EVOPLUS / EVOPLUS SAN

WET ROTOR ELECTRONIC CIRCULATORS

EVOPLUS SAN

EVOPLUS

TECHNICAL DATA

Operating range: from 3 a 75.6 m³/h with head of up to 18 metres.
Pumped liquid temperature range: from -10 °C to +110 °C.
Pumped liquid: clean, free of solids and mineral oils, non-viscous, chemically neutral, with properties similar to water. (glycol max 30%).
Maximum operating pressure: 16 bar (1600 kPa).
Standard flanges: DN 32, DN 40, DN 50, DN 65, PN 6 / PN 10 / PN 16 (4 holes), DN 80 and DN 100, PN 6 (4 holes).
Maximum ambient temperature: + 40 °C.
Minimum suction pressure: the values are shown in the corresponding tables.
Special executions on request: DN 80, DN 100 PN 10 / PN 16 (8 holes).
Accessories (Counter flanges): PN 10 DN 32 - DN 40 - DN 50 - DN 65 PN 6 DN 80 - DN 100.
Electromagnetic compatibility: EVOPLUS circulator comply with EN 61800-3 standard, category C2, as far as electromagnetic compatibility.
Electromagnetic emissions - Residential environment (containment measures might be required in some cases).
Conducted emissions - Residential environment (containment measures might be required in some cases).

APPLICATIONS

EVOPLUS circulation electronic pumps can be used in heating, ventilation, and air conditioning systems for residential and commercial buildings, like:
-Large residential buildings -Condominiums and small apartment buildings -Homes
-Private and public hospitals -Schools -Office buildings
-Real estate buildings
All the models are available both in the single and twin version.
Bronze pump execution for the recirculation of sanitary water, available in single version with DN 32, DN 40, DN 50 and DN 65 flanged ports.
Supplied as a standard ready for control using 0-10 V or PWM external signal, and for the connection to ModBus management systems (LonBus with appropriate communication module available as optional). **You can remotely control the single version thanks to the Dconnect service** (with Dconnect Box provided separately).

HEATING SYSTEM APPLICATIONS

The heating required for the different applications varies significantly during day and night, due to the external temperature, or the degree of occupancy inside the areas. To the above, one must add the different needs of the various environments, and the opening or closing of the various circuit branches of complex systems. Electronic wet rotor pumps ensure at all times, and virtually in all correctly sized systems, a sufficient level of energy, together with a quieter operation, and more comfort, together with an important reduction of operating costs.

AIR CONDITIONING APPLICATIONS

Unlike conventional electronic pumps, EVOPLUS electronic circulators can also be used in air conditioning systems where the temperature of the pumped liquid is lower than the room temperature. In these conditions, condensation tends to form on the outer surface of the circulator, which however does not affect the operation of the electronic and the mechanical components. The unit is designed and sized in such a way that it allows condensation to drain without damage to the construction components.

SANITARY RECIRCULATION APPLICATIONS

The SAN version, with bronze pump body, was specifically developed for the recirculation of sanitary water. With the constant temperature mode of operation, the temperature inside the recirculation piping is controlled without the need for thermostat valves, therefore optimizing comfort.

CONSTRUCTION FEATURES

Monobloc circulation pump consisting of the cast iron hydraulic section, and the wet rotor synchronous motor. Aluminium motor casing. Scroll type pump body featuring high hydraulic efficiency thanks to highly precise design and smooth internal surfaces. In-line suction and delivery ports.
The single version is supplied as standard with insulating casing, to avoid heat dispersion and/or the formation of condensation on the pump body.
For the twin version, the insulation must be provided by the installer. In any case, pay attention not to obstruct the condensation drainage ducts, to avoid impairing the operation of the circulator.

Technopolymer impeller, stainless steel motor shaft on ceramic bushings lubricated by the pumped liquid. Stainless steel rotor protection liner. Ceramic thrust ring, ethylene-propylene seal rings and carbon fibre composite stator liner. Asynchronous motor with permanent magnet rotor. The twin version features an automatic swing check valve incorporated in the delivery port, to avoid water recirculating through the unit when this is not running; in addition, a blank flange is also supplied as standard, to allow either of the two motors to be removed for servicing. The standard execution of the pump body is PN 16. DN 80 and DN 100 PN 16 (8 holes) also available on request.
Circulator protection class: IP X4D
Insulation class: F
Standard voltage: single-phase 220/240 V / 50/60 Hz
sound pressure value $\leq$ 45 dB(A)
Product compliant with European Standards EN 61800-3 – EN 60335-1 – EN 60335-2-51

