Application:

The Oventrop "Regusol X" stations with heat exchanger allow for the controlled transmission of the heat of the solar circuit (primary circuit) to a storage cylinder circuit (secondary circuit). The capacity amounts to 25 kW. The product assembly "Regusol X-Duo 25" is additionally equipped with a three-way conversion valve for the transmission of the solar heat to a second storage cylinder circuit (storage cylinder with loading operation section by section / second storage cylinder).

To avoid excess pressure, the primary and secondary circuit are equipped with safety valves. The primary circuit features a connection facility for an expansion tank. The "Regusol X" stations are suitable for standard solar liquids basing on glycol.

The soldered plate heat exchanger complies with the requirements of the European Pressure Equipment Directive (2014/68/EU). Due to turbulent flow conditions, an excellent self-cleaning effect is produced and thus, a contamination is avoided.

The leak tested components of the heat exchanger system are pre-assembled on a board. The controller "Regtronic RX" is wired with the internal electric components and features the following connections:

Outputs:
- Output for solar circuit pump
- Output for loading pump
- Output for three-way conversion valve ("Regusol X-Duo 25" only)
- Freely assignable outputs

Apart from the mentioned outputs, the "Regtronic RX" features a data bus (S-bus) for the connection to the data logger "CS-BS-6).

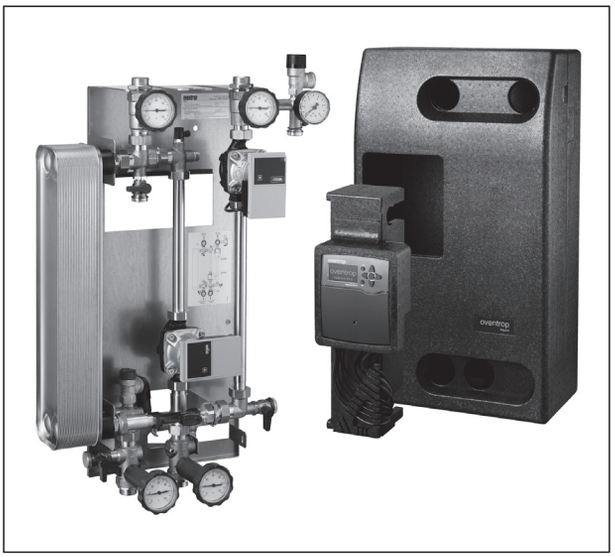
Inputs:
- Temperature input for collector
- Temperature input heat exchanger entry point-primary side
- Temperature input heat exchanger exit point- secondary side
- 3 temperature inputs for storage cylinder with operation section by section
- Interface for electronic flow transducer

Plain text is clearly shown on the display of the controller.

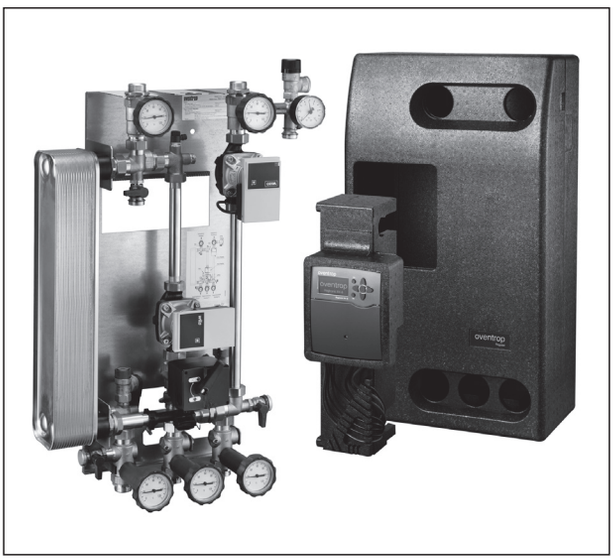
Advantages:

- high functional reliability
- all components from one supplier
- high quality materials
- max. short-term starting temperature 160 °C
- max. continuous operating temperature 120 °C
- insulation made of expanded polypropylene (EPP) supplied with each "Regusol X"
- completely insulated product assembly
- primary side with G 1 "Regusol" compression fittings and secondary side G 1 flat sealing for a quick and simple installation
- time-saving installation
- efficient microprocessor based control with easy menu navigation via graphic display for a comprehensible visualisation of the system conditions

Models:	**Item no.:**
"Regusol X-Uno 25"	1361060
"Regusol X-Duo 25"	1361050



"Regusol X-Uno 25"



"Regusol X-Duo 25"

Tender specification:

“Regusol X-Uno 25” Station
For the connection to the solar circuit DN 25 by use of “Regusol” compression fittings (to be ordered separately). Connection to the storage cylinder circuit DN 25 G 1 flat sealing.
Complete, pre-assembled and leak tested unit with wall mounting device and insulation.

Technical data:

Distance between supply and return:	100 mm
Max. continuous operating temperature:	120 °C
Max. short-term starting temperature:	160 °C
Opening pressure check valves:	20 mbar
Controller with S-bus interface:	“Regtronic RX”

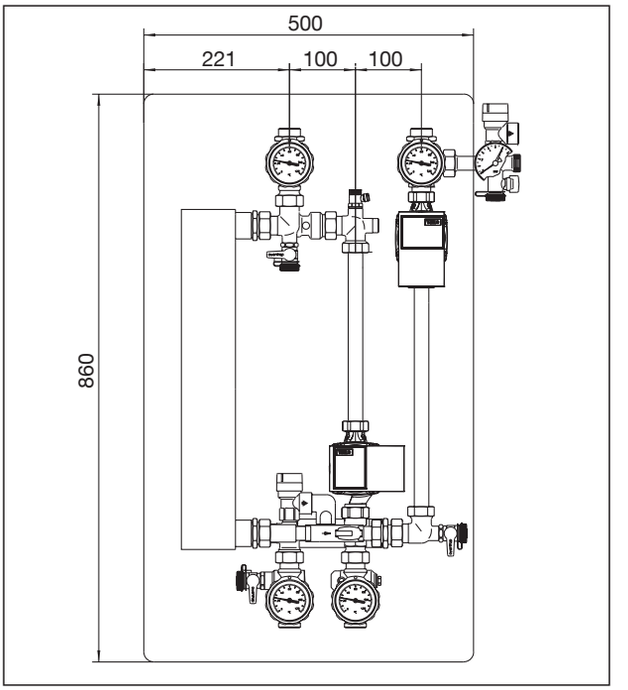
(for the connection to the data logger “CS-BS-6”)

