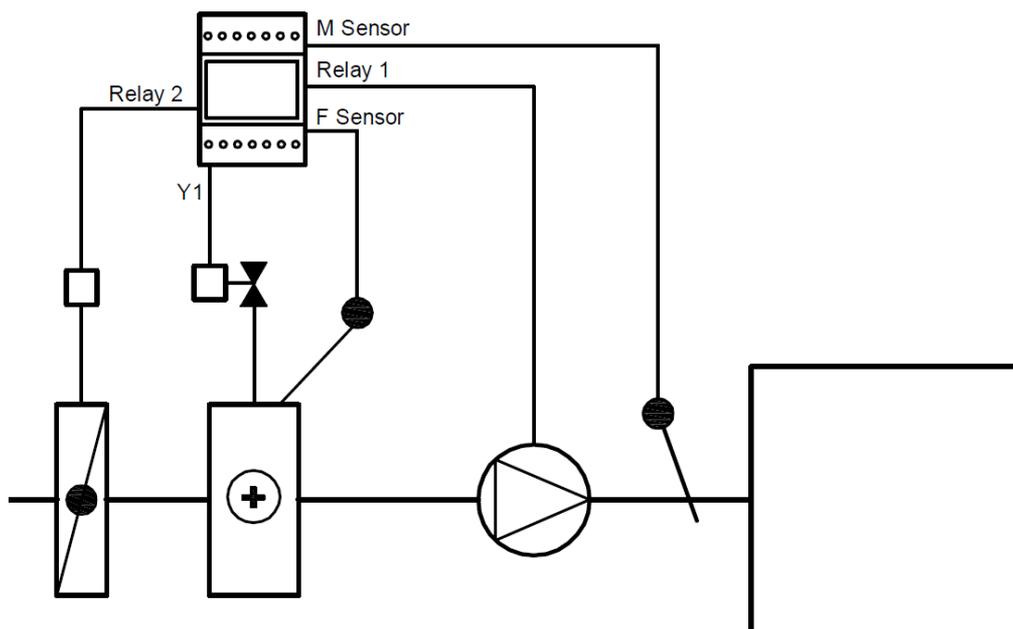


APPLICATION NOTE

PRODUCT ID: TRD-3986

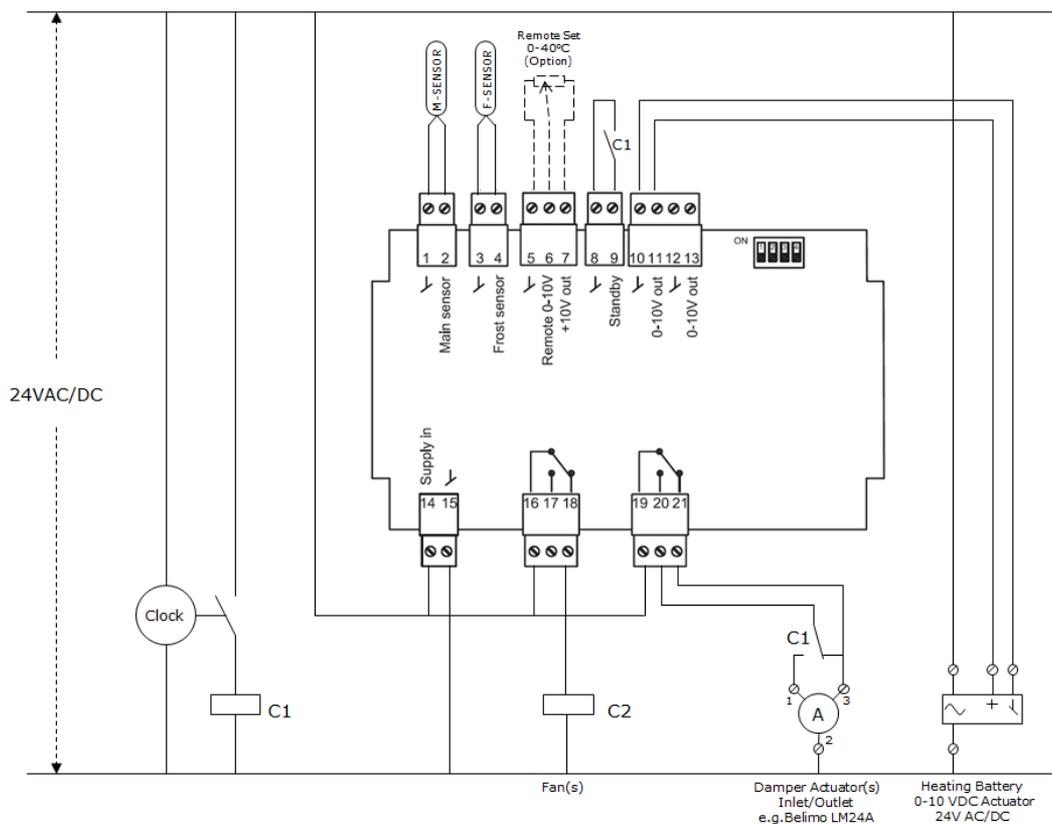
Duct control of one heating battery

APPLICATION 1



Frost protect: Y1
 Regulator mode: PI Duct
 Y2: Heat

ELECTRICAL WIRING DIAGRAMME (Principe)



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 DK-6400 SØNDERBORG
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APPLICATION NOTE

APPLICATION 1

Duct control of one heating battery

FUNCTIONALITY

Introduction

TRD-3986 is a temperature controller with built-in frost protection feature specially designed for small and medium-sized ventilation systems. TRD-3986 has two analogue 0-10 V DC outputs, which are easily configured by means of DIP switches for the control of a single heating battery or the sequential control of a heating battery and a cooling battery, a heating battery and a heat exchanger or two heating batteries. TRD-3986 also has two digital relay outputs for controlling damper motors and starting/stopping fans. TRD-3986 has two standard PT-1000 sensor inputs: one for the main sensor, located either in the inlet duct of a ventilation system or in the room where temperature is to be controlled, and one for a sensor used to protect the heating battery from frost.

Startup procedure

The system is started and the controller released for control purposes by activating the "Standby input" on terminals 8 & 9 (8-9 = "1"). Initially, the heating step on Y1 is set to 100% for 60 seconds (see instruction fig. 22). If the temperature recorded by the main sensor drops below the value set on the "a" button and DIP4 is set to "Heating" ("OFF"), Y2 is set to 100% for 60 seconds and the fan is then started by R1 switching to "ON" (R1=16-18="1"). TRD then controls the temperature recorded by the main sensor in accordance with the value set on the setpoint dial (button "a") or the setpoint received via a remote signal, DIP3.

