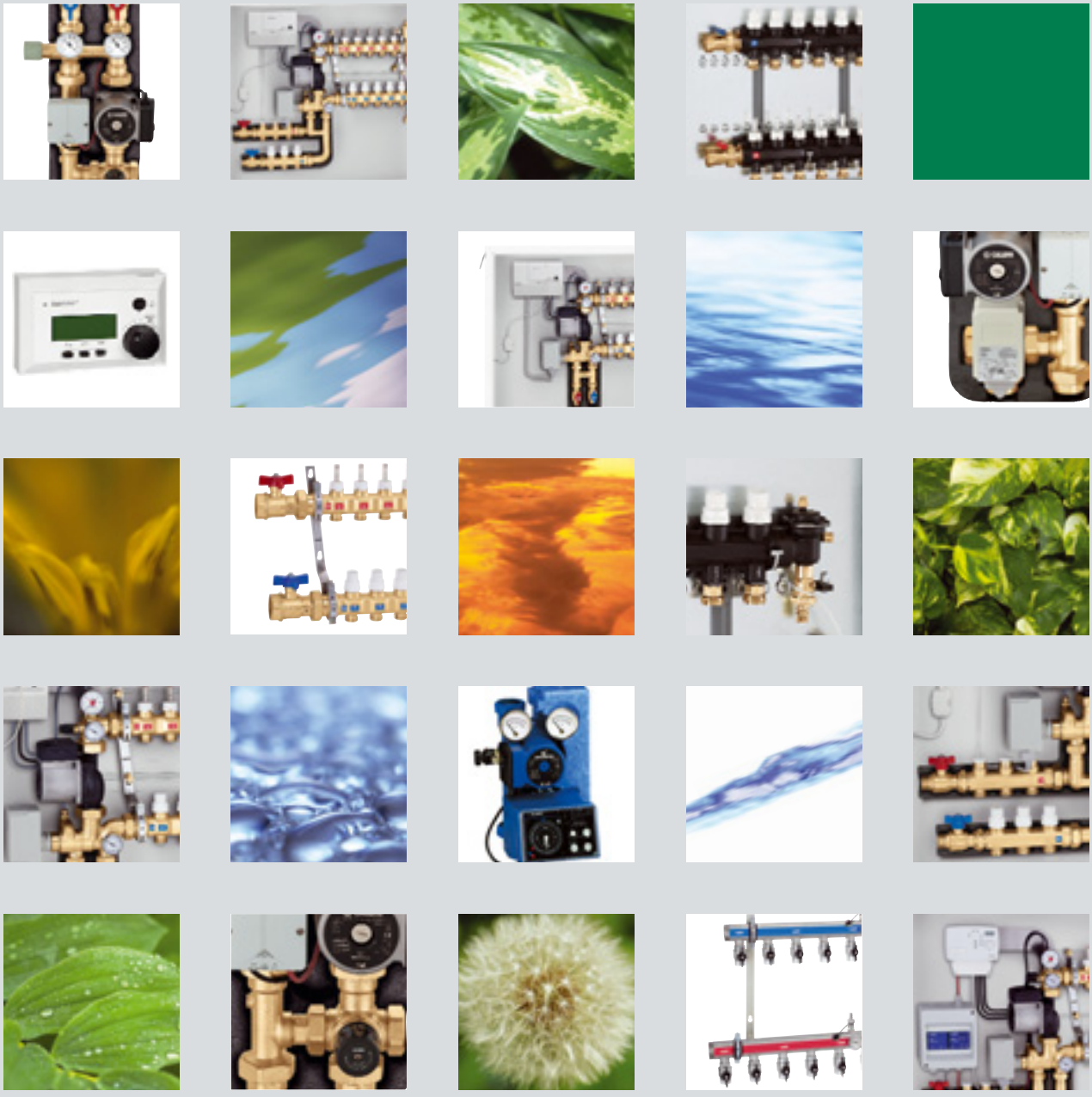
CALEFFI
Hydronic Solutions



CALEFFI UNDERFLOOR HEATING SYSTEM CONTROL

UNDERFLOOR HEATING SYSTEM CONTROL

Terms and definitions

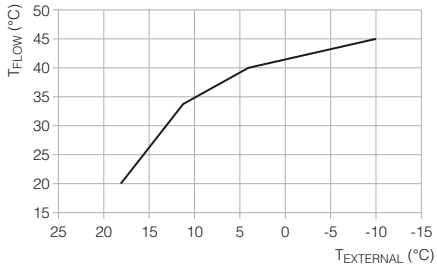
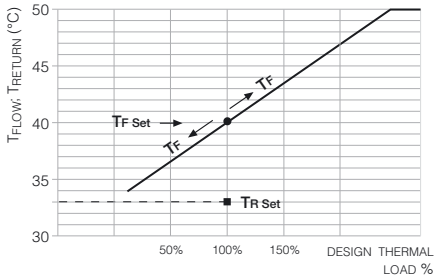
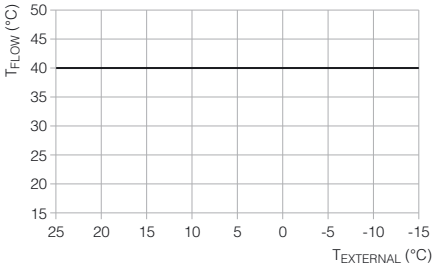
The system temperature regulation can be carried out in only two basic ways:

