SIEMENS

Infrastructure & Cities

Synco™ 700

Central control unit RMB795B

For room controllers RXB/RXL and room thermostats RDG/RDF/RDU

Basic documentation

CE1P3122en
18.01.2012

Building Technologies

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Contents

1 Overview

1.1 Central control unit RMB795B

What is the RMB795B central control unit?

The RMB795B is a central control and operator unit for room control in connection with Synco™ RXB/RXL and with room thermostats RDG/RDF/RDU. It significantly extends the field of use of the Synco™ system.

Note

The room controller RXB/RXL and Synco room thermostats RDG/RDF/RDU are referred to below as individual room controller.

KNX makes it possible

Thanks to the KNX bus, the bus communication capability of the controller network can be used in the easiest possible manner. For that, the typical easy-to-understand Synco™ operating concept has been maintained.

User-friendliness at all levels

Whether for end-users, engineering, service or commissioning staff, menu-driven operation in clear-text underlines the system's user-friendliness at all levels.
The RMB795B central control unit is operated via a plug-in type or detached operator unit.

Function

The RMB795B central control unit facilitates central operation of room groups equipped with RXB/RXL room controllers while offering the following features:

- Time switch, calendar and special day programs
- Preselected setpoints and trend functions
- Supervision of the highest / lowest temperatures and device supervision
- Collects and forward demand signals to the primary side

1.2 Product range

Control units, accessories

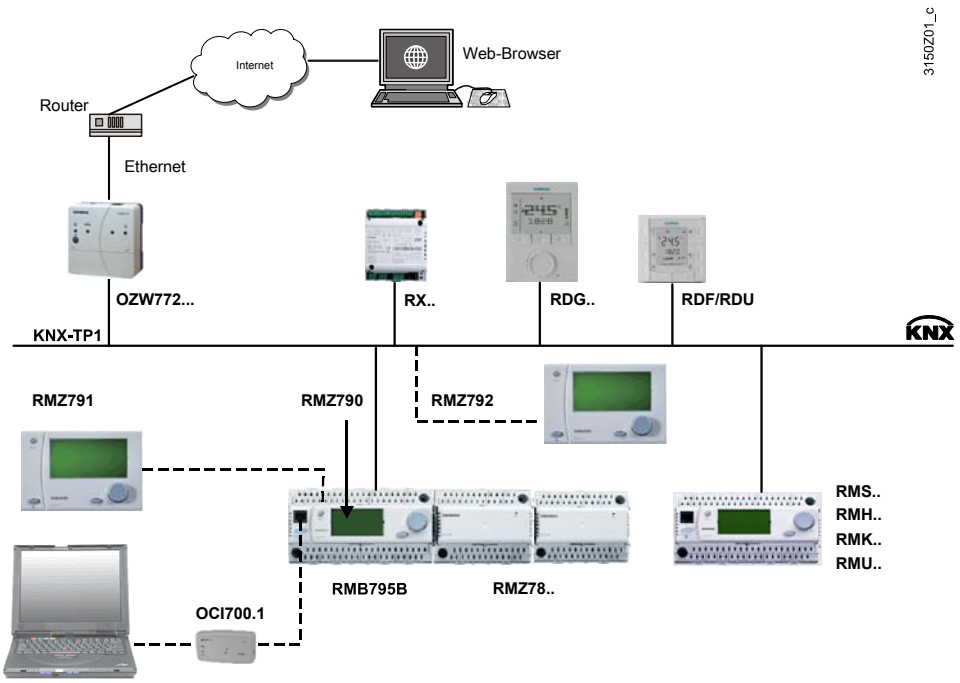
The table below shows the various comprehensive solutions for use with the RMB795B and individual room controllers:

Room unit	*Illustration*	*Name*	*Type*	*Data Sheet*
Switching and control units		Central control unit	**RMB795B**	N3122
		Room controlled	**RXB..**	N3873 N3874
		Room controller	**RXL**	N3877
		Room thermostat	**RDF**	N3171

		Room thermostat	**RDG**	N3191 N3192
		Room thermostat	**RDU**	N3172
Extension modules		Universal module	**RMZ787**	N3146
		Universal module	**RMZ785**	N3146
		Module connector	**RMZ780**	N3138
Operator units		Operator unit, plug-in type	**RMZ790**	N3111
		Operator unit, detached	**RMZ791**	N3112
		Type of room unit	**QAW740**	N1633
Operator unit 1		Service tool	**OCI700.1**	N5655

1.3 Synco™ 700 topology

Use of RMB795B central control unit



Key

RMU..	Universal controller	RMK..	Boiler sequence controller
RMZ790	Operator unit, plug-in type	RMB795B	Central control unit
RMZ791	Operator unit, detached	RX..	Room controller
RMZ792	Bus operator unit	RDG.. RDF.. RDU..	Room thermostat
RMZ78..	Extension modules	OCI700.1	Service tool
RMS..	Switching and monitoring device	OZW772..	Web server
RMH	Heating controllers		

1.4 Equipment combinations

Sensors and monitors

The table below shows the types of devices that can be combined with the RMB795 and the extension modules:

Room unit	*Type*	*Data Sheet*
Passive sensors	All types of sensors with sensing element LG-Ni1000, Pt1000, T1 (PTC)	N1721...N1847, N1713
Active sensors	All types of sensors: • operating on AC 24 V • with modulating output DC 0...10 V	N1821, N1850...N1962
Monitors	QAF81..., QAF64..., QFA81, QFM81, QFA1000, QFA1001, QFX21, QXA2000, QBM81...	N1284, N1283, N1513, N1514, N1518, N1541, N1542 N1552
Volume flow controller VAV	G…B181.1E/3 G…B181.1E/KN networked versions	N3544 N3547

1.5 Product documentation

Supplementary information

In addition to this Basic Documentation, the product documents listed below provide detailed information about the safe and correct deployment and operation of Synco™ 700 products in building services plant.

Type of document	*Document no.*
Range description: Synco™700	**CE1N3110en**
Basic documentation: Central control unit RMB795B	**CE1P3122en**
Data sheet: Central control unit RMB795B	**CE1N3122en**
Data sheet: Universal modules RMZ78..	**CE1N3146en**
Data sheet: Module connector RMZ780	**CE1N3138en**
Data sheet: KNX bus	**CE1N3127en**
Basic documentation: Communication via KNX bus	**CE1P3127en**
Installation instructions (G3151xx): RMB795, RMS705B, RMU7..B	**74 319 0731 0**
Mounting instructions (M3110xx): RMZ78..	**74 319 0353 0**
Mounting instructions (M3112xx): RMZ791	**74 319 0339 0**
Declaration of Conformity (CE) HVAC Controls Synco 700 Range	**CE1T3110xx**
Environmental declaration (RMU7..B, RMS705, RMB795, RMH760, RMK770)	**CE1E3110en01**
Environmental declaration (RMZ78..)	**CE1E3110en02**
Environmental declaration (RMZ790)	**CE1E3110en03**
Environmental declaration (RMZ791)	**CE1E3110en04**
Environmental declaration (RMZ792)	**CE1E3131en**

1.6 Output

Overview

Summary of the functions and features for the central control unit RMB795B:

Outfit / functions	***RMB795B***
Canned applications	1
Extension modules Extension with 2 universal modules RMZ787 each with 4 universal inputs and 4 relay outputs Extension with 1 universal module RMZ785 with 8 universal inputs	3
Room groups	10
Control of room operating mode per room group	✓
Via operator unit RMZ79x	✓
Via digital inputs (room operating mode selector switch and timer function)	✓
Via internal time switch (7-day time switch)	✓
Via room unit QAW740	✓
Via KNX bus (room operating mode selector switch and timer function)	✓
Control of calendar per room group	✓
Via operator unit RMZ79x	✓
Via digital inputs (for holidays/special days)	✓
Via KNX bus (for holidays/special days)	✓
Control functions per room group	✓
Fire alarm off.	✓
Smoke extraction supply air/extract air	✓
Night cooling.	✓
Free cooling	✓

Outfit / functions	*RMB795B*
Precooling	✓
Fan only	✓
Boost heating	✓
Emergency heating	✓
Off	✓
Room operating mode output per room group	✓
Setpoint per room group	✓
Summer/winter compensation.	✓
Setpoints (absolute)	✓
Setpoint readjustment via room unit QAW740	✓
Setpoint priority for RMB or room controller	✓
Highest / lowest temperature supervision per room group	✓
Alarms	✓
Free fault inputs (digital or analog)	10
Fault status signal relay.	2
Universal inputs (central control unit and extension modules)	22 (6 + 4 + 4 + 8)
As analog input DC 0...10 V.	✓
As analog input Ni 1000.	✓
As analog input Pt 1000	✓
As analog input T1.	✓
As digital input.	✓
Data acquisition	
Online trend channels	4
Pulse counter	4
Switching outputs (relays)	12 (4 + 4 + 4)
Modulating outputs (analog)	2
Logic blocks	10
Heat demand signal Relays and modulating	✓
Refrigeration demand signal Relays and modulating	✓
H/C changeover of 2-pipe system	✓
Operation and observation of RXB/RXL room controllers	✓
Setpoints for room groups	✓
Monitoring devices	✓

1.7 Important notes

⚠ This symbol draws your attention to special safety notes and warnings. Failing to observe these notes may result in injury and / or serious damage.

Field of use You may only use Synco™ 700 products to control and monitor heating, ventilation, air conditioning and chilled water plants.

Intended use Safe and trouble-free operation of Synco™ 700 products presupposes transport, storage, mounting, installation and commissioning as intended as well as careful operation.

Electrical installation Fuses, switches, wiring and earthing must comply with local safety regulations for electrical installations.

Commissioning Only qualified staff trained by **Siemens Building Technologies** may preparte for use and commission Synco™ 700 products.

Operation Synco™ 700 products may only be operated by staff instructed by **Siemens Building Technologies** or its delegates and who understand the potential risks.

Wiring

When wiring the system, strictly segregate the AC 230 V section from the AC 24 V safety extra-low voltage (SELV) section to ensure protection against electric shock hazard!

Storage and transport

For storage and transport, observe the limits from the relevant data sheets at all times.
If in doubt, contact your supplier or Siemens Building Technologies.

Maintenance

Synco™ 700 products are maintenance-free and require only cleaning at regular intervals. We recommend removing dust and dirt from system components installed in the control panels during standard service.

Faults

If system faults occur and you are not authorized to perform diagnostics and rectify faults, call your Siemens Building Technologies service representative.

Only authorized staff may perform diagnostics, remedy faults, and restart the plant. This also applies to working within the panel (e.g. testing or changing fuses).

Disposal

Do not dispose of devices with electrical and electronic components as part of domestic waste.
Observe all local legislation.

2 Operation

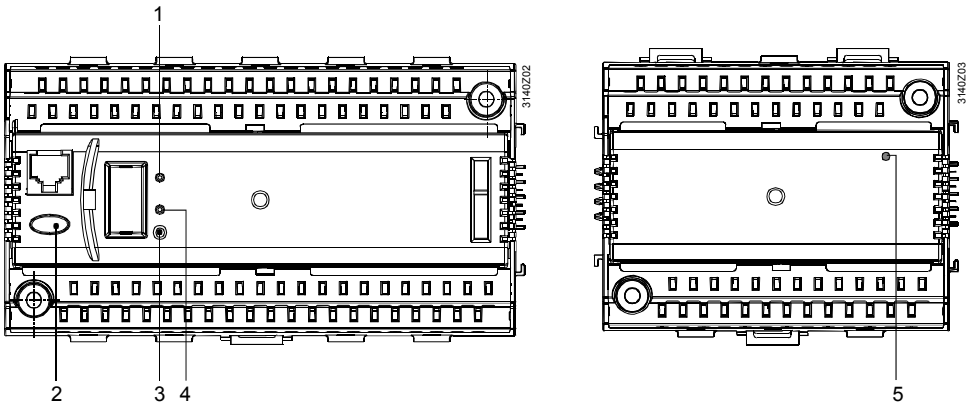
⚠

Synco™ 700 devices may only be operated by staffs who has been instructed by Siemens Building Technologies or their delegates and whose attention has been drawn to potential risks.

2.1 Operation without operator unit

Operating elements

Without the operator unit, the following operating elements on the central control unit RMB795B and extension module can be used:



Central control unit | Extension module

Functions

The operating elements shown above have the following functions:

Ref.	*Operating element*	*Function*
1	LED **Run**	Indication of the unit's operating state: *LED lit:* Power on, correct use and no fault in the peripheral devices *LED off:* No power or incorrect use / faulty peripheral devices
2	**Fault button** 🔔 with LED (red)	Indication and acknowledgement of a fault status message: *LED flashes:* Fault status message ready for acknowledgement *LED lit:* Fault status message still present but not yet reset *LED off:* No fault status message present *Press button* Acknowledge fault or reset.
3	**Prog** button	Learning button for switching between normal mode and addressing to adopt the physical device address (tool required)
4	LED **Prog**	LED to indicate "Normal mode" (LED off) or "Addressing mode" (LED on); it extinguishes after adoption of the physical address
5	LED **Run**	Supervision of power supply and addressing: *LED lit:* Power on, module addressing lit *LED flashes:* Power on, but module not yet addressed by the RMB795B central control unit *LED off:* No power

2.2 Operation with operator unit

2.2.1 Operator unit functions

Brief description

The operator unit is used to make all settings and readouts required for operating the RMB795B central control unit.
All entries made on the operator unit are transmitted to the central control unit where they are handled and stored. The operator unit itself does not store any data. The information for the user is generated by the central control unit and forwarded to the operator unit where it is displayed.

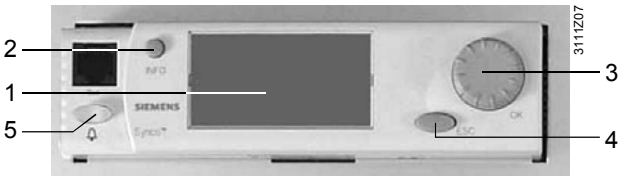
2.2.2 Operating concept

Basics

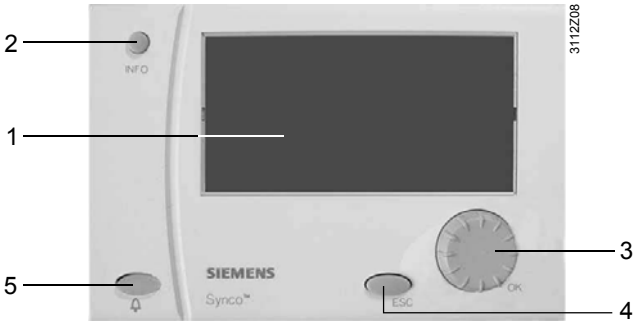
All setting and readout values are arranged as data points (operating lines) in a software menu tree. Using the operating elements, any data point can be selected and read or set. The LCD shows all menus in plain text..
The central control unit has several languages loaded. Enter the relevant language during commissioning. The Operating Instructions for the end user are included with the central control unit; they contain the languages with which the unit is supplied.

Operating elements

The pictures below show the 2 types of operator units with their operating elements:



Plug-in type operator unit RMZ790.



Detached operator unit RMZ791

Functions

The operating elements shown above have the following functions:

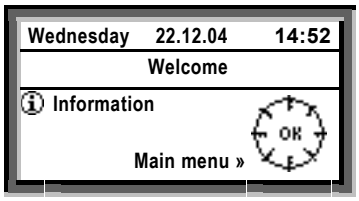
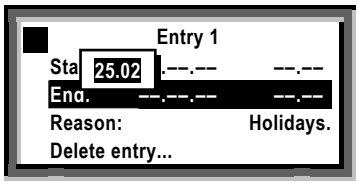
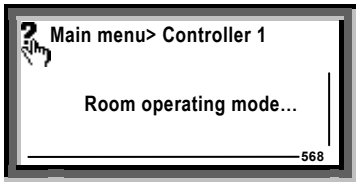
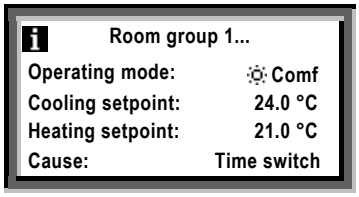
Ref.	*Operating element*	*Function*
1	Display	Display of key plant data (info level)
2	**INFO** button	*Function 1:* Display of key plant data *Function 2:* Display of information about the individual data points on the current menu
3	Press-and-select knob **OK**	*Turn:* Selection of operating line and adjustment of value *Press:* Confirmation of operating line or setting.
4	**ESC** button	Going back to the previous menu
5	**Fault button** 🔔 with LED (red)	*LED:* Indicates a fault. *Press:* Acknowledge fault or reset.

Backlit display

When one of the operating elements is activated, the backlit display will automatically be switched on. It switches off and the start page appears when inactive for 30 minutes.

Display examples

The pictures below show a number of typical displays, including explanations:

Display	*Explanation*
	**Start page**
	**Setting level** Selection of a setting parameter, e.g. on the main menu of the user level.
	**Setting level** Pop-up, setting a numerical value
	**Setting level**, **INFO** button pressed: Help picture with explanations relating to the selected setting parameter (as long as **INFO** button is kept depressed). *Note:* When on the access levels "Service" and "Password", the number in the bottom right-hand corner is the text ID number of the menu or setting parameter.
	**Info level** Here, for example, info page RG1 (room group 1), after pressing the **INFO** button and selecting **Display of key plant data**. *Note:* When turning the knob, the other info pages can be retrieved, e.g. the time programs of the relevant room group.

Note

The names of the submenus **Room group 1…10 and Trend channel 1…4** are factory settings. They can be replaced by the service engineer during commissioning by using project-related clear-text names.
If, later, with the respective menu lines, the **INFO** button is pressed, the original default text will reappear.

2.2.3 Operating levels

Two operating levels

There are 2 operating levels:
- Info level
- Setting level

These 2 levels are always available, no matter which access level is active.

Info level

Important plant data can be queried in this level.

Setting level

The setting level is arranged in the form of a menu structure. It provides for reading and adjustment of data points.
Using the **INFO** button, explanations relating to the menus with the individual data points can be displayed. The information is displayed as long as the button is kept depressed.

Switching between the operating levels

Switching from the info level to the setting level:
1. Select the start page by pressing the **ESC** button.
2. Press the **OK** knob to change to the setting level.

Switching from the setting level to the info level:
1. Select the start page with the **ESC** button. Press the button repeatedly until the start page reappears.
2. Press the **INFO** button to change to the info level.

2.2.4 Access levels

3 access levels

The RMB795B central control unit has 3 access levels. An access right is defined for each parameter (operating line).

Level	*Access*	*Symbol*
User level (for the plant operator)	The user level can be accessed any time. Users can modify all data points that are visible/adjustable at this level.	
Service level (for maintenance)	Press the **OK** knob and the **ESC** button simultaneously. Then, select operating line **Service level** and confirm by pressing the **OK** knob.	
Password level (for commissioning)	Press the **OK** knob and the **ESC** button simultaneously; then select operating line **Password level** and confirm by pressing the **OK** knob. Then, enter number **7** as the password and confirm by pressing the **OK** knob.	

Common properties

- The access level determines which individual menus and operating lines are activated.
- A higher access level also shows the menus and operating lines for the lower access levels
- The levels use a shared menu as a basis The password level displays the entire menu tree
- After a time-out, the central control unit changes to the user level.
  Time-out: If the central control unit is not operated for 30 minutes

Changing the access level

Switching from the current access level to some other access level:

1. Press the **OK** knob and the **ESC** button simultaneously:
   The **Access levels** menu is displayed.
2. Select the required access level by turning the **OK** knob and confirm by pressing the knob.
3. Enter number **7** to access the **password level**.

3 Room group philosophy

3.1 What is a room group?

Room group

A room group is a combination of 1 to maximum 63 individual room controllers (rooms) with the following features:

- Same operating mode
- Same setpoints and setpoint adjustments
- Simultaneous release of night cooling
- Same fire and smoke extraction zones

For details, refer to Section 8 Function block: "Room group"

Number of room groups

On the RMB795B central control unit, up to 10 independent room groups can be released. Following can be selected per room group:

- Own time program
- Own calendar

Use of room group

A room group can consist of one or several rooms.

To simplify operational management, it can make sense to interconnect several room applications and to have them managed by one room group.

Each room is equipped with several individual room controllers that are used to control of local applications (e.g. radiators, chilled ceiling, fan coils, or VAV).

The individual room controllers are assigned by entering the geographical zone address via the KNX bus of a room group of the RMB795B central control unit.

3.2 Application example

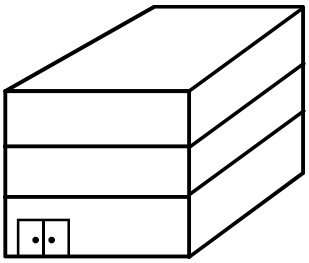
Introduction

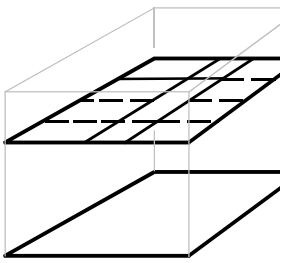
To explain the philosophy of the room group, we use the following example.

Building floor plan

The building has three stories used by different companies for their headquarters. The 2 following companies are located on the third floor:

- Company *Sport Ltd* with conference room and two offices.
- Company *Logistics GmbH* with 6 offices and 1 meeting room.





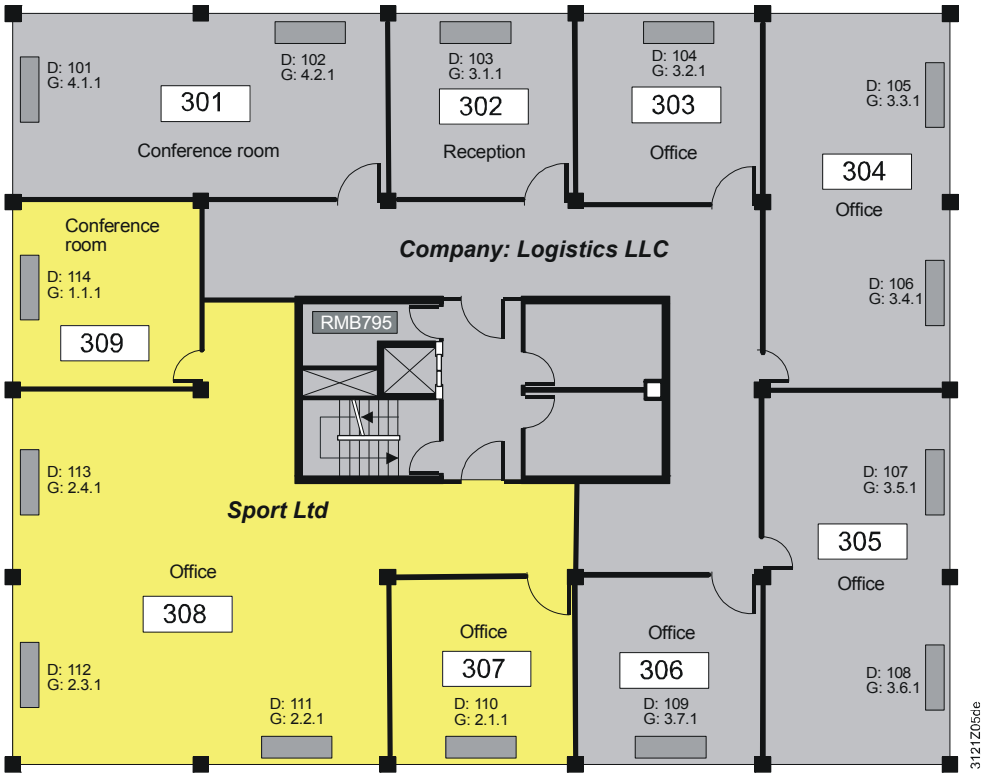
User requirements / operating modes

Each of the two companies wants to operate their room groups at different operating modes, i.e. with the following separate items:

- Schedules.
- Setpoints.
- Fire and smoke extraction functions.

Floor plan, third floor

The following floor plan shows usage of the rooms on the third floor by *Logistics Ltd* and *Sport Ltd*:

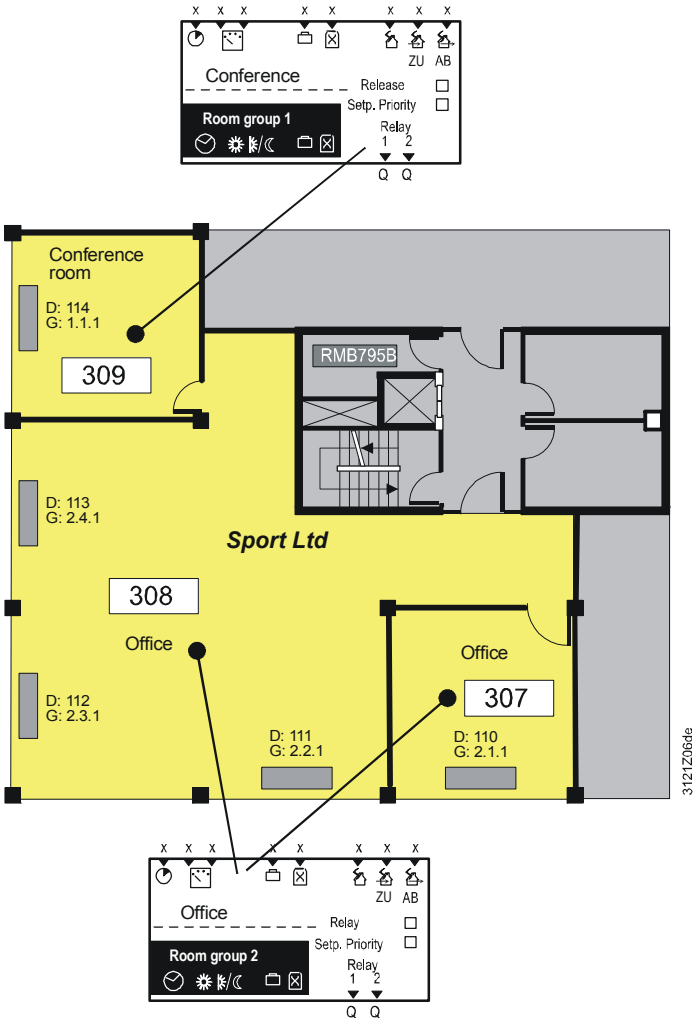


Two room groups for *Sport Ltd*

Let us know look at the floor plan for company *Sport Ltd*.
Due to company needs, a subdivision into 2 room groups or 2 "geographical zones (apartment)" is made:

- Conference room (room group 1).
- All other offices (room group 2).

The fan coil units equipped with RXB room controllers were entered in the floor plan, and the addresses assigned accordingly:



Key

D = Device address, G = Geographical zone (Apartment . Room . Subzone).

Room group definition

On the KNX bus, several rooms are summarized in a room group via geographical zone addressing. This address comprises three parts:

Geographical zone: **Apartment . room . subzone** (e. g. **2** . **1** . **1**)

Important!

A geographical zone **must** be assigned:

- To each RXB room controller.
- To each room group of the RMB795B control station.

Here, all devices to be part of the **same room group** must have the same apartment number.

Settings on the control unit

On the RMB795B central control unit, only the room group, that is, the "Geographical zone (**apartment**)" can be set.

The room and subzone are fixed (room = 1, subzone = 1).

To set the room group at the control unit, the following applies:
Room group = geographical zone (**apartment**. 1 . 1)

Room controller settings

The following settings are available in the RXB room controllers:

- Geographical zone (**apartment**).
- Geographical zone (**room**)
- Geographical zone (**subzone**)

For HVAC applications with RXB room controllers, use only the geographical zone (**apartment**) and the geographical zone (room).

Extending the address by the geographical zone (**room**) results in room control by means of RXB room controllers. This in turn allows for individual operating interventions (from an operator unit and the control unit via the bus) such as room setpoint correction in any room or on any device.

Meaning of subzone

For additional division of the geographical zone (**room**), the RXB room controller offers the geographical zone (**subzone**).
This subzone is meaningful in lighting installations, e.g. if a geographical zone (room) must be subdivided into two subzones "lighting along window" and "lighting along hallway".
For HVAC applications, keep the subzone at = 1.

Meaning of supplementary labels

The supplementary labels "(**apartment**)", "(**room**)" and "(**subzone**)" are predefined by KNX. However, apartment does necessarily denote an actual apartment.

Device address

Each KNX member requires an individual device address, entered in the floor plan above with D:11x.
The device addresses in our example were assigned based on the bus topology.

Assign external time switch to room controllers

On the RXB room controller, the setting "Time switch slave (apartment)" must be set to the same apartment number as the room group where the room controller is located. Room and subzone are not relevant and set to 1 (see completed engineering and commissioning protocol for the plant *Sport Ltd in Sec. 3.3* Implement application example.

3.3 Implement application example

Procedure for planning

Using the "C3127_Planning and Commissioning Report, Communication Synco 700" , the plant and the required communication settings can be represented in an easy-to-understand way.
Proceed as follows:

1. Enter general information, such as: Plant name, device names, device types, applications, etc.
2. Copy the device addresses for the bus members along with the basic settings for communication from the building floor plan.
3. Enter the geographical zone addresses as per the defined groups.

Example for *Sport Ltd* The following example shows the completed protocol for the plant of *Sport Ltd:*

	Possible settings	RMU	RMH	RMK	OZW	RMB	RXB	QAW	1	2	3	4	5	6	7
Information 1	Plant								Sport Ltd	Sport Ltd	Sport Ltd	Sport Ltd	Sport Ltd	Sport Ltd	Sport Ltd
	Room number									309		307	308	308	308
	Device name	X	X	X	-	X	X	-	Main office	Conference	Main office	Office	Office	Office	Office
	Device type	RMU 7..	RMH, RMZ	RMK	OZW 771...	RMB 795	RXB	QAW 740	RMB795	RXB..	RMB795 [2]	RXB..	RXB..	RXB..	RXB..
	Plant type	X	X	X	-	X	X	-	B	FC03		FC03	FC03	FC03	FC03
	KNX-ID (example ID: 00FD000016D5)	X	X	X	X	X	X	X							
Basic settings 2	Range [0...15] . Line [1; 2...15] . Device address [1..253;**255**]	X	X	X	X	X	X	X	0.2.10	0.2.114		0.2.110	0.2.111	0.2.112	0.2.113
	Bus power decentralized [off, on]	X	X	X	-	X	-	-	Aus						
	Clock operation [**Autonomous**, slave, master]	X	X	X	X	X	-	-	Autonom						
	Clock slave remote adjustment [No, yes]	X	X	X	X	X	-	-	Nein						
	Fault, remote unlocking [no, yes]	X	X	X	-	X	-	-	Nein						
Room/Room group 3	Geographic zone (apartment.room.subzone) (A.R.S) [**1**...126].[1...63]. [1]	X_2	2X	X	-	10X	X.X.1	X	1.1.1	1.1.1	2.1.1	2.1.1	2.2.1	2.3.1	2.4.1
	(mit eigenem Raumfühler)	X_1	2X	X	-	-	X	X		X		----	X	X	X
	Time switch mode [**autonomous, s**lave, master]	X_1	2X	X	-	-	-	-							
	Time switch slave (apartment) [**1**...126] . 1 . 1	X_1	2X	X	-	-	X.1.1	-		1.1.1		2.1.1	2.1.1	2.1.1	2.1.1
	Temperature control [m**aster**, slave]	-	-	-	-	-	X	-		Master		Master	Master	Master	Master
	* Control strategy [c**askade**, constant, changing]	X_4	-	-	-	-	-	-							
	** Room control combination [**master**, slave external setpoint, slave internal setpoint]	-	2X	X	-	-	-	-							
	Room group (name)	-	-	-	-	10X	-	-	Conference		Office				
	QAW zone (apartment) [---,**1**...126] . 1 . 1	-	-	-	-	10X	-	-							

Room group conference
Apartment = 1

Room group office
Apartment = 2

Implementation upon commissioning Upon commissioning, enter the settings for the same-name data points in the devices according to the created list.

