Installation and Commissioning Instructions

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Thermostatic Mixer Control Group

- Thermostatic mixing valve with remote sensor for accurate control of flow temperature
- Easy to use thermostatic head with temperature locking feature
- Flow increase valve to increase flow rate for larger manifolds/heat outputs
- Adjustable temperature range from 20°C to 70°C making it suitable for screed drying
- Built-in non-return valve to aid filling during commissioning
- Built-in automatic air-vent
- Built-in temperature gauge
- Mounting bracket for additional stability and noise reduction
- 1" male close coupled primary flow and return connections
- 1" male manifold connections with union for fast assembly/removal
- Suitable for Topway Type 2 manifolds or any manifold with connections on 210mm centres
- Optional ball valve set for fitting to 1" M primary connections
- Valve body kv range:3.0-4.8

Installation and Commissioning Instructions

1.Construction

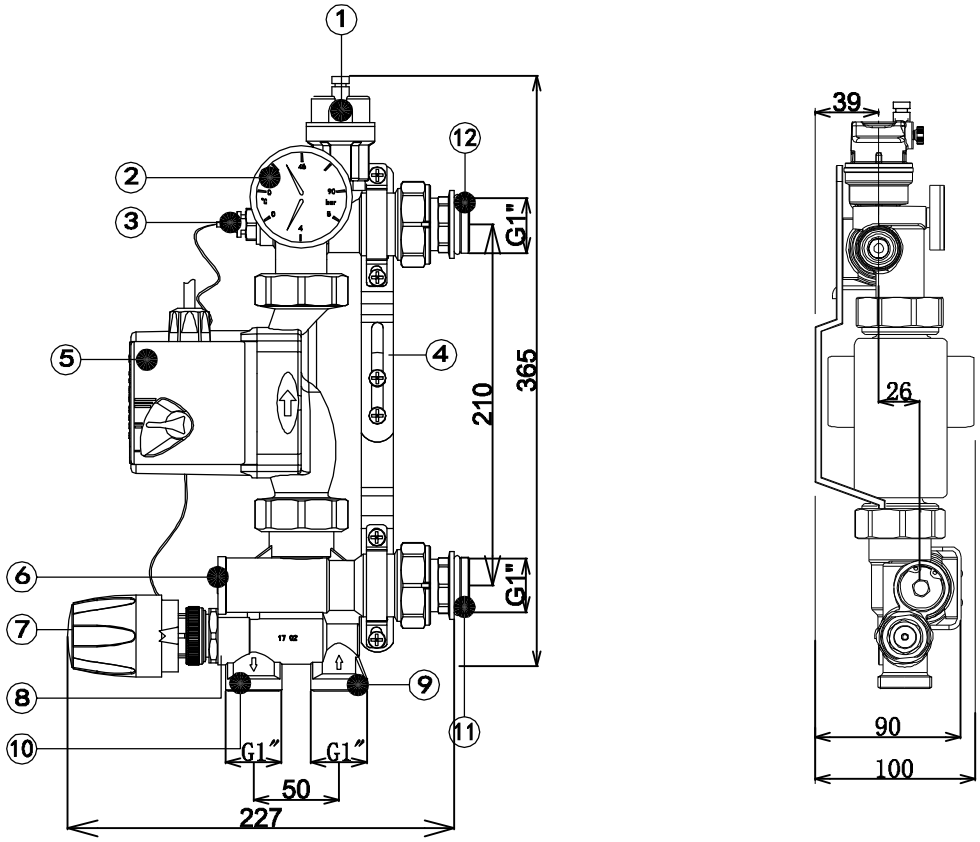

Fig.1

1.Automatic air-vent
2.Temperature gauge 0°C-80°C
3.Thermostatic sensor phial located in pocket
4.Mounting bracket
5.Flow increase valve(thermostatic model only)
6.Mixing valve thermostatic head with remote sensor. adjustable from 20°C to 70°C with M30x1.5 securing ring.
7.Mixing valve body with M30x1.5 thread for fixing the thermostatic head
8.Primary flow connection.1"BSP
9.Primary return connection.1"BSP
10.1"BSP UFH manifold return coupling with union
11.1"BSP UFH manifold flow coupling with union

Thermostatic Mixer Control Group

2.Technical Date

Mixer Control Group:

Primary circuit maximum temperature:	90°C	Climatic regulation:	11.5kW
Maximum pressure:	10bar	Mixing valve pressure drop (thermostatic regulation):	Kv3
Primary circuit max ΔP:	1bar	pressure drops with open bypass valve (thermostatic regulation):	Kvmax4.8
Secondary control range: (thermostatic regulation)	20°C-70°C	Thermometer scale	0°C-80°C
Heating capacity that can be exchanged at Δ T7°C, Δ P available 0.25 bar:		Mixing unit inlet connections:	1"BSP male
Thermostatic regulation:	10kW by-pass pos.0	Manifold outlet connections:	DN24x19tpi
Thermostatic regulation:	12.5kW by-pass pos.5	Lowara Ecocirc circulator connections:	1"1/2BSP male union

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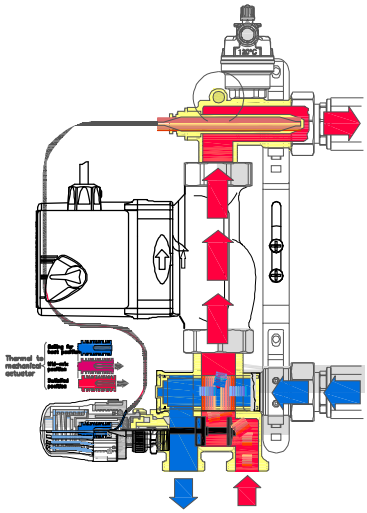
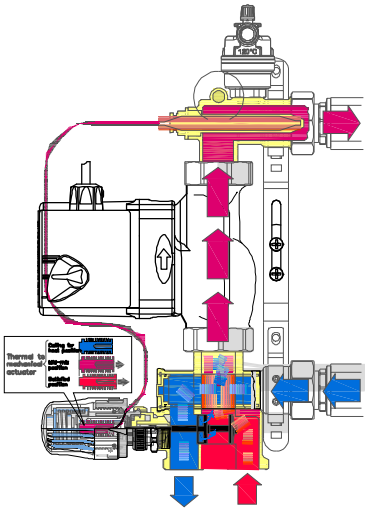
3.Operation

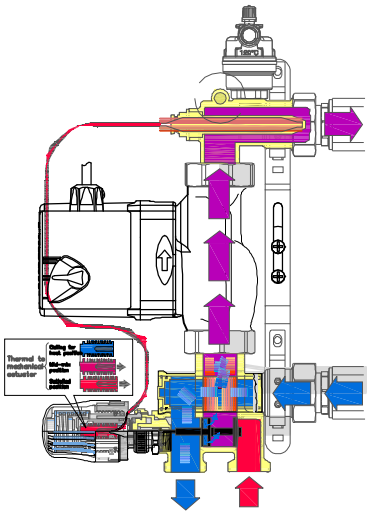
The Control Group has mixing valve at its heart which ensures accurate temperature control of underfloor heating. The unique design of the internal mixing valve components ensures that hot water from the heat source and return water from the underfloor circuit are mixed together in the valve body to produce a range of temperatures from 20°C to 70°C. This range of temperatures suits the whole field of underfloor heating applications, from commissioning new floor screeds to operating with very thick floor screeds in commercial applications. The illustrations below show how the mixing valve operates through its remote sensing thermostatic head:



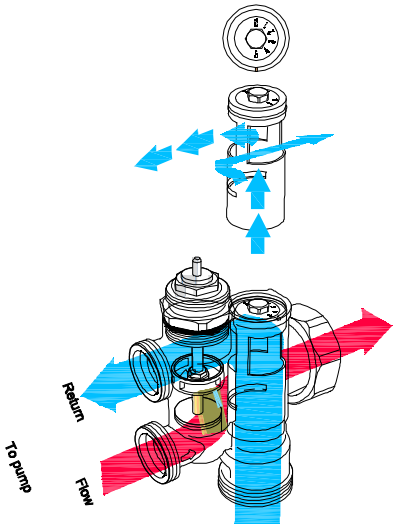
Initially the cool liquid in the remote sensing probe.allows almost all of the primary hot water from the heat source through the valve.Gradually the temperature of the probe rises as the underfloor circuts begin to warm up.



Depending on the temperature setting of the thermostatic head as the temperature of the probe rises,the shuttle starts to close off the primary hot water allowing return water to maintain the temperature set on the head,up to 70°C if required.