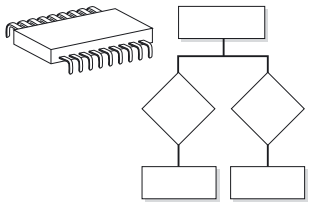
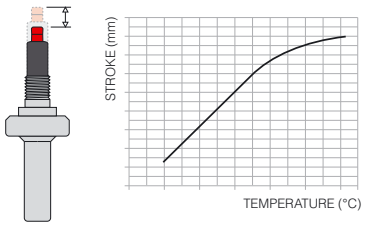
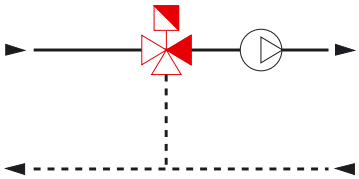
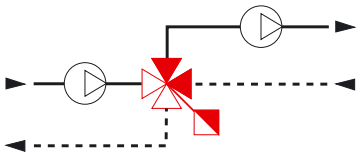
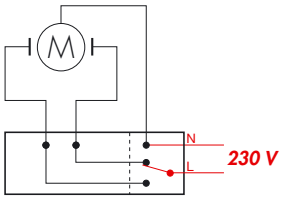
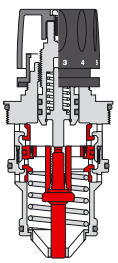
1 **Flow rate control** of the medium feeding the heat transfer terminals **at a constant temperature**. This approach uses on/off valves or flow rate modulating valves with the pump always upstream of the valve.

2 **Flow temperature control of the medium** feeding the terminals **at a constant flow rate**. This approach employs modulating mixing valves to control the temperature and the pump is always downstream of the valve.

Panel system temperature regulator units control the temperature of the medium supplied to the panels according to way (2). The flow temperature to the panels is generally different from that of the boiler or chiller unit, so that there must be a mixing unit upstream of the circulation pump for the panels circuit.

We give below a number of definitions used in the temperature regulation by means of regulation units.

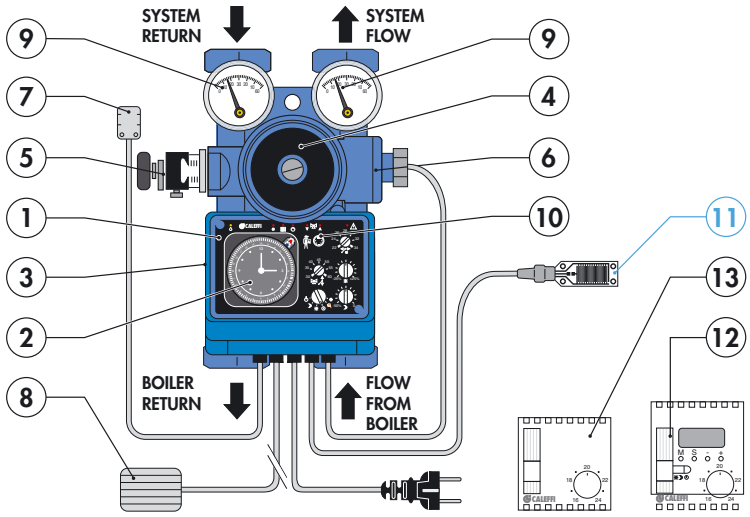
Definition	Description	Reference drawing or diagram
Type of regulation		
Outside compensated temperature regulation	*The flow temperature supplied to the system varies depending on the outside temperature changes according to a regulation curve.*	
Modulating temperature regulation with compensated set point	*The flow temperature supplied to the system varies depending on the return temperature changes from the system. This latter temperature is the characteristic parameter of the actual instantaneous thermal load.*	
Set point regulation	*The flow temperature supplied to the system is constant at an adjustable value.*	

Definition	Description	Reference drawing or diagram
Type of regulation unit		
Digital regulator	*Electronic device which processes the temperature signals, using a microprocessor and software, and sends control signals to the regulation valve actuators.*	
Thermostatic regulator	*Mechanical device working by means of a thermostatic element expansion or contraction in contact with the fluid being controlled.*	
Type of valve / application		
3-way / mixing	*Simultaneous control of the primary circuit medium and the system return medium. They are mixed directly inside the valve.*	
4-way / mixing	*Simultaneous control of the primary circuit medium and the system return medium. They are mixed directly inside the valve, so as to enable double circulation on both the primary and secondary circuit.*	
Type of actuator		
Three point (or position) electrical actuator	*Electrically supplied actuator with common contact, opening contact and closing contact. The contacts are supplied directly by the regulator, which is also a three-point controller.*	
Integrated thermostatic control	*Mechanical device controlled by a built-in sensor containing the thermostatic element which expands or contracts.*	

OUTSIDE COMPENSATED TEMPERATURE REGULATING UNIT FOR CENTRALISED INSTALLATIONS

OUTSIDE COMPENSATED TEMPERATURE REGULATION WITH AMBIENT PROBE AND RETURN PROBE

- Variable flow temperature depending on the outside temperature, system return temperature and ambient temperature
- Digital regulation with 4-way motorised valve
- Heating and cooling control
- Programmable comfort/set back mode clock
- Adjustable differential by-pass