Other details For detailed descriptions of the choices and settings offered by the RMB795B central control unit, refer to the following chapters and sections of this document.

4 Engineering and commissioning guidelines

Introduction

These guidelines describe the procedure to be followed when engineering and commissioning the RMB795B central control unit.

Based on the HVAC plant concept, the RXB/RXL room controllers and Synco room thermostats RDG/RDF/RDU must be assigned to room groups.

Within these room groups, the RMB795B central control unit permits central control of time, calendar and special day programs, preselected setpoints, trend functions, highest / lowest room temperatures, device supervision of the RXB/RXL room controllers, and Synco room thermostats RDG/RDF/RDU as well as forwarding of request signals.

Procedure

The procedure for engineering and commissioning the RMB795B central control unit should be the following:

1. Provision of the necessary tools
2. Planning 1: Implementation of the HVAC plant concept for the central control unit RMB795B.
3. Planning 2: Organization of communication on the KNX bus.
4. Installation of devices and KNX bus.
5. Commissioning.

A detailed description of the necessary tools and the procedure to be followed is given in the following.

Provide necessary tools

Check to ensure that the following tools are available:

Tools	*Note*
HVAC plant concept based on the specific user needs	(Engineer, customer)
Floor plans of the object	(Engineer, customer)
Synco™ planning and commissioning tool	C3127
Synco™ Basic Documentation "KNX bus"	CE1P3127en
Synco™ datasheet "KNX bus"	CE1P3127en
Synco™ OCI700.1, ACS790	
Configuration diagram RMB795B	
Synco™ Select (contains additional documentation on Synco™ 700)	

Planning 1: Implement HVAC plant concept

Steps required to implement the HVAC plant concept for the RMB795B central control unit:

step	*Procedure*	*Notes*
1	Decide on the device types, their number and application	Number of RXB/RXL..., RMB795B, QAW740, RMU7x, RDG/RDF/RDU, etc.
2	Define device installation	RMB795B plug-in type or detached operator unit, location of controller
3	RXB/RXL room controller and Synco room thermostats RDG/RDF/RDU combined into room groups	Based on the HVAC plant concept given on the floor plans
4	Enter the devices on the floor plan	Including addressing of the room group and the geographical zone address [1…126].[1…63].

Planning 2: Organize communication

Organization of communication on the KNX bus is subdivided as follows:

- Engineer bus network
- Complete the "Synco™ planning and commissioning protocol Communication (C3127)"

Engineer bus network

And these are the individual steps to be followed:

step	*Procedure*	*Notes*
1	Topology: Define area, backbone and line, define the device addresses	Depending on: Number of devices, network extension, embedding
2	Define the type of bus power supply	Size, central, decentralize
3	Define the required system components	Line couplers, bus power supply, etc.
4	Check limitations	Number of bus users per line, network extension, bus power supply
5	Design the network structure and connection diagrams	
6	Create the cable lists	
7	Transfer the topology and the physical device addresses [1…254] to the floor plan	Define cable routing and cable lengths

Complete planning and commissioning protocol

These are the individual steps to be followed when completing the Synco™ planning and commissioning protocol "Communication" (C3127):

Step	*Procedure*	*Notes*
1	Enter general information about the plant and the device types	
2	Press button **Menu > Update fields**	Fields that need not be completed appear with hatched lines
3	Enter the device addresses of all users	To be adopted from the floor plans
4	Define the names and room numbers of all users and room groups	While observing the floor plans
5	Define the bus power supply according to the supply concept	Refer to Data Sheet N3127, "KNX bus"
6	Define clock time operation	Autonomous, slave, master.
7	Enter the geographical zone address	To be adopted from the floor plans
8	Define the QAW zone (apartment)	According to the room group assignments
9	Define the time switch zone	According to customer needs
10	Define holidays / special day zones	Ditto
11	Define the outside temperature zones	According to HVAC plant
12	Define the refrigeration distribution zones on the consumer side	Ditto
13	Define the refrigeration distribution zones on the generation side	Ditto
14	Define the heat distribution zones on the consumer side	Ditto
15	Define the heat distribution zones on the generation side	Ditto

Installation

Observance of the points listed below contributes to trouble-free and effective commissioning:

- Early coordination of installation of devices and KNX bus with the project leader or installer responsible for the project
- Correct installation of the devices in accordance with the mounting instructions
- Observance of KNX bus installation instructions
- Setting a commissioning date on which the installation will be completed and all forms of energy (electricity, heat and refrigeration) will have to be available

Commissioning

Commission the plant line by line.

And these are the individual steps to be followed:

Step	*Procedure*	*Notes*
1	Make addressing of the line couplers.	
2	Commissioning RXB/RXL room controller and Synco room thermostats RDG/RDF/RDU using the service tool OCI700.1 1. Select the application and adjust the setting values according to HVAC planning. 2. Set RXB/RXL communication data points according to the Synco™ Planning and Commissioning Protocol C3127.	
3	Commissioning the RMB795B central control unit 1. Set configuration and setting values according to the configuration diagram. 2. Make the wiring test. 3. Set the RMB795B communication data points according to the Synco™ Planning and Commissioning Protocol C3127. 4. Run search of device supervision 5. Compare the identified devices against the planning documentation. 6. Exit commissioning	
4	Commissioning additional devices	Line coupler filter tables, QAW740, RMU7xx, RMH760, etc.
5	Check setpoints and setting values, time programs, calendar, etc. Check building functions.	Night cooling, fire shutdown, smoke extraction, heating demand, refrigeration demand, etc.
6	Generate the commissioning protocols.	
7	Do the final work, handover, instructions to the customer / plant operator.	

5 Commissioning

5.1 Before you start

5.1.1 Safety notes

Preparation for use and commissioning of Synco™ 700 products must be undertaken by qualified staff trained by Siemens Building Technologies.

- When the central control unit is in commissioning mode, control will remain off, that is, all outputs are set to a defined OFF state.
- In that case, all internal safety functions of the central control unit will also be deactivated. Communication also stays inactive.

5.1.2 Potential impact of power failures

Starting point

As mentioned above, certain activities of the central control unit will be interrupted during commissioning. In the case of distributed plant, this can have the effect of a partial power failure.

Plant example

The possible effects are investigated and explained using a plant example with the following devices:

Room unit	*Function*
RMB795B	Preselection of operating modes for the different room groups
RXB/RXL, RDG/RDF/RDU	Room controllers and room thermostats, assigned to different room groups.
RMU7.. (or RMH760)	Collection of the refrigeration / heat request signals of preparation

Results

A power failure or wrong configuration of communication has exactly the same effect as if the respective device was in commissioning mode.
The following table shows the results in detail:

Case	***RMB795B***	***RXB/RXL, RDG/RDF/RDU***	***RMU7...***	***Potential effect***
1	Power failure / commissioning mode	Operating mode Comfort.	According to the request signals	Preparation may also be in progress during the night
2	Normal operation	Power failure / commissioning mode	No demand → OFF	No room control and no preparation
3	Normal operation	By operating mode RMB795B	Power failure / commissioning mode	No preparation

Recommendation

If, during "Economy" mode at night, power failures are to be expected, it is recommended to change RXB/RXL setting parameter "Veto time" (timer function) from 30 minutes to 0 minutes.
This ensures that, after power-up, the RXB/RXL room controllers will not work in "Comfort" mode for 30 minutes.

5.2 Start commissioning

5.2.1 Start during initial power-up

Starting

The central control unit RMB795B automatically enters the commissioning menu when the AC 24 V power supply is applied. Note:

- The control process remains deactivated in the commissioning mode – all outputs are set to a defined OFF state on central control unit power-up.
- All internal safety functions of the central control unit are deactivated

Basic settings

After startup, the operator unit displays the **Language** menu. Now, proceed as follows:

Step	*Action*	*Result*
1	Select and confirm the **Language** for commissioning or operating the plant using the **OK** knob	The display appears in the selected language.
2	Select and confirm in the same way the **Time of day**, the **Date** and the **Year**.	The **Commissioning** menu is displayed. The access level is set to **Password level.**
3	Change to the **Plant type** menu. Path: Main menu > Commissioning > Basic configuration > Plant type	A choice of plant types is offered.

Further procedure

When commissioning the RMB795B central control unit for the first time, follow the Installation Instructions 74 319 0398 0 (G3140). They are enclosed with the RMB795B.

5.2.2 Start from the main menu

Procedure

To navigate from the main menu to commissioning:

Step	*Action*	*Result*
1	To select the **Access level** menu, press simultaneously the **OK** knob and the **ESC** button. Select operating line **Password level** and confirm with the **OK** knob. Enter the password (**7**).	The password level is active.
2	Select and confirm operating line **Commissioning** with the **OK** knob	
3	Press the **OK** knob a second time 	On the device side: • The application (communication) is stopped • All outputs are set to a defined OFF state. On the display: • The **Commissioning** menu is displayed. 

5.3 Basic configuration

Introduction

The **Basic configuration** menu is used to make the following settings:
- Selecting basic type "B"
- Assign the central control unit position to the connected extension modules

5.3.1 Select basic type "B"

Selection deletes extra configuration

On the RMB795B central control unit, an empty "Basic configuration" is filed. If selected, all configurations of the extra configuration will be deleted (for connections, refer to the configuration diagram).

Maintained values

When selecting a new, empty basic configuration, the following values will not be deleted:
- All user-defined texts and business cards.
- Calendar and time switch room group settings.
- Basic settings on the **Communication** menu.
- Current time of day.
- Trend settings.
- Values on the **Settings > Device** menu

New extra configuration

After selecting basic type "B", a start can be made with a new configuration on the **Extra configuration** menu.

5.3.2 Assign extension modules

Selection

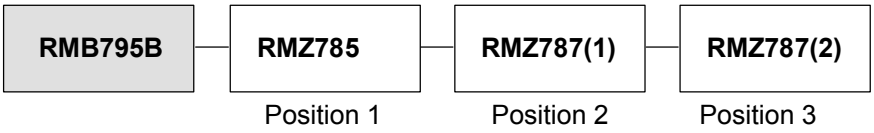
The number of inputs and outputs of the RMB795B central control unit can be increased by attaching extension modules.
Each central control unit RMB795B can be connected to these modules:

Number	*Type*	*Purpose*
1	RMZ785	Extension of inputs with 8 universal inputs.
2	RMZ787	Extension of inputs and outputs by 4 universal inputs each and 4 relay outputs each

Activation and assignment

The extension modules are activated simply by attaching them to the RMB795B central control unit. The positions of the extension modules must be set on the central control unit.

Example showing the assignment of positions:



Observe the following notes in connection with the extension modules:

- Prior to attaching an extension module, the system must be disconnected from power
- Free configuration can also contain connections to the extension modules. The relevant functions are only active if the respective extension module has been connected and activated
- The extension modules can be arranged in any order desired

5.3.3 Settings

Configuration

Main menu > Commissioning > Basic configuration

Operating line	*Adjustable values / remarks*
Basic type	B
Position 1	---, RMZ785, RMZ787(1), RMZ787(2)
Position 2	---, RMZ785, RMZ787(1), RMZ787(2)
Position 3	---, RMZ785, RMZ787(1), RMZ787(2)

Fault status messages

A fault status message will be generated in the following cases:

- If the extension modules actually fitted and their positions do not agree with the values entered on the list of the central control unit
- If, during operation, an extension module becomes defective

No.	*Name*	*Effect*
7101	Fault extension module	Urgent message; must be acknowledged.

5.4 Create free configuration

Application examples

The central control unit RMB795B can be adapted to the needs of the plant with the help of configuration diagrams, see Sec. 19.2 Configuration diagram.

5.5 Wiring test

Functions

A wiring test can be made after all peripheral devices are connected. We recommend testing after configuration and settings are complete.
It provides the following functions:

- Display read-only values for inputs.
- Switching aggregates connected to the outputs, e.g. operating mode outputs, heat demand, fault relay, etc.

During the wiring test, the application is deactivated.

- The outputs are in a defined OFF state, and safety-related functions (e.g. smoke extraction) are deactivated!
- Communication with RXB/RXL room controllers is interrupted. No more defined values are transmitted

Error checks

During wiring test, both inputs and outputs are checked for the following errors:

- Connection error (mixed up wires)
- Position error (mixed up sensors or actuating devices)
- Discrepancy between the type of connections made and the configuration of the central control unit, e.g. Ni 1000 in place of active DC 0...10 V

Settings

Main menu > Commissioning > Wiring test > Inputs

Operating line	*Comments*
E.g. N.X1	Display of the current measured value.

Main menu > Commissioning > Wiring test > Outputs

Operating line	*Positions*
E.g. operating mode room group 1	---, Comfort, Precomfort, Economy, Protection

5.6 Exit commissioning

Procedure

Exit the Commissioning menu as follows:

Step	*Action*	*Result*
1	Press the **ESC** button	The display shows a dialog box with the following information: 
2	Confirm the information by pressing the **OK** knob	The central control unit starts with the settings made, the application (communication) starts and the display shows the Main menu: 

5.7 Back up data

Purpose

The entire commissioning data set (configuration and all settings) can be saved to the central control unit RMB795B after commissioning. If, in operation, an unauthorized user makes important readjustments, the function can be used to retrieve the state the device had after commissioning.

Warning

When making a data backup, the following values are not saved or restored:

- All user-defined texts and business cards.
- Calendar and time switch room group settings.
- Basic settings on the **Communication** menu.
- Current time of day.
- Trend settings.
- Values on the **Settings > Device** menu

Setting values

Main menu > Data backup >

Operating line	*Range*	*Factory setting*
Restore		
Save		

Display values

Main menu > Data backup >

Operating line	*Comments*
Storage date	Display of date on which the commissioning data set was downloaded to the memory of the central control unit
Storage year	Display of the year the commissioning data set was downloaded to the memory of the central control unit

5.8 Exit password level

Set user level

On completion of commissioning, set the user level, i.e. access level for the plant operator. To do this, exit the main menu and proceed as follows:

Step	*Action*	*Result*
1	Press simultaneously the **OK** knob and the **ESC** button	The **Access levels** menu is displayed.
2	Select the user level by turning the **OK** knob and confirm by pressing the knob.	The selected user level is set and the previous menu reappears.

5.9 View device information

Purpose

Important information about the RMB795B central control unit, the connected extension modules, the configuration and the communication settings can be viewed on the **Device information** menu.

Display values

Main menu > Device information > Controller

Operating line	*Comments*
Basic type	Display of application (application "B") loaded during commissioning.
Adapt basic type	Display of intervention in the programmed application (yes, no)
File name	Name of an application that was downloaded by the ACS
Device type	Display of the device used (e.g. RMB795B-1).
software version	Display the software version.
Hardware version	Displays hardware version.

Main menu > Device information > Position 1…3

Operating line	*Comments*
Extension module.	Display of the module's type reference.
software version	Display of the module's software version
Hardware version	Displays hardware version.

Main menu > Device information > Extra configuration

All settings for extra configurations can be read under this menu. This offers a quick overview of the connections used in the configuration.

Main menu > Device information > Communication

All communication settings can be viewed here.

5.10 Mark an intervention

ID

When the internal standard application (that is, basic type "B") was adapted, or the **Extra configuration** menu was subsequently accessed, an asterisk will be set on

the **Basic configuration** menu, in front of type reference "B" on operating line "Plant type.
In addition, on operating line "Plant type changed" of the "**Device information**" menu, the value is set to "Yes".

Note

The asterisk is set automatically when leaving the **Extra configuration** menu, even if nothing has been changed.

Reset the marking

The asterisk is deleted and the value "No" appears on operating line "Plant type changed" when, on the "**Basic configuration**" menu, the old or a new standard application (i.e. basic type B) is loaded. A new configuration will be made based on basic type "B".

6 General settings

6.1 Time of day and date

6.1.1 Operating principle

Yearly clock

The central control unit has a yearly clock with time of day, weekday and date.

2 time formats available

The following time formats can be selected:

24 h:

- The **date** is displayed as dd.mm.yyyy (day.month.year).
  Example: 31.05.2005
- The **time of day** is displayed as hh:mm (hours: minutes).
  Example: 15:56

Am/pm

- The **date** is displayed as mm/dd/yy (month/day/year).
  Example: 05/31/2005
- The **time of day** is displayed as hh:mm am/pm (hours:minutes am/pm).
  Example: 03:56 PM

Setting values

Main menu > Commissioning > Settings > ... *or*
Main menu > Settings > Device >

Operating line	*Range*	*Factory setting*
Time format	24 hours 12 hours (am/pm)	24 h

Main menu > Time of day/Date

Operating line	*Range*	*Factory setting*
Time	00:00...24:00	00:00
Date	01.01...31.12	01.01
Year	2000...2100	Current

Summer-/winter changeover

The change from daylight saving to standard, and vice versa, is made automatically in accordance with the settings.
The date of the earliest changeover can be readjusted should the relevant regulations change.

Setting values

Main menu > Time of day/Date

Operating line	*Range*	*Factory setting*
Start of summertime	01.01. … 31.12	25.03
Wintertime start	01.01. … 31.12	25.10

Notes

The dates set for the change from standard to daylight saving time, or vice versa, ensure that on the first Sunday after that date the time of day changes from 02:00 (standard time) to 03:00 (daylight saving time), and from 03:00 (daylight saving time) to 02:00 (standard time).

If both dates are set to coincide, daylight saving/standard time changeover is inactive.

6.1.2 Communication

Clock time operation

Depending on the master clock , different sources for the time of day can be used. This can be selected on the RMB795B central control unit. Time of day and date can be exchanged via bus.
The following setting available for clock time operation:

- Autonomous (does not transmit and does not receive)
- Clock time *from* the bus: Clock time slave (receives the synchronization signal from the bus)
- Clock time *to* the bus: Clock time master (sends the synchronization signal to the bus)

Setting values clock time operation

Commissioning > Communication > Basic settings >

Operating line	*Range*	*Factory setting*
Clock time operation	Autonomous, slave, master.	Autonomously

If the central control unit is set as a time-of-day slave, it can also be selected whether it shall be possible to adjust the master clock's time of day from this central control unit.
For remote adjustment of the clock slave, the following setting choices exist:

- No (clock time slave with no adjustment facility for the system time).
- Yes (clock time slave with adjustment facility for the system time).

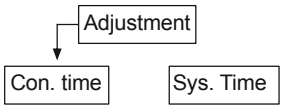
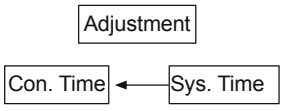
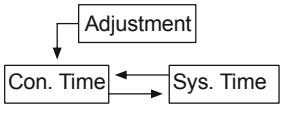
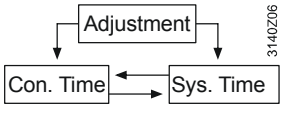
Setting values remote setting clock slave

Commissioning > Communication > Basic settings >

Operating line	*Range*	*Factory setting*
Remote setting clock slave	Yes, no	Yes

Impact of setting values

The above settings have the following impact:

Entry	*Effect*	*Diagram*
Autonomously	The clock time on the central control unit can be adjusted. The central control unit's clock time will not be adapted to the system time.	
Slave, remote setting clock slave **No**	The clock time on the central control unit cannot be adjusted. The central control unit's clock time is continuously and automatically adapted to the system time.	
Slave, remote setting clock slave **Yes**	The clock time on the central control unit can be adjusted and, at the same time, adjusts the system time. The central control unit's clock time is continuously and automatically adapted to the system time.	
Master	The clock time on the central control unit can be adjusted and, at the same time, adjusts the system time. The time of day for the central control unit is used for the system.	

Note

Only 1 clock time master per system may be used. If several devices are parameterized as master, a fault status message (to the master) will be delivered.

Recommendation

System should always be run in synchronized mode, that is, in master-slave operation (1 master, all others as slaves).

6.1.3 Troubleshooting

Possible cases

In connection with the time of day and date, the RMB795B central control unit generates a fault status message in the following cases:

- If the clock on the bus is missing and the local clock is parameterized as the clock time slave, operation continues with the internal clock and fault status message "System time failure" will be delivered
- If several devices on the bus are parameterized as clock time masters, fault status message ">1 clock time master" will be delivered.
- The clock in the central control unit has a reserve of 12 hours. If a power failure exceeds 12 hours, the time of day must be readjusted.
  If, after a power failure, the central control unit loses its time of day and it does not receive it again via bus, fault status message "Invalid time of day" will be delivered. *Note:* An invalid time of day flashes.

Fault status messages

No.	*Text*	*Effect*
5001	System time failure	Non urgent message; must not be acknowledged.
5002	> 1 clock time master	Non-urgent message; must be acknowledged.
5003	Invalid time of day	Non urgent message; must not be acknowledged.

6.2 Select language

Behavior when switching on for the first time

Every RMB795B central control unit has several languages loaded.
When switching on the central control unit for the first time, the **Language** menu appears in English, independent of the unit's language set. Select the required language from that menu.
The language can also be changed later during operation. See data sheet N3132.

Selection of languages

The following languages are loaded, depending on the type of central control unit:

Type	*Language 1*	*Language 2*	*Language 3*	*Language 4*	*Language 5*	*Language 6*
RMB795B-1	German	French	Italian	Spanish	Portuguese	-
RMB795B-2	German	French	Dutch	English	-	-
RMB795B-3	Danish	Finnish	Norwegian	Swedish	-	-
RMB795B-4	Czech	Hungarian	Polish	Slovakian	Russian	Bulgarian
RMB795B-5	Romanian	Slovenian	Serbian	Croatian	Greek	Turkish
RMB795B-6	Chinese	-	-	-	-	-

Setting values

Main menu > Commissioning > Settings > ... *or*
Main menu > Settings > Device >

Operating line	*Range*	*Factory setting*
Language		English

6.3 Select temperature unit

Setting values

On the RMB795B, the unit of temperature can be switched between °C/K and °F.

Main menu > Commissioning > Settings > .... *or*
Main menu > Settings > Device >

Operating line	*Range*	*Factory setting*
Unit	Degrees Celsius, degrees Fahrenheit	°C

6.4 Operator unit display contrast

Setting values

The contrast of the display can be matched to the environment.

Main menu > Commissioning > Settings > ... *or*
Main menu > Settings > Device >

Operating line	*Range*	*Factory setting*
Contrast	0...100 %	50 %

6.5 Text entry

6.5.1 Device name

Setting values

The text for the device name appears on the welcome screen:

Main menu > Commissioning > Settings > ... *or*
Main menu > Settings > Texts >

Operating line	*Range*	*Factory setting*
device name	Max. 20 characters.	

6.5.2 File name

Setting values

The file name can be assigned individual text for the selected application:

Main menu > Commissioning > Settings > ... *or*
Main menu > Settings > Texts >

Operating line	*Range*	*Factory setting*
File name	Max. 20 characters.	B

6.5.3 Electronic business card

Configuration

The text for the electronic business card is displayed as an info picture. The electronic visitor's card must specially be activated in the extra configuration.

Main menu > Commissioning > Extra configuration > Miscellaneous > Business card

Operating line	*Range*	*Factory setting*
Business card	Yes, no	Yes

Settings

Main menu > Commissioning > Settings > ... *or*
Main menu > Settings > Texts > Business cards

Operating line	*Range*	*Factory setting*
Business card line 1	Max. 20 characters.	
Business card line 2	Max. 20 characters.	
Business card line 3	Max. 20 characters.	
Business card line 4	Max. 20 characters.	

6.5.4 Editable text

Text can be assigned to the following elements: Maximum length of the text is 20 characters.

- Inputs (see chapter 7.6.).
- Room groups (see chapter 8.2).
- Room temperature supervision (See chapter 8.6).
- Reference rooms (See 13.2.2).
- Device supervision (See 16.5).
- Logic and operation selector (see Sec 9.3).
- Fault inputs (see chapter 10.3).
- Trend channels (see Sec. 15.1.3)
- Meter (see Sec. 15.2.7).

At the password level, user texts such as menu texts, fault texts or operating lines can be reset as follows:

Main menu > Settings > Texts >

Operating line	*Comments*
Reset text	No, Yes

Note

The texts for the operating lines "Device name", "File", and "Business card line 1...4" are not deleted when the menu texts are reset.

7 Inputs

7.1 Universal inputs (Xx)

7.1.1 General settings

Connectable signals

The following signals can be connected to universal inputs:
- Digital signals
- Passive analog signals.
- Active analog signals.

Number of universal inputs

The following number of universal inputs is available:
RMB795B: 6 inputs.

If more inputs are required, the number can be increased by a maximum of 3 extension modules:
RMZ785: 8 inputs.
RMZ787: 4 inputs.

Hence, the maximum number of inputs is:
RMB795 (6) + RMZ785 (8) + RMZ787 (4) + RMZ787 (4) = 22 inputs.

7.1.2 Activate function

Availability

All universal Xx inputs are always available. If not required for their assigned functionality, they can be used for display.

Recommendation

Inputs that are not required are to be set to "Digital".

Assign identifiers

To activate, assign a label (identifier) to each input used. The identifier also defines the input's unit. The following identifiers are available:

- Outside temperature [1)]
- °C
- %
- g/kg
- kJ/kg
- W/m
- m/s
- bar
- mbar
- Pa
- ppm
- Universal 000.0: Universal input with 1 decimal place, resolution –99.9…+999.9, adjustment step 0.1.
- Universal 0000: Universal input without decimal place, resolution –999…+9999, increment 1.
- Digital
- Pulse

[1)] The identifier can provide additional functionality; see Sec. 7.5.2 "Outside temperature at terminal".

Configuration

Main menu > Commissioning > Extra configuration > Input identifier >

Operating line	*Adjustable values / remarks*
N.X1	Activation of function by assigning one of these identifier to the input: Outside air temperature, °C, %, g/kg, kJ/kg, W/m², m/s, bar, mbar, Pa, ppm, universal 000.0, universal 0000, digital, pulse.
...	Ditto
RMZ787(2).X4	Ditto

The settings made here are also displayed under:
"Main menu > Device information > Extra configuration > Input identifier"

Notes

- The unit of the outside temperature is always °C or °F.
- The outside air temperature can also be sent via bus (KNX), see Sec. 7.5 "Outside temperature"
- The units °C, %, g/kg, kJ/kg, W/m², m/s, bar, mbar, Pa, ppm, 100 and 1000 are always analog inputs
- Digital inputs are without units.
  Logical display for signal handling: 0 = off, 1 = on.

7.1.3 Cause

Cause displays the source of an input value. The following types are available:

- Terminal: Used as local terminal
- LTE mode: Used as LTE transmission and reception objects
- S-mode: Used as S-mode object
- Simulation: Input terminal simulation

Main menu > Commissioning > Settings > ... *or*
Main menu > Settings > Inputs > ...X...

Operating line	*Range*	*Factory setting*
Cause	Terminal, LTE mode, S-mode, Simulation	

Note

The LTE transmission and reception objects are described in Section 13.2.4.

7.1.4 Input terminal simulation

Each input terminal can be simulated to test plant reaction.

Setting values

Main menu > Inputs > Simulation inputs >

Operating line	*Range (depends on type)*	*Factory setting (by type)*
N.X1… A8 (2).X4	----, −50...+50 °C	----

⚠ Only authorized staff may override inputs within a limited period of time!
The fault message "Simulation inputs active" is sent during terminal simulation.

Fault status messages

No.	*Text*	*Effect*
100	Simulation inputs active	Non urgent message; must not be acknowledged.

The fault message remains active until "Simulation" is returned to "----". This is to make certain it will not be forgotten on the plant to reset the simulation.

Note

The simulated input terminal value is used only locally; it is not sent via bus to other controllers.

7.1.5 Troubleshooting

First set input identifiers

With some of the function blocks, defined inputs are mandatory, such as the outside temperature. For this reason, when making a configuration, the input identifiers must always be set first.

Exercise caution when changing identifiers!

If input identifiers are changed after configuration of other function blocks, certain functions for the other blocks may be set to inactive, as they would have to work with units invalid for the particular block.

7.1.6 Functional check / wiring test

Checking the measured values

During the wiring test, the measured values of all inputs can be checked as follows:

Main menu > Commissioning > Wiring test > Inputs >

Operating line	*Adjustable values / remarks*
N.X1	Display of the current measured value.
...	Ditto
RMZ787(2).X4	Ditto

7.2 Analog inputs (Xx)

7.2.1 Activation and type

Activation

The analog inputs can be activated as described in Sec. 7.1.2 "Activate function". With the analog inputs, the following settings can be made:

- Type
- Measuring range
- Measured value correction

Type

If the unit is °C, the type is selectable. The following types are available:

- Ni1000
- 2xNi1000
- T1
- Pt1000
- 0..0.10 V

If the unit is not °C, the type is always 0...10 V.

Setting values

Main menu > Commissioning > Settings > ... *or*
Main menu > Settings > Inputs > ...X...

Operating line	*Range*	*Factory setting*
Type	Ni1000, 2xNi1000, T1, Pt1000, DC 0…10 V	Ni1000

7.2.2 Measuring range

Passive temperature signals

The following measuring ranges are defined for passive temperature signals:

Temperature signal	*Measuring range*
LG-Ni 1000	–50…+250 °C (fixed)
2 x LG-Ni1000 or T1	–50…+150 °C (fixed)
Pt1000	–50…+400 °C (fixed)

Active signals

In the case of active signals, the measuring range is definable. A lower and an upper measured value must be entered.
Active 0…10 V temperature signals have a default measuring range of 0…200 °C, but they are adjustable within the overall range of –50…+500 °C.

Examples

Room temperature with an active signal of DC 0...10 V = 0...50 °C:
Lower measured value:0 °C
Upper measured value:50 °C

Setting values

Main menu > Commissioning > Settings > ... *or*
Main menu > Settings > Inputs > ...X...

Operating line	*Range*	*Factory setting*
Value low	Depending on selected type.	Depending on type.
Value high	Depending on selected type.	Depending on type.

7.2.3 Measured value correction

Purpose

With passive temperature sensors, the measured value can be readjusted by –3,0 to +3,0 K to compensate for line resistance.
This can be used to perform on site calibration with a reference measuring unit.

Setting values

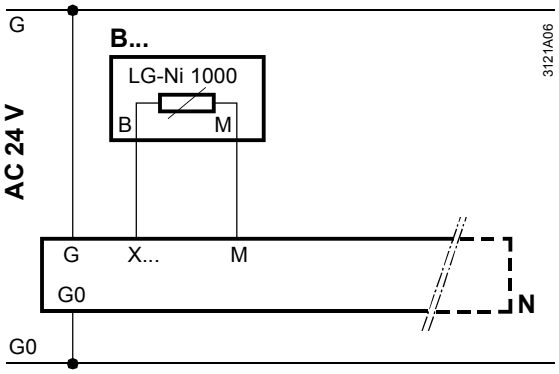
Main menu > Commissioning > Settings > ... *or*
Main menu > Settings > Inputs > ...X...

