

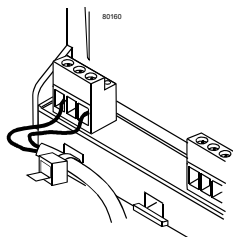
Installation

Place of installation

- Mounting choices:
 - Control cabinet
 - Control panel
 - Side of FCU
 - Wall, ceiling space, cupboard
- Easy access is required for service personnel
- The controller should not be freely accessible by building occupants
- Do not install outside without suitable weather protection
- Permissible ambient temperature: 0..50°C

Electrical installation

- The local regulations for electrical installations must be observed
- Cable restraints must be used for the wires to terminals L, N, Q.. (AC230V)
- Cable restraints should be used for all wiring to avoid disconnection (see diagram below)

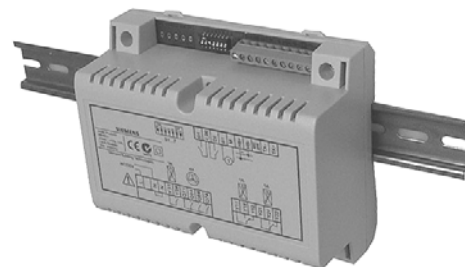


Permissible cable lengths

- For all field devices: room unit, sensors
 - max. 60 m where $A \geq 0.5 \text{ mm}^2$
 - max. 100 m where $A \geq 1.0 \text{ mm}^2$
- Signal cable type
 - 2-wire standard installation cable (unshielded)
 - Twisted pair (unshielded) is recommended for enhanced immunity to external electromagnetic interference, for example, in the vicinity of radio transmitters or frequency converters.
- RRV851 controller can be mounted in any orientation
- Ensure adequate air circulation to dissipate heat generated during operation

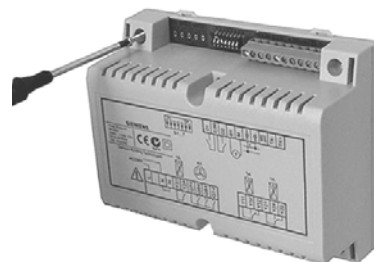
DIN rail mounting

1. The housing rail is designed for snap mounting on DIN rails, type EN50022-35 X 7.5



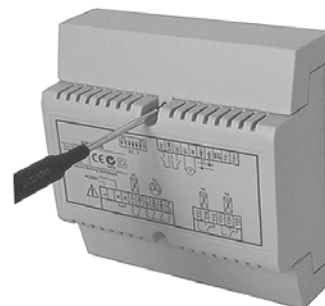
Surface mounting

1. Hold controller against the surface
2. Mark fixing holes on the wall
3. Drill holes
4. Screw controller to the surface
5. When mounting controller to a FCU, take care not to damage internal components. E.g. Drilling through coils



Terminal covers

- The covers will provide IP30 protection when surface mounting on wall or FCU. IP20 without terminal covers
- The terminal covers include screws for fixing to controller and knock-out holes for cable entry



