TECHNICAL SPECIFICATIONS

OPE 6 / 8 m

Technical specifications



PRODUCT MODEL

OPE- XX-6/8-XXX

One Pump S.r.l.| Registered office: Via Tosarelli 67, 40055 CASTENASO (BO)
Operating office: Via P. Matteucci 4, 40057 GRANAROLO DELL'EMILIA (BO)
Tel.: +39 051 19616352 | Fax.: +39 051 531129
info@onepump.it | www.onepump.it

IDENTIFICATION AND APPLICATION

Operating conditions

Model designation:

Example: OPE 20-8-130	
OPE	**Series code**
25	**Inlet and outlet diameter: 25 mm**
8	**Maximum head: 8 m (flow rate 0 m³/h)**
130	**Inlet-to-outlet distance: 130 mm**

Operating conditions:

Liquid temperature: -10 °C to +110 °C
Ambient temperature: -25 °C to +53 °C
Maximum system pressure: 10 bar
Protection rating: IP44
Insulation class: F
Pumped liquid: clean, free from solids and mineral oils, non-toxic, chemically neutral, with properties similar to water.

Pumped liquids and temperature:

Heating water
Ethylene glycol solution at a concentration of ≤50%

Pump installation requirements

Install the pump with the motor shaft horizontal. Do not run the pump without water. Before installation, ensure that the pipework is in good condition and clean. Impurities, such as welding slag and dirt, may damage the pump.

- Install the pump in a location that allows easy maintenance and replacement.

FEATURES

Technical parameters

Parameter	Specification
Pump type	Centrifugal circulator (non-self-priming)
Power supply (AC/DC)	AC
Voltage	230 V
Frequency	50/60 Hz
Maximum input power	45 W / 65 W
IP protection rating	IP44
Insulation class	Class F
Energy efficiency index (EEI)	≤0.21
Maximum head	6 m / 8 m
Maximum flow rate	4 m³/h
Corresponding pipe diameter	DN20 DN25 DN32
Inlet and outlet threads	G1 G1.5 G2
Pump efficiency	≥40%
Insulation resistance	Cold: ≥100 MΩ; hot: ≥5 MΩ
Temperature rise	≤70 K
Liquid temperature	-10 °C to +110 °C
Storage ambient temperature	-35 °C to +80 °C
Maximum system pressure	1.0 MPa (10 bar)
Direction of rotation	Clockwise, viewed from the control box towards the pump body

Product functions

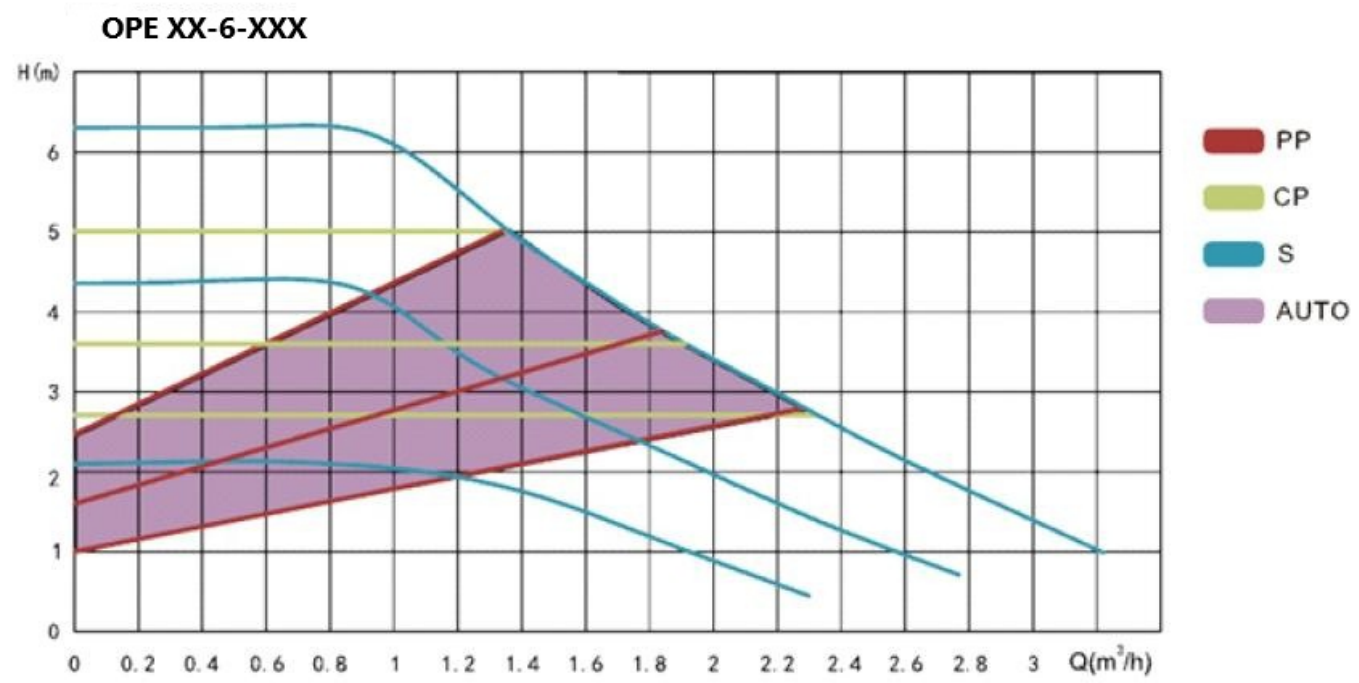
Features available on the different models:

