GB

tuxhorn

tubra®- PGM-KR DN 25/32

Pump group module

Assembly and operating instructions

Content

1 Introduction

This manual describes the assembly, operation and maintenance of the **tubra®-PGM-KR DN 25/32** heating circuit station.

Please read through these instructions carefully before starting installation.
Non-compliance will invalidate all claims under the guarantee and warranty.
This manual is intended for trained specialists with an adequate level of expertise in handling heating systems, water pipe installations and electrical installations.

The installation and commissioning procedures should only be conducted by qualified, specialist personnel.

The **tubra®-PGM-KR DN 25/32** pump group must only be installed and operated in a dry environment that is protected from frost.

Illustrations are symbolic and may differ from product to product.
Subject to technical changes and errors.

1.1 Intended purpose

The **tubra®-PGM-KR** pump group serves exclusively to mix and circulate the heating water for operating a heating circuit. The pump group must only be operated in conjunction with the media listed in the technical data.

Any improper use or modifications to the assembly, structure or components can prevent safe operation of the system and result in the exclusion of all claims under the warranty and guarantee.

1.2 Safety information

In addition to country-specific guidelines and local directives, the following technical regulations must also be taken into account:

- EN 12 828 Heating systems in buildings
- DIN 4753 Water heaters, water heating installations and storage water heaters for drinking water
- DIN 18 380 Heating systems and central water heating systems
- DIN 18 381 VOB: Gas-, water-, sewage installation works
- DIN 18 421 VOB: thermal insulation work on thermal installations
- VDI 2035 Avoidance of damage in hot water heating systems
- VDE 0100 Series of standards on the use of electrical equipment of machines
- VDE 0701 Repair, modification and testing of electric equipment
- VDE 0190 Main equipotential bonding of electric facilities
- BGV Accident prevention regulations of workers' compensation associations

As the system can reach temperatures > 60 °C, there is a risk of scalding and burning through contact with the components.

1.3 Other applicable documents

Also observe the assembly and operating instructions for the various components used, such as the servo motors.

1.4 Delivery and transport

Please check to ensure the product is complete and undamaged immediately after receipt. Any damage or complaints must be reported immediately.

