UPM3

UPM3, UPM3 HYBRID, UPM3 AUTO, UPM3 AUTO L, UPM3 FLEX AS, UPM3 FLEX AC, UPM3 SOLAR, UPM3 DHW, UPM3 K

1 x 230 V, 50 Hz

be
think
innovate

GRUNDFOS

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1. Introduction

UPM3 - PWM variants

UPM3	7.5 m	(only externally controlled PWM A/C profile)
UPM3	7 m	
UPM3	6 m	
UPM3	5 m	
UPM3	4 m	

UPM3 - HYBRID variants

UPM3	FLEX AC	7.5 m	(only externally controlled PWM A/C profile)
UPM3	FLEX AC	7 m	
UPM3	FLEX AC	5 m	
UPM3	FLEX AS	7.5 m	(MAX or externally controlled PWM A profile)
UPM3	FLEX AS	7 m	
UPM3	FLEX AS	5 m	
UPM3	SOLAR	14.5 m	(CC or externally controlled PWM C profile)
UPM3	SOLAR	10.5 m	
UPM3	SOLAR	7.5	
UPM3	DHW	7 m	(MAX or externally controlled PWM A profile)
UPM3	DHW	5 m	
UPM3	DHW	2 m	
UPM3	AUTO L	7 m	(only internally controlled PP/CP/CC)
UPM3	AUTO L	5 m	
UPM3	AUTO	7 m	(only internally controlled PP/CP/CC/AA)
UPM3	AUTO	5 m	
UPM3	HYBRID	7 m	(PWM A/C or PP/CP/CC/AA)
UPM3	HYBRID	5 m	

Note:

PWM A/C: externally controlled via PWM profile A or profile C (see page 23)

PWM: pulse-width modulation

PP: Proportional Pressure

CP: Constant Pressure

CC: Constant Curve

MAX: Maximum curve of PWM range

AA: $AUTO_{ADAPT}$

Applications

In a modern heating, cooling and domestic hot water supply system there are different circuits in which UPM3 circulator 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 circulator pumps are used in primary or internal circuits e.g. 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 (e.g. 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 flow in primary and secondary circuits. Without separator, the primary pump creates a differential pressure in the secondary circuits. A generator effect can happen in the secondary pump, from which UPM3 are protected.

The primary circulator pump is mostly integrated into the heating appliance and controlled via a digital signal (e.g. PWM) to ensure the optimum operation of the boiler, for instance.

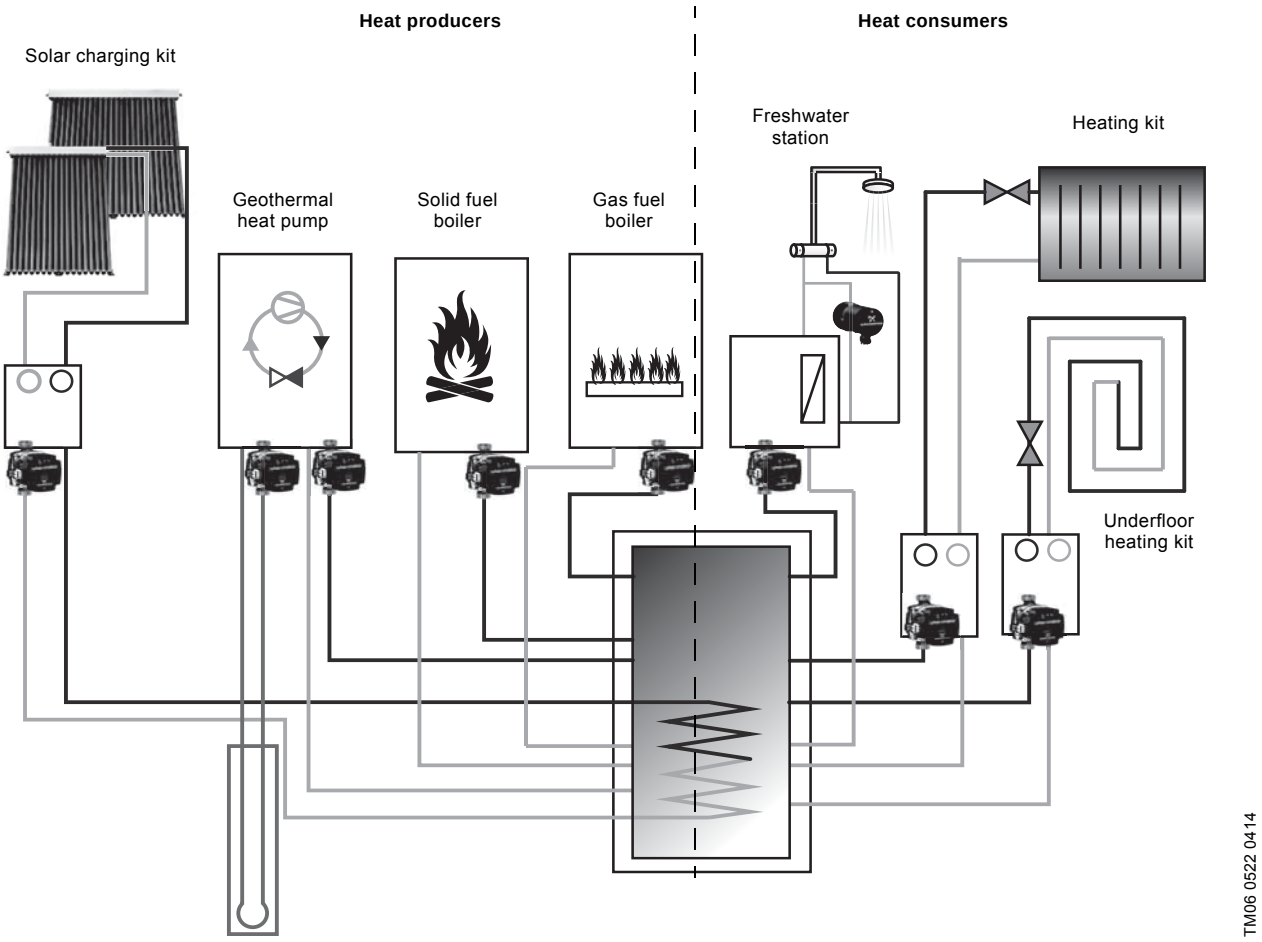

Fig. 1 Complete domestic heating system combined with renewable energy sources

	Application	Recommended circulator type
Heat production or heat transmission side	Gas or oil-fired space and combination heaters	UPM3, UPM3 FLEX AS
	Solid fuel heaters	UPM3 FLEX AS, UPM3 AUTO
	Heat pumps (brine side)	UPM3 (K), UPM3(K) FLEX AS, UPM3(K) FLEX AC
	Heat pumps (heating side)	UPM3, UPM3 FLEX AS, UPM3 FLEX AC
	Mini combined heat and power cogeneration	UPM3, UPM3 FLEX AS
	Thermal solar system (collector side)	UPM3(K) SOLAR
	District heating systems with heat exchanger	UPM3 FLEX AS, UPM3 AUTO
Heat distribution side	Space heating systems	UPM3 AUTO, UPM3 AUTO L, UPM3 HYBRID
	Space heating and cooling systems	UPM3(K) AUTO, UPM3(K) AUTO L, UPM3(K) HYBRID
	Domestic hot water generation (heating side)	UPM3 FLEX AS, UPM3 FLEX AC
	Domestic hot water generation (DW side)	UPM3(K) DHW
	Domestic hot water recirculation	UPM3 DHW

Gas or oil-fired space and combination heaters

Most of the installed systems for space and water heating in building services are still using 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 as wall-mounted boilers are only fired when there is a minimum flow through the primary heat exchanger. In a combi-boiler, the circulator 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 medium temperature temporarily above DHW temperature level. In small residential buildings, the heating demand for DHW is higher than for space heating.

Internal (or external) circulator 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 circulator 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 might 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 circulator pump with customised specification is installed inside such a process unit.

Primary circulator pumps are depending on the heat transmission principle:

- Air-to-air heat pumps are often used in air-conditioning systems
  - No circulator 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 minus 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 circulator pump that must stand liquid temperatures down to minus 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 circulator pump that must stand liquid temperatures down to plus 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 anti-freeze (brine) to the evaporator of the heat pump. This circuit is circulated by a circulator pump that must stand liquid temperatures down to plus 2 °C or lower. For smaller heat pumps with a minimum brine temperature of +2 °C, we recommend UPM3K with PWM signal input.

The secondary circulator pumps do not differ much from boiler applications. The liquid temperature is normally not above 60 °C, the differential temperature is mostly small, e.g. 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 circulator, which should 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 circulator pumps with customised specification are often installed inside the fuel cell process unit. Used secondary circulators 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 up to 110 °C with short peaks of up to 130 °C. Rarely, during start-up of the system, the liquid temperature can cause condensation in the pump. For this reason, the UPM3 SOLAR has a drain hole, which must point downwards. 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.

UPM3 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 UPM3 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, UPM3 SOLAR can be set to constant speed, only switched on and off by the controller.

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 circulator pumps do not differ much from boiler applications, because system pressure and temperature are equal.

Space heating systems

The secondary circulator pump is often a self-controlled stand-alone circulator 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 2-pipe heating systems with thermostatic valves, hydraulic balancing helps to avoid noises, oversupply, undersupply, too high pump performance, and saves energy. If an automatic bypass valve is installed to ensure a minimum flow, you must adjust the differential pressure control of the circulator 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

Floor-heating or ceiling-cooling systems together with reversible heat pumps can heat rooms in winter and reduce the temperature of the room air by an appreciable 4 to 6 degrees 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. For this reason, it is recommended to use UPM3K circulator pumps in such systems.

Domestic hot water generation

In indirect heated DHW systems, the circulator pump can be placed on both sides of the heat exchanger. In a DHW cylinder, potable 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 potable water on the secondary side from the taps back to the water heater to ensure comfort and to avoid legionella. All pumps that come into contact with drinking water must be approved to be suitable for drinking water. UPM3 DHW are offered with either stainless steel or PPS housings, which are approved by KTW (DE), DVGW W270 (DE), ACS (FR) and WRAS (GB).

UPM3 - PWM variants

This circulator pump range is designed for integration in boilers and other heating appliances with remote control of the speed, corresponding to low-voltage PWM signal input.

UPM3 - HYBRID variants

This circulator pump range with user interface is designed for several purposes:

- The internal-controlled variant can be used in heating appliances as stand-alone or replacement pump, for example in heating kits.
- The remote-controlled variant can be integrated in boilers and other heating appliances where the speed is changed, corresponding to low-voltage PWM signal input.
- A combination of both.

The internal-controlled variants are suitable for the following systems:

- Systems with constant or slightly variable flows such as one-pipe heating systems
- Systems with variable flows such as two-pipe heating systems with thermostatic valves for radiators or underfloor heating.

Examples of systems

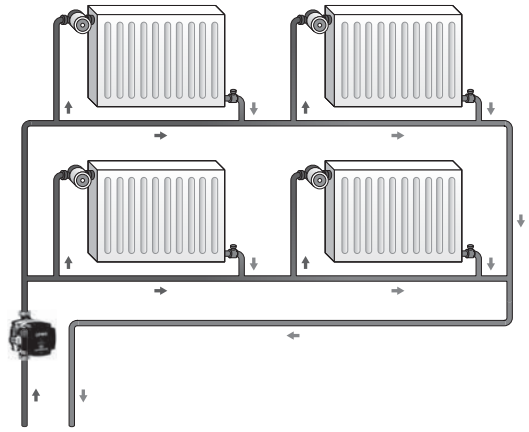

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Fig. 2 One-pipe heating system

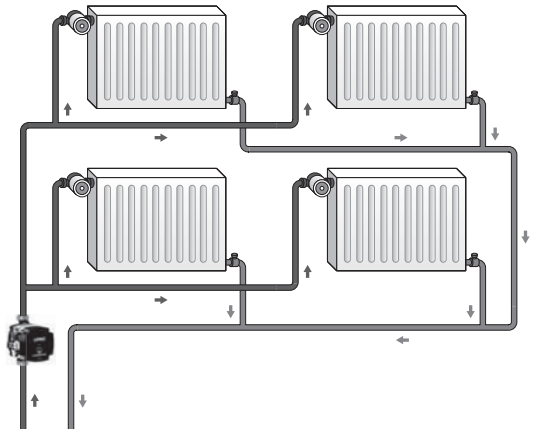

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Fig. 3 Two-pipe heating system

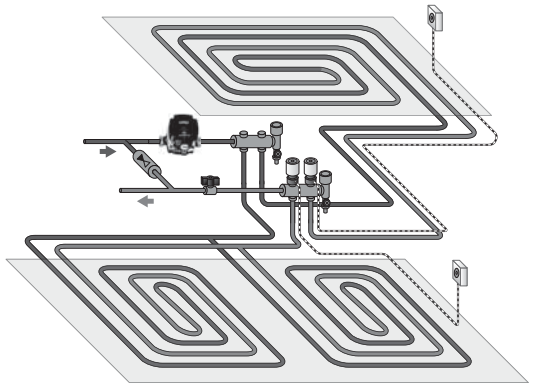

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Fig. 4 Underfloor heating system

2. Features and benefits

Features

- Speed-controlled, high-efficiency circulator fitted with electronically commutated motor (ECM) with permanent-magnet rotor and frequency converter.
- Either externally controlled by digital pulse-width modulation (PWM) low-voltage signal or internally controlled in constant pressure, proportional pressure or constant speed mode defined by the means of a smart user interface or factory pre-setting.
- Third generation of the first boiler-integrated, variable-speed ECM circulators which combines both validated and newly developed components and concepts.
- Highly reliable as more than 1,000,000 UPM units have been installed with success since 2006.
- Fit into existing boiler ranges, small as UP15 standard circulators.
- Cost-optimised and reliably available due to new established mass production facilities.
- Energy-optimised due to improved hydraulic and motor efficiency.

Benefits

- Use up to 87 % less electrical power than conventional constant-speed circulators.
- Use up to 68 % less electrical power than conventional speed-controlled circulators.
- Use up to 25 % less electrical power than the first generation of ECM pumps.

Unique Selling Points of UPM3 and UPM3 HYBRID variants

- UPM3 is the first Grundfos high efficiency circulator with terminal box in front and access to a mechanical de-blocking device.
- UPM3 is the first Grundfos high efficiency circulator for high ambient and media temperature of up to 70 °C/110 °C.
- UPM3 is the first Grundfos high efficiency circulator with relay for active inrush current limitation to 4 Amps.
- UPM3 is the first Grundfos high efficiency, PWM controlled circulator with an EEI below benchmark level of EEI ≤ 0.20. Therefore, it fulfils the ecodesign requirements for 2015.
- UPM3 is the first Grundfos OEM circulator with TE Superseal connectors for power and signal supply.
- UPM FLEX AC is the first Grundfos PWM controlled circulator with flexible setting of maximum curve of the speed control range and its profile A or C.
- UPM3 AUTO is the first Grundfos self-controlled circulator with $AUTO_{ADAPT}$ constant pressure mode, which can be used in underfloor heating systems.
- UPM3 HYBRID is the first hybrid version of externally and internally controlled, high efficiency Grundfos circulators.

ErP, Ecodesign regulation in brief

The EU has addressed the climate challenge in a EuP/ErP directive: Since 2013 all stand-alone circulators must fulfil Ecodesign requirements, defined in regulation 641/2009/EC on glandless circulators, which was amended by 622/2012/EC. In August 2015, the second step of this regulation will take effect and apply to integrated circulators in products as well. The regulation will set radically new standards for energy efficiency in circulators integrated in boiler, solar and heat pump systems.

The essentials

- Glandless circulators integrated in products must have an energy efficiency index (EEI) of not more than 0.23. The benchmark level is 0.20.
- Stand-alone circulators will be measured according to EN 16297-2.
- Integrated circulators will be measured according to EN 16297-3. due to the various integrated functions in the many customized hydraulic solutions on the market.
- All circulators integrated in products which generate and/or transfer heat, and all types of media, are included. This means that not only heating systems, but also solar thermal and heat circulator systems, will be affected by the Ecodesign regulation.
- Spare circulators for integrated circulators sold before August 2015 are allowed until 2020.
- Conformity with EU regulations will be governed through mandatory CE marking.

UPM3 circulators are "ErP-ready"

The UPM3 and UPM3 HYBRID variants already meet the new ecodesign requirements from 2015 measured by EN 16297-2 and EN 16297-3:2012.

Identification

Type key

Example:	UPM3	SOLAR	15	-145	130		C	A	EU	X	9	XXX

Type

UPM3	Standard
UPM3 K	K-Version

Control variant

FLEX AS	PWM A, MAX
FLEX AC	PWM A, PWM C
SOLAR	PWM C, CC
DHW	PWM A, MAX
AUTO L	PP, CP, CC
AUTO	PP, CP, CC, AA
HYBRID	PWM A/C, PP, CP, CC, AA

Nominal diameter

15	R 1/2" / G 1
25	R 1" / G 1 1/2
32	R 1 1/4" / G 2

Maximum head

20	2 m
40	4 m
50	5 m
60	6 m
70	7 m
75	7.5 m
105	10.5 m
145	14.5 m

Pump housing

130	Cast iron CED, 130 mm
180	Cast iron CED, 180 mm
N 130	Stainless steel, 130 mm
N 150	Stainless steel, 150 mm
N 180	Stainless steel, 180 mm
GGES2	Cast iron CED, end suction UPM3
GGMBP3	Cast iron CED, GGMBP3 UPM3
GGBP3	Cast iron CED, GGBP3 UPM3
CIL3PA	Composite CIL3, PA6.6 UPM3
CIL3PP	Composite CIL3, PPS UPM3
CIAO2A	Composite CIAO2 AC
CIAO2	Composite CIAO2
CESAO1	Composite CESAO1
CESAO2	Composite CESAO2
CESAO4	Composite CESAO4
CACAO	Composite CACAO
AOKR	Composite AOKR
CAOD3	Composite CAOD3 UPM3

External control signals 1 and 2

A	PWM Profile A, heating
C	PWM Profile C, solar
D	KM bus (Profile D)
Z	No profile

Minimum speed

A	0-563 rpm
J	> 2.025 rpm

Voltage

EU	230 VAC

Control signal connector

X	MSS (TE Mini Superseal)
Y	FCI (as UPER/UPM2)

Control box orientation

3	3 h (right)
6	6 h (below)
9	9 h (left)
0	12 h (top)

Customer code

XXX

Nameplate options

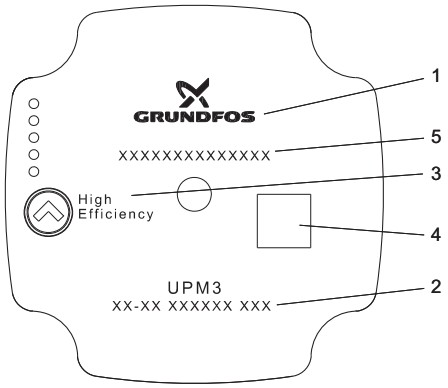

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Fig. 5 Nameplate: Grundfos standard

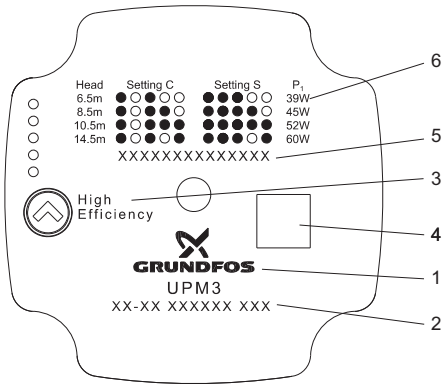

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Fig. 6 Nameplate: Grundfos with setting indication

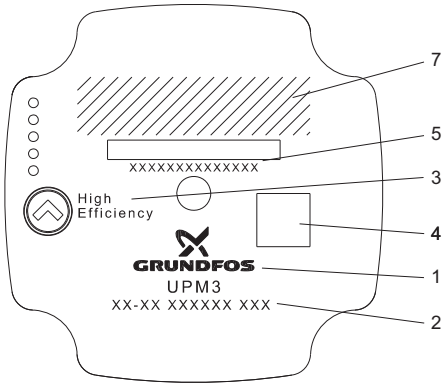

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Fig. 7 Nameplate: customised layout

Pos.	Description
1	Grundfos logo
2	Type designation
3	High efficiency indicating ECM technology
4	Grundfos data matrix
5	Customer product number or barcode
6	Settings indication
7	Area for customer specific logo

Terminal box side

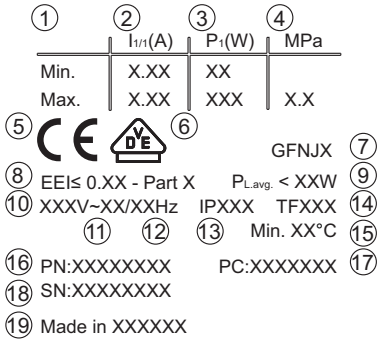

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Fig. 8 Terminal box side

Pos.	Terminal box side
1	Speed
2	Rated current, $I_{1/1}$ [A] at maximum and minimum
3	Input power P_1 [W] at maximum and minimum
4	Maximum system pressure [MPa]
5	CE mark
6	Approvals
7	VDE code
8	Energy index with indication of measurement standard
9	Average power input $P_{L,avg}$ (Ecodesign regulation)
10	Power supply voltage AC
11	Voltage [V]
12	Frequency [Hz]
13	Enclosure class
14	Temperature class
15	Minimum medium temperature (only cold water pumps)
16	Product number PN
17	Production code PC (YYWWCustomerID)
18	Serial number SN
19	Place of production

3. Performance range

Pump curves:

UPM3 xx-75

UPM3 xx-70

UPM3 xx-60

UPM3 xx-50

UPM3 xx-40

UPM3 xx-20

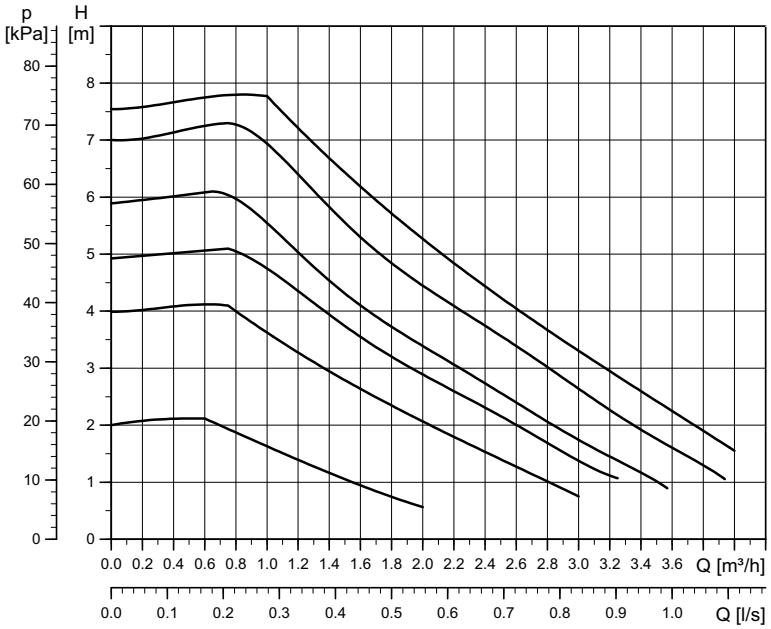

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Fig. 9 Performance range UPM3, cast iron pump housing

Pump curves:

UPM3 SOLAR xx-145

UPM3 SOLAR xx-105

UPM3 SOLAR xx-75

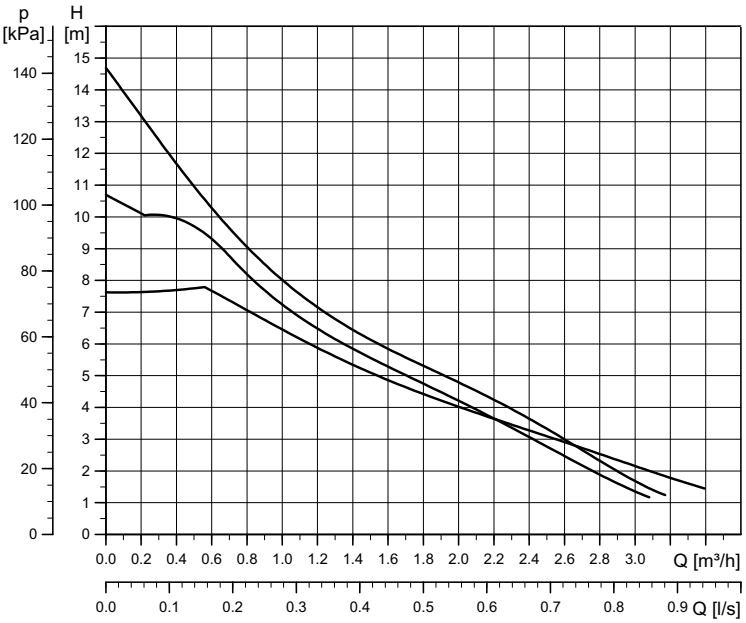

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Fig. 10 Performance range UPM3 SOLAR, cast iron pump housing

Pump type	Port-to-port length [mm]	Connection pipe thread	Control signal		Voltage + 10/- 15 % 50 Hz
			Internally controlled PP/CP/CC	Digital low voltage PWM bidirectional	
UPM3(K) 15-75 130	130	R 1/2 / G 1	-	●	1 x 230 V
UPM3(K) 25-75 130 (N)	130	R 1 / G 1 1/2	-	●	1 x 230 V
UPM3(K) 25-75 180 (N)	180	R 1 / G 1 1/2	-	●	1 x 230 V
UPM3(K) 32-75 180 (N)	180	R 1 1/4 / G 2	-	●	1 x 230 V
UPM3(K) 15-70 130	130	R 1/2 / G 1	-	●	1 x 230 V
UPM3(K) 25-70 130 (N)	130	R 1 / G 1 1/2	-	●	1 x 230 V
UPM3(K) 25-70 180 (N)	180	R 1 / G 1 1/2	-	●	1 x 230 V
UPM3(K) 32-70 180 (N)	180	R 1 1/4 / G 2	-	●	1 x 230 V
UPM3(K) 15-60 130	130	R 1/2 / G 1	-	●	1 x 230 V
UPM3(K) 25-60 130 (N)	130	R 1 / G 1 1/2	-	●	1 x 230 V
UPM3(K) 25-60 180 (N)	180	R 1 / G 1 1/2	-	●	1 x 230 V
UPM3(K) 32-60 180 (N)	180	R 1 1/4 / G 2	-	●	1 x 230 V
UPM3(K) 15-50 130	130	R 1/2 / G 1	-	●	1 x 230 V
UPM3(K) 25-50 130 (N)	130	R 1 / G 1 1/2	-	●	1 x 230 V
UPM3(K) 25-50 180 (N)	180	R 1 / G 1 1/2	-	●	1 x 230 V
UPM3(K) 32-50 180 (N)	180	R 1 1/4 / G 2	-	●	1 x 230 V
UPM3(K) 15-40 130	130	R 1/2 / G 1	-	●	1 x 230 V
UPM3(K) 25-40 130 (N)	130	R 1 / G 1 1/2	-	●	1 x 230 V
UPM3(K) 25-40 180 (N)	180	R 1 / G 1 1/2	-	●	1 x 230 V
UPM3(K) 32-40 180 (N)	180	R 1 1/4 / G 2	-	●	1 x 230 V
UPM3(K) FLEX AC 15-75 130	130	R 1/2 / G 1	-	●	1 x 230 V
UPM3(K) FLEX AC 25-75 130 (N)	130	R 1 / G 1 1/2	-	●	1 x 230 V
UPM3(K) FLEX AC 25-75 180 (N)	180	R 1 / G 1 1/2	-	●	1 x 230 V
UPM3(K) FLEX AC 32-75 180 (N)	180	R 1 1/4 / G 2	-	●	1 x 230 V
UPM3(K) FLEX AC 15-70 130	130	R 1/2 / G 1	-	●	1 x 230 V
UPM3(K) FLEX AC 25-70 130 (N)	130	R 1 / G 1 1/2	-	●	1 x 230 V
UPM3(K) FLEX AC 25-70 180 (N)	180	R 1 / G 1 1/2	-	●	1 x 230 V
UPM3(K) FLEX AC 32-70 180 (N)	180	R 1 1/4 / G 2	-	●	1 x 230 V
UPM3(K) FLEX AC 15-50 130	130	R 1/2 / G 1	-	●	1 x 230 V
UPM3(K) FLEX AC 25-50 130 (N)	130	R 1 / G 1 1/2	-	●	1 x 230 V
UPM3(K) FLEX AC 25-50 180 (N)	180	R 1 / G 1 1/2	-	●	1 x 230 V
UPM3(K) FLEX AC 32-50 180 (N)	180	R 1 1/4 / G 2	-	●	1 x 230 V
UPM3(K) FLEX AS 15-75 130	130	R 1/2 / G 1	-	●	1 x 230 V
UPM3(K) FLEX AS 25-75 130 (N)	130	R 1 / G 1 1/2	-	●	1 x 230 V
UPM3(K) FLEX AS 25-75 180 (N)	180	R 1 / G 1 1/2	-	●	1 x 230 V
UPM3(K) FLEX AS 32-75 180 (N)	180	R 1 1/4 / G 2	-	●	1 x 230 V
UPM3(K) FLEX AS 15-70 130	130	R 1/2 / G 1	-	●	1 x 230 V
UPM3(K) FLEX AS 25-70 130 (N)	130	R 1 / G 1 1/2	-	●	1 x 230 V
UPM3(K) FLEX AS 25-70 180 (N)	180	R 1 / G 1 1/2	-	●	1 x 230 V
UPM3(K) FLEX AS 32-70 180 (N)	180	R 1 1/4 / G 2	-	●	1 x 230 V
UPM3(K) FLEX AS 15-50 130	130	R 1/2 / G 1	-	●	1 x 230 V
UPM3(K) FLEX AS 25-50 130 (N)	130	R 1 / G 1 1/2	-	●	1 x 230 V
UPM3(K) FLEX AS 25-50 180 (N)	180	R 1 / G 1 1/2	-	●	1 x 230 V
UPM3(K) FLEX AS 32-50 180 (N)	180	R 1 1/4 / G 2	-	●	1 x 230 V
UPM3(K) AUTO L 15-70 130	130	R 1/2 / G 1	●	-	1 x 230 V
UPM3(K) AUTO L 25-70 130 (N)	130	R 1 / G 1 1/2	●	-	1 x 230 V
UPM3(K) AUTO L 25-70 180 (N)	180	R 1 / G 1 1/2	●	-	1 x 230 V
UPM3(K) AUTO L 32-70 180 (N)	180	R 1 1/4 / G 2	●	-	1 x 230 V
UPM3(K) AUTO L 15-50 130	130	R 1/2 / G 1	●	-	1 x 230 V
UPM3(K) AUTO L 25-50 130 (N)	130	R 1 / G 1 1/2	●	-	1 x 230 V
UPM3(K) AUTO L 25-50 180 (N)	180	R 1 / G 1 1/2	●	-	1 x 230 V
UPM3(K) AUTO L 32-50 180 (N)	180	R 1 1/4 / G 2	●	-	1 x 230 V
UPM3(K) AUTO 15-70 130	130	R 1/2 / G 1	●	-	1 x 230 V
UPM3(K) AUTO 25-70 130 (N)	130	R 1 / G 1 1/2	●	-	1 x 230 V
UPM3(K) AUTO 25-70 180 (N)	180	R 1 / G 1 1/2	●	-	1 x 230 V
UPM3(K) AUTO 32-70 180 (N)	180	R 1 1/4 / G 2	●	-	1 x 230 V
UPM3(K) AUTO 15-50 130	130	R 1/2 / G 1	●	-	1 x 230 V
UPM3(K) AUTO 25-50 130 (N)	130	R 1 / G 1 1/2	●	-	1 x 230 V
UPM3(K) AUTO 25-50 180 (N)	180	R 1 / G 1 1/2	●	-	1 x 230 V
UPM3(K) AUTO 32-50 180 (N)	180	R 1 1/4 / G 2	●	-	1 x 230 V
UPM3(K) HYBRID 15-70 130	130	R 1/2 / G 1	●	●	1 x 230 V
UPM3(K) HYBRID 25-70 130 (N)	130	R 1 / G 1 1/2	●	●	1 x 230 V
UPM3(K) HYBRID 25-70 180 (N)	180	R 1 / G 1 1/2	●	●	1 x 230 V
UPM3(K) HYBRID 32-70 180 (N)	180	R 1 1/4 / G 2	●	●	1 x 230 V

Pump type	Port-to-port length [mm]	Connection pipe thread	Control signal		Voltage + 10/- 15 % 50 Hz
			Internally controlled PP/CP/CC	Digital low voltage PWM bidirectional	
UPM3(K) HYBRID 15-50 130	130	R 1/2 / G 1	•	•	1 x 230 V
UPM3(K) HYBRID 25-50 130 (N)	130	R 1 / G 1 1/2	•	•	1 x 230 V
UPM3(K) HYBRID 25-50 180 (N)	180	R 1 / G 1 1/2	•	•	1 x 230 V
UPM3(K) HYBRID 32-50 180 (N)	180	R 1 1/4 / G 2	•	•	1 x 230 V
UPM3(K) DHW 25-70 130 N	130	R 1 / G 1 1/2	•	-	1 x 230 V
UPM3(K) DHW 25-70 180 N	180	R 1 / G 1 1/2	•	-	1 x 230 V
UPM3(K) DHW 32-70 180 N	180	R 1 1/4 / G 2	•	-	1 x 230 V
UPM3(K) DHW 25-50 130 N	130	R 1 / G 1 1/2	•	-	1 x 230 V
UPM3(K) DHW 25-50 180 N	180	R 1 / G 1 1/2	•	-	1 x 230 V
UPM3(K) DHW 32-50 180 N	180	R 1 1/4 / G 2	•	-	1 x 230 V
UPM3(K) DHW 25-20 130 N	130	R 1 / G 1 1/2	•	-	1 x 230 V
UPM3(K) DHW 25-20 180 N	180	R 1 / G 1 1/2	•	-	1 x 230 V
UPM3(K) DHW 32-20 180 N	180	R 1 1/4 / G 2	•	-	1 x 230 V
UPM3(K) DHW 15-70 CIL3 PPS	130	R 1/2 / G 1	•	-	1 x 230 V
UPM3(K) DHW 15-50 CIL3 PPS	130	R 1/2 / G 1	•	-	1 x 230 V
UPM3(K) DHW 15-20 CIL3 PPS	130	R 1/2 / G 1	•	-	1 x 230 V
UPM3(K) SOLAR 15-145 130	130	R 1/2 / G 1	•	-	1 x 230 V
UPM3(K) SOLAR 25-145 130	130	R 1 / G 1 1/2	•	-	1 x 230 V
UPM3(K) SOLAR 25-145 180	180	R 1 / G 1 1/2	•	-	1 x 230 V
UPM3(K) SOLAR 15-105 130	130	R 1/2 / G 1	•	-	1 x 230 V
UPM3(K) SOLAR 25-105 130	130	R 1 / G 1 1/2	•	-	1 x 230 V
UPM3(K) SOLAR 25-105 180	180	R 1 / G 1 1/2	•	-	1 x 230 V
UPM3(K) SOLAR 15-75 130	130	R 1/2 / G 1	•	-	1 x 230 V
UPM3(K) SOLAR 25-75 130 (N)	130	R 1 / G 1 1/2	•	-	1 x 230 V
UPM3(K) SOLAR 25-75 180 (N)	180	R 1 / G 1 1/2	•	-	1 x 230 V
UPM3(K) SOLAR 32-75 180 (N)	180	R 1 1/4 / G 2	•	-	1 x 230 V
UPM3(K) FLEX AS 15-75 CIL3 PPS	130	R 1/2 / G 1	•	-	1 x 230 V
UPM3(K) FLEX AS 15-75 CIL3 PA	130	R 1/2 / G 1	•	-	1 x 230 V
UPM3(K) FLEX AS 15-75 GGES3	ES	R 1/2 / G 1	•	-	1 x 230 V
UPM3(K) FLEX AS 15-75 GGMBP3	BP	See data sheet page 77	•	-	1 x 230 V
UPM3(K) FLEX AS 15-75 GGBP3	BP	See data sheet page 78	•	-	1 x 230 V
UPM3(K) FLEX AS 15-75 CIAO2	130	R 1/2 / G 1	•	-	1 x 230 V
UPM3(K) FLEX AS 15-75 CIAO2 AC	130	R 1/2 / G 1	•	-	1 x 230 V
UPM3(K) FLEX AS 15-75 CES3	ES	R 1/2 / G 1	•	-	1 x 230 V
UPM3(K) FLEX AS 15-75 CACAO	130	R 1/2 / G 1	•	-	1 x 230 V
UPM3(K) FLEX AS 15-75 CESAO1	OEM	See data sheet page 83	•	-	1 x 230 V
UPM3(K) FLEX AS 15-75 CESAO2	OEM	See data sheet page 84	•	-	1 x 230 V
UPM3(K) FLEX AS 15-75 CESAO4	OEM	See data sheet page 85	•	-	1 x 230 V
UPM3(K) FLEX AS 15-75 AOKR	OEM	See data sheet page 86	•	-	1 x 230 V
UPM3(K) FLEX AS 15-75 CAOD	OEM	See data sheet page 87	•	-	1 x 230 V

Other versions or housings with different dimensions, materials, design or functionality are available on request. Please contact your Grundfos HVAC OEM KAM.