DCONNECT SERVICE

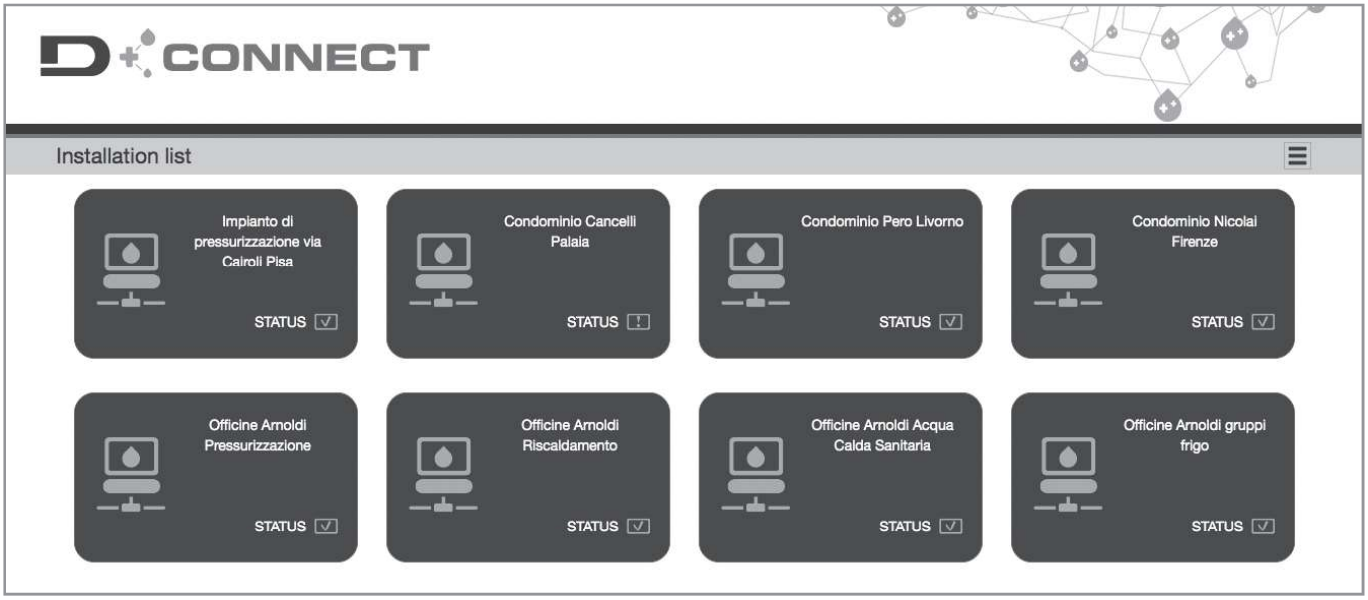
REMOTE CONTROL FOR ELECTRONIC RESIDENTIAL AND COMMERCIAL SYSTEMS

The Dconnect service offers simple and intuitive remote control of your installation, without the need of a server or specialist personnel.
With Dconnect, you can remotely manage your installations as if you were right in front of them.
Thanks to the system operation charts, you will also be able to optimise operation. You will also receive prompt notifications of any system faults.

THE CONNECTIVITY SERVICE ALLOWS YOU TO:

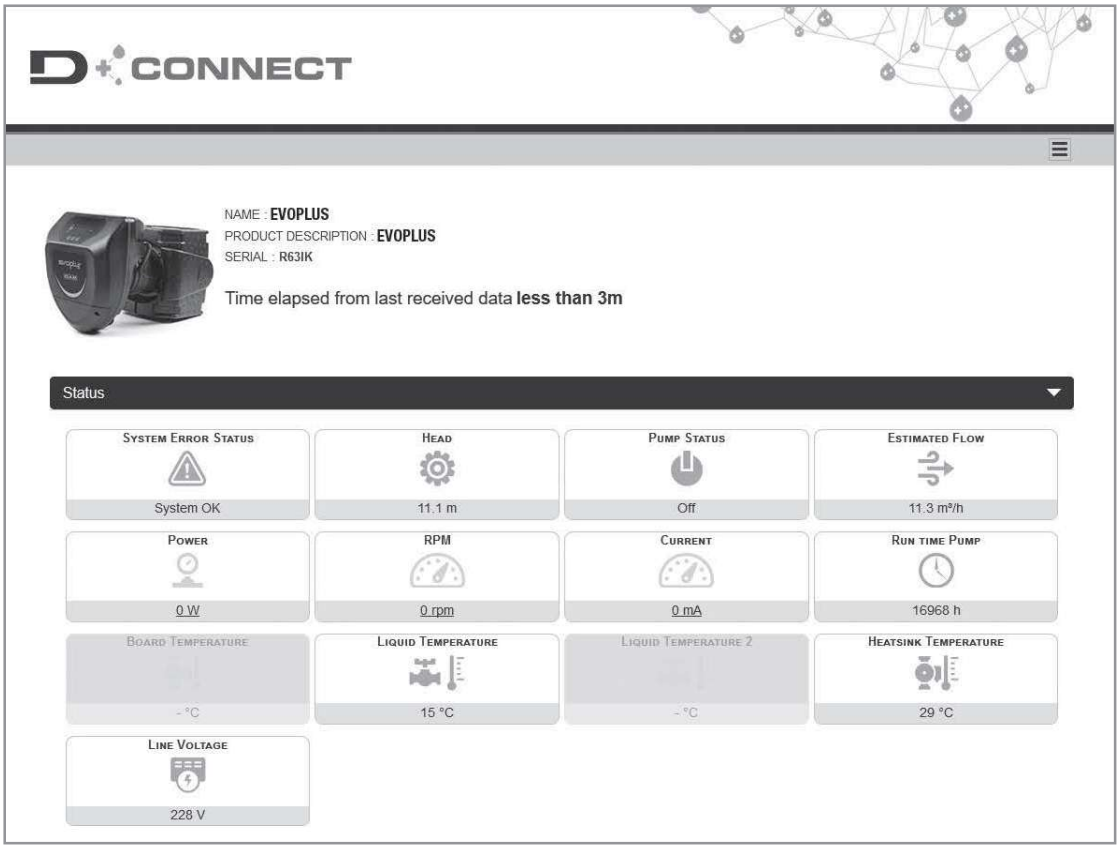
EASILY MONITOR YOUR SYSTEMS

The installations with green status are OK, while the orange ones need attention, and the red ones are experiencing problems



TAKE ANY NECESSARY ACTIONS AS IF YOU WERE RIGHT IN THE PUMP ROOM

Using the internet site or the APPs, you will be able to easily and quickly control your systems.



DCONNECT SERVICE

REMOTE CONTROL FOR ELECTRONIC RESIDENTIAL AND COMMERCIAL SYSTEMS

In order to use the Dconnect service, registration and connected products are required.
Connect to the website: **https://dconnect.dabpumps.com**, using Internet Browsers such as Microsoft Edge or Google Chrome.
The Android and iOS Dconnect APPs can be downloaded from the relevant Stores:

REMOTE ALARMS

In case of alarm, the Dconnect service will promptly send you a notification, so that you can check what is happening and organise a visit to the system before the issue becomes an emergency for your customer.

WHAT PRODUCTS CAN YOU MANAGE USING THE DCONNECT SERVICE?

MCE/P, MCE/C, ADAC, Active driver Plus, Ebox, Evoplus, Esybox, Esybox mini, Esybox Diver, Dtron 3.

WHAT DO YOU NEED TO USE THE SERVICE?

1. DConnect Box
2. Cables for the connection of the DConnect Box / Dconnect Box 2 to the products to control
3. One or more compatible products
4. An internet connection in the system to control

For more information visit: **internetofpumps.com**

EVOPLUS CONSTRUCTION CHARACTERISTICS COLLECTIVE SYSTEMS (ELECTRONIC DEVICE)*

EVOPLUS circulators are controlled by a latest generation NPT technology IGBT device, for better efficiency and strength. The specific features are:

- Sine-wave PWM modulation
- High carrier frequency to eliminate all audio band noise
- 2 dedicated 32 bit processors

one for driving the motor
one for the user interface, enabling to perform the following functions:

- start/stop command
- Economy command
- 0-10 V analogue signal command
- PWM signal command
- 4-20 mA analogue signal command
- ΔT temperature sensor signal command
- connection to ModBus system management devices. Optional LonBus with appropriate module.

