SIEMENS

3172

Semi flush-mount room thermostat with KNX communications

RDU341

For VAV heating and cooling systems

- **KNX bus communications (S-mode and LTE mode)**
- **Backlit display**
- **PI / P control**
- **Outputs for DC 0…10 V actuator and AC 230V electrical heater (ON-OFF)**
- **Output signal inversion as an option (DC 0...10 V → DC 10...0 V)**
- **2 multifunctional inputs for keycard contact, external sensor, etc.**
- **Operating modes: Comfort, Economy and Protection**
- **Control depending on the room or the return air temperature**
- **Automatic or manual heating/cooling changeover**
- **Minimum and maximum limitation of room temperature setpoint**
- **Adjustable minimum and maximum limitation for air flow signal DC 0..10V**
- **Adjustable commissioning and control parameters**
- **Commissioning with Synco ACS700, ETS3 Professional or via local HMI**
- **Integration into Synco**
- **Integration into DESIGO and Apogee via group addressing (ETS3) or via individual addressing**
- **Integration into third-party system via group addressing (ETS3)**
- **Mounting on recessed rectangular conduit box, 60.3 mm fixing centers**
- **AC 24 V operating voltage**

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Building Technologies

Use

Room temperature control (heating or cooling) in individual rooms and zones by means of:

- Heated or cooled by single duct system
- Heated or cooled by single duct system with electrical heater.

The RDU341 is suitable for use with VAV systems in connection with the VAV compact controllers, e.g. types G…B181.1E/3.

The RDU341 controls

- One DC 0…10 V actuator
- One DC 0…10 V actuator and AC 230V 1-stage electrical heater

Used in systems with:

- Heating or cooling mode
- Automatic heating/cooling changeover
- Manual heating/cooling changeover
- Heating and cooling single duct (single duct with electrical heater)

The room thermostats are delivered with a fixed set of applications.
The relevant application is selected and activated during commissioning using one of the following tools:

- Synco ACS
- ETS3 Professional (planned)
- Via local DIP switch and HMI

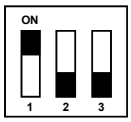
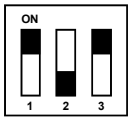
Functions

- Maintain room temperature via built-in temperature sensor or external room temperature / return air temperature sensor
- Changeover between heating and cooling mode (automatic via local sensor or bus, or manual)
- Select application via DIP switches or commissioning tool (ACS700, ETS3 Professional)
- Select operating mode via operating mode button on the thermostat
- Temporary Comfort mode extension
- Display current room temperature or setpoint in °C and/or °F
- Minimum and maximum limitation of room temperature setpoint
- Minimum and maximum limitation of air flow signal DC 0...10 V
- Button lock (automatic and manual)
- Two multifunctional inputs, freely selectable for:
  - Operating mode switchover contact (keycard)
  - Automatic heating/cooling changeover sensor
  - External room temperature sensor or return air temperature sensor
  - Dewpoint sensor
  - Electrical heater enable
  - Fault input
  - Monitor input for temperature sensor or switch status
- Reload factory settings for commissioning and control parameters
- KNX bus (terminals CE+ and CE-) for communication with Synco or KNX compatible devices
- Display of outdoor temperature or time of day via KNX bus

- Time scheduling and central control of setpoints via KNX bus
- With a Synco RMB7xx or RMUxx controller, the air demand signal of the thermostat is used to optimize supply air temperature.

Applications

The thermostat supports the following applications, which can be configured using the DIP-switches on the inner side of the thermostat's front panel or a commissionning tool.
All DIP switches need to be set to OFF (remote configuration, factory setting) to select an application via commissioning tool.

	Applications and control output	DIP-switches
	Remote configuration via commissioning tool (factory setting) • Synco ACS • ETS3 professional (planned)	
Single duct	Single duct heating or cooling DC 0...10 V output signal normal	
	Single duct heating or cooling *DC 10...0 V output signal inverted*	
Single duct with electrical heater	Single duct heating and cooling, with electrical heater DC 0...10 V output signal normal	
	Single duct heating and cooling, with electrical heater *DC 10...0 V output signal inverted*	

Type summary

Product number	Stock number	Operating voltage	Control outputs			Housing color
			3 pt	on/off	DC 0..10 V	
RDU341	S55770-T106	AC 24 V	--	✓	✓	white

Ordering

- When ordering, indicate both product number / stock number and name:
- E.g. **RDU341 / S55770-T106 room temperature controller**
- Order valve actuators separately.