4. UPM external control mode and signals

Control principles

The UPM3 and UPM3 FLEX circulators are controlled via a digital low-voltage pulse-width modulation (PWM) signal which means that the speed of rotation depends on the input signal. UPM3 HYBRID circulators are controlled either internally or externally can be set to either internal or externally controlled. The speed changes as a function of the input profile. These communication signals are standardized in the VDMA Einheitsblatt 24244 "Wet runner circulating pumps - Specification of PWM control signals".

Control signals

Digital low-voltage PWM signal

The square-wave PWM signal is designed for a 100 to 4,000 Hz frequency range. The PWM signal is used to select the speed (speed command) and as feedback signal. The PWM frequency on the feedback signal is fixed at 75 Hz in the circulator.

Duty cycle

d % = 100 x t/T

Example	Rating
T = 2 ms (500 Hz)	U_{iH} = 4-24 V
t = 0.6 ms	U_{iL} ≤ 1 V
d % = 100 x 0.6 / 2 = 30 %	I_{iH} ≤ 10 mA (depending on U_{iH})

Example

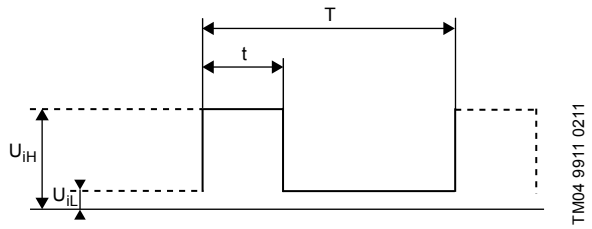


Fig. 11 PWM signal

Abbreviation	Description
T	Period of time [sec.]
d	Duty cycle [t/T]
U_{iH}	High-level input voltage
U_{iL}	Low-level input voltage
I_{iH}	High-level input current

Interface

The UPM3 PWM interface consists of an electronic part connecting the external control signal to the circulator. The interface translates the external signal into a signal type that the microprocessor can understand.

In addition, the interface ensures that the user cannot get into contact with dangerous voltage if touching the signal wires when power is connected to the circulator.

Note: "Signal ref." is a signal reference with no connection to protective earth.

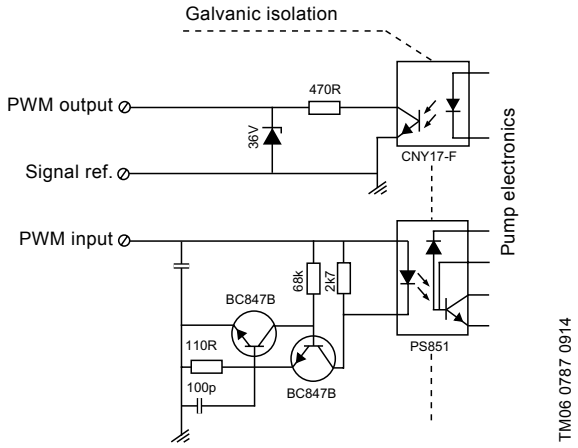


Fig. 12 Schematic drawing, interface

PWM input signal profile A (heating)

At high PWM signal percentages (duty cycles), a hysteresis prevents the circulator from starting and stopping if the input signal fluctuates around the shifting point. At low PWM signal percentages, the circulator speed is high for safety reasons. In case of a cable breakage in a gas boiler system, the circulators will continue to run at maximum speed to transfer heat from the primary heat exchanger. This is also suitable for heat circulators to ensure that the circulators transfer heat in case of a cable breakage.

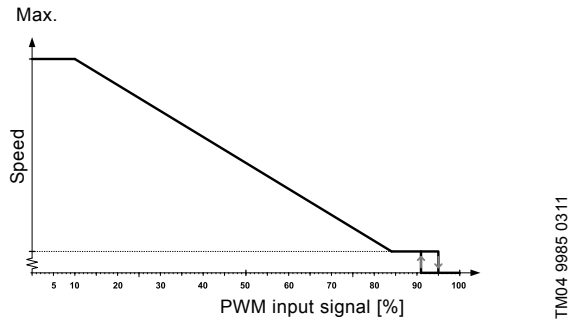


Fig. 13 PWM input profile A (heating)

PWM input signal [%]	Pump status
≤ 10	Maximum speed: max.
> 10 / ≤ 84	Variable speed: min. to max.
> 84 / ≤ 91	Minimum speed: IN
> 91/95	Hysteresis area: on/off
> 95 / ≤ 100	Standby mode: off

PWM input signal profile C (solar)

At low PWM signal percentages (duty cycles), a hysteresis prevents the circulator from starting and stopping if the input signal fluctuates around the shifting point. Without PWM signal percentages, the circulator will stop for safety reasons. If a signal is missing, for example due to a cable breakage, the circulator will stop to avoid overheating of the solar thermal system.

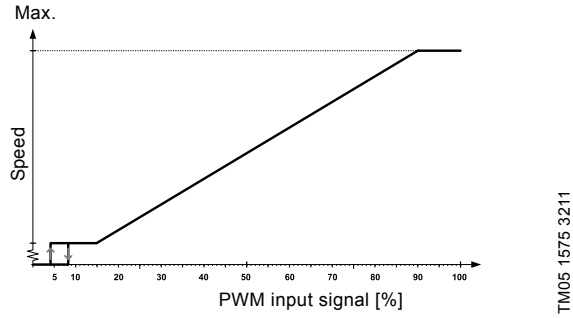


Fig. 14 PWM input profile C (solar)

PWM input signal [%]	Pump status
≤ 5	Standby mode: off
> 5 / ≤ 8	Hysteresis area: on/off
> 8 / ≤ 15	Minimum speed: IN
> 15 / ≤ 90	Variable speed: min. to max.
> 90 / ≤ 100	Maximum speed: max

PWM feedback signal - power consumption (standard)

The PWM feedback signal offers pump information like in BUS systems:

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

Alarms

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

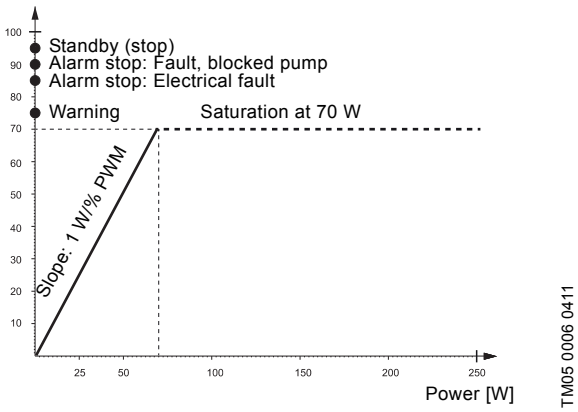


Fig. 15 PWM feedback signal - power consumption

PWM output signal [%]	QT [s]	Pump info	DT [s]	Priority
95	0	Standby (STOP) by PWM signal	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
0-10		0-70 W (slope 1 W/% PWM)		6
Output frequency: 75 Hz ± 5 %				

Note: QT =qualification time, DT =disqualification time

PWM feedback signal - flow estimation (on demand)

On demand there will be an option that the PWM feedback signal can also be used to indicate the flow of the circulator on defined pump housings. The accuracy of the feedback signal is depending on the operation point and media temperature, but it gives a good indication on the actual flow.

Example: In this case 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.

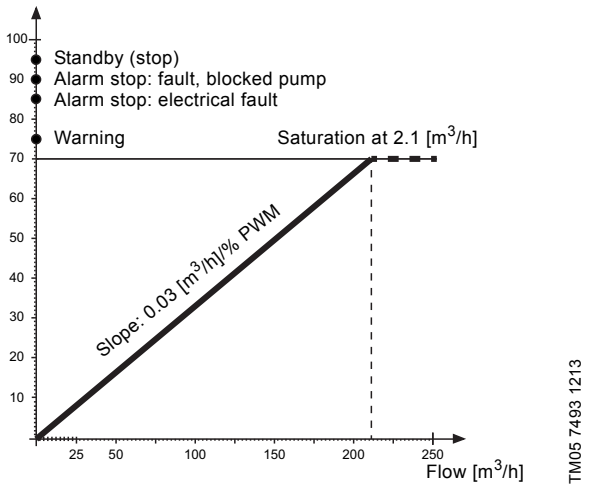


Fig. 16 PWM feedback signal - flow estimation

Data

Maximum rating	Symbol	Value
PWM frequency input with high-speed optocoupler	f	100-4000 Hz
Guaranteed standby power consumption		< 1 W
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	PWM	0-100 %
PWM frequency output, open collector	f	75 Hz ± 5 %
Accuracy of output signal regarding power consumption	-	± 2 % (of PWM signal)
Output duty cycle	PWM	0-100 %
Collector emitter breakdown voltage on output transistor	U_c	< 70 V
Collector current on output transistor	I_c	< 50 mA
Maximum power dissipation on output resistor	P_R	125 mW
Zener diode working voltage	U_z	36 V
Maximum power dissipation in Zener diode	P_z	300 mW

5. UPM3 HYBRID control modes, user interface and settings

HYBRID control modes and curves

Up to five different control modes, each with up to four curves, are available for UPM3 HYBRID variants for different maximum heads.

Externally controlled		Internally controlled		
PWM Profile A	**PWM Profile C**	**Proportional Pressure**	**Constant Pressure**	**Constant Curve**
Curve 1	Curve 1	Curve 1	Curve 1	Curve 1
Curve 2	Curve 2	Curve 2	Curve 2	Curve 2
Curve 3	Curve 3	Curve 3	Curve 3	Curve 3
Curve 4 (MAX)	Curve 4 (MAX)	$AUTO_{ADAPT}$	$AUTO_{ADAPT}$	Curve 4 (MAX)

HYBRID variants

These setting options can be delivered as pre-configured variants.

Variant	Application	Functionality	Control modes and curves				Number of settings	Factory-preset
			Externally controlled		Internally controlled			
FLEX AS	Heating appliances	Runs with or without PWM signal. Without PWM signal, this pump runs on MAX curve.	PWM A	4	MAX	4	4	Depends on the pump type
FLEX AC	Heating and/or solar thermal systems	Runs with PWM A (heating) profile or PWM C (solar) profile.	PWM A PWM C	4 4			8	
SOLAR	Solar thermal systems	Runs with PWM C (solar) profile or on Constant Curve.	PWM C	4			8	
DHW	Domestic hot water systems	Runs with or without PWM signal. Without PWM signal, this pump runs on MAX curve.	PWM A	4	MAX	4	4	
AUTO L	Heating kits DHW system	Runs with all self-controlled modes and curves, except $AUTO_{ADAPT.}$			PP CP CC	3 3 4	10	
AUTO	Heating kits DHW system	Runs with all self-controlled modes and curves.			PP CP CC	3+AA 3+AA 4	12	
HYBRID	Any HVAC system	Runs with all available modes and curves.	PWM A PWM C	4 4	PP CP CC	3+AA 3+AA 4	20	

User interface

The user interface is designed with a single push button, one red/green LED and four yellow LEDs.

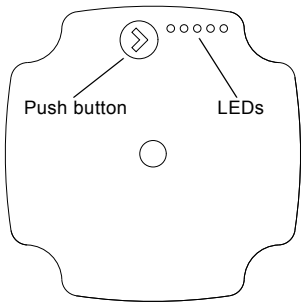


Fig. 17 User interface with one push button and five LEDs

The user interface shows:

- performance view (during operation)
  - operation status
  - alarm status
- settings view (after pressing the button).

During operation, the display shows the performance view. If you press the button, the user interface switches the view or runs in the setting selection mode.

Performance view

The performance view shows either the operation status or the alarm status.

Operation status

When the circulator is running, LED 1 is green. The four yellow LEDs indicate the current power consumption (P1) as shown in the table below. See fig. 18. When the operation mode is active, all active LEDs are constantly on in order to differentiate this mode from the select setting mode. If the circulator is stopped by an external signal, LED 1 flashes green.

Display	Indication	Performance in % of P1 MAX
One green LED (flashing)	Standby (only externally controlled)	0
One green LED + one yellow LED	Low performance	0-25
One green LED + two yellow LED	Medium low performance	25-50
One green LED + three yellow LED	Medium high performance	50-75
One green LED + four yellow LED	High performance	75-100

Operation area

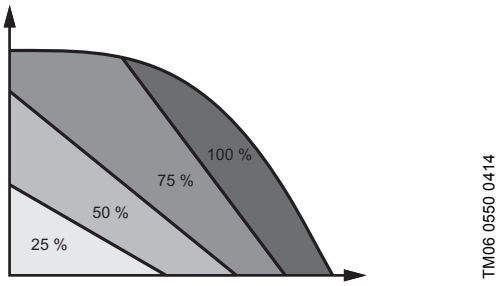


Fig. 18 Operation area according to performance load

Alarm status

If the circulator has detected one or more alarms, the bi-colored LED 1 switches from green to red. When an alarm is active, the LEDs indicate the alarm type as defined in the table below. If multiple alarms are active at the same time, the LEDs only show the error with the highest priority. The priority is defined by the sequence of the table.

When there is no active alarm anymore, the user interface switches back to operation mode.

Display	Indication	Pump operation	Counter action
One red LED + one yellow LED (LED 5)	Rotor is blocked.	Trying to start again every 1.33 seconds.	Wait or deblock the shaft.
One red LED + one yellow LED (LED 4)	Supply voltage too low.	Only warning, pump runs.	Control the supply voltage.
One red LED + one yellow LED (LED 3)	Electrical error.	Pump is stopped because of low supply voltage or serious failure.	Control the supply voltage / Exchange the pump.

Settings view

You can switch from the performance view to the settings view by pressing the push button. The LEDs indicate the actual setting. The settings view shows which mode controls the circulator. No settings can be made at this stage. After 2 seconds, the display switches back to performance view.

If LED 1 is green, it indicates operation or internal control. If LED 1 is red, it indicates alarm or external control. LED 2 and 3 indicate the different control modes and LED 4 and 5 indicate the different curves.

	LED 1	LED 2	LED 3	LED 4	LED 5
Proportional pressure	Green	●			
Constant pressure	Green		●		
Constant curve	Green	●	●		
PWM A profile	Red	●			
PWM C profile	Red		●		
Curve 1					
Curve 2				●	
Curve 3				●	●
Curve 4/AUTO$_{ADAPT}$					●

Note: ● = The LED is yellow.

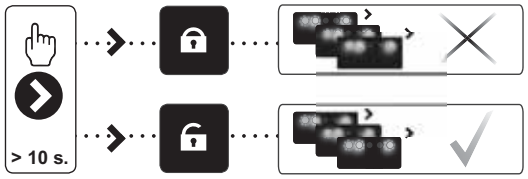
Navigation

Key lock function

The purpose of the key lock function is to avoid accidental change of settings and misuse.

When the key lock function is enabled, all long key presses will be ignored. This prevents the user from entering the "select setting mode" area and allows the user to see the "show setting mode" area.

If you press the key lock for more than 10 seconds, you can toggle between enabling/disabling the key lock function. When doing so, all LEDs, except for the red LED, will flash for a second indicating that lock is toggled.



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Factory presetting

The circulator starts at the factory preset operation mode fixed in the Grundfos software file (GSC). It is overwritten after the first personal setting. A customised factory preset might be requested by the customer for his specific product specification. The following factory preset options are available:

UPM3 standard range	Type	max. H nom. [m]	Max. rpm	Min. rpm	Max. P1 nom. [W]	User interface	PWM Profile A	PWM Profile C	Constant curve	Constant pressure	CP AUTO$_{ADAPT}$	Proportional pressure	PP AUTO$_{ADAPT}$	Factory preset																			
														Proportional pressure				Constant pressure				Constant curve				PWM A profile				PWM C profile			
														PP1	PP2	PP3	PP4	CP1	CP2	CP3	CP4	CC1	CC2	CC3	CC4	A1	A2	A3	A4	C1	C2	C3	C4
PWM A	xx-75	7.5	5991	563	60		•							/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	❑	/	/	/	/
	xx-70	7	5766	563	52		•							/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	❑	/	/	/	/
	xx-60	6	5288	563	39		•							/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	❑	/	/	/	/
	xx-50	5	4838	563	33		•							/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	❑	/	/	/	/
	xx-40	4	4360	563	25		•							/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	❑	/	/	/	/
PWM C	xx-75	7.5	5591	563	60			•						/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	❑
	xx-65	6.5	5513	563	45			•						/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	❑
	xx-45	4.5	4641	563	30			•						/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	❑
FLEX AS	xx-75	7.5	5991	563	60	•	•							/	/	/	/	/	/	/	/	/	/	/	/	•	•	•	❑	/	/	/	/
	xx-70	7	5766	563	52	•	•							/	/	/	/	/	/	/	/	/	/	/	/	•	•	•	❑	/	/	/	/
	xx-50	5	4838	563	33	•	•							/	/	/	/	/	/	/	/	/	/	/	/	•	•	•	❑	/	/	/	/
FLEX AC	xx-75	7.5	5991	563	60	•	•	•						/	/	/	/	/	/	/	/	/	/	/	/	•	•	•	❑	•	•	•	•
	xx-70	7	5766	563	52	•	•	•						/	/	/	/	/	/	/	/	/	/	/	/	•	•	•	❑	•	•	•	•
	xx-50	5	4838	563	33	•	•	•						/	/	/	/	/	/	/	/	/	/	/	/	•	•	•	❑	•	•	•	•
DHW	xx-70	7	5766	563	52	•	•							/	/	/	/	/	/	/	/	/	/	/	/	•	•	•	❑	/	/	/	/
	xx-50	5	4838	563	33	•	•							/	/	/	/	/	/	/	/	/	/	/	/	•	•	•	❑	/	/	/	/
	xx-20	2	3112	563	11	•	•							/	/	/	/	/	/	/	/	/	/	/	/	•	•	•	❑	/	/	/	/
SOLAR	xx-145	14.5	5991	563	60	•		•	•					/	/	/	/	/	/	/	/	•	•	•	❑	/	/	/	/	•	•	•	•
	xx-105	10.5	5766	563	52	•		•	•					/	/	/	/	/	/	/	/	•	•	•	❑	/	/	/	/	•	•	•	•
	xx-75	7.5	5991	563	45	•		•	•					/	/	/	/	/	/	/	/	•	•	•	❑	/	/	/	/	•	•	•	•
AUTO L	xx-70	7	5766	563	52	•			•	•		•		•	•	❑	/	•	•	•	/	•	•	•	•	/	/	/	/	/	/	/	/
	xx-50	5	4838	563	33	•			•	•		•		•	•	❑	/	•	•	•	/	•	•	•	•	/	/	/	/	/	/	/	/
AUTO	xx-70	7	5766	563	52	•			•	•	•	•	•	•	•	❑	•	•	•	•	•	•	•	•	•	/	/	/	/	/	/	/	/
	xx-50	5	4838	563	33	•			•	•	•	•	•	•	•	❑	•	•	•	•	•	•	•	•	•	/	/	/	/	/	/	/	/
HYBRID	xx-70	7	5766	563	52	•	•	•	•	•	•	•	•	•	•	❑	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	xx-50	5	4838	563	33	•	•	•	•	•	•	•	•	•	•	❑	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

❑ Standard

• Possible

/ Impossible

Setting selection

You can choose between the performance view and settings view.

If you press the button for 2 to 10 seconds, the user interface switches to "setting selection" if the user interface is unlocked. You can change the settings as they appear. The settings appear in a particular order in a closed loop. When you release the button, the user interface switches back to the performance view and the last setting is stored.

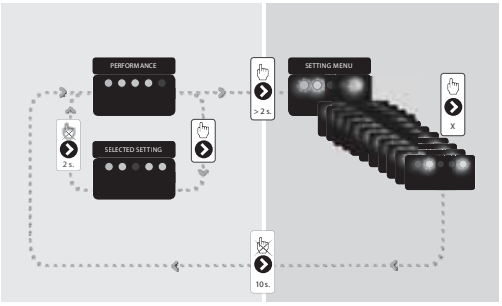

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Fig. 19 Setting selection

User interface control modes for UPM3 HYBRID variants

All UPM3 HYBRID variants can be controlled with a single push-button and a LED interface.

The following operation modes can be selected with the push-button.

The user interface shows the flashing LEDs in the combination shown in the tables below.

UPM3 FLEX AS

This circulator pump is either for external PWM profile A signal control or speed selection.

The maximum curve of the pump operation range can be defined.

- With PWM signal, the pump runs at the corresponding speed.
- Without PWM signal, the pump runs at maximum speed.

PWM profile A (heating)

PWM A profile	LED1 red	LED2 yellow	LED3 yellow	LED4 yellow	LED5 yellow
A1	•	•			
A2	•	•		•	
A3	•	•		•	•
A4 (max.)	•	•			•

UPM3 FLEX AC

This circulator pump is for external PWM signal control with profile A or C.

The maximum curve of the pump operation and its profile can be defined.

PWM A profile (heating)

PWM A profile	LED1 red	LED2 yellow	LED3 yellow	LED4 yellow	LED5 yellow
A1	•	•			
A2	•	•		•	
A3	•	•		•	•
A4 (max.)	•	•			•

PWM C profile (solar)

PWM C profile	LED1 red	LED2 yellow	LED3 yellow	LED4 yellow	LED5 yellow
C1	•		•		
C2	•		•	•	
C3	•		•	•	•
C4 (max.)	•		•		•

UPM3 DHW

This circulator pump is either for external PWM profile A signal control or speed selection.

The maximum curve of the pump operation range can be defined.

- With PWM signal, the pump runs at the corresponding speed.
- Without PWM signal, the pump runs at maximum speed.

PWM A profile (heating)

PWM A profile	LED1 red	LED2 yellow	LED3 yellow	LED4 yellow	LED5 yellow
A1	•	•			
A2	•	•		•	
A3	•	•		•	•
A4 (max.)	•	•			•

UPM3 SOLAR

This circulator pump is either for external PWM signal control with profile C or internal control on Constant Curve mode.

Constant Curve mode

Constant Curve	LED1 green	LED2 yellow	LED3 yellow	LED4 yellow	LED5 yellow
CC1	•	•	•		
CC2	•	•	•	•	
CC3	•	•	•	•	•
CC4 (max.)	•	•	•		•

PWM C profile (solar)

PWM C profile	LED1 red	LED2 yellow	LED3 yellow	LED4 yellow	LED5 yellow
C1	•		•		
C2	•		•	•	
C3	•		•	•	•
C4 (max.)	•		•		•

UPM3 AUTO L

This circulator pump is for internal control with three control modes without AUTO$_{ADAPT}$.

Proportional pressure mode

Proportional Pressure	LED1 green	LED2 yellow	LED3 yellow	LED4 yellow	LED5 yellow
PP1	●	●			
PP2	●	●		●	
PP3	●	●		●	●

Constant pressure mode

Constant Pressure	LED1 green	LED2 yellow	LED3 yellow	LED4 yellow	LED5 yellow
CP1	●		●		
CP2	●		●	●	
CP3	●		●	●	●

Constant curve mode

Constant Curve	LED1 green	LED2 yellow	LED3 yellow	LED4 yellow	LED5 yellow
CC1	●	●	●		
CC2	●	●	●	●	
CC3	●	●	●	●	●
CC4 (max.)	●	●	●		●

UPM3 AUTO

This circulator is for internal control with three control modes with AUTO$_{ADAPT}$.

Proportional pressure mode

Proportional Pressure	LED1 green	LED2 yellow	LED3 yellow	LED4 yellow	LED5 yellow
PP1	●	●			
PP2	●	●		●	
PP3	●	●		●	●
PP AA	●	●			●

Constant pressure mode

Constant Pressure	LED1 green	LED2 yellow	LED3 yellow	LED4 yellow	LED5 yellow
CP1	●		●		
CP2	●		●	●	
CP3	●		●	●	●
CP AA	●		●		●

Constant curve mode

Constant Curve	LED1 green	LED2 yellow	LED3 yellow	LED4 yellow	LED5 yellow
CC 1	●	●	●		
CC 2	●	●	●	●	
CC 3	●	●	●	●	●
CC 4 (max.)	●	●	●		●

UPM3 HYBRID

This circulator pump is either for external PWM signal control with profile A or C or internal control with three control modes with AUTO$_{ADAPT}$.

Proportional pressure mode

Proportional Pressure	LED1 green	LED2 yellow	LED3 yellow	LED4 yellow	LED5 yellow
PP1	●	●			
PP2	●	●		●	
PP3	●	●		●	●
PP AA	●	●			●

Constant pressure mode

Constant Pressure	LED1 green	LED2 yellow	LED3 yellow	LED4 yellow	LED5 yellow
CP1	●		●		
CP2	●		●	●	
CP3	●		●	●	●
CP AA	●		●		●

Constant curve mode

Constant Curve	LED1 green	LED2 yellow	LED3 yellow	LED4 yellow	LED5 yellow
CC1	●	●	●		
CC2	●	●	●	●	
CC3	●	●	●	●	●
CC4 (max.)	●	●	●		●

PWM A profile (heating)

PWM A profile	LED1 red	LED2 yellow	LED3 yellow	LED4 yellow	LED5 yellow
A1	●	●			
A2	●	●		●	
A3	●	●		●	●
A4 (max.)	●	●			●

PWM C profile (solar)

PWM C profile	LED1 red	LED2 yellow	LED3 yellow	LED4 yellow	LED5 yellow
C1	●		●		
C2	●		●	●	
C3	●		●	●	●
C4 (max.)	●		●		●

Toggling the settings of UPM3

When you switch on the circulator, it runs with the factory pre-setting or the last setting. The display shows the current operation status.

1. Press the button to switch to the setting view. The LEDs show the current setting for 2 seconds.
2. Release the button for more than 2 seconds. The user interface shows the current performance in "operation status".
3. Press the button for more than 2 seconds and the circulator switches to "setting selection". The LEDs flash and show the current setting mode. Please note that if the key lock is disabled, the circulator will not switch to "setting selection". In this case, unlock the key lock by pressing the button for more 10 seconds.
4. During a period of 10 seconds, press shortly on the button and the circulator switches to the next setting.
5. To select between the settings, instantly press the button until you find the setting you want. If you pass a setting, you need to continue until the setting appears again as it is not possible to go back in the settings menu.
6. Release the button for more than 10 seconds and the user interface switches back to the performance view and the last setting is stored.
7. Press the button and the display switches to the setting view and the LEDs show the current setting for 2 seconds.
8. Release the button for more than 2 seconds and the user interface switches back to the performance view.

Settings navigation

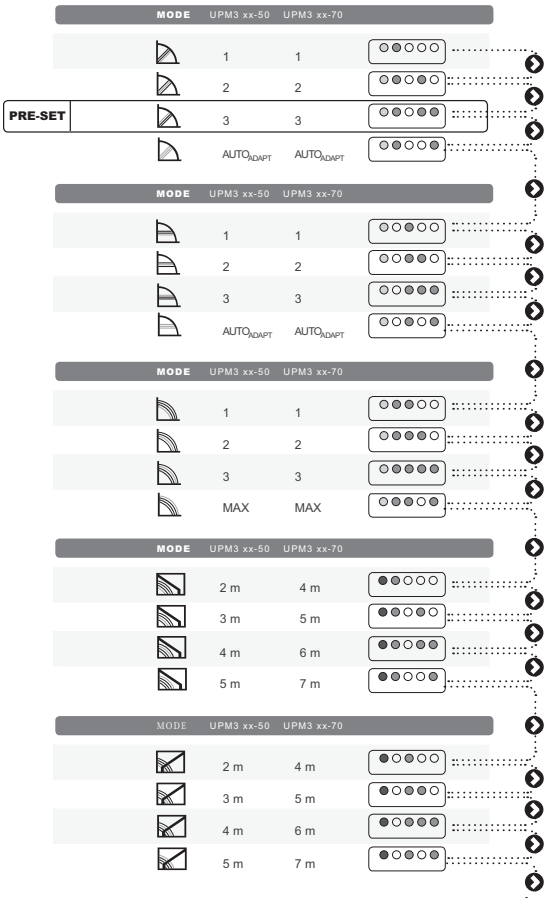


Fig. 20 Settings navigation

Control modes with pump curves

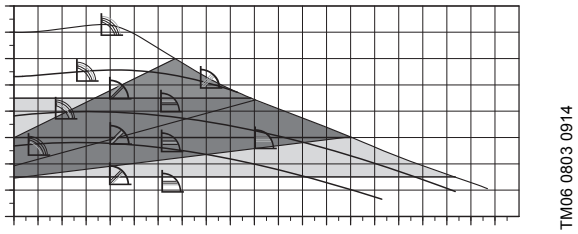


Fig. 21 UPM3 AUTO/HYBRID control modes with pump curves

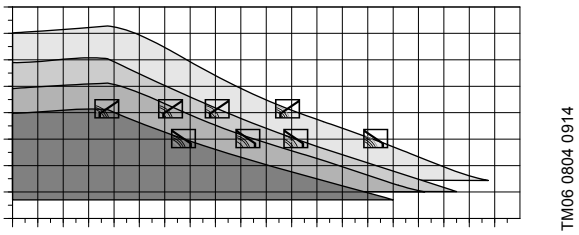


Fig. 22 UPM3 FLEX/HYBRID control modes with pump curves

Control mode explanation

Proportional pressure

The head (pressure) is reduced at falling heat demand and increased at rising heat demand.

The duty point of the circulator will move up or down on the selected proportional-pressure curve, depending on the heat demand in the system.

TM06 0704 0814

- PP1: lowest proportional pressure curve
- PP2: intermediate proportional pressure curve
- PP3: highest proportional-pressure curve
- AUTO$_{ADAPT}$: highest to lowest proportional pressure curve.

The AUTO$_{ADAPT}$ function enables the circulator to control the pump performance automatically within a defined performance range.

- Adjusting the pump performance to the size of the system.
- Adjusting the pump performance to the variations in load over time.

In proportional pressure AUTO$_{ADAPT}$, the circulator is set to proportional-pressure control.

Constant pressure

The head (pressure) is kept constant, irrespective of the heat demand.

The duty point of the circulator will move out or in on the selected constant-pressure curve, depending on the heat demand in the system.

TM06 0705 0814

- CP1: lowest constant-pressure curve
- CP2: intermediate constant-pressure curve
- CP3: highest constant-pressure curve
- AUTO$_{ADAPT}$: highest to lowest constant-pressure curve.

The AUTO$_{ADAPT}$ function enables the circulator to control the pump performance automatically within a defined performance range.

- Adjusting the pump performance to the size of the system.
- Adjusting the pump performance to the variations in load over time.

In constant pressure AUTO$_{ADAPT}$, the circulator is set to constant-pressure control.

Constant curve

The circulator runs on a constant curve, which means that it runs at a constant speed or power.

The duty point of the circulator moves up or down on the selected constant curve, depending on the heat demand in the system.

TM06 0805 0914

Constant Curve	UPM3 xx-20	UPM3 xx-50	UPM3 xx-70	UPM3 xx-75	UPM3 xx-105	UPM3 xx-145
CC1	0.5 m	2 m	4 m	4 m	4.5 m	6.5 m
CC2	1.0 m	3 m	5 m	5 m	6.5 m	8.5 m
CC3	1.5 m	4 m	6 m	6 m	8.5 m	10.5 m
CC4 (max.)	2.0 m	5 m	7 m	7.5 m	10.5 m	14.5 m

PWM profile A (heating)

The circulator runs on constant speed curves depending on the current PWM value.

The speed decreases when the PWM value increases. If PWM equals 0, the circulator runs at maximum speed.

TM06 0706 0814

PWM profile	UPM3 xx-20	UPM3 xx-50	UPM3 xx-70	UPM3 xx-75
A1	0.5 m	2 m	4 m	4 m
A2	1.0 m	3 m	5 m	5 m
A3	1.5 m	4 m	6 m	6 m
A4 (max.)	2.0 m	5 m	7 m	7.5 m
MAX	**UPM3 xx-20**	**UPM3 xx-50**	**UPM3 xx-70**	**UPM3 xx-75**
A1	0.5 m	2 m	4 m	4 m
A2	1.0 m	3 m	5 m	5 m
A3	1.5 m	4 m	6 m	6 m
A4	2.0 m	5 m	7 m	7.5 m

The circulator runs on constant speed curves depending on the current PWM value.

PWM Profile C (solar)

The circulator runs on constant speed curves depending on the current PWM value.

Speed will increase with increasing PWM value. If PWM equals 0, the circulator stops.

TM06 0707 0814

PWM profile	UPM3 xx-50	UPM3 xx-70	UPM3 xx-75	UPM3 xx-105	UPM3 xx-145
C1	2 m	4 m	4 m	4.5 m	6.5 m
C2	3 m	5 m	5 m	6.5 m	8.5 m
C3	4 m	6 m	6 m	8.5 m	10.5 m
C4 (max.)	5 m	7 m	7.5 m	10.5 m	14.5 m

Pump control in heating systems

The heating required in a building varies greatly during the day due to changing outdoor temperatures, solar radiation and heat emanating from people, electric appliances, etc.

Add to this that the need for heating may vary from one section of the building to another and that the thermostatic valves of some radiators may have been turned down by the users. These circumstances will cause an uncontrolled circulator to produce a too high differential pressure when the heat demand is low.

An uncontrolled circulator will produce a too high differential pressure when the heat demand and flow is low.

Possible consequences:

- too high energy consumption
- irregular control of the system
- noise in thermostatic radiator valves and similar fittings.

GRUNDFOS UPM3 HYBRID, UPM3 AUTO and UPM3 AUTO L automatically control the differential pressure by adjusting the pump performance to the actual heat demand, without the use of external components.

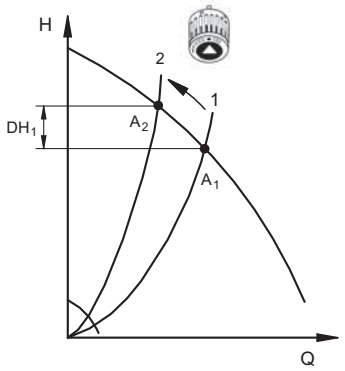
Advantages of pump control

In GRUNDFOS UPM3 HYBRID, UPM3 AUTO and UPM3 AUTO L pump control is effected by adapting the differential pressure to the flow (proportional-pressure and constant-pressure control). Contrary to an uncontrolled circulator, a constant-pressure-controlled circulator keeps the differential pressure constant. A proportional-pressure-controlled circulator reduces the differential pressure as a result of falling heat demand.

For example:

If the heat demand falls, for instance due to solar radiation, the thermostatic radiator valves will close, and, for the uncontrolled circulator, the flow resistance of the system will rise, for instance from A1 to A2.

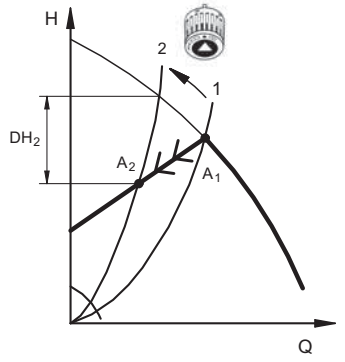
In a heating system with an uncontrolled circulator, this situation will cause a pressure rise in the system by ΔH_1.



TM06 0857 1014

Fig. 23 Uncontrolled circulator

In a system with a proportional-pressure-controlled circulator, operated in the proportional pressure mode the pressure will be reduced by ΔH_2 and result in reduced energy consumption.



TM06 0858 1014

Fig. 24 Circulator operated in proportional-pressure control mode

In a system with an uncontrolled circulator, a pressure rise will often cause flow-generated noise in the thermostatic radiator valves. This noise will be reduced considerably with the proportional pressure control.

AUTO$_{ADAPT}$

If you select AUTO$_{ADAPT}$, the circulator starts with the medium proportional or constant control curve and runs on this curve as long as a new curve will be adapted.

The AUTO$_{ADAPT}$ proportional pressure functionality is well known from millions of installed GRUNDFOS trade circulators as ALPHA2 or MAGNA. The AUTO$_{ADAPT}$ setting continually analyses and finds the setting where optimal comfort meets minimal energy consumption. It automatically delivers perfect comfort at the lowest possible energy level. It adapts to the requirements of the heating system before reaching the maximum pump curve and allows the circulator to adjust the proportional pressure or constant pressure curve both up and down.

Advantages of AUTO$_{ADAPT}$

- Easy installation
- Automatic setting
- Demand-controlled operations
- Optimum comfort
- Energy savings
- Reduced CO_2 emissions.

Constant pressure at all load conditions is essential for how well the thermostatic valves can control the heat emission from the radiators. It is a well-known fact that optimum pump control in a two-pipe heating system with thermostatic radiator valves is best obtained by controlling pump pressure on a proportional pressure curve. In systems as underfloor heating or one-pipe systems it might be better to use constant pressure control. However, predicting the best position in real-life applications is rather difficult, because the optimum position depends on correlated factors such as the size of the heating system, the boiler type, the load condition, etc. This is where AUTO$_{ADAPT}$ steps in to ensure that the circulator is controlled in an optimum manner.