Once the temperature set on the head has been reached at the probe, the shuttle balances the right amount of primary hot water and secondary return water to maintain this temperature. Depending on the thermostat setting,the hot water could be almost completely closed off allowing very low temperatures suitable for commissioning screed floors right down to 20°C if required



The thermostatic mixing valve has a flow increase valve which allows return water to flow directly into the mixed water outlet. This cools the mixed water temperature sensed by the remote phial and causes the mixing valve to open allowing more primary hot water through the mixing chamber and raises the temperature to the setting on the head

Installing the Mixing Unit

4.Installation

4.1 Installing the Mixing Unit

The mixing unit can be installed directly on the wall by securing its bracket with suitable fixings (depending on the kind of wall). These need to be inserted into the designated holes shown in or in manifold cabinet suitable for 120 mm minimum depth partitions.Where the mixing unit is to be wall-mounted, then the mounting surface should be flat and vertical. The space necessary for the mixing unit and a Topway or manifold can be determined from the table and drawing below.Ensure that there is room for the isolating valves and fittings below the mixing unit inlet connections and leave at least 300mm from the lower manifold rail to the floor to prevent damage to the pipes where they enter the floor

Assemble the mixing unit to the manifold using the 1" male union connectors to the top and bottom rails of the manifold (Floor Mixing Unit is already assembled).The mounting bracket holes can be used to mark the fixing positions and the mixing unit and manifold assembly screwed to the wall/ mounting surface using suitable fixings ensuring that the assembly is level. The pump should be turned to face forwards to avoid fouling the wall/ mounting surface Where the mixing unit is to be mounted in a cabinet, check the overall dimensions of the mixing unit using a Topway T2 underfloor heating manifold using the table and drawing on the next page.

FMU2 T3 Manifold

Type	2 ways	3 ways	4 ways	5 ways	6 ways	7 ways	8 ways	9 ways	10 ways	11 ways	12 ways
L mm	160	210	260	310	360	410	460	510	560	610	660

Topway T2 Manifold

Type	2 ways	3 ways	4 ways	5 ways	6 ways	7 ways	8 ways	9 ways	10 ways	11 ways	12 ways
L mm	172	222	272	322	372	422	472	522	572	622	672

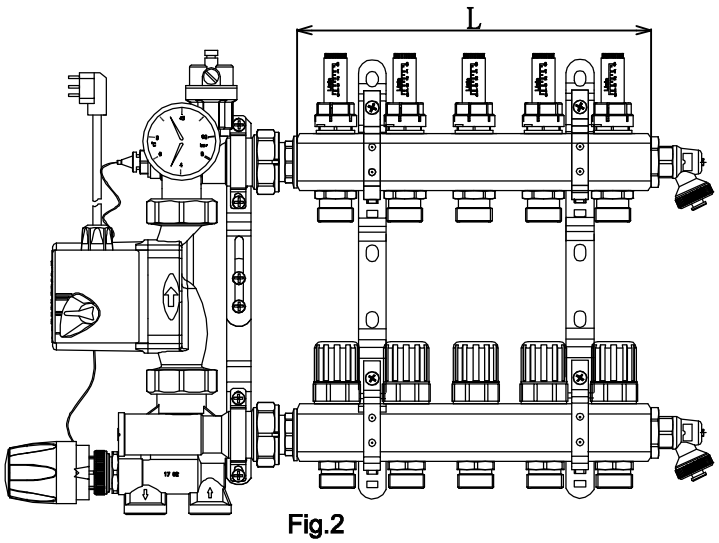


Fig.2

Secure the mixing unit and manifold assembly inside the cabinet. Ensure that there is room for the isolating valves and fittings below the mixing unit inlet connections and leave at least 300mm from the lower manifold rail to the floor to prevent damage to the pipes where they enter the floor.The cabinets have movable internal mounting rails which allow the pump to be turned sideways to minimise the depth (see Fig.1 Page 2 and Fig. 2) and enable the assembly to fit inside the cabinet.

Adjust the cabinet feet with the 2 wing screws at each side, so that there is at least 300mm between the lower manifold rail and the floor. See Fig. 3.

Secure the casing to the wall with suitable fixings and fill any gaps around the case with cement mortar or other suitable filler. A cardboard protector is provided with cabinets to prevent the mortar entering the case.

Connect the flow and return pipes for the underfloor heating system circuits with a Monoblocco connector selected from the range for the type of pipe being installed.

4.2 Installation of the thermostatic head and remote sensor for thermostatic regulation

For thermostatic regulation, a thermostatic head, purchased as a separate item, ZL-2014A, must be used. Set the thermostatic head to the maximum setting then position the head on the thermostatic valve body (see Fig 1. Item 7) with the index marker facing to the front. Then attach the head to the valve body using the securing ring on the head, tightening the ring lightly: do not over tighten.

