

# Room controller

## LS 990 / LS plus

### Stainless Steel / Aluminium



2

		Ref.-No.
<b>KNX room controller display</b>		
ETS-product family:	Heating, ventilation, A/C	
Product type:	Regulator	
<b>3-gang</b>	ivory	RCD 2021
	white	RCD 2021 WW
	light grey	RCD 2021 LG
	stainless steel	RCDES 2021
	aluminium (laquered)	RCDAL 2021
	anthracite (laquered)	RCDAL 2021 AN
	gold coloured	RCDGO 2021
<b>4-gang</b>	ivory	RCD 2022
	white	RCD 2022 WW
	light grey	RCD 2022 LG
	stainless steel	RCDES 2022
	aluminium (laquered)	RCDAL 2022
	anthracite (laquered)	RCDAL 2022 AN
	gold coloured	RCDGO 2022
<b>5-gang</b>	ivory	RCD 2023
	white	RCD 2023 WW
	light grey	RCD 2023 LG
	stainless steel	RCDES 2023
	aluminium (laquered)	RCDAL 2023
	anthracite (laquered)	RCDAL 2023 AN
	gold coloured	RCDGO 2023
<b>6-gang</b>	ivory	RCD 2024
	white	RCD 2024 WW
	light grey	RCD 2024 LG
	stainless steel	RCDES 2024
	aluminium (laquered)	RCDAL 2024
	anthracite (laquered)	RCDAL 2024 AN
	gold coloured	RCDGO 2024
<b>8-gang</b>	ivory	RCD 2044
	white	RCD 2044 WW
	light grey	RCD 2044 LG
	stainless steel	RCDES 2044
	aluminium (laquered)	RCDAL 2044
	anthracite (laquered)	RCDAL 2044 AN
	gold coloured	RCDGO 2044

- 3** The KNX room controller with display combines three devices:
- Universal push-button plus additional features
  - Room thermostat with continuous control or 2 point switch control method for heating and/or cooling and additional heating/cooling system, plus additional features
  - LCD display (visible: 30 mm / 35 mm), with restricted functions
  - Fan Coil Control

Via corresponding symbols the different operation modes are indicated. The device has a green operation LED and each push-button has its own red status LED with the option of an own communication object.

The device comes with a separate software which contains the application software as well as the data base. That software has to be installed first within the directory of the used ETS version. Then the data base has to be imported as usual within the ETS. By opening the parameters the embedded software is started automatically.

The room controller can be extended with additional push-buttons or socket outlets by using 3- to 5-gang frames.

The BCU is already integrated into the device.

**Note:** The device comes together with the software.

The latest software can be downloaded from our web-page: [www.jung.de](http://www.jung.de)

## 4 Technical data

### Supply

**Voltage:** 24 V DC (+6 V / -4 V) via integrated BCU

**Power consumption:** max. 240 mW

**Connection:** KNX connection block

**Range of measurement:** 0 ... 40°C

**Comfort temperature:** 7 ... 40°C

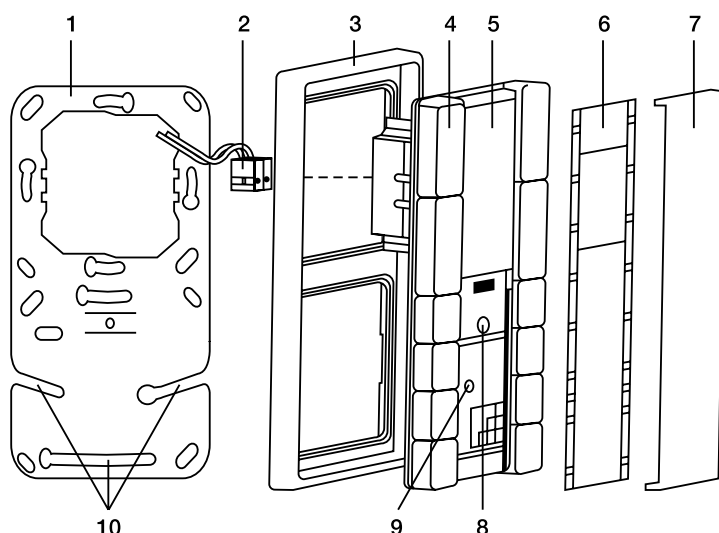
**Set point offset:** max. ± 10 K

**Protection:** IP 20

**Operation temperature:** -5°C ... +45°C

**Storage temperature:** -25°C ... +75°C

## 5 Connection and mounting of RCD 20xx:



### Mounting:

a. Metal supporting frame (1) to be mounted on one or two vertically arranged wall boxes.

