Solar Controller RVA78.690

- Multifunctional solar controller for applications and residential/commercial buildings with plain text display
- Modulating pump control for optimum energy utilization

**Application**

**Fields of use**
- Typical fields of use:
  - Detached and semidetached houses
  - Small multiple dwelling units
  - Commercial buildings

**Application**

For regulation and control of thermal solar systems. Suitable for flat and tube collectors. Along with the basic functions, the RVA78 controller provides a wide variety of additional options and functions for optimum usage of the solar system.

**Market**

The controller was developed for the OEM market. It is delivered directly to the manufacturer.
## Functions

### Controller functions
- One or two collector fields using the independent delta T-function
- Power on and off differential gap for collector pump
- Integration of drinking water tanks
- Integration of buffer storage tanks
- Overtemperature and frost protection for drinking water tanks
- Overtemperature and frost protection for buffer storage tanks
- Collector overtemperature and frost protection, recooling function
- Solar yield measurement
- Integration of solid material boiler using the delta T-function
- Power on and off differential gap for the solid material boiler
- Heat requirement for an external heat generator (for example, boiler, electronics unit)
- Timer with power reserve (minimum of two hours)

### Operational functions
- Plain text display with background illumination
- Different user levels derived from ergonomic and functional principles
- Simple access to the key information for the system user
- User-friendly commissioning thanks to preset hydraulic schemes (preselection)

### General functions
- Compact housing for wall mounting or DIN rail mounting
- Easy installation

## Product documentation

Detailed information and descriptions can be obtained from the user manual U2396.
Design

Operating elements

Display

Full display

View of all display segments:

Display options

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>R1</td>
<td>Collector pump (output Q5) is active</td>
</tr>
<tr>
<td>R2</td>
<td>Multifunctional output (ZX1) is active</td>
</tr>
<tr>
<td>⌚</td>
<td>Error messages</td>
</tr>
<tr>
<td>⏳</td>
<td>Active process – please wait</td>
</tr>
</tbody>
</table>
Notes

Product liability
- The unit must only be used in building service systems and only for the applications described.
- To use the unit, all requirements described in the Technical Data chapter must be satisfied.
- All local safety regulations (installation, etc.) must be observed.
- The unit must not be opened. Contravention of the regulations will void warranty.

Electrical installation
- The electrical power must be disconnected prior to the installation.
- The connection terminals for low-voltage and mains voltage are arranged on different sides of the unit.
- The requirements stipulated by protection class II for the wiring must be satisfied – i.e., sensor and mains power lines are not allowed to be routed in the same cable duct.

Configuration
- Air circulation around the unit must be ensured at all times so that the heat produced by the controller can be dissipated.
- The unit is designed in compliance with the guidelines set out in protection class II and must be mounted accordingly.
- Power may be applied to the unit only when the installation/electrical installation is complete. Otherwise, there is a risk of electric shock at the connection terminals.
- The unit must not be exposed to dripping water.
- Permissible ambient temperature for installed operational unit: 0…50 °C.
- Power lines must be clearly separated from low-voltage lines (sensor) when being laid (minimum clearance: 100 mm).

Installation
Mounting location
- Wall installation
- Control panel

Installation preparations
The unit has two prepunched connection openings at the rear and six on the underside. The required openings for the connections must be broken open before installation.

![Diagram of the unit with connection openings highlighted]
Installation methods

Wall installation
Drill holes using the drilling figure (see dimension figures)

Insert all dowels (if required).
Screw the upper screw in until a gap of 3.5 mm is left.

Place the unit on the protruding screw (1) and press it gently downwards (2).
Fasten the unit with the remaining two screws (3) and (4).

