UPM10, UPM20

GRUNDFOS

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1. Product description

UPM10 and UPM20 can be used as stand-alone or integrated circulator pumps in existing systems as a replacement or in new systems with either variable or constant flow rate. They can be used in a large range of system applications. The speed can be controlled by a low-voltage PWM (Pulse Width Modulation) signal, Local Interconnect Network (LIN) bus communication protocol, 0-10 V or internally controlled via constant-pressure, proportional-pressure or constant-speed mode defined from factory or via a smart operating panel.

Features

- Speed-controlled, high-efficiency pump fitted with electronically commutated motor (ECM) with permanent-magnet rotor and frequency converter.
- Externally controlled by PWM, LIN bus or 0-10 V signal.
- Hydronic balancing with Grundfos GO Balance.
- Digital nameplate.
- Intuitive user interface.
- Improved flow estimation.

Benefits

UPM10 and UPM20 are Grundfos high-efficiency pumps with the following benefits:

- Terminal box in the front.
- EEI below benchmark level of EEI ≤ 0.20.
- TE Superseal connectors for power, and Mini Superseal and FCI connectors for signal supply.
- Designed for high ambient and media temperatures of up to 70 and 110 °C.
- The minimum permissible media temperature can be down to -20 °C.

UPM10

The UPM10 pump range is designed for integration in boilers, heat pumps, and other heating appliances with extended performance. The table below shows the head and power of the UPM10 variants.

Product	Head [m]	Power [W]
UPM10M	9.5	100
UPM10L	10.5	140
UPM10XL	12.5	180

UPM20

The UPM20 pump range is designed for integration in boilers, heat pumps, and other heating appliances with extended performance. The table below shows the head and power of the UPM20 variants.

Product	Head [m]	Power [W]
UPM20M	13	200

2. Identification

Type key

Example: UPM10XL LIN 32-130 180 9 XXX

Code	Explanation	Designation
UPM10M	Max. 100 Watt	Pump type
UPM10L	Max. 140 Watt	
UPM10XL	Max. 180 Watt	
UPM20M	Max. 200 Watt	

	Explanation	Designation
[ ]	PWM	Control variant
LIN	LIN bus input signal	
0-10 V	0-10 V	
AUTO	AUTO	
HYBRID	HYBRID	
SOLAR	SOLAR	
DHW	DHW	

Code	Explanation	Designation
15	R 1/2" / G 1"	Nominal diameter
25	R 1" / G 1 1/2"	
32	R 1 1/4" / G 2"	

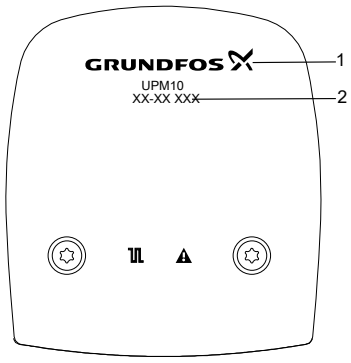
Code	Explanation	Designation
95	9.5 m	Max. head
105	10.5 m	
125	12.5 m	
130	13 m	
145	14.5 m	

Code	Explanation	Designation
130	Cast iron CED, 130 mm	Pump housing
180	Cast iron CED, 180 mm	
N 180	Stainless steel, 180 mm	
CHBL	CHBL, 130 mm	

Code	Explanation	Designation
3	3 o'clock (right)	Control box orientation
6	6 o'clock (below)	
9	9 o'clock (left)	

Code	Explanation	Designation
	XXX	Customer code

Front foil



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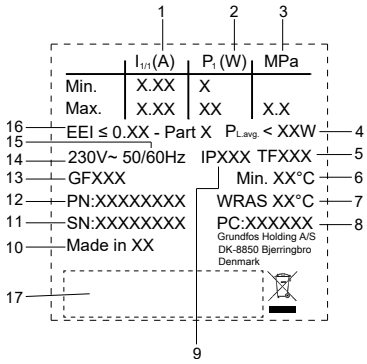
Pos.	Description
1	Grundfos logo
2	Customer product number

Nameplate



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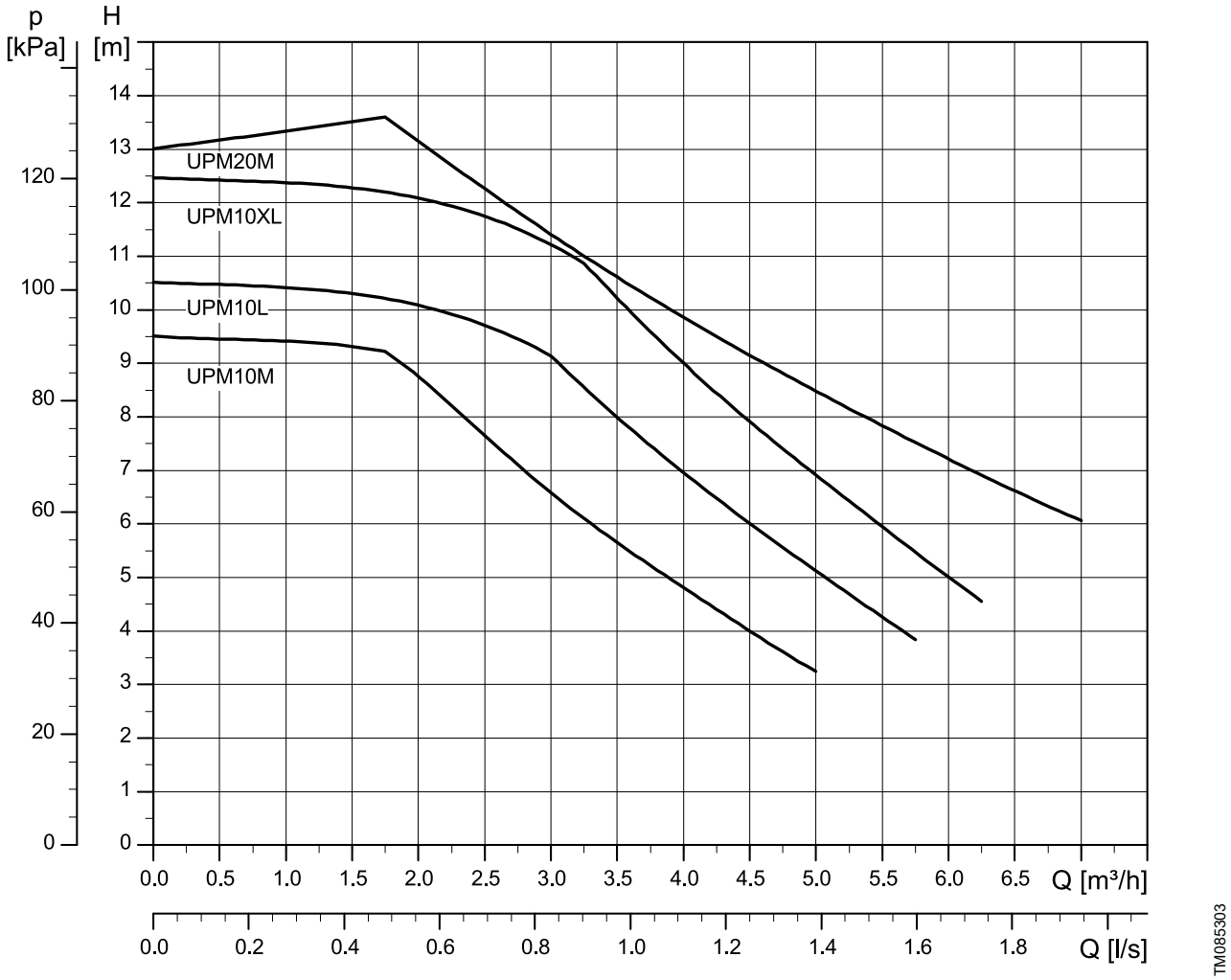
Pos.	Description
1	Rated current at min. and max. performance
2	Input power at min. and max. performance
3	Max. operating pressure
4	Average power input $P_{L,avg}$ (Ecodesign regulation)
5	Temperature class
6	Min. liquid temperature
7	WRAS approval temperature
8	Production code (year and week) and customer ID
9	Enclosure class
10	Production site
11	Serial number
12	Product numberFrequency
13	Product mark (legal product code)
14	Voltage [V]
15	[Hz]
16	Energy index with indication of measurement standard
17	Approvals

3. Product range



4. System application

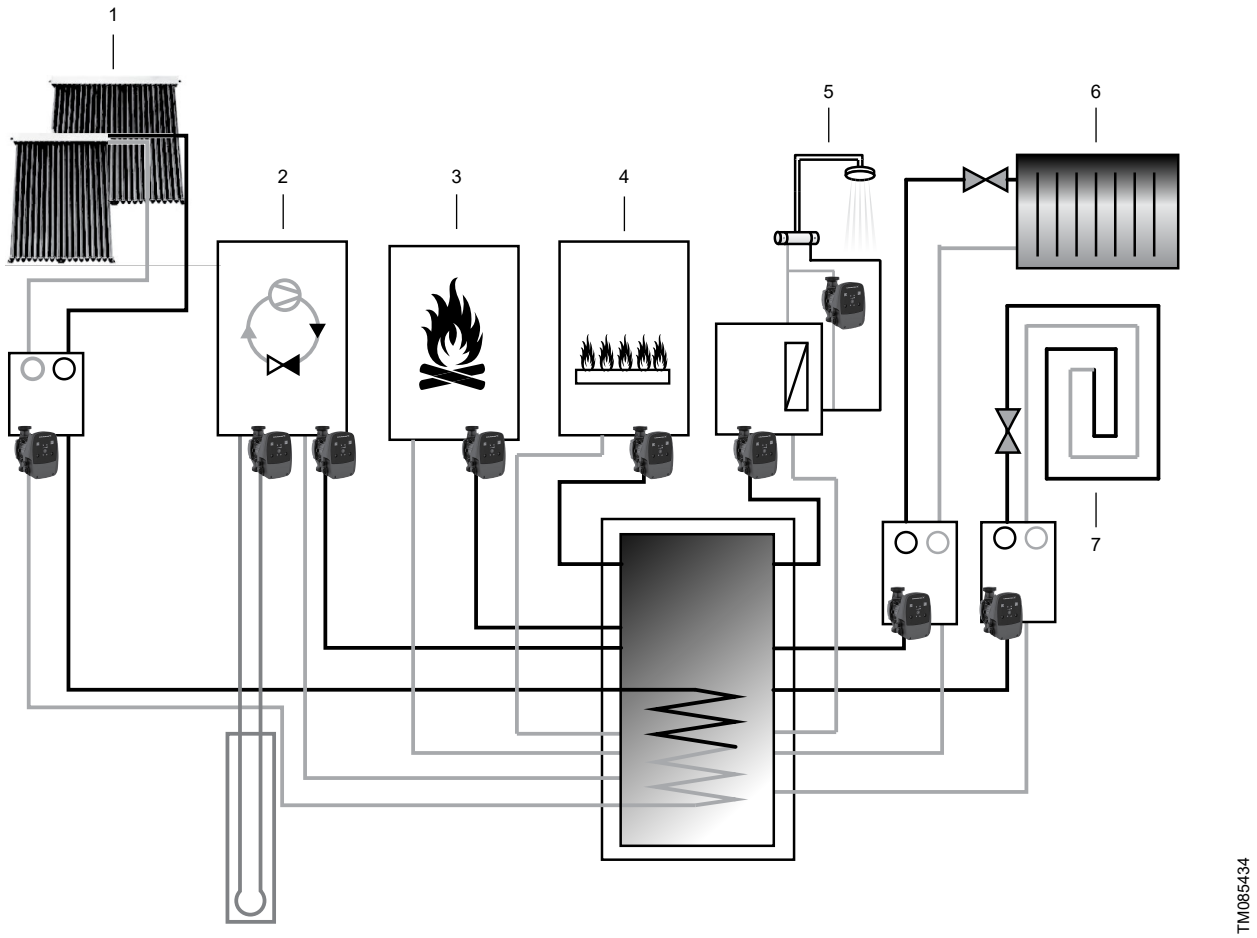
In a modern heating, cooling and domestic hot-water supply system, there are different circuits in which UPM pumps in different versions can be placed. A differentiation must be made between the heating (or cooling) production and the distribution.

On the production side, there are some applications where pumps are used in primary or internal circuits, for example, for geothermal or solar thermal brine circuits.

The distribution side is often split into two circuits - a primary and a secondary circuit - in order to keep the flow and temperature independent from each other. A heat exchanger, a hydraulic separator or a buffer tank can be used for this separation.

For some heating generators, for example, condensing boilers, heat pumps or district heating, it is important to keep the return temperature as low as possible. Therefore, it is necessary to keep the right balance between the flow in primary and secondary circuit. Without a separator the primary pump creates a differential pressure in the secondary circuits. A generator effect can happen in the secondary pump from which UPM is protected.

The primary pump is mostly integrated into the heating appliance and controlled via a digital signal, such as PWM, to ensure the optimum operation of the boiler.



Complete domestic heating system combined with renewable energy sources

Pos.	Description
1	Solar charging kit
2	Geothermal heat pump
3	Solid fuel boiler
4	Gas fuel boiler

Pos.	Description
5	Freshwater station
6	Heating kit
7	Underfloor heating kit

Recommended pump type according to application

	Application	Recommended type
Heat production or heat transmission side	Gas- or oil-fired space and combination heaters	UPM10 PWM, UPM10 LIN UPM20 PWM, UPM20 LIN
	Solid fuel heaters	UPM10 AUTO, UPM20 AUTO
	Heat pumps (brine side)	UPM10 LIN, UPM10 PWM, UPM20 LIN, UPM20 PWM
	Heat pumps (heating side)	UPM10 PWM, UPM10 LIN UPM20 PWM, UPM20 LIN
	Mini combined heat and power cogeneration	UPM10 PWM, UPM10 LIN UPM20 PWM, UPM20 LIN
	Thermal solar system (collector side)	UPM10 SOLAR
	District heating systems with heat exchanger	UPM10 AUTO
Heat distribution side	Space heating systems	UPM10 AUTO, UPM10 HYBRID UPM20 AUTO, UPM20 HYBRID
	Space heating and cooling systems	UPM10 AUTO, UPM10 HYBRID UPM20 AUTO, UPM20 HYBRID
	Domestic hot-water generation (DW side)	UPM10 DHW
	Domestic hot-water recirculation	UPM10 DHW

Gas- or oil-fired space and combination heaters

Most of the installed systems for space and water heating in building services still use fossil fuels, such as natural gas or mineral oil, although the use of gas and liquid fuels out of biomass is increasing. Heaters with higher water content, such as floor-standing boilers, are heated independent of the actual flow. Heaters, such as wall-mounted boilers, only operate when there is a minimum flow through the primary heat exchanger. In a combi-boiler, the pump supplies both the heating system and the hot-water supply.

More and more of these heaters are condensing boilers temperature-controlled by a weather-compensating system controller with different time programs, which means the central heating water temperature is often lower than the domestic hot-water temperature. In systems with domestic hot-water supply either as combination heaters with integrated DHW supply or with external DHW tank or heat exchanger, there is a need to increase the media temperature temporarily above DHW temperature level. In small residential buildings, the heating demand for DHW is higher than for space heating.

Internal (or external) pumps for these primary circuits must be controlled by the needs of the heaters to optimise the combustion conditions and the condensation process. Often this can only be guaranteed by using a variable-speed pump with external control signal from the boiler controller.

Solid fuel heaters

As most of these heaters use wood biomass, such as pellets, split logs or wood chips, they can be seen as renewable energy and CO_2 neutral. These heaters are mostly reacting slowly on different heat demands. For this reason, the liquid temperature may increase, and there is a need for keeping the flow constant and for storing the energy in a buffer tank.

Heat pumps

Different types of heat pumps are on the market:

- Compressor heat pumps with electric or combustion motors
- Sorption heat pumps. Sorption is a physical-chemical process where either a liquid or a gas is absorbed by another liquid (absorption) or is retained by the surface of a solid object (adsorption). Both processes are reversible and only occur under certain conditions through physical effects (pressure, temperature). Often a pump with customised specification is installed inside such a process unit.

Primary pumps depend on the heat transmission principle:

- Air-to-air heat pumps are often used in air-conditioning systems

No pump is used.

- Air-to-water heat pumps for space heating and cooling or water heating

The heat source is mainly outdoor air down to an outside temperature of -20 °C. Its energy is mainly extracted directly by a fan-supplied air evaporator of the heat pump. Sometimes there is a primary brine circuit between an outdoor air unit and a brine-to-water heat pump. This circuit is circulated by a pump that must stand liquid temperatures down to -20 °C.

- Water-to-water heat pumps for space heating and cooling or water heating

The energy source can be groundwater between 7 and 12 °C. Groundwater is extracted mainly via a submersible pump in a supply well and returned via a return well. If its water quality is not guaranteed, there is a primary circuit between a heat exchanger and the heat pump. This circuit is circulated by a pump that must stand liquid temperatures down to 2 °C.

- Brine-to-water heat pumps for space heating and cooling or water heating

Horizontal ground collectors or probes set vertically into the ground deliver the ground-stored solar energy via a mixture of water and antifreeze (brine) to the evaporator

of the heat pump. This circuit is circulated by a pump that must stand liquid temperatures down to 2 °C or lower. For smaller heat pumps with a minimum brine temperature of 2 °C, UPM10 or UPM20 would be a recommended choice.

The secondary pumps do not differ much from boiler applications. The liquid temperature is normally not above 60 °C, the differential temperature is mostly small, for example, ΔT 5K. Constant-speed compressor heat pumps often require constant flow and long cycle times. A buffer tank can prolong the cycle time and make the flow through the heat pump independent of the flow in the heating distribution circle. Variable-speed compressors often go together with a variable-speed pump, which can be externally controlled by the heat pump controller.

Micro/Mini combined heat and power cogeneration

Cogeneration of heat and power (CHP) can be divided into combustion engines, stirling engines and fuel cells. Dosing and pumps with customised specification are often installed inside the fuel cell process unit. Used secondary pumps are not that different from boiler applications. However, vibrations, liquid temperature and ambient temperature can be relatively high. Often a constant flow is required, therefore a buffer tank is an advantage.

Thermal solar system

Solar collectors convert sunlight into heat that can be used for heating or domestic hot-water supply of buildings. The primary circuit is only in use if there is a positive temperature difference between the collector and the heat exchanger or tank. In pressurised thermal solar systems, pumps must stand glycol-based solar liquids with a high temperature range from 2 °C to 110 °C with short peaks of up to 130 °C. Rarely, during startup of the system, the liquid temperature can cause condensation in the pump. The required flow and head can vary depending on the sizing of the system components. In a drain-back system, the pump must be able to fill up the system each time it starts, which means that the head must be as high as the geodetic height of the system top.

