

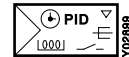
## flexotron® 800: Electronic ventilation, air-conditioning and heating controller

### Areas of use

Used universally in ventilation, air-conditioning and heating systems, or in similar applications

### Features

- Configurable controllers for a wide range of applications for ventilation, air-conditioning and heating
- Many functions for sequences and monitoring
- Clear operation due to large, illuminated LCD unit and buttons
- Menus in 20 languages
- Weekly and calendar switching programmes with summertime/wintertime change-over
- Configuration using display or PC tool
- RS485 interfaces with Modbus or TCP/IP and integrated Web server



### Product

Type	Description
RDT808F211	Universal controller, 24 V~, 8 inputs/outputs, with LCD unit, with Modbus
RDT815F011	Universal controller, 24 V~, 15 inputs/outputs, without LCD unit, with Modbus
RDT815F211	Universal controller, 24 V~, 15 inputs/outputs, with LCD unit, with Modbus
RDT815F221	Universal controller, 24 V~, 15 inputs/outputs, with LCD unit, with integrated Web server
RDT828F011	Universal controller, 24 V~, 28 inputs/outputs, without LCD unit, with Modbus
RDT828F211	Universal controller, 24 V~, 28 inputs/outputs, with LCD unit, with Modbus
RDT828F221	Universal controller, 24 V~, 28 inputs/outputs, with LCD unit, with integrated Web server

### Technical data

#### Electrical supply

Power supply	24 V~, ±15%, 50...60 Hz
	21...36 V=
Dissipated power	approx. 9.8 VA, 3.5 W
	approx. 11.5 VA, 4.2 W Web models
Start-up current	20 A (2 ms)

#### Specifications

Control characteristic	P, P/PI
P range Xp	0...300 K
Integral action time	0...600 s

#### Setting and measuring ranges

Measuring range for normal temperature	-50...115 °C
Reduced temperature	-50...115 °C
Setpoint and actual value auxiliary controller	-50...115 °C
Humidity	0...100% rh
Pressure sensor	-500...5000 Pa
CO <sub>2</sub>	0...5000 ppm

#### Ambient conditions

Permissible ambient temperature	0...50 °C
Storage and transport temperature	-20...70 °C
Permissible ambient humidity	5...95% rh
	no condensation

#### Inputs and outputs

Universal inputs	Ni1000 (DIN 43760)
Digital inputs	Potential-free contacts
Analogue inputs	Ni 1000, 0...10V
Analogue outputs	0...10 V, 2 mA, protected against short circuit
Digital outputs	Mos-FET each 2 A, 24 V~/V=, not protected against short circuit, max. 8 A total

#### Structural design

Dimensions W x H x D	148 x 123 x 60 mm (with terminal)
Screw terminals	Pluggable terminals, for connecting cables up to 1.5 mm <sup>2</sup>
Fitting	Top-hat rail, switch panel (with accessories)

#### Standards and directives

Type of protection	IP 20 (when installed)
CE conformity as per	
EMC Directive 2004/108/EC	EN 61000-6-1, EN 61000-6-3

#### Additional information

Fitting instructions	P100011437
Material and environmental declaration	MD 46.300
Wiring diagram	<a href="#">A10707</a> , <a href="#">A10708</a> , <a href="#">A10709</a>
Dimension drawing	<a href="#">M11510</a>
Ventilation user manual	P100012081
Ventilation short manual	P100012084
User manual for CASE flexotron®	P100012096
Modbus variables for ventilation	P100012093

## Accessories

Type	Description
XYE460F002	Demo case for flexotron®800
0460240001	Pluggable terminal strips for flexotron®400/800
0460240011	Cabinet fitting kit for flexotron®800
RDB800F001	Operating unit for RDT800 (11.5 × 9.5 cm)
EGT338F102	External setpoint adjuster, room operating unit with potentiometer

## Abbreviations/symbols

- SAV: supply air ventilator
- RAV: return air ventilator

## Definition

The flexotron®800 devices are digital controllers for the air-conditioning, heating and boiler control in building automation. The controllers are freely configurable - the configuration and parameterisation are easily performed using the integrated display with 20 languages, a separate display, or a configuration tool.