Equipment combinations

	Type of unit		Product no.	Data sheet
	Cable temperature sensor		**QAH11.1**	1840
	Room temperature sensor		**QAA32**	1747
	Condensation detector / Supply unit		**QXA2000 / QXA2001 / AQX2000**	1542
DC 0…10 V actuators	Electrical actuator, DC 0..10V (for radiator valve)		**SSA61...**	4893
	Electrical actuator, DC 0..10 V (for 2 and 3 port valves / V…P45)		**SSC61…**	4895
	Electrical actuator, DC 0..10V (for small valve 2,5 mm)		**SSP61…**	4864
	Electrical actuator, DC 0..10V (for small valves 5.5 mm)		**SSB61...**	4891
	Electrical actuator, DC 0..10 V (for Combi-valve VPI45)		**SSD61...**	4861
	Electrical actuator, DC 0..10V (for valves 5.5 mm)		**SQS65…**	4573
	Thermal actuator, DC 0..10V (for small valves and radiator valves)		**STS61**	4880
	DC 0…10 V damper actuator		**GQD161…**	4605
			**GDB161…**	4634
			GLB161…	
			**GMA161…**	4614
			GEB161…	4621
			**GCA161…**	4613
			GBB161…	4626
			GIB161…	
	VAV compact controller		**GDB181.1E/3**	3544
			GLB181.1E/3	

Accessories

Type of unit	Product number Stock number	Data sheet
Changeover mounting kit (50 pcs/package)	**ARG86.3**	N3009
Plastic mounting bracket for semi-flush-mount thermostats for increasing the headroom in the conduit box by 10mm	**ARG70.3**	N3009
Conduit box for semi-flush mounted thermostat	**ARG71 / S55770-T137**	N3009
KNX Power supply 160 mA (Siemens BT LV)	**5WG1 125-1AB01**	--
KNX Power supply 320 mA (Siemens BT LV)	**5WG1 125-1AB11**	--
KNX Power supply 640 mA (Siemens BT LV)	**5WG1 125-1AB21**	--

Mechanical design

The controller consists of 2 parts:

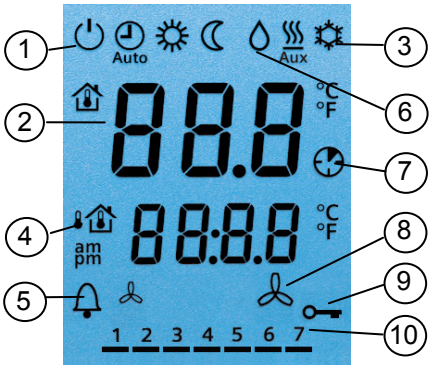
- Front panel with electronics, operating elements and built-in room temperature sensor.
- Mounting base with the power electronics.

The rear of the mounting base contains the screw terminals.
The base fits on a rectangular conduit box with 60.3 mm fixing centers.
Slide the front panel in the mounting base and snap on.

Operation and settings

1 Operating mode selector / Protection
2 Adjust setpoint and control parameters

Display



1 Operating mode
- Protection
- Comfort
- Economy
- Auto Timer according to schedule (via KNX)

2 Displays room temperature, setpoints and control parameters.
Symbol indicates the current room temperature

3 Heating/cooling mode
- Cooling
- Heating,
- Aux Electrical heater active

4 Additional user information, like outdoor temperature or time of day from KNX bus

5 Indicates fault or reminder

6 Condensation in room (dewpoint sensor active)

7 Temporary comfort prolong active

8 Primary fan is active (only supported with Synco700 primary controller)

9 Button lock active

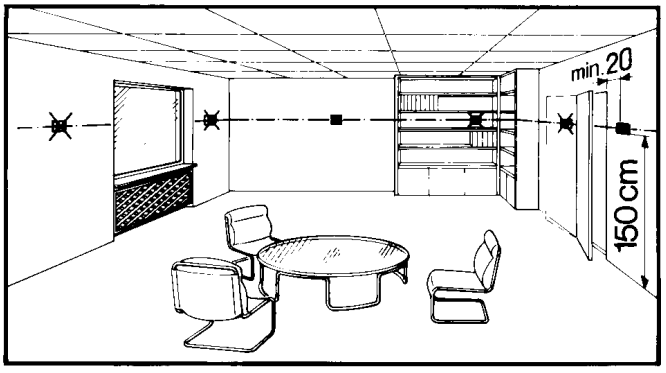
10 1 2 3 4 5 6 7
Weekday 1…7 from KNX bus
(1 = Monday / 7 = Sunday)

Engineering notes

See the "Reference documentation", page 11 for information on how to engineer the KNX bus (topology, bus repeaters, etc.) and how to select and dimension connecting cables for supply voltage and field devices.