2 Layout – scope of delivery

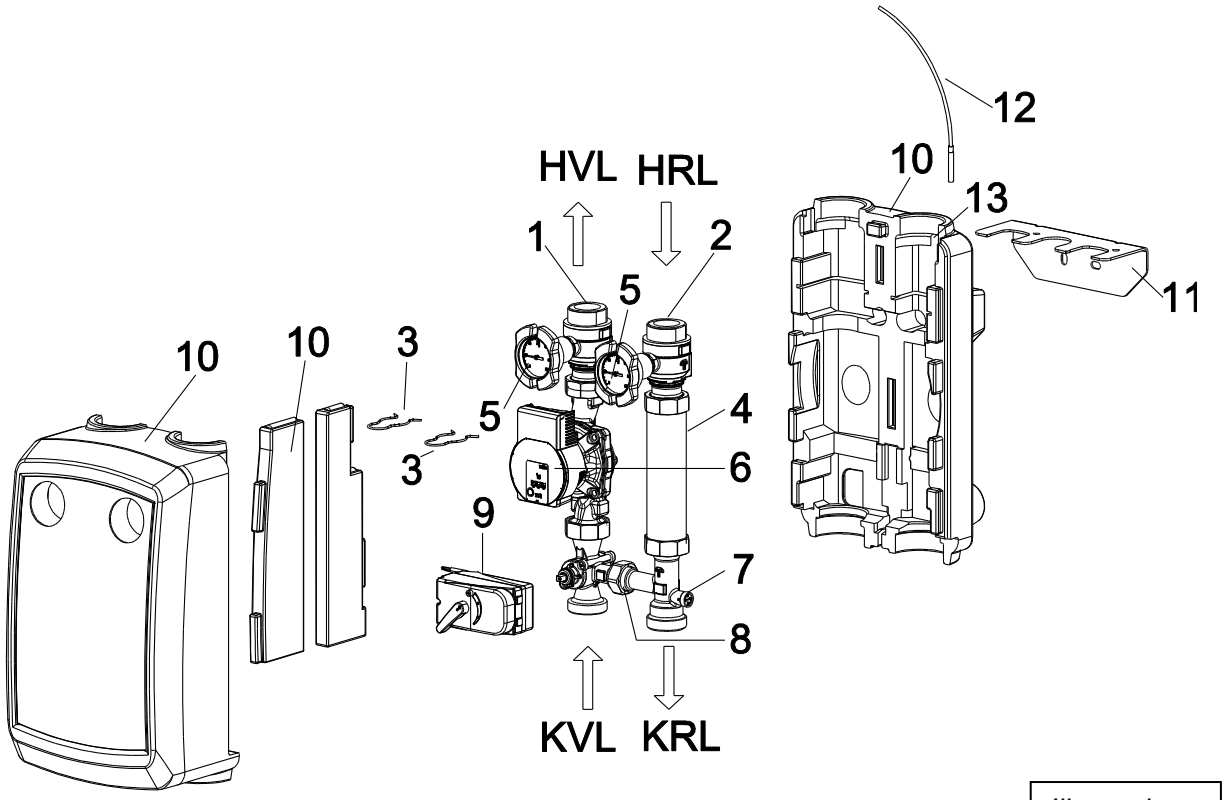


Illustration
Flow left

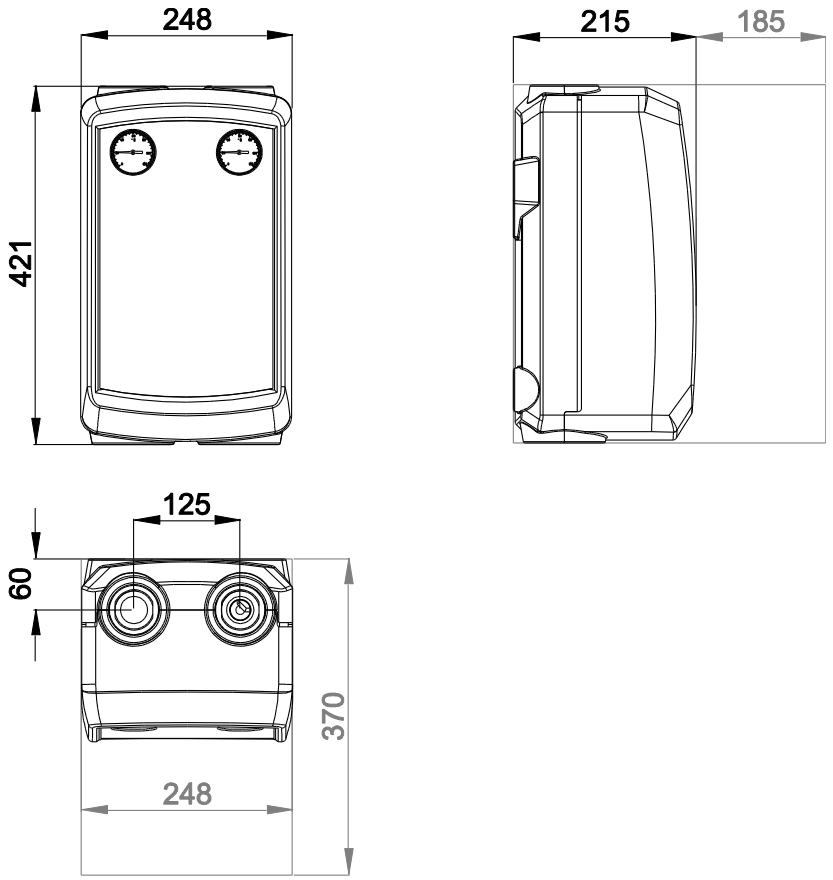
Item	Designation	ET- Number	
1	Ball valve for heating flow (HF), with applying prism for temperature sensor	DN 25: 968.70.58.00.01 DN 32: 968.50.58.00.01	
2	Ball valve for heating return (HR), with applying prism for temperature sensor	DN 25: 968.70.57.00.01 DN 32: 968.50.57.00.01	
3	Safety springs		
4	Adapter pipe	968.00.08.00.01	
5	Dial thermometer (flow/retrun)	665.24.25.00	
6	Circulation pump	auf Anfrage	
7	Gravity brake spindle	949.25.11.00.01 / 949.32.11.00.01	
8	Mixer flow right	949.25.10.00.01 / 949.32.10.00.01	
9	Servo-motor with constant value control	649.20.69.00.01	
10	Insulation consisting of front and rear shell, cover and inserts		
11	Mounting angle		
12	Sensor of the servo-motor		
13	Recess for the flow sensor		
HVL	Heating flow	KVL	Boiler flow
HRL	Heating return	KRL	Boiler return

