

EC1

RESOL®

Installation manual
**Variable controller for
circulation systems**



48000990

Thank you for buying this RESOL product.
Please read this manual carefully to get the best performance from this unit.
Please keep this manual carefully.

en

Manual
www.resol.com

Safety advice

Please pay attention to the following safety advice in order to avoid danger and damage to people and property.

Instructions

Attention must be paid to the valid local standards, regulations and directives!

Information about the product

Proper usage

The controller is designed for use in circulation systems with a flow switch in compliance with the technical data specified in this manual. Improper use excludes all liability claims.

CE Declaration of conformity

The product complies with the relevant directives and is therefore labelled with the CE mark. The Declaration of Conformity is available upon request, please contact the manufacturer.



Note

Strong electromagnetic fields can impair the function of the controller.

- Make sure the controller as well as the system are not exposed to strong electromagnetic fields.

Subject to technical change. Errors excepted.

Target group

These instructions are exclusively addressed to authorised skilled personnel. Only qualified electricians allowed to carry out electrical works. Initial commissioning must be effected by the system installer or qualified personnel named by the system installer.

Description of symbols

WARNING! Warnings are indicated with a warning triangle!



→ **They contain information on how to avoid the danger described.**

Signal words describe the danger that may occur, when it is not avoided.

- **WARNING** means that injury, possibly life-threatening injury, can occur.
- **ATTENTION** means that damage to the appliance can occur.



Note

Notes are indicated with an information symbol.

→ Arrows indicate instruction steps that should be carried out.

Disposal

- Dispose of the packaging in an environmentally sound manner.
- At the end of its working life, the product must not be disposed of as urban waste. Old appliances must be disposed of by an authorised body in an environmentally sound manner. Upon request we will take back your old appliances bought from us and guarantee an environmentally sound disposal of the devices.

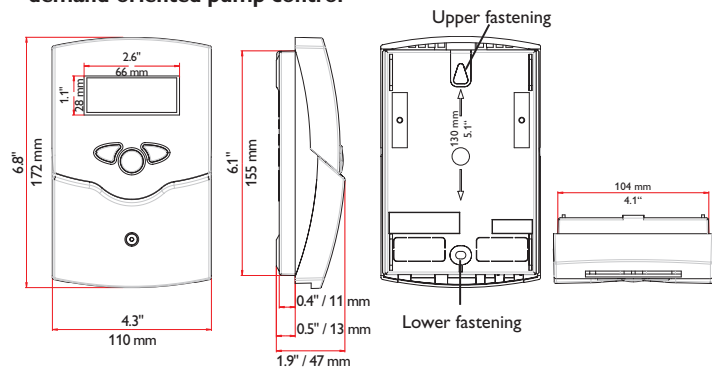


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Overview

- variable controller for circulation systems
- demand-oriented pump control



Technical data

Input: 1 sensor input for flow switch

Output: 1 semiconductor relay

Switching capacity: 1(1)A 240V~

Power supply: 220 ... 240 V~ (50 ... 60 Hz)