UPM10 SOLAR is designed to be integrated in all kinds of thermal solar systems with either variable (matched-flow) or constant flow. High-efficiency ECM pumps, such as UPM, must not be speed-controlled by an external speed controller varying or pulsing the supply voltage. The speed can be controlled by a low-voltage PWM C signal from a solar controller in order to optimise the solar harvesting and the temperature of the system. Additionally, the power consumption of the pump will be reduced considerably. If no PWM signal is available, UPM10 SOLAR can be set to constant speed I, II and III using the operating panel .

District heating systems with heat exchanger

District heating systems supply all kinds of buildings with space heating and domestic hot-water centrally or by flat stations. In systems with heat exchangers, the secondary pumps do not differ much from boiler applications because the system pressure and temperature values are equal.

Space heating systems

The secondary pump is often a self-controlled stand-alone pump, which can be mounted in a heating kit, and responds to the changing flow demand of heat consumers like radiators or underfloor heating circuits. Providing the best operating conditions for all components, hydraulic balancing is important for well-performing hydraulic systems. Especially in two-pipe heating systems with thermostatic valves, hydraulic balancing helps to avoid noises, oversupply, undersupply, too high pump performance and high energy consumption. If an automatic bypass valve is installed to ensure a minimum flow, you must adjust the differential-pressure control of the pump in a way to ensure the function of the automatic bypass valve. For example, select a constant-pressure curve that is higher than the differential pressure of the valve. The maximum liquid temperature and differential temperature depends on the system design. T_{max} is normally from 30 to 90 °C, ΔT is between 5 and 20 K.

Combined space heating and cooling systems

Underfloor-heating or ceiling-cooling systems together with reversible heat pumps can heat rooms in winter and reduce the temperature of the room air by 4 to 6 °C in summer with one system. When cooling the system, the liquid temperature must be kept above the dew point of the air to avoid condensing on the cooled floor, walls or ceilings. Condensation can occur in the pump occasionally.

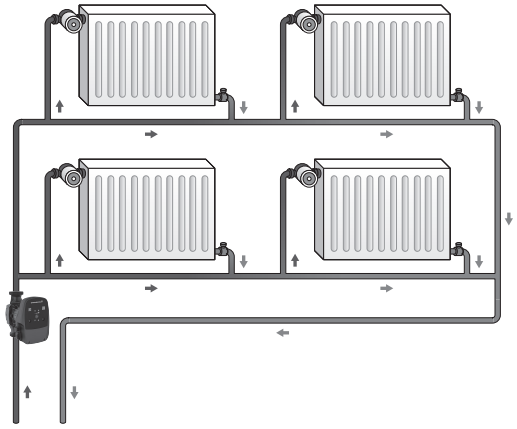
Domestic hot-water generation

In indirect heated DHW systems, the pump can be placed on both sides of the heat exchanger. In a DHW cylinder, drinking water is stored and usually heated indirectly by primary heating water from the boiler either by an external plate heat exchanger or by an internal indirect coil. Especially in renewable energy sourced systems, the primary heating water is stored and instant hot water is created by fresh water stations.

Domestic hot-water recirculation

Hot-water recirculation pumps circulate the drinking water on the secondary side from the taps back to the water heater to ensure comfort and to avoid legionella. UPM10 pumps with stainless-steel housings are made of materials which are suitable for drinking water. The pumps are ACS (FR) and WRAS (UK) approved, and the materials in contact with drinking water comply to the applicable evaluation criteria issued by UBA (DE).

Examples of systems



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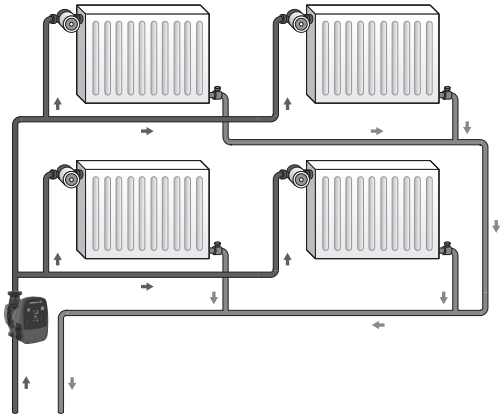
One-pipe heating system



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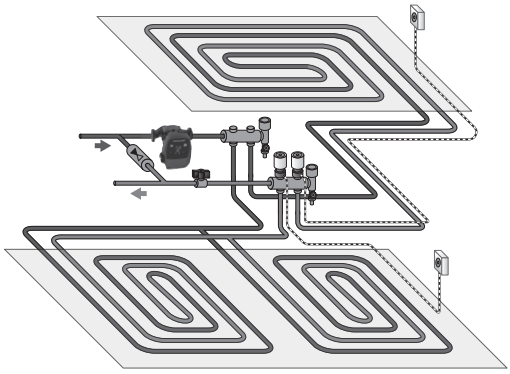
Two-pipe heating system



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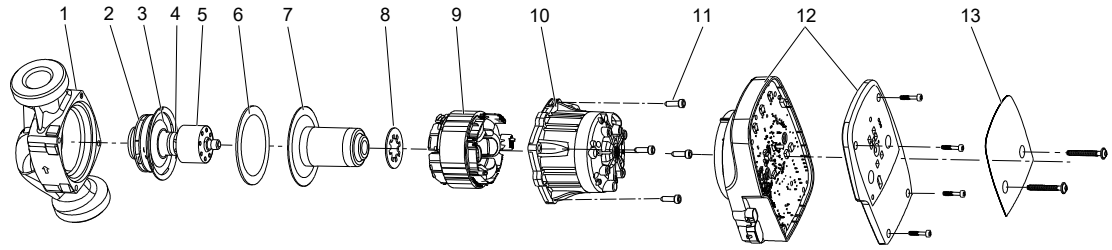
Underfloor-heating system

5. Construction

Exploded view and sectional view



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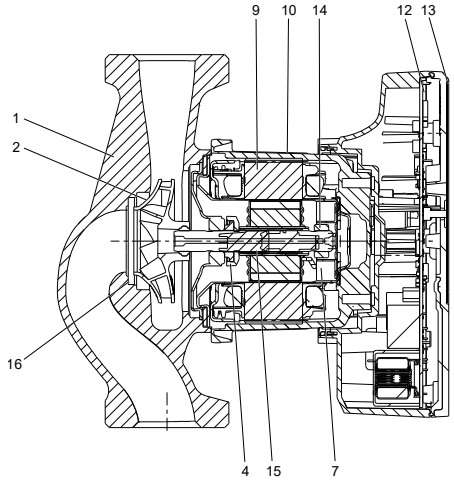

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Material specification

Pos.	Component	Material	EN/DIN
1	Pump housing	Cast iron GG15	EN-GJL-150
		Stainless steel	1.4308
		Composite PA 6.6 30 % GF	
		Composite PPS 40 % GF	
2	Impeller	ULTRASON E 2010 G6 PES-GF30	
3	Bearing plate	Stainless steel	1.4301
	Ceramic ring	Ceramics (CERAMIC ALUMINA HILOX 961)	
4	Axial bearing	Carbon graphite FC941	
	Axial bearing retainer	EP 7-3-7	
5	Rotor	NdFeB	1.4401
	Cover plate	Stainless steel	
	Magnet	Isotropic bonded NdFeB	
	Rotor cladding	Stainless steel	1.4404
6	Gasket	EP 10-7-7	
7	Rotor can	Stainless steel	1.4401
8	Gasket	EP 10-7-7	

Pos.	Component	Material	EN/DIN
9	Stator	Copper wire	
	Stator lamination	Laminated iron	
	Pin for earth connection	Steel	
	Wire end cover for star point	Rynite	
	Cover for ingress protection	Rynite	
10	Stator housing	Aluminium, silumin	
11	Screws	Ecosyn-lubric Auto Silver	
12	Control box	LEXAN	
	Control electronics	PCB with SMD components	
	Screws	Steel	
13	Front foil	LEXAN	
14	Bearing	Ceramic	
	Bearing retainer	Stainless steel	1.4301
15	Shaft	Ceramic	
16	Neck ring	Stainless steel	1.4301

Components

The pumps are of the canned-rotor type as pump and motor form an integral unit without shaft seal and with two gaskets for sealing and four screws for fastening the stator housing to the pump housing. The bearings are lubricated by the pumped liquid as the rotor can is filled with water. The focus has been on using eco-friendly materials as well as on limiting the number of materials.

Motor

The efficiency of the three-phase, 4-pole, synchronous, electronically commutated permanent-magnet (ECM/PM) motor type is considerably higher compared to a conventional asynchronous squirrel-cage motor.

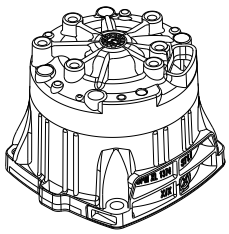
The ECM/PM motor is designed according to the canned-rotor principle. The design of the mechanical motor components has mainly focused on the following features:

- Reliable with stainless-steel rotor can in one part and a specific formed EPDM gasket
- simple design meaning as few components as possible, each with several functions
- high efficiency due to permanent magnets and low-friction bearings.

The motor is cooled by the pumped liquid, which reduces the sound pressure level to a minimum. Being software-protected, the pump requires no further motor protection.

Stator housing

The aluminium die-cast stator housing with four fixing holes is following the design of the well-accepted Grundfos UP pumps. It enables easy change of motor positions by removing the four screws holding the stator housing and turning the housing to the desired position. The stator housing features drain holes and is CED electrocoated.



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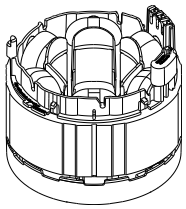
Stator housing

Stator and windings

The product has a three-phase stator with six concentric-positioned in-slot windings.



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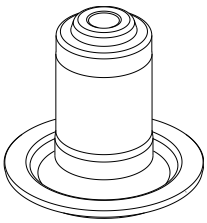
Stator

Rotor can

The rotor can is drawn out of one sheet of stainless steel. It contains the ground and honed upper radial bearing.



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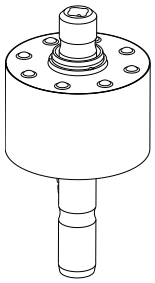
Rotor can with bearing holder and ceramic bearing

Shaft with rotor

The shaft is made of ceramics. To avoid precipitation of calcium in the radial bearings, the shaft has been plunge-ground at the journal bearings. It has a throughgoing hole to ensure good lubrication and cooling of the upper bearing. The rotor can does not need to be vented as air inside the rotor chamber escapes the system through the throughgoing hole of the shaft.

The rotor core is made of bonded neodymium permanent magnets.



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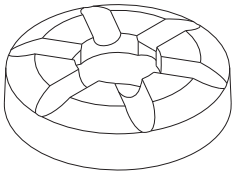
Example of a shaft with rotor

Thrust bearing

The antimony-free carbon thrust bearing is fitted to the shaft in a flexible EPDM retainer.

In combination with the bearing plate, the thrust bearing prevents forces from being transmitted axially to the rotor and rotor can.



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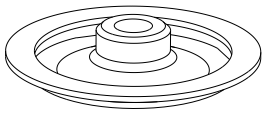
Thrust bearing

Bearing plate

The bearing plate is made of stainless steel. The ground and honed inner radial and axial ceramic bearing is pressed into the bearing plate. The axial bearing is lapped to reduce any friction and the run-in period of the pump. Due to the relatively large bearing plate surface, the motor heat is effectively carried away by the pumped liquid. Tiny laser holes through the bearing plate ensure optimum venting and minimise the gradual replacement of rotor liquid with the pumped liquid.



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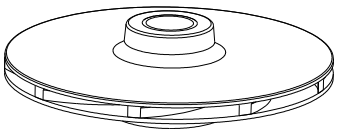
Bearing plate with ceramic bearing

Impeller

The composite impeller is of the radial type with curved blades. The impeller shaft with rotor and bearing plate is assembled in one unit to eliminate possible misalignment in the bearings.



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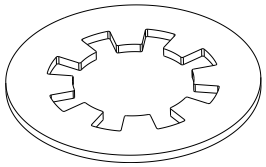
Impeller

Gaskets

The gaskets are formed flat and made of EPDM, which is applicable for drinking-water use as well. The gaskets seal up stator housing, pump housing, rotor can and bearing plate.



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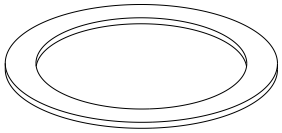
Top gasket



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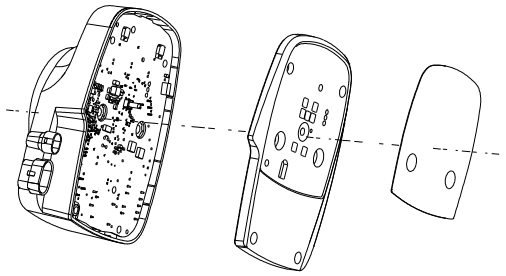
Bottom gasket

Control box

The control box housing is made of two composite parts welded together. Power and signal connectors are integrated. There are two versions available with signal connection designed for FCI connector or TE Mini Superseal connector.

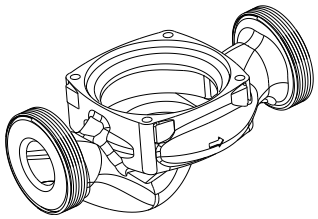
The control box contains the PCBs for internal power supply, control and communication. The control box includes all relevant functions and EMC filter components. It is available with different hard- and software, mainly different regarding internal or external control, with or without operating panel and communication signal, such as PWM.



Pump housing

As a standard, the pump housing is available in electrocoated cast iron with threaded inlet and outlet ports. The reference pump housing is of the in-line type. The stainless-steel neck ring is pressed into the pump housing to minimise the amount of liquid running from the outlet side of the impeller to the inlet side.

OEM specific housings are available on request.



TM085329

Pump housing

OEM-specific housings

The products are available with a wide range of integrated standard pump housings or customised pump housings with different dimensions, in different materials, designs and with additional functionalities.

Cast-iron electrocoated (CED) in-line housings

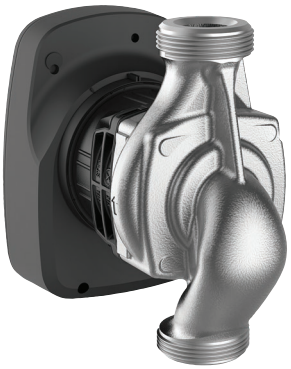
CED 15 × 130 mm

CED 25 × 130 mm

CED 25 × 180mm

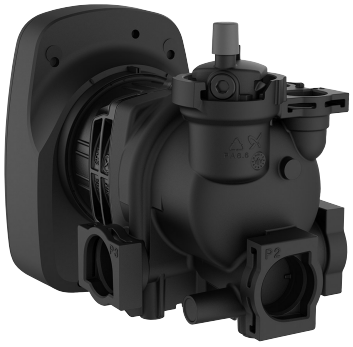
CED 32 × 180 mm

Stainless-steel (N) in-line housings



Stainless steel 25 × 180 mm

Composite housings (CHBL)



CHBL 25 × 130 mm

Overview of pump housings

Material	Pump type	Port-to-port length [mm]	DN	Weight [kg]	PN [bar]	Max. temperature [°C]	Drinking water approvals	Inlet	Outlet
Cast iron CED	UPM10	130	15	0.8	10	110	-	G 1	G 1
		130	25	1	10	110	-	G 1 1/2	G 1 1/2
		180	25	1.1	10	110	-	G 1 1/2	G 1 1/2
		180	32	1.3	10	110	-	G 2	G 2
	UPM20	180	25	1.5	10	110	-	G 1 1/2	G 1 1/2
		180	32	1.7	10	110	-	G 2	G 2
Stainless steel	UPM10	180	25	1.3	10	110	•	G 1 1/2	G 1 1/2
CHBL (composite)	UPM10	- [1]	20	0.3	6	95	-	Clip	Clip

[1] The port-to-port measurement depends on the application. Contact Grundfos for more information.

Combination of pump housings for UPM10, UPM20

Standard range		UPM10			UPM20M
Pump housing		XX-95	XX-105	XX-125	XX-130
Cast iron CED, PN 10	15 × 130 mm	•	•	•	
	25 × 130 mm	•	•	•	
	25 × 180 mm	•	•	•	•
	32 × 180 mm	•	•	•	•
Stainless steel, PN 10	N 25 × 180 mm	•	•	•	
	N 32 × 180 mm	•	•	•	
Composite	CHBL, PN 10	•	•	•	

6. Operating panel and settings

Control modes for UPM10, UPM20

UPM10 and UPM20 are externally controlled via a PWM or LIN bus signal.

Operating panel

TM085435

Pos.	Description
1	Signal established with the product. For LIN and PWM communication, the LED flashes when communication is established.
2	Alarm symbol

For more information on the different control panels, scan below QR code:

:

QR92811652

Alarm status

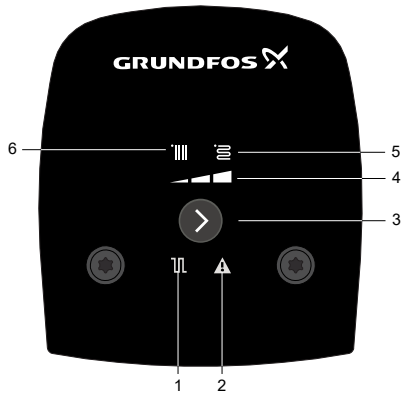
If the pump detects an alarm, the external signal LED turns off and the alarm LED is permanently red. This means that the rotor is blocked or there is an electrical error.

The warnings can be read out via the PWM or LIN bus signal.

Control modes for UPM10, UPM20 HYBRID, AUTO, SOLAR, DHW variants

UPM10 and UPM20 HYBRID can be externally controlled via a PWM or LIN bus signal or manually via the operating panel. The operating panel features five LEDs and one button.

Operating panel



TM086252

Pos.	Description
1	Signal established with the product. For LIN and PWM communication, the LED flashes when communication is established.
2	Alarm symbol
3	Push button
4	Settings for the selected control mode Speed I, II, III or Autoadapt
5	Control mode Constant pressure
6	Control mode Proportional pressure

For more information on the different control panels, scan below QR code:

:

QR92811652

Alarm status

If the pump detects an alarm, the external signal LED turns off and the alarm LED is permanently red. This means that the rotor is blocked or there is an electrical error.

The warnings can be read out via the PWM or LIN bus signal.

7. Technical data

Ambient and liquid temperature

The ambient and liquid temperature of the specific pump is indicated in the table below. The ambient temperature is measured in a distance of no more than 5 cm in front of the front foil at its lower edge.

	70 °C ambient temperature
Cast-iron pump housings, 100-180 W	TF110
Cast-iron pump housings, 200 W	TF95
All composite pump housings	TF95

The above-mentioned temperature ranges do not take temperature limitations of the drinking-water approvals into account.