3 Technical specifications

3.1 General instructions

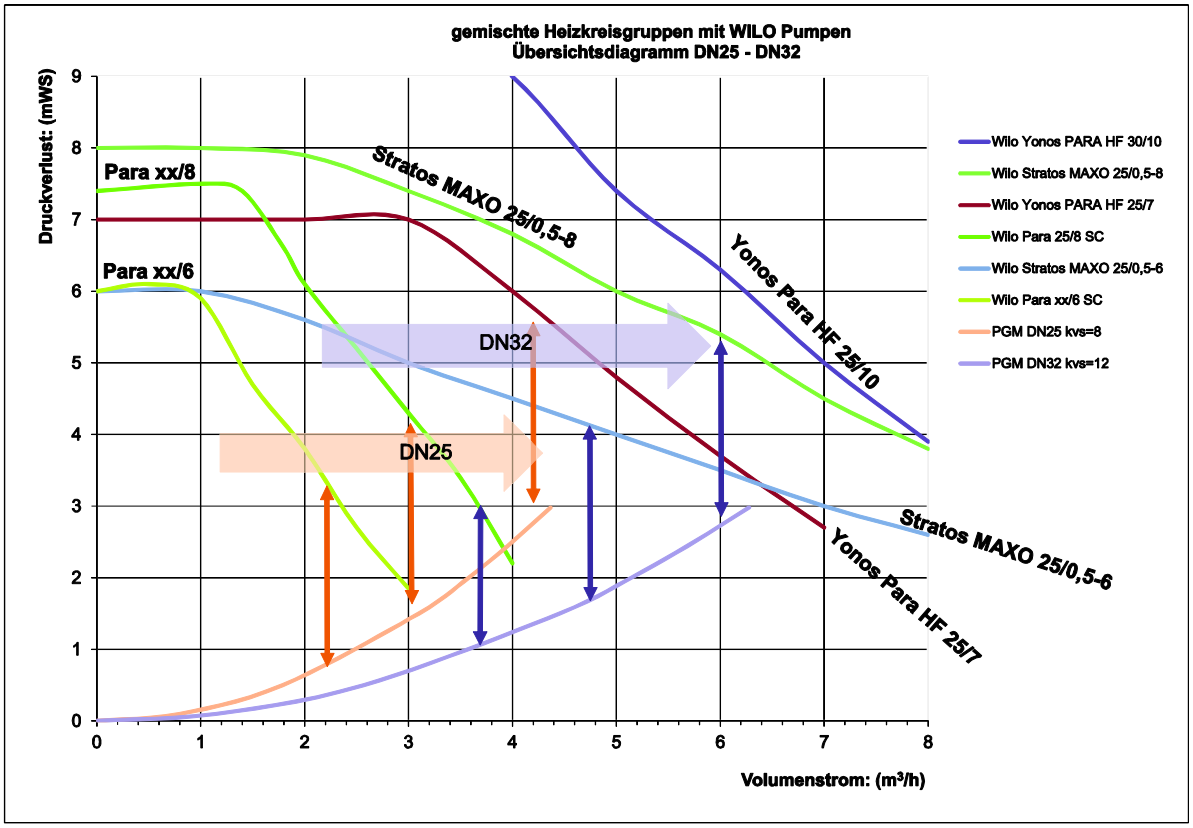
Designation/type		**tubra®-PGM**	**tubra®-PGM**
Nominal size		DN 25	DN 32
Nomina output ΔT 10 K (20 K), k_{vs} Mischer		k_{vs} 4 up to 8 m³/h Output: depending on pump type up to 50 kW (100kW)	k_{vs} 6 bis 12 m³/h Output: depending on pump type up to 75 kW (150 kW)
Connections	On the heating circuit	G1½ AG / Rp 1"	G1½ AG / Rp 1"
	On the boiler	G1½ AG	G2 AG
Max. operating pressure		3 bar	3 bar
Max. operating temperature		95 °C	95 °C
Medium		Heizungswasser nach VDI 2035	Heizungswasser nach VDI 2035
Opening pressure on the gravity brake		20 mbar	20 mbar
Circulation pump		Wilo Para RS 25/6 SC	Wilo Para RS 25/8 SC
	optional	Wilo Para RS 25/8 SC	
	optional	Grundfos UPM3 25-70 AUTO	Grundfos UPM3 25-70 AUTO
	optional	ohne Pumpe	ohne Pumpe
	On demand	Other pumps (see pressure loss curve)	
Electrical connection		230 V AC/ 50-60 Hz	230 V AC/ 50-60 Hz
Mixing device with servo motor and integrated constant value controller			
Mixer time / rotation angle		110 s / 90°	110 s / 90°
Permitted ambient temperature		0-55°C	0-55°C
Electrical connection		230 V AC/ 50-60 Hz	230 V AC/ 50-60 Hz
Power draw		1m Kabel	1m Kabel
Input	Operational	5 W	5 W
	Standby	0 W	0 W
Housing protection type/protection class		IP 44 IEC 529	IP 44 IEC 529
Protection class		II VDE 0631	II VDE 0631