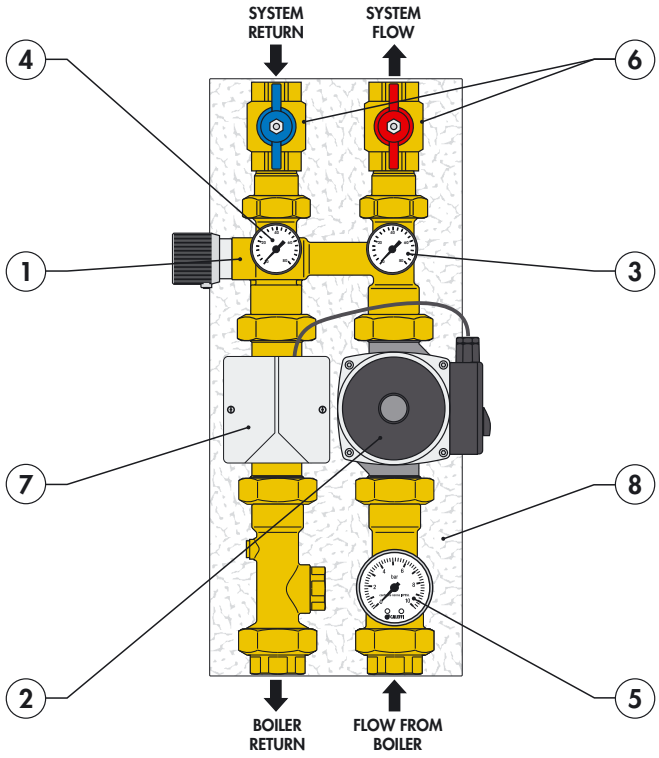


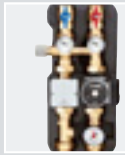


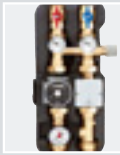
152-153 series		Code:	152600/1	153600/1	152650/1
		Brochure:	01082		01088
1	**Digital temperature controller for heating** and cooling		✔	✔	✔ ✔
2	**Programmable clock with indicators**		✔		✔
3	**4-way mixing valve**		✔	✔	✔
4	**Three-speed circulation pump**	**UPS 25-60**	152600	153600	152650
		UPS 25-80	152601	153601	152651
5	**Differential by-pass valve** with graduated scale		✔	✔	✔
6	**Flow temperature probe**		✔	✔	✔
7	**Return temperature probe**		✔	✔	✔
8	**Outside temperature probe** (mounts to clamp)		✔	✔	✔
9	**Pocket temperature gauges** on the circuit flow and return		✔	✔	✔
10	**Remote transmission connection**		✔	✔	✔
11	**Relative humidity limit control sensor**				✔
12	**Room probe thermostat** with digital clock and switch			✔	
13	***Room probe thermostat***		***optional***		***optional***

DIRECT SUPPLY UNIT FOR CENTRALISED INSTALLATIONS

- Complete with adjustable differential by-pass
- Complete with temperature gauges and pressure gauge
- Three-speed pump
- Can be coupled to separator-manifold SEPCOLL





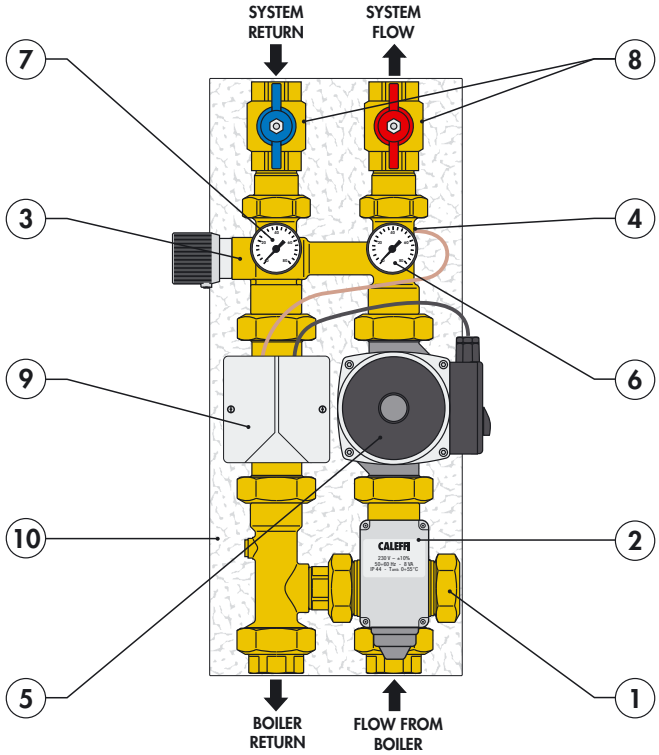


	163 series	Code:	16362.	16363.
		Brochure:	01128	01128
	Version with bottom-up flow-supply RH side		✔	
	Version with bottom-up flow-supply LH side			✔
1	Differential by-pass valve		✔	✔
2	Three-speed circulation pump UPS 25-60		163620	163630
	Three-speed circulation pump UPS 25-80		163621	163631
3	Flow temperature gauge with pocket		✔	✔
4	Return temperature gauge with pocket		✔	✔
5	Pressure gauge		✔	✔
6	Circuit shut-off valves		✔	✔
7	Electrical wiring box		✔	✔
8	Pre-formed shell insulation		✔	✔

MOTORISED TEMPERATURE REGULATING UNIT FOR CENTRALISED INSTALLATIONS

COMBINABLE WITH OUTSIDE COMPENSATED AND COMPENSATED SET POINT TEMPERATURE REGULATORS

- Regulation with 3-way motorised valve
- Complete with adjustable differential by-pass
- Three-speed pump
- Can be coupled to separator-manifold SEPCOLL

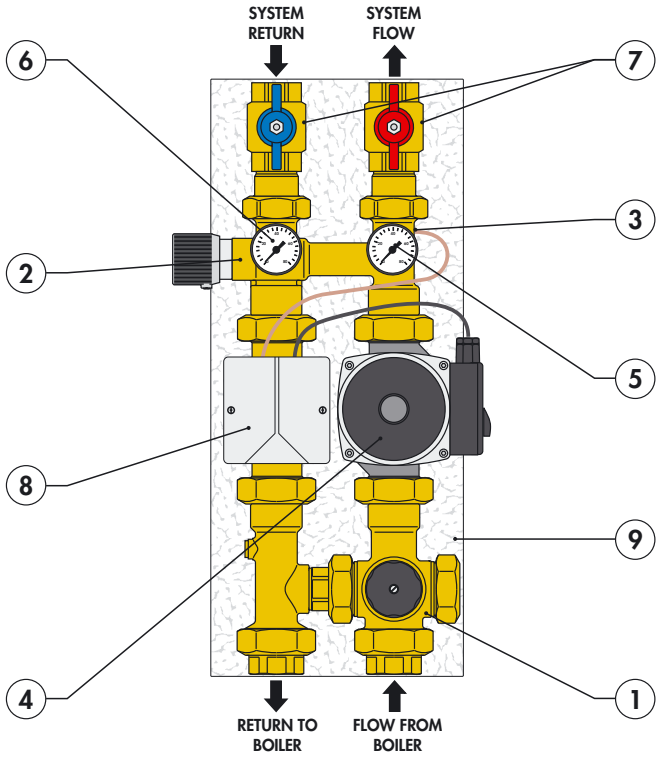


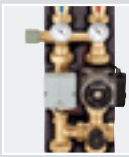
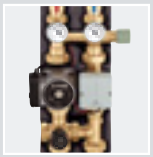
				
