

**RESOL®**

Controllers for solar thermal systems

2009/2010



New products

[www.resol.com](http://www.resol.com)

GB

## DeltaSol® BX



rosenthal design 

- Extra large display
- 4 relay outputs
- 7 sensor inputs
- Inputs for Grundfos Direct Sensors™
- Speed control of high-efficiency pumps
- Datalogging onto SD memory card
- Drainback option
- RESOL VBus®
- Energy-saving switching-mode power supply

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

### RESOL DeltaSol® BX

System controller for simple solar and heating systems

Price bracket A Article-no: 115 450 03

**301,00 €**

### RESOL DeltaSol® BX - 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: 115 450 13

**359,70 €**



### RESOL DeltaSol® BX - Full kit incl. SD3

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

Price bracket A Article-no: 115 450 23

**458,70 €**

The DeltaSol® BX is equipped with four relay outputs as well as two PWM outputs for the speed control of energy-saving high-efficiency pumps; one of the PWM outputs can be converted into a 0-10 V signal output. Additionally, the controller is equipped with five Pt1000 sensor inputs, two analog Grundfos sensor inputs, an impulse input as well as a supplemental L'-output for the connection of an actuator.

The integrated SD memory card slot enables an easy datalogging to an SD memory card as well as a quick and effortless transfer of logged system data to a PC. The extra-large display vouches for a precise visualisation of the system status.

Pre-defined functions allow easier parametrisation of the system; functional additions such as a drainback option broaden the range of applications. Of course, the DeltaSol® BX is also equipped with a RESOL VBus®.

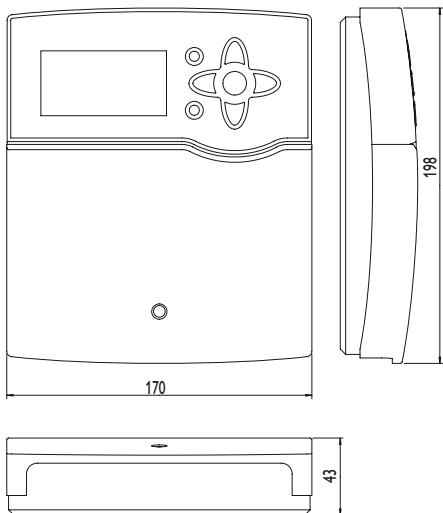
### DeltaSol® BX

Max. number of collectors	2 <sup>1</sup>
Max. number of storages	2 <sup>1</sup>
Display	System-Monitoring illuminated
Sensor inputs (temperature)	5 (7) <sup>2</sup>
Total relay outputs	4
Number of semiconductor relays (pump speed control)	3
Number of potential-free relays	-
Impulse input (V40)	1
WMZ with flowmeter	✓ <sup>1</sup>
WMZ with V40	✓
Weather-compensated heating circuits	-
Additional T-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/store sequence control	✓
VBus®	✓

<sup>1</sup> system-dependent

<sup>2</sup> incl. Grundfos Direct Sensors™ inputs

Technical data



**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:** 7 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:**

5 temperature sensors Pt1000, SD memory card slot, 2 Grundfos Direct Sensors™, 1 Impulse input V40

**Output:**

3 semiconductor relays, 1 standard relay and 2 PWM outputs

**Bus:** RESOL VBus®

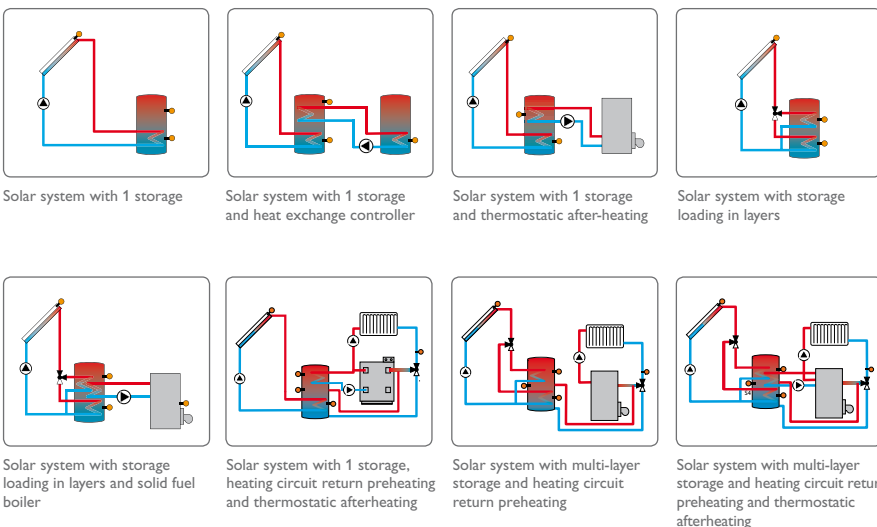
**Power supply:** 100 ... 240V~, 50-60 Hz