Model	Internal control			External control
	PP	CP	S	PWM
OPE XX - X - XXX T	I	I	I	PWM1 PWM2
	II	II	II	
	III	III	III	
	AUTO	/	/	

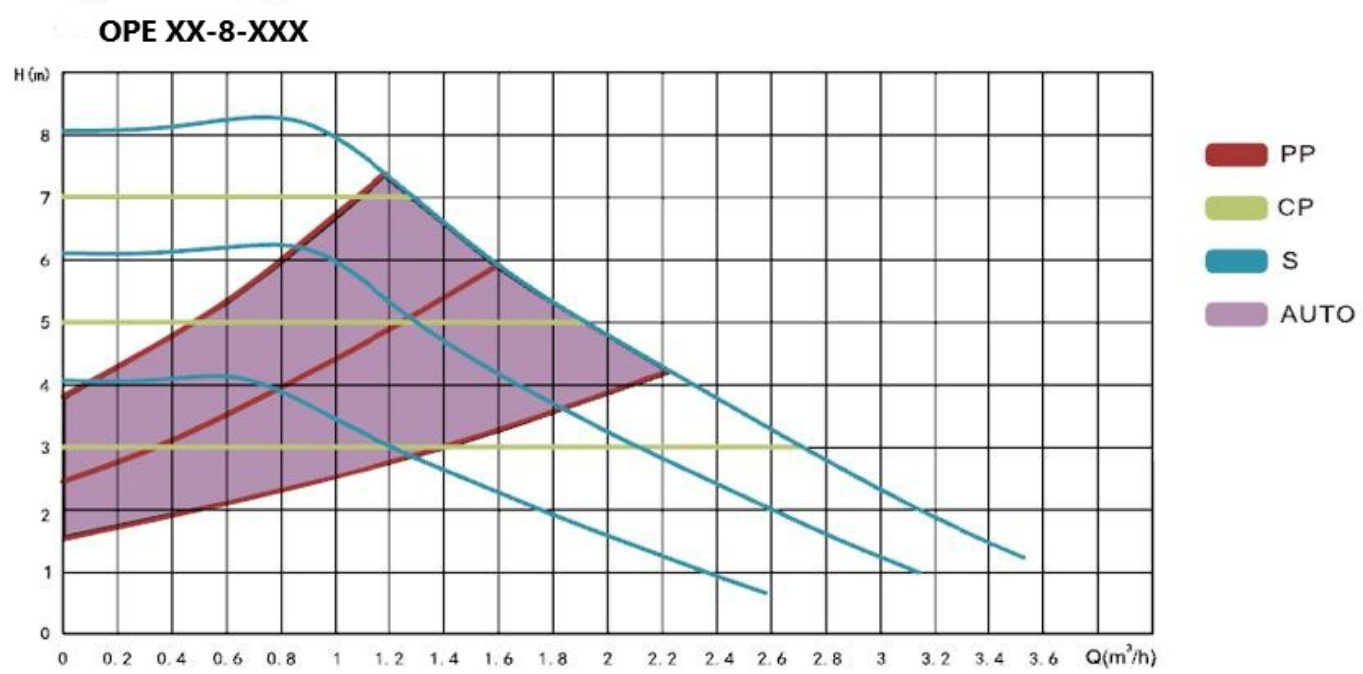
PERFORMANCE

Hydraulic curves

6 m



8 m



RANGE AND CONTROL

Models and PWM control

Model	Inlet diameter	Connection G	Maximum flow rate	Head range	Voltage	Frequency	Power	Current
	mm		m³/h	m	V	Hz	W	A
OPE 20-6-130	20	G1	2.4	1~6		50/60	45	0.5
OPE 25-6-130	25	G1.5	3.2					
OPE 25-6-180	25	G1.5	3.2					
OPE 32-6-180	32	G2	3.6					
OPE 20-8-130	20	G1	2.9	1~8			65	0.65
OPE 25-8-130	25	G1.5	3.4					
OPE 25-8-180	25	G1.5	3.6					
OPE 32-8-180	32	G2	4.0					