164 series		Code:	164**60.**	164**61.**
		Brochure:	01159	01159
	Version with bottom-up flow-supply RH side		✔	
	Version with bottom-up flow-supply LH side			✔
1	3-way mixing valve		✔	✔
2	Three-point actuator		✔	✔
3	Differential by-pass valve		✔	✔
4	Safety thermostat		✔	✔
5	Three-speed circulation pump UPS 25-60		164600	164610
	Three-speed circulation pump UPS 25-80		164601	164611
6	Flow temperature gauge with pocket		✔	✔
7	Return temperature gauge with pocket		✔	✔
8	Circuit shut-off valves		✔	✔
9	Electrical wiring box		✔	✔
10	Pre-formed shell insulation		✔	✔

THERMOSTATIC TEMPERATURE REGULATING UNIT FOR CENTRALISED INSTALLATIONS

SET POINT THERMOSTATIC REGULATING UNIT

- Adjustable constant flow temperature
- 3-way mechanical thermostatic regulation with built-in sensor
- Complete with adjustable differential by-pass
- Three-speed pump
- Can be coupled to separator-manifold SEPCOLL



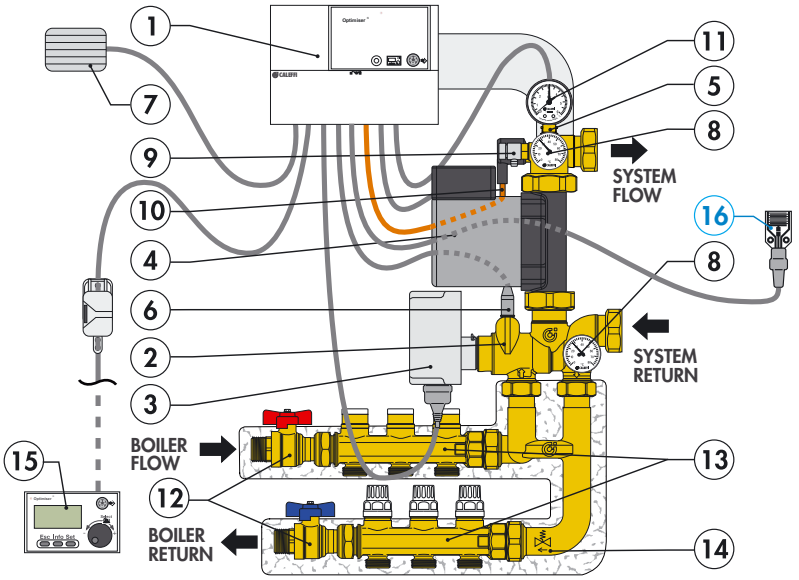



163 series		Code:	163**60.**	163**61.**
		Brochure:	01121	01121
	Version with bottom-up flow-supply RH side		✔	
	Version with bottom-up flow-supply LH side			✔
1	3-way thermostatic valve with built-in temperature sensor		✔	✔
2	Differential by-pass valve		✔	✔
3	Safety thermostat		✔	✔
4	Three-speed circulation pump UPS 25-60		163600	163610
	Three-speed circulation pump UPS 25-80		163601	163611
5	Flow temperature gauge with pocket		✔	✔
6	Return temperature gauge with pocket		✔	✔
7	Circuit shut-off valves		✔	✔
8	Electrical wiring box		✔	✔
9	Pre-formed shell insulation		✔	✔

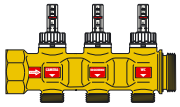
OUTSIDE COMPENSATED TEMPERATURE REGULATING UNIT IN INSPECTION WALL BOX

TEMPERATURE REGULATION WITH AMBIENT PROBE AND RETURN PROBE

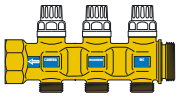
- Variable flow temperature depending on the outside temperature, system return temperature and ambient temperature
- Digital regulation with 3-way motorised valve, for heating and cooling control
- Panel distribution manifolds with differential by-pass
- Kit for primary circuit with manifolds with built-in valves and differential by-pass
- Box with adjustable height/depth brackets

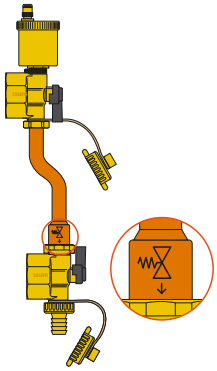


Flow manifold equipped with flow meters and balancing valves.



Return manifold equipped with shut-off valves.





End fittings with multi-position ball valves, automatic air vent, **differential pressure control by-pass kit** and fill/drain hose connection.