Pumped liquids

The pump is suitable for the following liquids:

- Clean, thin, non-aggressive and non-explosive liquids, not containing solid particles or fibres.
- In heating systems, the water must meet the requirements of accepted standards on water quality in heating systems, for example the German standard VDI 2035.
- The pH must be between 8.2 and 9.5. The minimum value depends on the water hardness and must not be below 7.4 at 4 °dH (0.712 mmol/l).
- The electrical conductivity at 25 °C must be equal to or larger than 10 microS/cm.
- Mixtures of water with antifreeze media, such as glycol, with a kinematic viscosity lower than 10 mm^2/s (10 cSt). When selecting a pump, the viscosity of the pumped liquid must be taken into consideration. If the pump is used for a liquid with a higher viscosity, the hydraulic performance of the pump is reduced.
- Solar media as used in typical solar thermal systems containing up to 50 volume % of antifreeze media.
- For drinking water use, approved housings must be used. These pumps are WRAS (UK) and ACS (FR) approved, and the materials in contact with drinking water comply with the applicable evaluation criteria issued by UBA (DE).
- In domestic hot-water systems, the pump must be used only for water with a degree of temporary hardness of less than 3 mmol/l CaCO3 (16.8 °dH). To avoid lime problems in hard waters, the media temperature must not exceed 65 °C.
- The water quality of test beds for the final production tests of complete heating appliances including pump must be observed to avoid calcification or biofilm formation during a longer storage period.

Minimum inlet pressure

To avoid cavitation and damage to the pump bearings, the following minimum pressures are required at the pump inlet port.

Liquid temperature	75 °C	95 °C	110 °C
Pressure	0.005 MPa	0.05 MPa	0.108 MPa
	0.05 bar	0.5 bar	1.08 bar

Leakage current

The pump mains filter causes a leakage current from line to earth during operation.

Leakage current: < 3.5 mA.

High-voltage test

All Grundfos pumps are tested with 1000 VAC for 1 second, according to EN 60335-1 Annex A.

Electronically commutated motor pumps incorporate filter components, including Y-capacitors, that are connected to protective earth. The capacitors are class Y2 film capacitors with normal requirements. Every high-voltage test exposes the Y-capacitors to high voltage.

The voltage level and the number of tests must be as low as possible in order to allow for the longest lifetime in the market. Additional standard high-voltage tests of the complete pump, including filter, must be avoided to eliminate the risk of filter damage.

Supply voltage

1 × 230 VAC +10 % / -15 %, 50/60 Hz.

The pump is externally controlled via PWM signal or LIN bus signal.

Reduced supply voltage

The pump runs optimally at 230 VAC. The pump can run with reduced performance if the voltage drops below 230 VAC.

Pumps with PWM and LIN bus control

If the voltage falls below 190 VAC, a low-voltage warning is sent via the PWM or LIN bus signal.

If the voltage falls below 150 VAC, the pump stops and a low-voltage alarm is sent via the PWM or LIN bus signal.

Pumps in internal control mode

If the voltage falls below 150 VAC, the pump stops.

Supply voltage	Pump performance	External signal LED	Alarm LED	PWM output signal
230 VAC	Nominal performance	● [2]		According to specification
< 195 VAC	Reduced	● [2]		Warning
< 150 VAC	Stopped		● [3]	Alarm [4]

[2] Permanently on: no external control. Flashing green: external control active.

[3] Constant red.

[4] The pump starts again when the voltage is above 160 VAC and the PWM output changes to either warning or according to specification depending on the level.

8. External control modes and signals

PWM

The pumps are controlled via a digital low-voltage pulse-width modulation (PWM) signal, which means that the speed of rotation depends on the input signal.

The speed changes as a function of the input profile. These communication signals are standardised in the VDMA Einheitsblatt 24224 "Wet runner circulating pumps - Specification of PWM control signals".

Digital low-voltage PWM signal

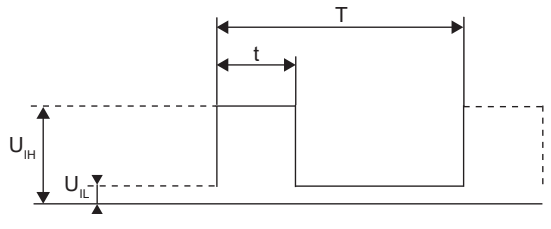
The PWM output provides feedback to the controller.

Duty cycle

d % = 100 × t/T

Example	Rating
T = 2 ms (500 Hz)	
t = 0.6 ms	
d % = 100 × 0.6 / 2 = 30 %	
U_{IH} = 5 V	U_{IH} = 4 - 24 V
U_{IL} = 0.5 V	U_{IL} ≤ 1 V

Example



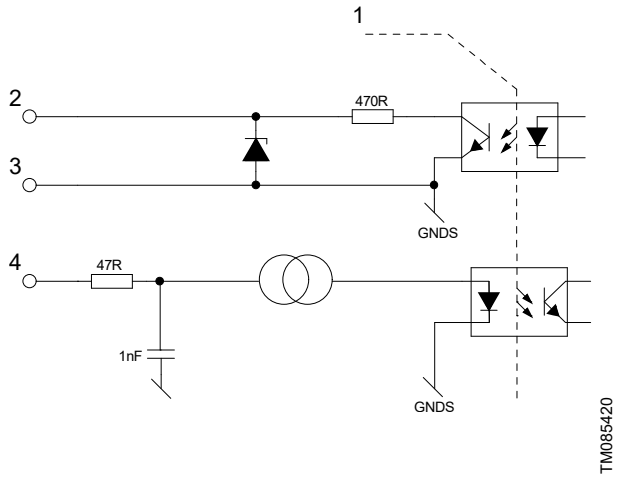
PWM signal

Abbreviation	Description
T	Period of time [s]
d	Duty cycle [t/T]
U_{IH}	High-level input voltage
U_{IL}	Low-level input voltage

PWM interface

The PWM interface consists of an galvanically isolated circuit connecting the external control signal to the pump. The interface translates the external signal into a signal type that the microprocessor can understand.

The galvanically isolated interface ensures that the user cannot get into contact with dangerous voltage if touching the signal wires when power is connected to the pump.

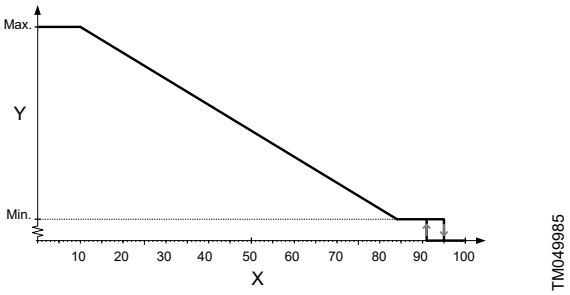


Schematic drawing, equivalent interface

Pos.	Description
1	Galvanic isolation
2	PWM output
3	Signal reference (without connection to protective earth)
4	PWM input

PWM input signal profile A (heating)

At high PWM signal duty cycles, a hysteresis prevents the pump from starting and stopping if the input signal fluctuates around the shifting point. At low PWM signal duty cycles, the pump speed is high for safety reasons. In case a cable breaks when mounted in a system, the pump starts to run at maximum speed. This is suitable for both boilers and heat pumps to ensure that the pump transfers heat even if a cable breaks.



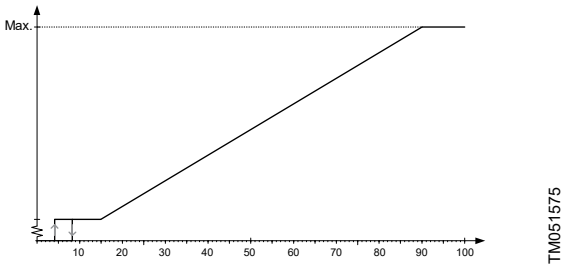
PWM input profile A (heating)

Axis	Value
X	Input duty cycle
Y	Speed

PWM input duty cycle	Pump status
PWM signal ≤ 10 %	Max. speed
10 % < PWM signal ≤ 84 %	Variable speed from min. to max. speed
84 % < PWM signal ≤ 91 %	Min. speed
91 % < PWM signal ≤ 95 %	Hysteresis area: on/off
95 % < PWM signal ≤ 100 %	Standby mode: off

PWM input signal profile C (SOLAR and HYBRID)

At low PWM signal duty cycles, a hysteresis prevents the pump from starting and stopping if the input signal fluctuates around the shifting point. Without PWM signal, the pump stops for safety reasons. If a signal is missing, for example if a cable breaks, the pump stops to avoid overheating of the solar thermal system.



PWM input profile C (solar)

Axis	Value
X	Input duty cycle
Y	Speed

PWM input duty cycle	Pump status
PWM signal ≤ 5 %	Standby mode: off
5 % < PWM signal ≤ 8 %	Hysteresis area: on/off
8 % < PWM signal ≤ 15 %	Minimum speed
15 % < PWM signal ≤ 90 %	Variable speed from minimum to maximum speed
90 % < PWM signal ≤ 100 %	Maximum speed

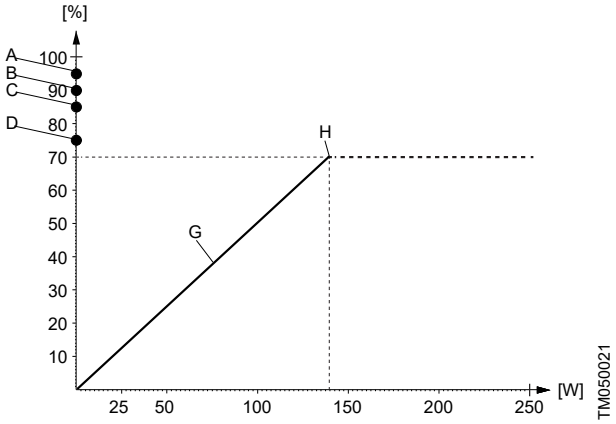
PWM feedback signal (standard)

The PWM feedback signal offers the same pump information as in bus systems:

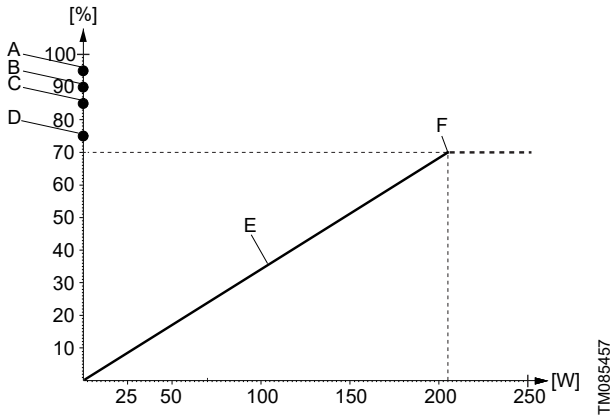
- current power consumption (accuracy ± 2 % of PWM signal)
- warning
- alarm
- operating status.

Alarms

Alarm output signals are available because some PWM output duty cycles are dedicated to alarm information. If a supply voltage is measured below the specified supply voltage range, the output duty cycle is set to 75 %. If the rotor is locked due to deposits in the hydraulics, the output duty cycle is set to 90 % as this alarm has a higher priority.



PWM feedback signal, UPM10M, UPM10L power consumption



PWM feedback signal, UPM10XL, UPM20M power consumption

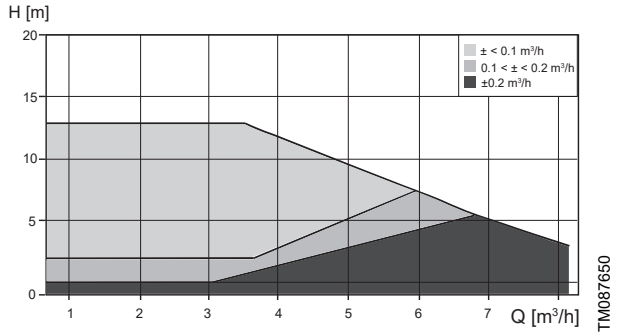
Pos.	Description
X-axis	Output power consumption [W]
Y-axis	PWM output duty cycle in percentage [%]
A	Standby (stop)
B	Alarm stop: fault, blocked pump
C	Alarm stop: electrical fault
D	Warning
E	Slope: 3 W / % PWM signal
F	Saturation at 210 W
G	Slope: 2 W / % PWM signal
H	Saturation at 140 W

PWM output duty cycle	QT [s]	Pump information	DT [s]	Priority
95	0	Standby (stop) by PWM duty cycle	0	1
90	30	Alarm, stop, blocked error	12	2
85	0-30	Alarm, stop, electrical error	1-12	3
75	0	Warning	0	5
0-70		0-70 W (slope 1 W/% PWM)		6
Output frequency: 75 Hz ± 5 %				

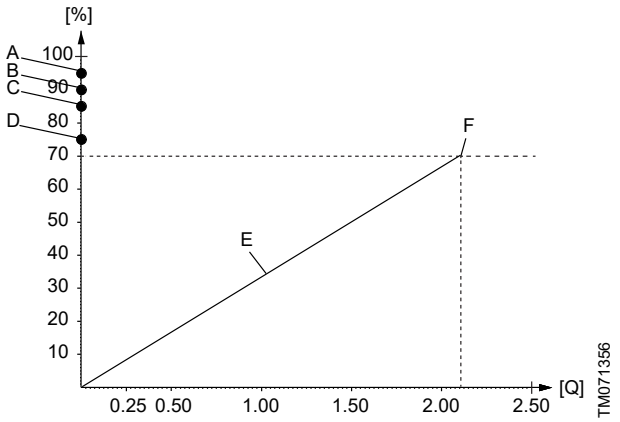
QT = qualification time, DT = disqualification time

PWM feedback signal - flow estimation (on request)

On request, the PWM feedback signal can also be used to indicate the flow of the pump on defined pump housings, for example cast iron inline, above a head of 1 m.
The accuracy of the feedback signal depends on the media, media temperature and operation point, but it gives information on the actual flow (see figure below).



In the following example, the PWM output range between 0-70 % shows the flow between 0 and 2.1 m^3/h with a slope of 0.03 m^3/h / % PWM (see figure below).



PWM feedback signal - flow estimation

Pos.	Description
A	Standby (stop)
B	Alarm stop: fault, blocked pump
C	Alarm stop: electrical fault
D	Warning
E	Slope: 0.03 [m^3/h]/% PWM
F	Saturation at 2.1 [m^3/h]

Control signal data levels

PWM input duty cycle	Symbol	Value
PWM input frequency with high-speed optocoupler	f_i	100-1500 Hz [5)]
Rated input voltage - high level	U_{iH}	4-24 V
Rated input voltage - low level	U_{iL}	≤ 1 V
High-level input current	I_{iH}	< 10 mA
Input duty cycle	D_i	0-100 %

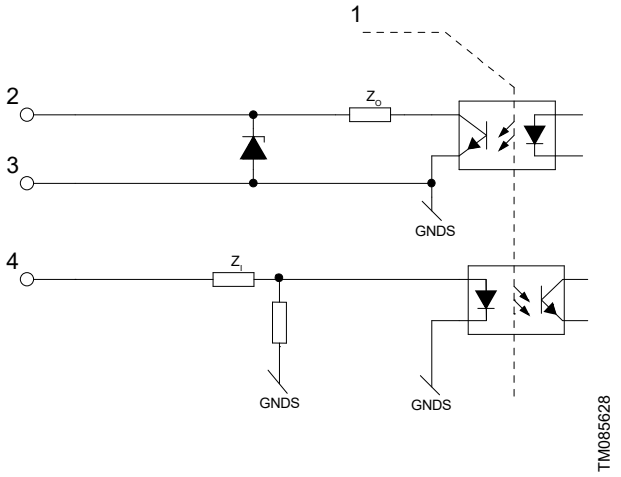
5) Only for standard profiles.

PWM output duty cycle	Symbol	Value
PWM frequency output, open collector	f_o	75 Hz ± 5 %
Accuracy of output signal regarding power consumption	-	± 2 % (of PWM signal)
Output duty cycle	D_o	0-100
Output impedance	Z_o	< 500 Ω

0-10 VDC

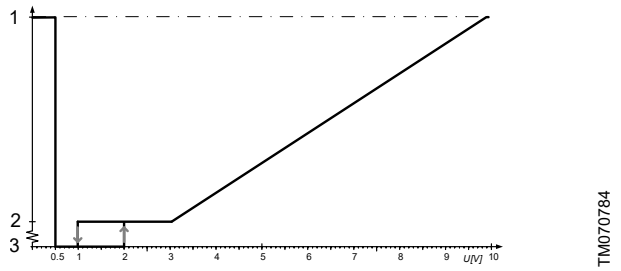
The product can be externally speed-controlled by an analog 0-10 VDC signal.

The pump requires a 0-10 VDC signal on the signal port to control the speed of the pump. The pump will run at its maximum speed if the signal fails (cable break).



Schematic drawing, equivalent interface

Pos.	Description
1	Galvanic isolation
2	Alarm output signal
3	Signal reference (without connection to protective ground)
4	0-10 VDC input



Profile R

Pos.	Description
1	Max.
2	Min.
3	Stop

U [V]	Pump status
0 < U ≤ 0.5	Max. speed
0.5 < U ≤ 1	Standby (Stop)
1 < U ≤ 2	Hysteresis
2 < U ≤ 3	Min. speed
3 < U ≤ 10	Speed between min. and max.

Alarm output signal

An alarm output signal is available.

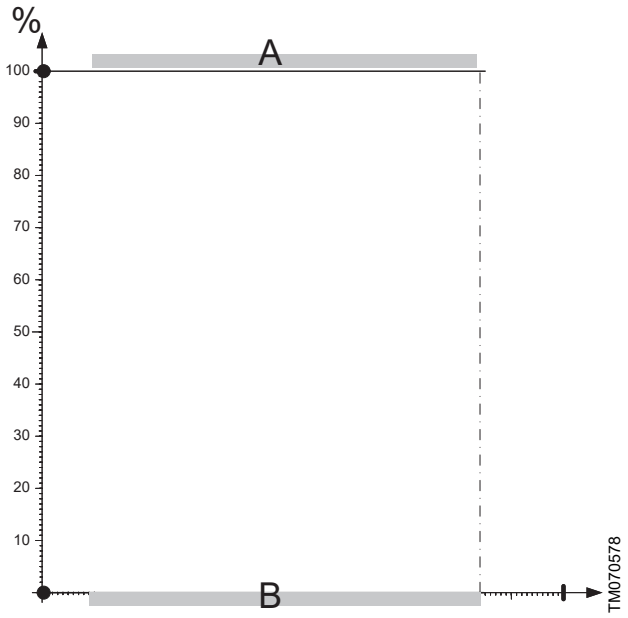
Output transistor status indicates pump operation.

