 2) and, activates the internal buzzer, just if it is enabled. In case of alarm and if the device has a display, is possible to view the error message, and the connected pumps will continue their normal operation.

7.2 Outputs connection

If alarms occur, this is indicated by the device in three ways:

- By the buzzer which can be activated and deactivated from the control panel, see chapter 14.4 Optional configurations.
- By the outputs OUT1, OUT2, OUT3 by switching of the output contacts. The alarm operating logic is the following: OUT1 closes following malfunctions of pump 1, OUT2 of pump 2 and OUT3 for general errors.
- The current alarm log can also be viewed via the indications on the display, and also access the alarm history.

If connected externally they can control an alarm.

7.2.1 Floats connection

2 or 3 control inputs can be used which must be connected as follows:

- **System with 2 floats:** in this case inputs B and C are used (A must not be used, and must be jumpered in the case of normally closed floats). The floats in the tank must be positioned as in Fig.9. For electrical installation, see Fig.10.



If normally closed floats are used, it is important to jumper input A. Otherwise the pumps will not stop.

- **System with 3 floats:** in this case inputs A, B and C are used. The floats in the tank must be positioned as in Fig.9. For electrical installation see Fig.10.

7.2.2 Level probes connection

2 or 3 control inputs can be used which must be connected as follows:

- **System with 2 level probes:** in this case inputs B and C are used (must not be used, and must be jumpered). The level probes in the tank must be positioned as in Fig.9. For electrical installation, see Fig.10.



It is important to jumper input A. Otherwise the pumps will not stop.

- **System with 3 level probes:** in this case inputs A, B and C are used. The level probes must be positioned as in Fig.9. For electrical installation, see Fig.10.



Common contact of the inputs A, B, C, R, N, S (See Fig.11). There is only one common contact for all the inputs and it is connected to the odd terminals (starting from left from 1 to 11). So, if level probes or electric probes are used, the common contact for the inputs: A, B, C, R, N must be connected to the terminals with odd numbers: 1, 3, 5, 7, 9, 11.

Level probes: can only be used with clear, clean water.

7.2.3 Depth sensor connection

The device may use a depth sensor as a control device. The maximum or minimum level alarms can be generated with the information from the depth sensor. So it is not necessary to connect floats or level probes to the inputs R or N. If maximum reliability is desired, as well as the depth sensor 2 floats or level probes can also be used, for the alarms R and N. The system allows selection of both alarms, none, or only one of the two.

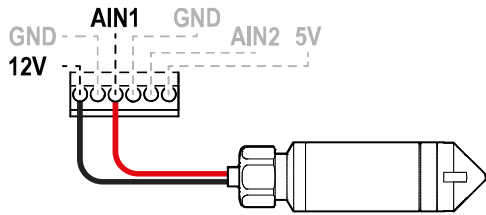


Fig.19: Depth sensor connection

Depth sensor connections 4 – 20mA	
Signal	Sensor
AIN1	- OUT / GND
12V	+Vs

The depth sensor must be positioned near the bottom of the tank, ensuring that it is above any solid residue or impurities, present or future.



ATTENTION: incorrect wiring of the sensor can damage the appliance and the sensor.

7.2.4 USB power port for external hotspot

The panel is equipped with a USB port that can power an auxiliary device (DAB kit-wifi modem) to be placed directly inside the panel, and can generate a wifi hotspot to be used to connect the device even if there is no pre-existing wifi network.

7.3 Configuration of control inputs

For configuration of drainage with floats, level probes or depth sensor follow the instructions given on the display, in the chapters 14.3.2 Use with floats, 14.3.3 Use level probes e 14.3.1 Use with depth sensor.

7.4 Rs485 Modbus RTU connection

For information on electrical connections and Modbus registers that can be consulted and/or edited, refer to chapter 17 MODBUS COMMUNICATION PROTOCOL.

8 COMMISSIONING



All commissioning operations must be carried out with the device cover closed!
Start the device only when all electrical and hydraulic connections have been completed.

Fully open the suction valve of the pump and keep the delivery valve almost closed, power on the system, check that the direction of rotation of the motor is the same as indicated on the pump.

Once the system has been started, it is possible to modify the operating mode to better fit to the needs of the system (see chapter 14 CONTROL PANEL).

8.1 Start-up

For the first start-up, follow the steps below:

- For a correct start-up, make sure you have followed the instructions given in chapter 5 INSTALLATION and 8 COMMISSIONING and the respective subsections.
- Provide electric power supply.
- there are integrated electronics, follow the instructions (see chapter 14 CONTROL PANEL).

9 MAINTENANCE

Disconnect the power supply before starting any work on the system. The system requires no routine maintenance operations. However, below are the instructions for carrying out extraordinary maintenance operations that may be necessary in particular cases:

- after a long period of use it is necessary to check the correct tightening of the cables on the relative terminals, particularly in the case of very high currents (A).

It is recommended not to apply force on the various parts with unsuitable tools.

9.1 Periodic checks

In normal operation the panel does not require any type of maintenance. However, it is advisable to check the current absorption periodically, in order to detect faults or wear in advance.

9.2 Modifications and spare parts

Any modification made without prior authorisation relieves the manufacturer of all responsibility.

9.3 CE marking and minimum instructions for DNA

	PRODUCT NAME Code N. Class SN.
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DAB PUMPS S.p.A. Via Marco Polo, 14
33035 Medicina (PD) - Italy
REA n. 328200





Made in

The image is for representative purposes only

Consult the Product configurator (DNA) available on the DAB PUMPS website.

The platform allows you to search for products by hydraulic performance, model or article number. Technical data sheets, spare parts, user manuals and other technical documentation can be obtained.



<https://dna.dabpumps.com/>

10 DECLARATION OF CONFORMITY

For the product indicated in chapter 2.1, we declare that the device described in this instruction manual and marketed by us complies with the relevant EU health and safety regulations.

A detailed and updated declaration of conformity is available with the product.

If the product is modified in any way without our consent, this statement will become invalid.

11 GUARANTEE

DAB undertakes to ensure that its Products comply with what has been agreed and are free from original defects and faults connected with their design and/or manufacture that make them unsuitable for the use for which they are normally intended.

For more details on the Legal Guarantee, please read the DAB Guarantee Conditions published on the website <https://www.dabpumps.com/en> or request a printed copy by writing to the addresses published in the “contact” section.

APPENDIX SECTION

12 TECHNICAL DATA

	NGPANEL
Supply voltage	3~550 – 600 V 1~200 – 240 V 3~380 – 480 V 1~110 – 127 V 3~200 – 240 V
Radio network protocols	Operating frequencies *: ▪ Wi-Fi: 2.412 at 2.472 GHz ▪ Bluetooth: 2.402 at 2.480 GHz Transmission power: ▪ Wi-Fi: 18.87 dBm ▪ Bluetooth: 7.67 dBm * in accordance with national regulations where the product is installed. The device includes radio equipment with associated software to ensure correct operation as envisaged by DAB Pumps s.p.a.
USB Port	For DAB modem-wifi kit power supply only (No other uses allowed)
Power supply tolerance	+10% - 15%
Frequency	50/60 Hz
No. pumps that can be connected	1 or 2
Maximum rated current of the pumps	12 A, 20 A or 29 A at 1~110 – 127 / 1~200 – 240 V 12A at 3~200 – 240 / 3~380 – 480 V 8A at 3~550 – 600 V
Maximum rated power of the pumps	5,5 kW at 3~550 – 600 / 3~380 – 480 / 3~200 – 240 V 1,5 kW at 1~110 – 127 / 1~200 – 240 V
Degree of protection	IP X5
Ambient working temperature	-10 ÷ 50° C
Storage temperature	-25°C ÷ 55° C
Air relative humidity	50% at 40° C 90% at 20° C
Dimension	355 x 285 x 177,2 mm
Weight	3.7 Kg
Protections against	Excess temperature with automatic reset (KK), Excess currents in pumps (amperometric protection), Abnormal voltages, Dry operation, Fluid leaks from the system, Inconsistency of floats and/or probes, Blocking of the pumps

Table 1: Technical Data

13 DESCRIPTION OF CONTROL PANEL

13.1 Control panel orientation

The control panel is designed to be placed in the most readable direction for the user: the square shape allows it to be rotated 90° by 90°.

