

INTRODUCTION



TRITONE is an all in one compact injection mixing control unit for the distribution of water at high and low temperature, for heating and cooling systems.

Compatible with all high and low temperature generators.

In order to give a real answer to the market requirements, TRITONE has been developed and created by GENERAL FITTINGS to ease the job of architects, engineers and installers in the realization of the systems.

TRITONE is a constant flow rate and adjustable temperature mixing control unit, for each individual loop independently.

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Application Fields

- Max temperature: 70°C
- Max pressure: 7 bar

Type of Systems

- Floor, wall and ceiling radiant systems
- Radiators
- Convectors

Available configurations and technical features - supplied instruments

Brass	
1" and 1 1/4" brass bar	CW603N
M30x1.5 connection spindle	CW617N
Shutoff valves with 3/4" connection	CW617N
Air venting valve	CW617N
Venting valve	CW617N
2 to 13 way shunt	3/4" x 18 Euroconus
Injectors	CW617N
Pump	
Variable flow rate pump, energy-saving (ERP)	Cast iron GG15/20 130mm 1 1/2" connection
Power supply	230Vac/50Hz
Pump connections	1 1/2" centre distance 130mm
Protective rating	IP44
Miscellaneous	
Knob	ABS
Thermometer	0...80°C

Optional instruments

Brass	
Euroconus Adapters	CW617N
Return flow meter	1 - 4 lt
1" fitting	CW617N
1 1/4" fitting	CW617N
Drawer	
Recessed drawer	Painted iron, RAL 9010
Support brackets	Painted iron, RAL 9010
Screws and bolts	Galvanised iron
Miscellaneous	
Circuit thermometers	4.8 x 1.2 cm
Electrothermal head	230Vac with 4 wires
Room thermostat	ON/OFF, wireless chronothermostat-thermostat
Control unit	8 relay 230Vac module
Antenna	Active antenna

Noise Level: TRITONE is equipped with an extremely silent last generation pump. This allows the mixing control unit to be installed in any room, even those more sensitive to heat (for example bedrooms).

The noise level is 22.8 dB.

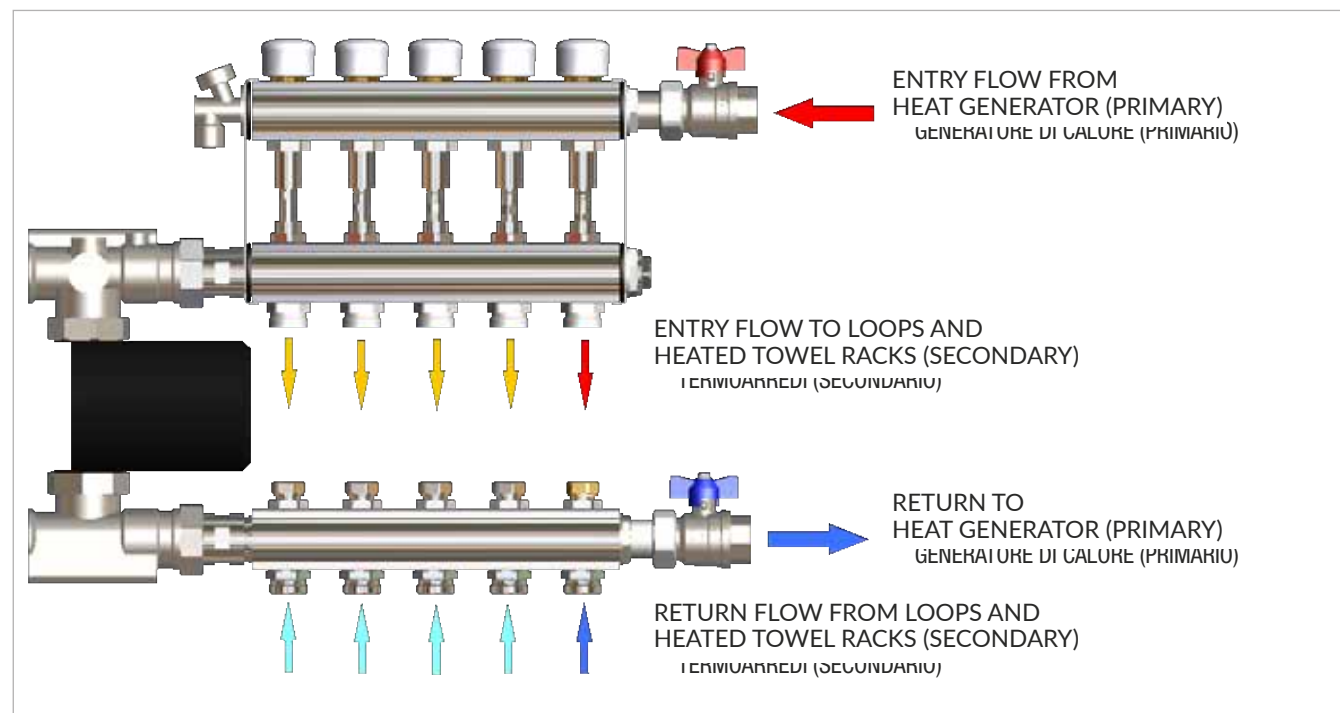
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Generators to connect TRITONE to

The TRITONE injection control unit can be fed by any heat generator which produces low temperature water (30-45) or high temperature water, to a maximum of 70°C.