Operating line	*Range*	*Factory setting*
Correction	−3.0…+3.0	0 K

7.2.4 Connection examples for sensors

1 sensor LG-Ni 1000

You can connect a passive LG-Ni 1000 temperature sensor to the input.
They must be connected according to the following diagram:



Input configuration

Main menu > Commissioning > Extra configuration > Input identifier >

Operating line	*Setting*
N.X1	°C

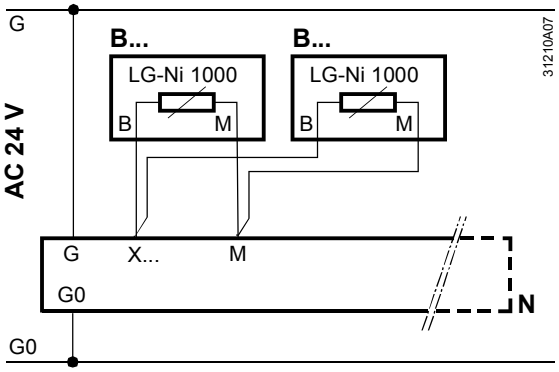
Setting values

Main menu > Commissioning > Settings > ... *or*
Main menu > Settings > Inputs > ...X...

Operating line	*Setting*
Type	Ni1000

2 sensors LG-Ni 1000

2 passive LG-Ni1000 temperature sensors can be connected to the input. The RMB795B central control unit calculates the average temperature. They must be connected according to the following diagram:



Input configuration

Main menu > Commissioning > Extra configuration > Input identifier

Operating line	*Setting*
N.X1	°C

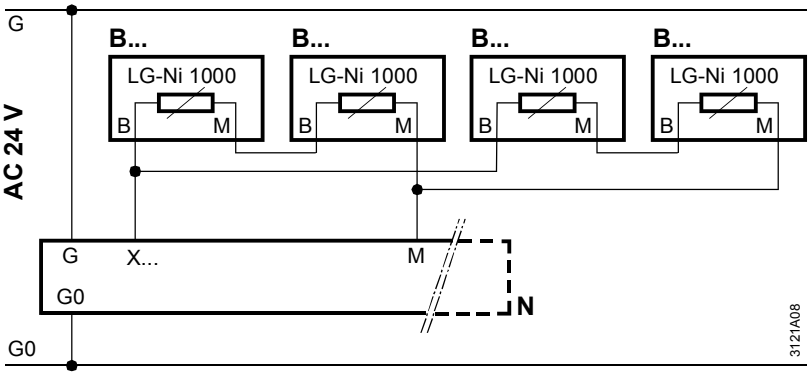
Setting values

Main menu > Commissioning > Settings > ... *or*
Main menu > Settings > Inputs > ...X...

Operating line	*Setting*
Type	2xNi1000

4 sensors LG-Ni 1000

It is also possible to do averaging with 4 passive sensors. They must be connected according to the following diagram:



Input configuration

Main menu > Commissioning > Extra configuration > Input identifier

Operating line	*Setting*
N.X1	°C

Setting values

Main menu > Commissioning > Settings > ... *or*
Main menu > Settings > Inputs > ...X...

Operating line	*Setting*
Type	Ni1000

7.2.5 Troubleshooting

Sensor signal monitoring

When leaving the commissioning menu, the central control unit checks to see which sensors are connected.
If, later, one of the sensors connected at this point in time is missing, or if there is a short-circuit, a fault status message will be delivered.
"[...X...]: Sensor error
Display with the measured value:

- Open-circuit: ----
- Short-circuit = oooo

Fault status messages

No.	*Text*	*Effect*
101… 224	[N.X1] sensor error, [RMZ787(2).X4] sensor error	Non urgent message; must not be acknowledged.

7.2.6 Multiple use of sensors

Problem and solution

Not all sensor signals can be routed via bus to another device.
For this reason, function "Multiple use of sensors" allows for wiring a passive signal at an input terminal directly to a Y-output and provide it as a DC 0…10 V signal.
The signal can then be fed to other devices.

Configuration

Main menu > Commissioning > Extra configuration > Sensor multiple use

Operating line	*Adjustable values / remarks*
Signal Y N.X1…	Activate function by assigning an input terminal to the output terminal.

Setting values

Conversion of a Ni 1000 or Pt 1000 signal to a DC 0...10 V signal is made via parameter setting "Value low" or "Value high".
See Sec. 7.5.2 "Outside temperature at terminal".

7.3 Digital inputs (Xx)

7.3.1 Use and activation

Use

Control function signals can be connected to the digital inputs.

Activation

The inputs can be activated as described under Sec. 7.1.2 "Activate function".

7.3.2 Normally closed

Setting values

Normally closed can be defaulted for each digital input:

Main menu > Commissioning > Settings > .... *or*
Main menu > Settings > Inputs > ...X...

Operating line	*Range*	*Factory setting*
Normally closed	Open, closed.	Open.

7.3.3 Texts for logical states 0 and 1

Each digital input can be assigned the logic states 0 and 1 and one free text (e.g. on/off, full/empty, etc.). A default text is displayed on the impacted input.

Setting values

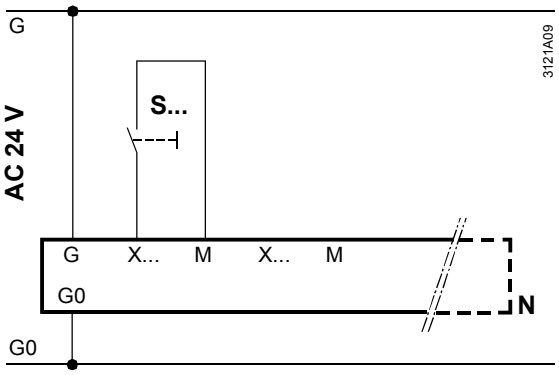
Main menu > Commissioning > Settings > ... *or*
Main menu > Settings > Inputs > ...X...

Operating line	*Range*	*Factory setting*
Text for: Logic 0	Max. 20 characters.	0
Text for: Logic 1	Max. 20 characters.	1

7.3.4 Connection example

Connection diagram

Potential-free contacts can be connected to the digital inputs. The connection must be made according to the following diagram:



Input configuration

Main menu > Commissioning > Extra configuration > Input identifier

Operating line	*Setting*
N.X2	Digital

Setting values

Main menu > Commissioning > Settings > .... *or*
Main menu > Settings > Inputs > ...X...

Operating line	*Setting*
Normally closed	Open.

7.3.5 Troubleshooting

No monitoring possible

Digital signals cannot be monitored.
If important protective functions, such as "Fire alarm off", are connected to this terminal, we recommend the following:

- Choose wiring such that "Fire alarm off"is also triggered if there is no signal (open-circuit)
- Setting for normal position: Closed.

7.4 Pulse

An input with this identifier can be used to connect a pulse counter. Pulses with the following specification can be received:

- Mechanical sources (Reed contact) without Namur circuitry, max. pulse frequency of 25 Hz and a min. pulse duration of 20 ms.
- Electronic pulse source with max. pulse frequency of 100 Hz and min. pulse duration of 5 ms.

7.4.1 Activate function

Configuration

Main menu > Commissioning > Extra configuration > Input identifier >

Operating line	*Adjustable values / remarks*
…X…	Pulse

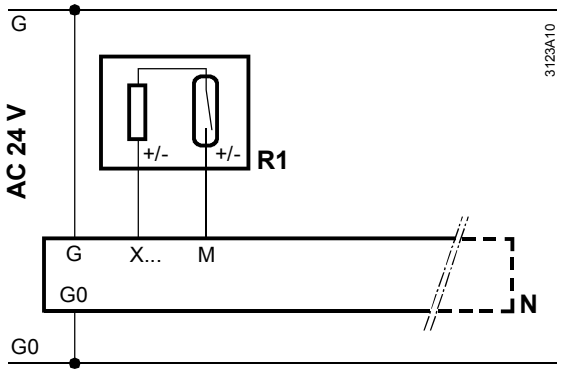
Electronic pulse sources (e.g. Open Collector outputs) generate shorter, less bouncing pulses than mechanical pulse sources (e.g. relays or Reed contacts). The type can be selected.

Setting value

Main menu > Commissioning > Settings > .... *or*
Main menu > Settings > Inputs > ...X...

Operating line	*Range*	*Factory setting*
Type	Mechanically or electronically	Mechanically

7.4.2 Connection diagram



R1 Reed pulse source.

7.5 Outside temperature

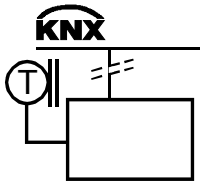
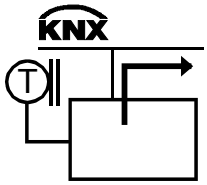
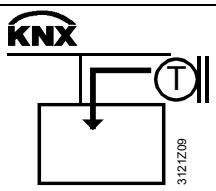
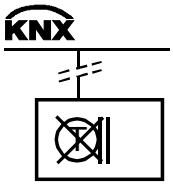
7.5.1 Connection choices

2 possible signal sources

For the outside temperature, the following 2 signal sources can be used:
- Outside air temperature connected locally to the terminal, activated by the identifier "Outside temperature"
- Outside temperature via bus.

4 variants

In addition, it is important whether or not "Outside temperature" communication is active. Hence, the following 4 variants are made available:

Variant	*Diagram*	*Effect*
Outside temperature at the terminal Communication outside temperature **not active**.		Central control unit operates with its own outside temperature. No impact on the bus.
Outside temperature at the terminal Communication outside temperature **active**.		Central control unit operates with its own outside temperature. Using the bus, the outside temperature is also delivered to other devices.
No outside temperature at terminal. Communication outside temperature **active**.		Central control unit operates with the outside temperature delivered via the bus by some other controller
No outside temperature at terminal. Communication outside temperature **not active**.		Central control unit has no outside temperature.

7.5.2 Outside temperature at terminal

Settings and connection

Settings and the connection diagram for the outside temperature on the terminal, is described under Sec. 7.2 "Analog inputs (Xx)".

Configuration

Main menu > Commissioning > Extra configuration > Input identifier

Op. line	*Adjustable values / remarks*
…X…	Activate function by assigning the "Outside temperature" value to the input.

Setting values

Main menu > Commissioning > Settings > ... *or*
Main menu > Settings > Inputs > ...X...

Op. line	*Range*	*Factory setting*
Type	Ni1000, 2xNi1000, T1, Pt1000, DC 0…10 V	Ni1000
Value low	Depending on selected type.	Depending on type.
Value high	Depending on selected type.	Depending on type.
Correction	−3.0…+3.0 K	0 K

7.5.3 Outside temperature via bus

Prerequisites

The outside temperature can only be provided via the bus if communication is active and an outside temperature set.

To enable different outside temperatures to be delivered via the bus (e.g. outside temperature on the northern side of the building for the air conditioning plant, and outside temperature on the eastern side of the building for heating zone "East", etc.), they must be assigned to specific outside temperature zones.

Setting values

Main menu > Commissioning > Communication > Distribution zones

Operating line	*Range*	*Factory setting*
Outside temperature zone	---, 1…31	---

An outside temperature zone identified by "----" means that the outside temperature on the bus is inactive.

7.5.4 Outside temperature simulation

Overriding the measured value

To simulate the outside temperature and test the response of the plant, the measured value of the outside temperature can be overridden.

Setting values

Main menu > Inputs

Operating line	*Range*	*Factory setting*
Outside temperature simulation	----, −50...+50 °C	----

Only authorized staff may override inputs within a limited period of time!

Fault status message

During simulation of the outside temperature, fault status message "Outside sensor simulation active" will be triggered:

No.	*Text*	*Effect*
12	Outs sensor simulation active	Non urgent message; must not be acknowledged.

The fault message remains active until "Simulation outside temp" is returned to "----". This is to make certain that staff on the plant will not forget to terminate the simulation.

Note

The simulated outside temperature will only be used locally; it will not be sent via the bus to other devices.

7.5.5 Troubleshooting

Supervision of the measured value

When the Commissioning menu is quit, the central control unit checks if there is a measured value of the outside temperature. If, at this point in time, a measured value is available and then missing later, a fault status message will be delivered: "[...X...]: Sensor error".

Fault status messages

No.	*Text*	*Effect*
101… 224	[N.X1] sensor error.. [RMZ787(2).X4] sensor fault	Non urgent message; must not be acknowledged.

Only 1 outside temperature allowed per zone

For each Synco system, only one outside temperature can be sent within the same zone, i.e. only one outside temperature master.
An error message occurs if multiple devices in the same zone send their outside temperatures: ">1 outside temperature sensor"
The message is delivered by the devices that send outside temperature signals to and receive them from the same zone.

Fault status message

No.	*Text*	*Effect*
11	>1 outside temperature sensor	Urgent message; must be acknowledged.

Outside temperature via bus available?

If the RMB795B central control unit expects an outside temperature from the bus and that outside temperature is not communicated, the following fault status message will be delivered: "Outside temp sensor error".

Fault status message

No.	*Text*	*Effect*
10	Outside temp sensor error	Non urgent message; must not be acknowledged.

If other outside temperature signals are available on the bus, any of them are used randomly.

7.6 Texts

Plant-specific text

Each input can be assigned plant-specific text with a maximum length of 20 characters.
Such texts are displayed locally in place of standard text (e.g. N.X1).

Setting values

Main menu > Commissioning > Settings > ... *or*
Main menu > Settings > Inputs > ...X...

Operating line	*Range*	*Factory setting*
N.X1	Max. 20 characters.	N.X1
N.X2	Max. 20 characters.	N.X2
N.X3	Max. 20 characters.	N.X3
N.X4	Max. 20 characters.	N.X4
N.X5	Max. 20 characters.	N.X5
N.X6	Max. 20 characters.	N.X6
RMZ785.X1	Max. 20 characters.	RMZ785.X1
RMZ785.X2	Max. 20 characters.	RMZ785.X2
RMZ785.X3	Max. 20 characters.	RMZ785.X3
RMZ785.X4	Max. 20 characters.	RMZ785.X4
RMZ785.X5	Max. 20 characters.	RMZ785.X5
RMZ785.X6	Max. 20 characters.	RMZ785.X6
RMZ785.X7	Max. 20 characters.	RMZ785.X7
RMZ785.X8	Max. 20 characters.	RMZ785.X8
RMZ787(1).X1	Max. 20 characters.	RMZ787(1).X1

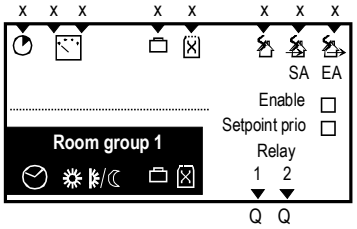
Operating line	*Range*	*Factory setting*
RMZ787(1).X2	Max. 20 characters.	RMZ787(1).X2
RMZ787(1).X3	Max. 20 characters.	RMZ787(1).X3
RMZ787(1).X4	Max. 20 characters.	RMZ787(1).X4
RMZ787(2).X1	Max. 20 characters.	RMZ787(2).X1
RMZ787(2).X2	Max. 20 characters.	RMZ787(2).X2
RMZ787(2).X3	Max. 20 characters.	RMZ787(2).X3
RMZ787(2).X4	Max. 20 characters.	RMZ787(2).X4

8 Function block: "Room group"

8.1 Overview

Connections

The following illustration displays the function block "Room group 1"and its connections and selection fields as shown on the configuration sheet:



The connections and functions are described in the following sections.

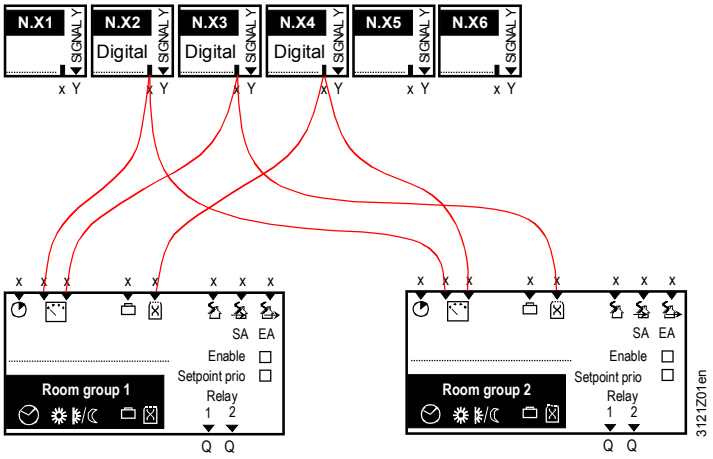
Functions and characteristics

The most important features and functions of the room group are the following:

- On an RMB795B central control unit, up to 10 individual room groups can be activated or configured
- One room group consists of 1 up to (theoretically) 63 rooms
- Every room group has its own time switch. Time switch entries can be copied
- Each room group can make use of a calendar. This calendar can act on several time switches or room groups
- For the entire room group, the same…
  - **Room operating modes** apply (Comfort, Precomfort, Economy, Protection); can be influenced via calendar, time switch program, user interventions.
  - **Room setpoints** apply; can be switched on and off via parameter "Setpoint priority".
    Setpoints can be overwritten or changed on each individual room controller where "Setpoint priority = Yes".
  - **Setpoint readjustments** apply (summer/winter compensation, QAW740 room unit).
  - **Emergency modes** apply (fire shutdown, smoke extraction).
  - **Room group control** (Auto, Heating, Boost heating, Cooling, Night purge, Precooling, Off, Emergency heating, Fan only, Free cooling). Extra functions, such as Night purge, can be activated, depending on the type of application.
  –

Same operating mode, but different setpoints

External signal sources integrated via digital inputs (timer, manual switch) can simultaneously act on several room groups. Example:



ACS operator station and RMB795B central control unit

If, in addition to the RMB795B central control unit, an ACS operator station is installed, following applies:

- The operating modes and setpoints of each room controller of a room group can be separately changed via the ACS operator station
- The values predefined by the ACS operator station or RMB795B central control unit apply until the next change is made.
  Consequence: If the ACS operator station shall assign the setpoints individually, configuration parameter "Setpoint priority RMB central control unit" must be set to "No".

Room operating modes

The central control unit RMB795B differentiates between 4 room operating modes:

Room operating mode	*Explanation*
Comfort (☼):	Operating mode for occupied rooms.
Precomfort (☼):	Energy-saving operating mode for the room.
Economy (☾)	Plant OFF. A minimum / maximum room temperature is ensured (sustained mode).
Protection (❄):	Plant OFF. Frost protection active.

8.2 Activate function block

Configuration

Each room group can be enabled via a configuration parameter:

Main menu > Commissioning > Extra configuration > Room group 1...10 >

Operating line	*Setting*
Enable	Yes / No

Setting values

Each room group can be assigned individual text:

Main menu > Commissioning > Settings > ... *or*
Main menu > Settings > Room group 1....n >

Operating line	*Range*	*Factory setting*
Room group 1...	Max. 20 characters.	Room group 1...
Room group 2...	Max. 20 characters.	Room group 2...
Room group 3...	Max. 20 characters.	Room group 3...
Room group 4...	Max. 20 characters.	Room group 4...
Room group 5...	Max. 20 characters.	Room group 5...

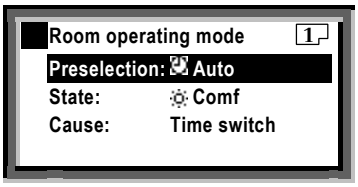
Operating line	*Range*	*Factory setting*
Room group 6...	Max. 20 characters.	Room group 6...
Room group 7...	Max. 20 characters.	Room group 7...
Room group 8...	Max. 20 characters.	Room group 8...
Room group 9...	Max. 20 characters.	Room group 9...
Room group 10...	Max. 20 characters.	Room group 10...

8.3 Room operating modes per room group

8.3.1 Room operating mode selector

"Room operating mode" menu

The **Room operating mode** menu has three operating lines:
- Preselection: Manual entry of operating mode for a room group
- State: Display of the actual room operating mode.
- Cause: Displays the reason for this operating mode.



The possible entries and displays are listed below.

Operating line "Preselection"
Setting values

The following operating modes are available for selection:

Main menu > Room group 1...10 > Room operating mode >

Operating line	*Range*	*Factory setting*
Preselection	Auto. Comfort. Precomfort. Economy. Protection.	Auto

Operating line "State"

The current room operating mode can have the following states:
- Comfort.
- Precomfort.
- Economy.
- Protection.

Operating line "Cause"

The various types of user intervention are given as a reason. The following types of user intervention are possible (in order of priority):
- Preselection room group control
- Room mode selection via digital inputs (room operating mode contact)
- Room operating mode selector (preselection under the **Room operating mode** menu)
  or Room operating mode via QAW740.
- Special day.
- Holidays.
- Time switch.

Display values

■ **Main menu > Room group 1…10 > Room operating mode >**

Operating line	*Comments*
State	
Cause	Room operating mode contact, room operating mode selector, timer function, special day, holidays, time switch, external master, night cooling, preselection room group control.

8.3.2 Room mode selection via digital inputs

Purpose

This function enables the user to make external interventions in the running program (e.g. via switches) without having to make manipulations on the RMB795B central control unit itself.
In order to activate this function, you have to configure the appropriate digital inputs.

Types of interventions

The following types of interventions can be configured:
- Timer function
- Switching to the desired room operating mode.
- Room operating mode selector

If several of these functions are simultaneously active, the following priority applies:
1. Room operating mode selector *or* switching to a desired operating mode.
2. Timer function

Settings

The following settings are required depending on the desired function:

Type of action	*Operating line*	*Value*
Timer function	Timer function (digital inputs only)	N.Xx
	Timer function (duration).	> 0 min
Switching to the desired room operating mode.	Room operating mode input 1.	N.Xx
	Room operating mode input 2.	---
	Preselected room optg mode.	Setting the desired operating mode.
Room operating mode selector	Room operating mode input 1.	N.Xx
	Room operating mode input 2.	N.Xx

Misconfiguration

If room operating mode input 1 is not wired, switching of the external contacts connected to Xx has no impact:

Operating line	*Value*	*Effect*
Room operating mode input 1.	---	No effect.
Room operating mode input 2.	N.Xx	

Timer function

The digital input selected for the timer function allows for switching the controller to Comfort mode (☼) for a selected period of time.

Configuration

Main menu > Commissioning > Extra configuration > Room group 1…10 > Room operating mode >

Operating line	*Adjustable values / remarks*
Timer function	---, N.X1, N.X2, ... (digital inputs only).

Setting values

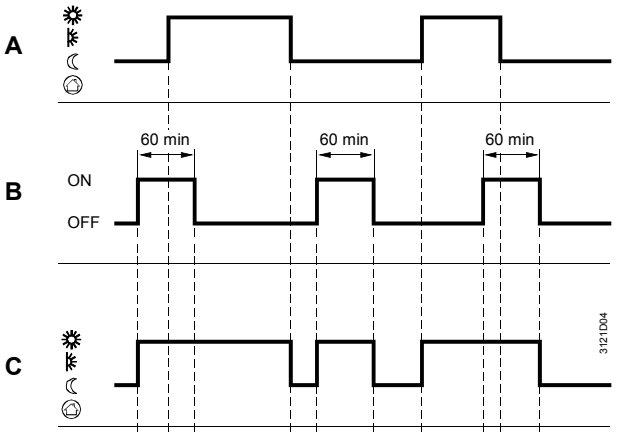
Main menu > Commissioning > Settings > ... *or*
Main menu > Settings > Room group 1....10 > Room operating mode >

Operating line	*Range*	*Factory setting*
Timer function	0...720 min	60 min

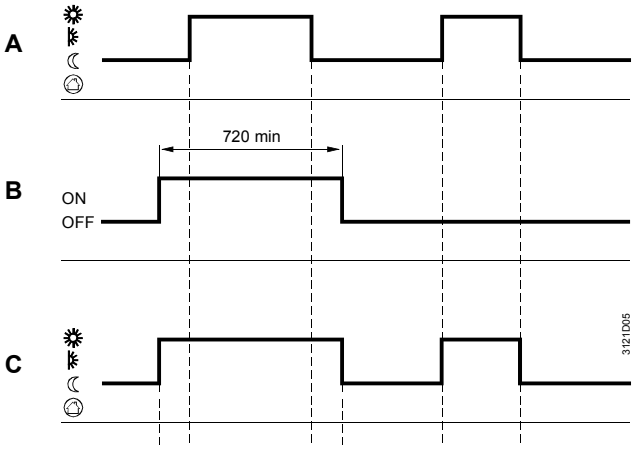
Function diagrams

The function diagrams below show the impact of the timer function on the effective room operating mode with 2 different setting values.

a) Setting value 60 min:



a) Setting value 720 min:



Key

A Time switch (Auto)
B Switching command via digital input for "Timer function" with time set for Comfort mode.
C Effective room operating mode

Switch to desired room operating mode

The digital input enables the plant to be constantly switched to the desired room operating mode. The required operating mode can be selected via data point "Room operating mode input 1" on menu **Room group X > Room operating mode >**.

This operating mode is active until the signal at the control input is no longer present. Only then does the normal 7-day program resume operation.

Configuration

Main menu > Commissioning > Extra configuration > Room group 1…10 > Room operating mode >

Operating line	*Adjustable values / remarks*
Room operating mode input 1.	---, N.X1, N.X2, ... (digital inputs only).

Setting values

Main menu > Settings > Room group 1…10 > Room operating mode >

Operating line	*Range*	*Factory setting*
Preselected room optg mode.	Comfort, Precomfort, Economy, Protection	Comf

Room operating mode selector

Two digital inputs enable the plant to be **externally switched** to the desired operating mode via an external switch.
This operating mode is active until the signal is no longer present. Only then does the normal 7-day program resume operation.

Configuration

Main menu > Commissioning > Extra configuration > Room group 1…10 > Room operating mode >

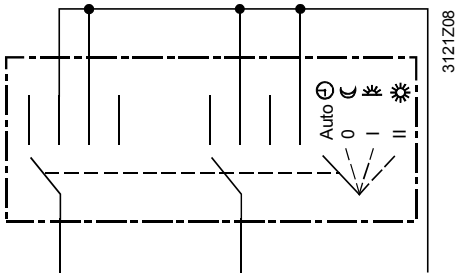
Operating line	*Adjustable values / remarks*
Room operating mode input 1.	---, N.X1, N.X2, … (digital inputs only).
Room operating mode input 2.	---, N.X1, N.X2, ... (digital inputs only).

The operating modes are assigned according to the following table:

State of control input 1	*State of control input 2*	*Resulting operating mode*
Normally closed	Normally closed	Auto
Operating position	Operating position	Economy.
Operating position	Normally closed	Precomfort
Normally closed	Operating position	Comfort.

Examples

The illustration shows an external switch and its wiring to 2 digital inputs:



(1) X... (2) X... M

Holidays/special days

It is also possible to configure separate control inputs for holidays and special days. For detailed information, refer to Sec. 8.3.6 "Holidays / special days".

Errors in operation

The RMB795B central control unit cannot monitor digital signals.

Recommendation

The potential-free contacts for the digital inputs should be open when in the normal position, enabling the RMB795B central control unit to operate in automatic mode in the event of an open-circuit.

8.3.3 Room operating mode selection using room unit QAW740

Activate function

A room operating mode preselection can be configured using a QAW740 room unit for each room group. It is active, if "QAW Zone (Apart.)" is set under communication (see Sec. 13.2.2 "Room group 1...10") and the same zone is preselected on the QAW740 room unit..

Operating principle

Using the Mode button on the QAW740 room unit, the required operating mode can be selected. This room operating mode is transmitted to the RMB room group. From the RMB795B central control unit, the setpoint readjustment is then passed on to the RXB/RXL room controllers of the room group. The QAW740 room unit does **not** act directly on RXB/RXL room controllers.

Preselection of the room operating mode by the QAW740 room unit has the same priority as preselection via the RMZ79x, whereby the latter always prevails.

Priority sequence for the room operating mode:

1. Contacts on the RMB795B central control unit.
2. RMZ79x or QAW740 room unit (mode or timer button).
3. Timer function on the RMB795B central control unit.
4. Special day contact / RMZ79x .
5. Holiday contact / RMZ79x.
6. Time switch.

Examples

The timer function of the QAW740 room unit can be used to extend the Comfort mode of a room group.

8.3.4 Release room unit QAX3x.x for time switch operating mode Economy

The user can switch the room unit from Economy to Comfort if the RXB/RXL room controller is equipped with a room unit QAX3x.x (with operating mode setting or fan stage). As a result the entire air handling system may be turned on because of one single room. Depending on the air system dimensions, inadmissible overpressure can be created in the air pipes. The setting parameter "Comfort via room unit" helps prevent this.

Comfort via room unit = Yes	Manual change of Economy to Comfort by QAX3x.x and QAW740 possible.
Comfort via room unit = No	Manual change of Economy to Comfort by QAX3x.x and QAW740 is not possible.

Note

See RXB-/RXL application descriptions N3873/N3877.

Setting values

Main menu> Commissioning> Settings> ... *or*
Main menu> Settings> Time switch 1 >

Operating line	*Area*	*Factory setting*
Comfort via room unit	Yes / No	Yes

8.3.5 7-day time switch

Assignment and function

Every function block "Room group" has its own 7-day time switch. This time switch is firmly coupled to the relevant room group.

The 7-day time switch controls the change of the operating modes and the associated setpoints in accordance with the 7-day program entered.

Different times from one week to another are not possible.

Operation of the 7-day time switch is described in the operating instructions B3121.

Setting values

A specific 24-hour profile can be selected for the following weekdays.

Main menu > Room group 1…10 > Time switch

Operating line	*Range*	*Factory setting*
Monday through Sunday	Comfort, Precomfort, Economy.	06:00 Comf. 22:00 Eco
Special day	Comfort, Precomfort, Economy.	06:00 Comf. 22:00 Eco

Activation of the special day

Activation of special day is described in Sec. 13 "Communication".
Every day can be assigned a maximum of 6 entries in the 24-hour program.
Entries required for an entry:

- Time of day from which the desired operating mode shall apply
- Desired operating mode.

Copy 24-hour profiles

When all entries for one day have been made, that day can be copied to the other days. In that case, the respective time switch must be selected (e.g. Room group 1 > Time switch > Monday).
When turning the OK knob in clockwise direction, the selection "Copy to" will appear at the end of the time switch entries. You can copy to Monday-Friday, Monday-Sunday or each day of the week.

Copying 7-day programs

When all entries have been made in a 7-day program, that program can be copied to other room groups. In that case, the respective time switch must be selected (e.g. Room group 1 > Time switch).
When turning the OK knob in clockwise direction, the selection "Copy to" will appear at the end of the list of weekdays. Here, you are given the choice of copying to all room groups or to each individual one.

Note

The copy process will only take place if the target room group in the function block is enabled.

Troubleshooting

For each "Time switch zone (Apartm)", only one time switch master may be set. If several devices are parameterized as masters, a fault status message occurs.

Fault status messages

No.	*Text*	*Effect*
5102	>1 Time switch in room group 1	Non-urgent message; must be acknowledged.
...		
5192	>1 Time switch in room group 10	Non-urgent message; must be acknowledged.

8.3.6 Holidays/special days

Assignment and function

For each room group, a specific holidays / special day program is available. This program is firmly coupled to the relevant room group.

The plant operator can enter days deviating from the normal 7-day program as holidays or special days via the "**Holidays / special days**".

Entry of holidays / special days is described in the Operating Instructions B3121.

As default, the holiday / special day program of room group 1 is defined as the master, and all other holiday / special day programs as slaves. This means that the settings apply to the entire RMB795B central control unit.

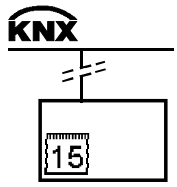
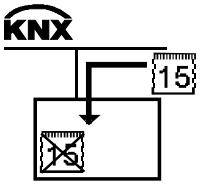
If independent holiday / special day programs are required, appropriate communication settings must be made:
Autonomous (for a specific holiday / special day program of room group x)
or
Master in some other calendar zone (for a holiday / special day program that shall also be used by other room groups)

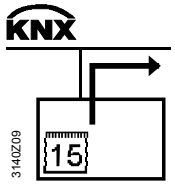
Assignment of holiday / special day programs

Holiday / special day programs can be assigned to room groups or to other devices on the bus.
Different sources can be used as the master. These can be entered on the RMB795B central control unit.