Supply connection: type Y attachment

Standby: 1,25 W

Mode of operation: type 1.Y

Rated impulse voltage: 2,5 kV

Housing: plastic, PC-ABS and PMMA

Mounting: wall mounting, mounting into patch panels is possible

Display: LC display, multi-functional combined display

Operation: by 3 push buttons at the front of the housing

Ingress protection: IP 20/EN 60529

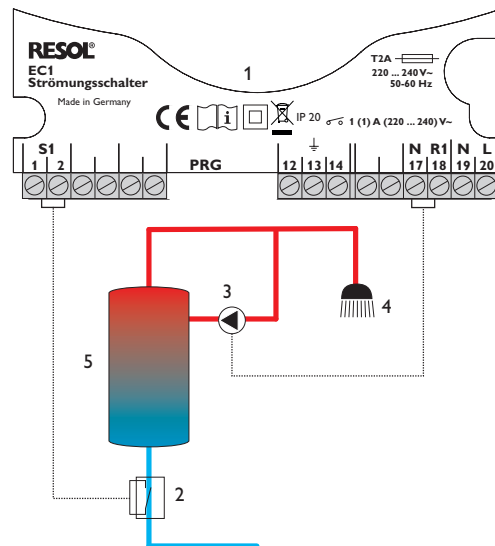
Protection class: II

Ambient temperature: 0 ... 40 °C

Degree of pollution: 2

Dimensions: 172 x 110 x 49 mm

1 General function description



The flow switch (2) built into the store inlet reacts to the water flow when the tap is being opened (4). Before actually drawing off water, open the tap for a brief moment. After that, the control unit (1) puts the circulating pump into operation (3) in order to let the hot water flow from the store (5) through the circulation line. When you open the tap again, hot water will arrive there within a few seconds. The control unit will now switch off the circulating pump again after the adjusted runtime in order to prevent hot water from being pumped through the circulation line when it is not used. In order to prevent the circulating pump from being switched on again after a brief pause, the re-start is avoided by the adjustable waiting time. In the case that the tap has not been opened for 12 hours (e.g. when the user is on holiday), the pump will be put into operation for the adjusted runtime R_c. This will protect the store against Legionella that can easily appear when the water is not flowing (Legionella protection). The time value is preadjusted to 12 h.



Note

In order to prevent water from being mixed with water from the circulation line, a circulating pump with a non-return valve should be used.

2 Installation

2.1 Mounting

WARNING! Electric shock!



Upon opening the housing, live parts are exposed!

→ Always disconnect the device from power supply before opening the housing!



Note

Strong electromagnetic fields can impair the function of the device.

→ Make sure the device as well as the system are not exposed to strong electromagnetic fields.

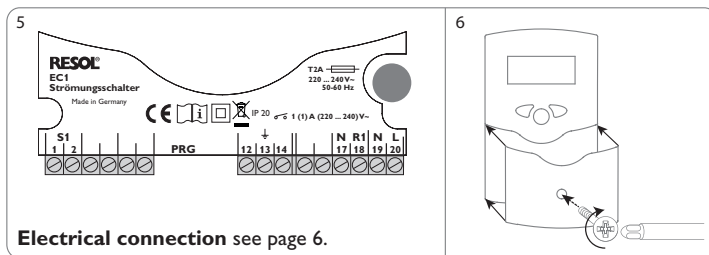
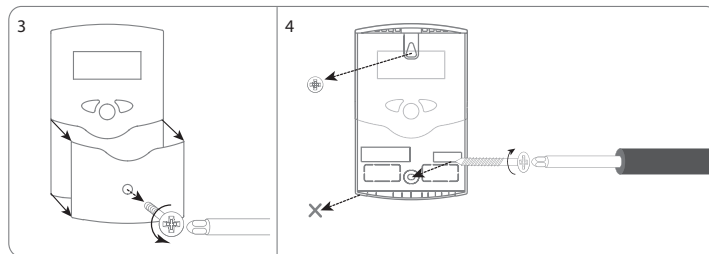
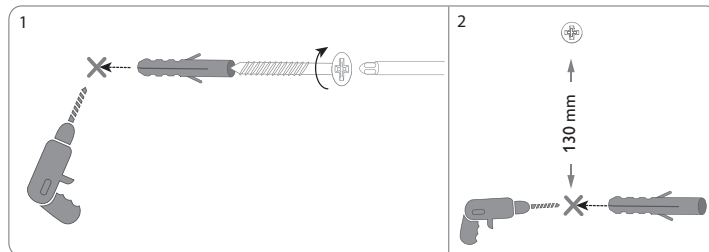
The device must only be located in dry interior rooms.

The controller must additionally be supplied from a double pole switch with contact gap of at least 3 mm.

Please pay attention to separate routing of sensor cables and mains cables.

