

# Connection and energy management compact unit

2850 series

**CALEFFI**  
**BIO MASS**



## Function

The connection and energy management compact unit enables combining solid fuel generators with another type of generator, which may already be present in the heating system.

Main functional features:

- connection of solid fuel generators (**with open vessel or closed vessel**) with other closed vessel generators
- possibility of **not adding the power outputs of the two generators**
- automatic system management with a specific digital regulator displaying synoptic diagram of the selected system layout
- built-in anti-condensation system (optional) for solid fuel generator
- easy access to components for maintenance
- practical installation thanks to the arrangement on a support plate.

## Reference documentation

- Technical brochure 01224 Anti-condensation recirculation and distribution unit



## Product range

Code 285060HE1	Connection and energy management compact unit without anti-condensation valve	size 1" F
Code 285065HE1	Connection and energy management compact unit	size 1" F
Code 285060HE2	Connection and energy management compact unit with high-efficiency pump on the primary circuit, without anti-condensation valve	size 1" F
Code 285065HE2	Connection and energy management compact unit with high-efficiency pump on the primary circuit	size 1" F

## Technical specifications

### Materials

Connection pipes: copper EN 12735-1 Cu-DHP

### Anti-condensation recirculation and distribution unit (with optional anti-condensation sensor)

Body:	brass EN 1982 CB753S
Obturator locking nut	brass EN 12164 CW614N
Unions:	brass EN 12165 CW617N
Ball built into the unions:	brass EN 12164 CW614N
Obturator:	PSU
Spring:	stainless steel
Seal elements:	EPDM

### Heat exchanger

Material: brazed stainless steel

### Check valve

Body:	brass EN 12164 CW614N
Obturator:	PPAG40

### Shut-off valves

Body:	brass EN 12165 CW617N
Ball:	brass EN 12164 CW614N
Seal elements:	EPDM

### Performance

Media:	water, glycol solutions
Maximum percentage of glycol:	30%
Maximum working pressure:	10 bar
Working temperature range:	5–100°C
Anti-condensation setting temperature (Tset):	55°C
Setting accuracy:	±2°C
By-pass complete closing temperature:	Tmix=Tset+10°C =Tr
Max. heat exchanger net output:	35 kW
Maximum recommended primary circuit flow rate:	1,7 m³/h
Max. recommended secondary circuit flow rate (system):	1,7 m³/h
Temperature gauge scale:	0–120°C

### Connections:

- primary side:	1" F (ISO 228-1)
- system secondary side:	1" F (ISO 228-1)
- boiler secondary side:	3/4" F (ISO 228-1)

### Regulator

Electric supply:	230 V - 50/60 Hz
Power consumption:	5,5 VA
Protection class:	IP 40

### Solid fuel generator temperature probe

NTC type

Working temperature range:

-20-100°C

Two-wire cable

### Pump

Three-speed pump on

primary side of solid fuel generator:

model RS 4-3

High efficiency pump on primary side of

solid fuel generator:

model YONOS PARA 25/6 RKC

High efficiency pump

on system secondary side:

model YONOS PARA 15/6 RKA

### Material

Electric supply:

230 V - 50/60 Hz

Max. ambient humidity:

95%

Max. ambient temperature:

80°C

Protection class: - RS 4-3

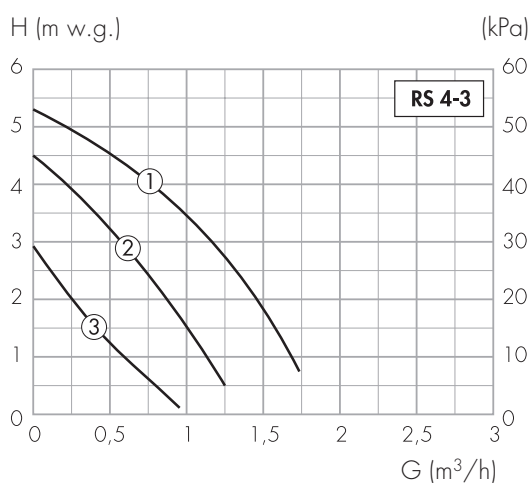
IP 44

- YONOS PARA 15/6 and 25/6

IPX4D

### Head available at unit connections

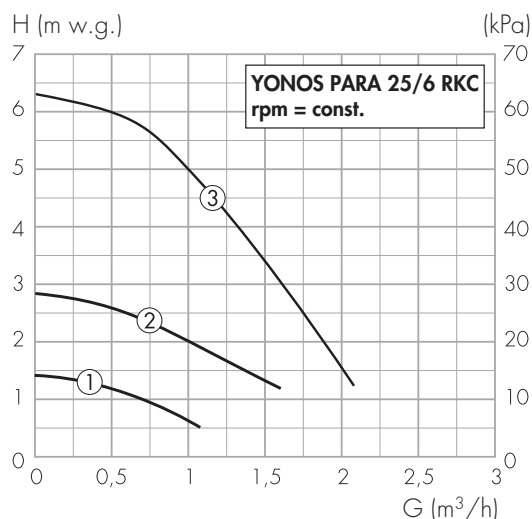
#### Primary side RS 4-3



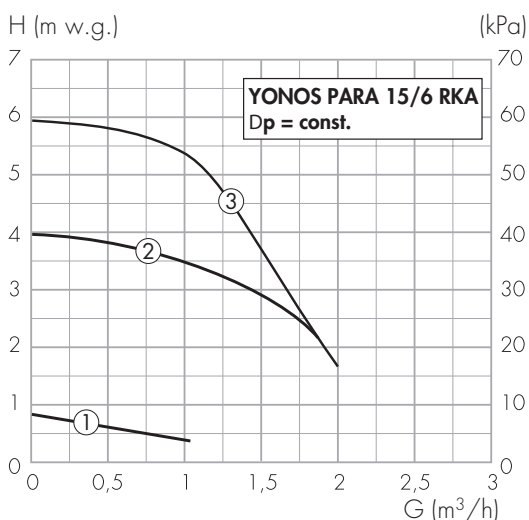
#### Power consumption

Speed	I (A)	P (W)	n (rpm)
3	0,40	90	1800
2	0,30	65	1100
1	0,20	45	700

#### Primary side YONOS PARA 25/6 RKC



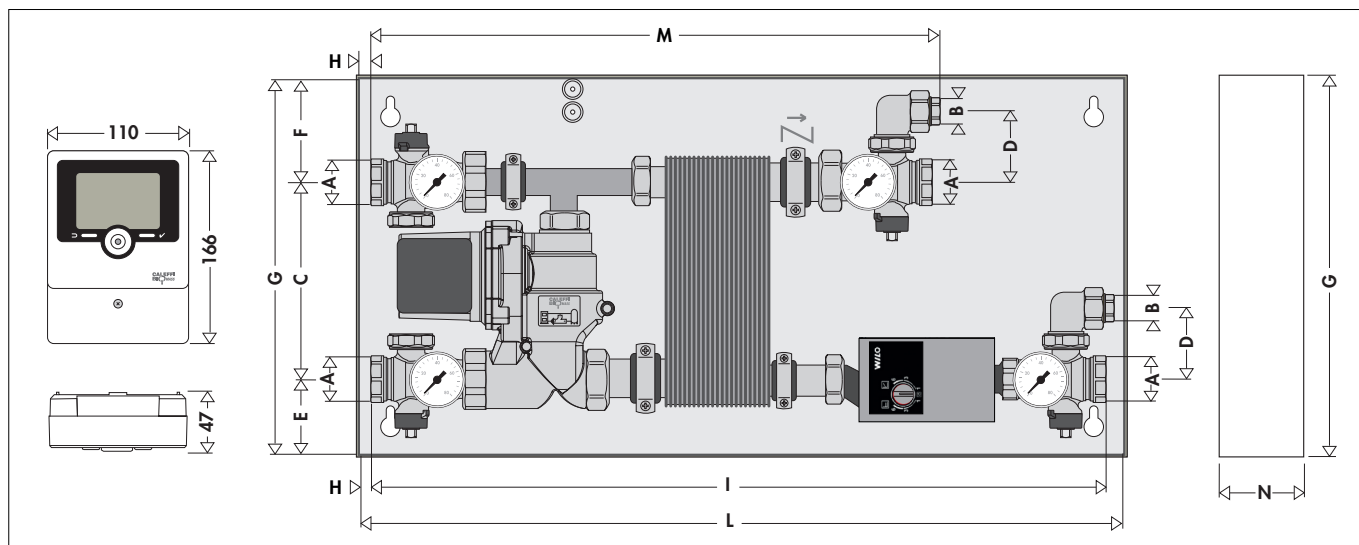
#### Secondary side YONOS PARA 15/6 RKA



#### Note:

Depending on the model, the YONOS PARA pump can operate with constant or proportional pressure control which adapts the performance to the system requirements. For further details, see the installation instruction sheet of the pump supplied in the package.

### Dimensions

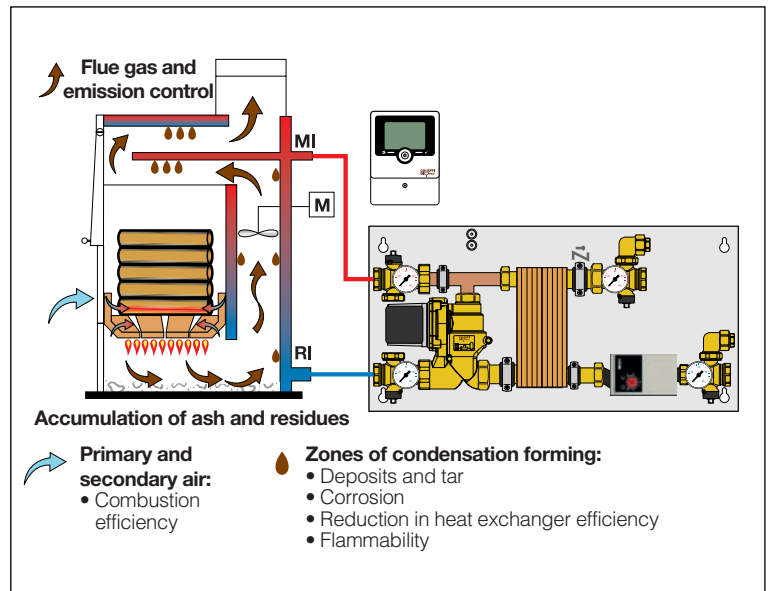


Code	A	B	C	D	E	F	G	H	I	L	M	N	Mass (kg)
28506.HE.	1"	3/4"	172	62	66	96	334	29	639	684	490	177	15,5

### Wooden biomass and condensation build-up

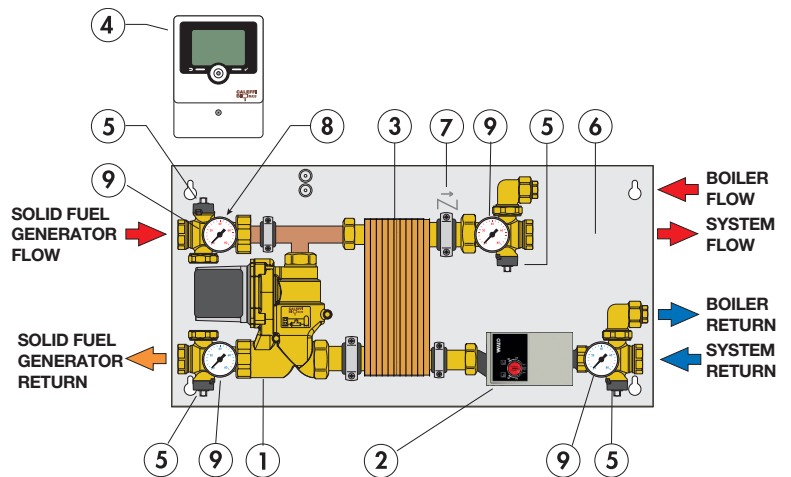
Wooden solid fuel contains a variable moisture percentage depending on the type (logs, pellets, woodchips etc.) and seasoning. Water vapour is released during the solid fuel drying phase inside the combustion chamber. The presence of cold zones in the generator or flue gas chimney can lower the temperature of the flue gas down to the dew point, causing condensation to occur. Water vapour condenses on the generator surfaces, together with soot and part of the unburned hydrocarbons contained in the flue gas, producing deposits and tar. These substances stick to the walls of the generator, covering most of the inner surfaces. In addition to being dangerous due to its flammability, tar is damaging to the integrity of the generator and limits the efficiency of the flue gas-system water exchanger.

