# Solar pump stations for solar heating systems

## series 255 & 256

CALEFFI SOLAR

BSI EN ISO 9001:2000 Cert. n° FM 21654
UNI EN ISO 9001:2000 Cert. n° 0003
01136/09 NA

c UL us LISTED

### Function

Solar pump stations are used on the primary circuit of solar heating systems to control the temperature of the hot water storage. The pump inside the unit is activated by the signal from a differential temperature controller. The unit contains the functional and safety devices for an optimal circuit control, and is available with both flow and return connection or with return connection only.

### General

The solar pump station is a pre-installed and leak-tested unit with fittings for transferring heat from the collector to the storage tank. It contains important fittings and safety devices for the operation of the solar thermal system:

- Ball valves in flow and return in combination with check valves to prevent gravity and thermo circulation.
- Ports for flushing, filling and emptying the system.
- Air vent for manual bleeding of the solar thermal system.
- Flow meter for displaying and setting the flow rate.
- Thermometer in flow and return for displaying both temperatures.
- Pressure gauge for displaying the system pressure.
- Safety relief valve to prevent overpressure.
- Three-speed solar pump for wide range of flow rates.

### Product range

| | | |
|---|---|---|
| Code 255050A | Dual line pump station, 3 speed, flow and return connection, flow meter scale: 1/2–5 gpm | 3/4" female |
| Code 255056A | Dual line pump station, without pump, flow and return connection, flow meter scale: 1/2–5 gpm | 3/4" female |
| Code 256050A | Single line pump station, 3 speed, return connection, flow meter scale: 1/2–5 gpm | 3/4" female |
| Code 256056A | Single line pump station, without pump, return connection, flow meter scale: 1/2–5 gpm | 3/4" female |

### Technical specifications

| | |
|---|---|
| Body: | brass |
| Temperature gauge: | steel / aluminium |
| Seals: | PTFE / EPDM |
| O-Rings: | EPDM / Viton |
| Union gaskets: | AFM 34, asbestos free |
| Insulating shell: | EPP, thermal conductivity value = R4 |

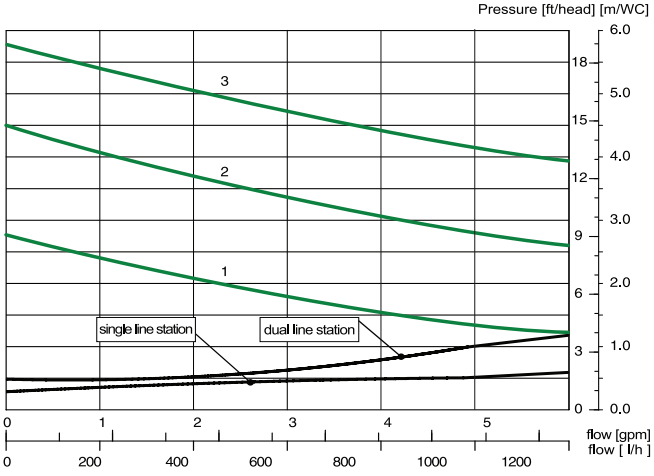
### Performance

| | |
|---|---|
| Medium: | water, glycol solutions |
| Max. percentage of glycol: | 50% |
| Max. working temperature: | 360°F (180°C) |
| Max. working pressure: | 150 psi (10 bar) |
| Safety relief valve temperature range: | -20 to 360°F (-30 to 180°C) |
| Safety relief valve factory setting: | 90 psi (6 bar) |
| Min. opening pressure for check valve: | Δp: 1/4 psi (2 kPa) |
| Adjustment range of flow meter: | 1/2 to 5 gpm (1 to 20 l/min) |
| Max return flow meter temperature: | 265°F (130°C) |
| Pressure gauge scale: | 0–90 psi (0—6 bar) |
| Temperature gauge scale: | 32–320°F (0—160°C) |
| Connections: | 3/4" female straight thread |
| Filling/drain hose connections: | 3/4" male hose thread |
| Expansion tank connection: | 1/2" male straight thread |