**Power consumption:** < 1W

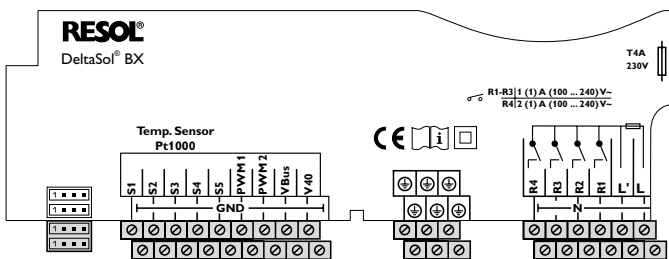
**Switching capacities:**

1 (1) A 100 ... 240V~ (semiconductor relay)  
2 (1) A 100 ... 240V~ (standard relay)

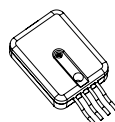
Examples



Electrical connection



Accessories



**RESOL Interface adapter VBus® / USB**

PC connection kit for RESOL controllers with VBus® incl. RESOL ServiceCenter Software

Price bracket B Article-no: 180 008 50 **57,00 €**



**RESOL AM1**

Alarm module for signalling system failures

Price bracket B Article-no: 180 008 70 **64,80 €**



**RESOL SP10**

Sensor-overvoltage protection

Price bracket A Article-no: 180 110 70 **16,90 €**

# DeltaSol® MX



rosenthal design 

- Full graphic display
- 13 relay outputs
- 12 sensor inputs
- Inputs for Grundfos Direct Sensors™
- Speed control of high-efficiency pumps
- Datalogging onto SD memory card
- Drainback option
- RESOL VBus®
- Energy-saving switching-mode power supply

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

## RESOL DeltaSol® MX

System controller for solar and heating systems

Price bracket A Article-no: 115 992 03

542,30 €

## RESOL DeltaSol® MX - Full kit

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

Price bracket A Article-no: 115 992 13

612,70 €



## RESOL DeltaSol® MX - Full kit incl. SD3

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

Price bracket A Article-no: 115 992 23

711,70 €

Available as of autumn 2009

The DeltaSol® MX is equipped with 13 relay outputs, four PWM outputs for the speed control of energy-saving high-efficiency pumps; two of the PWM outputs can be converted into 0-10 V signal outputs. Additionally, the controller has one frequency input, three impulse inputs as well as a range of different sensor inputs. Up to four extension modules can be connected via the RESOLVBus®.

The integrated SD memory card slot enables an easy datalogging to an SD memory card as well as a quick and effortless transfer of logged system data to a PC. The large full graphic display allows the direct display of balance and progression diagrams.

Pre-defined functions allow easier parametrisation of the system; functional additions such as a drainback option broaden the range of applications.

## DeltaSol® MX

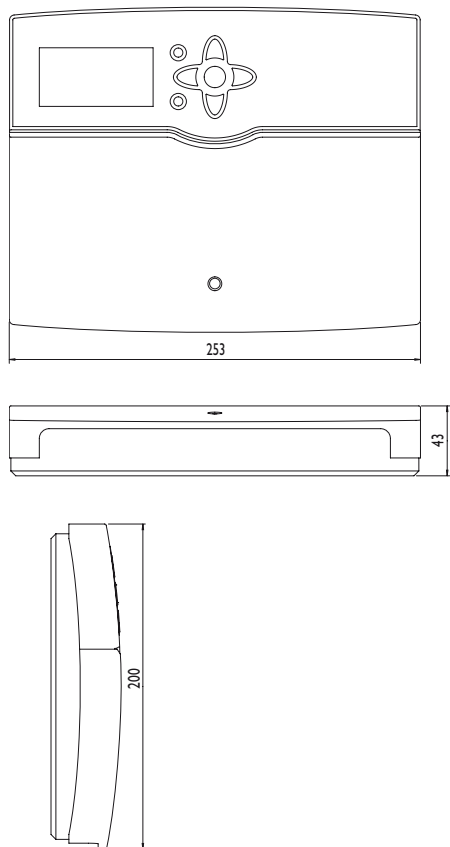
Max. number of collectors	2 <sup>1</sup>
Max. number of storages	5 <sup>1</sup>
Display	Full graphic illuminated
Sensor inputs (temperature)	12 (14) <sup>2</sup>
Total relay outputs	13
Number of semiconductor relays (pump speed control)	12
Number of potential-free relays	1
Input CS10 (irradiation)	1
Impulse input (V40)	3
WMZ	7
Thereof with V40	up to 3
Weather-compensated heating circuits	4 (8) <sup>3</sup>
Additional T-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/store sequence control	✓
VBus®	✓