PWM

Basic control logic

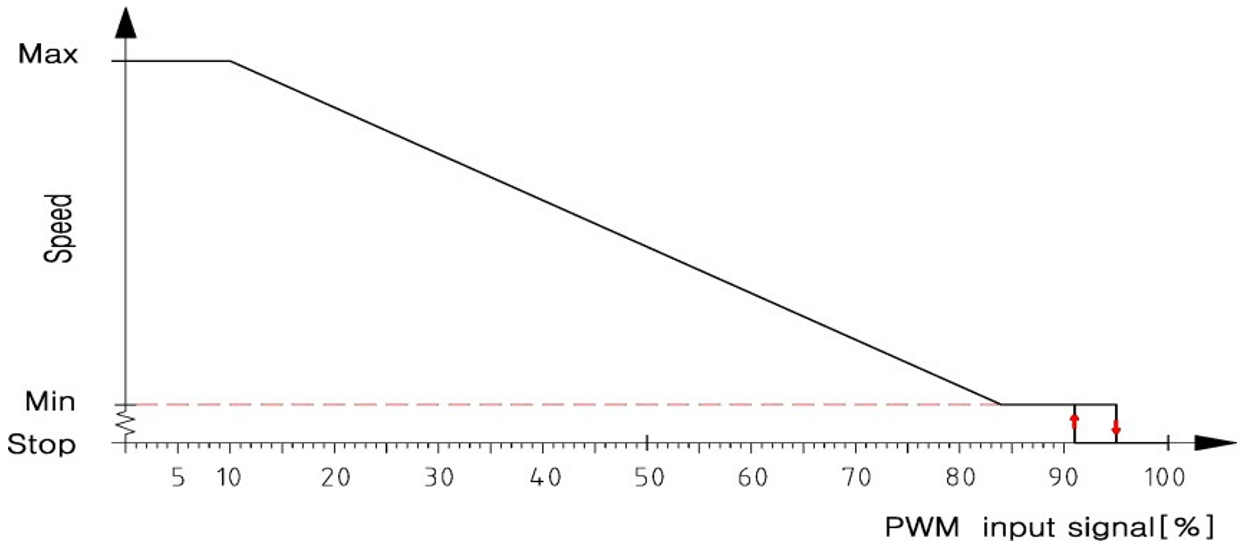
The pump is normally controlled by the connected PWM signal. If no PWM signal is present, it operates according to its internal control logic.

PWM input signal (PWM1 - heating)

At high PWM duty cycles, hysteresis prevents repeated starting and stopping of the circulator when the input signal fluctuates around the switching point. At low PWM duty cycles, the pump runs at high speed for safety reasons. If the signal cable in a gas boiler system is damaged, the pump continues to run at maximum speed to transfer heat away from the primary heat exchanger. The same principle applies to heating circulators, ensuring heat transfer if the signal cable is damaged.

EXTERNAL CONTROL

PWM1 signal



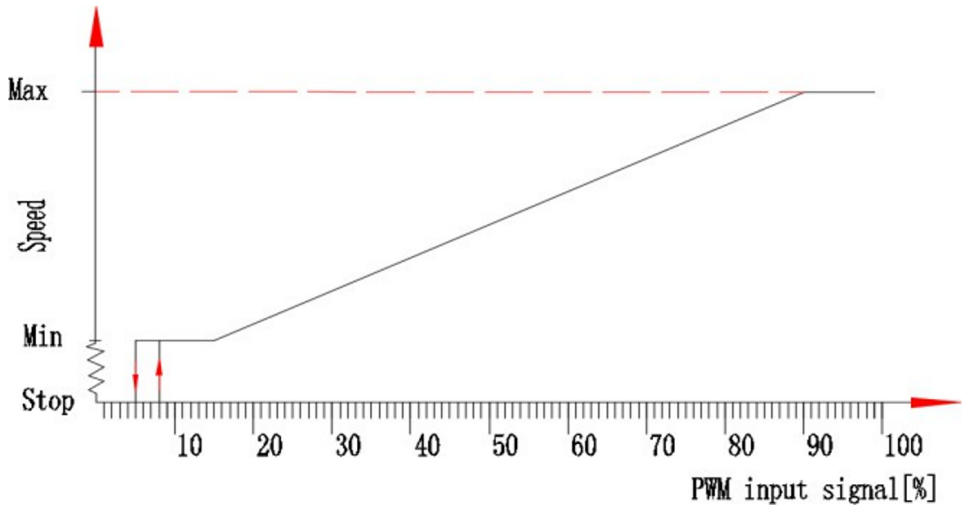
PWM input signal (%)	Pump status
0≤PWM≤5	Pump runs at maximum speed
5<PWM≤84	Pump speed decreases from maximum to minimum
84<PWM≤93	Pump runs at minimum speed
88<PWM≤93	Hysteresis prevents repeated starting and stopping when the input signal fluctuates around the switching point.
94<PWM≤100	Standby: pump stopped

PWM input signal (PWM2 - solar)

At low PWM duty cycles, hysteresis prevents repeated starting and stopping of the circulator when the input signal fluctuates above and below the switching point. If there is no PWM signal, the circulator stops for safety reasons. If the signal is lost, for example because the cable is damaged, the circulator stops to prevent overheating of the solar thermal system.