The following settings can be made:
Autonomously: Does not send and does not receive
Slave: Receives holiday / special day program from the bus.
Master: Transmits the holidays / special day program via bus.

The impact of the individual settings is explained below:

Setting	*Effect*	*Diagram*
Auto-nomously	The holiday / special day program only acts locally on this central control unit. It has no impact on the holiday / special day zone entered under "Communication".	
Slave	The holiday / special day program in this central control unit is not active. The program that acts is the external holiday / special day program that has the same holiday / special day zone set. The external holidays / special day program must be set as the master holidays / special day program.	

Setting	*Effect*	*Diagram*
Master	The holiday / special day program in this central control unit is active. Holiday / special day program also acts on all other devices where the holiday / special day program is switched off (slave) and which lie in the same holiday / special day zone.	

Note

Settings for holiday/special day zone is described in Sec. 13.2.2 "Room group 1...10

Holidays: Explanation

Holidays are periods of time when the building is not used and whose start and duration are known in advance. Examples:

- Works holidays in commercially used spaces and buildings
- School holidays/vacation in school buildings.
- Public holidays.

Setting values

It is possible to enter if during the holiday period operating mode ☾ Economy or ⊗ Protection is to be used.

Main menu > Room group 1...10 > Holidays / special days

Operating line	*Range*	*Factory setting*
Room operating mode holidays	☾ Economy, ⊗ Protection	☾ Eco

Explanations relating to the setting values

When the RMB795B central control unit is connected to other devices via communication, the operating mode selected here will apply to all devices in the same holiday / special day zone.

Special days: Explanation

Special days are periods of time when the building is used for **special** purposes and whose start and duration are known in advance. Examples:
Visitor days in special homes.
Church holidays

Entry choices

An extra 24-hour program (special day) as a special day program can be entered in the 7-day program, refer to Sec. 8.3.5 "7-day time switch" under "Setting values").
When the RMB795B central control unit (master) is connected to other devices on the bus (slaves) via communication, a specific 24-hour program (as a special day) can be entered for each of these slaves. The time of the special day is communicated, however, by the master and applies to all devices in the same holiday / special day zone.

Calendar entries
A maximum of 16 calendar entries can be made. The central control unit sorts the entries in chronological order. Each entry requires an entry of:

- Date, year and start time.
- Date and end time.
- Reason for entry (holidays or special day).

Setting values

Main menu > Room group 1...10 > Holidays / special days > Calendar

Operating line	*Range*	*Factory setting*
Entry 1...16	Start End Reason	

Annual holidays or special days

Annually reoccurring holidays or special days can be entered by setting an asterisk "*" for the annual setting. Otherwise, the entries will automatically be deleted after the relevant days have been handled.

Priority

If 2 entries overlap, following applies:
Special days have priority over holidays. Example of a special day during the holiday period: Stage play in the school building.

Note on optimum start control

At the end of the holiday period or special day, the room operating mode resumes as per the normal 7-day program.

During this transition period, it can occur that optimum start control (e.g. boost heating for a plant) cannot be started in due time.

We thus recommend moving up the end of the holidays to give the plant sufficient time to adapt to the respective setpoints.

Control input "Holidays / special days"

The holidays and special days can also be activated via digital inputs. For that purpose, they must be assigned.

Configuration

Main menu > Commissioning > Extra configuration > Room group 1..10 > Room operating mode

Operating line	*Adjustable values / remarks*
Holiday input	---, N.X1, N.X2, ... (digital inputs only).
Special day input	---, N.X1, N.X2, ... (digital inputs only).

Notes

These inputs have an effect only if holidays / special day is set to "Autonomous" or "Master".

Activation of a special day or holiday period via the digital inputs will not be entered in the holiday / special day program, so that there will be no annual reoccurrence.

Holiday input

The digital input enables the plant to be constantly switched to "Holiday" mode without necessitating interventions on the central control unit RMB795B.
If a permanent signal is applied to the configured input, the plant changes to "Holiday" mode. This operating mode is maintained as long as the signal is present. Only then does the normal 7-day program resume operation.

Special day input

The digital input enables the plant to constantly use the special day program contained in the 7-day program without necessitating interventions on the RMB795B central control unit.
If a continuous signal is fed to the configured input, the special day program is activated. This operating mode is maintained as long as the signal is present. Only then does the normal 7-day program resume operation.

Priorities

If a special day or holidays are activated simultaneously via control switches and entry in the calendar, the following priority list applies:
Control switch "Special day".
Control switch "Holidays".
"Special day" entry in the calendar.
"Holidays" entry in the calendar.

Note

If other devices are configured as slaves in the same holidays / special day zone, the digital inputs also act on these devices.

Troubleshooting

When handling errors, a differentiation is made between the 2 following cases:
Only one master may be set per holiday / special day zone (see Sec. 13.2.2 "Room group 1…10).
If several devices are set as masters, a fault status message occurs. The device, that receives two holiday/special day signals, sends the message.
If the RMB795B central control unit expects a holidays/special day signal from the bus and it is not communicated, the following fault status message is sent: "Hol/spec day program failure".
In both cases, the operating modes of the 7-day program are used, without giving consideration to the holiday / special day entries.

Fault status messages

No.	*Text*	*Effect*
5201	Hol/spec day prog room group 1	Non urgent message; must not be acknowledged.
...	...	...
5291	Hol/spec day prog room group 10	Ditto
5202	>1 hol/spec day prog R'grp. 1	Non-urgent message; must be acknowledged.
...	...	...
5292	>1 hol/spec day prog R'grp. 10	Ditto

Priorities

When evaluating the priority in the holidays / special day program, only the first 2 entries are taken into consideration. If more than two overlapping entries are made, the special day may no longer have priority over the holidays.

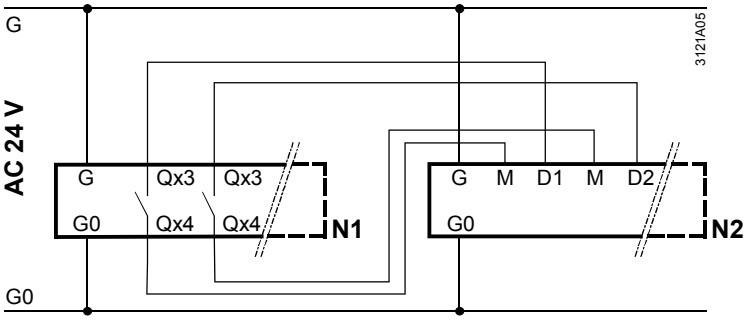
8.3.7 Room operating mode outputs

Purpose

Outputs Relays 1 / 2" (operating mode relays) at the function block make it possible to feed the resulting room operating mode of the respective room group to 2 relays Qx of the RMB795B central control unit.

Possible application

Forwarding the resulting room operating mode from the Qx relay outputs of the central control unit to a Synco™200 controller:



Key

N1: RMB795B
N2: Synco™200 RLU2...

Configure operating mode relays 1 and 2

Main menu > Commissioning > Extra configuration > Room group 1…10 > Room operating mode

Operating line	*Adjustable values / remarks*
Operating mode relay 1	---, N.Q1 ... (only free relays) / assignment of operating mode relays
Operating mode relay 2	---, N.Q1 ... (only free relays) / assignment of operating mode relays

Settings

On the **Settings** menu, the operating mode relay to be energized can be defined for each room operating mode. This ensures full flexibility, offering a host of applications.

Main menu > Settings > Room group 1…10 > Room operating mode

Operating line	*Adjustable values / remarks*	*Factory setting*
Comfort relay control	--, R1, R2, R1 + R2	---
Precomfort relay control	--, R1, R2, R1 + R2	---
Economy relay control	--, R1, R2, R1 + R2	R2
Protection relay control	---, R1, R2, R1 + R2	R1 + R2

Meaning of adjustable values

The adjustable values previously listed under "Settings" mean the following for the operating mode relay:

Value set	*State of relay R1*	*State of relay R2*
---	Normally closed	Normally closed
R1	Operating position	Normally closed
R2	Normally closed	Operating position
R1 + R2	Operating position	Operating position

Note on factory setting

The factory setting was chosen to allow for direct connection of the digital outputs to the digital inputs of the Synco™200 controller.
As the Synco™ 200 controllers do not know operating mode Precomfort, the central control unit RMB795B switches the Synco™ 200 controllers directly to Comfort in the event of Precomfort. This setting can be changed to suit individual needs.

Connect room operating modes

When the digital outputs "Relays 1/2" of a "Room group" function block are connected to the room operating inputs of 1 or several other "Room group" function blocks, the following assignments for the "Relays 1/2" outputs are to be made:

Operating line	*Assignment*
Comfort.	R2
Precomfort	R1
Economy.	R1 + R2
Protection.	---

Display values

The **Outputs** menu shows the state of the operating mode relays:

Main menu > Room group 1...10 > Room operating mode >

Operating line	*Current state*
Operating mode relay 1	Off, On
Operating mode relay 2	Off, On

8.3.8 Functional check / wiring test

Purpose

During the wiring test, the room operating mode outputs of the room groups can be switched directly, enabling their function to be checked.

Setting values

Main menu > Commissioning > Wiring test > Outputs

Operating line	*Comments*
Operating mode room group 1…10	----, Comfort, Precomfort, Economy, Protection.

8.4 Setpoints and setpoint adjustments

8.4.1 Setpoints

Preselected setpoints per room group

Specific setpoints can be predefined for operating modes Comfort, Precomfort and Economy for each room group.

The RXB/RXL room controllers adopt the setpoints only if configuration parameter "**Setpoint priority**" has been set to "Yes". In that case, the setpoints locally adjusted on the RXB/RXL room controller are overwritten by the setpoints of the room group.

Configuration

Main menu > Commissioning > Extra configuration > Room group 1...10 >

Operating line	*Adjustable values / remarks*
Setpoint priority	Yes, no

Setting values

Main menu > Commissioning > Settings > ... *or*
Main menu > Settings > Room group 1...10 > Room temp. setpoint >

Operating line	*Range*	*Factory setting*
Economy cooling setpoint	Precomfort cooling setpoint … 250 °C	30 °C
Precomfort cooling setpoint	Comfort cooling setpoint … economy cooling setpoint	28 °C
Comfort cooling setpoint	Comfort heating setpoint … Precomfort cooling setpoint	24 °C
Comfort heating setpoint	Precomfort heating setpoint … Comfort cooling setpoint	21 °C
Precomfort heating setpoint	Economy heating setpoint … comfort heating setpoint	19 °C
Economy heating setpoint	–50.0 °C... Precomfort heating setpoint	15 °C

Impact on the setting values

The values can be influenced as follows:

- Per room group by summer / winter compensation (refer to the following subsection)
- Individually on each RXB/RXL room controller by a QAX room unit, see functional description of RXB/RXL (Technical Handbook CA2A3899en)
- The absolute heating/cooling setpoints can be changed individually on each room controller. It can be influenced accordingly with the setting setpoint priority.

Setting values

Main menu > Commissioning > Settings > ... *or*

Main menu > Settings > Room group 1...10 > Room temp. setpoint >

Operating line	*Range*	*Factory setting*
Setpoint master	Always, Not in Comfort mode, Only when changed	Not in Comfort mode

Range	*Description*
Always	RMB795B is the setpoint master. The absolute setpoints set locally on the room controller are always overwritten again.
Not in Comfort mode	The absolute setpoints can be overwritten locally on the room controller during Comfort operating mode. The RMB795B is the setpoint master for all other room operating modes. The absolute setpoints set locally on the room controller are always overwritten again.
Only when changed	The user can normally change the absolute setpoints on the room controller at any time. The setpoints are overwritten on the room controller, however, when the setpoints are changed on the central control unit.

8.4.2 Application example, setpoint priority, setpoint master

Types of building	**Setpoint priority**	**Setpoint master**	**Description of absolute setpoints**
Business, manufacturing building	yes	Always	Setpoints cannot be adjusted in the room, but rather only by the central control unit RMB795B. Setpoints adjusted in the room are reset after a max. of 15 min to the basis setpoints for the RMB795B.
Office, school	yes	Not in Comfort mode	The setpoints can be adjusted in any manner in the individual room during the Comfort phase. They are reset to the basis setpoints for the RMB, however, as soon as the RMB operating mode changes to Pcf, Eco. During the Economy phase, the setpoints cannot be adjusted, or they are automatically reset after a max. of 15 min.
Hospital, hotel	yes	Only when changed	Setpoints can always be adjusted in the room, but are overwritten only when the setpoints are changed by the central control unit RMB795B (e.g. via WEB by the facility manager).
Villa	no	n/a	The setpoints can be freely adjusted in each room.

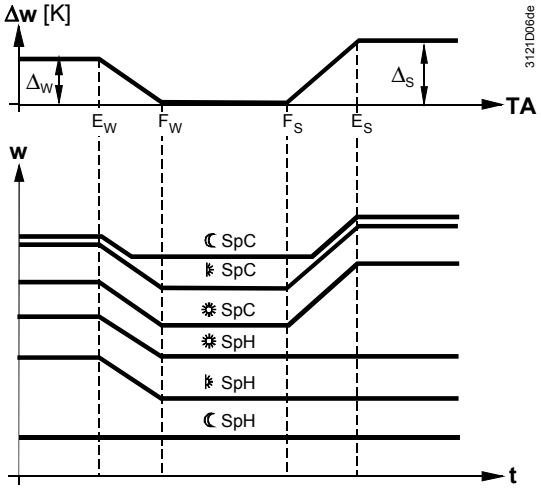
8.4.3 Summer/winter compensation

Activation

For each room group, summer / winter compensation can be parameterized. It is active when the outside temperature is available. This function always acts independently of setting parameter "Setpoint priority".

Operating principle

Summer / winter compensation shifts the setpoint of the RXB/RXL room controllers according to the outside temperature.
The setpoint shift adjustment on the Comfort and Precomfort setpoints according to the following diagram:



Key:

F_S	Summer compensation start
E_S	Summer compensation end
E_W	Winter compensation end
F_W	Winter compensation start
□w_S	Summer compensation delta
□w_W	Winter compensation delta

Application

Summer/winter compensation is used for the following reasons:
- Summer compensation to compensate for the lighter clothing worn by building occupants
- Winter compensation to give consideration to the cold envelope of the space (e.g. the windows)

Setting values

Main menu > Commissioning > Settings > ... *or*
Main menu > Settings > Room group 1....10 > Setpoint effects >

Operating line	*Range*	*Factory setting*
Summer compensation delta	0...+50.0 K	0 K
Summer compensation end	Summer compensation start…250 °C.	30 °C
Summer comp. starting point	Winter compensation start Summer compensation end	20 °C
Winter compensation start	Winter compensation end Summer comp. starting point	0 °C
Winter compensation end	−50.0…Winter compensation start	−10 °C
Winter compensation delta	−50.0...+50.0 K	0 K

Troubleshooting

If there is no outside temperature sensor signal, the controller does not adjust the setpoint.

8.4.4 Relate setpoint adjustment using room unit QAW740

Activate function

A setpoint adjustment can be configured using a QAW740 room unit for each room unit.. It is active, if "QAW Zone (Apart.)" is set under communication (see Sec. 13.2.2 "Room group 1...10") and the same zone is preselected on the QAW740 room unit.

Operating principle

The setpoint readjustment via the QAW740 room unit acts on the relevant setpoint readjustments of the RMB room group. From the RMB795B central control unit, the setpoint readjustment is then passed on to the RXB/RXL room controllers of the room group. The QAW740 room unit does **not** act directly on RXB/RXL room controllers.
If, in addition, summer / winter compensation has been parameterized, the setpoint readjustment will be added to the RMB room group (example 2).

Examples

The following examples show the assignment of zone addresses, the passing on of setpoint readjustments and the resulting setpoints on the RXB/RXL room controllers:

					
	QAW740	RMB795B room group 1	RXB/RXL…	RXB/RXL…	RXB/RXL…
Geographical zone	Apartment: **3**.1.1	QAW zone: **3**.1.1			
Geographical zone		Apartment: **5**.1.1	Apartment: **5**.1.1	Apartment: **5**.2.1	Apartment: **5**.3.1

Example 1					
Operating mode		Comfort.	Comfort.	Comfort.	Comfort.
Comfort heating setpoint		21 °C	21 °C	21 °C	21 °C
Summer / winter compensation		0 K	0 K	0 K	0 K
Setpoint readjustm.	+2 K → →	+2 K → →	+2 K	+2 K	+2 K
Resulting heating setpoint			23 °C	23 °C	23 °C

Example 2					
Operating mode		Comfort.	Comfort.	Comfort.	Comfort.
Comfort heating setpoint		21 °C	21 °C	21 °C	21 °C
Summer / winter compensation		+3 K → →	+3 K	+3 K	+3 K
Setpoint readjustm.	+1 K → →	+1 K → →	+1 K	+1 K	+1 K
Resulting heating setpoint			25 °C	25 °C	25 °C

Notes

Passing on the setpoints from the RMB795B central control unit to the RXB/RXL room controllers takes place only if, during room group configuration, "Setpoint priority" has been set to "Yes".
Additional setpoint readjustments can be made on the RXB/RXL room controller by means of the QAX room unit or the OCI700.1 service tool. These settings are not shown in the examples.

8.5 Temperatures "Reference rooms"

Purpose

1 to 3 specially selected individual rooms can be defined as reference rooms, which are used for calculating the "Night cooling" function.
The temperatures of the reference rooms can be displayed for each room group.

Configuration

The reference rooms can be defined in the **Communication** menu:

Commissioning > Communication > Room group x > Reference room x

See Sec. 13.2.2 "Room group 1...10".

Display values

The temperature values for the reference rooms are displayed under the menu item **Room temp actual value**:

Main menu > Room group 1...10 > Room temp actual value

Operating line	*Actual room temperature*
Reference room 1	Temperature value for reference room 1.
Reference room 2	Temperature value for reference room 2.
Reference room 3	Temperature value for reference room 3.

Note

"Reference room X" is the default text. It can be edited and will then be displayed.

8.6 Temperature supervision

Purpose

Temperature supervision should provide an overview of the temperature distribution in a room group. For this purpose, the following temperatures are displayed:

- The highest current room temperature in a room group and the zone address of the relevant RXB/RXL room controller
- The lowest current room temperature in a room group and the zone address of the relevant RXB/RXL room controller

The evaluation is made in the form of a dynamic list which constantly records the highest and the lowest valid room temperature.

Note

A device must be created as described in Sec. 16.3 "Create device list" for temperature supervision to work.

Display values

Main menu > Room group 1...10 > Room temp actual value >

Operating line	*Description*
Highest room temperature	Currently highest room temperature in a room group
Zone (Apart.Room)	Geographical zone address of the RXB/RXL room controller with the highest room temperature, e.g. 2.1.
Lowest room	Currently lowest room temperature in a room group.

Operating line	*Description*
temperature	
Zone (Apart.Room)	Geographical zone address of the RXB/RXL room controller with the lowest room temperature, e.g. 2.4.

Limit values

For each room group, a high and a low limit value for the room temperature can be set. If one of the limit values is crossed, a fault status message will be delivered.

Main menu > Commissioning > Settings > ... *or*
Main menu > Settings > Room group 1...10 > Room temp. supervision >

Operating line	*Range*	*Factory setting*
Limit value high	0...50 °C	40 °C
Limit value low	0...50 °C	12 °C

Fault status message

In the fault status message, the geographical zone address is given in the following format:

"Apartment.Room" (e.g. 6.24).

Based on this address and the planning documentation, the relevant RXB/RXL room controller can be unambiguously identified.

No.	*Text*	*Effect*
45XX	Room temperature > Limit val. or R'grp 1…10	Non urgent message; must not be acknowledged.
45XX	Room temperature < Limit val. or R'grp 1…10	Non urgent message; must not be acknowledged.

Text adjustments

The fault status message texts are predefined. They can be adjusted via operation.

Main menu > Commissioning > Settings > ... *or*
Main menu > Settings > Room group 1...10 > Room temp. supervision >

Operating line	*Range*	*Factory setting*
Room temperature > Limit val. or R'grp X	20 characters	Room temperature > Limit val. or R'grp X
Room temperature > Limit val. and R'grp X	20 characters	Room temperature > Limit val. and R'grp X

8.7 Optimum start control for individual room controllers

The function optimum start control preheats or precools the rooms prior to an automatic change of the operating mode to ☼ Comfort to the desired room temperature. This applies only to switches to a higher operating mode to ☼ Comfort (e.g. a change from ☾ Economy to ☼ Comfort).

The plant is switched on at the latest possible time required to achieve the setpoint for the next higher operating mode. The time switch can thus be set to actual room occupancy. The actual operating period for the plant is significantly reduced resulting in considerable energy savings.

8.7.1 Activate function

The function optimum start control can be activated for each room group.

Setting values

Main menu> Commissioning > Settings > ... *or*

Main menu > Settings > Room group 1..10 > Optimum start control >

Operating line	*Area*	*Factory setting*
Optimum start control.	Off, On: Fixed values	Off

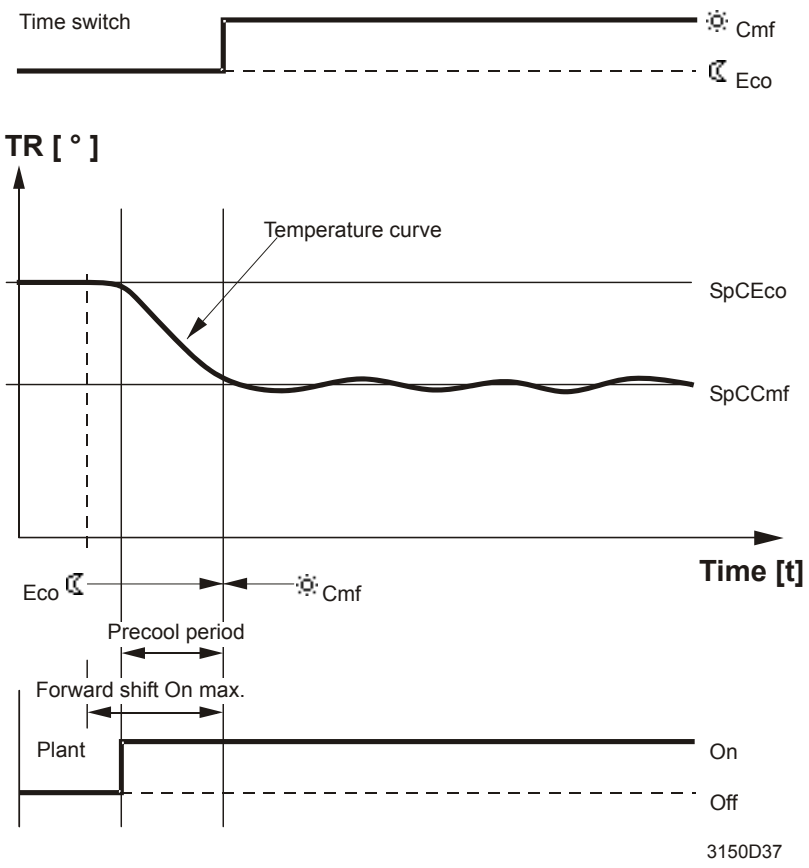
Additionally, the following measured value must be available for optimum start control:

- Room temperature (via reference room temperature for an individual room controller for the room group, see Sec. 13 "Communication"

8.7.2 Operating principle optimum start control

Example: Optimum start control for cooling

The controller makes the calculations based on the variable "Room temperature setback" and precooling required by the current reference room temperature, so that the new "Room temp. setpoint cooling" is already achieved at the time the operating mode is changed.



Setting values

Main menu > Commissioning > Settings > ... *or*

Main menu > Settings > Room group 1..10> Optimum start control >

Operating line	*Area*	*Factory setting*
Boiler setpoint setback	1…600 min/K	30 min/K
Room temperature rise	1…600 min/K	30 min/K

The maximum precooling/preheating period can be limited.

Main menu > Commissioning > Settings > ... *or*

Main menu > Settings > Room group 1..10> Optimum start control >

Operating line	*Area*	*Factory setting*
Forward shift on max	0...2880 min	360 min

All plant elements are switched in accordance with the next operating mode during optimum start control.

8.7.3 Troubleshooting

Optimum start control is not executed without a reference room temperature.

8.8 Control functions for individual room controllers

Manual control functions can preset various plant operating modes on individual room controllers. The functions are only executed by the individual room controller for a room group, however, only if the conditions on the individual room controller so permit, e. g. emergency heating is only run if the room temperature drops below the heating setpoint. The control function remains active until you manually reset it to "Auto" on the RMB795B.

Setting values

Main menu > Room group 1…10 > Room operating mode >

Operating line	*Range*	*Factory setting*
Preselection room grp control	Auto, Heating, Boost heating, Cooling, Night purge, Precooling, Off, Test, Emergency heating, Fan only, Free cooling).	Auto

Response by the individual room controllers for the various control functions depends on the connected type of device.

Control function	***Influence on RXB/RXL room controller***	***Influence on RDG/RDF/RDU room thermostats***
Auto	**Heating or cooling.** Individual room controller automatically changes over between heating and cooling dependent on the actual and setpoint temperature.	
Heating	**Heating only** Individual room controllers can only heat. The cooling sequences on the individual room controllers are locked. Note: This superposed control function is relevant to 4-pipe systems only. It does not impact the H/C changeover in a 2-pipe system.	
Boost heating	**Maximal heating** The room controller must be in Economy operating mode. It heats as quickly as possible to the Precomfort setpoint if the actual temperature is below the setpoint. Objective: Preheat the room in the event of heating.	**Not supported** The room thermostat assumes the function **Heating**.

Control function	*Influence on RXB/RXL room controller*	*Influence on RDG/RDF/RDU room thermostats*
Cooling	**Cooling only** Individual room controllers can only cool. The heating sequences on the individual room controllers are locked. Note: This superposed control function is relevant to 4-pipe systems only. It does not impact the H/C changeover in a 2-pipe system!	
Night purge	**Air damper open to the max position, fan at high speed** The room controller must be in Economy room operating mode. It cools using outside air from the open outside air damper and active fan to the Comfort cooling setpoint. The outside air temperature must be less than the room temperature (hysteresis).	**Air damper open to max. position** This function may only be used with VAV thermostats. The VAV thermostat must be in Economy room operating mode. It cools using outside air from the open outside air damper to the Comfort cooling setpoint. The outside air temperature must be less than the room temperature (hysteresis).
Precooling	**Maximum cooling** The room controller must be in Economy or Precomfort room operating mode. It cools prior to actual occupancy using the fan and cooling coil to the Comfort cooling setpoint.	**Not supported** The room thermostat assumes the function **Cooling**.
Off	**Neither cooling nor heating** Temperature control for the individual room controllers is completely shut down. Safety functions (e. g. frost) are to some extent out of service. All other functions as well as communication remain active.	
Test	**Not supported** (S-mode function)	**Not supported**
Emergency heating	**Maximal heating** The room controller switches on all installed heating aggregates as soon as the room temperature drops below the frost limit value independent of the active operating mode. Heating ends as soon as the room temperature once again exceeds the Protection heating setpoint.	**Not supported** The room thermostat assumes the function **Heating**.
Fan only	**Air damper open to the max position, fan at high speed** The room controller must be in Economy or Precomfort room operating mode. It only operates the fan or air damper to achieve a maximum air exchange. Temperature control is switched off; heating and cooling sequences on the room controller are locked.	**Air damper open to the max position, fan at high speed** The VAV thermostat opens the air damper to achieve a maximum air exchange. The fancoil thermostat only operates the fan at the maximum speed. Temperature control is switched off; heating and cooling sequences on the VAV thermostat are locked.
Free cooling	**Not supported** The room controller assumes the function precooling	**Not supported** The room thermostat assumes the function cooling.

Note

The following applies to RXB/RXL room controllers: The sequence Heating → Auto → Cooling must be selected if the control function specification calls for changing over from one control function (e. g. heating) to another control function (e. g. cooling).
This does not apply to RDG/RDF/RDU.

8.8.1 Priorities

Priority sequence for individual room controller room operating mode/individual room control:

1. Smoke extraction
2. Fire alarm off
3. Room operating mode/control functions (combined)
4. Optimum start control
5. Night cooling

8.9 Night cooling

Purpose

The "Night cooling" function is used in the summer during non-occupancy times to cool down the rooms with cool outside air.
Cooling energy can thus be saved during occupancy times.

8.9.1 Activate function

Conditions

For the "Night cooling" function to be activated, the following conditions must be satisfied:

- At least 1 reference room temperature must be available
- Outside temperature must be available.

Reference rooms

For acquisition of the reference room temperature, following applies:
In the Communication menu, you can define 1 to 3 individual rooms from the corresponding room group as a reference room by assigning the geographic zone (room), see Sec. 13.2.2 "Room group 1...10".

- Of the maximum of 3 reference rooms, it is always the highest room temperature that is selected

Setting values

Main menu > Commissioning > Settings > ... *or*
Main menu > Settings > Room group 1....10 > Night cooling >

Operating line	*Range*	*Factory setting*
Outside temperature limit	0...50 °C	12 °C
Room-outside temp delta	0.0...20.0 K	5 K
Operating time min	0...720 min	30 min
Precooling time max	0...2880 min	0 min

Deactivate night cooling

Night cooling function is disabled by setting the the parameter "Precooling time max" to 0 minutes (default value).

8.9.2 Operating principle

Use and release

When individual room controllers are used on applications that support the "Night cooling" function, the room controllers can be released via the RMB795B central control unit.

For detailed information about RXB/RXL room controllers that support the "Night cooling" function, refer to the relevant RXB/RXL documentation.

Switch-on conditions

The switch-on conditions for the "Night cooling" function are the following:

- Room temperature (OT actual value) > ☼ Comfort heating setpoint plus 1 K.
- Outside temperature (OT actual value) > Outside temperature limit value (OT limit value).
- Room temperature minus outside temperature > Room-outside temp delta.
- Period of time to the next time the plant is switched on according to the time switch or the holiday / special period program < maximum precooling time
- Controlleroperates in Auto mode (☾ Economy from the time switch program).

Switch-off conditions

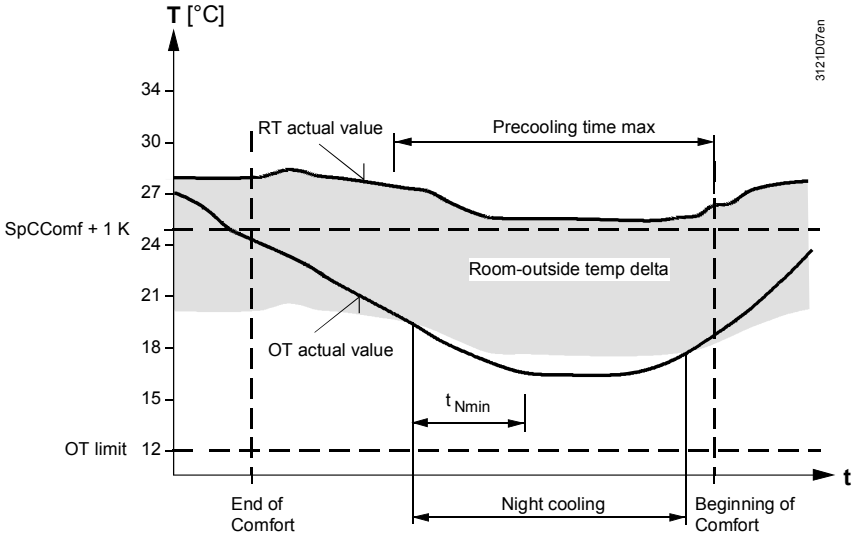
The switch-off conditions for the "Night cooling" function are the following:

- Room temperature < ☼ Comfort heating setpoint.
- Outside temperature < outside temperature limit value.
- Room temperature minus outside temperature < Room-outside temp delta.