Primary circuit (solar circuit) consisting of:
1. Flushing, filling and draining connection
2. Ball valve with check valve, temperature sensor connection and thermometer inside handle
3. Ball valve, temperature sensor connection and thermometer inside handle, with connection for safety group
4. Safety group with pressure gauge, safety valve 6 bar
5. High-efficiency pump
6. Flushing, filling and draining connection
7. Electronic flow and temperature sensor
8. Electronic solar controller
9. Plate heat exchanger

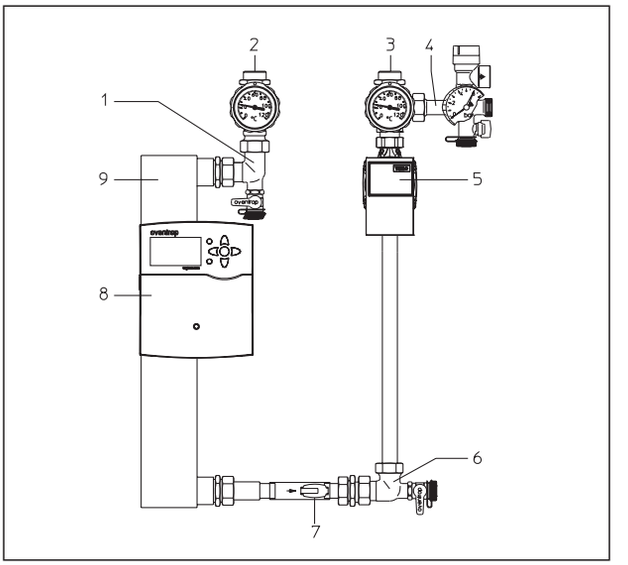
Max. excess operating pressure (safety valve):	6 bar
High-efficiency pump Wilo-Yonos ST PWM 15/7:	
Max. pump head:	6 m
Max. delivery capacity:	4.1 m^3/h
k_V (“Regusol X-Uno 25”):	2.4

Secondary circuit (storage cylinder circuit) consisting of:
1. Check valve
2. Venting valve and temperature sensor connection
3. High-efficiency pump
4. Ball valve with thermometer and temperature sensor connection
5. Ball valve with thermometer
6. Flushing, filling and draining connection
7. Safety valve 3 bar
8. Plate heat exchanger

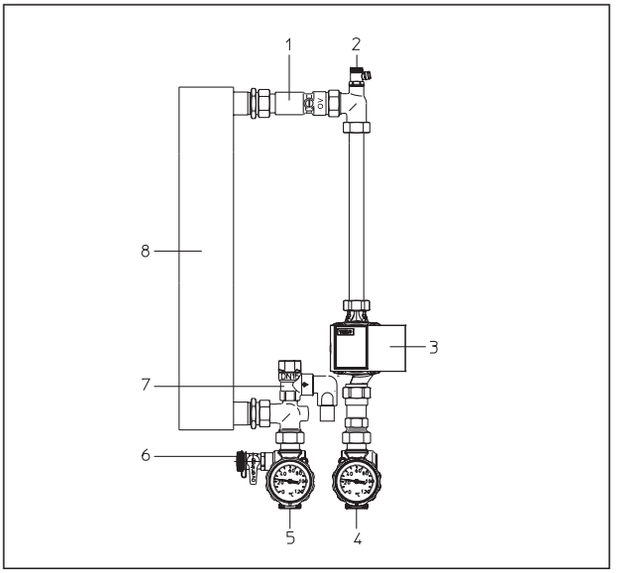
Max. excess operating pressure (safety valve):	3 bar
High-efficiency pump Wilo-Yonos RS PWM 15/7:	
Max. pump head:	6 m
Max. delivery capacity:	3.9 m^3/h
k_V (“Regusol X-Uno 25”):	3.6



Dimension “Regusol X-Uno 25”



Primary circuit “Regusol X-Uno 25” (front level)



Secondary circuit “Regusol X-Uno 25” (back level)

Tender specification:

“Regusol X-Duo 25” Station
For the connection to the solar circuit DN 25 by use of “Regusol” compression fittings (to be ordered separately). Connection to the storage cylinder circuit DN 25 G 1 flat sealing.
Complete, pre-assembled and leak tested unit with wall mounting device and insulation.

Technical data:

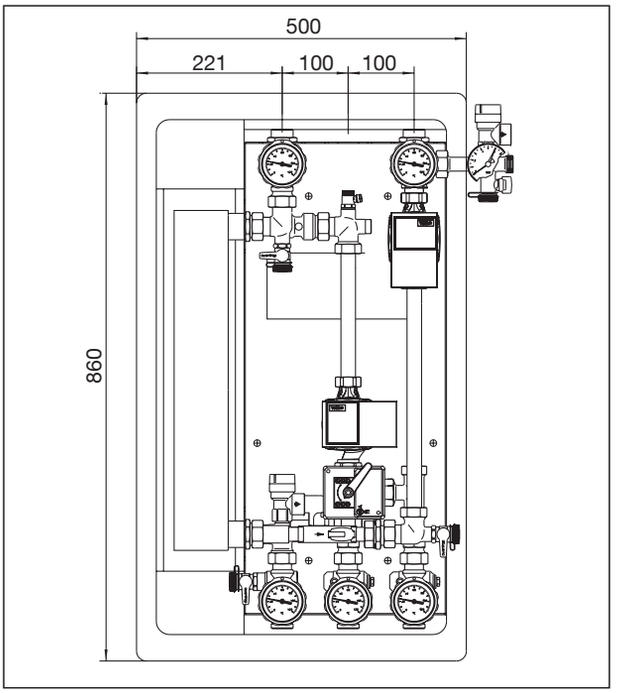
Distance between supply and return:	100 mm
Max. continuous operating temperature:	120 °C
Max. short-term starting temperature:	160 °C
Opening pressure check valves:	20 mbar
Controller with S-bus interface: (for connection to the data logger “CS-BS-6”)	“Regtronic RX”

