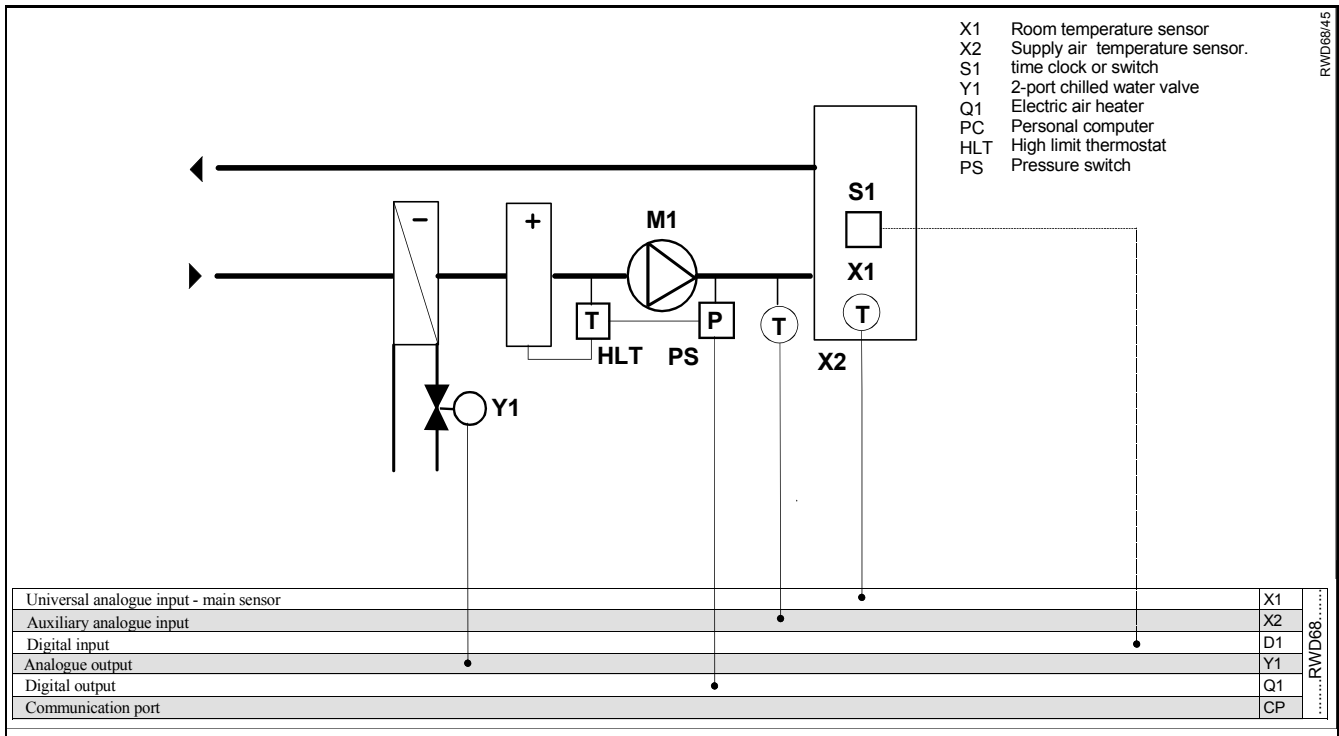


RWD68 Universal Controller
Application 45
Cascade control

Room temperature control
 Air electric heater
 Chilled water control valve

- Control (P or PI)
- Room temperature control
- On/off control of the air electric heater
- Proportional control (0..10Vdc) of the chilled water valve.
- Cascade control .
- Optional day / night set point adjustment .



Supplemental features

Control

- Room temperature sensor can be selected as Ni1000, Pt1000, or active sensor.(X1)
- Adjustable dead zone with separate heating and cooling set points.
- Adjustable differential of digital output Q1.
- Adjustable proportional band of analogue output Y1.
- Integral action function selection and adjustment.
- Duct temperature sensor can be selected as Ni1000, Pt1000, or active sensor.(X2)
- Cascade control of the supply air by the room temperature sensor.
- Day / night set points can be selected via time clock or switch.

Operating modes

Safety functions

- A high limit manual reset thermostat is mounted downstream of the air electric heater, and de-energises the heater on excessive duct temperatures. This thermostat has to be manually reset following detection of overheating. It is often supplied by the supplier of the electric heater.
- A pressure switch is also specified to detect loss of static pressure in the duct, indicating loss of fan. This also de-energises the electric heater but it is auto reset and allows electric heater function following the detection of fan operation.
- These safety units can be connected directly in series with small electric heaters, but for larger electric heaters they are connected to a heater contactor that switches the electric heater.