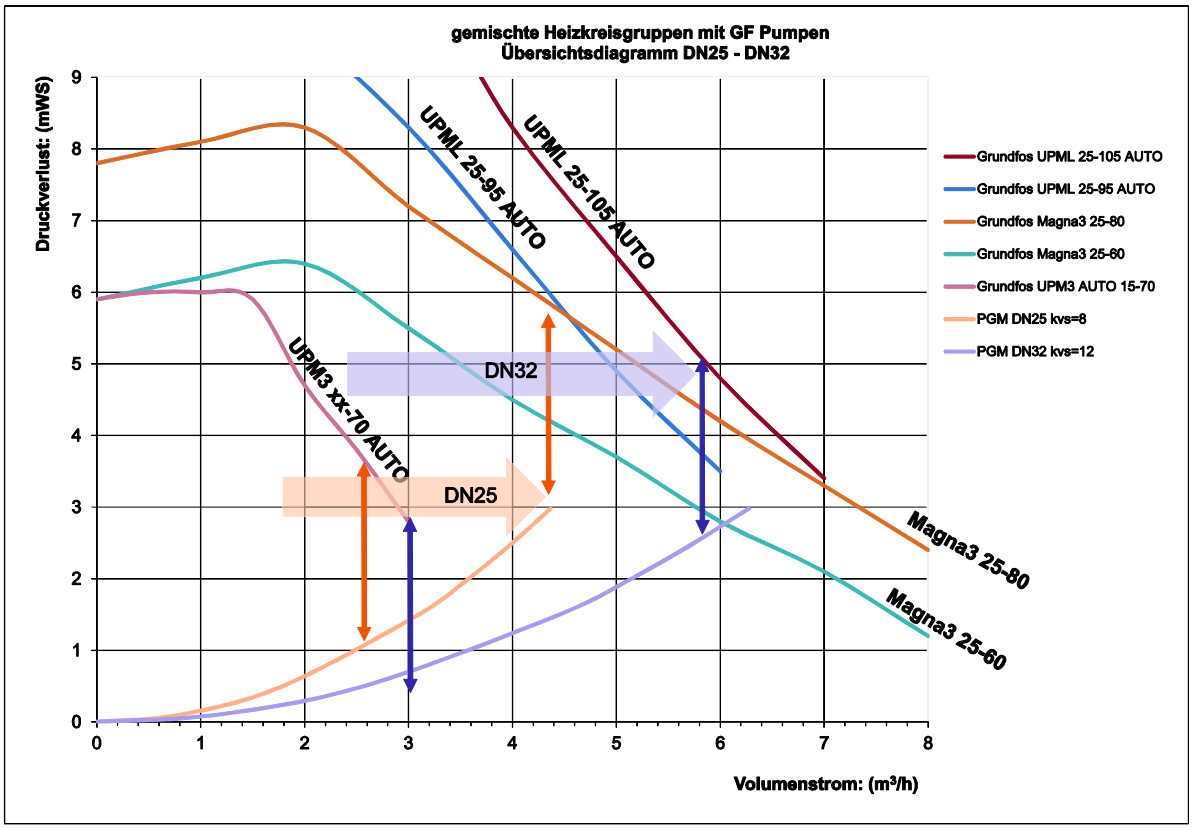
3.2 Dimensions / required space



Dimensions and minimum space required for assembly and maintenance work

3.3 Pressure loss



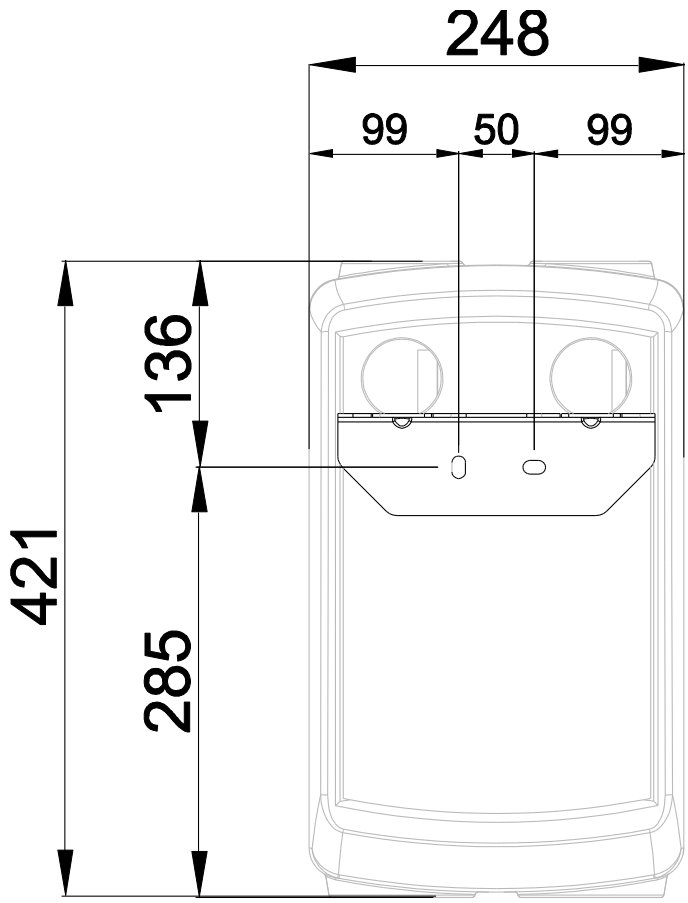


4 Assembly

4.1 General

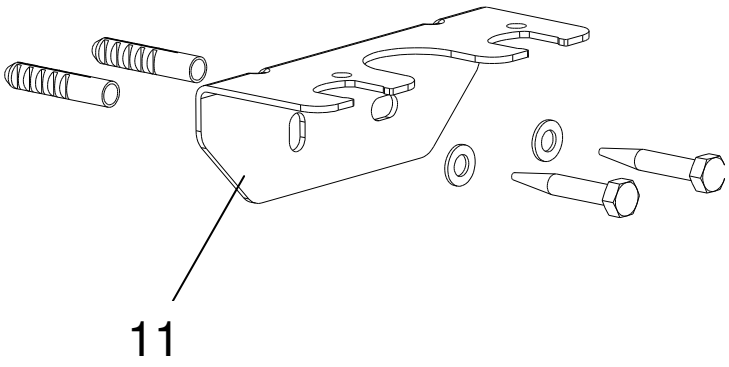
The heating circuit station can be installed and operated in many different installation positions, provided that the pump shaft is horizontal.

4.2 Wall mounting



Remove securing springs [3].
Lift the feed and return lines and remove them from the
Pull out angle [11].
Remove the rear insulation shell.

Mark attachment points of the mounting bracket [11] to the wall and drill two ø10 mm holes.



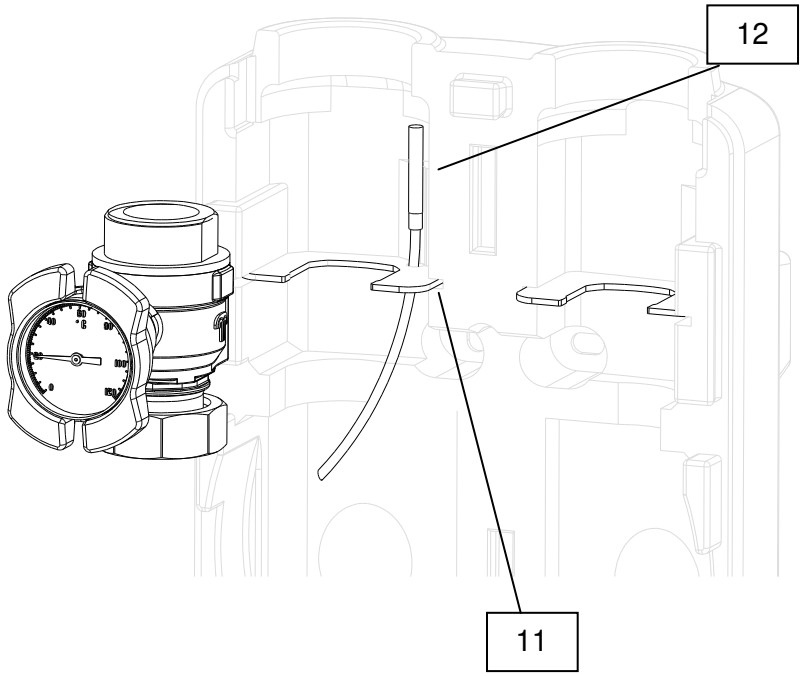
Place the dowel and tighten the mounting bracket [11] with the screws and washers.