Primary circuit (solar circuit) consisting of:
1. Flushing, filling and draining connection
2. Ball valve with check valve, temperature sensor connection an thermometer inside handle
3. Ball valve, temperature sensor connection and thermometer inside handle, with connection for safety group
4. Safety group with pressure gauge, safety valve 6 bar
5. High-efficiency pump
6. Flushing, filling and draining connection
7. Electronic flow and temperature sensor
8. Electronic solar controller
9. Plate heat exchanger

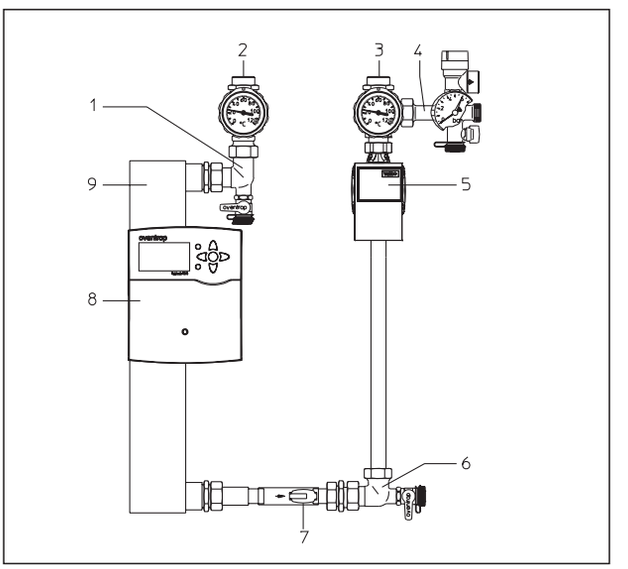
Max. excess operating temperature (safety valve):	6 bar
High-efficiency pump Wilo-Yonos ST PWM 15/7:	
Max. pump head:	6 m
Max. delivery capacity:	4.1 m^3/h
k_V (“Regusol X-Duo 25”)	2.4

Secondary circuit (storage cylinder circuit) consisting of:
1. Check valve
2. Venting valve and temperature sensor connection
3. High-efficiency pump
4. Three-way conversion valve
5. Ball valve with thermometer
6. Ball valve with thermometer
7. Ball valve with thermometer
8. Flushing, filling and draining connection
9. Safety valve 3 bar
10. Plate heat exchanger

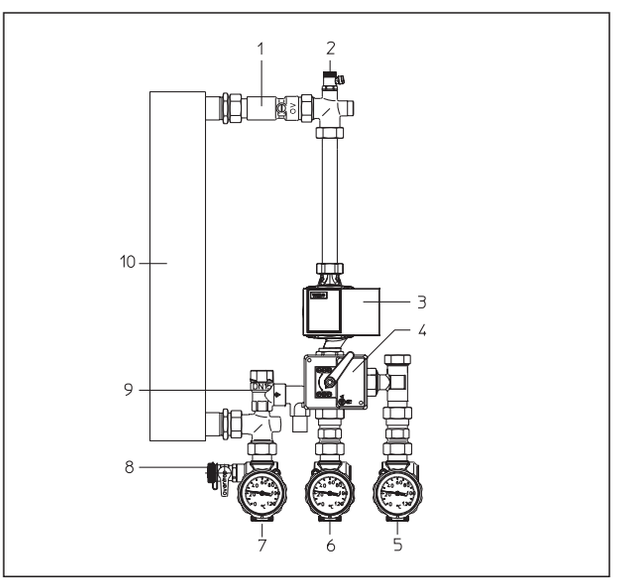
Max. excess operating pressure (safety valve):	3 bar
High-efficiency pump Wilo-Yonos RS PWM 15/7:	
Max. pump head:	6 m
Max. delivery capacity:	3.9 m^3/h
k_V (“Regusol X-Duo 25”):	3.2



Dimensions “Regusol X-Duo 25”



Primary circuit “Regusol X-Duo 25” (front level)



Secondary circuit “Regusol X-Duo 25” (back level)

Function “Regusol X-Uno” / “Regusol X-Duo”:

The heat is transmitted to the soldered plate heat exchanger via the primary circuit (solar circuit). The secondary circuit (storage cylinder circuit) passes through the heat exchanger in reverse direction and absorbs the heat. Depending on the application, the corresponding section of the storage cylinder is loaded.

On the supply side of the primary circuit, the stations feature a ball valve with check valve serving to avoid gravity circulation in the solar circuit. The return side features a flow and temperature sensor for energy measurement. The high-efficiency pumps are especially suitable for use in solar circuits. The safety group with connection facility for an expansion tank, pressure gauge and 6 bar safety valve is connected to the return ball valve. Fill and drain valves at the entry and exit point of the heat exchanger and at the safety group allow for an easy filling and flushing of the primary circuit.

The supply of the secondary circuit is equipped with a ball valve, the high-efficiency pump for the storage cylinder circuit and a venting valve. A check valve at the exit point of the heat exchanger prevents gravity circulation. The return features a 3 bar safety valve and a ball valve with filling, flushing and draining connection.

The station “Regusol X-Duo” is additionally equipped with a three-way conversion valve and a second supply with ball valve for the connection of a further secondary circuit.
The leak tested components are pre-assembled on a mounting board for wall attachment.

Function of the electronic controller “Regtronic RX”

The “Regusol X” stations are equipped with an electronic Oventrop controller “Regtronic RX”.
The controller is wired with the internal electric components and features the following connections:
Outputs:
– Output for solar circuit pump
– Output for loading pump
– Output for three-way conversion valve (“Regusol X-Duo 25” only)
– Freely assignable outputs

Apart from the mentioned outputs, the “Regtronic RX” features a data bus (S-bus) for the connection to the data logger “CS-BS-6”.