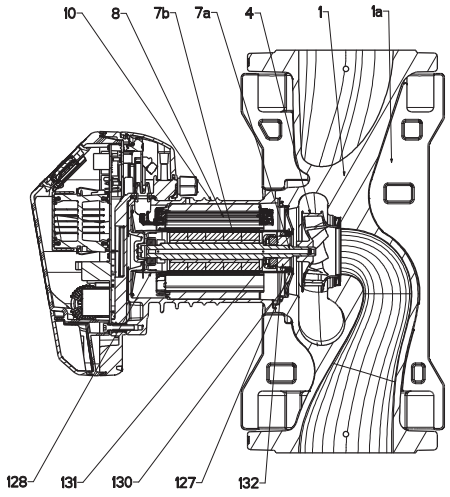
- Optimised "space vector" algorithm
- Presence/absence of system alarms
- Pump in operation notification

*** Inputs only available if the associated function is active.**

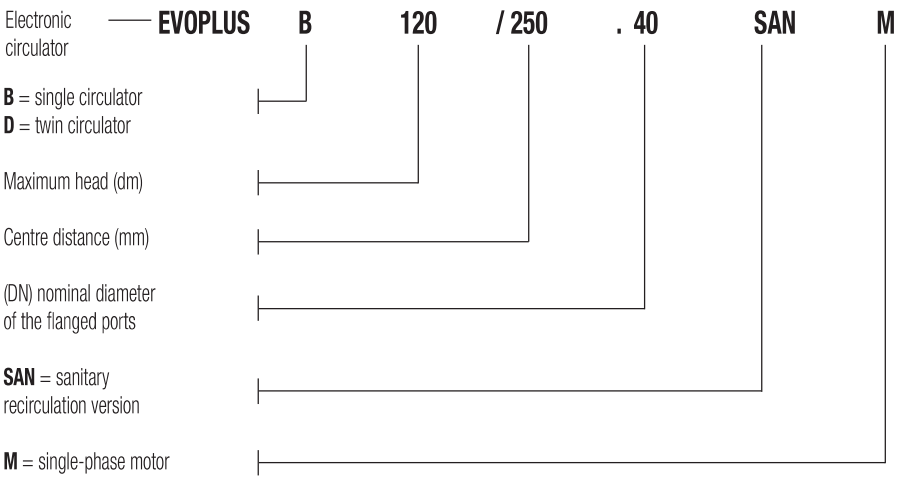
An intuitive and functional user interface guarantees ease of calibration by all users. The easy to read OLED display on the control panel, three simple navigation keys, an in-line cascade menu featuring the latest mobile technology trends, and a wide range of functions, mean that EVOPLUS circulators are truly revolutionary products. A reliable and sturdy construction, together with a modern and innovative design, complete the product, also in terms of aesthetic value.

MATERIALS

N.	PARTS	MATERIALS
1	PUMP BODY	CAST IRON 250 UNI ISO 185 - CTF BRONZE (for the SAN version)
4	IMPELLER	TECHNOPOLYMER
7A	MOTOR SHAFT	STAINLESS STEEL
7B	ROTOR	STAINLESS STEEL LINER
8	STATOR	-
10	MOTOR CASING	DIE-CAST ALUMINIUM
127	SEAL RING	EPDM RUBBER
128	STATOR LINER	COMPOSITE AND CARBON FIBRE
130	CLOSING FLANGE	STAINLESS STEEL
131	THRUST RING SUPPORT	STAINLESS STEEL
132	BUSHINGS	ALLUMINA



- Legend:
(example)

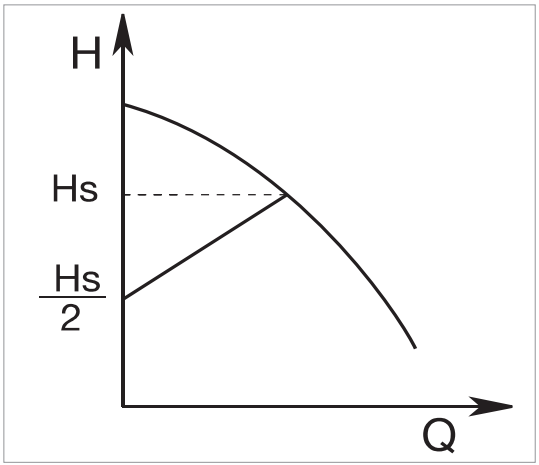


MODES OF OPERATION

All the functions listed below can be consulted by the users (including less experienced ones) by simply scrolling through the menu. The calibration and the modification of the parameters are protected, and can only be completed by expert users. The factory settings of the EVOPLUS range are for proportional differential pressure control mode in the curve that ensures the best energy efficiency index (EEI).

