# EY-RU 355: Room operating unit, ecoUnit355

How energy efficiency is improved

Individual setting of occupancy and absence as well as room setpoint correction, control of lights and window blinds for optimum energy usage in the room. Visualisation of the local energy consumption by means of multicolour LED indicator

Features

- Part of the SAUTER modulo system family
- Room operating unit for ecos311, ecos504/505 modu 6-AS and ASV2, A*M***SA
- Local, intuitive operation for temperature, fan and occupancy
- Large backlit (BL) display for status information on the room condition
- Ergonomic buttons with mechanical, tactile feedback
- Individual adjustment of the room climate via temperature detection and setpoint adjustment
- Operating mode can be set for room occupancy and actuation of a 3-speed fan
- ECO button for resetting to automatic mode
- Multicolour LED indicator for visualisation of energy consumption or as position LED
- Sturdy surface of front cover
- Fits into standard frame with 55 × 55 mm aperture
- Individually assignable keys with different symbols, can be ordered as accessories
- Expandable with EY-SU 358 switching unit for operating lights, window blinds etc.
- Frame can be ordered as an accessory
- Room operating unit with various functions, designs and colours
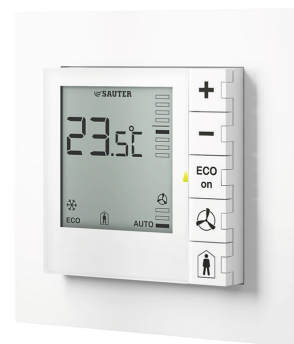
EY-RU355F051

Technical data

Power supply

Power supply	Power supply	F***: 12...24 VDC, ± 20% (with BL) F0**/A**: 5 VDC, ± 20% (without BL) from ecos 5/ecos311/ASV2: 5 VDC from ecos311: 15 VDC from EY-PS, modu6**-AS, A*M-SA: 24 VDC
	Current consumption	≤ 7 mA (at 24 VDC, with BL) ≤ 10 mA (at 15 VDC, with BL) ≤ 9 mA (at 5 VDC, without BL) ≤ 12 mA with 2 x EY-SU 358 (24 VDC)

Ambient conditions

	Operating temperature	0...45 °C
	Storage and transport temperature	−25...70 °C
	Ambient humidity	10...85% rh, no condensation

Parameters

Sensor	Measuring range	0...40 °C
	Resolution	0.1 K
	Time constant	14 min.
	Measuring accuracy	0.5 K in 15...35 °C range
Functionality	Setpoint correction	Can be set and reset; LCD
	Room occupancy (presence)	3 modes; LCD
	Fan speeds	3 levels, off, automatic; LCD
	Position/energy LED	1; green, red, orange, off; switchable
	Symbols in LCD	Time/date, air quality, heating/cooling, ECO, different units, state symbols (window, dew point, locked), SAUTER logo (can be hidden)

Interfaces, communication

Connection to automation station, controller	Activation	ecos 5**, ecos311, modu6*0-AS, ASV215, A*M***SA
	Interface	RS-485
	Protocol	SLC
	Line	4-wire, twisted, shielded

	Line length[1]	≤ 100 m with bus termination
	Connection terminals	Pluggable, for wire of 0.12...0.5 mm² (Ø 0.4...0.8 mm)

Construction

	Fitting	Recessed/surface-mounted (see accessories)
	Dimensions W × H × D	55 × 55 × 23 mm
	Weight	0.05 kg
	Housing	F0xx/F1xx: traffic white FAxx/FBxx: jet black
	Button printing	F0xx/F1xx: black FAxx/FBxx: white

Standards, directives

	Type of protection	IP30 (EN 60529)
	Protection class	III (EN 60730-1)
	Environment class	3K3 (IEC 60721)
CE/UKCA conformity[2]	EMC-D 2014/30/EU (CE)	EN 61000-6-1, EN 61000-6-2, EN 61000-6-3, EN 61000-6-4
	EMC-2016 (UKCA)	EN 61000-6-1, EN 61000-6-2, EN 61000-6-3, EN 61000-6-4
	RoHS 2011/65/EU & 2015/863/EU (CE)	EN IEC 63000:2018
	RoHS-2012 (UKCA)	EN IEC 63000:2018