Control of one heating battery

Inlet temperature is controlled by regulating a heating valve (see instruction figs 3, 4 & 23). If the inlet temperature is below the value set on button "a" or via an external temperature setpoint signal, the Y1 output is gradually increased towards 100% (+10 V DC), depending on the P-band and I-time settings. If the inlet/room temperature is above the value set on button "a" or via an external temperature setpoint signal, the Y1 output is gradually reduced towards 0% (+0 V DC), depending on the P-band and I-time settings (only with PI control). Note the DIP switch settings (see instruction fig. 18).

OJ ELECTRONICS COMPONENTS



Electronic
Day-/Week clock for DIN-rail
OJ Nr.:
MM-7595
EAN:4011732013110



Electronic
Air Temperature Controller
OJ Nr.:
TRD-3986
EAN:5703502550497



Supply Air Sensor
Duct Mounting
OJ Nr.:
ETF-1098L1-4
EAN:5703502701349



Frost Sensor
Water Heating Battery
OJ Nr.:
ETF-198-3
EAN:5703866101052

NON OJ COMPONENTS

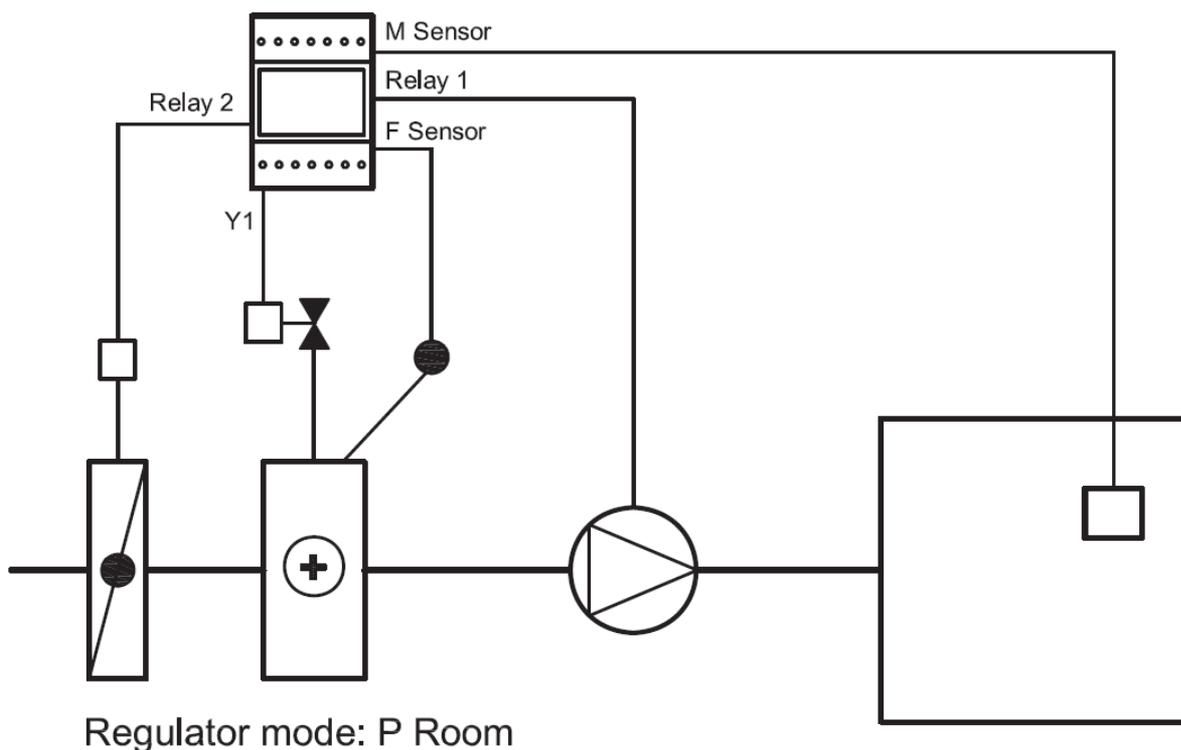
- Dampermotor for inlet- and exhaust dampers (e.g. Belimo)
- Cirkulationpump, valve og valvemotor for heating battery (e.g. Belimo)
- Electrical cabinet

APPLICATION NOTE

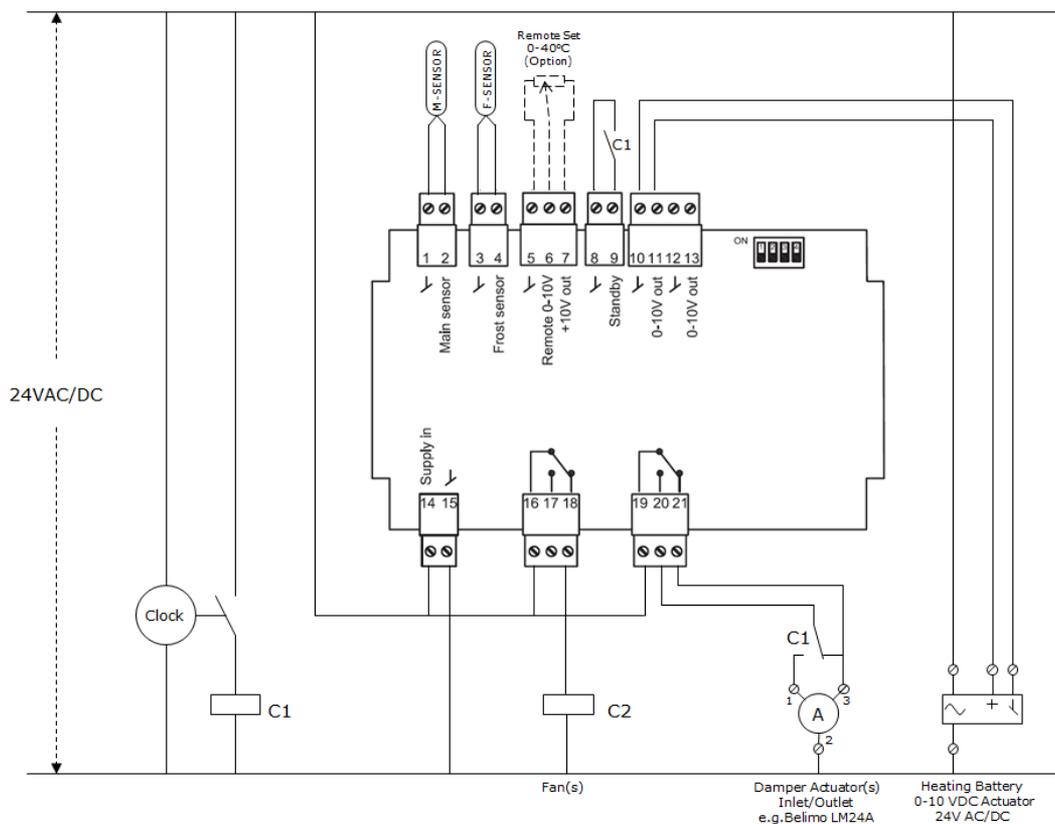
PRODUCT ID: TRD-3986

Room control of one heating battery

APPLICATION 2



ELECTRICAL WIRING DIAGRAMME (Principe)



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OJ ELECTRONICS
taking comfort further

APPLICATION NOTE

APPLICATION 2

Room control of one heating battery

FUNCTIONALITY

Introduction

TRD-3986 is a temperature controller with built-in frost protection feature specially designed for small and medium-sized ventilation systems. TRD-3986 has two analogue 0-10 V DC outputs, which are easily configured by means of DIP switches for the control of a single heating battery or the sequential control of a heating battery and a cooling battery, a heating battery and a heat exchanger or two heating batteries. TRD-3986 also has two digital relay outputs for controlling damper motors and starting/stopping fans. TRD-3986 has two standard PT-1000 sensor inputs: one for the main sensor, located either in the inlet duct of a ventilation system or in the room where temperature is to be controlled, and one for a sensor used to protect the heating battery from frost.

