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CONTROLLER APPLICATION OVERVIEW

The R7426A controller provides one output with one mode of operation, heating or cooling, and is suitable for the following applications:

- **Space or return air temperature control**
- **Discharge air temperature control**
- **Space or return air temperature control with low limit discharge air temperature control**
- **Cascade control of space or return air and discharge air temperature**
- **Cascade control of space air and supply water temperature**
- **Outside air compensated supply water temperature control with or without low or high limit return water temperature control**
- **Constant supply water temperature control with or without return water temperature limit control**

The R7426B,C controllers provide three outputs for sequence control of heating, mixed air dampers or energy recovery systems and cooling and are suitable for the following applications:

- **Space or return air temperature control**
- **Discharge air temperature control**
- **Cascade control of space or return air and discharge air temperature**

Additional control function:

- **Compensation by outside air temperature of main setpoint, e.g. compensated space, return or discharge air temperature**

OPTIONS FOR ALL APPLICATIONS

Remote Control Point Adjustment (CPA). The controller control point can be remotely adjusted through a range of ±5K using a control point adjustment potentiometer in discharge air applications or a room sensor with control point adjustment potentiometer in room control applications connected to terminals 2&4. The configuration parameter C.05 (CPATYP) has to be set to 1, 2 or 4 in accordance to the used potentiometer resistance range.

Remote Setpoint Adjustment (RSA). The controller setpoint can be remotely adjusted through a range of 15...30°C using a room sensor with setpoint adjustment potentiometer connected to terminals 2&4. The configuration parameter C.05 (CPATYP) has to be set to 3.

Comfort/Standby Mode. The controllers provide occupied and unoccupied temperature setpoints. Connecting a room temperature sensor with occupied/unoccupied switch or a presence sensor to the controller occupancy input terminals 1&4 allows to change the controller into Comfort (closed contact) or Standby (open contact) mode.

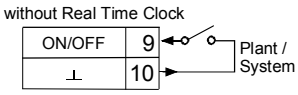
Summer/Winter Compensation. When an outside air temperature sensor (T3) is connected to terminals 7&8 winter and/or summer compensation of the main setpoint can be performed.

Summer/Winter Changeover. The occupancy input, terminals 1&4 on the R7426A controllers can alternatively be used to switch the controller between summer (cooling) and winter (heating) operation in applications using a common valve for heating and cooling control. In summer operation the controller provides a direct acting output (Y1), with an increase in the controlled variable, i. e. room temperature increases, the output increases. In winter operation the controller output (Y1) is reverse acting, with a decrease in the controlled variable the output increases. Summer/Winter changeover function is activated by setting the configuration parameter C.15 (Y1CTRF) to 2. A potential free contact or strap-on thermostat connected to terminals 1&4 is used to switch the controller mode to cooling (contact closed) or heating (contact open) control.

OPTIONS ON CONTROLLERS WITHOUT REAL TIME CLOCK

Controller ON/OFF Operating Mode. Connecting an external time clock or manual switch to the controller Plant/System ON/OFF input terminals 9&10, the controller can be switched ON or OFF. In the OFF operating mode the controller automatically generates zero position output signals on all outputs to drive the valve and damper actuators into the fully closed position. In mixed air damper applications the outdoor and exhaust air dampers are closed and the return air damper is fully open. The time clock also switches the fan(s) OFF and drives the damper actuators (6) in full outside air applications into the closed position by an external installed relay, if the dampers are not controlled by the controller. In full outside air applications the fan(s) switch ON after a time delay to allow the dampers time to open.

NOTE: For Terminals 9&10 see the following Figure



Day/Night Setpoint Operation. An external time clock connected to the controller occupancy input terminals 1&4 provides day/night main temperature setpoint control determined by the programmed offset parameter value P.16 (SOFFS) for those heating or ventilation systems operating 24 hour per day.

