HIGH-EFFICIENCY ELECTRONIC CIRCULATOR

GPA III PRO

GPA-XX-7.5-XXX-III-PRO | Installation length 130 / 180 mm



The GPA III PRO is a wet-rotor circulator with a permanent-magnet motor.

The self-adapting mode, enabled by default, provides four selectable speeds.

When connected to the power supply, the circulator starts automatically and adjusts its performance to the system requirements and the maximum head selected by the operator.

The speed can also be controlled by an external PWM signal.

ERP ENERGY EFFICIENCY	EEI ≤ 0.20 - Part 2*

Applications

Water heaters and heating boilers, renewable energy systems, hydronic distribution kits and radiant panel heating.

Permitted fluids

- Heating water in accordance with VDI 2035 and UNI 8065.
- Water and glycol mixtures, with a glycol content not exceeding 50%.
- Clean, non-aggressive and non-explosive liquids, free from solid particles, fibres and mineral oils.

CIRCULATOR FEATURES

Technical data

Motor electrical data

Parameter	Value
Voltage and frequency	1 × 230 V (±10%); 50/60 Hz
Rated power input P1	Max 60 W
Rated current I1	Max 0.50 A
Insulation class	H
Protection rating	IP44

Operating conditions

Parameter	Value
Ambient temperature	+2 °C to +70 °C
Liquid temperature**	+2 °C to +110 °C
Permitted liquid temperature according to ambient temperature	Ambient 50 °C: +2 °C to +110 °C Ambient 60 °C: +2 °C to +90 °C Ambient 70 °C: +2 °C to +70 °C
System pressure	Max 1.0 MPa (10 bar)
Minimum inlet pressure	0.05 bar at a fluid temperature of 75 °C 0.5 bar at a fluid temperature of 90 °C 1.08 bar at a fluid temperature of 110 °C
Maximum relative humidity	≤ 95%
Sound pressure level	< 42 dB(A)

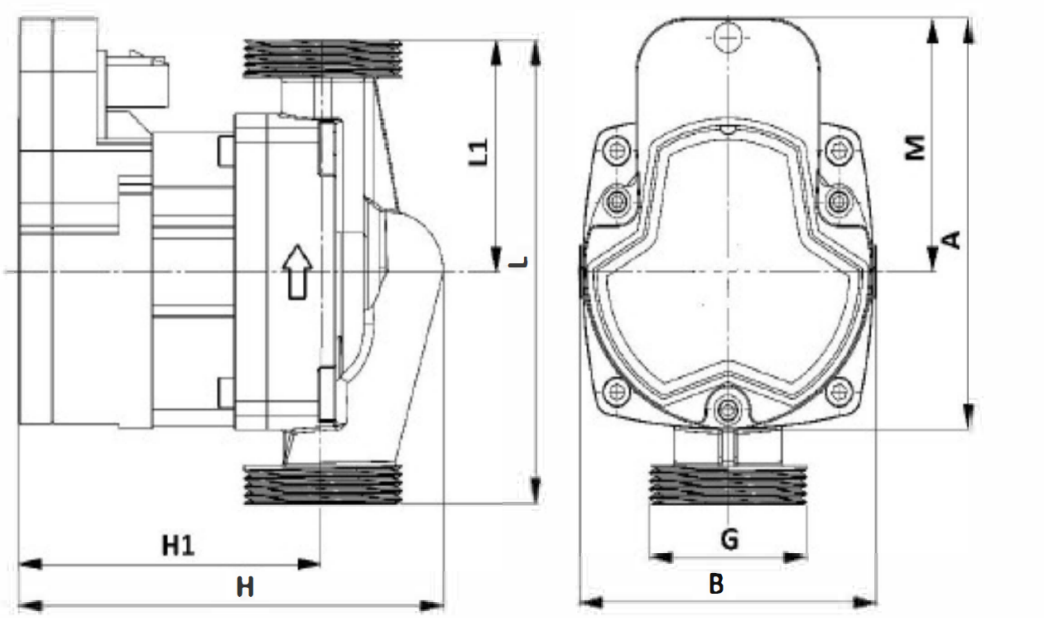
* The benchmark for the most efficient circulators is EEI ≤ 0.20.

** To prevent condensation on the motor and control electronics, the pumped liquid temperature must always be higher than the ambient temperature.

INSTALLATION DIMENSIONS

Dimensions and models

Dimensions in millimetres; G connection size in inches.