The AUTO$_{ADAPT}$ algorithm

The objective of the AUTO$_{ADAPT}$ algorithm is to measure and analyse the heating system during operation and adapt to the current heating pattern. The system adapts to night vs. day operations, summer vs. winter season, and heat losses or gains affecting room temperature, for example, from radiators, walls and windows, sun radiation, electrical equipment, and people.

AUTO$_{ADAPT}$ three-step task

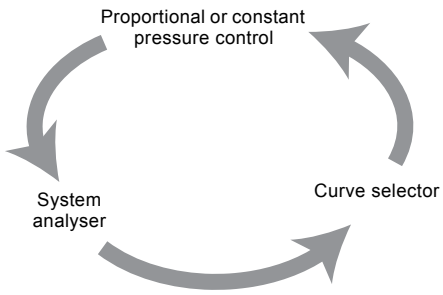


Fig. 25 The AUTO$_{ADAPT}$ three-step task

Basically, AUTO$_{ADAPT}$ optimises the position of the proportional or constant pressure curve via a three-step task as illustrated in fig. 25.

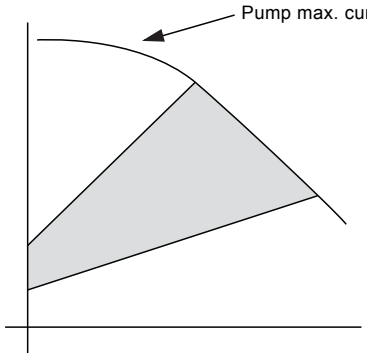
The "system analyser" analyses the heating system, which the circulator is a part of. On the basis of the analysis, AUTO$_{ADAPT}$ verifies whether the pump pressure is too high, too low, or correct. The "curve selector" then uses this knowledge to select the optimum proportional or constant pressure curve for the circulator. Finally, the circulator is controlled according to the selected proportional or constant pressure curve by means of the "proportional or constant pressure control". The circulator will continue this cycle as long as the circulator is running.

Example

This example shows proportional pressure AUTO$_{ADAPT}$.

Note: The constant pressure AUTO$_{ADAPT}$ function will act accordingly just by utilising constant pressure control, and not proportional pressure control as shown in the example below.

The AUTO$_{ADAPT}$ function can operate and adjust pump speed according to duty point within a specific area.

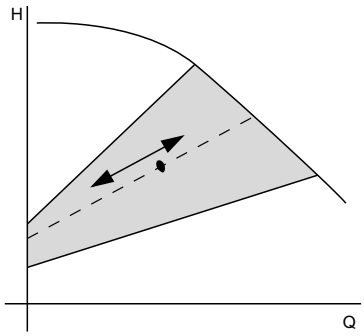


TM06 0848 1014

Fig. 26 Proportional pressure AUTO$_{ADAPT}$ operation area

As default the AUTO$_{ADAPT}$ is preset to operate the circulator on the middle proportional pressure curve. By use of an immediate acting PI-controlling function the circulator will adapt to the system on this proportional pressure curve.

Note: The PI controller is set to eliminate any offset within a time frame of 120 seconds.



TM06 0851 1014

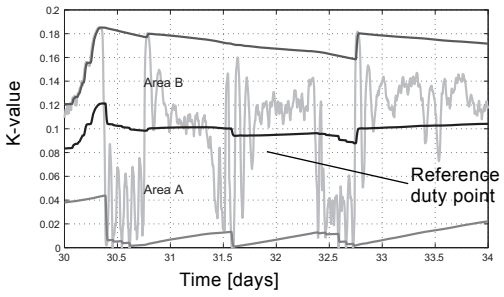
Fig. 27 Proportional pressure control

System analyser

From the preset reference duty point, the circulator will immediately start to analyse the heating pattern.

The system resistance (K_{sys}) is logged and based on this data, a more optimal curve for operation is selected.

Note: K_{sys} = m^3/h to create a system pressure loss of 1 bar.

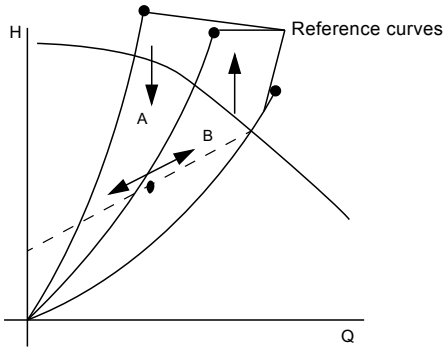


TM06 0845 1014

Fig. 28 K_{sys}-values logged for the system analyser

If the actual duty point deviates from the reference duty point over time, the circulator will automatically adjust its performance accordingly. If a tendency of operation in area A is shown, the performance of the circulators is too high. The circulator will then select a lower proportional curve. In other words, if the requirement of the heating system exceeds the reference duty point, the circulator will choose a higher proportional pressure curve. Should the requirement be lower, a lower curve will be chosen.

Curve selector



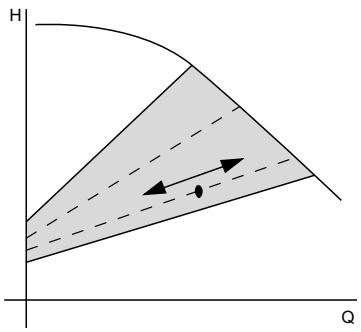
TM06 0849 1014

Fig. 29 Duty point on selected proportional pressure curve

Note: The arrows symbolise the change of the proportional pressure curve.

New reference setting

When changing the proportional pressure curve setting to adapt to the requirements of the heating system, AUTO$_{ADAPT}$ automatically sets a new reference duty point. From the new setting, the process starts over again: AUTO$_{ADAPT}$ will continuously adapt to changes in the heating pattern.



TM06 0850 1014

Fig. 30 New lower proportional pressure curve

Selection of control mode

The selection of the control mode depends on the system type and the allocation of pressure losses defined by the valve or consumer authority.

System type			Recommended control mode
Heating system with PWM control of the circulator.			PWM Profile A 
Solar system with PWM control of the circulator.			PWM profile C 
System without PWM control of the circulator (stand-alone).			Internally controlled
Variable-flow system with relatively high pressure losses inside heating appliance and pipework (> 50 % of pump head).	Two-pipe systems with thermostatic radiator valve with low valve authority.	H_N > 2 m for noise reduction.	Proportional pressure / $AUTO_{ADAPT}$ proportional pressure 
		Long distribution pipes.	
		High pressure losses in system parts with total flow.	
		Heat consumers with low pressure losses.	
	Primary circulator.	Primary circuit with high pressure losses.	
Variable-flow system with relatively low pressure losses inside heating appliance and pipework (< 50 % of pump head).	Two-pipe systems with thermostatic radiator valve with high valve authority.	$H_N \leq$ 2 m for noise reduction.	Constant pressure / $AUTO_{ADAPT}$ constant pressure 
		Former gravity systems.	
		Low pressure losses in system parts with total flow.	
		Heat consumers with high pressure losses.	
	Floor heating system with variable flow.	System with thermostatic zone valves.	
	One-pipe system with variable flow.	System with thermostatic radiator valves.	
	Primary circulator.	Primary circuit with low pressure losses.	
	Systems with low flow variation.	Systems with minimum flow ensured by an automatic bypass valve.	
Constant flow systems			Constant curve 

6. Technical description

Exploded view and sectional view

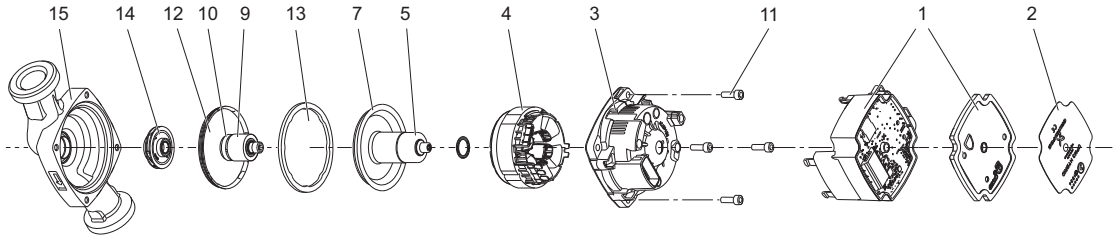


Fig. 31 UPM3 exploded view

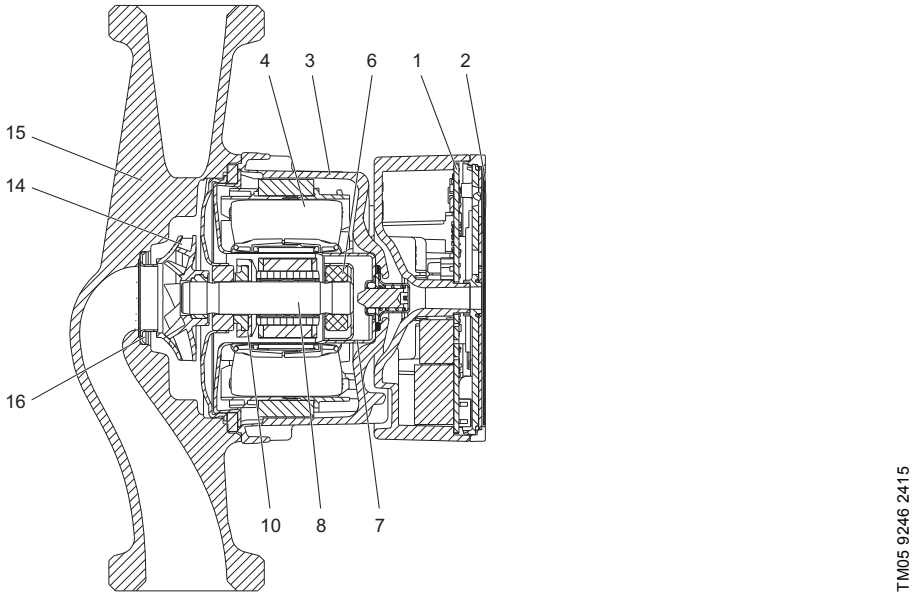


Fig. 32 UPM3 sectional view

Material specification

Pos.	Component	Material	EN/DIN
1	Control box	Composite PC-GF10 FR	
	Control electronics	PCB with SMD components	
	Control box heat sink	Aluminium	
2	Front foil	LEXAN 8A13F	
3	Stator housing	Aluminium, silumin	
4	Stator	Copper wire	
	Stator lamination	Laminated iron	
5	Push deblocking device		
	Plunger	Stainless steel	1.4404
	Spring	Stainless steel	1.4310
	Housing for spring	Stainless steel	1.4401
	Guide disc	Stainless steel	1.4401
	Housing for sealing	Stainless steel	1.4401
	Sealing	EPDM	
6	Radial bearing	Ceramics	
7	Rotor can	Stainless steel	1.4401
8	Shaft	Ceramics	

Pos.	Component	Material	EN/DIN
9	Rotor	NdFeB	
	Rotor tube	Stainless steel	1.4521
	Rotor cladding	Stainless steel	1.4401/ 1.4301
	Bush	Stainless steel	1.4301
10	Thrust bearing	Carbon	
	Thrust bearing retainer	EPDM	
11	Screws	Steel, eco-lubric coated	
12	Bearing plate	Stainless steel	1.4301
13	Gasket	EPDM	
14	Impeller	Composite/PES 30 % GF	
15	Pump housing	Cast iron GG15	EN-GJL-150
		Stainless steel	1.4308
		Composite PA 6.6 30 %GF	
		Composite PPS 40 %GF	
16	Neck ring	Stainless steel	1.4301

Description of components

The Grundfos UMP3 circulators are of the canned-rotor type as circulator and motor form an integral unit without shaft seal and with only one gasket 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 description

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.

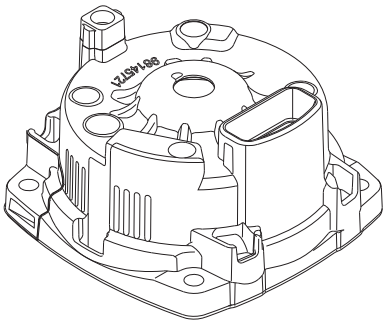
The ECM/PM motor is designed according to the canned-rotor principle. The design of the mechanical motor components has mainly focused on these features:

- 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 efficient 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 circulator 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. There are two versions: one without drain hole as IP44, and one with one drain hole in two possible positions as IPX4D. During operation, the drain hole must always point downwards. UPM3 is IP44 as standard for non-condensing applications and IPX4D in UPM3 Solar. As K-variant for condensing applications, the stator housing IPX4D version is CED electrocoated.

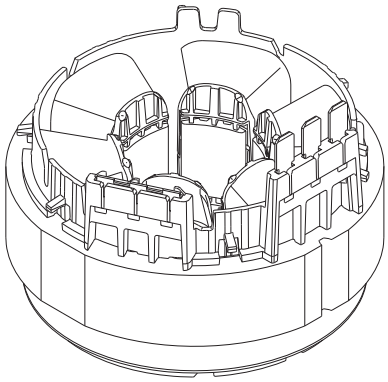


TM05 9258 3613

Fig. 33 Stator housing

Stator and windings

The UPM3 have a three-phase stator with six concentric positioned in-slot windings.

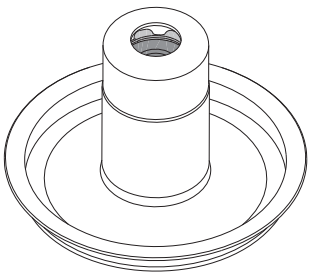


TM05 9260 3613

Fig. 34 Stator

Rotor can

The rotor can is drawn out of one sheet of stainless-steel. It contains the grinded and honed upper radial bearing. On top the rotor can has a hole on which the deblocking device is welded.



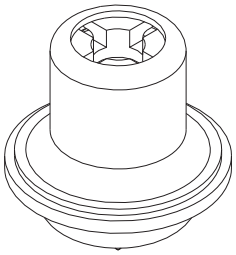
TM05 9247 3613

Fig. 35 Rotor can with bearing holder and ceramic bearing

Deblocking device

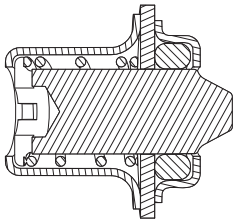
The deblocking device consists of an axial moving plunger tightened by an O-ring and pulled back by a spring inside a stainless steel housing that is welded to the rotor can. The deblocking device is designed for circulators integrated in appliances to give access to the shaft from the front of the circulator without demounting the control box.

By pushing and turning a screw driver, Phillips No. 2, the plunger pushes the shaft in axial direction into the circulator, while it can be turned as well. The force is high enough to deblock circulators which are seized by lime e.g. if an appliance is stored for months after being wet tested. Before, during and after the deblocking, the device is tight and must not release any water.



TM05 9253 3613

Fig. 36 Deblocking device



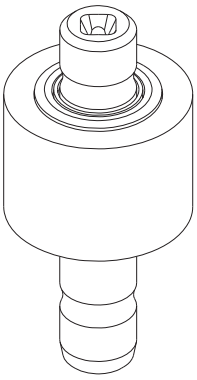
TM06 02915013

Fig. 37 Sectional drawing of deblocking device

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 through-going 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 will escape the system through the through-going hole of the shaft.

The rotor core is made of bonded neodymium permanent magnets. The rotor is encapsulated in a thin stainless-steel cladding welded to the end covers. The rotor is fixed on the shaft by a back iron with a bush. After assembly the whole unit is balanced.



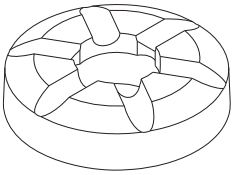
TM03 9250 3613

Fig. 38 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 rotor and rotor can.

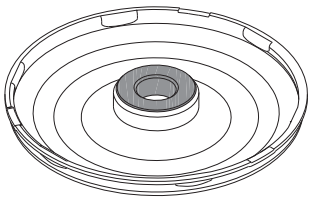


TM05 9252 3613

Fig. 39 Thrust bearing

Bearing plate

The bearing plate is made of stainless steel. The grinded 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 circulator. Due to the relatively large bearing plate surface, the motor heat is effectively carried away by the pumped liquid. Five tiny laser holes through the bearing plate ensure optimum venting and minimise the gradual replacement of rotor liquid with the pumped liquid. The bearing plate is made of stainless steel. The ground and honed inner radial bearing is pressed into the bearing plate. Due to the relatively large bearing plate surface, the motor heat is effectively carried away by the pumped liquid. The four holes of the bearing plate ensure optimum venting and minimise the gradual replacement of rotor liquid with the pumped liquid.

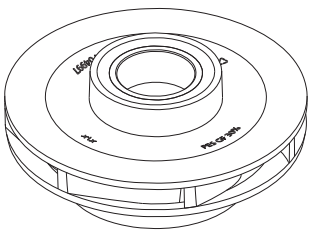


TM05 9249 3613

Fig. 40 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.

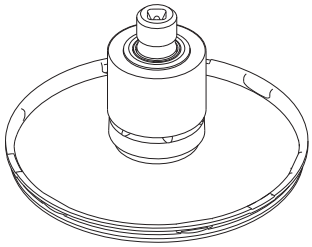


TM05 9251 3613

Fig. 41 Impeller

Running unit

The unit is a pre-mounted combination of shaft with rotor, thrust bearing with retainer, bearing plate and impeller. The running unit is inserted into the rotor can with the upper radial bearing. The unit runs as a bearing system, ceramic/ceramic, with almost no wear as long as it is lubricated. During production the unit is lubricated with glycerine. When the unit is mounted in a water-filled system, the system water lubricates the bearings. This guarantees the extremely reliable Grundfos ceramic bearing system of wet-running circulators.

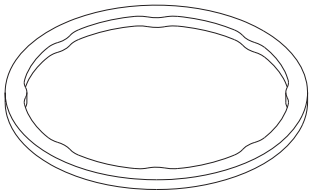


TM05 9256 3613

Fig. 42 Running unit

Gasket

The gasket is a formed flat O-ring made of EPDM, which is applicable for drinking water as well. The gasket seals up stator housing, pump housing, rotor can and bearing plate.



TM05 9257 3613

Fig. 43 Gasket

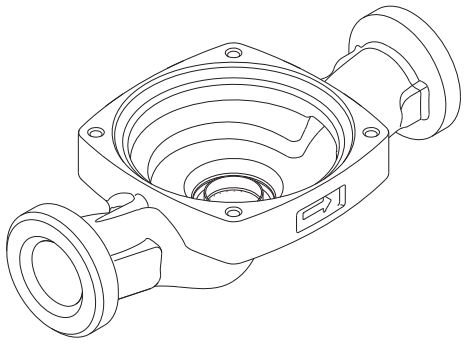
TM06 0846 1014

Fig. 44 Sectional drawing showing sealing principle of gasket

Pump housing

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

A wide range of OEM specific pump housings is available.



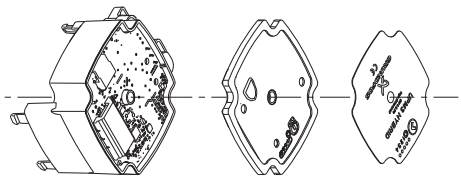
TM05 9254 3613

Fig. 45 Pump housing

Control box

The UPM3 control box housing is made of two composite parts welded together with an aluminium heat sink on top and covered by a front foil which cannot be removed. Power and signal connectors are integrated. There are two versions available with signal connection designed for Grundfos UPER/UPM 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 user interface and communication signal as PWM.



TM06 0826 1014

Fig. 46 Control box

UPM3 OEM specific housings

UPM3 circulator pumps are available with a wide range of integrated standard housings or customised pump housings with different dimensions, in different materials, designs and with additional functionalities. Composite housings are mostly injection-moulded at the Grundfos factory using the tools designed and manufactured by Grundfos. The advantage of composite housings is the flexibility in forming complex housings and other hydraulic parts with low weight and production costs. Composite housings are limited to high-volume parts due to their high investment costs.

Cast-iron electrocoated (CED) inline housings with threads

TM06 4423 2215

CED 15 x 130 mm

TM06 4424 2215

CED 25 x 130 mm

TM06 4425 2215

CED 25 x 180 mm

TM06 4426 2215

CED 32 x 180 mm

Stainless-steel (N) inline housings with threads - approved for drinking water

TM06 4427 2215

NIRO 25 x 130 mm

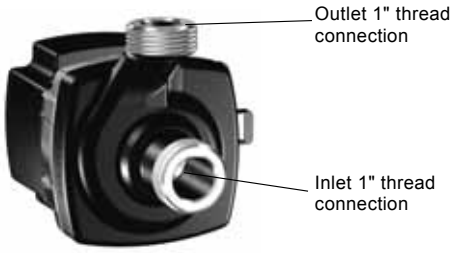
TM06 4428 2215

NIRO 25 x 180 mm

TM06 4429 2215

NIRO 32x 180 mm

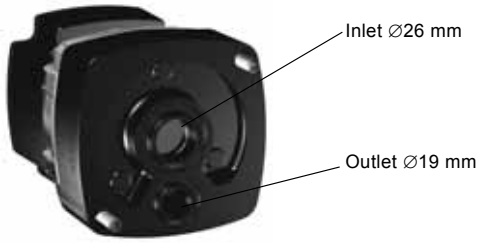
Cast-iron electrocoated (CED) OEM housings - end-suction with threads



TM06 4430 2215

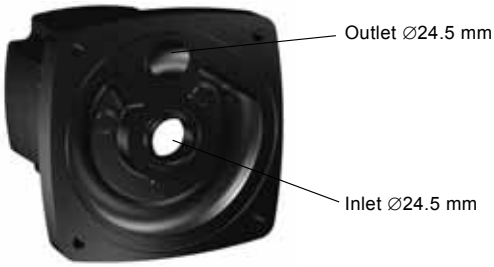
GGES cast-iron, end-suction

Cast-iron electrocoated (CED) OEM housings - end-suction for back-panel mounting



TM06 4431 2215

GGMBP3 cast-iron, mini back-panel

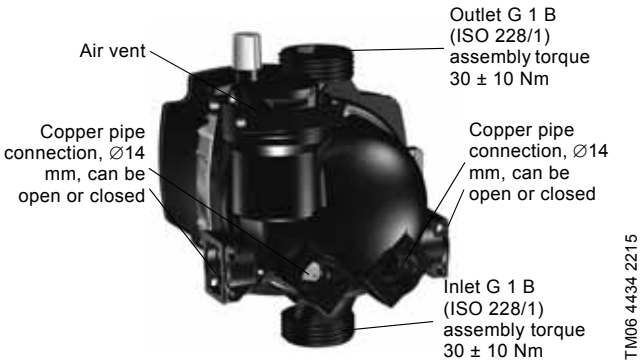


TM06 4432 2215

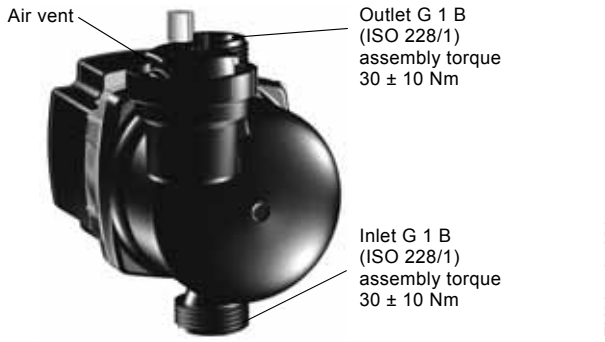
GGBP3 cast-iron, mini back-panel

Composite inline housings with threads, integrated air vent and additional connections

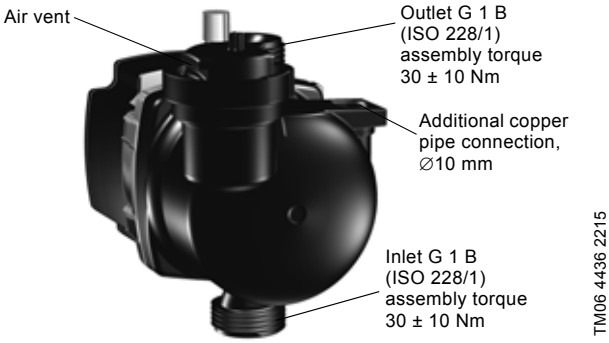
CIL3 composite, inline, 1" x 130 mm



CACAO composite, alternate connection, air outlet

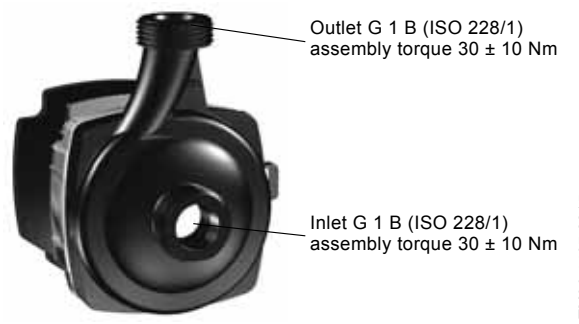


CIAO2 composite, inline, air outlet

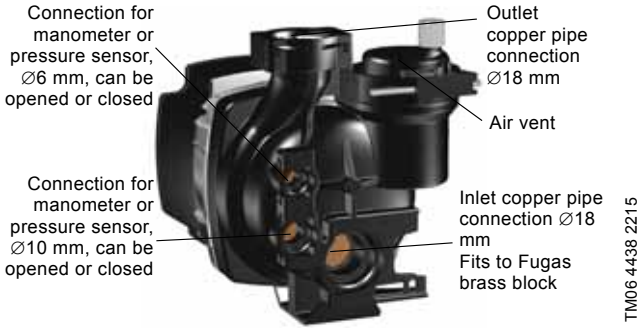


CIAO2 AC composite, inline, air outlet, alternate connection

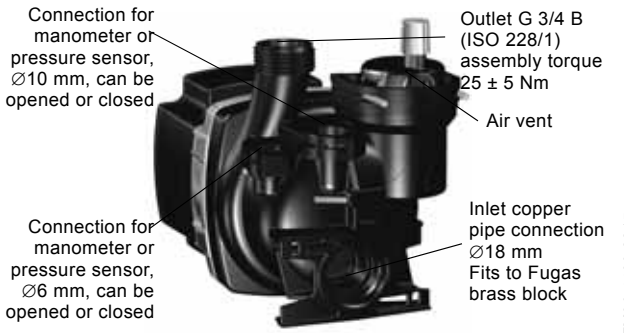
Composite end suction housings with threads or clips, with integrated air vent and special connections



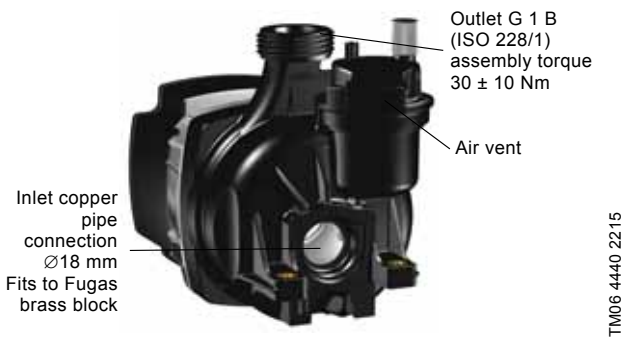
CES3 composite, end-suction



CESAO1 composite, end-suction, air outlet

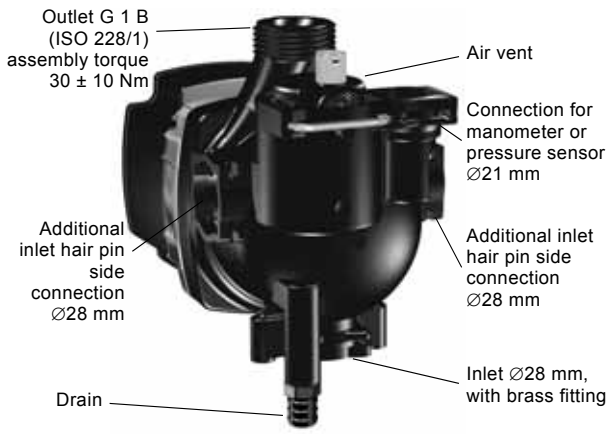


CESAO2 composite end-suction air outlet

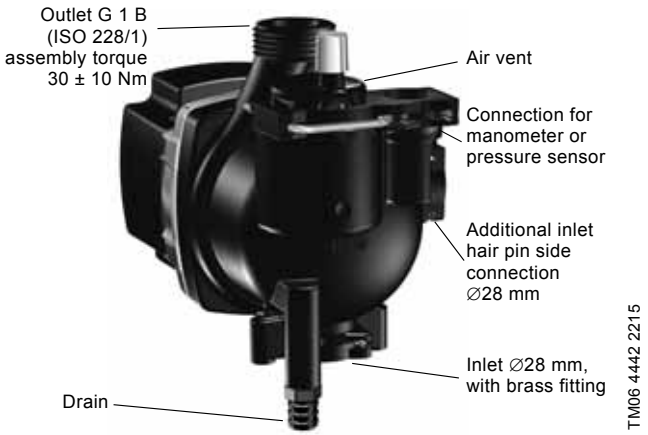


CESAO4 composite end-suction air outlet

Composite inline housings with threads or clips, with integrated air vent, drain and special connections



AOKR composite, air outlet, alternate connection, drain



CAOD composite, air outlet, drain

Material	Type	GG cast iron CED	N stainless steel	C composite PPS	C composite PA6.6	Housing weight [kg]	PN [bar]	Max. Temperature [°C]	Drinking water approvals	IL inline	ES end suction	BP back panel	DN	Fitting length	Inlet	Outlet	AC alt. connection C1	AC alt. connection C2	AC alt. connection C3	AC alt. connection C4	AO air vent integrated	D drain valve
Cast iron CED PN 10	15 x 130 mm	●	-	-	-	0.7	10	130	-	●	-	-	15	130	G 1	G 1	-	-	-	-	-	-
	25 x 130 mm	●	-	-	-	0.9	10	130	-	●	-	-	25	130	G 1 1/2	G 1 1/2	-	-	-	-	-	-
	25 x 180 mm	●	-	-	-	1.0	10	130	-	●	-	-	25	180	G 1 1/2	G 1 1/2	-	-	-	-	-	-
	32 x 180 mm	●	-	-	-	1.2	10	130	-	●	-	-	32	180	G 2	G 2	-	-	-	-	-	-
Cast iron CED PN 10 for SOLAR	S 15 x 130 mm	●	-	-	-	0.8	10	130	-	●	-	-	15	130	G 1	G 1	-	-	-	-	-	-
	S 25 x 130 mm	●	-	-	-	0.9	10	130	-	●	-	-	25	130	G 1 1/2	G 1 1/2	-	-	-	-	-	-
	S 25 x 180 mm	●	-	-	-	1.1	10	130	-	●	-	-	25	180	G 1 1/2	G 1 1/2	-	-	-	-	-	-
Stainless steel PN 10	N 25 x 130 mm	-	●	-	-	1.0	10	130	●	●	-	-	25	130	G 1 1/2	G 1 1/2	-	-	-	-	-	-
	N 25 x 180 mm	-	●	-	-	1.2	10	130	●	●	-	-	25	180	G 1 1/2	G 1 1/2	-	-	-	-	-	-
	N 32 x 180 mm	-	●	-	-	1.4	10	130	●	●	-	-	32	180	G 2	G 2	-	-	-	-	-	-
Cast iron CED PN 10 (ready 8/2015)	GGES3	●	-	-	-	1.1	10	130	-	-	●	-	15	65	G 1	G 1	-	-	-	-	-	-
	GGMBP3	●	-	-	-	1.2	10	130	-	-	-	●	15	90	26.0	19.0	-	-	-	-	-	-
	GGBP3	●	-	-	-	1.7	10	130	-	-	-	●	15	117	24.5	24.5	-	-	-	-	-	-
PPS PN 10	CIL3 PPS	-	-	●	-	0.2	10	95	●	●	-	-	15	130	G 1	G 1	-	-	-	-	-	-
Composite PA 6.6 PN3 (customised versions not included, available on request)	CIL3 PA 6.6	-	-	-	●	0.2	3	95	-	●	-	-	15	130	G 1	G 1	-	-	-	-	-	-
	CES3	-	-	-	●	0.1	3	95	-	-	●	-	15	87	G 1	G 1	-	-	-	-	-	-
	CIAO2	-	-	-	●	0.2	3	95	-	●	-	-	15	130	G 1	G 1	-	-	-	-	●	-
	CIAO2 AC	-	-	-	●	0.2	3	95	-	●	-	-	15	130	G 1	G 1	10	-	-	-	●	-
	CACAO	-	-	-	●	0.2	3	95	-	●	-	-	15	130	G 1	G 1	14	14	10	10	●	-
	CESAO1	-	-	-	●	0.2	3	95	-	-	●	-	15	94	18	18	6	10	-	-	●	-
	CESAO2	-	-	-	●	0.2	3	95	-	-	●	-	15	94	G 3/4	18	6	10	-	-	●	-
	CESAO4	-	-	-	●	0.3	3	95	-	-	●	-	15	87	G 1	18	-	-	-	-	●	-
	AOKR	-	-	-	●	0.3	3	95	-	●	-	-	15	128	G 1	28	28	28	21	-	●	●
	CAOD	-	-	-	●	0.3	3	95	-	●	-	-	15	128	G 1	28	28	21	-	-	●	●

Note:

Composite PA 6.6 pumps swith threaded flat sealings

Since 1989, Grundfos has been manufacturing and selling pump housings and integrated hydraulic units of polymeric composite, primarily PA6.6 with 30 % glass-fibre reinforcement. When using composite, the optimal design of connections is clip or hair-pin, because of their low internal stress-generating level.

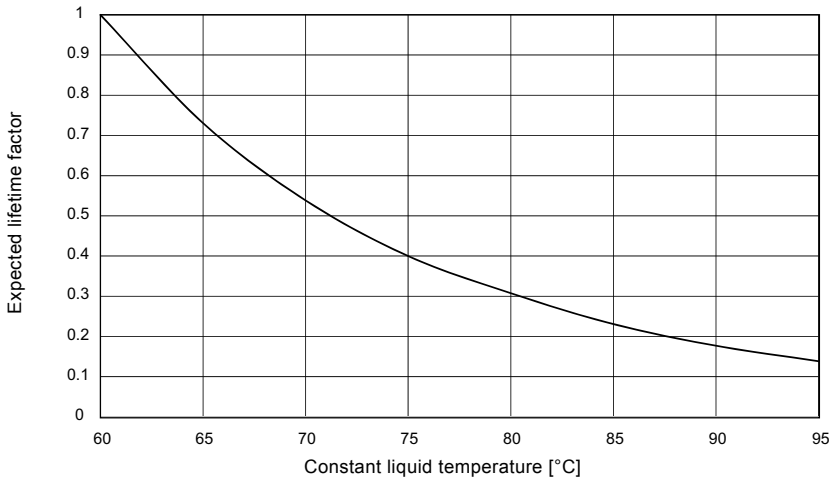
For threaded connections, the full thread length must be used. The maximum assembly torque (e.g. 30 Nm ± 10) is mentioned in the specifications of the pump. We recommend to use EPDM gaskets (see page 89):

For reason of overload risk, Grundfos does not recommend to use composite threads for standalone connections outside appliances.

All PA6.6 housings are defined as integrated. For integrated pumps, the respective pump heads are tested according to EN 16297/3 on a reference housing.

Expected lifetime of composite PA 6.6 housings

The expected lifetime of composite PA 6.6 housings in heating applications depends on the liquid temperature and the system pressure. The liquid temperature should not exceed 95 °C, the system pressure should not exceed 3 bar (0.3 MPa). The expected lifetime also depends on the time/temperature profile of the application, based on which an equivalent constant liquid temperature can be calculated. The influence of the liquid temperature between 60 °C and 95 °C on the expected lifetime is shown in the following diagram.