Description of operation

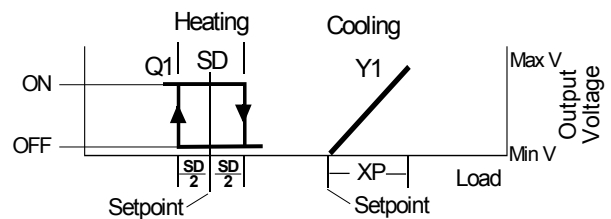
Cascade control is where deviation of room temperature from setpoint adjusts the control point of the leaving air temperature controlling heating and cooling in sequence.

On a fall in room temperature, the leaving air temperature control point is increased and heating is provided via Q1 digital output switching the air electric heater on and off as determined by the heating set point and differential settings.

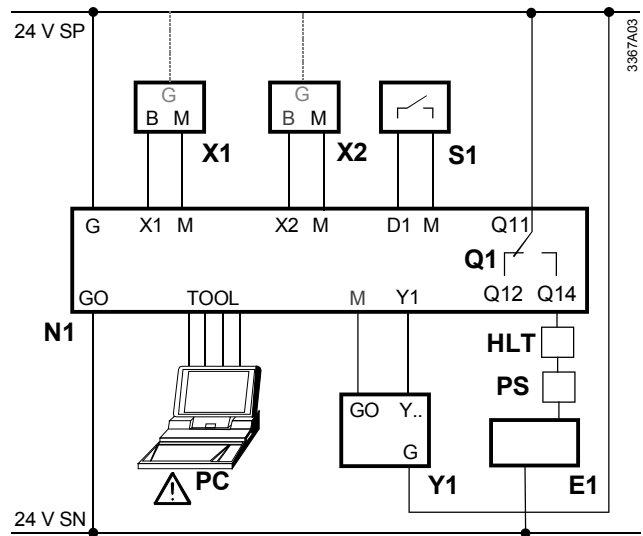
On a rise in room temperature, the leaving air temperature control point is decreased and cooling is provided via the Y1 analogue output modulating the chilled water valve as determined by the cooling set point and proportional band settings.

Function diagram

Heating and cooling sequences



Connection diagram



RWD68

- N1 RWD68 controllers
- X1 Main temperature sensor
- X2 Leaving air temperature sensor.
- S1 Time clock or switch
- Q1 Potential-free relay contacts for 2-position
- Y1 Valve actuator with 0..10Vdc input
- E1 Electrical load 2-position control
- HLT High limit safety thermostat
- PS Pressure switch
- PC Personal Computer

Main Display

The main display shows ,

- Whether Q1 is On or Off (= off, = on)
- Y1 output in Volts dc. (0..10V = 0..100% range)
- Whether day or night set point is selected. (☐ = day, ◐ = night)
- X1 value (room temperature) in ° C.

Other displays are available by pressing the + button, and the various displays are listed below in sequence from the main display.

On entering any of the four set point displays, the setpoint on display can be adjusted by pushing the ● enter/save button, increase value by pressing the ▲+ button or decrease the value by pressing the ▼- button, and when the required value is reached, press the ●enter/save button to save the new value.

The alternative displays return to the main display after 20 seconds.

Press buttons	Action	Current display	Selected display	Selected display comments
▲	Push + button	Q1 Y1 ☐ X1	Q1 SP – h ☐ 25.0c	Q1 heating day set point.
▲	Push + button	Q1 SP – h ☐ 25.0c	Y1 SP – c ☐ 28.0c	Y1 cooling day set point.
▲	Push + button	Y1 SP – c ☐ 28.0c	Q1 SP – h ◐ 16.0c	Q1 heating night set point.
▲	Push + button	Q1 SP – h ◐ 16.0c	Y1 SP – c ◐ 32.0c	Y1 cooling night set point.
▲	Push + button	Y1 SP – c ◐ 32.0c	X1 26.0c	X1 - main temperature sensor reading
▲	Push + button	X1 26.0c	X2 19.0c	X2 - auxiliary supply air temperature sensor reading
▲	Push + button	X2 19.0c	Y1 5.0	Y1 – cooling analogue output value in Vdc to one decimal point
▲	Push + button	Y1 5.0	Q1 OFF	Q1 – heating digital output, display on or off.
▲	Push + button	Q1 OFF	CASC <input type="checkbox"/> / 45	Control sequence diagram and application number display.
▲	Push + button	CASC <input type="checkbox"/> / 45	Q1 Y1 ☐ X1	Back to main display

Values shown are either default values or nominated for information only

Alternatives

- 1) Modulating chilled water valve and two position heating valve.