When using only one box, the lower part has to be screwed via the fixing holes (10).

b. Attach the frame (3) to the RCD.

c. Connect the bus terminal (2) at the back side.

d. Attach the RCD (4) and frame (3) on the metal supporting frame (1).

e. Screw on the fixing screw (8).

f. Remove the protection foil (5) from the display.

g. Put on the transparent cover (7) with the inscription foil (6) to the RCD.

The programming mode is activated by pushing the programming button (9).

**Note:** Do not mount the device next to heat sources due to the influence of the integrated temperature sensor.

## 5

**Description of software application:**

There are two operation levels to operate the room controller:

1. complete universal push-button functionality on **all** push-buttons
2. temperature adjustment with the four push-button beside the LCD display

By pressing the upper two push-buttons simultaneously for approx. 3 sec. the second level is activated. After the adjustments in this level, the change over into the first level is dependent on the parameter.

**1. Operation level:**

- Switching, toggling
- Dimming (single level / two level dimming)
- Shutter / blind control (single level / two level control)
- Value transmitter
- Light scene recall with memory
- Light scene recall without memory
- Brightness value transmitter (0 ... 1500 Lux)
- Presence push-button for thermostat (comfort / stand by mode)
- Set temperature offset adjustment (+ / -)
- Enable / disable function for single push-buttons or for the whole RCD
- Status LED for each push-button with separate objects
- Display indication:
  - week day, time
  - set or real temperature
  - actual operation mode of the thermostat
  - external value (e.g. wind speed, outside temperature, etc.)
- Fan coil control:
  - manual in 3 or 4 steps
  - automatic

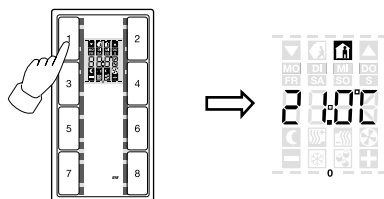
**Default setting:**

In operation level 1 all push-buttons have the parameterised function. The LCD can display either the actual temperature, the actual set-temperature of the continuous regulator, the actual time, the actual date or an external value. When more than one information has to be displayed, the display is alternating.

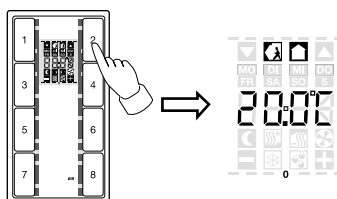
In the default setting, the push-button on the left and right side of the display serve the presence and the set-temperature adjustment.

According to the needs, the default setting can be changed to the full function of an universal push-button.

Switch-over  
between comfort-temperature  
and

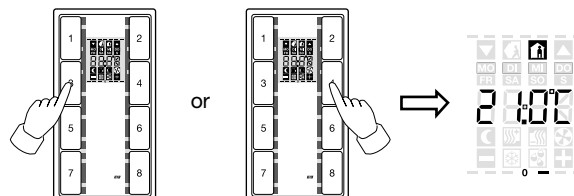


standby-temperature.



Adjusting the comfort-temperature:

Left push-button: lower the comfort-temperature  
Right push-button: raise the comfort-temperature



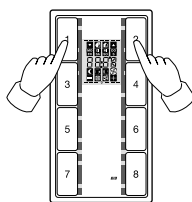
## 5

## Description of software application:

## 2. Operation level:

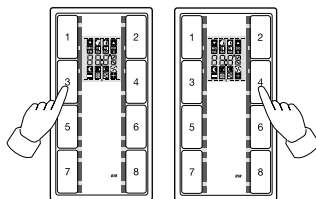
- First display in this level can be parameterized
- First pair of push-buttons: scroll function of the operation modes with their corresponding temperatures values, as comfort temperature, standby / night shift back, display contrast and display segment test
- Second pair of push-buttons: adjustment of the different functions
- Rest of the push-buttons: no function

Via long push-button action (> 3 s) of push-button 1 + 2 the device switches over to the 2nd operation level. In this operation level the set-values of the continuous regulator and the contrast of the LC-Display can be adjusted. Scroll through the menu using push-buttons next to ▲ / ▼ symbols.