Code completion in relation to outlet number

E = 5 outlets	H = 8 outlets	M = 11 outlets
F = 6 outlets	I = 9 outlets	N = 12 outlets
G = 7 outlets	L = 10 outlets	O = 13 outlets

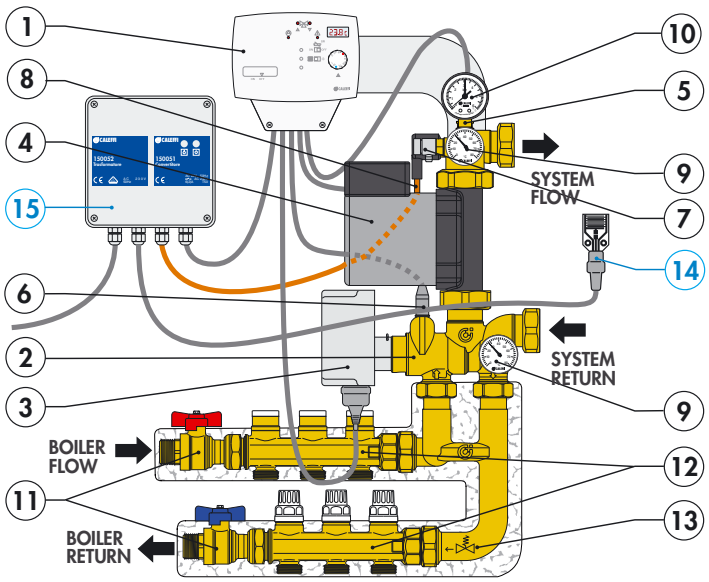



174 series	Code:	1745..	1745..	1745.. 003	1745.. 003
	Brochure:	01157	01167	01158	01168
1	Optimiser regulator for heating and cooling	✔	✔✔	✔	✔✔
2	3-way mixing valve	✔	✔	✔	✔
3	Three-point actuator	✔	✔	✔	✔
4	Three-speed circulation pump UPS 25-60	1745.1	1745.2	1745.1 003	1745.2 003
	Three-speed circulation pump UPS 25-80	1745.3	1745.4	1745.3 003	1745.4 003
5	Flow temperature probe	✔	✔	✔	✔
6	Return temperature probe	✔	✔	✔	✔
7	Outside temperature probe	✔	✔	✔	✔
8	Flow and return temperature gauges with pockets	✔	✔	✔	✔
9	Adjustable drain cock	✔	✔	✔	✔
10	Safety thermostat	✔	✔	✔	✔
11	Pressure gauge	✔	✔	✔	✔
12	Primary circuit shut-off valves	✔	✔	✔	✔
13	Distribution manifolds with built-in valves for primary circuit			✔	✔
14	Differential by-pass kit for primary circuit	✔	✔	✔	✔
15	Remote control and room probe thermostat	✔	✔	✔	✔
16	Relative humidity limit control sensor		✔		✔

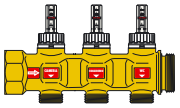
MODULATING TEMPERATURE REGULATING UNIT IN INSPECTION WALL BOX

COMPENSATED SET POINT REGULATION WITH SYSTEM RETURN PROBE

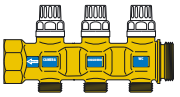
- Variable flow temperature depending on the system return temperature
- Digital regulation with 3-way motorised valve, for heating and cooling control
- Panel distribution manifolds with differential by-pass
- Kit for primary circuit with manifolds with built-in valves and differential by-pass
- Box with adjustable height/depth brackets

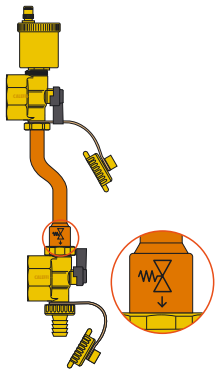


Flow manifold equipped with flow meters and balancing valves.



Return manifold equipped with shut-off valves.





End fittings with multi-position ball valves, automatic air vent, **differential pressure control by-pass kit** and fill/drain hose connection.

Code completion in relation to outlet number

E = 5 outlets	H = 8 outlets	M = 11 outlets
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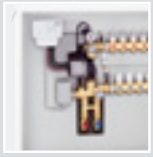
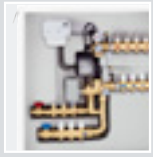


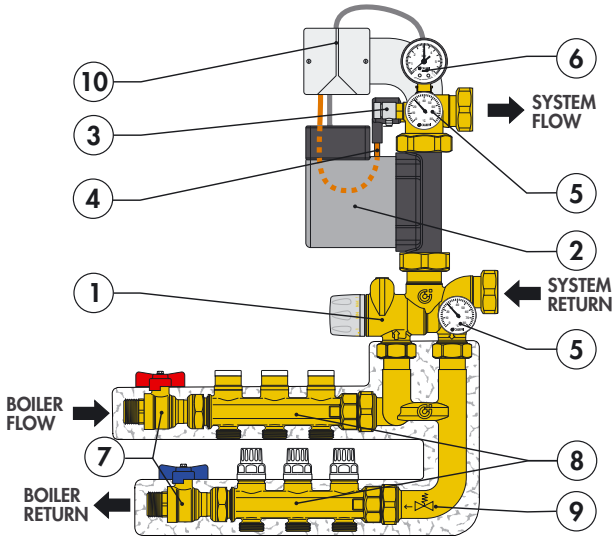



171 series	Code:	1715..	1715..	1715.. 003	1715.. 003
	Brochure:	01151	01152	01153	01154
1	Digital temperature regulator for heating and cooling	✔	✔ ✔	✔	✔ ✔
2	3-way mixing valve	✔	✔	✔	✔
3	Three-point actuator	✔	✔	✔	✔
4	Three-speed circulation pump UPS 25-60	1715.1	1715.2	1715.1 003	1715.2 003
	Three-speed circulation pump UPS 25-80	1715.3	1715.4	1715.3 003	1715.4 003
5	Flow temperature probe	✔	✔	✔	✔
6	Return temperature probe	✔	✔	✔	✔
7	Adjustable drain cock	✔	✔	✔	✔
8	Safety thermostat	✔	✔	✔	✔
9	Flow and return temperature gauges with pockets	✔	✔	✔	✔
10	Pressure gauge	✔	✔	✔	✔
11	Primary circuit shut-off valves	✔	✔	✔	✔
12	Distribution manifolds with built-in valves for primary circuit			✔	✔
13	Differential by-pass kit for primary circuit	✔	✔	✔	✔
14	Relative humidity limit control probe		✔		✔
15	Relative humidity control components		✔		✔