In order to mount the device to the wall, carry out the following steps:

- Unscrew the crosshead screw from the cover and remove it along with the cover from the housing.
- Mark the upper fastening point on the wall. Drill and fasten the enclosed wall plug and screw leaving the head protruding.
- Hang the housing from the upper fastening point and mark the lower fastening point (centres 130 mm).
- Insert lower wall plug.
- Fasten the housing to the wall with the lower fastening screw and tighten.
- Carry out the electrical wiring in accordance with the terminal allocation (see page 6).
- Put the cover on the housing.
- Attach with the fastening screw.



Electrical connection see page 6.

2.2 Electrical connection

WARNING! Electric shock!



Upon opening the housing, live parts are exposed!

→ Always disconnect the device from power supply before opening the housing!

ATTENTION! ESD damage!



Electrostatic discharge can lead to damage to electronic components!

→ Take care to discharge properly before touching the inside of the device! To do so, touch a grounded surface such as a radiator or tap!



Note

Connecting the device to the power supply must always be the last step of the installation!



Note

It must be possible to disconnect the device from the mains at any time.

- Install the mains plug such that it is accessible at any time.
- If this is not possible, install a switch that can be accessed.

Do not use the device if it is visibly damaged!

The power supply of the device must be 220... 240 V~ (50... 60 Hz). Attach flexible cables to the housing with the enclosed strain relief and the corresponding screws.

The controller is equipped with one standard relay, to which loads such as pumps, valves etc. can be connected:

18 = conductor R1

17 = neutral conductor N

13 = ground conductor ÷

The **flow switch** (S1) is to be connected to the following terminals with either polarity:

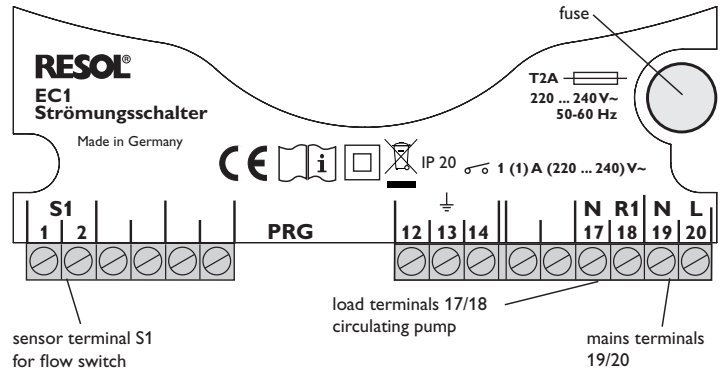
1/2 = flow switch

The mains supply is to be carried out at the terminals:

19 = neutral conductor N

20 = conductor L

12 = ground conductor ÷



3 Flow switch

The FS07/FS08 Flow switch 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.

Technical data

Housing: brass

Dimensions: 102 mm x 36 mm

Temperature range: -30 °C... +100 °C

Maximum pressure: 10 bar

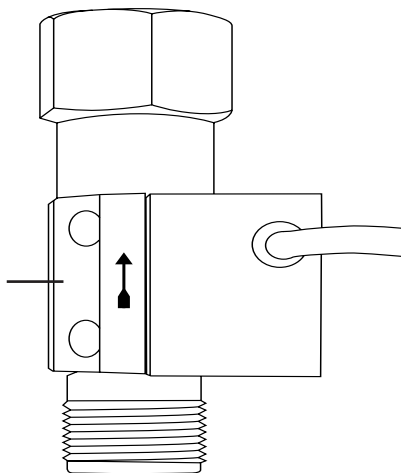
Switching capacity: 250 V~/3 A (FS07); 300 V~/1 A (FS08)

Switching point: 1 litre/min

Fittings:

Upper connection thread: IT ¾"

Lower connection thread: ET 22 mm, flat sealing'



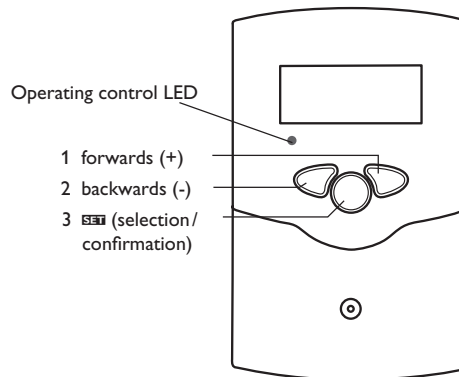
Note

Suitable for vertical installation only.

