

282 anti-condensation
circulation unit



altecnic

282 anti-condensation circulation unit



Function

The Altecnic anti-condensation circulation unit connects between a biomass burning boiler and a direct or indirect heating system or domestic hot water system.

It controls the return temperature to the boiler avoiding condensation, by means of an integral thermostatic sensor.

Keeping the boiler at a high temperature prevents condensation forming from the water vapour contained in the flue gases.

It can be used on central biomass boilers or residential biomass burners such as fireplace heating systems and solid fuel stoves and cookers

The anti-condensation circulation unit gives the boiler a longer life and ensures greater efficiency.

The Altecnic 282 unit incorporates a circulation pump, an anti-condensation thermostatic valve, check valve, 2 temperature gauges and is supplied with a preformed insulation shell.

Design

Application

The 282 unit had been designed for use with the Altecnic 559 SEPCOLL hydraulic separator manifold for heating systems but be used manifolds and other systems.

The 282 unit is available in both left and right hand configurations with the choice of two centre dimensions of 90 and 125mm to suit most installations.

Anti-condensation valve

Anti-condensation valve incorporates a thermostatic sensor to control the temperature of water returning to the boiler, preventing the formation of condensation.

The sensor has been specifically designed to be removed from the valve body for maintenance or replacement if necessary.

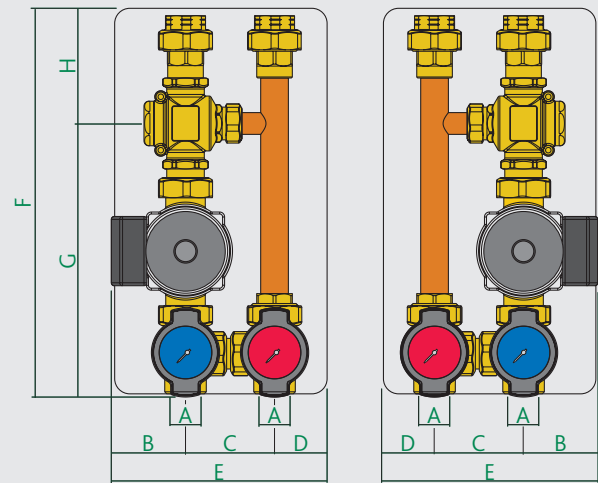
Check Valve

The check valve prevents reverse circulation through the unit and is especially useful when the unit is connected directly to the heating system and not through a hydraulic separator or manifold.

Product Specification

Code	Boiler return on	Centre Distance	kg
28260	Left side	90mm	6.6
28261	Right side	90mm	6.6
28262	Left side	125mm	6.7
28263	Right side	125mm	6.7

Dimensions



Code	A	B	C	D	E	F	G	H
28260•	G1	75	90	45	210	407	290	117
28261•	G1	75	90	45	210	407	290	117
28262•	G1	75	125	45	245	407	290	117
28263•	G1	75	125	45	245	407	290	117

Code 6th Digit

Setting	45°C	55°C	60°C	70°C
•	4	5	6	7

Technical Specification

Component	Material	Specification
Anti-condensation valve		
Body:	Brass	BS EN 1982 CB753S
Cap:	Brass	BS EN 12164 CW614N
Obturator:	Polymer	PSU
Spring:	Stainless steel	
Sealing elements:	EPDM	
Union seal:	Non-asbestos fibre	
Sensor:	Wax thermostatic	

Isolation valves

Body:	Brass	BS EN 12165 CW617N
Union seal:	Non-asbestos fibre	

Check Valve

Body:	Brass	BS EN 12164 CW614N
Obturator:	Polymer	PPAG40

Performance

Medium:	water glycol solution
Max. glycol percentage:	50%
Max. working pressure:	10 bar
Max. operating temperature:	5°C to 100°C
Temperature gauge scale:	0°C to 120°C

Connections

Pipe connections:	1" female parallel BS EN 228-1
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Technical Specification Continued