Overview of types

Type	Features	Buttons _ = dummy button, PRA = presence
EY-RU355Fx02	Operating device, LCD, NTC, 0T	No buttons supplied
EY-RU355Fx21	Operating device, LCD, NTC, 2T	+ | − | _ | _ | _
EY-RU355Fx31	Operating device, LCD, NTC, 3T	+ | − | _ | _ | PRA
EY-RU355Fx32	Operating device, LCD, NTC, 3T	+ | − | _ | FAN | _
EY-RU355Fx41	Operating device, LCD, NTC, 4T	+ | − | _ | FAN | PRA
EY-RU355Fx42	Operating device, LCD, NTC, 4T	+ | − | ECO | _ | PRA
EY-RU355Fx51	Operating device, LCD, NTC, 5T	+ | − | ECO | FAN | PRA
EY-RU355Fx52	Operating device, LCD, NTC, 5T	+ | − | UP | DOWN | PRA
EY-RU355Fx53	Operating device, LCD, NTC, 5T	+ | − | UP | DOWN | LIGHT
EY-RU355Fx54	Operating device, LCD, NTC, 5T	+ | − | ECO | FAN | °C/°F
EY-RU355Fx55	Operating device, LCD, NTC, 5T	+ | - | UP | DOWN | FAN

🔆 *All types:*
x = 0 ≙ traffic white, 5/12...24 VDC
x = 1 ≙ traffic white, 12...24 VDC
x = A ≙ jet black, 5/12...24 VDC
x = B ≙ jet black, 12...24 VDC

Accessories

Type	Description	Colour
EY-SU358F021	Push-button unit with 2 button functions	Traffic white
EY-SU358FA21	Push-button unit with 2 button functions	Jet black
EY-SU358F041	Push-button unit with 4 button functions	Traffic white
EY-SU358FA41	Push-button unit with 4 button functions	Jet black
EY-SU358F081	Push-button unit with 8 button functions	Traffic white
EY-SU358FA81	Push-button unit with 8 button functions	Jet black

Fitting accessories, spare parts

Type	Description
0940240***	For frames, mounting plates and adapters for third-party frames, see product data sheet 94.055
0940240103	Frame, single, recessed, white (RAL9016), 10 pcs.

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[1] *SLC/RS-485 permits a line length of up to 500 m (decentralised supply)*

[2] *Explanation of abbreviations in the "Further information" section of the product data sheet and in the appendix to SAUTER's product catalogues*

Type	Description
0940240104	Frame, single, recessed, black (RAL9005), 10 pcs.
0940240703	Mounting plate, single, for recessed fitting (10 pcs.)
0940240203	Frame, double, recessed, white (RAL9016), 10 pcs.
0940240204	Frame, double, recessed, black (RAL9005), 10 pcs.
0940240802	Mounting plate, double, for recessed fitting (10 pcs.)
0940240302	Frame, single, surface-mounted, white (RAL9016), 10 pcs.
0940240303	Frame, single, surface-mounted, black (RAL9005), 10 pcs.
0940240402	Frame, double, surface-mounted, white (RAL9016), 10 pcs.
0940240403	Frame, double, surface-mounted, black (RAL9005), 10 pcs.
094013****	Buttons as accessories/spares, 10 pcs. (see product data sheet 94.055)
0949360004	Push-in terminal RU/SU (for wire), 2 × 10 pcs. 2-pin (01/02, 03/04)
0940360005	Terminal RU-SU, push-in, @3P (V,C,DQ), 10 pcs. (accessory for EY-SU 358)
0940360007	Terminal RU-SU, screw, @3P (V,C,DQ), 10 pcs. (optional accessory for EY-SU 358)
0940360006	Terminal and cable RU-SU, @3P (V,C,DQ), 15 cm, 10 pcs. (optional accessory for EY-SU 358)
0940360012	Screw terminal RU/SU (optional for stranded cable), 2 × 10 pcs. 2-pin (01/02, 03/04)