Align mounting bracket [11] horizontally.

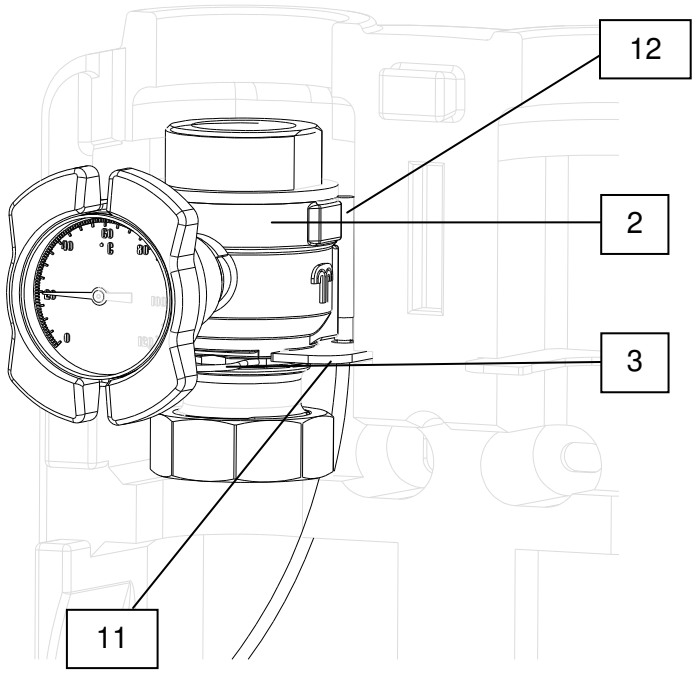
Slide the rear insulation shell onto the mounting bracket [11].

Insert the feed and return line in the mounting bracket and secure with the locking springs [3].

4.3 Mounting sensor



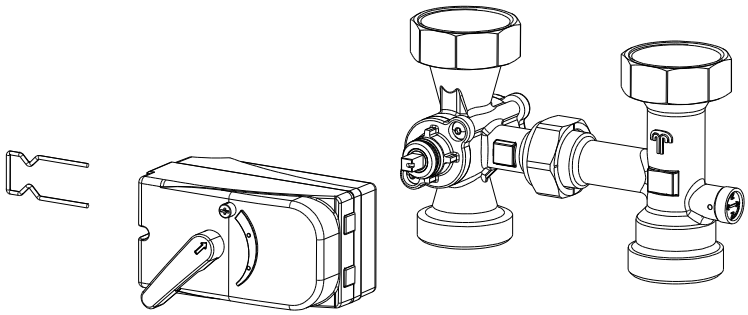
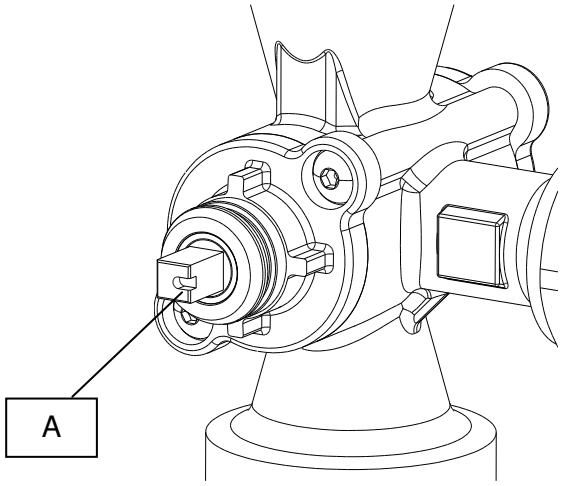
The sensor [12] is inserted into the hole provided in the mounting bracket [14] from below.



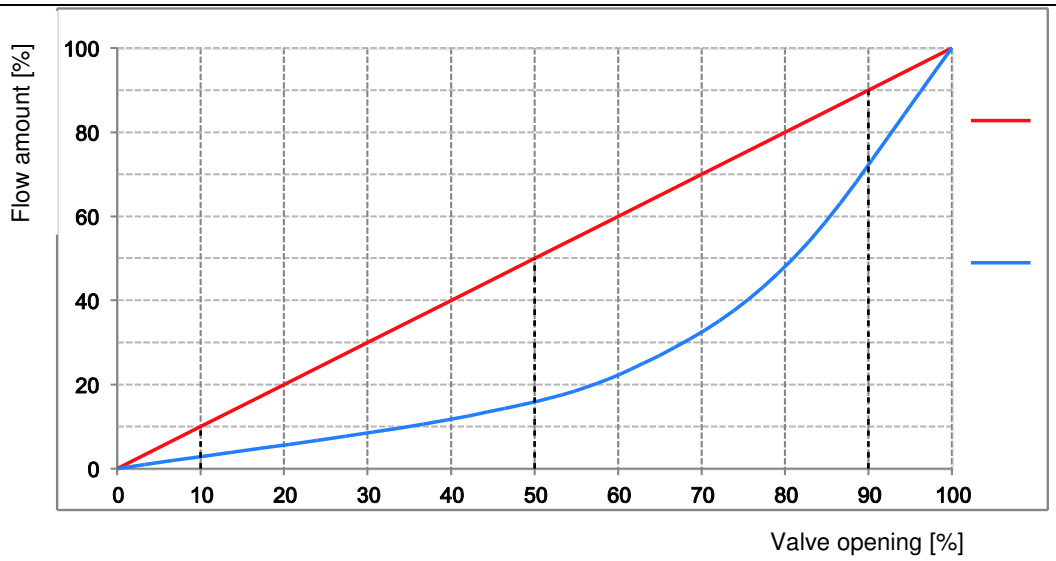
Mount pump group and secure ball valves [2] with safety spring [3].