EXTERNAL CONTROL

PWM2 signal



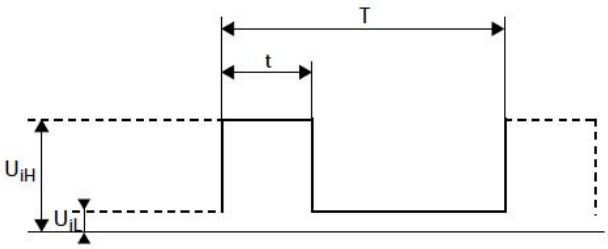
PWM input signal (%)	Pump status
0≤PWM<7	Standby: pump stopped
7<PWM≤15	Hysteresis prevents repeated starting and stopping when the input fluctuates around the switching point.
12<PWM≤15	Pump runs at minimum speed
15<PWM≤95	Pump speed increases from minimum to maximum
95<PWM≤100	Pump runs at maximum speed

PWM signal characteristics

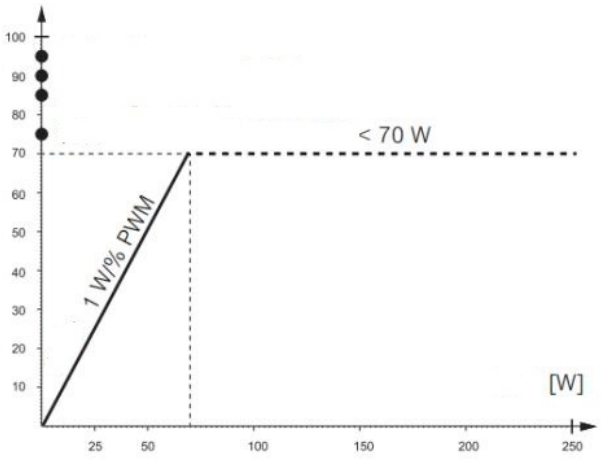
Optocoupler isolation	YES
PWM input frequency	100-5000 Hz
High-level input voltage UiH	3.3-24 V
Low-level input voltage UiL	<0.7 V
High-level input current IH	3.5 mA-10 mA
PWM adjustment range	0-100%
Signal polarity	Fixed
Signal cable length	<3 m
Rise and fall time	<T/1000

SIGNAL AND DIAGNOSTICS

PWM output and feedback



PWM waveform



Feedback logic diagram

PWM signal (%)	QT time (s)	Pump information	DT time (s)	Priority
100	0	PWM standby signal (low)	0	1
95	0-60	Alarm / stop / locked rotor fault (locked rotor or dry running; pump stopped)	0-600	2
90	0-30	Alarm / stop / electrical fault (phase loss or overcurrent; pump stopped)	1-5	3
85	0	Warning: undervoltage / overvoltage; pump stopped	0	4
80	0	Warning: 160-194 V. Reduced pump efficiency and reduced accuracy of power feedback; the pump continues to operate.	0	5
5-75	0	Normal pump operation; power feedback 5-65 W	0	7

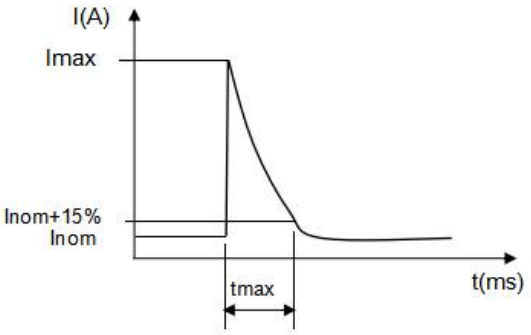
ELECTRICAL CHARACTERISTICS

Feedback and inrush current

		Power information		
2	0	Standby: waiting at the hysteresis point	0	6
0	0	PWM signal interrupted (operation at maximum power)	0	8
Output frequency	75Hz+/-5%			

Start-up inrush current

Pump model	Input voltage	Imax	Tmax
OPE 20-6-130	180V	<4A	<25 ms
	230V		
Remarks	To avoid self-heating, the interval between two measurements must be at least 2 minutes.		



Inrush-current graph

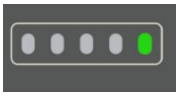
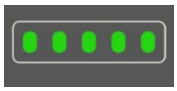
Operation and panel display

Operation and panel overview. When no PWM input signal is present, the pump follows the maximum constant-power curve. When a PWM input signal is present, it follows the PWM speed-control logic. The figure on the right shows the panel overview.