Description of operation

The ecoUnit355 (EY-RU 355) room operating unit records and transmits the room temperature to the connected room automation station. The device has five buttons to control different functions:
- Setpoint correction (+ and −)
- Presence mode selection
- Fan speed selection
- Freely assignable button

The EY-RU 355 belongs to the modulo product family (ecos 5, ecos311, modu 6) and can be connected to an automation station from the modulo system family using a digital RS-485 connection. The EY-RU 355 can also be used with a communicative actuator (ASV215 controller, A*M***SA Smart Actuator) and its applications. The EY-RU 355 displays current values on the LCD.

Intended use

This product is only suitable for the purpose intended by the manufacturer, as described in the "Description of operation" section. All related product regulations must also be adhered to.
The device is only intended for use inside buildings. The device may only be connected to an electrical circuit with protection class III. Modifying or converting the product is not admissible.

Buttons

The various types of devices differ mainly in the button functions and symbols. The buttons can be replaced. Individually assignable buttons are possible.
The following standard types are available:

Meaning of ...Fxyz

F: Standard type
x [0/1, A/B]: Housing colour (0/1=traffic white, A/B=jet black)
y [0, 2-5]: Number of printed buttons
z: Variant button set

Engineering and fitting notes

NOTICE!

Installation and assembly may only be carried out by an authorised electrician.

Fitting

The EY-RU 355 room operating unit is suitable for recessed and surface mounting. Product data sheet PDS 94.055 shows the fitting options and the accessory material required.

Notice

The mounting plate is screwed onto a recessed junction box. The device insert is placed on the frame and connected to the mounting plate by being pressed in.

The EY-RU 355 can be connected to the EY-SU 358 push-button unit for eight additional button functions. The EY-SU 358 is connected to the EY-RU 355 with a 3-core connection and can only ever be used in conjunction with this device.

Two EY-SU 358 with the same button assignment or function can be connected in parallel. The EY-SU 358 can be installed up to 30 m (total line length) away from the EY-RU 355.

Connection to the automation station and power supply

The EY-RU 355 is connected to the automation station or controller with a 4-wire shielded cable with twisted wire pairs. The maximum admissible bus length depends on the cable type used and the correct termination with terminating resistors.

Attention must be paid to the power supply and the device types. A supply voltage that is too high can irreparably damage the device.

Observe the correct polarity of all signals. For optimum resistance to interference, the cable shield of the entire bus line must be connected continuously, and connected to protective earth as directly as possible (max. 10 cm) at one location (usually at the station).

For Ethernet CAT-5 cables and J-Y(ST)Y cables, the maximum permissible bus length is 100 m. A possible voltage drop along the length of the cable must be taken into account. If the power supply (V, C) is implemented using the same cable as the data lines, the power supply cable (V) must be protected with suitable miniature fuses (see the manufacturer's data sheet; recommended values: < 0.33 mm^2 = 1 A, > 0.33 mm^2 = 3 A).

In the case of RS-485 interfaces, the bus wiring must follow line topology. Star, tree or branch topologies are not recommended. The devices do not have internal terminating resistors. Therefore, a terminating resistor of 120 Ω (0.25 W) must be connected at the start and end of the bus line, parallel to the D+/D− data lines.

The SLC/RS-485 bus communication permits a cable length of up to 500 m. The 24 VDC power supply of the EY-RU 355 must then be decentralised and implemented with a separate supply cable. The decentralised power supply for the EY-RU 355 must have the same reference potential as the supply to the controller.

With longer supply lines, interference from cross-currents can occur, if the supply is also used for other devices. To prevent this, it is advisable to provide a separate supply (24 VDC) for the EY-RU 355.

If the supply for the EY-RU 355 is performed with that for the EY-RC504/505, no other devices may be powered using the same supply cable. Any difference in the reference potential caused by the common supply cable may not be more than 2.5 V.

For the ecos311 it is advisable to set the power supply for the EY-RU 355 to 15 VDC using the DIP switch so that the backlight can be operated.

