

# Circulation units for solar heating systems

**255 - 256 series**

**CALEFFI  
SOLAR**



## Function

Circulation units are used on the primary circuit of solar heating systems to control the temperature of the hot water storage. The pump inside the units is activated by the signal from the differential temperature regulator. The units contain the functional and safety devices for an optimal circuit control. Available with flow and return connection and with return connection only.

## Product range

Code 255056	Circulation unit for solar heating systems, flow and return connection, flow meter scale: 1–13 l/min	size 3/4"
Code 255156	Circulation unit for solar heating systems, flow and return connection, flow meter scale: 8–30 l/min	size 3/4"
Code 255166	Circulation unit for solar heating systems, flow and return connection, flow meter scale: 5–40 l/min with Grundfos Solar 25-120 pump	size 1"
Code 256056	Circulation unit for solar heating systems, return connection, flow meter scale: 1–13 l/min	size 3/4"

## Technical specifications

### Materials:

Body:	brass EN 12165 CW617N
Temperature gauge:	steel / aluminium
Seals:	PTFE / EPDM
O-Rings:	EPDM / Viton
Gaskets:	AFM 34, asbestos free
Insulating shell:	EPP, thermal conductivity = 0,041 W/(m·K)

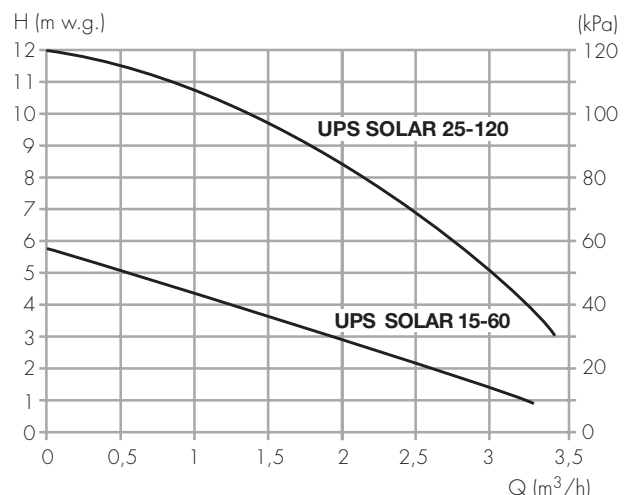
### Performance:

Medium:	water, glycol solutions
Max. percentage of glycol:	50%
Max. working temperature:	180°C
Max. working pressure:	10 bar
Safety relief valve temperature range:	-30–160°C
Safety relief valve factory setting:	6 bar
(for other factory settings, see 253 series)	
Min. opening pressure for shut-off and check valve:	$\Delta p$ : 2 kPa
(200 mm w.g.)	
Adjustment range of flow meter:	1–13 l/min (code 255056 - 256056)
	8–30 l/min (code 255156)
	5–40 l/min (code 256166)
Max flow meter temperature:	120°C
Pressure gauge scale:	0–6 bar
Temperature gauge scale:	0–160°C
Connections:	3/4" F
Hose connection:	3/4" M
Filling/drain connections:	with $\varnothing$ 13 mm hose connection