Inputs:
– Temperature input for collector
– Temperature input heat exchanger entry point-primary side
– Temperature input heat exchanger exit point- secondary side
– 3 temperature inputs for storage cylinder with operation section by section
– Interface for electronic flow transducer

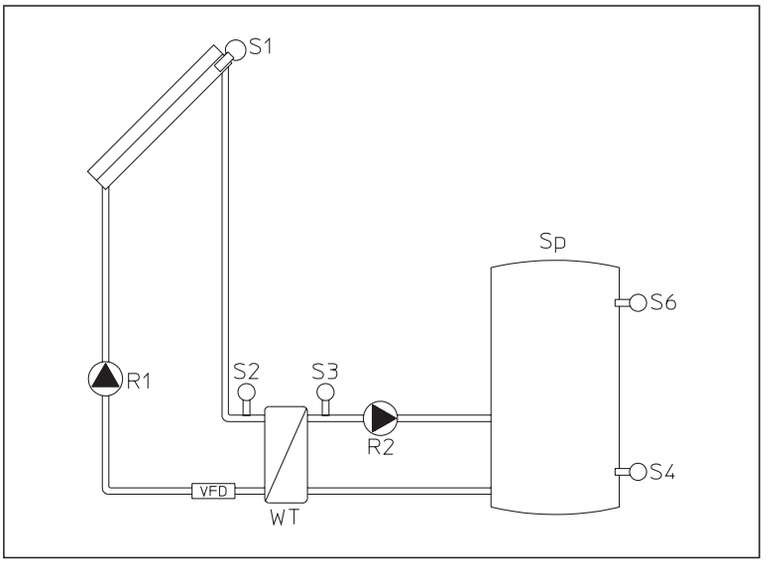
The adjustable parameters allow for an adaptation of the preloaded schemes to individual requirements.

	“Regusol X-Uno 25”	“Regusol X-Duo 25”
Item no.:	1361060	1361050
Controller	“Regtronic RX”	
High-efficiency pump (primary circuit)	Wilo-Yonos ST PWM 15/7	
High-efficiency pump (secondary circuit)	Wilo-Yonos RS PWM 15/7	
Three-way conversion valve		X
S-bus interface	X	X

Hydronic schemes/System examples:

“Regusol X-Uno 25”

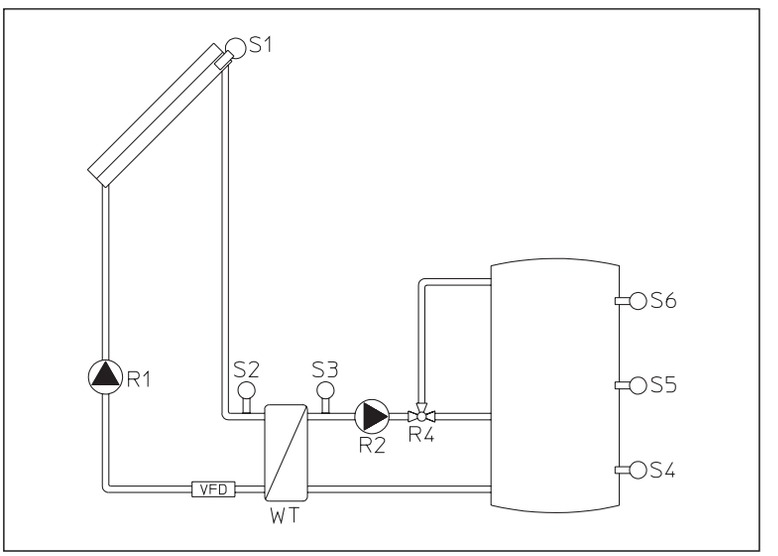
WT: Heat exchanger
VFD: Flow and temperature sensor
R1: Solar circuit pump
R2: Loading pump
S1: Collector temperature
S2: Temperature primary circuit
S3: Temperature secondary circuit
S4: Lower storage cylinder temperature
S6: Upper storage cylinder temperature



“Regusol X-Uno 25““

“Regusol X-Duo 25” – Loading section by section

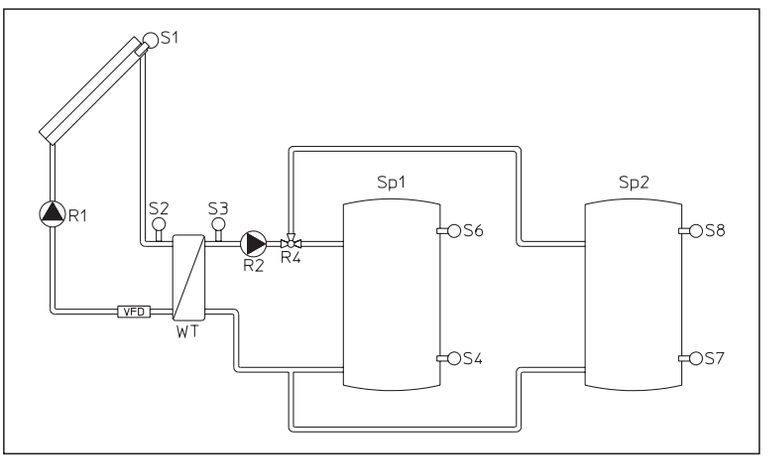
WT: Heat exchanger
VFD: Flow and temperature sensor
R1: Solar circuit pump
R2: Loading pump
R4: Three-way conversion valve
S1: Collector temperature
S2: Temperature primary circuit
S3: Temperature secondary circuit
S4: Lower storage cylinder temperature
S5: Central storage cylinder temperature
S6: Upper storage cylinder temperature



“Regusol X-Duo 25” - Loading section by section

“Regusol X-Duo 25” – Loading of 2 storage cylinders

WT: Heat exchanger
VFD: Flow and temperature sensor
R1: Solar circuit pump
R2: Loading pump
R4: Three-way conversion valve
Sp1: Storage cylinder 1
Sp2: Storage cylinder 2
S1: Collector temperature
S2: Temperature primary circuit
S3: Temperature secondary circuit
S4: Lower storage cylinder temperature Sp 1
S6: Upper storage cylinder temperature Sp 1
S7: Lower storage cylinder temperature Sp 2
S8: Upper storage cylinder temperature Sp 2

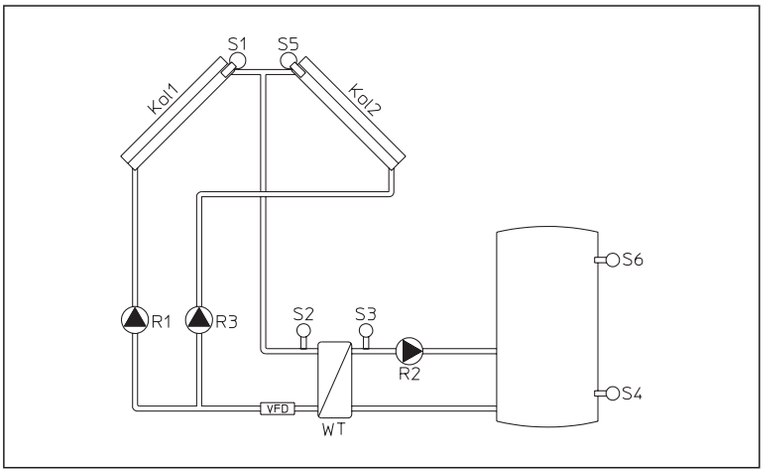


“Regusol X-Duo 25” – Loading of 2 storage cylinders

Hydronic schemes/System examples:

“Regusol X-Uno 25”
with supplementary set “Regusol-X”

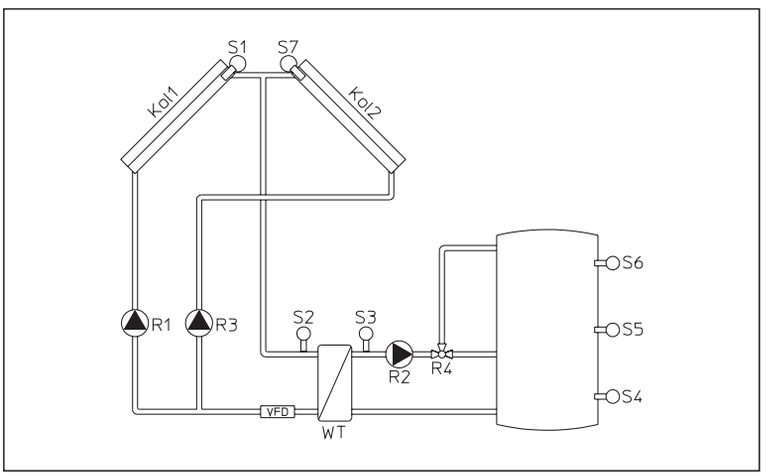
WT: Heat exchanger
VFD: Flow and temperature sensor
Kol1: Collector field 1
Kol2: Collector field 2
R1: Solar circuit pump for collector field1
R2: Loading pump
R3: Solar circuit pump for collector field 2
S1: Temperature collector field 1
S2: Temperature primary circuit
S3: Temperature secondary circuit
S4: Lower storage cylinder temperature
S5: Temperature collector field 2
S6: Upper storage cylinder temperature



For 2 collector fields with storage cylinder connection for simple operation

“Regusol X-Duo 25” – Loading section by section with supplementary set ”Regusol-X“

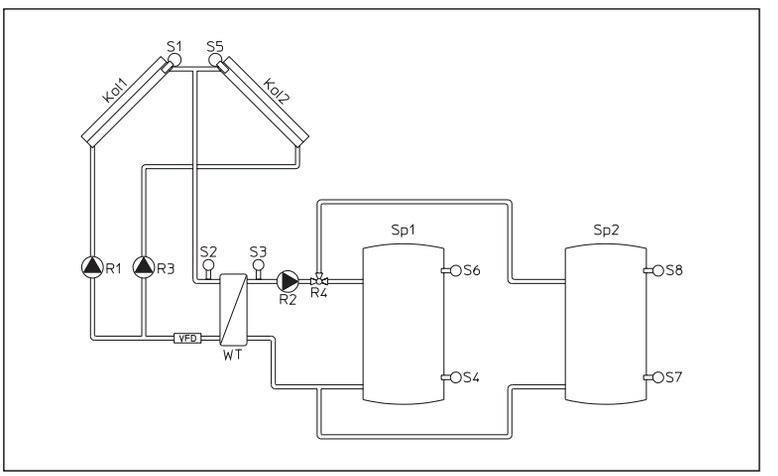
WT: Heat exchanger
VFD: Flow and temperature sensor
Kol1: Collector field 1
Kol2: Collector field 2
R1: Solar circuit pump for collector field 1
R2: Loading pump
R3: Solar circuit pump for collector field 2
R4: Three-way conversion valve
S1: Temperature collector field 1
S2: Temperature primary circuit
S3: Temperature secondary circuit
S4: Lower storage cylinder temperature
S5: Central storage cylinder temperature
S6: Upper storage cylinder temperature
S7: Temperature collector field 2



For 2 collector fields with storage cylinder connection for loading section by section

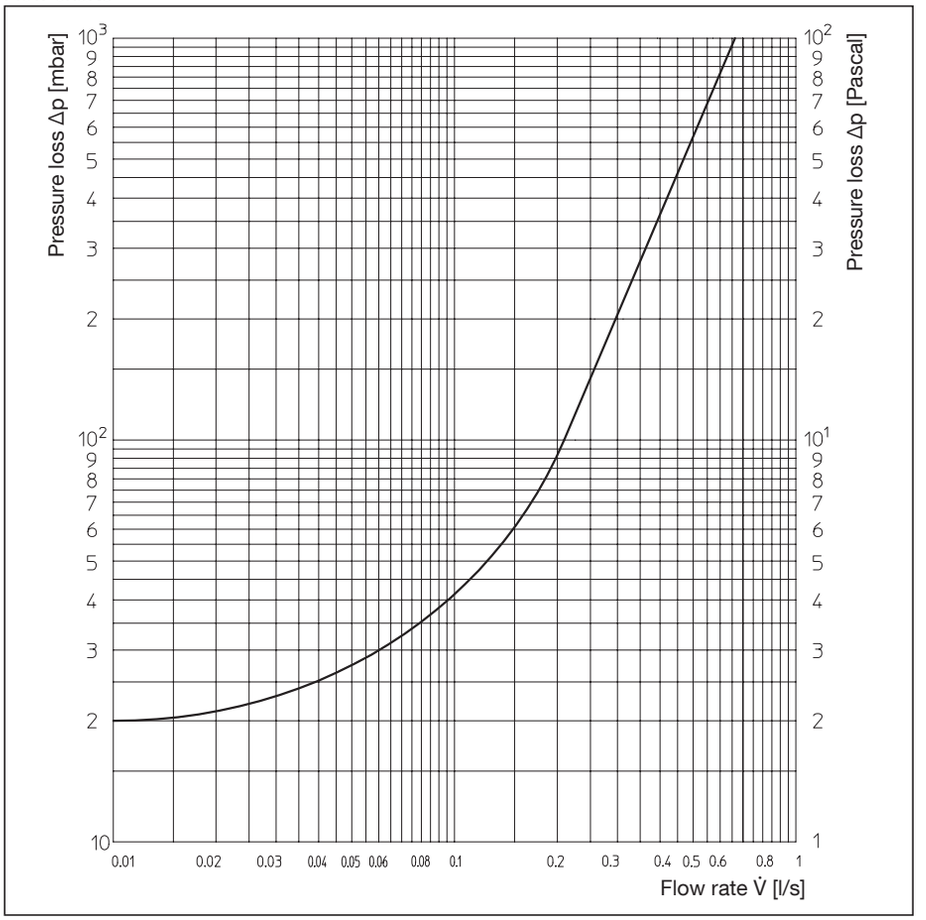
“Regusol X-Duo 25” – Loading of 2 storage cylinders with supplementary set “Regusol-X”