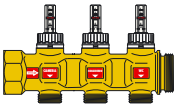
SET POINT THERMOSTATIC TEMPERATURE REGULATING UNIT IN INSPECTION WALL BOX

SET POINT THERMOSTATIC REGULATION UNIT

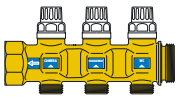
- **Adjustable constant flow temperature**
- **3-way mechanical thermostatic regulation with built-in sensor**
- **Panel distribution manifolds with differential by-pass**
- **Kit for primary circuit with manifolds with built-in valves and differential by-pass**
- **Box with adjustable height/depth brackets**

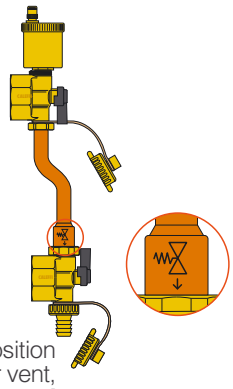


Flow manifold equipped with flow meters and balancing valves.



Return manifold equipped with shut-off valves.





End fittings with multi-position ball valves, automatic air vent, **differential pressure control by-pass kit** and fill/drain hose connection.

Code completion in relation to outlet number

E = **5** outlets	**H** = **8** outlets	**M** = **11** outlets
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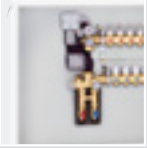


172 series	Code:	1725..	1725.. 003
	Brochure:	01155	01156
1	3-way thermostatic mixing valve with built-in sensor	✔	✔
2	Three-speed circulation pump UPS 25-60	1725.1	1725.1 003
	Three-speed circulation pump UPS 25-80	1725.3	1725.3 003
3	Adjustable drain cock	✔	✔
4	Safety thermostat	✔	✔
5	Flow and return temperature gauges with pockets	✔	✔
6	Pressure gauge	✔	✔
7	Primary circuit shut-off valves	✔	✔
8	Distribution manifolds with built-in valves for primary circuit		✔
9	Differential by-pass kit for primary circuit	✔	✔
10	Electrical wiring box	✔	✔

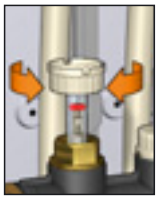
COMPOSITE MANIFOLDS FOR UNDERFLOOR HEATING SYSTEMS

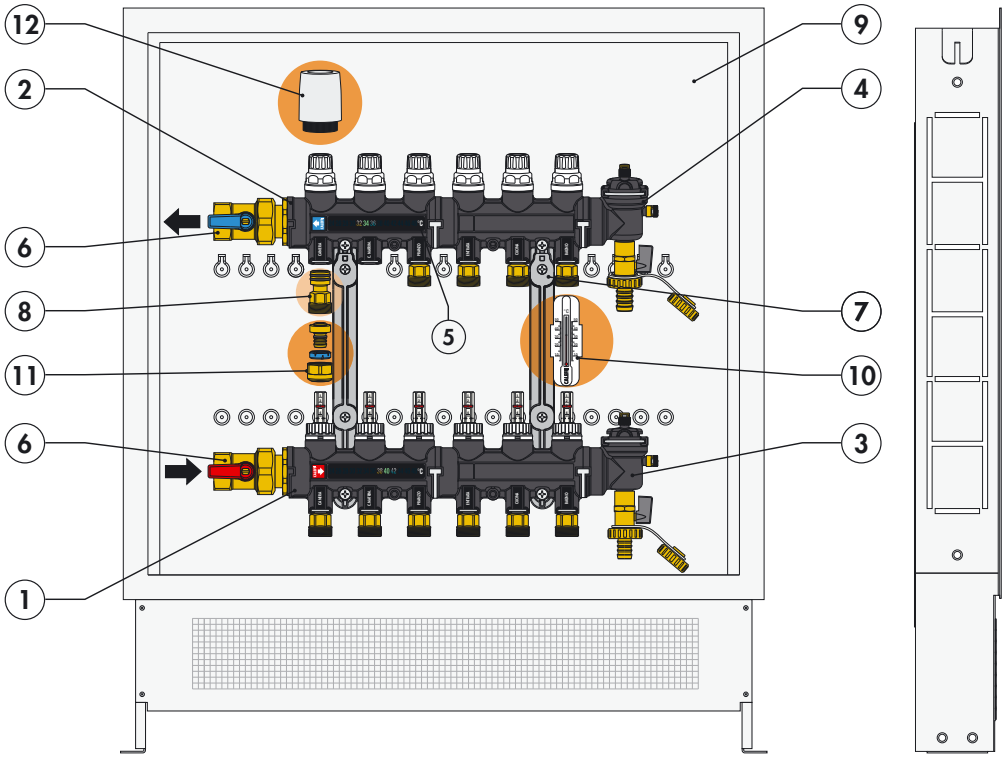
MEDIUM DISTRIBUTION AND CONTROL BY MEANS OF SPECIAL COMPONENTS

- Specific selected material
- Flow rate regulation and direct measurement with flow meter for each circuit
- Automatic shut-off for each circuit
- Thermal emission control for each panel
- Quick pipe connection with coupling adapter with clip