By keeping the generator walls at the highest possible temperature, the anti-condensation valve (optional) incorporated into the unit limits the formation of these substances, thereby increasing the combustion efficiency, controlling the emissions into the environment and prolonging the generator life.

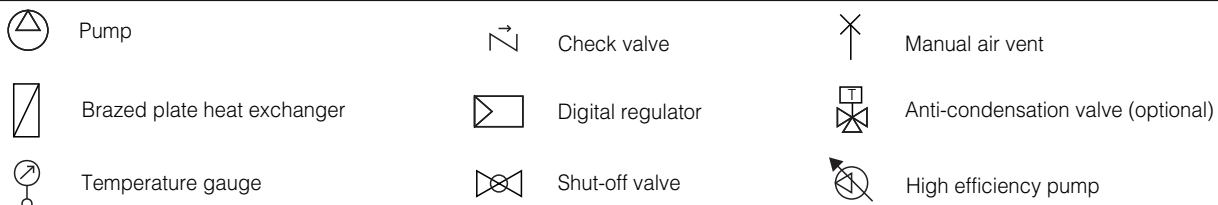
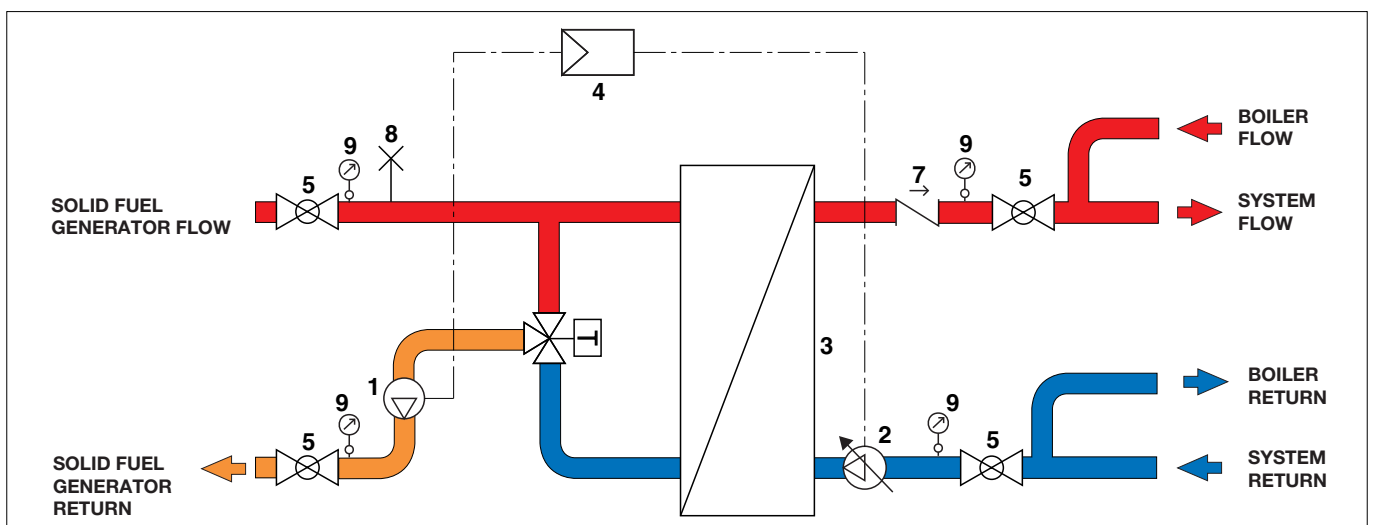


### Characteristic components

- 1) Single casting unit with RS 4-3 or YONOS PARA 25/6 RKC pump complete with anti-condensation valve (optional), primary side
- 2) YONOS PARA 15/6 RKA pump, secondary side (system)
- 3) Brazed plate heat exchanger
- 4) Digital regulator
- 5) Shut-off valve
- 6) Support plate
- 7) Check valve
- 8) Manual air vent
- 9) Temperature gauge