- Unscrew the 4 screws at the corners of the panel with the accessory tool (if supplied) or a normal torx wrench.
- Do not remove the screws completely, it is recommended to unscrew them only from the thread on the body of the product.
- Be careful not to drop the screws into the system.
- Move the panel, taking care not to stretch the signal cable.
- Replace the panel in its seat with the chosen orientation, taking care not to pinch the cable.
- Tighten the 4 screws with the accessory tool (if supplied) or a normal torx wrench.

13.2 Filling system operation

Operation with 2 floats or 2 level probes

The operating logic is the following:

- Float or level probe connected to input B keeps only one of the two pumps running, while it stops the operation of the other.
- Float or level probe connected to input C activates both pumps. If input B has already activated one pump, activating input C only activates the remaining pump.

Filling operation with 2 floats or 2 level probes		
	Start	Stop
Pump P1	Float or level probe on B = Active status	Float or level probe on B = Normal status
Pump P2	Float or level probe on C = Active status	Float or level probe on B = Normal status

Table 2: Filling operation with 2 floats

Operation with 3 floats or 3 level probes

The operating logic is the following:

- Float or level probe connected to input B starts pump P1.
- Float or level probe connected to input C starts pump P2.
- Both pumps are stopped on the float or level probe connected to A.

Filling operation with 3 floats or 3 level probes		
	Start	Stop
Pump P1	Float or level probe on B = Active status	Float or level probe on A = Normal status
Pump P2	Float or level probe on C = Active status	Float or level probe on B = Normal status

Table 3: Filling operation with 3 floats



Note: the function with 3 floats is used in installations with deep narrow tanks that do not allow an ample travel of the floats!

Operation with a depth sensor

For configuration of filling with a depth sensor follow the instructions given on the display, in the chapter 14.3.1 Use with depth sensor.

13.3 Drainage system operation

Operation with 2 floats or 2 level probes

The operating logic is the following:

- Float or level probe connected to input B keeps only one of the two pumps running, while it stops the operation of the other.
- Float or level probe connected to input C activates both pumps. If input B has already activated one pump, activating input C only activates the remaining pump.

Filling operation with 2 floats or 2 level probes		
	Start	Stop
Pump P1	Float or level probe on B = Active status	Float or level probe on B = Normal status
Pump P2	Float or level probe on C = Active status	Float or level probe on B = Normal status

Table 4: Filling operation with 2 floats

Operation with 3 floats or 3 level probes

The operating logic is the following:

- Float or level probe connected to input B keeps only one of the two pumps running, while it stops the operation of the other.
- Float or level probe connected to input C activates both pumps. If input B has already activated one pump, activating input C only activates the remaining pump.
- Both pumps are stopped on the float or level probe connected to A.

Filling operation with 3 floats or 3 level probes		
	Avvio	Arresto
Pump P1	Float or level probe on B = Active status	Float or level probe on A = Normal status
Pump P2	Float or level probe on C = Active status	Float or level probe on A = Normal status

Table 5: Filling operation with 3 floats

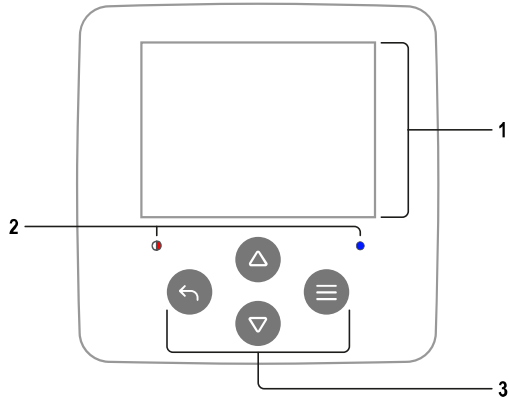


Note: the function with 3 floats is used in installations with deep narrow tanks that do not allow an ample travel of the floats!

Operation with a depth sensor

For configuration of filling with a depth sensor follow the instructions given on the display, in the chapter 14.2.1 Use with depth sensor.

14 CONTROL PANEL



1 – Display

2 – Led

System starting



System active



System in error



3 – Buttons



Press to confirm or go to the next screen.
Press to access the selected menu page.



Press to cancel or return to the previous screen.
Press to leave the current menu page.

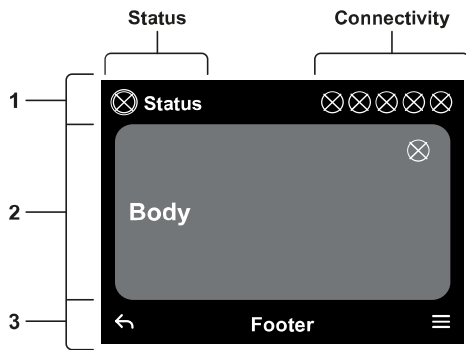


Press to browse the menu.
Press to increment the selected parameter.
Press and hold to increase the increment speed.



Press to browse the menu.
Press to decrement the selected parameter.
Press and hold to increase the decrement speed.

DISPLAY



1 – Header

Status: Describes the condition of the entire system (pumps and panel).

Connectivity: Describes the connectivity status of the system. Only if given by the product.

2 – Body

The central part of the display varies depending on the page being viewed, and describes the necessary information.

3 – Footer

The lower part of the display contains the items “BACK” and “CONFIRM”. In addition, further items will appear in relation to the displayed menu page.

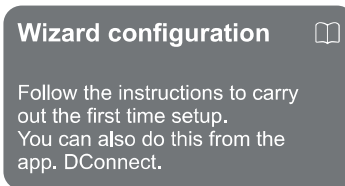
14.1 Initial configuration

When the panel is started for the first time, the initial configuration process is displayed on the screen. Follow the on-screen instructions to complete the process.

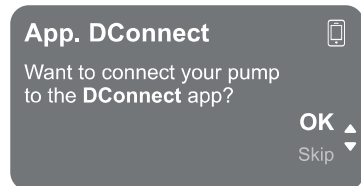
1 Selected Language



2 Wizard Configuration

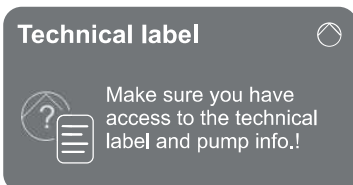


3 DConnect App.

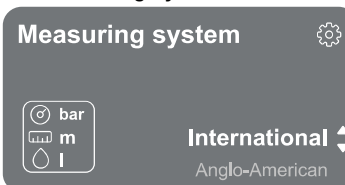


For configuration with the DConnect App. see chapter 14.1.1 Initial configuration with DConnect App.

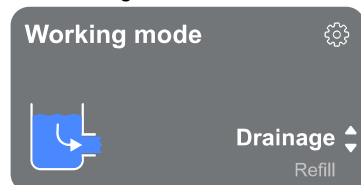
4 Technical Label



5 Measuring System



6 Working mode

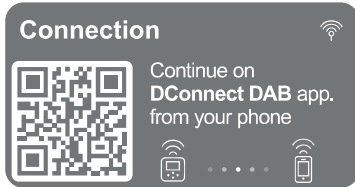


The last step of the Initial configuration allows to choose the preferred working mode between: 14.2 Drainage configuration and 14.3 Filling configuration.



