## Ventilation Plant, Heating

Synco™ 100 RLM162

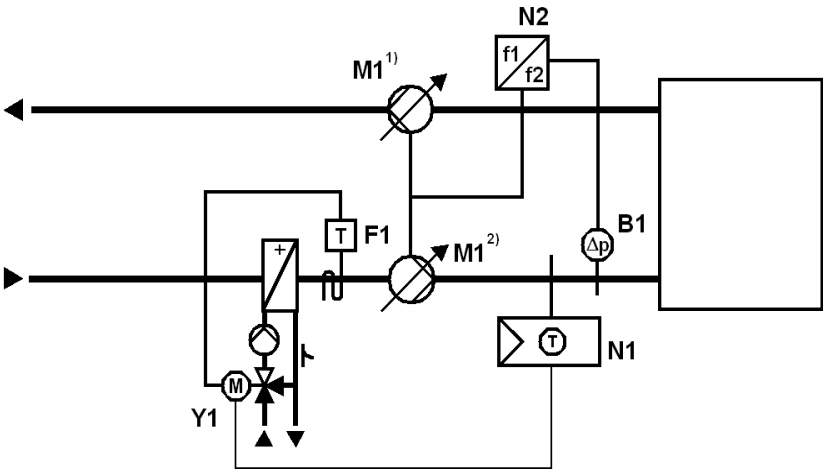
### Supply Air Temperature Control

Air handling unit with heating coil, frequency inverter controlled supply and extract fans

**Use**

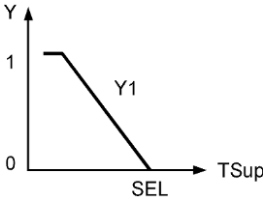
- Office buildings
- Public buildings
- Stores
- Theatres

**Plant diagram**

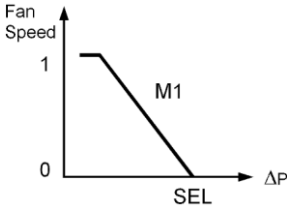



**Function diagrams**

**Temperature control**




**Pressure control**




| | |
|---|---|
| Δp | Pressure difference |
| B1 | Differential pressure sensor |
| F1 | Frost protection unit |
| M1 1) | Extract fan |
| M1 2) | Supply fan |
| SEL | Setpoint |
| TSup | Supply air temperature |
| Y | Control signal |
| Y1 | Heating coil |

**Description of Functions**

**Basic functions**

Synco™ 100 temperature controller (N1) compares the supply air temperature (measured by its built-in temperature sensor) with the setpoint value.
If the supply air temperature falls below the setpoint, the controller adjusts the heating valve (Y1) accordingly.
The speed of the fan motor is controlled via the integrated PID controller within the frequency inverter to maintain a constant supply air pressure.
If the supply air pressure measured by the pressure sensor (B1) falls below the setpoint, the frequency inverter adjusts the fan speed (M1) accordingly

**Frost protection**

A frost protection unit (F1) can be provided to protect the heater battery from freezing.