WT: Heat exchanger
VFD: Flow and temperature sensor
Kol1: Collector field 1
Kol2: Collector field 2
Sp1: Storage cylinder 1
Sp2: Storage cylinder 2
R1: Solar circuit pump for collector field 1
R2: Loading pump
R3: Solar circuit pump for collector field 2
R4: Three-way conversion valve
S1: Temperature collector field 1
S2: Temperature primary circuit
S3: Temperature secondary circuit
S4: Lower storage cylinder temperature Sp 1
S5: Temperature collector field 2
S6: Upper storage cylinder temperature Sp 1
S7: Lower storage cylinder temperature Sp 2
S8: Upper storage cylinder temperature Sp 2

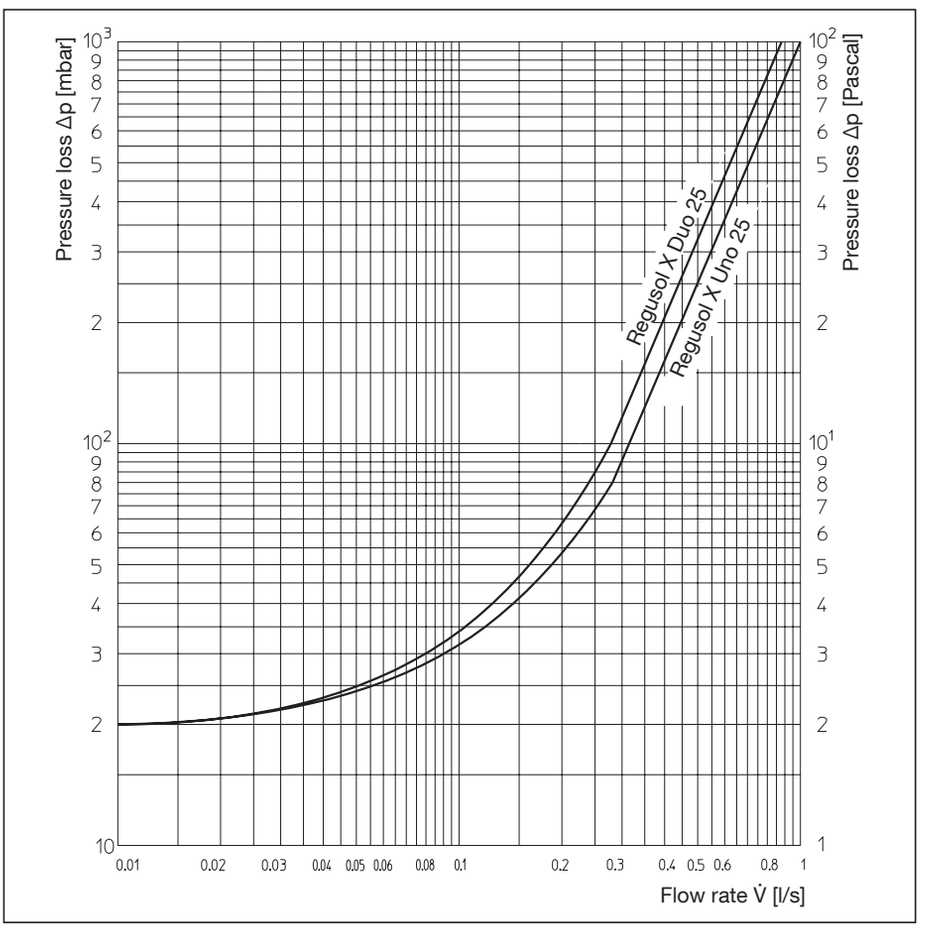


For 2 collector fields with storage cylinder connection for loading of 2 separate storage cylinders