Once the operating mode has been chosen and the initial configuration completed, it is no longer possible to change the type of panel operation. This will only be possible by resetting to the factory data.

14.1.1 Initial configuration with DConnect App



To simplify, it is possible to set the Initial Configuration with the assistance of the App on smartphone.

From this page the panel activates the DConnect connection.

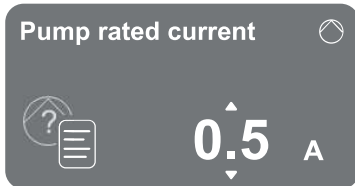
If the connection fails or timeout, try again with the key . Follow the instructions on your smartphone. Once the connection between the panel and the smartphone has been made, a confirmation pop-up appears on the display. To cancel the procedure, press the key .



The DConnect App can also be used for normal setup and consultation and the association can be done later. To associate the App after the product configuration, press the button from the main screen.

14.2 Drainage configuration

Follow the step-by-step wizard as shown below.



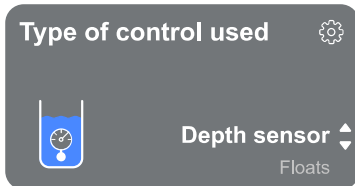
Absorbed current

Enter the rated current shown on the motor label.

The range of values depends on the selected panel and on the supply voltage.



When first installed, the key is inhibited, as entering a value is mandatory.



Type of control used

The following controls are available:



Depth sensor



Floats



Level probes



When first installed, the key is inhibited, as entering a value is mandatory.

Once you have selected the type of control to drive the system, proceed to set up its characteristics. Refer to the following paragraphs.

14.2.1 Use with depth sensor

Follow the step-by-step wizard as shown below.



Use a security float

Indicate whether you want to use security floats.

Once you have made your choice, then indicate the polarity of your floats.



No float
(no protection is set)



High float
(protection against overflow)



Low float
(protection against empty tank emergency)



Both floats
(both protections are set)

Type of depth sensor

Indicate the type of depth sensor.

Refer to our DAB catalogue for the choice of values.



When first installed, the key  is inhibited, as entering a value is mandatory.

Tank high

Set the height of the tank at your disposal, which cannot be higher than the full scale value of the sensor.

Configuration with protection levels

With the depth sensor, it is possible to set a maximum level alarm for "overflow" and a minimum level alarm for "dry run".

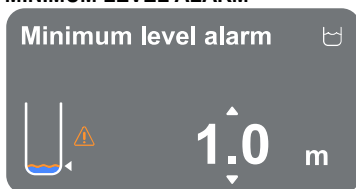


If floats for "overflow" and "empty tank emergency" have already been provided, these inhibit the alarms set with the depth sensor.

The decision to provide both protections is for greater system safety.

Then proceed to set the levels for each pump.

MINIMUM LEVEL ALARM

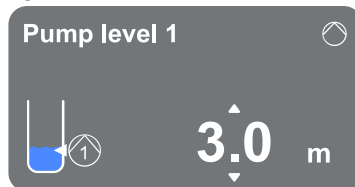


To be set only if Configuration with protection levels is selected on the previous page

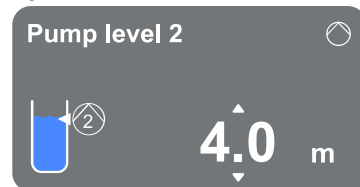
STOP PUMPS



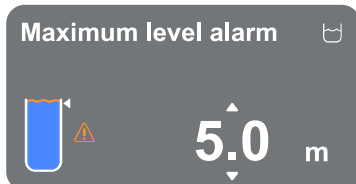
PUMP 1 LEVEL



PUMP 2 LEVEL



MAXIMUM LEVEL ALARM

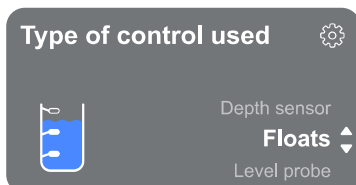


To be set only if Configuration with protection levels is selected on the previous page.



Once the control type has been configured, see section 14.2.4 Concluding configuration.

14.2.2 Use with floats



Follow the step-by-step wizard as shown below:

- Indicate floats as the type of control.
- Once you have made your choice, then indicate the polarity of your floats.



Once the control type has been configured, see section 14.2.4 Concluding configuration.

14.2.3 Use level probes

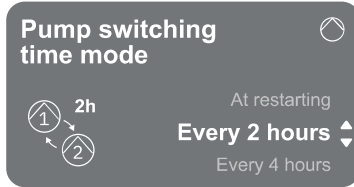


Indicate the level probe as the type of control.



Once the control type has been configured, see section 14.2.4 Concluding configuration.

14.2.4 Concluding configuration



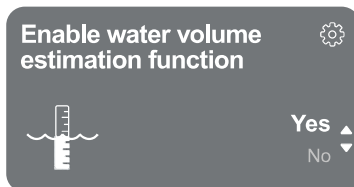
Pump exchange mode

One of the following intervals can be set:

- At restart
- Every 2 hours
- Every 4 hours
- Every 8 hours
- Every 12 hours
- Every 16 hours
- Every 20 hours
- Every 24 hours
- Never



The choice of exchange mode is necessary to prevent wear of a single pump.

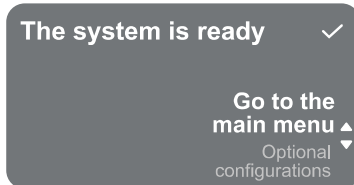


Enable water volume estimation function

To enable this function, refer to the chapter 14.2.5 Enabling water volume estimation. This option, which is only available when using the depth sensor, allows you to monitor the amount of liquid in the tank.



If this function is not enabled during the Filling or Draining Configuration, it can no longer be activated. This will only be possible by resetting to the factory data.



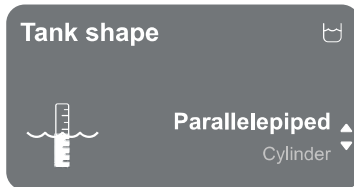
The system is ready

All the parameters have been set, the system is now in standby.



From here you can choose whether to access the "Main Menu" or set the "Optional Configurations". Refer to the respective chapters 14.5 Main menu and 14.4 Optional configurations.

14.2.5 Enabling water volume estimation



Tank shape

You can set the shape of the tank from those listed:

- Parallelepiped
- Cylinder

Once the shape has been chosen, indicate the volume by setting the largest side/diameter and the smallest side of the section.



Once configuration is complete, the system will be ready but in standby. You can choose whether to access the "Main Menu" or set the "Optional Configurations". Refer to the respective chapters 14.5 Main menu and 14.4 Optional configurations.

14.3 Filling configuration

Follow the step-by-step wizard as shown below.

Pump rated current

0.5 A

Absorbed current

Enter the rated current shown on the motor label.

The range of values depends on the selected panel and on the supply voltage.



When first installed, the key is inhibited, as entering a value is mandatory.

Type of control used

Depth sensor

Floats

Type of control used

The following controls are available:



Depth sensor



Floats



Level probes



When first installed, the key is inhibited, as entering a value is mandatory.



Tank with dry running float

Indicate whether the tank will be provided with a float that stops the operation of the pumps in case of an lack of liquid.

14.3.1 Use with depth sensor

Follow the step-by-step wizard as shown below:

Tank with security float?

No float

High float

Use a security float

Indicate whether you want to use security floats.

Once you have made your choice, then indicate the polarity of your floats.



No float
(no protection is set)



High float
(protection against overflow)



Low float
(protection against empty tank emergency)



Both floats
(both protections are set)

Type of depth sensor

Indicate the type of depth sensor.

Refer to our DAB catalogue for the choice of values.



When first installed, the key is inhibited, as entering a value is mandatory.

Tank high

Set the height of the tank at your disposal, which cannot be higher than the full scale value of the sensor.