The controllers are available as models with or without a display, and depending on the model they can be used in networks by means of a Modbus or using the integrated Web server. For controllers without an integrated display, a separate display can be connected.

The flexotron®800 controllers are equipped with 8, 15 or 28 inputs and outputs in order to meet the widest range of requirements.

## Engineering notes

3-point activation of the valves:

- With 24 V= power supply for the controllers, the closing/opening commands are passed on to the actuators via coupling relays.
- For actuators and devices with 24 V~, the LS terminal (24V) of the RDT is connected to the MM terminal (ground in SAUTER devices) of the actuators. If additional components are connected in the system, you must be sure to avoid ground faults. If required, coupling relays are used to activate the actuators.

0...10 V sensor signals on the analogue inputs for controlling CO<sub>2</sub> and pressure must not fall below -0.5 V or exceed 10.5 V, as otherwise the control function is stopped.

The voltage of +24 V at the terminal may only be used for controlling the digital inputs.

The ground wiring for the analogue inputs and outputs and the universal inputs must be performed according to the diagram and separately in order to avoid measurement errors.

## Inputs and outputs

Type	Analogue inputs	Digital inputs	Universal inputs	Analogue outputs	Digital outputs	Display	Web server
RDT808F211	2	3	–	1	2	•	–
RDT815F011	4	4	–	3	4	–	–
RDT815F211	4	4	–	3	4	•	–
RDT815F221	4	4	–	3	4	•	•
RDT828F011	4	8	4	5	7	–	–
RDT828F211	4	8	4	5	7	•	–
RDT828F221	4	8	4	5	7	•	•

## Configuration and parameterisation

The configuration and parameterisation of devices is performed via the integrated display and the buttons, or via a separate module that contains the same display and operating elements as the device.

### SAUTER CASE flexotron®

One variant is to perform the configuration and the settings using the CASE flexotron® PC tool.

This PC-based software can be used to perform all the settings on the computer and then load them to the controller. Configurations can be saved for later use.

If required, these configuration files can simply be sent by e-mail, for example, or printed out.

This configuration program provides access to all inputs and outputs, as well as to setpoints and alarms. Setpoints can be adjusted, and alarms confirmed or even blocked or deactivated.

In manual mode, the program also allows the user to change output signals directly. Another feature is the representation of actual values for up to four signals as data points in a diagram. This data can also be exported.

In the CASE flexotron® program, the operating times and holiday times can also be set.

The program can also be used to configure the settings for the communication via TCP/IP.