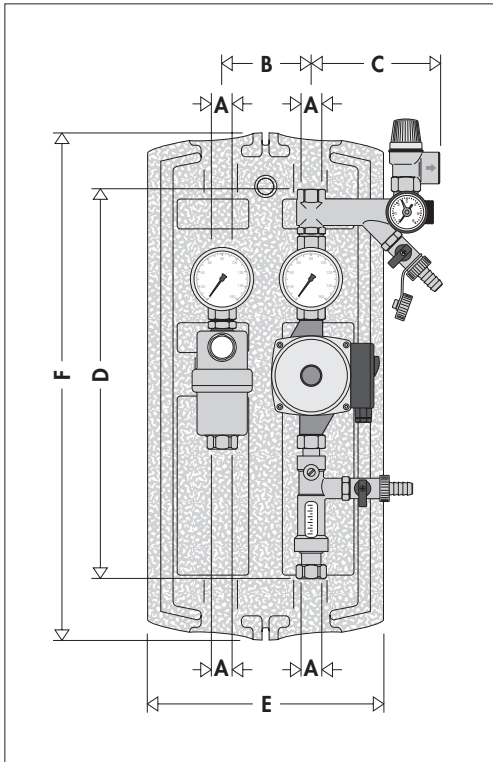
### Grundfos pump

Code 255056, 255156 and 256056	solar model 15-60
Code 255166	solar model 25-120
Body:	cast iron GG 15/20
Power supply:	230 V - 50 Hz
Max. pressure:	10 bar
Max. temperature:	110°C
Protection class:	IP 42

### Grundfos pump Solar 15-60 and Solar 25-120 hydraulic characteristics

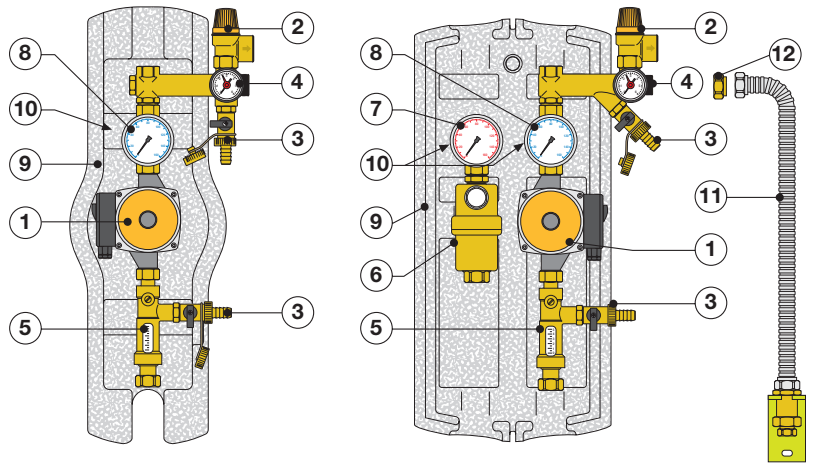


## Dimensions

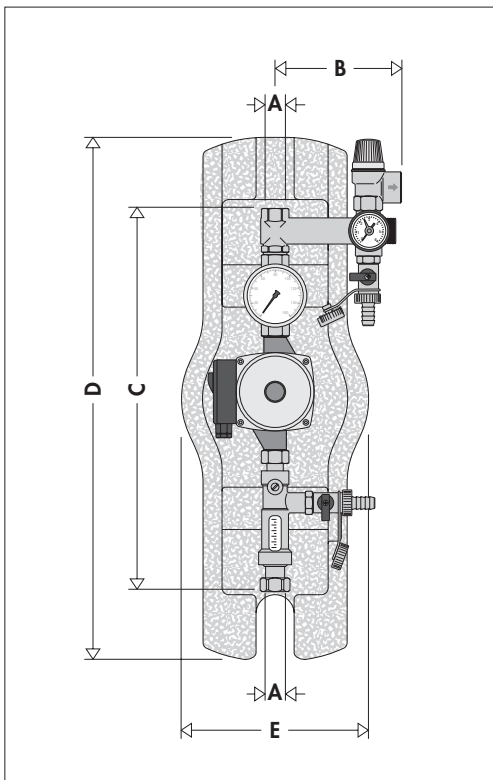


Code	A	B	C	D	E	F	Weight (kg)
255056	3/4"	90	130	405	245	520	7,00
255156	3/4"	90	130	405	245	520	7,25
255166	1"	90	130	405	245	520	9,50

## Characteristic components



- 1 Grundfos-Solar circulation pump
- 2 Safety relief valve for solar heating systems, 253 series
- 3 Filling/drain cock
- 4 Fitting connector with pressure gauge
- 5 Flow meter
- 6 Air vent
- 7 Flow temperature gauge
- 8 Return temperature gauge
- 9 Pre formed insulation shell
- 10 Shut-off and check valve (on the back side of the temperature gauge)
- 11 Connection kit for expansion vessel (optional)
- 12 3/4" plug (to be used if no expansion vessel is installed)