### Functional diagram



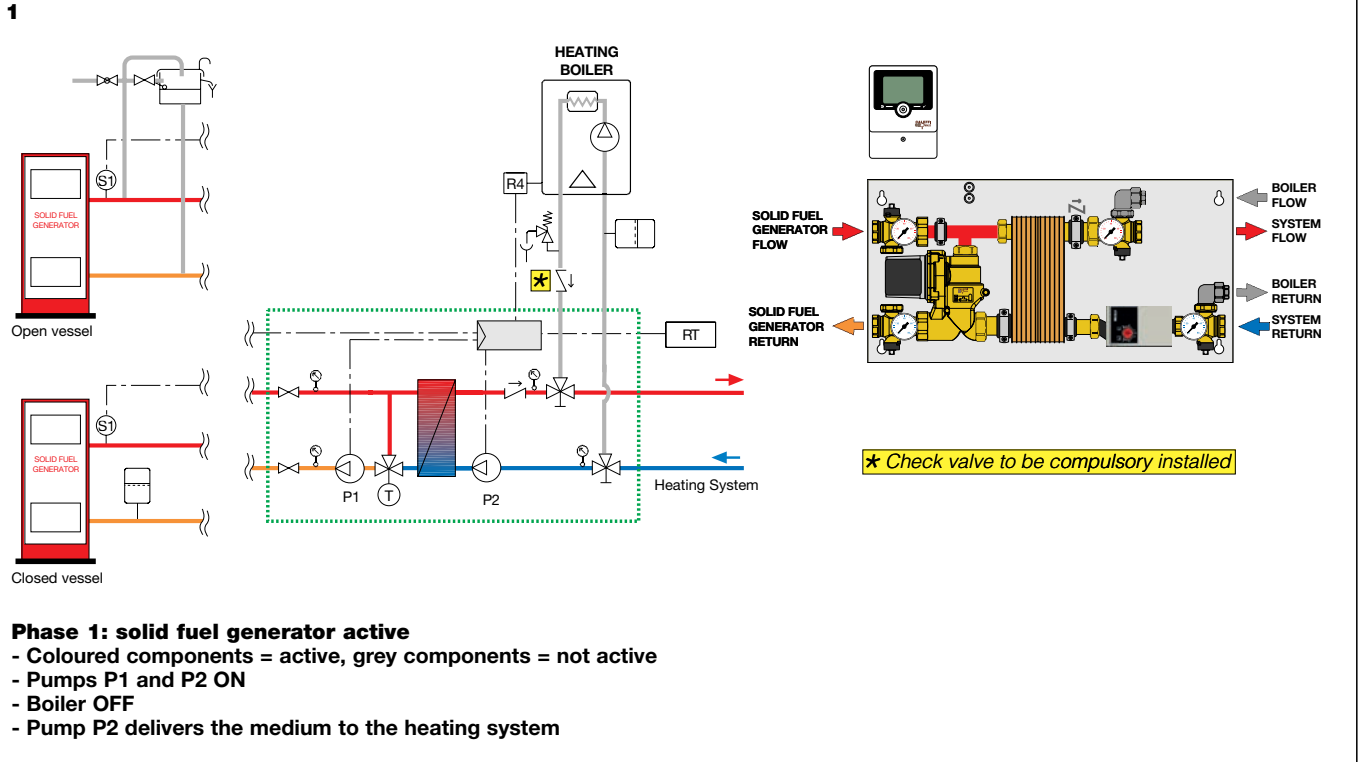
## Operating conditions

The digital regulator automatically manages the unit's operation, receiving the signal from the probe on the solid fuel generator and activating the pumps or, alternatively, the integration boiler.

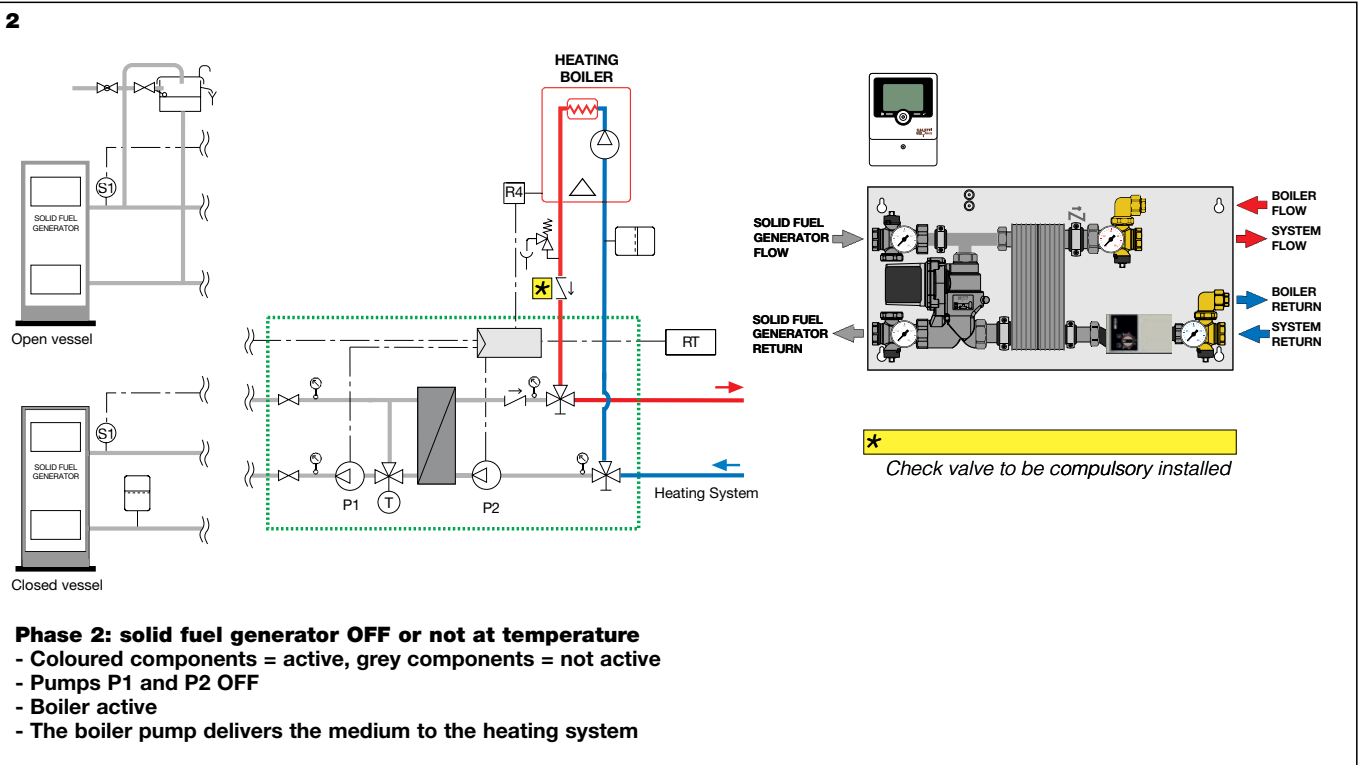
The room thermostat RT provides the regulator with information regarding the room temperature. When the room calls for thermal energy, the regulator reads the solid fuel generator temperature by means of probe S1 and connects it to the system, via the plate heat exchanger, activating the circulation pumps P1 and P2 (fig. 1).

With the solid fuel generator not at temperature, the regulator activates the integration boiler by means of contact R4 and simultaneously stops pumps P1 and P2. Connected to the specific connections and equipped with suitable check valves, the integration boiler supplies thermal energy to the secondary system by means of its circulation pump. In this situation, the secondary system receives energy directly from the integration boiler (fig. 2).

### Heating with solid fuel generator



### Heating with boiler



Construction details

Anti-condensation recirculation and distribution unit

This device incorporates a thermostatic sensor (optional) to control the temperature of the water returning to the solid fuel generator so as to prevent condensation. The sensor has been specifically realised to be removed from the valve body for maintenance or replacement if necessary.

Heat exchanger

The presence of the heat exchanger allows the connection of an open or closed vessel solid fuel generator (or other type of generator) to a system, new or already in place, equipped with another type of closed vessel generator. The heat exchanger represents a hydraulic break, in other words a physical separation between the two circuits, therefore the power outputs of the two generators are not added together, as indicated by INAIL - Ex ISPEL (Italy).

The heat exchanger also helps to protect the integrity of the solid fuel generator, since it physically separates the two circuits and prevents impurities in the existing circuit from clogging the solid fuel generator.