The most common types of hot water generators are:

- Sealed chamber boiler
- Condensation boiler
- Biomass/fireplace boilers
- Heat pumps
- Geo-heat exchangers



Available configurations and technical features - supplied instruments

TRITONE was designed so that each injector corresponds to a secondary distribution loop. Each injector can be tuned independently from the others.

Temperature of heat generator's liquid

We propose two cases:

1. Environments with high temperature device (for example heated towel rack or radiator) and low temperature (for example radiat floor system).

The liquid temperature of the primary circuit must be the same as the device which requires high temperatures.

2. Environments with only low temperature device (for example radiating panel heating).

The temperature of the liquid of the high temperature flow (primary) must be at least 10° higher than the highest temperature requested by the system flow (secondary), anyhow never lower than 40-45°C. We recommend 50°C.

According to standard UNI EN 1264-4:2009 (Water based surface embedded heating and cooling systems), the temperature of the floor should be lower than 29°C, aside from rare cases in areas closed to the external walls or to windows.

Adjustment of the liquid temperature in the loop

TRITONE injectors are tuned with the default setted points. The liquid temperature of the loops therefore varies depending on the liquid temperature of the heat generator.

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The liquid temperature of the loops connected to TRITONE CAN be modified at any time in a simply and quick way. The temperature of each loop can be increased or decreased by simply adjusting the injectors according to the project or environment confort.

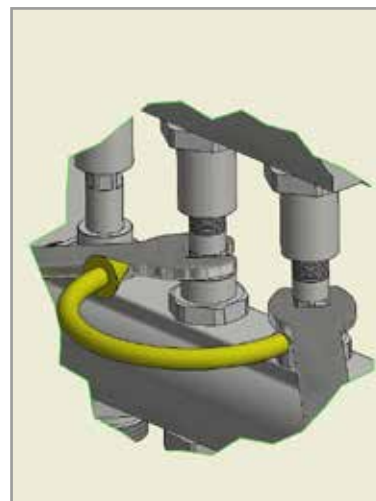
After calibrating the injector, the appropriate controls must be carried out. The temperature variation of the loop can be checked and tuned quickly with contact thermometers pointed on the secondary loops pipes. On the other hand to measure the variation of room temperature (thermostat) you must wait a few days with the system operating.

Operativity of the tuning of secondary loops liquid temperature

Temperature is controlled by turning the injectors with a simple 11mm spanner.

- Turn the injector clockwise to rise the temperature of the circuit to the maximum temperature set in the heat generator.
- Turn the spanner anticlockwise to obtain the desired temperature by mixing of the delivery and return liquids.

Use contact thermometers to check the temperature.



Determination of system flow rate

Since TRITONE is a constant flow rate and adjustable temperature mixing control unit, a simple graph must be set to calculate the flow rate of the system and to check its correct operation:

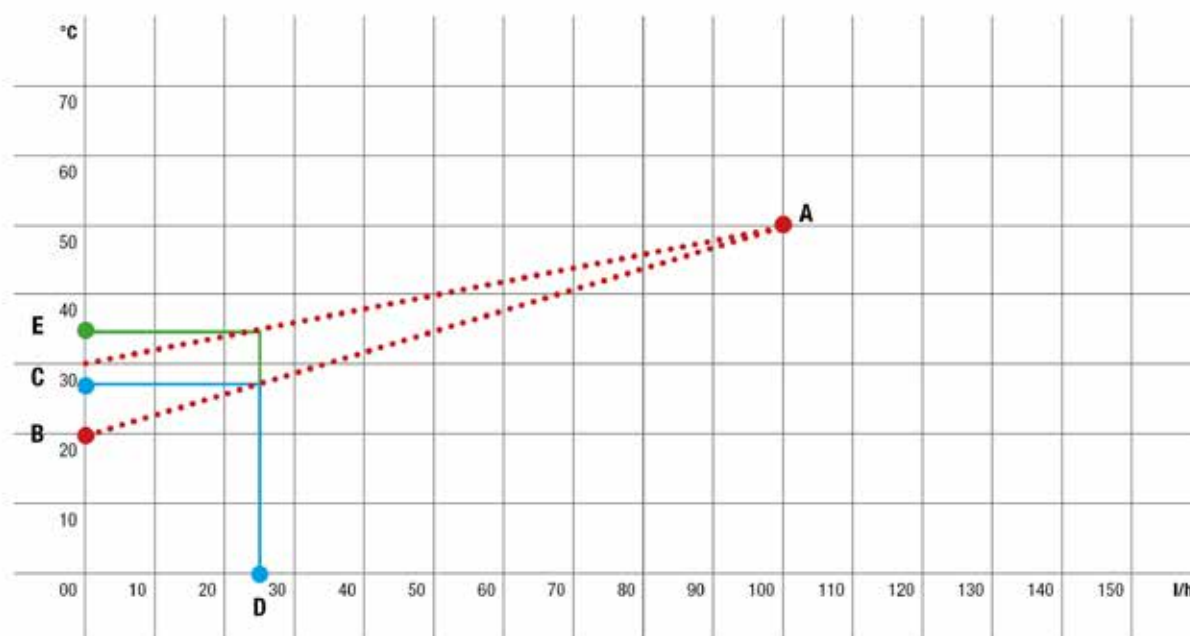
A. is the point of intersection between the delivery temperature of the heat generator (e.g. 50°C) and the overall flow rate of the circuit as per design (e.g. 100l/h)

