

RESOL®

Controllers for solar thermal systems

2009/2010



www.resol.com

GB



Intelligent use of solar energy

Since 1977 RESOL has been standing for intelligent solar thermal control technology.

Caused by the oil crisis in the middle of the 1970s, the social conscience for the use of renewable energies arose and solar energy became very important. In the meantime, solar thermal systems have become an inherent part of construction planning. Not least because of rising energy prices, it frequently becomes a hot topic again. According to scientific research, fossil fuels will have run out by the year 2040, but the effect of that is already tangible both economically and ecologically.

Nowadays, RESOL products optimise the control of about 2.7 million active solar heating and swimming pool systems in 50 countries world-wide.

In recognition of a convincing corporate philosophy, the sophisticated quality and functionality as well as the outstanding design of our products, RESOL has already been awarded with several prizes. The award „Roter Punkt“ by the „Design Center NRW“ and the „IF-Siegel“ of the „Industrie Forum Design, Hannover“ reward the close and long-standing cooperation with rosenthal design, Essen.

The perfect combination of functionality, quality and aesthetics continues to be the decisive principle for RESOL products.

... for more than 30 years!
products committed to the future



In 2001 RESOL was awarded „Solar-Unternehmen 2000“ by the Initiative Solar-Unternehmen 2001+ for exceptional engagement in production and utilisation of solar energy.



reddot design award
winner 2005

rosenthal design 

Sophisticated and award-winning design for future-oriented technology.



product
design
award

2008 

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Solar- and differential temperature controllers

Solar thermal systems are operated and controlled by solar controllers. RESOL differential temperature controllers are used in solar, heating and air-conditioning systems to initiate switching processes depending on thermal, hydraulic and environmental conditions. Apart from these basic functions, RESOL controllers offer a variety of options and functions for the optimum use of individual solar and heating systems.

The system-monitoring-display...

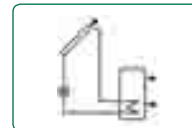


The installer or user will not benefit from ingenious controller functions if the relationship in the solar system does not become clear.

Therefore, RESOL has developed a display for several controllers of the DeltaSol®-series. The display meets the demand for simple system visualisation which gives the user an idea of the status of the system and the controller at a glance.

More than 30 different solar systems can be visualised with the display. Flashing symbols for sensors, pumps and valves enable an immediate allocation of temperatures, temperature differences and active actuators. Therefore, adjustment and control of the solar system are also possible without the necessity of reading the manual.

...the whole system at a glance!



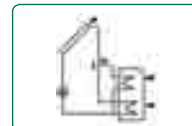
Solar system with 1 storage



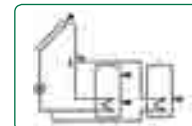
Solar system with 1 storage and heat exchange controller



Solar system with 1 storage and thermostatic after-heating



Solar system with storage loading in layers



Solar system with 2 storages, valve logic



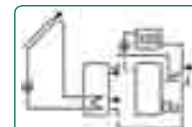
Solar system with 2 storages, pump logic



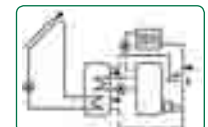
Solar system with east-/west collectors and 1 storage



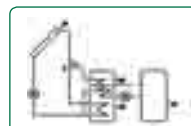
Solar system with 1 storage and solid fuel boiler



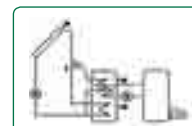
Solar system with 1 storage and heating circuit reverse raising



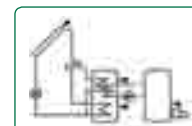
Solar system with 1 storage, heating circuit return pre-heating and thermostatic after-heating



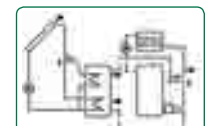
Solar system with storage loading in layers and quantity exchange controller



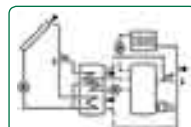
Solar system with storage loading in layers and thermostatic after-heating



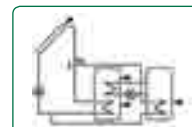
Solar system with storage loading in layers and solid fuel boiler



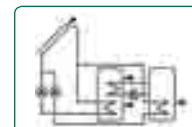
Solar system with storage loading in layers and heating circuit return pre-heating



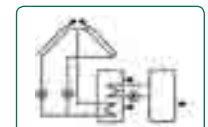
Solar system with storage loading in layers, heating circuit return pre-heating and thermostatic after-heating



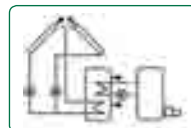
Solar system with 2 storages, valve logic and heat exchange controller



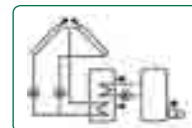
Solar system with 2 storages, pump logic and heat exchange controller



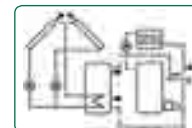
Solar system with east-/west collectors and heat exchange controller



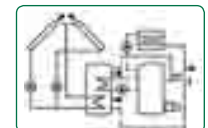
Solar system with east-/west collectors and thermostatic after-heating



Solar system with east-/west collectors and solid fuel boiler



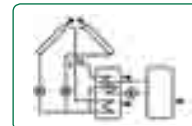
Solar system with east-/west collectors and heating circuit return pre-heating



Solar system with east-/west collectors, heating circuit return pre-heating and thermostatic after-heating



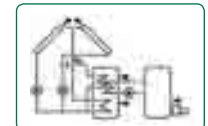
Solar system with east-/west collectors and storage loading in layers



Solar system with east-/west collectors, storage loading in layers and heat exchange controller



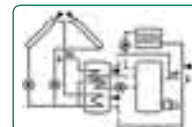
Solar system with east-/west collectors, storage loading in layers and thermostatic after-heating



Solar system with east-/west collectors, storage loading in layers and solid fuel boiler



Solar system with east-/west collectors, storage loading in layers and heating circuit return pre-heating











Solar system with east-/west collectors, storage loading in layers, heating circuit reverse raising and thermostatic after-heating



Solar system with east-/west collectors and 2 storages, valve logic



Solar system with east-/west collectors, 2 storages and heat exchange controller

		Max. number of collectors	Max. number of storages	Display (System-Monitoring illuminated)	Display (4 line text illuminated)	Sensor inputs (temperature)	Total relay outputs	Number of semiconductor relays (pump speed control)	Number of potential-free relays	Input CS10 (irradiation)	Impulse input (V40)	WMZ with flowmeter	WMZ with V40	Weather-compensated heating circuits	VBus®
	DeltaSol® AX	1	1	-	-	2	1	-	-	-	-	-	-	-	-
	DeltaSol® BS	1	1	✓	-	4	1 (BS/1; 2) 2 (BS/3; 4)	1 (BS/2) 1 (BS/4)	-	-	-	✓	-	-	✓
	DeltaSol® BS Plus	2 ¹	2 ¹	✓	-	4	2	2	-	-	-	✓ ¹	-	-	✓
	DeltaSol® C HE*	1	1	-	-	3	1 + 1x PWM	1 ⁹	-	-	-	✓	-	-	✓
	DeltaSol® DB	1	1	✓	-	4	1 (DB/1; 2) 2 (DB/3; 4)	1 (DB/2) 1 (DB/4)	-	-	-	✓	-	-	✓
	DeltaSol® ES	2	2	✓	-	8	7	3	1	✓	1	-	1	-	✓
	DeltaSol® E	2 ¹	4 ¹	-	✓	10	7	3	1	✓	1	1 ⁷	1 ³	4 ^{1.6}	✓
	DeltaSol® M	2 ¹	4 ¹	-	✓	12	9	4	1	✓	2	2 ^{2/7}	2 ^{2/3}	2 ⁶	✓

¹ system-dependent

² 2 calorimeters are possible in total

³ another calorimeter with V40 via module WMZ is possible

⁴ a second heating circuit via module HKM2 is possible

⁵ switchable collector minimum limitation or storage maximum limitation

⁶ possible by module HKM2 (external only)

⁷ internal counter switchable

⁸ measured value only

⁹ speed control by means of PWM-signal

* for high-efficiency pumps

Additional ΔT -regulation (e.g. heat exchange)	Thermostat function	Bypass solar circuit	External heat exchanger	Pump speed control	DVGW-protection against legionella	Frost protection	Heating circuit backup	Collector cooling function	Minimum collector limitation	Collector emergency shutdown	Cooling function	Mixer regulation heating circuit	Tube collector function	Recooling function	Timer / Time	Storage loading in layers	Priority logic/parallel loading/oscillating loading
-	-	-	-	-	✓	-	-	✓ ^s	-	-	-	-	-	-	-	-	-
- (BS/3; 4)	-	- (BS/2; 4)	-	✓	-	✓	✓	✓	-	-	✓	✓	(BS/3; 4)	-	-	-	
✓	✓	-	-	-	✓	-	✓	-	✓	-	-	✓	-	✓	✓	✓	
-	-	-	✓	-	✓	-	✓	✓	✓	-	-	✓	✓	✓	-	-	
- (DB/3; 4)	-	- (DB/2; 4)	-	-	-	-	✓	✓	-	-	-	-	-	-	-	-	
✓	✓	-	✓	-	✓	-	✓	✓	✓	-	-	✓	✓	✓	✓	✓	
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

DeltaSol® A/DeltaSol® AX



rosenthal design 



reddot design award
winner 2005

- Adjustable temperature difference 2 ... 16 K, hysteresis 1,6 K
- Frost protection adjustable by jumper/micro-switch
- Maximum or minimum temperature limitations adjustable by micro-switch (DeltaSol® AX)
- Protection against dripping water
- Outstanding design for robust application

RESOL DeltaSol® A

Differential temperature controller for solar, heating and air conditioning systems

Price bracket A Article-no: 115 211 23

RESOL DeltaSol® A - Full kit

Differential temperature controller for solar, heating and air conditioning systems incl. 2 sensors Pt1000 (1 x FKP6, 1 x FRP6)

Price bracket A Article-no: 115 211 33

As above, but with minimum or maximum temperature limitation

RESOL DeltaSol® AX

Differential temperature controller for solar, heating and air conditioning systems

Price bracket A Article-no: 115 211 73

RESOL DeltaSol® AX - Full kit

Differential temperature controller for solar, heating and air conditioning systems incl. 2 sensors Pt1000 (1 x FKP6, 1 x FRP6)

Price bracket A Article-no: 115 211 83

Universal and robust differential temperature controller for solar, heating and air conditioning systems.

The version DeltaSol® A is equipped with an adjustable temperature difference 2 ... 16 K and a frost protection function which can be activated/deactivated by jumpers.

The version DeltaSol® AX presents an extended version which is additionally equipped with an adjustable target temperature for minimum or maximum temperature limitation (adjustable by micro-switch). The enclosed silicone sealing cord guarantees a protection against dripping water.

The controller can be branded with your own logo. Please contact our sales team.

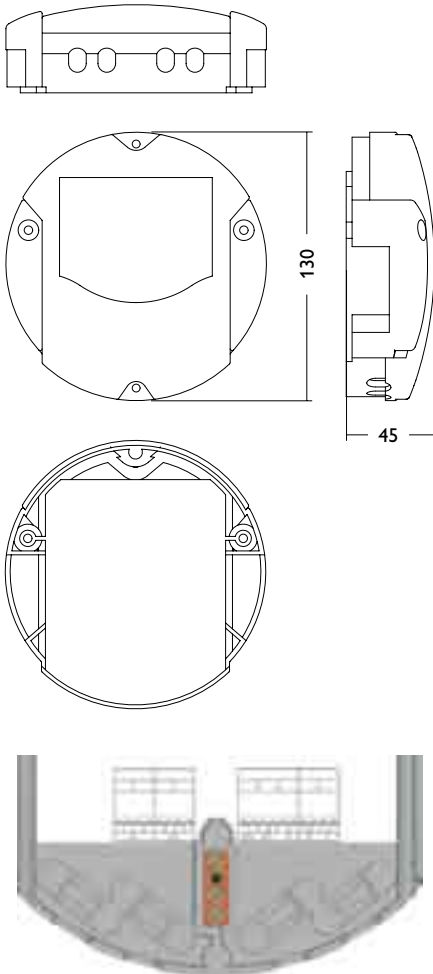


DeltaSol® AX

Max. number of collectors	1
Max. number of storages	1
Display	-
Sensor inputs (temperature)	2
Total relay outputs	1
Number of semiconductor relays (pump speed control)	-
Number of potential-free relays	-
Input CS10 (irradiation)	-
Impulse input (V40)	-
WMZ with flowmeter	-
WMZ with V40	-
Weather-compensated heating circuits	-
Frost protection	✓
Minimum collector limitation	✓ ⁵
VBus®	-

⁵ switchable collector minimum limitation or storage maximum limitation

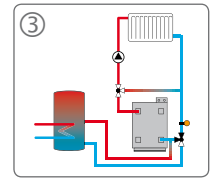
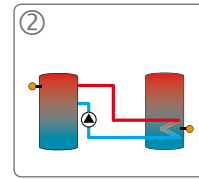
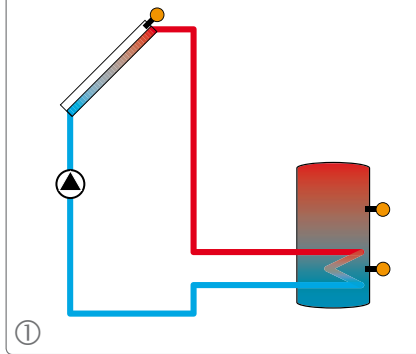
Technical data



Housing: plastic, PC-ABS and PMMA
Protection type: IP 20, with seal IP 22 (DIN 40050)
Ambient temperature: 0 ... 40 °C
Dimensions: Ø 130 mm, depth 45 mm
Mounting: wall mounting
Display: 1 control lamp
Switch-on difference: ΔT 2 ... 16 K adjustable
Hysteresis: 1,6 K below switch-on value
Control range: -20 ... +150 °C
Special functions: frost protection, DeltaSol® AX additionally with maximum or minimum temperature limitation
Inputs: 2 temperature sensors Pt1000
Outputs: 1 standard relay (changeover)
Total switching current: max. 4 A
Power supply: 220 ... 240 V~

OEM versions and versions ready to plug in are available on request

Examples



- ① Solar system with 1 storage
 ② Heat exchange controller
 ③ Heating circuit return preheating



Potentiometer for temperature difference and maximum or minimum temperature limitation.



In water protected housing (dripping water)



Undetachable screw



Strain reliefs for all lines. Simple electrical connection by pluggable terminals.

Accessories

**RESOL HR230**

Auxiliary relay (see page 29)

Price bracket A Article-no: 280 002 60

**RESOL HRG2**

Housing for up to 2 auxiliary relays HR230 (see page 29)

Price bracket A Article-no: 280 003 10

**RESOL SP10**

Sensor-overvoltage protection (see page 68)

Price bracket A Article-no: 180 110 70

DeltaSol® BS



rosenthal design 

- Illuminated system-monitoring-display
- Up to 4 temperature sensors Pt1000
- Optional pump speed control, solar operating hours counter and thermostat function
- 2 basic systems are possible
- Heat quantity measurement, tube collector function
- Function control

Controller	BS/1	BS/2	BS/3	BS/4
Semiconductor relay	-	1	-	1
Standard relay	1	-	2	1
Operating hours counter	✓	✓	✓	✓
Pump speed control	-	✓	-	✓
Thermostat function	-	-	✓	✓
Heat quantity measurement	✓	✓	✓	✓
VBus®	✓	✓	✓	✓
Art.-No.	115 412 13	115 412 33	115 424 93	115 425 13
Full kit				
incl. 3 sensors Pt1000 (1 x FKP6, 2 x FRP6)	BS/1	BS/2	BS/3	BS/4
Art.-No.	115 412 23	115 412 43	115 425 03	115 425 23



Full kit incl. SD3 (see also page 39)
and 3 sensors Pt1000
(1 x FKP6, 2 x FRP6)

	BS/1	BS/2	BS/3	BS/4
Art.-No.	115 412 53	115 412 63	115 425 33	115 425 43

The RESOL controller for standard solar thermal systems. The DeltaSol® BS controller provides a clear operating concept and is equipped with the newly developed illuminated combined display with system-monitoring.

Flashing symbols for sensors, pumps and valves enable an immediate allocation of temperatures, temperature differences and active actuators.

The DeltaSol® BS controller is available in 4 versions, depending on the demands. Details concerning the type and number of the relays as well as additional functions are shown in the table.

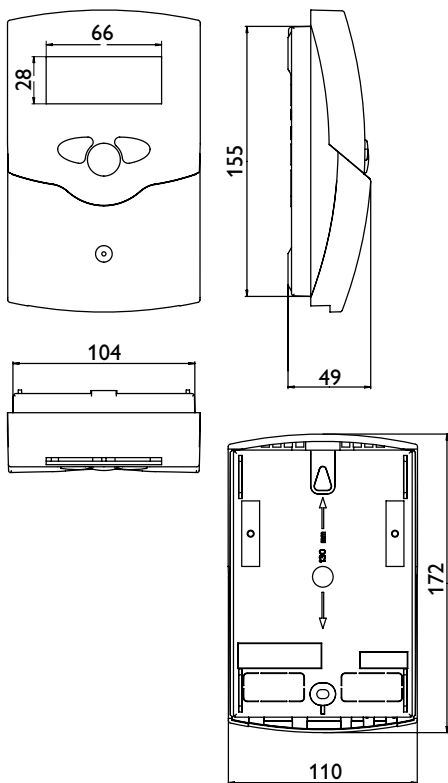
The controller can be branded with your own logo. Please contact our sales team.

DeltaSol® BS

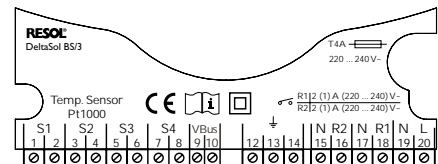
Max. number of collectors	1
Max. number of storages	1
Display	System-Monitoring illuminated
Sensor inputs (temperature)	4
Total relay outputs	1 (BS/1, BS/2) 2 (BS/3, BS/4)
Number of semiconductor relays (pump speed control)	1 (BS/2) 1 (BS/4)
Number of potential-free relays	-
Input CS10 (irradiation)	-
Impulse input (V40)	-
WMZ with flowmeter	✓
WMZ with V40	-
Weather-compensated heating circuits	-
Thermostat function	(BS/3, BS/4)
Pump speed control	(BS/2, BS/4)
Frost protection	✓
Collector cooling function	✓
Minimum collector limitation	✓
Collector emergency shutdown	✓
Tube collector function	✓
Recooling function	✓
VBus®	✓

All prices are subject to price bracket A. BS/1 and BS/3 are also available as 115V ~ versions for the US market

Technical data



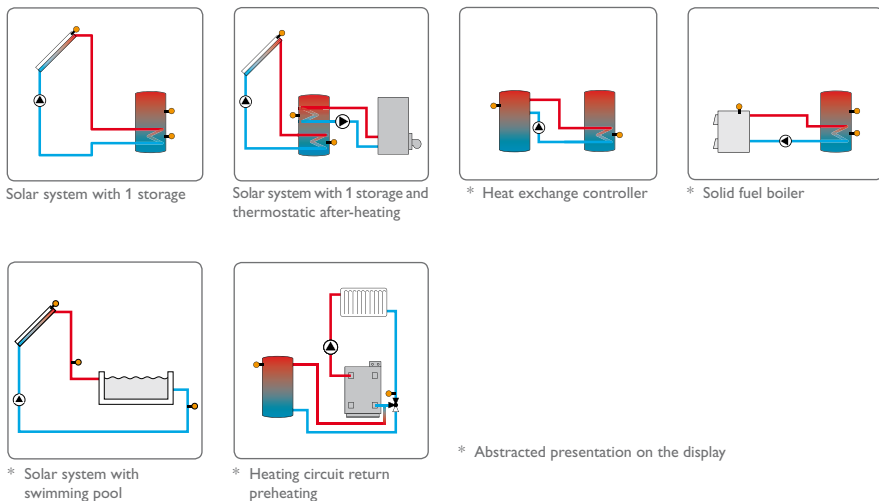
Electrical connection



Housing: plastic, PC-ABS and PMMA
Protection type: IP 20/DIN 40050
Ambient temperature: 0 ... 40 °C
Dimensions: 172 x 110 x 49 mm
Installation: wall mounting, mounting into patch panels is possible
Display: system-monitoring for visualisation of systems, 16-segment- and 7-segment display, 8 symbols for indication of system status and operating control lamp
Operation: 3 pushbuttons at the front
Functions: differential temperature controller with adjustable system functions: function control according to BAVV-directions, solar operating hours counter for solar pump, tube collector function, heat quantity balancing and pump speed control (DeltaSol® BS/2, BS/4)
Inputs: 4 temperature sensors Pt1000
Output: Dependent on the version, see table on page 10
Bus: RESOL VBus®
Power supply: 220 ... 240V~
Power consumption: approx. 2VA
Switching capacities:
 1 (1) A 220 ... 240V~ (semiconductor relay)
 2 (1) A 220 ... 240V~ (standard relay)

OEM versions are available on request

Examples



Illuminated system-monitoring-display



Safe and rapid connection



Uncomplicated adjustment and control



Easy mounting...



...operation...



...and service

Accessories



RESOL HR230
 Auxiliary relay (see page 29)
 Price bracket A Article-no: 280 002 60



RESOL HRG2
 Housing for up to 2 auxiliary relays HR230 (see page 29)
 Price bracket A Article-no: 280 003 10



RESOL SP10
 Sensor-overvoltage protection (see page 68)
 Price bracket A Article-no: 180 110 70

DeltaSol® BS Plus



rosenthal design 

- Illuminated system-monitoring-display
- Up to 4 temperature sensors PT1000
- 2 semiconductor relays for pump speed control
- 9 basic systems are possible
- Heat quantity measurement
- Function control
- Thermostat function (time-controlled)
- RESOLVBus®

System survey:

- System 1 : Standard solar system
- System 2 : Solar system with heat exchange
- System 3 : Solar system with after-heating
- System 4 : Solar system with storage loading in layers
- System 5 : 2-storage solar system with valve logic
- System 6 : 2-storage solar system with pump logic
- System 7 : Solar system with 2 collectors and 1 storage
- System 8 : Solar system with after-heating by solid fuel boiler
- System 9 : Solar system with heating circuit return preheating

RESOL DeltaSol® BS Plus

System controller for simple solar and heating systems

Price bracket A Article-no: 115 422 03

RESOL DeltaSol® BS Plus - Full kit

System controller for simple solar and heating systems incl. 4 sensors Pt1000 (2 x FKP6, 2 x FRP6)

Price bracket A Article-no: 115 422 13



RESOL DeltaSol® BS Plus - Full kit incl. SD3

System controller for simple solar and heating systems incl. SD3 (see also page 39) and 4 sensors Pt1000 (2 x FKP6, 2 x FRP6)

Price bracket A Article-no: 115 425 53

A 115V~ version without speed control is available for the US market

The DeltaSol® BS Plus controller is pre-programmed for different hydraulic basic systems and equipped with pump speed control and heat quantity measurement.

The controller additionally has a time controlled thermostat function and is equipped with the RESOLVBus® for data communication. This VBus® permits two-way communication between modules, PCs or dataloggers. The controller can easily be configured by PC using the RESOL ServiceCenter Software. Temperatures in certain time slots can be adjusted independently using the integrated thermostat function and real time clock.

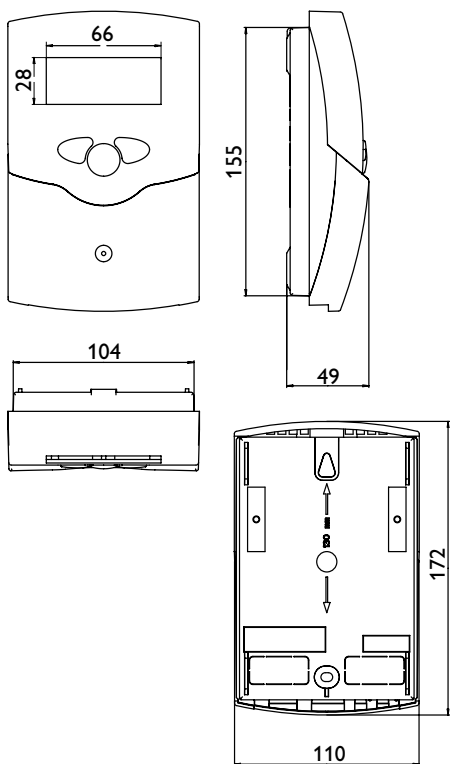
The controller can be branded with your own logo. Please contact our sales team.

DeltaSol® BS Plus

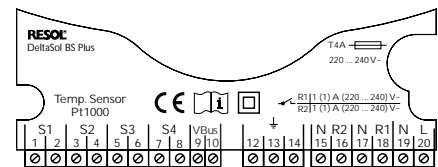
Max. number of collectors	2 ¹
Max. number of storages	2 ¹
Display	System-Monitoring illuminated
Sensor inputs (temperature)	4
Total relay outputs	2
Number of semiconductor relays (pump speed control)	2
Number of potential-free relays	-
Input CS10 (irradiation)	-
Impulse input (V40)	-
WMZ with flowmeter	✓ ¹
WMZ with V40	-
Weather-compensated heating circuits	-
Additional ΔT-regulation (e.g. heat exchange)	✓
Thermostat function	✓
Pump speed control	✓
Frost protection	✓
Collector cooling function	✓
Minimum collector limitation	✓
Collector emergency shutdown	✓
Tube collector function	✓
Recooling function	✓
Storage loading in layers	✓
Priority logic/parallel loading/oscillating loading	✓
VBus®	✓

¹ system-dependent

Technical data

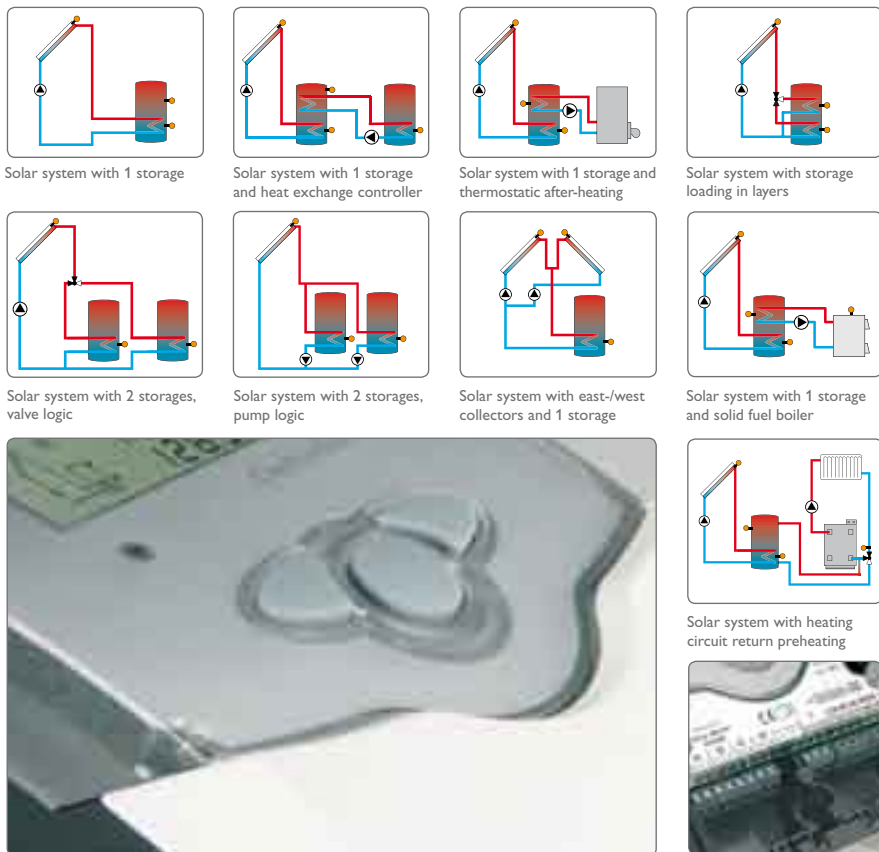


Electrical connection



Housing: plastic, PC-ABS and PMMA
Protection type: IP 20/DIN 40050
Ambient temperature: 0 ... 40 °C
Dimensions: 172 x 110 x 49 mm
Installation: wall mounting, mounting into patch panels is possible
Display: system-monitoring for visualisation of the systems, 16-segment- and 7-segment display, 8 symbols for indication of the system status and operating control lamp
Operation: 3 pushbuttons at the front
Functions: differential temperature controller with adjustable system functions. Function control according to BAW-guidelines, operating hours counter for the solar pump, tube collector function, thermostat function, pump speed control, heat quantity measurement and time-controlled thermostat function
Inputs: 4 temperature sensors Pt1000
Output: 2 semiconductor relays
Bus: RESOL VBus®
Power supply: 220 ... 240V~
Power consumption: approx. 2 VA
Switching capacities:
 1 (1) A 220 ... 240V~ (semiconductor relay)
 1 (1) A 220 ... 240V~ (semiconductor relay)

Examples



Uncomplicated operation and control



Easy mounting...