1 - ΔP-v proportional differential pressure adjustment mode

With ΔP-v adjustment mode, with the variation of the flow rate, the value of the delivery of the head also varies in a linear manner, from Hsetp to Hsetp/2.



This adjustment is particularly indicated for the following systems:

a. Two-pipe heating systems with thermostat valves and with:

- head greater than 4 metres;
- very long circuit piping;
- valves with wide operating range;
- differential pressure regulators;
- high pressure drops in those parts of the system carrying the entirety of the water flow rate;
- low differential pressure.

b. Under-floor central heating systems with thermostatic valves and significant pressure drops in the boiler circuit.

c. Systems with primary circuit pumps with high pressure drops.

Example of set-up of the set-point with ΔP-v

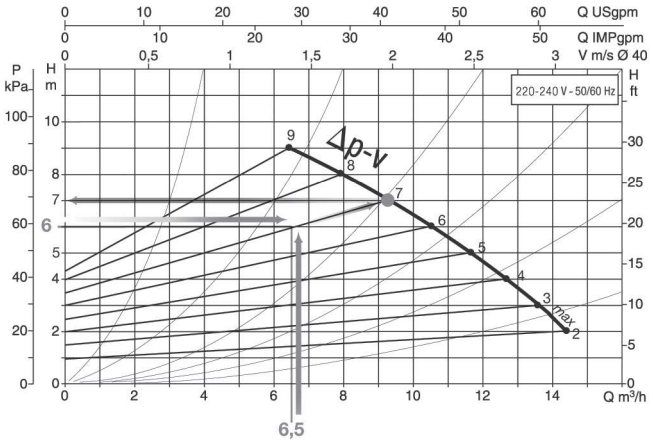
The following operating point is required:

Q = 6,5 m³/h

H = 6 m

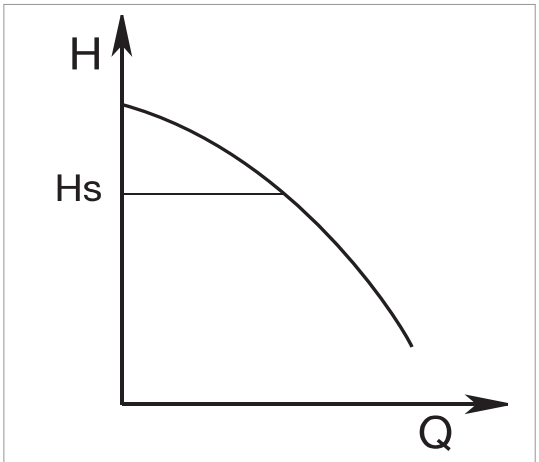
PROCEDURE:

1. In the graph, find the desired operating point, and then find the EVOPLUS curve closest to it (in this case the point lies precisely on the curve)
2. Follow the curve upwards until reaching the intersection with the limit curve of the circulator.
3. The head reading at this limit point is the set-point head that must be entered to obtain the desired operating point.



2 - ΔP-c constant differential pressure adjustment mode

The ΔP-c adjustment mode keeps the differential pressure of the system constantly at the H setp value set, even in case of variation of the flow rate.



This adjustment is particularly indicated for the following systems:

a. Two-pipe heating systems with thermostat valves and with:

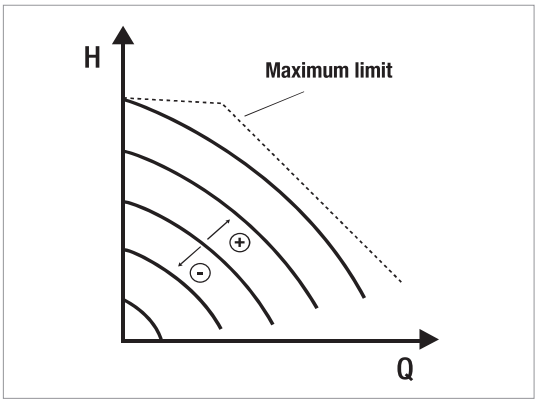
- head lower than 2 metres;
- natural circulation;
- low pressure drops in those parts of the system carrying the entirety of the water flow rate;
- high differential temperature (central heating).

b. underfloor heating systems with thermostat valves

c. single-pipe heating systems with thermostat valves and calibration valves

d. Systems with primary circuit pumps with low pressure drops.