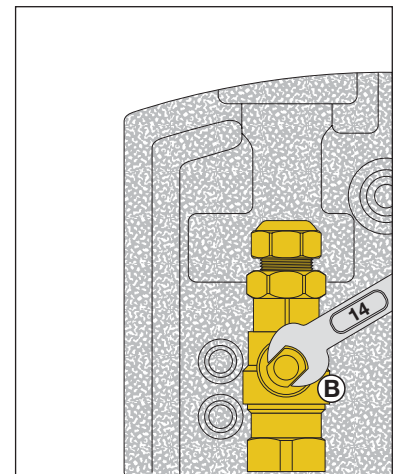
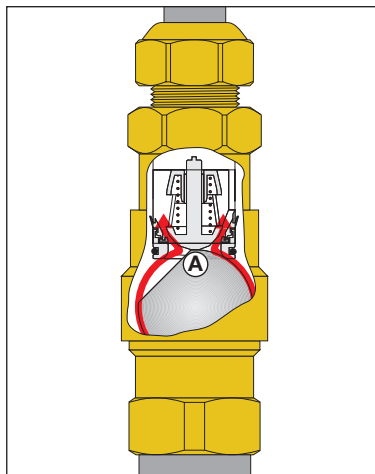
Code	A	B	C	D	E	Weight (kg)
256056	3/4"	130	405	555	200	5,00

## Construction details

### Shut-off and check valve

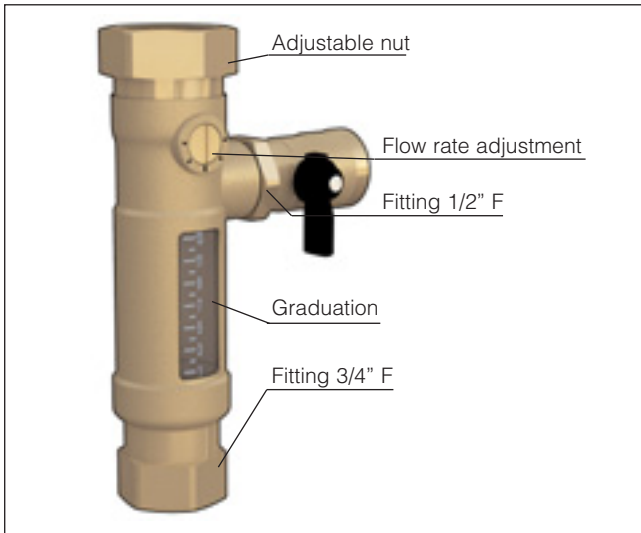
The shut-off and check valves are built into the ball cocks of the temperature gauge connectors.

To allow the medium to flow in both directions it is necessary to open the respective ball cocks (B) to 45° with a 14 mm fixed spanner. The check valve is opened by the ball, see figure (A). In normal system operation the ball cocks must be fully open.



## Flow meter

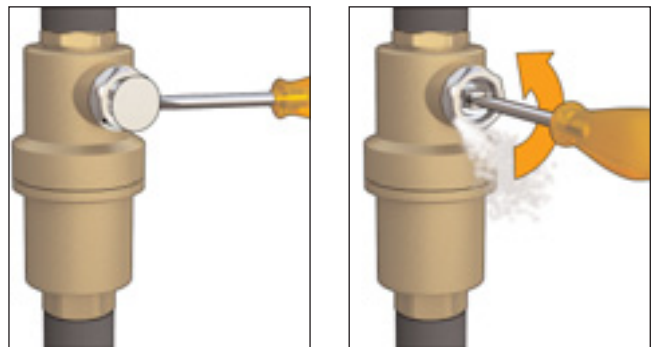
The flow meter has a built-in adjustable flow limiter. The meter is available with three different ranges of 1–13 l/min, 8–30 l/min and 5–40 l/min depending on the version. **The flow meter must be fitted in a vertical position only.**



## Air separator

The solar circulation unit, version with flow and return connection, is equipped with an air vent separator on the flow line. The gases, separated from the thermal carrier medium, are collected at the top of the deaerator.