... adjustment...



... and service



Illuminated system-monitoring display

Safe and rapid connection

Accessories



RESOL HR230
 Auxiliary relay (see page 29)
 Price bracket A Article-no: 280 002 60



RESOL HRG2
 Housing for up to 2 auxiliary relays HR230 (see page 29)
 Price bracket A Article-no: 280 003 10



RESOL SP10
 Sensor-overvoltage protection (see page 68)
 Price bracket A Article-no: 180 110 70

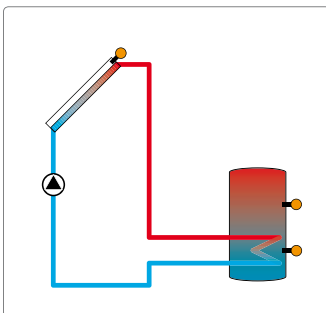
DeltaSol® C HE



rosenthal design 

- Full graphic display with intuitive symbols
- Up to 3 temperature sensors Pt1000
- PWM output for high-efficiency pumps
- Function control
- Graphic balancing functions
- Real time clock

Example



RESOL DeltaSol® C HE - Full kit

System controller for simple solar and heating systems
incl. 2 sensors Pt1000 (1 x FKP6, 1 x FRP6)

Price bracket A Article-no: 115 413 23

The DeltaSol® C HE is designed for the control of a high-efficiency pump in standard solar thermal systems. The control is effected via a PWM-output.

The controller is equipped, amongst other functions, with speed control, heat quantity measurement, tube collector function and a graphical balancing function. For data communication, the DeltaSol® C HE is equipped with the RESOL VBus®.

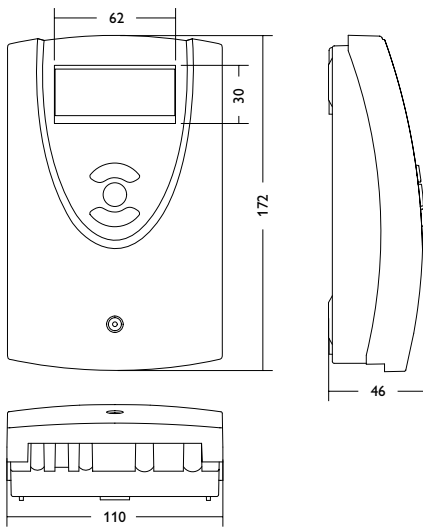
The controller can be branded with your own logo. Please contact our sales team.

DeltaSol® C HE

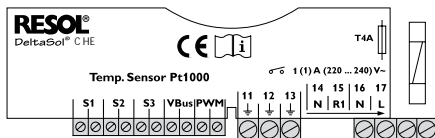
Max. number of collectors	1
Max. number of storages	1
Display	Illuminated full graphic display
Sensor inputs (temperature)	3
Total relay outputs	1
Number of semiconductor relays (pump speed control)	1 ⁹
Number of potential-free relays	-
Input CS10 (irradiation)	-
Impulse input (V40)	-
WMZ with flowmeter	✓
WMZ with V40	-
Weather-compensated heating circuits	-
Additional ΔT-regulation (e.g. heat exchange)	-
Thermostat function	-
Pump speed control	-
Frost protection	✓
Collector cooling function	✓
Minimum collector limitation	✓
Collector emergency shutdown	✓
Tube collector function	✓
Recooling function	✓
Storage loading in layers	-
Priority logic/parallel loading/oscillating loading	-
VBus®	✓

⁹ speed control by means of PWM-signal

Technical data



Electrical connection



Housing: plastic, PC-ABS and PMMA

Protection type: IP 20/DIN 40050

Ambient temperature: 0 ... 40 °C

Dimensions: 172 x 110 x 46 mm

Installation: wall mounting, mounting into patch panels is possible

Display: Full graphic display

Operation: 3 pushbuttons at the front

Functions: differential temperature controller with add-on functions. Function control according to BAW-guidelines, operating hours counter for the solar pump, tube collector function and heat quantity measurement

Inputs: 3 temperature sensors Pt1000

Output: 1 semiconductor-relay, 1 PWM

Bus: RESOL VBus®

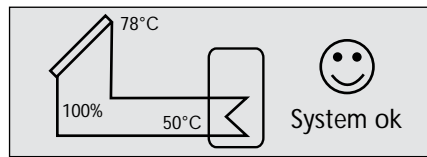
Power supply: 220 ... 240V~

Standby power consumption: 1,94 W

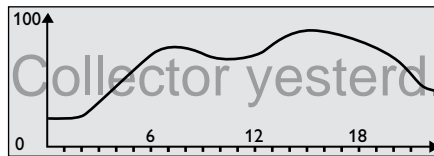
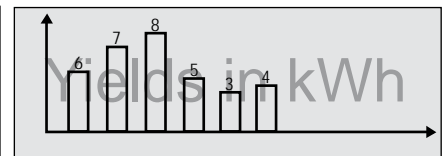
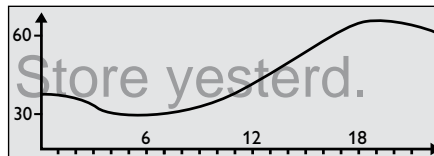
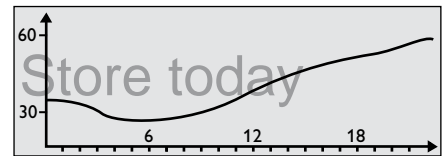
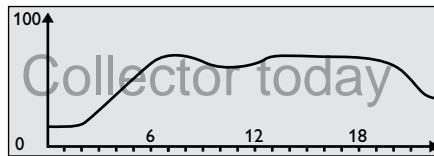
Switching capacities:

1 (1) A 220 ... 240V~ (semiconductor-relay)

Status and measurement values display



Balance values



Accessories



RESOL SP10

Sensor-overvoltage protection (see page 68)

Price bracket A Article-no: 180 110 70

DeltaSol® DB



rosenthal design 

- Illuminated system-monitoring-display
- Up to 4 temperature sensors Pt1000
- Optional pump speed control, solar operating hours counter and thermostat function
- 3 basic systems to choose from
- Heat quantity measurement
- Function control

Controller	DB/1	DB/2	DB/3	DB/4
Semiconductor relay	-	1	-	1
Standard relay	1	-	2	1
Operating hours counter	✓	✓	✓	✓
Pump speed control	-	✓	-	✓
Thermostat/booster function	-	-	✓	✓
Heat quantity measurement	✓	✓	✓	✓
VBus®	✓	✓	✓	✓
Art.-No.	11542563	11542583	11542603	11542623
Full kit				
incl. 3 sensors Pt1000 (1 x FKP6, 2 x FRP6)	DB/1	DB/2	DB/3	DB/4
Art.-No.	115 425 73	115 425 93	115 426 13	115 426 33



Full kit incl. SD3 (see also page 39)
and 3 sensors Pt1000
(1 x FKP6, 2 x FRP6)

	DB/1	DB/2	DB/3	DB/4
Art.-No.	115 427 53	115 427 63	115 427 73	115 427 83

All prices are subject to price bracket A. DB/1 and DB/3 are also available as 115V~ versions for the US market

The DeltaSol® DB is a differential temperature controller for solar drainback systems. Depending on the product version, it provides speed control, heat quantity measurement, etc.

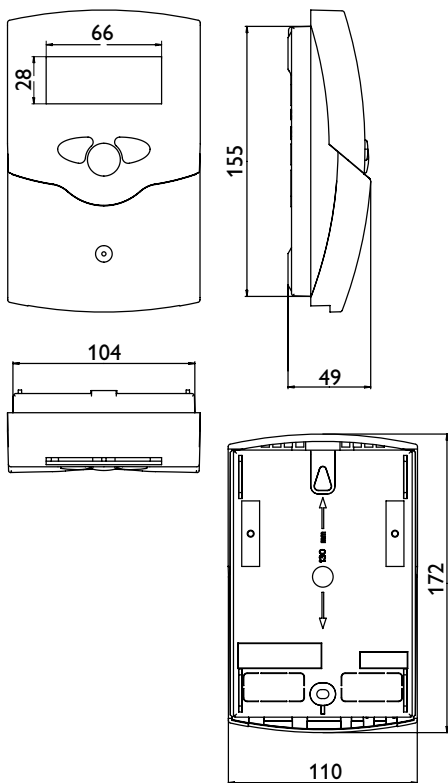
The DeltaSol® DB is available in the versions 1 to 4. The DB/3 and DB/4 controllers are additionally equipped with a booster function for the quick filling of the system using a second pump. For data communication, the DeltaSol® DB is equipped with the RESOLVBus®.

The controller can be branded with your own logo. Please contact our sales team.

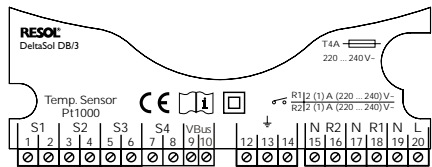
DeltaSol® DB

Max. number of collectors	1
Max. number of storages	1
Display	System-Monitoring illuminated
Sensor inputs (temperature)	4
Total relay outputs	1 (DB/1, DB/2) 2 (DB/3, DB/4)
Number of semiconductor relays (pump speed control)	1 (DB/2) 1 (DB/4)
Number of potential-free relays	-
Input CS10 (irradiation)	-
Impulse input (V40)	-
WMZ with flowmeter	✓
WMZ with V40	-
Weather-compensated heating circuits	-
Thermostat/booster function	(DB/3, DB/4)
Pump speed control	(DB/2, DB/4)
Frost protection	-
Collector cooling function	-
Minimum collector limitation	✓
Collector emergency shutdown	✓
Tube collector function	-
Recooling function	-
VBus®	✓

Technical data



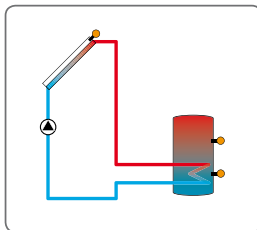
Electrical connection



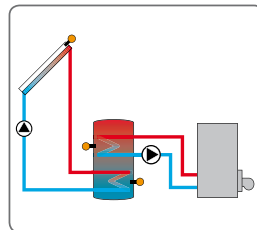
Housing: plastic, PC-ABS and PMMA
Protection type: IP 20/DIN 40050
Ambient temperature: 0 ... 40°C
Dimensions: 172 x 110 x 49 mm
Installation: wall mounting, mounting into patch panels is possible
Display: system-monitoring for visualisation of systems, 16-segment- and 7-segment display, 8 symbols for indication of system status and operating control lamp
Operation: 3 pushbuttons at the front
Funktionen: differential temperature controller with adjustable system functions: function control according to BAW-directions, solar operating hours counter for solar pump, heat quantity measurement and pump speed control (DeltaSol® DB/2, DB/4)
Inputs: 4 temperature sensors Pt1000
Output: dependent on the version, see table on page 16
Bus: RESOL VBus®
Power supply: 220 ... 240V~
Power consumption: approx. 2 VA
Switching capacities:
 1 (1) A 220 ... 240V~ (semiconductor-relay)
 2 (1) A 220 ... 240V~ (standard-relay)

OEM versions on request

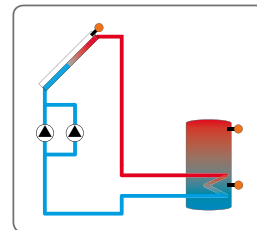
Examples



Solar system with 1 storage



Solar system with 1 storage and thermostatic after-heating



Solar system with booster



Illuminated system-monitoring-display



Safe and rapid connection



Uncomplicated adjustment and control



Easy mounting...



...operation...



...and service

Accessories



RESOL HR230
 Auxiliary relay (see page 29)
 Price bracket A Article-no: 280 002 60



RESOL HRG2
 Housing for up to 2 auxiliary relays HR230 (see page 29)
 Price bracket A Article-no: 280 003 10



RESOL SP10
 Sensor-overvoltage protection (see page 68)
 Price bracket A Article-no: 180 110 70

DeltaSol® ES



rosenthal design 

- Illuminated system-monitoring-display
- 36 basic systems to choose from
- Pump speed control, solar operating hours counter and heat quantity measurement
- 8 sensor inputs
- 7 relay outputs
- Function control
- RESOL VBus®
- User-friendly operation
- Easy-to-mount housing with outstanding design

RESOL DeltaSol® ES

System controller for solar and heating systems

Price bracket A Article-no: 115 660 93

RESOL DeltaSol® ES - Full kit

System controller for solar and heating systems incl. 5 sensors Pt1000 (2 x FKP6, 3 x FRP6)

Price bracket A Article-no: 115 661 03



RESOL DeltaSol® ES - Full kit incl. SD3

System controller for solar and heating systems incl. SD3 (see also page 39) and 5 sensors Pt1000 (2 x FKP6, 3 x FRP6)

Price bracket A Article-no: 115 662 73

The number of sensor inputs and relay outputs (10/6) bridges the gap between the versions DeltaSol® BS and DeltaSol® M. The sophisticated and shapely design as well as the proven user-friendly operation of this product series are continued and also upgraded by further adjustable parameters.

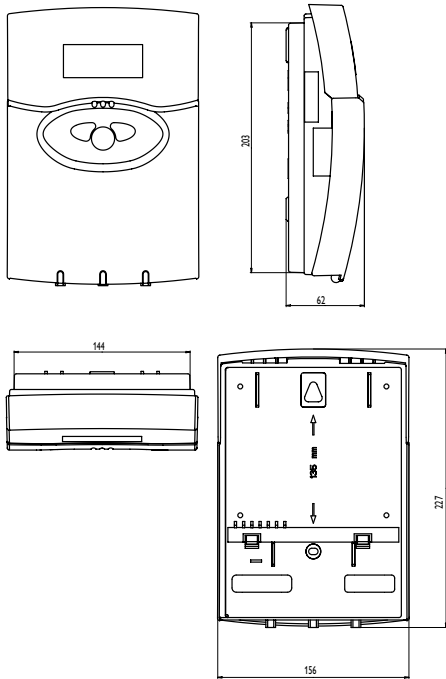
The controller is pre-programmed for 36 solar and heating systems, the individual installation configuration can be selected via the menu and represented graphically via the system-monitoring display. For data communication and remote maintenance, the controller is equipped with the RESOL VBus® which permits two-way communication between modules, PCs or dataloggers.

The controller can be branded with your own logo. Please contact our sales team.

DeltaSol® ES

Max. number of collectors	2
Max. number of storages	2
Display	System-Monitoring illuminated
Sensor inputs (temperature)	8
Total relay outputs	7
Number of semiconductor relays (pump speed control)	3
Number of potential-free relays	1
Input CS10 (irradiation)	1
Impulse input (V40)	1
WMZ with flowmeter	-
WMZ with V40	1
Weather-compensated heating circuits	-
Additional ΔT -regulation (e.g. heat exchange)	✓
Thermostat function	✓
Pump speed control	✓
Frost protection	✓
Collector cooling function	✓
Minimum collector limitation	✓
Collector emergency shutdown	✓
Tube collector function	✓
Recooling function	✓
Timer / Time	✓
Storage loading in layers	✓
Priority logic/parallel loading/oscillating loading	✓
VBus®	✓

Technical data



- Housing:** Plastic, PC-ABS and PMMA
- Protection type:** IP 20/DIN 40050
- Ambient temperature:** 0 ... 40 °C
- Abmessung:** 227 x 156 x 62 mm
- Dimensions:** 227 x 156 x 62 mm
- Installation:** wall mounting, mounting into patch panels is possible
- Display:** system-monitoring for visualisation of systems, 16-segment- and 7-segment display, 8 symbols for indication of system status and operating control lamp
- Operation:** 3 pushbuttons at the front
- Functions:** solar and heating controller with 36 preprogrammed solar and heating systems such as: 2-storage systems, east-/west collectors, heating circuit backup, heat exchange regulation, thermostatic after-heating, solid fuel boilers, adjustable functions and options as heat quantity measurement, collector cooling function, tube collector function, frost protection, minimum temperature limitation, pump speed control, balance and diagnostics functions, function control according to BAW-guidelines.
- Inputs:** 8 sensor inputs for Pt1000, CS10, V40
- Output:** 7 relay outputs, 3 of them for pump speed control and 1 potential-free relay
- Bus:** RESOL VBus®
- Power supply:** 220 ... 240V~
- Power consumption:** approx. 4 VA
- Total switching capacity:** 4 (2) A 220 ... 240V~

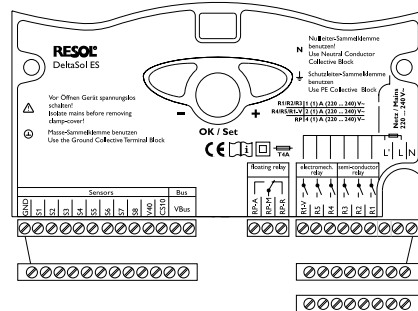


Rapid maintenance



Uncomplicated operation and control

Electrical connection



Simple connection...



...and adjustment

Accessories



RESOL HR230
Auxiliary relay (see page 29)
Price bracket A Article-no: 280 002 60

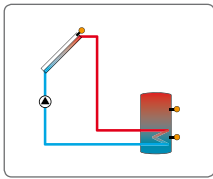


RESOL HRG2
Housing for up to 2 auxiliary relays HR230 (see page 29)
Price bracket A Article-no: 280 003 10

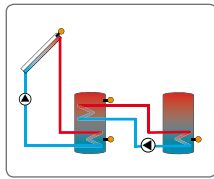


RESOL SP10
Sensor-overvoltage protection (see page 68)
Price bracket A Article-no: 180 110 70

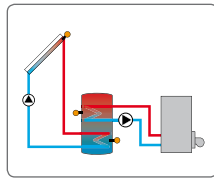
Examples DeltaSol® ES



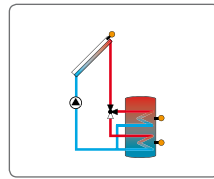
Solar system with 1 storage



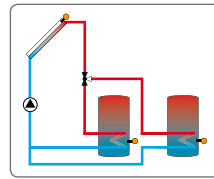
Solar system with 1 storage and heat exchange controller



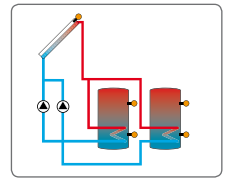
Solar system with 1 storage and thermostatic after-heating



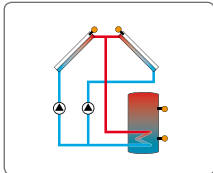
Solar system with storage loading in layers



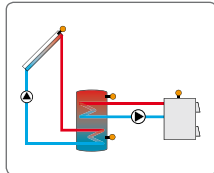
Solar system with 2 storages, valve logic



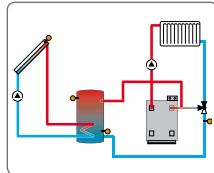
Solar system with 2 storages, pump logic



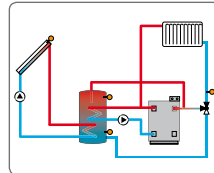
Solar system with east-west collectors and 1 storage



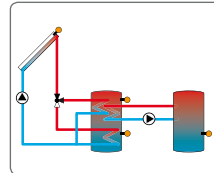
Solar system with 1 storage and solid fuel boiler



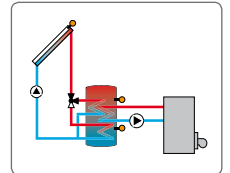
Solar system with 1 storage and heating circuit return pre-heating



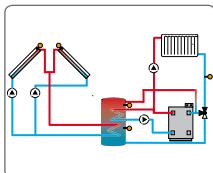
Solar system with 1 storage, heating circuit return pre-heating and thermostatic after-heating



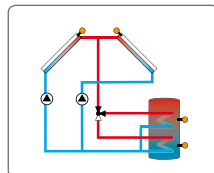
Solar system with storage loading in layers and heat exchange controller



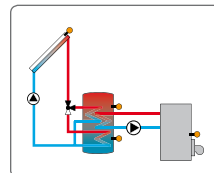
Solar system with storage loading in layers and thermostatic after-heating



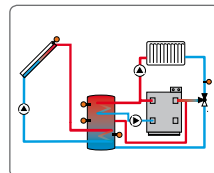
Solar system with east-west collectors, heating circuit return pre-heating and thermostatic after-heating



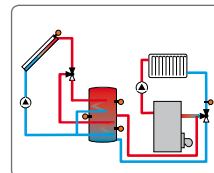
Solar system with east-west collectors and storage loading in layers



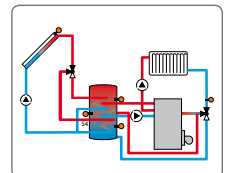
Solar system with storage loading in layers and solid fuel boiler



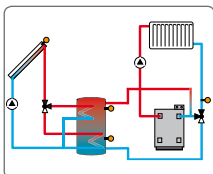
Solar system with 1 storage, heating circuit return pre-heating and thermostatic after-heating



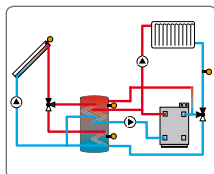
Solar system with multi-layer storage and heating circuit return pre-heating



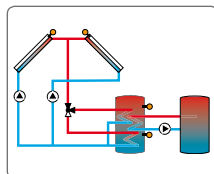
Solar system with multi-layer storage and heating circuit return pre-heating and thermostatic after-heating



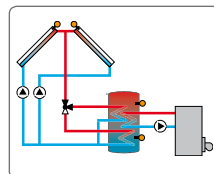
Solar system with storage loading in layers and heating circuit return pre-heating



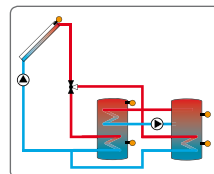
Solar system with storage loading in layers, heating circuit reverse raising and thermostatic after-heating



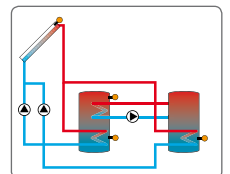
Solar system with east-west collectors, storage loading in layers and heat exchange controller



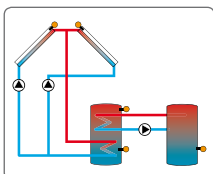
Solar system with east-west collectors, storage loading controller and thermostatic after-heating



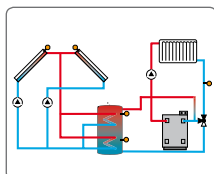
Solar system with 2 storages, valve logic and heat exchange controller



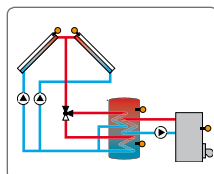
Solar system with 2 storages, pump logic and heat exchange controller



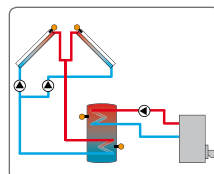
Solar system with east-west collectors and heat exchange controller



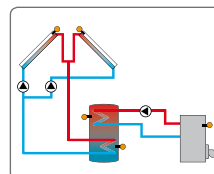
Solar system with east-west collectors, storage loading in layers and heating circuit return pre-heating



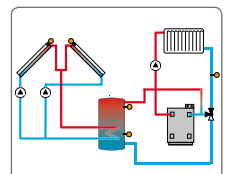
Solar system with east-west collectors, storage loading in layers and solid fuel boiler



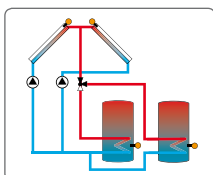
Solar system with east-west collectors and thermostatic after-heating



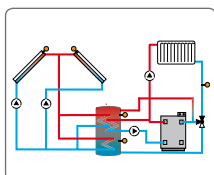
Solar system with east-west collectors and solid fuel boiler



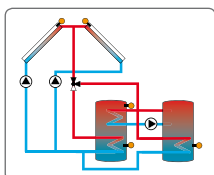
Solar system with east-west collectors and heating circuit return pre-heating



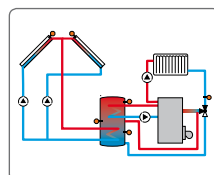
Solar system with east-west collectors and 2 storages



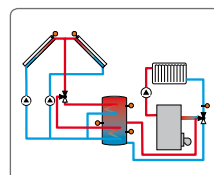
Solar system with east-west collectors, storage loading in layers, heating circuit return pre-heating and thermostatic after-heating



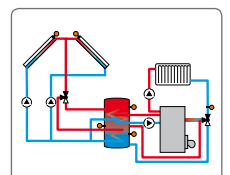
Solar system with east-west collectors, 2 storages and heat exchange controller



Solar system with east-west collectors, heating circuit return pre-heating and thermostatic after-heating



Solar system with east-west collectors, multi-layer storage, heating circuit return pre-heating and thermostatic after-heating



Solar system with east-west collectors, multi-layer storage, heating circuit return pre-heating and thermostatic after-heating

Accessories for the controller DeltaSol® ES



... additional plausibility control

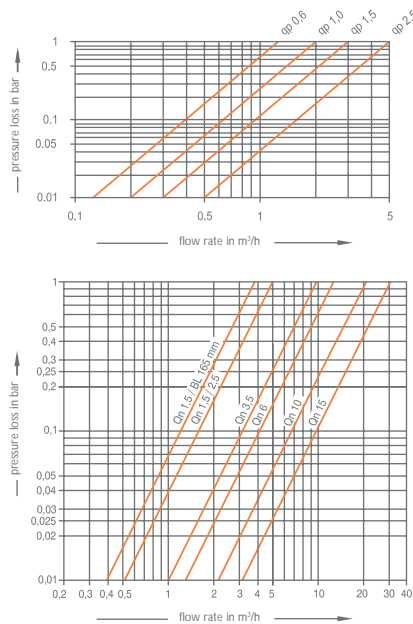
The solar cell CS10 is used for measurement of the current solar irradiation intensity and enables an additional plausibility control for the system status. The connection cable can be extended to up to 100 m. Please see page 69 for further information.