Newer variants of EY-RU 355 (F1**, FB**) no longer support a +5 V supply and must be supplied with 12...24 VDC. These EY-RU 355 cannot be used as replacement devices for EY-RU 34x with +5 V supply.

If the EY-RU 355 is used with a Smart Actuator (A*M***SA), it must not be supplied with 24 VAC in order to use the 24 V terminal (24 VDC) of the RS-485/SLC connector.

Addressing the operating units

To allow the EY-RU 355 to be addressed by the automation station, a device address must be set on the EY-RU 355. The device address is not set on delivery (Ad00). The EY-RU 355 communicates with the controllers with address RU1...RU4 for each SLC/RS-485 bus.
The device address is set using the plus (+) and minus (–) buttons.

> **Notice**
> For addressing the EY-RU355Fx02 room operating unit, the top two buttons from the optional accessories must be assigned.

Addressing mode

The device address can be set within 60 minutes from switching on. Addressing mode is indicated by the flashing "Ad00" or "Ad01"..."Ad04" signals.
The following applies:

Indicator/display	Status	Meaning
Ad00	Flashing	Device is not addressed (as delivered ex works)
Ad01..04	Flashing	Device is in addressing mode (temporary)
E02	Continuous	Communication error (no valid address or faulty connection to the controller)
E06	Continuous	Insufficient supply voltage, as of FW V1.07 (especially for F1**/FB**, if supply < 8.5 VDC)

Setting or changing the address

On delivery, the EY-RU 355 devices are not addressed and "Ad00" flashes in the display.
When the top two buttons (usually (+) and (–)) are pressed simultaneously for more than five seconds, the device changes to addressing mode. The displayed device address (Ad00) flashes. The device address (Ad01 to Ad04) can be set in addressing mode using the (+) and (–) buttons.
The addresses 0 and 5 to 16 are not supported by the automation stations at present. If the top button (+) is pressed for more than five seconds, the address setting is saved and the EY-RU 355 switches to operating mode within a few seconds.
If no further change is made for 60 seconds in addressing mode, the EY-RU 355 returns to operating mode without saving the setting.

Error message on the LCD

Display: E02
Meaning: No communication to the automation station.
Possible causes:
- Communication line is not correctly installed.
- Engineering error, e.g. "ROOM_UNIT" firmware module not used.
- Automation station (controller) is not yet fully started.
- Controller has not yet completed synchronisation with the EY-RU 355.
- Download or parameter download from CASE Engine to the controller.
- Use of Ad02, 03, 04 for controllers, stations supporting only one EY-RU 355 (Ad01).

Display: E06 (since firmware version 1.07)
Meaning: Insufficient supply voltage.
Possible causes:
- F1**/FB** type devices are supplied with +5 VDC.

LED as a position LED or as energy consumption indicator

The following states and colours of the LED (1) can be set with the user program of the automation station: green, red, orange, off.
The LED function can be used, for example, to indicate optimal energy consumption in the room with the colour green. The colour red can be used in the same way in order to indicate energy

consumption that is too high. The LED can also be used as a position LED to make it easier to find the room operating unit in the dark.
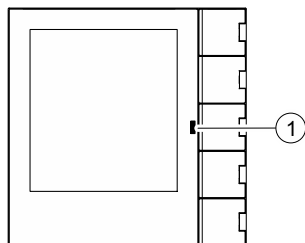
Backlight

The EY-RU 355 has a backlight that makes the display easy to read. The brightness can be adjusted to eight levels using the "ROOM_UNIT" firmware module. The backlight automatically switches to the lowest brightness after a configured time. Turning off the backlight can save about 100 mW of power.

Integrating the EY-RU 355 in the automation station user program

How the automation station or the operating unit and display respond to the press of a button is programmed in the user program. The "ROOM_UNIT" module is available in the firmware for this purpose. This module is described in the "Firmware modules" documentation.

Compatibility with EY-RU 34x/EY-SU 306

In combination with the EY-SU 358 push-button unit, the EY-RU 355 is very compatible with the device combination EY-RU 34x/EY-SU 306.