B. indicates the average return temperature which can be viewed on the thermometer above the pump (e.g. 20°C)

C. is the delivery temperature of the secondary circuit (in example 27.5°C)

D. is the consequent flow rate of the secondary circuit which can be calculated based on the intersection of value C with the axis AB (in example 25l/h)

For example, when the average return temperature is 30°C, the delivery temperature will be 35°C (point E).



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Environment temperature control

Standards in force impose a temperature control for each room connected to one or more loops.

Room temperature control can be managed by a room thermostat or air conditioning control unit which communicates with TRITONE's electrothermal heads or electromechanical actuators.

With several environments, when one or more rooms reach the room temperature set on the relative thermostats, the electrothermal heads/electric actuators connected close the liquid flow coming from the heat generator.

If the temperature set on the thermostat is not reached in a certain environment, the TRITONE pump keeps running. In this way the liquid flow will allow the set temperature to be reached even in the cooler room. In the other rooms, the liquid flow will maintain the temperature longer, slowing down thermal excursion.

Electrothermal heads or electromechanical actuators

The electrothermal head is an electromechanical actuator which controls opening and closing (ON/OFF) of TRITONE's mechanical shutter.

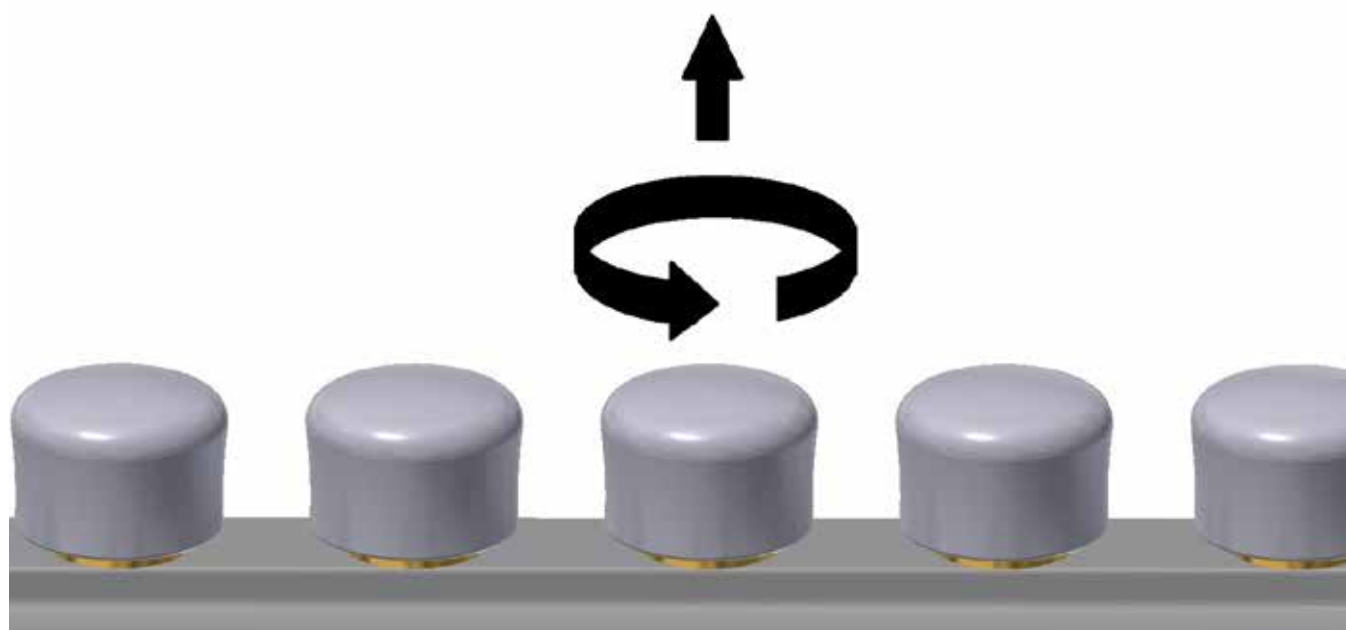
General Fittings supplies electrothermal heads with 4-wire 230Vac power supply, with auxiliary control to switch off the pump.

Electrothermal head assembly

General Fittings heads are fitted on the thermostatic spindles/shutters of the manifolds with a M30x1.5 thread.

