

HVAC OEM Division

Newsletter ISH 2017

UPM3 family is extended

The new high-efficiency UPM3 range of integrated heating circulators gets extended with the UPM3S up to 6 m with a ferrite IMM rotor and an extended UPM3L up to 75 W. [See the range overview and details on page 2](#)



Medium UPM for larger boiler or heat pumps

In the EU, high-efficiency circulators have been required for all kinds of heating and cooling systems since August 2015. The role played by the UPM2 or UPM3 in smaller heating appliances is handled by our range of medium UPMs including the UPMML, UPMPL or UPMXL for larger boiler or heat pumps with a flow of up to 6 m³/h. This range is also available in a US version for 115V and 230V. [See the range overview and details on page 3](#)



How to upgrade systems using old hydraulic interfaces

If you are planning to upgrade your heating appliances to conform to Ecodesign requirements without implementing a new hydraulic platform, Grundfos has developed the UPMO. It implements all features of the new UPM3 range on existing hydraulic units. [See details on page 4](#)



China goes from coal to clean energy



China's National Energy Administration (NEA) has announced that in the next three years alone, China will invest \$361 billion in promoting the substitution of coal for renewable power generation. Within this initiative, two big projects are pushing sales of circulators for gas boilers and heat pumps: coal to gas and coal to electricity. [See details on page 7](#)

Hydro blocks for medium-sized boiler and heat pump systems

While CHB or CRU based hydro blocks are ideal for smaller heating appliances, the CHBL hydro block with different pump heads such as a UPS or UPM with 3/4" connections is ideal for larger boilers or heat pumps with a flow up to 5 m³/h. Additionally, Grundfos offers a DN20 return valve with actuators. [See details on page 6](#)



High efficiency ECM circulators become state of art all over the world

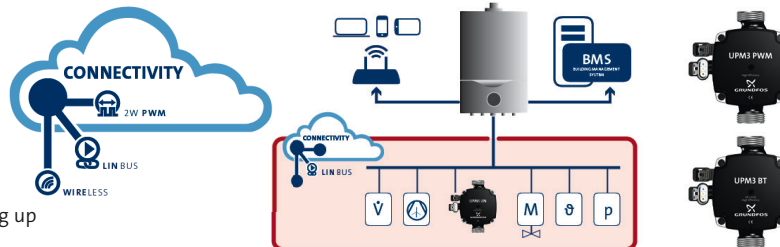
What is going on in Europe and America regarding legal requirements, subsidies or approvals for high efficiency ECM circulators? [Read more on page 3](#)

Digitalization and Connectivity for HVAC OEM Circulators

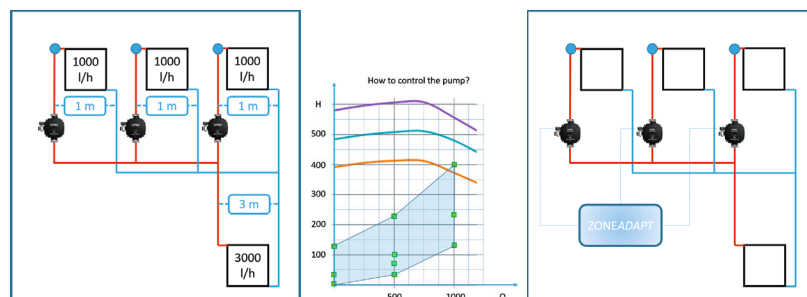
2-way PWM signal
In the market since 1999

LIN BUS
The new standard

Wireless communication
Appliance connectivity coming up
[See details on page 2](#)



GRUNDFOS ZONEADAPT The next generation of AUTOADAPT

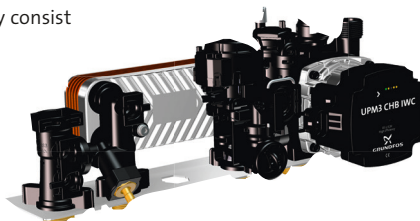


In all systems with more zones in parallel, the pumps are influencing each other. To avoid noises, too high return temperatures or under-supply, the performances of all pumps must be corrected. Grundfos ZONEADAPT is taking care for that!