TM06 4413 2215

Fig. 47 Diagram temperature/expected lifetime for PA 6.6 30 % GF

Combination of housings and UPM3 control variants

UPM3 standard range		UPM3					FLEX AC			FLEX AS			SOLAR			DHW			AUTO L		AUTO		HYBRID	
UPM3 K version		UPM3K					FLEX AC			FLEX AS			SOLAR			DHW			AUTO L		AUTO		HYBRID	
Type	xx-	75	70	60	50	40	75	70	50	75	70	50	145	105	75	70	50	20	70	50	70	50	70	50
Max. H nom [m]		7.5	7	6	5	4	7.5	7	5	7.5	7	5	14.5	10.5	7.5	7	5	2	7	5	7	5	7	5
Max. P1 nom [W]		60	52	39	33	25	60	52	33	60	52	33	60	52	45	52	33	11	52	33	52	33	52	33
Cast iron CED PN 10	15 x 130 mm	●	●	●	●	●	●	●	●	●	●	●	/	/	●	/	/	/	●	●	●	●	●	●
	25 x 130 mm	●	●	●	●	●	●	●	●	●	●	●	/	/	●	/	/	/	●	●	●	●	●	●
	25 x 180 mm	●	●	●	●	●	●	●	●	●	●	●	/	/	●	/	/	/	●	●	●	●	●	●
	32 x 180 mm	●	●	●	●	●	●	●	●	●	●	●	/	/	●	/	/	/	●	●	●	●	●	●
Cast iron CED PN 10	S15 x 130mm	/	/	/	/	/	/	/	/	/	/	/	●	●	/	/	/	/	/	/	/	/	/	/
	S25 x 130 mm	/	/	/	/	/	/	/	/	/	/	/	●	●	/	/	/	/	/	/	/	/	/	/
	S25 x 180 mm	/	/	/	/	/	/	/	/	/	/	/	●	●	/	/	/	/	/	/	/	/	/	/
Stainless steel PN 10	N25 x 130 mm	●	●	●	●	●	●	●	●	●	●	●	/	/	●	●	●	●	●	●	●	●	●	●
	N25 x 180 mm	●	●	●	●	●	●	●	●	●	●	●	/	/	●	●	●	●	●	●	●	●	●	●
	N32 x 180 mm	●	●	●	●	●	●	●	●	●	●	●	/	/	●	●	●	●	●	●	●	●	●	●
PPS PN 10	CIL3 PPS	●	●	●	●	●	●	●	●	●	●	●	/	/	●	●	●	●	-	-	-	-	-	-
Cast iron CED PN 10 (ready 8/15)	GGES3	●	●	●	●	●	●	●	●	●	●	●	/	/	❍	/	/	/	●	●	●	●	●	●
	GGMBP3	●	●	●	●	●	●	●	●	●	●	●	/	/	❍	/	/	/	●	●	●	●	●	●
	GGBP3	●	●	●	●	●	●	●	●	●	●	●	/	/	❍	/	/	/	-	-	-	-	-	-
Composite PA 6.6 PN3 (customised versions available on request)	CIL3 PA 6.6	●	●	●	●	●	●	●	●	●	●	●	/	/	❍	/	/	/	-	-	-	-	-	-
	CES3	●	●	●	●	●	●	●	●	●	●	●	/	/	❍	/	/	/	-	-	-	-	-	-
	CIAO2	●	●	●	●	●	●	●	●	●	●	●	/	/	❍	/	/	/	-	-	-	-	-	-
	CIAO2 AC	●	●	●	●	●	●	●	●	●	●	●	/	/	❍	/	/	/	-	-	-	-	-	-
	CACAO	●	●	●	●	●	●	●	●	●	●	●	/	/	❍	/	/	/	-	-	-	-	-	-
	CESAO1	●	●	●	●	●	●	●	●	●	●	●	/	/	❍	/	/	/	-	-	-	-	-	-
	CESAO2	●	●	●	●	●	●	●	●	●	●	●	/	/	❍	/	/	/	-	-	-	-	-	-
	CESAO4	●	●	●	●	●	●	●	●	●	●	●	/	/	❍	/	/	/	-	-	-	-	-	-
	AOKR	●	●	●	●	●	●	●	●	●	●	●	/	/	❍	/	/	/	-	-	-	-	-	-
	CAOD	●	●	●	●	●	●	●	●	●	●	●	/	/	❍	/	/	/	-	-	-	-	-	-

● Possible

❍ Possible for max. 95 °C

- not ready yet

/ not possible

7. Installation

Pumped liquids

- Thin, clean, non-aggressive and non-explosive liquids, not containing solid particles, fibres or mineral oil.
- In heating systems, the water should meet the requirements of accepted standards on water quality in heating systems, for example the German standard VDI 2035.
- Mixtures of water with antifreeze media such as glycol with a kinematic viscosity lower than 10 mm^2/s (10 cSt).
- Solar media as used in typical solar thermal systems containing up to 50 Vol % of antifreeze media.
- For drinking water systems, approved housings must be used, such as CIL3 PPS or stainless steel N. These pumps and their components in contact with water are approved by WRAS (GB), ACS (FR), KTW (DE) and DIN DVGW W270 (DE).
- In domestic hot-water systems the pump should 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 medium temperature should not exceed 65 °C.

Note: The circulator pump must not be used for circulation of flammable liquids such as diesel oil and petrol.

Caution: Risk of malfunctions or pump damages when adding inhibitors to the media.

Mechanical installation

Mounting dimensions can be found in the data sheets.

Arrows on the pump housing indicate the liquid flow direction through the circulator. The circulator is designed to be installed with horizontal shaft pumping upwards, downwards or horizontally.

Note: The circulator must always be installed with horizontal motor shaft within ± 5 °.

The circulator should be installed in the system in such a way that no major amount of air flowing through the circulator or gathering in the pump housing will affect the circulator when it is out of operation. If, in addition, a non-return valve is installed in the flow pipe, there is a high risk of dry running as the air cannot pass the valve.

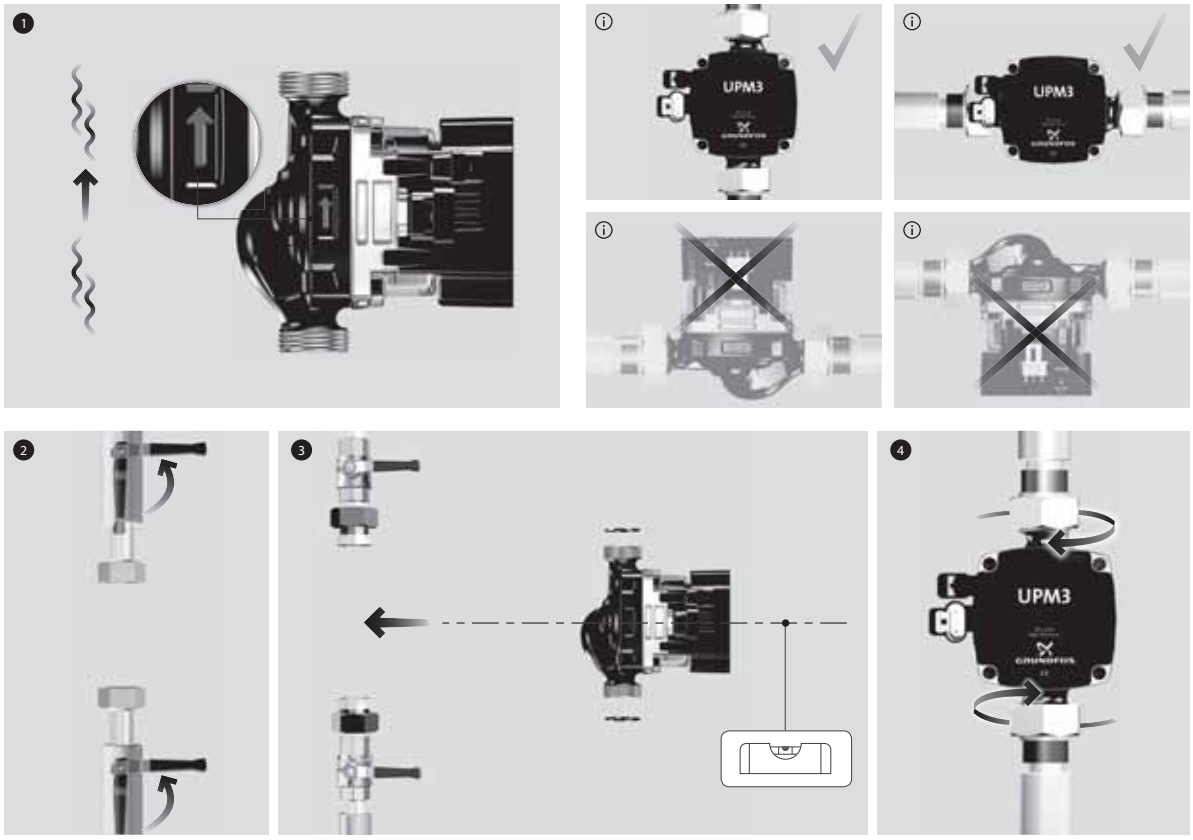


Fig. 48 Mechanical installation

Control box positions

The terminal box has been designed to avoid the necessity of turning the terminal box, which gives access to the terminals from the front. If necessary, you can turn the pump head with terminal box in steps of 90 degrees to all four options. Please notice that you turn the user interface of the UPM3 HYBRID as well. As standard the user interface is on top (12 h), if the terminals are in position 9 h. You can choose to have the orientation of the front foil in four different positions. In this way, the nameplate is always in horizontal position when the circulator is mounted.

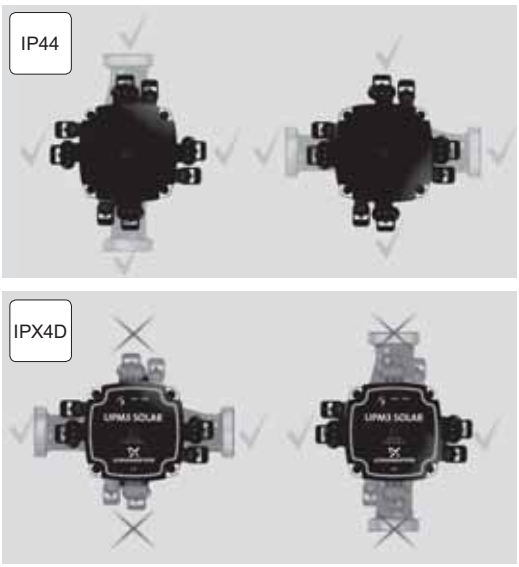


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Fig. 49 Control box positions

Changing the control box position

To change the control box position, do as follows:

1. Remove the screws holding the pump head.
2. Turn the control box to the desired position.
3. Replace the screws and tighten securely. The nameplate position cannot be changed.

Note: Before any dismantling of the circulator, the system must be drained, or the isolating valves on either side of the circulator must be closed.

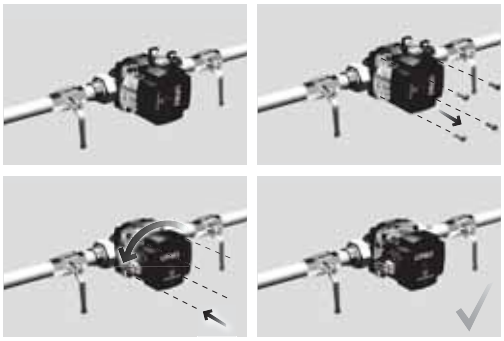

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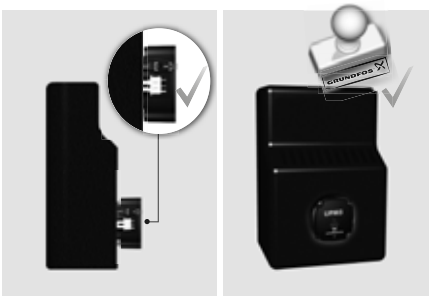
Fig. 50 Changing the control box position

Insulation

When insulating the circulator, the front plate of the control box must not be covered in order to allow cooling by the surrounding air.

If the circulator is installed inside a cabinet, a boiler or a heating kit encapsulated with insulation shells, the inside air temperature has to be evaluated and must not be higher than 70 °C during operation.



TM06 4411 2215

Fig. 51 Insulation of a circulator

Ambient temperature

The ambient temperature must not exceed 70 °C (measured in a distance of not more than 5 cm in front of the front foil at its lower edge).

Note: The dew point of the air at ambient temperature should always be lower than the liquid temperature, otherwise condensation may form in the stator housing.

Relative air humidity

IP44: The relative air humidity must not exceed 95 % in a non-condensing environment.

K-Version/IPX4D: Condensation is acceptable.

Storage temperature

-40 to +75 °C.

Liquid temperature

UPM3 with cast iron or stainless steel housing:

- max. 110 °C at 70 °C ambient temperature
- max. 130 °C at 60 °C ambient temperature

UPM3 with composite housing (PA 6.6):

- max. 95 °C

Note: For further lifetime evaluation, the temperature profile must be defined.

Inlet pressure

To avoid cavitation noise and damage to the pump bearings, the following minimum pressures are required at the pump suction 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

Electrical installation

The electrical connection and protection must be carried out in accordance with local regulations.

- The circulator requires no external motor protection.
- Check that the supply voltage and frequency correspond to the values stated on the nameplate.
- The circulator must not be used with an external speed control which varies the supply voltage.
- If an earth leakage circuit breaker is used, check which type it is.
- If an external relay is used, check if it can stand the inrush current.

Supply voltage

1 x 230 V + 10 %/- 15 %, 50 Hz.

The UPM3 circulators are externally controlled via PWM signal or internally speed-controlled by a frequency converter. Therefore, the circulators must not be used with an external speed control which varies the supply voltage for example phase-cut or pulse-cascade control.

Reduced supply voltage

The pump operation is ensured above 160 VAC with reduced performance.

UPM3 with PWM control: If the voltage falls below the specified voltage range, a low voltage warning is sent via PWM return signal.

UPM3 in internal control mode: If the voltage falls below the specified voltage range, a low voltage warning is shown. If it falls below the minimum voltage, the circulator stops and shows alarm.

Earth leakage circuit breaker (ELCB)

If the circulator is connected to an electric installation that uses an earth leakage circuit breaker (ELCB) as additional protection, this circuit breaker must trip when earth fault currents with DC content (pulsating DC) occur.

The earth leakage circuit breaker must be marked with the first (type A) or both (type B) of the symbols shown below:

Fig. 52 Symbol on earth leakage circuit breaker

Leakage current

The pump mains filter will cause a discharge current to earth during operation.

Leakage current: < 3.5 mA.

High-voltage test

The circulator incorporates filter components that are connected to protective earth. Therefore, a standard high-voltage test **cannot** be made without damaging the filters.

Inrush current

All electronic circulators contain electronic units that must be protected by filters including capacitors and ECM circulators frequency converters with AC/DC rectifiers containing capacitors to equalize the waves. This is not the case in most asynchronous circulators.

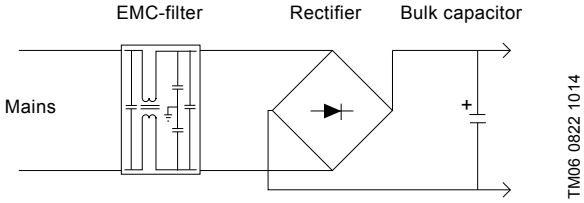


Fig. 53 Rectification of VAC voltage to DC voltage

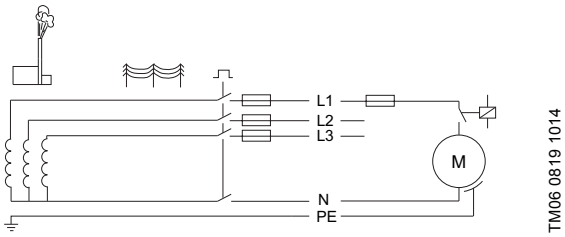
The load of electronically commutated motors (ECM) behaves as a capacitive load and not as a motor load like in a standard circulator.

At start, the capacitor is unloaded. Hereby the amplitude of the current peak depends on the grid impedance, until the capacitor is charged. The faster the capacitor is charged, the higher amplitude, and the faster the circulator can be started. After this period of time, the current will drop to the rated current.

Definition: Inrush current is the current peak charging the capacitors in the electronics when the supply voltage is connected.

Note: When discussing measurements, it is important to refer to the same method. Since 2007, Grundfos uses the IEC 61000-3-3 Annex B method for measuring inrush current.

The inrush current peak charges the bulk capacitor to 325 VDC as fast as the power grid allows. That shows that inrush current is not only depending on the integrated electronics but as well on the impedance of the grid.



If you use a relay to switch the power supply of the circulator, you risk excessive wear on the relay contact surface.

To avoid such problems there are different external and internal solutions.

External solutions in the controller of the appliance unit

- Specific relays with silver tin oxide ($AgSnO_2$) inrush relay contacts.
- Switching at ZERO crossing.
- Standby operation - circulator only switches via the PWM signal.

Internal solutions in the circulator

- NTC resistor in the power input circuit (passive)
- Bypass relay with PTC resistor, controlled by the electronics (active)

UPM3 circulators are available with different hardware:

NTC resistor (passive - option for UPM3)

We recommend that you use this option for circulators that are permanently connected to the grid and switched on/off by external PWM signal.

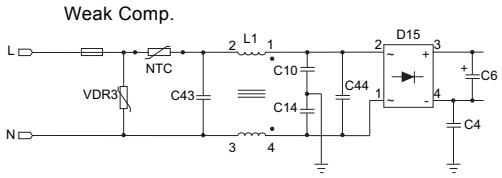


Fig. 54 NTC

At startup the operating temperature of the circulator including the NTC resistor is cold. In this situation the NTC resistor has a high resistance and is able to limit the inrush current down to ~ 10 A.

During operation the operating temperature of the circulator including NTC resistor is hot. There is no inrush current but the NTC resistance decreases so that the loss is limited.

Note: At restart, the operator must ensure that the NTC resistor has been cooled down so that an efficient operation is guaranteed. Normally, it takes 1 minute to cool down the resistor.

When the power supply to the circulator is switched on and off via an external relay, you must ensure that the contact material of the relay is able to handle higher inrush currents.

Relay and PTC (active - standard for UPM3 HYBRID variants)

We recommend that you use this option for circulators that are not in permanent operation and can be interrupted by a relay of the controller of the appliance.

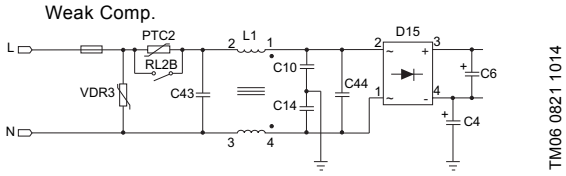


Fig. 55 Relay and PTC

At startup the relay is open. In this mode the PTC resistor is able to limit the inrush current down to a level of approximately 4 A.

During operation the relay is closed. In this mode the resistor is by-passed so that efficient operation is guaranteed.

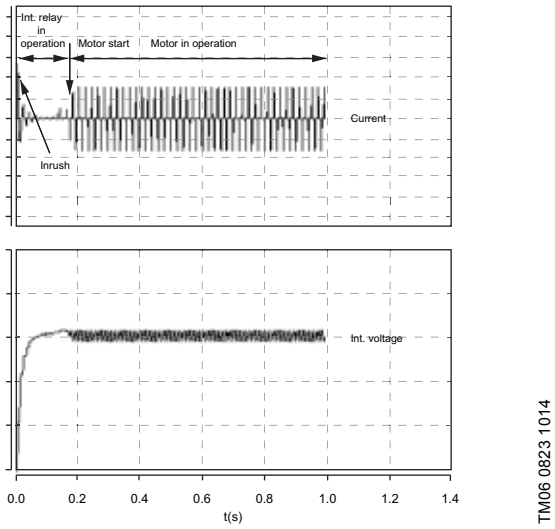


Fig. 56 Example: UPM3 with internal inrush relay

Note: The inrush current is measured on a flicker network according to IEC 61000-3-3:1994 + A1, + A2, Annex B.

Control box connections

All UPM3 control boxes have 2 electrical connections on one side: power supply and signal connection. If the signal connection is not needed (e.g. UPM3 AUTO (L)), it can be covered by a blind plug (available as accessory). This is not mandatory for safety reasons.

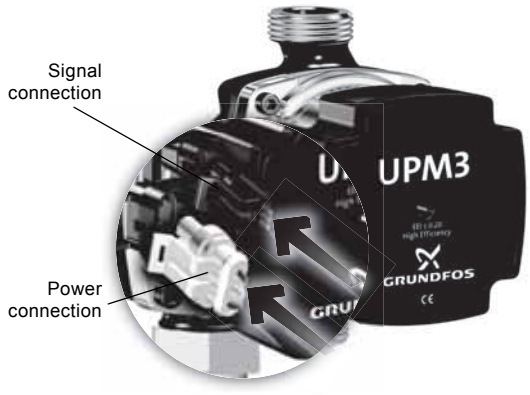


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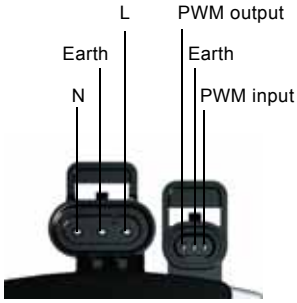
Fig. 57 Signal connection and power connection



TM06 4416 2215

Fig. 58 Connections

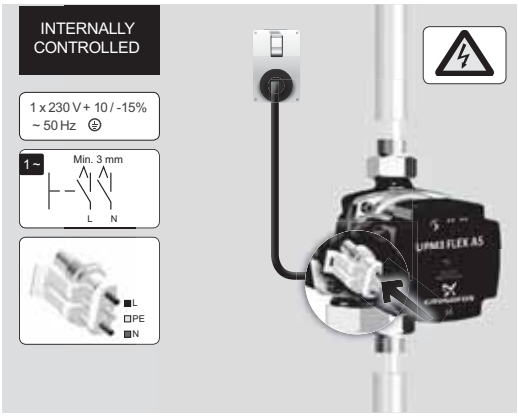


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Fig. 59 Control box with Mini SS connection

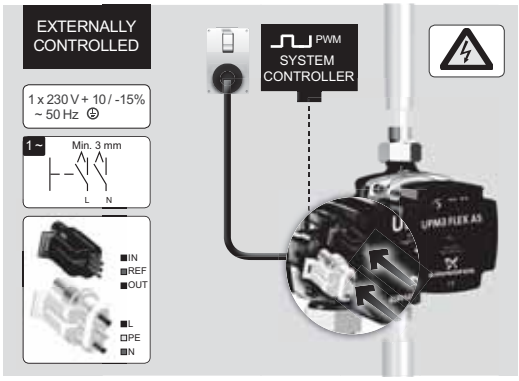

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Fig. 60 Control box with FCI connection

Power supply connection

The circulator pump must be connected to the power supply with the TE Superseal connector. Adapters are available for cables with Molex or Volex connectors.

TE Superseal power connector

TM06 4415 2215

Fig. 61 TE Superseal power connector

Reliability

- Temperature-proof and fireproof glow wire
- Waterproof

Safety

- Additional locking latch with pull-out force > 100 N
- Lock can only be opened with a screwdriver

Availability

- Worldwide as TE standard

Control signal connection

UPM3 circulators are externally speed-controlled. A signal cable is required to enable the pump control. Otherwise the circulator with profile A runs continuously at maximum speed, the circulator with profile C stops.

UPM3 HYBRID circulators are either internally or externally speed-controlled.

If you set the circulator to external control mode (PWM profile A or C) via the user interface, you need a signal cable. If you set the circulator to internal control mode, a blind plug is available to close the signal connection. The plug is not required for safety reasons.

The signal cable connection has three leads: signal input, signal output and signal ref. The cable must be connected to the control box either by FCI or TE Mini Superseal plug. The optional signal cable can be supplied with the circulator as an accessory.

The cable length can be customised to specific requirements (max. 3 m).

TE Mini Superseal

TM06 4414 2215

Fig. 62 TE Mini Superseal

Safety

- Additional locking latch with pull-out force > 100 N
- Lock can only be opened with a screwdriver

Availability

- Worldwide as TE standard

Grundfos FCI (for UPER/UPM)

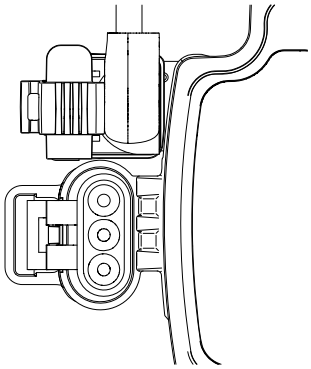

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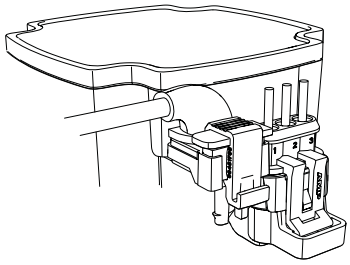
Fig. 63 Grundfos FCI for UPER/UPM

Backwards compatibility

- For replacement of UPER/UPM circulators or in appliances that use FCI plug, e.g. cable trees

Safety

- Two-part design: separate lock is needed to meet the pull-force requirements > 100 N



TM06 4418 2215

Fig. 64 FCI signal cable fixed by a separate lock

Availability

- Many cable suppliers use these cable connections.

Overview of technical data

Feature	Specification
CE mark Conformity with the following relevant EC Directives	EMC Directive (2004/108/EC) Standards used: EN 61000-6-2:2005, EN 61000-6-3:2007, EN 55014-1:2006/ A1:2009, EN 55014-2:1997/ A1:2001/ A2:2008
	Low Voltage Directive (2006/95/EC) Standards used: EN 60335-1:2012/ AC:2014 EN 60335-2-51:2003/ A1:2008/ A2:2012
	Standards used: EN 16297-1:2012, EN 16297-2:2012, EN 16297-3:2012 Ecodesign Directive (2009/125/EC) Commission Regulation (EC) No 641/2009 Commission Regulation (EU) No 622/2012
Ecodesign Energy Efficiency Index EEI	EEI ≤ 0.20, EN 16297/3 or EN 16297/2
REACh compliancy	REACh Directive 1907/2006 (see page 91)
WEEE compliancy	Grundfos sees circulators exempted in 4 (c) (large scale fixed installations…)
RoHS compliancy	RoHS Directive 2011/65/EU (see page 91)
VDE Approval	VDE certificate: No. 40039416 (see page 90) The VDE certificate proves the conformity with the essential safety requirements of the EC Low Voltage Directive (2006/95/EC) including amendments.
VDE code	GFNJB (Hybrid variants) and GFNJC (UPM3)
Enclosure class	IP44 (standard without drain holes). K-version: IPX4D (with drain holes)
TF class	TF110 at 70 °C ambient temperature
High voltage protection	EN 60335-1 1000 VAC
Drinking water approvals (ACS, WRAS, KTW, DVGW W270)	All pump head components are compliant. Specific compliant pump housings are available.
Feature	**Specification**
Deblocking software	Continuously restarting after 1.33 seconds with max. torque
Deblocking device	Manual deblocking device, access from front side
Dry run ability - first start	3 x 20 seconds (5 minutes interval), all circulators will be lubricated with glycerine
Dry run ability - during operation	Rotor can filled with water: fulfils EN 60335-2-51
Expected lifetime	> 100,000 h (with specified load profile)
Expected lifetime	> 500,000 on/off cycles
Minimum switching time power on/off	With NTC: 1 minute. With relay: No specific requirements.
Flow estimation	Available depending on the housing, accuracy: see PWM specification
Inrush current	With relay: < 4 A. With NTC: < 10 A.
Equipment class	I (EN 60335-1)
Insulation class	F (EN 60335-1)
Maximum leakage current	≤ 3.5 mA (EN 60335-1)
Speed range	563 to 5991 min^{-1} (depending on the variant)
Maximum ambient temperature	70 °C at 100 °C or 60 °C at 130 °C
Maximum media temperature	95 °C for composite housings, 110 °C/130 °C for cast iron housings
Maximum system pressure	1 MPa (10 bar) (depending on the housing material)
Minimum inlet pressure	0.05 MPa (0.5 bar) at 95 °C liquid temperature
Minimum media temperature	2 °C (IP44: above dew point of ambient air)
Minimum supply voltage	160 VAC (with reduced performance)
Motor protection	The motor is protected by the electronics in the control box and requires no external motor protection.
Nominal supply voltage	EU: 1 x 230 V + 10 %/- 15 %, 50 Hz
Reaction time - power on	< 3.3 seconds
Reaction time - standby	< 1.5 seconds
Reaction time - speed change	< 1 second
Relative air humidity	Maximum 95 %, non-condensing environment.
Storage temperature	-40 to +75 °C

8. Startup

Before you start the UPM3 circulator, do as follows:

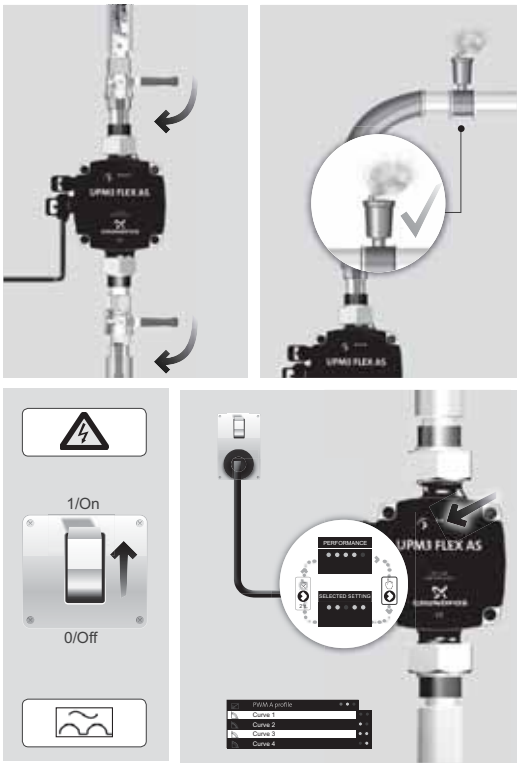
1. Mount the circulator in the right way (see *7. Installation*).
2. Check that the unions are tightened.
3. Check that the valves are opened.
4. Fill the system and vent it above the circulator
5. Check if the required minimum inlet pressure is available at the pump inlet.
6. Switch on the power supply.
7. If the circulator is externally controlled, check if the system controller sends a signal to the circulator which controls the speed or might even stop the circulator.
8. If the circulator is internally controlled, the circulator starts with factory pre-setting (e.g. proportional pressure curve 3). Change the setting if necessary (see *User interface* on page 18).

Caution: Do not start the pump until the system has been filled with liquid and vented.

UPM3 pumps are self-venting and must not be vented before startup. Air inside the pump is transported by the liquid into the system in the first minutes after pump startup.

Warning: This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge, if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.

Hint for OEM customers: This warning must be available in local language when placing the product on the market. It is part of the Quick Guides.



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9. Fault finding

Warning: Before starting any work at the pump, switch off the power supply. Make sure that the power supply cannot be switched on accidentally.

Be aware that capacitors will be live up to 30 seconds after the power supply has been switched off.

Fault	Cause	Remedy
1. Pump is not running. No power supply.	• System is switched off.	Check the system controller.
	• A fuse in the installation is blown.	Replace the fuse.
	• The circuit breaker has tripped.	Check the power connection and switch on the circuit breaker.
	• Power supply failure.	Check the power supply.
2. Pump is not running. Normal power supply.	• Controller is switched off.	Check the controller and its settings.
	• Pump is blocked by impurities.	Remove impurities. Deblock the pump from the front of the control box with a screwdriver.
	• Pump is defective.	Replace the pump.
3. Pump runs at maximum speed and cannot be controlled.	• No signal from signal cable.	Check if the cable is connected to the controller. If it is, replace the cable.
4. Noise in the system.	• Air in the system.	Vent the system.
	• Differential pressure is too high.	Reduce the pump performance at the pump or external controller.
5. Noise in the pump.	• Air in the pump.	Let the pump run. The pump vents itself over time.
	• Inlet pressure is too low.	Increase the system pressure or check the air volume in the expansion tank, if installed.
6. Insufficient flow.	• Pump performance is too low.	Check the external controller and the pump settings.
	• Hydraulic system is closed or system pressure is insufficient.	Check the non-return valve and filter. Increase the system pressure.
7. Pump LED5 is on. Pump tries to restart every 1.5 sec.	• Rotor shaft is blocked.	Deblock the rotor shaft by pushing it with a screwdriver from the front of the pump.
8. Pump LED4 is on. Pump is running.	• Supply voltage is too low.	Check the supply voltage.
9. Pump LED3 is on. Pump stops.	• Supply voltage is too low. • Serious failure.	• Check the supply voltage. • Exchange the pump.

10. Disposal

This product or parts of it must be disposed of in an environmentally sound way:

- Use the public or private waste collection service.
- If this is not possible, contact the nearest Grundfos company or service workshop.

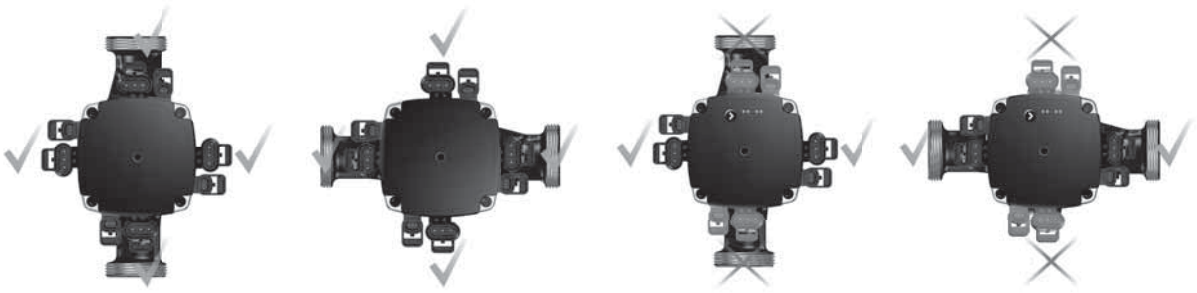
See also the product recycling section on the Grundfos website:

http://www.grundfos.com/products/product-sustainability/product-recycling.html

11. Control box positions

Different positions of the control box are available and must be defined as follows:

- IP44 versions without drain holes: All positions are allowed.
- IPX4D versions with drain holes (UPM3K, UPM3 SOLAR): The drain hole must point downwards after installation. Only connector positions to the side are possible.



IP 44 IP X4D

TM06 0855 1014

Name plate orientation after installation: horizontal				
Connector position	9 h	12 h	6 h	3 h
IP 44 (without drain holes)	Allowed	Allowed	Allowed	Allowed
IPX4D (with drain hole downwards)	Allowed	Not allowed	Allowed	Not allowed

12. Performance curves, technical data

Curve conditions

The guidelines below apply to the performance curves on the following pages:

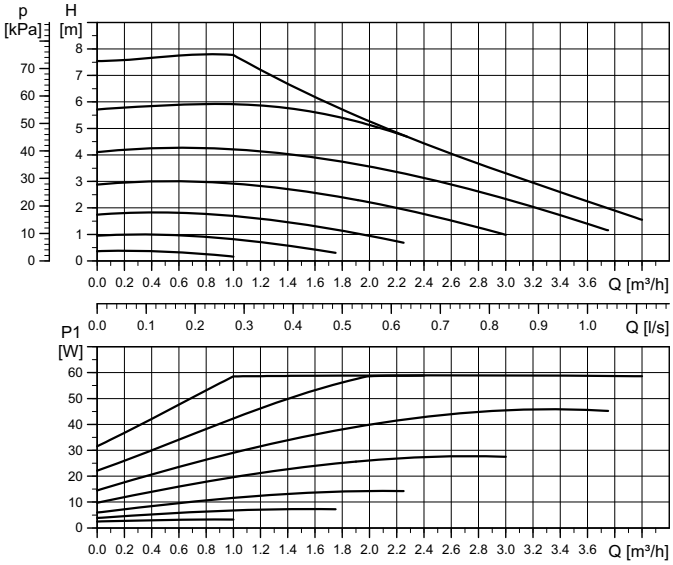
- Test liquid: airless water.
- The curves apply to a density of 983.2 kg/m^3 and a liquid temperature of +20 °C.
- All curves show average values and should not be used as guarantee curves. If a specific minimum performance is required, individual measurements must be made.
- The curves apply to a kinematic viscosity of 0.474 mm^2/s (0.474 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, e.g. hot water, the discharge pressure is proportional to the density.
- Curves obtained according to EN 16297.
- UPM3 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 (circulators 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 B (option) at approximately 1 m.

