



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, Energy Saving 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

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

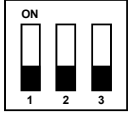
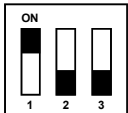
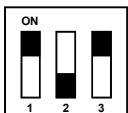
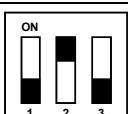
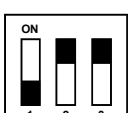
- Maintain room temperature via built-in temperature sensor or external room temperature / return air temperature sensor
- Changeover between heating and cooling mode (automatic via local sensor or bus, or manual)
- Select application via DIP switches or commissioning tool (ACS700, ETS3 Professional)
- 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 commissioning 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 |
|------------------------------------|--|---|
| Single duct | Remote configuration via commissioning tool (factory setting) <ul style="list-style-type: none"> • Synco ACS • ETS3 professional (planned) |  |
| | Single duct heating or cooling DC 0...10 V output signal normal |  |
| Single duct with electrical heater | Single duct heating or cooling <i>DC 10...0 V output signal inverted</i> |  |
| | Single duct heating and cooling, with electrical heater DC 0...10 V output signal normal |  |
| Single duct with electrical heater | Single duct heating and cooling, with electrical heater <i>DC 10...0 V output signal inverted</i> |  |

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

DC 0...10 V actuators

| Type of unit | | Product no. | Data sheet |
|--|---|--------------------------|------------|
| Cable temperature sensor |  | QAH11.1 | 1840 |
| Room temperature sensor |  | QAA32 | 1747 |
| Condensation detector / Supply unit |  | QXA2000 / AQX2000 | 1542 |
| 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 |
| Electromotoric actuator, DC 0..10V (for valves 5.5 mm) |  | SQS65... | 4573 |
| Thermal actuator, DC 0..10V (for small valves and radiator valves) |  | STS61 | 4880 |
| |  | GQD161... | 4605 |
| |  | GDB161... | 4634 |
| | | GLB161... | |
| DC 0...10 V damper actuator |  | 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 320 mA  | ACX95.320/ALG | Q3663 |
| KNX Power supply 160 mA (Siemens IA) | 5WG1 125-1AB01 | -- |
| KNX Power supply 320 mA (Siemens IA) | 5WG1 125-1AB11 | -- |
| KNX Power supply 640 mA (Siemens IA) | 5WG1 125-1AB21 | -- |

Mechanical design

The controller consists of 2 parts:

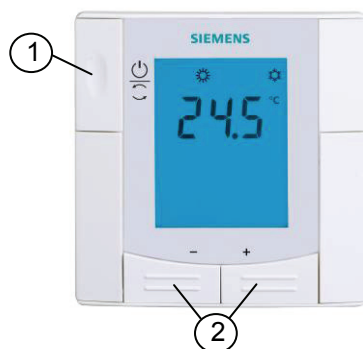
- Front panel with electronics, operating elements and built-in room temperature sensor.
- Mounting base with the power electronics.

The rear of the mounting base contains the screw terminals.

The base fits on a rectangular conduit box with 60.3 mm fixing centers.

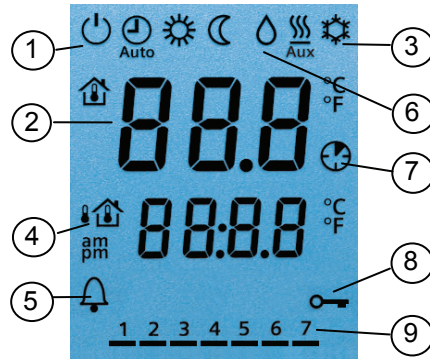
Slide the front panel in the mounting base and snap on.

Operation and settings



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

Display



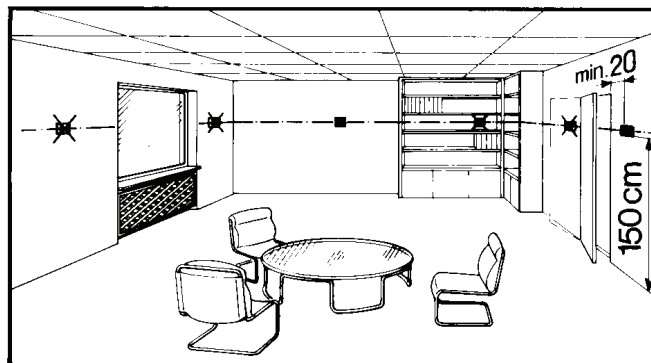
- | | |
|--|---|
| <p>1 Operating mode</p> <ul style="list-style-type: none"> ⏻ Protection ☀ Comfort 🌙 Energy Saving 🕒 Auto Timer according to schedule (via KNX) <p>2 Displays room temperature, setpoints and control parameters.</p> <ul style="list-style-type: none"> 🏠 Symbol indicates the current room temperature <p>3 Heating/cooling mode</p> <ul style="list-style-type: none"> ❄ Cooling 🔥 Heating, 🔥 Aux Electrical heater active | <p>4 Additional user information, like outdoor temperature 🏠 or time of day from KNX bus</p> <p>5 🔔 Indicates fault or reminder</p> <p>6 💧 Condensation in room (dewpoint sensor active)</p> <p>7 🕒 Temporary comfort prolong active</p> <p>8 🔑 Button lock active</p> <p>9 <u>1 2 3 4 5 6 7</u> Weekday 1...7 from KNX bus (1 = Monday / 7 = Sunday)</p> |
|--|---|