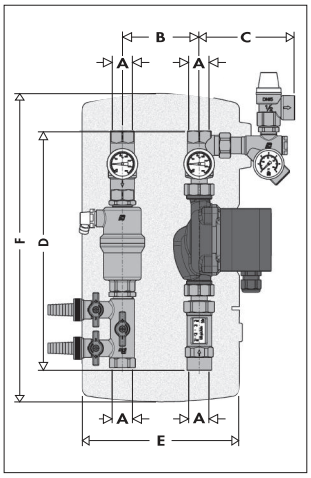
### Pump

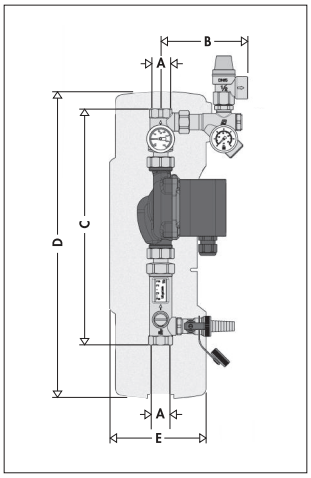
| | |
|---|---|
| Wilo solar model: | Star S-16 U15 |
| Body: | cast iron |
| Power supply: | 115 V - 60 Hz |
| Max. pressure: | 150 psi (10 bar) |
| Max. temperature: | 230°F (110°C) |
| Agency approval: | cULus |

### Wilo Star S-16 U15 hydraulic characteristics



## Dimensions

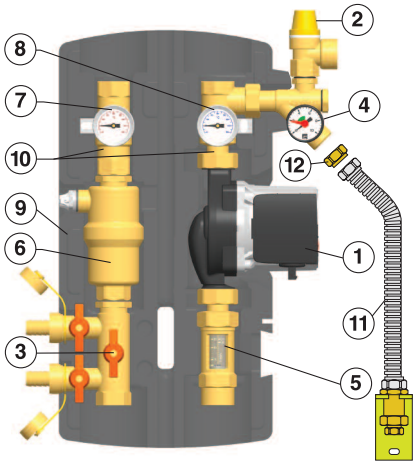


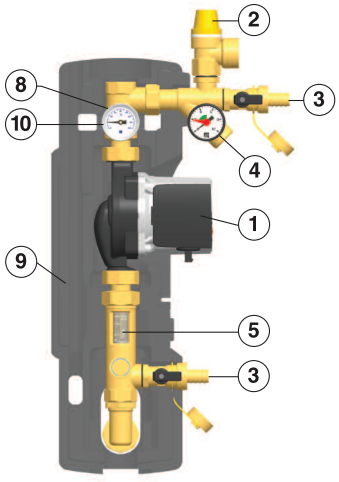




| Code | A | B | C | D | E | F | Weight (lb) |
|---|---|---|---|---|---|---|---|
| 255050A | 3/4" | 4" | 4 7/8" | 15" | 8" | 16" | 15 |
| 255056A | 3/4" | 4" | 4 7/8" | 15" | 8" | 16" | 10 |

| Code | A | B | C | D | E | Weight (lb) |
|---|---|---|---|---|---|---|
| 256050A | 3/4" | 7" | 16 1/4" | 17" | 5" | 12 |
| 256056A | 3/4" | 7" | 16 1/4" | 17" | 5" | 8 |

## Characteristic components




1 Wilo-Solar circulation pump
2 Safety relief valve 253 series
3 Filling/drain valve
4 Pressure gauge
5 Flow meter
6 Air trap and vent
7 Flow temperature gauge
8 Return temperature gauge
9 Pre-formed insulation shell
10 Shut-off and check valve
11 Expansion Tank connection kit
12 3/4" cap (used if no expansion tank is installed)