Please pay attention to the flow direction (from bottom to top in direction of the arrow) indicated on the housing!

4 Operation and function

4.1 Buttons



The controller is operated via the 3 push buttons below the display.

Button 1 (+): Scrolling forwards, increasing adjustment values

Button 2 (-): Scrolling backwards, reducing adjustment values

Button 3 (OK/OK): confirming/ selecting

During normal operation, display channels will be displayed.

→ In order to scroll between display channels, press buttons 1 and 2.

Access to adjustment channels

→ Use button 1 in order to scroll to the last display channel, then press and hold down button 1 for approx. 2 s.

If an **adjustment channel** is shown on the screen, **OK** will be displayed on the right-hand side next to the channel name.

→ Press button 3 in order to select an adjustment channel.

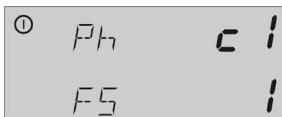
OK starts flashing.

→ Adjust the desired value with buttons 1 and 2.

→ Briefly press button 3.

OK permanently appears, the adjusted value has been saved.

5 Commissioning



➔ Establish the power supply.

The controller runs an initialisation phase. The controller is then ready for operation and normally the factory settings will give close to optimum operation.

Operating control LED

Red: ready, pump not controlled.

Green: pump is running.

5.1 Contoller parameter and indication channels

• Ph = Phase

Phase 0: The controller is ready for starting a new cycle. The new cycle will start, when the flow switch closes during this phase.

Phase 1: Switch-on delay in order to prevent the circulating pump from being switched on by pressure surge in the pipes.

Phase 2: The contactor has been switched on, the circulating pump is put into operation for the runtime **Rc** (Runtime of circulation).

Phase 3: Water has been tapped over a longer period, the circulating pump switches off after the runtime **Rc** is over.

• FS = Flow Switch

Flow switch

0 = open contact, no water flow

1 = closed contact, water flow

• tc = control time of circulation

Check channel for Rc and Wc

• Rc = Runtime of circulation

Runtime of the circulation

• Wc = Waiting time for (next) circulation

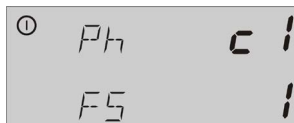
Waiting time

• Dc = Delay circulation

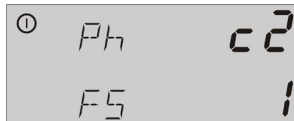
Switch-on delay for the circulating pump

- **MM = Mode Manual**
Manual mode
0 = manually off
1 = manually on
2 = automatic operation
- **Pg = Programme**
Programme
- **VN = Version Number**
Version number

5.2 Phase (Ph)



Phase **c1**: The flow switch has been closed and the controller puts the circulating pump into operation if for the runtime Rc.



Phase **c2**: After the runtime Rc is over, the pump is switched off at least for the duration of the waiting time Wc.

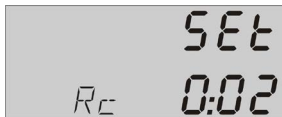
Ph shows the current phase or the state of the controller.

The flow switch is closed during draw off, the controller is in phase c1 and puts the circulating pump into operation. After the runtime Rc has ended, the controller switches the pump off again and is in phase c2.

The controller stops for the adjusted runtime Wc before the pump can be put into operation again. This way, unnecessary pump operation and water circulation can be avoided.

If water is being drawn off again within the time interval Wc, the counter will be switched off for the duration of the draw off for the waiting time and will be put into operation again. This way, the whole time interval between the first and the second pumping process, during which there is no water flow, equals the adjusted time interval Wc.