Anti-condensation valve

Setting temperature: 45°C, 55°C, 60°C & 70°C
 Setting accuracy: ±2°C
 Bypass complete closing temperature: T_{set} + 10°C

Pump

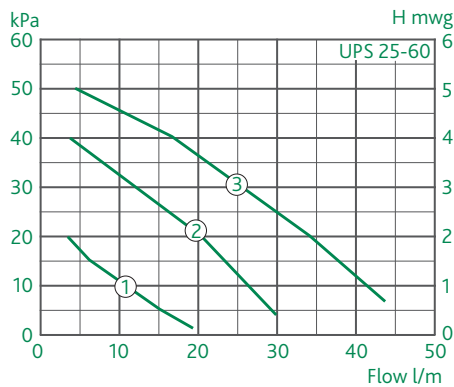
3 speed: model UPS 25-60
 Electrical Supply: 230 V - 50 Hz
 Max. ambient humidity: 95%
 Max. ambient temperature: 80°C
 Protection class: IP 44
 Pump centre distance: 130mm

Insulation

Material: closed cell expanded PE-X
 Thickness: 20mm
 Density: Inner part 30 kg/m³
 Outer part 50 kg/m³
 Thermal conductivity (DIN 52612)
 at 0°C 0.038 W/(mK)
 at 40°C 0.045 W/(mK)

Co-efficient of resistance to the diffusion of water vapour (DIN 52615): > 1300
 Working temperature range: 0°C to 100°C
 Reaction to fire (DIN 4102): Class B2

Pump Characteristic Chart



Power Consumption

Speed	n rpm	P W	I A
3	1,800	90	0.40
2	1,100	65	0.30
1	700	45	0.20

The 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.

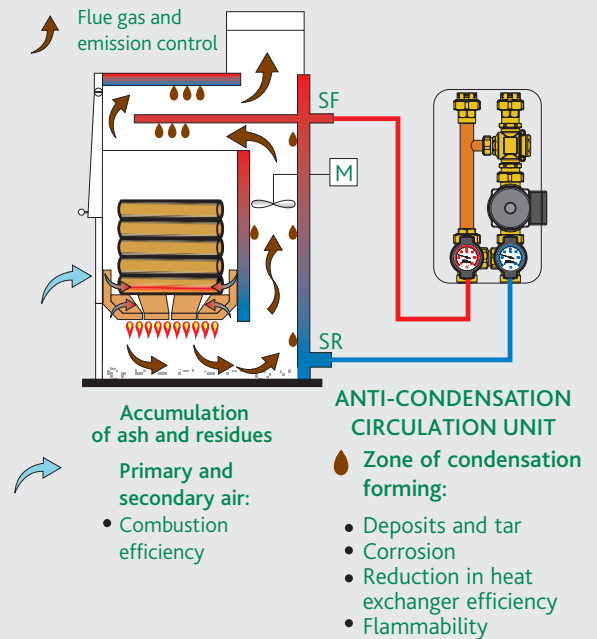
The presence of cold zones in the boiler or flue gas chimney can lower the temperature of the flue gas down to the dew point, causing condensation to occur.

Water vapour condenses onto the boiler surfaces, together with soot and part of the unburnt hydrocarbons contained in the flue gas, producing deposits and tar.

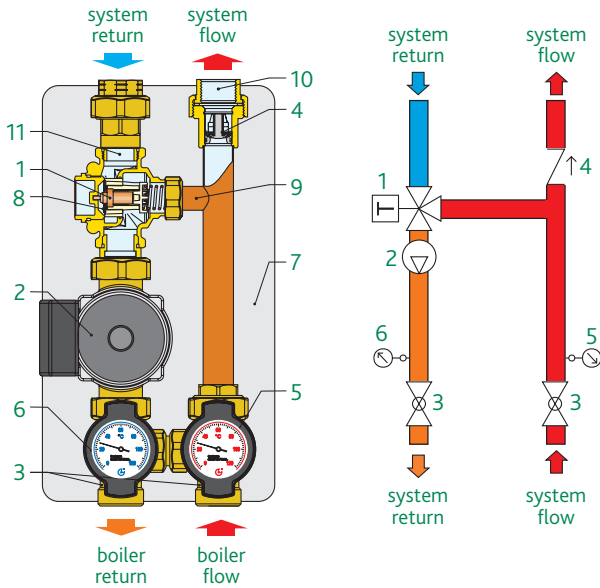
These substances stick to the walls of the boiler, covering most of the inner surfaces.