## Display

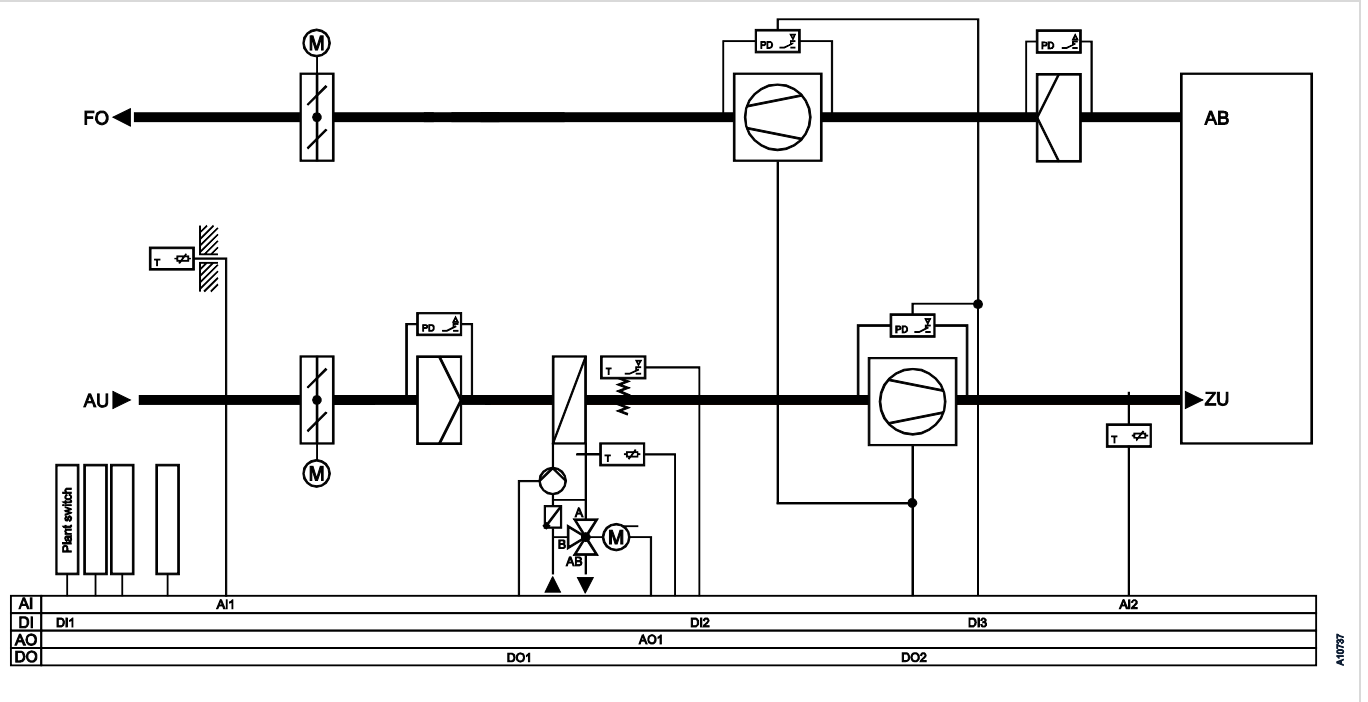
The display is illuminated and has four lines of 20 characters each. The illumination is activated when the buttons are pressed.

The user can select from 20 languages for displaying the menus and the parameter names.

**Example applications**

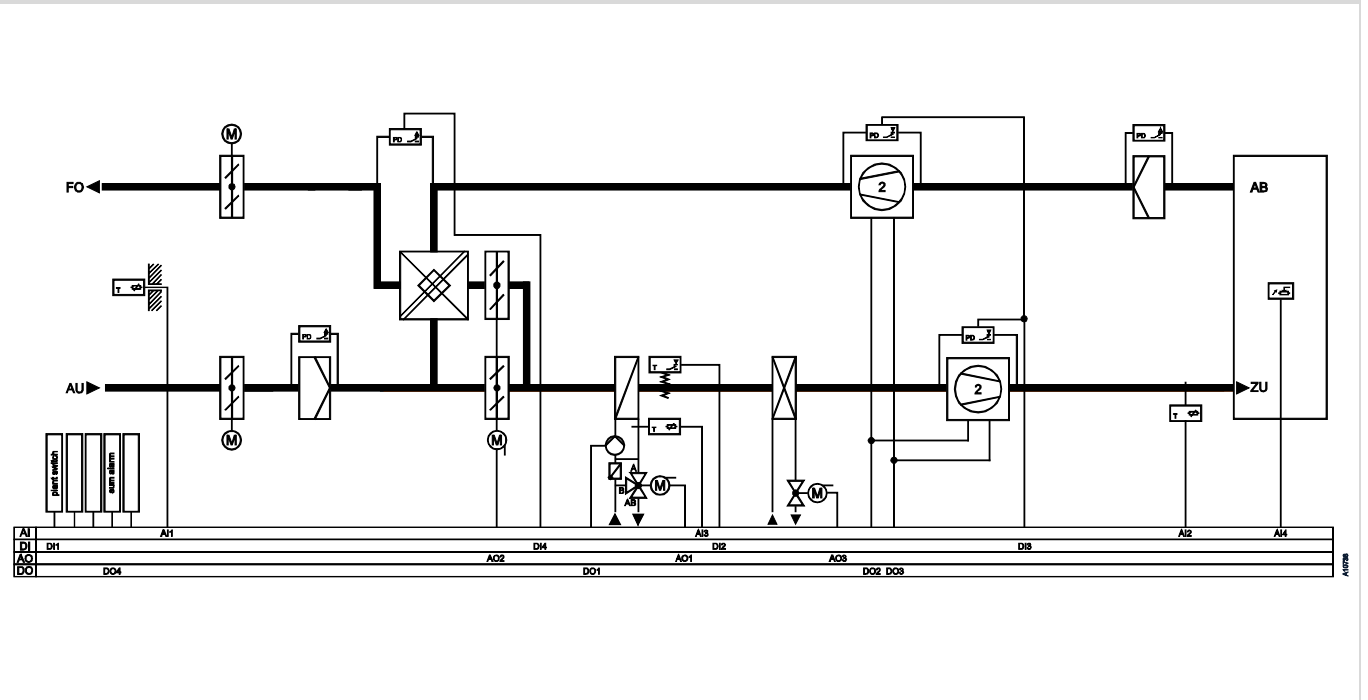
When the controller is switched on for the first time, the basic function for the ventilation, the heating or the boiler must be selected. Depending on the model, one or two basic configurations are prepared for the ventilation:

**RDT808: Fixed-value controller with heater**



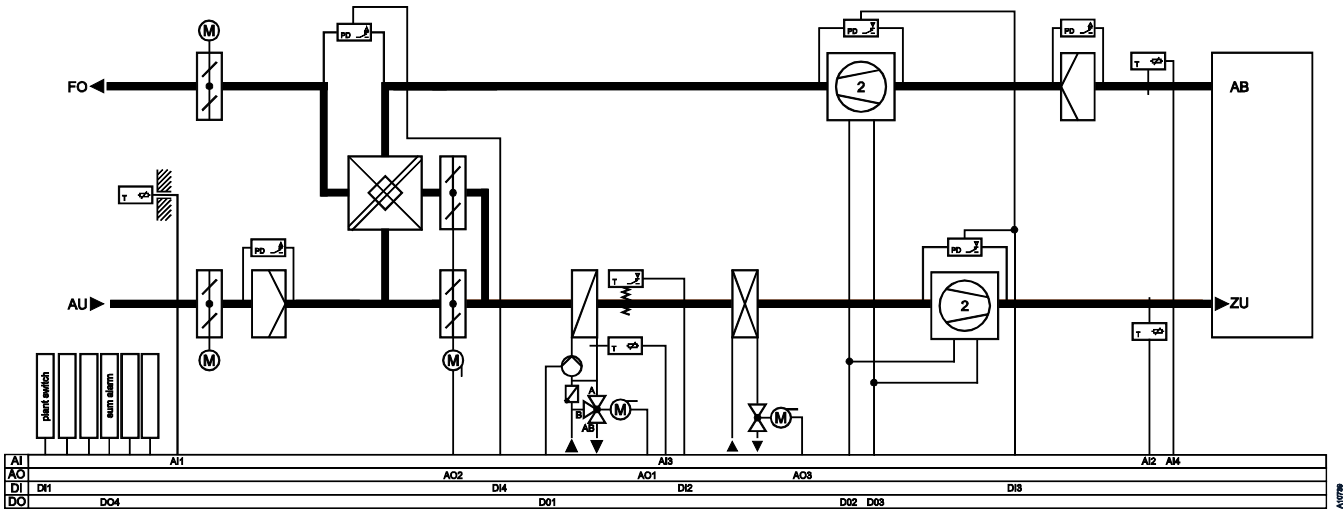
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**RDT815: Fixed-value controller with heater, cooler and heat exchanger**