Mounting and installation

Mount the room controller on a recessed rectangular conduit box with 60.3mm fixing centers. Do not mount on a wall in niches or bookshelves, behind curtains, above or near heat sources, or exposed to direct solar radiation. Mount about 1.5 m above the floor.



Mounting

⚠

- Mount the room thermostat on a clean, dry indoor place without direct airflow from a heating / cooling device, and not exposed to drips or splash water.
- In case of limited space in the conduit box use the mounting bracket ARG70.3 to increase the headroom by 10mm

Wiring

See the mounting instructions M3172 enclosed with the controller.

⚠ • Comply with local regulations to wire, fuse and earth the controller.

⚠ • The AC 230 V mains cable and the AC 24 V supply line must have an external fuse or circuit breaker with a rated current of no more than 10 A.

⚠ • Isolate the cables of SELV inputs X1-M/X2-M for 230 V if the conduit box carries AC 230 V mains voltage.

• Inputs X1-M or X2-M of different units (e.g. summer/winter switch) may be connected in parallel with an external switch. Consider overall maximum contact sensing current for switch rating.

⚠ • Isolate the cables of KNX communication input CE+ / CE- for 230 V if the conduit box carries AC 230 V mains voltage.

• No metal conduits.

• No cables provided with a metal sheath.

• Disconnect from supply before opening the cover.

Commissioning notes

Applications

The room thermostats are delivered with a fixed set of applications.

Select and activate the relevant application is selected and activated during commissioning using one of the following tools:

- Local DIP switch and HMI
- Synco ACS
- ETS3 Professional (planned)

Set the DIP switches before snapping the front panel to the mounting plate, if you want to select an application via **DIP switches**.

All DIP switches need to be set to “OFF” ("remote configuration"), if you want to select an application via **commissioning tool**.

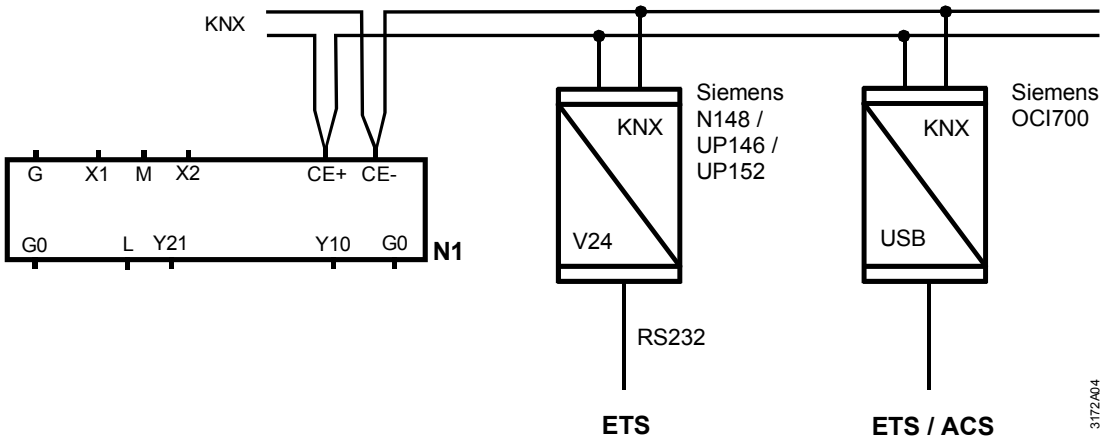
After power is applied, the thermostat resets and all LCD segments flash, indicating that the reset was correct. After the reset, which takes about 3 seconds, the thermostat is ready for commissioning by qualified HVAC staff.

If all DIP switches are OFF, the display reads "NONE" to show that an application needs to be set via tool.

Note Each time the application is changed, the thermostat reloads the factory setting for all control parameters, except for KNX device and zone addresses!