Startup procedure

The system is started and the controller released for control purposes by activating the "Standby input" on terminals 8 & 9 (8-9 = "1"). Initially, the heating step on Y1 is set to 100% for 60 seconds (see instruction fig. 22). If the temperature recorded by the main sensor drops below the value set on the "a" button and DIP4 is set to "Heating" ("OFF"), Y2 is set to 100% for 60 seconds and the fan is then started by R1 switching to "ON" (R1=16-18="1"). TRD then controls the temperature recorded by the main sensor in accordance with the value set on the setpoint dial (button "a") or the setpoint received via a remote signal, DIP3.

Control of one heating battery

Room temperature is controlled by regulating a heating valve (see instruction figs 3, 4 & 23). If the room temperature is below the value set on button "a" or via an external temperature setpoint signal, the Y1 output is gradually increased towards 100% (+10 V DC), depending on the P-band and I-time settings. If the inlet/room temperature is above the value set on button "a" or via an external temperature setpoint signal, the Y1 output is gradually reduced towards 0% (+0 V DC), depending on the P-band and I-time settings (only with PI control). Note the DIP switch settings (see instruction fig. 18).

OJ ELECTRONICS COMPONENTS



Electronic
Day-/Week clock for DIN-rail
OJ Nr.:
MM-7595
EAN:4011732013110



Electronic
Air Temperature Controller
OJ Nr.:
TRD-3986
EAN:5703502550497



Room Sensor
Room Mounting
OJ Nr.:
ETF-998-H
EAN:5703502500300



Frost Sensor
Water Heating Battery
OJ Nr.:
ETF-198-3
EAN:5703866101052

NON OJ COMPONENTS

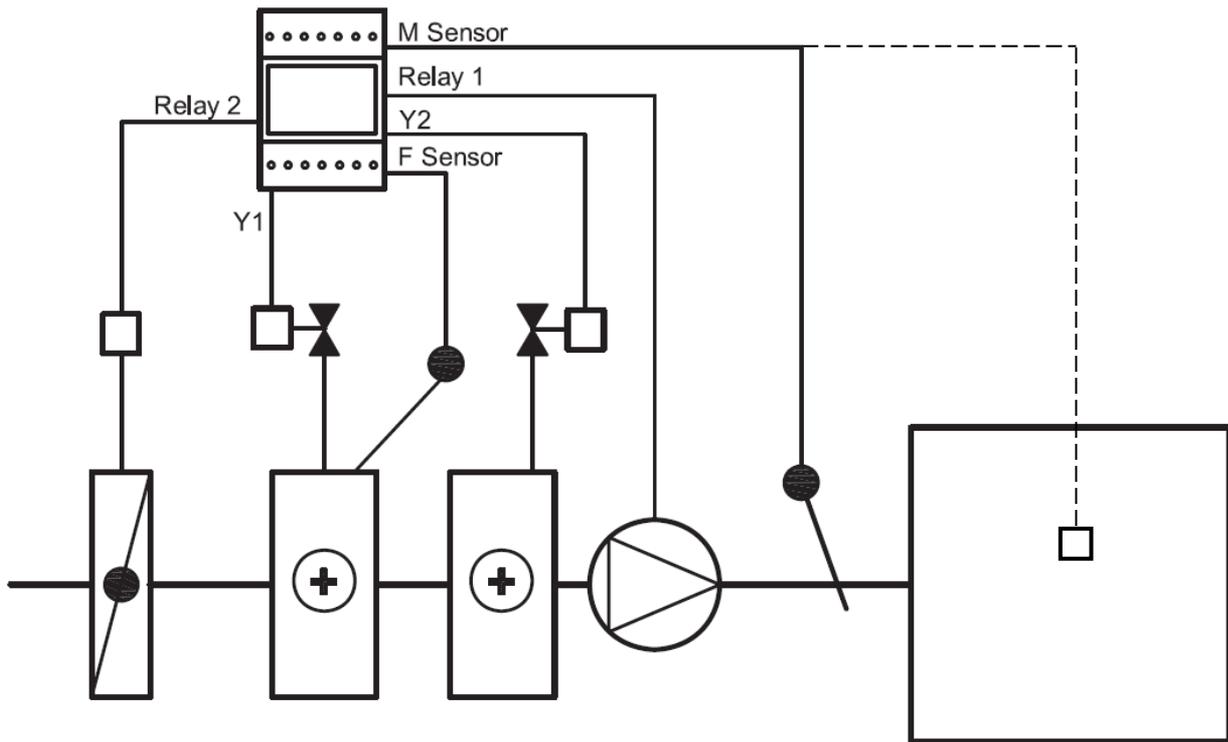
- Dampermotor for inlet- and exhaust dampers (e.g. Belimo)
- Cirkulationpump, valve og valvemotor for heating battery (e.g. Belimo)
- Electrical cabinet