The output signal is activated in the following cases:

- The pump stops when the input signal is between 0.5 and 2 VDC.
- The pump stops because of an alarm and the input signal is between 2 and 10 VDC.

Output signal is not activated in the following cases:

- Pump fault.
- The pump is running (input voltage is above 0.5 VDC).



Output profile 0-10 VDC

Pos.	Alarm output signal %	Description
A	100	Standby (stop) or alarm stop
B	0	Pump is running.

0-10 VDC	Symbol	Value
Operating voltage	U_I	0-10 VDC
Input impedance	Z_I	≥ 50 kΩ
Max input voltage	-	26 VDC
Continuous short circuit protection	-	Yes
Reverse polarity protection	-	Yes, Limit: 26 V, 20 mA

Alarm output signal

State	Symbol	Value
Off	$Z_{O, off}$	> 100 kΩ
On	$Z_{O, on}$	< 500 Ω

LIN bus

The LIN variant is ready for the Local Interconnect Network (LIN) bus communication protocol that is standardised in the "VDMA Einheitsblatt 24226". This data bus has been developed as LIN in the automotive sector and enables interchange of data between the pump and the HVAC application.

Grundfos LIN bus enables a flexible and extended communication protocol in the heating system that gives the customer great features, such as:

- Grundfos LIN bus Basic
- Grundfos LIN bus Basic+
- Grundfos LIN bus DigitalAnalytics1

Grundfos LIN bus Basic makes it possible to control the following:

- start/stop
- constant curve
- readouts of pump status and static pump information
- configuration of pump address and fallback settings.

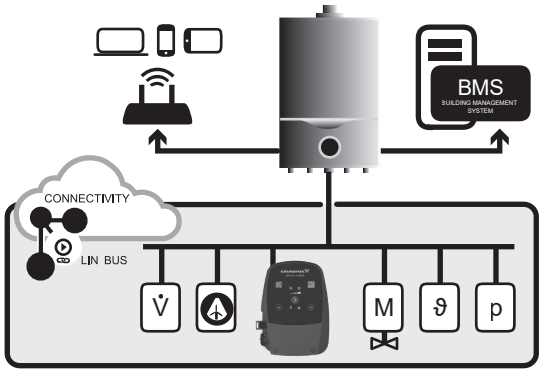
Grundfos LIN bus Basic+ enables:

- constant and proportional pressure operation
- reading of estimated Q&H performance data in real time.

Grundfos LIN bus DigitalAnalytics1 features:

- reading of estimated Kv, RPM, mains voltage and pump operation limitation details
- advanced control and optimisation of the pump in real time.

Grundfos LIN bus makes it possible to share data with Grundfos to improve and develop new features and tools. An overview of all available LIN bus features can be found in the Grundfos Technical Guide LIN specific content for UPM pumps.



TM085501

LIN bus on fieldbus of heating control systems

Hydronic balancing

Hydronic balancing is important for a well-performing heating system with respect to energy consumption and room comfort. A balanced system secures the best possible distribution of the needed flow in the heating system. It also secures that the pump performance is not too high.

When using a UPM LIN pump together with the Grundfos GO Balance app and the ALPHA Reader dongle, it is possible to perform hydronic balancing of two-pipe or underfloor-heating systems by using real-time flow measurement from the pump.

TM066574

ALPHA Reader

9. Performance curves and technical data

Curve conditions

The guidelines below apply to the performance curves:

- The test liquid is airless water.
- The curves apply to a density of 998.21 kg/m^3 and a liquid temperature of 20 °C.
- All curves show average values and should not be used as guarantee curves. If a specific minimum performance is required, individual measurements must be made.
- The curves apply to a kinematic viscosity of 1.004 mm^2/s (1.004 cSt).
- The conversion between head H [m] and pressure p [kPa] has been made for water with a density of 1000 kg/m^3. For liquids with other densities, for example hot water, the outlet pressure is proportional to the density.
- Curves have been obtained according to EN 16297.
- Pump variants with PWM signal connection are designed to be speed controlled by an external system controller. Therefore, EEI and $P_{L,Avg}$ of the different pump heads (pumps without pump housings) are measured to be in compliance with the Ecodesign requirements of regulation EC/622/2012 with a reference housing in accordance with EN 16297-3.
- It is not obligatory to show $P_{L,Avg}$, but it gives an indication on the yearly expectable average power consumption.
- The performance of PWM controlled pumps is measured with A profile (heating) at eight PWM values: 5 % (max.), 20 %, 31 %, 41 %, 52 %, 62 %, 73 %, 88 % (min.).
- C profile curves are measured mirrored with 95 % (max.), 80 %, 69 %, 59 %, 48 %, 38 %, 27 %, 12 % (min.).
- Maximum curves are limited by speed and power
- Variants with two different minimum curves are available: minimum curve A (standard) at approximately 0.1 m and minimum curve J (optional) at approximately 1 m.
- Other curves for different control signals or OEM housings are available on request.

Measured pump head variants

UPM10M		Product mark	P_1 max. nom. [W]	EEI Part 3
PWM	XX-95	GFBSA	100	≤ 0.20
LIN	XX-95	GFBSA	100	≤ 0.20
0-10 V	XX-95	GFBSA	100	≤ 0.20
HYBRID	XX-95	GFBSA	100	≤ 0.20
AUTO [6]	XX-95	GFBSA	100	≤ 0.20

UPM10L		Product mark	P_1 max. nom. [W]	EEI Part 3
PWM	XX-105	GFBSA	140	≤ 0.20
LIN	XX-105	GFBSA	140	≤ 0.20
0-10 V	XX-105	GFBSA	140	≤ 0.20
HYBRID	XX-105	GFBSA	140	≤ 0.20
AUTO [6]	XX-105	GFBSA	140	≤ 0.20
SOLAR	XX-145	GFBSA	140	≤ 0.20

UPM10XL		Product mark	P_1 max. nom. [W]	EEI Part 3
PWM	XX-125	GFBSA	180	≤ 0.20
LIN	XX-125	GFBSA	180	≤ 0.20
0-10 V	XX-125	GFBSA	180	≤ 0.20
HYBRID	XX-125	GFBSA	180	≤ 0.20
AUTO [6]	XX-125	GFBSA	180	≤ 0.20
DHW	XX-125	GFBSA	180	≤ 0.20

[6] Only applicable for 180 mm pump housings. For 130 mm pump housings, ≤ 0.23 applies.

UPM20M		Product mark	P_1 max. nom. [W]	EEI Part 3
PWM	XX-130	GFBUA	200	≤ 0.20
LIN	XX-130	GFBUA	200	≤ 0.20
0-10 V	XX-130	GFBUA	200	≤ 0.20
HYBRID	XX-130	GFBUA	200	≤ 0.20
AUTO	XX-130	GFBUA	200	≤ 0.20

Overview of technical data

Features

Dry-running ability - first start	All pumps are lubricated with glycerine. Max. operation time without water is 2 minutes.
Dry-running ability - during operation	The rotor can must be filled with water in compliance with EN 60335-2-51.
Expected lifetime (UPM10M, UPM10L, UPM10XL)	> 90,000 h (with specified load profile)
Expected lifetime (UPM20)	< 72,000 h (with specified load profile)
RF emissions	-6 dB CE / EN 55014-1,-2
Acoustic sound pressure level (LW)	≤ 38 dB(A) on cast-iron housings (UPM10)
	≤ 41 dB(A) on cast-iron housings (UPM20)
Max. altitude of installation	2000 m above sea level

System pressure

Max. system pressure	1 MPa (10 bar) (depending on the housing material)
Min. inlet pressure	0.005 MPa (0.05 bar) at 75 °C liquid temperature 0.05 MPa (0.50 bar) at 95 °C liquid temperature 0.108 MPa (1.08 bar) at 110 °C liquid temperature

Mechanical data

Equipment class	I (EN 60335-1)
Insulation class	F (EN 60335-1)
Enclosure class	IPX4D
Temperature class for UPM10	Cast-iron pump housing, 100-180 W: TF110 at 70 °C ambient temperature Cast-iron pump housing, 200 W: TF95 at 70 °C ambient temperature
Max. ambient temperature	70 °C
Min. ambient temperature	-20 °C
Max. media temperature	UPM10: 110 °C for cast-iron housings UPM20: 95 °C for cast-iron housings
Min. media temperature	-20 °C
Relative humidity	Maximum 95 %
Storage temperature	-40 to +75 °C

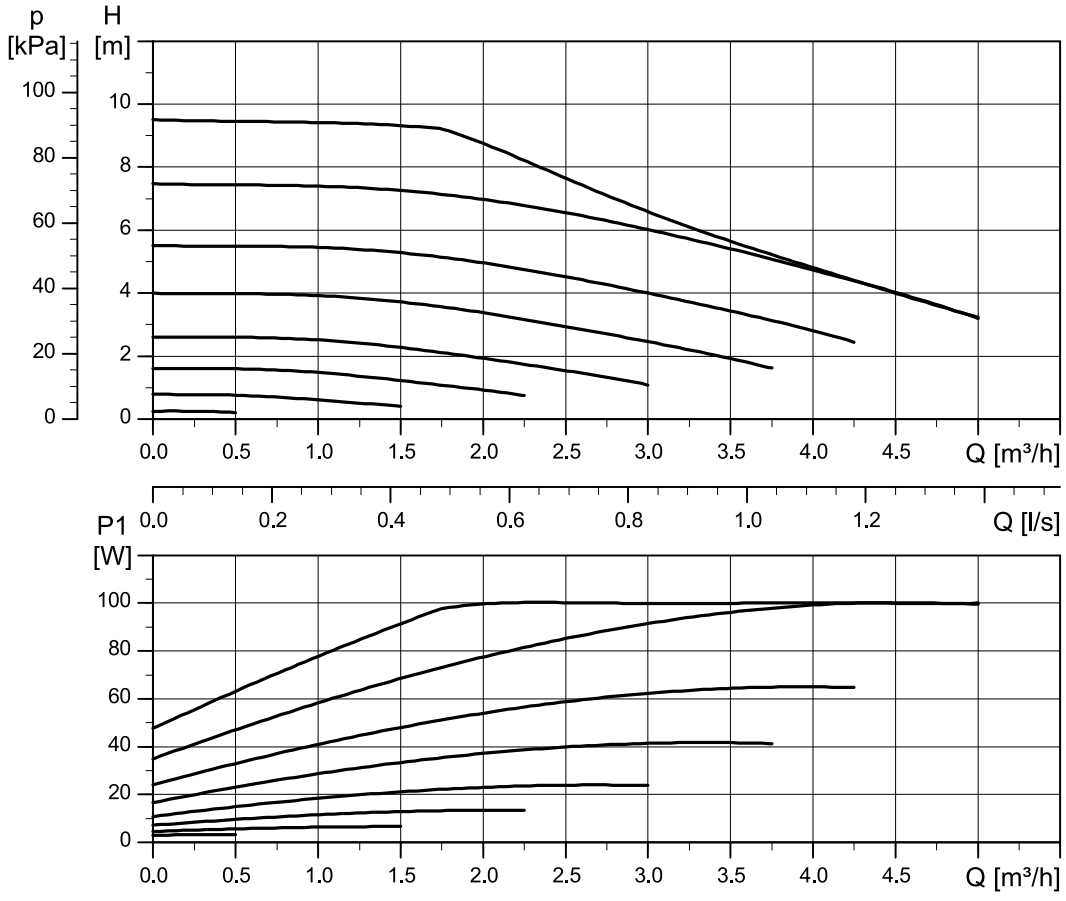
Electrical data

Nominal supply voltage	EU: 1 × 230 VAC +10 % / -15 %, 50/60 Hz
Min. supply voltage	160 VAC (runs with reduced performance)
Standby power consumption	< 0.4 W
Surge robustness	> 4 kV (DM/CM)
Inrush current	< 3 A
Max. leakage current	≤ 2.5 mA (EN 60335-1)
Min. switching time power on/off	< 1 second
Reaction time - power on	< 1 second
Reaction time - standby	< 1 second
Reaction time - speed change	< 1 second
Speed range	560 to 5020 min^{-1} (depending on the variant)
Motor protection	The motor is protected by the electronics in the control box and requires no external motor protection.
High voltage protection	EN 60335-1 1000 VAC

Approvals

Drinking water approvals (ACS, WRAS, UBA)	Specific compliant pump housings are available.

UPM10M PWM XX-95 130/180



EEI ≤ 0.20 Part 3

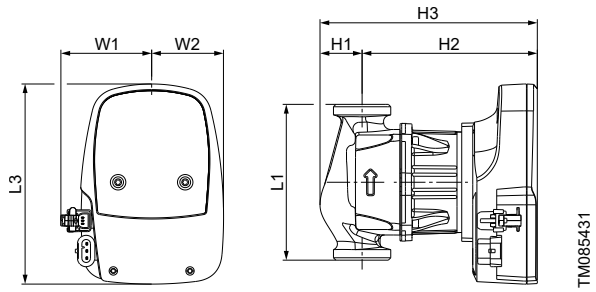
$P_{L,avg}$ ≤ 43 W

Pump settings
1 factory preset

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	3	0.05
Max.	100	0.8

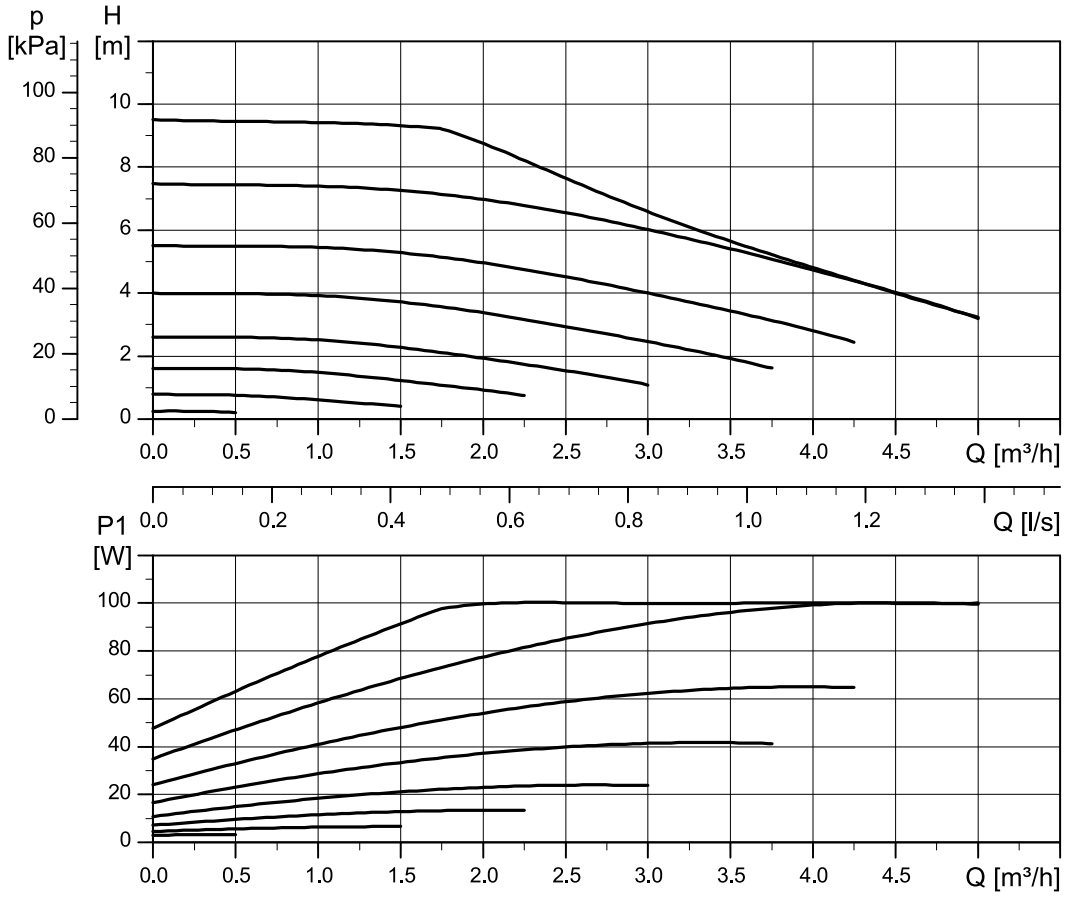
Technical data	
System pressure	Max. 1.0 MPa (10 bar)
Min. inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature
Liquid temperature	-20 to +110 °C (TF110)
Enclosure class	IPX4D
Motor protection	No external protection needed
Approval and marking	Not available yet. Specific compliant pump housings are available upon request.

Dimensions



Pump type	Dimensions [mm]							Connections [inch]	Weight [kg]
	L1	L3	W1	W2	H1	H2	H3		
25-95 180	180	167	76	60	41	136	177	1 1/2	2.8
25-95 130	130	167	76	60	30	146	176		2.6

UPM10M 0-10 V XX-95 130/180



EEI ≤ 0.20 Part 3

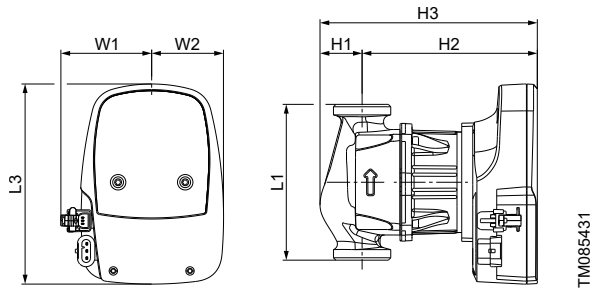
$P_{L,avg}$ ≤ 43 W

Pump settings
1 factory preset

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	3	0.05
Max.	100	0.8

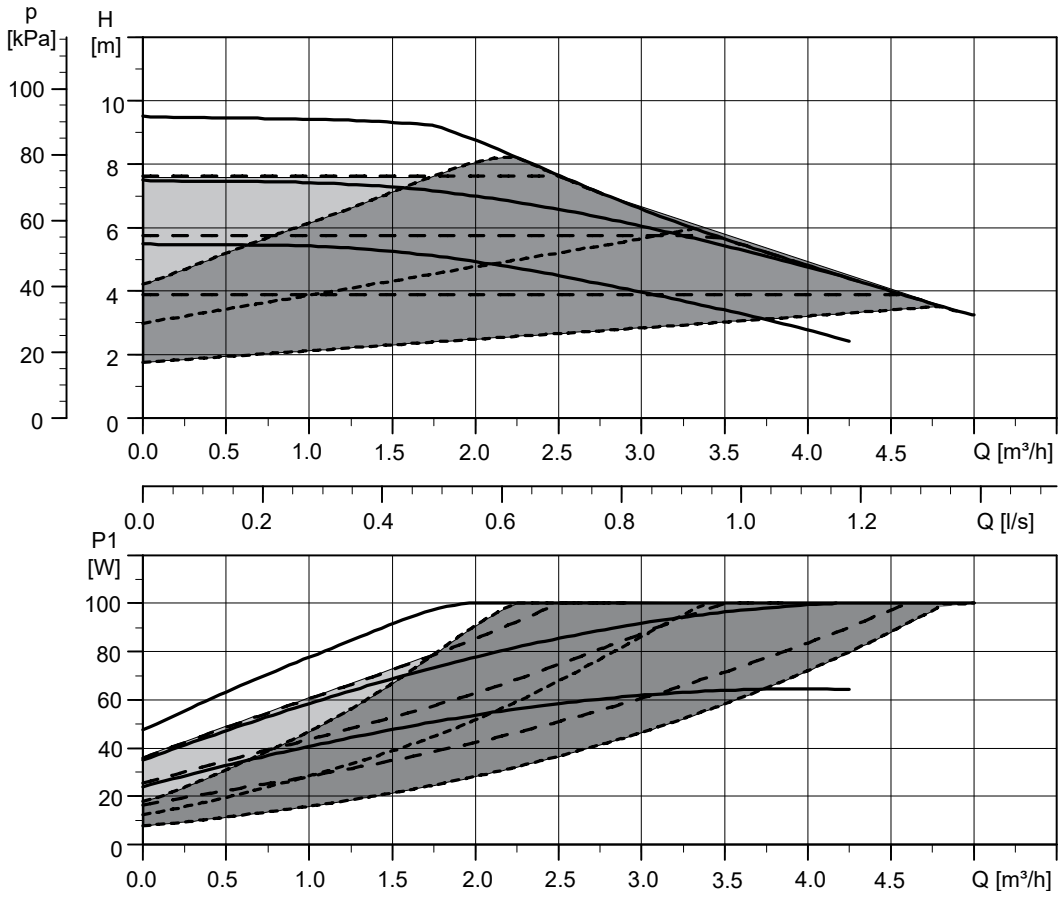
Technical data	
System pressure	Max. 1.0 MPa (10 bar)
Min. inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature
Liquid temperature	-20 to +110 °C (TF110)
Enclosure class	IPX4D
Motor protection	No external protection needed
Approval and marking	Not available yet. Specific compliant pump housings are available upon request.