<sup>1</sup> system-dependent

<sup>2</sup> incl. Grundfos Direct Sensors™ inputs

<sup>3</sup> through additional modules

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:** Full graphic display  
**Operation:** 7 pushbuttons at the front  
**Functions:**

Solar system controller for use in solar and heating systems. 7 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 10 sensors Pt1000 and 2 remote controls RTA11-M, 2 Grundfos Direct Sensors™, 3 flowmeters RESOL V40 and 1 solar cell CS10

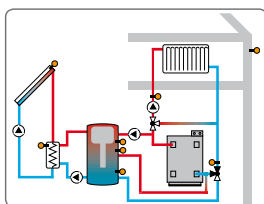
**Relay outputs:** 13 relay outputs, 12 of them are semiconductor relays for pump speed control, 1 potential-free relay and 4 PWM outputs (two of which convertible to 0-10 V-signal outputs)

**Bus:** RESOL VBus®

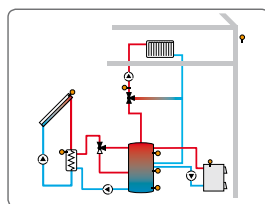
**Power consumption:** < 1W

**Power supply:** 100 ... 240V~, 50-60 Hz

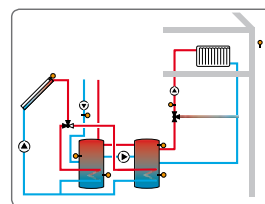
Examples



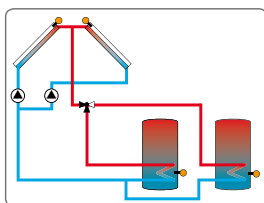
Solar system with combined storage, external heat exchanger, weather-compensated heating circuit, return preheating and after-heating



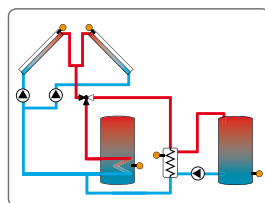
Solar system with external heat exchanger and after-heating by solid fuel boiler



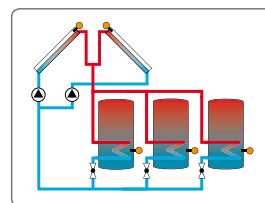
Solar system with 2 storages, circulation pump control, heat exchange control and weather-compensated heating circuit



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

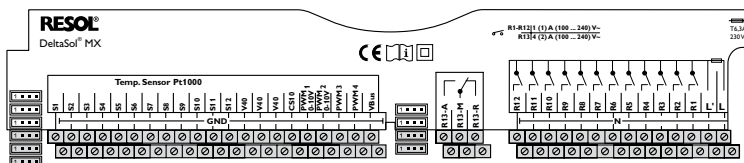


Solar system with east-/west collectors, 2 storages and external heat exchanger 3-way-valve control

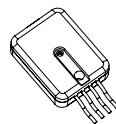


Solar system with east-/west collectors and 3 storages, pump-/valve

Electrical connection



Accessories



**RESOL Interface adapter VBus®/USB**

PC connection kit for RESOL controllers with VBus® incl. RESOL ServiceCenter Software

Price bracket B Article-no: 180 008 50 57,00 €



**RESOL AM1**

Alarm module for signalling system failures

Price bracket B Article-no: 180 008 70 64,80 €



**RESOL SP10**

Sensor-overvoltage protection

Price bracket A Article-no: 180 110 70 16,90 €



**RESOL HKM2 - Full kit**

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

Price bracket A Article-no: 145 440 40 254,00 €

## FlowCon C HE pump station



rosenthal design 

6

The pump station FlowCon C HE is a preinstalled and leak-tested group of fittings for transferring heat from the collector to the store. It contains a high-efficiency pump as well as 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 for manual bleeding of 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 VBus®