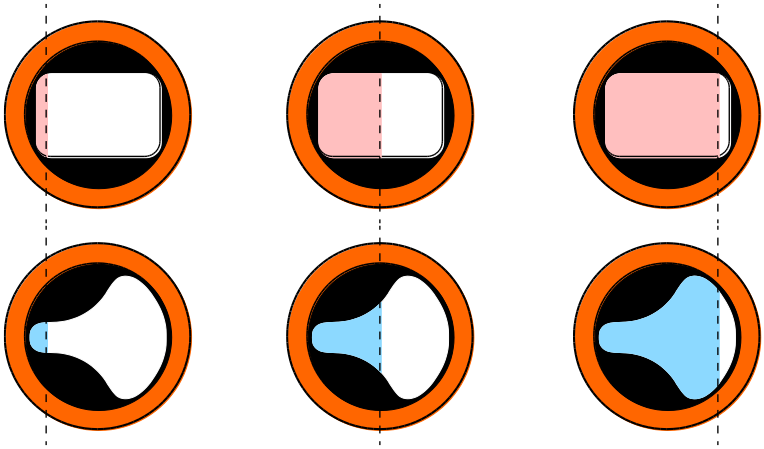
Fasten sensor [12] and cable with cable tie.

4.4 Servo motor of the mixing device

Mount servo motor on valve	
	**Work on the electrical system as well as the opening of electronic housings may only be carried out in a voltage-free state and only by authorized specialist personnel.** To remove the servomotor, the clip must be pulled out of the servomotor. Then the servomotor can be removed from the valve.
	**Attention** When assembling the servomotor, the actuating handle of the actuator must be in the maximum position and the notch of the driver [A] must be left at 3 o'clock on the left and 9 o'clock on the right in the pre-run. Before mounting, the clip must be positioned in the servomotor. Then place the servomotor on the valve and press down. Insert clip to fix the servomotor.

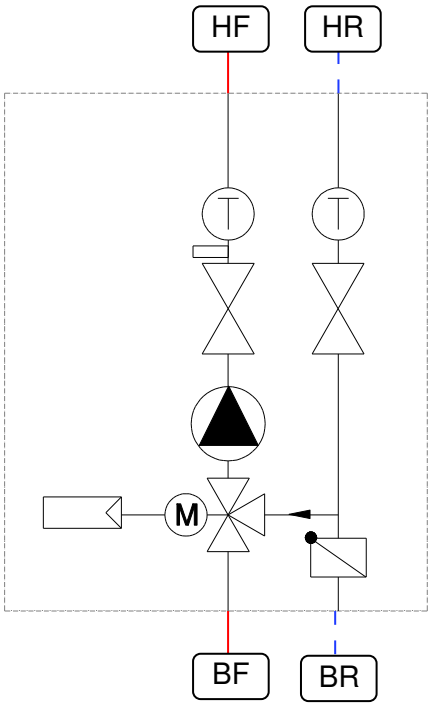
4.5 Progressive curve / mixer behavior





Thanks to its special characteristics, the progressive mixer in the PGM can control the amount of water better than a linear mixer. With a valve opening of 50%, a linear mixer has a flow rate of 50%. The progressive mixer with the same kvs value has a flow rate of 18% with a valve opening of 50%. The progressive mixer can thus precisely regulate small flow rates. Due to the high control quality, "swinging" is prevented by the mixer.

4.6 Hydraulic Connection



HF	Heating flow
HR	Heating return
BF	Boiler flow
BR	Boiler return

This is a sample illustration which does not claim to be exhaustive; it does not replace specialist planning.

4.7 Electrical connection

4.7.1 General instructions

Only authorised, specialist personnel are permitted to open electrical housings and work on the electrical system after de-energising the equipment.
When establishing connections, make sure the terminal assignments and polarity are correct.
Protect the electrical components from overvoltage.

Danger!

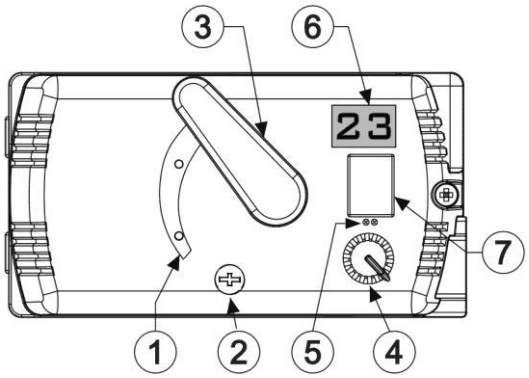
Risk of fatal electric shock as a result of incorrect electrical connections.
- → Electrical connections must exclusively be created by electricians approved by energy suppliers and as per the locally applicable regulations.
- → Disconnect the supply voltage prior to conducting any work.

4.7.2 Circulation pump

Observe the operating manual of the circulation pump.

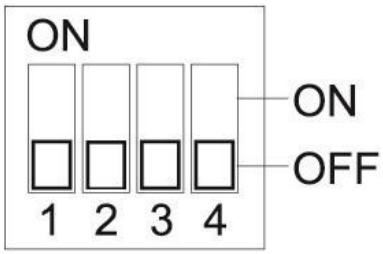
4.7.3 Servo motor mixer with cable

Bauteile und Funktionen



1) Position indicator
2) Unlocking button (automatic or manual operation)
3) Handle
4) Handwheel for temperature setting
5) Status LED:
   a) RED ON: Opening
   b) BLUE ON: Closing
   c) Fast flashing:
      - RED- Actuator in open end position
      - BLUE- Actuator in closed end position
   d) Between the calibrations of the actuat or, the blue or red LED flashes once a second.
6) Dispaly of the current or the target temperature. Example:
   Display 23 ➔23°C = current temperature
   Display 23**.** ➔(24°C) = target temperature
7) Covered DIP-Switch for setting the parameters.