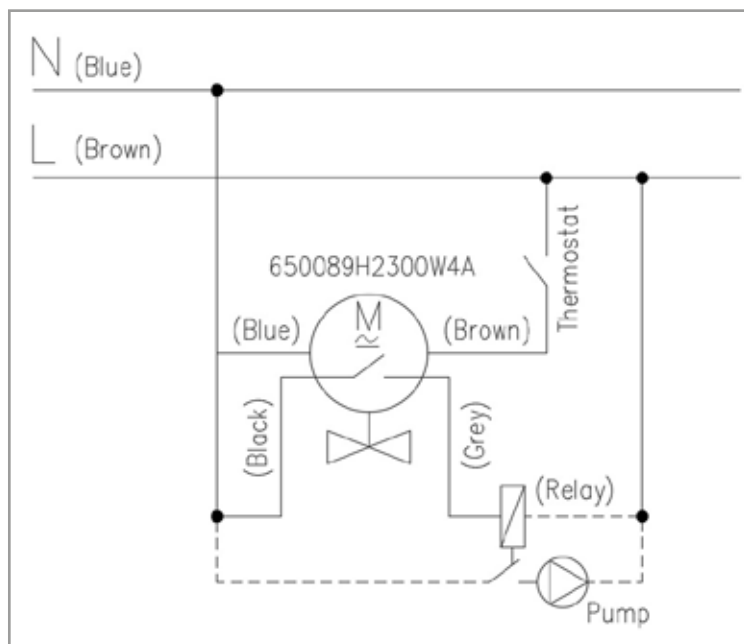
The installation procedure is as follows:

- remove the protective cap
- place the thermostatic head on the spindle/shutter
- screw the metal ring nut by hand
- perform the electrical connections as per diagram.



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Electrical connections



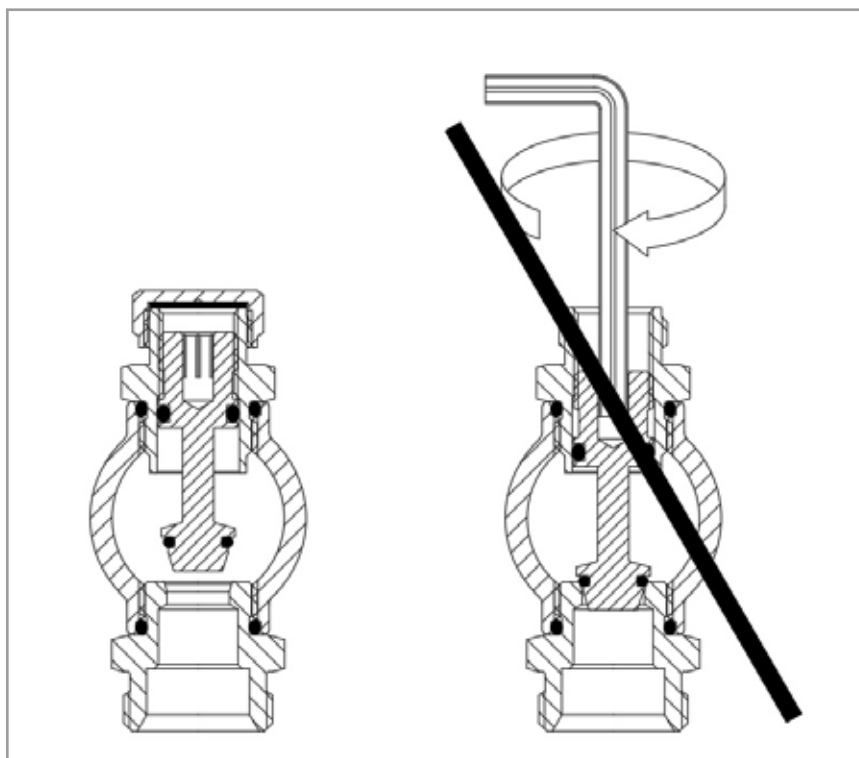
Balancing the loops

TRITONE does not require balancing the flow rate of the circuits, as it is a constant flow rate control unit. It is however possible to adjust the temperature of each individual circuit.

Whether TRITONE is supplied with mechanical lockshield memory or with flowmeter on the return of the secondary circuit, their adjustments must never be modified without consulting our technical department.