Connection diagrams

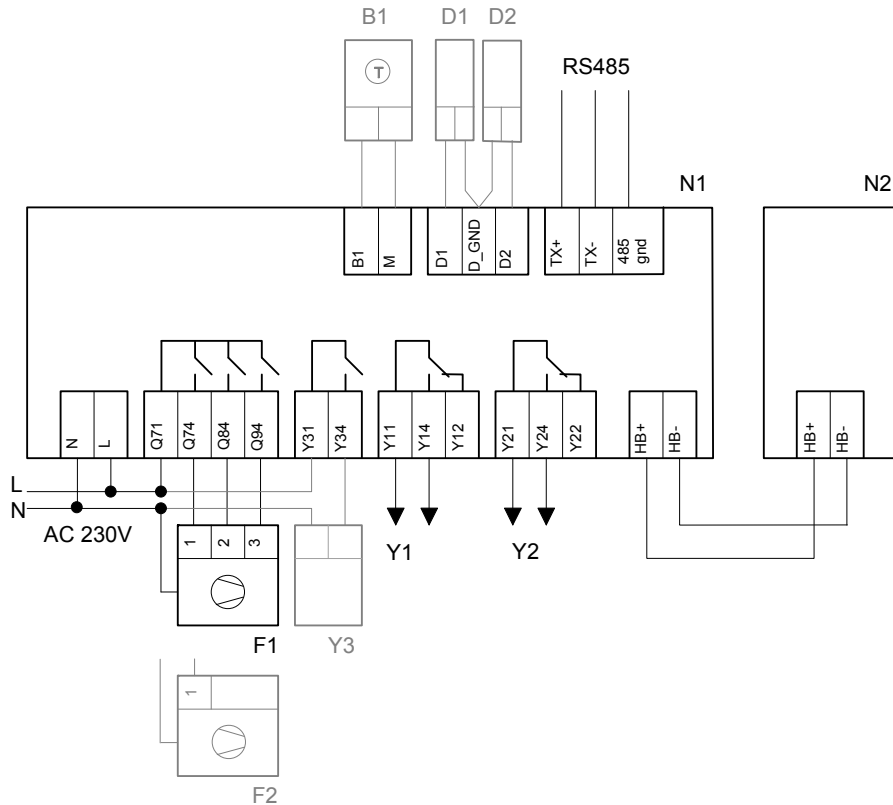
RRV851 - Terminals

B1 Signal input (ext. sensor NTC)
 M Signal ground
 D1,D2 Digital inputs

D_GND Digital ground
 HB+, HB- Communication bus
 L, N AC 230V supply

Q... Digital outputs, AC24..230V, 6(4) A
 Y... Digital outputs, AC24..230V, 3(1) A

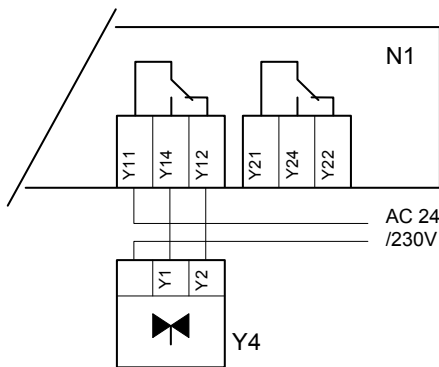
RRV851 - Typical connection



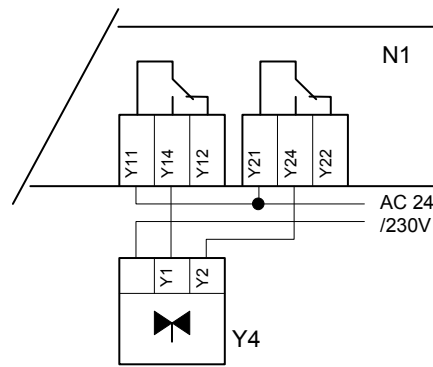
*the RS485 connections are only suitable for downloading manufacturer specific parameter sets.

- | | | | | | |
|----|--|----|---|-----|----------------------------|
| N1 | RRV851 controller | D2 | Faults or emergency heat | F2 | Single speed fan |
| N2 | QAX850 master room unit | Y1 | Cooling output | RV | Reversing valve |
| B1 | External temperature sensor (optional) or pipe changeover sensor, appl. A8 | Y2 | Heating output | CR1 | Compressor relay stage 1 |
| D1 | Remote activation of comfort mode | Y3 | Auxiliary heat, emergency heat or 2 nd stage cooling | CR2 | Compressor relay stage 2 |
| | | F1 | Three speed fan | Y4 | Valve actuator, AC24/ 230V |

Output connection for 2-p control, appl. A8

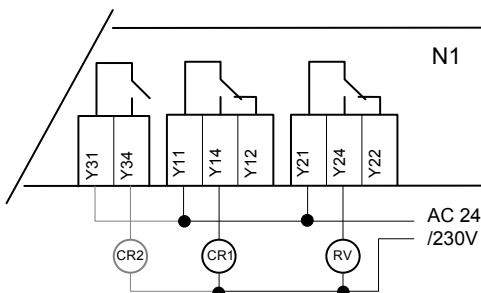


Output connection for optional 3-p control, appl. A1, A2 & A8



Output connection for heat pumps, appl. A5

(for single compressor heat pumps, CR2 is not connected)



Note!