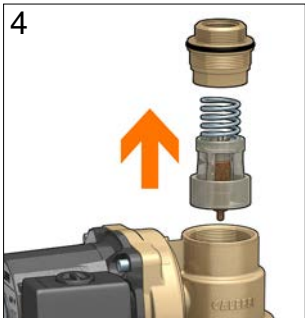
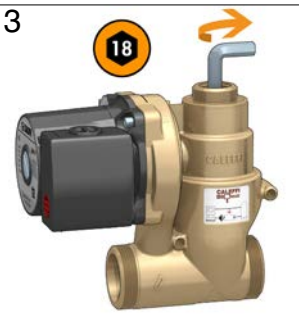
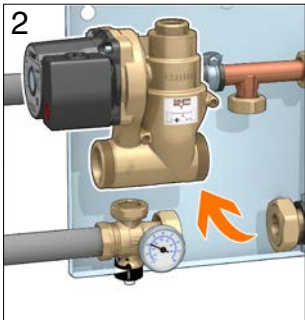
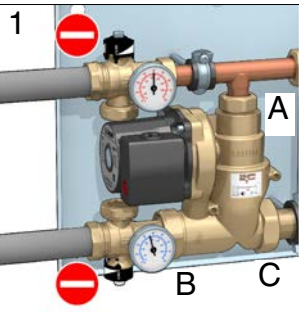
Shut-off valves

The unit is equipped with four shut-off valves, two on the primary side and two on the secondary side of the exchanger. The valves make it possible to isolate the exchanger for maintenance requirements while leaving the connection between integration boiler and system unaffected.

Maintenance / Setting modification

To remove the regulating thermostatic sensor for maintenance purposes, setting changes, or for insertion of the plug to disable the anti-condensation function, proceed as follows, paying attention to the position of each component:

- 1) Shut off the ball valves in the end fittings and remove the body of the unit from the pipes by completely unscrewing the unions using a 52 mm wrench (fig. 1 and 2).
- 1b) Alternatively, using a 52 mm hex wrench slightly loosen nuts B and C and fully unscrew nut A. Rotate the unit on the B-C axis while still mounted on the pipe.
- 2) Using an 18 mm hex wrench (fig. 3), unscrew and extract the obturator locking nut, entering through the upper by-pass port on the unit.
- 3) Extract the spring: fixed to it are the obturator and the thermostatic sensor (fig. 4).
- 4) Carry out maintenance or replace the thermostatic sensor with a suitable spare part or with a plug to inhibit the anti-condensation function. The sensor can be fully inserted into its seat with a slight interference.
- 5) Reassemble the obturator unit following the procedure in reverse order.

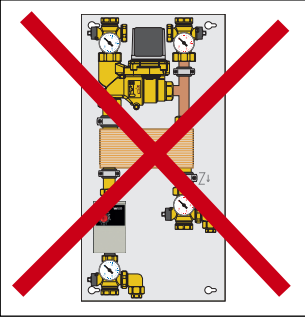
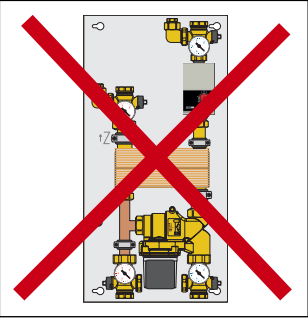
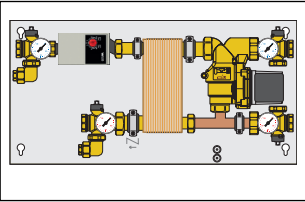
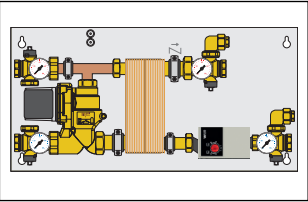


Check valves

The unit incorporates a check valve on the flow pipe of the heat exchanger towards the secondary heating system. During installation it is mandatory to fit a check valve on the flow from the integration boiler to the unit. The two check valves prevent undesirable medium circulations during the alternate operation of the two generators and, in addition to the exchanger, they constitute a further mechanical separation between the circuits.


Installation

The connection and energy management compact unit is supplied preassembled on a support plate for wall mounting. The unit can be installed only in a horizontal position, with all the threaded connections facing sideways. It is recommended to clean accurately the existing system, so as to minimize clogging problems at the heat exchanger. For this purpose, it is advisable to install strainers of suitable capacity in the existing secondary system as well, to ensure a continuous cleaning action.



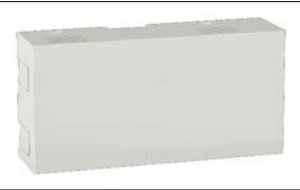
Accessories

In the version with anti-condensation valve, the connection and energy management compact unit is supplied with a sensor having a factory setting of 55°C. Spare sensors are available with different settings, as shown in the following table.

	Code	Setting
	F29633	45°C
	F29634	55°C
	F29635	60°C
	F29636	70°C



Anti-condensation function exclusion plug code 41625/N. To be used in place of the anti-condensation thermostatic sensor.



Protection cover code 285010 size 668 x 338 x 186 mm.



Regulator support bracket code 12044.

## Digital regulator

Following a request from the room thermostat, the digital regulator automatically manages the unit's operation: by means of the temperature probe signal it checks the possibility of withdrawing thermal energy from the solid fuel generator and starts the unit's pumps, or alternatively it starts the integration boiler by means of the specific contact.

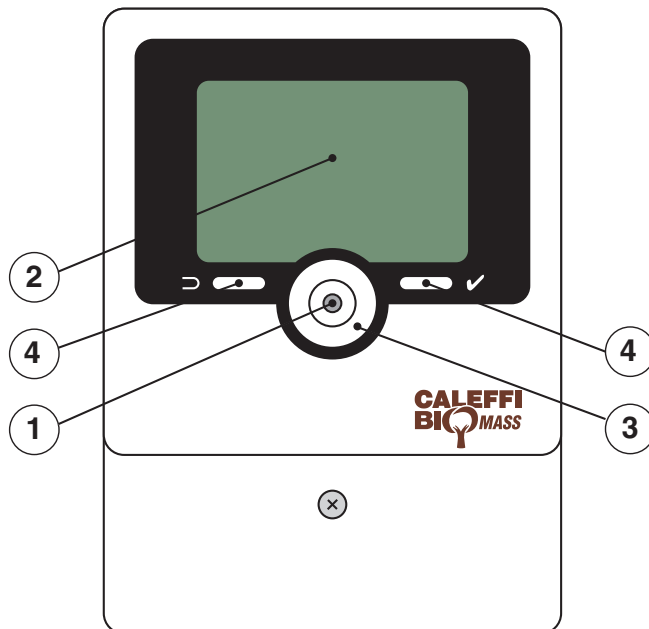
The regulator has a display for activation of the pre-set programs, for display of the functional synoptic diagram and to set the control parameters, namely cut-in temperatures, safeties, etc.