Connect tool

Connect the Synco ACS or ETS3 Professional tools to the KNX bus cable at any point for commissioning:



ACS and ETS3 require an interface:

- RS232 KNX interface (e.g. Siemens N148 / UP146 / UP152)
- OCI700 USB- KNX interface

Note An external KNX bus power supply is required if an RDU341 is connected directly to a tool (ACS or ETS3) via KNX interface.

Control parameters

The thermostat's control parameters can be set to ensure optimum performance of the entire system (see basic documentation P3172).
The parameters can be adjusted using

- Local HMI
- Synco ACS
- ETS3 Professional (planned)

Control sequence
- The control sequence may need to be set via parameter P01 depending on the application. The factory setting for the single duct application is “Cooling only”.

Calibrate sensor
- Recalibrate the temperature sensor if the room temperature displayed on the controller does not match the room temperature measured (after min. 1 hour of operation). To do this, change parameter P05.

Setpoint and range limitation
- We recommend to review the setpoints and setpoint ranges (parameters P08…P12) and change them as needed to achieve maximum comfort and save energy.

Programming mode

The programming mode helps identify the thermostat in the KNX network during commissioning.
Press buttons “operating mode” and “+” simultaneously for 6 sec to activate programming mode, which is indicated on the display with "PrOg".
Programming mode remains active until thermostat identification is complete.

Assign KNX group addresses

Use ETS3 Professional to assign the KNX group addresses of the RDU communication objects.

KNX serial number

Each device has a unique KNX serial number inside the front panel. An additional sticker with the same KNX serial number is enclosed in the packaging box. This sticker is intended for installers for documentation purposes.

Disposal

This device is classified as waste electronic equipment under European Directive 2002/96/EC (WEEE) and may not be disposed of as unsorted municipal waste. Adhere to all relevant national laws.
Regarding disposal, use the systems setup for collecting electronic waste. Observe all local and applicable laws.

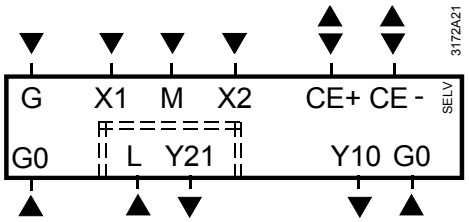
Technical data

⚠ Power supply	Operating voltage		SELV AC 24 V +/-20 %
	Rated voltage		AC 24 V
	Frequency		50/60 Hz
	Power consumption		Max. 2.5 VA / 0.9 W
Outputs	Control output Y21-N (N.O.)		AC 230 V
	Rating		Max. 5(2) A
	Control output Y10-G0		SELV DC 0…10 V
	Resolution		39 mV
	Current		Max. ±1 mA
Inputs	Multifunctional input X1-M/X2-M		
	Temperature sensor input:		
	Type		QAH11.1 (NTC)
	Digital input:		
	Operating action		Selectable (N.O./N.C.)
	Contact sensing		SELV DC 0...5 V/max 5 mA
	Insulation against mains voltage (SELV)		4 kV, reinforced insulation
	Function input:		Selectable
	External temperature sensor, heating/cooling changeover sensor, operating mode switchover contact, dewpoint monitor contact, enable electrical heater contact, fault contact, monitor input		X1: P38 X2: P40
KNX bus	Interface type		KNX, TP1-64 (electrically isolated)
	Bus current		20 mA
	Bus topology: See KNX manual (reference documentation, see below)		
Operational data	Switching differential, adjustable		
	Heating mode	(P30)	2 K (0.5...6K)
	Cooling mode	(P31)	1 K (0.5...6K)
	Setpoint setting and range		
	☼ Comfort	(P08)	21°C (5...40 °C)
	☾ Economy	(P11-P12)	15°C/30°C (OFF, 5...40 °C)
	⏻ Protection	(P65-P66)	8°C/OFF (OFF, 5...40 °C)