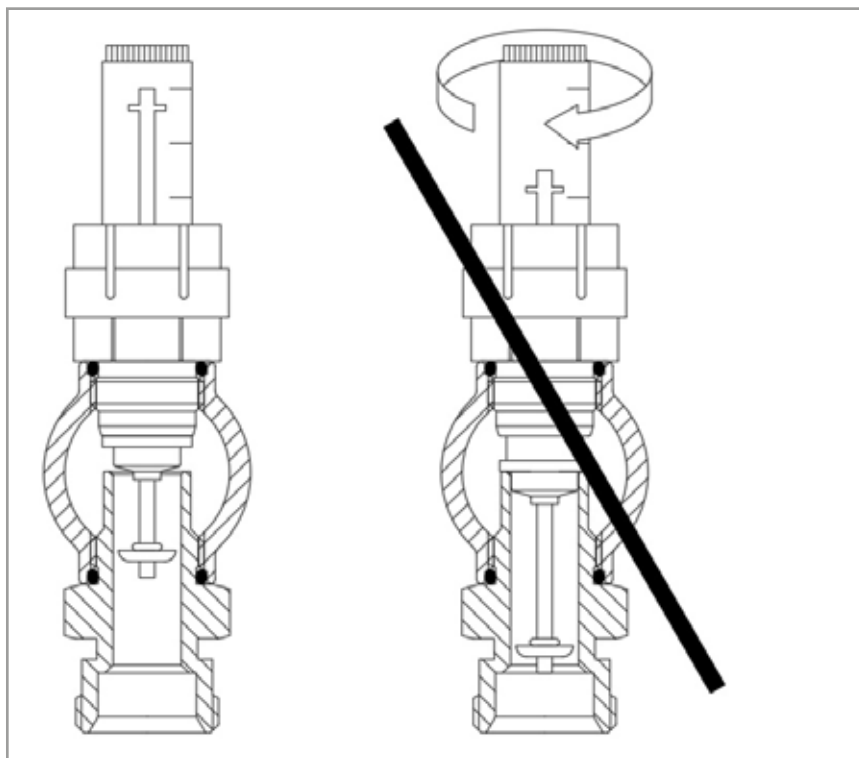
TRITONE is equipped with lockshields or flow meters on demand at the complete opening position.

Situation with lockshields



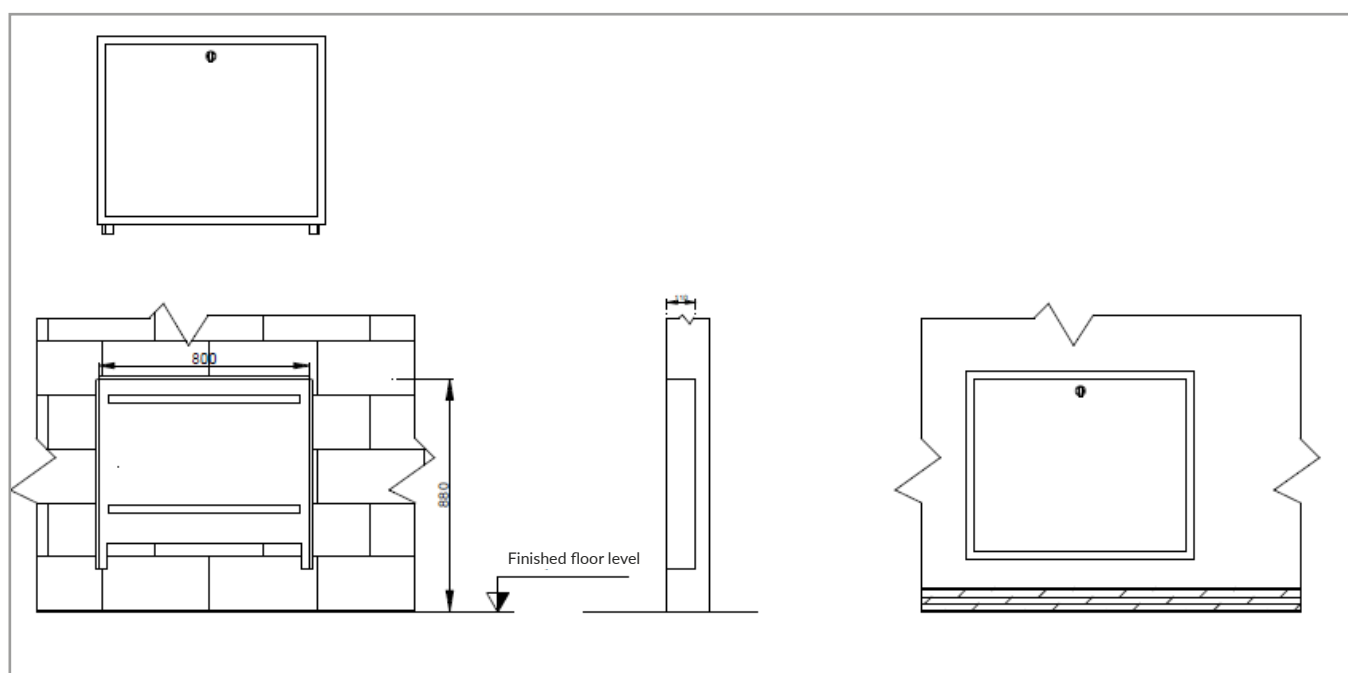
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Situation with flow meters