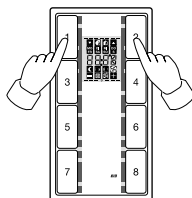
While the display flashes, the set-values can be adjusted.

With the push-buttons next to the ± symbols the values can be changed.

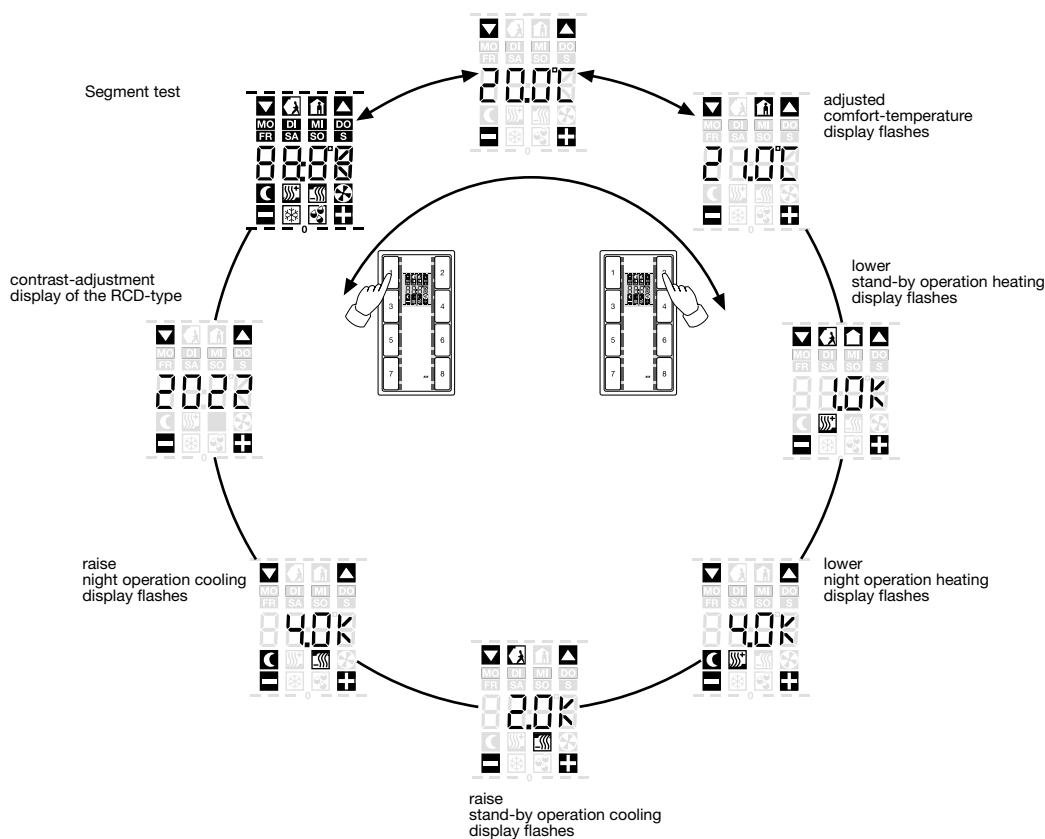


Long push-button action (> 3s) of the push-buttons 1 + 2:

Storing and back to operation level 1.



The first indication of the display in the 2nd operation level can be parameterised. Hence the menu guidance can differ from the display at the device.



## 5

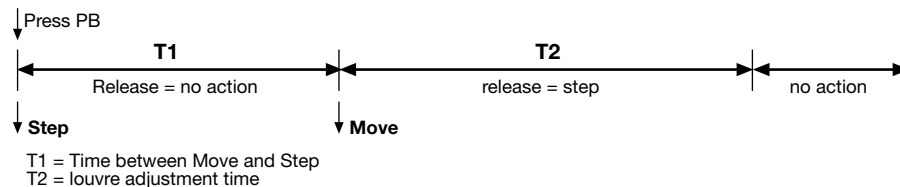
**Description of software application:****A) Enable / disable function:**

It is possible to disable single push-buttons or all push-buttons. When a disabled push-button is pressed (or released) there is either no reaction or a command, which is normally released by another push-button.