Measured pump head variants

Pump type	P_1 max. nom. [W]	Speed max. [min^{-1}]	Speed min.	EEI Part 3	$P_{L,Avg}$ [W]
UPM3(K) xx-75	60	5991	A (~0.1 m)	≤ 0.20	≤ 28
UPM3(K) xx-70	52	5766	A (~0.1 m)	≤ 0.20	≤ 23
UPM3(K) xx-60	39	5288	A (~0.1 m)	≤ 0.20	≤ 18
UPM3(K) xx-50	33	4838	A (~0.1 m)	≤ 0.20	≤ 16
UPM3(K) xx-40	25	4360	A (~0.1 m)	≤ 0.20	≤ 12
UPM3(K) FLEX AS xx-75	60	5991	A (~0.1 m)	≤ 0.20	≤ 28
UPM3(K) FLEX AS xx-70	52	5766	A (~0.1 m)	≤ 0.20	≤ 23
UPM3(K) FLEX AS xx-50	33	4838	A (~0.1 m)	≤ 0.20	≤ 16
UPM3(K) FLEX AC xx-75	60	5991	A (~0.1 m)	≤ 0.20	≤ 28
UPM3(K) FLEX AC xx-70	52	5766	A (~0.1 m)	≤ 0.20	≤ 23
UPM3(K) FLEX AC xx-50	33	4838	A (~0.1 m)	≤ 0.20	≤ 16
UPM3(K) DHW xx-70	52	5766	A (~0.1 m)	≤ 0.20	≤ 23
UPM3(K) DHW xx-50	33	4848	A (~0.1 m)	≤ 0.20	≤ 16
UPM3(K) DHW xx-20	11	3122	A (~0.1 m)	≤ 0.20	≤ 7
UPM3(K) SOLAR xx-145	60	5794	A (~0.1 m)	≤ 0.20	≤ 25
UPM3(K) SOLAR xx-105	52	4950	A (~0.1 m)	≤ 0.20	≤ 22
UPM3(K) SOLAR xx-75	45	5991	A (~0.1 m)	≤ 0.20	≤ 20
UPM3(K) AUTO L xx-70	52	5766	-	≤ 0.20	≤ 25
UPM3(K) AUTO L xx-50	33	4838	-	≤ 0.20	≤ 16
UPM3(K) AUTO xx-70	52	5766	-	≤ 0.20	≤ 25
UPM3(K) AUTO xx-50	33	4838	-	≤ 0.20	≤ 16
UPM3(K) HYBRID xx-70	52	5766	A (~0.1 m)	≤ 0.20	≤ 25
UPM3(K) HYBRID xx-50	33	4838	A (~0.1 m)	≤ 0.20	≤ 16

13. Data sheets

UPM3(K) 15-75 130, 25-75 130 (N), 25-75 180 (N), 32-75 180 (N)



Performance curve

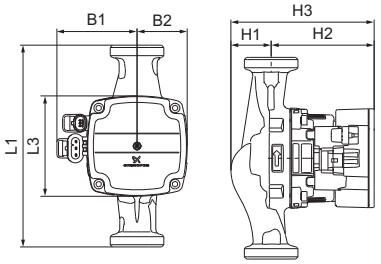
High efficiency
Ready for Ecodesign 2015

EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 28 W

TM06 0580 0814

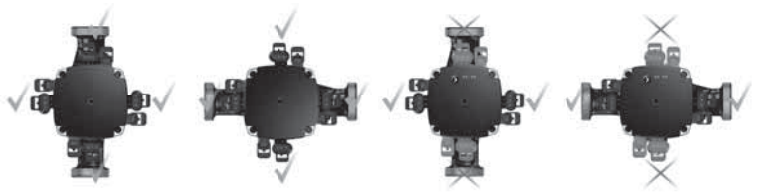
Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	2	0.04
Max.	60	0.58

Settings
1 factory preset



Dimensions

TM06 3878 1115



IP44

IPX4D
or K version

TM06 3880 1115

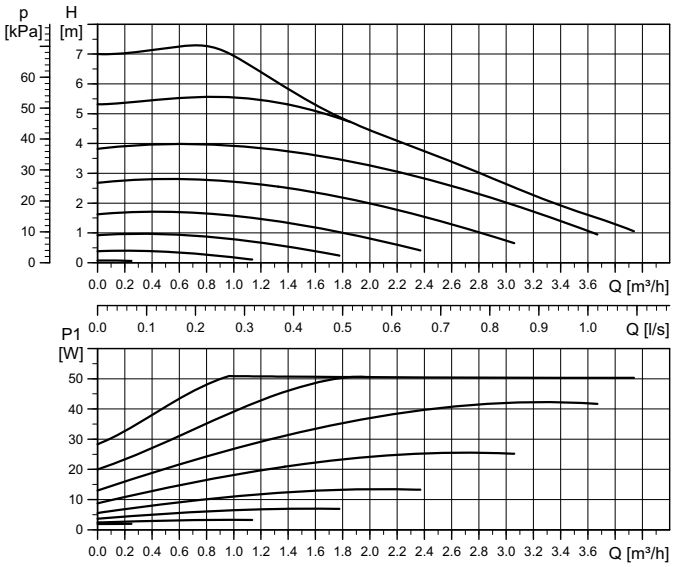
Control box position

Pump type	Dimensions [mm]							Connections	Weight [kg]
	L1	L3	B1	B2	H1	H2	H3		
UPM3(K) 15-75 130	130	90	72	45	36	92	128	G 1	1.8
UPM3(K) 25-75 130 (N)	130	90	72	45	36	92	128	G 1 1/2	1.9
UPM3(K) 25-75 180 (N)	180	90	72	45	36	92	128	G 1 1/2	2.0
UPM3(K) 32-75 180 (N)	180	90	72	45	36	92	128	G 2	2.0

Technical data

System pressure	Max. 1.0 MPa (10 bar)	**Enclosure class**	IP44 (non-condensing) K: IPX4D (condensing)
Minimum inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	**Motor protection**	No external protection needed
Liquid temperature	+2 °C to +110 °C (TF110)	**Approval and marking**	VDE, CE

UPM3(K) 15-70 130, 25-70 130 (N), 25-70 180 (N), 32-70 180 (N)



Performance curve

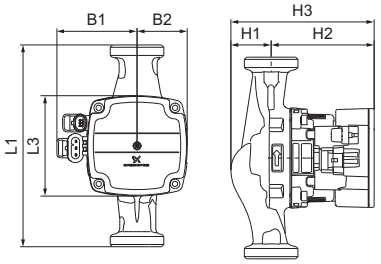
High efficiency
Ready for Ecodesign 2015

EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 23 W

TM06 0579 0814

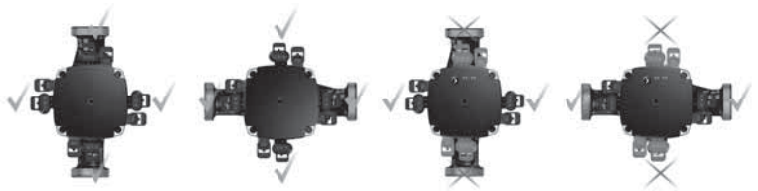
Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	2	0.04
Max.	52	0.52

Settings
1 factory preset



Dimensions

TM06 3878 1115



IP44

IPX4D
or K version

TM06 3880 1115

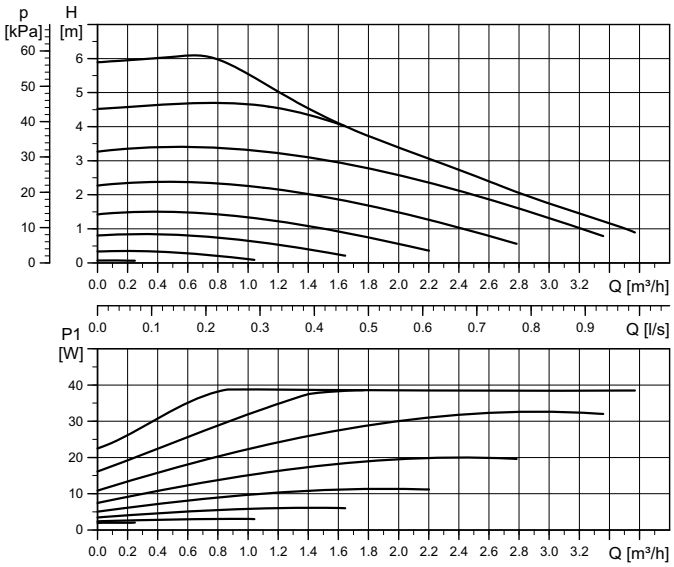
Control box position

Pump type	Dimensions [mm]							Connections	Weight [kg]
	L1	L3	B1	B2	H1	H2	H3		
UPM3(K) 15-70 130	130	90	72	45	36	92	128	G 1	1.8
UPM3(K) 25-70 130 (N)	130	90	72	45	36	92	128	G 1 1/2	1.9
UPM3(K) 25-70 180 (N)	180	90	72	45	36	92	128	G 1 1/2	2.0
UPM3(K) 32-70 180 (N)	180	90	72	45	36	92	128	G 2	2.2

Technical data

System pressure	Max. 1.0 MPa (10 bar)	**Enclosure class**	IP44 (non-condensing) K: IPX4D (condensing)
Minimum inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	**Motor protection**	No external protection needed
Liquid temperature	+2 °C to +110 °C (TF110)	**Approval and marking**	VDE, CE

UPM3(K) 15-60 130, 25-60 130 (N), 25-60 180 (N), 32-60 180 (N)



Performance curve

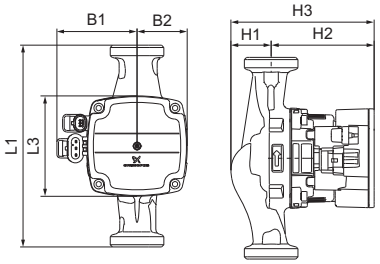
High efficiency
Ready for Ecodesign 2015

EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 18 W

TM06 0578 0814

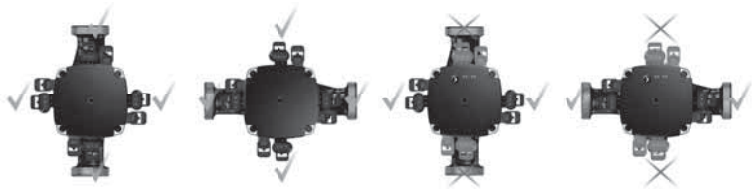
Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	2	0.04
Max.	39	0.42

Settings
1 factory preset



Dimensions

TM06 3878 1115



Control box position

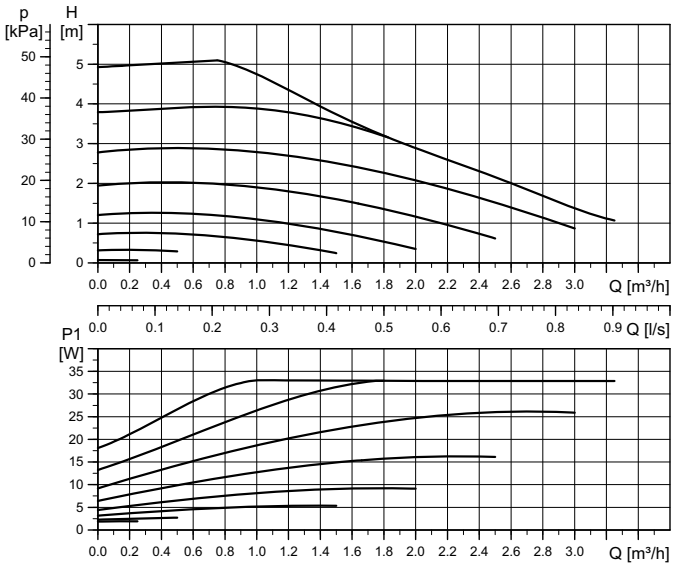
TM06 3880 1115

Pump type	Dimensions [mm]							Connections	Weight [kg]
	L1	L3	B1	B2	H1	H2	H3		
UPM3(K) 15-60 130	130	90	72	45	36	92	128	G 1	1.8
UPM3(K) 25-60 130 (N)	130	90	72	45	36	92	128	G 1 1/2	1.9
UPM3(K) 25-60 180 (N)	180	90	72	45	36	92	128	G 1 1/2	2.0
UPM3(K) 32-60 180 (N)	180	90	72	45	36	92	128	G 2	2.2

Technical data

System pressure	Max. 1.0 MPa (10 bar)	**Enclosure class**	IP44 (non-condensing) K: IPX4D (condensing)
Minimum inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	**Motor protection**	No external protection needed
Liquid temperature	+2 °C to +110 °C (TF110)	**Approval and marking**	VDE, CE

UPM3(K) 15-50 130, 25-50 130 (N), 25-50 180 (N), 32-50 180 (N)



Performance curve

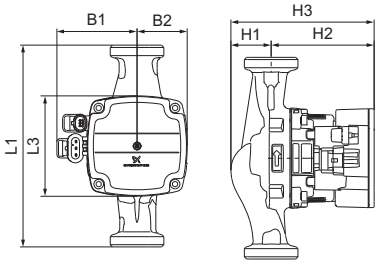
High efficiency
Ready for Ecodesign 2015

EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 16 W

TM06 0577 0814

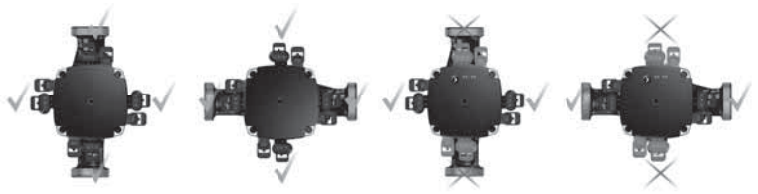
Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	2	0.04
Max.	33	0.36

Settings
1 factory preset



Dimensions

TM06 3878 1115



Control box position

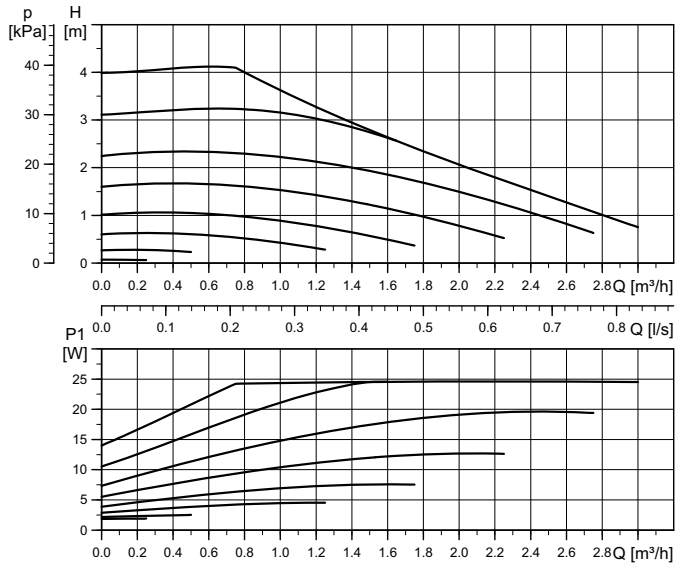
TM06 3880 1115

Pump type	Dimensions [mm]							Connections	Weight [kg]
	L1	L3	B1	B2	H1	H2	H3		
UPM3(K) 15-50 130	130	90	72	45	36	92	128	G 1	1.8
UPM3(K) 25-50 130 (N)	130	90	72	45	36	92	128	G 1 1/2	1.9
UPM3(K) 25-50 180 (N)	180	90	72	45	36	92	128	G 1 1/2	2.0
UPM3(K) 32-50 180 (N)	180	90	72	45	36	92	128	G 2	2.2

Technical data

System pressure	Max. 1.0 MPa (10 bar)	**Enclosure class**	IP44 (non-condensing) K: IPX4D (condensing)
Minimum inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	**Motor protection**	No external protection needed
Liquid temperature	+2 °C to +110 °C (TF110)	**Approval and marking**	VDE, CE

UPM3(K) 15-40 130, 25-40 130 (N), 25-40 180 (N), 32-40 180 (N)



Performance curve

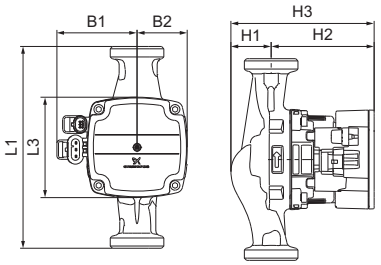
High efficiency
Ready for Ecodesign 2015

EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 12 W

TM06 0576 0814

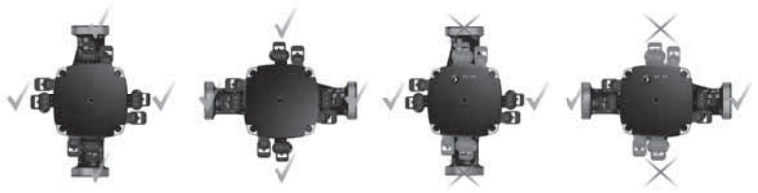
Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	2	0.04
Max.	25	0.29

Settings
1 factory preset



Dimensions

TM06 3878 1115



Control box position

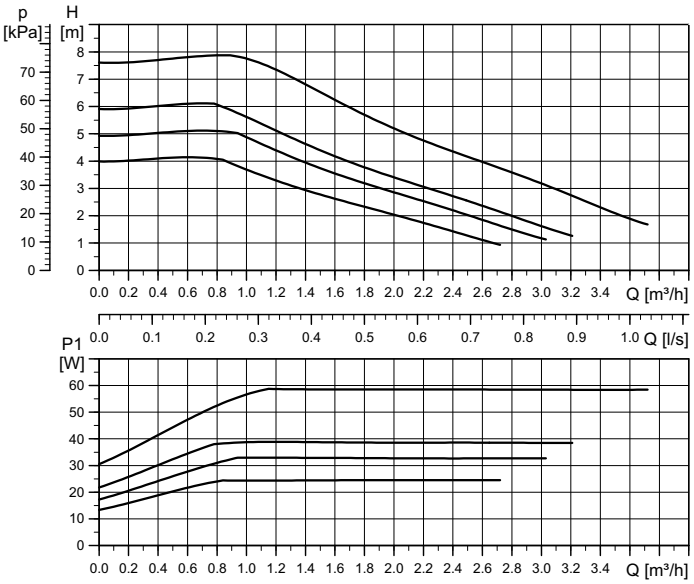
TM06 3880 1115

Pump type	Dimensions [mm]							Connections	Weight [kg]
	L1	L3	B1	B2	H1	H2	H3		
UPM3(K) 15-40 130	130	90	72	45	36	92	128	G 1	1.8
UPM3(K) 25-40 130 (N)	130	90	72	45	36	92	128	G 1 1/2	1.9
UPM3(K) 25-40 180 (N)	180	90	72	45	36	92	128	G 1 1/2	2.0
UPM3(K) 32-40 180 (N)	180	90	72	45	36	92	128	G 2	2.2

Technical data

System pressure	Max. 1.0 MPa (10 bar)	**Enclosure class**	IP44 (non-condensing) K: IPX4D (condensing)
Minimum inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	**Motor protection**	No external protection needed
Liquid temperature	+2 °C to +110 °C (TF110)	**Approval and marking**	VDE, CE

UPM3(K) FLEX AC 15-75 130, 25-75 130 (N), 25-75 180 (N), 32-75 180 (N)



Performance curve

High efficiency
Ready for Ecodesign 2015

Setting	Max. head $_{nom}$
Curve 1	4 m
Curve 2	5 m
Curve 3	6 m
Curve 4	7.5 m

Setting	Max. $P_{1\ nom}$
Curve 1	25 W
Curve 2	33 W
Curve 3	39 W
Curve 4	60 W

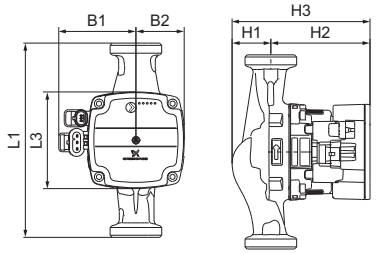
EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 28 W

TM06 3872 1115

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	2	0.04
Max.	60	0.58

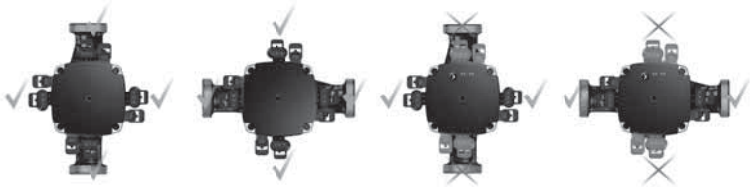
Settings				
PWM A	**PWM C**	**PP**	**CP**	**CC**
4	4	-	-	-

Note: For PWM speed curves see data sheet *UPM3(K) 15-75 130, 25-75 130 (N), 25-75 180 (N), 32-75 180 (N)*.



Dimensions

TM06 3879 1115



Control box position

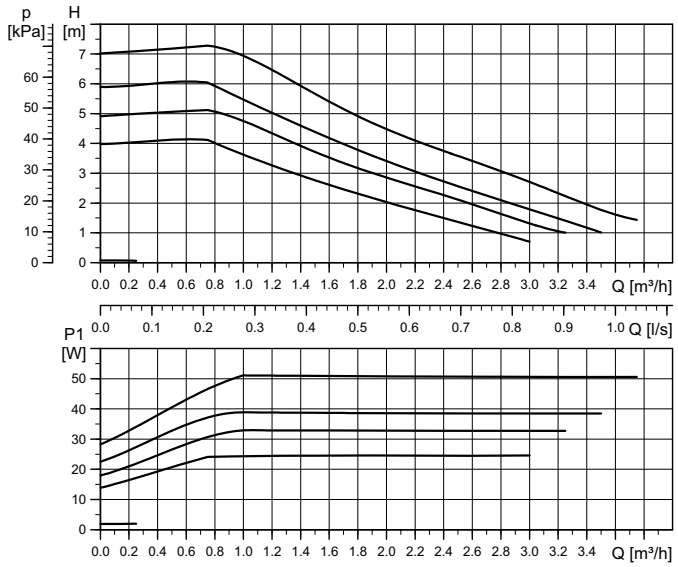
TM06 3880 1115

Pump type	Dimensions [mm]							Connections	Weight [kg]
	L1	L3	B1	B2	H1	H2	H3		
UPM3(K) FLEX AC 15-75 130	130	90	72	45	36	92	128	G 1	1.8
UPM3(K) FLEX AC 25-75 130 (N)	130	90	72	45	36	92	128	G 1 1/2	1.9
UPM3(K) FLEX AC 25-75 180 (N)	180	90	72	45	36	92	128	G 1 1/2	2.0
UPM3(K) FLEX AC 32-75 180 (N)	180	90	72	45	36	92	128	G 2	2.0

Technical data

System pressure	Max. 1.0 MPa (10 bar)	**Enclosure class**	IP44 (non-condensing) K: IPX4D (condensing)
Minimum inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	**Motor protection**	No external protection needed
Liquid temperature	+2 °C to +110 °C (TF110)	**Approval and marking**	VDE, CE

UPM3(K) FLEX AC 15-70 130, 25-70 130 (N), 25-70 180 (N), 32-70 180 (N)



Performance curve

High efficiency
Ready for Ecodesign 2015

Setting	Max. head $_{nom}$
Curve 1	4 m
Curve 2	5 m
Curve 3	6 m
Curve 4	7 m

Setting	Max. $P_{1\ nom}$
Curve 1	25 W
Curve 2	33 W
Curve 3	39 W
Curve 4	52 W

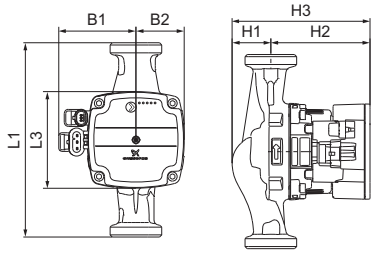
EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 23 W

TM06 0584 0814

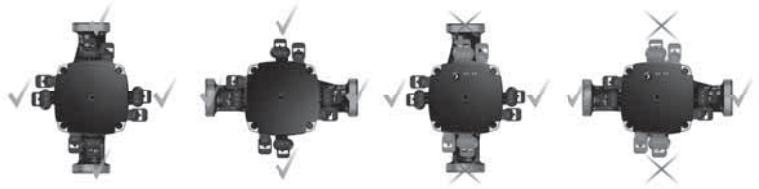
Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	2	0.04
Max.	52	0.52

Settings			
PWM A	**PWM C**	**PP**	**CP**
4	4	-	-

Note: For PWM speed curves see data sheet *UPM3(K) 15-70 130, 25-70 130 (N), 25-70 180 (N), 32-70 180 (N)*.



Dimensions



TM06 3879 1115

Control box position

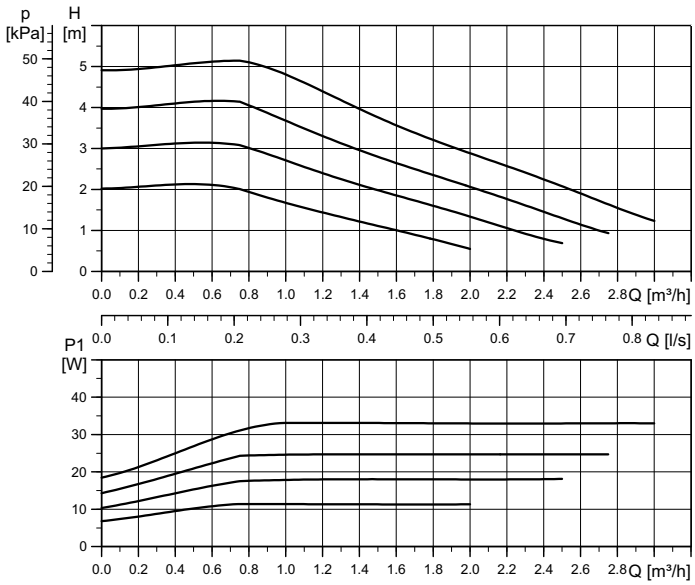
TM06 3880 1115

Pump type	Dimensions [mm]							Connections	Weight [kg]
	L1	L3	B1	B2	H1	H2	H3		
UPM3(K) FLEX AC 15-70 130	130	90	72	45	36	92	128	G 1	1.8
UPM3(K) FLEX AC 25-70 130 (N)	130	90	72	45	36	92	128	G 1 1/2	1.9
UPM3(K) FLEX AC 25-70 180 (N)	180	90	72	45	36	92	128	G 1 1/2	2.0
UPM3(K) FLEX AC 32-70 180 (N)	180	90	72	45	36	92	128	G 2	2.2

Technical data

System pressure	Max. 1.0 MPa (10 bar)	**Enclosure class**	IP44 (non-condensing) K: IPX4D (condensing)
Minimum inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	**Motor protection**	No external protection needed
Liquid temperature	+2 °C to +110 °C (TF110)	**Approval and marking**	VDE, CE

UPM3(K) FLEX AC 15-50 130, 25-50 130 (N), 25-50 180 (N), 32-50 180 (N)



Performance curve

High efficiency
Ready for Ecodesign 2015

Setting	Max. head $_{nom}$
Curve 1	2 m
Curve 2	3 m
Curve 3	4 m
Curve 4	5 m

Setting	Max. $P_{1\ nom}$
Curve 1	11 W
Curve 2	18 W
Curve 3	25 W
Curve 4	33 W

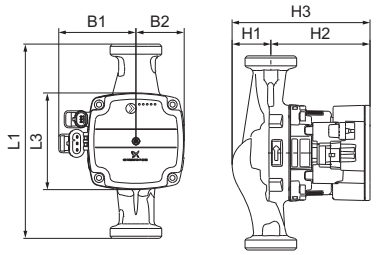
EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 16 W

TM06 4090 1515

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	2	0.04
Max.	33	0.36

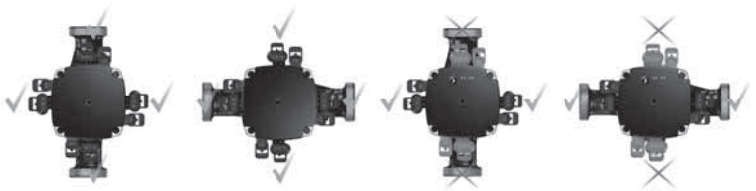
Settings				
PWM A	**PWM C**	**PP**	**CP**	**CC**
4	4	-	-	-

Note: For PWM speed curves see data sheet *UPM3(K) 15-50 130, 25-50 130 (N), 25-50 180 (N), 32-50 180 (N)*.



Dimensions

TM06 3879 1115



Control box position

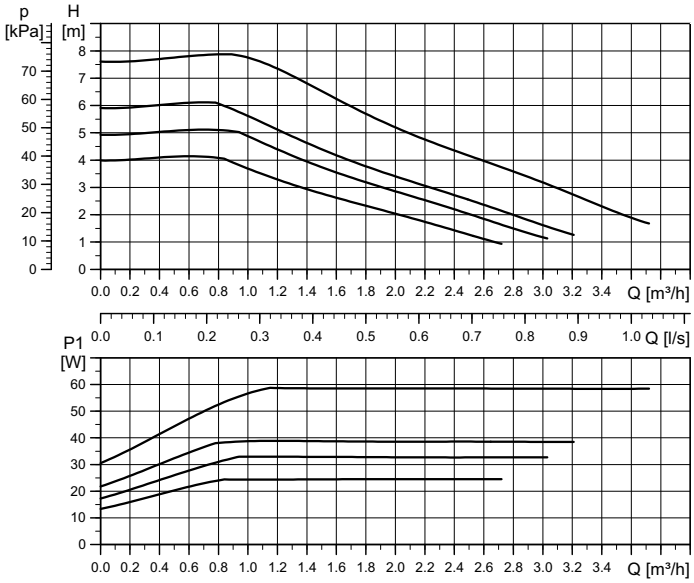
TM06 3880 1115

Pump type	Dimensions [mm]							Connections	Weight [kg]
	L1	L3	B1	B2	H1	H2	H3		
UPM3(K) FLEX AC 15-50 130	130	90	72	45	36	92	128	G 1	1.8
UPM3(K) FLEX AC 25-50 130 (N)	130	90	72	45	36	92	128	G 1 1/2	1.9
UPM3(K) FLEX AC 25-50 180 (N)	180	90	72	45	36	92	128	G 1 1/2	2.0
UPM3(K) FLEX AC 32-50 180 (N)	180	90	72	45	36	92	128	G 2	2.2

Technical data

System pressure	Max. 1.0 MPa (10 bar)	**Enclosure class**	IP44 (non-condensing) K: IPX4D (condensing)
Minimum inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	**Motor protection**	No external protection needed
Liquid temperature	+2 °C to +110 °C (TF110)	**Approval and marking**	VDE, CE

UPM3(K) FLEX AS 15-75 130, 25-75 130 (N), 25-75 180 (N), 32-75 180 (N)



Performance curve

High efficiency
Ready for Ecodesign 2015

Setting	Max. head $_{nom}$
Curve 1	4 m
Curve 2	5 m
Curve 3	6 m
Curve 4	7.5 m

Setting	Max. $P_{1\ nom}$
Curve 1	25 W
Curve 2	33 W
Curve 3	39 W
Curve 4	60 W

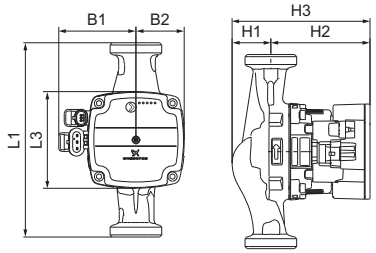
EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 28 W

TM06 3872 1115

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	2	0.04
Max.	60	0.58

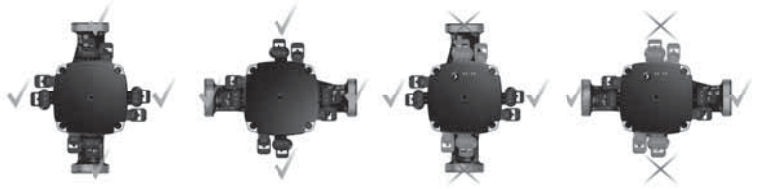
Settings				
PWM A	**PWM C**	**PP**	**CP**	**CC**
4	-	-	-	-

Note: For PWM speed curves see data sheet *UPM3(K) 15-75 130, 25-75 130 (N), 25-75 180 (N), 32-75 180 (N)*.



Dimensions

TM06 3879 1115



Control box position

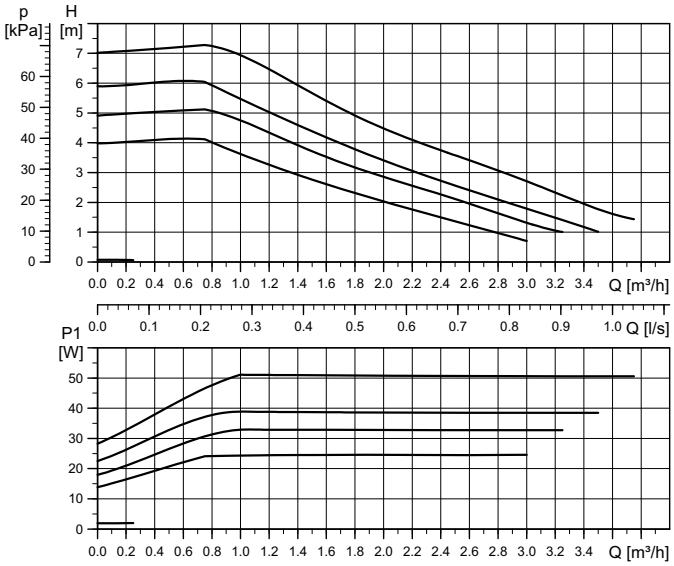
TM06 3880 1115

Pump type	Dimensions [mm]							Connections	Weight [kg]
	L1	L3	B1	B2	H1	H2	H3		
UPM3(K) FLEX AS 15-75 130	130	90	72	45	36	92	128	G 1	1.8
UPM3(K) FLEX AS 25-75 130 (N)	130	90	72	45	36	92	128	G 1 1/2	1.9
UPM3(K) FLEX AS 25-75 180 (N)	180	90	72	45	36	92	128	G 1 1/2	2.0
UPM3(K) FLEX AS 32-75 180 (N)	180	90	72	45	36	92	128	G 2	2.0

Technical data

System pressure	Max. 1.0 MPa (10 bar)	**Enclosure class**	IP44 (non-condensing) K: IPX4D (condensing)
Minimum inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	**Motor protection**	No external protection needed
Liquid temperature	+2 °C to +110 °C (TF110)	**Approval and marking**	VDE, CE

UPM3(K) FLEX AS 15-70 130, 25-70 130 (N), 25-70 180 (N), 32-70 180 (N)



Performance curve

High efficiency
Ready for Ecodesign 2015

Setting	Max. head $_{nom}$
Curve 1	4 m
Curve 2	5 m
Curve 3	6 m
Curve 4	7 m

Setting	Max. $P_{1\ nom}$
Curve 1	25 W
Curve 2	33 W
Curve 3	39 W
Curve 4	52 W

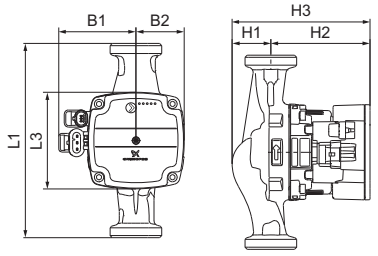
EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 23 W

TM06 0584 0814

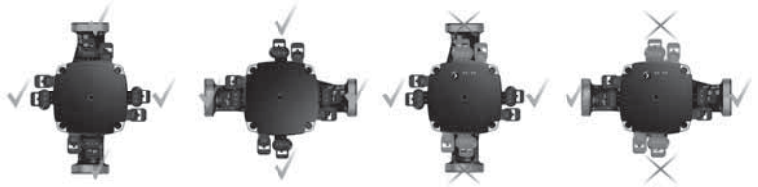
Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	2	0.04
Max.	52	0.52

Settings				
PWM A	**PWM C**	**PP**	**CP**	**CC**
4	-	-	-	-

Note: For PWM speed curves see data sheet *UPM3(K) 15-70 130, 25-70 130 (N), 25-70 180 (N), 32-70 180 (N)*.



Dimensions



TM06 3879 1115

IP44

IPX4D
or K version

TM06 3880 1115

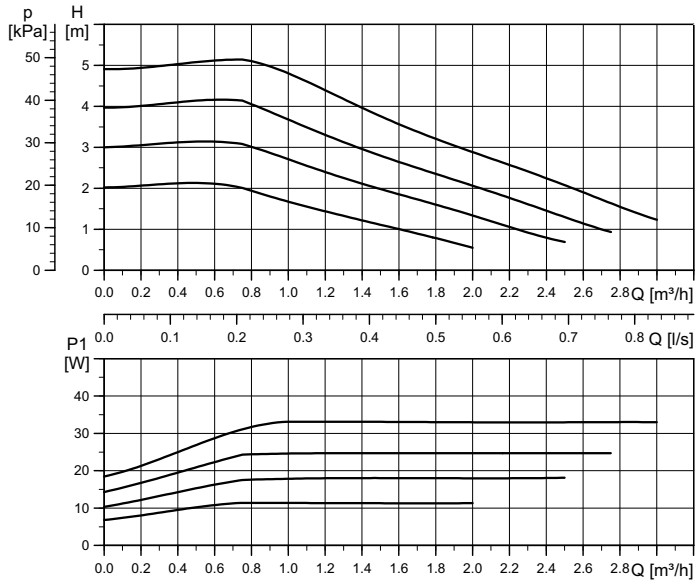
Control box position

Pump type	Dimensions [mm]							Connections	Weight [kg]
	L1	L3	B1	B2	H1	H2	H3		
UPM3(K) FLEX AS 15-70 130	130	90	72	45	36	92	128	G 1	1.8
UPM3(K) FLEX AS 25-70 130 (N)	130	90	72	45	36	92	128	G 1 1/2	1.9
UPM3(K) FLEX AS 25-70 180 (N)	180	90	72	45	36	92	128	G 1 1/2	2.0
UPM3(K) FLEX AS 32-70 180 (N)	180	90	72	45	36	92	128	G 2	2.2

Technical data

System pressure	Max. 1.0 MPa (10 bar)	**Enclosure class**	IP44 (non-condensing) K: IPX4D (condensing)
Minimum inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	**Motor protection**	No external protection needed
Liquid temperature	+2 °C to +110 °C (TF110)	**Approval and marking**	VDE, CE

UPM3(K) FLEX AS 15-50 130, 25-50 130 (N), 25-50 180 (N), 32-50 180 (N)



Performance curve

High efficiency
Ready for Ecodesign 2015

Setting	Max. head $_{nom}$
Curve 1	2 m
Curve 2	3 m
Curve 3	4 m
Curve 4	5 m

Setting	Max. $P_{1\ nom}$
Curve 1	11 W
Curve 2	18 W
Curve 3	25 W
Curve 4	33 W

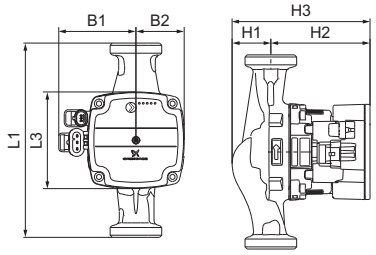
EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 16 W

TM06 4090 1515

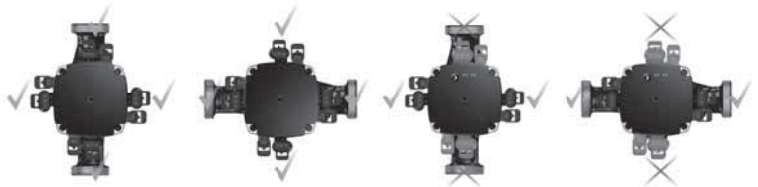
Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	2	0.04
Max.	33	0.36

Settings				
PWM A	**PWM C**	**PP**	**CP**	**CC**
4	-	-	-	-

Note: For PWM speed curves see data sheet *UPM3(K) 15-50 130, 25-50 130 (N), 25-50 180 (N), 32-50 180 (N)*.