... with heat quantity measurement

The RESOL V40 (see page 59) is a measuring instrument with a contactor for measuring the flow of water or water-

glycol-mixtures and can be connected directly to the controller for heat quantity measurement. After a specific volume has passed, the V40 reed switch sends an impulse to the controller. The heat quantity used is calculated from these impulses and the temperature difference measured between flow and return using pre-defined parameters (glycol type, concentration, heat capacity etc.). The temperature sensors are delivered with immersion sleeves and can be easily installed (also subsequently) into flow and return using a T-piece (see page 68).



WMZ-kit 1

Flowmeter V40-06 incl. 2 sensors Pt1000 (2 x FRP30)

Price bracket A Article-no: 290 006 10

WMZ-kit 2

as above, but with flowmeter V40-15

Price bracket A Article-no: 290 006 20

WMZ-kit 3

as above, but with flowmeter V40-25

Price bracket A Article-no: 290 006 30

WMZ-kit 4

as above, but with flowmeter V40-35

Price bracket A Article-no: 290 013 60

WMZ-kit 5

as above, but with flowmeter V40-60

Price bracket A Article-no: 290 013 70

WMZ-kit 6

as above, but with flowmeter V40-100

Price bracket A Article-no: 290 013 80

WMZ-kit 7

as above, but with flowmeter V40-150

Price bracket A Article-no: 290 013 90

... and GA3/SD3

The large display GA3 and the Smart Display SD3 are completely mounted display modules used for visualising the collector temperature, storage temperature and the energy yield of a solar thermal system via one 6-digit and two 4-digit 7-segment displays. Designed for simple connection to all controllers with RESOL VBus®. For further information see pages 38 and 39.

DeltaSol® E



rosenthal design 

- 7 basic systems to choose from
- Pump speed control, solar operating hours counter and heat quantity measurement
- Internal calorimeter
- 4 heating circuits can be activated
- 10 sensor inputs
- 7 relay outputs
- Function control
- RESOLVBus®
- User-friendly operation

Seven basic systems are preprogrammed for the controller:

- | | |
|--|--|
| 1: Solar system with 1 storage | 5: Solar system with 3 storages |
| 2: East-/west collectors/1 storage | 6: East-/west collectors/3 storages |
| 3: Solar system with 2 storages | 7: Solar system with 4 storages |
| 4: East-/west collectors/2 storages | |

RESOL DeltaSol® E

System controller for solar and heating systems

Price bracket A Article-no: 115 661 23

RESOL DeltaSol® E - Full kit

System controller for solar and heating systems incl. 6 sensors Pt1000 (2 x FKP6, 4 x FRP6)

Price bracket A Article-no: 115 661 33



RESOL DeltaSol® E - Full kit incl. SD3

System controller for solar and heating systems incl. SD3 (see also page 39) and 6 sensors Pt1000 (2 x FKP6, 4 x FRP6)

Price bracket A Article-no: 115 662 83

A multitude of adjustable functions and options are possible using 7 relay outputs and 10 sensor inputs for Pt1000, CS10 and V40. Due to its intelligent and easy-to-understand system configuration and its integrated calorimeter, the controller also offers the control of complex systems with up to 4 weather-compensated heating circuits. For data communication and remote maintenance, the controller is equipped with the RESOLVBus®, which permits two-way communication between modules, PCs or dataloggers.

The controller can be branded with your own logo. Please contact our sales team.

DeltaSol® E

Max. number of collectors	2 ¹
Max. number of storages	4 ¹
Display	4 line text, illuminated
Sensor inputs (temperature)	10
Total relay outputs	7
Number of semiconductor relays (pump speed control)	3
Number of potential-free relays	1
Input CS10 (irradiation)	✓
Impulse input (V40)	1
WMZ with flowmeter	1 ⁷
WMZ with V40	1 ³
Weather-compensated heating circuits	4 ^{1,6}
Additional ΔT-regulation (e.g. heat exchange)	✓
Thermostat function	✓
Bypass solar circuit	✓
External heat exchanger	✓
Pump speed control	✓
DVGW-protection against legionella	✓
Frost protection	✓
Heating circuit backup	✓
Collector cooling function	✓
Minimum collector limitation	✓
Collector emergency shutdown	✓
Cooling function	✓
Mixer regulation heating circuit	✓
Tube collector function	✓
Recooling function	✓
Timer / Time	✓
Storage loading in layers	✓
Priority logic/parallel loading/oscillating loading	✓
VBus®	✓

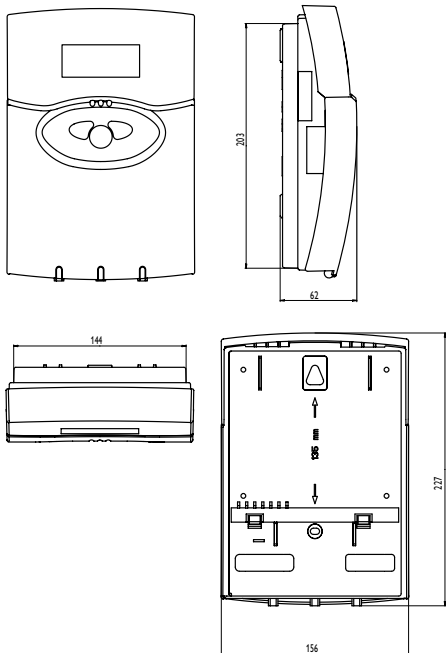
¹ system-dependent

³ another calorimeter with V40 via module WMZ is possible

⁶ possible by module HKM2 (external only)

⁷ internal counter switchable

Technical data



Housing: plastic, PC-ABS and PMMA
Protection type: IP 20/DIN 40050
Ambient temperature: 0 ... 40 °C
Dimensions: 227 x 156 x 62 mm
Installation: wall mounting, mounting into patch panels is possible
Display: 4-line LC-text display, illuminated, menu-driven (multilingual)
Operation: 3 pushbuttons at the front
Functions: Solar system controller for use in solar and heating systems. 7 preprogrammed solar and heating systems, internal calorimeter and control of 3 weather-compensated heating circuits by modules. Adjustable system parameters and options (menu-driven), balance and diagnostics functions, function control according to BAWguidelines.
Inputs: 10 sensor inputs for Pt1000, CS10, V40
Outputs: 7 relay outputs, 3 of them semiconductor relays for pump speed control, 3 standard relays and 1 potential-free relay
Bus: RESOL VBus®
Power supply: 220 ... 240 V~
Power consumption: approx. 4 VA
Total switching capacity: 4 (2) A 220 ... 240 V~

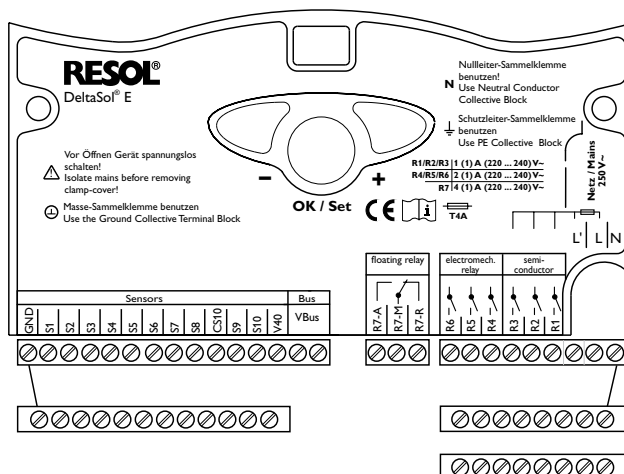


Rapid maintenance



Uncomplicated operation and control

Electrical connection



Simple connection

Accessories



RESOL HR230
 Auxiliary relay (see page 29)
 Price bracket A Article-no: 280 002 60



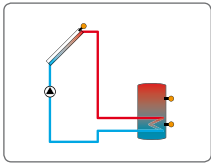
RESOL HRG2
 Housing for up to 2 auxiliary relays HR230 (see page 29)
 Price bracket A Article-no: 280 003 10



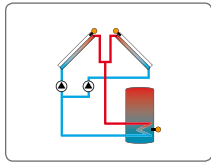
RESOL SP10
 Sensor-overvoltage protection (see page 68)
 Price bracket A Article-no: 180 110 70

Basic systems DeltaSol® E

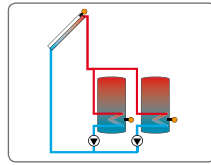
The controller is preprogrammed for 7 basic systems. A multitude of versions is possible by add-on functions and options.



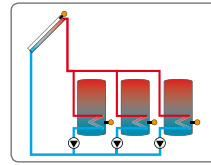
Solar system with 1 storage



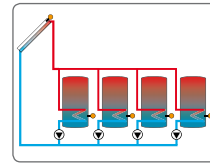
Solar system with east-/west collectors and 1 storage, pump control



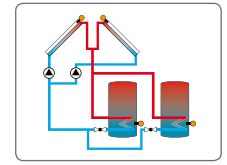
Solar system with 2 storages, pump control



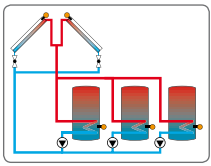
Solar system with 3 storages, pump control



Solar system with 4 storages, pump control

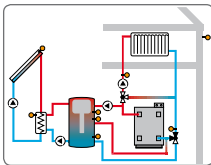


Solar system with east-/west collectors and 2 storages, pump-/valve control

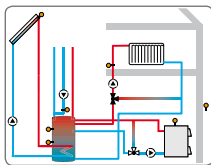


Solar system with east-/west collectors and 3 storages, valve-/pump control

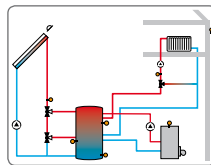
Examples



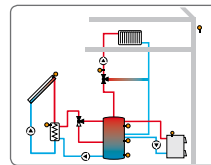
Solar system with combined storage, external heat exchanger, weather-compensated heating circuit, return preheating and afterheating



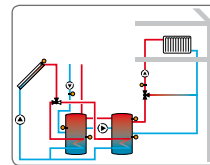
Solar system with weather-compensated heating circuit, solid fuel boiler and circulation pump control



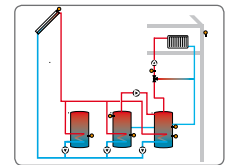
Solar system with storage loading in layers, after-heating and weather-compensated heating circuit



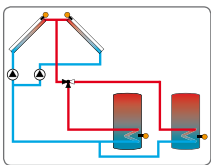
Solar system with external heat exchanger and after-heating by solid fuel boiler



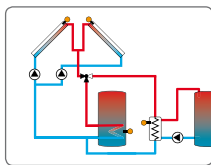
Solar system with 2 storages, circulation pump control, heat exchange control and weather-compensated heating circuit



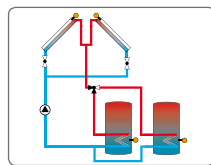
Solar system with 3 storages pump control, heat exchange controller and weather-compensated heating circuit



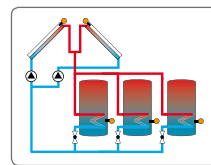
Solar system with east-/west collectors and 2 storages, pump-/3-way-valve control



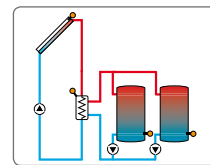
Solar system with east-/west collectors, 2 storages and external heat exchanger, 3-way valve control



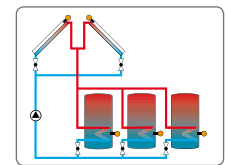
Solar system with east-/west collectors and 2 storages 3-way-valve control



Solar system with east-/west collectors and 3 storages, pump-/valve control



Solar system with 2 storages and external heat exchanger, pump control



Solar system with east-/west collectors and 3 storages, valve control

More examples can be found at www.resol.com

Accessories for DeltaSol® E controller



... with heat quantity measurement

The RESOLV40 is a measuring instrument with a contactor for measuring the flow of water or water-glycol-mixtures and can be connected directly to the controller for heat quantity balancing. After a specific volume has passed, the V40 reed switch sends an impulse to the controller. The heat quantity used is calculated from these impulses and the temperature difference measured between flow and return using pre-defined parameters (glycol type, concentration, heat capacity etc.). The temperature sensors are delivered with immersion sleeves and can be easily installed (also subsequently) into flow and return by means of a T-piece (see pages 66 and 68).



... with additional heating circuit module

The heating circuit module HKM2 (see also page 29) as an accessory for the system controller DeltaSol® E makes it possible to control three additional heating circuits. One HKM2 is required for each heating circuit. The controller can be extended to a coupled heating/solar controller unit by a simple connection via the VBus®.



... and remote control

The remote control RTA11-M (see also page 29) is designed for connection to the HKM2 and the controller and allows a comfortable adjustment of the controller's heating curve. Increasing the setting causes an increase in flow temperature, a fall causes a decrease. The remote control additionally allows the functions "heating circuit off" and "rapid warm-up".



... and additional plausibility control

The solar cell (see also page 69) is used for measuring the momentary irradiation intensity and allows additional plausibility control for the system status. The connection cable can be extended to up to 100 m.



... and GA3/SD3

The large display GA3 and the Smart Display SD3 are completely mounted display modules used for visualising the collector temperature, storage temperature and the energy yield of a solar thermal system via one 6-digit and two 4-digit 7-segment displays. Designed for simple connection to all controllers with RESOLVBus®. For further information see pages 38 and 39.

DeltaSol® M



rosenthal design 

- Illuminated text display with menu navigation
- 12 sensor inputs
- 9 relay outputs
- 7 variable basic solar systems
- Add-on options and functions
- Free allocation for temperature difference and thermostat functions
- RESOL VBus® and RS232-interface
- User-friendly operation

7 basic systems are preprogrammed for the controller:

- | | |
|--|--|
| 1: Solar system with 1 storage | 5: Solar system with 3 storages |
| 2: East-/west collectors/1 storage | 6: East-/west collectors/3 storages |
| 3: Solar system with 2 storages | 7: Solar system with 4 storages |
| 4: East-/west collectors/2 storages | |

RESOL DeltaSol® M

System controller for solar and heating systems

Price bracket A Article-no: 115 990 13

RESOL DeltaSol® M - Full kit

System controller for solar and heating systems incl. 6 sensors Pt1000 (2 x FKP6, 4 x FRP6)

Price bracket A Article-no: 115 990 23



RESOL DeltaSol® M - Full kit incl. SD3

System controller for solar and heating systems incl. SD3 (see also page 39) and 6 sensors Pt1000 (2 x FKP6, 4 x FRP6)

Price bracket A Article-no: 115 990 73

The DeltaSol® M is equipped with a multilingual menu, 9 relay outputs and 12 sensor inputs as well as a multitude of add-on functions and options, which enable the adaptation of the controller to individual solar and heating systems.

The controller is equipped with an interface for communication with the RESOL ServiceCenter Software (see page 36).

The controller can be branded with your own logo. Please contact our sales team.

DeltaSol® M

Max. number of collectors	2 ¹
Max. number of storages	4 ¹
Display	4 line text, illuminated
Sensor inputs (temperature)	12
Total relay outputs	9
Number of semiconductor relays (pump speed control)	4
Number of potential-free relays	1
Input CS10 (irradiation)	✓
Impulse input (V40)	2
WMZ with flowmeter	2 ^{2/7}
WMZ with V40	2 ^{2/3}
Weather-compensated heating circuits	2 ⁶
Additional ΔT-regulation (e.g. heat exchange)	✓
Thermostat function	✓
Bypass solar circuit	✓
External heat exchanger	✓
Pump speed control	✓
DVGW-protection against legionella	✓
Frost protection	✓
Heating circuit backup	✓
Collector cooling function	✓
Minimum collector limitation	✓
Collector emergency shutdown	✓
Cooling function	✓
Mixer regulation heating circuit	✓
Tube collector function	✓
Recooling function	✓
Timer/Time	✓
Storage loading in layers	✓
Priority logic/parallel loading/oscillating loading	✓
VBus®	✓
RS232	✓

¹ system-dependent

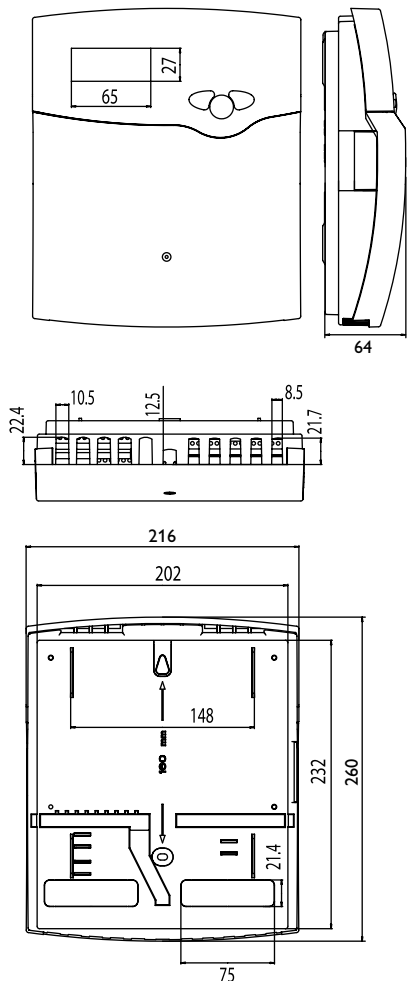
² another calorimeter with V40 via module WMZ is possible

³ another calorimeter with V40 via module WMZ is possible

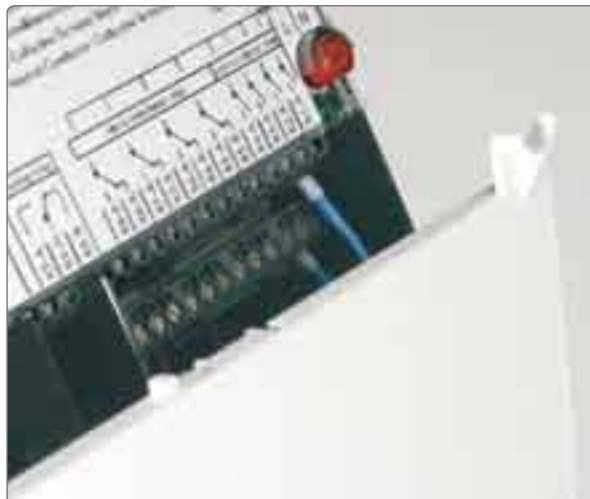
⁶ possible by module HKM2 (external only)

⁷ internal counter switchable

Technical data

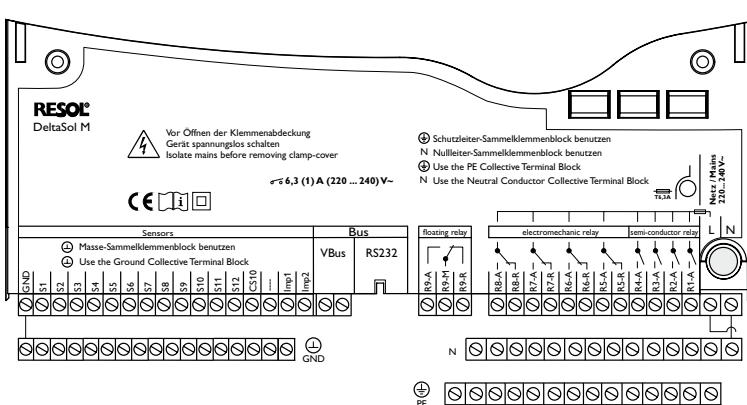


Housing: plastic, PC-ABS and PMMA
Protection type: IP 20 / DIN 40050
Ambient temperature: 0 ... 40 °C
Dimensions: 260 x 216 x 64 mm
Installation: wall mounting, also suitable for mounting into patch panels
Display: 4-line LC-text display, illuminated, menu-driven (multilingual), 2-coloured LED
Operation:
 3 pushbuttons at the front of the housing
Functions: Solar system controller for use in solar and heating systems. Two integrated calorimeters and control of a weather-compensated heating circuit. Adjustable system parameters and add-on options (menu-driven), balance and diagnostics functions, function control according to BAW-guidelines
Sensor inputs: 12 temperature sensors Pt1000 or 11 sensors PT1000 and 1 remote control RTA11-M, 2 flowmeters RESOLV40 and 1 solar cell CS10
Relay outputs: 9 relay outputs, 4 of them are standard relays, 4 semiconductor relays and 1 potential-free relay
Bus: RESOL VBus®, RS232
Power supply: 220 ... 240V~



Uncomplicated operation, control, adjustment and service

Electrical connection



Accessories



RESOL HR230
 Auxiliary relay (see page 29)
 Price bracket A Article-no: 280 002 60



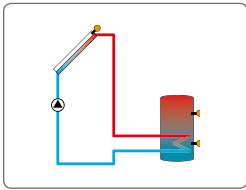
RESOL HRG2
 Housing for up to 2 auxiliary relays HR230 (see page 29)
 Price bracket A Article-no: 280 003 10



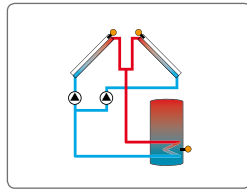
RESOL SP10
 Sensor-overvoltage protection (see page 68)
 Price bracket A Article-no: 180 110 70

Basic systems DeltaSol® M

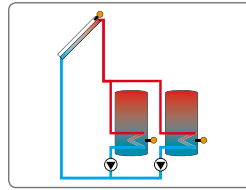
The controller is preprogrammed for 7 basic systems. A multitude of versions is possible by add-on functions and options.



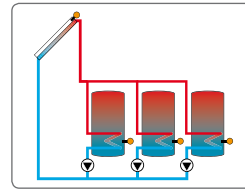
Solar system with 1 storage



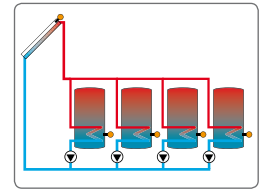
Solar system with east-/west collectors and 1 storage, pump control



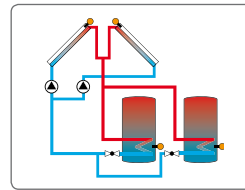
Solar system with 2 storages, pump control



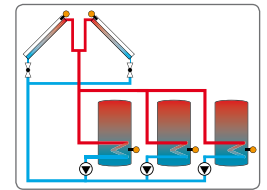
Solar system with 3 storages, pump control



Solar system with 4 storages, pump control

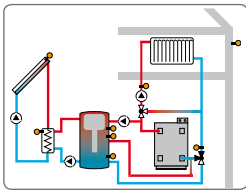


Solar system with east-/west collectors and 2 storages, pump-/valve control

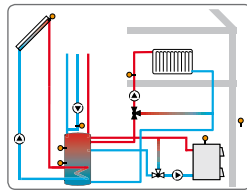


Solar system with east-/west collectors and 3 storages, valve-/pump control

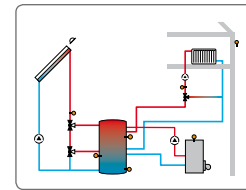
Examples



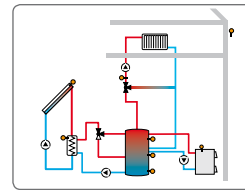
Solar system with combined storage, external heat exchanger, weather-compensated heating circuit, return preheating and after-heating



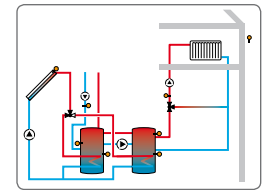
Solar system with weather-compensated heating circuit, solid fuel boiler and circulation pump control



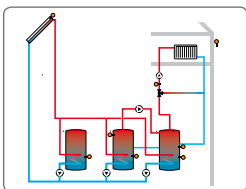
Solar system with storage loading in layers, after-heating and weather-compensated heating circuit



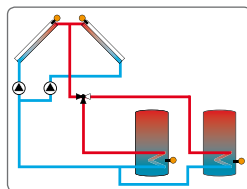
Solar system with external heat exchanger and after-heating by solid fuel boiler



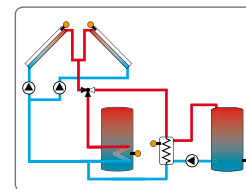
Solar system with 2 storages, circulation pump control, heat exchange control and weather-compensated heating circuit



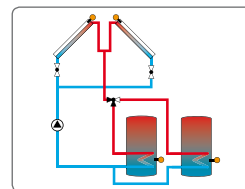
Solar system with 3 storages pump control, heat exchange controller and weather-compensated heating circuit



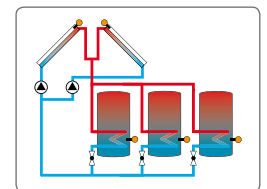
Solar system with east-/west collectors and 2 storages, pump-/3-way-valve control



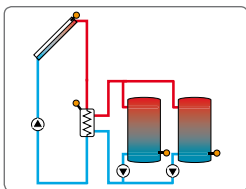
Solar system with east-/west collectors, 2 storages and external heat exchanger 3-way-valve control



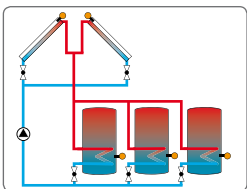
Solar system with east-/west collectors and 2 storages valve-/3-way-valve control



Solar system with east-/west collectors and 3 storages, pump-/valve control



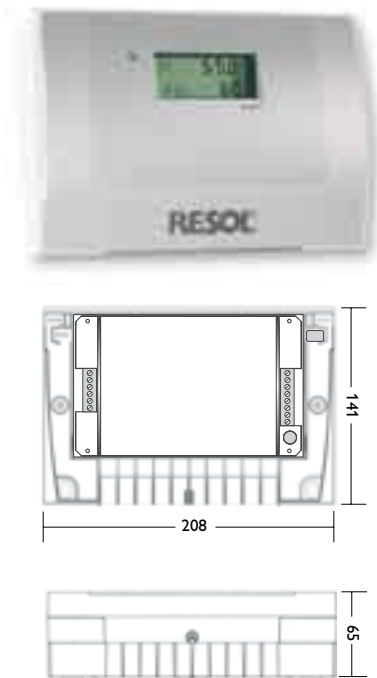
Solar system with 2 storages and external heat exchanger, pump control



Solar system with east-/west collectors and 3 storages, valve-control

More examples can be found at www.resol.com

Accessories for DeltaSol® M controller



RESOL HKM2

Heating circuit module
for a weather-compensated heating circuit

Article-no: 145 440 33

RESOL HKM2 - Full kit

Heating circuit module incl. 2 sensors
(1 x FAP12, 1 x FRP21)

Article-no: 145 440 43

All prices are subject to price bracket A

... GA3/SD3

(see pages 38 and 39)



... with additional heating circuit module

The heating circuit module HKM2 as an accessory for the system controller DeltaSol® M makes it possible to control an additional heating circuit. The controller can be extended to a coupled heating/solar controller unit by a simple connection via VBus®.