Installation of thermo-electric actuator

Flow rate regulation with flow meter





Code completion in relation to outlet number

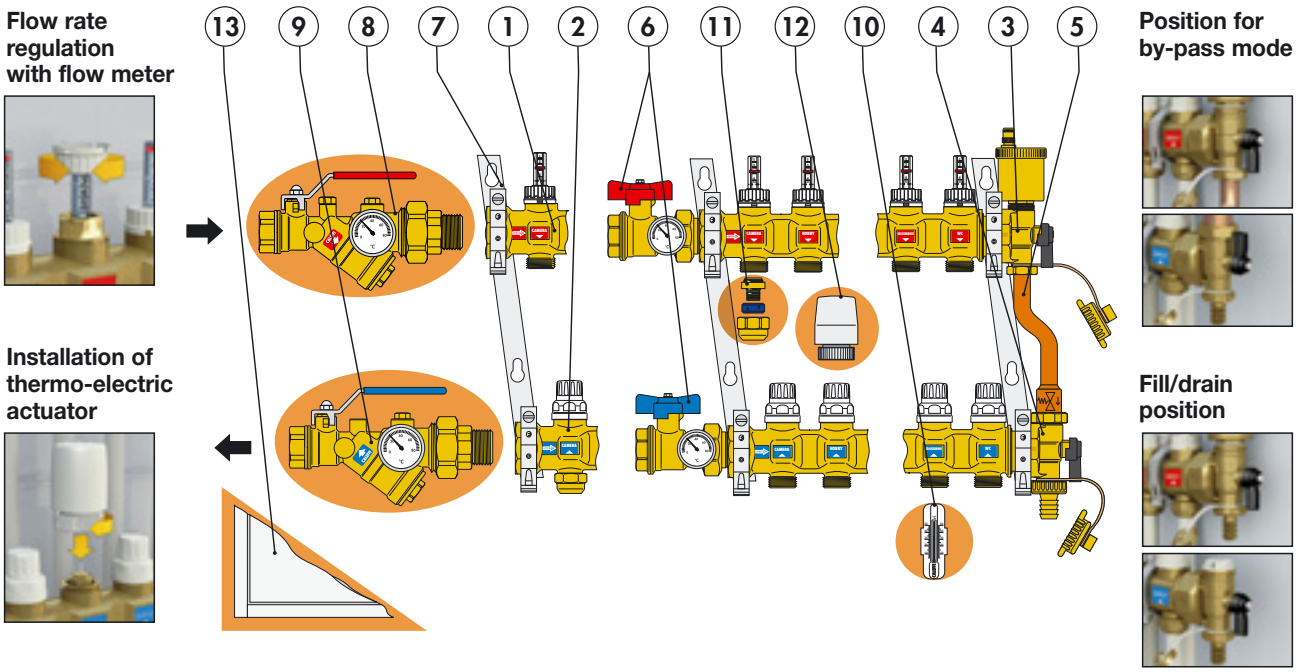
C	=3 outlets	F	=6 outlets	I	=9 outlets
D	=4 outlets	G	=7 outlets	L	=10 outlets
E	=5 outlets	H	=8 outlets		

670 series	Code:	6706.1
	Brochure:	01126
1	Flow manifold with built-in flow meters and flow rate regulation valves	✔
2	Return manifold with built-in shut-off valves suitable for thermo-electric actuator	✔
3	Flow end fitting complete with automatic air vent and fill/drain valve	✔
4	Return end fitting complete with automatic air vent and fill/drain valve	✔
5	LCD digital temperature gauges	✔
6	Ball shut-off valves	✔
7	Brackets for box or wall mounting	✔
8	Coupling adapter for panel pipe connection	✔
9	Low depth box with adjustable height/depth brackets	✔
10	*Code 675900, push-fit temperature gauge for panel pipe*	*optional*
11	*680 series, fitting for plastic or multi-layer panel pipe*	*optional*
12	*6561 and 6563 series, thermo-electric actuators*	*optional*

DISTRIBUTION MANIFOLDS IN BRASS FOR UNDERFLOOR HEATING SYSTEMS

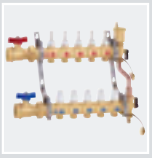
MEDIUM DISTRIBUTION AND CONTROL WITH SPECIFIC COMPONENTS

- Flow rate regulation and direct measurement with flow meter to each circuit
- Automatic shut-off of each circuit
- Differential pressure control
- Simple filling and commissioning with multi-position valves
- Thermal emission control for each panel



Code completion in relation to outlet number

C = 3 outlets	F = 6 outlets	I = 9 outlets	N = 12 outlets
D = 4 outlets	G = 7 outlets	L = 10 outlets	O = 13 outlets
E = 5 outlets	H = 8 outlets	M = 11 outlets	



668...S1 series	Code:	668...S1
	Brochure:	01144
1	Flow manifold with built-in flow meters and flow rate regulation valves	✔
2	Return manifold with built-in shut-off valves suitable for thermo-electric actuator	✔
3	Flow end fitting complete with two-position ball valve, automatic air vent and fill/drain hose connection	✔
4	Return end fitting complete with three-position ball valve, by-pass connection and fill/drain hose connection	✔
5	Off-centre differential by-pass kit complete with pipe for manifold connection	✔
6	Ball shut-off valves	✔
7	Brackets for box or wall mounting	✔
8	*120 series, strainer*	*optional*
9	*120 series, Autoflow*	*optional*
10	*Code 675900, push-fit temperature gauge for panel pipe*	*optional*
11	*680 series, fitting for plastic or multy-layer panel pipe*	*optional*
12	*6561 and 6563 series, thermo-electric actuators*	*optional*
13	*659 and 661 series , box*	*optional*

MANIFOLDS AND ACCESSORIES FOR UNDERFLOOR HEATING SYSTEMS

Code completion in relation to outlet number

C = **3** outlets
D = **4** outlets
E = **5** outlets
F = **6** outlets
G = **7** outlets
H = **8** outlets


	666...S1 - 667...S1 series	**Code:**	**666**7.5S1	**667**7.5S1
		Brochure:	**01144**	
1	**Flow manifold with built-in flow meters and flow rate regulation valves**			✔
2	**Return manifold complete with shut-off valves suitable for thermo-electric actuators**		✔	