Dimensions



TM06 3879 1115

TM06 3880 1115

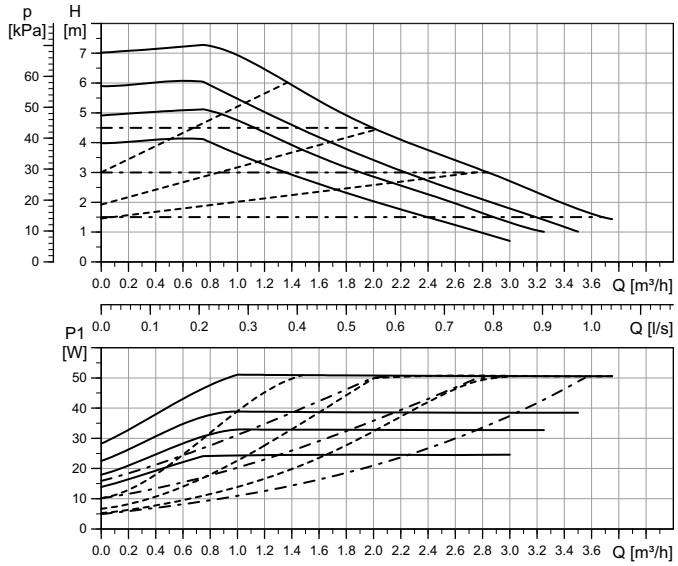
Control box position

Pump type	Dimensions [mm]							Connections	Weight [kg]
	L1	L3	B1	B2	H1	H2	H3		
UPM3(K) FLEX AS 15-50 130	130	90	72	45	36	92	128	G 1	1.8
UPM3(K) FLEX AS 25-50 130 (N)	130	90	72	45	36	92	128	G 1 1/2	1.9
UPM3(K) FLEX AS 25-50 180 (N)	180	90	72	45	36	92	128	G 1 1/2	2.0
UPM3(K) FLEX AS 32-50 180 (N)	180	90	72	45	36	92	128	G 2	2.2

Technical data

System pressure	Max. 1.0 MPa (10 bar)	**Enclosure class**	IP44 (non-condensing) K: IPX4D (condensing)
Minimum inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	**Motor protection**	No external protection needed
Liquid temperature	+2 °C to +110 °C (TF110)	**Approval and marking**	VDE, CE

UPM3(K) AUTO L 15-70 130, 25-70 130 (N), 25-70 180 (N), 32-70 180 (N)



Performance curve

High efficiency
Ready for Ecodesign 2015

Setting	Max. head $_{nom}$
Curve 1	4 m
Curve 2	5 m
Curve 3	6 m
Curve 4	7 m

Setting	Max. $P_{1\ nom}$
Curve 1	25 W
Curve 2	33 W
Curve 3	39 W
Curve 4	52 W

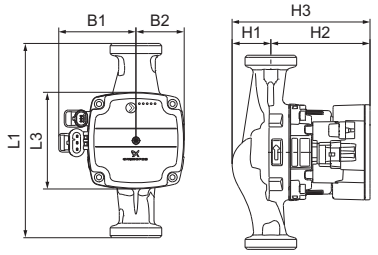
EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 25 W

TM06 0582 0814

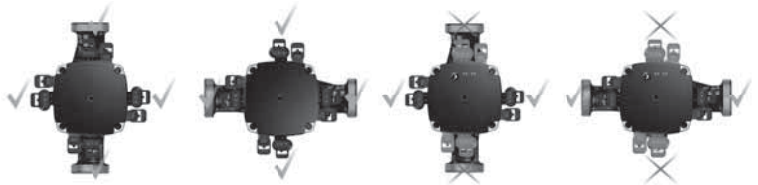
Line type	Description
————	Constant Curve
- - - - - - - - - -	Proportional Pressure
— · — · — · —	Constant Pressure

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	5	0.07
Max.	52	0.52

Settings				
PWM A	**PWM C**	**PP**	**CP**	**CC**
-	-	3	3	4



Dimensions



TM06 3879 1115

IP44

IPX4D
or K version

TM06 3880 1115

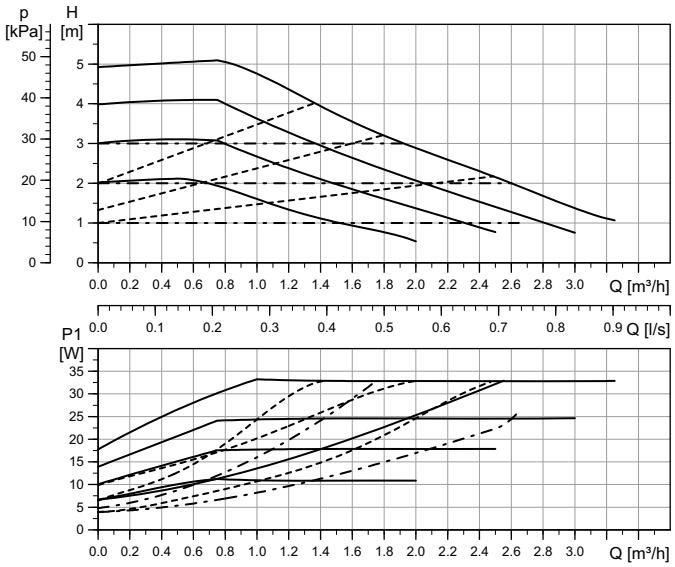
Control box position

Pump type	Dimensions [mm]							Connections	Weight [kg]
	L1	L3	B1	B2	H1	H2	H3		
UPM3(K) AUTO L 15-70 130	130	90	72	45	36	92	128	G 1	1.8
UPM3(K) AUTO L 25-70 130 (N)	130	90	72	45	36	92	128	G 1 1/2	1.9
UPM3(K) AUTO L 25-70 180 (N)	180	90	72	45	36	92	128	G 1 1/2	2.0
UPM3(K) AUTO L 32-70 180 (N)	180	90	72	45	36	92	128	G 2	2.2

Technical data

System pressure	Max. 1.0 MPa (10 bar)	**Enclosure class**	IP44 (non-condensing) K: IPX4D (condensing)
Minimum inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	**Motor protection**	No external protection needed
Liquid temperature	+2 °C to +110 °C (TF110)	**Approval and marking**	VDE, CE

UPM3(K) AUTO L 15-50 130, 25-50 130 (N), 25-50 180 (N), 32-50 180 (N)



Performance curve

High efficiency
Ready for Ecodesign 2015

Setting	Max. head $_{nom}$
Curve 1	2 m
Curve 2	3 m
Curve 3	4 m
Curve 4	5 m

Setting	Max. $P_{1\ nom}$
Curve 1	11 W
Curve 2	18 W
Curve 3	25 W
Curve 4	33 W

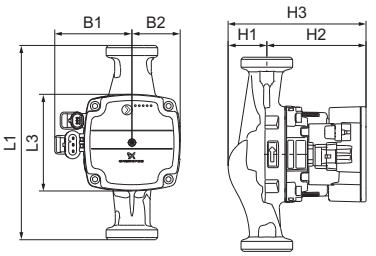
EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 16 W

TM06 0581 0814

Line type	Description
————	Constant Curve
- - - - - - - - - -	Proportional Pressure
— - — - — - —	Constant Pressure

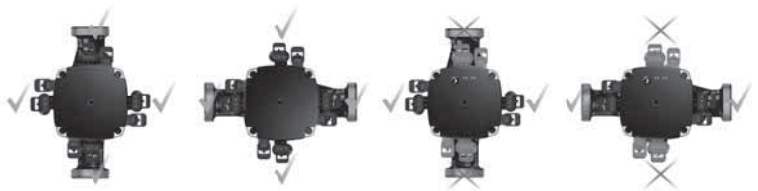
Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	4	0.06
Max.	33	0.36

Settings				
PWM A	**PWM C**	**PP**	**CP**	**CC**
-	-	3	3	4



Dimensions

TM06 3879 1115



Control box position

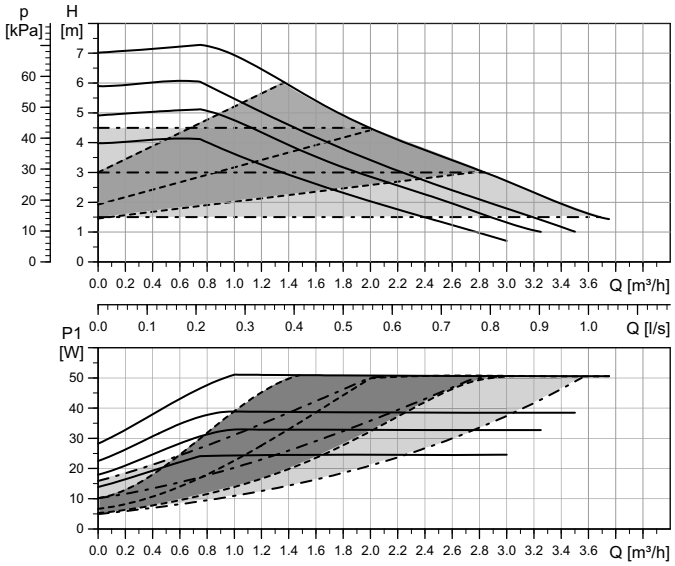
TM06 3880 1115

Pump type	Dimensions [mm]							Connections	Weight [kg]
	L1	L3	B1	B2	H1	H2	H3		
UPM3(K) AUTO L 15-50 130	130	90	72	45	36	92	128	G 1	1.8
UPM3(K) AUTO L 25-50 130 (N)	130	90	72	45	36	92	128	G 1 1/2	1.9
UPM3(K) AUTO L 25-50 180 (N)	180	90	72	45	36	92	128	G 1 1/2	2.0
UPM3(K) AUTO L 32-50 180 (N)	180	90	72	45	36	92	128	G 2	2.2

Technical data

System pressure	Max. 1.0 MPa (10 bar)	**Enclosure class**	IP44 (non-condensing) K: IPX4D (condensing)
Minimum inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	**Motor protection**	No external protection needed
Liquid temperature	+2 °C to +110 °C (TF110)	**Approval and marking**	VDE, CE

UPM3(K) AUTO 15-70 130, 25-70 130 (N), 25-70 180 (N), 32-70 180 (N)



Performance curve

High efficiency
Ready for Ecodesign 2015

Setting	Max. head $_{nom}$
Curve 1	4 m
Curve 2	5 m
Curve 3	6 m
Curve 4	7 m

Setting	Max. $P_{1\ nom}$
Curve 1	25 W
Curve 2	33 W
Curve 3	39 W
Curve 4	52 W

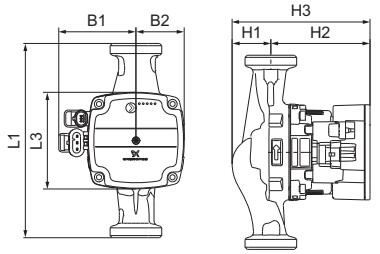
EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 25 W

TM06 1179 1814

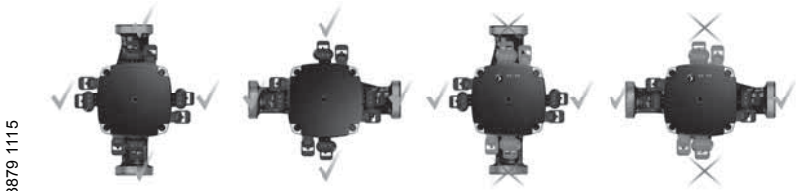
Line type	Description
————	Constant Curve
- - - - - - - - - -	Proportional Pressure
— - — - — - —	Constant Pressure

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	5	0.07
Max.	52	0.52

Settings				
PWM A	**PWM C**	**PP**	**CP**	**CC**
-	-	3/AA	3/AA	4



Dimensions



TM06 3879 1115

IP44

IPX4D
or K version

TM06 3880 1115

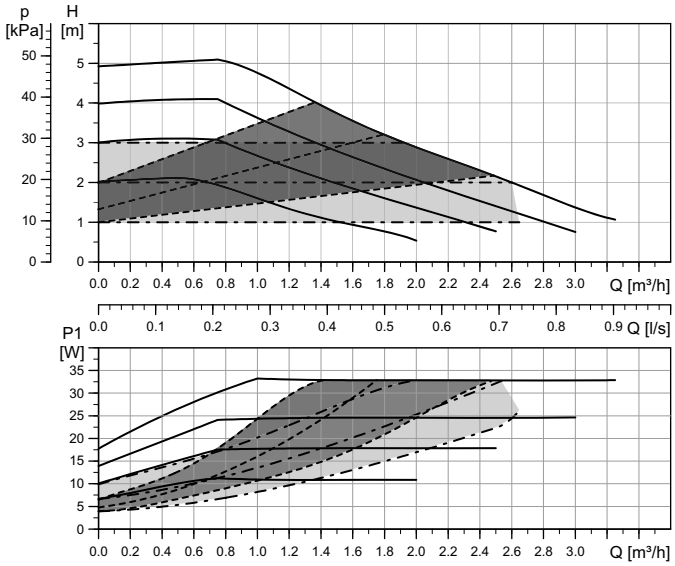
Control box position

Pump type	Dimensions [mm]							Connections	Weight [kg]
	L1	L3	B1	B2	H1	H2	H3		
UPM3(K) AUTO 15-70 130	130	90	72	45	36	92	128	G 1	1.8
UPM3(K) AUTO 25-70 130 (N)	130	90	72	45	36	92	128	G 1 1/2	1.9
UPM3(K) AUTO 25-70 180 (N)	180	90	72	45	36	92	128	G 1 1/2	2.0
UPM3(K) AUTO 32-70 180 (N)	180	90	72	45	36	92	128	G 2	2.2

Technical data

System pressure	Max. 1.0 MPa (10 bar)	**Enclosure class**	IP44 (non-condensing) K: IPX4D (condensing)
Minimum inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	**Motor protection**	No external protection needed
Liquid temperature	+2 °C to +110 °C (TF110)	**Approval and marking**	VDE, CE

UPM3(K) AUTO 15-50 130, 25-50 130 (N), 25-50 180 (N), 32-50 180 (N)



Performance curve

High efficiency
Ready for Ecodesign 2015

Setting	Max. head $_{nom}$
Curve 1	2 m
Curve 2	3 m
Curve 3	4 m
Curve 4	5 m

Setting	Max. $P_{1\ nom}$
Curve 1	11 W
Curve 2	18 W
Curve 3	25 W
Curve 4	33 W

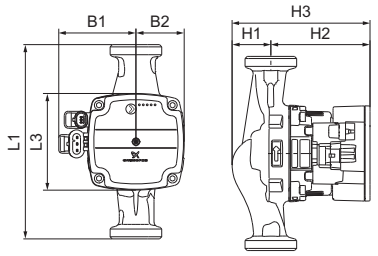
EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 16 W

TM06 1180 1814

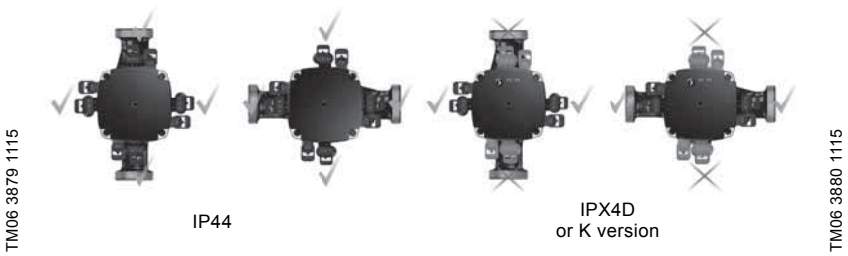
Line type	Description
————	Constant Curve
- - - - - - - - - -	Proportional Pressure
— · — · — · —	Constant Pressure

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	4	0.06
Max.	33	0.36

Settings				
PWM A	**PWM C**	**PP**	**CP**	**CC**
-	-	3/AA	3/AA	4



Dimensions



TM06 3879 1115

TM06 3880 1115

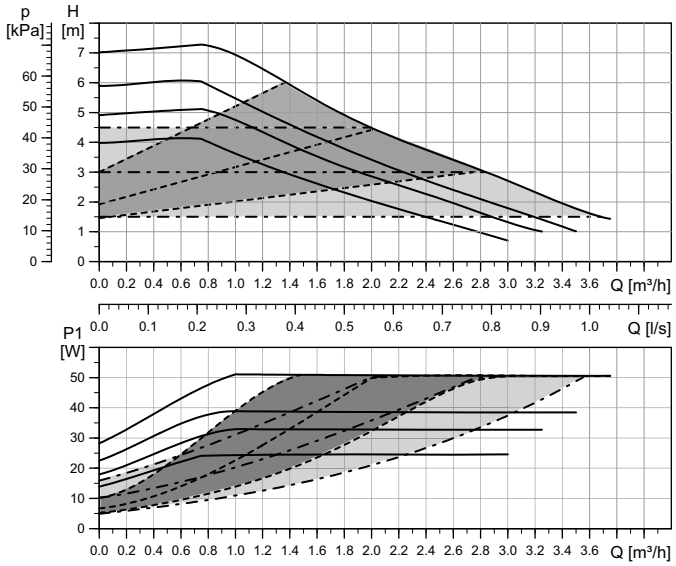
Control box position

Pump type	Dimensions [mm]							Connections	Weight [kg]
	L1	L3	B1	B2	H1	H2	H3		
UPM3(K) AUTO 15-50 130	130	90	72	45	36	92	128	G 1	1.8
UPM3(K) AUTO 25-50 130 (N)	130	90	72	45	36	92	128	G 1 1/2	1.9
UPM3(K) AUTO 25-50 180 (N)	180	90	72	45	36	92	128	G 1 1/2	2.0
UPM3(K) AUTO 32-50 180 (N)	180	90	72	45	36	92	128	G 2	2.2

Technical data

System pressure	Max. 1.0 MPa (10 bar)	**Enclosure class**	IP44 (non-condensing) K: IPX4D (condensing)
Minimum inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	**Motor protection**	No external protection needed
Liquid temperature	+2 °C to +110 °C (TF110)	**Approval and marking**	VDE, CE

UPM3(K) HYBRID 15-70 130, 25-70 130 (N), 25-70 180 (N), 32-70 180 (N)



Performance curve

High efficiency
Ready for Ecodesign 2015

Setting	Max. head $_{nom}$
Curve 1	4 m
Curve 2	5 m
Curve 3	6 m
Curve 4	7 m

Setting	Max. $P_{1\ nom}$
Curve 1	25 W
Curve 2	33 W
Curve 3	39 W
Curve 4	52 W

EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 25 W

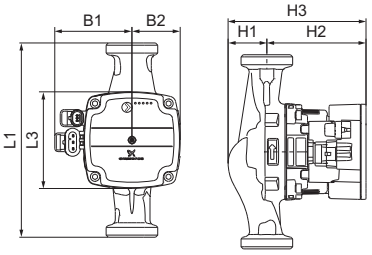
TM06 1179 1814

Line type	Description
————	Constant Curve
- - - - - - - - - -	Proportional Pressure
— · — · — · —	Constant Pressure

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	2	0.04
Max.	52	0.52

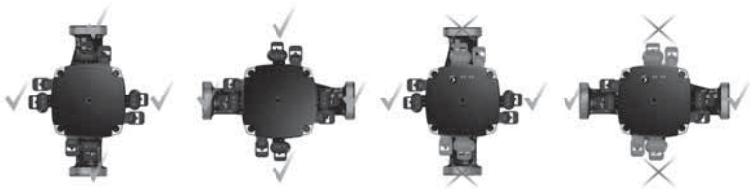
Settings				
PWM A	**PWM C**	**PP**	**CP**	**CC**
4	4	3/AA	3/AA	4

Note: For PWM speed curves see data sheet *UPM3(K) 15-70 130, 25-70 130 (N), 25-70 180 (N), 32-70 180 (N)*.



Dimensions

TM06 3879 1115



Control box position

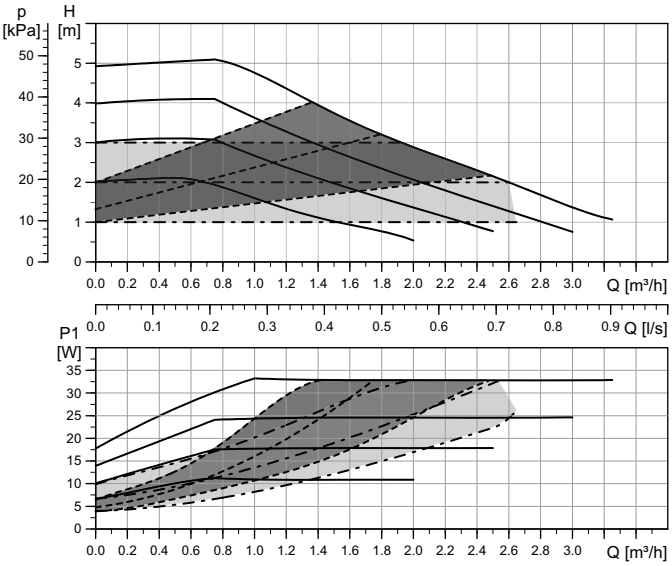
TM06 3880 1115

Pump type	Dimensions [mm]							Connections	Weight [kg]
	L1	L3	B1	B2	H1	H2	H3		
UPM3(K) HYBRID 15-70 130	130	90	72	45	36	92	128	G 1	1.8
UPM3(K) HYBRID 25-70 130 (N)	130	90	72	45	36	92	128	G 1 1/2	1.9
UPM3(K) HYBRID 25-70 180 (N)	180	90	72	45	36	92	128	G 1 1/2	2.0
UPM3(K) HYBRID 32-70 180 (N)	180	90	72	45	36	92	128	G 2	2.2

Technical data

System pressure	Max. 1.0 MPa (10 bar)	**Enclosure class**	IP44 (non-condensing) K: IPX4D (condensing)
Minimum inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	**Motor protection**	No external protection needed
Liquid temperature	+2 °C to +110 °C (TF110)	**Approval and marking**	VDE, CE

UPM3(K) HYBRID 15-50 130, 25-50 130 (N), 25-50 180 (N), 32-50 180 (N)



Performance curve

High efficiency
Ready for Ecodesign 2015

Setting	Max. head $_{nom}$
Curve 1	2 m
Curve 2	3 m
Curve 3	4 m
Curve 4	5 m

Setting	Max. $P_{1\ nom}$
Curve 1	11 W
Curve 2	18 W
Curve 3	25 W
Curve 4	33 W

EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 16 W

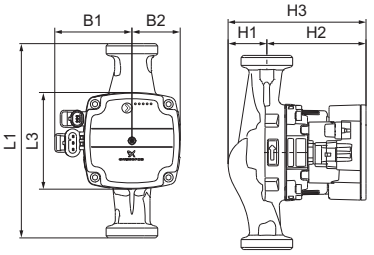
TM06 1180 1814

Line type	Description
————	Constant Curve
- - - - - - - - - -	Proportional Pressure
— · — · — · —	Constant Pressure

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	2	0.04
Max.	33	0.36

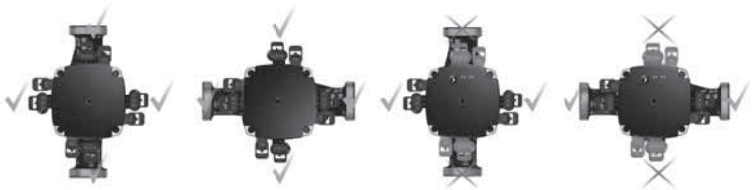
Settings				
PWM A	**PWM C**	**PP**	**CP**	**CC**
4	4	3/AA	3/AA	4

Note: For PWM speed curves see data sheet *UPM3(K) 15-50 130, 25-50 130 (N), 25-50 180 (N), 32-50 180 (N)*.



Dimensions

TM06 3879 1115



Control box position

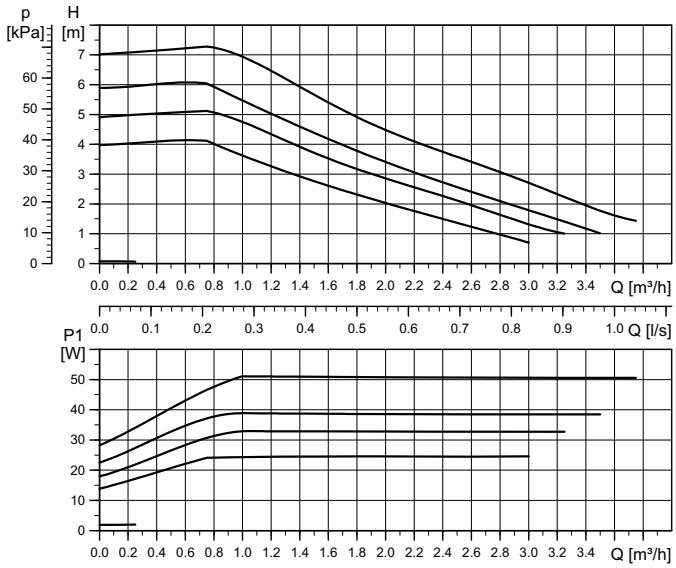
TM06 3880 1115

Pump type	Dimensions [mm]							Connections	Weight [kg]
	L1	L3	B1	B2	H1	H2	H3		
UPM3(K) HYBRID 15-50 130	130	90	72	45	36	92	128	G 1	1.8
UPM3(K) HYBRID 25-50 130 (N)	130	90	72	45	36	92	128	G 1 1/2	1.9
UPM3(K) HYBRID 25-50 180 (N)	180	90	72	45	36	92	128	G 1 1/2	2.0
UPM3(K) HYBRID 32-50 180 (N)	180	90	72	45	36	92	128	G 2	2.2

Technical data

System pressure	Max. 1.0 MPa (10 bar)	**Enclosure class**	IP44 (non-condensing) K: IPX4D (condensing)
Minimum inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	**Motor protection**	No external protection needed
Liquid temperature	+2 °C to +110 °C (TF110)	**Approval and marking**	VDE, CE

UPM3(K) DHW 25-70 130 N, 25-70 180 N, 32-70 180 N



Performance curve

High efficiency
Ready for Ecodesign 2015

Setting	Max. head $_{nom}$
Curve 1	4 m
Curve 2	5 m
Curve 3	6 m
Curve 4	7 m

Setting	Max. $P_{1\ nom}$
Curve 1	25 W
Curve 2	33 W
Curve 3	39 W
Curve 4	52 W

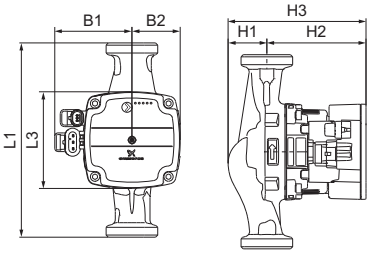
EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 23 W

TM06 0584 0814

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	2	0.04
Max.	52	0.52

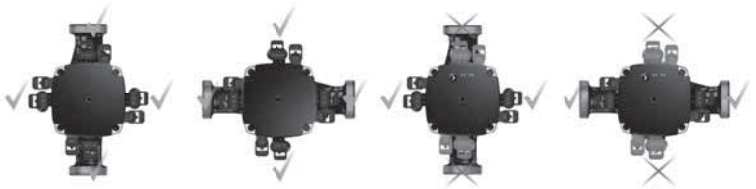
Settings				
PWM A	**PWM C**	**PP**	**CP**	**CC**
4	-	-	-	-

Note: For PWM speed curves see data sheet *UPM3(K) 15-70 130, 25-70 130 (N), 25-70 180 (N), 32-70 180 (N)*.



Dimensions

TM06 3879 1115



Control box position

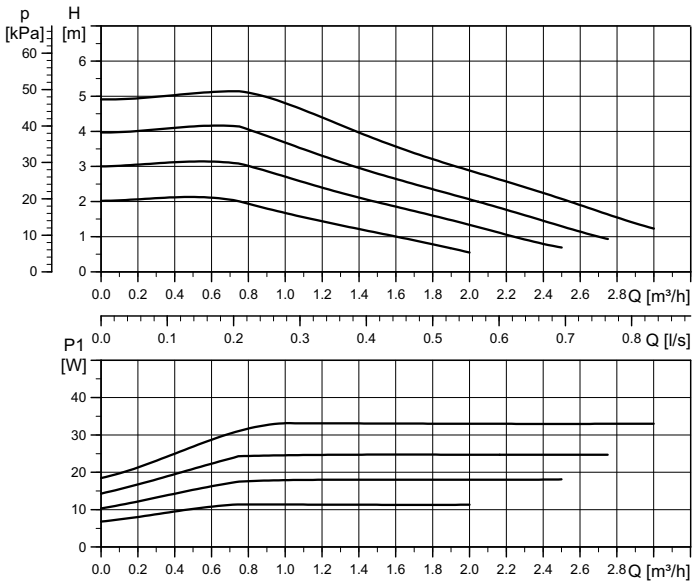
TM06 3880 1115

Pump type	Dimensions [mm]							Connections	Weight [kg]
	L1	L3	B1	B2	H1	H2	H3		
UPM3(K) DHW 25-70 130 N	130	90	72	45	36	92	128	G 1 1/2	2.1
UPM3(K) DHW 25-70 180 N	180	90	72	45	36	92	128	G 1 1/2	2.2
UPM3(K) DHW 32-70 180 N	180	90	72	45	36	92	128	G 2	2.4

Technical data

System pressure	Max. 1.0 MPa (10 bar)	**Enclosure class**	IP44 (non-condensing) K: IPX4D (condensing)
Minimum inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	**Motor protection**	No external protection needed
Liquid temperature	+2 °C to +110 °C (TF110)	**Approval and marking**	VDE, CE, drinking water approvals KTW (DE), DVGW W270 (DE), ACS (FR), WRAS (GB)
Temporary hardness	Max. 3 mmol/l $CaCO_3$ (16.8 ° dH)		

UPM3(K) DHW 25-50 130 N, 25-50 180 N, 32-50 180 N



Performance curve

High efficiency
Ready for Ecodesign 2015

Setting	Max. head $_{nom}$
Curve 1	2 m
Curve 2	3 m
Curve 3	4 m
Curve 4	5 m

Setting	Max. $P_{1\ nom}$
Curve 1	11 W
Curve 2	18 W
Curve 3	25 W
Curve 4	33 W

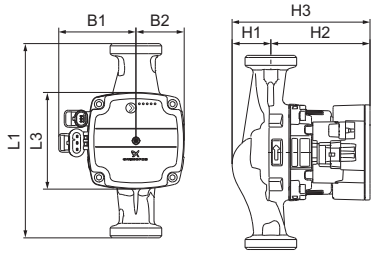
EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 16 W

TM06 4074 1515

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	2	0.04
Max.	33	0.36

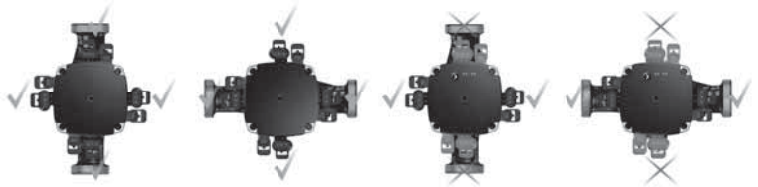
Settings				
PWM A	**PWM C**	**PP**	**CP**	**CC**
4	-	-	-	-

Note: For PWM speed curves see data sheet *UPM3(K) 15-50 130, 25-50 130 (N), 25-50 180 (N), 32-50 180 (N)*.



Dimensions

TM06 3879 1115



Control box position

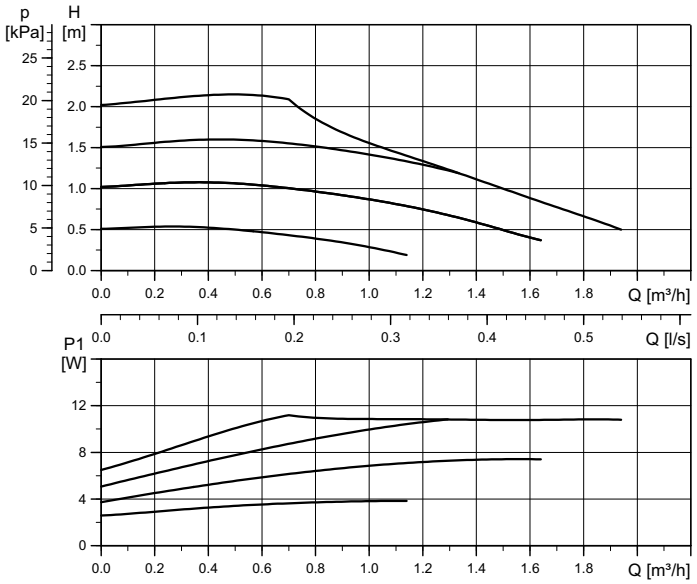
TM06 3880 1115

Pump type	Dimensions [mm]							Connections	Weight [kg]
	L1	L3	B1	B2	H1	H2	H3		
UPM3(K) DHW 25-50 130 N	130	90	72	45	36	92	128	G 1 1/2	2.1
UPM3(K) DHW 25-50 180 N	180	90	72	45	36	92	128	G 1 1/2	2.2
UPM3(K) DHW 32-50 180 N	180	90	72	45	36	92	128	G 2	2.4

Technical data

System pressure	Max. 1.0 MPa (10 bar)	**Enclosure class**	IP44 (non-condensing) K: IPX4D (condensing)
Minimum inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	**Motor protection**	No external protection needed
Liquid temperature	+2 °C to +110 °C (TF110)	**Approval and marking**	VDE, CE, drinking water approvals KTW (DE), DVGW W270 (DE), ACS (FR), WRAS (GB)
Temporary hardness	Max. 3 mmol/l $CaCO_3$ (16.8 ° dH)		

UPM3(K) DHW 25-20 130 N, 25-20 180 N, 32-20 180 N



Performance curve

High efficiency
Ready for Ecodesign 2015

Setting	Max. head $_{nom}$
Curve 1	0.5 m
Curve 2	1 m
Curve 3	1.5 m
Curve 4	2 m

Setting	Max. $P_{1\ nom}$
Curve 1	4 W
Curve 2	7 W
Curve 3	9 W
Curve 4	11 W

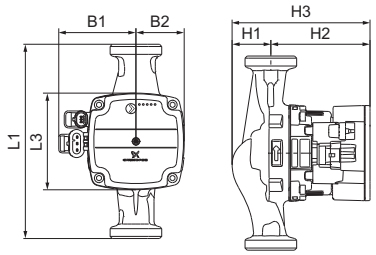
EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 7 W

TM06 4075 1515

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	2	0.04
Max.	12	0.14

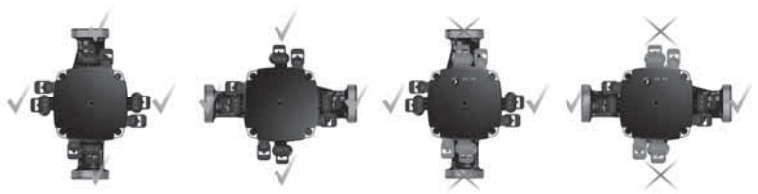
Settings				
PWM A	**PWM C**	**PP**	**CP**	**CC**
4	-	-	-	-

Note: PWM speed curves on request.