Configuration with protection levels

With the depth sensor, it is possible to set a maximum level alarm for "overflow" and a minimum level alarm for "dry run".

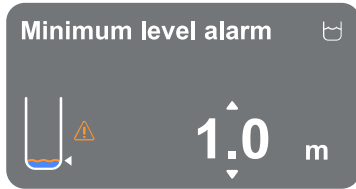


If floats for "overflow" and "empty tank emergency" have already been provided, these inhibit the alarms set with the depth sensor.

The decision to provide both protections is for greater system safety.

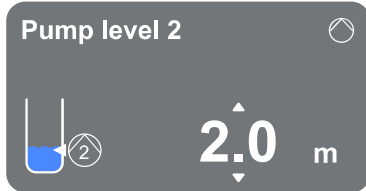
Then proceed to set the levels for each pump.

MINIMUM LEVEL ALARM

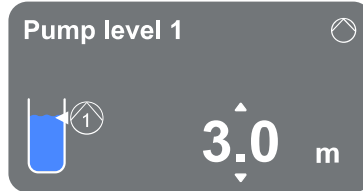


To be set only if Configuration with protection levels is selected on the previous page.

PUMP 2 LEVEL



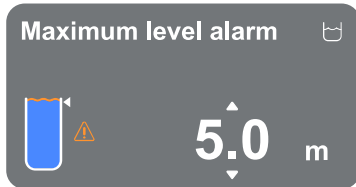
PUMP 1 LEVEL



STOP PUMPS



MAXIMUM LEVEL ALARM

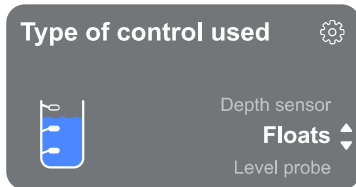


To be set only if Configuration with protection levels is selected on the previous page.



Once the control type has been configured, see section 14.3.4 Concluding configuration.

14.3.2 Use with floats



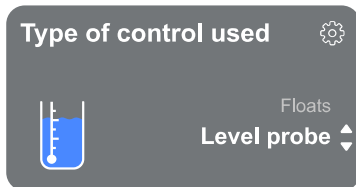
Follow the step-by-step wizard as shown below:

- Indicate floats as the type of control.
- Once you have made your choice, then indicate the polarity of your floats.



Once the control type has been configured, see section 14.3.4 Concluding configuration.

14.3.3 Use level probes

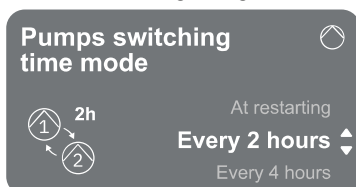


Indicate the level probe as the type of control.



Once the control type has been configured, see section 14.3.4 Concluding configuration.

14.3.4 Concluding configuration



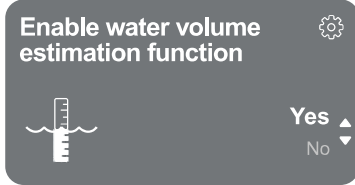
Pump exchange mode

One of the following intervals can be set:

- | | |
|------------------|------------------|
| - At restart | - Every 16 hours |
| - Every 2 hours | - Every 20 hours |
| - Every 4 hours | - Every 24 hours |
| - Every 8 hours | - Never |
| - Every 12 hours | |



The choice of exchange mode is necessary to prevent wear of a single pump.

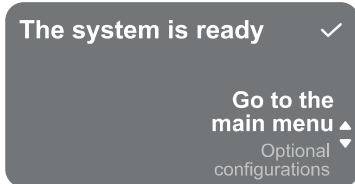


Enable water volume estimation function

To enable this function, refer to the chapter 14.3.5 Enabling water volume estimation. This option, which is only available when using the depth sensor, allows you to monitor the amount of liquid in the tank.



If this function is not enabled during the Filling or Draining Configuration, it can no longer be activated. This will only be possible by resetting to the factory data.



The system is ready

All the parameters have been set, the system is now in standby.



From here you can choose whether to access the "Main Menu" or set the "Optional Configurations". Refer to the respective chapters 14.5 Main menu and 14.4 Optional configurations.

14.3.5 Enabling water volume estimation



Tank shape

You can set the shape of the tank from those listed:

- Parallelepiped
- Cylinder

Once the shape has been chosen, indicate the volume by setting the largest side/diameter and the smallest side of the section.



Once configuration is complete, the system will be ready but in standby. You can choose whether to access the "Main Menu" or set the "Optional Configurations". Refer to the respective chapters 14.5 Main menu and 14.4 Optional configurations.

14.4 Optional configurations

14.4.1 Communication protocol configuration

This screen allows you to enable or disable the Modbus communication protocol to be applied to the device.



This section is intended for users who are familiar with Modbus devices. The operator should have a basic knowledge of this protocol and of the technical specifications.



It is also assumed that there is already a Modbus RTU network with a "master" device.



The protocol is implemented in the device, on the RS 485 input.

Its use is based on the remote control of drainage or waste water stations via the network. In this way, the device equipped with Modbus communication and appropriately connected to the pump will allow information and commands relating to its status to be transferred over the network

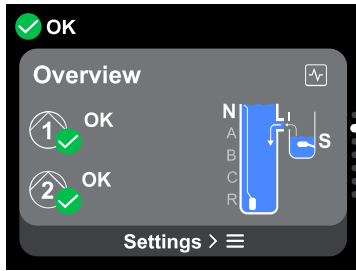


The electrical connections and supported parameters for MODBUS RTU communication are described in chapter 17 MODBUS COMMUNICATION PROTOCOL.

14.4.2 Additional settings

This screen allows the activation or deactivation of the alarm buzzer that warns and accompanies any warning and/or alarm phenomena occurring in the system.

14.5 Main menu



Panoramic view of the display

The screen describes:

- On the left pump 1 symbol and its status, pump 2 symbol and its status.
- On the right a graphic representation of the system condition and its status.

Status icons

The following icons apply to both pumps and the system



No status detected



Device ready



Device running



Warning



Alarm



Danger



The image is for representative purposes only. It does not describe an actual condition of the system.

14.5.1 First installation

Operation of the start system

Manual control ▲
Automatic control ▼



The “Pumping System Operation” pop-up appears only on first installation.

Activation of the system is allowed via “Manual Control” or “Autonomous Operation”.

Manual Control: press and hold the key ▲ to activate pump 1, press and hold the key ▼ to activate pump 2, press and hold the key ≡ to activate both pumps.



Once the system has been tested manually, it is necessary to return to the previous screen by pressing the key ↶ and selecting “Start Autonomous Operation”

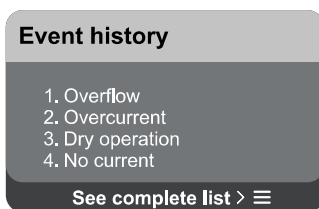
Start Autonomous Operation: it is possible to indicate from this screen which pumps to enable or disable, allowing the system to manage their activation autonomously.