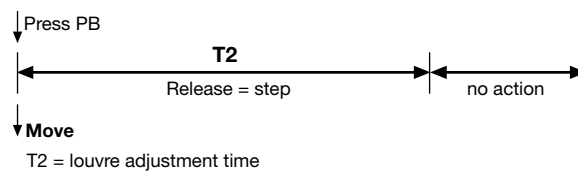
Furthermore, there are parameters to define telegrams even during the blocking and at the end of blocking.

**B) Shutter / blind operation modes:****Concept 1: Step-Move-Step** („normal universal push-button concept“).

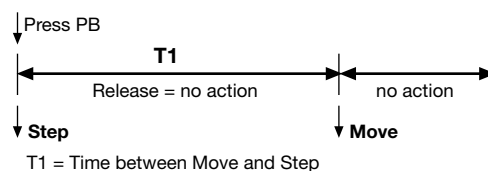
A push-button (PB) action causes a step telegram. The step-move time (T1) runs. Releasing the push-button within T1 causes no further telegram. By pressing the PB longer than T1, a move telegram will be send, the louvres adjustment time (T2) starts. Releasing the PB within T2 causes a step telegram while pressing longer than T2 causes no further telegram.

**Concept 2: Move-Step**

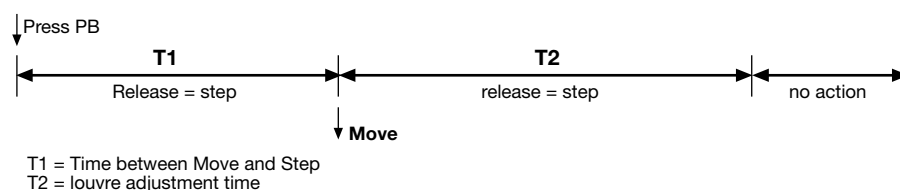
A PB action causes a move telegram. The louvres adjustment time (T2) runs. Releasing the PB within T2 causes a step telegram while pressing longer than T2 causes no further telegram.

**Concept 3: Step-Move**

A PB action causes a step telegram. The step-move time (T1) runs. Releasing the PB within T1 causes no further telegram. By pressing the PB longer than T1, a move telegram will be send.

**Concept 4: Move-Step or Step**

This concept is similar to concept 1. In difference, the first PB action causes no step telegram. The step-move time (T1) starts. Releasing the push-button within T1 causes a step telegram. By pressing the PB longer than T1, a move telegram will be send, the louvres adjustment time (T2) starts. Releasing the PB before T2 is finished causes a step telegram while pressing longer than T2 causes no further telegram.



T1 = Time between Move and Step

T2 = Louvre adjustment time

## 5

**C) Fan coil control**

The use of **fan coil control** requires the "constant PI-control" or the "PWM control" for regulation.

The fan coil control can be carried out:

- Automatically operated
- Manually operated

**Automatic operation mode:**

The **set value** of the **controller** is used for the internal control of **the fan level**.

When changing between fan levels, it can only be changed to the next higher or lower fan level to secure a possibly required leadtime of the heating/cooling medium.

**Manual operation mode:**

By means of pressing the button with the function "Manual control" the RCD differs if it is in automatic or manual operation mode.

If it is in automatic operation mode, it will switch into manual operation mode and the fan will be switched OFF.

If the RCD is already in the manual operation mode, it will switch into the next higher fan level.

If the RCD is in the manual operation mode and the fan is in the highest level, the fan will be switched OFF.

**Push-button functions "fan level"**

The push-button function "fan level" can be parameterised in two ways:

Fan control in automatic operation mode or fan control in manual operation mode

By means of pressing the button with the function "automatic", the automatic operation mode will be active.

By means of pressing the button with the function "manual control", the manual operation mode will be active.

The push-button function "fan level" has no communication objects. This function refers directly to the object values and the automatic object.

**Indication on Display**

When the fan is running, a symbol for the fan appears in the display of the RCD. The actual fan level will be displayed in the upper segment line from right to the left.

For example the fan level 3 will be displayed with the 3 upper segments on the right side.

**Forced position**

With the parameter "forced position" **a specific** fan levels can be predefined. When the respective object receives the value 1, the "forced position" is activated. Then only the predefined fan level is activated and can not be changed with automatic or manual operation mode to another fan level. When the respective object receives the value 0, the "forced position" is deactivated.

**Level restriction**

With the parameter "level restriction" a **maximum** fan level can be predefined. When the respective object receives the value 1, the "level restriction" is activated.