Dimensions

TM06 3879 1115



IP44

IPX4D
or K version

TM06 3880 1115

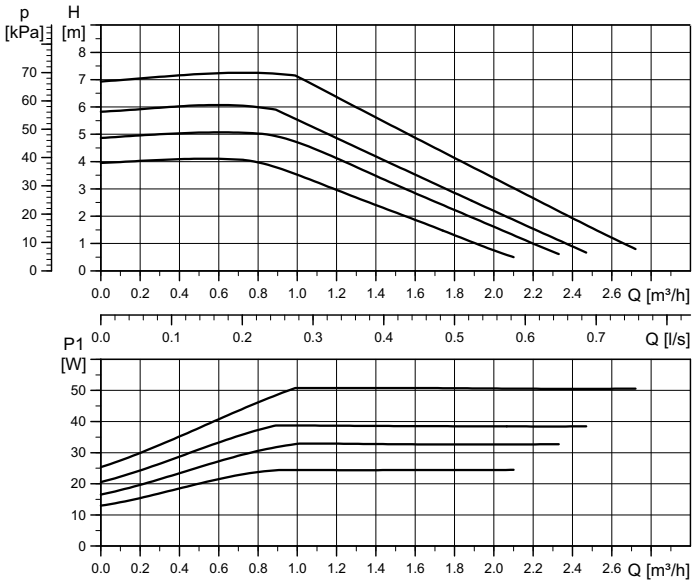
Control box position

Pump type	Dimensions [mm]							Connections	Weight [kg]
	L1	L3	B1	B2	H1	H2	H3		
UPM3(K) DHW 25-20 130 N	130	90	72	45	36	92	128	G 1 1/2	2.1
UPM3(K) DHW 25-20 180 N	180	90	72	45	36	92	128	G 1 1/2	2.2
UPM3(K) DHW 32-20 180 N	180	90	72	45	36	92	128	G 2	2.4

Technical data

System pressure	Max. 1.0 MPa (10 bar)	**Enclosure class**	IP44 (non-condensing) K: IPX4D (condensing)
Minimum inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	**Motor protection**	No external protection needed
Liquid temperature	+2 °C to +110 °C (TF110)	**Approval and marking**	VDE, CE, drinking water approvals KTW (DE), DVGW W270 (DE), ACS (FR), WRAS (GB)
Temporary hardness	Max. 3 mmol/l $CaCO_3$ (16.8 ° dH)		

UPM3(K) DHW 15-70 CIL3 PPS



Performance curve

High efficiency
Ready for Ecodesign 2015

Setting	Max. head $_{nom}$
Curve 1	4 m
Curve 2	5 m
Curve 3	6 m
Curve 4	7 m

Setting	Max. $P_{1\ nom}$
Curve 1	25 W
Curve 2	33 W
Curve 3	39 W
Curve 4	52 W

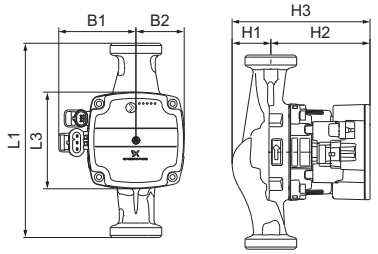
EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 23 W

TM06 4076 1515

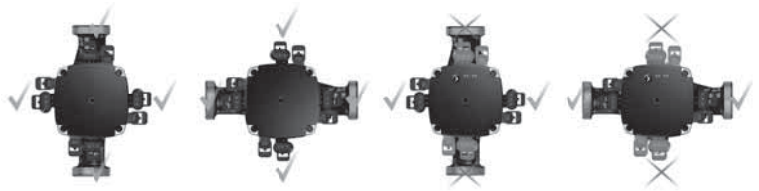
Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	2	0.04
Max.	52	0.52

Settings				
PWM A	**PWM C**	**PP**	**CP**	**CC**
4	-	-	-	-

Note: PWM speed curves on request.



Dimensions



TM06 3879 1115

IP44

IPX4D
or K version

TM06 3880 1115

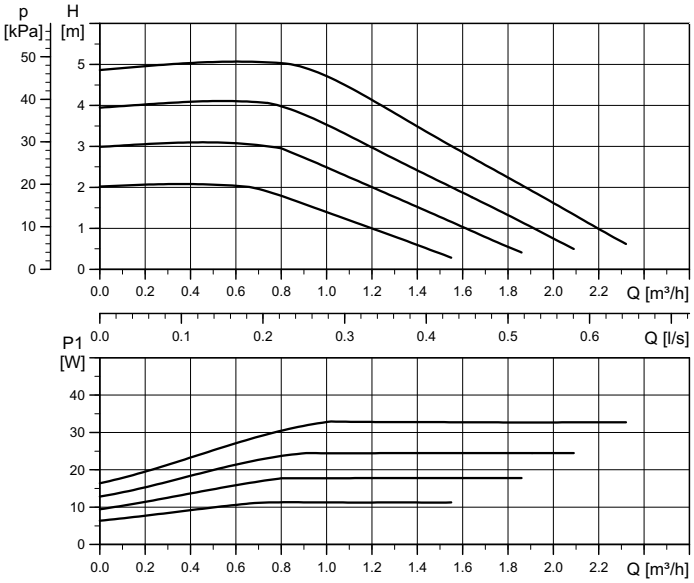
Control box position

Pump type	Dimensions [mm]							Connections	Weight [kg]
	L1	L3	B1	B2	H1	H2	H3		
UPM3(K) DHW 15-70 CIL3 PPS	130	90	72	45	36	92	128	G 1	1.3

Technical data

System pressure	Max. 1.0 MPa (10 bar)	**Enclosure class**	IP44 (non-condensing) K: IPX4D (condensing)
Minimum inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	**Motor protection**	No external protection needed
Liquid temperature	+2 °C to +95 °C (TF95)	**Approval and marking**	VDE, CE, drinking water approvals KTW (DE), DVGW W270 (DE), ACS (FR), WRAS (GB)
Temporary hardness	Max. 3 mmol/l $CaCO_3$ (16.8 ° dH)		

UPM3(K) DHW 15-50 CIL3 PPS



Performance curve

High efficiency
Ready for Ecodesign 2015

Setting	Max. head $_{nom}$
Curve 1	2 m
Curve 2	3 m
Curve 3	4 m
Curve 4	5 m

Setting	Max. $P_{1\ nom}$
Curve 1	11 W
Curve 2	18 W
Curve 3	25 W
Curve 4	33 W

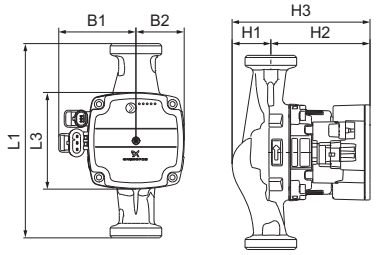
EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 16 W

TM06 4077 1515

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	2	0.04
Max.	33	0.34

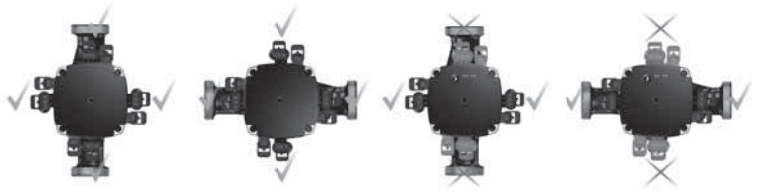
Settings				
PWM A	**PWM C**	**PP**	**CP**	**CC**
4	-	-	-	-

Note: PWM speed curves on request.



Dimensions

TM06 3879 1115



Control box position

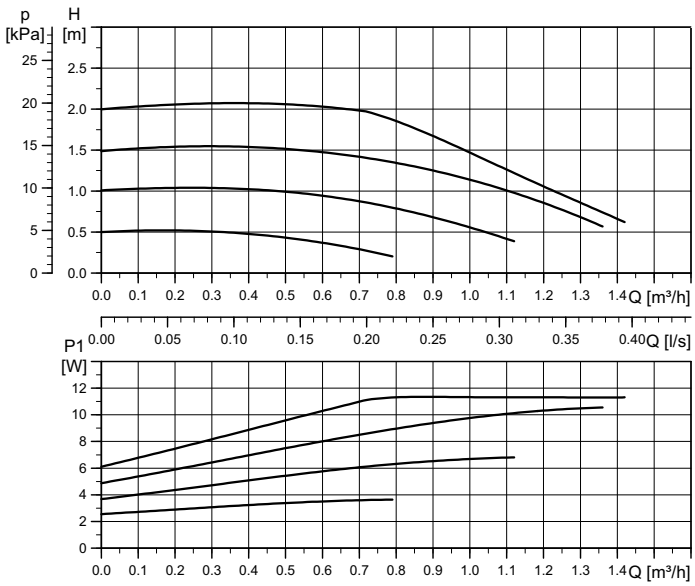
TM06 3880 1115

Pump type	Dimensions [mm]							Connections	Weight [kg]
	L1	L3	B1	B2	H1	H2	H3		
UPM3(K) DHW 15-50 CIL3 PPS	130	90	72	45	36	92	128	G 1	1.3

Technical data

System pressure	Max. 1.0 MPa (10 bar)	**Enclosure class**	IP44 (non-condensing) K: IPX4D (condensing)
Minimum inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	**Motor protection**	No external protection needed
Liquid temperature	+2 °C to +95 °C (TF95)	**Approval and marking**	VDE, CE, drinking water approvals KTW (DE), DVGW W270 (DE), ACS (FR), WRAS (GB)
Temporary hardness	Max. 3 mmol/l $CaCO_3$ (16.8 ° dH)		

UPM3(K) DHW 15-20 CIL3 PPS



Performance curve

High efficiency
Ready for Ecodesign 2015

Setting	Max. head $_{nom}$
Curve 1	0.5 m
Curve 2	1 m
Curve 3	1.5 m
Curve 4	2 m

Setting	Max. $P_{1\ nom}$
Curve 1	4 W
Curve 2	7 W
Curve 3	9 W
Curve 4	11 W

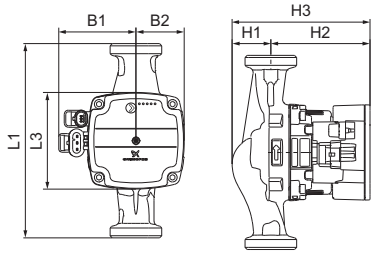
EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 7 W

TM06 4078 1515

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	2	0.04
Max.	12	0.14

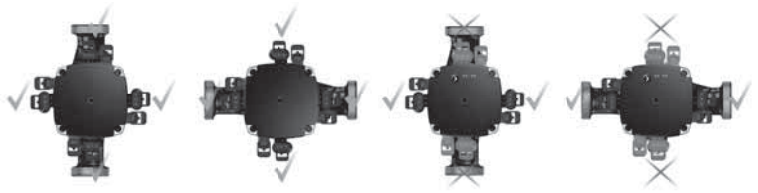
Settings				
PWM A	**PWM C**	**PP**	**CP**	**CC**
4	-	-	-	-

Note: PWM speed curves on request.



Dimensions

TM06 3879 1115



Control box position

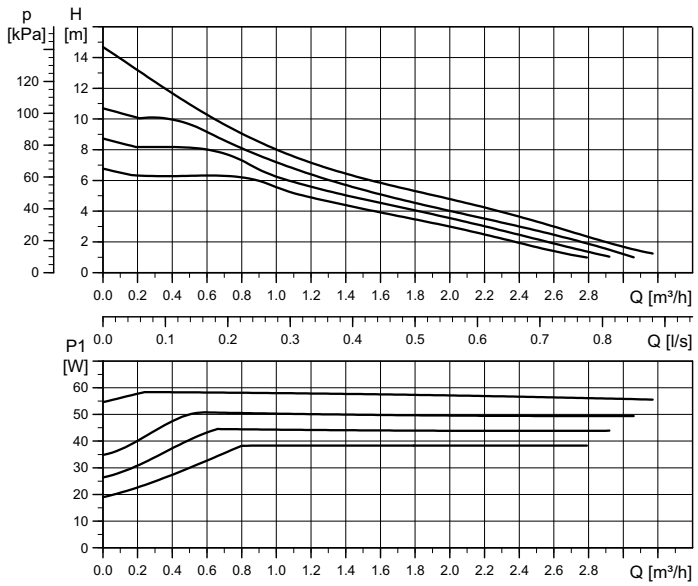
TM06 3880 1115

Pump type	Dimensions [mm]							Connections	Weight [kg]
	L1	L3	B1	B2	H1	H2	H3		
UPM3(K) DHW 15-20 CIL3 PPS	130	90	72	45	36	92	128	G 1	1.3

Technical data

System pressure	Max. 1.0 MPa (10 bar)	**Enclosure class**	IP44 (non-condensing) K: IPX4D (condensing)
Minimum inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	**Motor protection**	No external protection needed
Liquid temperature	+2 °C to +95 °C (TF95)	**Approval and marking**	VDE, CE, drinking water approvals KTW (DE), DVGW W270 (DE), ACS (FR), WRAS (GB)
Temporary hardness	Max. 3 mmol/l $CaCO_3$ (16.8 ° dH)		

UPM3(K) SOLAR 15-145 130, 25-145 130, 25-145 180



Performance curve

High efficiency
Ready for Ecodesign 2015

Setting	Max. head $_{nom}$
Curve 1	6.5 m
Curve 2	8.5 m
Curve 3	10.5 m
Curve 4	14.5 m

Setting	Max. $P_{1\ nom}$
Curve 1	39 W
Curve 2	45 W
Curve 3	52 W
Curve 4	60 W

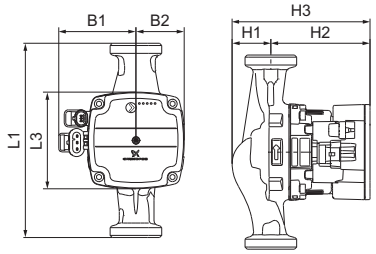
EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 25 W

TM06 3652 0815

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	2	0.04
Max.	60	0.58

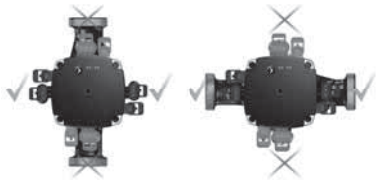
Settings				
PWM A	**PWM C**	**PP**	**CP**	**CC**
-	4	-	-	4

Note: PWM speed curves on request.



Dimensions

TM06 3879 1115



Control box position

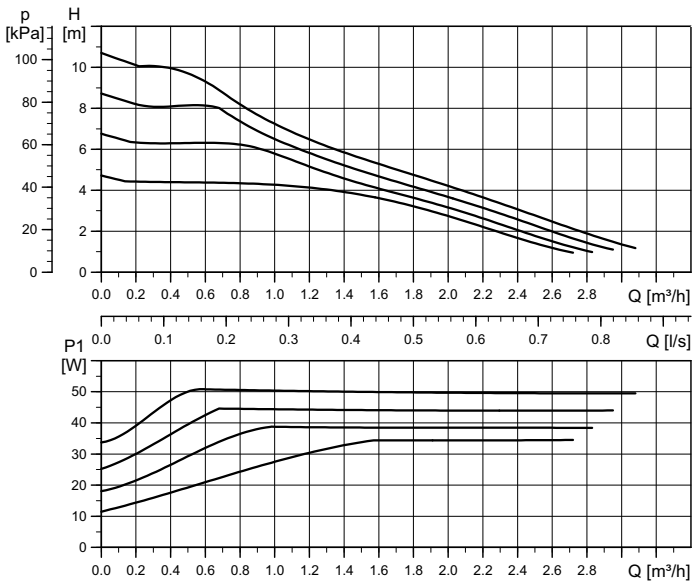
TM06 4200 1115

Pump type	Dimensions [mm]							Connections	Weight [kg]
	L1	L3	B1	B2	H1	H2	H3		
UPM3(K) SOLAR 15-145 130	130	90	72	45	25	103	128	G 1	1.8
UPM3(K) SOLAR 25-145 130	130	90	72	45	25	103	128	G 1 1/2	1.9
UPM3(K) SOLAR 25-145 180	180	90	72	45	25	103	128	G 1 1/2	2.0

Technical data

System pressure	Max. 1.0 MPa (10 bar)	**Enclosure class**	IPX4D
Minimum inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	**Motor protection**	No external protection needed
Liquid temperature	+2 °C to +110 °C (TF110) Max. 130 °C (60 °C ambient temperature)	**Approval and marking**	VDE, CE

UPM3(K) SOLAR 15-105 130, 25-105 130, 25-105 180



Performance curve

High efficiency
Ready for Ecodesign 2015

Setting	Max. head $_{nom}$
Curve 1	4.5 m
Curve 2	6.5 m
Curve 3	8.5 m
Curve 4	10.5 m

Setting	Max. $P_{1\ nom}$
Curve 1	35 W
Curve 2	39 W
Curve 3	45 W
Curve 4	52 W

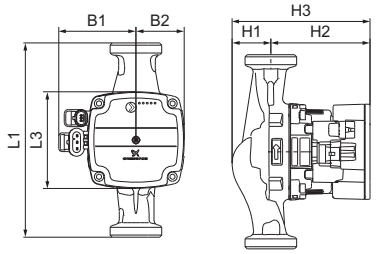
EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 22 W

TM06 63651 0815

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	2	0.04
Max.	52	0.52

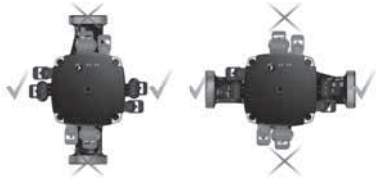
Settings				
PWM A	**PWM C**	**PP**	**CP**	**CC**
-	4	-	-	4

Note: PWM speed curves on request.



Dimensions

TM06 3879 1115



Control box position

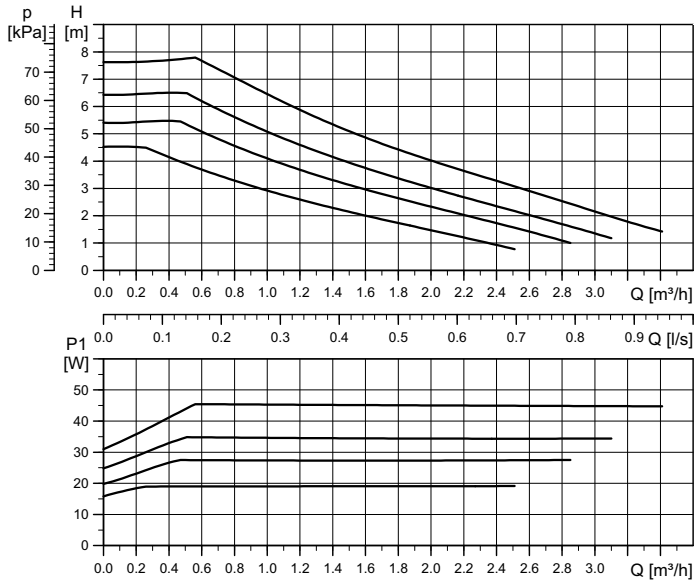
TM06 4200 1115

Pump type	Dimensions [mm]							Connections	Weight [kg]
	L1	L3	B1	B2	H1	H2	H3		
UPM3(K) SOLAR 15-105 130	130	90	72	45	36	92	128	G 1	1.8
UPM3(K) SOLAR 25-105 130	130	90	72	45	36	92	128	G 1 1/2	1.9
UPM3(K) SOLAR 25-105 180	180	90	72	45	36	92	128	G 1 1/2	2.0

Technical data

System pressure	Max. 1.0 MPa (10 bar)	**Enclosure class**	IPX4D
Minimum inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	**Motor protection**	No external protection needed
Liquid temperature	+2 °C to +110 °C (TF110) Max. 130 °C (60 °C ambient temperature)	**Approval and marking**	VDE, CE

UPM3(K) SOLAR 15-75 130, 25-75 130 (N), 25-75 180 (N), 32-75 180 (N)



Performance curve

High efficiency
Ready for Ecodesign 2015

Setting	Max. head $_{nom}$
Curve 1	4.5 m
Curve 2	5.5 m
Curve 3	6.5 m
Curve 4	7.5 m

Setting	Max. $P_{1\ nom}$
Curve 1	19 W
Curve 2	28 W
Curve 3	35 W
Curve 4	45 W

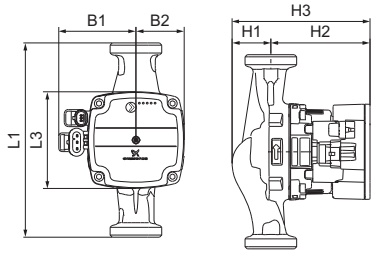
EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 20 W

TM06 3658 0815

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	2	0.04
Max.	45	0.48

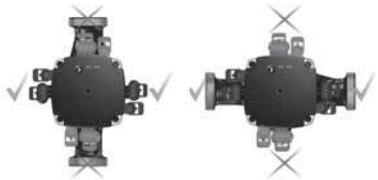
Settings				
PWM A	**PWM C**	**PP**	**CP**	**CC**
-	4	-	-	4

Note: PWM speed curves on request.



Dimensions

TM06 3879 1115



Control box position

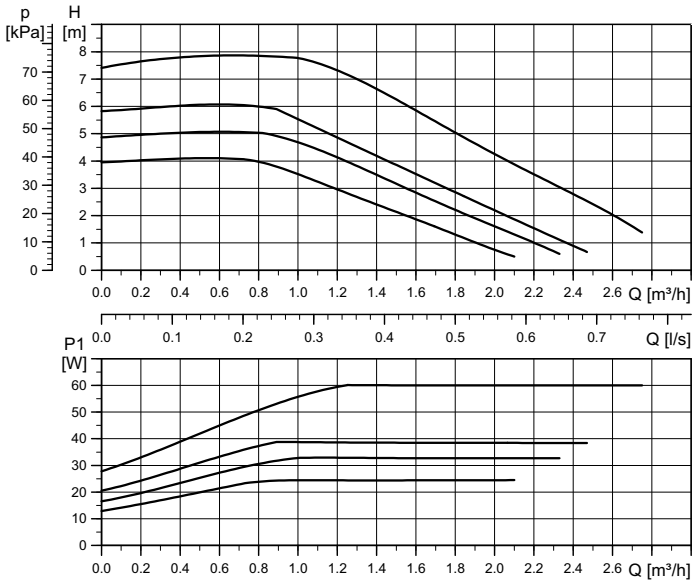
TM06 4200 1115

Pump type	Dimensions [mm]							Connections	Weight [kg]
	L1	L3	B1	B2	H1	H2	H3		
UPM3(K) SOLAR 15-75 130	130	90	72	45	36	92	128	G 1	1.8
UPM3(K) SOLAR 25-75 130 (N)	130	90	72	45	36	92	128	G 1 1/2	1.9
UPM3(K) SOLAR 25-75 180 (N)	180	90	72	45	36	92	128	G 1 1/2	2.0
UPM3(K) SOLAR 32-75 180 (N)	180	90	72	45	36	92	128	G 2	2.2

Technical data

System pressure	Max. 1.0 MPa (10 bar)	**Enclosure class**	IPX4D
Minimum inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	**Motor protection**	No external protection needed
Liquid temperature	+2 °C to +110 °C (TF110) Max. 130 °C (60 °C ambient temperature)	**Approval and marking**	VDE, CE

UPM3(K) FLEX AS 15-75 CIL3



Performance curve

High efficiency
Ready for Ecodesign 2015

Setting	Max. head $_{nom}$
Curve 1	4 m
Curve 2	5 m
Curve 3	6 m
Curve 4	7.5 m

Setting	Max. $P_{1\ nom}$
Curve 1	25 W
Curve 2	33 W
Curve 3	39 W
Curve 4	60 W

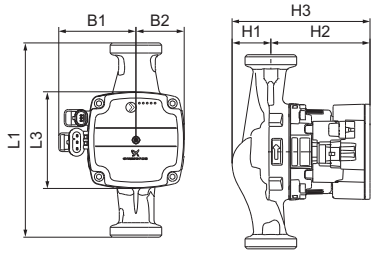
EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 28 W

TM06 3869 1115

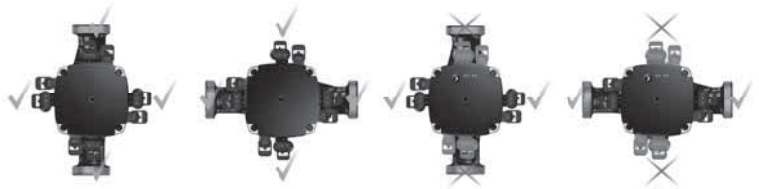
Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	2	0.04
Max.	60	0.58

Settings				
PWM A	**PWM C**	**PP**	**CP**	**CC**
4	-	-	-	-

Note: PWM speed curves on request.



Dimensions



TM06 3879 1115

TM06 3880 1115

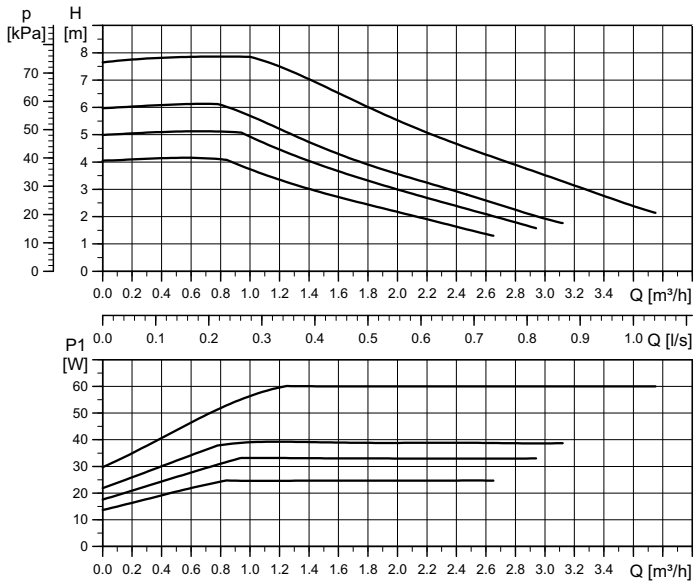
Control box position

Pump type	Dimensions [mm]							Connections	Weight [kg]
	L1	L3	B1	B2	H1	H2	H3		
UPM3(K) FLEX AS 15-75 CIL3	130	90	72	45	28	96	124	G 1	1.3

Technical data

System pressure	PA 6.6: Max. 0.3 MPa (3 bar) PPS: Max. 1.0 MPa (10 bar)	**Enclosure class**	IP44 (non-condensing) K: IPX4D (condensing)
Minimum inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	**Motor protection**	No external protection needed
Liquid temperature	+2 °C to +95 °C (TF95)	**Approval and marking**	VDE, CE

UPM3(K) FLEX AS 15-75 GGES3



Performance curve

High efficiency
Ready for Ecodesign 2015

Setting	Max. head $_{nom}$
Curve 1	4 m
Curve 2	5 m
Curve 3	6 m
Curve 4	7.5 m

Setting	Max. $P_{1\ nom}$
Curve 1	25 W
Curve 2	33 W
Curve 3	39 W
Curve 4	60 W

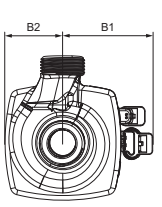
EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 28 W

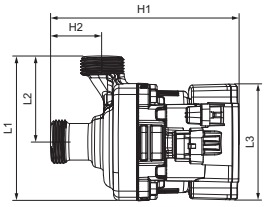
TM06 3870 1115

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	2	0.04
Max.	60	0.58

Settings				
PWM A	**PWM C**	**PP**	**CP**	**CC**
4	-	-	-	-

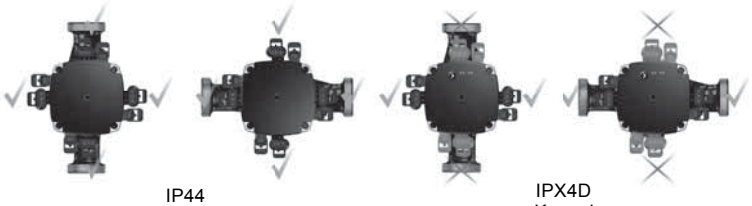
Note: PWM speed curves on request.





Dimensions

TM06 3949 1315



Control box position

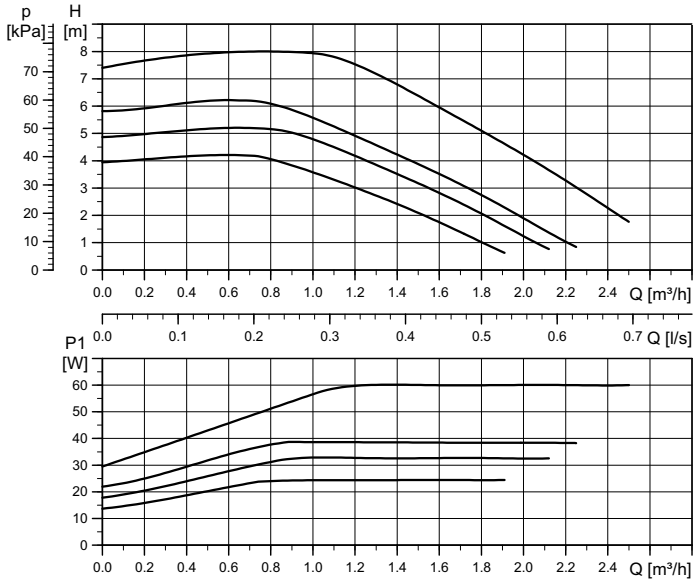
TM06 3880 1115

Pump type	Dimensions [mm]							Connections	Weight [kg]
	L1	L2	L3	B1	B2	H1	H2		
UPM3(K) FLEX AS 15-75 GGES3	110	65	90	72	47	141	39	2 x G 1	2.0

Technical data

System pressure	Max. 1.0 MPa (10 bar)	**Enclosure class**	IP44 (non-condensing) K: IPX4D (condensing)
Minimum inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	**Motor protection**	No external protection needed
Liquid temperature	+2 °C to +110 °C (TF110)	**Approval and marking**	VDE, CE

UPM3(K) FLEX AS 15-75 GGMBP3



Performance curve

High efficiency
Ready for Ecodesign 2015

Setting	Max. head $_{nom}$
Curve 1	4 m
Curve 2	5 m
Curve 3	6 m
Curve 4	7.5 m

Setting	Max. $P_{1\ nom}$
Curve 1	25 W
Curve 2	33 W
Curve 3	39 W
Curve 4	60 W

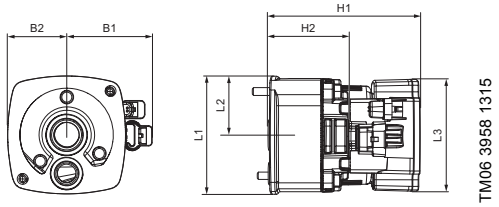
EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 28 W

TM06 3871 1115

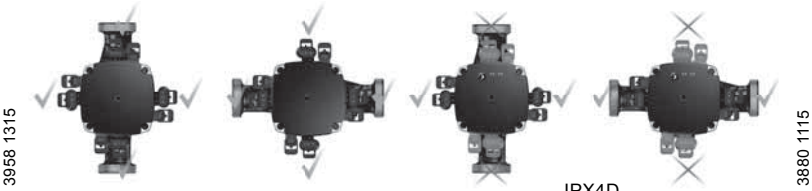
Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	2	0.04
Max.	60	0.58

Settings				
PWM A	**PWM C**	**PP**	**CP**	**CC**
4	-	-	-	-

Note: PWM speed curves on request.



Dimensions



TM06 3958 1315

TM06 3880 1115

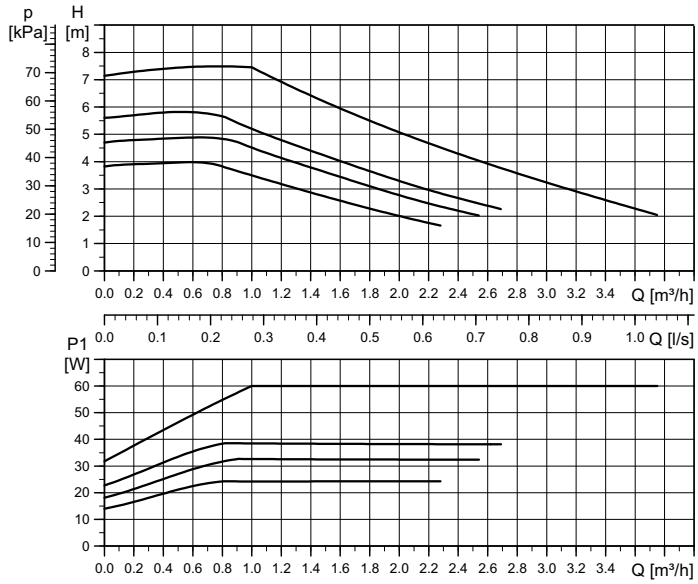
Control box position

Pump type	Dimensions [mm]							Connections	Weight [kg]
	L1	L2	L3	B1	B2	H1	H2		
UPM3(K) FLEX AS 15-75 GGMBP3	93	46.5	90	72	47	114	48.5	19/26	2.2

Technical data

System pressure	Max. 1.0 MPa (10 bar)	**Enclosure class**	IP44 (non-condensing) K: IPX4D (condensing)
Minimum inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	**Motor protection**	No external protection needed
Liquid temperature	+2 °C to +110 °C (TF110)	**Approval and marking**	VDE, CE

UPM3(K) FLEX AS 15-75 GGBP3



Performance curve

High efficiency
Ready for Ecodesign 2015

Setting	Max. head $_{nom}$
Curve 1	4 m
Curve 2	5 m
Curve 3	6 m
Curve 4	7.5 m

Setting	Max. $P_{1\ nom}$
Curve 1	25 W
Curve 2	33 W
Curve 3	39 W
Curve 4	60 W

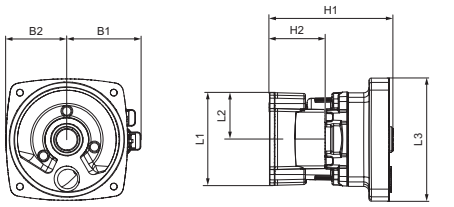
EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 28 W

TM06 4091 1515

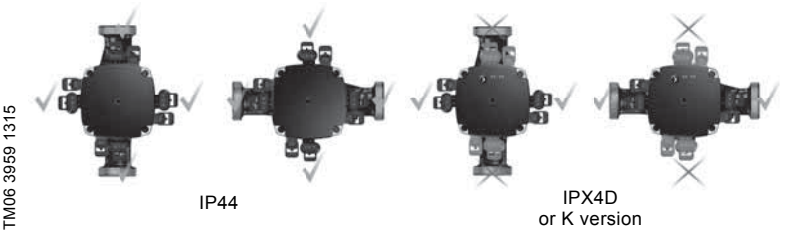
Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	2	0.04
Max.	60	0.58

Settings				
PWM A	**PWM C**	**PP**	**CP**	**CC**
4	-	-	-	-

Note: PWM speed curves on request.



Dimensions



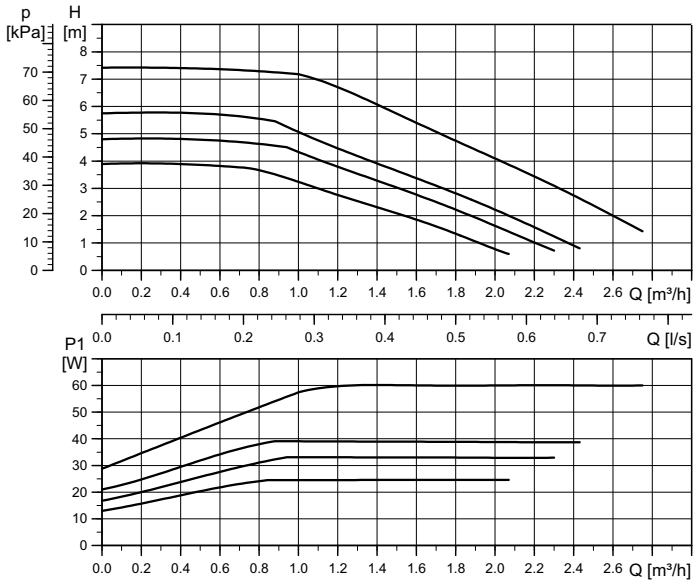
Control box position

Pump type	Dimensions [mm]							Connections	Weight [kg]
	L1	L2	L3	B1	B2	H1	H2		
UPM3(K) FLEX AS 15-75 GGBP3	117	58.5	90	72	58.5	115	39	2 x 24.5	2.7

Technical data

System pressure	Max. 1.0 MPa (10 bar)	**Enclosure class**	IP44 (non-condensing) K: IPX4D (condensing)
Minimum inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	**Motor protection**	No external protection needed
Liquid temperature	+2 °C to +110 °C (TF110)	**Approval and marking**	VDE, CE

UPM3(K) FLEX AS 15-75 CIAO2



Performance curve

High efficiency
Ready for Ecodesign 2015

Setting	Max. head $_{nom}$
Curve 1	4 m
Curve 2	5 m
Curve 3	6 m
Curve 4	7.5 m

Setting	Max. $P_{1\ nom}$
Curve 1	25 W
Curve 2	33 W
Curve 3	39 W
Curve 4	60 W

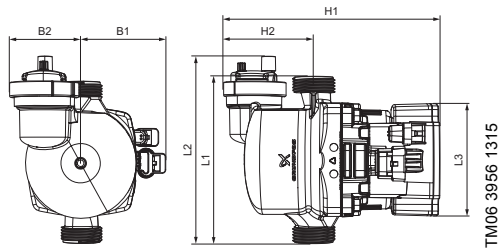
EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 28 W

TM06 3868 1115

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	2	0.04
Max.	60	0.58

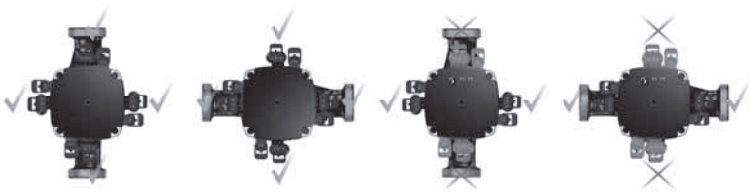
Settings				
PWM A	**PWM C**	**PP**	**CP**	**CC**
4	-	-	-	-

Note: PWM speed curves on request.