In addition to being dangerous due to its flammability, tar is damaging to the integrity of the boiler and limits the efficiency of the flue gas-system water exchanger.

By keeping the boiler walls at the highest possible temperature, the anti-condensation recirculation and unit limits the formation of these substances, thereby increasing the combustion efficiency, controlling the emissions into the environment and prolonging the life of the boiler.



Components



- 1 Anti-condensation thermostatic sensor
- 2 Three speed pump
- 3 Isolation valve
- 4 Check valve
- 5 Flow temperature gauge
- 6 Return temperature gauge
- 7 Pre-formed insulation

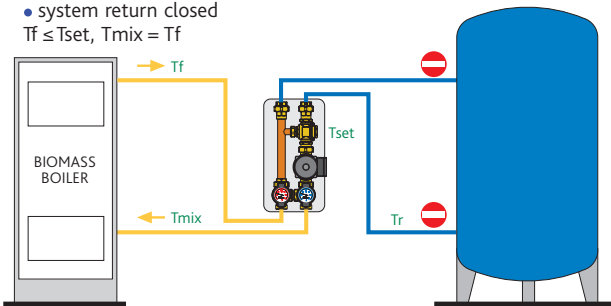
Operating principles

The thermostatic sensor (1) is completely immersed in the medium, controls the movement of the obturator (8) which regulates the flows through the by-pass (9) toward the heating system (10).

When the boiler starts up the circulation unit re-circulates the flow of water so as to bring the boiler up to temperature as quickly as possible.

$T_f \leq T_{set}$ SYSTEM START UP TRANSIENT

- by-pass open
 - system return closed
- $T_f \leq T_{set}$, $T_{mix} = T_f$

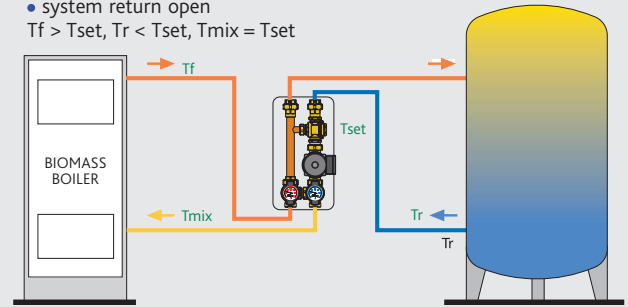


Operating principles continued

When the flow temperature T_f exceeds the set temperature of the anti-condensation valve T_{set} , the unit's cold port (11) starts opening to produce mixed water T_{mix} : in this phase the system loading begins.

$T_f > T_{set}$ START OF SYSTEM LOADING

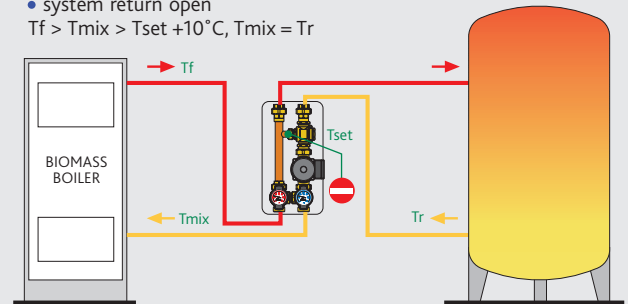
- by-pass open
 - system return open
- $T_f > T_{set}$, $T_r < T_{set}$, $T_{mix} = T_{set}$



When the return temperature to the boiler T_{mix} is greater than the setting of the anti-condensation valve by approximately 10°C , the by-pass port (9) starts to close and water returns to the boiler at the same temperature as the system return temperature T_r .