14.5.2 Menu structure

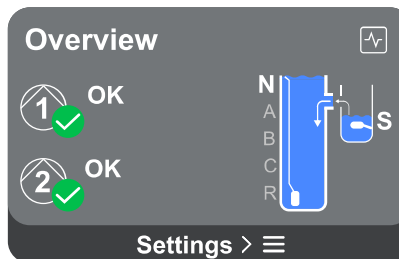


The first screen visible in the main menu is the “Overview”.
It is possible to view the all functions available in the menu structure from Fig.17

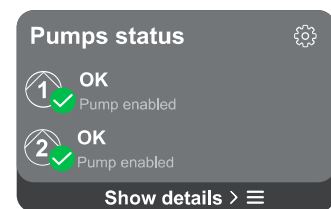
Error and Alarm Log



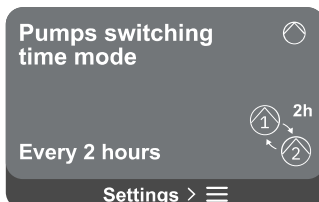
Overview



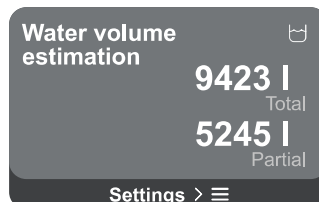
Pump status



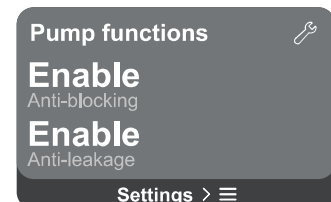
Pump exchange mode

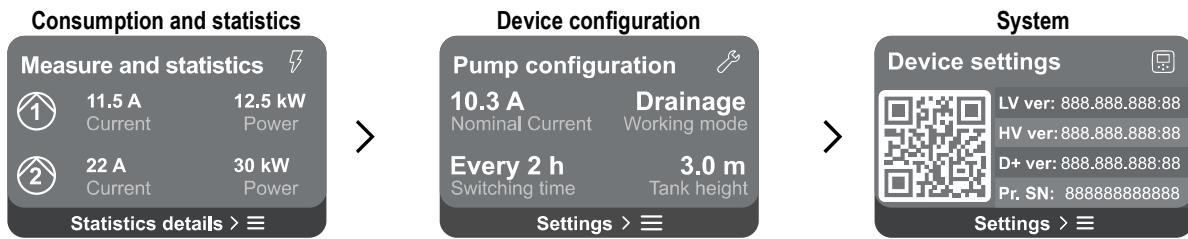


Water volume estimation



Auxiliary functions

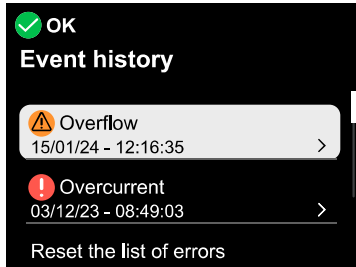




A description of each individual page follows.

To view the function provided by every single page, press key . Once you reach the last section of a menu page, use the key to navigate backwards to the main menu.

Error and Alarm Log



The alarm log is easily accessible in the list of pages in the main menu, immediately above the "Overview" menu page. This page shows the event history starting with the most recent one recorded by the system.

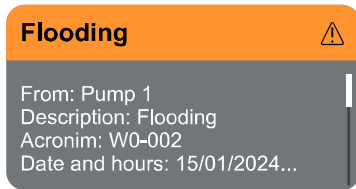
In the event of system and/or pump problems, check the information pop-up on the display and follow the step-by-step instructions.

The system provides a total of three types of alerts, in order of importance:

Warning
It detects a malfunction in the system or pumps, but this does not prevent operation.
(E.g. *Overflow*)

Error
It detects a malfunction that prevents the system or pumps from operating normally.
(E.g. *Overcurrent*)

Danger
It detects a critical issue in the system or pumps, which blocks their normal operation. In this condition it is suggested not to touch the devices and to contact Customer Service.



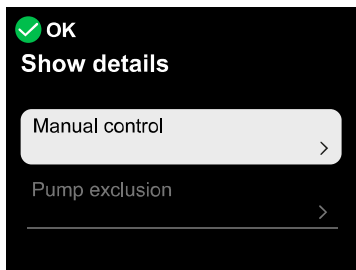
Pop-up Warnings and Alarms

From the list of events it is possible to view their description.

This allows you to understand the cause and the next action to be taken to remedy the fault.

The same section Error and Alarm Log, offers the possibility of resetting the list of errors recorded up to that moment. This operation requires confirmation in order to continue.

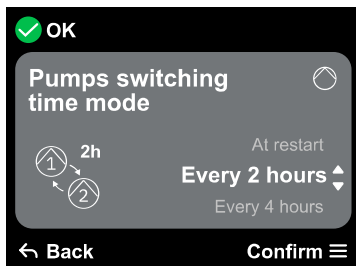
Pump status



The screen shows the operating status of the pumps in the system. When you access the menu page, the following options are shown:

- **Manual Control:** press and hold the key to activate pump 1, press and hold the key to activate pump 2, press and hold the key to activate both pumps.
- **Pump exclusion:** it is possible to indicate from this screen which pumps to enable or disable, allowing the system to manage their activation autonomously.

Pump exchange mode



Pump exchange mode

One of the following intervals can be set:

- At restart
- Every 2 hours
- Every 4 hours
- Every 8 hours
- Every 12 hours
- Every 16 hours
- Every 20 hours
- Every 24 hours
- Never

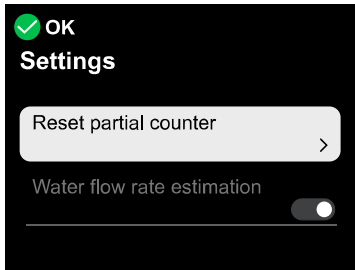


The choice of exchange mode is necessary to prevent wear of a single pump.

Water volume estimation



This function is not visible unless it has been activated during Drainage configuration or Filling configuration. This function can only be activated by resetting to the factory data.



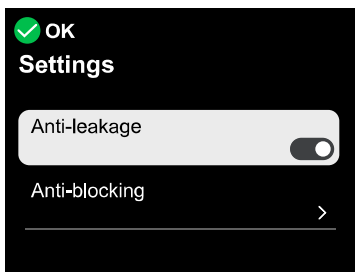
The screen shows a total and partial estimate of the liquid contained in the tank. When you access this menu page, the following options are shown:

- **Reset partial counter:** selecting this option deletes the partial liquid measurement. Confirm twice to delete.
- **Water volume estimation:** selecting this option allows the Water volume estimation menu to be masked from the main menu screens.



This function is not visible unless it has been activated during Drainage configuration or Filling configuration. This function can only be activated by resetting to the factory data.

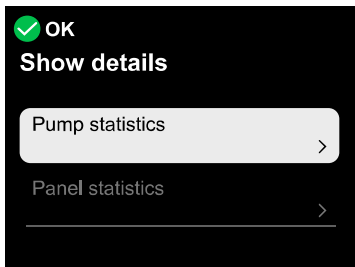
Auxiliary functions



When you access this menu page, the following options are shown:

- **Anti-leakage:** if this function is active, there will not be more than 8 starts per minute, per pump.
- **Anti-blocking:** this function is used to prevent blocking of the pumps due to long inactivity. If enabled, the system can start the pumps every 2 to 5 days.

Consumption and statistics



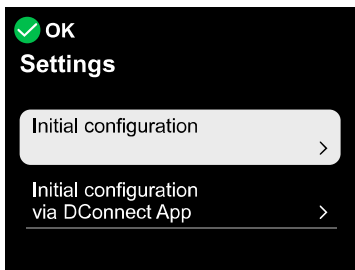
The screen shows the absorbed current and power of each pump in the system. When you access this menu page, the following options are shown:

- **Pump statistics:** this section shows the partial and total counts, both of hours worked and number of restarts, for each of the pumps in the system. To reset the counts, go to the subsection "Reset counters", see the corresponding section below.
- **Hours of panel operation:** this section shows the total count of hours worked by the panel, starting from the first installation.

Reset counters

By accessing this subsection of the menu, it is possible to reset the worked hours and restarts, only of partial counts. This operation can be carried out on Pump 1, on Pump 2, or on both pumps. Each deletion requires double confirmation to continue.

Device configuration



The screen shows a brief summary of the status and settings assigned to the system. The main items described are: the absorbed current, the system operating mode, the pump exchange mode, and finally the tank height.