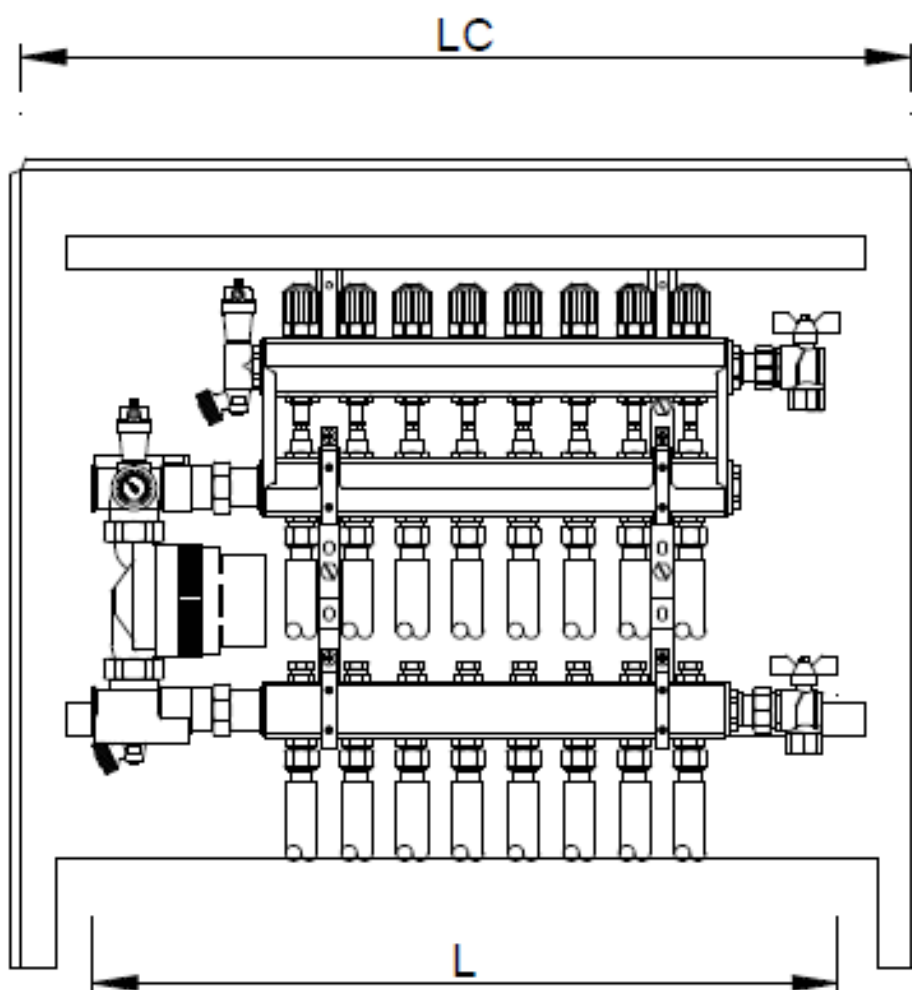
Type of case and positioning

TRITONE is supplied in Basic configuration coupled to a case (optional) the size of which is indicated below. It can also be used with third-party recessed metal cases, with the size indicated below.



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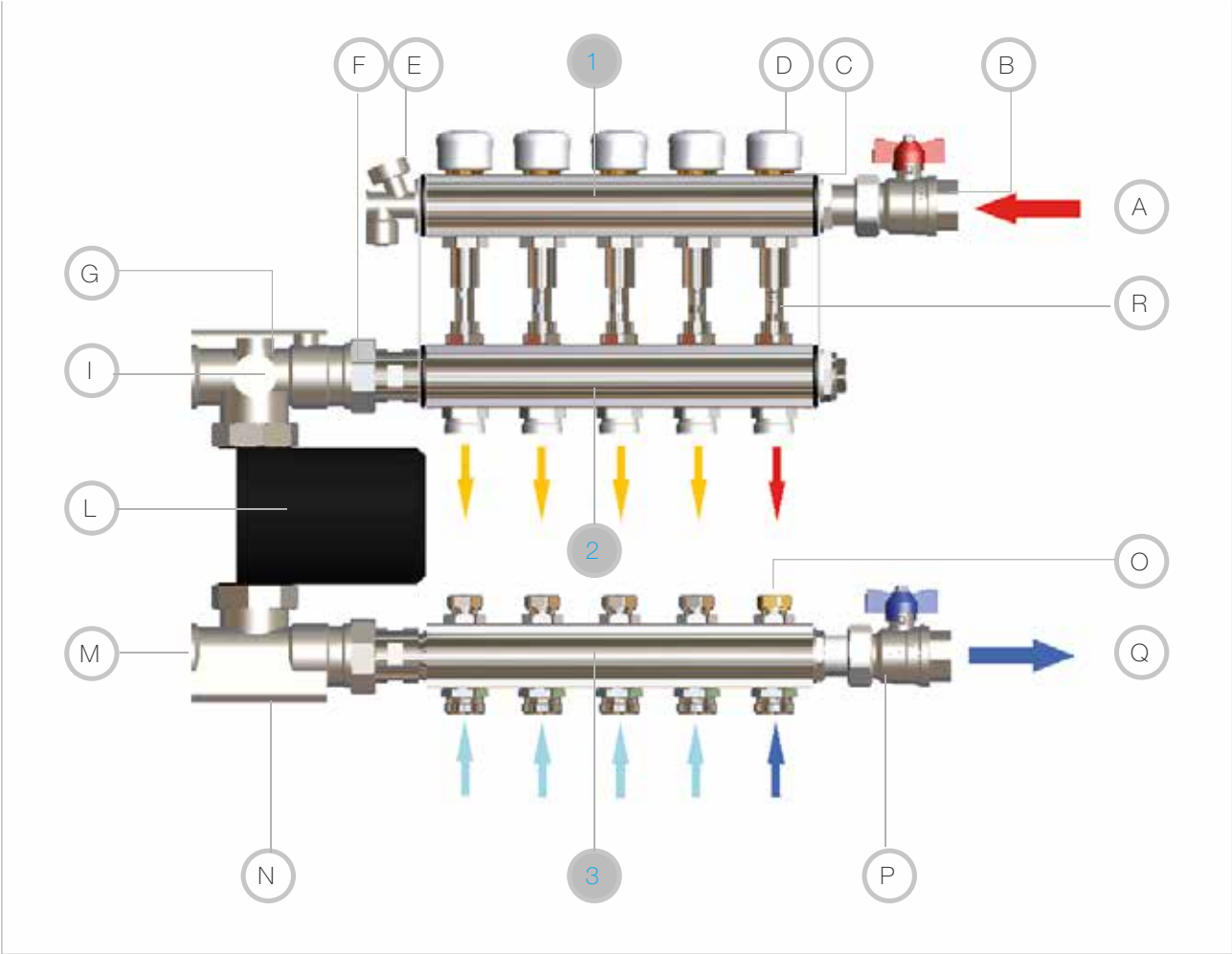
MIXING CONTROL UNIT	L	LC
2 connections	370 mm	720 x 700 mm
3 connections	420 mm	720 x 700 mm
4 connections	470 mm	720 x 700 mm
5 connections	520 mm	720 x 700 mm
6 connections	570 mm	720 x 700 mm
7 connections	620 mm	720 x 700 mm
8 connections	670 mm	720 x 900 mm
9 connections	720 mm	720 x 900 mm
10 connections	770 mm	720 x 900 mm
11 connections	820 mm	720 x 1000 mm
12 connections	870 mm	720 x 1000 mm
13 connections	920 mm	720 x 1000 mm