Dimensions



Pump type	Dimensions [mm]							Connections [inch]	Weight [kg]
	L1	L3	W1	W2	H1	H2	H3		
25-95 180	180	167	76	60	41	136	177	1 1/2	2.8
25-95 130	130	167	76	60	30	146	176		2.6

UPM10M HYBRID XX-95 130/180



EEI ≤ 0.20 Part 3

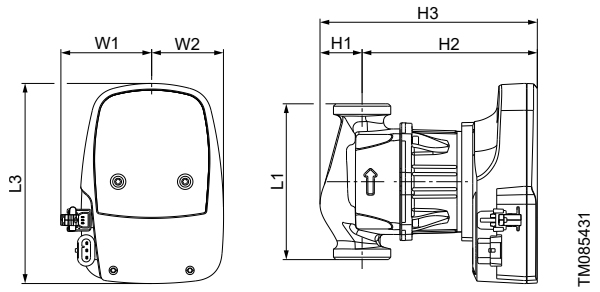
$P_{L,avg}$ ≤ 43 W

Pump settings
1 factory preset

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	3	0.05
Max.	100	0.8

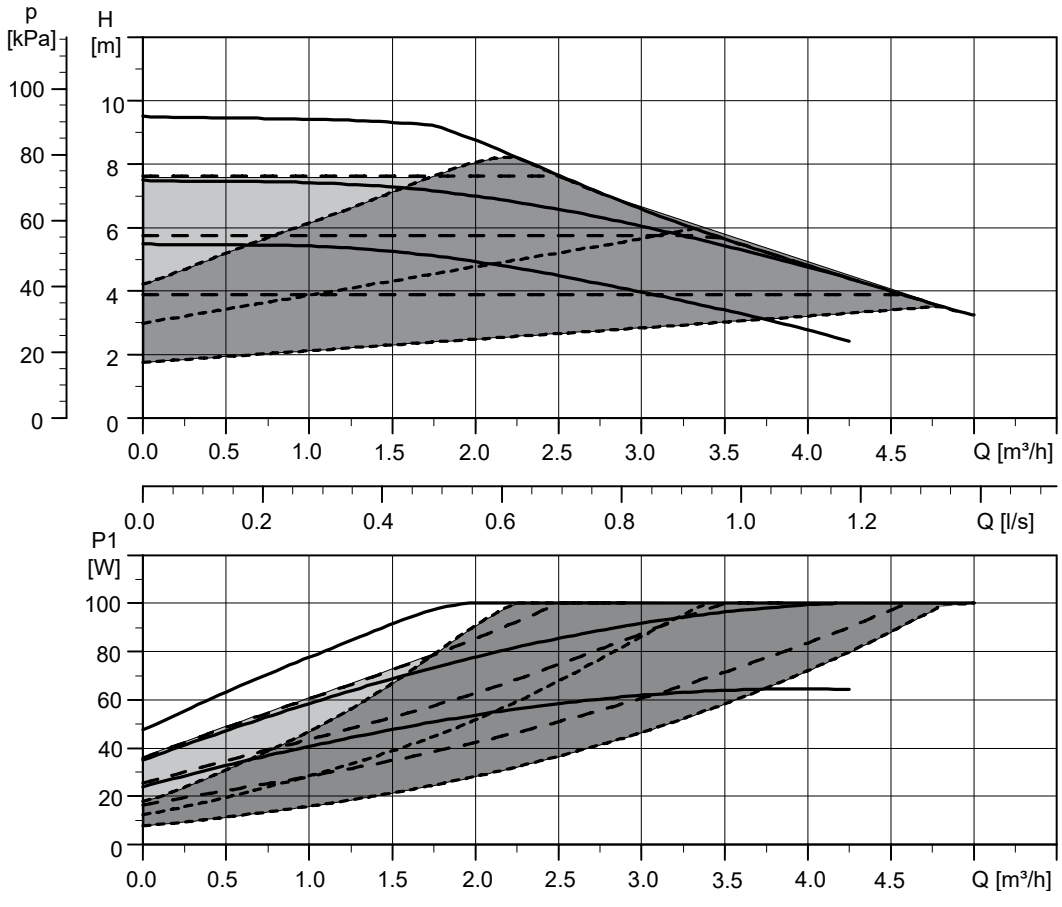
Technical data	
System pressure	Max. 1.0 MPa (10 bar)
Min. inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature
Liquid temperature	-20 to +110 °C (TF110)
Enclosure class	IPX4D
Motor protection	No external protection needed
Approval and marking	Not available yet. Specific compliant pump housings are available upon request.

Dimensions



Pump type	Dimensions [mm]							Connections [inch]	Weight [kg]
	L1	L3	W1	W2	H1	H2	H3		
25-95 180	180	167	76	60	41	136	177	1 1/2	2.8
25-95 130	130	167	76	60	30	146	176		2.6

UPM10M AUTO XX-95 130/180



EEI ≤ 0.20 Part 3

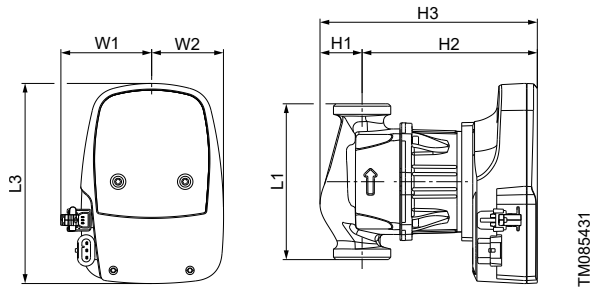
$P_{L,avg}$ ≤ 43 W

Pump settings
1 factory preset

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	3	0.05
Max.	100	0.8

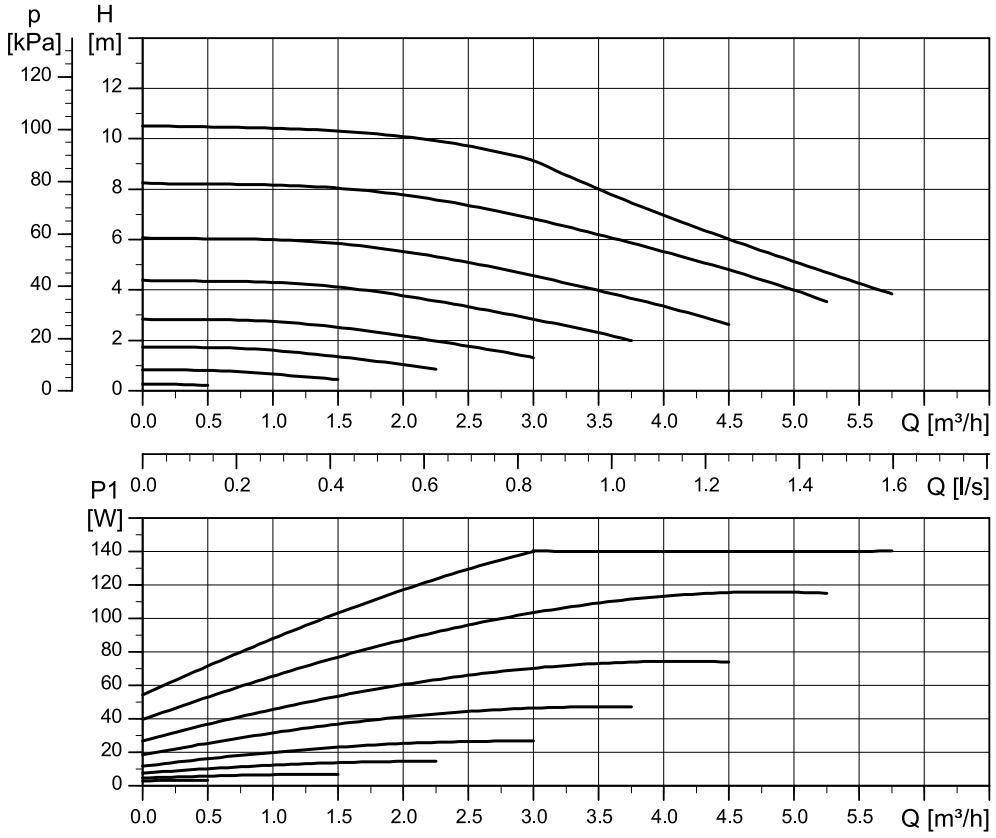
Technical data	
System pressure	Max. 1.0 MPa (10 bar)
Min. inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature
Liquid temperature	-20 to +110 °C (TF110)
Enclosure class	IPX4D
Motor protection	No external protection needed
Approval and marking	Not available yet. Specific compliant pump housings are available upon request.

Dimensions



Pump type	Dimensions [mm]							Connections [inch]	Weight [kg]
	L1	L3	W1	W2	H1	H2	H3		
25-95 180	180	167	76	60	41	136	177	1 1/2	2.8
25-95 130	130	167	76	60	30	146	176		2.6

UPM10L PWM XX-105 130/180



TM085273

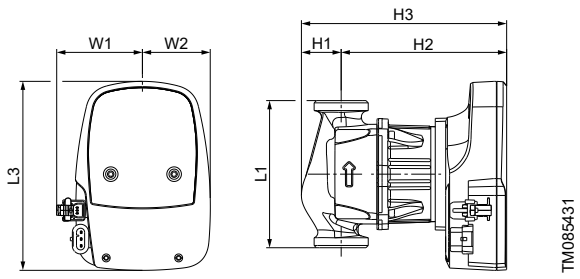
EEI ≤ 0.20 Part 3

$P_{L,avg}$ ≤ 59W

Pump settings
1 factory preset

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	3	0.05
Max.	140	1.1

Dimensions

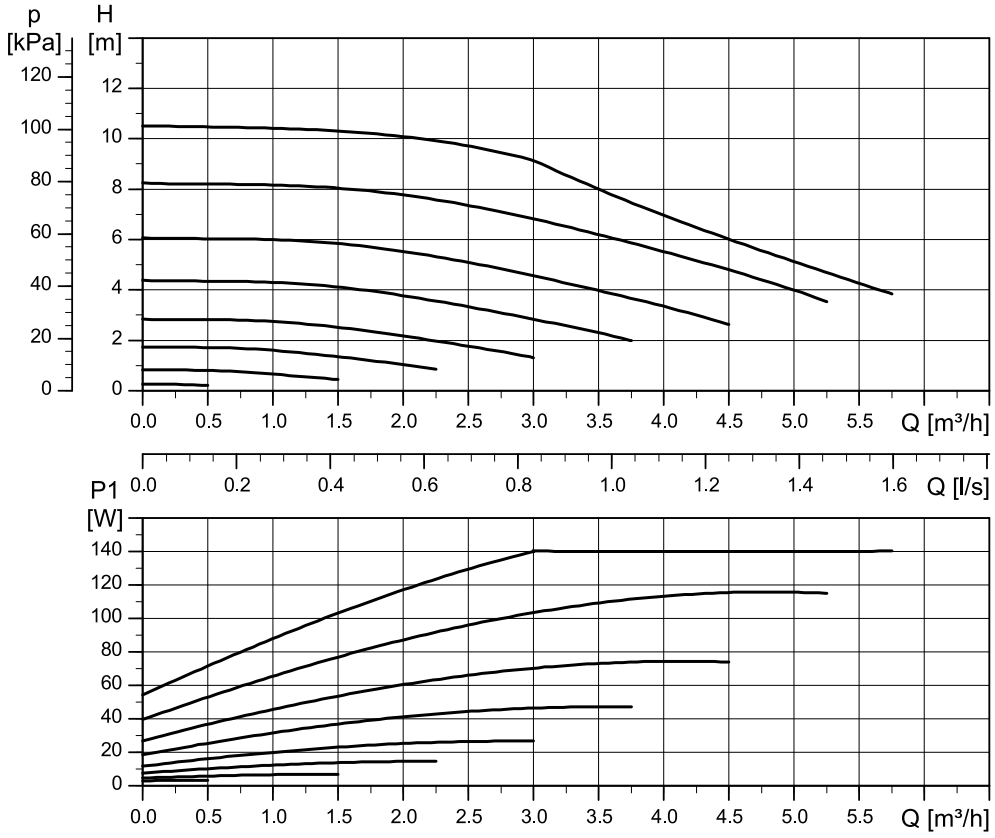


TM085431

Pump type	Dimensions [mm]							Connections [inch]	Weight [kg]
	L1	L3	W1	W2	H1	H2	H3		
25-105 180	180	167	76	60	41	136	177	1 1/2	2.8
25-105 130	130	167	76	60	30	146	176		2.6

Technical data	
System pressure	Max. 1.0 MPa (10 bar), depending on the pump housing material
Min. inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature
Liquid temperature	-20 to 110 °C (TF110)
Enclosure class	IPX4D
Motor protection	No external protection needed
Approval and marking	Not available yet. Specific compliant pump housings are available upon request.

UPM10L 0-10 V XX-105 130/180



TM085273

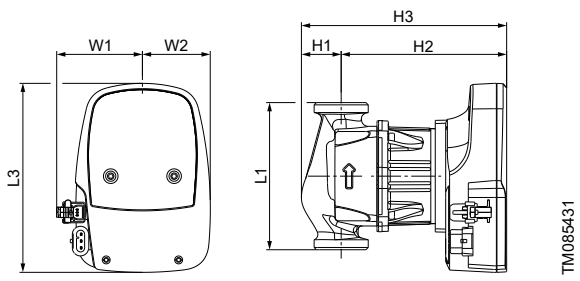
EEI ≤ 0.20 Part 3

$P_{L,avg}$ ≤ 59W

Pump settings
1 factory preset

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	3	0.05
Max.	140	1.1

Dimensions

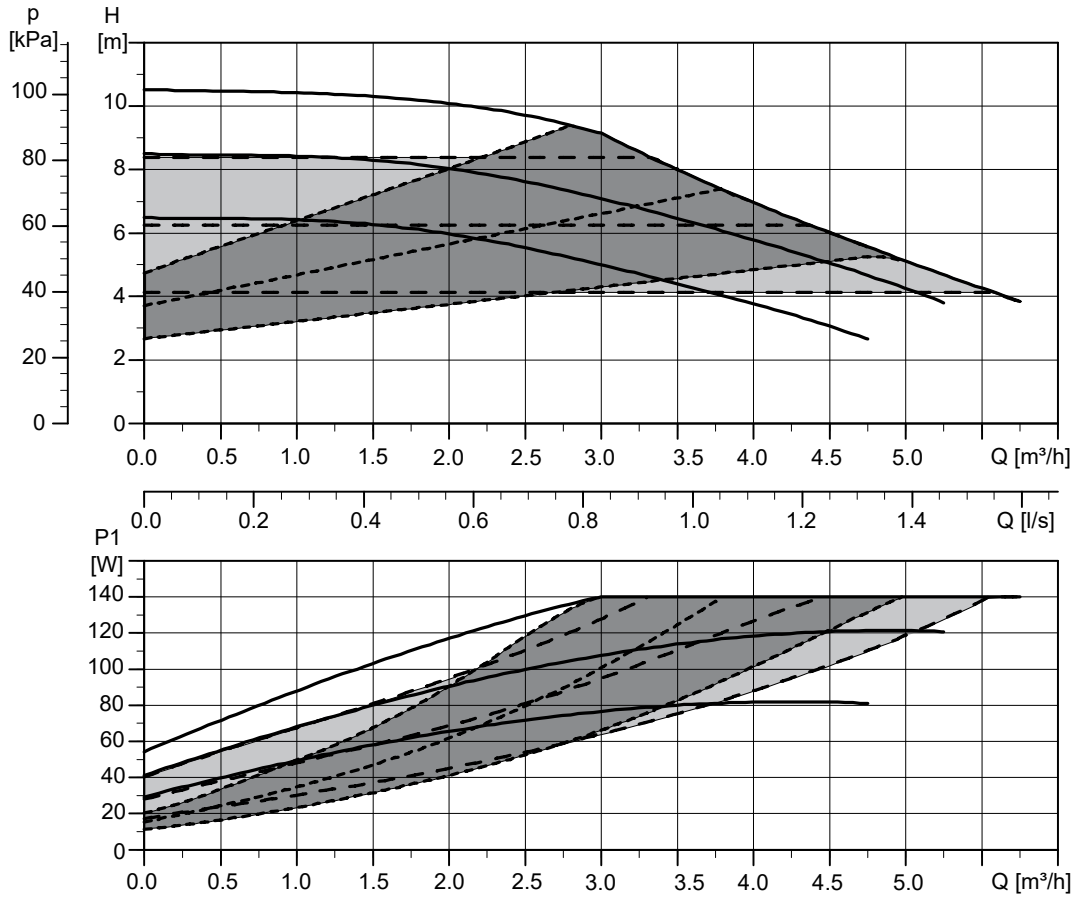


TM085431

Pump type	Dimensions [mm]							Connections [inch]	Weight [kg]
	L1	L3	W1	W2	H1	H2	H3		
25-105 180	180	167	76	60	41	136	177	1 1/2	2.8
25-105 130	130	167	76	60	30	146	176		2.6

Technical data	
System pressure	Max. 1.0 MPa (10 bar), depending on the pump housing material
Min. inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature
Liquid temperature	-20 to 110 °C (TF110)
Enclosure class	IPX4D
Motor protection	No external protection needed
Approval and marking	Not available yet. Specific compliant pump housings are available upon request.