Both device types can be parameterised with the "ROOM_UNIT" firmware module. From CASE Engine 3.9 SR1 onward, the extended functions of the EY-RU 355 are available. However, the EY-RU 355 can also be used as a replacement for the EY-RU 341...346 room operating unit. The EY-RU 355 has a corresponding compatibility mode.

For reasons of compatibility, buttons 1 to 5 (from top to bottom) of the EY-RU 355 are assigned to the outputs SW5, SW2, SW4, SW6 and SW1 of the "ROOM_UNIT" module.

Notice

SW3 can no longer be used. Applications that use SW3 must be adapted. If an EY-RU 34* was supplied with +5 VDC, the appropriate EY-RU 355 type with +5 VDC supply must be selected (F0**/FA**).
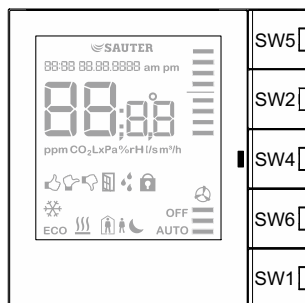

Resetting the setpoint correction to increase energy efficiency

In order to reduce energy consumption, it is possible to centrally reset, at regular intervals, the temperature setpoint correction set locally by the room user, for example using a building management system. The setpoint correction is reset via the "X2" input of the "ROOM_UNIT" firmware module (CASE Engine). The offset command resets the display (numerical value and bargraph) of the EY-RU 355 and the "Offset" output of the "ROOM_UNIT" module.

Additional information on parameterisation and the functionality of the EY-RU 355/EY-SU 358 device combination with the "ROOM_UNIT" module can be found in the CASE online help.

Display functions
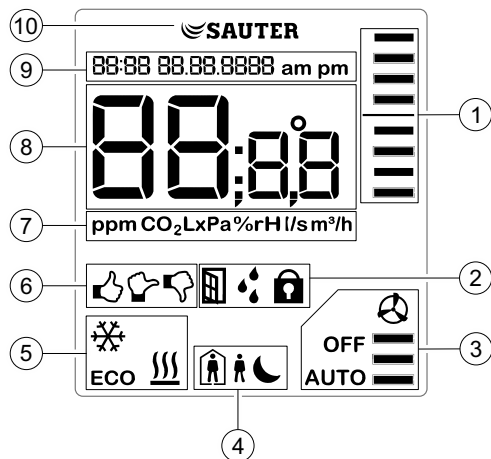
(1) Temperature setpoint correction

(2) State symbols: Window open, dew point, operation locked (wind alarm)

(3) Fan speeds: 1-3, off, automatic

(4) Room occupancy: Normal mode (presence), reduced mode (absence), night reduction

(5) Room climate mode: Cooling, heating, ECO

(6) Room air quality: Good, moderate, poor

(7) Units for displayed value

(8) 7-segment display, e.g. for temperature (°C/°F), CO_2 concentration (ppm), light intensity (Lx)

(9) Time and date (12- and 24-hour format)

(10) SAUTER logo (can be hidden)

Additional information

Fitting instructions	P100015234
Declaration on materials and the environment	MD 94.041