Contact your local Siemens Building Technologies representatives for application specific wiring diagrams and information

Note!

- All Input and bus terminals are not protected against connection to AC 230 V.
- Observe the technical data for fan relay outputs: Max. AC 250 V, 6(4) A.
- All output cables used must satisfy the insulation requirements with regard to mains potential.
- AC 24 V outputs must be segregated from AC 250 V outputs.
- Care should be taken when cables pass through sharp metal openings, conduits or ducts.
- Double insulation on output cables is recommended.
- Local installation regulations must be observed.

- The pwr LED on the RRV851 will be on
- The QAX850 will display all LCD icons for 3 seconds and then the software version number for another 3 seconds. It will then revert to normal mode. Time segments will be blinking if time needs to be set
- The LED on the QAX850 will be flashing if there is a communication error between the RRV851 and QAX850

- Power must be switched off to reset application
- An adhesive label is included in the packaging for final recording of Dip switch positions

Commissioning

Preparatory checks

1. DO NOT switch on power
2. Check wiring according to the plant connection diagram
3. Ensure correct position of Dip switch settings to match the HVAC equipment. See Dip settings
4. The pre-configured application is selected by the Dip switch located at the top of the controller
5. When switching on power

Digital inputs (D1, D2)

- A potential free contact closed across the D1 and G terminals will override to comfort when mode selector is set to Auto timer mode only
- D2 can be configured for an emergency heat enable signal or an external fault lockout signal. Either of these functions can be selected via the configuration Dip switches
- When emergency heat is selected, a potential free contact closed across the D2 and G terminals will disable the primary heating output and enable the emergency heat output. The emergency heat output will only activate when there is demand for heating
- When external fault (default) is selected, a potential free contact closed across the D2 and G terminals will deactivate all outputs and the standby icon on the QAX850 LCD will flash to indicate the fault. Fault will disappear after contact is opened

Dip settings

Function	Selections	1	2	3	4	5	6	7
Y3 Aux. output	Auxiliary heat 20 min delay	off	off	-	-	-	-	-
	Auxiliary heat 10 min delay	on	off	-	-	-	-	-
	Emergency heat via D2	off	on	-	-	-	-	-
	2 nd stage cool or compressor	on	on	-	-	-	-	-
Fan speed	Single speed	-	-	off	-	-	-	-
	Three speed	-	-	on	-	-	-	-
Applications	A1 - Heat only	-	-	-	off	off	off	off
	A2 - Cool only	-	-	-	on	off	off	off
	A3 - Cool / (heat 3 speed fan)	-	-	-	off	on	off	off
	A4 - Cool / (heat 1 speed fan)	-	-	-	on	on	off	off
	A5 - Heat pump (comp + RV)	-	-	-	off	off	on	off
	A6 - Heat pump (heat/cool)	-	-	-	on	off	on	off
	A7 - 4 pipe FCU	-	-	-	off	on	on	off
	A8 - 2 pipe FCU	-	-	-	on	on	on	off

Installer level parameter settings

- Default parameter values are suitable for basic system operation. If default values are not suitable for a particular installation, then adjustment can be made. Refer to application sheets for default values or follow the instructions below
1. Simultaneously press together the ▲ and ▼ buttons on the QAX850 for 3 seconds, release, within 2 seconds press the ▲ button for 3 seconds
 2. P00 will appear on the LCD
 3. Press ◀ to view the parameter
 4. Press ▲ or ▼ for adjustment
 5. Press ◀ to save the adjustment
 6. Continue through all the parameter list to return to normal mode

Time out

- If no adjustment is made within 20 seconds while changing parameter values, the controller will exit and return to normal mode

Setting elements on QAX850 master room unit



- 1 Navigation buttons: adjusting or searching values
- 2 OK button: confirming values

Sensor calibration

- Generally there is no need to calibrate sensor, however the displayed room temperature on the QAX850 LCD can be calibrated if there is any discrepancy from the actual temperature measured with a certified thermometer. cali-

bration function can be accessed by pressing the ▲ and ▼ buttons simultaneously for 5 seconds. Displayed value can then be adjusted via the same buttons in 0.1K steps. Range is +/- 3K.