## Construction details

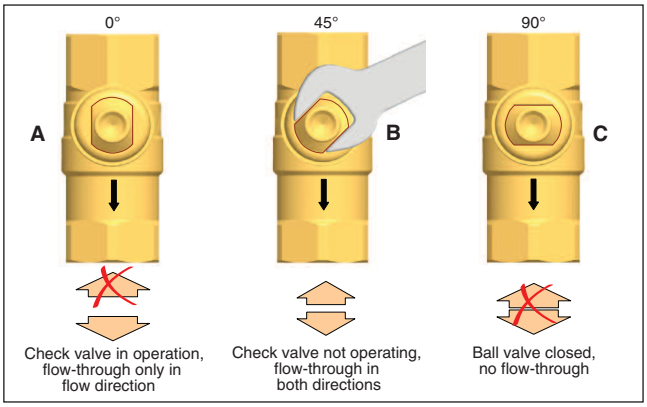
### Shut-off and check valve

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

**A.** In normal system operation, the ball valves must be fully open.

**B.** To allow the fluid to flow in both directions, it is necessary to rotate the respective ball valve to 45°.

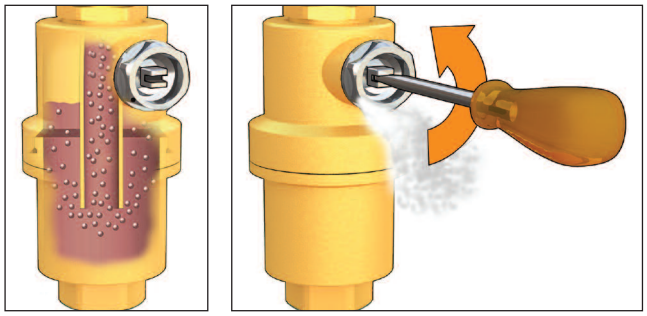
**C.** To close ball valve, rotate 90°.




### Air vent

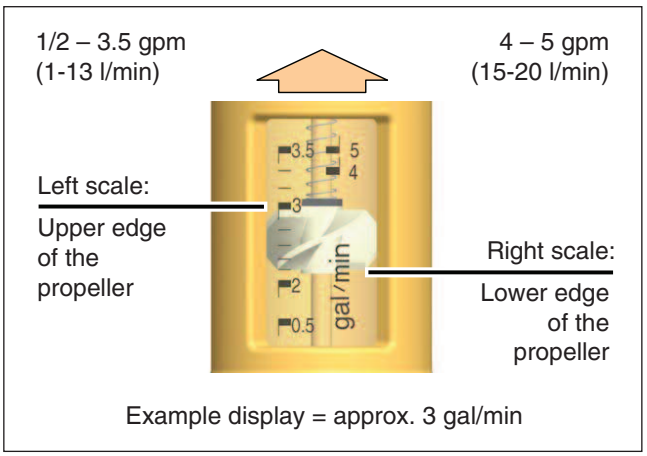
The solar pump unit version with flow and return connection is equipped with an air vent on the flow line. The air, separated from the fluid, is collected at the top of the vent.

The collected air must be released from time to time — every day after the initial installation; however, it can eventually be done weekly or monthly, depending on the quantity of the air. The collected air is released using the manual air vent with a screwdriver.