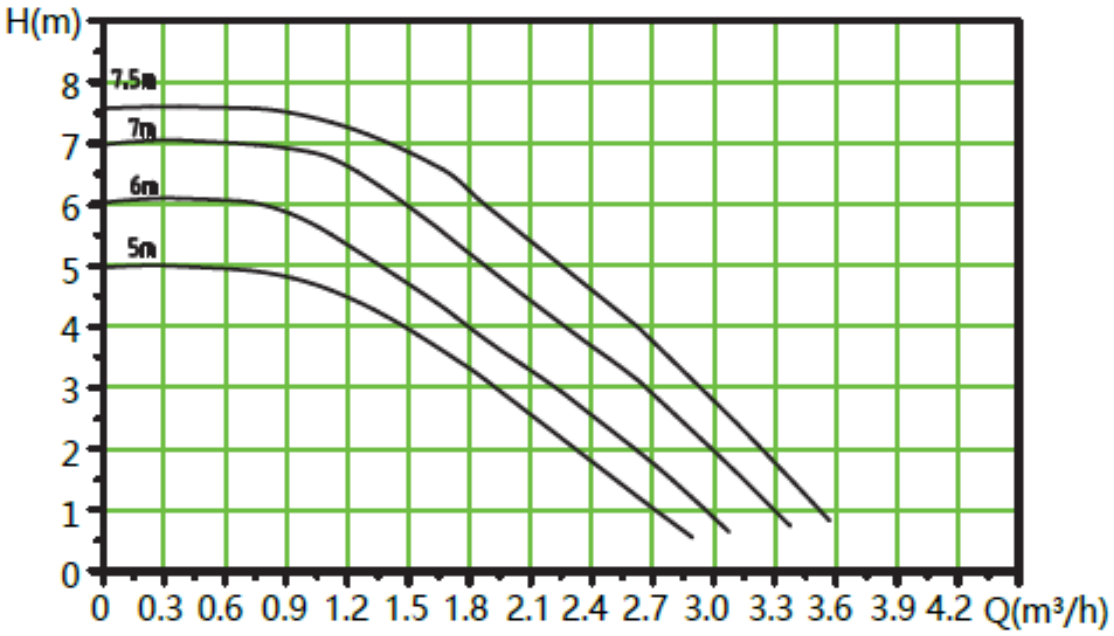
Dimension / model	GPA 20-7.5 III-PRO-130	GPA 25-7.5 III-PRO-130	GPA 25-7.5 III-PRO-180	GPA 32-7.5 III-PRO-180
G	1"	1 1/2"	1 1/2"	2"
L	130	130	180	180
B	89.5	89.5	89.5	89.5
M	71	71	71	71
A	115	115	115	115
L1	65	65	65	65
H	128.9	130.5	130.5	130.5
H1	93.4	93.4	93.4	93.4