APPLICATION NOTE

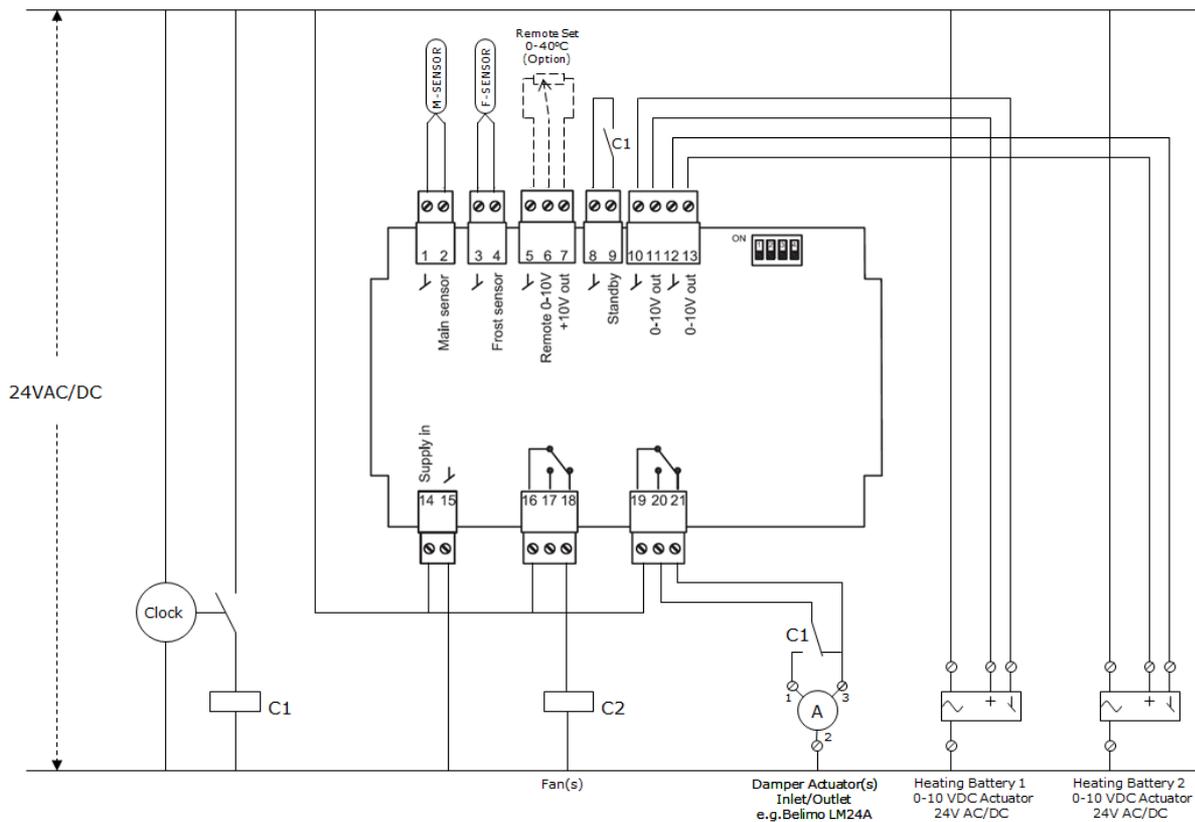
PRODUCT ID: TRD-3986

Sequential control of two heating batteries

APPLICATION 3



ELECTRICAL WIRING DIAGRAMME (Principe)



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 WWW.OJ.DK

APPLICATION NOTE

APPLICATION 3

Sequential control of two heating batteries

FUNCTIONALITY

Introduction

TRD-3986 is a temperature controller with built-in frost protection feature specially designed for small and medium-sized ventilation systems. TRD-3986 has two analogue 0-10 V DC outputs, which are easily configured by means of DIP switches for the control of a single heating battery or the sequential control of a heating battery and a cooling battery, a heating battery and a heat exchanger or two heating batteries. TRD-3986 also has two digital relay outputs for controlling damper motors and starting/stopping fans. TRD-3986 has two standard PT-1000 sensor inputs: one for the main sensor, located either in the inlet duct of a ventilation system or in the room where temperature is to be controlled, and one for a sensor used to protect the heating battery from frost.

Startup procedure

The system is started and the controller released for control purposes by activating the "Standby input" on terminals 8 & 9 (8-9 = "1"). Initially, the heating step on Y1 is set to 100% for 60 seconds (see instruction fig. 22). If the temperature recorded by the main sensor drops below the value set on the "a" button and DIP4 is set to "Heating" ("OFF"), Y2 is set to 100% for 60 seconds and the fan is then started by R1 switching to "ON" (R1=16-18="1"). TRD then controls the temperature recorded by the main sensor in accordance with the value set on the setpoint dial (button "a") or the setpoint received via a remote signal, DIP3.

Sequential control of two heating batteries

Inlet/room temperature is controlled by sequentially regulating two heating valves (see instruction figs 6, 20 & 24). If the inlet/room temperature is below the value set on button "a" or via an external temperature setpoint signal, first the Y1 output and then the Y2 output are gradually increased towards 100% (+10 V DC), depending on the P-band and I-time settings (I-time only with PI control, i.e. DIP2="off"). If the inlet/room temperature is above the value set on button "a" or via an external temperature setpoint signal, first the Y2 output and then the Y1 output are gradually reduced towards 0% (+0 V DC), depending on the P-band and I-time settings (I-time only with PI control, i.e. DIP2="off"). Note the DIP switch settings (see instruction fig. 18).

OJ ELECTRONICS COMPONENTS



Electronic
Day-/Week clock for DIN-rail
OJ Nr.:
MM-7595
EAN:4011732013110



Electronic
Air Temperature Controller
OJ Nr.:
TRD-3986
EAN:5703502550497



Supply Air Sensor
Duct Mounting
OJ Nr.:
ETF-1098L1-4
EAN:5703502701349

or



Room Sensor
Room Mounting
OJ Nr.:
ETF-998-H
EAN:5703502500300



Frost Sensor
Water Heating Battery
OJ Nr.:
ETF-198-3
EAN:5703866101052

NON OJ COMPONENTS

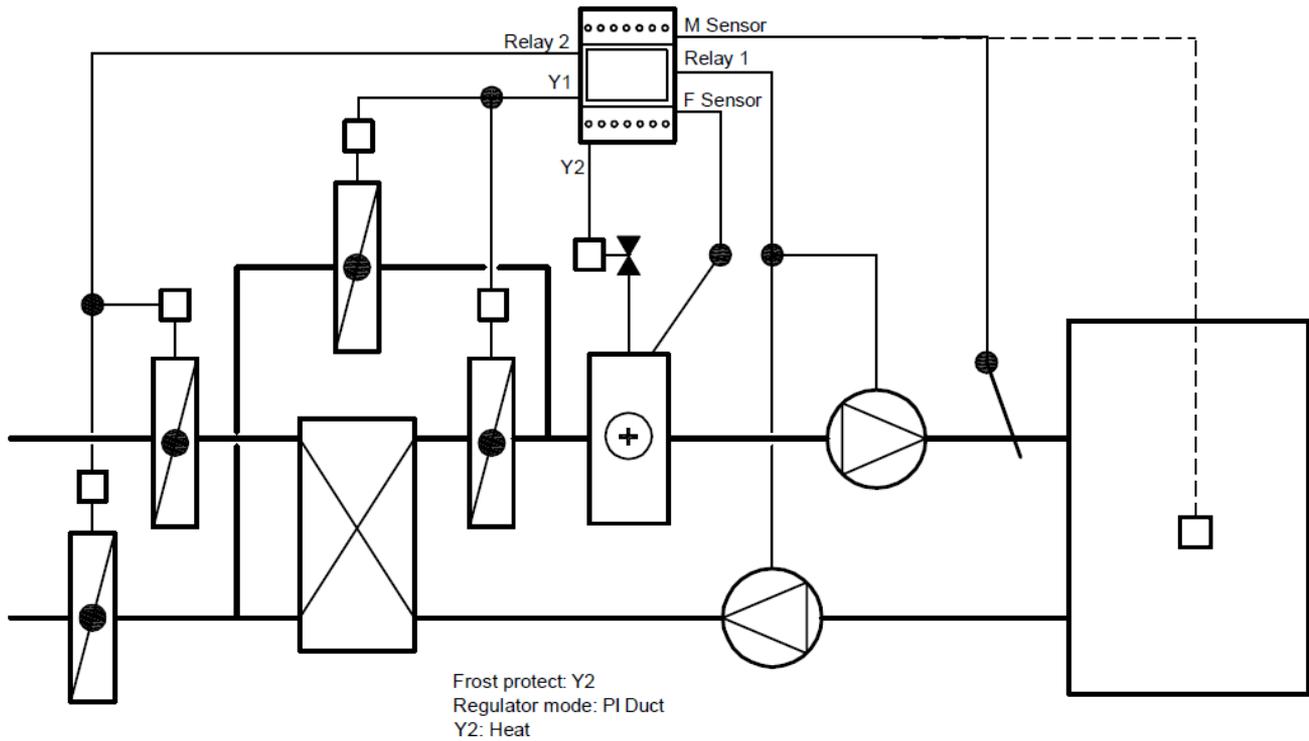
- Dampermotor for inlet- and exhaust dampers (e.g. Belimo)
- Cirkulationpump, valve og valvemotor for heating battery (e.g. Belimo)
- Electrical cabinet