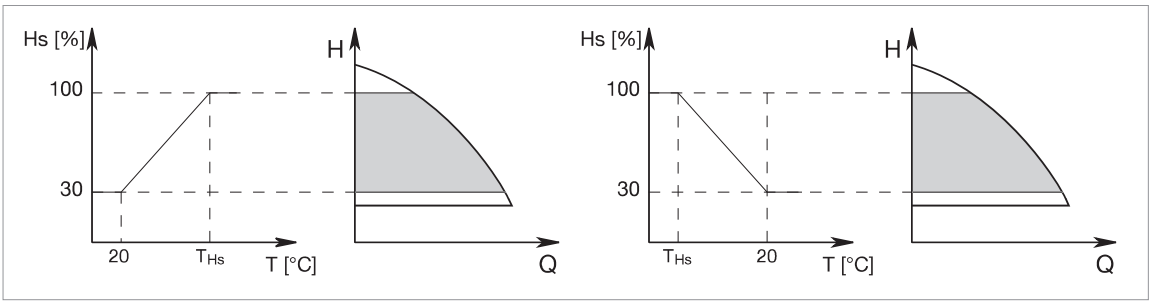
3 - Constant curve adjustment modes



In this control mode, the circulator works based on constant speed characteristic curves. The operation curve is selected by setting the rotation speed using a percentage factor. The 100 % value indicates the maximum limit curve. The actual rotation speed may be affected by the power and differential pressure limitations of the actual circulator model. The rotation speed may be set using the display, or either a 0-10 V or PWM external signal.

Control mode indicated for constant flow rate heating and air conditioning systems.

4 - Constant differential pressure control mode with proportional control based on the water temperature



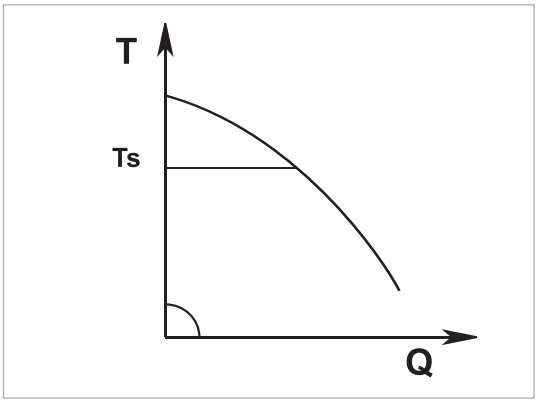
The circulator head set-point is reduced in accordance with the water temperature. The liquid temperature can be set between 0 °C to 100 °C.

This adjustment is particularly indicated for the following systems:

a. - in variable flow rate systems (two-pipe central heating systems), for which a further reduction of the circulator performance levels is provided in accordance with the lowering of the temperature of the circulating liquid, in case of reduced heating demand.

b. - in constant flow rate systems (single-pipe and under-floor central heating systems), where the performance of the circulator can only be adjusted by activating the temperature influence function.
It is set through the EVOPLUS control panel.

5 - ΔT-c * constant differential temperature adjustment mode



The **ΔT-c control mode keeps the pumped liquid at constant temperature, changing the flow rate to the Tsetp settable value.**
This adjustment is particularly indicated for the following systems:

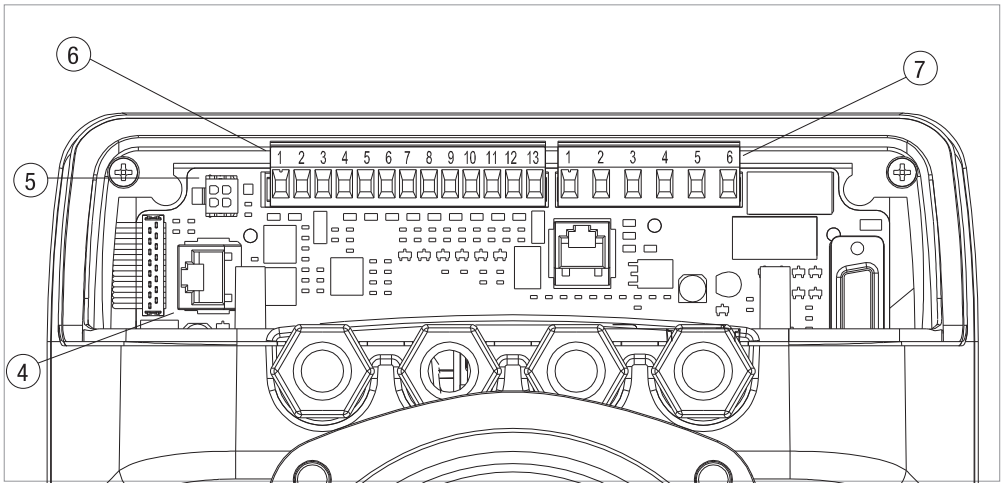
- Under-floor heating systems.
- Systems with circuit pumps with heat exchanger.
- Solar energy systems with storage tanks.
- Solar panel swimming pool heating systems.