When you access this menu page, the following options can be displayed:

- **Initial configuration:** this feature offers:
Read-only access: This function allows you to view all the settings defined during the Initial configuration. Access is read-only and therefore values cannot be changed.

Modify configuration: This function allows the Initial configuration, to be performed again, allowing the user to change previously set values. Refer to the chapter 14.1 Initial configuration.



Once confirmed this choice, the device will stop and will restart from the initial configuration. To run the system it is necessary to redo the configuration..

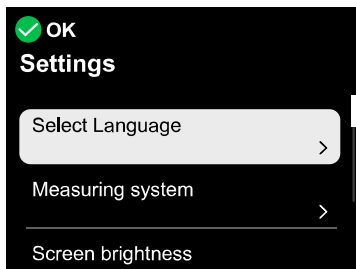
- **Initial configuration via DConnect App:** this feature allows the initial configuration to be performed again via the Dconnect application. Refer to the chapter 14.1.1 Initial configuration with DConnect App.



Once confirmed this choice, the device will stop and will restart from the initial configuration. To run the system it is necessary to redo the configuration..

- **Communication protocol:** This screen allows you to manage the Modbus communication protocol, for BMS to be applied to the device. Specifically, it is possible to:
 - Configure the Modbus protocol (see chapter 17), if not done at first Installation;
 - Activate or deactivate the Modbus protocol;
 - Consult the details of the Modbus configuration in read-only mode.
- **Additional settings:** This screen allows the activation or deactivation of the alarm buzzer that warns and accompanies any warning and/or alarm phenomena occurring in the system.

System



The screen shows the parameters identifying the panel and its firmware versions on the right, and a QR-code containing more product identification data on the left.

When you access this menu page, you can view the functions described in the System settings section.



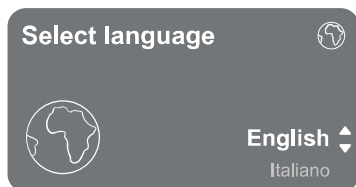
ATTENTION!!

Press and hold the key  for 5 seconds to display the QR-code complete with all product identification data. To exit this page, wait 2 minutes or press any key.

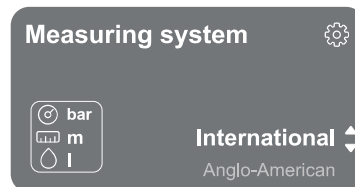
System settings

Below are the main system settings.

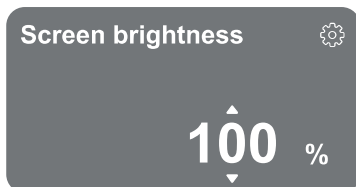
Select language



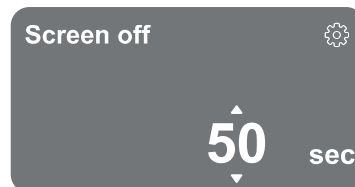
Measuring system



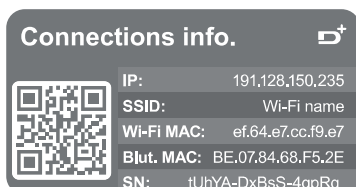
Screen brightness



Screen off



Connectivity details



Press and hold the key  to display the complete connectivity serial

Reset factory data



ATTENTION!!

Make sure the system is secured before proceeding!
The configuration requires double confirmation to continue. This is because the action will cause the engine to stop, and all settings and configurations will be reset to factory values. The procedure cannot be undone in any way.

15 GENERAL SYSTEM RESET

To reset the device, hold down the 4 keys on the panel simultaneously for at least 1 sec. This operation does not delete the settings saved by the user.

15.1 Restoring the factory settings

To restore the factory settings, refer to chapter System settings.

16 APP AND DCONNECT CLOUD SYSTEM REQUIREMENTS

Through the app or through the service center, you can update the product software to the latest version available.

APP requirements: Smartphone

- Android ≥ 8 .
- IOS ≥ 12
- Internet access

PC requirements for accessing the Cloud dashboard

- WEB browser that supports JavaScript (e.g. Microsoft Edge, Firefox, Google Chrome, Safari).
- Internet access.

Internet Network Requirements for Dconnect Cloud access

- Active and permanent direct Internet connection on site.
- Modem/Router WiFi.
- Good quality WiFi signal and power in the area where the product is installed.



If the WiFi signal is deteriorated, we suggest using a Wifi Extender.



The use of DHCP is recommended, although a Static IP can be set.

Firmware Updates

Before starting to use the device, make sure that the product is updated to the latest SW version available.

Updates ensure you of a better use of the services offered by the product.

To get the most out of the product, also check out the online manual and watch the demonstration videos. All the necessary information is available at dabpumps.com or on: Internetofpumps.com.

16.1 App download and installation

The product can be configured and monitored via a special app available from the main stores.

In case of doubt, go to internetofpumps.com for guidance.

- Download the DConnect! APP from Google Play Store for Android devices or the App Store for Apple devices.
- Once downloaded, the icon associated with the DConnect APP will appear on the screen of your device.
- For optimum operation of the APP, accept the conditions of use and all the required permits to interact with the device.
- For the initial set-up and/or registration to the DConnect cloud and the installation of the controller to be successful, it is necessary to read carefully and follow all the instructions given in the DConnect APP.

download the app from
<http://internetofpumps.com>



16.2 DConnect DAB Cloud Registration

If you do not already have a DConnect DAB account, register by clicking on the appropriate button. A valid email is required to which the activation link will be sent for confirmation.

Enter all required data marked with an asterisk. Please agree to the privacy policy and fill in the required data.

Registration with DConnect is free of charge and enables you to receive information on the use of DAB products.

16.3 Product configuration

The product can be configured and monitored via a special app available from the main stores. In case of doubt, go to internetofpumps.com for guidance.

The app guides the installer step-by-step through the initial set-up and installation of the product. The app also allows the installer to update the product and take advantage of DConnect digital services. Refer to the APP itself to complete the operation.

17 MODBUS COMMUNICATION PROTOCOL

The purpose of this paragraph is to illustrate the correct use of the MODBUS interface to be applied to the device.



This section is intended for users who are familiar with Modbus devices. The operator should have a basic knowledge of this protocol and of the technical specifications.



It is also assumed that there is already a Modbus RTU network with a "master" device.

Abbreviations and definitions

CRC	CyclicRedundancyCheck
RTU	Remote Terminal Unit
0x	Prefix identifying a hexadecimal number

17.1 Electrical connection

The Modbus protocol is implemented on the RS 485 bus. The connections must be made according to the table below.

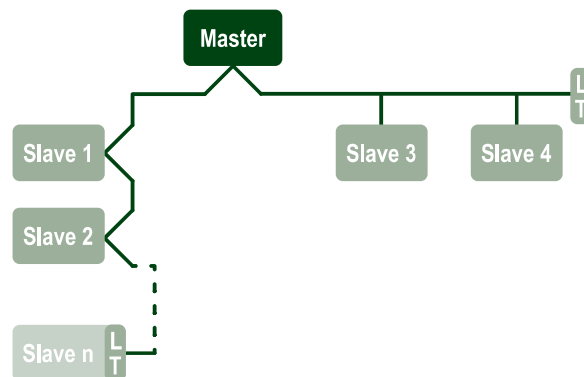
Modbus Terminal	Description
A	Terminal not inverted (+)
B	Terminal inverted (-)
Y	GND

Tabella 6

17.2 Modbus Configuration

The device can be directly connected in a MODBUS RTU RS485 network as a slave device.

The following graph provides a graphic representation of the type of network to be created.



Through Modbus communication, the pump will allow the transfer of information and commands relating to its status and the status of any pump set to which it belongs.

The parameters supported for MODBUS RTU communication are described below.