APPLICATION NOTE

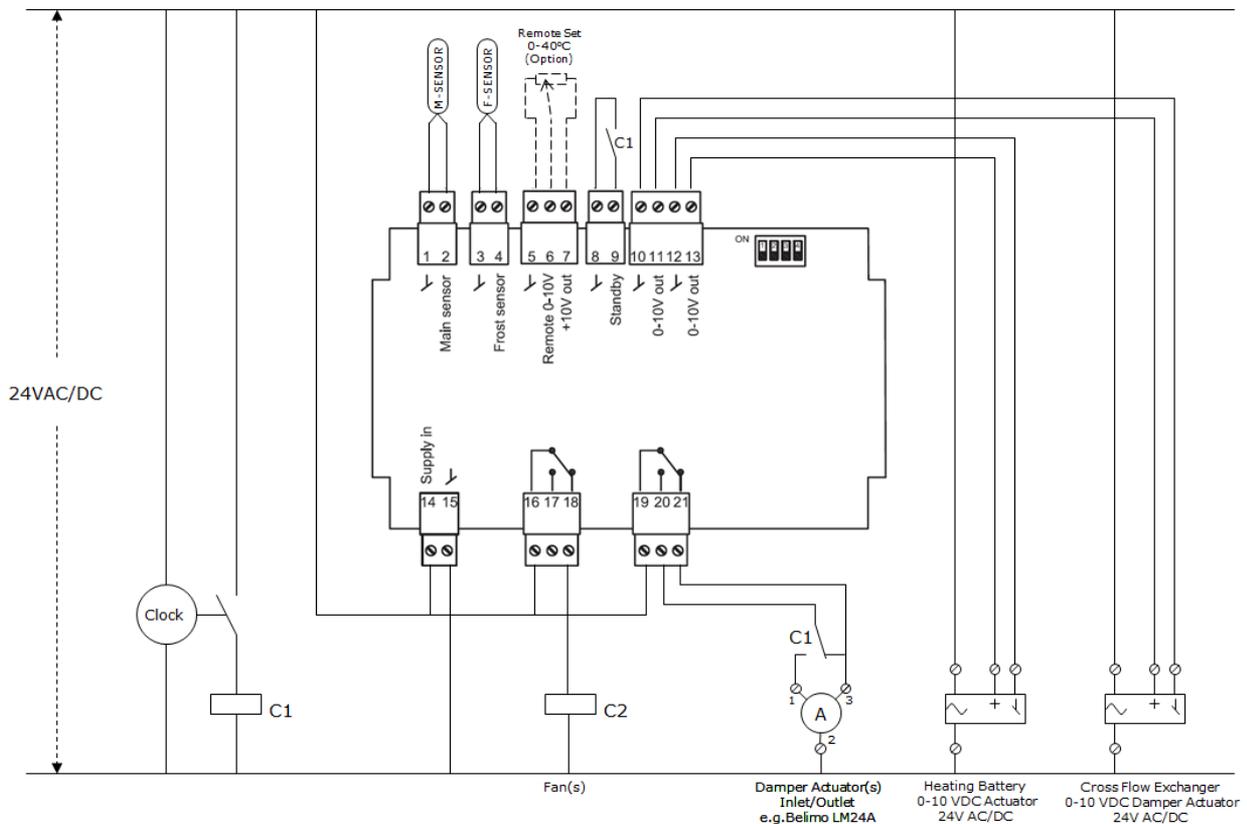
PRODUCT ID: TRD-3986

Sequential control of cross-flow heat exchanger and heating battery

APPLICATION 4



ELECTRICAL WIRING DIAGRAMME (Principe)



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APPLICATION NOTE

APPLICATION 4

Sequential control of cross-flow heat exchanger and heating battery

FUNCTIONALITY

Introduction

TRD-3986 is a temperature controller with built-in frost protection feature specially designed for small and medium-sized ventilation systems. TRD-3986 has two analogue 0-10 V DC outputs, which are easily configured by means of DIP switches for the control of a single heating battery or the sequential control of a heating battery and a cooling battery, a heating battery and a heat exchanger or two heating batteries. TRD-3986 also has two digital relay outputs for controlling damper motors and starting/stopping fans. TRD-3986 has two standard PT-1000 sensor inputs: one for the main sensor, located either in the inlet duct of a ventilation system or in the room where temperature is to be controlled, and one for a sensor used to protect the heating battery from frost.

Startup procedure

The system is started and the controller released for control purposes by activating the "Standby input" on terminals 8 & 9 (8-9 = "1"). Initially, the heating step on Y1 is set to 100% for 60 seconds (see instruction fig. 22). If the temperature recorded by the main sensor drops below the value set on the "a" button and DIP4 is set to "Heating" ("OFF"), Y2 is set to 100% for 60 seconds and the fan is then started by R1 switching to "ON" (R1=16-18="1"). TRD then controls the temperature recorded by the main sensor in accordance with the value set on the setpoint dial (button "a") or the setpoint received via a remote signal, DIP3.