	Multifunctional input X1/X2		Selectable 0...8
	Input X1 default value	(P38)	3 (Operating mode switchover)
	Input X2 default value	(P40)	1 (External temperature sensor)
	Built-in room temperature sensor		
	Measuring range		0…49 °C
	Accuracy at 25 °C		< ± 0.5 K
	Temperature calibration range		± 3.0 K
	Settings and display resolution		
	Setpoints		0.5 °C
	Current temperature value displayed		0.5 °C
Environmental conditions	Operation		As per IEC 721-3-3
	Climatic conditions		Class 3K5
	Temperature		0...+50 °C
	Humidity		<95 % r.h.
	Transport		As per IEC 721-3-2
	Climatic conditions		Class 2K3
	Temperature		–25...+60 °C
	Humidity		<95 % r.h.
	Mechanical conditions		Class 2M2
	Storage		As per IEC 721-3-1
	Climatic conditions		Class 1K3
	Temperature		–25...+60 °C
	Humidity		<95 % r.h.
Standards and directives	CE conformity		
	EMC directive		2004/108/EC
	Low-voltage directive		2006/95/EC
	C-tick conformity to EMC emission standard		AS/NZS 61000.6.3: 2007
	RoHS 2002/95/EC Reduction of hazardous substances		2002/95/EC
	Product standards		
	Automatic electrical controls for household and similar use		EN 60730–1
	Special requirements for temperature-dependent controls		EN 60730–2-9
	Electronic control type		2.B (micro-disconnection on operation)
	Home and Building Electronic Systems		EN 50090-2-2
	Electromagnetic compatibility		
	Emissions (residential)		IEC/EN 61000-6-3
	Immunity (industrial and residential)		IEC/EN 61000-6-2
	Safety class		II as per EN 60730
	Pollution class		Normal
	Degree of protection of housing		IP 30 as per EN 60529
General	Connection terminals		Solid wires or prepared stranded wires 1 x 0.4…2.5 mm2 or 2 x 0.4…1.5 mm2
	Housing front color		RAL 9003 white
	Weight without / with packaging		0.163 kg / 0.233 kg

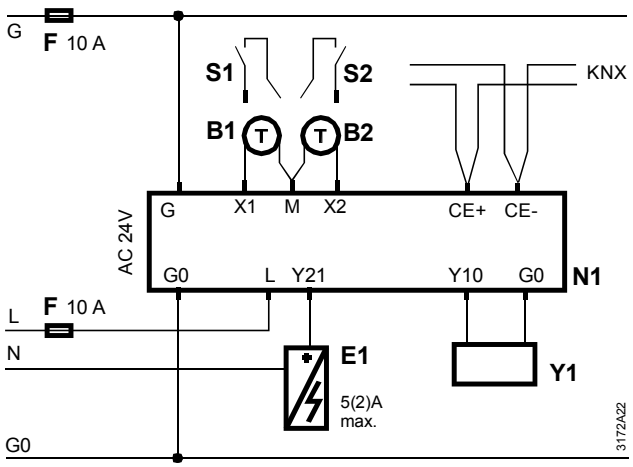
Reference documentation	Handbook for Home and Building Control - Basic Principles (www.knx.org/uk/news-press/publications/publications/)	
	Synco	CE1P3127 Communication via the KNX bus for Synco 700, 900 and RXB/RXL Basic documentation
	DESIGO	CM1Y9775 DESIGO RXB integration – S-mode CM1Y9776 DESIGO RXB / RXL integration – individual addressing CM1Y9777 Third-party integration CM1Y9778 Synco integration CM1Y9779 Working with ETS
	Apogee	Installation Instruction: KNX Driver for PXC Modular; Document No. 565-132 Technical Spec Sheet: KNX Driver for PXC Modular; Document No. 127-1676 Technical Reference for KNX Driver; Document No. 140-0804 Application 6206 Point Map for RDU

Connection terminals



G, G0	Operating voltage SELV AC 24 V
L	Supply for electrical heater AC 230 V
X10, G0	Output for damper, VAV compact controller
Y21	Output for electrical heater
X1, X2	Multifunctional input for temperature sensor (e.g. QAH11.1) or potential-free switch Factory setting: – X1 = Operating mode switchover contact – X2 = External sensor (function can be selected via parameter P38 / P40).
M	Measuring neutral for sensor and switch
CE+	KNX data +
CE-	KNX data -

Connection diagram



N1	Room thermostat RDU341
Y1	Damper actuator, VAV compact controller
E1	Electrical heater
F	External fuse
S1, S2	Switch (keycard, window contact, etc.)
B1, B2	Temperature sensor (return air temperature, external room temperature, changeover sensor, etc.)
CE+	KNX data +
CE-	KNX data -

Dimensions

Dimensions in mm