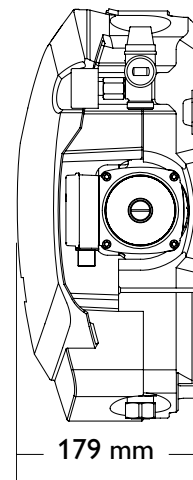
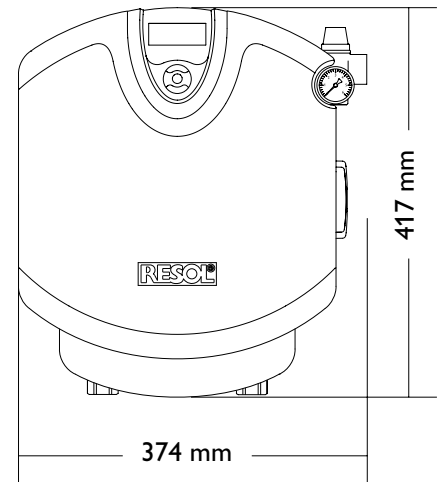
### RESOL FlowCon C HE

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

Price bracket A Article-no: 290 017 23

852,00 €

### Technical data



**Circulating pump:** Grundfos PM15-85

**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

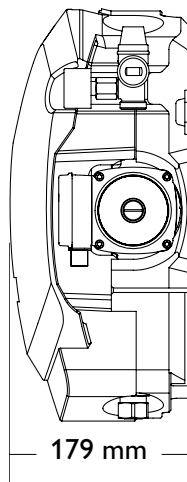
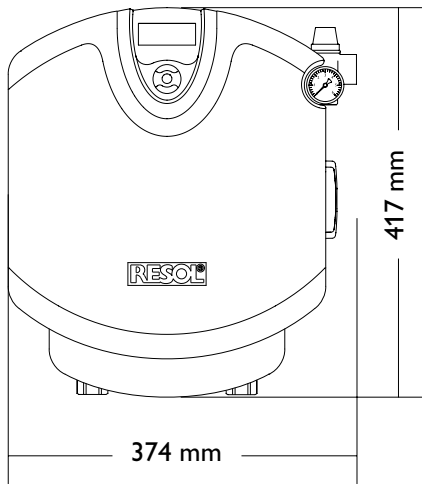
**Flow range:** 1 ... 20 l/min



### Filling and flushing unit

Price bracket A Article-no: 290 013 40 48,70 €

## Technical data



**Circulating pump:** WILO Star ST15/6 or Grundfos PM15-85

**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 48,70 €

## FlowCon Sensor pump station



rosenthal design 

The FlowCon Sensor is a complete pump station that integrates the vital electric and hydraulic components of the solar system along with the necessary sensors in one pre-assembled unit. The separate installation of collector and storage sensors is not required. Upon entering the necessary variables such as the geographical position and the tilt

of the collector, an innovative algorithm calculates the optimal working time-frame for the solar gain.

The FlowCon Sensor provides the functionality and the efficiency of a standard solar thermal system at an even better reliability rate, while requiring less installation effort.

- Complete with pre-assembled Grundfos Direct Sensors™
- 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 Sensor

Twin-line pump station, incl. DeltaSol® Sensor controller and 2 digital sensors

Price bracket A Article-no: 290 017 33

645,00 €

## RESOL FlowCon Sensor with high-efficiency pump

Twin-line pump station, incl. DeltaSol® Sensor controller and 2 digital sensors

Price bracket A Article-no: 290 017 43

915,00 €

## Calorimeter WMZ-G1



The WMZ-G1 is a measurement and display unit for solar thermal systems and conventional heating systems. It is possible to connect up to two Grundfos Direct Sensors™, which measure the temperature as well as one additional value – depending on the type: flow rate, relative or differential pressure.

If at least one of the sensors measures the flow rate, the heat quantity can be calculated. The WMZ-G1 also monitors the operating status of the system and displays deviations.