HYDRAULIC AND ELECTRICAL PERFORMANCE

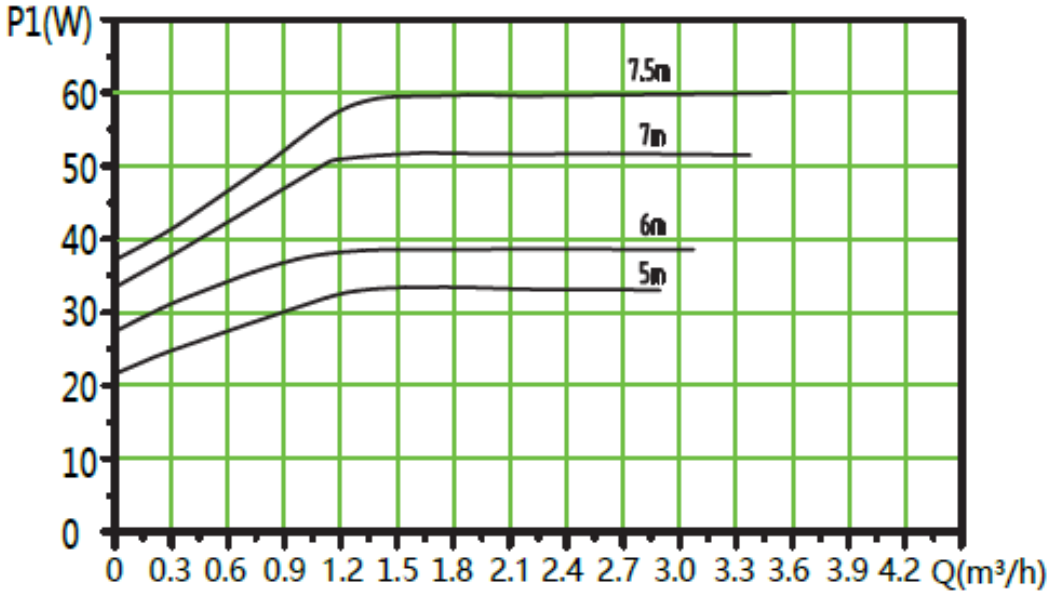
Curves for the four settings

Head H in metres, flow rate Q in m³/h and power input P1 in watts.

Head / flow rate curve



Power input / flow rate curve

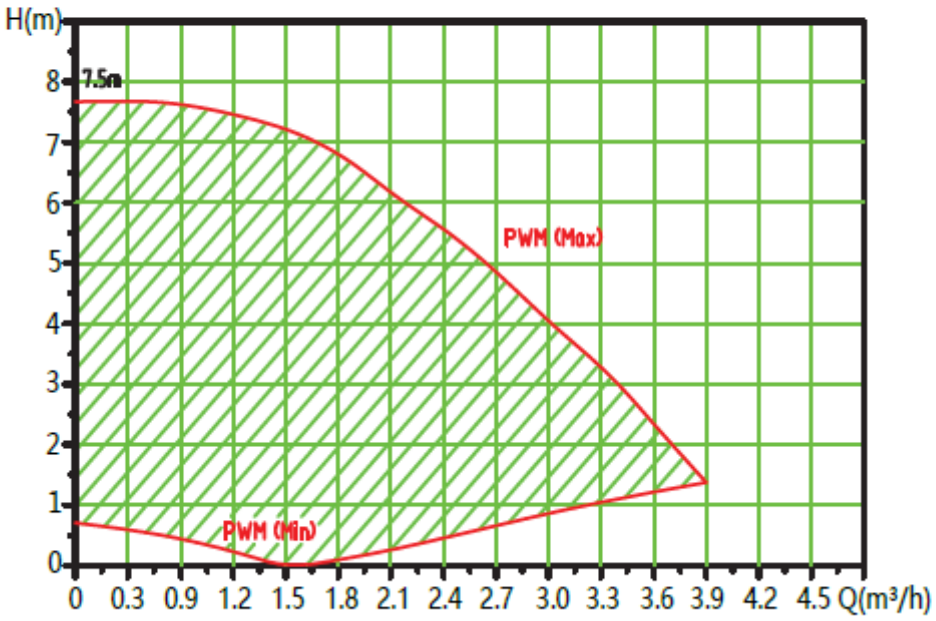


EXTERNAL CONTROL

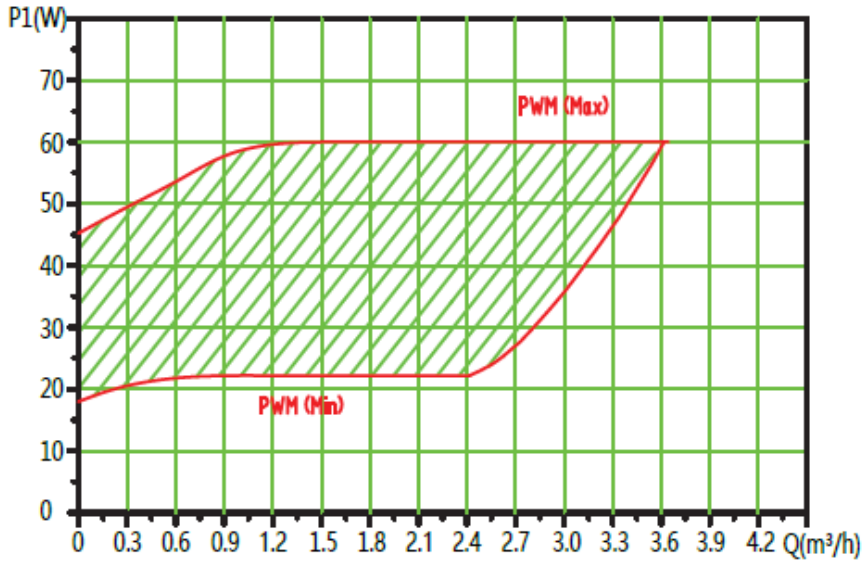
PWM operating range

Head H in metres, flow rate Q in m³/h and power input P1 in watts.