### Description of controls

1. Operating status indicator LED.
2. Display: visualisation of menu and system synoptic diagram.
3. Rotary selector for functions and parameter editing.
4. Function buttons, menu selection.

**If there are no special needs, the factory-set parameters of the regulator ensure optimum operation of the system without further changes.**

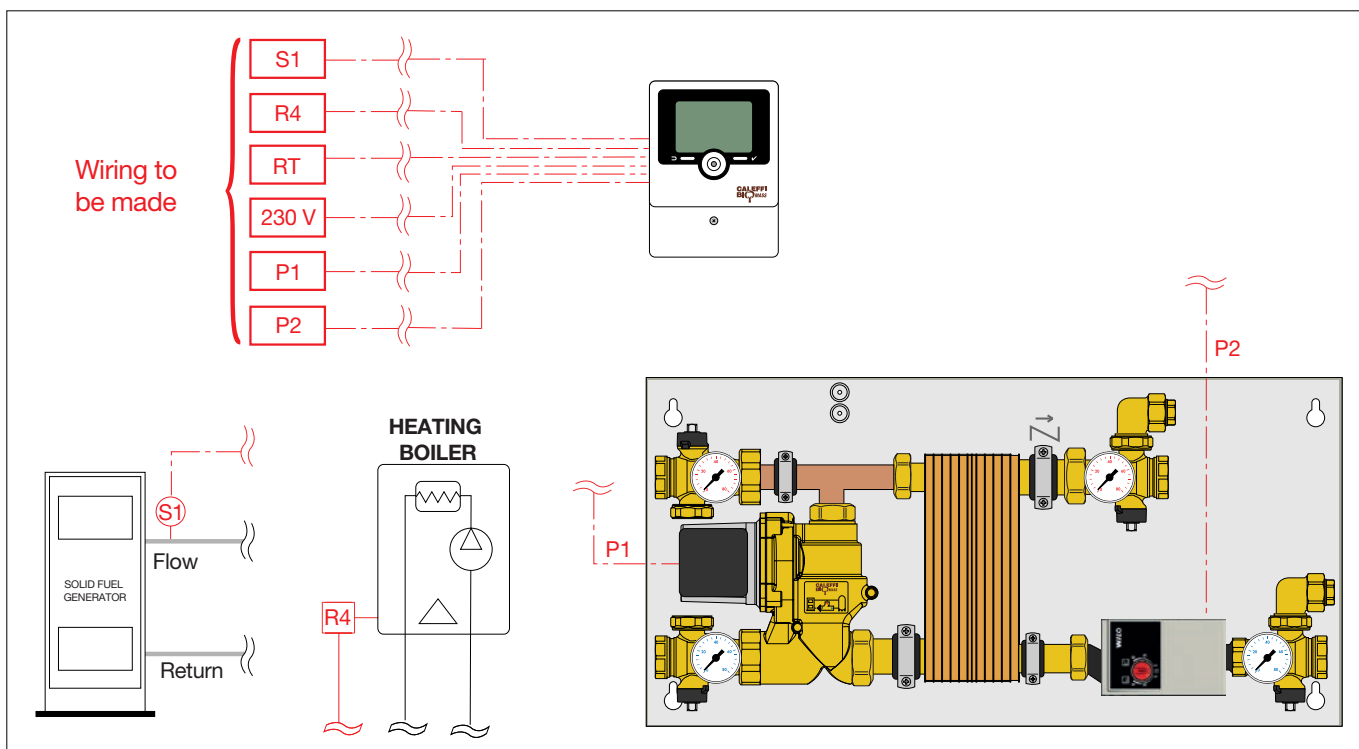
For operating details of the various programs, see instruction sheet code 28228.



### Electric connections

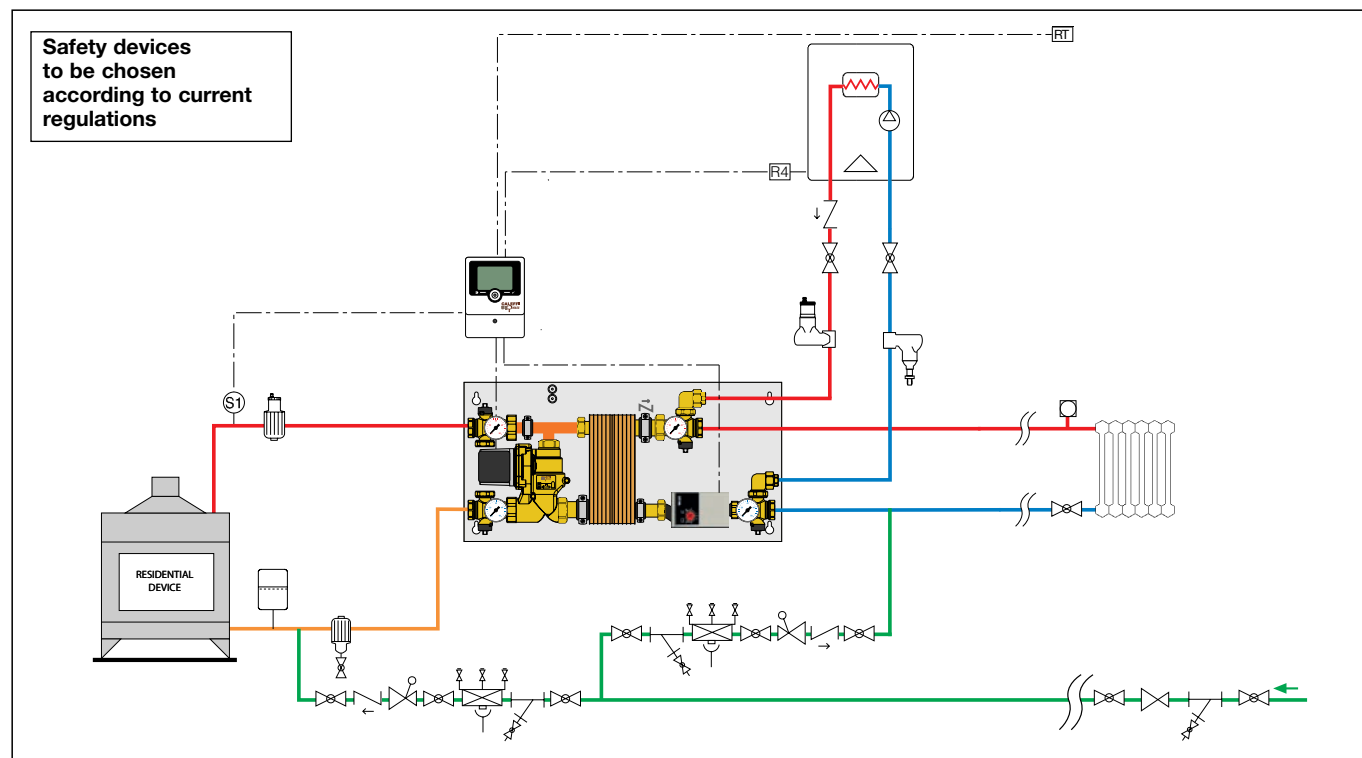
For use of the 2850 series unit make the following wiring connections with the regulator:

- 1) probe S1 to be installed on the solid fuel generator flow pipe as close as possible to the flow pipe outlet or in a specific probe pocket on board the generator;
- 2) contact R4 for activation of the integration gas boiler;
- 3) contact for room thermostat RT;
- 4) electric supply 230 V;
- 5) heat exchanger primary side pump P1;
- 6) heat exchanger secondary side pump P2;

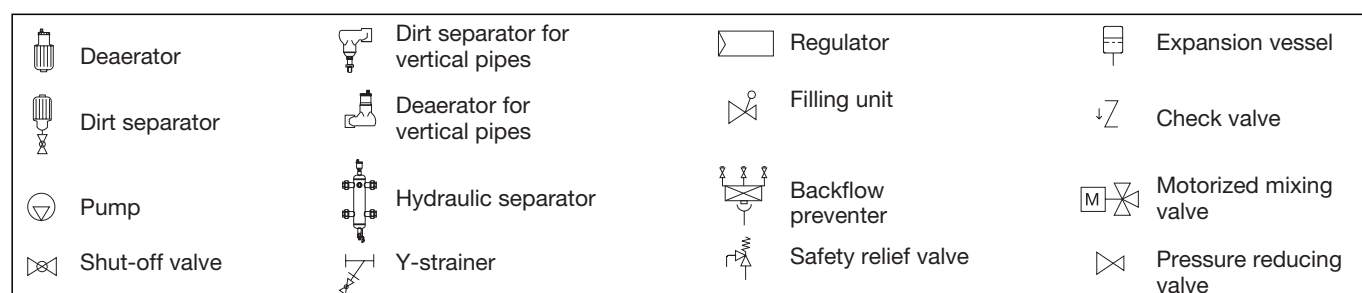
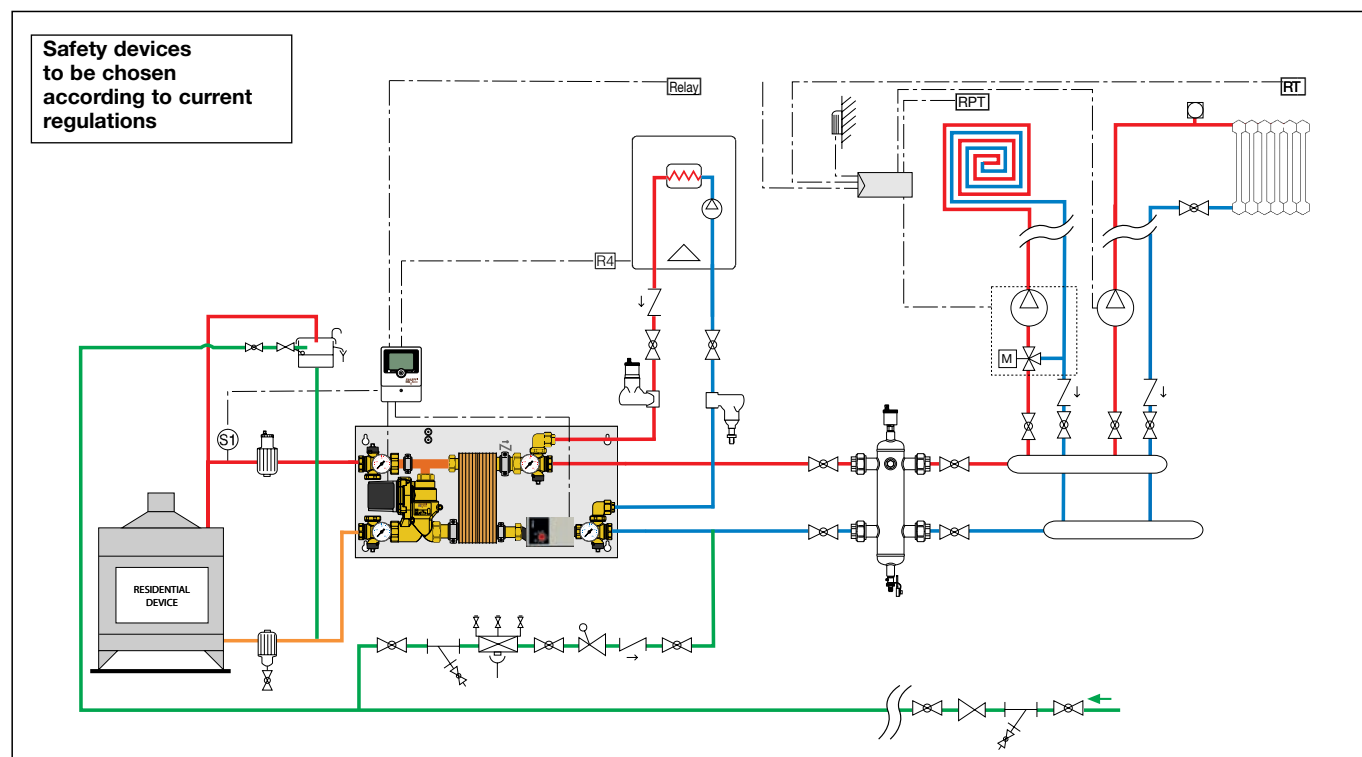


## Application diagram

Solid fuel generator combined with auxiliary boiler for direct heating.