Sequential control of cross-flow heat exchanger and heating battery

Inlet/room temperature is controlled by sequentially regulating the damper motor(s) on a cross-flow heat exchanger and a heating valve (see instruction figs 9, 20 & 26). If the inlet/room temperature is below the value set on button "a" or via an external temperature setpoint signal, the Y1 output (damper motor) is gradually increased towards 100% (+10 V DC). The bypass damper closes and the heat exchanger damper opens. The Y2 output (heating) is then gradually increased towards 100% (+10 V DC), depending on the P-band and I-time settings (I-time only with PI control, i.e. DIP2="off"). If the inlet/room temperature is above the value set on button "a" or via an external temperature setpoint signal, the Y2 output (heating) is gradually reduced towards 0% (+0 V DC). The Y1 output (damper motor) is then gradually reduced towards 0% (+0 V DC), depending on the P-band and I-time settings (I-time only with PI control, i.e. DIP2="off"), thus closing the heat exchanger damper and opening the bypass damper. Note the DIP switch settings (see instruction fig. 18).

OJ ELECTRONICS COMPONENTS



Electronic
Day-/Week clock for DIN-rail
OJ Nr.:
MM-7595
EAN:4011732013110



Electronic
Air Temperature Controller
OJ Nr.:
TRD-3986
EAN:5703502550497



Supply Air Sensor
Duct Mounting
OJ Nr.:
ETF-1098L1-4
EAN:5703502701349

or



Room Sensor
Room Mounting
OJ Nr.:
ETF-998-H
EAN:5703502500300



Frost Sensor
Water Heating Battery
OJ Nr.:
ETF-198-3
EAN:5703866101052

NON OJ COMPONENTS

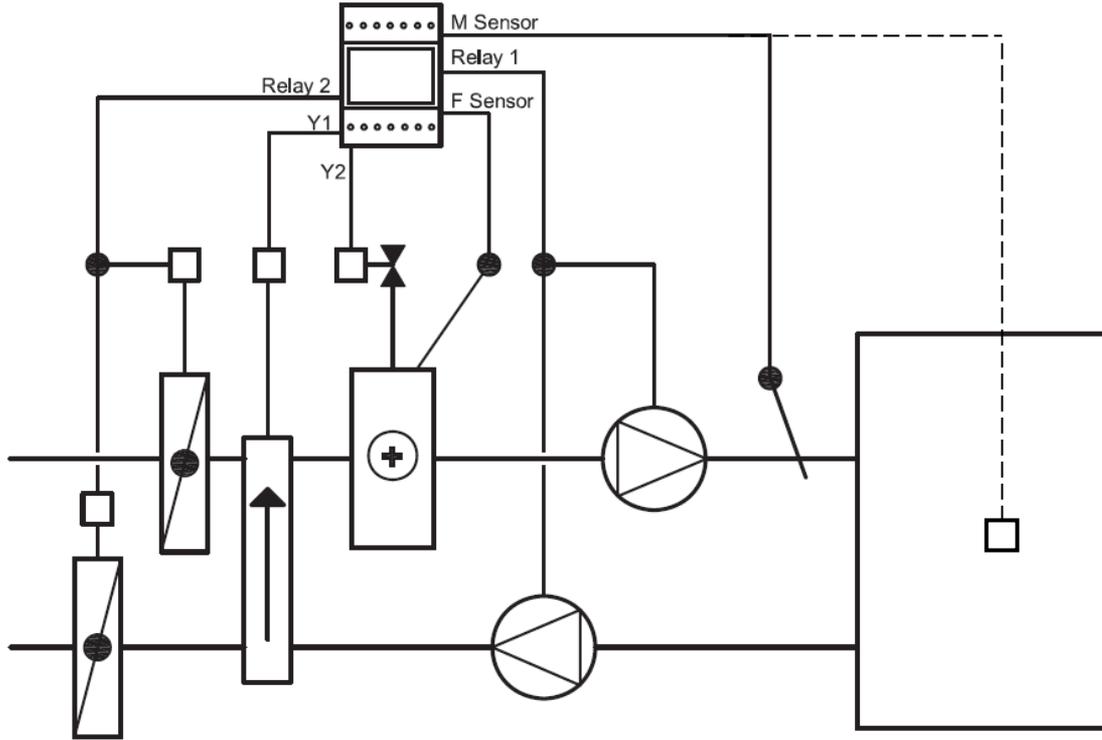
- Dampermotor for inlet- and exhaust dampers (e.g. Belimo)
- Cirkulationpump, valve og valvemotor for heating battery (e.g. Belimo)
- Electrical cabinet

APPLICATION NOTE

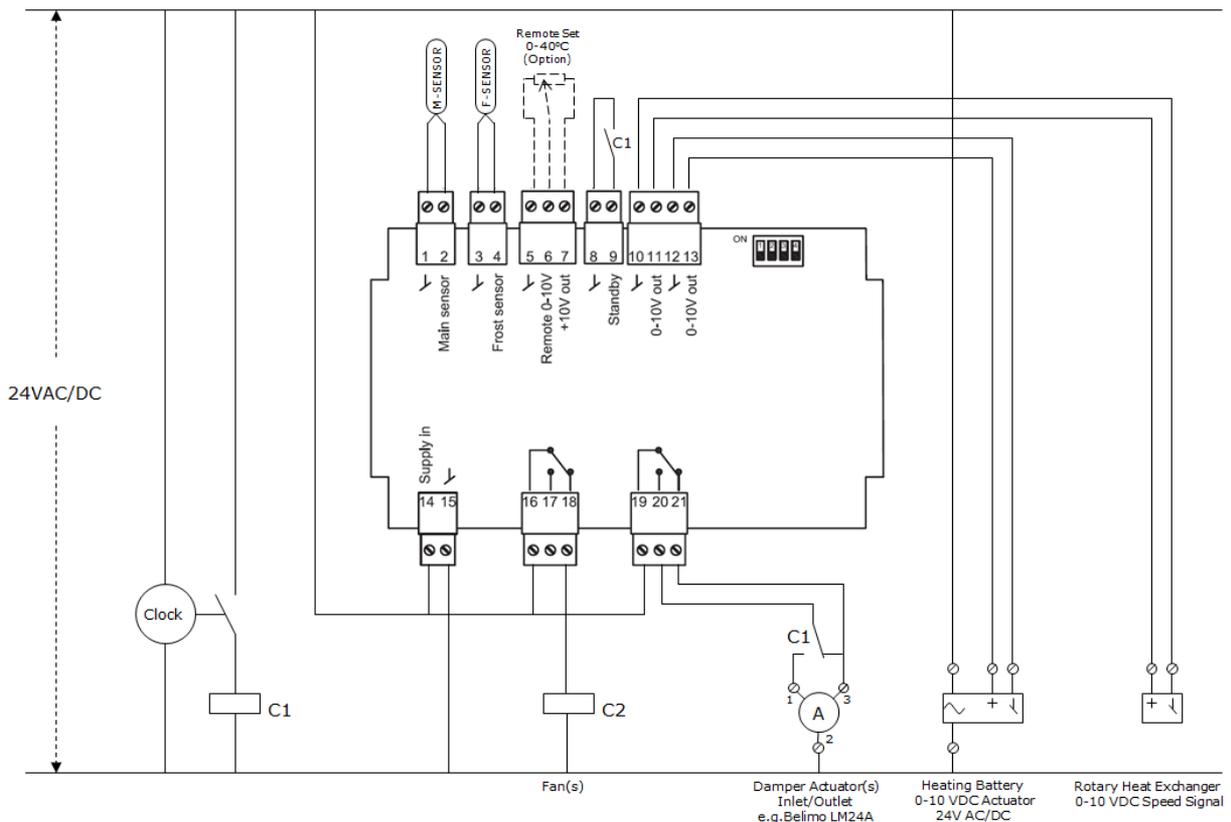
PRODUCT ID: TRD-3986

Sequential control of rotary heat exchanger and heating battery

APPLICATION 5



ELECTRICAL WIRING DIAGRAMME (Principe)