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.

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**.

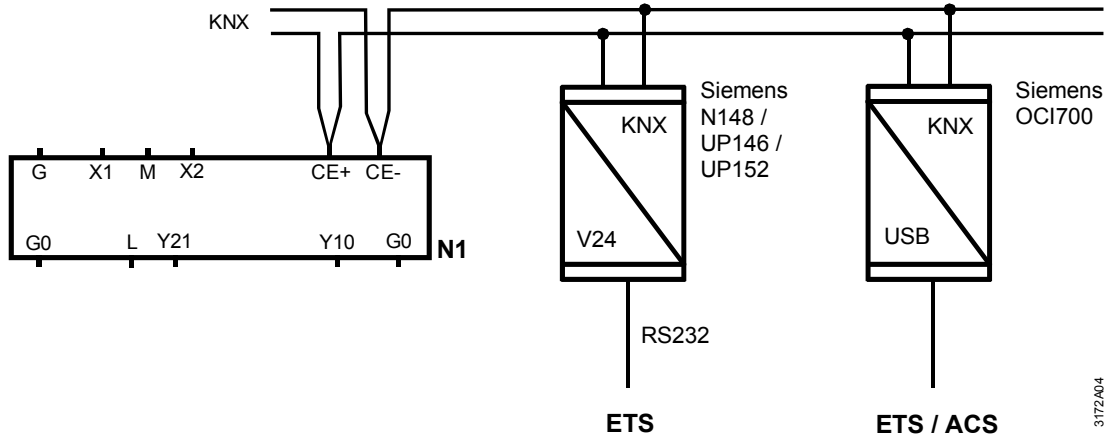
All DIP switches need to be set to “OFF” (“remote configuration”), if you want to select an application via **commissioning tool**.

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.

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)
- OC1700 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. 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.

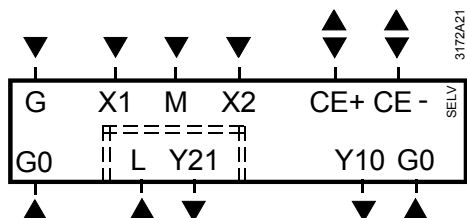
Technical data

| | | |
|--|---|--|
| ⚠ 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 |
| Inputs | Current | Max. ±1 mA |
| | 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 elec- trical heater contact, fault contact, monitor input | | |
| 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 mode | (P08) 21°C (5...40 °C) |
| | ☾ Energy Saving mode | (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 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 | IEC/EN 61000-6-3 | |
| Immunity | 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 mm ² or 2 x 0.4...1.5 mm ² |
| | Housing front color | RAL 9003 white |
| | Weight without / with packaging | 0.163 kg / 0.233 kg |

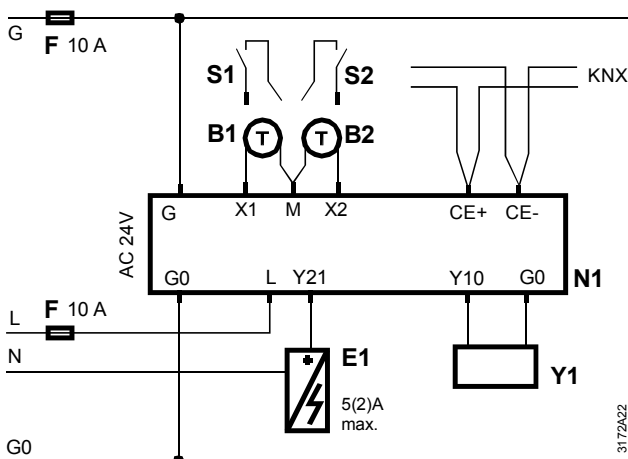
| | |
|--------------------------------|--|
| Reference documentation | Handbook for Home and Building Control - Basic Principles (www.knx.org/uk/news-press/publications/publications/) |
| Synco | CE1P3127 Communication via the KNX bus for Synco 700, 900 and RXB/RXL Basic documentation |
| DESIGO | CM1Y9775 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 |
| 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