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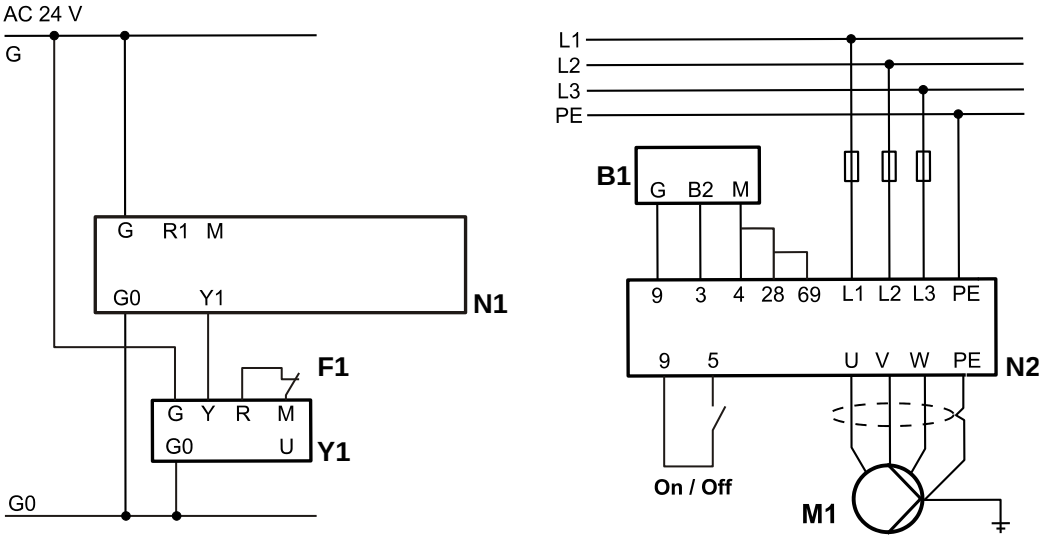
**Device list**

| Legend | Type of unit | Data sheet | Product No. | Qty. |
|---|---|---|---|---|
| N1 | Air duct temperature controller, AC 24 V, 2 outputs DC 0…10 V | N3332 | RLM162 | 1 |
| N2 | Variable Speed Drive for pumps and fans | N5111 + | G120P.. | 1 |
| B1 | Air duct differential pressure sensor, 0...250 Pa / 0...500 Pa | N1910 | QBM66.202 | 1 |
| F1 | Frost monitor, 2-point | N1284 | QAF81.. | 1 |
| Y1 | 2- or 3-port valve | + | VV.. / VX.. / M.. | 1 |
| | Modulating valve actuator, AC 24 V, DC 0...10 V | + | S..6... | 1 |

**Variants**

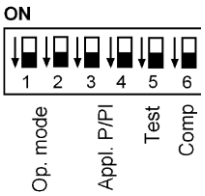
| Legend | Type of unit | Data sheet | Product No. | Qty. |
|---|---|---|---|---|
| B1a | Differential pressure sensor, DC 0...10 V | N1910 | QBM66.. | 1 |

**Connection diagram**




| | |
|---|---|
| B1 | Differential pressure sensor |
| F1 | Frost protection unit |
| M1 | Supply fan (extract fan) |
| N1 | Supply air temperature controller |
| N2 | Variable speed drive |
| Y1 | Heating valve |

**Parameter settings**




| Function | No | Setting | DIP switch settings |
|---|---|---|---|
| **RLM162 (controller N1)** | | | |
| Operating mode | 1 | Single stage heating | OFF |
| | 2 | | OFF |
| Application (P/PI) | 3 | Supply air control (MEDIUM) | OFF |
| | 4 | PI integral action time = 180 s | OFF |
| Test | 5 | Test mode = OFF | OFF |
| Compensation | 6 | Not used | OFF |

**Note**

Press "P" and then "Fn" to round up r0000
Press "P" to access the display

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**Engineering notes RLM162**

- Default values have been used whenever possible
- Some settings are plant-specific and may need altering after the initial commissioning of the controller
- **We have not shown all plant interlocks in the connection diagram; only those directly connected to the controllers or associated equipment**
- To check the control wiring, the controller can be switched into test mode (DIP switch 5 = ON) so that the response of the actuating device can be checked. In test mode, the rotary knob position drives the output between DC 0…10 V
- If the control is unstable, increase the proportional band; if it is too slow, decrease the proportional band
- An operating voltage of AC 24 V is necessary for the controller. The required transformer capacity should be determined by adding together the power consumption of the individual items

**Engineering notes G120P**

- The speed of the fan motor shall be controlled via the integrated PID controller within the G120P
- A digital input is required to start / stop the fan
- Error messages are available via relay output DO0
- Indication of the operating state is available via relay output DO2
- The drive needs to be turned on or off by a digital input. This can be done individually depending on the plant or application
- This is a multi-motor application. Please check the commissioning guide for application note





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