[Read more on page 2](#)

Standard IWCs – flexible and customisable solutions for boilers

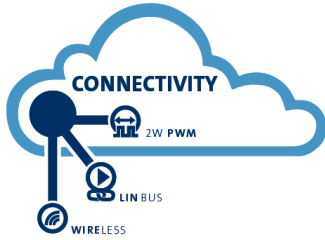
For boiler manufacturers who do not want to invest in costly and time-consuming design of customised hydraulic units, Grundfos offers CHB or CRU integrated water circuits based on standard components. These standard IWCs can also be configured for combi or bi-thermic boilers with standard or high-efficiency pumps. They consist of a return and a flow group pre-mounted in-line on a bottom plate and can be combined with a plate heat exchanger. [See details on page 5](#)



Components for HIU (Heat Interface Unit) for supply of DHW and CH on demand

Heat Interface Units (HIU) are units for supplying houses or flats with domestic hot water or heating on demand from centralised or district heating. Based on our experience with fresh water modules, Grundfos offers system components that can be combined into very efficient and compatible components. [See details on page 8](#)

Digitalization and Connectivity of HVAC OEM Circulators



These days, digitalization and connectivity are in focus of many different market sectors. Even integrated circulators can be involved in this kind of communication. There are different ways of connectivity:

2-way PWM signal

Since 1999, more than 13 million Grundfos OEM pumps with PWM communication have been installed in gas combi boilers or heat pumps (see VDMA Einheitsblatt 24244).

The PWM feedback signal offers pump information such as:

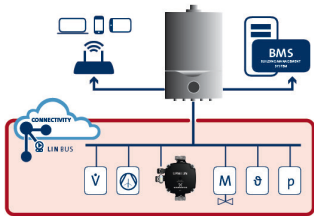
- current power consumption or flow
- warning alarm or operation status

LIN BUS

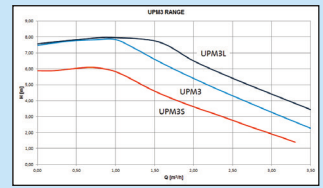
This new BUS communication standard was developed for automotive appliances. It is now on its way to become the new standard in HVAC appliances. A new VDMA Einheitsblatt will follow.

Wireless communication

Appliance connectivity is coming up. It is already used in Grundfos Fresh Water Modules between pumps and sensor box. ALPHA3 is using the ALPHA Reader to transmit data via bluetooth to smart phones for hydraulic balancing.



UPM3 family is extended



GRUNDFOS UPM3S Integrated pumps with injection moulded ferrite magnet rotor

This circulator pump range is designed for integration in boilers and other heating appliances with limited performance up to 6 m/42 W. Its rotor is injection moulded with PPS bonded hard ferrite magnetic particles.



GRUNDFOS UPM3L Integrated pumps with extended performance at limited ambient temperature

This circulator pump range is designed for integration in boilers and other heating appliances with extended performance up to 7.5 m/75 W. The ambient temperature is limited to 55°C.



GRUNDFOS UPM3 anti-blocking concept

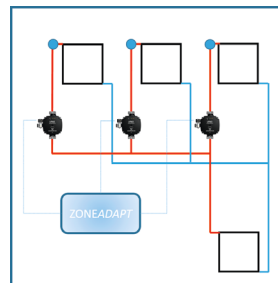
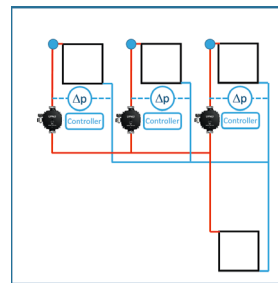
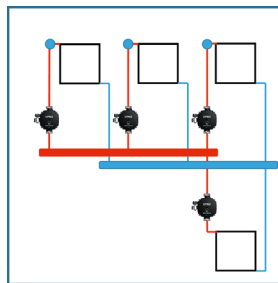
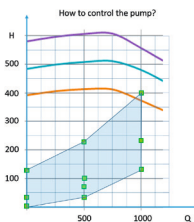
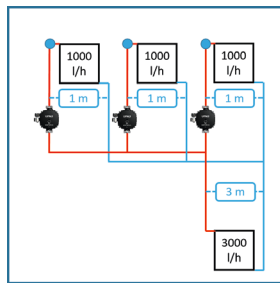
After a long shut-off period, there is a risk that circulators may not start again. The UPM3 features a double safety de-blocking system:

- Improved electronic start-up function that maintains the maximum starting torque, up to 25 Ncm.
- Manual de-blocking accessible from the front without demounting the control box.