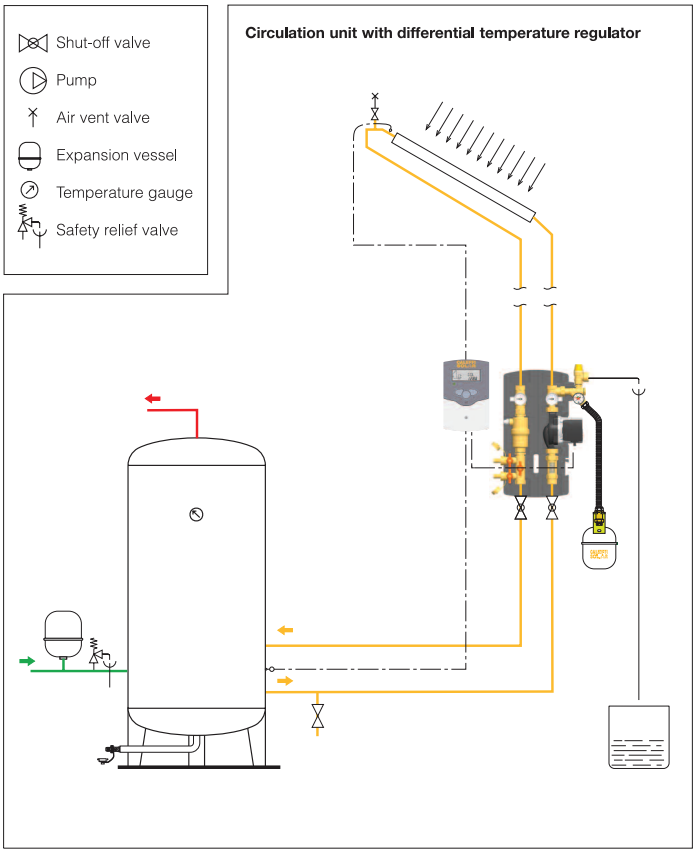
### Flow meter

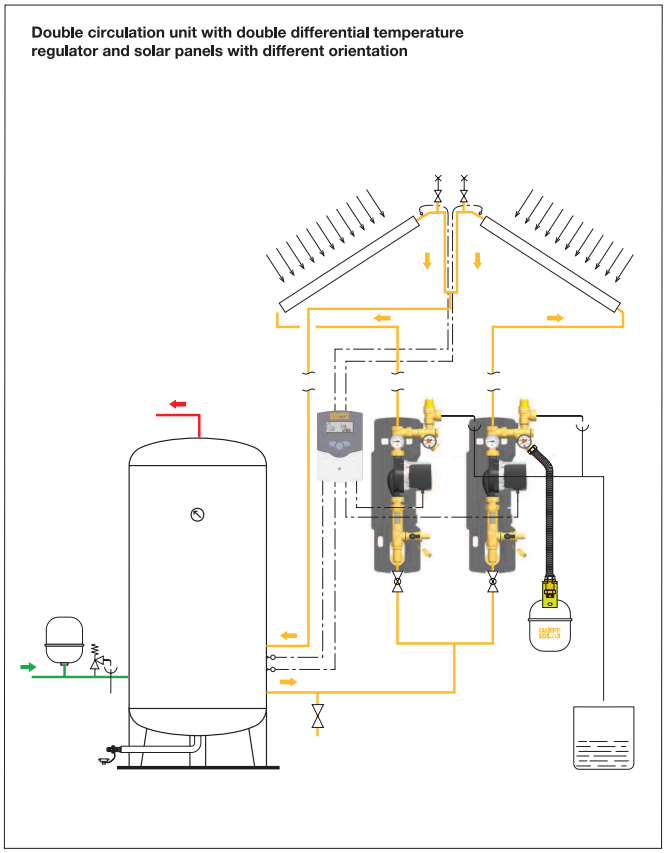
The Flow meter is for measurement and display of the flow rate of 1/2 to 5 gpm (1-20 l/min). For accurate function of the measuring device the system must be flushed and free from foreign substances.