Head / flow rate curve



Power input range



CONTROLS AND INDICATIONS

Control and protection

Briefly press the button to select the maximum head in sequence:
5 m, 6 m, 7 m and 7.5 m.

Head	5 m	6 m	7 m	7.5 m
Power	33 W	39 W	52 W	60 W

Energy efficiency index: EEI ≤ 0.20 - Part 2, with a standard pump housing. In the event of an error, the green light indicates the fault.

Button flashes	Protection and restart
1	Overvoltage: 270 ± 5 V. Restarts when the voltage returns to normal.
2	Undervoltage: 165 ± 5 V. Restarts when the voltage returns to normal.
3	Overcurrent. Restarts after 8 seconds.
4	Phase loss. Restarts after 8 seconds.
5	Locked rotor. Restarts after 8 seconds.
6	Light load. Restarts after 8 seconds.
7	Overtemperature. Restarts after the ambient temperature has returned to normal for 5 seconds.

Overheating protection: at rated voltage and frequency, with high ambient and water temperatures, pump operation is reduced if the IPM module surface temperature exceeds 120 ± 5 °C.

In the event of a fault, disconnect the power supply before checking the pump. After resolving the problem, reconnect the power supply and restart the pump.

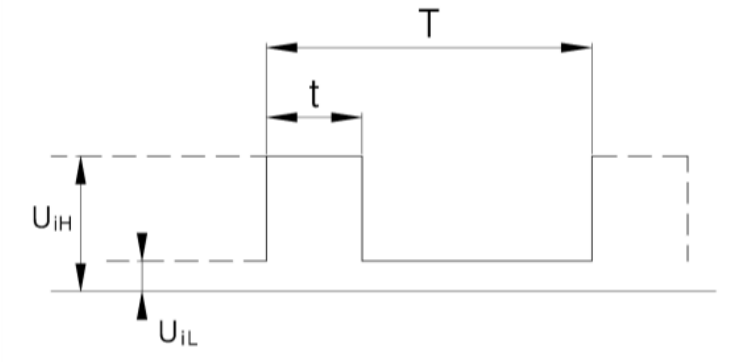
EXTERNAL PWM CONTROL

Signal characteristics

In PWM (Pulse Width Modulation) mode, the circulator speed depends on the external signal. The speed command is varied by adjusting the input signal duty cycle.

Parameter	Value / meaning
Input signal frequency	40 Hz to 4,000 Hz
Feedback signal frequency	75 Hz
T	Signal period
d	Duty cycle
UiH - high input voltage	4 to 24 V
UiL - low input voltage	≤ 1 V
IiH - input current	≤ 10 mA, depending on UiH

Duty cycle



d = t / T

Example:

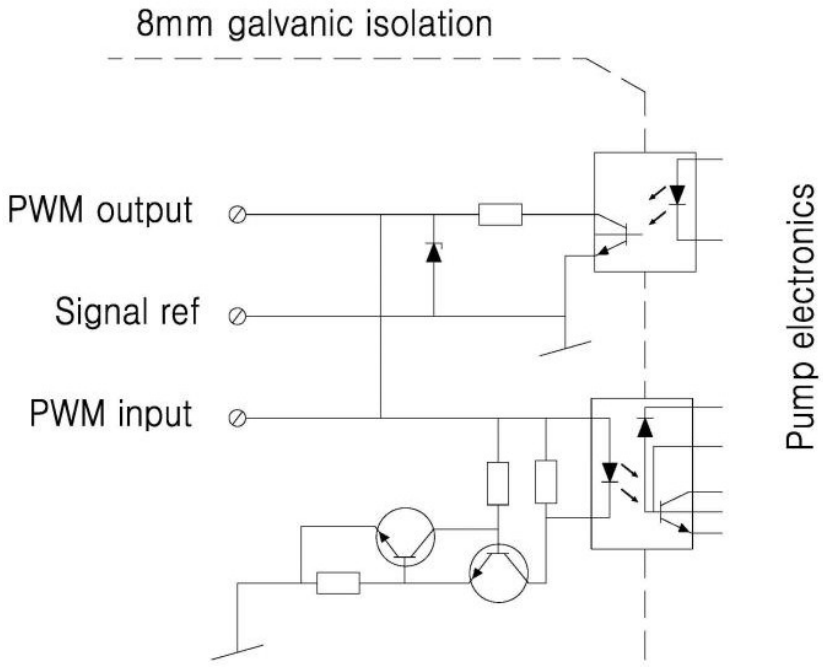
T = 2 ms (500 Hz)
t = 0.6 ms

d% = 100 × 0.6 / 2 = 30%

CONNECTION AND CONTROL

PWM interface and logic

The circulator receives commands from external electrical devices through the PWM interface.