Electrical Connections

The Domestic Building Services Compliance Guide recommends the use of a separate flow temperature high limit thermostat for systems connected to a high temperature water supply (i.e. More than 60℃) to ensure that the water temperature in an underfloor heating system does not rise above the temperature recommended for the floor. We offer a thermostat for this purpose. We also offer the EWC-1 and EWC-2 wiring centre components in underfloor heating systems:

EWC-1 230V 8-way wiring centre with on-off switch
EWC-1 24V 8-way wiring centre with on-off switch
EWC-2 230V 8-way wiring centre
EWC-2 230V 12-way wiring centre

This allows the connection of the mains power supply, thermostats and actuators with electrical interlock terminals for the boiler and manifold pump as required by Building Regulations. Full instructions are provided with all four items. Please ensure that the electrical wiring of the installation and connections to and from electrical system components are in accordance with BS 7671, the latest edition of the IET Wiring Regulations.

High limit thermostat

Wall Mounting - Install the high limit thermostat adjacent to the manifold where the thermostat phial can be trapped between the rubber mounting pad in the support bracket and the surface of the flow manifold, fixing it to the wall with suitable fixings.

Cabinet mounting - Where the manifold is installed in an manifold cabinet, install the thermostat in the enclosure above or to the side of the manifold assembly. Make the electrical connections to the thermostat as shown in the installation leaflet. Maximum suggested thermostat setting: 45/50℃ for cement slabs; for other materials refer to the maximum values as stated by the supplier, and not more than 55℃ (EN 1264-4).

EWC-1 wiring centre

EWC-2 wiring centre

Wall mounting - Install the wiring centre adjacent to the manifold so that the electrical cables from the electrothermic heads can reach the wiring centre, ideally on the lower face of the centre, then fix the centre to the wall using the fixings supplied.

Cabinet mounting - where the manifold is installed in manifold cabinet, the wiring centre can be installed above or to one side of the manifold providing all electrothermic head cables can reach the centre. Make the electrical connections to the centre as shown in the installation leaflet. Take extra care to ensure that EWC-2 manifolds are kept away from water.

Hydraulic Connections

Connect the flow and return pipes to the G1 male inlet connections on the mixing unit. We recommend installing a suitable isolating valve for connection to the G1 inlet connections:

- 3/4"F x 1"F union, 1 pair with red and blue butterfly handles (no gaskets)
- 1"F x 1"F union, 1 pair with red and blue butterfly handles

The use of jointing paste and hemp or similar sealing materials is not recommended as this may interfere with the correct operation of the mixing valve and manifold.

5.Commissioning

5.1Filling and Testing

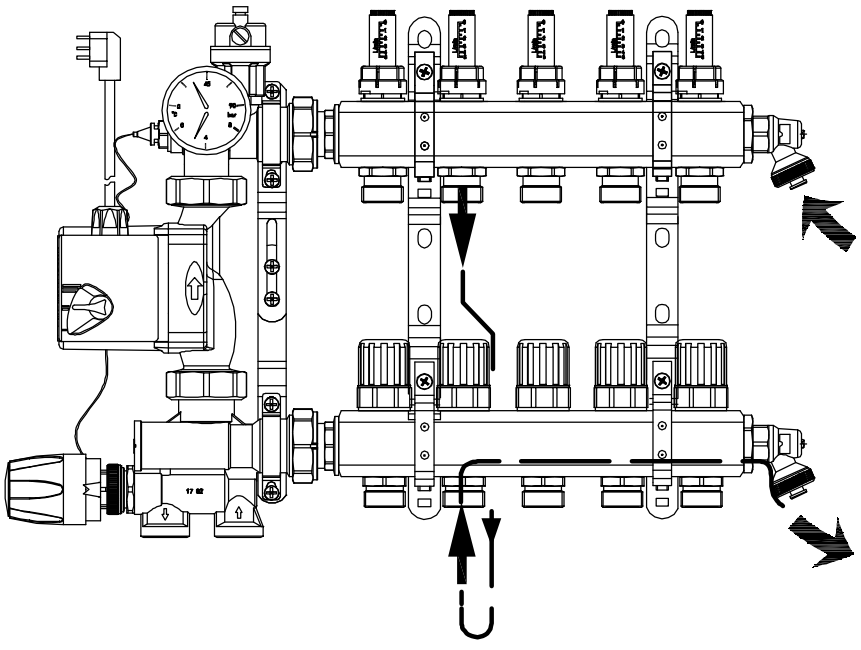
The mixer Control Group has a built-in non return valve to ensure that the underfloor heating circuits can be simply filed from the drain and fill valves fitted to manifolds.