CONTROL PANEL

Operating modes

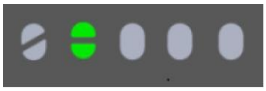
After power-up, all green LEDs flash 2-4 times. The speed-control mode is displayed as follows:

Pump status	LED indication	Pump status	LED indication
No PWM signal		PWM speed control	

Button presses	Mode code	Description	Panel indication
0	**CS III (factory setting)**	**Constant-speed curve Speed III**	
1	**AUTO**	**Adaptive mode**	
2	**PP I**	**Proportional-pressure curve Speed I**	
3	**PP II**	**Proportional-pressure curve Speed II**	
4	**PP III**	**Proportional-pressure curve Speed III**	
5	**CP I**	**Constant-pressure curve Speed I**	
6	**CP II**	**Constant-pressure curve Speed II**	
7	**CP III**	**Constant-pressure curve Speed III**	
8	**CS I**	**Constant-speed curve Speed I**	
9	**CS II**	**Constant-speed curve Speed II**	

CONTROL AND PROTECTION

Modes and fault indications

10	**CS III**	**Constant-speed curve Speed III**	
11	**PWM1**	**PWM heating mode**	
12	**PWM2**	**PWM solar mode**	
/	**PWM speed-control mode**	**-**	
Note: at an input duty cycle of 1-100%, the button is locked. To change mode, disconnect the signal or set the duty cycle to 0%.			

Fault indications

Fault-protection description		
Function	**Description**	**LED indication**
Locked-rotor protection	**If the pump rotor shaft is locked, the pump attempts to restart every 5 seconds. During each restart attempt, a locked-rotor fault is reported and the panel displays the fault code. The pump stops after 5 restart cycles.**	
Overvoltage / undervoltage protection	**If the input voltage falls below 170 V or rises above 270 V, the pump enters protection mode and stops. An electrical fault is reported and the panel displays the fault code, preventing operation outside the permitted range and possible damage. The pump resumes operation when the voltage returns to 170-270 V.**	
Phase-loss protection	**If a phase-loss fault occurs, the pump attempts to restart every 1 second. During each attempt, an electrical fault is reported and the panel displays the fault code. The pump stops after 5 restart cycles.**	
Overcurrent (short-circuit) protection	**If faults such as a short circuit or overheating occur, the pump attempts to restart every 5 seconds. During each attempt, an electrical fault is reported and the panel displays the fault code.**	

PROTECTION AND IDENTIFICATION

Quality and safety

Dry-running protection	**If the pump runs dry for 1 minute, it stops and reports a fault. It restarts after 3 minutes. After 5 such restart cycles, the pump stops.**	

Quality and safety requirements

Applicable standards

Standard	Complies with
EN 60335	YES
EN 60335-2-51	YES
2006/95/EC	YES
EN 61008-3	YES
EN 61000-6-1	YES
EN 61000-6-2	YES
EN 61000-6-3	YES
EN 61000-6-4	YES

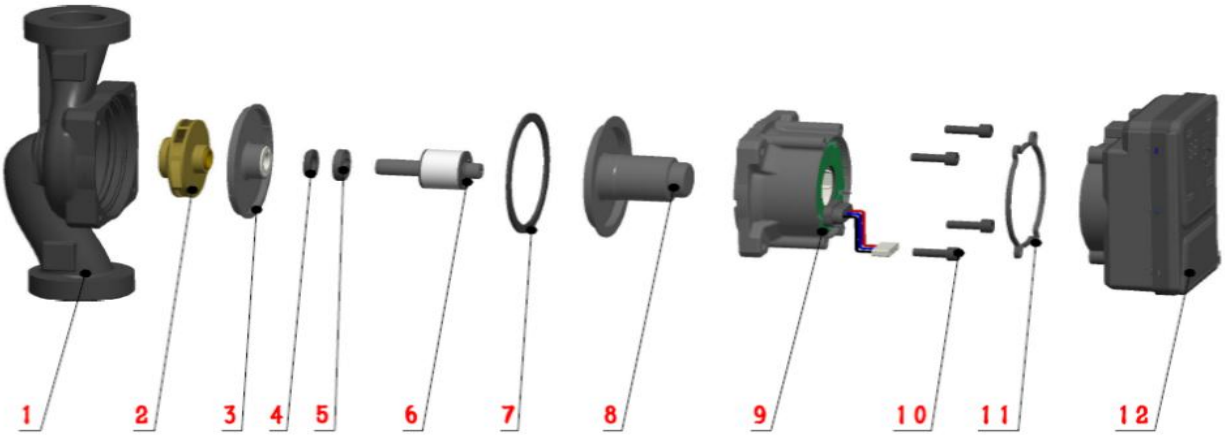
Pump identification

Functional requirements	Description
Product brand	ONE PUMP
RoHS certification	RoHS Directive
CE certification	CE
ErP certification	OPE/6: EEI≤0.20; OPE 8: EEI≤0.21