Parameter list

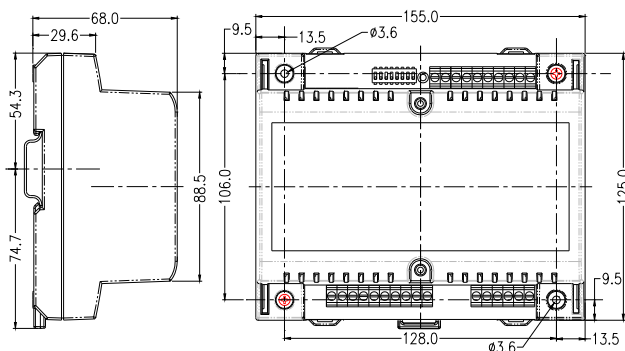
Line	Function, display	Range	Explanations, notes and tips
P00	Temperature scale	°C/ F°	
P01	Frost protection limit in OFF mode	Off/5..8°C	If temp is below the set limit, heating will be activated
P02	Over-temperature limit in OFF mode	Off/30..35°C	If temp is above the set limit, cooling will be activated
P03	Min. OFF time delay	0..600s	Min off time is used to prevent short cycling of compressor
P04	Min. ON time delay	0..600s	Min on time is used to prevent short cycling of compressor
P05	Dead band between cool and heat OFF points	0.5..6K	Zero energy band. When actual temp is in dead band, outputs are off
P06	RV ON in heat or cool mode	Heat/Cool	The reversing valve(RV) can be energized in cooling or heating demand. Dependent on the internal equipment circuitry
P07	Fan run ON after heat output turns Off	0..300s	Fan run ON delay is used to remove the residual heat and to prevent the high limit electric heater thermostat from tripping off
P08	Fan run ON after cool output turns Off	0..300s	Fan run ON delay can be used to make use of residual cooling and to remove condensation
P09	FCU flush pipe time	120..600s	On start up, the controller will open the valve (flush time) and the sensor will detect for hot or chilled water in the system. Only for 2-pipe FCU, appl. A8
P11	Water temp heat mode change-over	22..32 °C	Only for 2-pipe FCU appl A8. This is the water temp setpoint for heating
P12	Water temp cool mode change-over	10..21 °C	Only for 2-pipe FCU appl A8. This is the water temp setpoint for cooling
P13	Fan auto-speed high range	H:80..100%	Switching point for high speed fan
P14	Fan auto-speed medium range	M:30..75%	Switching point for medium speed fan
P15	Fan auto-speed low range	L:1..15%	Switching point for low speed fan is only applicable for 3-position modulating control. For 2-position control, low speed fan synchronizes with the first stage heating/cooling switch on and switch off points
P17	2-p or 3-p control selection	2-p/3-p	3-position modulation control is possible for appl. A1, A2 and A8
P18	P-band in heat mode /Switching differential	0.5..10K	Heating proportional band for 3-position modulating control or switching differential for on/off outputs
P19	P-band in cool mode /Switching differential	0.5..10K	Cooling proportional band for 3-position modulating control or switching differential for on/off outputs
P20	Integration time	0..60.0 min in 0.5 min steps	Integration time for 3-position modulating control
P21	3-p valve actuator running time	50..300s	Valve actuator run time. Refer to the technical data of the actuator for this value
P23	Ventilation in dead zone	Off, H/C, C only	When the temp is in dead zone, the fan can be set to run continuously. When C only is selected, fan turns off with the heating output but continues to run after cooling output turns off

*Default values and available parameters are dependent on application selected

*Refer to application sheets for further details if required

Dimensions

Without terminal covers



Dimensions in mm

With terminal covers