DIN rail installation
The base contains an opening for installation on a DIN rail.
Place the unit with the upper part of the opening on the DIN rail (1) and press the lower section onto the rail (2).
Push the mounting slider upwards (3) to its final position (4).
### Technical data

#### Power supply
- **Rated voltage**: AC 230 V (± 10%)
- **Rated frequency**: 50/60 Hz
- **Maximum power consumption**: RVA78.690: 2 VA
- **Fuse protection for supply lines**: max. 10 AT

#### Terminal wiring
- **Power supply and outputs**: Wire or strand (twisted or with crimp sleeve):
  - 1 wire: 0.5 mm²...2.5 mm²
  - 2 wires: 0.5 mm²...1.5 mm²
  - 3 wires: Not allowed

#### Functional data
- **Software class**: A
- **Operation according to EN 60730**: 1.B (automatic operation)

#### Inputs
- **Sensor inputs B6, BX1…BX3**: NTC10k, Pt1000 (optional for collector sensor)
- **Permissible sensor lines (Cu)**:
  - For line diameters:
    - 0.25
    - 0.5
    - 0.75
    - 1.0
    - 1.5 mm²
  - Maximum length:
    - 20 m
    - 40 m
    - 60 m
    - 80 m
    - 120 m

#### Outputs
- **Triac outputs Q5, ZX1**
- **Rated current range**:
  - AC 0.05…1 (1) A
  - AC 0.05…0.8 (0.8) A
- **Speed control**
  - 4 A for <1 s
  - 30 A for < 20 ms
- **PWM output P1**
  - **Signal frequency**: 3 kHz
  - **Output voltage**:
    - $V_{\text{out\_high}} > + 4$ V (unloaded)
    - $V_{\text{out\_low}} < + 1$ V
  - **Modulation depth**: 3% ... 97%

#### Protection type and class
- **Housing protection class according to EN 60529**: IP 00
- **Protection class according to EN 60730**: Low-voltage carrying parts comply when correctly installed with the requirements for protection class II
- **Level of contamination according to EN 60730**: Normal contamination

#### Standards, safety, EMC, etc.
- **CE conformance according to EMC directives**: 89/336/EWG
- **Noise immunity**: EN 61000-6-2
- **Emissions**: EN 61000-6-3
- **Low-voltage directive**: 73/23/EWG
- **Electrical safety**: EN 60730-1, EN 60730-2-9

#### Climatic conditions
- **Storage according to IEC721-3-1, class 1K3**: Temp. -20...65 °C
- **Transport according to IEC721-3-2, class 2K3**: Temp. -25...70 °C
- **Operation according to IEC721-3-3, class 3K5**: Temp. 0...50 °C (no condensation)

### Weight
- **Net weight**: RVA78.690: 530 g
Circuit diagrams

Connection terminals
The wiring is implemented using connectors that are inserted into the relevant sockets of the controller.
The connector sockets are assigned according to the image below:

![Image of circuit diagram]

Terminal designations
Low voltage

<table>
<thead>
<tr>
<th>Use</th>
<th>Connector type</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>Ground</td>
</tr>
<tr>
<td>BX3</td>
<td>Multifunctional sensor input 3</td>
</tr>
<tr>
<td>M</td>
<td>Ground</td>
</tr>
<tr>
<td>BX2</td>
<td>Multifunctional sensor input 2</td>
</tr>
<tr>
<td>M</td>
<td>Ground</td>
</tr>
<tr>
<td>BX1</td>
<td>Multifunctional sensor input 1</td>
</tr>
<tr>
<td>M</td>
<td>Ground</td>
</tr>
<tr>
<td>B6</td>
<td>Collector sensor 1</td>
</tr>
<tr>
<td>M</td>
<td>Ground</td>
</tr>
<tr>
<td>H1</td>
<td>Digital input (pulse measurement)</td>
</tr>
<tr>
<td>M</td>
<td>Ground</td>
</tr>
<tr>
<td>P1</td>
<td>Output pulse width modulation (PWM)</td>
</tr>
</tbody>
</table>

Power

<table>
<thead>
<tr>
<th>Use</th>
<th>Connector location</th>
<th>Connector type</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>U</td>
<td>AGP8S.03C/109</td>
</tr>
<tr>
<td>ZX1</td>
<td>U</td>
<td>AGP8S.03C/109</td>
</tr>
<tr>
<td>N</td>
<td>U</td>
<td>AGP8S.03C/109</td>
</tr>
<tr>
<td>Q5</td>
<td></td>
<td>AGP4S.03E/109</td>
</tr>
<tr>
<td>L</td>
<td>N</td>
<td>AGP4S.03E/109</td>
</tr>
<tr>
<td>N</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Siemens Solar Controller
Building Technologies
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Dimension figures

Dimension figure

Drilling figure

Dimensions in mm

Dimensions in mm