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Hydraulic diagram

TRITONE is supplied in Basic configuration coupled to a case (optional) the size of which is indicated below. It can also be used with third-party recessed metal cases, with the size indicated below.



A	Hot water from generator	I	Thermometer
A	Hot water from generator	I	Thermometer
B	Entry flow primary circuit shut-off valve	L	Pump
C	Mechanical actuator	M	Pump connection
D	Protective cap	N	Exhaust valve
E	Fillier valve/venting valve	O	Lockshield
F	Check valve	P	Return primary circuit shut-off valve
G	Pump connection	Q	Return water to generator
1 -2 - 3	Bar manifolds	R	Injector

The liquid (A) comes from the heat generator and enters the TRITONE manifold (1) through the ball valve (B).

The liquid is thrust by the pump of the heat generator into the injectors (R) that send it to the loops of the secondary circuits or to the high temperature utilities.

The return liquid of the loops of the secondary circuit enters the manifold (3):

- if mixed it is partially recalled by the pump of the control unit (L)
- if coming from the high temperature loops (heated towel rack or radiators), it is recalled by the pump of the heat generator (Q) passing through the valve (P).

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The high temperature return circuit must be positioned in the closest connection to the return in the heat generator (valve P).

The low temperature return circuit transits from the valve unit (M) recalled by the pump (L), then from the unit (G) from the check valve (F) entering the manifold (2) where it mixes with the high temperature liquid through the injectors (R) coming from the heat generator (A) again entering in circulation.

The return manifold (3) can be supplied with mechanical memory lockshield (O) which is always fully open, or with flow meters (*) also in the fully open maximum flow position.

The control unit is completed by the filler valve (E) upon which a venting valve and an exhaust valve (N) are fitted.

(*) on demand

Filling the system

Filling the system is a delicate operation which must be performed by skilled personnel. It is aimed having the minimum amount of air possible inside the pipes which in certain situations could determine malfunctioning.

Operate as follows:

1. Close both the entry flow ball valve (B) and the return flow ball valve (P).
 2. Connect the liquid flow to the filler valve (E) applied to the manifold (1).
 3. Close all the connections (D) of the loop on the manifold (1), except the first closest to the filler valve (E): it is closed by turning the supplied plastic caps mounted on the thermostatic spindles clockwise.
 4. Close all the lockshields/flow meters (O) applied to the manifold (3), except the one on the connections left open.
 5. Open the water flow on the filler valve (E).
 6. Open the exhaust valve N on the manifold (3), making sure there are absolutely no air.
 7. Close the exhaust valve (N).
 8. Close the connection just filled (D) and the respective lockshield (O).
 9. Open the connection after the one just closed (D) and repeat steps 4-7.
- This step is repeated for each connection.