UPM10L HYBRID XX-105 130/180



TM086424

EEI ≤ 0.20 Part 3

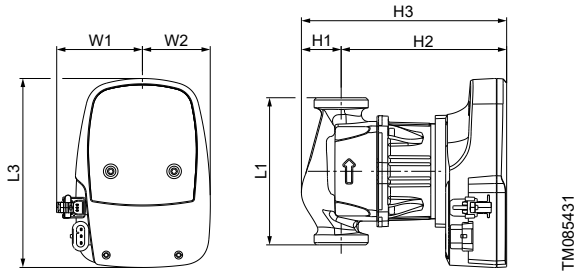
$P_{L,avg}$ ≤ 59 W

Pump settings
1 factory preset

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	3	0.05
Max.	140	1.1

Technical data	
System pressure	Max. 1.0 MPa (10 bar), depending on the pump housing material
Min. inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature
Liquid temperature	-20 to 110 °C (TF110)
Enclosure class	IPX4D
Motor protection	No external protection needed
Approval and marking	Not available yet. Specific compliant pump housings are available upon request.

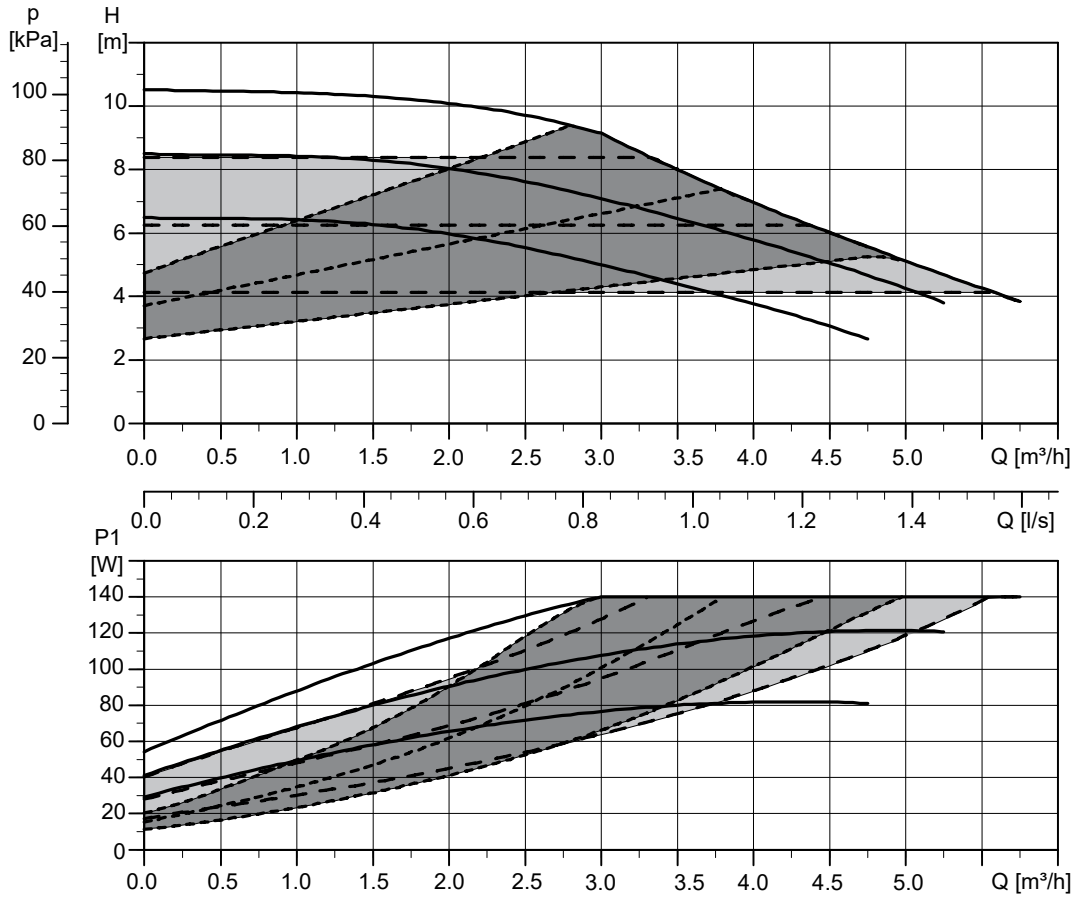
Dimensions



TM085431

Pump type	Dimensions [mm]							Connections [inch]	Weight [kg]
	L1	L3	W1	W2	H1	H2	H3		
25-105 180	180	167	76	60	41	136	177	1 1/2	2.8
25-105 130	130	167	76	60	30	146	176		2.6

UPM10L AUTO XX-105 130/180



TM086424

EEI ≤ 0.20 Part 3

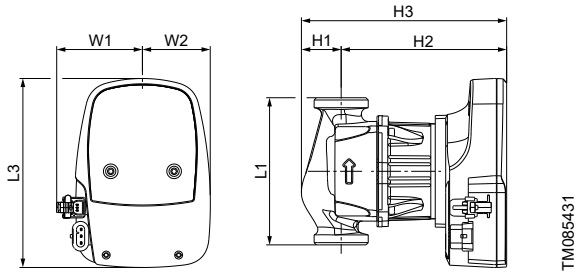
$P_{L,avg}$ ≤ 59 W

Pump settings
1 factory preset

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	3	0.05
Max.	140	1.1

Technical data	
System pressure	Max. 1.0 MPa (10 bar), depending on the pump housing material
Min. inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature
Liquid temperature	-20 to 110 °C (TF110)
Enclosure class	IPX4D
Motor protection	No external protection needed
Approval and marking	Not available yet. Specific compliant pump housings are available upon request.

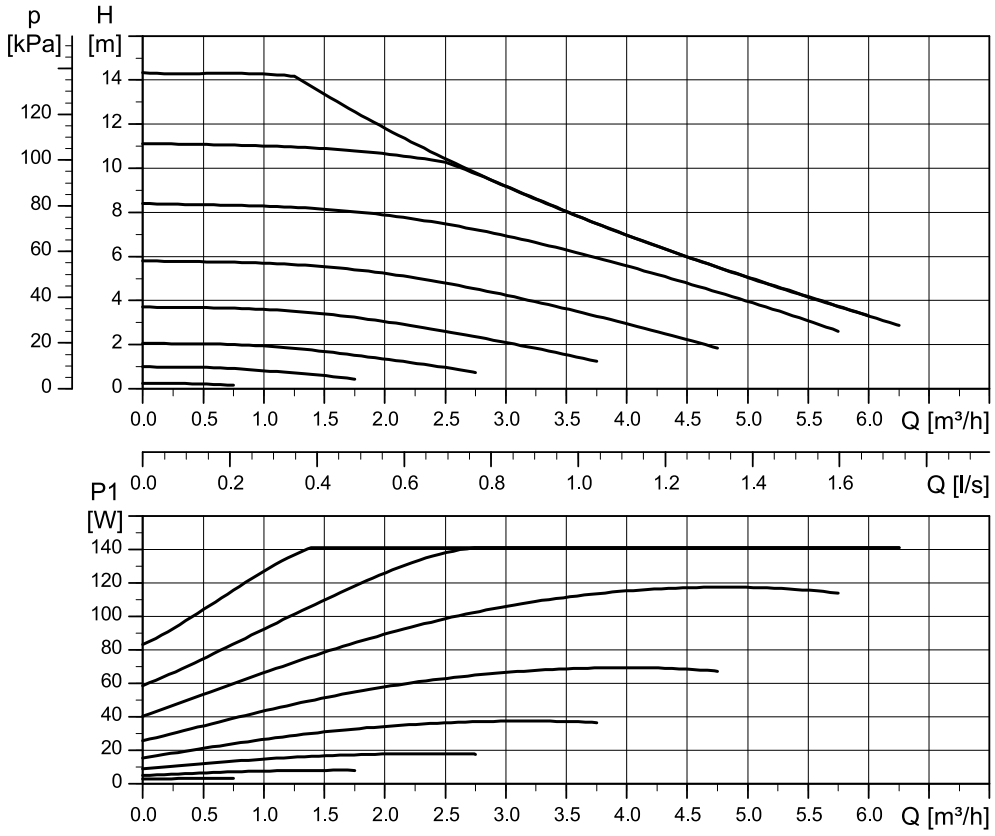
Dimensions



TM085431

Pump type	Dimensions [mm]							Connections [inch]	Weight [kg]
	L1	L3	W1	W2	H1	H2	H3		
25-105 180	180	167	76	60	41	136	177	1 1/2	2.8
25-105 130	130	167	76	60	30	146	176		2.6

UPM10L SOLAR XX-145 130/180



TM088035

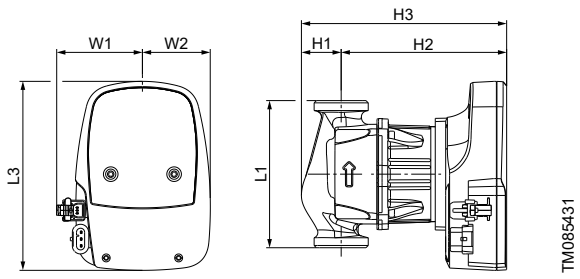
EEI ≤ 0.20 Part 3

$P_{L,avg}$ ≤ 59W

Pump settings
1 factory preset

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	3	0.05
Max.	140	1.1

Dimensions

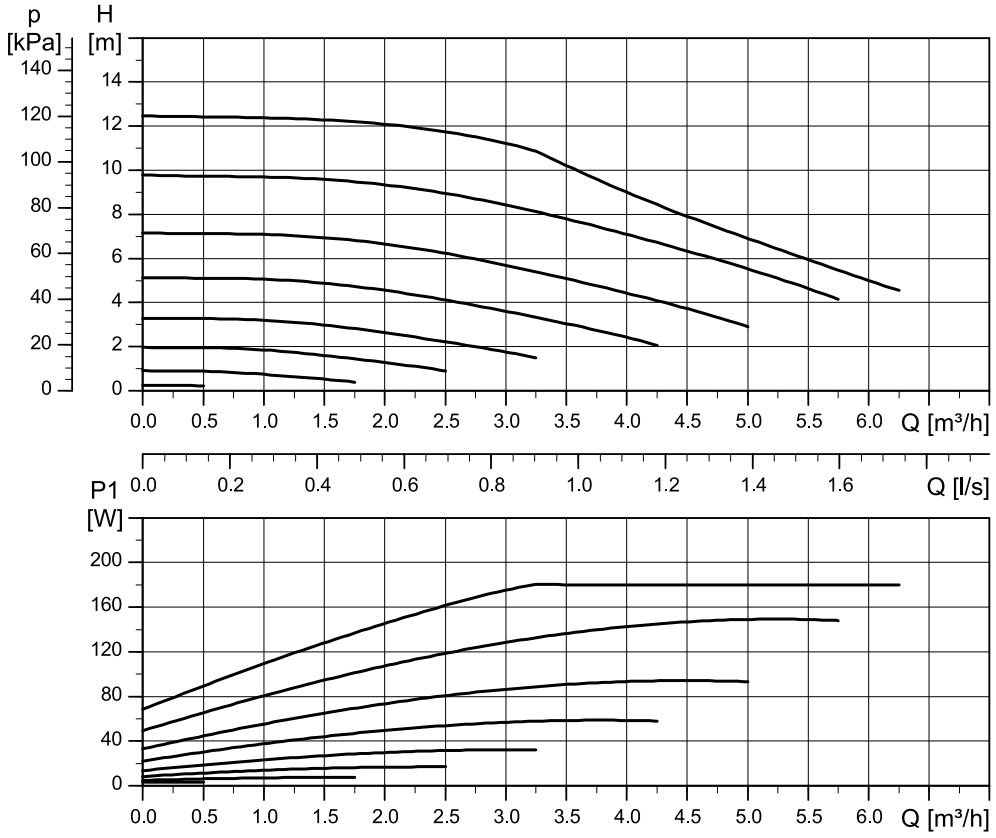


TM085431

Pump type	Dimensions [mm]							Connections [inch]	Weight [kg]
	L1	L3	W1	W2	H1	H2	H3		
25-105 180	180	167	76	60	41	136	177	1 1/2	2.8
25-105 130	130	167	76	60	30	146	176		2.6

Technical data	
System pressure	Max. 1.0 MPa (10 bar), depending on the pump housing material
Min. inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature
Liquid temperature	-20 to 110 °C (TF110)
Enclosure class	IPX4D
Motor protection	No external protection needed
Approval and marking	Not available yet. Specific compliant pump housings are available upon request.

UPM10XL PWM XX-125 130/180



TM085275

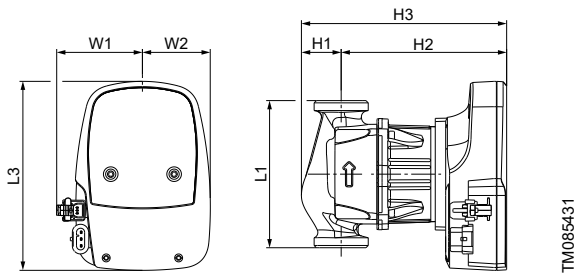
EEI ≤ 0.20 Part 3

$P_{L,avg}$ ≤ 77 W

Pump settings
1 factory preset

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	3	0.05
Max.	180	1.4

Dimensions

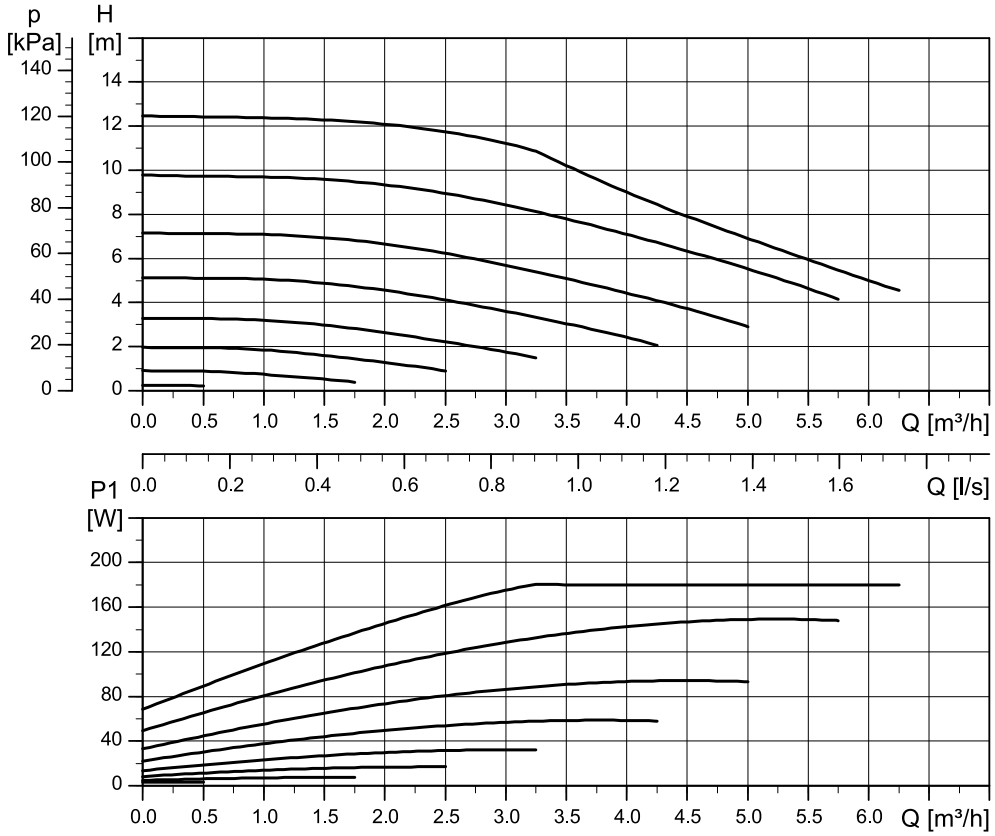


TM085431

Pump type	Dimensions [mm]							Connections [inch]	Weight [kg]
	L1	L3	W1	W2	H1	H2	H3		
25-125 180	180	167	76	60	41	136	177	1 1/2	2.8
25-125 130	130	167	76	60	30	146	176		2.6

Technical data	
System pressure	Max. 1.0 MPa (10 bar), depending on the pump housing material
Min. inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature
Liquid temperature	-20 to 110 °C (TF110)
Enclosure class	IPX4D
Motor protection	No external protection needed
Approval and marking	Not available yet. Specific compliant pump housings are available upon request.