5.3 Runtime/Disinfection (Rc)



Rc: Circulation runtime

(Runtime of circulation)

Factory setting: 2 Min

Indication in minutes

Adjustment range: 0:01 ... 0:10

The runtime Rc indicates the time (hh:mm) in which the pump is put into operation by the controller during draw off. The runtime Rc is simultaneously used for the disinfection function. This function puts the pump into operation automatically for the runtime, if no water has been drawn off within 12 hours.

5.4 Waiting time (Wc)



Wc:

Waiting time for next circulation

Factory setting: 10 Min

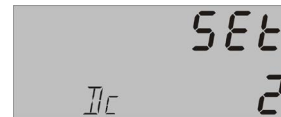
Indication in minutes

Adjustment range: 0:00 ... 0:20

If Wc is set to 0:00, the pump will be operating as long as the flow switch is closed.

Wc stands for the waiting time (hh:mm) during which the controller puts the circulating pump into operation after the runtime Rc is over. If water is being drawn off during the waiting time, the time counter is switched off and will be switched on again afterwards. This will avoid unnecessary pumping of hot water through the pipe system.

5.5 Switch-on delay (Dc)



Dc: Delay

Factory setting: 0 s

Adjustment range: 0 ... 2 s

The switch-on delay is the time during which the flow switch FS08 must be closed in order to detect water flow. This will prevent the circulating pump from being switched by water hammer in the pipes.

5.6 Manual/Automatic mode (MM)

MM: Manual mode (ManualMode)

Factory setting : 2

MM Pump

0 off

1 on

2 auto



By means of the adjustment value MM3, different operation modes for the controller can be selected: Manually on, manually off and automatic.

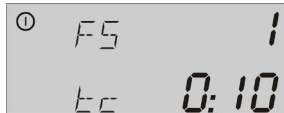
5.7 Check value flow switch (FS)

FS: Status of the flow switch (FlowSwitch)

0 = no draw-off

1 = draw-off

5.8 Counter of the current time frame (tc)

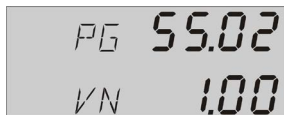


tc: Check time for Rc or Wc (control time of circulation)

The output value tc is a time counter that counts up from t=0 to the value of Rc or Wc depending on the current phase.

During phase c1, the value tc indicates the counter from 0 to Rc, in phase c2, the counter from 0 to Wc.

5.9 Programme and Version (PG and VN)



PG: Programme (ProGramme)

VN: Version number (VersionNumber)

PG specifies the current hardware programme number and VN the current software version.

6 Troubleshooting

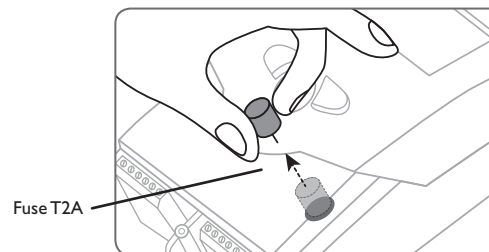
WARNING! Electric shock!



Upon opening the housing, live parts are exposed!

→ Always disconnect the device from power supply before opening the housing!

The controller is protected by a fuse.



Operating control LED is permanently off.

If the display is off, check the power supply of the controller. Is it disconnected?

no

yes

The fuse of the controller could be blown. The fuse holder (which holds the spare fuse) becomes accessible when the cover is removed. The fuse can then be replaced.

Check the supply line and reconnect it.



Note

For answers to frequently asked questions (FAQ) see www.resol.com.

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Important note

The texts and drawings in this manual are correct to the best of our knowledge. As faults can never be excluded, please note:

Your own calculations and plans, under consideration of the current standards and directions should only be basis for your projects. We do not offer a guarantee for the completeness of the drawings and texts of this manual - they only represent some examples. They can only be used at your own risk. No liability is assumed for incorrect, incomplete or false information and / or the resulting damages.

Note

The design and the specifications can be changed without notice.

The illustrations may differ from the original product.

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