With these conditions, the minimum operating time of the “Night cooling” function is observed.

Function diagram

The following diagram is an example of the period of time night cooling takes place based on the setting values according to “Activation of function“ and the above mentioned switch-on and switch-off criteria:
Night cooling starts where the actual outside temperature leaves the grey "Room-outside temp delta" band (setting value). It ends where the actual outside temperature reenters the band.



8.9.3 Troubleshooting

Brief description

Supervision of outside temperature is described in Sec. 7.5 "Outside temperature". The values of the reference room temperature are communicated by the RXB/RXL room controllers.
If no reference room temperatures or no outside temperature values are available, the "Night cooling" function will be deactivated.

8.10 Fire alarm off

Function

In case of emergency, a room group can be switched off via a digital input at an input Xx of the RMB795B central control unit. The signal can be delivered by an external fire alarm system, for example.

8.10.1 Activate function

Configuration

The function is activated by configuring a digital input:

Main menu > Commissioning > Extra configuration > Room group 1…10 > Fire and smoke extraction >

Operating line	*Adjustable values / remarks*
Fire alarm off	---, X1, X2, ... (digital inputs only).

8.10.2 Operating principle

Bus telegram to the individual room controllers

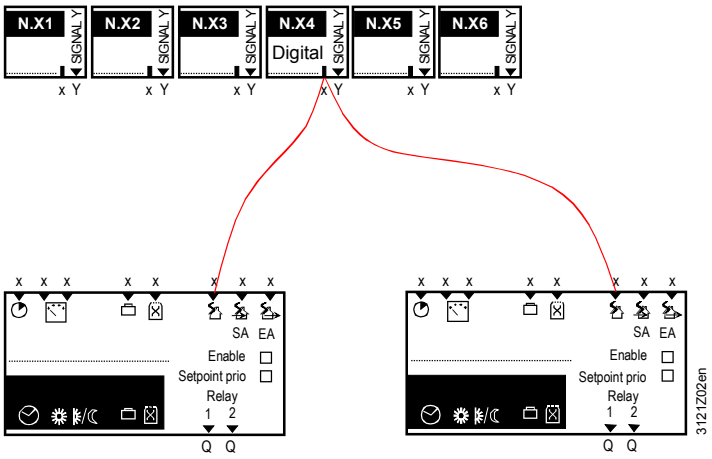
When individual room controllers are used on applications that support the "Emergency override" function, the RMB795B central control unit can transmit to them via bus the signal for fire alarm off received via the digital input.
The signal acts on the geographical zone of the relevant room group. It has no impact on the operating mode of that room group.

Note

For detailed information about the RXB/RXL room controllers that support the "Emergency override" function, refer to the relevant RXB/RXL documentation.

Application example

The signal at digital input X4 is forwarded to the inputs "Fire alarm off" of two room groups:



8.10.3 Troubleshooting

Priority is urgent

Fault priority is always "urgent". A fire alarm signal must always be acknowledged and reset. Only then will the room group(s) resume normal operation according to the time program.

Fault status messages

No.	*Text*	*Effect*
3890-3899	Fire alarm off	Urgent message; must be acknowledged and reset.

8.11 Smoke extraction

Function

Function block "Room group" can be switched to "Smoke extraction" mode via 1 or 2 digital signals at its inputs "SA" and "EA".

8.11.1 Activate function

Configuration

The function is activated by configuring at least 1 digital input Xx:

Main menu > Commissioning > Extra configuration > Room group 1...10 > Fire and smoke extraction >

Operating line	*Adjustable values / remarks*
Smoke extraction supply air	---, X1, X2, ... (digital inputs only).
Smoke extraction extract air	---, X1, X2, ... (digital inputs only).

8.11.2 Operating principle

Bus telegram to the individual room controllers

When individual room controllers are used on applications that support the "Emergency override" function, the RMB795B central control unit can transmit to them via bus the smoke extraction signal for supply air, extract air or supply air / extract air operation.
The signal acts on the geographical zone of the relevant room group. It has no impact on the operating mode of that room group.

Notes on configuration

For detailed information about the RXB/RXL room controllers that support the "Emergency override" function, refer to the relevant RXB/RXL documentation.

Smoke extraction with supply air and / or extract air can be configured separately:

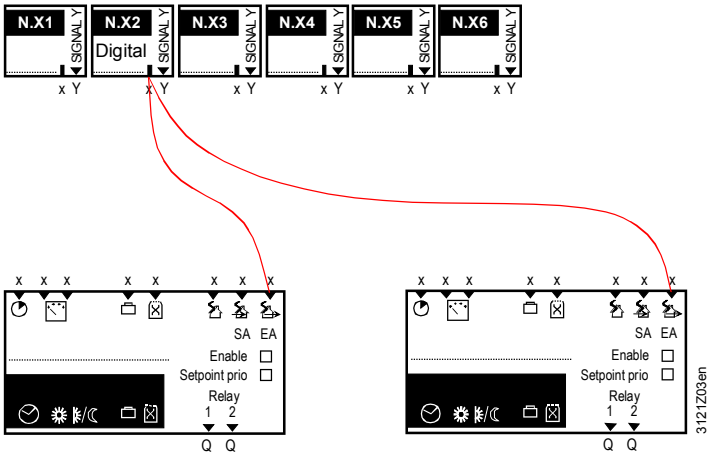
- If smoke extraction is accomplished with supply air and extract air, both function block inputs can be controlled.
- Digital input Xx can be configured to smoke extraction with supply air as well as smoke extraction with extract air.

Priority

Smoke extraction has a higher priority than fire alarm off, i.e. extraction is executed despite the signal "Fire alarm off".

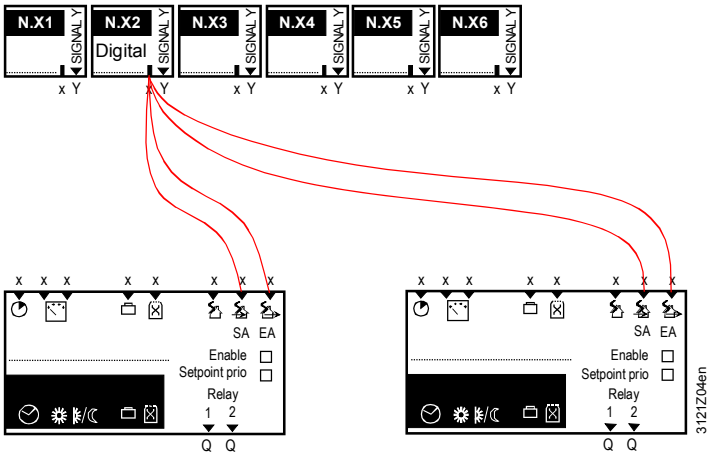
Configuration example: Smoke extraction extract air

Smoke extraction with extract air for the rooms in room groups 1 and 2 is triggered via the signal from digital input X2:



Configuration example: Smoke extraction supply air and extract air

Smoke extraction with supply and extract air for the rooms in room groups 1 and 2 is triggered via the signal from digital input X2:



8.11.3 Troubleshooting

Priority is urgent

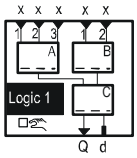
Fault priority is always "urgent". Smoke extraction must always be acknowledged. When the relevant external contact is de-energized so that the signal at digital input Xx is no longer present, the room group(s) will resume normal automatic operation according to the time program.

Fault status messages

No.	*Text*	*Effect*
3880-3889	Smoke extraction	Urgent message; must be acknowledged.

9 Logic

9.1 Function



Purpose

The logic block is used to make logical links to multiple input signals.
10 independent logic function blocks are available.

Operation selector

One operation selector can be activated per logic function block to allow the use to manually intervene at the upper main menu level.
Auto, Off and On can be selected. The intervention acts on the output of the logic function block.

Settable times

You can set a switch on and switch off delay as well as minimum switch on and off period for the output signal on function area C.
These times always act (e.g. for an operation selector intervention), except during a wiring test.

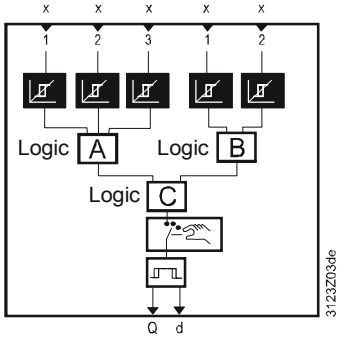
Converting an analog signal to a digital signal

Each input can be assigned a digital or analog signal.
Using switch-on and switch-off values, an analog signal can be converted to an On/Off signal. Where:
Switching value on > switching value off: Transition from 0 → 1
Switching value on < switching value off: Transition from 1 → 0

A difference between switching value On and switching value Off represents the hysteresis.

Internal structure

- Inputs 1, 2 and 3 are internally connected to logic A.
- Inputs 1 and 2 are connected to logic B.
- For logic A and logic B, logic functions AND, NAND, OR or NOR can be selected.
- The results from logics A and B act on logic C.
- Logic functions AND, NAND, OR, NOR , EXOR or EXNOR can be selected in logic C.



Note

The logic function blocks are processed ascending from 1 to 10.
The following logic tables show the settable logic functions AND, NAND, OR, NOR, EXOR and EXNOR using the example of 2 inputs.

Logic tables

AND

Input1	Input2	Output
0	0	0
0	1	0
1	0	0
1	1	1

NAND

Input1	Input2	Output
0	0	1
0	1	1
1	0	1
1	1	0

OR

Input1	Input2	Output
0	0	0
0	1	1
1	0	1
1	1	1

NOR

Input1	Input2	Output
0	0	1
0	1	0
1	0	0
1	1	0

EXOR

Input1	Input2	Output
0	0	0
0	1	1
1	0	1
1	1	0

EXNOR

Input1	Input2	Output
0	0	1
0	1	0
1	0	0
1	1	1

9.2 Activate the logic

The logic is activated by configuring at least 1 input or the operation selector.
The type of internal logic A, B and C can be configured via the Extra configuration menu.
The setting "Operation selector" in the operating line selects if the operation selector is displayed in the main menu at the user level.

Note

The operation selector enables the user to make manual interventions. During a manual intervention, no warning is displayed.

Configuration

Main menu > Commissioning > Extra configuration > Logic functions > Logic 1...10 >

Operating line	*Adjustable values*	*Factory setting*
[Logic A] input 1	---, X1, X2, ...	---
[Logic A] input 2	---, X1, X2, ...	---
[Logic A] input 3	---, X1, X2, ...	---
[Logic B] input 1	---, X1, X2, ...	---
[Logic B] input 2	---, X1, X2, ...	---

[Logic A] function	AND, NAND, OR, NOR	OR
[Logic B] function	AND, NAND, OR, NOR	NOR
[Logic C] function	AND, NAND, OR, NOR, EXOR, EXNOR	AND
Logic relay	---, N.Q1, N.Q2, .../ (only free outputs)	---
Operation selector	Yes, no	No
Time format	h:m, m:s	m:s

Notes

The format "h:m" can be used if an advanced time format is required for the logic function (> 59.59 m:s).

Important

The changeover impacts all time-related parameters of the logic function block (switch-on/off delay and min. switch-on/off time).
The time format "h:m" can be set in 10-minute increments.

9.3 Assign texts

A specific text can be assigned to each logic and operation selector. This text appears on the menu and in the operating line.

Setting values

Main menu > Commissioning > Settings > ... *or*
Main menu > Settings > Logic functions > Logic 1...10 >

Operating line	*Range*	*Factory setting*
Logic 1...10	Max. 20 characters.	Logic 1...10
Operation selector 1...10	Max. 20 characters.	Operation selector 1...10

Additional information on editable texts is available at Sec. 6.5.4.

9.4 Setting values

9.4.1 Switching value On and Off

The logic can process digital and analog signals. Setting values "[Logic x switching value n] on" and "[Logic x switching value n] off" are used to convert a continuous signal to a 2-position (on/off) signal.

Setting values

Main menu > Commissioning > Settings > ... *or*
Main menu > Settings > Logic functions > Logic 1...10 >

Operating line	*Range*	*Factory setting*
[Logic A switching value 1] on	Depending on selected type	Depending on type.
[Logic A switching value 1] off	Depending on selected type	Depending on type.
[Logic A switching value 2] on	Depending on selected type	Depending on type.
[Logic A switching value 2] off	Depending on selected type	Depending on type.
[Logic A switching value 3] on	Depending on selected type	Depending on type.
[Logic A switching value 3] off	Depending on selected type	Depending on type.
[Logic B switching value 1] on	Depending on selected type	Depending on type.
[Logic B switching value 1] off	Depending on selected type	Depending on type.
[Logic B switching value 2] on	Depending on selected type	Depending on type.
[Logic B switching value 2] off	Depending on selected type	Depending on type.

9.4.2 Switch-on delay / switch-off delay

For the logic output, a switch-on delay and switch-off delay can be set.

Setting values

Main menu > Commissioning > Settings > ... *or*
Main menu > Settings > Logic functions > Logic 1...10 >

Operating line	*Range*	*Factory setting*
Switch-on delay	00.00...59.59 m:s or* 00.00...23.50 h:m.	00.00 m:s
Switch-off delay	00.00...59.59 m:s or* 00.00...23.50 h:m.	00.00 m:s

* See reference on time format in Sec. 9.2.

Note

The switch-on delay always acts on the switch-on command, the switch-off delay on the switch-off command.

9.4.3 Minimum on-time

For the logic output, a minimum switch-on delay can be set. In other words, the output remains switched on for the set time if a switch-on command arrives.

Setting values

Main menu > Commissioning > Settings > ... *or*
Main menu > Settings > Logic functions > Logic 1...10 >

Operating line	*Range*	*Factory setting*
On time minimum	00.00...59.59 m:s or* 00.00...23.50 h:m.	00.00 m:s

* See reference on time format in Sec. 9.2.

The minimum on-time always takes effect after a switch-on command.

9.4.4 Minimum off-time

The minimum off time prevents aggregates from cycling too frequently.

Setting values

Main menu > Commissioning > Settings > .... *or*
Main menu > Settings > Logic functions > Logic 1...10 >

Operating line	*Range*	*Factory setting*
Off time minimum	00.00...59.59 m:s or* 00.00...23.50 h:m.	00.00 m:s

* See reference on time format in Sec. 9.2.

The minimum off time always takes effect after a switch-off command.

9.5 Operation selector

The operating mode of the output can be preselected via the operation selector in the main menu.
Logic blocks are preselected and the current state is displayed. Switch-on and switch-off delay as well as minimum on and off time are considered.

Display values

Main menu > Operation selector 1...10 >

Operating line	*Comments*
Preselection	Auto, Off, On.
State	Display of the current state: Off, On.

Important note

If the configuration of the operation selector is reset subsequently, you must first ensure that it is set to Auto. Otherwise, the output constantly remains "On" or "Off".

9.6 Wiring test

During the wiring test, the logic block outputs can be directly switched via the control switch. During the wiring test, delay and on times are inactive.

Wiring test

Main menu > Commissioning > Wiring test > Outputs >

Operating line	*Comments*
Logic 1…10	Off, On.

9.7 Priorities

For logic operations, the following priorities apply:

7. ON/OFF during the wiring test.
8. Off by "Off time minimum"
9. On by "On time minimum"
10. Off by Switch-on delay
11. On by Switch-off delay
12. On by Operation selector
13. On by logic inputs.

9.7.1 Notes

- There is no hysteresis for an analog input of the logic block where the switching value On = switching value Off.
- If an error occurs at a configured input, the "Off" state is issued for the entire logic block.
- If only inputs are configured with logic A, logic C is ignored and the signal of logic A is sent directly to the output.
- If only inputs are configured with logic B, logic C is ignored and the signal of logic B is sent directly to the output.

Processing order

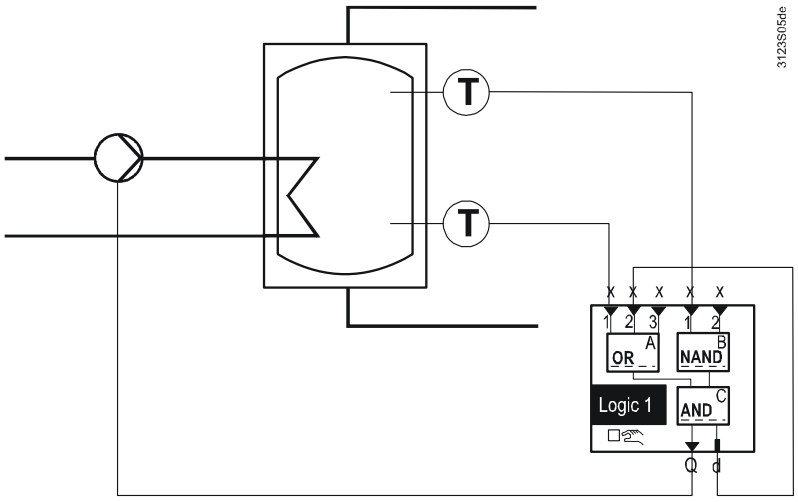
- The logic blocks are handled sequentially in accordance with their instance number, that is, first logic 1, then logic 2 through logic 10.
- If outputs are looped back, e.g. from the output of logic block 7 to the input of logic block 2, the result at logic block 2 will only become available with the next handling cycle.

9.8 Application examples

9.8.1 Application example storage tank charging

The following application example shows a solution for a self-holding function:

- The measured value connected to logic A input 1 gives the switch-on command for storage tank charging.
- The measured value at logic B input 1 terminates charging.

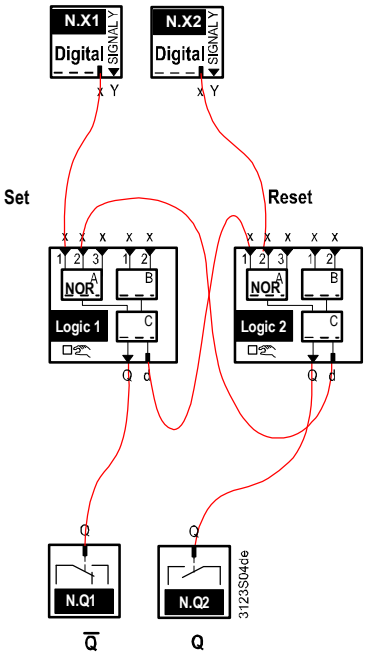


Required configuration and setting values:

Operating line	*Comments*
[Logic A] function	OR
[Logic B] function	NAND
[Logic C] function	AND
[Logic A switching value 1] on	30 °C
[Logic A switching value 1] off	35 °C
[Logic B switching value 1] on	65 °C
[Logic B switching value 1] off	60 °C

9.8.2 Application example RS flip-flop

The following application example shows a solution for an RS flip-flop:



Required configuration:

Operating line	*Comments*
Logic 1 > [Logic A] function	NOR
Logic 2 > [Logic A] function	NOR

Truth table for the RS flip-flop:

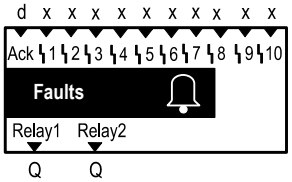
Setting	Reset	Q	$\overline{Q}$	State
0	0	X	X	Save
0	1	0	1	Reset
1	0	1	0	Setting
1	1			Undetermined

10 Function block: "faults"

10.1 Purpose and activation

Purpose

Function block "Faults" collects all fault status messages, evaluates them and responds to protect building and plant.



Activation

To activate the function block, 1 of the inputs Aux1…Aux10 must be configured.

Many faults are acquired automatically and need not be specifically configured in function block "Faults". These faults are described with the relevant function. Example: "Fire alarm off".

10.2 Fault priorities and acknowledgement

Fault priorities

The RMB795B central control unit differentiates between 2 fault priorities:

Urgent	These are fault status messages that represent plant risks, or where reliable operation of plant can no longer be ensured (e.g. "Smoke extraction").
Not urgent.	These are fault messages that represent no direct risk to plant operation (e.g. "Outside temp sensor error").

Fault acknowledgement

The RMB795B central control unit differentiates between 3 types of fault acknowledgement:
None/acknowledge/acknowledge and reset.
For details, see Sec. 17.2.2 "Alarm acknowledgement".

10.3 Universal fault inputs

Connections

Using function block “Faults“, the RMS795B has 10 universal fault inputs at its disposal. Any type of analog or digital signal can be fed to these inputs.
To activate a fault input, an Xx input of the central control unit or of an extension module must be assigned to it.

Configuration

Main menu > Commissioning > Extra configuration > Faults

Operating line	*Adjustable values / remarks*
Fault input 1	---, N.X1, N.X2, ...
...	
Fault input 10	---, N.X1, N.X2, ...

Settings

The following settings are possible for each fault message:

- Fault status signal delay. Elapsed time until a pending fault generates a fault message.
- Alarm acknowledgement
- Fault priority

- Limit value "Fault on": Limit value from which the fault status message is generated.
- Limit value "Fault off": Limit value for the normal state (difference to "Limit value fault on" is the switching differential)

Setting values

Main menu > Commissioning > Settings > ... *or*
Main menu > Settings > Faults > Fault input 1...10

Operating line	*Range*	*Factory setting*
Fault status signal delay	00.00...59.55 m:s.	00.05 m:s
Alarm acknowledgement	None, acknowledge, acknowledge and reset.	None
Fault priority	Urgent, not urgent.	Not urgent.
Limit value fault on	Depending on the selected type.	Depending on the type.
Limit value fault off	Depending on the selected type.	Depending on the type.

Notes

If the upper and the lower limit of a measured value is to be monitored, the signal is must be fed to 2 fault inputs.

To monitor the lower limit, data point "Limit value fault on" is to be set below "Limit value fault off". This generates a fault message when the measured value is lower than the "Limit value fault on".

The differential of data point "Limit value fault on" and "Limit value fault off" represents the hysteresis.

If data point "Limit value fault on" is set equal to "Limit value fault off", no fault status message will be generated.

Fault text

The texts for the universal fault inputs are predefined by "[Fault input 1]" to "[Fault input 10]". They can be adjusted via operation.

Main menu > Commissioning > Settings > ... *or*
Main menu > Settings > Faults > Fault input 1...10

Operating line	*Range*	*Factory setting*
Fault text 1	Max. 20 characters.	[Fault inp 1] fault
Fault text 2	Max. 20 characters.	[Fault inp 1] fault
Fault text 3	Max. 20 characters.	[Fault inp 1] fault
Fault text 4	Max. 20 characters.	[Fault inp 1] fault
Fault text 5	Max. 20 characters.	[Fault inp 1] fault
Fault text 6	Max. 20 characters.	[Fault inp 1] fault
Fault text 7	Max. 20 characters.	[Fault inp 1] fault
Fault text 8	Max. 20 characters.	[Fault inp 1] fault
Fault text 9	Max. 20 characters.	[Fault inp 1] fault
Fault text 10	Max. 20 characters.	[Fault inp 1] fault

Fault status messages

No.	*Standard text*	*Effect*
9000	>1 fault input faulty	Urgent message; does not require acknowledgement (Effect can be set for each fault input).
9001	[Fault inp 1] fault	According to the settings (refer to "Setting values")
9002	[Fault inp 2] fault	Ditto
9003	[Fault inp 3] fault	Ditto

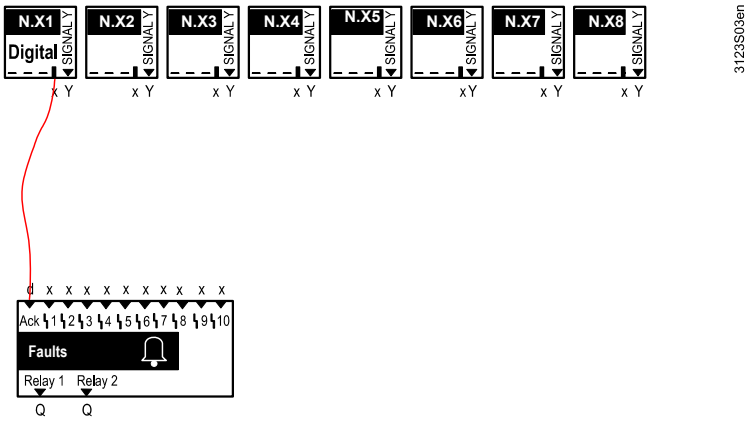
No.	Standard text	Effect
9004	[Fault inp 4] fault	Ditto
9005	[Fault inp 5] fault	Ditto
9006	[Fault inp 6] fault	Ditto
9007	[Fault inp 7] fault	Ditto
9008	[Fault inp 8] fault	Ditto
9009	[Fault inp 9] fault	Ditto
9010	[Fault inp 10] fault	Ditto

>1 fault input faulty

The fault with the highest priority is sent over the KNX bus. If more than one fault input wants to report priority "Urgent", the message ">1 fault input faulty" is sent at the highest priority. Only the message from one fault input would otherwise be known within this fault message. The newly arriving fault message can be viewed on the Info level under "Fault status message bus".

10.4 External fault button

The fault block allows for connecting an external fault button. The external fault button has the same function as fault button "🔔" on the RMB795B. Both can be operated in parallel. The current alarm state can be externally indicated via the fault relay.



Configuration

Main menu > Commissioning > Extra configuration > Faults >

Operating line	Adjustable values / remarks
Fault button external	---, N.X1, N.X2, ... (digital only).

10.5 Fault relay

Route fault status messages

To pass on fault status messages, or to have them optically or acoustically indicated on a control panel, for example, 2 fault status outputs "Relay1" and "Relay2" of the function block can be configured to any 2 free outputs N.Qx of the central control unit RMB795B.

Configuration

Main menu > Commissioning > Extra configuration > Faults

Operating line	*Adjustable values / remarks*
Fault relay 1	---, N.Q1 ... (free relays only) / assignment of fault relay.
Fault relay 2	---, N.Q1 ... (free relays only) / assignment of fault relay.

Settings

The following settings can be made separately for Fault relay 1 and 2:

- Fault priority: Priority at which the relay is to be energized.
  - **Urgent**
  - **Not urgent**
  - **All**
- Indication of fault: The following indications of fault can be selected:
  - **Internal fault (optically)**: The fault relay only indicates internal faults and remains energized until faults are no longer present.
  - **Internal fault (audible):** The fault relay only indicates internal faults and remains energized until the fault is acknowledged.
  - **Fault via bus (audible):** The fault relay only indicates device-internal faults from the bus and remains active until the fault is acknowledged.
- Inversion:
  - **Yes**: In case of fault, the relay is de-energized.
  - **No**: In case of fault, the relay is energized.

Setting values

Main menu > Commissioning > Settings > ... *or*

Main menu > Settings > Faults > Fault relay 1...2 >

Operating line	*Range*	*Factory setting*
Fault priority	Urgent, Not urgent, All	All
Indication of fault	Fault internally (optically), Fault internally (audibly), Fault via bus (audibly) **	Fault internally (audibly) *
Inversion	Yes, No	No

* Factory setting for Fault relay 2: "Fault via bus (audibly)"

** A maximum of one bus fault status message can be handled (even if they are of different priority). Recommendation: Do not configure 2 bus fault relays.

Display values

Under menu item **Outputs**, the state of the 2 fault relays can be read off:

Main menu > Faults >

Operating line	*Current state*
Fault relay 1	Off, On.
Fault relay 2	Off, On.

10.6 Functional check / wiring test

Wiring test

During the time the wiring test is made, the 2 fault relays can be activated directly:

Main menu > Commissioning > Wiring test > Outputs

Operating line	*Comments*
Fault relay 1	Off, On.
Fault relay 2	Off, On.

11 Distribution zones

11.1 Overview

Types of application

With regard to the distribution zones, we differentiate between 3 types of application:

- Direct application (normal situation)
- Indirect application
- 2-pipe system (or changeover system)

The individual applications are depicted and described below.

11.1.1 Direct application

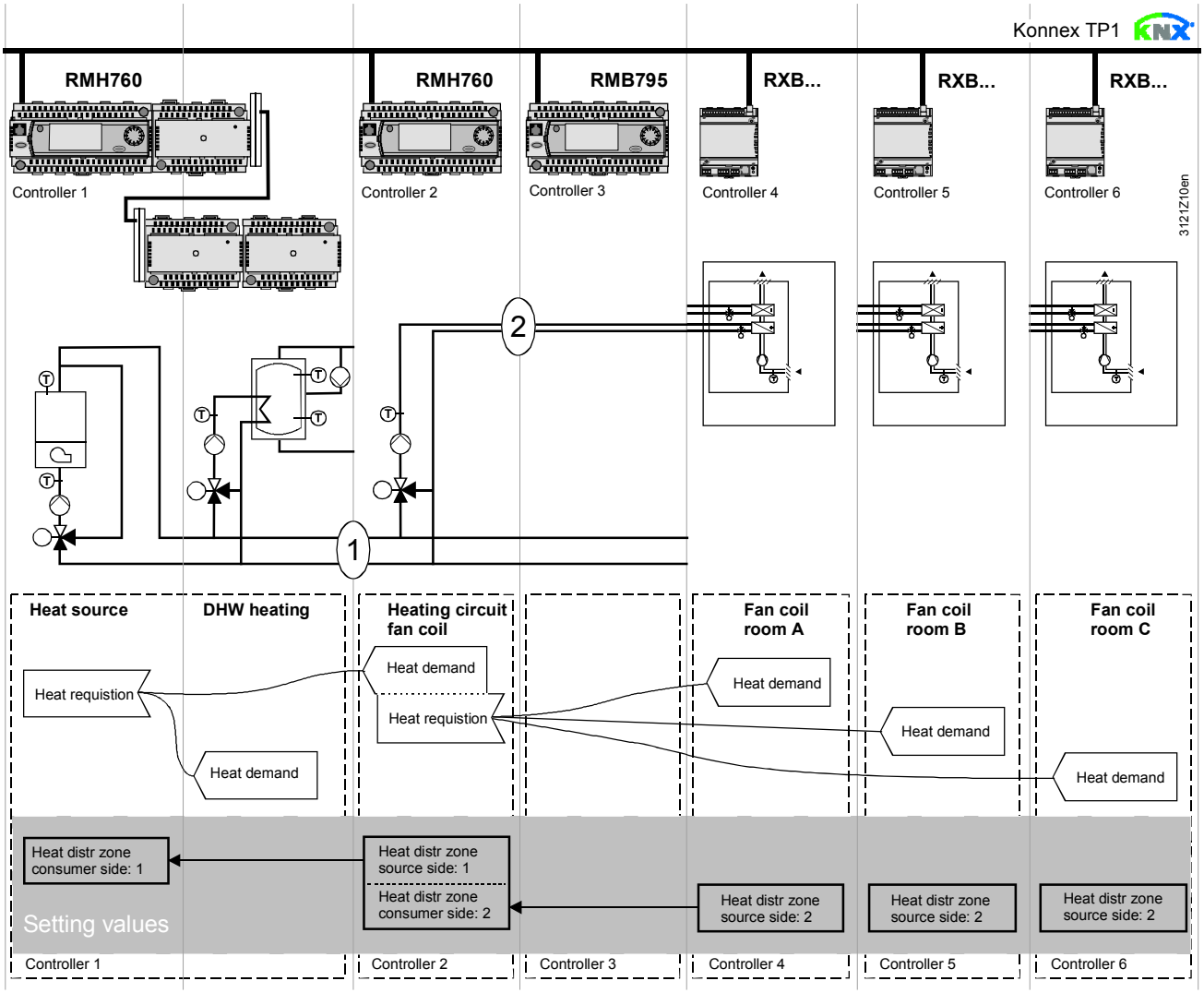


Illustration notes

In a typical application, the individual RXB/RXL room controllers signal their heat demand direct to the primary controller by bypassing the RMB control unit (to the RMH760 in the above illustration).