The collected gases must be evacuated from time to time (every day after putting into operation and afterwards, depending on the quantity of air, once a week or once a month) using the manual air vent with a suitably sized screwdriver. To maintain optimal efficiency of the solar heating system, afterwards, it is necessary to vent the system every six months by using the deaerator.



## Accessories



### 259

Welded expansion vessel for solar heating systems. Diaphragm certified DIN 4807-3 standard. Compatible with glycol solutions. Max. working pressure: 10 bar. Max. diaphragm temperature: 100°C. System temperature range: -10–120°C.



Code	Litres	Connections	Precharge (bar)
259012	12	3/4"	2,5
259018	18	3/4"	2,5
259025	25	3/4"	2,5
259035	35	3/4"	2,5
259050	50	3/4"	2,5



### 255

Expansion vessel connection kit. Consisting of: stainless steel hose, automatic shut-off cock, wall bracket. Max. working pressure: 10 bar. Max. cock working temperature: 110°C. Hose length: 500 mm. Used on a bracket for expansion vessels with a maximum capacity of 24 l.

Code	Connections
255001	3/4"



### 255

System filling pump for circulation units 255 and 256 series.

Code	Connections
255010	3/4"



### 257

broch. 01143

Differential temperature regulator for solar heating systems, with relay output. Complete with box, contact probe and immersion probe with pocket. Box protection class: IP 65. Electric supply: 230 V  $\pm$ 6% - 50 Hz. Power consumption: 1,45 VA. Contacts rating on switch-over: 6 A (230 V).  $\Delta$ T adjustment range: 2–20 K. Hysteresis: 2 K ( $\pm$  1 K).



Code  
257020



### 257

broch. 01143

Thermostat for solar heating systems, with relay output. For thermal integration control and diverter valves. Complete with box, contact probe. Box protection class: IP 65. Electric supply: 230 V  $\pm$ 6% - 50 Hz. Power consumption: 1,45 VA. Contacts rating: 6 A (230 V). Adjustment temperature range: 20–90°C. Hysteresis: 1 K.



Code  
257030



### 257

broch. 01143

Regulator and thermostat for solar heating systems, with relay output. Complete with box, 1 contact probe and 2 immersion probes with pocket. Box protection class: IP 65. Characteristics as codes 257020 and 257030.



Code  
257040



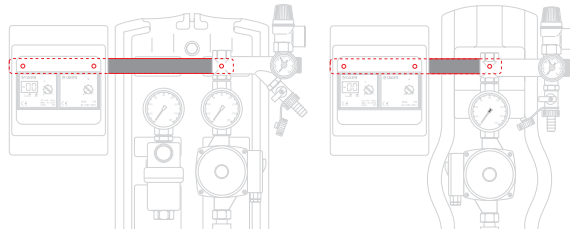
## 2544

Male fitting, mechanical o-ring seal for solar heating systems.  
 For soft (annealed) copper an hard copper, brass, mild and stainless steel pipes.  
 Max. working pressure: 16 bar.  
 Temperature range: -30–160°C.  
 Black nickel plated nut.