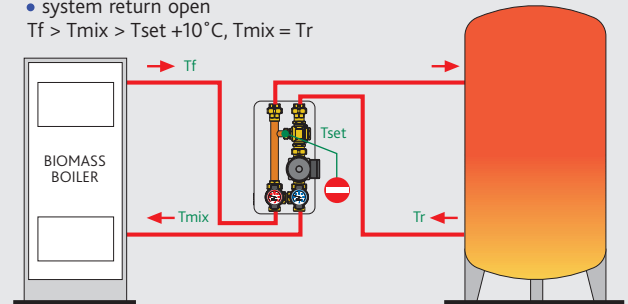
$T_{mix} = T_{set} + 10^\circ\text{C}$ BYPASS CLOSING

- by-pass closed
 - system return open
- $T_f > T_{mix} > T_{set} + 10^\circ\text{C}$, $T_{mix} = T_r$



$T_{mix} > T_{set} + 10^\circ\text{C}$ SYSTEM LOADED

- by-pass closed
 - system return open
- $T_f > T_{mix} > T_{set} + 10^\circ\text{C}$, $T_{mix} = T_r$



T_f = Flow temperature

T_{set} = Anti-condensation set temperature

T_{mix} = Mixed water temperature returning to boiler

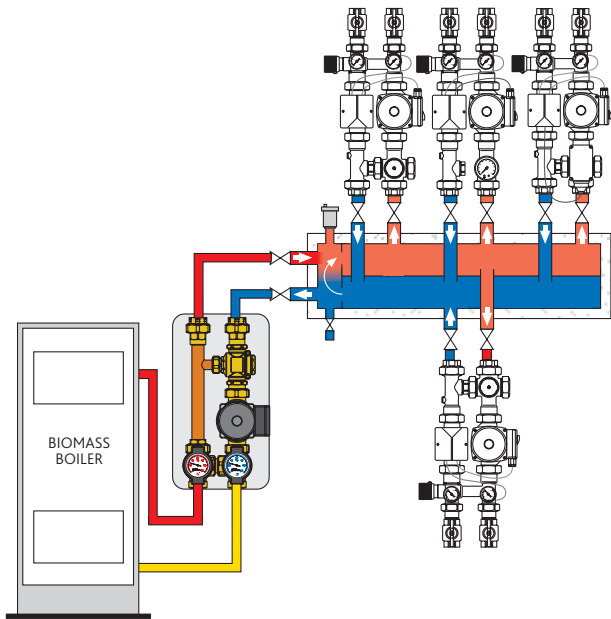
T_r = Return water temperature from storage cylinder

Application

The anti-condensation circulation unit is used to connect the biomass boiler to the heating system according to the following system design logics:

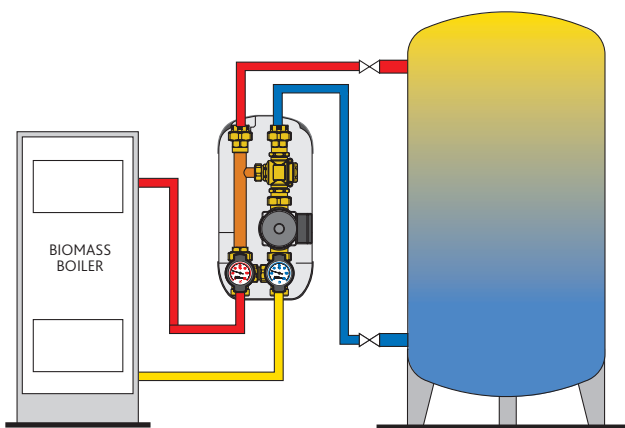
Connection to the primary side of the 559 series SEPCOLL separator or manifold.

The biomass boiler is used as a single energy source (primary side) and is therefore connected upstream of the hydraulic separation zone of the 559 series SEPCOLL unit.