Only the predefined level and lower fan levels can be selected with the automatic or manual operation mode. (Exception: Forced position)

If a higher fan level is switched on before activation of the "level restriction", the parameterised fan level will be activated.

**Switching of operation modes (fan)**

The switch over between manual and automatic operation mode will be enabled via:

switch objects (1 bit)

value objects (1 byte)

**Fan level switching via switch object (1 bit)**

Each fan level has a switch object. When changing between fan levels, the active fan level will be switched off before the new selected fan level will be switched on.

The switch objects of the respective switch actuator are **only** allowed to be switched from the RCD. Only the RCD should be able to send writing telegrams.

**Fan level switching via value object (1 byte)**

Each fan level is assigned to one value of the value object (see chart). The respective switch actuator must be able to read values of the 1 byte object to switch the desired fan level contact. Only the RCD should be able to send writing telegrams.

Object No. 89 "Fan, fan level 1 – 3 (4)"

Object value	Fan level
0	OFF level
1	Level 1
2	Level 2
3	Level 3
4	Level 4
5	

## 5

**D) First operation level**

In the first operation level it is possible to parameterise up to 5 indications. If more than 1 indication is parameterised, these will alternate.

In the first operation level can be displayed:

- Actual value
- Set value
- Date
- Time
- External value

For better identification of actual and setpoint temperature an additional "s" is indicated in the display together with the **set** temperature.

The external value can be displayed in format 1 byte or 2 byte. It can be added a leading sign or a measuring unit. When the external value is displayed, all other display symbols are not indicated. The external value will always be displayed without decimal places. The range of values depends on the parameterisation.

**Range of values (1 byte)**

	with measuring unit	without measuring unit
With leading sign	-99 ... 99	-128 ... 127
Without leading sign	0 ... 255	0 ... 255

**Range of values (2 byte)**

	with measuring unit	without measuring unit
With leading sign	-99 ... 99	-999 ... 999
Without leading sign	0 ... 999	0 ... 9999

**E) Second operation level**

In the second operation level the switch over between standby and comfort mode can be released with the parameter "changing of operation mode in operation level 2". If the changing is released, the operation mode can be switched over in the second display of the second operation level.

**Consideration of outdoor temperature**

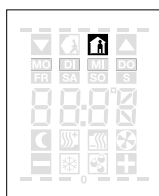
If the parameter "Consideration of outdoor temperature" will be parameterised with "yes", the ECON generates the object "outdoor temperature" (object 95) of type EIS 5. The connected function limits the setting of the setpoint temperature to max. 6 Kelvin. This also means, that the setpoint temperature will be adjusted to the outdoor temperature (outdoor temperature minus 6 K).

This parameter and the connected functionality is only visible, if the operation mode "cooling" or "heating & cooling" is parameterised.

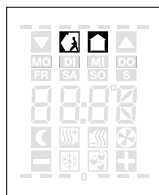
**Commissioning note:**

When an ETS project with an RCD has to be exported and imported into another PC, please ensure that the software is also installed on the target PC!

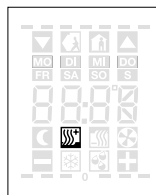
# 6 Symbols



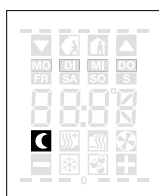
Comfort mode

Heat protection  
(dew point)

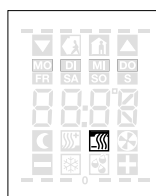
Standby mode



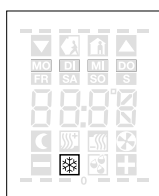
Heating



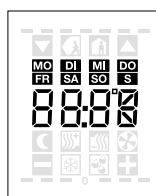
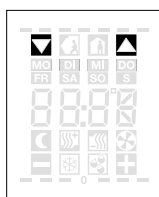
Night mode



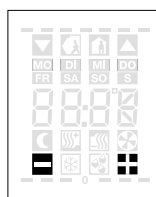
Cooling



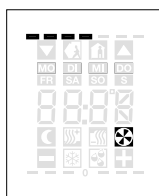
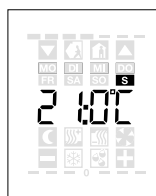
Frost protection

Date, time or  
temperature display

Menu operation



Set point adjustment

Step 1 – 4  
FanCoil

Set temperature