To use the non-return valve the underfloor heating circuits must be filled using the drain and fill valve fitted to the upper rail only - it will not work if the lower drain and fill valve is used to fill the circuits - see Fig. 4. (The manifold is shown but the Topway T2 manifold is filled in the same way).

The control group, manifold and underfloor circuits can now be filled and commissioned in accordance with the manifold instructions. Prior to filling, a final check of all joints should be made to ensure no connections have loosened during transit (For details of the recommended commissioning procedure please refer to the literature for the manifold).

The manifolds are provided with double regulating valves supplied fitted with either lockshields or flowmeters as standard.

We recommend filling each circuit separately, opening the relative valves and double regulating valves each time and closing them again when the operation is completed. Once filled the system should be pressure tested in accordance with EN 1264.



Thermostatic Mixer Control Group

5.2 Setting the Flow Increase Valve

ΔTip = 10℃ T Boiler = 70℃ Tip = 45℃ΔPip = 0,25 bar

Capacity(w)	Circulator Setting	Valve Setting
18000	maximum	5
17000	maximum	3-4
16000	maximum	2
15000	maximum	1
14000	maximum	0
13000	average	5
12000	average	4
11000	average	2-3
10000	average	1

ΔTip = 5℃ T Boiler = 70℃ Tip = 45℃ΔPip = 0,25 bar

Capacity(w)	Circulator Setting	Valve Setting
9000	maximum	5
8000	maximum	2-3
7000	maximum	0
6000	average	5
5000	average	2-3
4000	average	0

Fig. 6

Mixing unit pressure drops

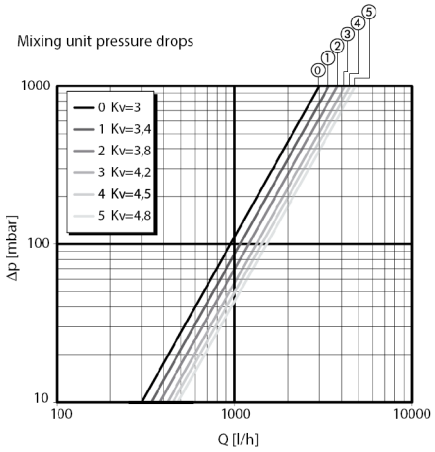


Fig.5

ΔTip - temperature difference on circuits
TBoiler - primary flow temperature
Tip - secondary flow temperature
ΔPip - underfloor circuit pressure drop
Once the total flow rate of the system has been calculated:
Qip = total underfloor system flow-rate = (P[W] x 0.86) / (ΔTip)
Where P is the total calculated heat demand in Watts and ΔTip is the calculated temperature difference across the underfloor system
The rpessure drop for the mixing unit can be read off on the graph Fig. 5. The mixing unit pressure drop curves show the Flow Increase Valve settings from fully closed to fully open and allow the installer / designer to choose a suitable flow rate and pressure drop to suit the system. Together with the calculated pressure drop of the underfloor system and manifold, the pump setting can then be chosen.
The tables, Fig. 6, show two examples of the required system output against the Flow Increase Valve setting based on assumed values of underfloor flow temperature, temperature drop and pressure drop for the underfloor system for guidance.
If necessary, adjust the Flow Increase Valve as follows:
- Excessively high temperature drop.
Insufficient flow rate - gradually open the Valve until you reach the required temperature drop.
- Flow temperature below the required value.
Gradually close the Valve until the required temperature is reached, allowing time for the system temperature to stabilise.

5.3 Setting the thermostatic head

Once the system has been filled and pressure tested, the individual underfloor circuits can be balanced. As part of this process the mixed flow temperature must be adjusted to the correct lever for the system design. To achieve this, the thermostatic mixing valve can be set on the thermostatic head (ref. No. 8. Fig. 1).

Temperature setting lock

The thermostatic head is provided with two setting pins, one red and the other blue. These pins are provided to lock the temperature setting as follows:
1.Set the required temperature as described above.
2.Locate the black dot - see Fig. 7 - and insert one pin on each side of the dot
3.The head can not now be rotated.

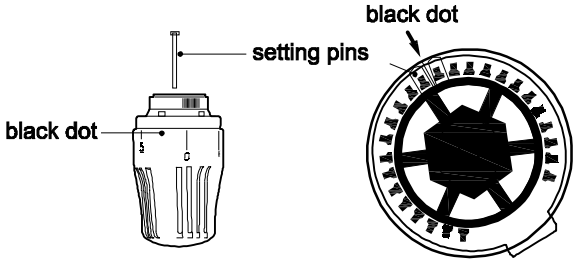


Fig.7