Code	Connections
254458	3/4" M x Ø 18 mm
254452	3/4" M x Ø 22 mm

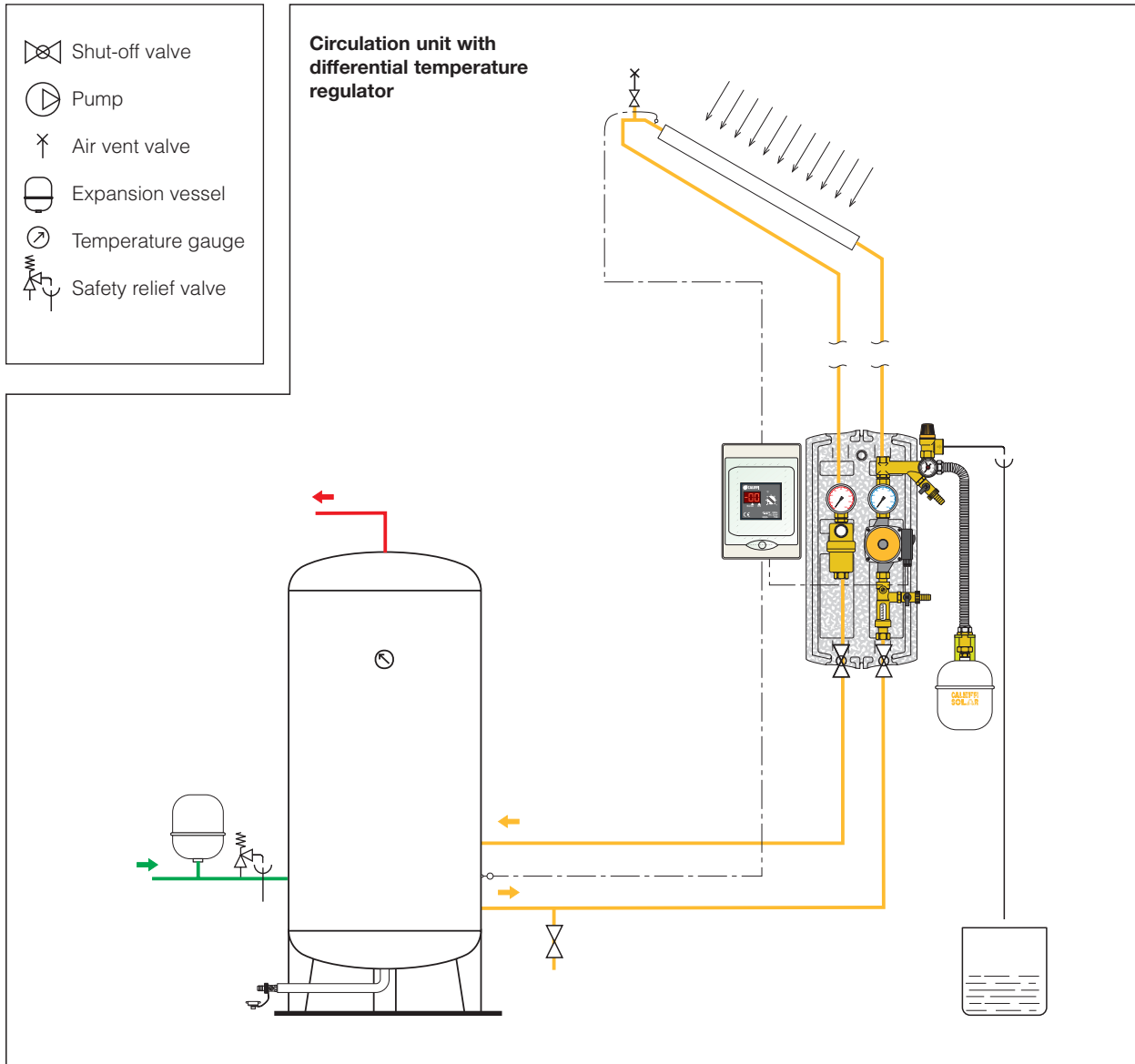
## 255-256

Fastening bracket supporting boxes containing regulator and thermostat, 257 series