| Item | Code | Description |
|---|---|---|
| **SolarFlex expansion tanks** | | |
|  | 255007 | Stainless steel tank connection kit 3/4" straight thread |
| | 259012 | Expansion tank 3 gallons, 3/4" straight thread connection |
| | 259018 | Expansion tank 5 gallons, 3/4" straight thread connection |
| | 259025 | Expansion tank 7 gallons, 3/4" straight thread connection |
| | 259035 | Expansion tank 9 gallons, 3/4" straight thread connection |
| | 259050 | Expansion tank 13 gallons, 3/4" straight thread connection |
| **Accessories for solar pump stations** | | |
|  | NA10092 | 18" SJ cord, stripped and pre-tinned for connecting pump to controller |
|  | NA26710 | Three-way diverting valve kit with valve body, elbow, tee,120V actuator and cord to mount to bottom of dual line station for diverting solar fluid to another tank, swimming pool hx or heat shedding device. |
|  | 255010A | Hand fill pump for solar pump stations 1 3.0 320.00 |
| **Solar pump stations fitting kits to connect SolarFlex directly** | | |
|  | NA26740 | 1/2" SolarFlex direct fitting kit includes (4) 3/4" male thread adaptors (NA12152) |
| | NA26640 | 1/2" SolarFlex direct fitting kit includes (2) 3/4" male thread adaptors (NA12152) |
|  | NA26750 | 3/4" SolarFlex direct fitting kit includes (4) 1" male thread adaptors (NA12162) |
| | NA26650 | 3/4" SolarFlex direct fitting kit includes (2) 1" male thread adaptors (NA12162) |
|  | NA26760 | 1" SolarFlex direct fitting kit includes (4) 1-1/4" male thread adaptors (NA12162 + NA10087 + R50055) |
| | NA26660 | 1" SolarFlex direct fitting kit includes (2) 1-1/4" male thread adaptors (NA12162 + NA10087 + R50055) |
| **Solar pump stations fitting kits to connect sweat copper pipe with union nuts** | | |
|  | NA26749 | 1/2" Sweat fitting kit includes (4) 3/4" male adaptors (NA12152), (4) nuts (R41298), (4) 1/2" sweat tail (NA10001) and (4) washers (R50056). |
| | NA26649 | 1/2" Sweat fitting kit includes (2) 3/4" male adaptors (NA12152), (2) nuts (R41298), (2) 1/2" sweat tail (NA10001) and (2) washers (R50056). |
|  | NA26759 | 3/4" Sweat fitting kit includes (4) 1" male adaptors (NA12162), (4) nuts R61008), (4) 3/4" sweat tail (NA10003) and (4) washers (R50055). |
| | NA26659 | 3/4" Sweat fitting kit includes (2) 1" male adaptors (NA12162), (2) nuts R61008), (2) 3/4" sweat tail (NA10003) and (2) washers (R50055). |
|  | NA26769 | 1" Sweat fitting kit includes (4) 1" male adaptors (NA12162), (4) 1" sweat tail with nut (59834A) and (4) washers (R50055). |
| | NA26669 | 1" Sweat fitting kit includes (2) 1" male adaptors (NA12162), (2) 1" sweat tail with nut (59834A) and (2) washers (R50055). |
| **Solar pump stations fitting kits to NPT male thread** | | |
|  | NA26756 | 3/4" NPT fitting kit includes (4) 1" male adaptors (NA12162), (4) nuts (R61008), (4) 3/4" NPT tail (31901A) and (4) washers (R50055). |
| | NA26656 | 3/4" NPT fitting kit includes (2) 1" male adaptors (NA12162), (2) nuts (R61008), (2) 3/4" NPT tail (31901A) and (2) washers (R50055). |

**Application diagrams**




## SPECIFICATION SUMMARIES

### Code 255050A/256050A

Circulation unit for solar heating systems. Connections 3/4" female straight thread. 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 360°F (180°C). Maximum working pressure 150 psi (10 bar). Safety relief valve temperature range -20–320°F (-30–160°C). Safety relief valve factory set at 90 psi (6 bar). Δp minimum opening shut-off and check valve 1/4 psi (2 kPa). Flow meter scale 1/2 - 5gpm (1–20 l/min). Maximum flow meter temperature 265°F (130°C). Pressure gauge scale 0-90 psi (0–6 bar). Temperature gauge scale 32-320°F (0–160°C). Filling/drain hose connections 3/4" male hose thread. Wilo Solar Star S-16 U15 pump. Cast iron body. Power supply 115V – 60 Hz. Maximum pressure 150 psi (10 bar). Maximum temperature 230°F (110°C). Agency approval class cULus. Expansion tank connection 1/2" male straight thread.

### Code 255056A/256056A

Circulation unit for solar heating systems. Connections 3/4" female straight thread. 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 360°F (180°C). Maximum working pressure 150 psi (10 bar). Safety relief valve temperature range -20–320°F (-30–160°C). Safety relief valve factory set at 90 psi (6 bar). Δp minimum opening shut-off and check valve 1/4 psi (2 kPa). Flow meter scale 1/2 - 5gpm (1–20 l/min). Maximum flow meter temperature 265°F (130°C). Pressure gauge scale 0-90 psi (0–6 bar). Temperature gauge scale 32-320°F (0–160°C). Filling/drain hose connections 3/4" male hose thread. Agency approval class cULus. Expansion tank connection 1/2" male straight thread.



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