Technical data

Housing: plug-in plastic

Operation: by pushbuttons

Dimensions: 208 x 141 x 65 mm

Protection type: IP21 / DIN 40050

Ambient temperature: 0 ... 40 °C

Inputs: 5 sensor inputs Pt1000,
1 RTA11 (-M)

Outputs: 3 standard relays, one of them
potential-free

Total switching current: max. 4 A

Options (possible): heating circuit, timer, remote control, switch-off of heating circuit, rapid warm-up of the heating circuit, mixer regulation, priority of domestic water, heating circuit pumps, blocking protection, frost protection, storage after-heating

Power supply: 220 ... 240V~

Power consumption: approx. 2 VA

... with solar irradiation measurement



RESOL CS10 (see page 69)

Solar cell

Price bracket A Article-no: 151 003 20

... remote control

The remote control RTA11-M is designed for connection to the HKM2 and DeltaSol® M and allows a comfortable adjustment of the controllers heating curve. Increasing the setting causes an increase in flow temperature, a fall causes a decrease. The remote control additionally allows the functions „heating circuit off” and „maximise flow temperature“.



RESOL RTA11-M

Remote control for connection to the HKM2 and the controller DeltaSol® M/E

Price bracket A Article-no: 136 000 20

... and HR230 and HRG2

Auxiliary relay for separation of different electric circuits. Switching capacity 16 A, 240V~, potential-free switch-on and switch-off contacts. The auxiliary relays can only be used for mounting into patch panels. In the case of wall mounting, please use the housing HRG2, appropriate for up to two auxiliary relays.



RESOL HR230

Auxiliary relay

Price bracket A Article-no: 280 002 60

RESOL HRG2

Housing for up to 2 auxiliary relays HR230

Price bracket A Article-no: 280 003 10

DeltaSol® Minipool



rosenthal design 

30

- Controller for heating a swimming pool by means of solar collectors and optimised operation of the filter system
- 4 sensor inputs
- 2 relay outputs
- Function control
- RESOL VBus®
- Filter runtime monitoring
- Maximum flow temperature limitation
- Cooling function
- Collector emergency shutdown
- Operating hours counter

RESOL DeltaSol® Minipool

Heating and swimming pool controller for swimming pool heating

Price bracket A Article-no: 115 662 93

RESOL DeltaSol® Minipool - Full kit

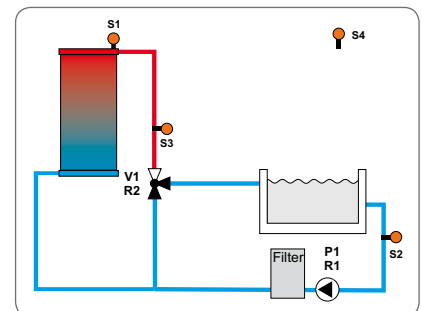
Heating and swimming pool controller for swimming pool heating incl. 3 Pt1000 sensors (1 x FKP6, 2 x FRP6)

Price bracket A Article-no: 115 663 03

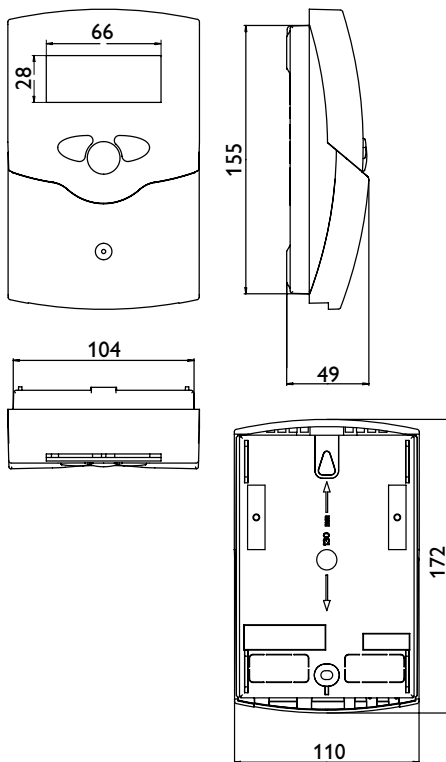
The RESOL DeltaSol® Minipool is a controller for heating a swimming pool by means of solar collectors and optimised operation of the filter system. The controller is equipped with a function control which shows whether the system runs faultlessly or if there is an error.

Furthermore, the controller has many additional pool functions such as: maximum limitation of flow temperature, pool cooling function and a flushing function. The DeltaSol® Minipool can easily be connected to other modules via the VBus®.

The controller can be branded with your own logo. Please contact our sales team.



Technical data



Uncomplicated operation and control



Easy mounting...

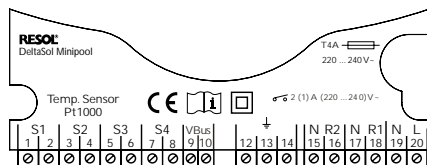


...adjustment...



...and service

Electrical connection



Housing: plastic, PC-ABS and PMMA

Protection type: IP 20/DIN 40050

Ambient temperature: 0 ... 40 °C

Dimensions: 172 x 110 x 49 mm

Installation: wall mounting, mounting into patch panels is possible

Display: graphic display, 160x64 pixels

Operation: 3 pushbuttons at the front

Functions: controller for heating a swimming pool by means of solar collectors and optimised operation of the filter system.

Inputs: 4 temperature sensors Pt1000

Output: 2 standard relays

Bus: RESOL VBus®

Power supply: 220 ... 240 V~

Power consumption: approx. 2 VA

Switching capacities:

2 (1) A 220 ... 240 V~ (standard relay)

Accessories

**RESOL HR230**

Auxiliary relay (see page 29)

Price bracket A **Article-no: 280 002 60**

**RESOL HRG2**

Housing for up to 2 auxiliary relays HR230 (see page 29)

Price bracket A **Article-no: 280 003 10**

**RESOL SP10**

Sensor-overvoltage protection (see page 68)

Price bracket A **Article-no: 180 110 70**

DeltaSol® Pool



rosenthal design 

- Controller for heating a swimming pool by means of solar collectors and optimised operation of the filter system
- Solar operating hours counter and heat quantity measurement
- 13 sensor inputs
- 7 relay outputs
- Function control
- RESOL VBus®
- Filter runtime monitoring
- Maximum flow temperature limitation
- Collector cooling function
- Collector emergency shutdown
- Pump monitoring

RESOL DeltaSol® Pool

Heating and swimming pool controller for swimming pool heating

Price bracket A Article-no: 115 661 73

RESOL DeltaSol® Pool - Full kit

Heating and swimming pool controller for swimming pool heating
incl. 3 Pt1000 sensors (1 x FKP6, 2 x FRP6)

Price bracket A Article-no: 115 661 83

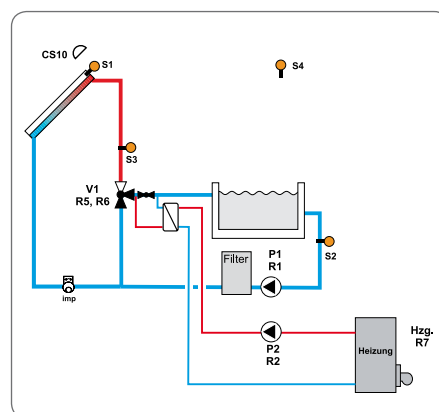
The new system controller for solar swimming pool heating

The RESOL DeltaSol® Pool is a controller for heating a swimming pool by means of solar collectors and optimised operation of the filter system. Back up heating of the swimming pool is varied according to solar power and pool demand, thus saving expensive energy. Furthermore, the controller is equipped with a function control which shows whether the system runs faultlessly or if there is an error.

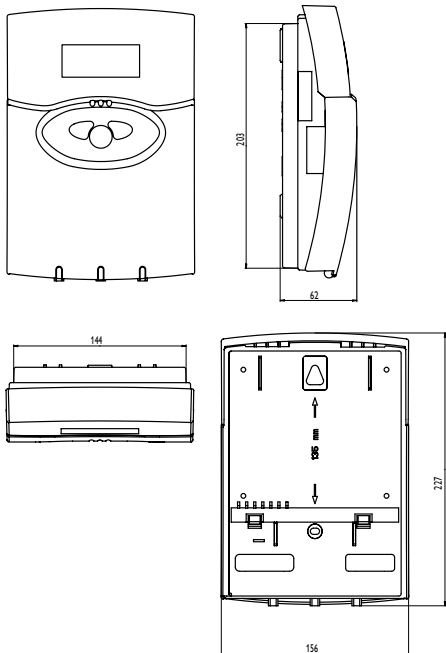
The controller has many additional pool functions such as: additional filter runtime, maximum limitation of flow temperature and a flushing function.

The DeltaSol® Pool can easily be connected to other modules via the RESOL VBus®.

The controller can be branded with your own logo. Please contact our sales team.



Technical data



Housing: plastic, PC-ABS and PMMA
Protection type: IP 20 / DIN 40050
Ambient temperature: 0 ... 40 °C
Dimensions: 156 x 227 x 62 mm
Mounting: wall mounting, mounting into patch panels is possible
Display: 4-line LCD text display
Operation: 3 push buttons at the front
Functions: controller for heating a swimming pool by means of solar collectors and optimised operation of the filter system. Add-on afterheating of the swimming pool depending on the need and on the power of the solar collectors.
 Solar loading: When the collector temperature exceeds the pool temperature by an adjusted value, solar loading starts. If the difference between flow and pool falls below a certain value, or if the maximum temperature is reached, solar loading is stopped.
Sensor inputs: 10 sensor inputs for Pt1000, 1 x CS10, 1 x IMP and 1 digital input
Relay output: 7 relay outputs, 1 of them floating
Bus: VBus®
Power supply: 220 ... 240 V~
Switching capacity:
 2 (1) A (220 ... 240) V~ (standard relay)
 4 (2) A (220 ... 240) V~ (potential-free relay)

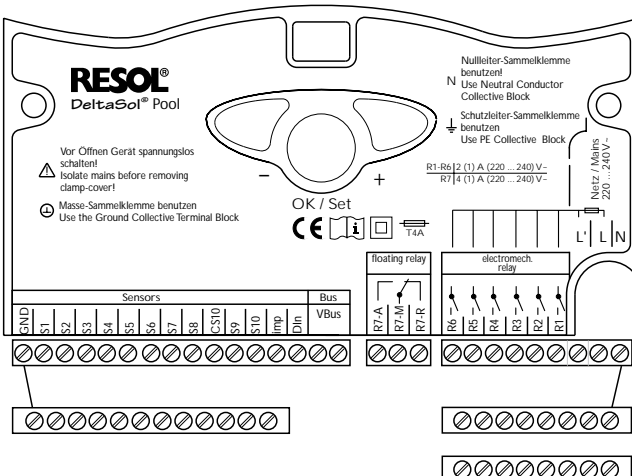


Rapid maintenance



Uncomplicated operation and control

Electrical connection



Simple connection

Accessories



RESOL HR230
 Auxiliary relay (see page 29)
 Price bracket A Article-no: 280 002 60



RESOL HRG2
 Housing for up to 2 auxiliary relays HR230 (see page 29)
 Price bracket A Article-no: 280 003 10



RESOL SP10
 Sensor-overvoltage protection (see page 68)
 Price bracket A Article-no: 180 110 70



VBus® accessories and software

Data communication between different components takes place via the RESOL VBus®. The controllers are therefore able to communicate with additional modules, allowing the system to be analysed and adapted to the individual consumer and system.

Technical data**Housing:** Plastic PC-ABS and PMMA**Protection type:** IP 20 / DIN 40050**Ambient temperature:** 0 ... 40 °C**Dimensions:** Ø 130 mm, depth 45 mm**Mounting:** wall mounting**Display:** Bar LED for monitoring the memory capacity, 1 illuminated pushbutton for indication of the SD card status**Interfaces:**

VBus® for connection to RESOL controllers. LAN

Power supply:

Input voltage of mains adapter: 100 ... 240 V~

Rated current: 350 mA

Input voltage of Datalogger: 5V DC ± 5%

Memory: 180 MB internal memory, with a logging interval of 5 min. sufficient for:

- 30 months for a systems with one DeltaSol® M, one HKM and one WMZ module
- 60 months for a system with one DeltaSol® M and one HKM
- 120 months for a system with one DeltaSol® M

The datalogger can be branded with your own logo. Please contact our sales team.

Please note:

An SD memory card is a delicate data carrier. The card must not be compressed, distorted, bent or subjected to other forms of strain. Keep the contacts free of any kind of soiling.

Pay attention to the instructions given by the manufacturer of the memory card. The manufacturer of the datalogger does not assume any liability or warranty for damage or loss of data.

Datalogger DL2rosenthal design 

This additional module enables the acquisition and storage of large amounts of data (such as measuring and balance values of the solar system) over a long period of time. The DL2 can be configured and read-out with a standard internet browser via its integrated web interface. For transmission of the data

stored in the internal memory of the DL2 to a PC, an SD card can be used. The DL2 is appropriate for all controllers with RESOL VBus®. The datalogger can be connected directly to a PC or router for remote enquiry and thus enables comfortable system monitoring for yield monitoring or for diagnostics of faults.

- Visualisation of system states
- Yield monitoring
- Easy error diagnostics
- Easy configuration by integrated web interface for standard internet browsers
- Export function for further data processing in spreadsheet programs
- Direct connection of PC or router for remote enquiry



Integrated LAN-connection



SD-card slot



Easy monitoring of memory capacity

RESOL Datalogger DL2

Datalogger incl. RESOL ServiceCenter Software full version ready to plug in with mains adapter and VBus®

Price bracket A Article-no: 180 007 10

SD-card

SD-card with 1 GB memory capacity

Price bracket A Article-no: 180 007 40

ServiceCenter Software with Interface adapter VBus®/USB



The interface adapter RESOLVBus®/USB enables the connection of a PC to controllers with RESOLVBus®. By means of the enclosed evaluation software, the measured data can be recorded numerically in a log-data file and subsequently be evaluated and visualised by means of a spreadsheet program. The adapter does not need an external power supply.

ically in a log-data file and subsequently be evaluated and visualised by means of a spreadsheet program. The adapter does not need an external power supply.

Included:

- USB 2.0 full-speed (12 Mbit/s) compatible
- 1 x USB-Plug type A
- 1 x VBus® cable 0,8 m
- 1 x Connection note
- CD with evaluation software (RSC, or RSC light) and driver (Microsoft Windows® XP/Microsoft Windows® Vista)

ServiceCenter Software RSC

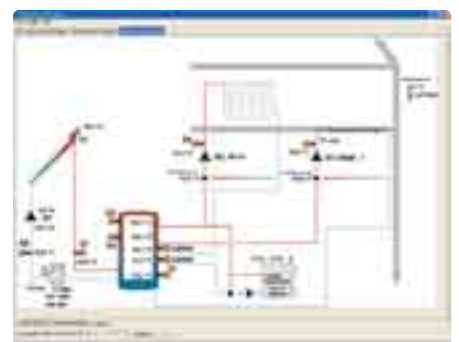
The modular designed software enables PC-recording of the data measured by the controller, editing of the data files for further processing by standard spreadsheet programs and visualisation of individual systems with all measuring and balancing values.

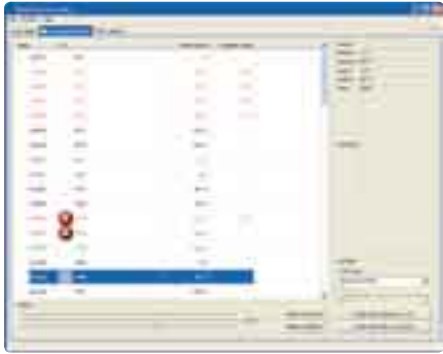
ServiceCenter light (limited version):

- multilingual version: German, English, French, Spanish, Italian
- VBus®-record: all measuring and balance values received by VBus® are filed in a text file; this file can be processed by a standard spreadsheet program
- Designer: allows the positioning of the VBus® values on a customised background graphic; in this way, system visualisations for any solar system can be presented in real-time
- Updates are provided on the Internet; no support

The RESOLVBus® is a two-wire bus, which allows RESOL controllers and additional modules to interchange data. These data are either purely informative or can be used for control purposes. In addition to that, it is possible to feed bus stations with electric energy, provided that their current consumption is low enough (e.g. remote data display); thereby, a special energy supply of these devices is no longer necessary.

The RESOL controllers of the more recent generation are all equipped with connection possibilities for the VBus®. The connections are established by two twisted wires each (e.g. bell wire).





ServiceCenter (full version):

- VBus®-record and Designer as described before in light-version, but additionally:
- Dataloggers: possibility to manage any number of datalogger; the ServiceCenter establishes connection at the push of a button, reads out the data, if necessary, deletes data from the logger and converts data into a text file
- Parametrisation: DeltaSol® M, E, ES and the BS-series (and future versions of the product family) can be configured user-friendly with a PC; the values are checked for domains and possible overlapping and are transferred to the controller via VBus®

RESOL VBus® / USB light

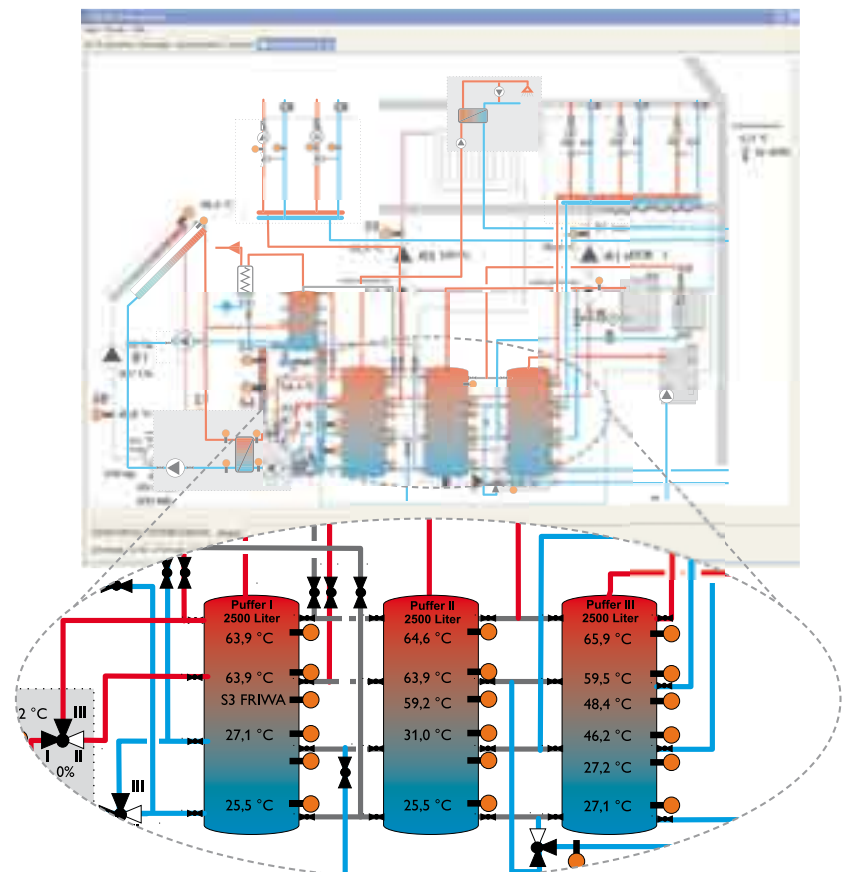
PC-connection set for RESOL controller with VBus®, with software RSC light

Price bracket B Article-no: 180 003 70

RESOL VBus® / USB full version

PC-connection set for RESOL controller with VBus®, with software RSC full version

Price bracket B Article-no: 180 003 80



Large display GA3



rosenthal design 

The RESOL GA3 is a completely mounted large display module for visualisation of collector- and storage temperatures as well as the heat quantity yield of the solar system via one 6-digit and two 4-digit 7-segment-displays. An easy connection to all controllers by RESOLVBus® is possible. Stainless steel frame with high quality multiplex wood elements and mounting

plates for interior wall mounting. The front plate is made of antireflective filter-glass and is printed with a light-resistant UV-lacquering. The universal RESOL VBus® allows the parallel connection of 8 large displays as well as additional VBus® modules. The bus line can be extended using a standard two-wire line.

RESOL GA3

Large display module with 3 displays for collector and storage temperatures as well as for heat quantity, incl. power supply

Price bracket C Article-no: 180 006 53

Technical data

Dimensions: 530 x 630 x 100 mm

Weight: approx. 10 Kg

Power supply: 220 ... 240V~
(by mains adapter; included)

Power consumption: max. 12VA

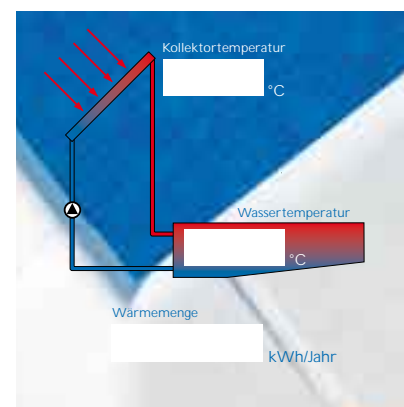
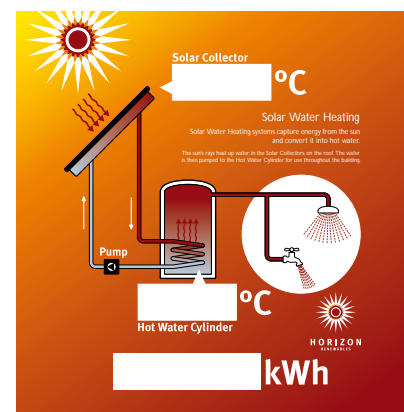
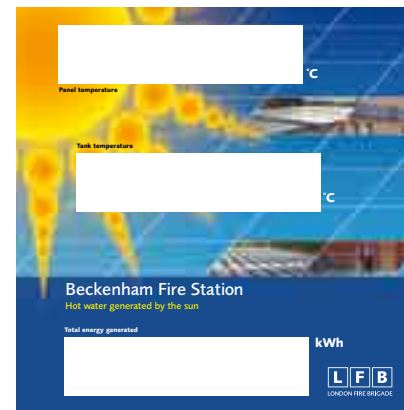
Protection type: IP 30

(suitable for dry rooms)

Ambient temperature: 0 ... 40 °C

Data input: RESOLVBus®

Further versions and customised layout of the front plate on request.



Examples of customised front plate layouts

- Simultaneous visualisation of collector and storage temperature as well as heat quantity
- One 6-digit and two 4-digit 7-segment LED displays
- Simple connection via RESOL VBus®
- Power supply via RESOL VBus®
- Outstanding design

Technical data

Dimensions: 150 x 165 x 24 mm

Protection type: IP 30 (suitable for dry rooms)

Ambient temperature: 0 ... 40 °C

Data input: RESOL VBus®

Smart Display SD3



rosenthal design 

The RESOL Smart Display is designed for simple connection to RESOL controllers with RESOL VBus®. It is used for visualising data issued by the controller: collector temperature, storage temperature and energy yield of the solar thermal system. The use of high-efficient LEDs and filter glass assures a high optical brilliance and good readability even in poor visibility conditions and from a larger distance. An additional power supply is not required.

RESOL Smart Display SD3

Display module for the living area with 3 displays for collector and storage temperature as well as for heat quantity

Price bracket A Article-no: 180 004 93

Technical data

Housing: plastic, PC-ABS

Protection type:

IP 20, with insulation IP 22 (DIN 40050)

Ambient temperature: 0 ... 40 °C

Dimensions: Ø 130 mm, depth 45 mm

Mounting: wall mounting

Display: 5 LEDs

Supply voltage: 220 ... 240V~

Interface: RESOL VBus®

The adapter is designed for the connection to the controllers DeltaSol® E, DeltaSol® ES and DeltaSol® M.

STA (Signal Translation Adapter)

The adapter is used for controlling the pump via a PWM- or 0-10-V-signal. Via the VBus® the adapter receives information from the controller about the pump speed. The speed is converted into a PWM- or direct voltage signal and put out to the corresponding terminals. A signal corresponding to the speed is only available if the corresponding relay is designed for pump speed control. Otherwise, a signal depending on the position of the relay, for the on or off state is transmitted.



RESOL STA

VBus® converter into PWM- or 0-10 V-signal

Price bracket B Article-no: 180 004 30

STA-W (kWh output module)



The kWh output module is an interface designed for the exchange of heat quantity measurement values between RESOL devices and external appliances. It can be connected to a RESOL controller or a calorimeter via the RESOLVBus®. Whenever the heat quantity increases by 1 kWh, the module operates a potential-free contact which is connected to the central building control system. The total number of operated contacts can be visualised as heat quantity by the software of the central building control system.

RESOL STA-W

VBus® converter heat quantity to impulses

Price bracket B Article-no: 180 008 20

Technical data

Housing: plastic, PC-ABS

Protection type:

IP 20, with insulation IP 22 (DIN 40050)

Ambient temperature: 0 ... 40 °C

Dimensions: Ø 130 mm, depth 45 mm

Mounting: wall mounting

Display: 1 LED

Power supply: RESOL VBus®

Interface: RESOLVBus®

Output: 1 potential-free relay
(max. 24VDC, 1 A, 15 W)

Max. frequency: 5 Hz

The RESOL STA-W is designed for the connection to the DeltaSol® BS, BS Plus, DB, E, ES, M, Minipool, and Pool controllers as well as to the pump station FlowCon D.

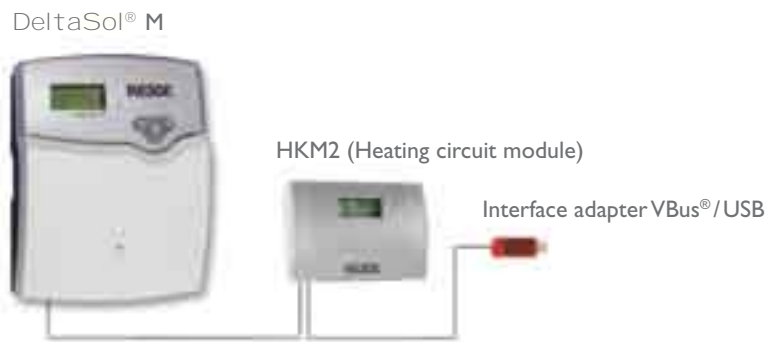
Application examples of the VBus®

Latest generation RESOL devices are equipped with VBus® connectors and are connected to each other using two twisted wires each (bell wire). Several VBus® modules can be connected in parallel.