Modbus specifications	Description	Notes
Protocol	Modbus RTU	Only "Slave" mode is supported
Connections	Terminal block	

Physical interface	RS485	
Modbus address	From 1 (default) to 247	
Speed supported	2400, 4800, 9600, 19200 (default), 38400	
Start bit	1	
Data bit	8	
Stop bit	1 (default), 2	
Parity bits	None, even (default), odd	
Response delay	From 0 (default) to 3000 millisecc. (3 sec.)	

Table 7 Modbus RTU parameters

17.3 Modbus RTU registers

The supported functions are shown in the following table:

Type	code	Hex	Name	Prefix Register
16-bit data (registers)	03	0x03	Read holding registers	4
	04	0x04	Read input registers	3
	05	0x05	Write coil	0
	06	0x06	Write holding register	4
	16	0x10	Write multiple holding registers	4

17.3.1 Type of Modbus messenger

Depending on the operating status of the slave, error messages may also be received. In particular, the device may return the following error messages:

Error code	Meaning
01	Invalid function. This error is also used in case of a generic error
02	Address invalid or not available at the time of request
03	Invalid value. The indicated value is invalid and therefore has not been set
04	Command not executed

Any possible error response will be highlighted after the individual command has been processed.

Type	Register	Name	R/W	Range	Description
Holding	0001	Select language	R/W	0-20	00 → ITA 11 → RUS 01 → ENG 12 → POR 02 → DEU 13 → THA (not present) 03 → SPA 14 → FRE 04 → DUT 15 → SLO (not present) 05 → FIN 16 → CHI (not present) 06 → SWE 17 → ARB 07 → TUR 18 → GRE 08 → RUM 19 → HUN 09 → CZE 20 → UKR 10 → POL
Holding	0002	Measuring system	R/W	0-1	0 → International 1 → Angloamerican
Holding	0003	Pump exchange mode	R/W	0-8	0 → Exchange at restart 5 → Exchange every 16 hours 1 → Exchange every 2 hours 6 → Exchange every 20 hours 2 → Exchange every 4 hours 7 → Exchange every 24 hours 3 → Exchange every 8 hours 8 → Exchange deactivated 4 → Exchange every 12 hours
Holding	0004	Pump exclusion	R/W	0-3	0 → Do not exclude 2 → Exclude pump 2 1 → Exclude pump 1 3 → Exclude all pumps
Holding	0005	Anti-lock	R/W	0-2	0 → Disabled 1 → Enabled with activation every 2 days

ENGLISH

					2 → Enabled with activation every 2 days	
Holding	0006	Operating mode	R	0-1	0 → Drainage 1 → Filling	
Holding	0007	Absorbed current	R	5-290	In tenths of A	
Holding	0008	Type of control	R	0-2	0 → Float 1 → Level probe 2 → Depth sensor (analogue input)	
Holding	0009	Tank with protection float	R	0-3	0 → No float 1 → High float	2 → Low float 3 → Both floats
Input	1001	Panel Status	R	0-4	0 → Initial status 1 → Standby status 2 → Fault status	3 → Warning status 4 → Communication error with MB
Input	1002	Panel Error* (H)	R		See Error list	
Input	1003	Panel Error* (L)	R		See Error list	
Input	1004	Pump 1 status	R	0-6	0 → Initial status 1 → Standby status (motor stopped, no error) 2 → Motor running status 3 → Warning status	4 → Motor stopped due to an error 5 → Pump excluded by control 6 → Communication error with MB
Input	1005	Pump 1* Error (H)	R		See Error list	
Input	1006	Pump 1* Error (L)	R		See Error list	
Input	1007	Pump 2 status	R	0-6	0 → Initial status 1 → Standby status (motor stopped, no error) 2 → Motor running status 3 → Warning status	4 → Motor stopped due to an error 5 → Pump excluded by control 6 → Communication error with MB
Input	1008	Pump 2* Error (H)	R		See Error list	
Input	1009		R		See Error list	
Input	1010	System status	R	0-4	0 → Initial status 1 → Standby status 2 → Fault status	3 → Warning status 4 → Communication error with MB
Input	1011	Present Current Pump 1	R			
Input	1012	Present Current Pump 2	R			
Input	1013	Present Power Pump 1	R			
Input	1014	Present Power Pump 2	R			
Input	2001	Estimated water volume (H)	R			
	2002	Estimated water volume (L)	R			
Input	2003	Panel operating hours (H)	R			
Input	2004	Panel operating hours (L)	R			
Input	2005	Number of pump 1 starts (H)	R			
Input	2006	Number of pump 1 starts (L)	R			
Input	2007	Number of pump 2 starts (H)	R			
Input	2008	Number of pump 2 starts (L)	R			
input	2009	Number of pump 1 starts (partial) (H)	R			
Input	2010	Number of pump 1 starts (partial) (L)	R			
Input	2011	Number of pump 2 starts (partial) (H)	R			
Input	2012	Number of pump 2 starts (partial) (L)	R			
Input	2013	Hours worked by pump 1 (H)	R			

ENGLISH

	2014	Hours worked by pump 1 (L)	R			
Input	2015	Hours worked by pump 2 (H)	R			
Input	2016	Hours worked by pump 2 (L)	R			
Input	2017	Hours (partial) worked by pump 1 (H)	R			
Input	2018	Hours (partial) worked by pump 1 (L)	R			
Input	2019	Hours (partial) worked by pump 2 (H)	R			
Input	2020	Hours (partial) worked by pump 2 (L)	R			
Input	3001	Error type (history) #1	R			
Input	3002	Error type (history) #2	R			
Input	3003	Error type (history) #3	R			
Input	3004	Error type (history) #4	R			
Input	3005	Error type (history) #5	R			
Input	3006	Error type (history) #6	R			
Input	3007	Error type (history) #7	R			
Input	3008	Error type (history) #8	R			
Input	3011	Error label (history) #1	R			
Input	3012	Error label (history) #2	R			
Input	3013	Error label (history) #3	R			
Input	3014	Error label (history) #4	R			
Input	3015	Error label (history) #5	R			
Input	3016	Error label (history) #6	R			
Input	3017	Error label (history) #7	R			
Input	3018	Error label (history) #8	R			
Input	3021	Error timestamp (error history) #1 (H)	R			
Input	3022	Error timestamp (error history) #1 (L)	R			
Input	3023	Error timestamp (error history) #2 (H)	R			
Input	3024	Error timestamp (error history) #2 (L)	R			
Input	3025	Error timestamp (error history) #3 (H)	R			
Input	3026	Error timestamp (error history) #3 (L)	R			
Input	3027	Error timestamp (error history) #4 (H)	R			
Input	3028	Error timestamp (error history) #4 (L)	R			
Input	3029	Error timestamp (error history) #5 (H)	R			
Input	3030	Error timestamp (error history) #5 (L)	R			
Input	3031	Error timestamp (error history) #6 (H)	R			
Input	3032	Error timestamp (error history) #6 (L)	R			
Input	3033	Error timestamp (error history) #7 (H)	R			
Input	0534	Error timestamp (error history) #7 (L)	R			
Input	0535	Error timestamp (error history) #8 (H)	R			
Input	0536	Error timestamp (error history) #8 (L)	R			

ENGLISH

Coil	0001	Reset the partial count. for pump 1	W		Write 1 to execute the command
Coil	0002	Reset the partial count. for pump 2	W		Write 1 to execute the command
Coil	0003	Reset Fault history	W		Write 1 to execute the command
Coil	0004	Reset Current Fault	W		Write 1 to execute the command

Abbreviations	
W	Write only register
R	Read only register
RW	Read / Write register

18 TROUBLESHOOTING



Before starting to look for faults it is necessary to disconnect the power supply to the pump.