Dimensions

TM06 3956 1315



Control box position

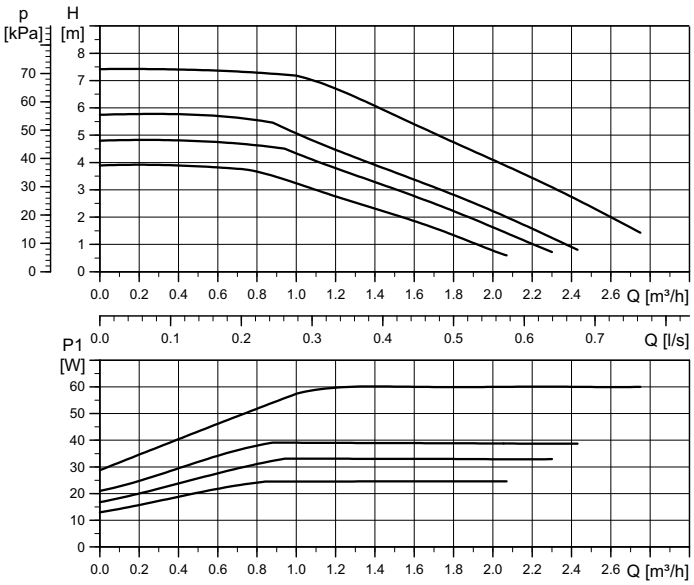
TM06 3880 1115

Pump type	Dimensions [mm]							Connections	Weight [kg]
	L1	L2	L3	B1	B2	H1	H2		
UPM3(K) FLEX AS 15-75 CIAO2	130	148	90	72	55	173	77	2 x G1	1.3

Technical data

System pressure	Max. 0.3 MPa (3 bar)	**Enclosure class**	IP44 (non-condensing) K: IPX4D (condensing)
Minimum inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	**Motor protection**	No external protection needed
Liquid temperature	+2 °C to +95 °C (TF95)	**Approval and marking**	VDE, CE

UPM3(K) FLEX AS 15-75 CIAO2 AC



Performance curve

High efficiency
Ready for Ecodesign 2015

Setting	Max. head $_{nom}$
Curve 1	4 m
Curve 2	5 m
Curve 3	6 m
Curve 4	7.5 m

Setting	Max. $P_{1\ nom}$
Curve 1	25 W
Curve 2	33 W
Curve 3	39 W
Curve 4	60 W

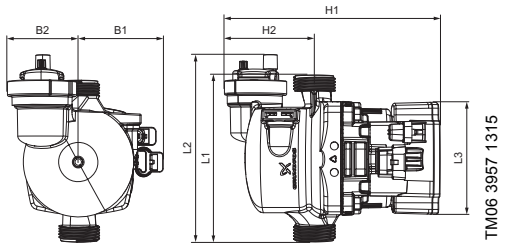
EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 28 W

TM06 3868 1115

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	2	0.04
Max.	60	0.58

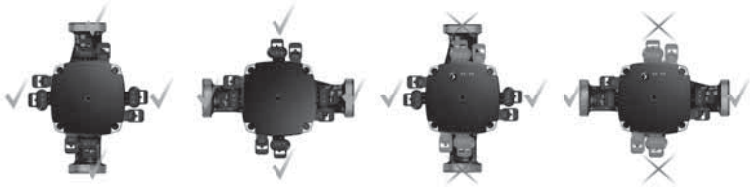
Settings				
PWM A	**PWM C**	**PP**	**CP**	**CC**
4	-	-	-	-

Note: PWM speed curves on request.



Dimensions

TM06 3957 1315



Control box position

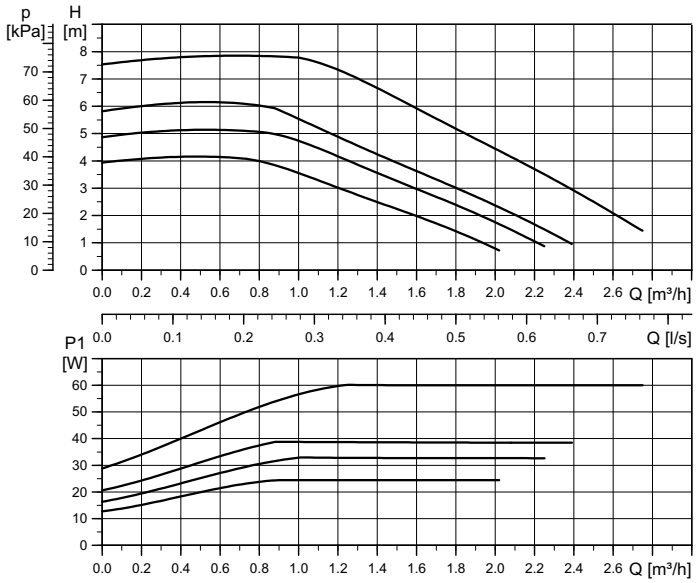
TM06 3880 1115

Pump type	Dimensions [mm]							Connections	Weight [kg]
	L1	L2	L3	B1	B2	H1	H2		
UPM3(K) FLEX AS 15-75 CIAO2 AC	130	148	90	72	55	173	77	2 x G1 + D10	1.3

Technical data

System pressure	Max. 0.3 MPa (3 bar)	**Enclosure class**	IP44 (non-condensing) K: IPX4D (condensing)
Minimum inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	**Motor protection**	No external protection needed
Liquid temperature	+2 °C to +95 °C (TF95)	**Approval and marking**	VDE, CE

UPM3(K) FLEX AS 15-75 CES3



Performance curve

High efficiency
Ready for Ecodesign 2015

Setting	Max. head $_{nom}$
Curve 1	4 m
Curve 2	5 m
Curve 3	6 m
Curve 4	7.5 m

Setting	Max. $P_{1\ nom}$
Curve 1	25 W
Curve 2	33 W
Curve 3	39 W
Curve 4	60 W

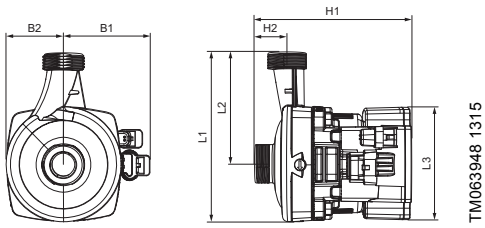
EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 28 W

TM06 3863 1115

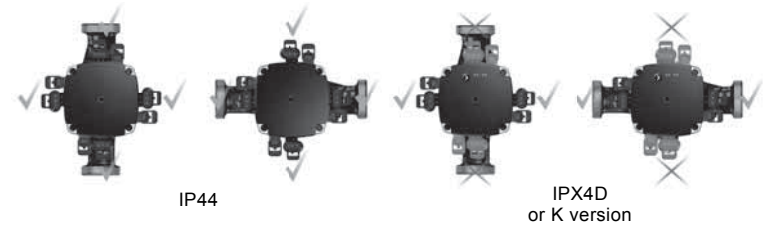
Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	2	0.04
Max.	60	0.58

Settings				
PWM A	**PWM C**	**PP**	**CP**	**CC**
4	-	-	-	-

Note: PWM speed curves on request.



Dimensions



TM063948 1315

TM06 3880 1115

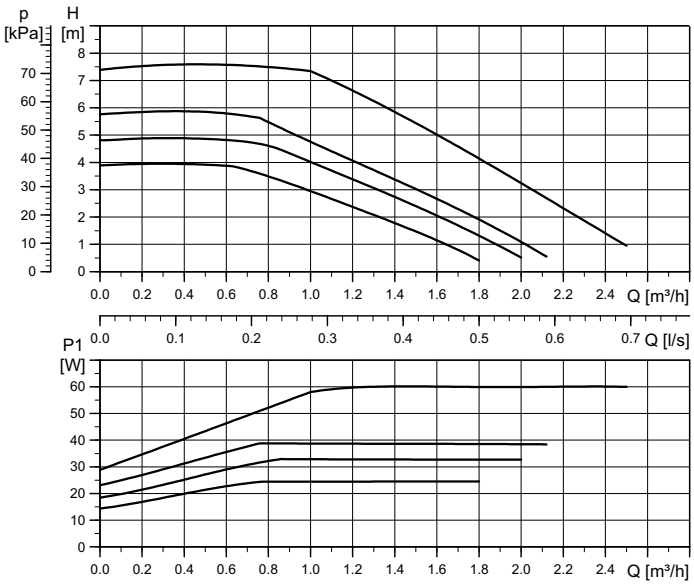
Control box position

Pump type	Dimensions [mm]							Connections	Weight [kg]
	L1	L2	L3	B1	B2	H1	H2		
UPM3(K) FLEX AS 15-75 CES3	132	87	90	72	47	120	25	2 x G1	1.2

Technical data

System pressure	Max. 0.3 MPa (3 bar)	**Enclosure class**	IP44 (non-condensing) K: IPX4D (condensing)
Minimum inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	**Motor protection**	No external protection needed
Liquid temperature	+2 °C to +95 °C (TF95)	**Approval and marking**	VDE, CE

UPM3(K) FLEX AS 15-75 CACAO



Performance curve

High efficiency
Ready for Ecodesign 2015

Setting	Max. head $_{nom}$
Curve 1	4 m
Curve 2	5 m
Curve 3	6 m
Curve 4	7.5 m

Setting	Max. $P_{1\ nom}$
Curve 1	25 W
Curve 2	33 W
Curve 3	39 W
Curve 4	60 W

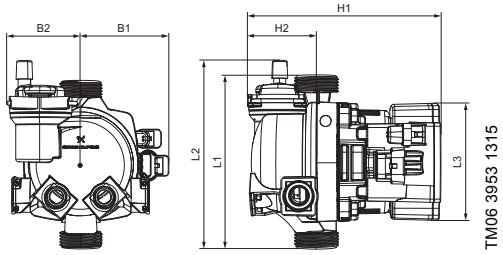
EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 28 W

TM06 3862 1115

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	2	0.04
Max.	60	0.58

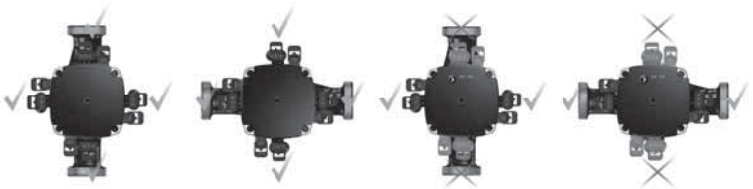
Settings				
PWM A	**PWM C**	**PP**	**CP**	**CC**
4	-	-	-	-

Note: PWM speed curves on request.



Dimensions

TM06 3953 1315



IP44

IPX4D
or K version

TM06 3880 1115

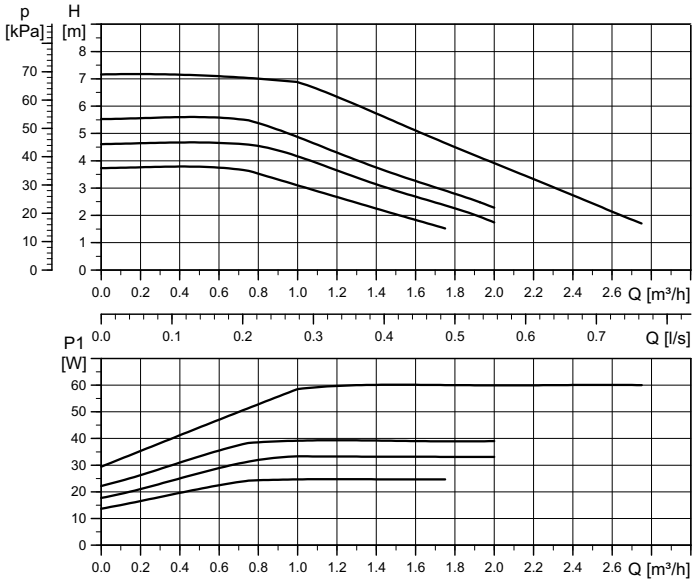
Control box position

Pump type	Dimensions [mm]							Connections	Weight [kg]
	L1	L2	L3	B1	B2	H1	H2		
UPM3(K) FLEX AS 15-75 CACAO	130	137	90	72	54	144	53	2 x G1/D14/D10	1.3

Technical data

System pressure	Max. 0.3 MPa (3 bar)	**Enclosure class**	IP44 (non-condensing) K: IPX4D (condensing)
Minimum inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	**Motor protection**	No external protection needed
Liquid temperature	+2 °C to +95 °C (TF95)	**Approval and marking**	VDE, CE

UPM3(K) FLEX AS 15-75 CESAO1



Performance curve

High efficiency
Ready for Ecodesign 2015

Setting	Max. head $_{nom}$
Curve 1	4 m
Curve 2	5 m
Curve 3	6 m
Curve 4	7.5 m

Setting	Max. $P_{1\ nom}$
Curve 1	25 W
Curve 2	33 W
Curve 3	39 W
Curve 4	60 W

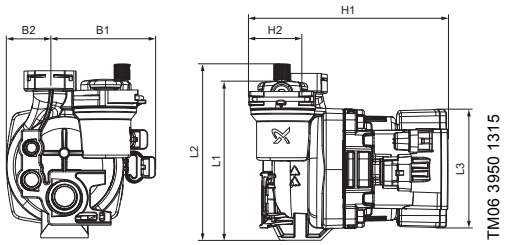
EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 28 W

TM06 3864 1115

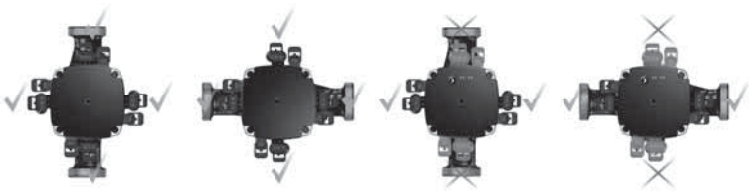
Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	2	0.04
Max.	60	0.58

Settings				
PWM A	**PWM C**	**PP**	**CP**	**CC**
4	-	-	-	-

Note: PWM speed curves on request.



Dimensions



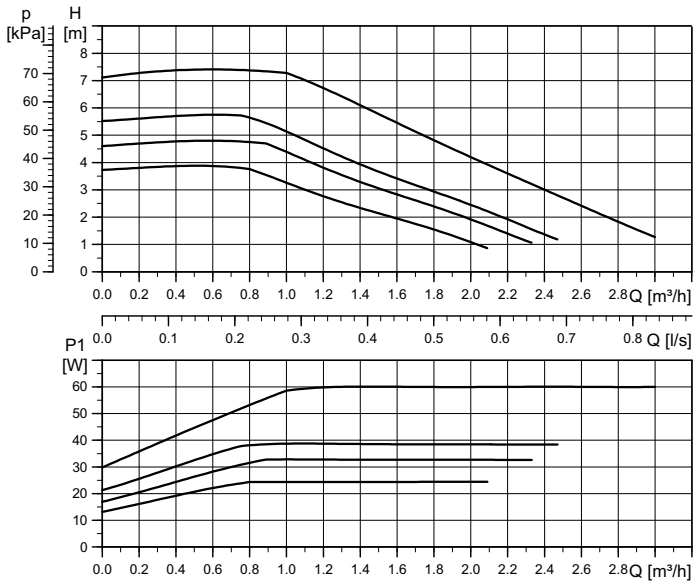
Control box position

Pump type	Dimensions [mm]							Connections	Weight [kg]
	L1	L2	L3	B1	B2	H1	H2		
UPM3(K) FLEX AS 15-75 CESAO1	124	128	90	72	45	144	45	2 x D18/D10/D6	1.3

Technical data

System pressure	Max. 0.3 MPa (3 bar)	**Enclosure class**	IP44 (non-condensing) K: IPX4D (condensing)
Minimum inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	**Motor protection**	No external protection needed
Liquid temperature	+2 °C to +95 °C (TF95)	**Approval and marking**	VDE, CE

UPM3(K) FLEX AS 15-75 CESAO2



Performance curve

High efficiency
Ready for Ecodesign 2015

Setting	Max. head $_{nom}$
Curve 1	4 m
Curve 2	5 m
Curve 3	6 m
Curve 4	7.5 m

Setting	Max. $P_{1\ nom}$
Curve 1	25 W
Curve 2	33 W
Curve 3	39 W
Curve 4	60 W

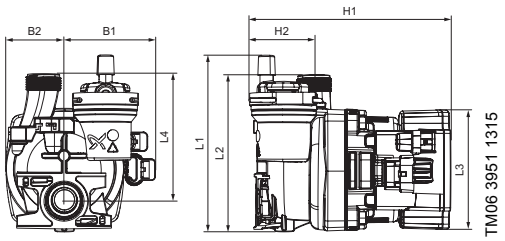
EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 28 W

TM06 3885 1115

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	2	0.04
Max.	60	0.58

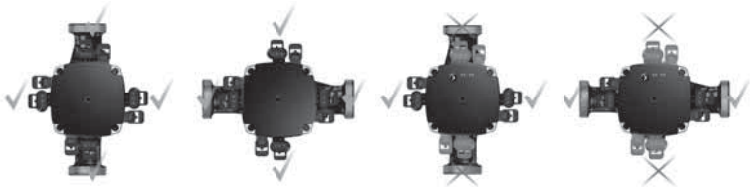
Settings				
PWM A	**PWM C**	**PP**	**CP**	**CC**
4	-	-	-	-

Note: PWM speed curves on request.



Dimensions

TM06 3951 1315



Control box position

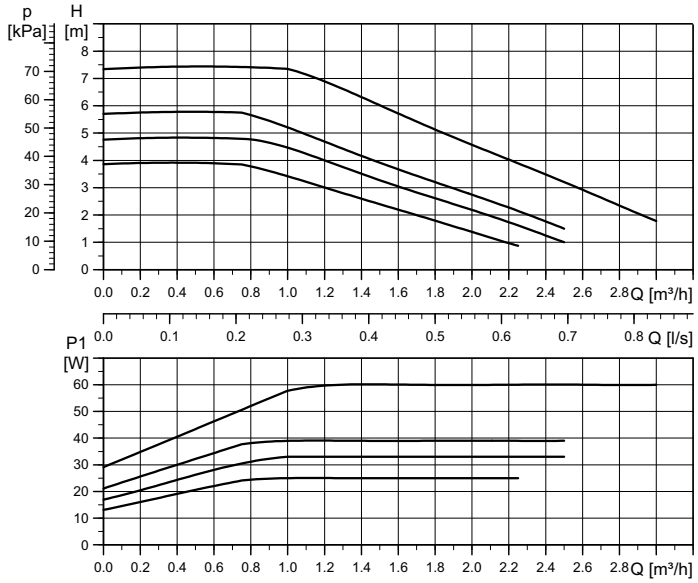
TM06 3880 1115

Pump type	Dimensions [mm]								Connections	Weight [kg]
	L1	L2	L3	L4	B1	B2	H1	H2		
UPM3(K) FLEX AS 15-75 CESAO2	138	116	90	87	72	45	144	45	G1/D18/D10/D6	1.3

Technical data

System pressure	Max. 0.3 MPa (3 bar)	**Enclosure class**	IP44 (non-condensing) K: IPX4D (condensing)
Minimum inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	**Motor protection**	No external protection needed
Liquid temperature	+2 °C to +95 °C (TF95)	**Approval and marking**	VDE, CE

UPM3(K) FLEX AS 15-75 CESAO4



Performance curve

High efficiency
Ready for Ecodesign 2015

Setting	Max. head $_{nom}$
Curve 1	4 m
Curve 2	5 m
Curve 3	6 m
Curve 4	7.5 m

Setting	Max. $P_{1\ nom}$
Curve 1	25 W
Curve 2	33 W
Curve 3	39 W
Curve 4	60 W

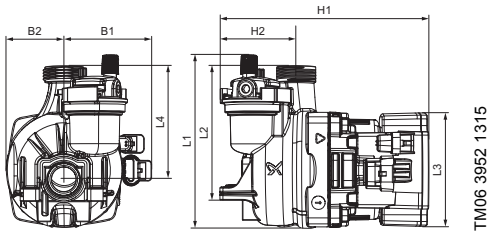
EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 28 W

TM06 3867 1115

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	2	0.04
Max.	60	0.58

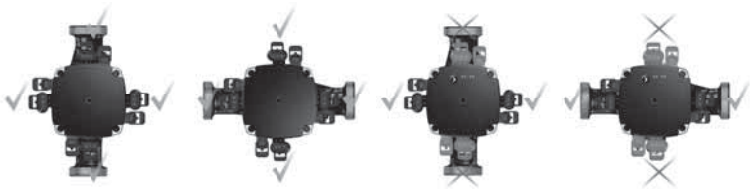
Settings				
PWM A	**PWM C**	**PP**	**CP**	**CC**
4	-	-	-	-

Note: PWM speed curves on request.



Dimensions

TM06 3952 1315



Control box position

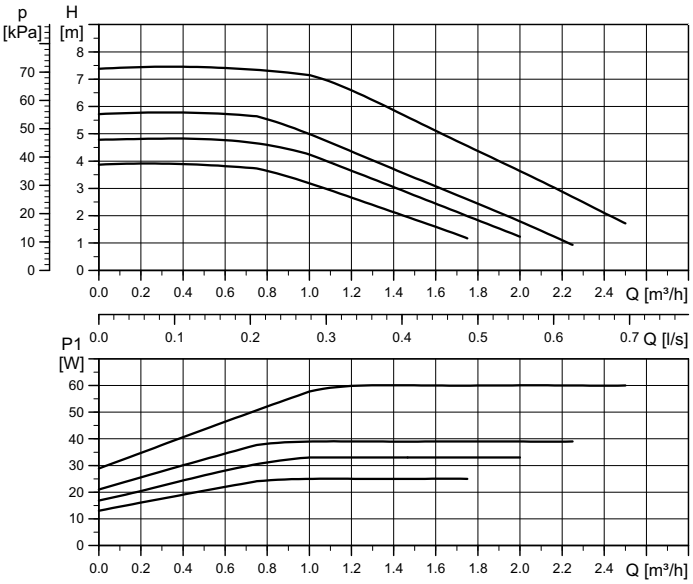
TM06 3880 1115

Pump type	Dimensions [mm]								Connections	Weight [kg]
	L1	L2	L3	L4	B1	B2	H1	H2		
UPM3(K) FLEX AS 15-75 CESAO4	138	126	90	93	88	29	144	45	G1/D18	1.3

Technical data

System pressure	Max. 0.3 MPa (3 bar)	**Enclosure class**	IP44 (non-condensing) K: IPX4D (condensing)
Minimum inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	**Motor protection**	No external protection needed
Liquid temperature	+2 °C to +95 °C (TF95)	**Approval and marking**	VDE, CE

UPM3(K) FLEX AS 15-75 AOKR



Performance curve

High efficiency
Ready for Ecodesign 2015

Setting	Max. head $_{nom}$
Curve 1	4 m
Curve 2	5 m
Curve 3	6 m
Curve 4	7.5 m

Setting	Max. $P_{1\ nom}$
Curve 1	25 W
Curve 2	33 W
Curve 3	39 W
Curve 4	60 W

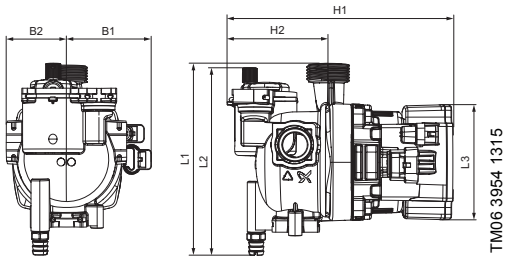
EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 28 W

TM06 4092 1515

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	2	0.04
Max.	60	0.58

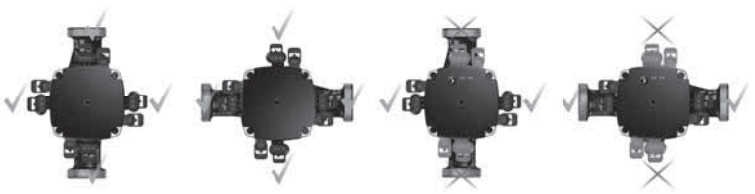
Settings				
PWM A	**PWM C**	**PP**	**CP**	**CC**
4	-	-	-	-

Note: PWM speed curves on request.



Dimensions

TM06 3954 1315



Control box position

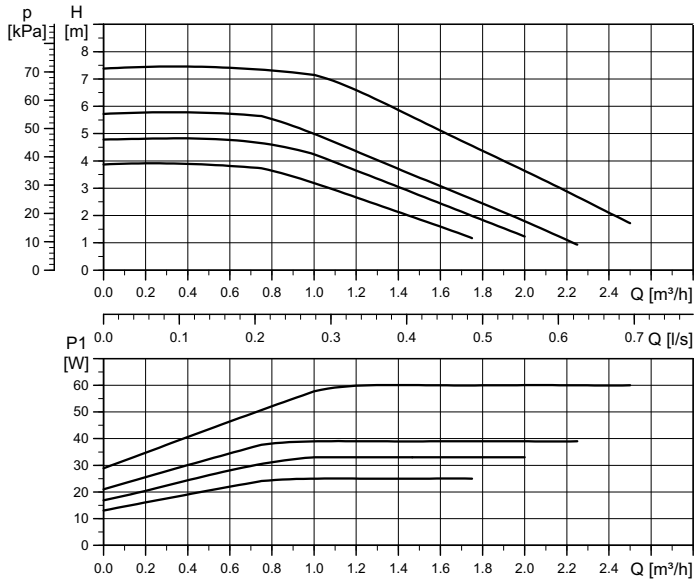
TM06 3880 1115

Pump type	Dimensions [mm]							Connections	Weight [kg]
	L1	L2	L3	B1	B2	H1	H2		
UPM3(K) FLEX AS 15-75 AOKR	148	151	90	72	45	172	79	G1/2 x D18/D15	1.4

Technical data

System pressure	Max. 0.3 MPa (3 bar)	**Enclosure class**	IP44 (non-condensing) K: IPX4D (condensing)
Minimum inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	**Motor protection**	No external protection needed
Liquid temperature	+2 °C to +95 °C (TF95)	**Approval and marking**	VDE, CE

UPM3(K) FLEX AS 15-75 CAOD



Performance curve

High efficiency
Ready for Ecodesign 2015

Setting	Max. head $_{nom}$
Curve 1	4 m
Curve 2	5 m
Curve 3	6 m
Curve 4	7.5 m

Setting	Max. $P_{1\ nom}$
Curve 1	25 W
Curve 2	33 W
Curve 3	39 W
Curve 4	60 W

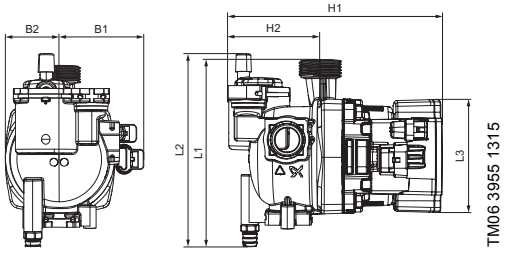
EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 28 W

TM06 4092 1515

Electrical data, 1 x 230 V, 50 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	2	0.04
Max.	60	0.58

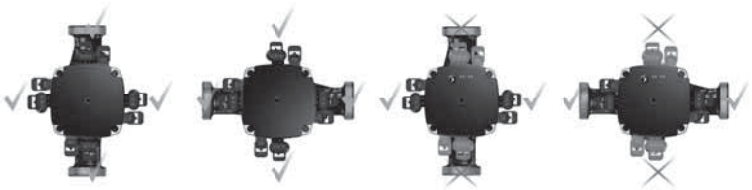
Settings				
PWM A	**PWM C**	**PP**	**CP**	**CC**
4	-	-	-	-

Note: PWM speed curves on request.



Dimensions

TM06 3955 1315



IP44

IPX4D
or K version

TM06 3880 1115

Control box position

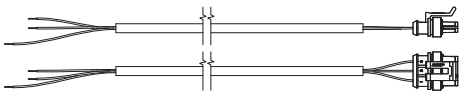
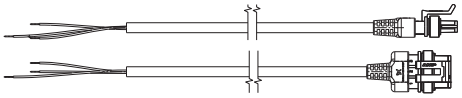
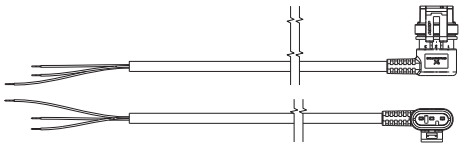
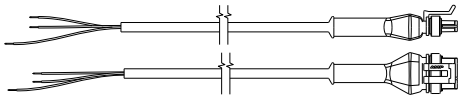
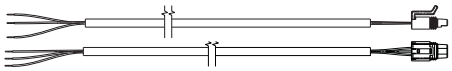
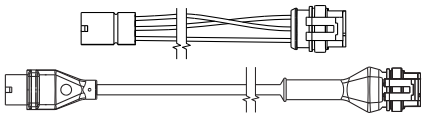
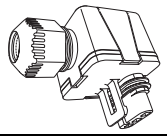
Pump type	Dimensions [mm]							Connections	Weight [kg]
	L1	L2	L3	B1	B2	H1	H2		
UPM3(K) FLEX AS 15-75 CAOD	148	151	90	72	45	172	79	G1/D18/D15	1.4

Technical data

System pressure	Max. 0.3 MPa (3 bar)	**Enclosure class**	IP44 (non-condensing) K: IPX4D (condensing)
Minimum inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	**Motor protection**	No external protection needed
Liquid temperature	+2 °C to +95 °C (TF95)	**Approval and marking**	VDE, CE

14. Accessories

Different accessories, such as cables, gaskets, insulation shells, quick guides or specific mounting parts are available for UPM3. They can be delivered together with the pump, or separately.

Picture	Product description	Length [mm]	Product number	Pcs/box	Product number box
	**Power supply Superseal**				
	Power supply cable Superseal	500	98830252		
	Power supply cable Superseal	1000	98460260	200	59200566
	Power supply cable Superseal	2000	98373382	100	59200567
	Power supply cable Superseal	4000	98460271	50	59200568
	**Power supply Superseal, overmoulded**				
	Power supply Superseal overmoulded	1000	98460258	200	59200569
	Power supply Superseal overmoulded	2000	98373384	100	59200570
	Power supply Superseal overmoulded	4000	98460259	50	59200571
	**Power supply Superseal, overmoulded, angled**				
	Power supply Superseal, overmoulded, angled 90 °	1000	98616020	200	59200572
	Power supply Superseal, overmoulded, angled 90 °	2000	98616051	100	59200535
	Power supply Superseal, angled 90 °, with rubber cap	1000	98664474	200	98677544
	**Signal cable Mini Superseal**				
	Signal cable, Mini Superseal	500	98830257		
	Signal cable, Mini Superseal	1000	98460256	200	59200573
	Signal cable, Mini Superseal	2000	98347385	100	59200574
	**Signal cable FCI**				
	Signal cable, FCI, 3 wire, with return signal	1000	96645398	100	59200577
		2000	97940991	100	59200578
	Signal cable, FCI, 2 wire, without return signal	1000	98386202	200	59200575
		2000	97698929	200	59200576
	**Power cable adapters**				
	Superseal Molex cable adapter	50	98556867	100	98854192
	Superseal Molex cable adapter, overmoulded	150	98614629	100	59200661
				300	59200637
	Superseal Volex cable adapter, overmoulded	150	98614444	100	59200633
	Superseal GSC plug, toolless (in preparation)	-	98652590		
	**Signal blind plugs**				
	Blind plug, FCI	-	97823485	100	59200643
	Blind plug, Mini Superseal	-	98451691	100	59200639
	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
EPDM	G 1 1/2	44	32	2	520046
K for drinking water	G 1 1/2	44	32	2	520226
EPDM	G 2	56	40	2	530243
K for drinking water	G 2	56	40	2	530086

Insulation kits

Insulation kits for warm water applications are available on request. Insulation kits for warm water applications contain two insulation shells. The thickness of the insulation shells corresponds to the nominal diameter of the pump. The insulation kit is tailor-made for the individual pump type and encloses the entire pump housing. Both insulation shells are easy to fit around the pump.

Diffusion-tight insulation shells for cold water applications are not available.

Quick guides

Quick guides for different UPM3 HYBRID variants are available on request.

Pins, clips, O-rings

Pins, clips, O-rings for the different composite housings are available on request.

15. Approvals and certificates

EC declaration of conformity

We, Grundfos, declare under our sole responsibility that the products **GFNJB (UPM variants with user interface)** and **GFNJC (other UPM3 variants)**, to which this declaration relates, are in conformity with these Council directives on the approximation of the laws of the EC member states:

Low Voltage Directive (2006/95/EC)

Standards used:

- EN 60335-1:2012/AC:2014
- EN 60335-2-51:2003/A1:2008/A2:2012

EMC Directive (2004/108/EC)

Standards used:

- EN 55014-1:2006/A1:2009
- EN 55014-2:1997/A1:2001/A2:2008

Ecodesign Directive (2009/125/EC)

Commission Regulation (EC) No 641/2009

Commission Regulation (EC) No 622/20012

Standards used:

- EN 16297-1:2012
- EN 16297-2:2012
- EN 16297-3:2012

Warning

The use of this product requires experience with and knowledge of the product. Persons with reduced physical, sensory or mental capabilities must not use this product, unless they are under supervision or have been instructed in the use of the product by a person responsible for their safety. Children must not use or play with this product.

Bjerringbro, 21st of February 2014

Preben Jakobsen
Technical Manager - HVAC OEM
GRUNDFOS Holding A/S
Poul Due Jensens Vej 7
8850 Bjerringbro, Denmark

Person authorised to compile technical file and
empowered to sign the EC declaration of conformity.

VDE certificate

These pumps are certified by VDE.

Product code: GFNJB or GFNJC

VDE certificate No. 40039416

This Marks Approval forms the basis of the CE declaration of conformity and the CE marking by the manufacturer or his agent and proves the conformity with the essential safety requirements of the EC Low Voltage Directive (2006/95/EC) including amendments.

Drinking water approvals

UPM3 circulators for drinking water systems are equipped with approved housings, such as CIL3 PPS or stainless steel N. These pumps or their components in contact with water are approved by:

- ACS (FR): ANNEX of ACS 12 ACC NY 184 (22 JAN 2015)
- WRAS (GB): Certificate No. 1403048 (30 JAN 2015) (*CIL3 PPS is requested)
- KTW (DE): Approvals for different components
- DVGW W270 (DE): Approvals for different components

UPM3 OEM circulators - Grundfos Product Chemical Compliance declaration concerning the non-use of certain chemical substances

GRUNDFOS Holding A/S and its subsidiaries are aware of their responsibilities and are committed not to use hazardous substances in their products.

Grundfos products manufactured and placed on the market within the European Union (EU) and the European Economic Area (EEA) comply with the following EU chemical legislation:

- REACH Regulation; Candidate List of SVHC, Restriction List and Authorization List (EC 1907/2006)
- RoHS directives (2002/95/EC and 2011/65/EU)
- Battery directives (2006/66/EC and 493/2012)
- Packaging and Packaging Waste directives (94/62/EC and 2004/12/EC)
- Ozone Depleting Substances directives (EC 1005/2009 and 2037/2000)
- Persistent Organic Pollutants directive (EC 850/2004)

Today, Grundfos products are not fully covered by the RoHS and WEEE directives.

In regards to the WEEE-directive (2002/96/EC) amended by directive (2012/19/EC) and its impact on circulators, the Grundfos position is that Grundfos sees circulators exempted in 4 (c) (large scale fixed installations…).

The RoHS directives on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) will in 2019 apply to all EEE except for the ones explicitly excluded - see in the position paper from Europump what pumps are considered excluded. Reference is made to the position paper from Europump (http://europump.net/publications/position-papers).

Grundfos strives on a voluntary basis to be RoHS-compliant regarding the non-use of certain hazardous substances in Grundfos products.

All suppliers of the raw materials and components to Grundfos Holding A/S and its subsidiaries are under contractual obligation to comply with the European chemical legislation.

To ensure that Grundfos is compliant, we have taken the following initiatives:

- Grundfos has launched the Grundfos Focus List in order to give our suppliers, contractors and other relevant stakeholder world wide a tool to help comply with chemical legislation. Grundfos has prepared the Grundfos Focus List, which bans or restricts the use of certain chemical substances in Grundfos products, Grundfos production processes and at Grundfos facilities (www.grundfos.com/focus-list)
- Grundfos continuously performs audits of their suppliers to ensure compliance with their contractual obligation to comply with the chemical legislation.
- Grundfos does not accept banned or restricted hazardous substances in their products. It is a standard task in product development projects to ensure that banned or restricted hazardous substances are not used.

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ECM: 1160097

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