Example illustrations, further configurations are possible.



Data communication between the devices takes place via the RESOL VBus®.



Data communication between the devices takes place via the RESOL VBus®.





Pump stations and heat exchange modules

Pump stations offer solutions for the efficient use of a system through harmonised components. They contain all units necessary for the operation of a solar system. Installation and initial operation of the stations are easy, because the components are already pre-assembled and ready to plug in.

		ST15/6	ST15/7	ST15/9	ST15/11	PM 15-85	Air-Stopp	Flowmeter 0,5 ... 5 l/min	Flowmeter 1 ... 13 l/min	Flowmeter 8 ... 30 l/min	DeltaSol® AX	DeltaSol® BS 1-4	DeltaSol® BS Plus	DeltaSol® C 1-4	DeltaSol® D	FlowCheck	Grundfos sensor
	FlowCon C	✓	✓				✓						✓		✓		
	FlowCon D	✓	✓				✓								✓		✓
	FlowCon D HE					✓	✓								✓		✓
	FlowCon A	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓				
	FlowCon S	✓	✓	✓			✓	✓	✓	✓		✓	✓				
	FlowCon B	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓				

FlowCon C pump station



rosenthal design 

The pump station FlowCon C is a preinstalled and leak-tested group of fittings for transferring heat from the collector to the storage. 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 circulation
- AirStopp: manual air vent for the solar thermal system
- FlowCheck for displaying the flow rate
- Manometer for displaying the system pressure
- Safety valve to prevent inadmissible overpressure
- Flushing and filling unit (optional) for flushing, filling and emptying the solar thermal system
- Heat quantity measurement
- Full graphic display

RESOL FlowCon C - DeltaSol® C/1

Twin-line pump station, incl. DeltaSol® C/1 controller and 3 sensors Pt1000 (1 x FKP6, 2 x FRP6)

Price bracket A Article-no: 290 016 23

RESOL FlowCon C - DeltaSol® C/2

Twin-line pump station, incl. DeltaSol® C/2 controller and 3 sensors Pt1000 (1 x FKP6, 2 x FRP6)

Price bracket A Article-no: 290 016 33

RESOL FlowCon C - DeltaSol® C/3

Twin-line pump station, incl. DeltaSol® C/3 controller and 3 sensors Pt1000 (1 x FKP6, 2 x FRP6)

Price bracket A Article-no: 290 012 23

RESOL FlowCon C - DeltaSol® C/4

Twin-line pump station, incl. DeltaSol® C/4 controller and 3 sensors Pt1000 (1 x FKP6, 2 x FRP6)

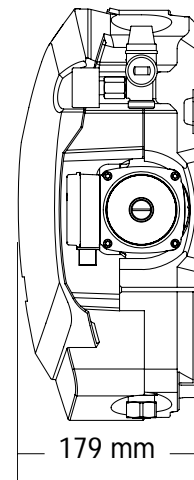
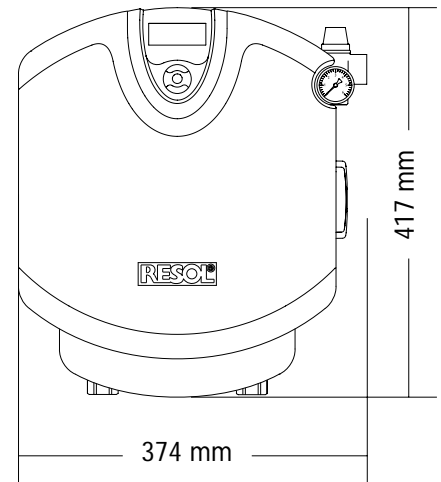
Price bracket A Article-no: 290 014 93

RESOL FlowCon C - DeltaSol® C Plus

Twin-line pump station, incl. DeltaSol® C Plus controller and 4 sensors Pt1000 (2 x FKP6, 2 x FRP6)

Price bracket A Article-no: 290 016 43

Technical data



Circulating pump: WILO Star ST15/6 or ST15/7

Nominal size: DN 20

Dimensions: approx. 374 x 417 x 179 mm (with insulation)

Connection for expansion vessel set:

3/4" ET, flat sealing

Outlet safety valve: 3/4" IT

Equipment:

Safety valve: 6 bar

Manometer: 0 - 6 bar

Non-return valves:

Opening pressure 200 mm head, openable

Material: Fittings: brass,

Sealings: EPDM,

Insulation: EPP, $\lambda = 0,041 \text{ W}/(\text{m} \cdot \text{K})$

Max. operating temperature: + 120 °C

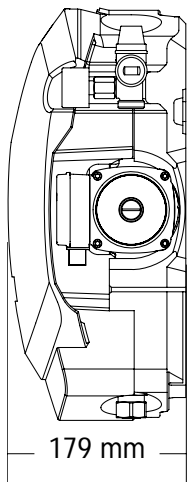
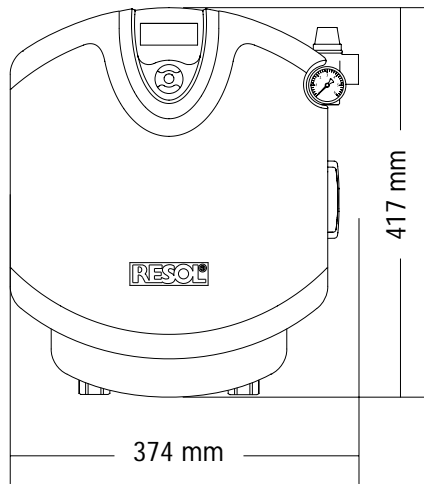
Flow rate: 1 ... 12 l/min



Filling and flushing unit

Price bracket A Article-no: 290 013 40

Technical data



Circulating pump: WILO Star ST15/6

Nominal size: DN 20

Dimensions: approx. 374 x 417 x 179 mm
(with insulation)

Connection for expansion vessel set:

3/4" ET, flat sealing

Outlet safety valve: 3/4" IT

Equipment:

Safety valve: 6 bar

Manometer: 0 - 6 bar

Non-return valves:

Opening pressure 200 mm head, openable

Material:

Fittings: brass

Sealings: EPDM

Insulation: EPP

Max. operating temperature: + 120 °C

Flow range: 100 ... 500 l/h



Filling and flushing unit

Price bracket A Article-no: 290 013 40

FlowCon D pump station



product
design
award

2008

rosenthal design

Pump stations offer solutions for the efficient use of a system through harmonized components. The new RESOL FlowCon D station is characterised by the digital sensors, which communicate with the controller via the RESOLVBus® and which ensure the precise measurement of temperature, pressure and flow

rate. The integrated controller has a full graphic display, which displays the system states and ensures easy and intuitive menu navigation. Pictograms within the graphic display allow easy and intuitive display of system states and whether the system runs faultlessly or if there is an error.

- Digital sensors via RESOLVBus®
- Ultra fast control
- Precise measurement of temperature, pressure and flow rate
- Directly controlled flow rate
- Heat quantity measurement
- Full graphic display
- Enhanced status and error diagnostics system

RESOL FlowCon D

Twin-line pump station, incl. DeltaSol® D controller, 2 digital sensors and 2 Pt1000 sensors (1 x FkP6, 1 x FRP6)

Price bracket A Article-no: 290 012 43

FlowCon D HE pump station



rosenthal design 

As is the case with all other RESOL pump stations, the shapely design of the FlowCon D HE plays an important role. The integrated controller has a full graphic display, which displays the system states and ensures easy and intuitive menu navigation.

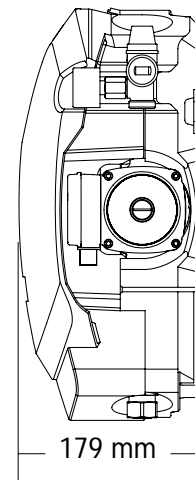
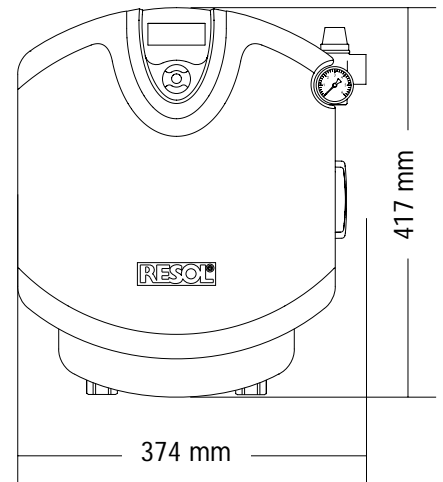
- Digital sensors via RESOLVBus®
- Ultra fast control
- Precise measurement of temperature, pressure and flow rate
- Directly controlled flow rate
- Heat quantity measurement
- Full graphic display
- Enhanced status and error diagnostics system
- Energy saving through high-efficiency pump PM 15-85

RESOL FlowCon D HE

Twin-line pump station, incl. DeltaSol® D HE controller, 2 digital sensors and 2 Pt1000 sensors (1 x FKP6, 1 x FRP6)

Price bracket A Article-no: 290 013 53

Technical data



Circulating pump: Grundfos PM 15-85

Nominal size: DN 20

Dimensions: approx. 374 x 417 x 179 mm (with insulation)

Connection for expansion vessel set:

3/4" AG, flat sealing

Outlet safety valve: 3/4" IT

Equipment:

Safety valve: 6 bar

Manometer: 0 - 6 bar

Non-return valves:

Opening pressure 200 mm head, openable

Material:

Fittings: brass

Sealings: EPDM

Insulation: EPP, $\lambda = 0,041 \text{ W/(m}^*\text{K)}$

Max. operating temperature: +120 °C

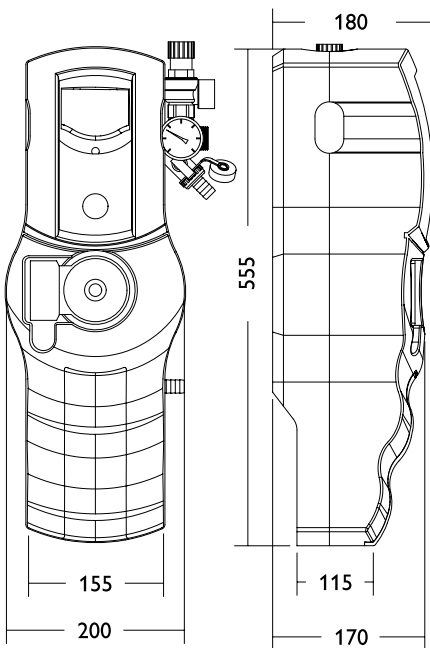
Flow range: 100 ... 500 l/h



Filling and flushing unit

Price bracket A Article-no: 290 013 40

Technical data



- Integrated DeltaSol® AX or DeltaSol® BS controller
- Solar thermal pump WILO Star ST15/6 or ST15/7 (surcharge)
- Flowmeter
- Safety assembly with relief valve and pressure gauge
- Filling and flushing connections
- Wall mounting bracket with screws and wall plugs
- Heat insulation
- Pre-assembled and ready to plug in

Circulation pump:

WILO Star ST15/6 or ST15/7 (surcharge)

Dimensions: approx. 200 x 550 x 180 mm (incl. insulation)

Nominal size: DN 20

Connections: ¾" IT

Material: Fittings: brass,

Sealings: Viton/ Teflon, Insulation: EPP

Adm. maximum temperature:

+120 °C, temporarily up to +180 °C

Safety valve: 6 bar

Spring pressure of non-return valve:

200 mm head

Flowmeter: 0,5 ... 5 l/min or 8 ... 30 l/min

FlowCon A pump station



rosenthal design 

Standard single-line solar pump station for integration into a solar return line. The pump station is available with either the RESOL DeltaSol® AX, BS or BS Plus controller. The most important

hydraulic components required for the operation of a solar system are already mounted for easy and quick installation. Please see pages 8 to 11 for further information about the controllers.

RESOL FlowCon A - DeltaSol® AX

Single-line pump station, incl. DeltaSol® AX controller and 2 sensors
Pt1000 (1 x FKP6, 1 x FRP6)

Price bracket A **Article-no: 290 007 43**

RESOL FlowCon A - DeltaSol® BS/1

Single-line pump station, incl. DeltaSol® BS/1 controller and 3 sensors
Pt1000 (1 x FKP6, 2 x FRP6)

Price bracket A **Article-no: 290 014 03**

RESOL FlowCon A - DeltaSol® BS/2

Single-line pump station, incl. DeltaSol® BS/2 controller and 3 sensors
Pt1000 (1 x FKP6, 2 x FRP6)

Price bracket A **Article-no: 290 011 53**

RESOL FlowCon A - DeltaSol® BS/3

Single-line pump station, incl. DeltaSol® BS/3 controller and 3 sensors
Pt1000 (1 x FKP6, 2 x FRP6)

Price bracket A **Article-no: 290 007 53**

RESOL FlowCon A - DeltaSol® BS/4

Single-line pump station, incl. DeltaSol® BS/4 controller and 3 sensors
Pt1000 (1 x FKP6, 2 x FRP6)

Price bracket A **Article-no: 290 009 83**

RESOL FlowCon A - DeltaSol® BS Plus

Single-line pump station, incl. DeltaSol® BS Plus controller and 4 sensors
Pt1000 (2 x FKP6, 2 x FRP6)

Price bracket A **Article-no: 290 011 83**

FlowCon S pump station



reddot design award
winner 2005

rosenthal design

Standard single-line solar pump station for integration into a solar return line. The pump station is available with either the RESOL DeltaSol® BS or DeltaSol® BS Plus controller. The most important hydraulic components

required for the operation of a solar system are already mounted for an easy and quick installation. Please see pages 10 to 13 for further information about the controllers.

RESOL FlowCon S - DeltaSol® BS/1

Single-line pump station incl. DeltaSol® BS/1 controller and 3 sensors
Pt1000 (1 x FKP6, 2 x FRP6)

Price bracket A Article-no: 290 016 53

RESOL FlowCon S - DeltaSol® BS/2

Single-line pump station incl. DeltaSol® BS/2 controller and 3 sensors
Pt1000 (1 x FKP6, 2 x FRP6)

Price bracket A Article-no: 290 016 63

RESOL FlowCon S - DeltaSol® BS/3

Single-line pump station incl. DeltaSol® BS/3 controller and 3 sensors
Pt1000 (1 x FKP6, 2 x FRP6)

Price bracket A Article-no: 290 005 33

RESOL FlowCon S - DeltaSol® BS/4

Single-line pump station incl. DeltaSol® BS/4 controller and 3 sensors
Pt1000 (1 x FKP6, 2 x FRP6)

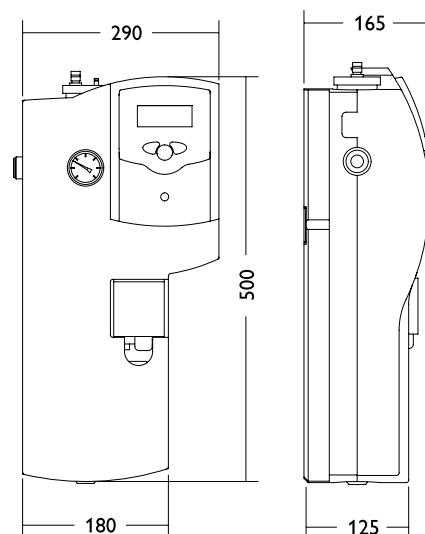
Price bracket A Article-no: 290 007 93

RESOL FlowCon S - DeltaSol® BS Plus

Single-line pump station incl. DeltaSol® BS Plus controller and 4 sensors
Pt1000 (2 x FKP6, 2 x FRP6)

Price bracket A Article-no: 290 005 43

Technical data



- Integrated DeltaSol® BS or DeltaSol® BS Plus controller
- Solar thermal pump WILO Star ST15/6 or ST15/7 (optional, surcharge)
- Manual vent
- Flowmeter
- Safety assembly with relief valve and pressure gauge
- Filling and flushing connections
- Wall mounting bracket with screws and wall plugs
- Heat insulation
- Pre-assembled and ready to plug in

Circulation pump: WILO Star ST15/6 or ST15/7 (surcharge)

Dimensions: approx. 290 x 500 x 165 mm (incl. insulation)

Nominal size: DN 20

Connections: 3/4" IT

Material: Fittings: brass, Sealings: Viton/Teflon, Insulation: EPP

Adm. maximum temperature: +120 °C, temporarily up to +180 °C

Safety valve: 6 bar

Spring pressure of non-return valve: 200 mm head

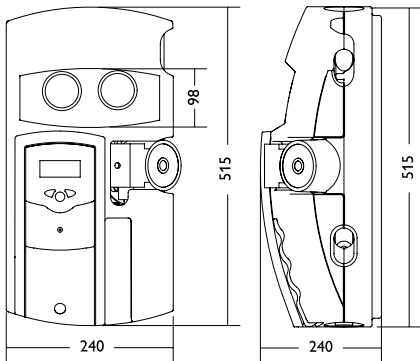
Flowmeter:

0,5 ... 5 l/min,

1 ... 13 l/min (standard) or

8 ... 30 l/min

Technical data



Standard twin-line solar pump station for integration of the DeltaSol® BS controller. The most important hydraulic components required for the operation of a solar system are already mounted for easy and quick installation:

- Prepared for integration of the DeltaSol® BS controller
- Solar thermal pump WILO Star ST15/6 or ST15/7 (optional, surcharge)
- Dial thermometers for flow and return
- Return line with ball valve and adjustable nonreturn valve
- Flowmeter with scale
- Safety assembly with relief valve and pressure gauge
- Fill/Drain valve for filling and flushing of the system
- Wall mounting with screws and dowels
- Heat insulation
- Pre-assembled and ready to plug in

Circulation pump: WILO Star ST15/6 or ST15/7 (surcharge)

Dimensions: approx. 240 x 515 x 240 mm (incl. insulation)

Nominal size: DN 20

Connections: ¾" IT

Material: Fittings: brass,

Sealings: Viton / Teflon, Insulation: EPP

Adm. maximum temperature: +110°C, temporarily up to +180°C

Safety valve: 6 bar

Spring pressure of non-return valves: 2 x 200 mm head = 400 mm head in total

Flowmeter:

1 ... 13 l/min (standard) or 8 ... 30 l/min

FlowCon B pump station



rosenthal design 

RESOL FlowCon B

Standard twin-line pump station

Price bracket A Article-no: 290 002 73

RESOL FlowCon BL

Standard twin-line pump station incl. AirStopp

Price bracket A Article-no: 290 002 83

RESOL FlowCon BS - Full kit

Standard twin-line pump station incl. DeltaSol® BS/1 controller and 3 sensors Pt1000 (1 x FKP6, 2 x FRP6)

Price bracket A Article-no: 290 010 83

RESOL FlowCon BSL - Full kit

as above, but with AirStopp

Price bracket A Article-no: 290 016 83

RESOL FlowCon BS - Full kit

Standard twin-line pump station incl. DeltaSol® BS/2 controller and 3 sensors Pt1000 (1 x FKP6, 2 x FRP6)

Price bracket A Article-no: 290 012 93

RESOL FlowCon BSL - Full kit

as above, but with AirStopp

Price bracket A Article-no: 290 016 73

RESOL FlowCon BS - Full kit

Standard twin-line pump station incl. DeltaSol® BS/3 controller and 3 sensors Pt1000 (1 x FKP6, 2 x FRP6)

Price bracket A Article-no: 290 006 73

RESOL FlowCon BSL - Full kit

as above, but with AirStopp

Price bracket A Article-no: 290 006 83

RESOL FlowCon BS - Full kit

Standard twin-line pump station incl. DeltaSol® BS/4 controller and 3 sensors Pt1000 (1 x FKP6, 2 x FRP6)

Price bracket A Article-no: 290 007 13

RESOL FlowCon BSL - Full kit

as above, but with AirStopp

Price bracket A Article-no: 290 017 13

RESOL FlowCon BS - Full kit

Standard twin-line pump station incl. DeltaSol® BS Plus controller and 4 sensors Pt1000 (2 x FKP6, 2 x FRP6)

Price bracket A Article-no: 290 014 83

RESOL FlowCon BSL - Full kit

as above, but with AirStopp

Price bracket A Article-no: 290 011 43

SOLEX heat exchange module



rosenthal design 

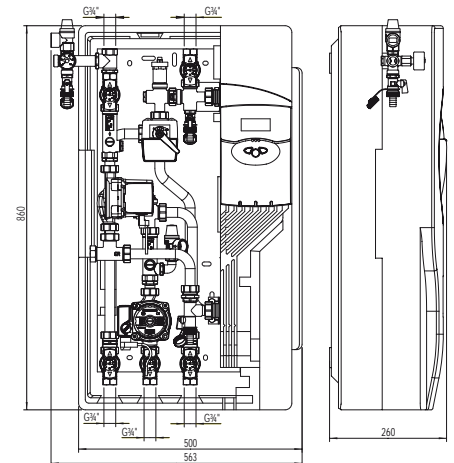
- Compact function optimised insulation
- Highly efficient stainless steel plate heat exchanger
- Integrated solar controller
- Optimum loading of the storage
- Minimisation of heat losses
- Illuminated text display
- VBus®

SOLEX is an heat exchange module which ensures optimum heat transfer between the solar collector and storage circuit. The station offers optimum loading of the storage and minimisation of

heat losses. SOLEX is completely pre-assembled with a plate heat exchanger and pre-wired controller. Mounting and commissioning are simple and safe.

Type	SOLEX HF 20	SOLEX HF 30	SOLEX LF 21	SOLEX LF 45
System	High-Flow	High-Flow	Low-Flow	Low-Flow
Heat exchanger	20	30	21	45
for collector area	up to 30 m ²	up to 50 m ²	up to 30 m ²	up to 50 m ²
Power	up to 15 KW	up to 25 KW	up to 15 KW	up to 25 KW
Price bracket B	✓	✓	✓	✓
Art.-No.	290 008 33	290 008 43	290 008 53	290 008 63

Technical data

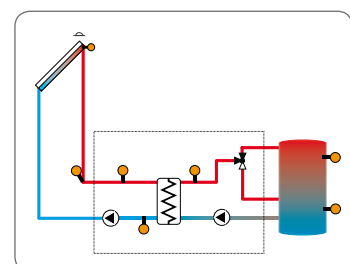


Controller

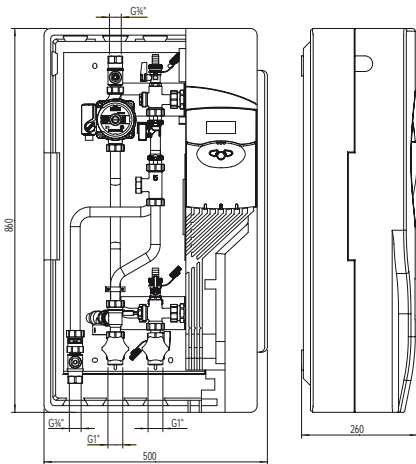
Housing: plastic, PC-ABS and PMMA
Protection type: IP 20/DIN 40050
Ambient temperature: 0 ... 40 °C
Dimensions: 220 x 155 x 62 mm
Operation:
 3 pushbuttons at the front of the housing
Bus: RESOL VBus®
Power supply: 4 (1) A (220 ... 240) V~

Station

Dimensions (incl. insulation):
 approx. 860 x 560 x 260 mm (HF)
 approx. 860 x 660 x 260 mm (LF)
Distance centre: 180 mm (secondary)
Pipe connections: ¾" IT
Safety valve: 6 bar primary (solar system), 3 bar secondary (heating system)
Manometer (primary):
 0 - 6 bar, with isolating valve
Max. pressure: 10 bar
Max. temperature: 60 °C, intermittent 130 °C
Max. operating temperature: secondary 95 °C
Fittings: brass
Sealings: Teflon/EPDM
Plate heat exchanger:
 stainless steel 1.4400/solder: 99,99% copper
Tubes: stainless steel 1.4401/04
O-Ring: EPDM/Viton
Flat sealings: AFM 34, asbestos free
Insulation: EPP
Non-return valve:
 400 mm head (primary),
 200 mm head (secondary)
 PPS/brass – clip VA



Technical data



Controller

Housing: Plastic, PC-ABS and PMMA

Protection type: IP 20/DIN 40 050

Ambient temperature: 0 ... 40 °C

Dimensions: 220 x 155 x 62 mm

Operation:

3 pushbuttons at the front of the housing

Bus: RESOL VBus®

Power supply: 220 ... 240V~

Total power supply: 4 (1) A (220 ... 240)V~

Station

Dimensions (incl. insulation):

approx. 860 x 560 x 260 mm

Distance centre: 90 mm (secondary),
with circulation (optional) 2x 90 mm

Pipe connections: ¾" female (primary),
1" OT (secondary) flat washers

Max. admissible pressure: 6 bar

Max. temperature: 2 ... 95 °C

Fittings: brass

Sealings: Teflon/EPDM

Plate heat exchanger:

stainless steel 1.4400/solder: 99,99% copper

Tubes: stainless steel 1.4401/04

O-rings: EPDM/Viton

Flat sealings: AFM 34, asbestos-free

Insulation: EPP

Non-return valve: primary, PPS/brass - clip VA

FriWa DHW heat exchange module

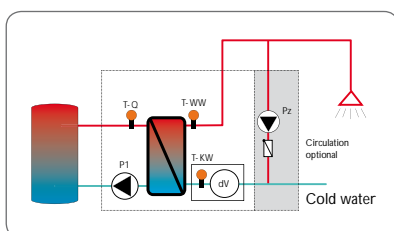


rosenthal design 

- Pre-assembled with all electrical and hydraulic components for plug and play installation
- Protection against legionella
- Minimisation of heat losses
- Optional circulation for hot water supply without delay
- VBus®
- No hot water storage necessary
- Hot water delivery of 1,5 l/min up to 40 l/min
- Hot water delivery at set temperature
- Calculation of the required pump speed with cold water, source, and hot water set temperature and the measured flow rate
- Quick reaction to changes of flow rate
- Optimum cooling of the heating water
- Highly suitable for the use in solar thermal and low temperature heating systems

FriWa is a DHW heat exchange module for comfortable and hygienic water heating which works on the principle of an instantaneous water heater. Warm water is immediately available. Hot water storage is not necessary, as the heat required

is taken directly from the buffer storage via the plate heat exchanger. It is completely pre-assembled and the controller is integrated. FriWa is available with or without a circulation pump.



RESOL FriWa

DHW heat exchange module

Price bracket B Article-no: 290 008 83

RESOL FriWa

DHW heat exchange module with circulation

Price bracket B Article-no: 290 008 73

Accessories for pump stations of the FlowCon series

Wall mounting for expansion vessel with screws and dowels, high grade steel corrugated tube and connection thread $\frac{3}{4}$ "

Wall mounting for expansion vessel

Price bracket A **Article-no: 280 004 60**



22m textile tube connection to the safety valve of the FlowCon pump stations

RESOL Flow set

Price bracket A **Article-no: 290 006 40**



Filling and injection pump with non-return valve for pressure increase and refilling of heat transfer fluids. $\frac{1}{2}$ " OT self-sealing with O-ring, 15mm tube connection, pump output 2 l/min, 4,5 bar max.