SAFETY FOR APPLICATIONS NO. D10 TO D16 AND R10 TO R16

Safe Operation of Electric Heater Battery. The high limit thermostat (7) installed close to the electric heater battery switches the electric air heater OFF at temperatures above its adjustable setpoint.
The air flow switch (10) also switches the electric heater battery OFF in the event of fan failure (no air flow). Alternatively, the differential air pressure switch (9) across the discharge air fan can be used for the same function.

Filter Monitoring. The differential air pressure switch (8) closes a contact to issue an alarm at a differential pressure above its adjustable setpoint to indicate that the filter is dirty and in need of maintenance.

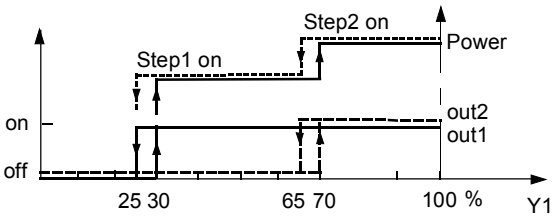
Fan Monitoring. The differential air pressure switch (9) switches the fan motor OFF at a differential pressure below its adjustable setpoint to indicate no air flow. An external time delay relay overrides the fan monitoring function for a short period during start-up to avoid false alarms. The monitoring function is re-established after the adjustable time delay period.

OPTIONS OF OUTPUT (Y1) OPERATION FOR APPLICATIONS NO. 1&2 BY SELECTION OF Y1 MODE

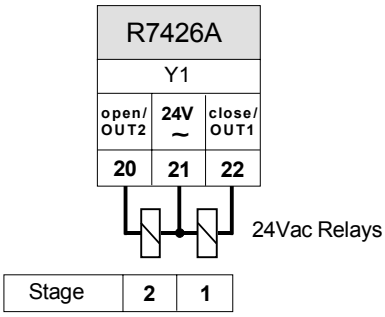
Control of Electric Heating, Configuration Parameter C.15, Y1CTRF = 1

1. 2-stage On/Off Sequence Control, Y1Mode = 1

Functional Diagram

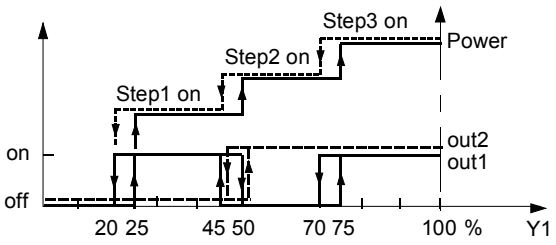


Wiring Connections

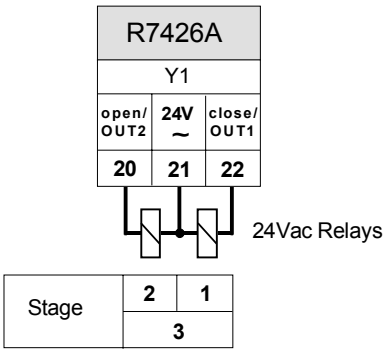


2. 3-stage Binary Coded On/Off Sequence Control, Y1Mode = 2

Functional Diagram



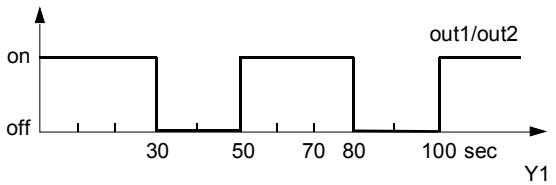
Wiring Connections



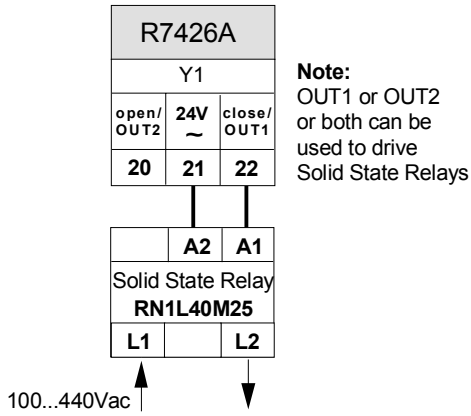
3. Time Proportional Control by Pulse Width Modulated Output, Y1Mode = 3