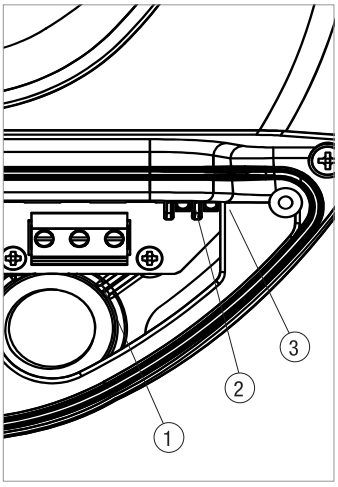
* Adjustment during implementation.

ECONOMY MODE

The economy function can be set directly on the control panel, by setting a reduction value (f.rid), the maximum value of which can be 50%. In all the previously listed settings, the Hset value must be replaced with an Hset x f.rid.

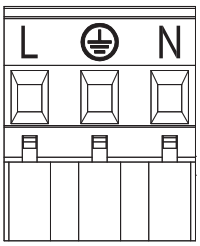
CONNECTION DIAGRAM





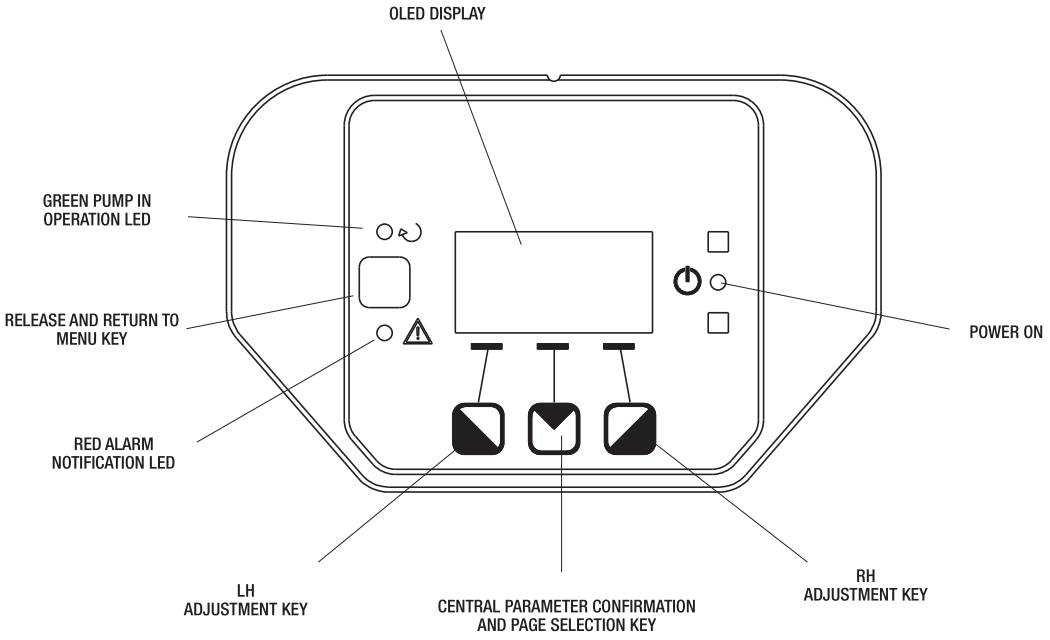
1	Removable terminal box for the connection of the power input line: 1x220-240 V, 50/60 Hz
2	Auxiliary LED
3	High voltage LED
4	Connector for twin circulators
5	Connector for pressure and temperature sensor on the circulator (as standard)
6	Removable 13-pole terminal box for the connection of MODBUS systems and inputs
7	Removable 6-pole terminal box for system status and alarm notification