Code	Possible causes	Solution
F0-002 F0-003	One of the two pumps has absorbed a current higher than the set rated current.	1. Check that the set rated current corresponds to the rating plate data of the pumps connected to the panel. If it is lower, increase it to the rating plate value. 2. Ensure that the rotor of pump is not blocked. If it is, try to eliminate the blockage. 3. Check that there are no short circuits in the stator windings of pump.
F0-004	The panel detects current absorption by one of the two pumps, although it has not been started	1. Switch off the panel and check whether the left-hand contactor is stuck in the closed position. If it is, replace it with one of the same model. 2. If the left-hand contactor is not locked in closed position, there may be a fault on the board. Contact Customer Service
F0-007	Overcurrent or power failure detected during attempts to unlock the pump	1. Check that the set rated current corresponds to the rating plate data of the pumps connected to the panel. If it is lower, increase it to the rating plate value. 2. Ensure that the rotor of the pump is not blocked. If it is, try to eliminate the blockage and remove the blocked pump error. 3. If the pump is not shown, disable it from the screen Pump status > Pump exclusion.
F0-008 F0-009	Input voltage different than at switch-on (lower or higher)	Check the condition of the panel power supply line.
F0-010 F0-024	EEPROM not read/written correctly	1. Fault on the board. Contact Customer Service. 2. Firmware problem. Contact Customer Service.
F0-017	Product type not set	Set product type via the serial configuration interface.
F1-001 F1-002	Parameters or parameter combinations with invalid values. Otherwise one or more parameters not set.	Perform initial configuration again.
F1-000 F1-003 F1-004 F1-005 F1-007	Internal voltage outside specifications	Fault on the board. Contact Customer Service.
F1-008	Filling tank above maximum level. Float/level probe connected to inlet N indicates presence of water.	1. Check that the float is not stuck in the low position. 2. Jumper input N, if you do not want to use the overflow float/probe and the digital inputs are NC (normally closed) floats. On the other hand, remove any jumper if the digital inputs are NO (normally open) floats or level probes. 3. Reconfigure the panel so that it does not use input N or so that it does not use inputs R and N (This choice is only possible with control via depth sensor). 4. Check that the polarity of the control or protection floats matches that of the floats used.
F1-009	Drainage tank below minimum level. Float/level probe connected to inlet N indicates lack of water.	1. Check that the float is not stuck in the low position. 2. Jumper input N, if you do not want to use the dry operation float/probe and the digital inputs are NO (normally open) floats or level probes. On the other hand, remove any jumper if the digital inputs are NC (normally closed) floats. 3. Reconfigure the panel so that it does not use input N or so that it does not use inputs R and N (This choice is only possible with control via depth sensor). 4. Check that the polarity of the control or protection floats matches that of the floats used.
F1-010	Dry run warning. Float/level probe connected to inlet S indicates lack of water.	1. Check that the float connected to inlet S is not stuck in the low position. 2. Jumper input S, if you do not want to use the dry operation float even though you decided to use it during initial configuration. 3. Reconfigure the panel so that it does not use input S (dry operation float). 4. Check that the dry operation float is of the NO (normally open) type. If it is not, replace it or change its configuration, acting on the float.

ENGLISH

F1-011	Depth sensor error	1. Check that the sensor is connected to input AIN1. 2. Check that the sensor is not damaged and that the connection cable to the panel is intact.
F1-012	The panel tried to start one of the two pumps, but measured a lower absorption than the set rated current.	1. Check that the set rated current corresponds to the rating plate data of the pumps connected to the panel. If it is higher, decrease it to the rating plate value. 2. Check whether one of the pump cables is not connected to the panel. 3. Check that the thermal protection built into pump has not tripped. 4. If the thermal protection built into pump is not available, check that the jumper is present on terminal KK.
F1-037	Rated current set unsuitable for product type and/or input voltage	1. Reset, reducing the rated current parameter. 2. Check that the input voltage matches the voltage stated on the data plate of the pumps in use.
W0-001	Pump stopped for a longer time than the anti-lock protection intervention time	1. Wait for the unlocking procedure to end. 2. Deactivate the anti-lock protection from the additional settings menu if you prefer it not to intervene.
W0-002	Current entering the panel from inlet AIN2	1. If you are going to use the flood sensor, check the functionality of the flood sensor connected to input AIN2 2. If you are not going to use the flood sensor, check that there are no wires connected to the input AIN2
W0-003	Filling tank below minimum level. Float/level probe connected to inlet R indicates lack of water.	1. Check that the float is not stuck in the high position. In the case of level probes, check that the tank is not conductive. 2. Jumper input R, if you do not want to use the empty delivery tank float/probe and the digital inputs are NC (normally closed) floats. On the other hand, remove any jumper from input R if the digital inputs are NO (normally open) floats or level probes. 3. Reconfigure the panel so that it does not use input R or so that it does not use inputs R and N (This choice is only possible with control via depth sensor). 4. Check that the polarity of the control or protection floats matches that of the floats used.
W0-004	Drainage tank above maximum level. Float/level probe connected to inlet R indicates presence of water.	1. Check that the float is not stuck in the high position. In the case of level probes, check that the tank is not conductive. 2. Remove any jumper from input R, if you do not want to use the overflow float/probe and the digital inputs are NO (normally open) floats or level probes. On the other hand, jumper input R if the digital inputs are NC (normally closed) floats. 3. Reconfigure the panel so that it does not use input R or so that it does not use inputs R and N (only possible with control via depth sensor). 4. Check that the polarity of the control or protection floats matches that of the floats used.
W0-005 W0-006	Filling: the pumping capacity of the usable pumps is not sufficient to empty the tank.	1. Check that the pumps present are both activated (not excluded from pumping). If they are not, activate them from the Pump status screen menu. 2. If any pumps are in error status, try resetting the errors by removing the cause and performing a reset from the Error and Alarm Log screen menu. 3. Remove any obstructions in delivery and/or suction. 4. Use pumps with higher pumping capacity.
	Drainage: one or more pumps forced into operation when there is no need to empty tank. Other causes result in the suction tank being emptied without the pumps running.	1. Eliminate forced operation. 2. Eliminate the cause of tank emptying, which is not due to the pumps connected to the panel.
W0-007	Internal voltage outside specifications	1. Current overload of the depth sensor connected to AIN1, or of the flood sensor connected to AIN2. Check that the sensors are intact. 2. Fault on the board. Contact Customer Service.
W0-008	No input voltage	Switch the panel back on to restore normal operation
W0-009	Water detected in the oil chamber of one of the two pumps.	Check that the seals of pump are intact
W0-010	The control (or in manual mode) requests more than 8 pump starts per minute.	1. When controlled by floats or level probes, use the pump stop float. If it is already in use, restore correct operation.

		2. When controlled by depth sensor, use levels that are more separated from each other.
W0-012	When first switched on, a discrepancy in water level status is detected in float A or between floats A and B.	1. Check that the float connected to inlet B is not stuck in the high position (Drainage) or low position (Filling), and that the float connected to inlet A is not stuck in the low position (Drainage) or high position (Filling). In the case of level probes, check that no non-conductive substances (e.g. plastic, wood, glass and paper) have been deposited on the probe connected to inlet A and that the probe connection cable is intact. 2. In case of subsequent addition of the float/probe connected to inlet A, carried out with the panel switched on, restart the panel.
W0-013	Float/probe connected to inlet B detect a discrepancy in water level status than Float/probe connected to inlet C	Check that the float connected to inlet B is not stuck in the low position (Drainage) or high position (Filling) and that the float connected to inlet C is not stuck in the high position (Drainage) or low position (Filling). In the case of level probes, check that no non-conductive substances (e.g. plastic, wood, glass and paper) have been deposited on the probe connected to inlet B and that the probe connection cable is intact.

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