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APPLICATION NOTE

APPLICATION 5

Sequential control of rotary heat exchanger and heating battery

FUNCTIONALITY

Introduction

TRD-3986 is a temperature controller with built-in frost protection feature specially designed for small and medium-sized ventilation systems. TRD-3986 has two analogue 0-10 V DC outputs, which are easily configured by means of DIP switches for the control of a single heating battery or the sequential control of a heating battery and a cooling battery, a heating battery and a heat exchanger or two heating batteries. TRD-3986 also has two digital relay outputs for controlling damper motors and starting/stopping fans. TRD-3986 has two standard PT-1000 sensor inputs: one for the main sensor, located either in the inlet duct of a ventilation system or in the room where temperature is to be controlled, and one for a sensor used to protect the heating battery from frost.

Startup procedure

The system is started and the controller released for control purposes by activating the "Standby input" on terminals 8 & 9 (8-9 = "1"). Initially, the heating step on Y1 is set to 100% for 60 seconds (see instruction fig. 22). If the temperature recorded by the main sensor drops below the value set on the "a" button and DIP4 is set to "Heating" ("OFF"), Y2 is set to 100% for 60 seconds and the fan is then started by R1 switching to "ON" (R1=16-18="1"). TRD then controls the temperature recorded by the main sensor in accordance with the value set on the setpoint dial (button "a") or the setpoint received via a remote signal, DIP3.

Sequential control of rotary heat exchanger and heating battery

Inlet/room temperature is controlled by sequentially regulating a rotary heat exchanger and a heating valve (see instruction figs 7, 20 & 27). If the inlet/room temperature is below the value set on button "a" or via an external temperature setpoint signal, the Y1 output (rotary heat exchanger) is gradually increased towards 100% (+10 V DC). The Y2 output (heating) is then gradually increased towards 100% (+10 V DC), depending on the P-band and I-time settings (I-time only with PI control, i.e. DIP2="off"). If the inlet/room temperature is above the value set on button "a" or via an external temperature setpoint signal, the Y2 output (heating) is gradually reduced towards 0% (+0 V DC). The Y1 output (rotary heat exchanger) is then gradually reduced towards 0% (+0 V DC), depending on the P-band and I-time settings (I-time only with PI control, i.e. DIP2="off"). Note the DIP switch settings (see instruction fig. 18).

OJ ELECTRONICS COMPONENTS



Electronic
Day-/Week clock for DIN-rail
OJ Nr.:
MM-7595
EAN:4011732013110



Electronic
Air Temperature Controller
OJ Nr.:
TRD-3986
EAN:5703502550497



Supply Air Sensor
Duct Mounting
OJ Nr.:
ETF-1098L1-4
EAN:5703502701349

or



Room Sensor
Room Mounting
OJ Nr.:
ETF-998-H
EAN:5703502500300



Frost Sensor
Water Heating Battery
OJ Nr.:
ETF-198-3
EAN:5703866101052

NON OJ COMPONENTS

- Dampermotor for inlet- and exhaust dampers (e.g. Belimo)
- Cirkulationpump, valve og valvemotor for heating battery (e.g. Belimo)
- Electrical cabinet



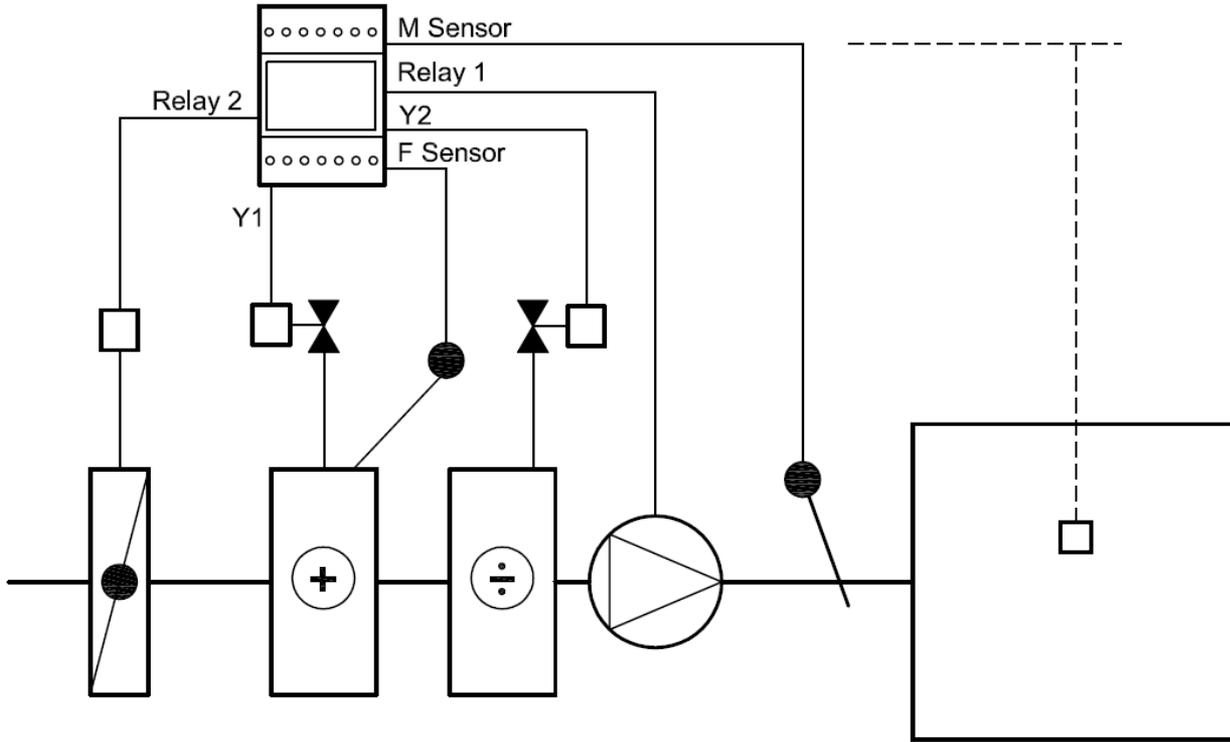
Controller and stepmotor for
Rotary Heat Exchanger
RHX2M
EAN:5703502550817