(1) and (2) stand for the distribution zone numbers.

Notes

This type of application can analogously be applied to refrigeration distribution zones.

11.1.2 Indirect application

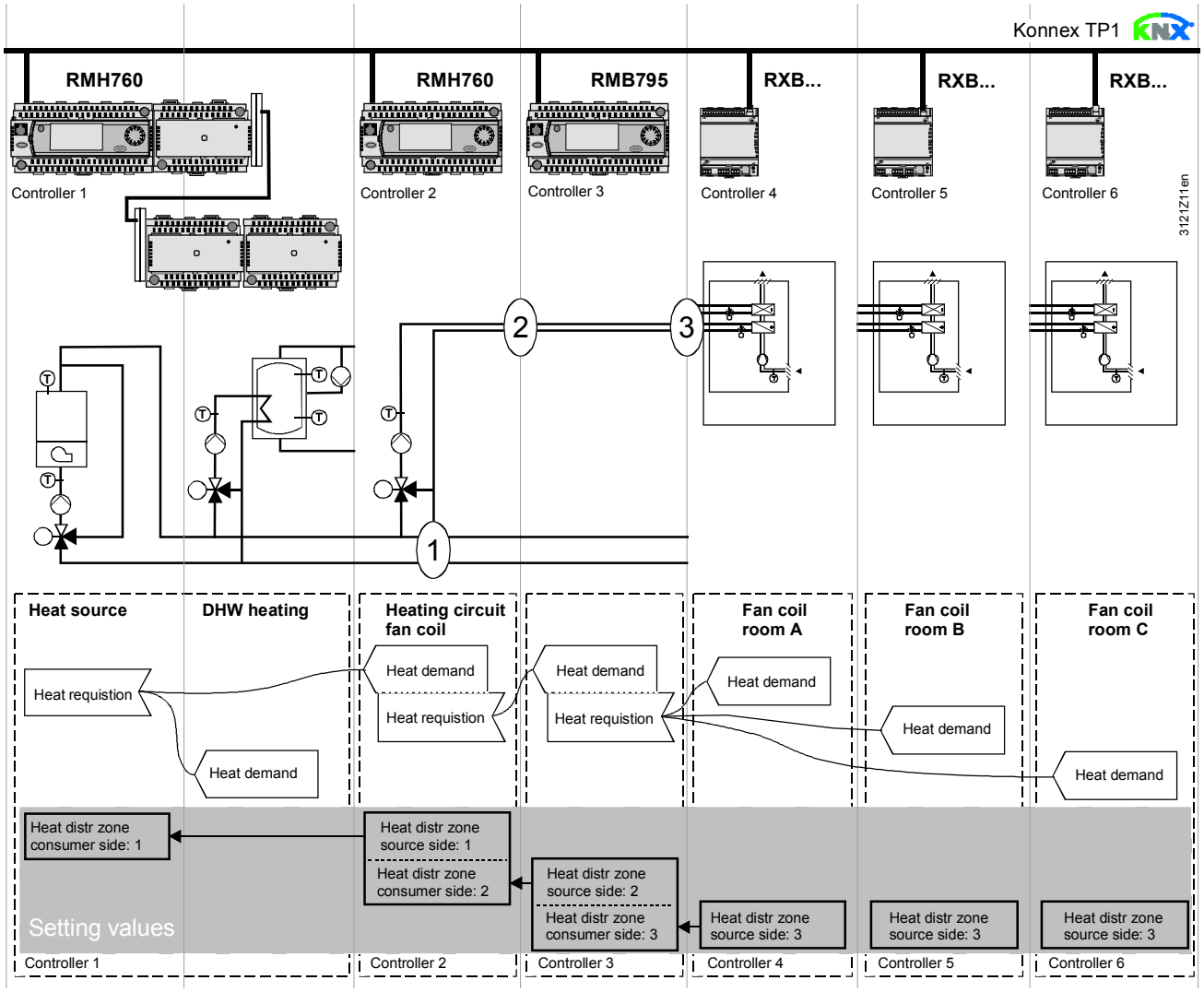


Illustration notes

With this type of application, the individual RXB/RXL room controllers signal their heat demand indirectly to the heat source via the RMB795B central control unit. This type of application is used for 2 reasons:

a) From the RMB central control unit, the heat demand signal is passed on to an external primary controller or heat source via a modulating output or relay output

b) To reduce the KNX network load, the request signals are collected on the RMB central control unit and passed on as heat demand signals to the heat source via a line coupler.

(1), (2) and (3) designate the numbers of the distribution zone.

Note

This type of application can analogously be applied to refrigeration distribution zones.

11.1.3 Explanation example 2-pipe system

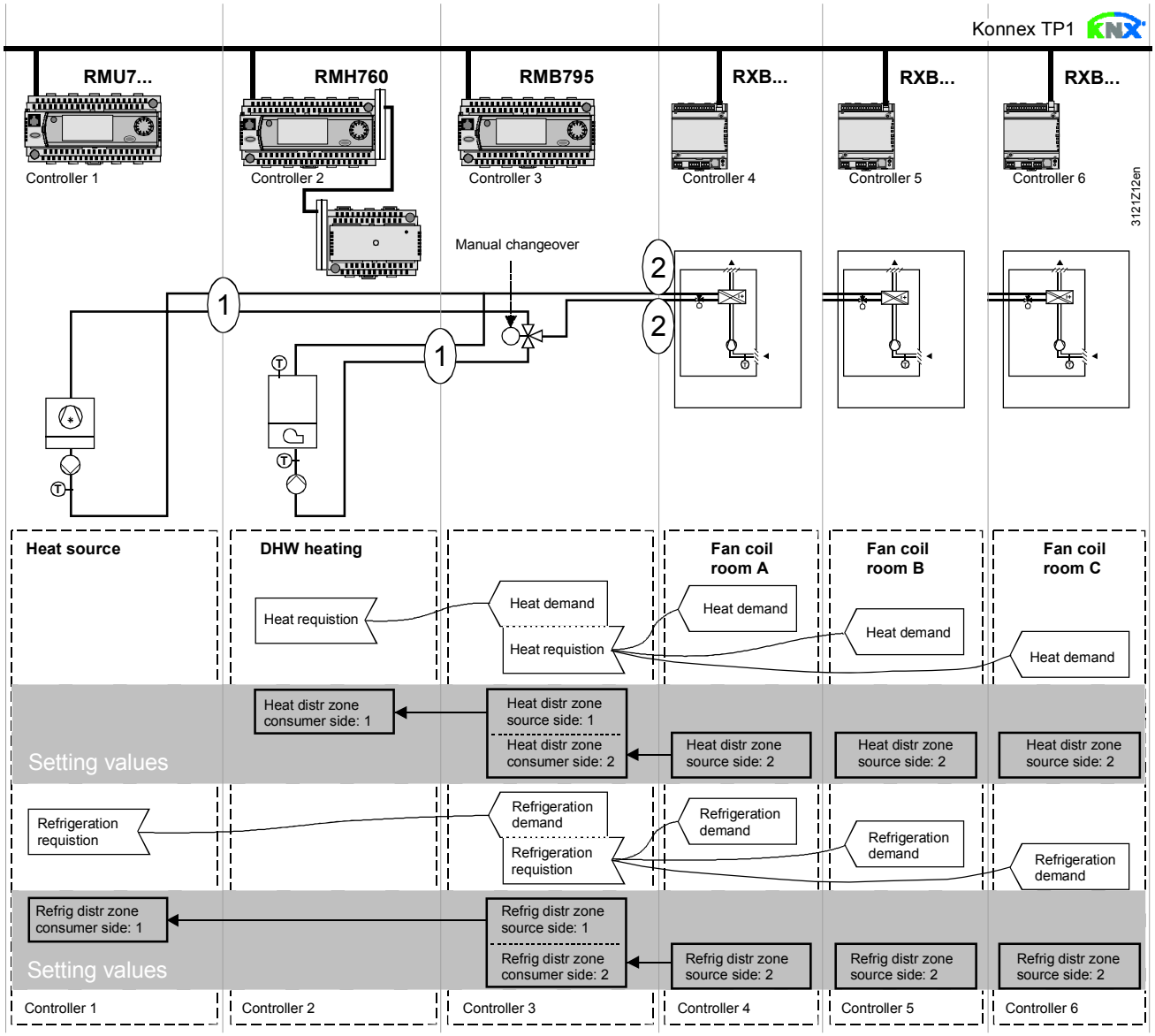


Illustration notes

With the 2-pipe system, the heat or refrigeration demand signal is sent to the primary plant depending on the changeover position.

(1) and (2) stand for the distribution zone numbers.

11.2 Function "Heat request"

11.2.1 Purpose and activation

Purpose

The "Heat request" function collects heat requests from different devices on the bus.

From these signals, a resulting preselected setpoint is determined (temperature request signal, heating flow setpoint, which is passed on to other devices via the “Heat demand" function block.

Activation

For the "Heat request" function to become activated, a heat distribution zone must be assigned to it on the consumption side:

Main menu > Commissioning > Communication > Distribution zones

Operating line	*Range*	*Factory setting*
Heat distribution zone	----, 1…31	1

11.2.2 Operating principle

Request signals

The RMB795B central control unit receives the following types of request signals via bus:

- Heat demand in %,
  e.g. from a room control system "RXB/RXL with heating coil"
- Valve position in %,
  e.g. from a control system "RMU7... as basic type A or U" for an air handling plant with heating coil / cooling coil
- Temperature request in °C,
  from an RMH760 controller (heating circuit controller or cascaded primary controller)

All these signals are handled simultaneously.

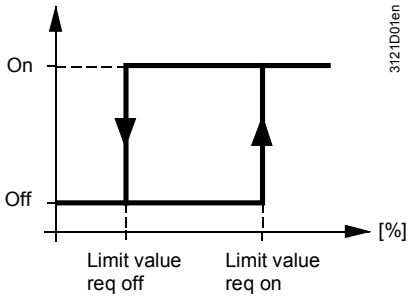
Setting values

Main menu > Commissioning > Settings > ... *or*
Main menu > Settings > Heat request >

Operating line	*Range*	*Factory setting*
Limit value request on	0...100 %	10 %
Limit value request off	0...100 %	5 %
Heating flow setpoint	0...140 °C	40 °C
Flow temperature reduction max	0..0.100 K	0 K
Control action	Slow, medium, fast.	Medium.
Evaluation of request	Average, maximum.	Maximum.

"Limit value request on"

The %-request signals received (heat demand or valve position) are passed on only when they have exceeded the level of "Limit value request on". This function prevents the heat generation plant from being switched on when heat request is only small.



"Heating flow setpoint", "Flow temperature reduction max"

From the request signals received, a resulting flow temperature is determined. This flow temperature is matched to the actual heat demand in a way that the valve position of the heat consumer with the greatest heat demand is 90%.

- If the valve position is >90 %, the flow temperature will be increased
- If the valve position is <90 %, the flow temperature will be decreased

The maximum flow temperature readjustment can be parameterized.
With valve positions ≤90 %, the current flow temperature is:
"Heating flow setpoint" – "Flow temperature reduction max".

“Control action”

To adapt the control system to the plant, the control action of the flow temperature can be adjusted to the setpoint shifts in 3 steps (fast, medium, slow).

Request evaluation

Setting "Request evaluation" is used to determine if the max value or the average of the requests is to be used.

- When using the "Maximum" setting, the flow temperature will be readjusted in a way that the valve position of the consumer with the greatest heat demand is 90 %
- When using the "Average setting, the flow temperature will be readjusted in a way that the valve positions of the 4 largest consumers will be 90 % on average

Note

This setting does not ensure that all consumers are covered. It makes certain, however, that an individual consumer cannot force the flow temperature to high levels (e.g. because a window was left open).

11.3 Function block "Heat demand"

11.3.1 Purpose

Heat demand signal generation

The function block generates a "Heat demand" signal that can be used by other devices. The heat demand is provided in the form of the following signals:

- Digital signal at output Q ("Heat demand relay")
- Analog signal at output Y ("Heat demand modulating")
- Bus signal ("Communication")

The 3 variants are described below.

11.3.2 Heat demand relay

Purpose and function

The heat demand relay must be configured to a relay output N.Qx of the RMB795B central control unit. Release for an external refrigeration source, for example, can be connected to this output.
The heat demand relay responds as soon as the bus calls for heat.
Meaning:

- Contact open = No heat demand.
- Contact closed = Heat demand

Configuration

Main menu > Commissioning > Extra configuration > Heat demand

Operating line	*Adjustable values / remarks*
Heat demand relay	---, N.Q1, N.Q3, ... / activation of output

11.3.3 Heat demand modulating

Purpose

In addition to the heat demand relay, the heat demand can be made available at a modulating output N.Yx for other devices.

Configuration

Main menu > Commissioning > Extra configuration > Heat demand

Operating line	*Adjustable values / remarks*
Heat demand modulating	---, N.Y1, N.Y2, ... Activate output.

Setting values

Main menu > Settings > Heat demand >

Operating line	*Range*	*Factory setting*
Setpoint at 0 V	–50…+50 °C	0 °C
Setpoint at 10 V	50…500 °C	100 °C
Limit value	–50…+250 °C	10 °C

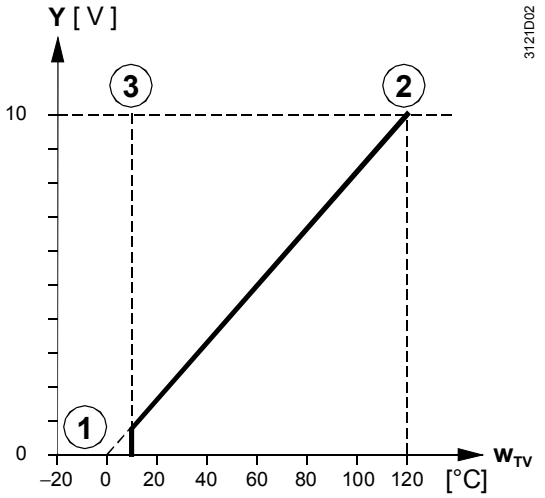
Explanations relating to the setting values

"Setpoint at 0 V" determines the flow temperature setpoint at DC 0 V.
"Setpoint at 10 V" determines the flow temperature setpoint at DC 10 V.

"Limit value" denotes "Limit value for heat demand": Temperatures below this level are interpreted as "no heat demand".
As long as the flow temperature setpoint does not exceed the set limit value, the output signal DC 0 V is sent. When the limit value is exceeded, the relevant output signal is sent until the setpoint is again below the limit value minus a hysteresis of 0.5 K.

Diagram relating to the setting values (example)

Output signal Y (DC 0…10 V) for the heat demand corresponds to a flow temperature setpoint range w_{TV} of 0…120 °C. This limit value should be at 10 °C. The diagram shows the values of the parameters to be set and the resulting progression of the heat demand signal:



Key

1	Setpoint in °C at DC 0 V.	here 0 °C (factory setting)
2	Setpoint in °C at DC 10 V.	here 120 °C
3	Limit value for heat demand	here 10 °C (factory setting)

11.3.4 Communication

Purpose

Heat demand can be transmitted over the bus to other devices of a heat distribution zone on the generation side if communication is activated (see Sec. 13).
A "Heat distribution zone source side" must be defined, see Sec. 13.2.3 "Distribution zones" menu item".

Setting values

Main menu > Commissioning > Communication > Distribution zones >

Operating line	*Range*	*Factory setting*
Heat distr zone source side	----, 1…31	----

11.3.5 Functional check / wiring test

Purpose

For making a functional check during the wiring test, the outputs of the "Heat demand" function block can be switched directly.

Settings

Main menu > Commissioning > Wiring test > Outputs

Operating line	*Comments*
Heat demand relay	---, 0...100 % (relay switches >= 1 %).
Heat demand modulating	---, 0...100 %

11.4 Function "Refrigeration request"

11.4.1 Purpose and activation

Purpose

The "Refrigeration request" function collects refrigeration requests from different devices on the bus.
From these signals, a resulting preselected setpoint is determined (chilled water flow setpoint), which is passed on to other devices via the “Refrigeration demand" function block.

Activation

For the "Refrigeration request" function to become activated, a refrigeration distribution zone must be assigned to it on the consumption side:

Main menu > Commissioning > Communication > Distribution zones

Operating line	*Range*	*Factory setting*
Refrigeration distribution zone	----, 1…31	1

11.4.2 Operating principle

Request signals

The RMB795B central control unit receives the following types of request signals via bus:

- Refrigeration demand in %,
  e.g. from a room control system "RXB/RXL with cooling coil or chilled ceiling"
- Valve position in %,
  e.g. from a control system "RMU7... as basic type A or U" for an air handling plant with heating coil/cooling coil
- Temperature request in °C,
  from a primary controller "RMU7… as basic type C"

All these signals are handled simultaneously.

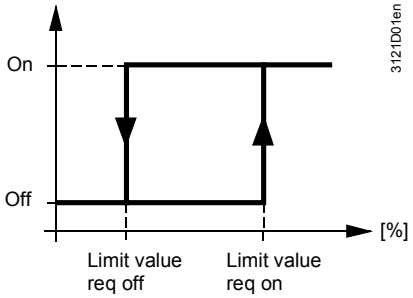
Setting values

Main menu > Commissioning > Settings > ... *or*
Main menu > Settings > Refrigeration request >

Operating line	*Range*	*Factory setting*
Limit value request on	0...100 %	10 %
Limit value request off	0...100 %	5 %
Chilled water flow setpoint	0...140 °C	6 °C
Flow temperature increase max	0…100 K	0 K
Control action	Slow, medium, fast.	Medium.
Request evaluation	Average, maximum.	Maximum.

"Limit value request on"

The received request signals received are passed on only when they have exceeded the level of "Limit value request on". This function prevents the refrigeration generation plant from being switched on due to a slight request.



"Chilled water flow temperature setpoint", "Flow temperature increase max"

From the request signals received, a resulting flow temperature is determined. This flow temperature is matched to the actual refrigeration demand in a way that the valve position of the refrigeration consumer with the greatest heat demand is 90 %.

- If the valve position is <90 %, the flow temperature will be increased
- If the valve position is >90 %, the flow temperature will be decreased

The maximum flow temperature readjustment can be parameterized.
With valve positions ≤90 %, the current flow temperature is:
"Chilled water flow temperature setpoint" + "Flow temperature increase max".

“Control action”

To adapt the control system to the plant, the control action of the flow temperature can be adjusted to the setpoint shifts in 3 steps (fast, medium, slow).

Request evaluation

Setting "Request evaluation" is used to determine if the max value or the average of the requests is to be used:

- When using the "Maximum" setting, the flow temperature will be readjusted in a way that the valve position of the consumer with the greatest heat demand is 90 %
- When using the "Average setting, the flow temperature will be readjusted in a way that the valve positions of the 4 largest consumers will be 90 % on average

Note

This setting does not ensure that the refrigeration demand of all consumers can be satisfied. However, in ensures that an individual consumer cannot force the flow temperature to a low level (e.g. because a window is open).

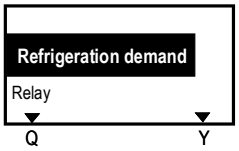
11.5 "Refrigeration demand" function block

11.5.1 Purpose

"Refrigeration demand" signal generation

The function block generates a "Refrigeration demand" signal that can be used by other devices. The refrigeration demand is provided in the form of the following signals:

- Digital signal at output Q ("Refrigeration demand relay")
- Analog signal at output Y ("Refrigeration demand modulating")
- Bus signal ("Communication")



The 3 variants are described below.

11.5.2 Refrigeration demand relay

Purpose and function

The refrigeration demand relay must be configured to a relay output N.Qx of the RMB795B central control unit. Release for an external refrigeration source, e.g., can be connected to this output.
The refrigeration demand relay responds as soon as the bus requests refrigeration.
Meaning:

- Contact open = No refrigeration demand.
- Contact closed = Refrigeration demand

Configuration

Main menu > Commissioning > Extra configuration > Demand for refrigeration

Operating line	*Adjustable values / remarks*
Refrigeration demand relay	---, N.Q1, N.Q3, ... / activation of output

11.5.3 Refrig demand modulating

Purpose

In addition to the refrigeration demand relay, the refrigeration demand can be provided at a modulating output N.Yx for other devices.

Configuration

Main menu > Commissioning > Extra configuration > Demand for refrigeration

Operating line	*Adjustable values / remarks*
Refrig demand modulating	---, N.Y1, N.Y2 activation of output

Setting values

Main menu > Settings > Refrigeration demand >

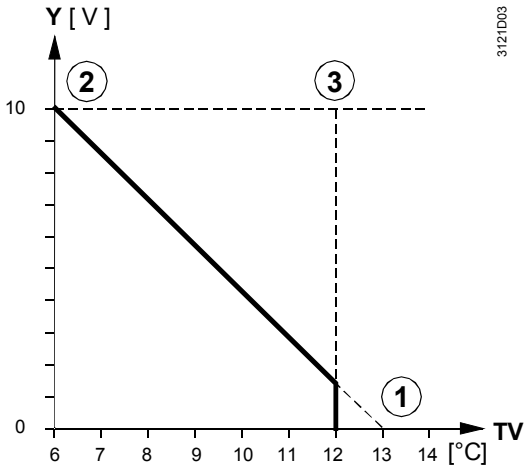
Operating line	*Range*	*Factory setting*
Setpoint at 0 V	–50…+50 °C	12 °C
Setpoint at 10 V	50…500 °C	6 °C
Limit value.	–50…+250 °C	12 °C

Explanations relating to the setting values

"Setpoint at 0 V" determines the flow temperature setpoint at DC 0 V.
"Setpoint at 10 V" determines the flow temperature setpoint at DC 10 V.
"Limit value" denotes "Limit value for refrigeration demand": Temperatures above this level are interpreted as no refrigeration demand.
As long as the flow temperature setpoint does not exceed the set limit value, DC 0 V output signal is issued. If the temperature drops below the limit value, the corresponding output signal is issued until the setpoint again exceeds the limit value plus hysteresis of 0.5 K.

Diagram relating to the setting values (example)

Output signal Y (DC 0…10 V) for refrigeration demand must correspond to a flow temperature setpoint range of 6…13 °C. This limit value should be at 12 °C. The diagram shows the parameters to be set and the progression of the refrigeration demand signals:



Key

1 Setpoint in °C at DC 0 V. here 13 °C
2 Setpoint in °C at DC 10 V. here 6 °C (factory setting)
3 Limit value for refrigeration demand here 12 °C (factory setting)

11.5.4 Communication

Purpose

Refrigeration demand can be transmitted over the bus to other devices of a refrigeration distribution zone if communication is activated (see Sec. 13). A "Refrig zone source" must be defined.

Setting values

Main menu > Commissioning > Communication > Distribution zones >

Operating line	*Range*	*Factory setting*
Refrigeration distribution zone, generation side	----, 1…31	----

11.5.5 Functional check / wiring test

Purpose

For making a functional check during the wiring test, the outputs of the "Refrigeration demand" function block can be switched directly.

Setting values

Main menu > Commissioning > Wiring test > Outputs

Operating line	*Comments*
Refrigeration demand relay	---, 0...100 % (relay switches >= 1 %).
Refrigeration demand modulating	---, 0...100 %

11.6 Function block "H/C changeover"

11.6.1 Use and functions

Application

The function block heating/cooling changeover is used to changeover the operating mode (heating or cooling) in 2-pipe systems.
The preselection heating/cooling can be generated on the device or received as signal heating/cooling from the bus.

The following types of changeover are available for operating mode preselection H/C:

- Changeover with operating mode selector via operation.
- Changeover with analog input (e. g. for changeover by outside temperature or by flow temperature).
- Changeover with digital input (e.g. to change over via manual switch or via changeover thermostat in the flow).
- Changeover by date.

If several changeover types are active, the operating mode is determined by the following priority selection:

1. Operating mode selector
2. H/C changeover input
3. Heating/cooling by calendar

The preselection operating mode heating/cooling is provided to the heat distribution zone and refrigeration distribution zone to all other controllers in the same zone.
In a hydraulic circuit, the operating mode heating/cooling can be preselected only via one point. If several changeover signals are sent simultaneously to the bus within the same distribution zone, a fault message is generated.

Recommendation

The preselected operating mode input H/C should be activated at the precontroller or generator where possible.

Function

When the function block has been activated and a "H/C changeover input" has been defined, the RMB795B central control unit can pass on via bus the external changeover signal received via a digital input Xx to the RXB/RXL room controllers.

11.6.2 Activate function

To activate the function, Yes must be set in operating line "2-pipe heating/cooling system".

Configuration

Main menu > Commissioning > Extra configuration > Heating/cooling ch'over

Operating line	*Area*	*Factory setting*
2-pipe heating /cooling system	No, Yes	No

11.6.3 Preselected operating mode input H/C

Changeover with operating mode selector.

Configuration

Main menu > Commissioning > Extra configuration > Heating/cooling ch'over

Operating line	*Area*	*Factory setting*
Operating mode selector	No, Yes	No

The H/C changeover signal can be preselected in operating line "Preselection". The current state is displayed in operating line "2-pipe heating/cooling system".

Main menu > H/C changeover

Operating line	*Area*	*Factory setting*
Preselection	Auto, Heating, Cooling	Auto
2-pipe heating /cooling system	Heating, Cooling	

Meaning:

Auto	Automation operation by H/C changeover input or heating/cooling by date
Heating	Set preselection to heating
Cooling	Set preselection to cooling

Changeover by calendar

Configuration

Main menu > Commissioning > Extra configuration > Heating/cooling ch'over

Operating line	*Area*	*Factory setting*
Heating/cooling by calendar	No, Yes	No

Changeover is carried out by date. After "Start date heating" "Heating" applies, after "Start date cooling" "Cooling" applies.

Setting values

Main menu > Commissioning > Settings Heating/cooling ch'over >

Operating line	*Area*	*Factory setting*
Start date heating	Day – month.	01.10.****
Start date cooling	Day – month.	01.05.****

Changeover with analog or digital input

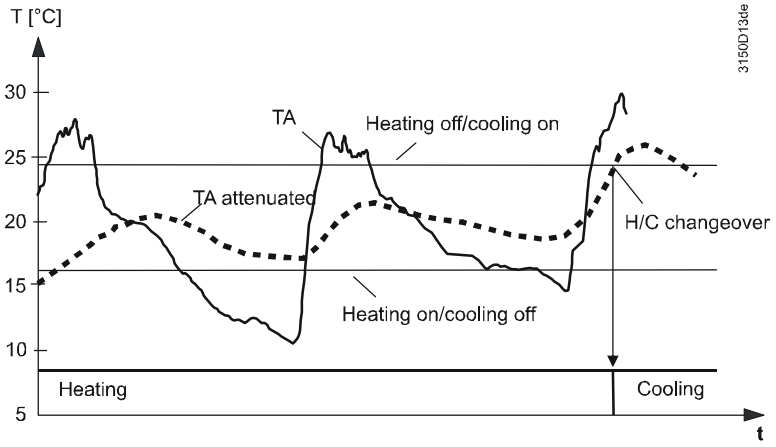
Configuration

Main menu > Commissioning > Extra configuration > Heating/cooling ch'over

Operating line	*Area*	*Factory setting*
H/C changeover input	---, N.X1, N.X2, ... /	---

If an analog input signal is used to generate the changeover signal, two limit values must be selected for changeover.

Example: Changeover by outside temperature



When value "Heating off/cooling on" is exceeded, the H/C changeover signal is changed to cooling. When value "Heating off/cooling off" is breached, the H/C changeover signal is changed to heating. "Attenuation can be set for the input signal.

Setting values

Main menu > Commissioning > Settings > Heating/cooling ch'over >

Operating line	*Area*	*Factory setting*
Heating on/cooling off	*	**
Heating off/cooling on	*	**
Attenuation	0…100 h	0 h

* depending on unit
** Variable units.

Note

If a digital input is used for changeover, operating line "Heating on/cooling off" = 1 and "Heating off/cooling on" = 0 must be set (factory setting).

Configuration error

If at the same time changeover is configured by date and digital input, the controller operates using the changeover by digital input.

11.6.4 Operating principle

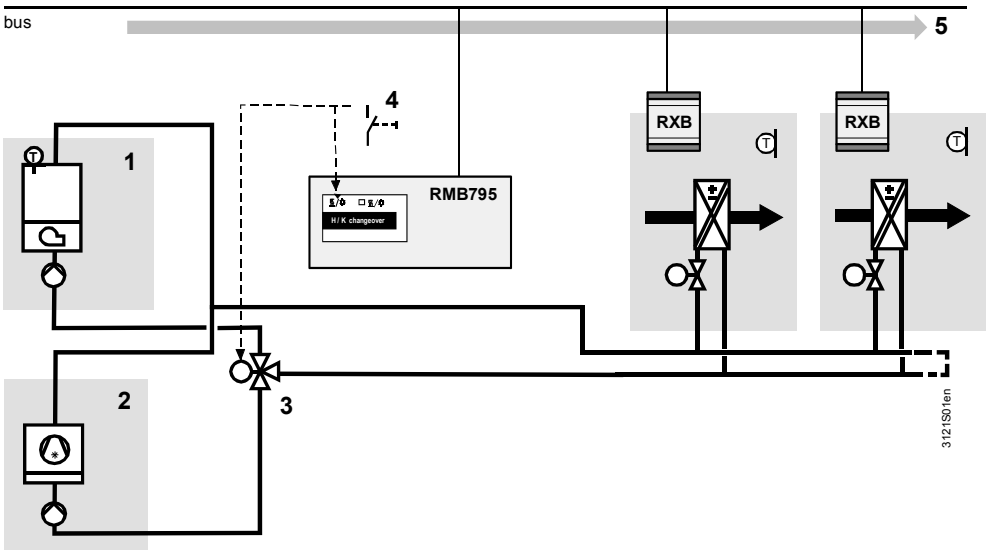
Impact of configuration parameters

If only the configuration parameter "2-pipe heating/cooling system" is activated, collection of the demand signals is only made on the cooling or heating side.

If, in addition, "H/C changeover" is activated, the information whether the pipes carry hot or cold water is sent to the RXB/RXL room controllers.

Example of plant

The plant diagram below shows a "2-pipe heating/cooling system" with heat and refrigeration generation. The diverting valve is switched over with a manual switch:



Key

Ref	*Element*
1	Heat generation
2	Refrigeration
3	Changeover valve
4	Manual switching to changeover valve and function block "H/C changeover"
5	Forwarding the "Heating / cooling" changeover signal via bus

Note

The central control unit RMS795B does not perform any control functions (precontrol) here, but only the collection of the demand signals and passing them on to the relevant source (generation of heat or refrigeration) via function blocks "Heat demand" and "Refrigeration demand".

11.6.5 Lock time

To prevent the refrigeration machine from switching on immediately following switch-off of heat generation, a locking time can be set.
Control is locked during the locking time so that no heat or refrigeration demand is generated and forwarded.

⚠ Excessive inlet temperature at the refrigeration machine can damage the refrigeration machine.

Setting values

Main menu > Commissioning > Settings > Heating/cooling ch'over >

Operating line	*Area*	*Factory setting*
Locking time	00.00...23.50 h.m	00.30 h.m

The locking time acts also after a power drop-related switch-off of the device and when exiting the Commissioning menu.

11.6.6 Display current state

The current state is displayed in menu "Heating/cooling changeover":

Main menu > H/C changeover

Operating line	*Comments*
2-pipe heating /cooling system	Heating / cooling

11.6.7 Heating/cooling ch'over relay

If the H/C-signal is not to be sent to the bus but rather to a relay output to e.g. switch a valve or to be routed to a non-communicative device, the H/C changeover relay can be configured accordingly.