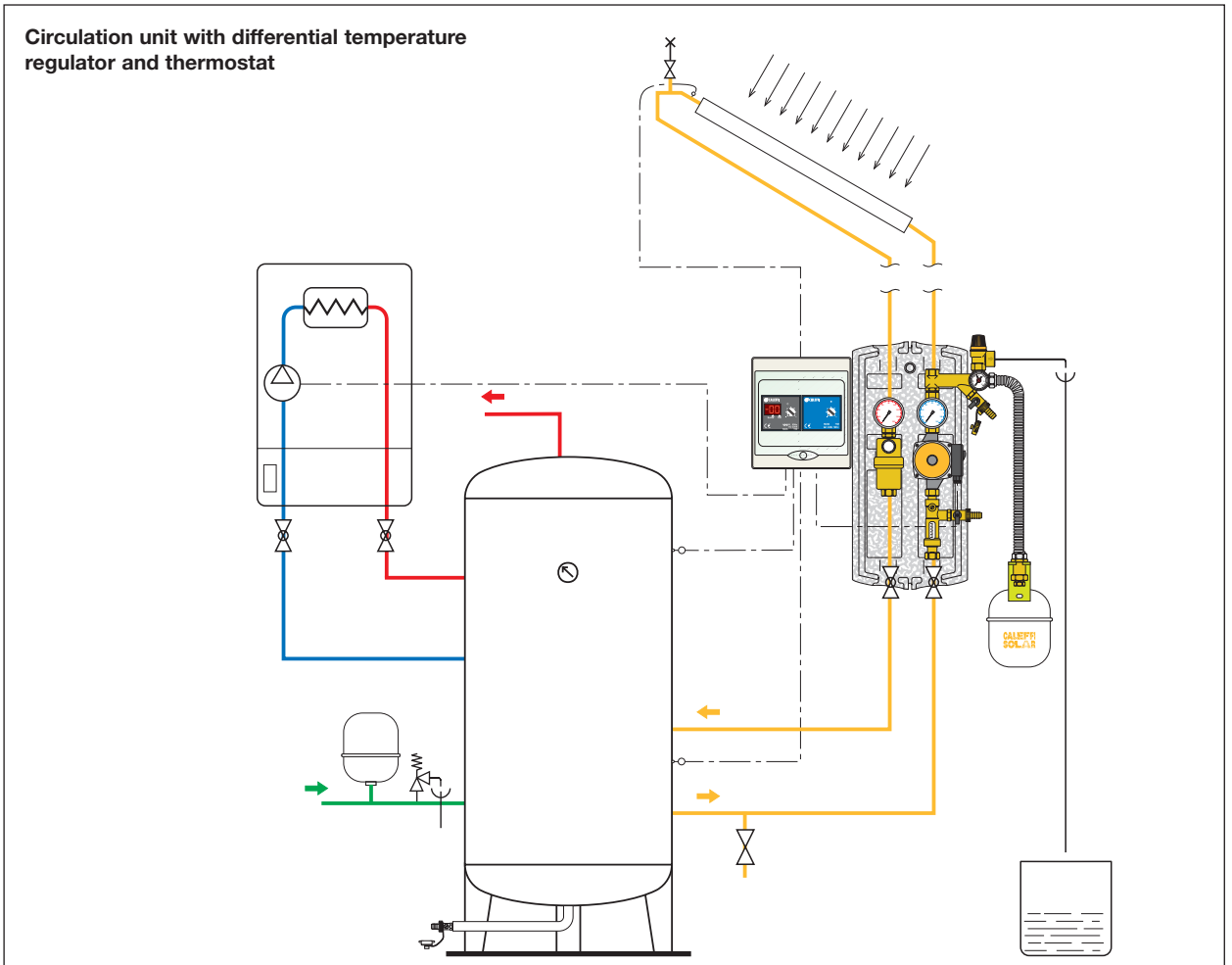


Code	
255002	for circulation unit 255 series
256002	for circulation unit 256 series