- Recording of:
  - Flow temperature
  - Return temperature
  - Power
  - Heat quantity
  - Flow rate
  - Pressure
  - Differential pressure
  - System errors
- Easy connection
- Dot matrix display
- Function control
- Configurable control parameters

### RESOL WMZ-G1

Calorimeter module for Grundfos Direct Sensors™

Price bracket A Article-no: 135 307 03 **150,00 €**

### Grundfos Direct Sensor™ VFS 1-12 l

Sensor incl. brass fitting, insert and connection cable

Price bracket A Article-no: 130 000 20 **68,50 €**

### Grundfos Direct Sensor™ VFS 2-40 l

Sensor incl. brass fitting, insert and connection cable

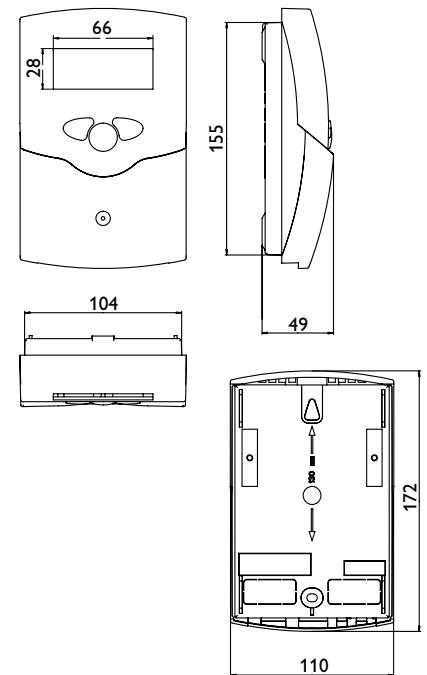
Price bracket A Article-no: 130 000 30 **78,50 €**

### Grundfos Direct Sensor™ RPS 0-10 bar

Sensor incl. brass fitting and connection cable

Price bracket A Article-no: 130 000 40 **53,50 €**

### Technical data



**Housing:** plastic, PC ABS and PMMA

**Protection class:** IP 20 / DIN 40050

**Ambient temperature:** 0 ... 40 °C

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

**Power supply:** 220 ... 240 V~

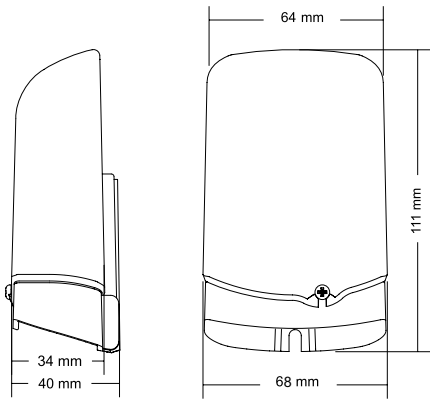
**Power consumption:** approx. 2 VA

**Measuring range:** -30 ... +150 °C

**Inputs:** 2 Grundfos Direct Sensors™ VFS, RPS oder DPS

**Interface:** RESOL VBus®

## Technical data



- Reliable failure signal by LED
- Connection to a building management system (BMS) possible
- Supply and control via RESOL VBus®

**Housing:** Plastic (PC 2207 UV);  
base part: Karilen E 42 D - H201

**Protection type:** IP 54

**Dimensions:** 111 x 68 x 40 mm

**Mounting:** Wall mounting

**Ambient temperature:** -25 ... +70 °C

**Display:** 1 LED

**Supply:** RESOL VBus®

**Interface:** RESOL VBus®

**Output:** 1 potential-free relay

**Switching capacity:** max. 30 V<sub>DC</sub>, 1 A;  
125 V<sub>AC</sub>, 0,5 A

## Alarm module AM1



The Alarm module AM1 is designed to signal system failures. It is to be connected to the VBus® of the controller and issues an optical signal via the red LED if a failure has occurred. The AM1 also has a potential-free relay output, which can e. g. be connected to a building management system (BMS). Thus, a collective error message can be issued in the case of a system failure. Depending on the controller and the sensors

connected, different fault conditions can be signalled, e. g. sensor failures, excess or negative system pressure as well as errors in the flow rate, such as a dry run of the pump. The Alarm module AM1 ensures that occurring failures can be immediately recognised and repaired, even if the system and the controller are difficult to access or located in a remote place. Thus, the reliability and the stable yield of the system are ensured.

## DeltaSol® M



## HKM3 (Heating circuit module)



## Alarm module AM1



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

## RESOL AM1

Alarm module for signalling system failures

Price bracket B Article-no: 180 008 70

64,80 €

## Interface adapter VBus® / USB



The new VBus®/USB interface adapter is the interface between the controller and a personal computer. With its standard mini-USB-Port it enables a fast transmission of system data for processing, visualising and archiving as well as the parametrisation of the controller via the VBus®. A full version of the RESOL ServiceCenter software is included.