RESOL Filling and injection pump

Price bracket A **Article-no: 280 005 40**



Self-sealing double nipples $\frac{3}{4}$ " OT

Price bracket A **Article-no: 280 008 90**



Filling and flushing unit

Price bracket A **Article-no: 290 013 40**





Solder-transition nipples

3/4" to 10 mm

Article-no: 280 008 40

3/4" to 12 mm

Article-no: 280 008 50

3/4" to 15 mm

Article-no: 280 008 60

3/4" to 18 mm

Article-no: 280 008 70

3/4" to 22 mm

Article-no: 280 008 80

All prices are subject to price bracket A



Fittings

Compression fitting 3/4" to 10 mm

Article-no: 280 007 90

Cutting ring fitting 3/4" to 12 mm

Article-no: 280 014 40

Cutting ring fitting 3/4" to 15 mm

Article-no: 280 014 50

Compression fitting 3/4" to 18 mm

Article-no: 280 008 20

Cutting ring fitting 3/4" to 22 mm

Article-no: 280 014 60

All prices are subject to price bracket A



A dirt filter with fine sieve is included in the system, 1" IT and OT, flat-sealing, temperature resistant up to 150 °C, mounting length 80 mm.

Dirt trap DN20

Price bracket A Article-no: 280 007 80

SBS 1000 Filling and flushing station



Solar thermal systems are usually filled with water or water-glycol-mixtures as the heat transfer fluid. The filling and flushing station allows quick and clean filling of solar thermal systems with the heat transfer fluid.

The filling and flushing station includes:

- Stainless steel trolley with robust tyred wheels, pump protection and hose holder
- Robust, powerful and silent pump with separate on and off switch
- 30-litre polyethylene tank with suction strainer, check valve, return turbulence reducer and drain valve
- Pressure-resistant, transparent flow and return hoses for easy visual checking
- Connection hoses with isolating ball valves for preventing the medium from leaking from the hose and for adjusting the delivery rate

Technical data

Dimensions:

H x W x D = 1000 x 430 x 470 mm

Weight (unfilled): 20 kg

Tank: 30 liters, PE, with suction strainer and check valve

Delivery flow: 5 - 47 l/min

Delivery height: 52 m

Pump power: 230V~, 1000 W

Isolating ball valves: 3/4" union nut

Check valve: 3/4"

Drain valve: 1/2"

Medium: Water or glycol mixtures

Medium temperature: max. 60 °C

SBS 1000

Full kit for filling and flushing solar thermal systems

Price bracket B Article-no: 280 010 53

Heat transfer fluids

In most cases, propylene-glycol-water mixtures are used as the heat transfer fluid. Schedule 3 (4th part of DIN 1988) shows possible combinations. Depending on the classification of the heat transfer fluids, there are different requirements towards the type of domestic hot water heater. If no specifications are given, a confirmation of special type C should be required implicitly.

An antifreeze-protection of about 40% of glycol in the mixture prevents the system from damage. Even with temperatures of $-21\text{ }^{\circ}\text{C}$, the system remains in operation status. Temperatures below this protection point will cause the development of ice-pulp, which however is not able to destroy tubes and piping. Unfortunately, today's high-end flat-collectors and direct flow vacuum-tube-collectors may cause the premature aging of conventional heat transfer fluid at high stagnation temperatures. In order to prevent this process, the operating pressure of the system can be limited to 4 bar or a high-temperature resistant heat transfer fluid can be used as well.

Tyfocon[®] L

Tyfocon[®] L is a long-time, anti-freeze and corrosion-protection concentrate for cooling and heating systems as well as for solar and heating pump systems. When the circuit system is being filled, 25 up to 75 volume percent of neutral water should be added to the Tyfocon[®] L. The concentration of corrosion-inhibitors in Tyfocon[®] L provides long-term protection against corrosion, premature failure and scaling of components and materials. Tyfocon[®] L keeps the heat transfer area clean and thus assures a constantly high efficiency of the system. Tyfocon[®] L is suitable for continuous temperatures of up to $170\text{ }^{\circ}\text{C}$.

Example mixing ratio Tyfocon[®] L:

1 tank Tyfocon[®] L + 15,6l water = 26l readymix with 40 Vol% ($-23,7\text{ }^{\circ}\text{C}$)

Tyfocon[®] LS

Tyfocon[®] LS is a ready for use, vaporisation-safe special heat transfer fluid on the basis of propylene-glycol. It is especially developed for use as a heat transfer fluid in solar heating systems which are capable of a high thermal load. (e.g. in vacuum-tube-collector systems). In order to keep its special properties, Tyfocon[®] LS must not be mixed with other heat transfer fluids or be diluted with water! Any loss in liquid can only be compensated by Tyfocon[®] LS.

Tyfocon[®] G-LS

Tyfocon[®] G-LS is a ready for use, vaporisation-safe special heat transfer fluid on the basis of propylene-glycol and was especially developed for use as heat transfer fluid in solar systems with direct discharge-flow through flat plate glass collectors. The properties are similar to those of Tyfocon[®] LS.

®Antifrogen SOL

®Antifrogen SOL is a ready for use, vaporisation-safe heat transfer fluid on the basis of propylene-glycol and higher boiling glycol. It is physiologically harmless and contains corrosion-inhibitors that will thoroughly protect all materials usually used in heating and solar thermal systems against corrosion, premature aging and incrustation. ®Antifrogen SOL HT will not segregate, withstand high operating temperatures and is suitable for both flat plate and vacuum tube collectors.

®Antifrogen SOL HT

®Antifrogen SOL HT has the same properties as ®Antifrogen SOL, but is predominantly based on higher boiling glycol, which makes it withstand operating temperatures of up to $200\text{ }^{\circ}\text{C}$ and even extremely high standstill temperatures of up to $270\text{ }^{\circ}\text{C}$ without decomposition. Hence it is particularly suitable for solar systems with a very high thermal load. ®Antifrogen SOL HT also offers a full frost protection up to $-23\text{ }^{\circ}\text{C}$ which will not diminish even after long-standing usage.

Data sheets can be downloaded from our website.



Please note:

- Use only antifreeze-protection which is suitable for solar heating systems
- Materials within the collector-circuit have to be glycol-resistant
- A verification of a labelling and a classification in terms of appendix I Nr. 1.1 the Gef-materialV of the antifreeze-protection material inquired from the producer
- Never use tin in the collector circuit, it will be dissolved by the glycol
- Concentrations of more than 50% of glycol are to be avoided, they can cause damage to the expansion vessel. Higher pump power is required, this unnecessarily reduces the efficiency of the system

Note:

The heat transfer fluids ®Antifrogen SOL and ®Antifrogen SOL HT come as a ready for use mixture and should not be diluted. If a dilution becomes necessary, the manufacturer must be consulted.

Ethylene glycol

Ethylene glycol is a frequently used anti-freeze protection medium (e.g. in the car) with quite good heating transfer qualities. It is offered with additions of corrosion-protection media and would be also suitable for solar heating systems. Unfortunately ethylene glycol is very harmful.

Propylene glycol

Expensive, but non-toxic heating medium on the basis of propylene glycol, additions of (nontoxic) corrosion-protection media added (e.g. Tyfocor® L). The viscosity of propylene glycol is higher (unfavourable) than that of ethylene glycol. The specific heat capacity is smaller (unfavourable).

Tyfocor® L, LS, G-LS and ®Antifrogen SOL, ®Antifrogen SOL HT are not subject to the Ordinance of Hazardous Substances.

Physical and chemical characteristics

Density at 20 °C (concentration 100 Vol-%): approx. 1.055 g/cm³

Tyfocor® L	
Form	liquid
Colour	colourless
Odour	nearly odourless
Cold protection (40 Vol-%)	< -50 °C
Boiling point	-23,7 °C
Flashing point	>150 °C
Density at 20 °C	>100 °C
	approx. 1.055 g/cm ³

Tyfocor® LS	
Form	liquid
Colour	red fluorescent
Odour	product-specific
Cold protection (40 Vol-%)	-28 °C
Boiling point	not allowed
Flashing point	>100 °C
Density at 20 °C	none
	approx. 1.034 g/cm ³

Tyfocor® G-LS	
Form	liquid
Colour	violet
Odour	product-specific
Cold protection (40 Vol-%)	-25 °C
Boiling point	not allowed
Flashing point	>100 °C
Density at 20 °C	none
	approx. 1.030 g/cm ³

®Antifrogen SOL	
Form	liquid
Colour	green
Odour	product-specific
Cold protection (40 Vol-%)	-27 °C
Boiling point	not allowed
Flashing point	>100 °C
Density at 20 °C	none
	approx. 1.065 g/cm ³

®Antifrogen SOL HT	
Form	liquid
Colour	green
Odour	product-specific
Cold protection (40 Vol-%)	-23 °C
Boiling point	not allowed
Flashing point	>100 °C
Density at 20 °C	none
	approx. 1.082 g/cm ³

For continuous operation up to 200 °C, stable up to 270 °C ✓

Tyfocor® L

Canister of 11 kg concentrate

Price bracket A Article-no: 290 000 10

Tyfocor® LS

Canister of 10 l readymix

Price bracket A Article-no: 290 000 20

Tyfocor® G-LS

Canister of 10 l readymix

Price bracket A Article-no: 290 005 50

®Antifrogen SOL

Canister of 10 l readymix

Price bracket A Article-no: 290 016 90

®Antifrogen SOL HT

Canister of 10 l readymix

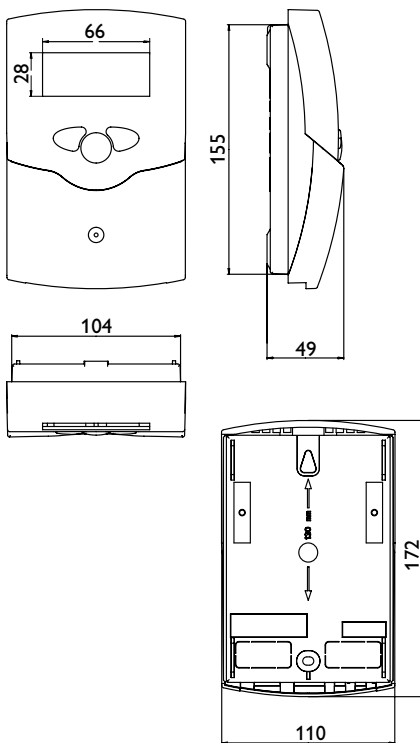
Price bracket A Article-no: 290 017 00



Thermostats, measuring instruments & calorimeters

Thermostats, measuring instruments and calorimeters are important devices for the installer as well as for the end user. A thermostat is an electronic controller which compares the temperature detected by the sensor to the preset value and controls it using actuators, such as pumps and valves, to achieve that value. The purpose of variable controllers for circulation systems is to make warm water available without delay. Furthermore, the RESOL product range includes components such as measuring instruments and calorimeters which can be used separately.

Technical data



The controller can be branded with your own logo.
Please contact our sales team.

Housing: plastic, PC-ABS and PMMA

Protection type: IP 20/DIN 40050

Ambient temperature: 0 ... 40 °C

Measuring range: -40 ... +250 °C

Dimensions: 172 x 110 x 49 mm

Power supply: 220 ... 240 V~

Switching capacity: 1 relay output

Switching current: 4(1) A

Display: LCD-display, multi-functional combined display with pictograms, two 2-digit text fields and two 4-digit 7 segment-displays as well as one bi-coloured LED.

Mounting: wall mounting, mounting into patch panel is also possible

Operation:

by 3 pushbuttons at the front of the housing

Input: 1 temperature sensor Pt1000

Output:

1 standard relay (changeover), potential-free

Adjustment range: -20 ... +150 °C

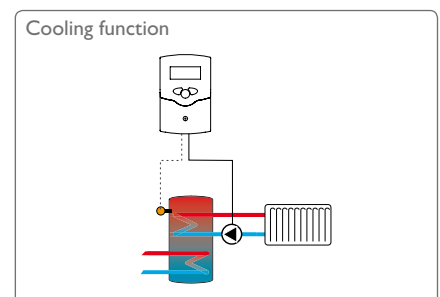
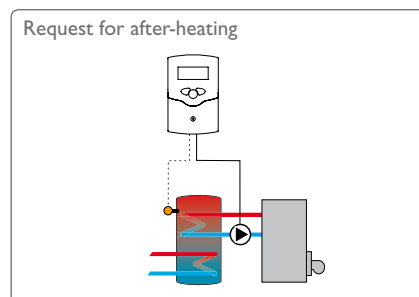
Thermostat TT1



The RESOL thermostat compares the temperature measured by a sensor with the preadjusted switch-on temperature. If this temperature is underrun (heating operation) the relay switches on. If the temperature is exceeded, the relay switches off. Depending on the adjustment of the switch-on and switch-off temperature, the controller operates in heating or cooling operation.

Depending on the application area, all Pt1000-temperature sensors from our product range can be used. Electronic temperature controller (thermostat) with combined LC-display for indication of the actual temperature and adjustment parameters (menu-driven). One temperature sensor from our product range is required (Pt1000, e.g. FKP 6, please order separately).

Examples



RESOL TT1

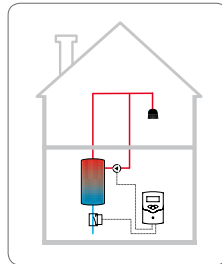
Thermostat

Price bracket A Article-no: 125 110 13

Variable controller for circulation systems EC1



- Energy savings by economic pump control
- Tap station as remote control
- Hot water without delay
- Easy to integrate into existing systems



Variable controller for circulation systems

The purpose of a circulation system is to provide the consumer with hot water as quick as possible when opening the tap. The pipe line system for the supply of domestic water is simultaneously used as a circulation system so that by means of the circulation pump, water is passed through the water pipes even without having to open the tap.

Via a flow switch in the cold water pipe, the unit monitors the water draw off. After opening the tap for a short moment, the circulation pump is switched on and will be switched off again due to the adjusted runtime. The tap operates like a „remote control“. This circulation pump control function is an eco-friendly and energy-saving solution in line with demand.

RESOL EC1 - Full kit

Variable controller for circulation systems with flow switch FS08

Price bracket A Article-no: 136 112 63

Flow switch FS07/FS08

The flow switch FS07/FS08 is used for flow detection and incorporates a „Reed“-contact, which will be closed as soon as the flow rate is larger than 1 litre/min.

Note!

Suitable for vertical installation only.
Please pay attention to the flow direction indicated on the housing!



RESOL FS07

Flow switch (230 V~ version; not for EC1)

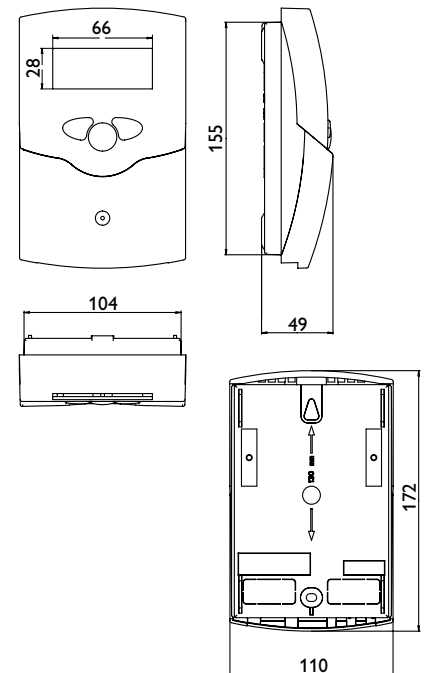
Price bracket A Article-no: 256 011 10

RESOL FS08

Flow switch

Price bracket A Article-no: 256 011 00

Technical data



Housing: plastic, PC-ABS and PMMA

Dimensions: 172 x 110 x 46 mm

Protection type: IP 20/DIN 40050

Display: LCD, multifunctional combined display

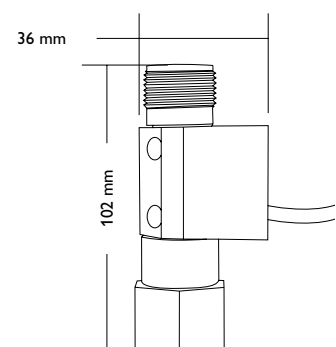
Controller adjustment: menu-driven

Input: 1 sensor input for flow switch

Output: 1 standard relay

Power consumption: approx. 2 VA

Power supply: 220 ... 240 V~



Housing: brass

Dimensions: 102 mm x 36 mm

Temperature range: -30 °C ... 100 °C

Maximum pressure: 10 bar

Switching capacity: 250 VAC / 3 A (FS07)
300 VDC / 1 A (FS08)

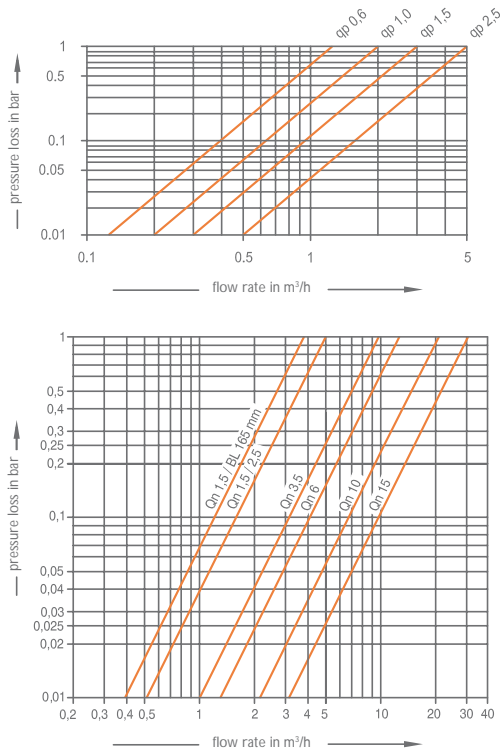
Switching point: 1 litre/min

Connections: IT/OT 3/4", 22 mm flat-sealing

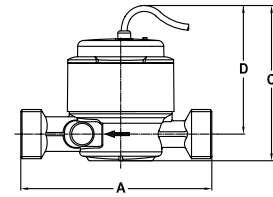
Flowmeter V40



The RESOL V40 is a measuring instrument with a contactor for detecting the flow of water or water-glycol-mixtures and is used with the RESOL calorimeter. It is ready for use in the RESOL calorimeters. After a specific volume has passed, the V40 reed switch sends an impulse to the calorimeter. The heat quantity used is calculated by these impulses, the temperature difference and pre-defined parameters (glycol type, concentration, heat capacity etc.). Delivery includes connecting screw.

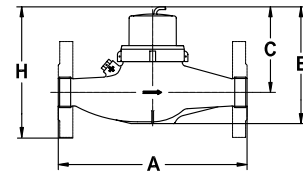


Version 1



Irradiation impeller DN20		0,6; 1,5 m³/h	2,5 m³/h
A	mounting length without screwing	110 mm	130 mm
	mounting with screwing	209 mm	228 mm
C	height with pulser	108 mm	
D	height at centre of pipe	90 mm	
	counter width	72 mm	
	weight without screwing	0,6 kg	0,7 kg
vertical and horizontal mounting is possible			

Version 2



Irradiation impeller DN25/DN32		3,5 m³/h	6,0 m³/h	10 m³/h	15 m³/h
A	mounting length without screwing	260 mm	300 mm		
B	total height	159 mm	185 mm	199 mm	
C	height at centre of pipe	116 mm	139 mm	142 mm	
H	height with flange	168 mm	208 mm	220 mm	
	weight with screwing	3,2 kg	3,5 kg	6,4 kg	7,4 kg
	weight without screwing	2,7 kg	2,8 kg	5,3 kg	5,8 kg
horizontal mounting is possible					

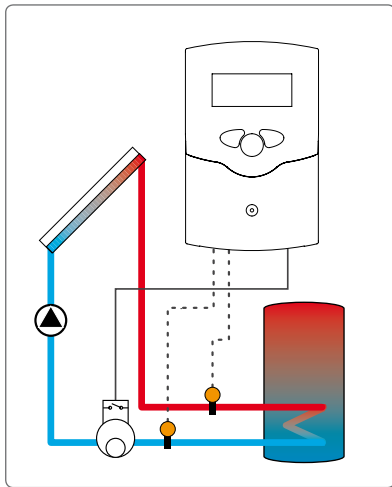
Note:

Version 1 is suitable for horizontal as well as for vertical mounting. Version 2 is for horizontal mounting only.

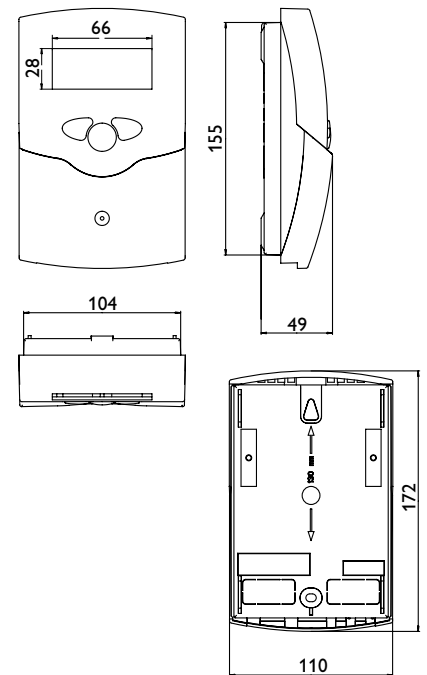
Type		V40-06	V40-15	V40-25	V40-35	V40-60	V40-100	V40-150
Version		1	1	1	2	2	2	2
Impulse rate	l/Imp	1	10	25	25	25	25	25
Nominal width	DN	20	20	20	25	32	40	50
Connection thread at the counter	"	1	1	1	1 ¼	1 ¼	2	2 ¾
Connection thread of the screwing	"	¾	¾	¾	1	1	1 ½	2
Max. operat. pressure	P _{max} bar	16	16	16	16	16	16	16
Max. operat. temp.	T _{max} °C	120	120	120	130	130	130	130
Nominal flow	Q _n m³/h	0,6	1,5	2,5	3,5	6	10	15
Maximum flow	Q _{max} m³/h	1,2	3	5	7	12	20	30
Insulation limit ± 3%	Q _t l/h	48	120	200	280	480	800	1200
Minimum flow horizontal	Q _{min} l/h	12	30	50	70	120	200	300
Minimum flow vertical	Q _{min} l/h	21	60	100	-	-	-	-
Art.-No.		280 01100	28001110	28001120	28001360	28001370	28001380	28001390

All prices are subject to price bracket A

Calorimeter WMZ



Technical data



Universal calorimeter module for solar and heating systems. Graphic display for indication of flow and return temperature, heat quantity, output, flow rate and sensor faults (balance values are also stored in the case of a power failure). Suited for solar systems with propylene-glycol-mixtures of 0 ... 70 Vol%.

Housing: plastic, PC-ABS and PMMA

Protection type: IP 20 / DIN 40050

Ambient temp.: 0 ... 40 °C

Display: Graphic display as well as bi-coloured LED-display

Power supply: 220 ... 240 V~

Power consumption: approx. 2 VA

Settings:

- **Volumetric content of glycol:** 0 ... 70% (1% - steps)
- **Impulse rate of flow rate:** 0 ... 99 l/Imp (1 l/Imp - steps) for RESOL V40 flowmeter

Temperature measurement:

RESOL Pt1000 sensors only

Temperature measurement: ± 0,3 K

Measuring range: -30 ... +150 °C

Interface: RESOL VBus®

T-piece sensor

(Please see page 68 for further information)



RESOL T22

T-piece sensor 22 mm with FKP 5,5 temperature sensor and TH30 immersion sleeve

Article-no: 155 005 80

RESOL T28

T-piece sensor 28 mm with FKP 5,5 temperature sensor and TH30 immersion sleeve

Article-no: 155 005 90

All Prices are subject to price bracket A

RESOL WMZ - Full kit

Calorimeter module incl. 2 temp. sensors Pt1000 (2 x FRP45) and flowmeter V40-0,6

Article-no: 135 304 13

as above, but with V40-1,5 flowmeter

Article-no: 135 304 23

as above, but with V40-2,5 flowmeter

Article-no: 135 304 33

as above, but with V40-3,5 flowmeter

Article-no: 135 305 03

as above, but with V40-6,0 flowmeter

Article-no: 135 305 13

as above, but with V40-10 flowmeter

Article-no: 135 305 23

as above, but with V40-15 flowmeter

Article-no: 135 305 33

All Prices are subject to price bracket A

RESOL WMZ

Calorimeter module incl. power supply

Price bracket A **Article-no:** 135 303 53



WMZ-kit 1

V40-0,6 flowmeter incl. 2 sensors Pt1000
(2 x FRP30)

Article-no: 290 006 10

WMZ-kit 2

as above, but with V40-15 flowmeter

Article-no: 290 006 20

WMZ-kit 3

as above, but with V40-25 flowmeter

Article-no: 290 006 30

WMZ-kit 4

as above, but with V40-35 flowmeter

Article-no: 290 013 60

WMZ-kit 5

as above, but with V40-60 flowmeter

Article-no: 290 013 70

WMZ-kit 6

as above, but with V40-100 flowmeter

Article-no: 290 013 80

WMZ-kit 7

as above, but with V40-150 flowmeter

Article-no: 290 013 90

All Prices are subject to price bracket A

Examples of connection**Cascade without controller****Cascade with controller**

The connection sequence at the VBus® is arbitrary.

Mini digital thermometer RTM1



Battery-operated mini digital thermometer with connected measuring sensor for universal application.

RESOL RTM1

Mini digital thermometer

Price bracket B Article-no: 236 000 20

Technical data

Colour: black

Dimensions: 48 x 28,6 x 14 mm (W x H x D)

Display: 3-digit LC-display, continuous indication

Measuring range: -50 ... +95 °C

Resolution: 0,1 °C

Precision: +/- 1 °C

Measuring rate: 10 seconds

Measuring sensor:

2,0 m connection cable (non extendable)

Incl. battery: G10X1PC

Tip:

Put several digital thermometers in the storage insulation so that you can always read out different temperatures of the storage.

Refractometer



Test set with precise refractometer for exact determination of the propylene- and ethylene-glycol proportion in the heat transfer fluid of the solar system. Additional scale for battery acid.

Refractometer set

Price bracket B Article-no: 280 009 60

Content of the refractometer set

- Padded plastic box
- Protective bag
- Refractometer with measuring scale for propylene-, ethylene-glycol and battery acid
- Pipet for sampling
- Mini screwdriver

Dimensions: 27 x 40 x 155 mm

Weight: 180 g

Content of the test box

- Test and indication badges
- Compass
- pH-test strips
- Screwdriver with voltage control
- Mini screwdriver
- Manometer
- Handheld refractometer
- Digital multimeter

**Test box**

Solar systems reach an increasingly high degree of efficiency but in many cases they can still further increase their efficiency through regular and professional maintenance. The test box is a professional service box for checking solar thermal systems quickly and easily. Problems affecting system operation can be detected reliably with the help of these measuring and testing devices.