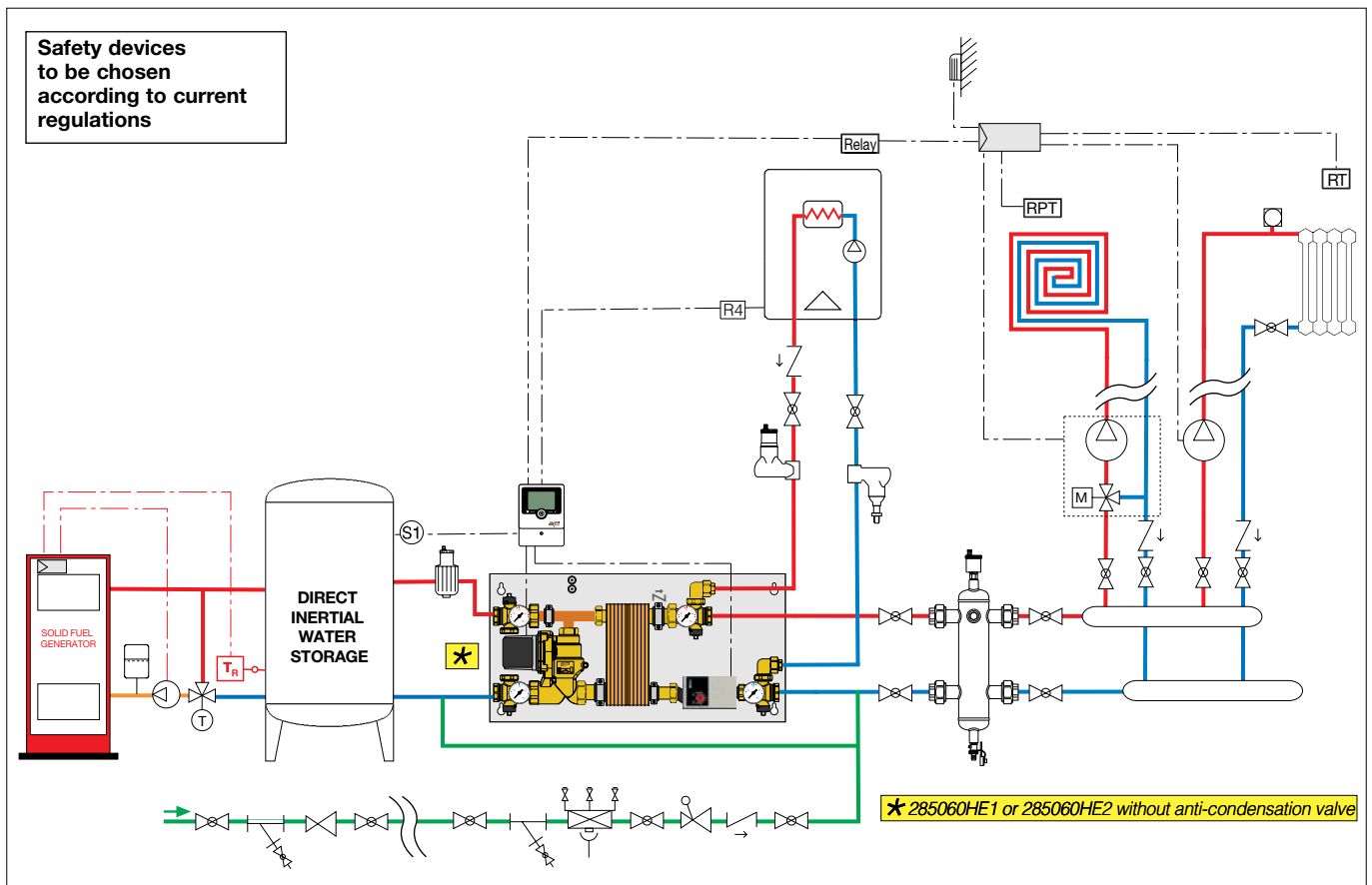


Solid fuel generator, combined with auxiliary boiler for direct heating by way of hydraulic separator





**Solid fuel generator, with direct inertial water storage, combined with auxiliary boiler for direct heating by way of hydraulic separator**



## SPECIFICATION SUMMARY

### 2850 series

Connection and energy management compact unit Primary side connections 1" F (ISO 228-1), system secondary side 1" F (ISO 228-1), boiler secondary side 3/4" F (ISO 228-1). Copper connection pipes. Medium water and glycol solutions. Maximum percentage of glycol 30%. Maximum working pressure 10 bar. Working temperature range 5–100°C. Complete with: anti-condensation recirculation and distribution unit, brass body, brass obturator locking nut, brass captive nuts and built-in ball, PSU obturator, stainless steel spring, PPS clapet valve, EPDM seals, anti-condensation (optional) setting temperature 55°C, setting accuracy  $\pm 2^\circ\text{C}$ , by-pass complete closing temperature  $T_{\text{set}} + 10^\circ\text{C}$ ; brazed plate heat exchanger with stainless steel body, maximum net output 35 kW, maximum recommended flow rate of primary circuit 1,7 m<sup>3</sup>/h, maximum recommended flow rate of secondary circuit (system) 1,7 m<sup>3</sup>/h; solid fuel primary side connections with built-in shut-off valve and manual air vent, brass body and ball, EPDM seals; system secondary side connections with built-in shut-off valve, brass body and ball, EPDM seals; check valve in PPAG40 on flow pipe to secondary system; digital regulator complete with temperature probe for solid fuel generator, electric supply 230 V - 50/60 Hz, protection class IP 40; three-speed pump, model RS 4-3 (primary side, solid fuel generator, or high efficiency model YONOS PARA 25/6 RKC) and high efficiency YONOS PARA 15/6 RKA (secondary side, system), electric supply 230 V - 50/60 Hz, maximum room humidity 95%, maximum room temperature 80°C, protection class IP 44 (for YONOS PARA 25/6 and 15/6 IPX4D). Solid fuel generator temperature probe type NTC. Supplied preassembled on support plate.

*We reserve the right to make changes and improvements to the products and related data in this publication, at any time and without prior notice.*