The interface converts the external signal to operate the pump. With a supply voltage between 220 V and 240 V, it isolates the signal line from the high voltage.

“Signal ref” is the signal ground reference and is not connected to protective earth.

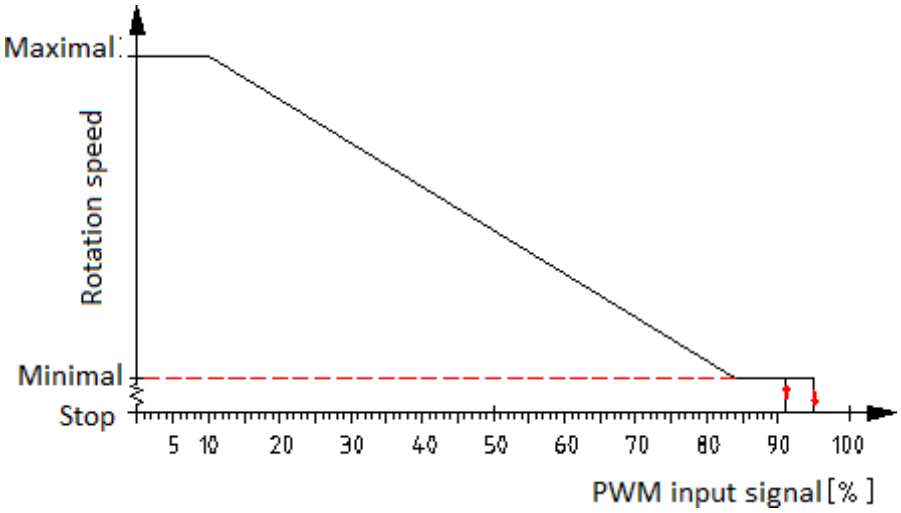
Automatic switching

The system automatically switches from non-PWM mode to PWM mode when a PWM input signal is present.

At a high duty cycle, a hysteresis zone prevents frequent starting and stopping if the signal fluctuates near the critical point.

SPEED CONTROL

PWM input signal



PWM input	Operating status
0%	Non-PWM mode; the system considers the input signal absent.
< 10%	Maximum rotational speed.
10-84%	The speed decreases from maximum to minimum.
85-91%	Minimum rotational speed.
91-95%	Hysteresis zone to prevent frequent starting and stopping.
96-99%	Standby: the pump stops.
100%	Standby: the pump stops.

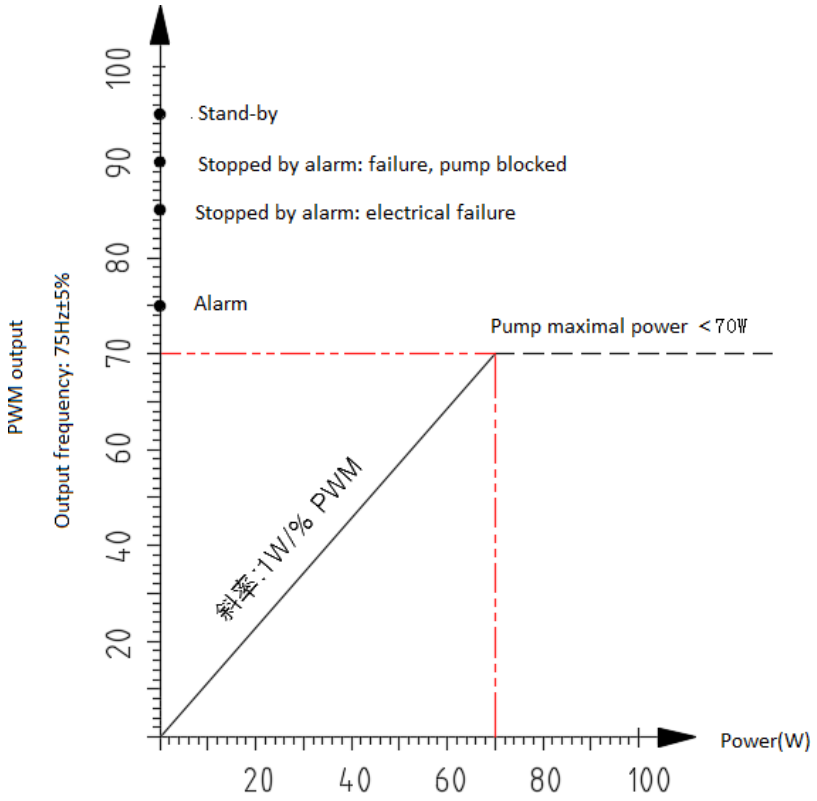
At a low duty cycle, the circulator runs at high speed: if the signal cable is faulty or disconnected, it continues to transfer heat through the main heat exchanger. This logic also applies to heat pumps.