Functional Diagram

The diagram shows as example, 60% Output Signal with Motor **RuntimeY1** set to 50 sec:



Wiring Connections



Note:
OUT1 or OUT2 or both can be used to drive Solid State Relays

On/Off Control of Cooling, Configuration Parameter C.15, Y1CTRF = 0

1. 2-stage On/Off Sequence Control, Y1Mode = 1

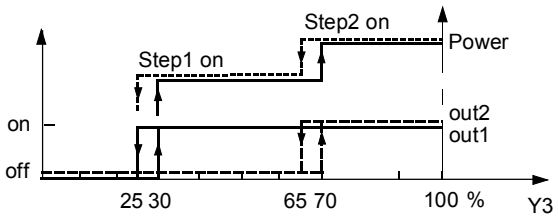
See functional diagram and wiring connections of option 1 for electric heating.

OPTIONS OF OUTPUT (Y3) OPERATION FOR APPLICATIONS NO. 3 TO 9 BY SELECTION OF Y3 MODE

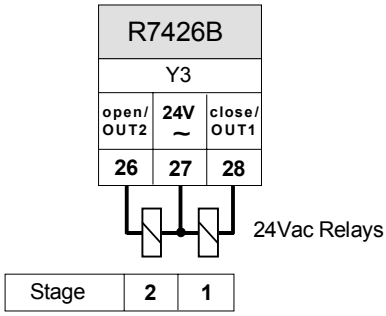
Control of Electric Heating, YMode = 0

1. 2-stage On/Off Sequence Control, Y3Mode = 1

Functional Diagram

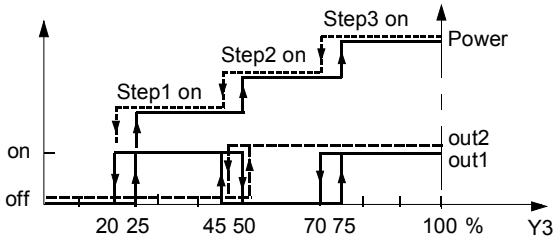


Wiring Connections

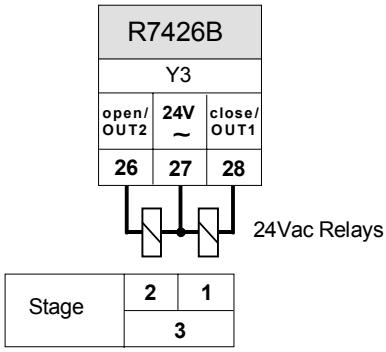


2. 3-stage Binary Coded On/Off Sequence Control, Y3Mode = 2

Functional Diagram



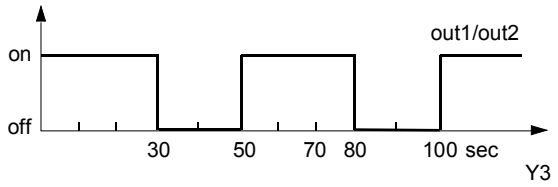
Wiring Connections



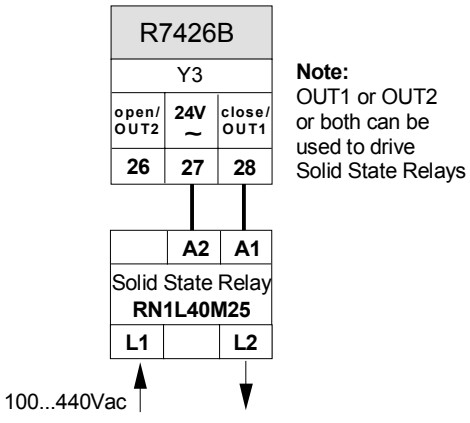
3. Time Proportional Control by Pulse Width Modulated Output, Y3Mode = 3