- USB 2.0 full speed compatible
- With mini-USB-B-port
- Remote parametrisation of the controller via VBus®
- Full version of RSC software included on CD-ROM

**Housing:** plastic

**Protection class:** IP20/DIN 40 050

**Dimensions:** 95 x 70 x 25 mm

**Power supply:** via RESOL VBus®

### RESOL Interface adapter VBus® / USB

PC connection kit for RESOL controllers with VBus® incl. RESOL ServiceCenter Software

Price bracket B Article-no: 180 008 50

57,00 €

## Interface adapter VBus® / PWM

The VBus®/PWM interface adapter enables the speed control of two high-efficiency pumps even without an integrated PWM-output on the system's controller. The adapter is installed between the VBus® output of the controller and the PWM-input of the high-efficiency pump, where it transforms the VBus® data packets into a 0-10V or a PWM signal.

- Speed control of high-efficiency pumps for controllers without integrated PWM outputs
- Convertible from PWM to 0-10V signal

**Housing:** plastic

**Protection class:** IP20/DIN 40 050

**Dimensions:** 95 x 70 x 25 mm

**Display:** Seven-segment LED display

**Power supply:**

Mains adapter input voltage:

100 ... 240 V~ (AC)/50-60 Hz

Adapter input voltage: 12V= (DC)

### RESOL Interface adapter VBus® / PWM

VBus®-converter to a PWM or 0-10V-signal

Price bracket B Article-no: 180 008 60

66,00 €

Available as of autumn 2009

## Interface adapter VBus® / LAN

The VBus®/LAN interface adapter is designed for the direct connection of the controller to a PC or router. It enables easy access to the controller via the local network of the owner. Thus, controller access, system parametrisation and data charting can be effected from every workstation of the network.

The VBus®/LAN interface adapter is suitable for all controllers equipped with a RESOL VBus®. A full version of the RESOL ServiceCenter software is included.

- The network connection for your solar system
- Access to the system via the complete network
- Remote parametrisation of the controller via VBus®
- Full version of the RSC software included on CD-ROM

**Housing:** plastic

**Protection class:** IP20/DIN 40 050

**Dimensions:** 95 x 70 x 25 mm

**Interfaces:**

VBus® for the connection to the controller

LAN connection RJ45 with 2 status LEDs

**Power supply:**

Mains adapter input voltage:

100 ... 240 V~ (AC)/50-60 Hz

Adapter input voltage: 5V= (DC)

### RESOL Interface adapter VBus® / LAN

Network connection set for RESOL controllers with VBus® incl. RESOL ServiceCenter Software

Price bracket B Article-no: 180 008 80

76,00 €

Available as of autumn 2009

**RESOL®**

Heiskampstraße 10  
D-45527 Hattingen

E-mail: [info@resol.de](mailto:info@resol.de)  
Internet: [www.resol.de](http://www.resol.de)

Tel.: +49 (0) 2324 9648 - 0  
Fax: +49 (0) 2324 9648 - 755

**RESOL®**  
France

67c rue de la Gare; BP-10  
F-67240 Oberhoffen sur Moder

E-mail: [contact@resol.fr](mailto:contact@resol.fr)  
Internet: [www.resol.fr](http://www.resol.fr)

Tel.: +33-388-062393  
Fax: +33-388-062394

**RESOL®**  
España

Miquel de Roncalí 41, 4º 3º  
ES-08940 Cornellá de Llobregat (Barcelona)

E-mail: [info@resol-espana.com](mailto:info@resol-espana.com)  
Internet: [www.resol-espana.com](http://www.resol-espana.com)

Tel.: +34-933 77 51 37  
Fax: +34-933 77 51 37

The logo for seconsolar features the word "seconsolar" in a lowercase, sans-serif font. To the left of the text is a stylized graphic element consisting of a grey crescent shape with a white outline, resembling a solar panel or a stylized 'S'.

Unit 87; Business & Innovation Centre Wearfield  
GB-Sunderland SR5 2TH

E-mail: [info@seconsolar.com](mailto:info@seconsolar.com)  
Internet: [www.seconsolar.com](http://www.seconsolar.com)

Tel.: +44 191 5166554  
Fax: +44 191 5166558

[www.resol.com](http://www.resol.com)

Presented by:

**RESOL – Elektronische Regelungen GmbH**

Heiskampstraße 10 • 45527 Hattingen • Germany

Tel.: +49 (0) 2324 9648 - 0 • Fax: +49 (0) 2324 9648 - 755 • E-mail: [info@resol.com](mailto:info@resol.com)