Connection to a domestic hot water cylinder.

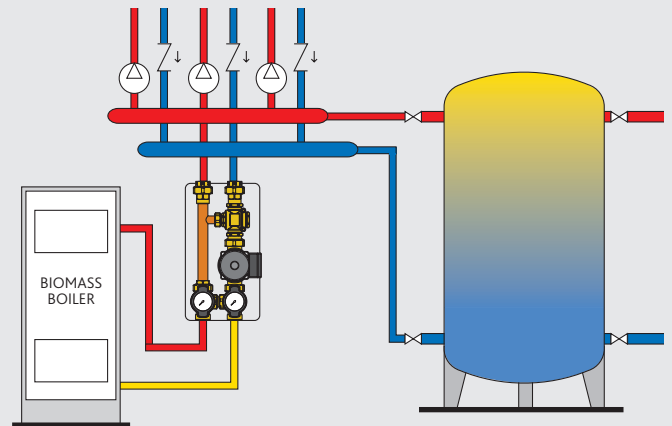
The unit connects directly between the biomass boiler and the domestic hot storage cylinder allowing circulation between them.



Application continued

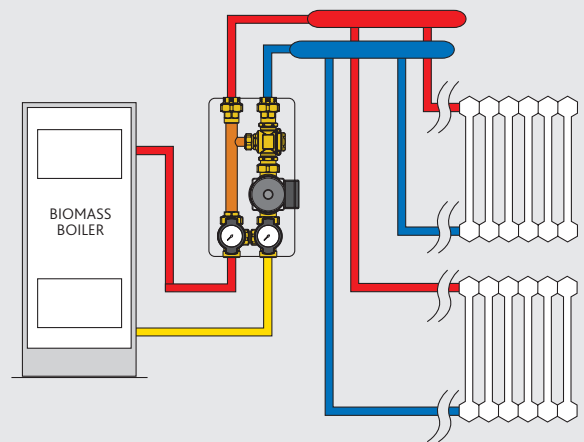
Connection to the manifold with water storage in parallel

The unit connects the boiler to the manifold for direct supply to the secondary heating circuits or in parallel to the domestic hot water storage cylinder.



Direct connection to the heating system.

The unit can be directly connected to the heating system, using the pump as a circulator for the entire system.