Purchase Codes

MIXING CONTROL UNIT

6500E9N100502A TRITONE 1" 2 WAY 3/4" EK NK MANIFOLD
 6500E9N100503A TRITONE 1" 3 WAY 3/4" EK NK MANIFOLD
 6500E9N100504A TRITONE 1" 4 WAY 3/4" EK NK MANIFOLD
 6500E9N100505A TRITONE 1" 5 WAY 3/4" EK NK MANIFOLD
 6500E9N100506A TRITONE 1" 6 WAY 3/4" EK NK MANIFOLD
 6500E9N100507A TRITONE 1" 7 WAY 3/4" EK NK MANIFOLD
 6500E9N100508A TRITONE 1" 8 WAY 3/4" EK NK MANIFOLD
 6500E9N100509A TRITONE 1" 9 WAY 3/4" EK NK MANIFOLD
 6500E9N100510A TRITONE 1" 10 WAY 3/4" EK NK MANIFOLD
 6500E9N120511A TRITONE 1"1/4 11 WAY 3/4" EK NK MANIFOLD
 6500E9N120512A TRITONE 1"1/4 12 WAY 3/4" EK NK MANIFOLD
 6500E9N120513A TRITONE 1"1/4 13 WAY 3/4" EK NK MANIFOLD

CASE

AC0080ITR0600H DRAWER X TRITONE 2-7 WAY L=700mm
 AC0080ITR0800H DRAWER X TRITONE 8-10 WAY L=900mm
 AC0080ITR1000H DRAWER X TRITONE 10-13 WAY L=1000mm

TEMPERATURE CONTROL

RSEITRD02B02AN - Thermostat display via radio 868 150mhz (ON/OFF)
 RSEIDCW01B01AN - Chronothermostat display programmable via radio 868 150mhz
 RSEIDA041101AN - Fsl repeater active antenna. 868mhz
 RSEIDL841M1AN - 8 relay module and 230V pump

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Purchase Codes

650042H04TANOR - Return flow meter, 1 - 4 lt

SC6501N040548H - 1" fitting for flow meter

SC6501N040558H - 1" 1/4 fitting for flow meter

FAQ

1. Why does room temperature drop?
TRITONE is a mechanical control static injection control unit with no movements. Nonetheless two failures could occur not directly related to TRITONE:
 - a. Failure of the electrothermal actuator blocks mixing of the liquid coming from the heat generator.
 - b. Failure of the pump so that the liquid does not circulate in the circuits.
2. How is the system balanced?
TRITONE is a constant flow rate control unit and no flow rate balancing is necessary. In particular situations, consult our technical department.
3. How is the temperature calibrated?
See chapter "Temperature adjustment for secondary loops liquid" in the manual.
4. What is the best delivery temperature of the heat generator?
See chapter "Temperature adjustment for secondary loops liquid" in the manual.
5. How are the lockshields and flow meters calibrated?
Neither the lockshields or flow meters must be used for particular adjustments, unless consulting our technical department.
6. If the temperature of one of the circuits is modified, how does the system behave?
The temperature variation of one circuit does not affect the temperatures of the remaining circuits.
7. Can the temperature be changed by modifying the position of the flow meter?
Before modifying the position of the flow meter, consult our technical department.
Changing calibration of the flow meter unbalances the system. It is recommended to act on the injectors to perform the temperature change.
8. What happens if the connections on the primary circuit are inverted during installation?
The system does not work because the fluid only circulates in the boiler without passing through the low temperature circuits because the pumps are in series and the heads add up.
9. What happens if the electrothermal head of the delivery circuit is damaged?
When the head is damaged, the corresponding shutter and its delivery circuit close. Thanks to the shape of TRITONE, circulation of the return liquid of the circuit remains active, slowing down cooling of room temperature.

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Installation Guide



1. Opening the box



2. Remove the TRITONE mixing control unit



3. Install the control unit in the specific case, first releasing it from the top brackets and then from the bottom ones.



4. Connection of entry/return flow primary circuits from heat generator



5. Connection and tightening of entry/return flow secondary circuit from high temperature and low temperature system

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Installation Guide



6. Filling the system: close the entry/return valves of the primary circuit (red and blue); open manually the first thermostatic shutter and turn the specific knob anticlockwise



7. Filling the system: close the following shutters by turning the specific knobs clockwise



8. Filling the system: open the first lockshield by turning the Allen wrench anticlockwise

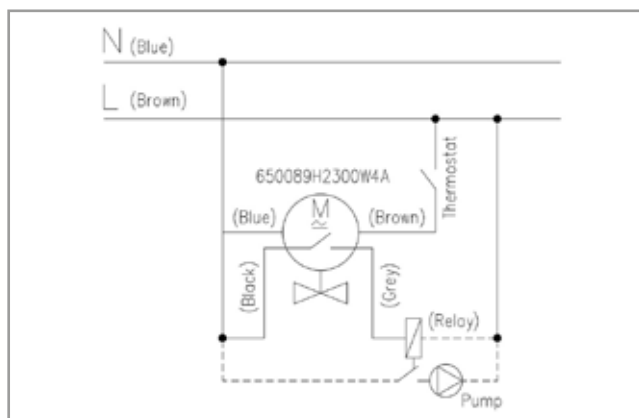


9. Filling the system: close the following lockshields by turning the Allen wrench clockwise

Steps 6-9 must be repeated for as many TRITONE configuration chosen connections.



10. Hydraulic connection



11. Electrical connection

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Installation Guide



12. Liquid temperature adjustment of secondary circuits with 11 mm spanner.