Configuration

Main menu > Commissioning > Extra configuration > Heating/cooling ch'over

Operating line	*Area*	*Factory setting*
Heating/cooling changeover relay	---, N.Q1, N.Q2,…/	---

The current state of the changeover relay can be queried:

Display values

Main menu > Heating/cooling ch'over

Operating line	*Current state*
Heating/cooling changeover relay	"Off": Cooling / "On": Heating

During wiring test, the H/C changeover relay can be switched directly.

Wiring test

Main menu > Commissioning > Wiring test > Outputs

Operating line	*Comments*
Heating/cooling changeover relay	"Off": Cooling / "On": Heating

11.6.8 Troubleshooting

Behavior

The controller continues to apply the last received value if in a 2-pipe system the changeover signal "Heating/cooling" is not on the bus. If there has never been a signal, "Heating" is used as the default value.

Fault status message

No.	*Text*	*Effect*
5801	H/C changeover signal failure	Non-urgent message; must not be acknowledged

Behavior

The fault message "> 1 H/C changeover signal" is sent, if, in a 2-pipe system an H/C changeover input heating/cooling is configured by date or Operating mode selector and a changeover signal in one of the zones is received by another device on the bus.

Fault status message

No.	*Text*	*Effect*
5802	>1 Heating/cooling changeover signal	Non-urgent message; must be acknowledged

12 Volume flow balancing VAV

Introduction

Forced control signals on the ventilation unit to set maximum air volume is required to setup the air volume. You can override the volume flow controller (open) for the corresponding air distribution zone regardless of the current available energy demand signals for heating or cooling. Activating the "Simulation VAV supply air" or "Simulation VVS extract air" switches on the supply air or extract air fan respectively. The fans should be controlled to provide sufficient pressure prior to the volume flow controller with the highest pressure loss so that even it can achieve the maximum volume flow.

Prerequisites

- All devices are installed, and commissioning is completed
- Communications between the devices is operational and all zone settings (geographical zone/air distribution zones) have been checked.

Observe the following during commissioning:

- Setting values dependent on time, such as the pre-command of fire protection dampers or dampers, switch-on delay, fans, ramp-up time and other setting values that may have an impact on plant start-up behavior.
- Time-related specifications such as overshoot time when using electric heating coils.
- Conduct function and communication tests of room control and the corresponding volume flow controllers.
- KNX communications between the primary air handling unit and individual room control: Data exchange of heat and refrigeration demand signals and request signals (temperature or pressure control) are checked and fully operational.
- Ensure when switching on the primary air handling unit that the volume flow controller is open and the fans cannot start when the dampers are closed.

Failure to comply with these items may result in damage to the aggregates and plant parts!

All volume flow controllers assigned to room groups 1-10 are controlled if RMB795B triggers the function.

Forced control

Main menu > Air flow balancing >

Operating line	*Comments*
Simulation VAV supply air	----, Vmax
Simulation VAV extract air	----, Vmax

For safety reasons the simulation is reset when entering the extra configuration!

The volume flow controller can control the corresponding room groups through forced controlled of the air volume flow balancing. The selection "Vmax" opens all VAV dampers for the corresponding air distribution zone. This allows you to make the optimum settings for required air flow. To exit the simulation, select "---". This resets the simulation mode.

The fault message "Simulation VAV supply air" or "Simulation VAV extract air" are sent while simulating the volume flow controller.

Fault status messages

No.	*Text*	*Effect*
3931	Simulation VAV supply air	Non urgent message; must not be acknowledged.
3932	Simulation VAV extract air	Non urgent message; must not be acknowledged.

A fault message "Smoke extraction" or "Fire" can be triggered on other decentralized air handling units (e. g. RMU7x0 GT-A) during simulation if the time switch program is received by the RMB. T'swi Slave (Apart.) corresponds to a room group zone for the RMB795B.

13 Communication

Introduction

See basic documentation "Communication via KNX bus" (order number: CE1P3127en) for a detailed description of communications.
The following section only gives a description of the most important settings so that a basic plant can be commissioned.

13.1 Activate communication

3 criteria for activation

Communication is active when:

- The device address is entered (each bus member requires an individual device address),
- Bus power supply is available
- The device is not in commissioning mode.

Fault status messages

No.	*Text*	*Effect*
5000	No bus power supply	Non urgent message; must not be acknowledged.
6001	>1 identical device address	Urgent message; must be acknowledged.

13.2 "Communication" menu

13.2.1 Factory settings

Setting values

Main menu > Commissioning > Communication > Basic settings >

Operating line	*Range*	*Factory setting*
Device address	1...253 (1...255)	255
bus power supply, decentral	Off, On.	On.
Clock time operation	Autonomous, slave, master.	Autonomously
remote setting clock slave	Yes, no	Yes
remote reset of fault	Yes, no	No

"Device address" operating line"

Each bus member requires an individual device address.
Device addresses 254 and 255 are reserved for special functions. Device address 255 is used to deactivate communication (no exchange of process data).
If two devices on the KNX bus have the same device address, fault message "> 1 identical device address" is triggered.

"Decentral bus power supply" operating line

For small plants, decentralized power supply suffices. This represents the default setting.
See data sheet N3127 (KNX bus) or basic documentation CE1P33127en (KNX communication) for more information.
If there is no bus supply, fault message "No bus power supply" appears.

"Clock time operation" operating line

If the system uses a common time of day, one of the devices must be defined as the master, all the other devices are slaves.
Using "Remote setting clock slave = Yes", the time of day can be adjusted at the respective slave. This is then sent to the master, which passes it on to all the other devices.
When set to "Autonomous", the neither sends nor receives the clock time.

Operating line "Remote setting clock slave"

The function "Remote setting clock slave" allows the user to set the time and date at the clock time slave. The new values are then sent to the clock time master via the KNX bus. The master sends the new time to all bus members. Hence, for the operator, operation is the same as on the time-of-day master.

"Remote reset of fault "operating line

All fault status messages can be acknowledged from a remote location (e.g. from the CI700.1 service tool).

13.2.2 Room group 1...10

Geographical zone (apartm.)

A "Geographical zone (apartment)" combines buildings or building sections from an operational point of view that must satisfy the following criteria:

- Same room operating mode
- Same room temperature (setpoint)

By definition, the address of a geographical zone is made up as follows:

Apartment.Room.Subzone

With the room groups, it is only the apartment number that needs to be set. Room and subzone use a fixed setting (=1).

Setting values

Main menu > Commissioning > Communication > Room group 1...10 >

Operating line	*Range*	*Factory setting*
Geographical zone (apartm.)	1...126	Room group 1 = 1 Room group 2 = 2 … Room group 10 = 10

Fault status message

If the same geographic zone (apartment) is set for two room groups, a fault status message ">1 time switch in room group x" is triggered.

Room units with communication

A zone can be defined via "QAW operation zone (Apartm)" in which a QAW740 room unit can communicate with a room group. It is then possible via this zone to preselect from the QAW740 the room operating mode and the setpoint readjustment of a group.

Setting values

Main menu > Commissioning > Communication > Room group 1...10 >

Operating line	*Range*	*Factory setting*
QAW zone (Apart.)	1...126	----

"Holidays / special days" menu item

Only 1 QAW740 room unit per room group can be defined.
For details, see Sec. 8.3.6 "Holidays/special days".

Setting values

Main menu > Commissioning > Communication > Room group 1…10 >

Operating line	*Range*	*Factory setting*
Holidays/special day operation	Autonomous, slave, master.	Room group 1 = Master, all other room groups slave
Holidays / special day zone	1...31	1

Explanations relating to the setting values

The behavior and the zone address for exchange of holiday/special day operation can be set:

- The setting "Master" means that the central control unit RMB795B sends, at the beginning of the switching period, and then cyclically at 15-minute intervals, the holidays/special days operating data via the KNX bus.
- For the setting "Slave", it receives the holidays/special days operating data from the holidays/special days master.
  The slave must be assigned to the same holidays/special days zone.

Reference room 1…3

1 to 3 specially selected individual rooms can be defined as reference rooms, which are used for calculating the "Night cooling" function (see Sec. 8.9). These rooms must then be in the same room group (geographical zone.apartment) as defined for the room group. For this reason, for choosing the reference rooms, it is not possible to set the Geographical zones apartment, but only the Geographical zones Room.
Each reference room can be assigned individual text.

Setting values

Main menu > Commissioning > Communication > Room group 1…10 > Reference room 1...3 >

Operating line	*Range*	*Factory setting*
Geographical zone (room)	---, 1...63	---
Reference room 1…3…3	20 characters	

13.2.3 "Distribution zones" menu item

Setting values

Main menu > Commissioning > Communication > Distribution zones >

Operating line	*Range*	*Factory setting*
Outside temperature zone	----, 1...31	----
Refrigeration distribution zone	----, 1...31	1
refrigeration distribution zone, generation side	----, 1...31	----
Heat distribution zone	----, 1...31	1
Heat distr zone source side	----, 1...31	----

13.2.4 Universal transmission and reception zones

The device RMU795B allows for the universal exchange of data via its own terminals as well as via terminals for the extension module RMZ78x. The data is exchanged via KNX bus from device to device.

Function principle	• Universal inputs, digital and analog outputs of the RMB795B can be used as send objects (to the send zones). • Universal inputs of the RMB795B can be used as receiving objects (in the receiving zones). • The data is exchanged as if the device terminals were hardwired.
Number of transmission / reception zones	A maximum of 32 transmission and reception zones each are permitted for each line (for the KNX bus, see N3127, P3127).
Note	"Allowed" and "not allowed" applications exist according to the KNX bus specifications (e.g. send frequency).
Examples of allowed applications	The use of universal transmission and reception zones is allowed and makes sense for: • Controlling decentralized aggregates such as motors, pumps, etc. • Simple control functions that are not time-critical • Common follow-on processing or use of bus information
Examples of not allowed applications	The applications below or input/output variables cannot be implemented using universal transmission and reception zones: • Safety-relevant plants and facilities (e.g. fire alarm off, smoke extraction, frost protection function). • If "simultaneous start behavior of plants" is requested. • Applications where the loss of communication of transmission and reception zones can cause damage. • Controlled systems of a time sensitive or highly complex manner (e.g. speed control via pressure, humidity). • Main controlled variable that must be present. • Recording and evaluating pulses.
Note	After switching on the RMB795B (Power-up) it takes some time, before the signals from the bus are available. This may result in fault responses on the part of the plant for non-permitted applications of the transmission and reception zone.
Activation	The desired transmission or reception zone must be set on a terminal on the RMU795B to activate the function. The partner device must be set in the same manner.
Note	The transmission/receiver procedure is a 1:n relationship, i.e. in a transmission/reception zone, one transmitter, but multiple receivers are possible.

Overview

Reception zones	*Transmission zones*
Inputs (N.X1…A7(2).X4)	Inputs (N.X1…A7(2).X4) Digital outputs (N.Q1…A7(2).Q5) Analog outputs (N.Y1…N.Y2)

Setting values

Main menu > Commissioning > Communication > LTE reception zones >

Operating line	*Range*	*Factory setting*
N.X1…A7(2).X4	---, 1…4095	---

Setting values

Main menu > Commissioning > Communication > LTE transmission zones >

Operating line	*Range*	*Factory setting*
N.X1…A7(2).X4 N.Q1…A7(2).Q5 N.Y1…N.Y2	---, 1…4095	---

Note

Bus signals can be simulated using the "Simulation inputs" function when commissioning the plant (Section 7.1.4).

Example 1

The air quality value for an air quality sensor is available on one RMB795B (device 1). This value is sent as a transmission object via an analog input and processed by an RMB795B (device 2).

Data exchange concept

The following transmission and reception zones are engineered for example tasks:

RMB795B, device 1		*RMB795B, device 2*		*Value*
Terminal	Transmission zone	Terminal	Reception zones	
N.Y1 ⇨	1	N.X1 ⇦	1	Indoor air quality

⇨ = Transmit
⇦ = Receive

Configuration device 1

In RMS705B, device 1, the following is configured:

Main menu > Commissioning > Communication > LTE transmission zones >

Operating line	*Range*	*Factory setting*
N.X1	1	

Device 2

In RMS705B, device 2, the following is configured:

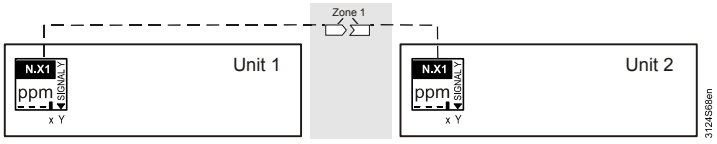
Main menu > Commissioning > Extra configuration > Input identifier >

Operating line	*Range*	*Factory setting*
N.X1	ppm	

Main menu > Commissioning > Communication > LTE reception zones >

Operating line	*Range*	*Factory setting*
N.X1	1	

Configuration diagram



Example 2

A RMB795B logic output wants a second device to be made available as release command. A release command generated in device 1 is sent as transmission object via a digital output. Device 2 uses this command to start the rooftop fan. In the reverse direction, any operating message in device 2 is sent as a transmission via a digital output to device 1, where it is processes accordingly.

Data exchange concept

The following transmission and reception zones are engineered for example tasks:

RMU7x0B, device 1		*RMS705B, device 2*		*Value*
Terminal N.Q1 ⇨	Transmission zone 1	Terminal N.X1 ⇦	Reception zones 1	Release rooftop fan
Terminal N.X1 ⇦	Reception zones 2	Terminal N.Q2 ⇨	Transmission zone 2	Operating message rooftop fan

⇨ = Transmit
⇦ = Receive

Configuration
Device 1

In RMS705B, device 1, the following is configured:

Main menu > Commissioning > Extra configuration > Input identifier >

Operating line	*Range*	*Factory setting*
N.X1	Digital	

Main menu > Commissioning > Communication > LTE transmission zones >

Operating line	*Range*	*Factory setting*
N.Q1	1	

Main menu > Commissioning > Communication > LTE reception zones >

Operating line	*Range*	*Factory setting*
N.X1	2	

Device 2

In RMS705B, device 2 (rooftop fan), the following is configured:

Main menu > Commissioning > Extra configuration > Input identifier >

Operating line	*Range*	*Factory setting*
N.X1	Digital	

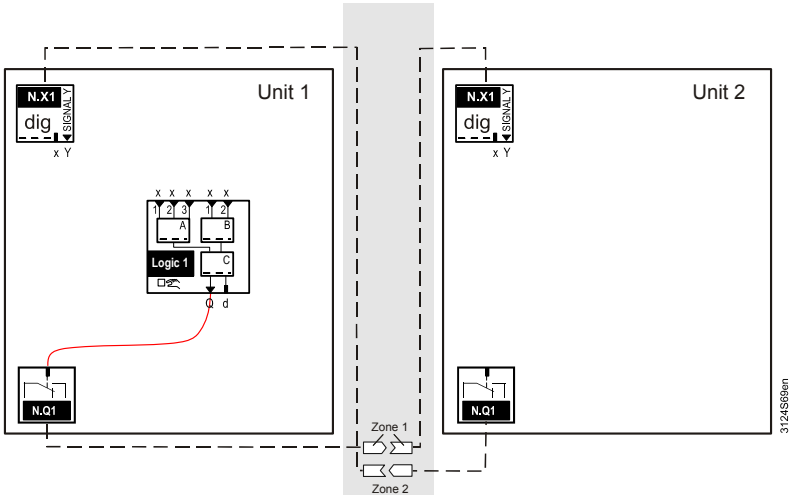
Main menu > Commissioning > Communication > LTE transmission zones >

Operating line	*Range*	*Factory setting*
N.Q1	2	

Main menu > Commissioning > Communication > LTE reception zones >

Operating line	*Range*	*Factory setting*
N.X1	1	

Configuration diagram



In the event an input is to receive as signal from the bus and this signal is unavailable, the fault message "[...X...] sensor error" is sent after a period expires (ca. 30 minutes).

Fault status messages

No.	*Text*	*Effect*
5902	>1 identical LTE zone	Non urgent message; must not be acknowledged.

14 RXB/RXL operation

14.1 Operation of individual RXB/RXL room controllers

What can be operated?

The description of the data points applies to both RXB and RXL.
Using menu item **Operation RXB/RXL**, a number of RXB/RXL data points can be read and written. These are specially selected values, such as:

- Room number
- Actual values and setpoints
- Operating mode
- Current heat and refrigeration requests, etc.

The data points displayed at a time depend on the type of RXB/RXL room controller used and its application.

Menu and displays

For the relevant RXB/RXL room controller to be addressed, its geographical zone (apartment and room) must be entered. The relevant information can then be read under the **RXB/RXL device data** menu.
The first data points displayed are the room number and the description, which give the user an unambiguous reference.

Updating of values can take a few seconds. During this period of time, the values are displayed as " --- ".
Data points not available in the room controller are also displayed as " --- ".

If the RMB/RXL is operated in an interconnected device system with a line couple and is in another area, the corresponding line couples must be set to "Route all" / "route" (by the corresponding GeoZones).

Setting values

Main menu >RXB / RXL operation >

Operating line	*Range*	*Factory setting*
Geographical zone (apartment)	---,1...126	---
Geographical zone (room)	---,1...63	---

Display values

Main menu > RXB / RXL operation > RXB / RXL device data

Operating line	*Description*	*R / W*
Room number	Text string stored in RXB/RXL.	R
Device name	Text string stored in RXB/RXL.	R
Active HVAC operating mode	Active HVAC room operating mode (Comfort / Pre-Comfort / Economy / Protection).	R
Actual value room temp	Actual value room temp	R
Present setpoint		R
Economy cooling setpoint		W
Precomfort cooling setpoint		W
Comfort cooling setpoint		W
Comfort heating setpoint		W
Precomfort heating setpoint		W
Economy heating setpoint		W

Operating line	*Description*	*R / W*
Local setpoint offset		R
Heating/cooling output		R
Fan output	Positioning signal in %	R
Heat demand signal	Calculated heat demand of the RXB/RXL in %	R
Cooling demand signal	Calculated refrigeration demand of the RXB/RXL in %	R

Key: R = read, W = write

14.2 Special features of setpoint readjustment

In the case of RMB795B setpoint priority

As can be seen from the "Display values" table, the setpoints for Economy, Precomfort and Comfort can also be directly overwritten.

Caution

If, in the relevant room group, configuration parameter "Setpoint priority RMB central control unit is set to "Yes", the setpoints are supplied by the room group and the individually adjusted values will be overwritten again.

Impact of slave function on RXB/RXL room controllers

If, on one of the RXB/RXL room controllers, the "Slave" function is selected, the setpoints can only be preselected conditionally, because they are coupled with the master's setpoints.

This means that only the master room controller acquires the room temperature. It sets the operating mode and setpoints for room temperature.

For more detailed information, refer to the description of the master-slave behavior in the Technical Handbook of the RXB/RXL room controller (CA2A3899en).

15 Data acquisition

15.1 Trend

15.1.1 Connections and application

Connections

The following illustration shows the function block connections as shown on the configuration sheet:

Application

The Trend function block is used for time-related recording of measured values. It provides 4 independent trend channels.

A trend channel can record **one** measured value.

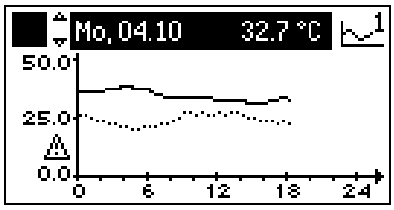
Two trend channels can be displayed per Trend view: Primary channel plus extra channel as a reference.

It is possible to record signals from local inputs of the central control unit RMB795B as well as room temperatures and outside temperature via bus.

15.1.2 Views

Examples

The following illustration shows a 24-hour view on the operator unit with primary trend curve and reference curve for an extra channel:



Contents

The current 24-hour views (8 minutes, 8 hours, 24 hours) show the date and the current value of the primary trend curve at the top.

The primary trend curve is shown as a solid line, the reference curve as a dotted line.

The Y-axis label refers to the settings of the primary channel. If the Y-axes of the two channels do not match, a warning symbol appears below the axis.

Change between views

Navigation between the 4 different views is made easy with the OK knob of the operator unit:

- 8-minute view: Sampling every 5 seconds, last 8 minutes.
- 8-hour view: Sampling every 5 minutes, last 8 hours.
- 24-hour view: Sampling every 15 minutes, current day.
- Rolling over the last 6 days: Sampling every 15 minutes, last 6 days.

Comment: The 24-hour view shows the last 6 days.

15.1.3 Trend function settings

Settings

Main menu > Settings > Data acquisition > Trend > Trend channel 1...4 >

Operating line	*Adjustable values / remarks*
Trend channel x	Name of channel (editable text comprising 20 characters)
Trend signal	Assign trend signal: ---, room temperature via bus, outside temperature via bus, N.X1, … A7(2).X4.
Geographical zone (apartment)	1…126, Only relevant if setting is "Room temperature via bus"
Geographical zone (room)	1…63 Only relevant if setting is "Room temperature via bus"
Outside temperature zone	1…31 Only relevant if "Outside temperature via bus"
Y-axis min	Depending on selected type.
Y-axis max	Depending on selected type.
Selection extra channel	Trend channel 1…Trend channel 4.

Explanation on the settings

A trend channel is activated by assigning a "Trend signal" data point to it.

Each trend channel can be assigned a plant-specific text with a maximum of 20 characters under data point "Trend channel x".

The bus address of the room whose room temperature is logged can be set via the "Geographical zone".

To acquire the outside temperature via bus, set the relevant "Outside temperature zone".

The Y-axes can be scaled for each trend channel. Data points "Y-axis min" and "Y-axis max" refer to the value display and must be set according to the expected signal range. If the current values lie outside the adjusted range, there will be no trending.

A second trend channel can be shown via data point "Selection extra channel". This channel is displayed as dotted line.

Notes on the extra channel

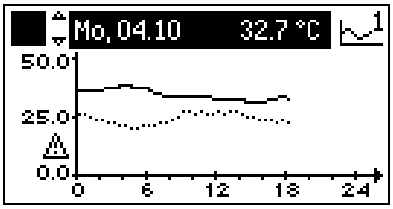
Only every second measured value is displayed for the extra channel; thus, the value to be measured should be put on the main channel.

The Y-axis label only refers to the primary channel. The extra channel is displayed according to its Y-axis settings. If the axes differ, a warning triangle appears next to the axis.

Display values

Call up the trend channels via the following menu:

Main menu > Data acquisition > Trend channel 1...4 >



The trend channels are displayed with their assigned text.
If a trend channel is selected, the display immediately switches to the 24-hour view.
The press-and-turn button allows you to navigate between the different views.

15.1.4 Troubleshooting

Trend signal not available

If a trend signal **at the local inputs** is no longer available (e.g. due to a faulty sensor), trends are no longer recorded.
In that case, the fault status messages must be checked under:

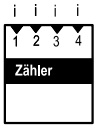
Main menu > Faults > Faults current >

If the values are not available **via bus**, trends are no longer recorded.
And there will be no fault status message

Power failure or restart

After a power failure or when leaving the "**Extra configuration**" menu (fresh start of the central control unit RMB795B), the values of the 8-hour and 8-minute view will be deleted.
However, the values of the 24-hour view and those of the last 6 days are retained.

15.2 Meters



Purpose

Meters are used to acquire consumption values.
4 independent meters are available.

Pulses from gas, hot water, cold water and electricity meters are processed. The pulse values represent:

- Energy in kJ, MJ, GJ, Wh, kWh and MWh.
- Volume in m^3, l or ml.
- Variables without unit (0…3 decimal places).
- Heat cost unit.
- BTU.

The pulses are converted to consumption values according to the setting values, added, and the cumulated values are stored as 15-month values at midnight when the month changes. The meters are used to optimize plant operation.

Note

Due to their inaccuracy, pulse counters in the RMB795B are not suited for billing purposes. Only direct meter readings (heat meters, electricity meters, etc.) deliver the valid values. Meters using Namur or S0 circuitry are not supported.

15.2.1 Activate meters

The meters are activated by assigning an input. Only inputs with input identifier "Pulse" can be assigned.

Configuration

Main menu > Commissioning > Extra configuration > Data acquisition > Meter 1…4 >

Operating line	*Range*	*Factory setting*
Input n	---, N.X1, N.X2, ...	---

15.2.2 Display format

Datapoint "Displayed unit", is used to select the unit to be displayed.
"Displayed format" defines the number of decimal places.

Display format

Main menu > Commissioning > Extra configuration > Data acquisition > Meter 1…4 >

Operating line	*Range*	*Factory setting*
Displayed unit	Wh, kWh, MWh, kJ, MJ, GJ, ml, l, m^3, Heat cost unit, No unit, BTU	kWh
Displayed format	0, 0.0, 0.00, 0.000	0

15.2.3 Pulse valency

Every pulse from a pulse source corresponds to a specific consumption value.
The pulse valency is imprinted on the meter. The pulse valency must be entered as a numerator and denominator.

Example 1

Pulse valency	20 liters / pulse.
Your setting	Pulse valency numerator = 20
	Pulse valency denominator = 1
	Pulse unit = Liter

Example 2

Pulse valency	3.33.. Wh / pulse.
Your setting	Pulse valency numerator = 10
	Pulse valency denominator = 3
	Pulse unit = Wh

Pulse valency

Main menu > Commissioning > Settings … *or*
Main menu > Settings > Data acquisition > Meter > Meter 1...4 >

Operating line	Range	Factory setting
Pulse unit	Wh, kWh, MWh, kJ, MJ, GJ, ml, l, m^3, Heat cost unit, No unit, BTU	kWh
Pulse valency numerator	1…9999 per pulse.	1
Pulse valency denominator	1…9999 per pulse.	1

15.2.4 Overflow value

The overflow value ensures that the reading on the display of the connected meter is the same as that on the RMB795B. The value at which the meter's display returns to 0 can be set.

Unit and decimal place depend on unit and format displayed.

Note

This value can only be changed via software tool OCI700.1.

Overflow value

Operating line	*Range*	*Factory setting*
Overflow value	0…999'999'999	99’999’999 kWh

15.2.5 Setting and resetting meter readings

In case of deviations, service staff can adjust the pulse meter reading via operating line "Meter reading current". This value can only be changed via software tool OCI700.1.
Using datapoint "Reset monthly values", the last 15 monthly values can be deleted. The current meter reading is retained.

Set and reset meter readings

Main menu > Commissioning > Settings ... *or*
Main menu > Settings > Data acquisition > Meter > Meter 1...4 >

Operating line	Range	Factory setting
Reset monthly values	No, yes	No

15.2.6 Display meter readings

The current meter reading, the date and the reading of the last 15 months are displayed.

Display values

Main menu > Data acquisition > Meter 1...4 >

Operating line	*Comments*
Meter reading current	0…999'999’999
Unit	As per configured display format.
[Readout 1] date	
[Readout 1] meter reading	
…	
[Readout 15] date	
[Readout 15] meter reading	

Notes

- The following operating lines apply analogously to meters 2 through 4.
- The monthly values are stored at midnight at the end of the month.
- The 15 monthly values can be deleted at the password level via operating line "Reset monthly values".

15.2.7 Assign texts

A specific text can be assigned to each meter. This text appears as menu text and operating line text on the operating pages.

Free text

Main menu > Commissioning > Settings ... *or*
Main menu > Settings > Data acquisition > Meter > Meter 1...4 >

Operating line	*Range*	*Factory setting*
Meter 1…4	Max. 20 characters.	Meter 1…4

Refer to section 6.5.4 for an overview of all editable texts and on how to reset them.

15.2.8 Troubleshooting

Some battery-powered or mechanical meters continue metering in the event of a power failure. During a power failure that affects the RMS795B, the pulses will not be counted.
Restart occurs after exiting the "Extra configuration" menu or after power failure. Pulses received between the last storage operation and the restart are not counted.

16 Device supervision

16.1 Overview

Purpose and function

The device supervision checks the connections (bus communication) to the RXB/RXL room controllers and the RDG/RDF/RDU room thermostats. This serves the following purposes:

- Checking the number of connected individual room controllers per room group.
- Detecting the failure of 1 or several room controllers

The individual room controllers are queried on a regular basis as per the generated device list. If the RMB795B central control unit does not receive a reply, it will generate a fault status message.

The geographic zone assigned to the individual room controllers is the key to supervision. The individual room controllers supervised are only those assigned to one of the activated room groups.

Note

If the individual room controllers are already supervised by other devices (e.g. the ACS790 plant operating software or the OZW772 web server), we recommend deactivate function. This measure should be taken to keep the bus load as low as possible.

16.2 Activate function

Configuration

To activate, device supervision must be switched on via the operating line "Function":

Main menu > Commissioning > Device supervision >

Operating line	*Range*	*Factory setting*
Function	Off, On.	Off

Notes

When the function is deactivated, no periodic supervision telegrams are sent via the bus.

Pending alarms are not deactivated if the function is switched off.
But the device list can also be created when the function is deactivated. This is because the device list is also required for other functions, such as min / max supervision of the room temperature.

16.3 Create device list

Prior to creation

When creating the device list, complete all commissioning work on the RMB795B central control unit and on the individual room controllers.
Bus connection to the individual room controllers must be ensured.

Settings

Main menu > Commissioning > Device supervision >

Operating line	*Range*	*Factory setting*
Device list	Creating, updating, deleting	Blank
Identified devices	Display of identified room controllers, room thermostats	

Command "Create"

The "Create" command is used to generate a complete device list. For that, a search is made on the KNX bus aimed at finding individual room controllers that have the same "Geographical zone (apartment) When the RMB795B central control unit receives a reply from an individual room controller, it is entered on the device list.

Search process

The search process takes several minutes, depending on the number of activated room groups. During the search process, the sandglass symbol ⌛ appears on the "Device list" line.
When the search process is finished, a tick will appear ✓.
Now, the number of identified devices is valid.
If the number of devices are not identical with the number given in the planning documentation, the connection to the individual room controllers is to be checked.

Command "Update"

The "Update" command is used to search the plant for devices that have not yet been detected.
This command is to be executed when devices have been added to the plant at a later point in time, for example.

Command "Delete"

The "Delete" command deletes the device list. Supervision does not occur when the list is empty and the number of identified devices is 0 accordingly.

16.4 Read device list

Settings

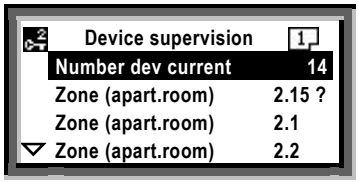
The list of assigned and supervised devices per room group can be read:

Main menu > Room group 1...10 > Device supervision >

Operating line	*Adjustable values / remarks*
Number devices current	Number of RXB/RXL room controllers and RDF/RDG/RDU room thermostats assigned to the room group.
Zone (Apart.Room)	Zone address (apartment.room) of the supervised room controllers, room thermostats.

Display

The list displayed provides the following information:
- Number of individual room controllers assigned to this room group
- and their geographical zone address on the display (apartment.room).



Symbol	*Meaning*	*Examples*
(Without)	Connection to room controller, room thermostat is ok.	Zone (Apart.Room) 2.1
?	Connection to room controller, room thermostat is interrupted.	Zone (Apart.Room) 2.15 ?

Notes

Based on the information of "Zone (apart.room)" and the plant diagram, the relevant individual room controller can be clearly identified.

If no devices are assigned to the selected room group, the value of "Number dev current" is "0" and under "Zone (apart.room)", symbol " -.- " appears everywhere.

If the RMB is operated in an interconnected device system with a line couple and is in another area, the corresponding line couples must be set to "Route all" / "route" (by the corresponding GeoZones).

