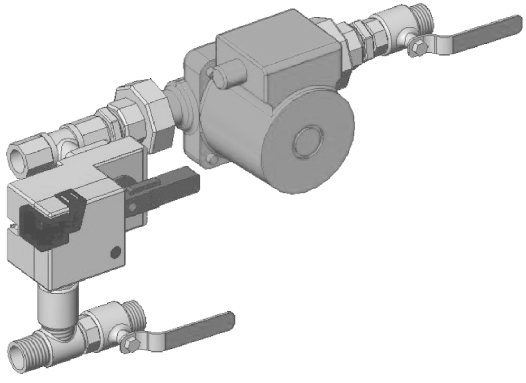


Water mixing unit

WMG

OPERATING AND INSTALLATION MANUAL

BLAUBERG Ventilatoren

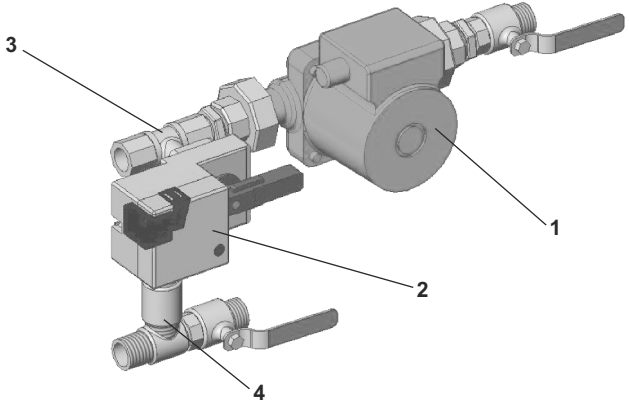
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APPLICATION

The WMG water mixing units are designed for circulation and temperature regulation of water or water mixture used as a heat medium water heaters of the ventilation systems.

DESIGN AND OPERATING LOGIC

The WMG unit design is shown in figure.
On customer's request both right-side and left-side modifications are available.
The unit manifold piping consists of the metal elements with the heat resistance up to +120 °C.



The circulation pump 1 provides continuous required water flow rate and pressure.
The temperature of the water supplied to the heat exchanger is regulated by mixing of the water supplied from the network with the heat exchanger recirculation water in the circulation loop.
The recirculation water amount supplied through the recirculation pipe 4 is regulated by the three-way valve 3 with electric actuator 2. The actuator control voltage is determined by the set supply air temperature at outlet of the water heater.

PRODUCT RANGE AND TECHNICAL DATA

Type WMG	Water flow [m^3/h]	Water pressure [kPa]	Kvs*	Pressure [bar]	Three-way valve	Connecting diameter	Weight [kg]
WMG 3/4-4	2.3	57	4	10	Belimo R317	3/4"	4.1
WMG 3/4-6	3	57	6.3	10	Belimo R318	3/4"	4.1
WMG 1-6	4.1	57	6.3	10	Belimo R322	1"	6.8
WMG 1-10	6	57	10	10	Belimo R323	1"	6.8
WMG 1 1/4-10	6.8	62	10	10	Belimo R329	1 1/4"	7.4
WMG 1 1/4-16	9	62	16	10	Belimo R331	1 1/4"	7.4
WMG 1 1/2-16	11	110	16	10	Belimo R338	1 1/2"	23
WMG 1/2-25	14	110	25	10	Belimo R339G	1 1/2"	23
WMG 2-25	21	115	25	10	Belimo R348	2"	31
WMG 2-40	27	115	40	10	Belimo R349G	2"	31

transmission factor $Kvs = \frac{V_{100}}{\sqrt{\frac{\Delta PV_{100}}{100}}}$

ΔPV_{100} - pressure loss at fully open valve

V_{100} - rated water flow at ΔPV_{100}

OPERATING CONDITIONS

The allowable operating conditions for the mixing units are determined by a number of elements included into its design and the following values:

- ambient temperature [^{0}C] +5…+40
- maximum water mixture temperature at inlet [^{0}C] +110...+120
- maximum pressure in the mixing unit pass [bar] 10

BASIC COMPONENTS

Circulation pump

Threaded or flange-type circulation DAB pump (DAB company, Italy) is used.

Type US	Pump	Operating temperature range [^{0}C]
WMG 3/4-4 / WMG 3/4-6	VA65/180	–10…+110
WMG 1-6 / WMG 1-10	A50/180XM	–10…+110
WMG 1 1/4-10 / WMG 1 1/4-16	A56/180XM	–10…+110
WMG 1 1/2-16 / WMG 1 1/2-25	BPH120/250.40M	–10…+120
WMG 2-25 / WMG 2-40	BPH120/280.40T	–10…+120

DAB pumps specifications:
- maximum operating pressure: 10 bar;
- capacity: 4 - 40 m^3/h;
- water mixture temperature: -10°C …+120°C;
- maximum ambient temperature: +40°C;
- number of speeds: 3;
- power consumption: 37-898 W;
- rated for continuous operation;
- motor: single-phase 1x230 V~50 Hz, insulation class F, protection rating IP42;
three-phase motor 3x230 V~50 Hz or 3x400 V~50 Hz for WMG 2-25, WMG 2-40 model, insulation class F, protection rating IP42;
- casing: cast iron/aluminium;
- impeller: technical polymer;
- shaft with rotor: stainless steel;
- rotor hub: stainless steel;
- mechanical seal: carbon/ceramics.