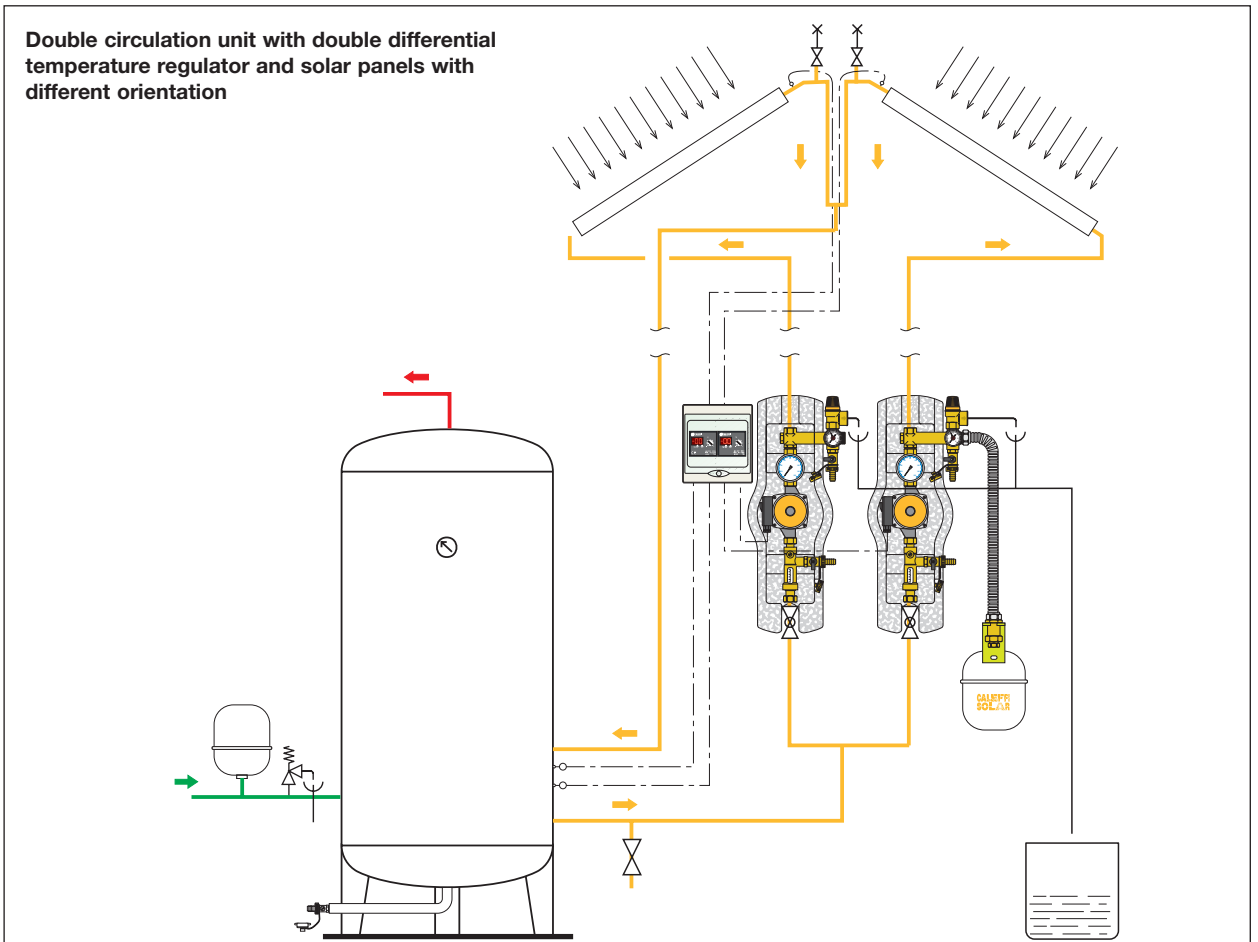
### Application diagrams



**Circulation unit with differential temperature regulator and thermostat**



**Double circulation unit with double differential temperature regulator and solar panels with different orientation**



## SPECIFICATION SUMMARIES

### Code 255056

Circulation unit for solar heating systems. Connections 3/4" F. Flow and return connection. Brass body. Steel and aluminium temperature gauge. PTFE and EPDM seals. EPDM and Viton O-Rings. AFM 34 gaskets, asbestos free. EPP insulating shell. Medium water and glycol solutions. Maximum percentage of glycol 50%. Maximum working temperature 180°C. Maximum working pressure 10 bar. Safety relief valve temperature range -30–160°C. Safety relief valve factory set at 6 bar.  $\Delta p$  minimum opening shut-off and check valve 2 kPa. Flow meter scale 1–13 l/min. Maximum flow meter temperature 120°C. Pressure gauge scale 0–6 bar. Temperature gauge scale 0–160°C. Filling/drain connections with  $\varnothing$  13 mm hose connection. Grundfos Solar 15-60 pump. Cast iron body GG 15/20. Electric supply 230 V – 50 Hz. Maximum pressure 10 bar. Maximum temperature 110°C. Protection class IP 42.

### Code 255156

Circulation unit for solar heating systems. Connections 3/4" F. Flow and return connection. Brass body. Steel and aluminium temperature gauge. PTFE and EPDM seals. EPDM and Viton O-Rings. AFM 34 gaskets, asbestos free. EPP insulating shell. Medium water and glycol solutions. Maximum percentage of glycol 50%. Maximum working temperature 180°C. Maximum working pressure 10 bar. Safety relief valve temperature range -30–160°C. Safety relief valve factory set at 6 bar.  $\Delta p$  minimum opening shut-off and check valve 2 kPa. Flow meter scale 8–30 l/min. Maximum flow meter temperature 120°C. Pressure gauge scale 0–6 bar. Temperature gauge scale 0–160°C. Filling/drain connections with  $\varnothing$  13 mm hose connection. Grundfos Solar 15-60 pump. Cast iron body GG 15/20. Electric supply 230 V – 50 Hz. Maximum pressure 10 bar. Maximum temperature 110°C. Protection class IP 42.