UPM10XL 0-10 V XX-125 130/180



TM085275

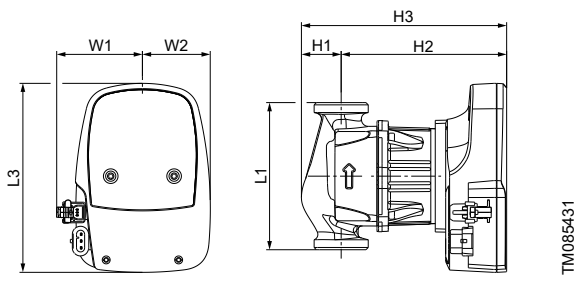
EEI ≤ 0.20 Part 3

$P_{L,avg}$ ≤ 77 W

Pump settings
1 factory preset

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	3	0.05
Max.	180	1.4

Dimensions

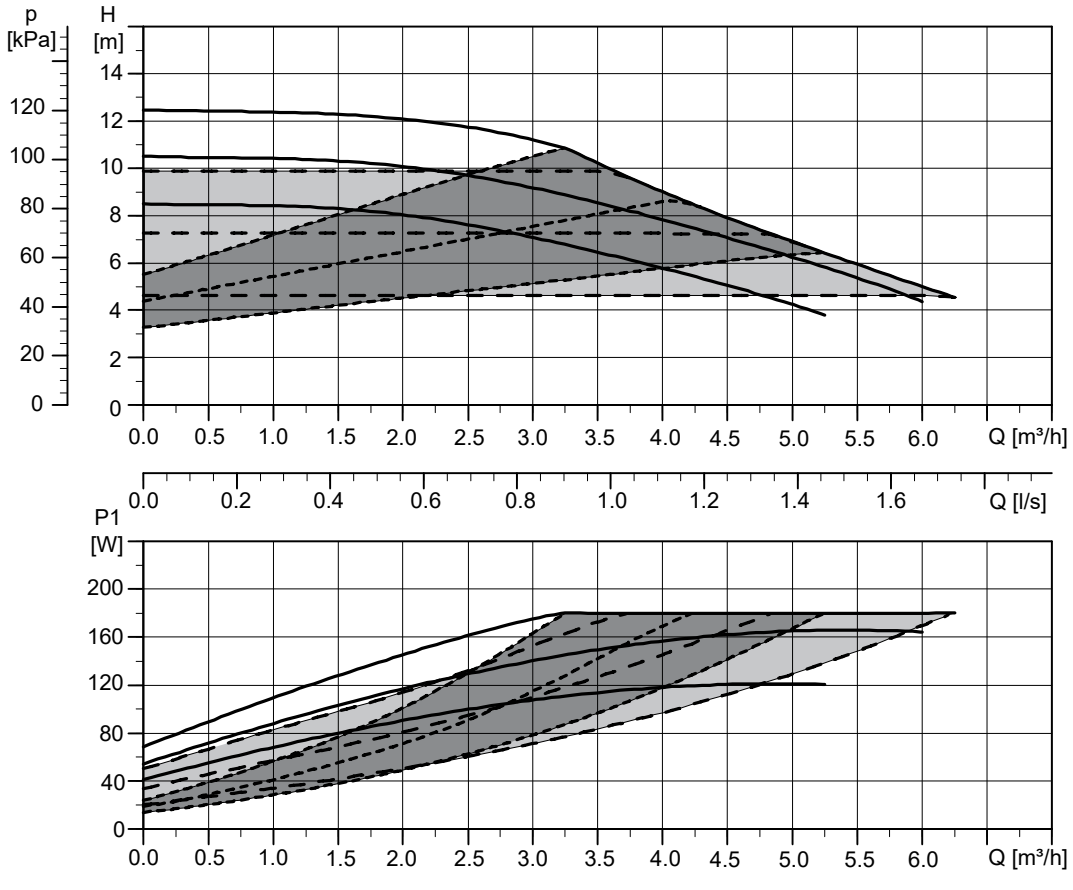


TM085431

Pump type	Dimensions [mm]							Connections [inch]	Weight [kg]
	L1	L3	W1	W2	H1	H2	H3		
25-125 180	180	167	76	60	41	136	177	1 1/2	2.8
25-125 130	130	167	76	60	30	146	176		2.6

Technical data	
System pressure	Max. 1.0 MPa (10 bar), depending on the pump housing material
Min. inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature
Liquid temperature	-20 to 110 °C (TF110)
Enclosure class	IPX4D
Motor protection	No external protection needed
Approval and marking	Not available yet. Specific compliant pump housings are available upon request.

UPM10XL HYBRID XX-125 130/180



TM086425

EEI ≤ 0.20 Part 3

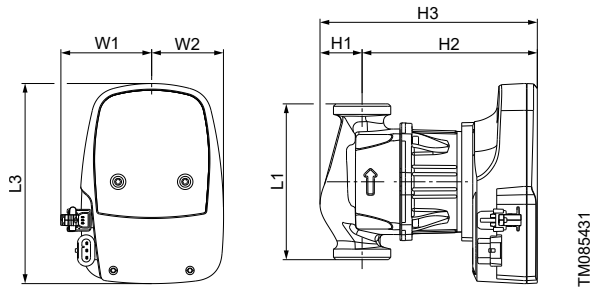
$P_{L,avg}$ ≤ 75 W

Pump settings
1 factory preset

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	3	0.05
Max.	180	1.4

Technical data	
System pressure	Max. 1.0 MPa (10 bar), depending on the pump housing material
Min. inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature
Liquid temperature	-20 to 110 °C (TF110)
Enclosure class	IPX4D
Motor protection	No external protection needed
Approval and marking	Not available yet. Specific compliant pump housings are available upon request.

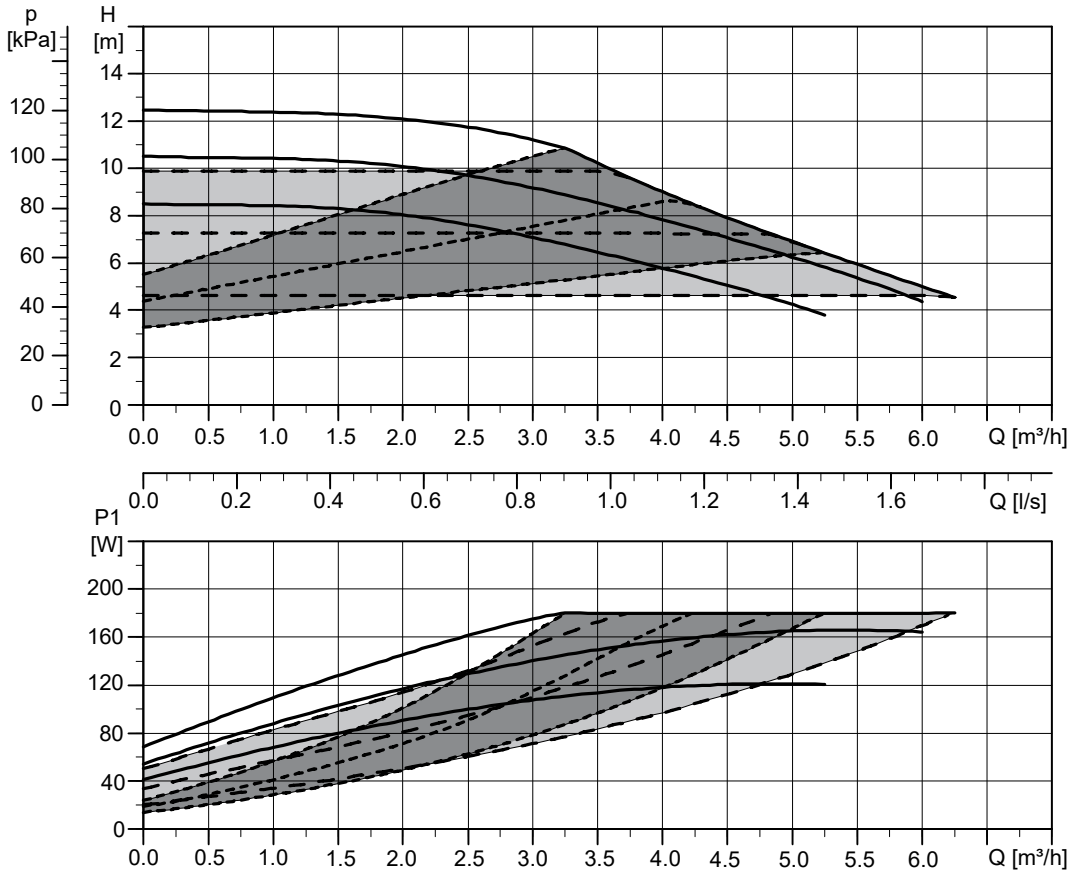
Dimensions



TM085431

Pump type	Dimensions [mm]							Connections [inch]	Weight [kg]
	L1	L3	W1	W2	H1	H2	H3		
25-125 180	180	167	76	60	41	136	177	1 1/2	2.8
25-125 130	130	167	76	60	30	146	176		2.6

UPM10XL AUTO XX-125 130/180



TM086425

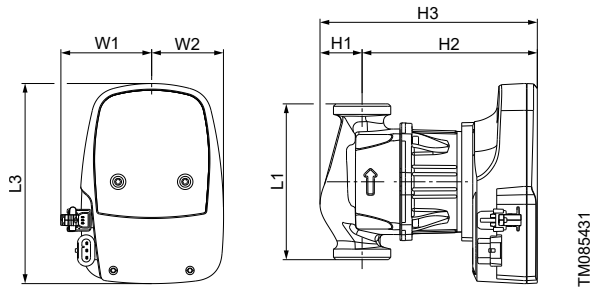
EEI ≤ 0.20 Part 3

$P_{L,avg}$ ≤ 75 W

Pump settings
1 factory preset

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	3	0.05
Max.	180	1.4

Dimensions

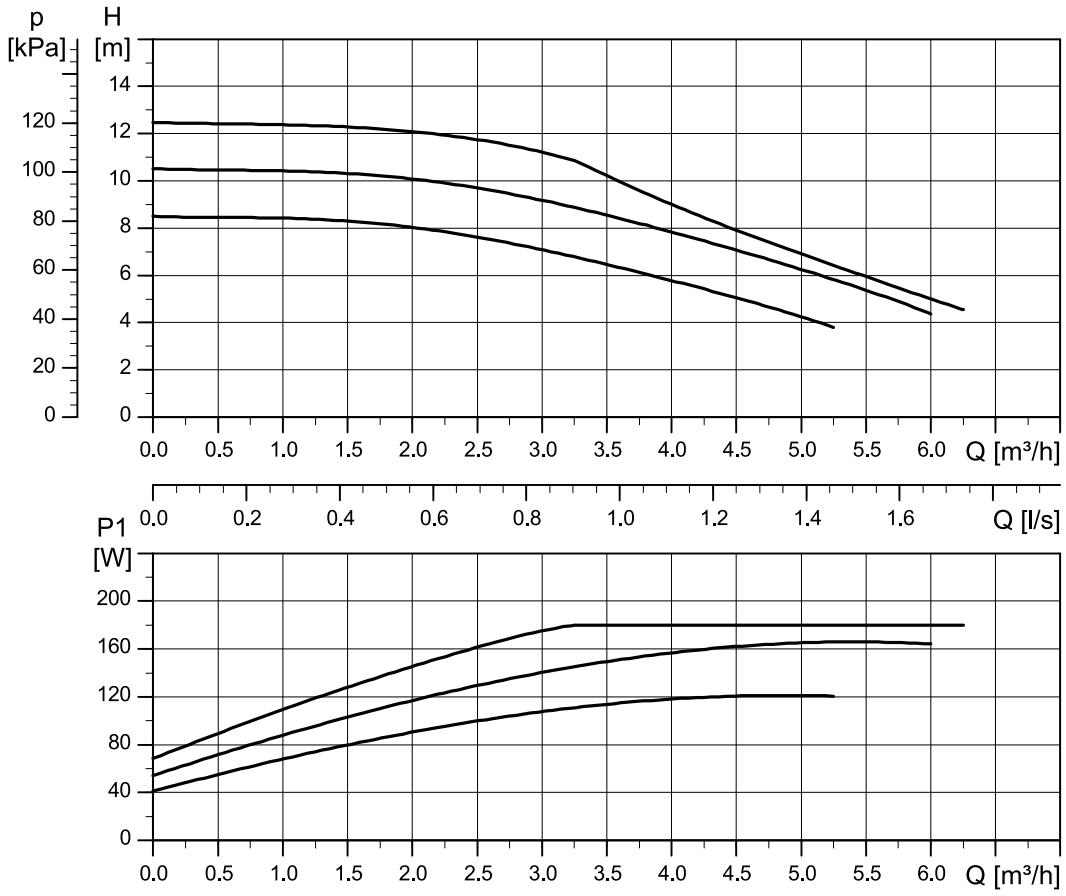


TM085431

Pump type	Dimensions [mm]							Connections [inch]	Weight [kg]
	L1	L3	W1	W2	H1	H2	H3		
25-125 180	180	167	76	60	41	136	177	1 1/2	2.8
25-125 130	130	167	76	60	30	146	176		2.6

Technical data	
System pressure	Max. 1.0 MPa (10 bar), depending on the pump housing material
Min. inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature
Liquid temperature	-20 to 110 °C (TF110)
Enclosure class	IPX4D
Motor protection	No external protection needed
Approval and marking	Not available yet. Specific compliant pump housings are available upon request.

UPM10XL DHW XX-125 180



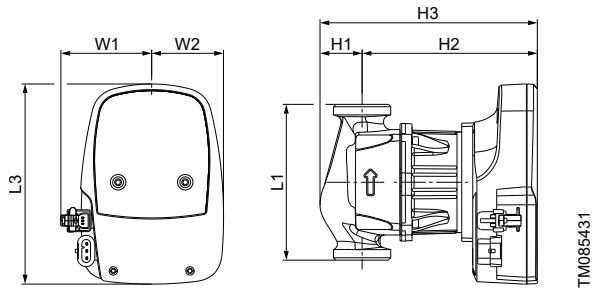
EEI ≤ 0.20 Part 3

$P_{L,avg}$ ≤ 75 W

Pump settings
1 factory preset

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	3	0.05
Max.	180	1.4

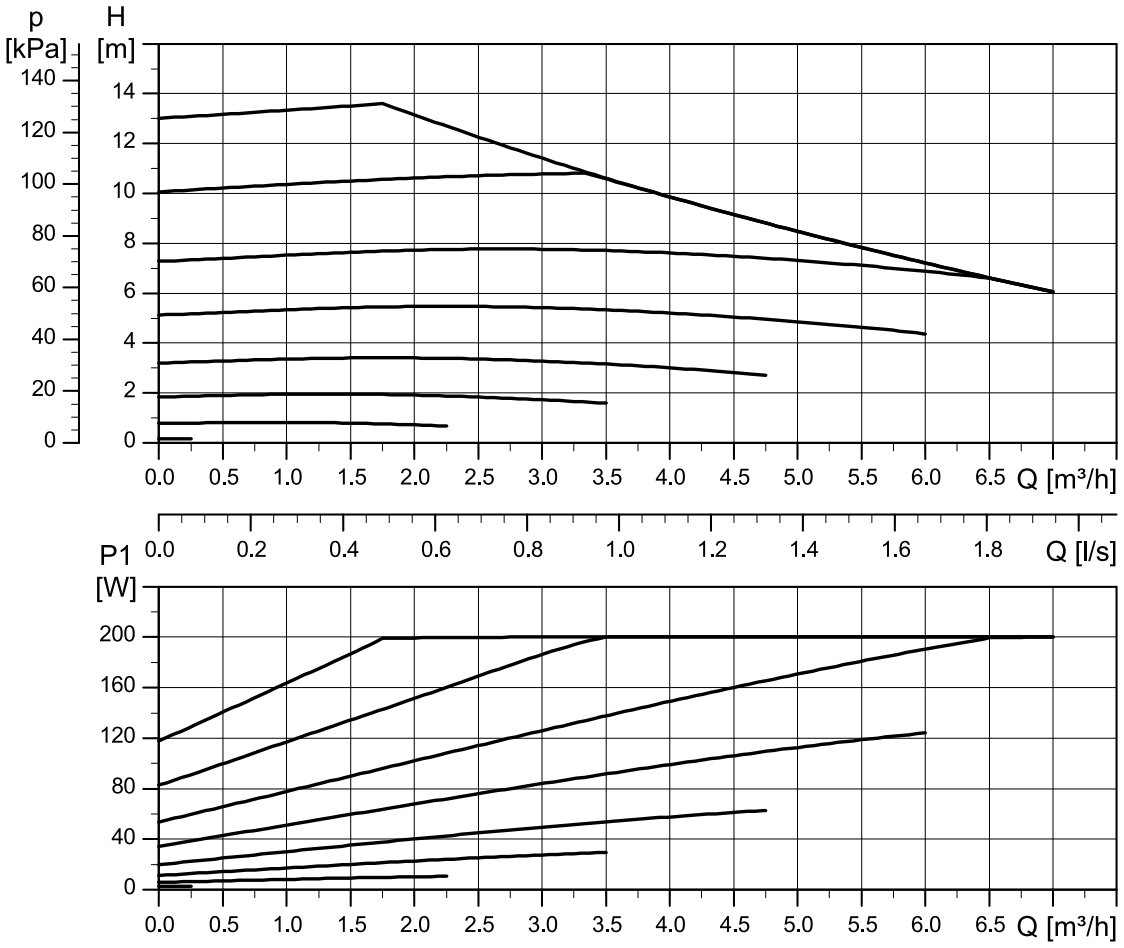
Dimensions



Pump type	Dimensions [mm]							Connections [inch]	Weight [kg]
	L1	L3	W1	W2	H1	H2	H3		
25-125 180	180	167	76	60	41	136	177	1 1/2	2.8

Technical data	
System pressure	Max. 1.0 MPa (10 bar), depending on the pump housing material
Min. inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature
Liquid temperature	-20 to 110 °C (TF110)
Enclosure class	IPX4D
Motor protection	No external protection needed
Approval and marking	WRAS, UBA, ACS. Specific compliant pump housings are available upon request.