Ball valve with electric actuator
The regulating three-way ball valves with electric actuators (manufactured by BELIMO company, Switzerland) are used. Equal percentage flow characteristics provided by a special adjusting valve plate is the main advantage of the above mentioned valves.
The valves are regulated by means of the rotating electric actuator LR24SR (NR24SR, SR24A-SR controlled by analogue signal.
Manual control function is available.

Electric actuator technical data
- power supply voltage: AC 24 V, 50/60 Hz, DC 24 V;
- power consumption: 0.2 - 2 W;
- control signal: DC 0…10 V, input resistance = 100 kOhm;
- operating range: DC 2…10 V, angle 0…90°;
- complete rotation time: 80…100 sec;
- protection rating: IP52;
- manual control: self-resetting push-button.

INSTALLATION AND SERVICING

Electrical connection and servicing works shall be performed by duly qualified electricians authorized for such works.
Do not operate the WMG unit beyond the specified temperature conditions or in aggressive or explosive environment.
Make sure the WMG unit is not damaged before connecting it to power mains.
While mounting the water mixing unit ensure the following conditions:
horizontal position of the motor shaft axis;
ensure dry start-up protection with no heat medium in the system);
no mechanical load transfer from connected pipelines to the WMG unit;
exclude any accidental touch of the power cables with the rotating parts of the WMG unit.

WMG unit connection to water supply system
Water is supplied to the WMG unit or drained from it either through fixed connecting pipelines to waterworks or flexible metal and rubber hoses thread-connected to inlet and outlet pipes.

While connecting the WMG unit to power mains make sure of no excessive loads that may result in mechanical or airtight damages.
Connect the pipelines to enable their easy and quick detachment for repair works.

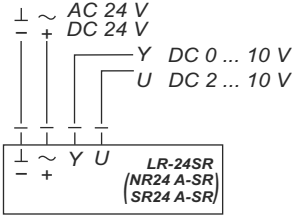
WARNING

While connecting the WMG unit to power mains make sure of no excessive loads that may result in mechanical or airtight damages.
The assembly is shipped from the factory in a partially assembled state; during installation, the joints must be sealed.
After installation of the WMG unit into the heat medium supply system check the thread connections for possible leakages from mechanical impact during installation operations.

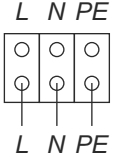
Electric connections
All electrical connections shall be performed by duly qualified electricians authorized for such works. Ground the pump before connecting the unit to power supply network.
Avoid any contact of the power cord with the pipeline or the pump.
Connection of the pump's electric motor and electric actuator in accordance with wiring diagrams below.

WIRING DIAGRAMS

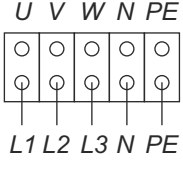
Wiring diagram of the ball valve drive



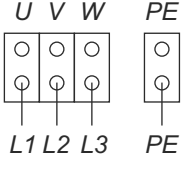
Wiring diagram of the single-phase pump motor.



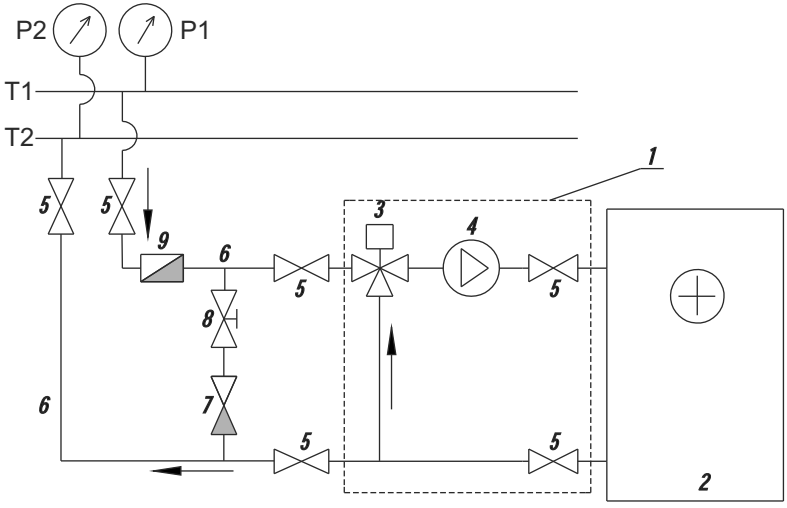
Wiring diagram of the three-phase pump motor 3x230V



Wiring diagram of the three-phase pump motor 3x400V



RECOMMENDED CONNECTION DIAGRAM TO MUNICIPAL WATER MAINS



T1 and T2 - supply and return pipelines of heating system
P1 and P2 - liquid pressure gages in the heat distribution system
1 - WMG mixing unit
2 - water heater
3 - three-way valve with actuator
4 - circulation pump
5 - shut-off valve
6 - supply and return pipeline connection between heating system and water heater
7 - non-return valve
8 - balancing valve
9 - coarse filter

SERVICING

While operating the unit observe the following servicing procedures:
- clean the unit surface at least once a year;
- clean the filter regularly (the required frequency is determined by operating conditions);
- use specially treated water from water mains to reduce salt sediment.

The three-way valve electric motor und actuator require no servicing.

MANUFACTURER'S WARRANTY

The manufacturer ensures the steady unit operation within 12 months since the date of sale through the retail distribution network provided that transportation, storage, mounting and operation instructions are observed.

In case of no mark of date of sale, the warranty period is counted starting from the date of manufacture.
In case of any failures in unit operation due to faulty equipment during warranty period, the Seller undertakes to replace the unit.

Replacement is offered by the Seller.

WARNING

The manufacturer reserves the right to use component parts produced by third-party manufacturers if these match the unit specifications.