Abbreviations used

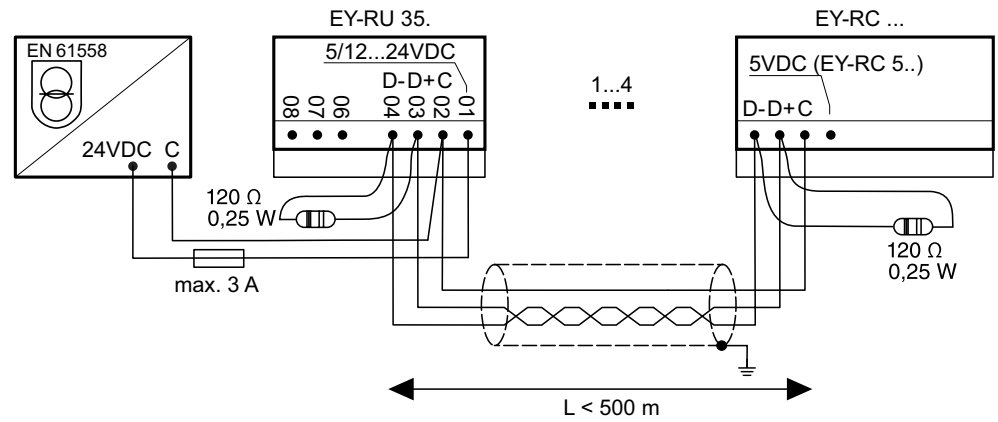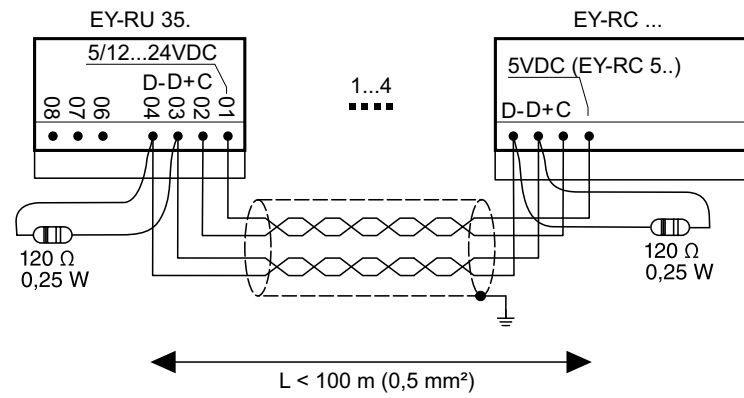| Abbreviation	Directive
EMC-D	Electromagnetic Compatibility Directive 2014/30/EU
EMC-2016	Electromagnetic Compatibility Regulations 2016
RoHS	RoHS Directives 2011/65/EU and 2015/863/EU
RoHS-2012	Restriction of Hazardous Substances (RoHS) Regulations 2012

Disposal

When disposing of the product, observe the currently applicable local laws.

More information on materials can be found in the Declaration on materials and the environment for this product.
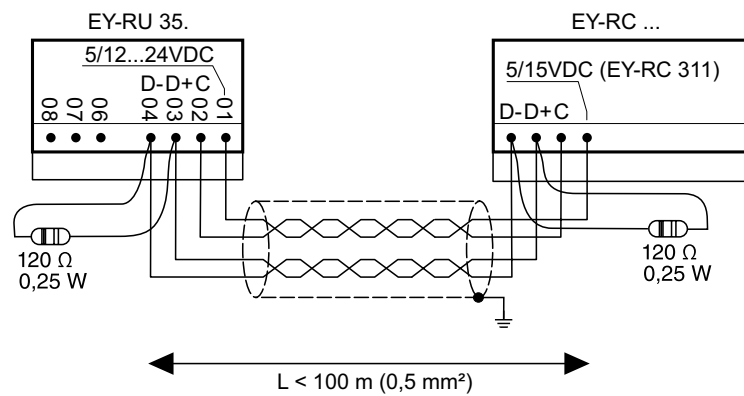
Connection diagram for EY-RC 500 (RS-485A), 502, 504, 505

EY-RU 35. EY-RC ...

EN 61558

5/12...24VDC
D-D+C
08 07 06 04 03 02 01

1...4

5VDC (EY-RC 5..)
D-D+C

24VDC C

120 Ω
0,25 W

max. 3 A

120 Ω
0,25 W

L < 500 m

Connection diagram for EY-RC 500 (RS-485A), 502, 504, 505 – compatibility with EY-RU 34*

EY-RU 35. EY-RC ...

5/12...24VDC
D-D+C
08 07 06 04 03 02 01

1...4

5VDC (EY-RC 5..)
D-D+C

120 Ω
0,25 W

120 Ω
0,25 W

L < 100 m (0,5 mm²)

Connection diagram for EY-RC 311 – compatibility with EY-RU 34*

EY-RU 35. EY-RC ...

5/12...24VDC
D-D+C
08 07 06 04 03 02 01

5/15VDC (EY-RC 311)
D-D+C

120 Ω
0,25 W

120 Ω
0,25 W

L < 100 m (0,5 mm²)

Dimension drawing