Functional Diagram

The diagram shows as example, 60% Output Signal with Motor **RuntimeY3** set to 50 sec:



Wiring Connections

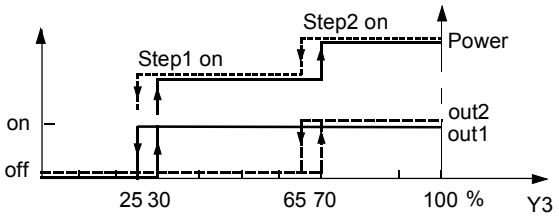


Note:
OUT1 or OUT2 or both can be used to drive Solid State Relays

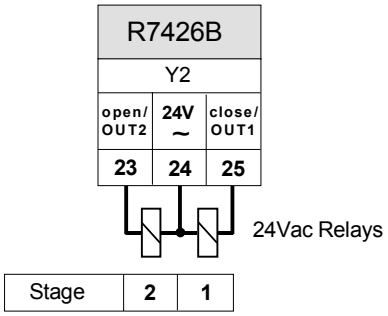
On/Off Control of Cooling, Ymode = 0

1. 2-stage On/Off Sequence Control, Y2Mode = 1

Functional Diagram



Wiring Connections



OPTIONS SEQUENCE OPERATION FOR APPLICATIONS NO. 10 TO 11

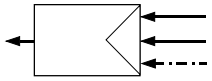
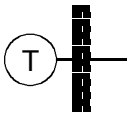
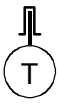
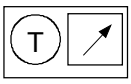
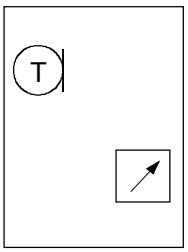
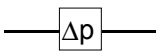
Application No. 10 (Selection: YMode = 3 and Y1mode = 4, Y3Mode = 4, Y2Mode = 1)

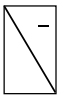
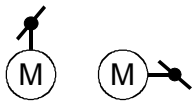
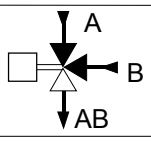
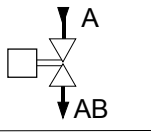
4-stage On/Off sequence control of cooling (Output Y1 & Y3) and 2-stage On/off sequence control of electric heating (Output Y2). The wiring connections are the same as shown in application example no. 10.

Application No. 11 (Selection: YMode = 3 and Y1mode = 4, Y3Mode = 4, Y2Mode = 0)

4-stage On/Off sequence control of cooling (Output Y1 & Y3) and modulating control of heating valve. The wiring connections are the same as shown in application example no. 11.

GRAPHICAL SYMBOLS

1		MicroniK 200 Controller
2		Duct Temperature Sensor or Outside Air Sensor, Duct Mounting
3		Room Air Sensor
4		Outdoor Air Sensor, Wall Mounting
5		Immersion Temperature Sensor
6		Freeze Protection or High Limit Thermostat in Elektric Heating Applications
7		Remote Setpoint Adjustment Potentiometer
8		Room Air Sensor with Remote Setpoint Adjustment
9		Room with e. g. Room Air Sensor and Remote Setpoint Adjustment Potentiometer
10		Differential Pressure Switch
11		Air Flow Switch

12		Supply Air Fan or Return Air Fan
13		Filter
14		Heating Coil
15		Energy Recovery Coil
16		Cooling Coil
17		Electric Heater
18		Radiator
19		Recirculation Pump
20		Damper Actuator
21		Valve/Actuator 3 - Way
22		Valve/Actuator 2 - Way
23		24Vac/230Vac Relays or Solid State Relay (Electric Current Valve)

NOTE: Connections shown with dotted lines are options.