	5996 series	**Code:**	**599674**	**599675**
		Brochure:	**01144**	
3	**End fitting composed of: double radial connection with two-position ball valve, automatic air vent and fill/drain hose connection**		✔	
4	**End fitting composed of: double radial connection with three-position ball valve, by-pass connections with cap and fill/drain hose connection**			✔

	668...S1 series	**Code:**	**668**000S1
		Brochure:	**01144**
5	**Off-centre differential by-pass kit complete with hoses for manifold connection**		

Code completion in relation to size

6 = connection **1" x 1 1/4"**
7 = connection **1 1/4" x 1 1/4"**


	391...S1 series	**Code:**	**391**0.7S1	**391**1.7S1
		Brochure:	**01144**	
6	**Pair of ball shut-off valves**		✔	
	Pair of ball shut-off valves complete with temperature gauges ∅ 40 mm with 0–80°C scale			✔

	658 series	**Code:**	**658**100
		Brochure:	**01144**
7	**Pair of mounting brackets for use with 659 and 661 series boxes or directly for wall mounting**		

Code completion in relation to size	Code completion in relation to flow rate. ΔP range 14–220 kPa				
6 = connection 1” x 1 1/4” 7 = connection 1 1/4” x 1 1/4”	1L2 = 1,20 m³/h 1L4 = 1,40 m³/h 1L6 = 1,60 m³/h	1L8 = 1,80 m³/h 2L0 = 2,00 m³/h	2L2 = 2,25 m³/h 2L5 = 2,50 m³/h		

	120 series	Code:	1209.1	1209.1 000
		Brochure:	01044	
8	Combination of automatic flow regulator and ball valve with temperature gauge 0-80°C			✔
9	Combination of Y-strainer and ball valve with temperature gauge 0-80°C			✔

	675 series	Code:	675900	
		Brochure:	01144	
10	Push-fit temperature gauge for panel pipe from 15 to 18 mm with 5-50°C temperature scale			

	680 series	Code:	6805..	
		Brochure:	01144	
11	Self-adjusting diameter fitting for plastic and multi-layer pipes			

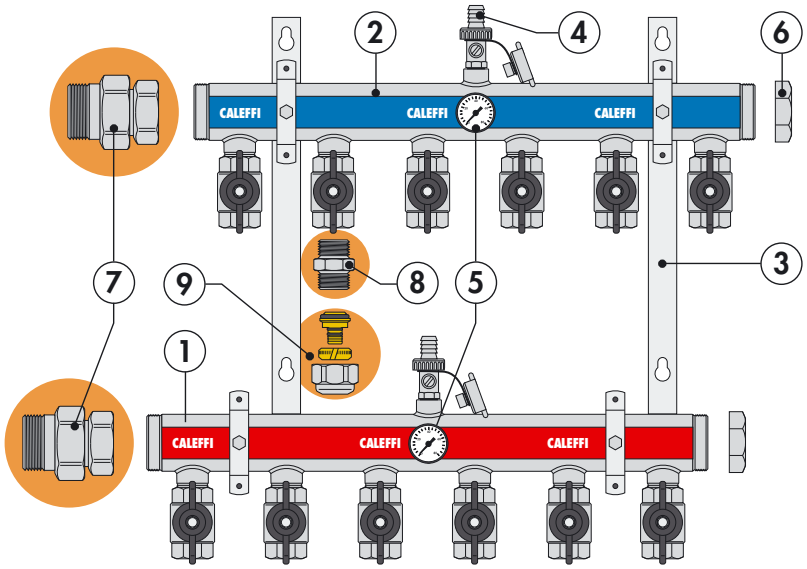
Code completion in relation to voltage						
2 = 230 V 4 = 24 V						
	6561 - 6563 series	Code:	65610.	65611.	65630.	65631.
		Brochure:	01042		01142	
12	Thermo-electric actuator. Normally closed		✔			
	Thermo-electric actuator. Normally closed. Equipped with auxiliary microswitch			✔		
	Thermo-electric actuator with manual handle and position indicator. Normally closed				✔	
	Thermo-electric actuator with manual handle and position indicator. Normally closed. Equipped with auxiliary microswitch					✔

	661 series	Code:	661043	661063	661083	661103	661123	
		Brochure:	01144					
13	Box (h= 500; d = 110 - 150)		(b = 400)	(b = 600)	(b = 800)	(b = 1000)	(b = 1200)	

STEEL MANIFOLDS FOR INDUSTRIAL UNDERFLOOR HEATING SYSTEMS

MEDIUM DISTRIBUTION AND CONTROL FOR HIGH FLOW RATE SYSTEMS

- Ideal for industrial applications
- Shut-off valve for each circuit
- Made entirely in stainless steel
- Simple fill and commissioning
- Controlled thermal emission



Code completion in relation to outlet number

03 = 3 outlets	06 = 6 outlets	09 = 9 outlets	12 = 12 outlets	15 = 15 outlets
04 = 4 outlets	07 = 7 outlets	10 = 10 outlets	13 = 13 outlets	16 = 16 outlets
05 = 5 outlets	08 = 8 outlets	11 = 11 outlets	14 = 14 outlets	

6509 series	Code:	6509..
	Brochure:	01150
1	Flow manifold complete with ball shut-off valves	✔
2	Return manifold complete with ball shut-off valves	✔
3	Pair of mounting brackets	✔
4	**Fill/drain cocks** with hose connection	✔
5	Pair of temperature gauges	✔
6	End fitting caps	✔
7	*Code 588091, three-piece 2" F x M union fitting*	*optional*
8	*942 series, sleeve fitting*	*optional*
9	*681 series, self-adjusting diameter fitting for plastic pipes*	*optional*

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