**Test box**

Price bracket B **Article-no: 290 009 20**

Test and indication badges (25 pieces)

Price bracket C **Article-no: 290 000 60**

pH-test strips (84 pieces)

Price bracket C **Article-no: 290 001 10**



Sensors

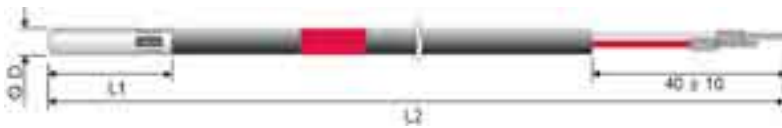
Sensors are used to detect certain quantities such as temperature and irradiation. Platinum sensors, which change their electrical resistance proportionally to the temperature, are used for temperature measurements. The sensor type is indicated by the third letter "P", for example: FKP or FRP. FK designates the sensor of the heat source (e.g. collector sensor) and FR the reference sensor (e.g. storage sensor). These sensor types have the same electrical features. They differ only in the connecting cable.

Temperature sensors

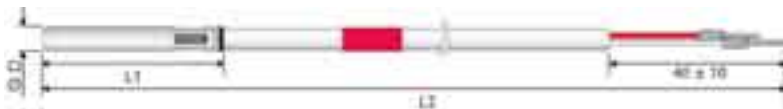
(for installation into immersion sleeves)



	D [mm]	L1 [mm]	L2 [mm]	Material	Application range	Temperature range	Article-no
FKP4	4	40	1000	Silicone cable	Collector	-50 ... +180 °C	155 000 10



	D [mm]	L1 [mm]	L2 [mm]	Material	Application range	Temperature range	Article-no
FKP5,5	5,5	28	1500	Silicone cable	Collector	-50 ... +180 °C	155 003 10
FRP5,5	5,5	28	2500	PVC-cable	Storage	-10 ... +80 °C	155 003 20

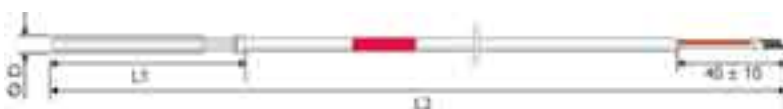


	D [mm]	L1 [mm]	L2 [mm]	Material	Application range	Temperature range	Article-no
FRP6	6	45	2500	PUR-cable	Storage	-10 ... +80 °C	155 000 80
FKP6	6	45	1500	Silicone cable	Collector	-50 ... +180 °C	155 000 20
FKP6	6	45	2500	Silicone cable	Collector	-50 ... +180 °C	155 004 40
FKP6	6	45	5000	Silicone cable	Collector	-50 ... +180 °C	155 004 50
FKP6	6	45	10000	Silicone cable	Collector	-50 ... +180 °C	155 004 60

The standard temperature sensors for collectors and storages are printed in bold.

High temperature sensors

(for temperatures up to 300 °C) Pt1000 version



	D [mm]	L1 [mm]	L2 [mm]	Material	Application range	Temperature range	Article-no
FKP4/H	4	40	1000	PTFE cable	Collector	-50 ... +250 °C	155 001 10
FKP6/H	6	46	1500	Silicone cable	Collector	-50 ... +230 °C	155 001 20

Note: The temperature range refers to the insulation of the sensor cable!



Further lengths are available on request!

Flatscrew sensors

(for installation on plane surfaces) Pt1000 version



	L1 [mm]	L2 [mm]	Material	Application range	Temperature range	Article-no
FKP9	32	1500	Silicone cable	Collector	-50 ... +180 °C	155 003 60
FRP9	32	2500	PVC-cable	Storage	-10 ... +80 °C	155 003 70

Cylindrical clip-on sensors

(for surface mounting on tubes, incl. pipe-clip) Pt1000 version



	L1 [mm]	L2 [mm]	Material	Application range	Temperature range	Article-no
FKP21	39	1500	Silicone cable	Collector	-50 ... +180 °C	155 003 30
FRP21	39	2500	PVC-cable	Storage	-10 ... +80 °C	155 005 40

Complete sensors

(Temperature sensors completed with immersion sleeve and strain relief)

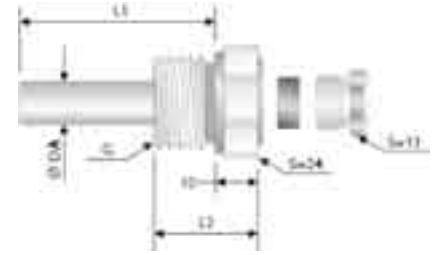
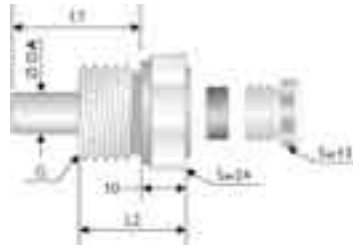
	Sensor	Immersion depth [mm]	Material	Temperature range	Article-no
FKP30	FKP5,5	30	Brass	-50 ... +180 °C	155 001 90
FRP30	FRP5,5	30	Brass	-5 ... +80 °C	155 002 80
FKP45	FKP6	45	Brass	-50 ... +180 °C	155 002 00
FRP45	FRP6	45	Brass	-5 ... +80 °C	155 002 10
FKP60	FKP6	60	Copper	-50 ... +180 °C	155 002 20
FRP60	FRP6	60	Copper	-5 ... +80 °C	155 002 30
FKP100	FKP6	100	Copper	-50 ... +180 °C	155 002 40
FRP100	FRP6	100	Copper	-5 ... +80 °C	155 002 50
FKP150	FKP6	150	Copper	-50 ... +180 °C	155 002 60
FRP150	FRP6	150	Copper	-5 ... +80 °C	155 002 70
FKP30V	FKP6	30	Stainless steel	-50 ... +180 °C	155 006 60
FRP30V	FRP6	30	Stainless steel	-5 ... +80 °C	155 006 70
FKP60V	FKP6	60	Stainless steel	-50 ... +180 °C	155 003 80
FRP60V	FRP6	60	Stainless steel	-5 ... +80 °C	155 003 90
FKP100V	FKP6	100	Stainless steel	-50 ... +180 °C	155 004 00
FRP100V	FRP6	100	Stainless steel	-5 ... +80 °C	155 004 10
FKP150V	FKP6	150	Stainless steel	-50 ... +180 °C	155 004 20
FRP150V	FRP6	150	Stainless steel	-5 ... +80 °C	155 004 30



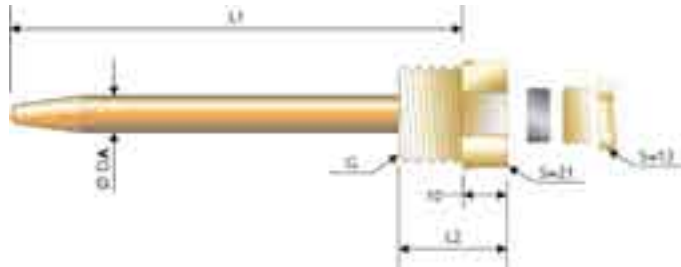
Immersion sleeves

(brass, copper or stainless steel)

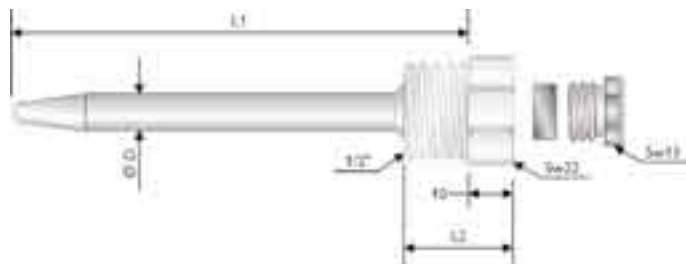
Because of the short component length, it is recommended to use the immersion sleeve TH30 with the temperature sensor FKP5,5 or FRP5,5.



	DA [mm]	DI [mm]	L1 [mm]	L2 [mm]	G [mm]	Material	Article-no
TH30	9	6,2	30	23	½	Brass	280 005 60
TH45	10	6,2	45	23	½	Brass	280 000 30



	DA [mm]	DI [mm]	L1 [mm]	L2 [mm]	G [mm]	Material	Article-no
TH60	8	6,2	60	23	½	Copper	280 000 40
TH100	8	6,2	100	23	½	Copper	280 000 50
TH150	8	6,2	150	23	½	Copper	280 000 60
TH200	8	6,2	200	23	½	Copper	280 000 70
TH300	8	6,2	300	23	½	Copper	280 000 90



	DA [mm]	DI [mm]	L1 [mm]	L2 [mm]	Material	Article-no
TH30V	8	6,2	30	23	Stainless steel	280 012 30
TH45V	8	6,2	45	23	Stainless steel	280 010 20
TH60V	8	6,2	60	23	Stainless steel	280 001 00
TH60V/4 (for high temperature sensors KP4/H)	5	4,2	60	23	Stainless steel	290 002 20
TH100V	8	6,2	100	23	Stainless steel	280 002 10
TH100V/4 (for high temperature sensors KP4/H)	5	4,2	100	23	Stainless steel	290 002 30
TH150V	8	6,2	150	23	Stainless steel	280 002 20
TH200V	8	6,2	200	23	Stainless steel	280 002 30

T-piece sensor

T-piece sensor for mounting into pipes. The T-piece sensor in the immersion sleeve measures the temperature of the circulation medium.



RESOL T22

T-piece sensor 22 mm with FKP 5,5 temperature sensor and TH30 immersion sleeve

Price bracket A Article-no: 155 005 80

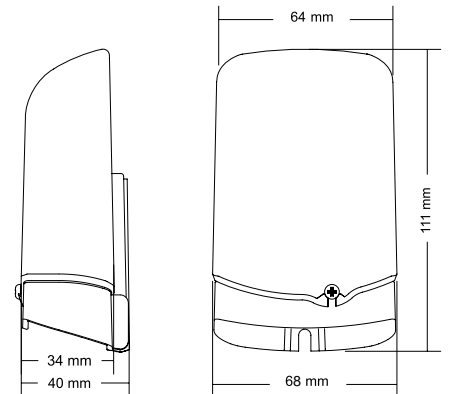
RESOL T28

T-piece sensor 28 mm with FKP 5,5 temperature sensor and TH30 immersion sleeve

Price bracket A Article-no: 155 005 90

Overvoltage protection SP10

Overvoltage protection device placed in housing with outstanding design, suitable for mounting outdoors. We generally recommend installing the overvoltage protection in order to avoid overvoltage damage at collector sensors, e.g. caused by local lightning storms.



RESOL SP10

Sensor-overvoltage protection

Price bracket A Article-no: 180 110 70

Indoor temperature sensor

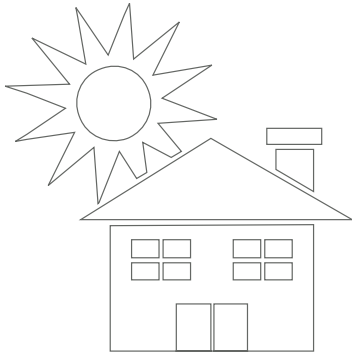
(for installation on planar surfaces) Pt1000 version



RESOL FRP11

Indoor temperature sensor

Price bracket A Article-no: 155 003 00



Solar cell CS10

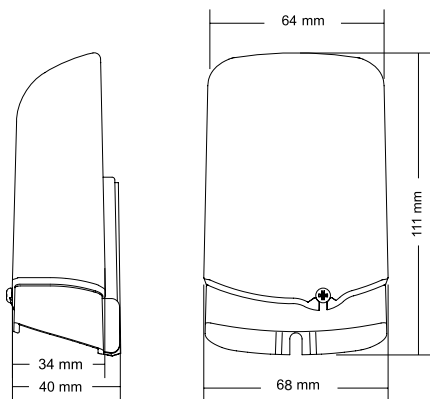
The solar cell is used for measuring the irradiation intensity. The short-circuit current rises with increasing irradiation intensity. Depending on the controller, the sensor can also be used for additional plausibility control or direct control. The connecting cable can be extended to 100 m.



RESOL CS10

Solar cell

Price bracket A Article-no: 151 003 20



Outdoor temperature sensor

(for installation on plane surfaces) Pt1000 version

The FAP13 is used for measuring the outdoor temperature with a platinum measuring element. The FAP13 is placed in a weather-resistant housing with outstanding design and is designed for mounting outdoors. Cable glands for the sensor cables at the bottom of the housing allow easy installation.



RESOL FAP13

Outdoor temperature sensor

Price bracket A Article-no: 155 008 10

Heat conductive paste

For installation of sensors (as flatscrew or pipe sensor) into the immersion sleeves, the heat conductive paste has to be used for a good heat transfer.



RESOL Heat conductive paste

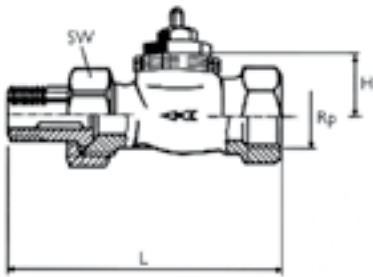
Price bracket A Article-no: 280 000 10



Valves

Valves are used to control fluid flow. In hydraulic systems, different valves are used in order to run parts of the system separately or to switch on or off particular parts as required. 2-port valves allow or stop flow rates. Change-over valves are used to distribute and redirect flow rates. In order to avoid noise pollution and system damage, there is no back stroke.

Technical data

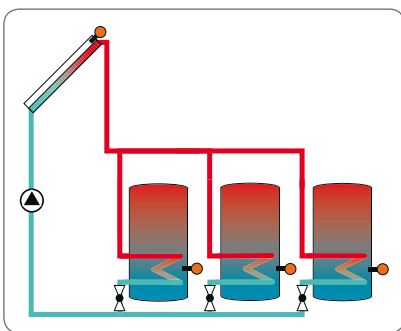


DN	15	20	25	32
L	95	106	118	135
H	21,5	21,5	23	23
Rp	1/2	3/4	1	1 1/4
SW	30	37	47	52

Valve housing: Corrosion resistant red brass
Internal parts: Brass and stainless steel
Sealings: EPDM
Max. pressure: 10 bar
Connection thread: 1/2", 3/4", 1" and 1 1/4"
Temperature range: Temperature resistant up to +120°C, for a short term up to +140°C

Actuator

Power supply: 220 ... 240V~
Power consumption: max. 2,5 W
Ambient temperature: max. 50 °C
Protection type:
 IP 44 vertical
 IP 42 horizontal
Spring force: 120 N
Stroke: 4 mm



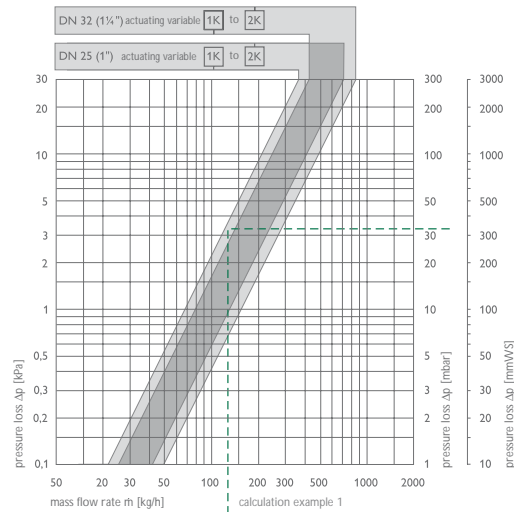
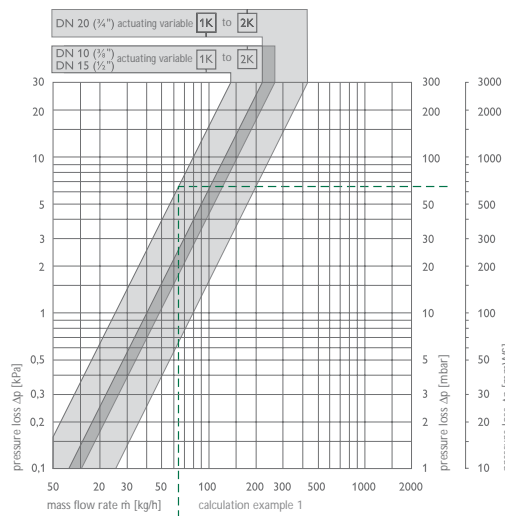
Note:
 Actuator is suitable for VA20 and VA300 valves

Actuator VA20/VA300

Price bracket A Article-no: 290 011 00

2-port valve VA20

In its initial state, the valve RESOL VA20 is closed when currentless. The initial state can easily be inverted. The valve is operated by an electro-thermal actuator (with manual emergency operation) and has an operation time of approximately 3 min. This way there is no blow-back within the tube system throughout flow rate regulation. RESOL VA20 valve comes with connection screws made of brass.



RESOL VA20-DN15

R 1/2", with actuator
 Price bracket A Article-no: 270 005 00

RESOL VA20-DN20

R 3/4", with actuator
 Price bracket A Article-no: 270 005 10

RESOL VA20-DN25

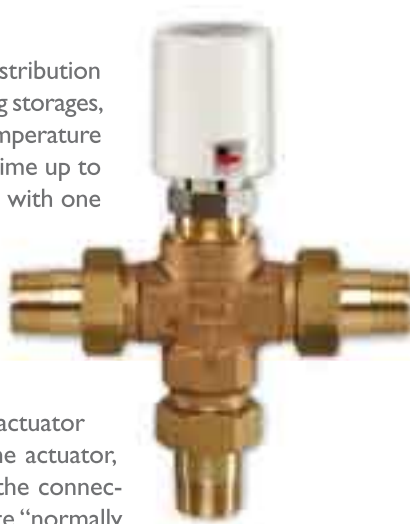
R 1", with actuator
 Price bracket A Article-no: 270 005 20

RESOL VA20-DN32

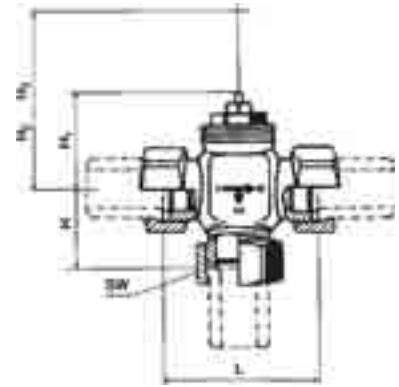
R 1 1/4", with actuator
 Price bracket A Article-no: 270 005 30

Changeover valve VA300

The 3-port valve RESOL VA300 is used for distribution of flow rates of bivalent heat sources or heating storages, e.g. in the solar and heat pump technology (temperature of the media: up to 120 °C, only for a short time up to 140 °C). The valve RESOL VA300 is equipped with one input and two outputs. The influx is changed over to one of the two outputs in accordance with the position of the valve spindle. The positioning is effected by an electrothermal actuator (with manual emergency operation). The straight interconnection is normally closed whereas the connection opposite of the actuator is open. During the current flow through the actuator, the straight interconnection is opened and the connection opposite the actuator is closed. The state "normally closed" can be easily changed to "normally open". Because of the smooth adjustment there are no water hammers in the system and the flow rate remains constant. The 3-port valves RESOL VA300 are supplied with thread sockets made of brass.



Technical data



DN	20	25	32	40
L	64	84	115	115
H	36	46	106	106
H ₁	44,5	50	64	64
H ₂	114,5	120	-	-
H ₃	93	98,5	-	-
SW	37	47	66	66

H₂ = Height with thermostat head K
H₃ = Height with thermal solar accuator EMOT

Valve housing: Corrosion resistant red brass

Internal parts: Brass and stainless steel

Sealings: EPDM

Max. pressure: 10 bar

Connection thread: ¾", 1", 1¼" and 1½"

Temperature range: Temperature-resistant up to +120 °C, for a short-term up to +140 °C

Actuator

Power supply: 220 ... 240 V~

Power consumption: max. 2,5 W

Ambient temperature: max. 50 °C

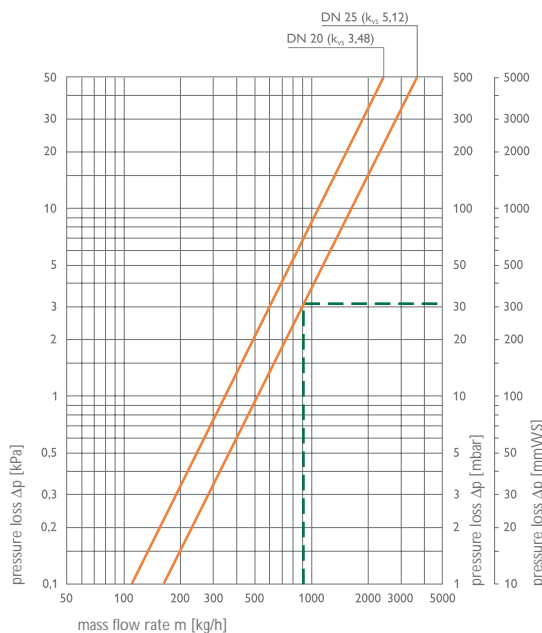
Protection type:

IP 44 vertical

IP 42 vertical

Spring force: 120 N

Stroke: 4 mm



RESOL VA300-DN20

R¾", with actuator

Price bracket A Article-no: 270 005 40

RESOL VA300-DN25

R1", with actuator

Price bracket A Article-no: 270 005 50

RESOL VA300-DN32

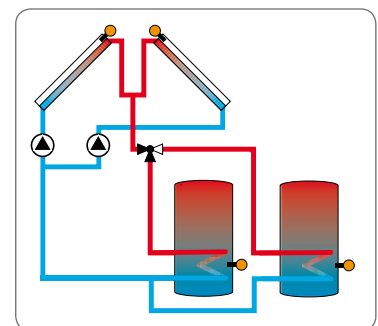
R1¼", with actuator

Price bracket A Article-no: 270 005 60

RESOL VA300-DN40

R1½", with actuator

Price bracket A Article-no: 270 005 70



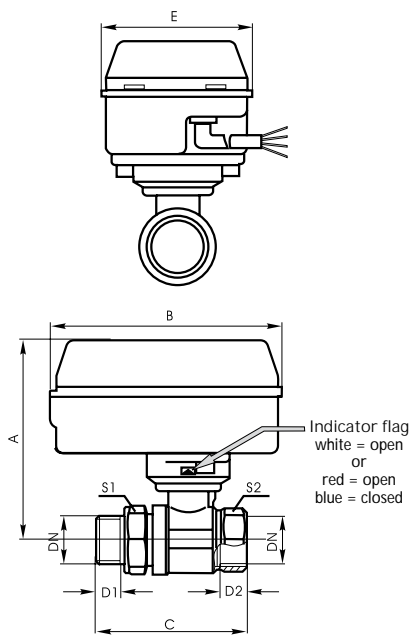
Note:

Actuator is suitable for VA20 and VA300 valves

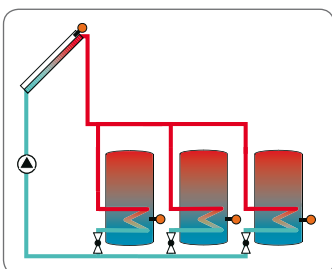
RESOL actuator VA20/VA300

Price bracket A Article-no: 290 011 00

Technical data

**Actuator****Operating voltage:** 230V~**Motor:** Synchronous motor**Load for limit switch:**

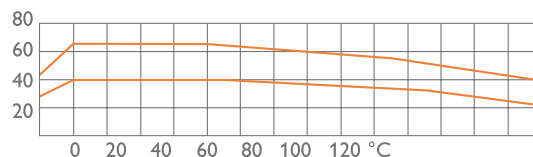
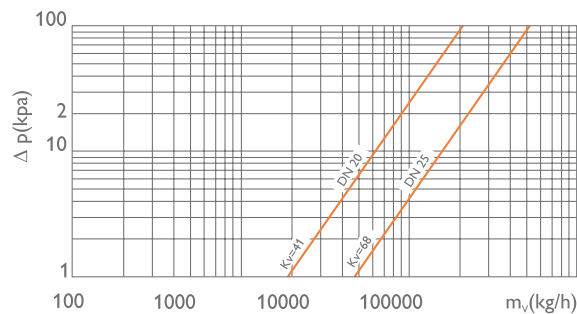
5 (1) A, 240V~

Power consumption: 7,5VA max.**Insulation class:** II insulated**Protection type:** IP44**Actuation time:** 30s / 90°**Operation mode:** open - closed**Ambient temperature:** 0 ... +50 °C**Torque:** 6 Nm (max. 8 Nm)**Electrical connection:** 4 x 0,5 mm²**Valve****Max. operating temperature:** 0 °C ... +120 °C**Nominal pressure:** PN 15 (max. PN 16)**Valve connection:** IT on both sides**Flow:** Full flow, according to nominal width NW.**Valve:** Pressed brass (CuZn40Pb2)**Valve connection:** Brass (CuZn40Pb2)**Valve spindle:** Brass (CuZn40Pb2)**Valve ball:** Brass, hard-chromium-plated**Ball sealing:** PTFE-ring teflon sealing**Spindle sealing:** 1 x O-ring EPDM, 1 x O-ring Viton and 1 x O-ring PTFE**Sealing spindle to valve:** 1 x O-ring EPDM, the axial stress between valve spindle and slot is compensated by another sealing.**2-port motor-driven ball valve VA22****Application area:**

The 2-port motor-driven ball valve RESOL VA22 is produced according to international standards and offers universal application possibilities in heating, warm water, solar and irrigation systems. A large number of application possibilities in the field of energy distribution is provided to the user.

Characteristics:

Compact size, modern design, insulated actuator housing. Simple manual control for commissioning or emergency operation. Universal electrical connection by integrated relay (220 ... 240V~). The control is effected via an on-off contact. The limit switch signal output can be used for control purposes (max. 1 A). The position of the ball valve is visible with the indicator flag (white). The actuator can be replaced quickly without demounting of the valve. No flow reduction, full flow according to the versions DN25 and DN32.



DN	20	25
A	108	110
B	125	125
C	90,5	105
D1	13	14
D2	12,3	14
E	78	78
S1	37	47
S2	31	38

RESOL VA22-DN20R³/₄" , Motor-driven ball valve

Price bracket A Article-no: 270 001 70

RESOL VA22-DN25

R1" , Motor-driven ball valve

Price bracket A Article-no: 270 001 80

RESOL VA22-DN32R1¹/₄" , Motor-driven ball valve

Price bracket A Article-no: 270 003 90

3-port motor-driven valve VA32



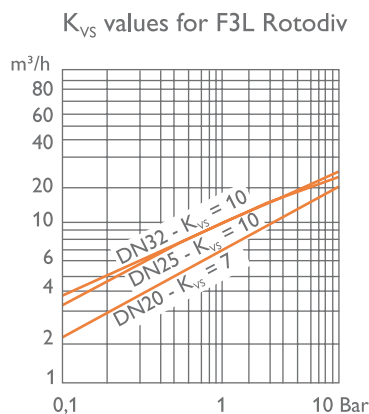
Application area:

The 3-port motor-driven valve VA32 is used in solar and heating systems, in which smaller parts of systems can be separately controlled or single equipment can be switched on or off.