### Code 255166

Circulation unit for solar heating systems. Connections 1" F. Flow and return connection. Brass body. Steel and aluminium temperature gauge. PTFE and EPDM seals. EPDM and Viton O-Rings. AFM 34 gaskets, asbestos free. EPP insulating shell. Medium water and glycol solutions. Maximum percentage of glycol 50%. Maximum working temperature 180°C. Maximum working pressure 10 bar. Safety relief valve temperature range -30–160°C. Safety relief valve factory set at 6 bar.  $\Delta p$  minimum opening shut-off and check valve 2 kPa. Flow meter scale 5–40 l/min. Maximum flow meter temperature 120°C. Pressure gauge scale 0–6 bar. Temperature gauge scale 0–160°C. Filling/drain connections with  $\varnothing$  13 mm hose connection. Grundfos Solar 25-120 pump. Cast iron body GG 15/20. Electric supply 230 V – 50 Hz. Maximum pressure 10 bar. Maximum temperature 110°C. Protection class IP 42.

### Code 256056

Circulation unit for solar heating systems. Connections 3/4" F. Flow and return connection. Brass body. Steel and aluminium temperature gauge. PTFE and EPDM seals. EPDM and Viton O-Rings. AFM 34 gaskets, asbestos free. EPP insulating shell. Medium water and glycol solutions. Maximum percentage of glycol 50%. Maximum working temperature 180°C. Maximum working pressure 10 bar. Safety relief valve temperature range -30–160°C. Safety relief valve factory set at 6 bar.  $\Delta p$  minimum opening shut-off and check valve 2 kPa. Flow meter scale 1–13 l/min. Maximum flow meter temperature 120°C. Pressure gauge scale 0–6 bar. Temperature gauge scale 0–160°C. Filling/drain connections with  $\varnothing$  13 mm hose connection. Grundfos Solar 15-60 pump. Cast iron body GG 15/20. Electric supply 230 V – 50 Hz. Maximum pressure 10 bar. Maximum temperature 110°C. Protection class IP 42.

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