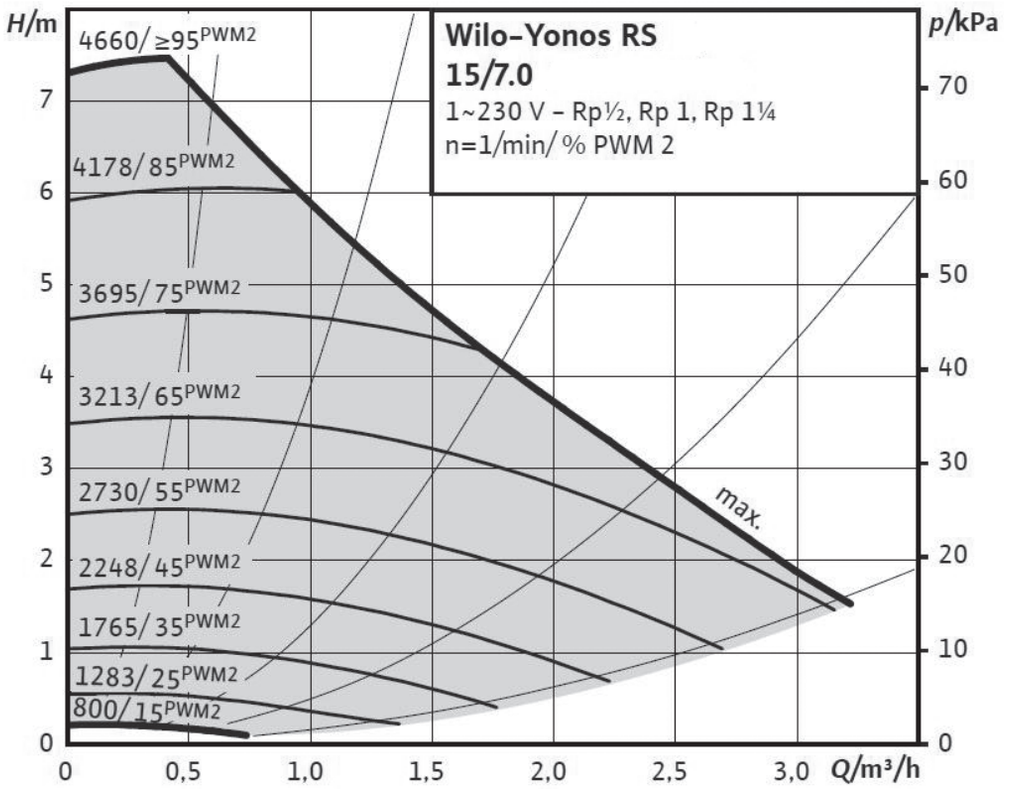
Flow charts

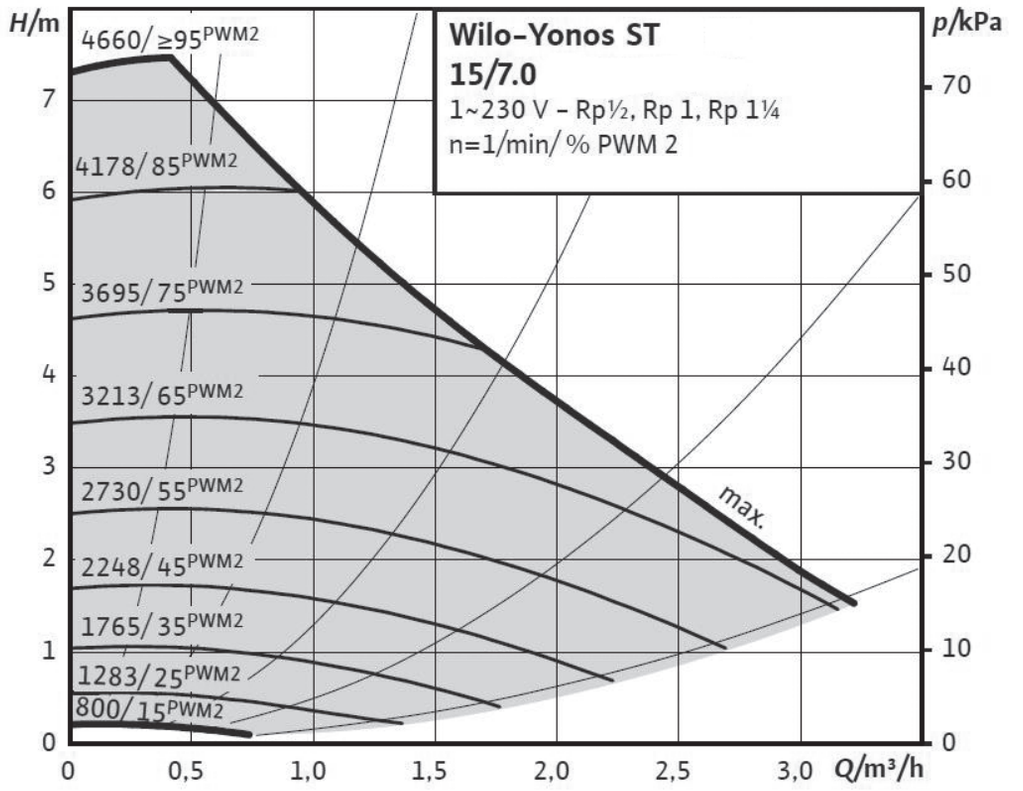


“Regusol X-Uno/Duo 25” - Primary side



“Regusol X-Uno/Duo 25” - Secondary side





Pump characteristic lines

Further products for solar thermal energy:

“Regusol” Deaerator

Application:

Especially after commissioning of the solar plant, the air expelled from the heat transfer medium gathers in the “Regusol” deaerator.
The deaerator serves to avoid malfunctions caused by airlocks or micro bubbles.
The deaerator must only be installed vertically with the venting valve pointing upwards. It is suitable for use with any standard solar liquids basing on glycol.

Max. operating temperature: 120 °C (for short periods up to 160 °C)

Item no.: 1364260

Advantages:

- optimum transmission of the heat from the collector to the storage cylinder, i.e. increased efficiency of the solar plant
- high functional reliability due to low wearing components
- large air chamber: the expelled air gathers in a reservoir and can be easily removed
- venting valve easily accessible, additional venting valves which are difficult to access are, in general, no longer required
- no disturbing noises
- increased service life of the plant, especially of pump and valves

Function:

The content of dissolved gases in liquids is pressure- and temperature-dependent, i.e. the higher the temperature and the lower the pressure, the lower the content of dissolved gases.

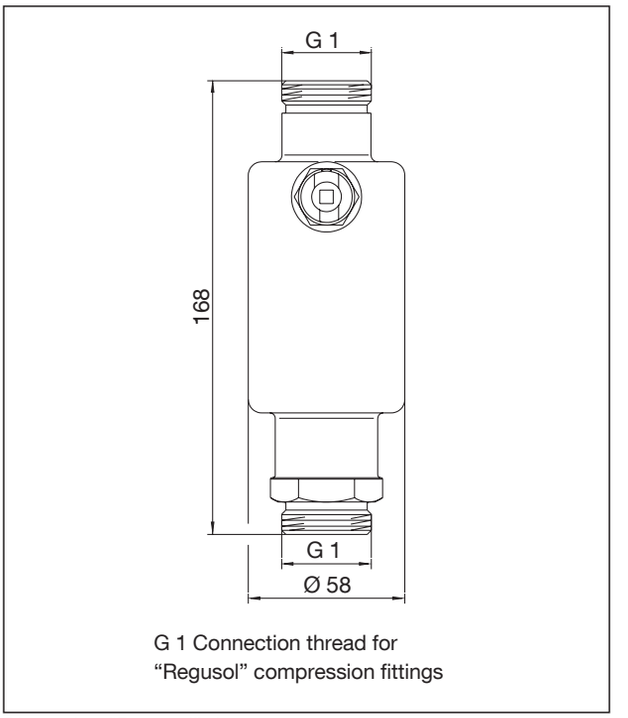
An optimum deaeration of a solar plant is guaranteed by installing a “Regusol” deaerator in the hot solar supply.

The significantly increased flow cross-section in the deaerator leads to a reduced velocity and thus to a reduced solubility of micro bubbles in the medium.