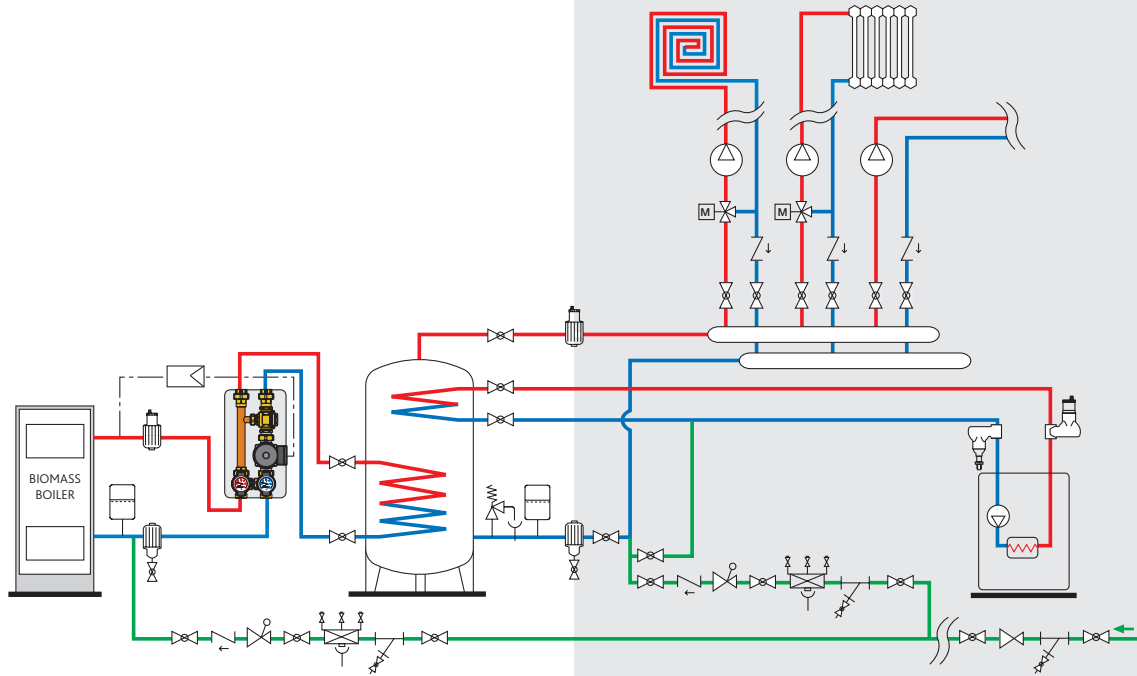
Schematic Symbols

- | | | | |
|--|-------------------------|--|-----------------------------------|
| | De-aerator | | Filling unit |
| | Dirt separator | | Backflow preventer |
| | Pump | | Safety relief valve |
| | Shut-off valve | | Dirt separator for vertical pipes |
| | Expansion vessel | | De-aerator for vertical pipes |
| | Check valve | | Y-strainer |
| | Motorised mixing valve | | Thermostatic mixing valve |
| | Pressure reducing valve | | Regulator |

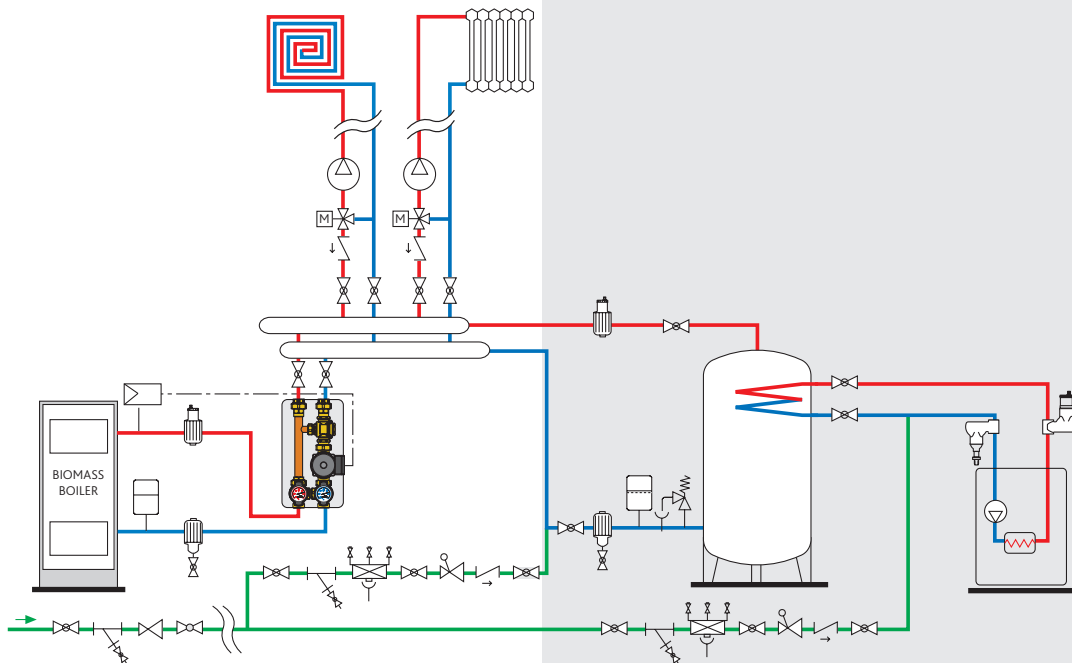
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Typical Applications

Biomass Boiler with Calorifier for Indirect Heating



Biomass Boiler with Direct Heating and Calorifier



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