POWER INPUT CONNECTION

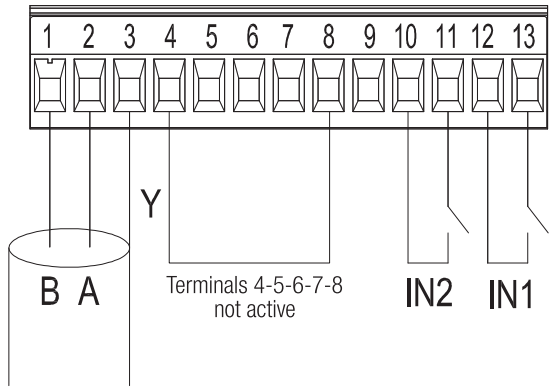


Removable power input terminal box

USER INTERFACE



Digital inputs



Input	Terminal no.	Type of contact	Associated function
IN1	12	Clean contact	**EXT:** If it is activated from the control panel, it will be possible to remotely control the switching on and off of the pump.
	13		
IN2	10	Clean contact	**Economy:** If it is activated from the control panel, it will be possible to remotely activate the set-point reduction function.
	11		

If the **EXT** and **Economy** functions have been activated using the control panel, the system will behave as follows:

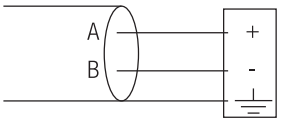
IN1	IN2	System status
Open	Open	Pump stopped
Open	Close	Pump stopped
Close	Open	Pump in operation with set-point set by the user
Close	Close	Pump in operation with reduced set-point

MODBUS

EVOPLUS circulators provide serial communication through an RS-485 input. The communication is established in accordance with the MODBUS specifications. Using the MODBUS, it is possible to remotely set the circulator operating parameters, like the desired differential pressure, the temperature influence, the control mode, etc. At the same time, the circulator can provide important information on the status of the system.

Modbus terminals	Terminal no.	Description
A	2	Terminal not inverted (+)
B	1	Terminal inverted (+)
Y	3	GND

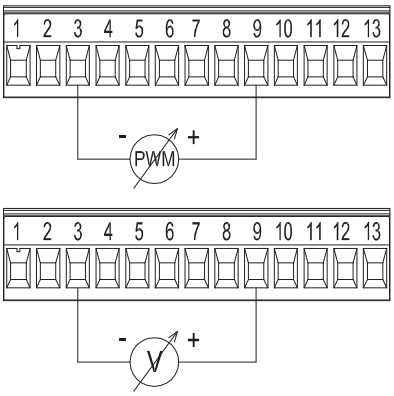
LONBUS



Gateway/ Evoplus connection

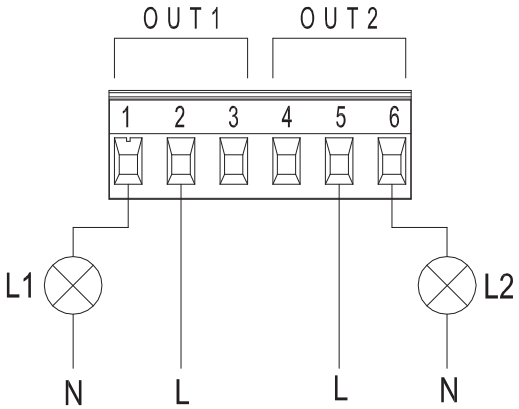
Using some modules available on the market, the circulator, and therefore its status, can also be made available to a LonWorks network. It will then be possible to change the parameters of the circulator by reading and amending the registers as indicated in the "Modbus Protocol instruction manual", available at the following address: "http://www.dabpumps.it/evoplus".

ANALOGUE AND PWM INPUT



Connection diagram for the external 0-10 V and PWM signals. The 2 signals share the same terminals of the terminal box, and therefore are mutually exclusive.

Digital outputs



Light L1 comes on when the system includes an alarm, and goes off when no faults are detected, while light L2 comes on when the pump is in operation, and goes off when the pump is stopped.

OUTPUT	TERMINAL NO.	TYPE OF CONTACT	ASSOCIATED FUNCTION
OUT1	1	NC	Presence/absence of system alarms
	2	COM	
	3	NO	
OUT2	4	NC	Pump in operation/Pump stopped
	5	COM	
	6	NO	

Outputs OUT1 and OUT2 are available on the 6-pole removable terminal box, where the type of contact is also shown (NC = Normally Closed, COM = Common, NO = Normally Open).

CHARACTERISTICS OF THE OUTPUT CONTACTS	
Max sustainable voltage [V]	250
Max sustainable current [A]	5 - If resistive load 2,5 - If inductive load
Max cable section accepted [mm²]	1,5

PERFORMANCE RANGE

The performance curves are based on kinematic viscosity values = 1 mm^2/s and density equal to 1000 kg/m^3. Curve tolerance according to ISO 9906.

GRAPHIC SELECTION TABLE