DIP-Switch



1) Flow direction setting
   a) **DIP 1 OFF: Opening direction anti-clockwise (supply right side)**
   b) DIP 1 ON: Opening direction clockwise (supply left side)

2), 3) Temperature range setting
   a) DIP2 OFF, DIP3 OFF: 20-80 °C (should be set)
   b) DIP2 ON, DIP3 OFF: 0-95 °C

4) Reaction factor setting
   a) **OFF: x1 (slower response of the controller to changes)**
   b) ON: x10 (faster response of the controller to changes)

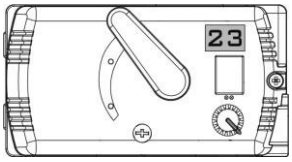
For systems with greater inertia, select x1, and x10 for systems with lower inertia

Note: Each time the DIP1 position is changed, the drive is calibrated. The green LED (1) (1x/sec.) flashes and the drive rotates to the extreme left and right sides. Leave the drive in the AUTO position during this period, do not change the settings or disconnect the power supply. During the calibration of the drive, to protect the system, the pump must be switched off or a temperature flashover in the system (floor heating, hot water ... process water) must be prevented in some other way.

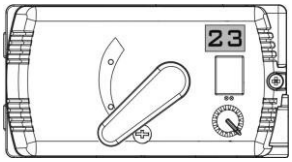
Main connection

The main connection is made via a main adapter.

Drehrichtung



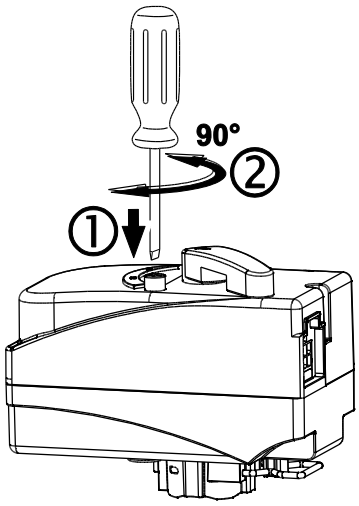
Position: „max“ =max. supply temperature



Position: „min“

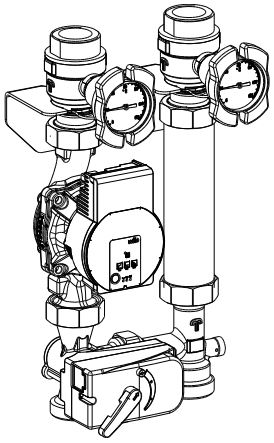
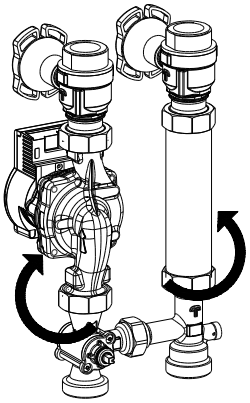
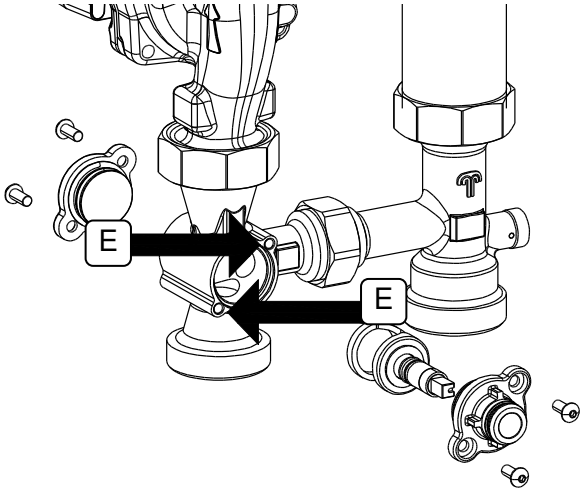
The actuator moves with its own controller to the required position.