CONSTRUCTION

Structure and components

Exploded view

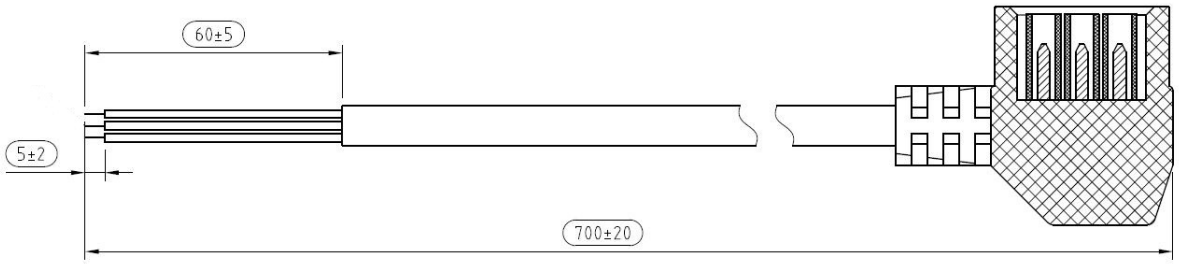


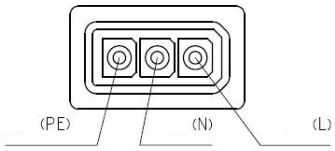
Parts description

NO.	Name
1	Pump body
2	Impeller
3	Pump cover assembly
4	Thrust bearing
5	Thrust bearing seat
6	Rotor assembly
7	Flat gasket I
8	Rotor can
9	Electric motor
10	Hexagon socket head cap screw
11	Flat gasket II
12	Controller assembly

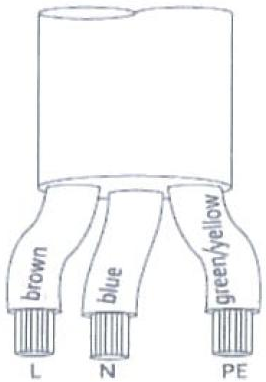
ELECTRICAL CONNECTIONS

Power supply cable



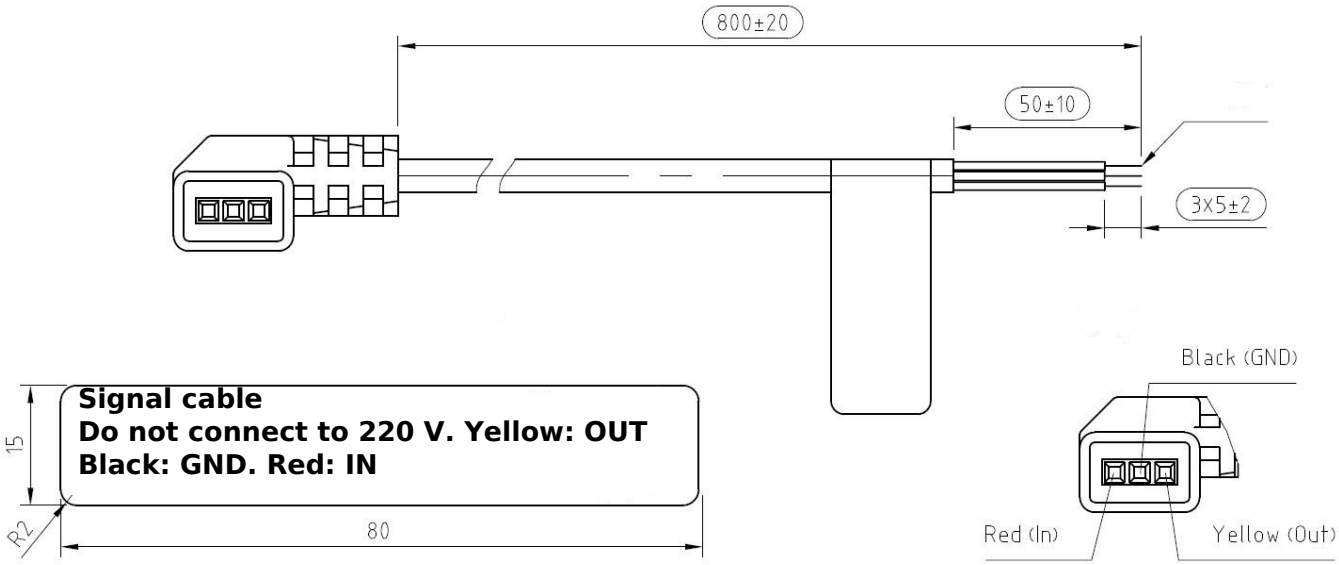


Power supply cable: connect the brown conductor to L (live) on the control board, the blue conductor to N (neutral), and the yellow-green conductor to PE (protective earth).