Characteristics:

Compact size, modern design, insulated actuator housing. Simple manual operation for commissioning or emergency operation. Electrical universal connection by integrated relay. The control is effected by an on-off contact. The limit switch signal output can be used for control purposes (max. 1 A). Position of the ball valve is visible with the indicator flag (white). The actuator can be quickly replaced without disassembly of the valve. No flow reduction, full flow according to the versions DN20-DN32.

DN	20	25	32
A	¾"	1"	1¼"
B	72	90	90
C	18,5	24	24
D	116	122	122
E	54	69	69



RESOL VA32-DN20

R¾", Changeover motor-driven valve

Price bracket A Article-no: 270 001 90

RESOL VA32-DN25

R1", Changeover motor-driven valve

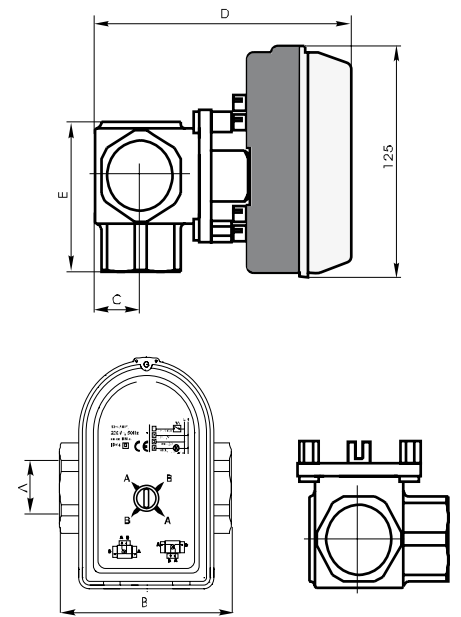
Price bracket A Article-no: 270 002 00

RESOL VA32-DN32

R1¼", Changeover motor-driven valve

Price bracket A Article-no: 270 003 10

Technical data



Actuator

Operating voltage: 230V~

Power consumption:

Standby 3 VA, otherwise 7,5 VA

Protection type: IP 44 (EN60335-1)

Safety class: II (IEC529)

Limit switch: 5 (1) A, 240 VA

Connection line: 4 x 0,5 mm², L = 2 m

Regulating angle: 90°

Actuation time: 18 s / 90°

Torque: 6 Nm (max. 8 Nm)

Ambient temperature: -10 °C ... +60 °C

Load of the limit switch: 5 (1) A, 240 V

Operation mode: open - closed

Valve

Max. operating temperature: 0 °C ... +110 °C

Max. operating pressure: 6 bar

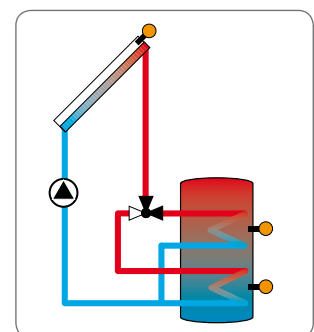
Housing: forged brass

Rotor with the axle: brass

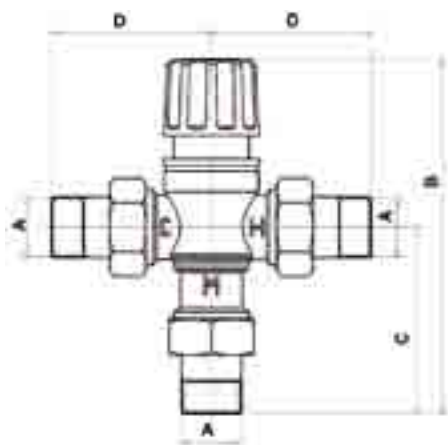
Axle sealing: 4 x O-Ring, EPDM

Possibility of motor control: UV-3

For reduction of axle friction: PA-plate



Technical data



A	R 3/4"
B	149 mm
C	81,5 mm
D	70 mm

Housing: dezincification-resistant brass

Guide component: PTFE

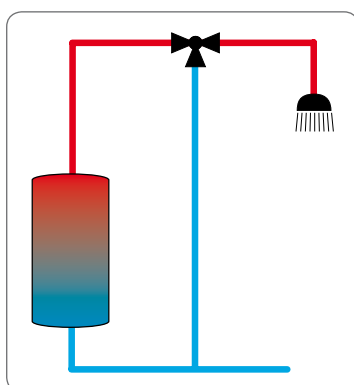
Internal seal: EPDM

External seal: asbestos-free, flat-sealing

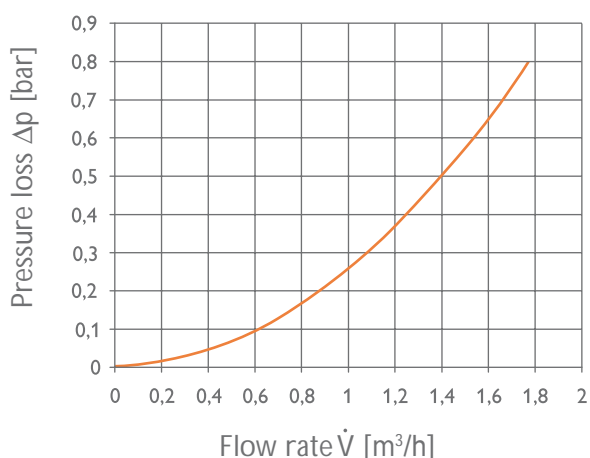
Operating pressure: max. 10 bar

Max. hot water temperature: max. 90 °C

Adjustment range: 35 ... 65 °C



Domestic water mixer valve MA10 (scald protection)



One-hand domestic water mixer valve for installation into hot water circuits as scald protection.

Application:

Domestic water mixer for an independent regulation and limitation of the domestic water temperature without auxiliary energy, continuously adjustable between 35 °C and 65 °C. PN 10 bar, entrance temperature 90 °C.

Installation:

In systems with stub or circulation pipes with screwed or soldered connections (according to scheme), any installation position is possible.

H = hot water connection

C = cold water connection

RESOL MA10

Domestic water mixer valve

Price bracket A Article-no: 280 013 40

Reducing bushes

OT 3/4", Set of 3 units for MA10

Price bracket A Article-no: 280 013 50

Spare fuses

10 Spare fuses

Spare fuses

Bag with fuses, 10 x T1,6 A

Price bracket A Article-no: 280 001 10

Spare fuses

Bag with fuses, 10 x T4 A

Price bracket A Article-no: 280 001 20

Spare fuses

Bag with fuses, 10 x T6,3 A

Price bracket A Article-no: 290 004 70

Spare fuses set 4

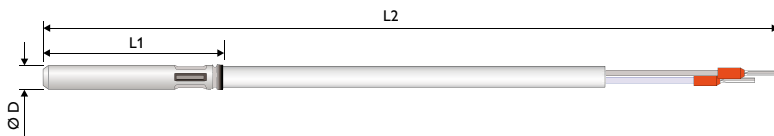
Bag with 5 x can fuse 1,6 A, 5 x can fuse 4,0 A, 5 x can fuse 6,3 A, 5 x glass fuse 4,0 A

Price bracket A Article-no: 290 007 70



Semiconductor sensors

(Spare part for older product series)



	DA [mm]	L1 [mm]	L2 [m]	Material	Application range	Temperature range	Article-no
FRY6	6	45	2,5	PVC-cable	storage	-5 ... +80 °C	151 000 80
FKY6	6	45	1,5	Silicone cable	collector	-50 ... +180 °C	151 000 20

Legend

Temperature sensor	Return	Storage	Heating circuit	Draw off
Pump	3-port-mixer	Flowmeter	Combined storage	Flow switch
Collector	3-port-valve	4-port-mixer	Solid fuel boiler	After-heating
Flow	2-port-valve	Swimming-pool	External heat exchanger	Burner

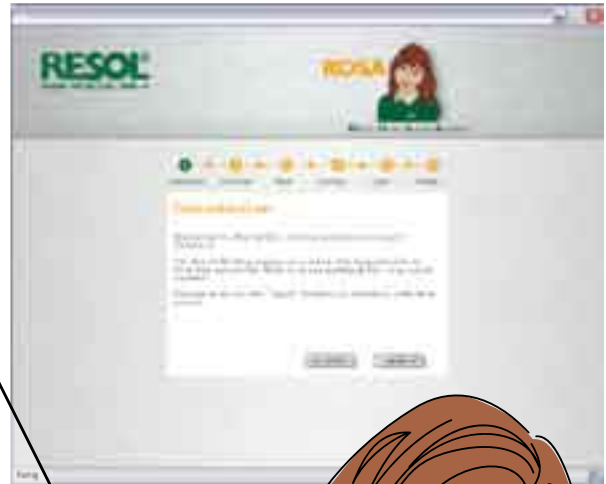
Indication:

Please pay attention to the installation position of the valves!

The installation positions shown in the systems can differ from the prescribed positions of the RESOL product range.

Hello,

I'm ROSA. I will help you to find the right controller to suit your solar or heating system. Furthermore, I can give you important information about the controller set values and the optimal use of the system. You can visit me under www.resol.com/rosa. There, I can provide you with information 24 hours a day. I will ask you for information about the structure of the system, for example the number of collector fields and storages. The structure of the heating system will then be analysed. After that, one or several hydraulic schemes will be represented along with the appropriate controller. The connection will also be shown. Furthermore, there is a link to a pdf document with additional information about the parts list, the connection and the set values of the controller.



RESOL Online System Assistant
www.resol.de/rosa

RESOL on the Internet

It's quite simple. On the RESOL WebPages we provide the opportunity to download the evaluation software for our controller systems, so that you are always up on function and operating status of our controllers. You don't have the manual of your controller at your fingertips? No problem: please visit our WebPages and click on "services" where you will find all manuals as a pdf-file for free download.

Training courses

RESOL offers you the possibility to participate in training courses on our products. For more information on dates and contents please visit our website www.resol.com or contact us directly.

Product labelling

Give your face to our products. RESOL offers you the possibility to individualize your controllers.

The housings of the controllers and modules can be branded with your own logo (prices depend on purchase quantity. Please contact our sales team). We will always be at your disposal for any further questions

Please give us a call.

Or do you need more precise information on a product in this catalogue? You will also find the information required at www.resol.com. We hold all data sheets with technical information about the RESOL products ready for free download. Our customer service will be glad to be at your disposal by phone for any further information.

Delivery and environment

On request, we are prepared to send our products in environmental-friendly returnable boxes. Please contact our sales team.

Note

All data mentioned in this catalogue correspond to the current standard of knowledge during printing, February 2009. The data are correct to the best of our knowledge. As faults can never be excluded, no liability is assumed for incorrect information.

Subject to change of product range. The products shown represent some examples - the illustrations may differ from the original product in shape and colour.

General Terms and Conditions

1. Valid area- Part of contract

RESOL - Elektronische Regelungen GmbH (in the following only RESOL) always delivers on the basis of the following regulations, which are valid in the following order:

1.1 individual, written agreement with the contracting parties;

1.2 RESOL - delivery and payment conditions as written down in this price list;

1.3 International trade: deliveries are effected on the basis of the current INCO-TERMS

1.4 the „General conditions of ZVEI for products and services of the electrical industry“ (current version).

RESOL - delivery and payment conditions are also valid for all future business with contracting parties.

2. Prices and delivery

Prices: Our prices are quoted ex works plus VAT for deliveries within Germany. Deliveries within the EU (Intra commerce) are only delivered VAT-free, if the valid sales tax identification number is presented with order. Our return delivery and payment conditions are valid. The prices of this price list are valid until a new price list is issued. Errors excepted. We have to charge a handling fee of 5,00 Euros for deliveries to a delivery address differing from the billing address.

Packaging: we only calculate prime costs for packaging. We preferably use biologically degradable materials, e.g. packing chips made of starch and recycled paper. On request, we can also send you our products in environmentally sound reusable boxes, which must be returned to us without causing RESOL any costs.

Delivery: For domestic orders, if no alternative mode of despatch has been agreed upon, our products will be sent by DHL (parcels up to 30 kg) or by a forwarding agency (parcels heavier than 30 kg).

2.1 Returns of products

Replacement deliveries are not free of charge. We decline the acceptance of unstamped return deliveries. Return deliveries without fault report, copy of invoice, delivery note and a legally valid signature cannot be accepted.

3. Conditions of payment

If no other terms of payment have been agreed upon, all our invoices have to be settled within 30 days net from the date of invoice or the information that the goods are ready to despatch. Settlement can be effected in cash or by wire transfer without any discount. If there is no other information, the date of invoice is also the date of delivery.

We reserve the right to limit the supply of new customers in Germany to certain payment methods (cash on delivery or bank withdrawal). In the case that you authorize us to debit the invoice amount to your account (possible in Germany only), we debit the invoice amount with a 3% discount 8 days from the date of invoice from your account. We ask our customers in Switzerland to generally pay into our foreign account.

The payments are settled with the oldest invoice. Bills of exchange are only accepted for payment and only against reimbursement of the discount and bank fees, credit notes for B/E are only valid for cashing. Loading and keeping back are only allowed for those demands of RESOL contracting parties, which have been accepted by RESOL in written form or have been established in a legally valid form.

In the case of default, RESOL will charge default interests of 4% above the rate of discount of the Deutsche Bundesbank. RESOL reserves the right to inform the credit insurer about the default.

4. Liability for faults

The contracting party can only ask for liability if they have properly fulfilled their due verification and rebuke obligations according to §§ 377, 378 HGB. Period of liability is 24 months from delivery date according to the General Conditions of the ZVEI. Further claims of the contracting party for resultant damages, mounting costs and lost gain are generally excluded.

5. Retention of title

The retention of title follows the „General conditions for products and services of the electrical industry“ (valid version at time of contract), as well as the additional clause „extended retention of title“ dated June 1999.

In the case of non-compliance with the conditions of payment or of circumstances which diminish the creditworthiness of the contracting party or the responsible persons, RESOL shall at any time be entitled to enter upon the premises of the contracting party and to repossess the RESOL-products. The value of utilization and the necessary measures to ensure that the goods are in adequate form will be taken into account to the cost of the contracting party. The resale of the products will be prohibited based on retention of title and RESOL shall be entitled to demand the announcement of the credit businesses.

6. Applicable law

Only German law is applicable on this contract - with the exception of the UN-sales rights.

7. Written form

Changes or supplements to this contract and to these clauses must be made in a written form.

8. Other agreements

According to § 26 BDSG RESOL informs, that the data of the contracting party, as far as necessary, are stored in the data processing system.

If one or more regulations of this contract are invalid, the effectiveness of the total contract is not affected. The parties are obliged to substitute ineffective regulations by economically useful regulations.

This price list is valid from the 01.03.2009 until a new price list is issued. Errors excepted!

Please note: Our products are in accordance with the current relevant prescriptions of the Federal Republic of Germany and the European Union for protection of the environment and health.

Our products are assembled of electronical components and printed circuit boards, which means that they contain several different hazardous substances. For that reason it is absolutely necessary to dispose of them as hazardous waste. If desired, we take old appliances back for an environmentally sound disposal. If the appliances are returned cost-free, we dispose of them free of charge for you. Appliances which are not produced by RESOL can only be disposed of against payment.

Our data sheets and price list are printed on chlorine free paper. Because of permanent technical innovations we reserve the right not to publish every modification immediately.

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Here you can find the right contact person at RESOL to answer your questions

For further questions concerning our products, our technical support staff are at your disposal. For orders or questions concerning order transaction as well as delivery times, please contact our sales team.

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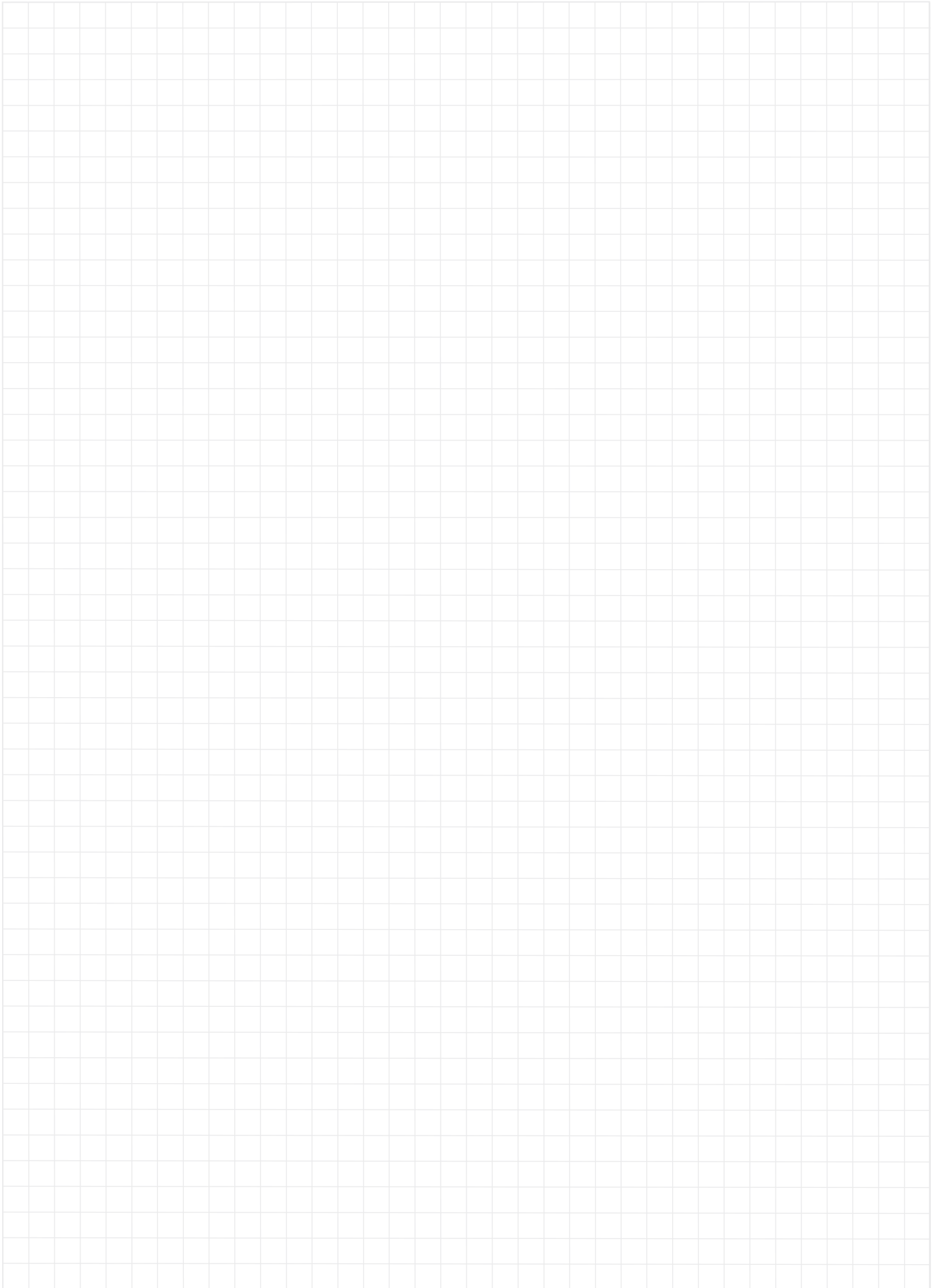
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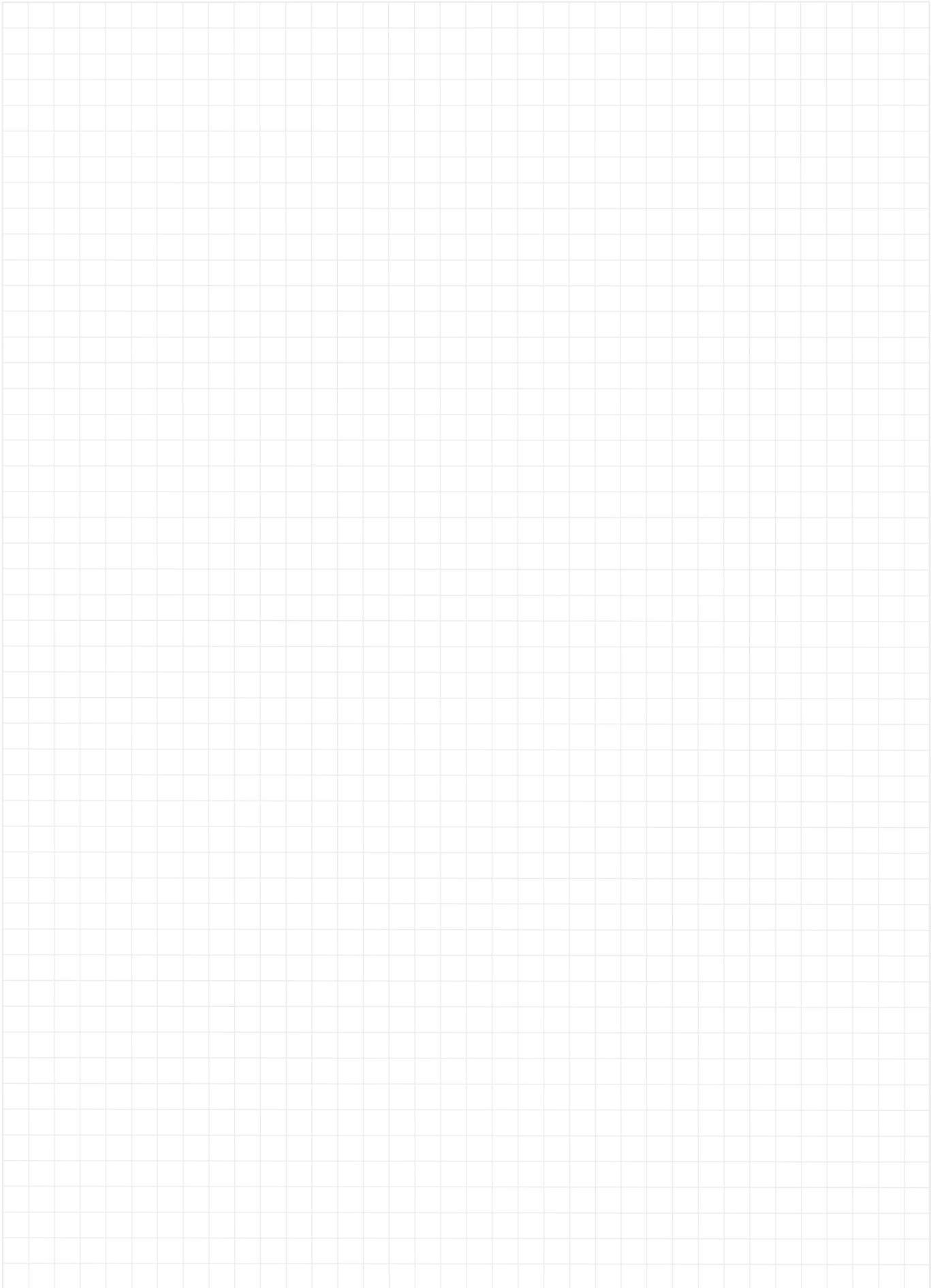


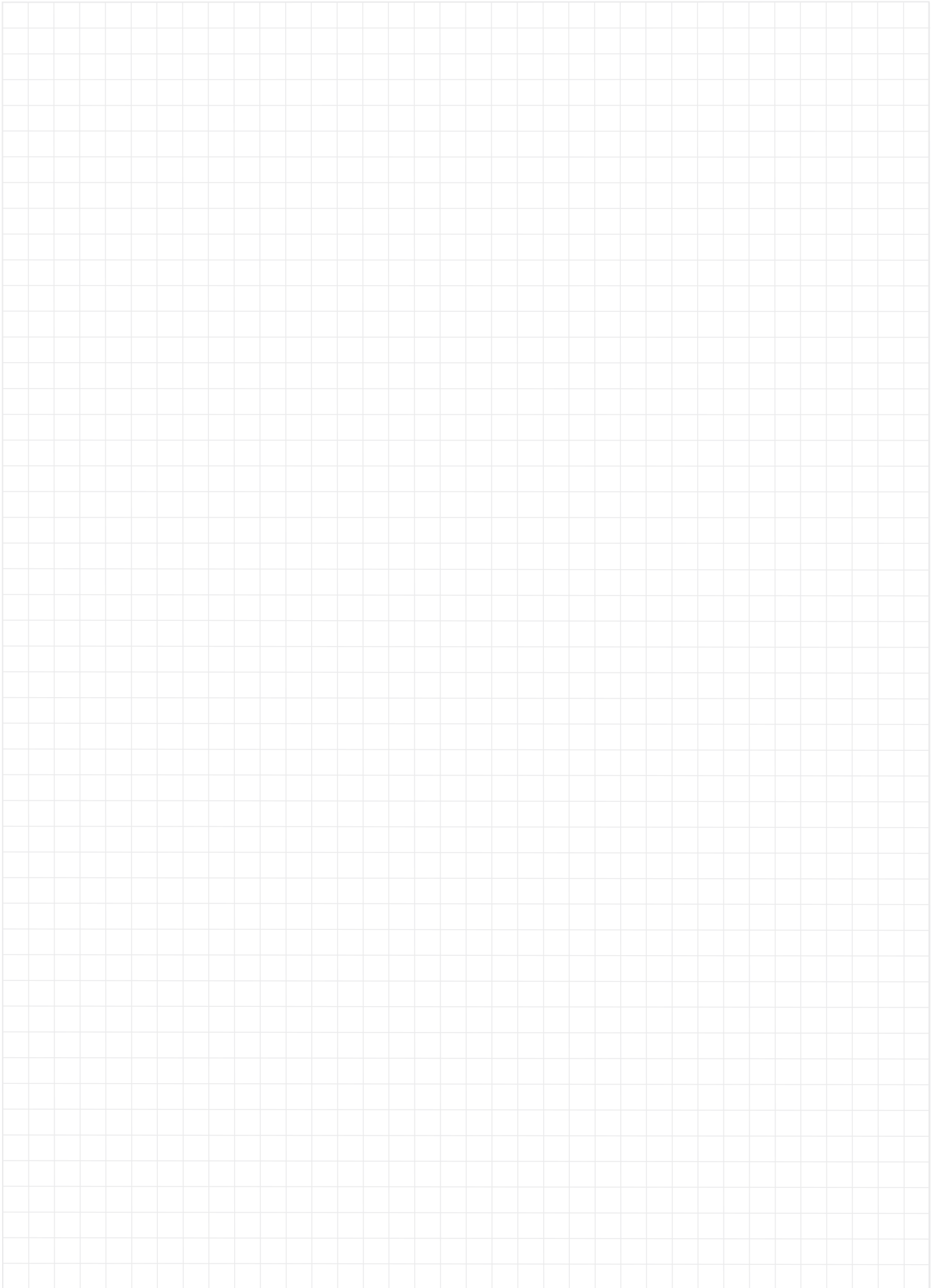
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