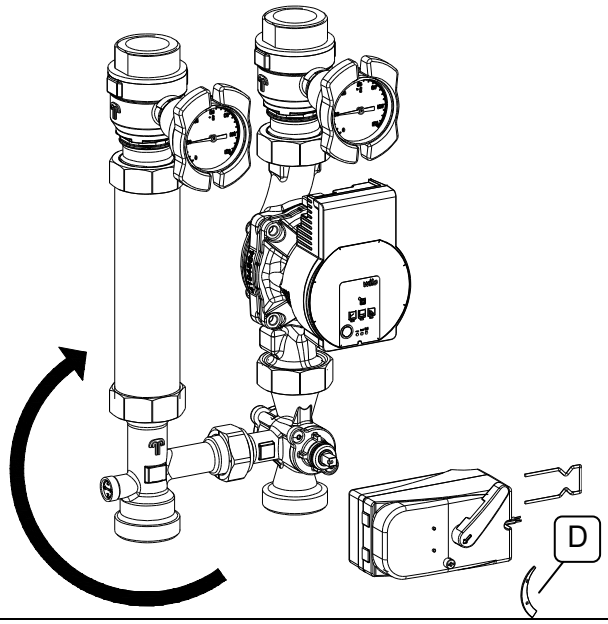
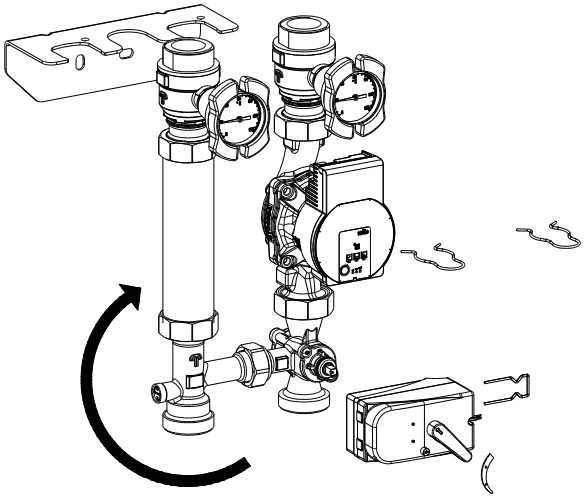
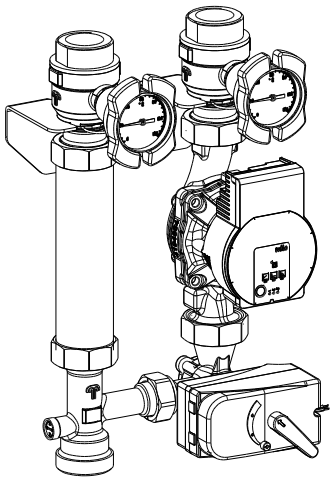
Manual adjustments



Manual adjustment:
Use a screwdriver to push the locking button inwards and turn it 90 °. Turn the handle to the desired position.

4.8 Modification from flow on the left to flow on the right

	Loosen union nut.
	Turn both flow and return line backwards.
	Disassemble actuator [9]. Remove the front and rear covers from the rotary valve. Take out the rotary valve and reassemble it from the front. Replace both caps. Notch of the rotary valve is at 9 o'clock. (see 4.4) Fixing screws [E] with hexagon socket

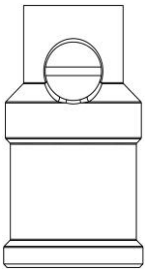
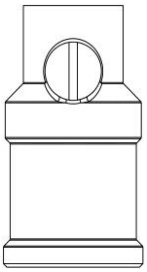
	Turn whole pump group. The flow line is now on the right, the pump is facing forwards. Tighten all the union nuts. Remove directional arrow [D], rotate through 180° and remount. Turn servo-motor to the new "max" position.
	Place servomotor [9] with mounted clip on the mixer. Hook the module back into the mounting bracket and secure it with the safety springs.
	The pump group has now been modified from flow on the left to flow on the right. Note the changed direction of rotation of the servo motor.

5 Operation

5.1 Circulation pump

Observe the operating manual of the circulation pump.

5.2 Gravity brake

 Operating position	 Maintenance position	The gravity brake [9] is put into operation in a diagonal position. The gravity brake can be vented for service and maintenance work. To vent the gravity brake, turn the adjusting screw to the flow direction. When the service work is complete, turn all the adjusting screws back to the operating position.

6 Start-up

Complete installation of all hydraulic and electrical components is a precondition for commissioning.
Turn all ball valves and gravity brakes to the operating position for commissioning.

6.1 Leak testing and filling the system

Check all of the system components, including all of the factory-fitted elements and stations, to ensure they are leak-tight; repair any detected faults accordingly. When doing so, adapt the test pressure and test duration to match the respective piping system and the respective operating pressure.
Only fill the heating system with filtered, treated water as per VDI 2035 and completely bleed the system.

6.2 Commissioning the circulation pump

Observe the operating manual of the circulation pump.

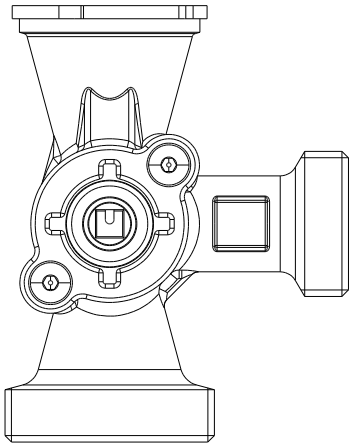
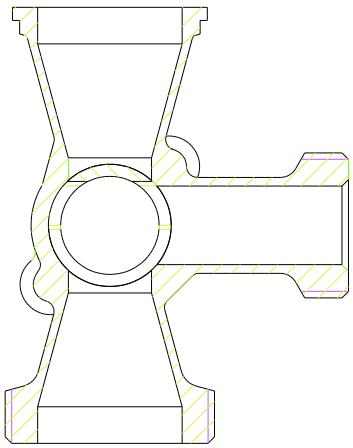
7 Maintenance/service

The manufacturer recommends having the system serviced annually by authorised, specialist personnel.

Checking	Activities
1. Control of the pump	Adjust if necessary, hydraulic adjustment
2. Actuation of all ball valves	
3. Control system pressure	If necessary adjust system pressure
4. Check water quality according to VDI 2035.	Take necessary measures if necessary.

7.1 Pump replacement

The pump can be completely shut off, it can be changed without the water of the heating circuit having to be completely drained.

	Shut off the ball valves in the supply and return lines. **Separate the expansion vessel from the system and depressurise it.** Pull the servo motor off the mixer. Turn the rotary valve of the mixer so that the marking point points upwards. Position 12 o'clock.
	The mixer is now sealed, drip tight. Pump replacement Turn the rotary slide through 180° back to the operating position, marking point at top, and open the ball valves. Fill and bleed the heating system to the required operating pressure.

Reseller	
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