See video

https://www.youtube.com/watch?v=cMC02526Z_s

GRUNDFOS ZONEADAPT The next generation of AUTOADAPT



How to control the differential pressure in parallel zones

In all systems with more zones in parallel, the pumps influence each other. Even in hydraulically balanced systems, the heat supply may at times be too high or too low if the zones are not hydraulically separated. As all pumps circulate their medium through the same primary circuit, its varying pressure losses must be added to the necessary differential pressures in the different zones.

It is therefore necessary to eliminate this influence when controlling the zone pumps.

Grundfos ZONEADAPT will take care of that!

To control the differential pressure in the zones, you need either DP-Zone controllers or a hydraulic separator plus primary pump or Grundfos ZONEADAPT.

PWM 2-way communication between pump and heater

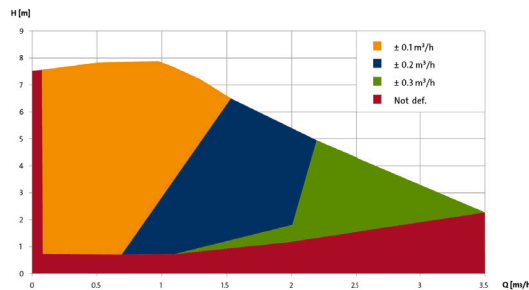
Some UPM3 circulators are controlled via a digital low-voltage pulse-width modulation (PWM) signal which means that the speed of rotation depends on the input signal. The speed changes as a function of the input profile. These communication signals are standardised in the VDMA Einheitsblatt 24244 "Wet runner circulating pumps - Specification of PWM control signals". It also offers the bi-directional dialogue between the pump and the

application (heating, solar, heat pump).

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

- current power consumption
- warning/ alarm/ operation status

Alternatively, the PWM feedback signal can also be used to indicate the flow of the circulator on defined pump housings. The accuracy of the



Accuracy of flow estimation at 20°C

GRUNDFOS UPM3

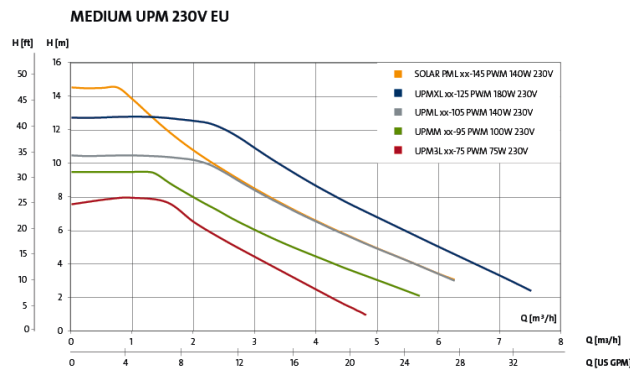
FlowEstimation feedback signal depends on the operation point and media

viscosity, but it gives a good indication of the actual flow in areas above 0.8 to 1 m.