Power supply cable	Image	
Cable - **Brown (L): 220 V** - **Blue (N): neutral** **- Yellow-green (PE): earth**	**Standard: three-core cable with stripped and tinned ends** 	

CONNECTIONS AND PACKAGING

Signal cable and packaging



Black wire: signal ground (GND)
Red wire: PWM input
Yellow wire: PWM output

Product packaging

- **Inner carton**

Pump inlet-to-outlet length	Length / L (mm)	Width / W (mm)	Height / H (mm)	Units per carton
130 mm	**170**	**135**	**90**	**1**
180 mm	**200**	**135**	**95**	**1**

INSTALLATION

Packaging and operating instructions

(For reference only; actual packaging may vary.)

- **Outer carton**

Pump inlet-to-outlet length	Length / L (mm)	Width / W (mm)	Height / H (mm)	Units per carton
130 mm	360	290	200	8
180 mm	420	280	210	8

Operating instructions

Before installing the pump, check that the pipework is securely connected and that impurities, welding slag, dirt and other debris have been removed.

Install the pump in a dry, ventilated location to prevent short circuits caused by moisture or splashing water. Ensure easy access for future maintenance and replacement.

For outdoor installations, provide a protective cover. For indoor installations, protect the pump from splashing water to prevent electric shock. Do not install it in a bathroom: water vapour or water entering the terminal box may cause electrical leakage.

To facilitate future maintenance, fit a separate shut-off valve at both the pump inlet and outlet.

When the pump supplies water to a heating system, do not touch the pump or its pipes with your hands: there is a risk of burns.

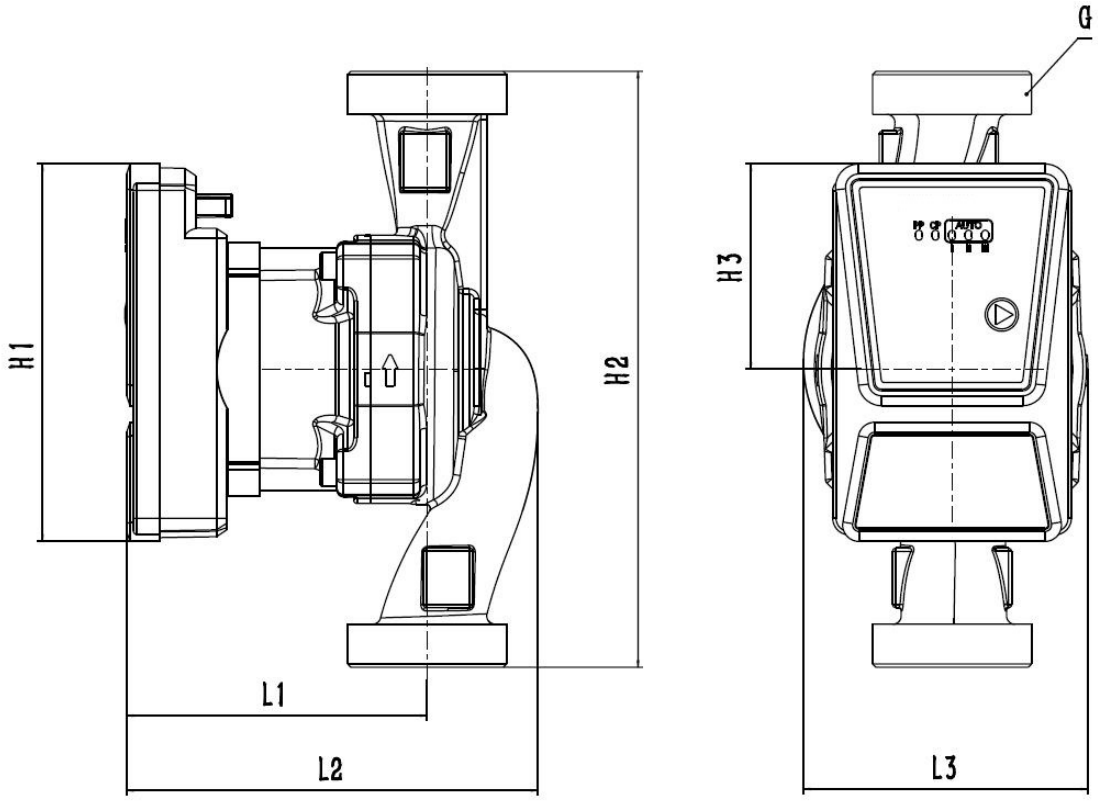
The power plug must be earthed. Its earth pin must make reliable contact with the earth connection of the socket. Do not modify the earthed plug without authorisation.