16.5 Fault status messages

Common fault status message

If the connection to 1 or several individual room controller is interrupted, a common fault status message will appear for each room group:

No.	*Text*	*Effect*
4503	Dev sup r grp 1	Non-urgent message; must be acknowledged.
4513	Dev sup r grp 2	Non-urgent message; must be acknowledged.
4523	Dev sup r grp 3	Non-urgent message; must be acknowledged.
4533	Dev sup r grp 4	Non-urgent message; must be acknowledged.
4543	Dev sup r grp 5	Non-urgent message; must be acknowledged.
4553	Dev sup r grp 6	Non-urgent message; must be acknowledged.
4563	Dev sup r grp 7	Non-urgent message; must be acknowledged.
4573	Dev sup r grp 8	Non-urgent message; must be acknowledged.
4583	Dev sup r grp 9	Non-urgent message; must be acknowledged.
4593	Dev sup r grp 10	Non-urgent message; must be acknowledged.

Based on this information, it can be checked on the **Device supervision** menu of the relevant room group for the affected individual room controllers.

Text adjustments

The fault status message texts are predefined. They can be adjusted via operation.

Main menu > Commissioning > Settings > Room group 1...10 … *or*
Main menu > Settings > Room group 1...10 > Device supervision>

Operating line	*Range*	*Factory setting*
Device supervision room grp X	20 characters	Device supervision R'g. X

17 Help in case of faults

17.1 Error/fault code list

Cause and effect

The following list contains all codes and assigned texts that appear in the event of fault.

Code no.	*Cause of fault*	*Effect*
10	Outside temp sensor error	see 7.5 "Outside temperature"
11	>1 outside temperature sensor	Ditto
12	Outs sensor simulation active	Ditto
101 ...224	[N.X1] sensor error ... [RMZ787(2).X4] sensor fault	See 7.2 "Analog inputs (Xx)" See 7.5 "Outside temperature"
3880 ... 3889	Smoke Extraction room group 1 ... Smoke Extraction room group 10	See 17.2 "Troubleshooting faults".
3890 ... 3899	Fire alarm off room group 1 ... Fire alarm off room group 10	Ditto
3931	Simulation VAV supply air	See Sec. 12 "Volume flow balancing VAV"
3932	Simulation VAV extract air	Ditto
4501	Room temperature > Limit val. and R'grp 1	see 8.6 "Temperature supervision"
...	...	Ditto
4591	Room temperature > Limit val. and R'grp 10	Ditto
4502	Room temperature > Limit val. or R'grp 1	Ditto
...		Ditto
4592	Room temperature > Limit val. or R'grp 10	Ditto
4503	Device supervision room grp 1	See 16 "Device supervision"
...		Ditto
4593	Device supervision room grp 10	Ditto
4920	RXB/RXL room temperature frost	Triggered by a RXB/RXL room controller. No impact on central control unit RMB795B. It only displays the fault.
4930	RXB/RXL room temperature condensation	Ditto
4940	RXB/RXL outside air frost	Ditto
4950	RXB/RXL El air heater overtemp.	Ditto
4960	RXB/RXL general fault	Ditto
5000	No bus power supply	See 13 "Communication".
5001	System time failure	See 6.1 "Time of day and date"
5002	> 1 clock time master	Ditto
5003	Invalid time of day	Ditto
5102	>1 Time switch in room group 1	See 8.3.5 "7-day time switch

Code no.	*Cause of fault*	*Effect*
		"
...	...	Ditto
5192	>1 Time switch in room group 10	Ditto

Code no.	*Cause of fault*	*Effect*
5201	Hol/spec day prog room group 1	See 8.3.6 "Holidays/special days "
...	...	Ditto
5291	Hol/spec day prog room group 10	Ditto
5202	>1 hol/spec day prog R'grp. 1	Ditto
...	...	Ditto
5292	>1 hol/spec day prog R'grp. 10	Ditto
5801	H/C changeover signal failure	See 11.6 "Function block "H/C changeover"
6001	>1 identical device address	See 13 "Communication".
7101 ... 7103	Fault extension module	Refer to 5.3 "Basic configuration".
9000	>1 fault input faulty	See Sec. 10 "Fault inputs".
9001 … 9010	[Fault inp 1] fault … [Fault inp 1] fault	Ditto

17.2 Troubleshooting

17.2.1 Fault indication

Significance of fault status messages

Fault status messages delivered to the RMB795B central control unit are indicated by the LED in the fault button. This button can be used to acknowledge fault status messages.

Meaning:

Fault status message	*Message ackn.*	*LED status*
Fault pending	no	Flashing
Fault pending	yes	Lit Also applies to fault status messages that must not be acknowledged
Fault no longer pending	no	Flashing
Fault no longer pending	yes	Off

If a fault relay is configured also (function block "Faults"), the LED of the fault button always flashes.

Note on acknowledgement

If the LED of the fault button is lit and does not extinguish when making acknowledgements, a fault status message is still pending.
The LED extinguishes only when faults are no longer present.

17.2.2 Alarm acknowledgement

No acknowledgement required

This instruction applies to all fault status messages that require **neither** acknowledgement **nor** resetting.

Example:
If there is no signal for the outside temperature, a fault status message will be delivered. If the signal for the outside temperature returns, the fault status message disappears automatically and the plant will resume normal operation.

Acknowledge

This instruction applies to fault status messages that **only** require acknowledgement.
An external solution is required for alarm latching and resetting.

Warning
When the fault status message disappears (external reset), the plant will return to normal operation, even if the fault status message has not been acknowledged.

Example:
The plant incorporates an alarm for smoke extraction which must be locally reset. The only purpose of the alarm indication is to make sure that the service staff take note of the alarm.

Acknowledgement and reset

This instruction applies to all fault status messages that must be acknowledged **and** reset.
The alarm remains after you have acknowledged it, until the fault signal is no longer present. Only then can you reset the alarm. After resetting, the LED in the fault button extinguishes.

Example:
A fire alarm off must be acknowledged and reset.
To prevent regeneration of the fault message each time the plant is started, the message is merely acknowledged. The fault status message shall be reset only after the fire alarm has disappeared.

Note

Fault status messages of other devices cannot be acknowledged on the RMB795B central control unit.

17.2.3 Delete fault status messages

Function

The operator unit allows for deleting the fault history list at the service level via operating line "Delete faults":

Main menu > Faults >

Operating line	*Comments*
Delete faults	All current faults are reset internally, the ”Faulty history” list is deleted.

Notes

When activating this function, all other fault status messages will be reset also. Only the pending faults continue to be displayed.

If the kind of acknowledgement with a pending fault is changed, it can happen that the fault status message can neither be acknowledged nor reset.
You can also use this function to reset these fault messages!

17.3 Troubleshooting

Questions and replies

The following list contains questions and replies relating to errors and fault status messages:

Question	*Answer*
The wrong language was selected during commissioning. Where do I find my language?	Press the ESC button and the OK knob simultaneously. Select the password level and enter number **112** as the password (same as international emergency call) and confirm by pressing the OK knob. The language changes to English. Select your language from the **Settings > Device > Language** menu.
The device is completely off, the operator unit displays "Operation locked, Remote operation". How do I restart the device?	The device was put into commissioning mode via remote operation (OCI700.1). Local operation is locked. It remains in this state, if the controller is not correctly restarted remotely. Locally, the controller can only be restarted by briefly disconnecting it from power.
It is not possible to change from the **Commissioning** menu to the **Main** menu. The operator unit displays "Caution! Invalid settings, start not possible". How do I restart the device?	The configuration was not completely downloaded via the service tool (OCI700.1). Reload the configuration with the service tool (OCI700.1), or reconfigure the device via the operator unit.
Fault status message "[N.X4] sensor error" cannot be acknowledged.	When the **Commissioning** menu is quit, the central control unit checks to see which sensors are connected. If, later, one of the sensors connected now is missing, a fault status message will be delivered. If an incorrectly wired sensor is only rewired later, a "wrong" fault status message will be generated. *Remedy:* Go to the "**Commissioning**" menu (Caution! plant stops), then back to the **main menu** (Caution! Plant starts).
The individual room controller is not operating using the preselected operating mode.	Check to see if communication is connected and operational. The geographical address (apartment) of the relevant room group must be the same for the RMB795B central control unit and individual room controllers. In addition, the time switch zone slave (room) must be set to 1 (fixed), and all settings of the subzones must be set to 1 (fixed).

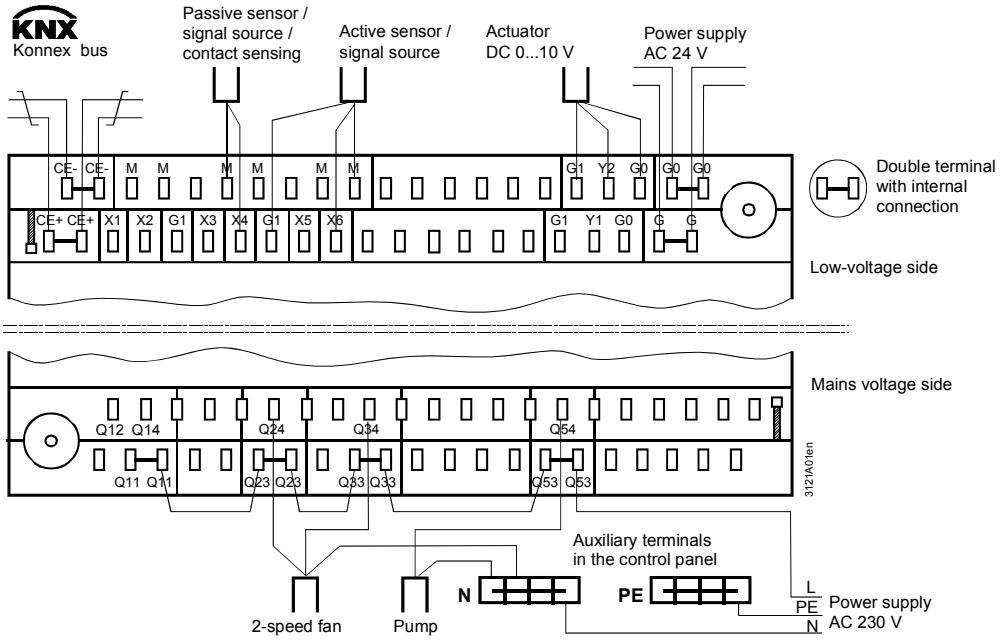
18 Electrical connections

18.1 Connection rules

Terminal connection concept

The following illustration shows the terminal base of the RMB795B central control unit including the connections:

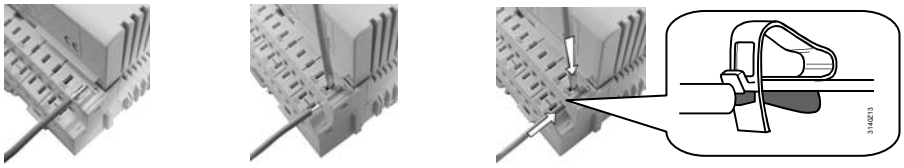
- Extra low-voltage side at the top
- Mains voltage side at the bottom



Note

Each terminal (cage terminal) can accommodate only 1 solid wire or 1 stranded wire.

Connection procedure with spring cage terminals



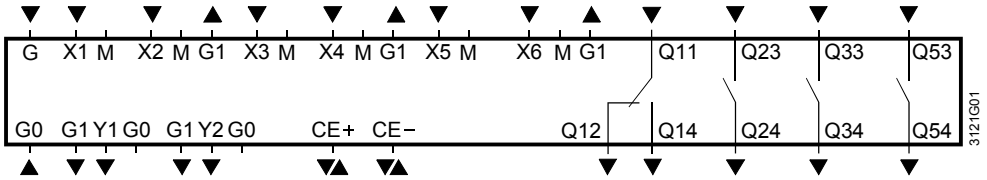
Procedure

1. Strip wire (length 7...8 mm; with module connector RMZ780 8...9 mm).
2. Have wire and screwdriver in place (size 0 to 1; with module connector size 0).
3. Apply pressure with the screwdriver while inserting the wire
4. Remove screwdriver

18.2 Connection terminals

18.2.1 Central control unit RMB795B

RMB795B

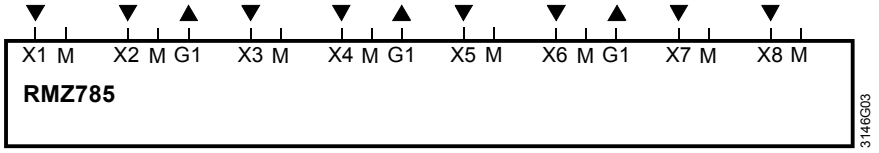


Key

G, G0	AC 24 V rated voltage
G1	AC 24 V power supply for active sensors, signal sources or limiters
M	Measuring neutral for signal input
G0	System neutral for signal output
X1...X6	Universal signal inputs for LG-Ni 1000, 2x LG-Ni 1000 (averaging), T1, Pt 1000, DC 0...10 V, contact sensing (potential-free)
Y1...Y2	Control or status outputs, analog DC 0...10 V
Q1...	Potential-free relay outputs (changeover) for AC 24...230 V
Q2...	Potential-free relay outputs (N.O.) for AC 24...230 V
Q3...	Potential-free relay outputs (N.O.) for AC 24...230 V
Q5...	Potential-free relay outputs (N.O.) for AC 24...230 V
CE+	KNX bus data line, positive
CE−	KNX bus data line, negative

18.2.2 Universal modules RMZ785

RMZ785

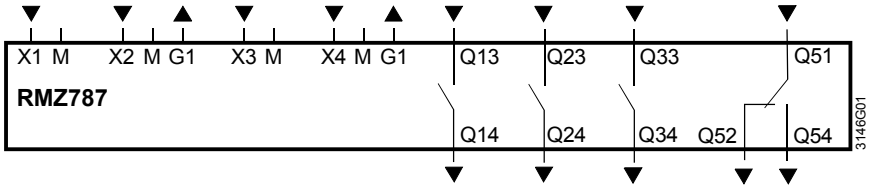


Key

M	Measuring neutral for signal input
X1...X8	Universal signal inputs for: LG-Ni 1000, 2x LG-Ni 1000 (averaging), T1, Pt 1000, DC 0...10 V, contact sensing (potential-free)

18.2.3 Universal module RMZ787

RMZ787



Key

M	Measuring neutral for signal input
G1	Power supply AC 24 V for connected active devices.
X1...X4	Universal signal inputs for: LG-Ni 1000, 2x LG-Ni 1000 (averaging), T1, Pt 1000, DC 0...10 V, contact sensing (potential-free)
Q1...	Potential-free relay outputs (N.O.) for AC 24...230 V
Q2...	Potential-free relay outputs (N.O.) for AC 24...230 V
Q3...	Potential-free relay outputs (N.O.) for AC 24...230 V
Q5...	Potential-free relay outputs (changeover) for AC 24...230 V

19 Appendix

19.1 Abbreviations used

To facilitate reading, the most common abbreviations are listed below in alphabetical order.

Abbreviation	*Meaning*
⊕	Heating
⊖	Cooling
Δw	Setpoint readjustment
Δw_S	Summer compensation delta
Δw_W	Winter compensation delta
AC	Alternating current
AI	Analog Input
AO	Analog Output
DC	Direct Current
DI	Digital input
DO	Digital output
E_S	Summer compensation end
E_W	Winter compensation end
F_S	Summer compensation start
F_W	Winter compensation start
KNX	KNX bus connection (for operation and process information)
LCD	Liquid crystal display
LED	Light emitting diode
HMI	Human machine interface
SpC	Cooling setpoint
SpCCmf	Comfort cooling setpoint
SpCEco	Economy cooling setpoint
SpH	Heating setpoint
SpHCmf	Comfort heating setpoint
SpHEco	Economy heating setpoint
SpSu	Supply air temperature setpoint
t	Time
OT	Outside temperature
t_{Nmin}	Operating time min for night cooling
TR	Room or exhaust air temperature
w	Setpoint
$\mathbf{w}_{TV}$	Flow temperature setpoint
x	Actual value

19.2 Configuration diagram

19.2.1 Explanation of configuration principle

Configuration diagram, contents

The RMB795B central control unit has a large number of preconfigured function blocks integrated. The available configuration options are shown in the configuration diagrams; they include:

- Input identifiers (inputs, input functions).
- Operating mode (calendar, scheduler)

- Function blocks for supervision, heat and refrigeration demand, including the functions provided by the extension modules.

Configuration diagram, use

Planning engineers use the configuration diagram to draw connections between individual input and output functions (or their internal signals) and the assigned terminals.

Designations

Devices and extension modules:
- N Central control unit RMB795B
- A5 Universal module RMZ785
- A7(1) Universal module RMZ787 (first module)
- A7(2) Universal module RMZ787 (second module)

Physical inputs:
- D digital
- X universal

Physical outputs:
- Q relay
- Y DC 0...10 V

Use of inputs Xx

The following rules and properties apply to inputs:
- The input identifier can be a device or a special sensor (outside temperature).
- Multiple use of inputs is possible, no limitations (e.g. fire alarm off acts on several room groups).
- When an input is connected, the controller presents only the possible units on the display
- Alarming for inputs is only active if the input is connected prior to the end of commissioning.

Procedure for extra configuration

Order of configuration:
- First basic configuration, then extra configuration.
- First the input identifiers, then the operating modes with all control functions

Possible wiring:
- Always from the arrow to the line
- From function to input: "x" to "x"
- From output block to output terminal: Analog "Y" to "Y"
- Relay "Q" to "Q".

Use of outputs Yx

When using the outputs, observe the following rules:
- Connect the output functions to the relevant terminals
- Each output terminal can be used only once (e.g. N.Q1 for the fault relay)

19.2.2 Overview of function blocks

Introduction

The following pages provide an overview of the function blocks for the RMB795B central control unit, including a brief description. For the number of function blocks and the assignment of inputs and outputs, refer to the configuration diagram of the RMB795B.

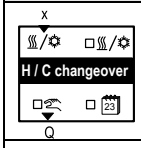
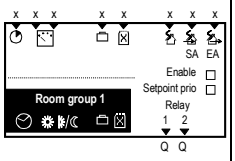
Basic configuration

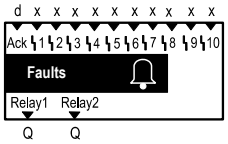
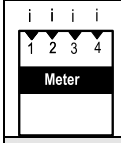
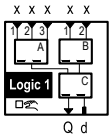
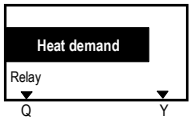
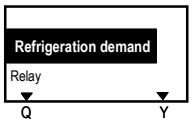
Configuration	Function
Basic type	• **Basic type B: RMB plant** (time programs with preselected setpoints and emergency control per room group)
☐ RMZ785 ☐ RMZ787 (1) ☐ RMZ787 (2)	• Use of additional inputs and outputs with the extension modules RMZ785 and RMZ787. The functions of the central control unit can be configured to these inputs / outputs • Input specifying which modules are connected to the central control unit in which order (position)

Input identifiers

Inputs	Configuration	Function
	N.X1…N.X6 RMZ785.X1...RMZ785.X8 RMZ787.X1... RMZ787.X4	Input of input identifier: • Physical units: °C, %, g/kg, kJ/kg, W/m², m/s, bar, mbar, Pa, ppm, universal 000.0 (display with one decimal place), universal 0000 (display with no decimal place). The unit is only required for presentation on the display. The controller presents all settings that depend on the unit (e.g. P-bands) in the unit. Sensors for °C: Ni 1000, 2 x Ni1000 (averaging), T1, Pt 1000, DC 0…10 V, all other units DC 0…10 V, range adjustable • Digital (input for potential-free contacts) • Special identifiers: Outside temperature With the special input identifier, internal connections are taken directly from the central control unit. • SIGNAL Y: For sensors with passive signals at an input terminal that cannot be passed on to another device via bus, as described in subsection 7.2.6, "Multiple use of sensors".
	Outside temperature	Outside temperature, sensor as described under "7.2 Analog inputs", for the following functions: • Summer/winter compensation • Release night cooling.

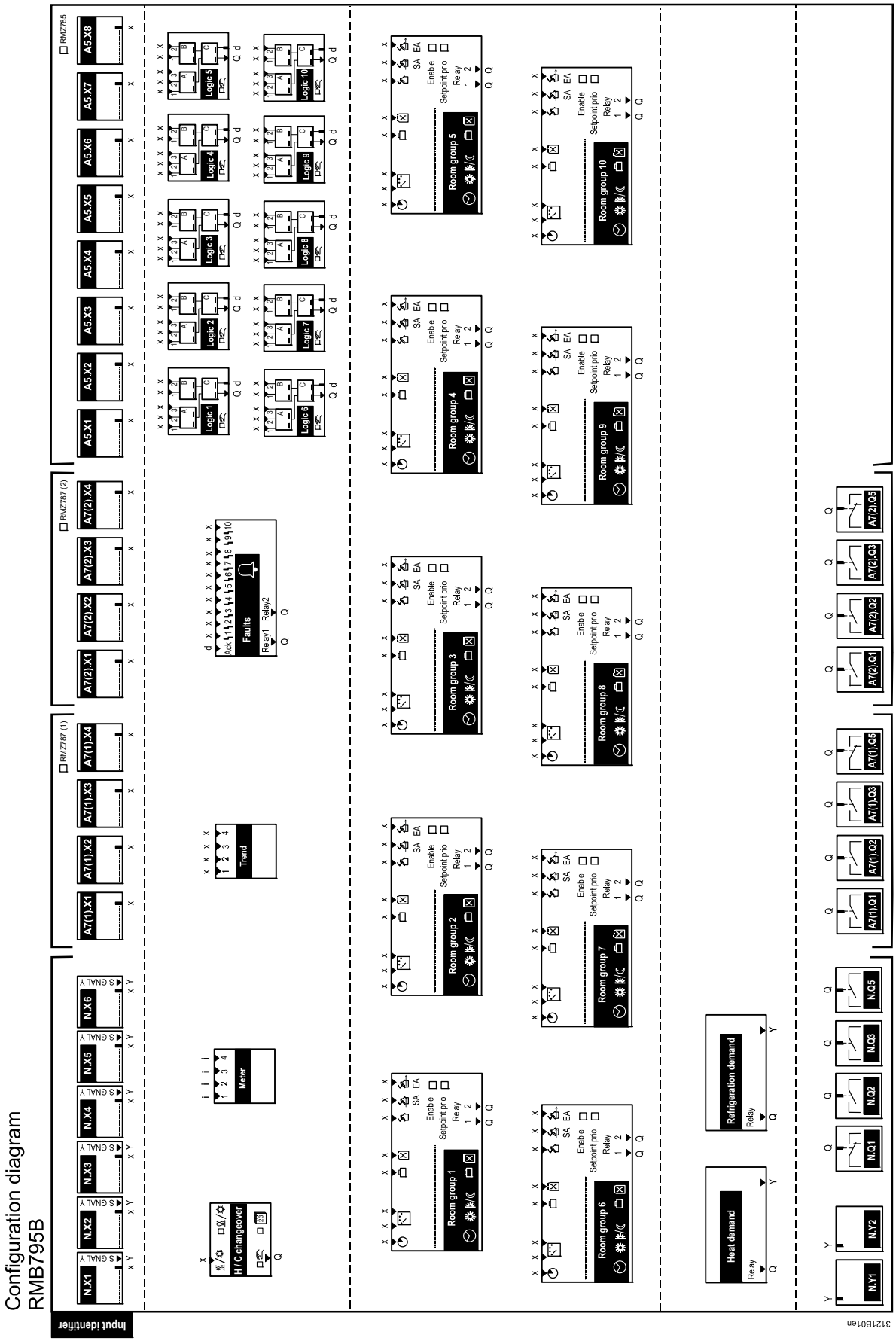
Open loop control functions

Operating mode	Configuration	Function
	• 2-pipe system H/C (☐ ☼/☾) • H/C changeover input (☼/☾)	Collection of heat and refrigeration demand operating modes. • Activation of 2-pipe system heating / cooling • Digital input for heating / cooling changeover (H/C changeover input).
	• Timer function (◔) • Rm optg mode inp 1 (▨) • Rm optg mode inp 2 (▨) • Fire alarm off(⌂) • Smoke extraction (⌂/⌂) • Holiday input (▭) • Special day input (☒)	Room operating modes. • Timer function: Digital input for room operating mode Comfort for a settable period of time. • Preselection of settable room operating mode with room operating mode input 1. • Room optg mode selector with room operating mode input 1+2. • Fire alarm off and smoke extraction (selectable with supply air, extract air, or supply air and extract air). Calendar functions • Holiday and special day input: Digital input for holidays (settable room operating mode) or special day (special day program of time switch).

faults	Configuration	Function
	• Fault inputs 1 through 10 • Fault relays 1 and 2 (relays...)	• 10 universal fault signal inputs, fault signal delay, fault acknowledgement (none, acknowledge, acknowledgement and reset), fault priority (urgent, not urgent) and fault effect (stop, no stop) can be set. • Supervision of analog signals with regard to limit value crossings • 2 fault status relays, priority (urgent, non-urgent, all) and source (internal, bus) can be selected
Trend	Configuration	Function
	• Input	The trend is used to log the progression of signals. • 4 independent trend channels. • Logging of local inputs, room temperatures and outside temperature from the bus. • Simultaneous display of 2 channels. • Views: 8-minutes, 8-hours, 24-hours and 6-day history.
Meters	Configuration	Function
	• Input	• Acquisition of pulse sources and display of cumulated values; selectable unit, valency, presentation, etc.
Logic functions.	Configuration	Function
	• Input • Logic function • Operation selector • Relay output • Digital output	• 10 logic blocks, logic 1 to 10. • Generation of digital signal from continuous input signals. • Selectable logic for logic A, B and C. • Selectable operation selector. • Delay times can be set for output signal. • Selectable time formats.
Heat demand refrigeration demand	Configuration	Function
	• Forwarding heat demand via KNX bus • Heat demand relay (relay Q) • Heat demand modulating	Plant functions when there is demand for heat. • Heat demand can also be transmitted via bus, (see Communication). • Heat demand relay for passing on the heat demand • Heat demand modulating for passing on the heat demand by means of analog DC 0…10 V signal.
	• Forwarding refrigeration demand via KNX bus • Refrigeration demand relay (relay Q) • Refrig demand modulating	Plant functions when refrigeration is requested. • Refrigeration demand can also be transmitted via bus, (see Communication). • Refrigeration demand relay for passing on the refrigeration demand. • Refrigeration demand modulating for passing on the heat demand by means of analog DC 0…10 V signal.

19.2.3 Configuration diagram RMB795B

Empty configuration diagram of basic type “B”:



19.3 C3127_Planning and commissioning protocol

Purpose

To ensure successful planning of KNX communication between the RMB795B central control unit and the RXB/RXL room controllers or RDG/RDF/RDU room thermostats, a Planning and Commissioning Report has been made available. It is used to straightforwardly list and document all settings required for communication.

The file name is: C3127_Planung+IBN-Protokoll_Komm.xls

Examples

The following illustration shows part of a report (application example Sport Ltd):

SIEMENS — Planning and Commissioning Report, Communication Synco 700

		Menu																		
	Possible settings	RMU	RMH	RMK	OZW	RMB	RXB	QAW	1	2	3	4	5	6	7	8	9	0
Information	Plant								Sport Ltd	Sport Ltd	Sport Ltd	Sport Ltd	Sport Ltd	Sport Ltd	Sport Ltd			
	Room number									309		307	308	308	308			
	Device name	X	X	X	-	X	X	-	Reception	Conference	Reception	Office	Office	Office	Office			
	Device type	RMU 7..	RMH, RMZ	RMK	OZW 771...	RMB 795	RXB	QAW 740	RMB795	RXB..	RMB795 [2]	RXB..	RXB..	RXB..	RXB..			
	Plant type	X	X	X	-	X	X	-	B	FC03		FC03	FC03	FC03	FC03			
	KNX-ID (Example ID: 00FD000016D5)	X	X	X	X	X	X	X										
Basic settings	Area [0...15] . Line [1; 2...15] . Device address [1..253;**255**]	X	X	X	X	X	X	X	0.2.10	0.2.114		0.2.110	0.2.111	0.2.112	0.2.113			
	Decentral bus power supply [Off, **On**]	X	X	X	-	X	-	-	Aus									
	Clock time operation [**Autonomous**, Slave, Master]	X	X	X	X	X	-	-	Autonom									
	Remote setting chlock slave [No, **Yes**]	X	X	X	X	X	-	-	Nein									
	Remote reset of fault [**No**, Yes]	X	X	X	-	X	-	-	Nein									
Room / Room group	Geographical zone (Apartment,Room,Subzone) (A.R.S) [**1**...126].[1...63]. [1]	X_2	2X	X	-	10X	X.X.1	X	1.1.1	1.1.1	2.1.1	2.1.1	2.2.1	2.3.1	2.4.1			
	(with own room sensor)	X_1	2X	X	-	-	X	X		X		---	X	X	X			
	Time switch operation [**Autonomous**, Slave, Master]	X_1	2X	X	-	-	-	-										
	Time switch slave (apartment) [**1**...126] . 1 . 1	X_1	2X	X	-	-	X.1.1	-		1.1.1		2.1.1	2.1.1	2.1.1	2.1.1			
	Temperature control [**Master**, Slave]	-	-	-	-	-	X	-		Master		Master	Master	Master	Master			
	* Control strategy [**Caskade**, Constant, Alternating]	X_4	-	-	-	-	-	-										
	** Combination of room control [**Master**, Slave external setpoint , Slave internal setpoint]	-	2X	X	-	-	-	-										
	Room group (name)	-	-	-	-	10X	-	-	Conference		Office							
	QAW operation zone (apartment) [---,**1**...126] . 1 . 1	-	-	-	-	10X	-	-										
Domestic hot water	DHW zone [**1**...31]	-	X	-	-	-	-	-										
	Time switch operation [**Autonomous**, Slave, Master]	-	X	-	-	-	-	-										
	Time switch slave, from BW zone [**1**...31]	-	X	-	-	-	-	-										
Holidays / Special days	Holidays / secial day operation [**Autonom**, Slave, Master]	X_1	X	X	-	10X	-	-										
	Holiday / special day zone [**1**...31]	X_1	X	X	-	10X	-	-										
Distribution zone	Outside temperature zone [----, 1...31]	X	X	X	-	X	-	-										
	(with own sensor)	X	X	X	-	X	-	-										
	Heat distribution zone source side [----, **1**...31]	X_1	X_5	-	-	X	X	-										
	Heat distribution zone consumer side [1...31]	X_3	X_6	-	-	X	-	-										
	Refrigation distr zone source side [----, 1...31]	X_2	-	-	-	X	X	-										
	Refrigeration zone consumer side [**1**...31]	X_3	-	-	-	X	-	-										
	Heat distribution zone main distributor [**1**...31]	-	-	X	-	-	-	-										
	Heat distribution zone prim controller [1, **2**...31]	-	-	X	-	-	-	-										
	Solar zone [----, 1...31]	-	X	-	-	-	-	-										
	(with own sensor)	-	X	-	-	-	-	-										
	Wind zone [----, 1...31]	-	X	-	-	-	-	-										
	(with own sensor)	-	X	-	-	-	-	-										
Generation zone	Boiler sequence zone [----, **1**...16]	-	-	X	-	-	-	-										

Legend:

* Commissioning > Settings > Controller 1 > Cascade controller > Control strategy

** Commissioning > Extra configuration Heating circuit 1/2 >Functions>Room control combination>

X_5 Basic type 0-x, 1-x, 2-x
X_6 Basic type 1-x, 2-x, 3-x, 4-x
X_1 Basic type A, U
X_2 Basic type A, C, U
X_3 Basic type C
X_4 Basic type A

Object			
Planner		Date	
Commissioner		Date	

Index

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