UPM20M PWM XX-130 180



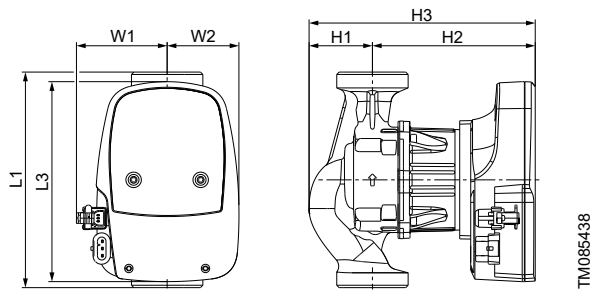
EEI ≤ 0.20 Part 3

$P_{L,avg}$ ≤ 84 W

Pump settings
1 factory preset

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	3	0.05
Max.	200	1.5

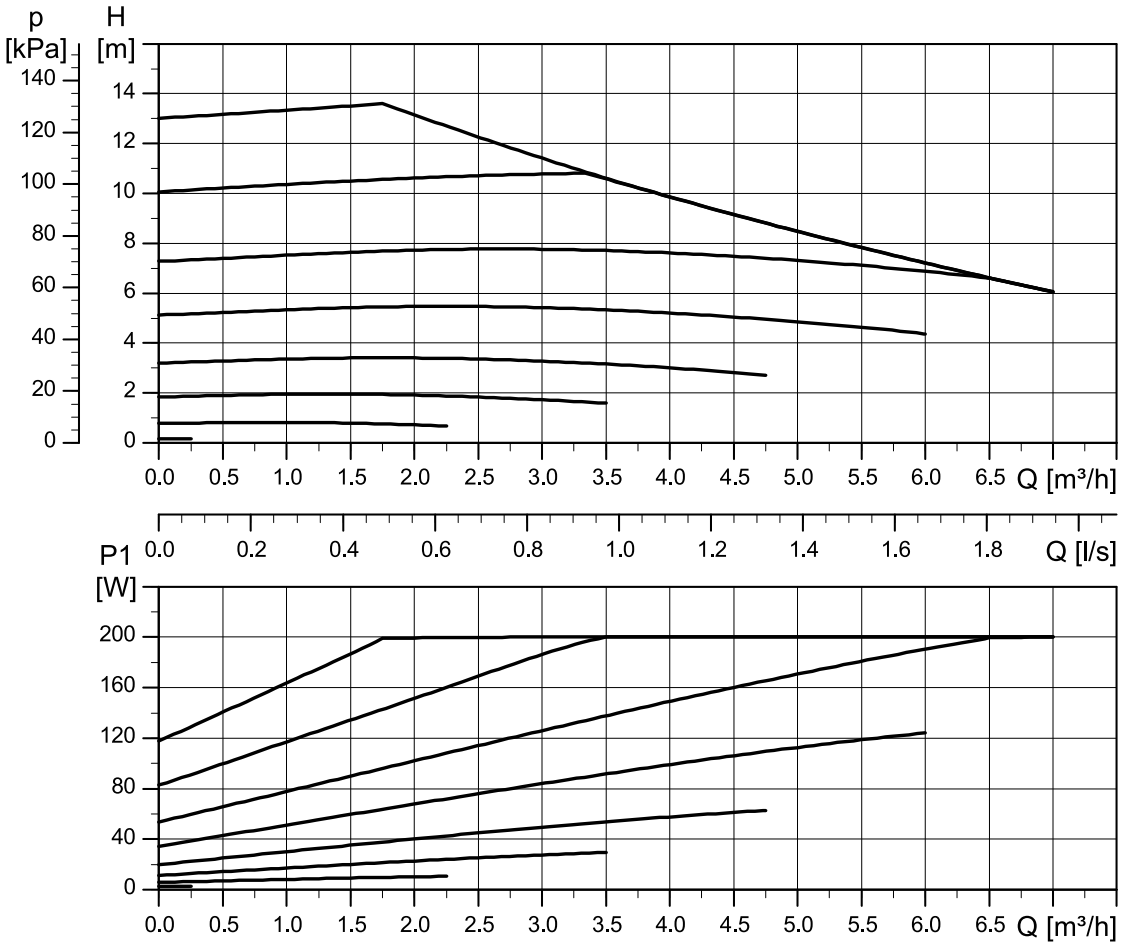
Dimensions



Pump type	Dimensions [mm]							Connections [inch]	Weight [kg]
	L1	L3	W1	W2	H1	H2	H3		
25-130 180	180	167	76	60	56	136	192	G 1 1/2	3.3

Technical data	
System pressure	Max. 1.0 MPa (10 bar), depending on the pump housing material
Min. inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature
Liquid temperature	-20 to 110 °C (TF95)
Enclosure class	IPX4D
Motor protection	No external protection needed
Approval and marking	Not available yet. Specific compliant pump housings are available upon request.

UPM20M 0-10 V XX-130 180



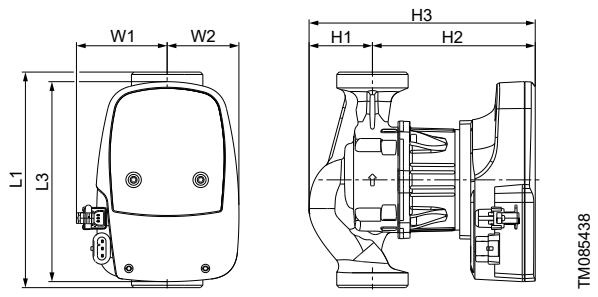
EEI ≤ 0.20 Part 3

$P_{L,avg}$ ≤ 84 W

Pump settings
1 factory preset

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	3	0.05
Max.	200	1.5

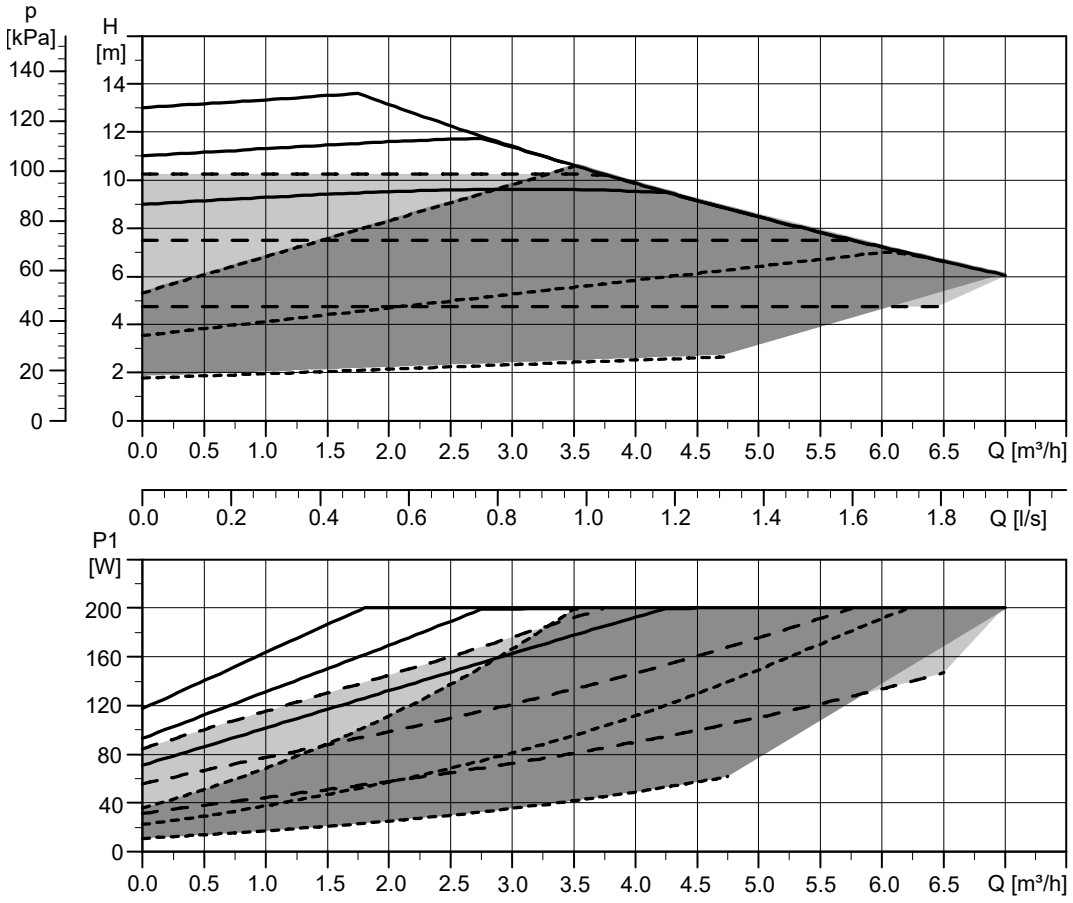
Dimensions



Pump type	Dimensions [mm]							Connections [inch]	Weight [kg]
	L1	L3	W1	W2	H1	H2	H3		
25-130 180	180	167	76	60	56	136	192	G 1 1/2	3.3

Technical data	
System pressure	Max. 1.0 MPa (10 bar), depending on the pump housing material
Min. inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature
Liquid temperature	-20 to 110 °C (TF95)
Enclosure class	IPX4D
Motor protection	No external protection needed
Approval and marking	Not available yet. Specific compliant pump housings are available upon request.

UPM20M HYBRID XX-130 180



TM086426

EEI ≤ 0.20 Part 3

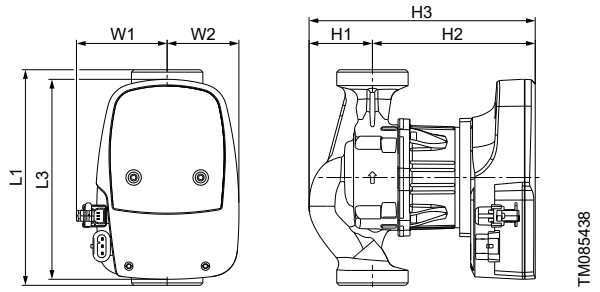
$P_{L,avg}$ ≤ 84 W

Pump settings
1 factory preset

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	3	0.05
Max.	200	1.5

Technical data	
System pressure	Max. 1.0 MPa (10 bar), depending on the pump housing material
Min. inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature
Liquid temperature	-20 to 110 °C (TF95)
Enclosure class	IPX4D
Motor protection	No external protection needed
Approval and marking	Not available yet. Specific compliant pump housings are available upon request.

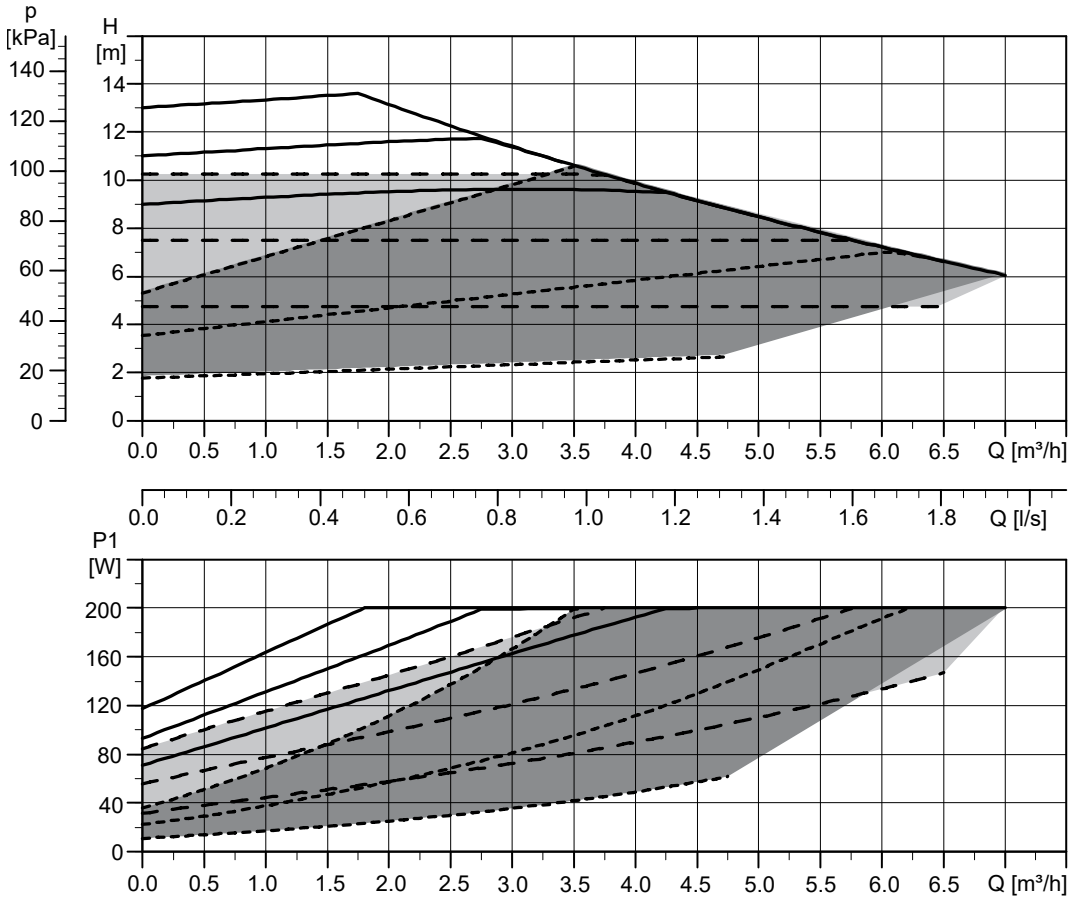
Dimensions



TM085438

Pump type	Dimensions [mm]							Connections [inch]	Weight [kg]
	L1	L3	W1	W2	H1	H2	H3		
25-130 180	180	167	76	60	56	136	192	G 1 1/2	3.3

UPM20M AUTO XX-130 180



TM086426

EEI ≤ 0.20 Part 3

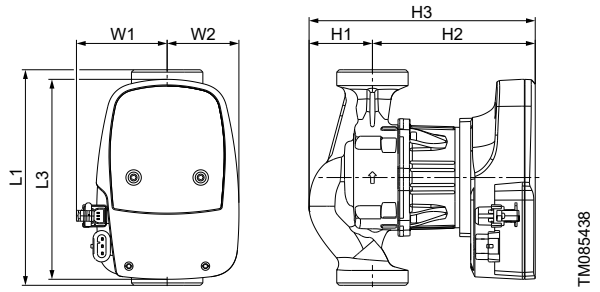
$P_{L,avg}$ ≤ 84 W

Pump settings
1 factory preset

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	3	0.05
Max.	200	1.5

Technical data	
System pressure	Max. 1.0 MPa (10 bar), depending on the pump housing material
Min. inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature
Liquid temperature	-20 to 110 °C (TF95)
Enclosure class	IPX4D
Motor protection	No external protection needed
Approval and marking	Not available yet. Specific compliant pump housings are available upon request.

Dimensions

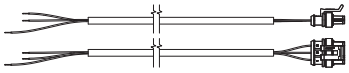
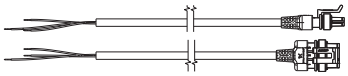
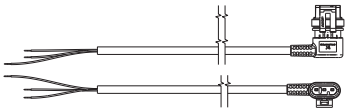
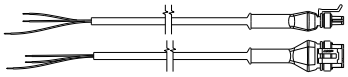


TM085438

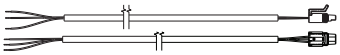
Pump type	Dimensions [mm]							Connections [inch]	Weight [kg]
	L1	L3	W1	W2	H1	H2	H3		
25-130 180	180	167	76	60	56	136	192	G 1 1/2	3.3

10. Accessories

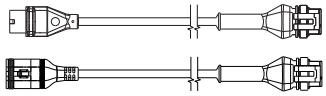
Power supply Superseal

	Description	Length [mm]	Product number	Pcs/box	Product number box
	Superseal power cable	1000	98460260	200	59200566
	Superseal power cable	2000	98373382	100	59200567
	Superseal power cable	4000	98460271	50	59200568
	Superseal power cable, overmoulded	1000	98460258	200	59200569
	Superseal power cable, overmoulded	2000	98373384	100	59200570
	Superseal power cable, overmoulded	4000	98460259	50	59200571
	Superseal power cable, overmoulded, angled 90°	1000	98616020	200	59200572
	Superseal power cable, overmoulded, angled 90°	2000	98616051	100	59200535
	Superseal power cable, with rubber cap	1000	98664474	200	98677544

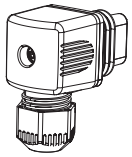
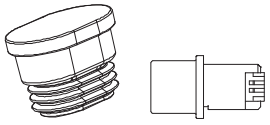
Signal cables

	Description	Length [mm]	Product number	Pcs/box	Product number box
	Mini superseal signal cable	1000	98460256	200	59200573
	Mini superseal signal cable	2000	98347385	100	59200574
	Signal cable, FCI, 3-wire, with return signal	1000	96645398	100	59200576
		2000	97940991	100	59200578
	Signal cable, FCI, 2-wire, without return signal	1000	98386202	200	59200575
		2000	97698929	200	59200577

Power cable adapters

	Description	Length [mm]	Product number	Pcs/box	Product number box
	Superseal Molex cable adapter, overmoulded, with rubber cap	150	98614629	100	59200661
	Superseal Volex cable adapter, overmoulded, with rubber cap	150	98614444	100	59200633

Plugs

	Description	Length [mm]	Product number	Pcs/box	Product number box
	Superseal installation plug	-	99436122	100	99171101
	Signal blind plug, FCI	-	97823485	100	59200643
	Signal blind plug, Mini Superseal	-	98451691	100	59200639
	Signal blind plug, Mini Superseal	-	98451691	500	59200640

Gaskets

Gasket material	Pump connection	External diameter (D) [mm]	Internal diameter (d) [mm]	Thickness (s) [mm]	Product number
EPDM	G 1	29.5	21	2	504023

Gasket material	Pump connection	External diameter (D) [mm]	Internal diameter (d) [mm]	Thickness (s) [mm]	Product number
EPDM	G 1 1/2	44	32	2	520046
EPDM	G 2	56	40	2	530243

Insulating shells

Description	Product number
Insulating shell [7)]	98653877

7) Only available for UPM10 variants with cast iron and stainless-steel pump housings.

ALPHA Reader

TM068574

ALPHA Reader is the receiver and transmitter of pump performance data. The unit uses a CR2032 lithium battery. The unit, together with the Grundfos GO Balance app, is used for balancing heating systems.

Description	Product number
ALPHA Reader MI401	98916967

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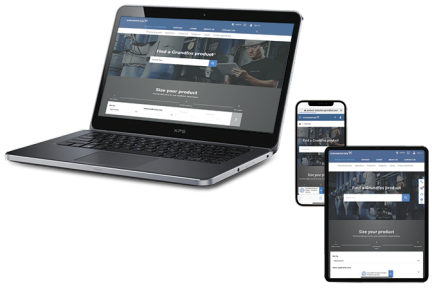

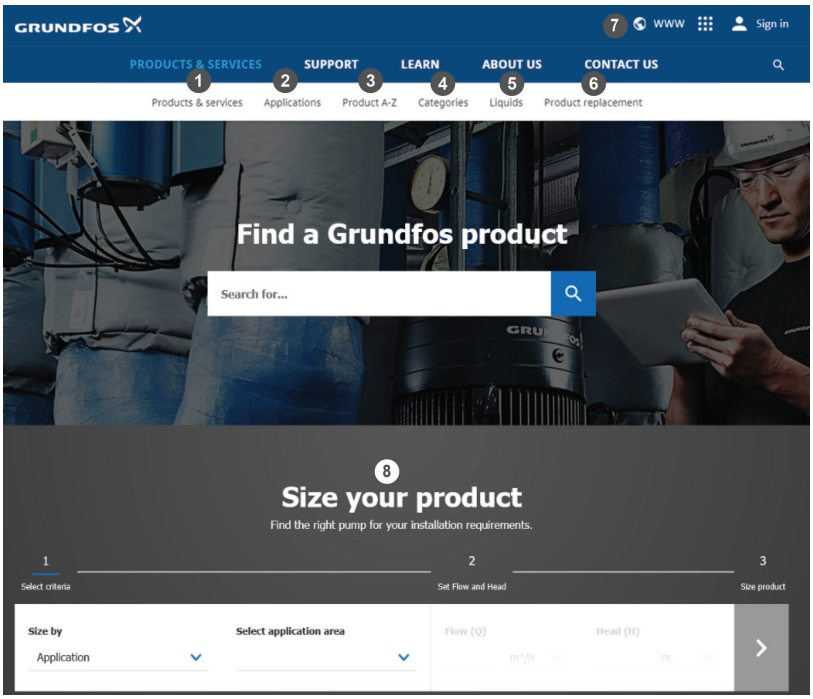

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4	**Categories** enables you to look for a product category.
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6	**Product replacement** enables you to find a suitable replacement.
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ECM: 1408434

GRUNDFOS Holding A/S
Poul Due Jensens Vej 7
DK-8850 Bjerringbro
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