The air rises into the air chamber and can be expelled via the venting valve.

Connection:

The “Regusol” deaerator must only be connected to the pipework with the help of “Regusol” compression fittings which are to be ordered separately.



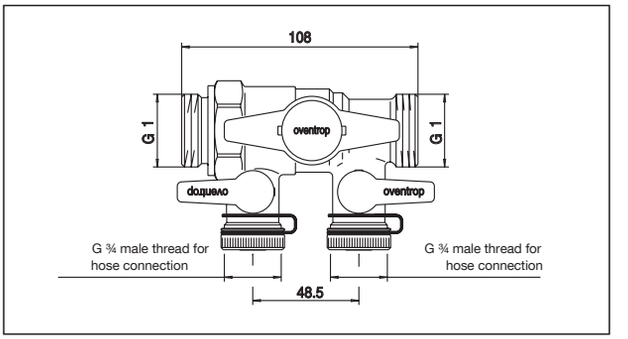
G 1 Connection thread for
“Regusol” compression fittings

Dimension “Regusol” deaerator

“Regusol” Filling and flushing device

With isolating ball valves. To be installed at the lowest point of the solar circuit. Connection with the help of compression fittings.

Item no.: 1363051

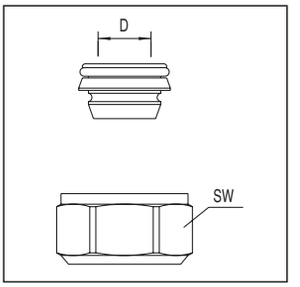


Dimensions “Regusol” filling and flushing device

“Regusol” Compression fittings DN 20
made of brass for the connection of “Regusol” stations and valves to the solar circuit; suitable for copper and precision steel pipes

Set = 4 compression fittings	**Item no.:**
12 mm	1367393
15 mm	1367395
16 mm	1367396
18 mm	1367397

Attention: When installing copper pipes with a wall thickness ≤ 1 mm, it is necessary to use reinforcing sleeves for the additional stabilisation of the pipe. Should the wall thickness exceed 1 mm, please contact the pipe manufacturer.



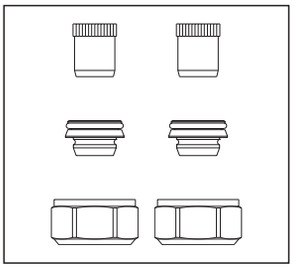
Size	D	SW*
12 mm	12	30
15 mm	15	30
16 mm	16	30
18 mm	18	30

*SW = Spanner size

Dimensions compression fittings DN 20

“Regusol” Compression fittings DN 25
with reinforcing sleeves
made of brass for the connection of “Regusol” stations and valves to the solar circuit; suitable for copper and precision steel pipes

Set 1 = 1 compression fitting	**Item no.:**
12 mm	1367573
15 mm	1367575
16 mm	1367576
18 mm	1367577
22 mm	1367579
Set. 2 = 2 compression fittings	
12 mm	1367583
15 mm	1367585
16 mm	1367586
18 mm	1367587
22 mm	1367589
Set 3 = 3 compression fittings	
12 mm	1367593
15 mm	1367595
16 mm	1367596
18 mm	1367597
22 mm	1367599

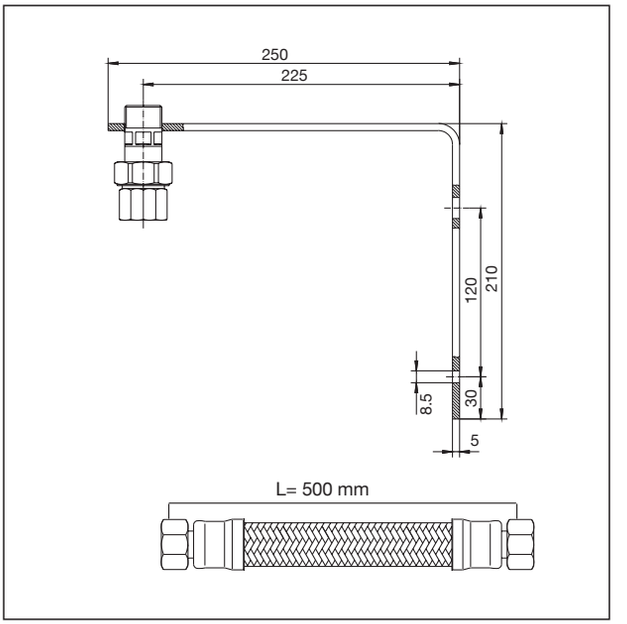


Größe	D	SW
12 mm	12	37
15 mm	15	37
16 mm	16	37
18 mm	18	37
22 mm	22	37

Dimensions compression fittings DN 25 with reinforcing sleeves

“Regusol” Connection set for diaphragm expansion tank
for the connection of a diaphragm expansion tank to the solar station “Regusol”.
Consisting of:
– Flexible hose 500 mm
– Angled wall bracket 210 x 250
– Quick coupling
– Fixing material

Item no.: 1369051

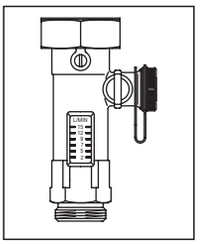


Dimensions connection set for diaphragm expansion tanks

Flow measuring and regulating device,
with isolation

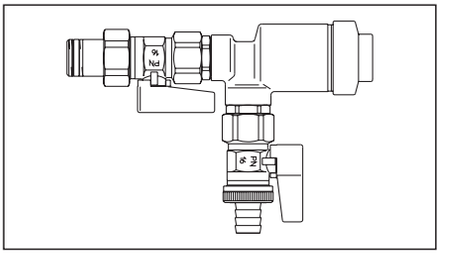
for “Regusol”	**Item no.:**
1- 6 l/min.	1364160
2-15 l/min.	1364161
7-30 l/min.	1364162
2-14 l/min.	1364163

Connection:
G 1½ collar nut x G 1 for “Regusol” compression fittings



“Regusol” Filling pump
The “Regusol” filling pump serves to manually fill a solar plant with the heat transfer medium from an external storage basin. It is suitable for stationary and mobile use.

Item no.: 1364250



Subject to technical modifications without notice.

Product range 9
ti 201-EN/10/MW
Edition 2017