Before adjusting the pump position or touching the pump, disconnect the power supply to prevent accidents.

If the ambient temperature falls below 0 °C in winter and the pump is stopped, drain the pipework to prevent the pump body from cracking due to freezing.

APPENDIX A

Pump dimensions

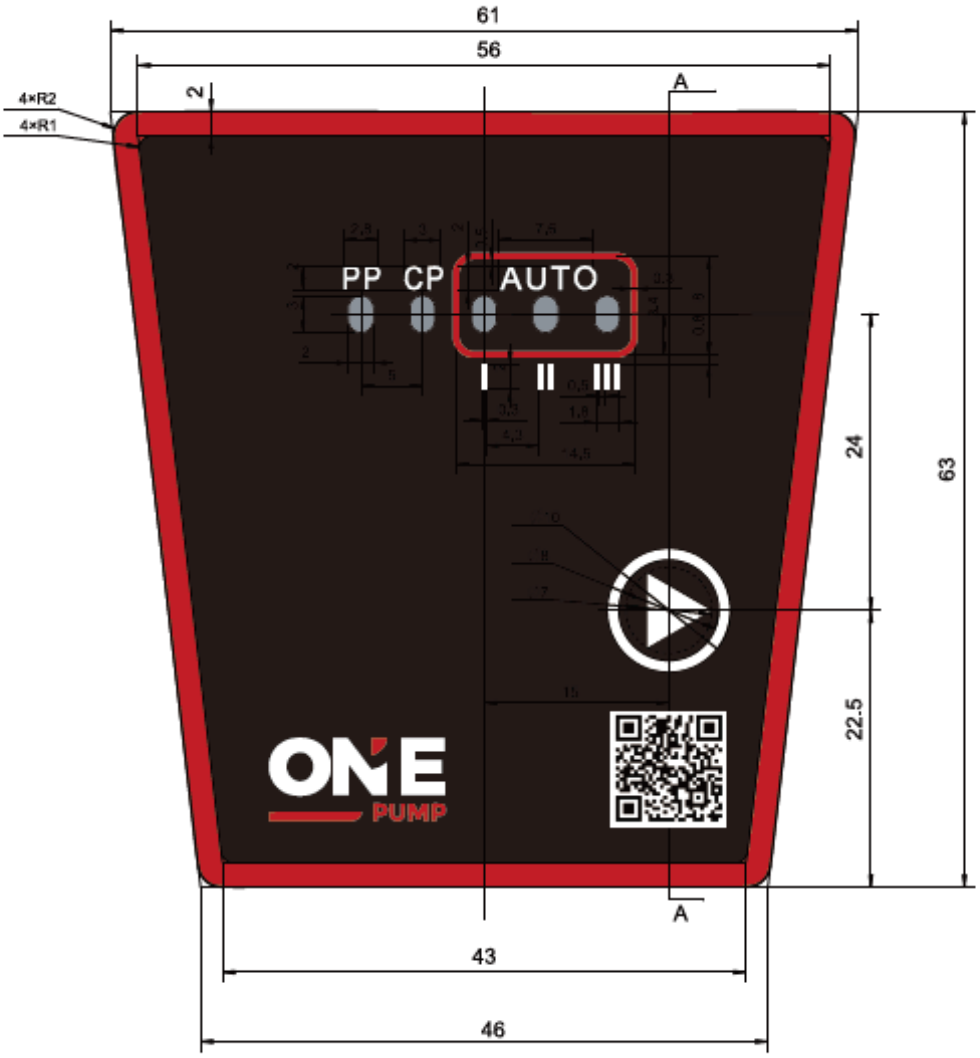


Model	Dimensions (mm)								Inner carton (kg)		Outer carton		
	L1	L2	L3	L4	H1	H2	H3	G	Net	Gross		Carton dimensions	
OPE 20-6-130T	93	126	86	114	130	62	G1	G1 to G3/4	1.4	1.8	8	360×290×200	16
OPE 20-8-130T							G1 1/2	G1 1/2 to G1	1.5	2.0			17
OPE 25-6-130T													
OPE 25-8-130T					180				1.7	2.2		420×280×210	15.5
OPE 25-6-180T													

APPENDIX A - CONTINUED

Dimensions and control panel

OPE 25-8-180													
OPE 32-6-180							G2	G2 to G1 1/4	1.8	2.5			21
OPE 32-8-180													



ONE PUMP

Notes and contacts

ONE PUMP SRL

Registered office: Via Tosarelli 67, 40055 CASTENASO (BO)
Operating office: Via P. Matteucci 4, 40057 GRANAROLO DELL'EMILIA (BO)
Tel.: +39 051 19616352
Fax.: +39 051 531129
info@onepump.it
www.onepump.it

Copyright © 2025 One Pump SRL - VAT No. IT03999511201
One Pump is a trademark registered by One Pump srl