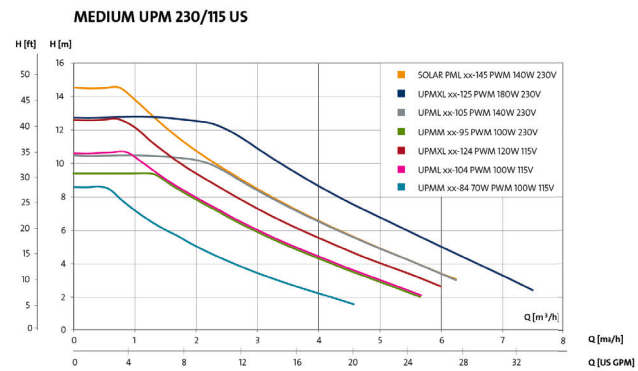


Medium UPM for larger boilers, geo and solar thermal systems

UPMM, UPML and UPMXL for the EU



UPMM, UPML and UPMXL for the US



UPM high efficiency pump range for small and medium sized boiler and heat pumps

Pump Flow [m³/h] at H=6m	0,9	1,2	1,7	2,1	2,4	2,7	3,3	3,8	4,3	5,2
Pump Flow [US GPM] at H=20 ft	3,8	5,3	7,5	9,2	10,6	11,9	14,5	16,7	18,9	22,7
Heat capacity heat pump (ΔT5K) [kW]	5	7	10	12	14	16	19	22	25	30
Required pump type 230V for heating and cooling	UPM3L 75 W			UPMM 100 W			UPML 140W		UPMXL 180W	
Required pump type 115V for heating and cooling	UPMM 70 W			UPML 100 W			UPMXL 120 W			
Heat capacity boiler (ΔT15K) [kW]	15	21	30	37	42	47	58	66	75	90
Required pump type 230V for heating only	UPM3L 75 W			UPMM 100 W			UPML 140W		UPMXL 180W	



UPMXL with new improved NTC power cables for inrush current limitation

Review study of Commission Regulation (EU) 641/2009 on circulators

www.ecocirculatorsreview.eu

The scope of the review focuses on mainly the three following aspects:

1. To review the Regulation in the light of technological progress
 2. To assess design options that can facilitate reuse and recycling
 3. To develop a technology roadmap
- The study started in end of May 2016, and included a November 2016 stakeholder meeting. It is expected to finish in the autumn of 2017.

There are some open issues in consideration:

- Improved EEL levels for limit and benchmark
- Extending the scope to drinking water pumps
- Postponement of deadline for asynchronous integrated sparepumps

Germany subsidies high efficient circulators

www.bafa.de

Using intelligent energy saving measures to reduce energy costs while avoiding emissions is the goal of the federal government's funding program. Various measures are to be taken, including the replacement of old, inefficient heating pumps.

These are often the largest electricity consumers in the household and use up to 80% more than modern high efficiency pumps.

By 2020, 10 million pumps are to be exchanged - funded by the state. If house owners replace their old pump with a modern high-efficiency pump, they will therefore receive a 30% subsidy on purchase price and assembly.

In addition, the federal government recommends hydraulic balancing, which will allow the installer to optimally adjust the overall heating system. Again, he receive a grant of 30% of the total cost. Two worthwhile investments!

Germany: UBA drinking water guidelines and evaluation criteria

www.umweltbundesamt.de

These UBA guidelines and recommendations on components in contact with drinking water will be implemented in the mandatory evaluation criteria in the coming years.

- Draft evaluation criteria for enamels and ceramic materials
- Evaluation criteria for metallic materials
- KTW guideline
- Coating guideline
- Elastomer guideline
- Lubricant guideline
- Thermoplastic elastomers
- De Minimis guideline
- Modelling guideline

US DOE has started activities for making rules on pump efficiency

www.pumps.org/DOE_Rulemaking.aspx

Under the Energy Policy and Conservation Act (EPCA), the US DOE may set energy conservation standards for types of pumps, including circulator pumps (42 U.S.C. 3211(1)(A)). On 3 February 2016, the DOE published a notice of intent to establish a working group for circulator pumps (81 FR 5658).

November 30, 2016: Circulator Pump Term Sheets Finalized

On 30 November 2016, Hydraulic Institute's staff along with representatives of members of the Hydraulic Institute from leading circulator manufacturers incl. Grundfos reached consensus on a term sheet as part of a 15 member ASRAC working group for circulator pumps. The working group recommended that the U.S. DOE make every effort to issue a final rule by the end of 2017 and a four year implementation period from the date of publication of the final rule (around January of 2022).