With a PWM input of 0% or 100%, the circulator switches to non-PWM mode and the system considers the PWM signal absent.

STATUS SIGNAL

PWM feedback

PWM feedback indicates the circulator operating status, power level and any faults or alarms.



Alarm priority

The output signal transmits alarm information. In the event of undervoltage, the feedback duty cycle is set to 75%.

If the rotor is blocked by impurities in the hydraulic system, the duty cycle is set to 90%; this alarm has a higher priority.

Output signal frequency: 75 Hz

FEEDBACK AND DOCUMENTATION

Status and certifications

PWM output	Status	Description
95%	Stand-by	The pump stops.
90%	Alarm: locked pump	The pump is stopped and restarts only after the problem has been resolved.
85%	Alarm: electrical fault	The pump is stopped and restarts only after the problem has been resolved.
75%	Alarm	The pump continues to run. The detected problem is not critical.
0-70%	Power 0-70 W	Slope: 1 W per PWM percentage point.

Using the signal

The signal can be used to measure pump energy consumption and determine the actual system operating point, as an alternative to measuring the current monitored by the system. It can also be used to compare the speed setting with the feedback.

Certifications

• CE marking.

• GS marking.

• Low Voltage Directive 2006/95/EC. Standards used: EN 62233, EN 60335-1, EN 60335-2-51.

• EMC Directive 2004/108/EC. Standards used: EN 61000-3-2, EN 61000-3-3, EN 55014-1, EN 55014-2.

TROUBLESHOOTING | 1 OF 2

Diagnostics and remedies

Description	Remedy
Internal error	1. Disconnect the power supply to the system. 2. Wait until the control panel indicator lights go out, then reconnect the power supply. 3. If the error persists, replace the circulator.
Low mains voltage (LP)	1. Disconnect the power supply to the system. 2. Wait until the control panel indicator lights go out, then reconnect the power supply. 3. Check the mains voltage and, if necessary, restore it to the nameplate values.
High mains voltage (HP)	1. Disconnect the power supply to the system. 2. Wait until the control panel indicator lights go out, then reconnect the power supply. 3. Check the mains voltage and, if necessary, restore it to the nameplate values.
Critical overheating of electronic components	1. Disconnect the power supply to the system. 2. Wait until the control panel indicator lights go out, then reconnect the power supply. 3. Check that the ventilation ducts are clear and the ambient temperature meets the specifications.
Sensor missing	1. Check the sensor connection. 2. Replace the sensor if it is faulty.
Overcurrent protection	1. Check that the circulator rotates freely. 2. Check that the glycol level is correct.

TROUBLESHOOTING | 2 OF 2

Diagnostics and support

Description	Remedy
Voltage error	1. Disconnect the power supply to the system. 2. Wait until the control panel indicator lights go out, then reconnect the power supply. 3. Check the mains voltage and, if necessary, restore it to the nameplate values.
Dry running	1. All LEDs flash to indicate dry running. 2. Add liquid.
Motor overtemperature	1. Disconnect the power supply to the system. 2. Wait for the motor to cool. 3. Reconnect the power supply. 4. Check that the ventilation ducts are clear and the ambient temperature meets the specifications.
f < 100 Hz; f > 5 kHz	1. Check that the external PWM signal is working and connected according to the specifications. 2. If the PWM controller malfunctions, the circulator runs at maximum speed (PWM1/A). In PWM2, it remains stopped, awaiting a control signal.
Circulator status	Refer to the operating and installation manual supplied in the box for the specific circulator instructions.

One Pump support

Contact support on +39 051 19616352.