APPLICATION NOTE

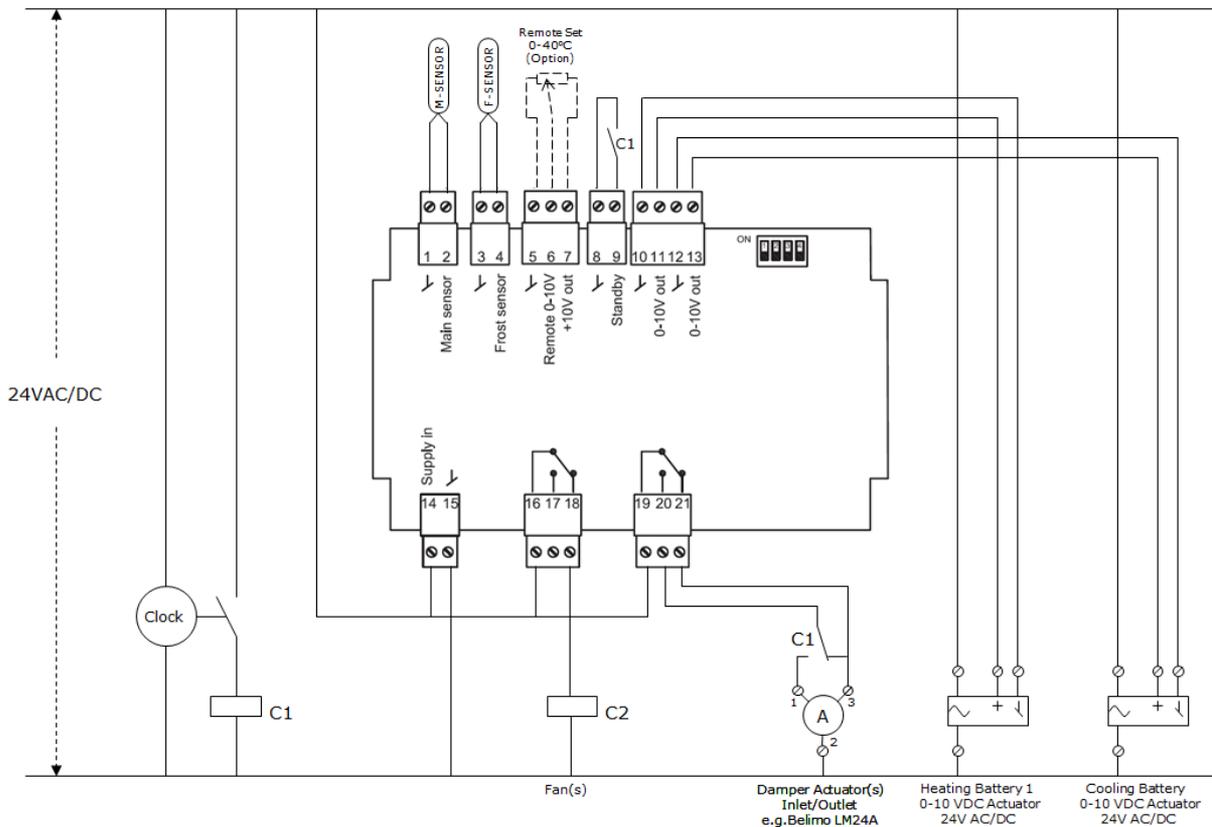
PRODUCT ID: TRD-3986

Sequential control of heating battery and cooling battery

APPLICATION 6



ELECTRICAL WIRING DIAGRAMME (Principe)



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APPLICATION NOTE

APPLICATION 6

Sequential control of heating battery and cooling battery

FUNCTIONALITY

Introduction

TRD-3986 is a temperature controller with built-in frost protection feature specially designed for small and medium-sized ventilation systems. TRD-3986 has two analogue 0-10 V DC outputs, which are easily configured by means of DIP switches for the control of a single heating battery or the sequential control of a heating battery and a cooling battery, a heating battery and a heat exchanger or two heating batteries. TRD-3986 also has two digital relay outputs for controlling damper motors and starting/stopping fans. TRD-3986 has two standard PT-1000 sensor inputs: one for the main sensor, located either in the inlet duct of a ventilation system or in the room where temperature is to be controlled, and one for a sensor used to protect the heating battery from frost.

Startup procedure

The system is started and the controller released for control purposes by activating the "Standby input" on terminals 8 & 9 (8-9 = "1"). Initially, the heating step on Y1 is set to 100% for 60 seconds (see instruction fig. 22). If the temperature recorded by the main sensor drops below the value set on the "a" button and DIP4 is set to "Heating" ("OFF"), Y2 is set to 100% for 60 seconds and the fan is then started by R1 switching to "ON" (R1=16-18="1"). TRD then controls the temperature recorded by the main sensor in accordance with the value set on the setpoint dial (button "a") or the setpoint received via a remote signal, DIP3.

Sequential control of heating battery and cooling battery

Inlet/room temperature is controlled by sequentially regulating a heating valve and a cooling valve (see instruction figs 5, 21 & 25). If the inlet/room temperature is below the value set on button "a" or via an external temperature setpoint signal, the Y2 output (cooling) is first gradually reduced towards 0% and then the Y1 output (heating) is gradually increased towards 100% (+10 V DC), depending on the P-band and I-time settings (I-time only with PI control, i.e. DIP2="off"). If the inlet/room temperature is above the value set on button "a" or via an external temperature setpoint signal (+2°C), the Y1 output (heating) is first gradually reduced towards 0% and then the Y2 output (cooling) is gradually increased towards 100% (+10 V DC), depending on the P-band and I-time settings (I-time only with PI control, i.e. DIP2="off"). Note: If cooling is demanded, the cooling valve is not activated until the temperature is +2°C (neutral zone) above the value set on button "a" or via an external temperature setpoint signal. Note the DIP switch settings (see instruction fig. 18).

OJ ELECTRONICS COMPONENTS



Electronic
Day-/Week clock for DIN-rail
OJ Nr.:
MM-7595
EAN:4011732013110



Electronic
Air Temperature Controller
OJ Nr.:
TRD-3986
EAN:5703502550497



Supply Air Sensor
Duct Mounting
OJ Nr.:
ETF-1098L1-4
EAN:5703502701349

or



Room Sensor
Room Mounting
OJ Nr.:
ETF-998-H
EAN:5703502500300



Frost Sensor
Water Heating Battery
OJ Nr.:
ETF-198-3
EAN:5703866101052

NON OJ COMPONENTS

- Dampermotor for inlet- and exhaust dampers (e.g. Belimo)
- Cirkulationpump, valve og valvemotor for heating battery (e.g. Belimo)
- Electrical cabinet