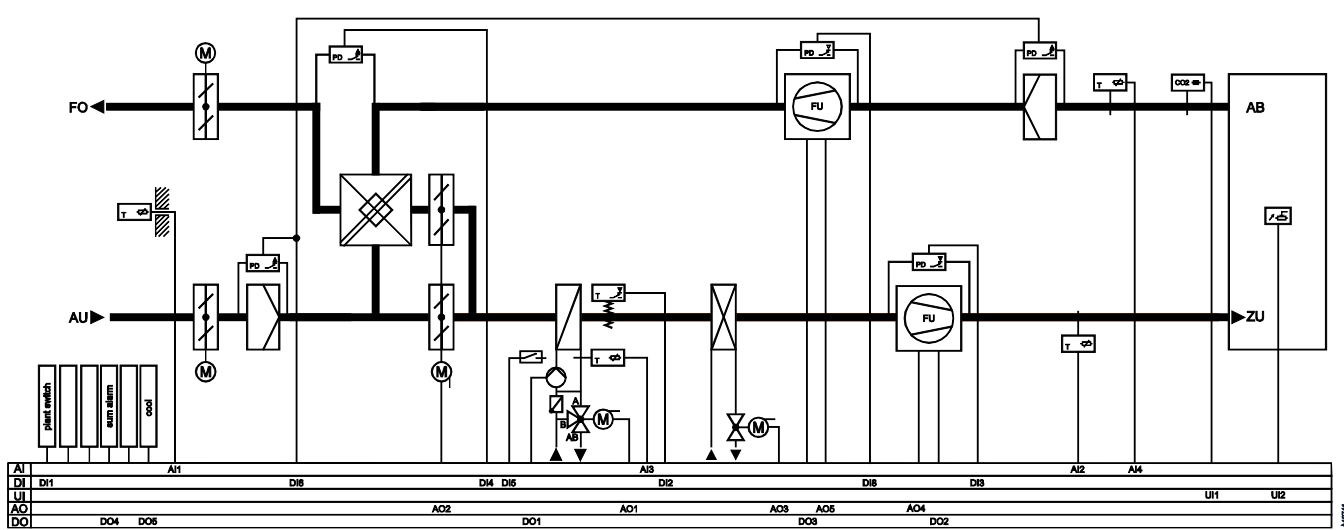


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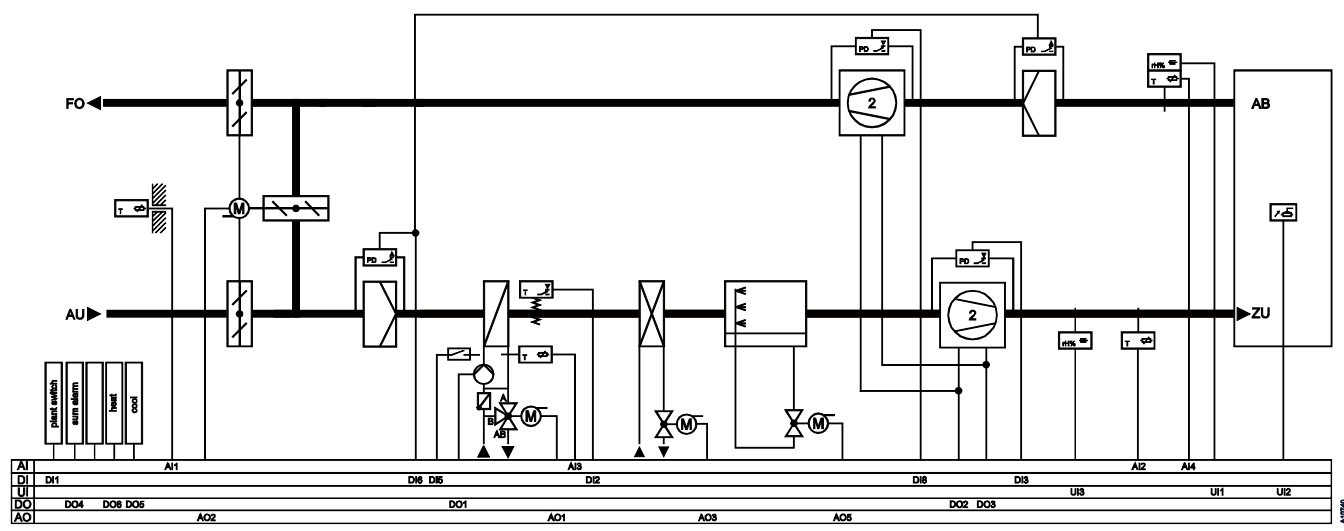
RDT815: Cascade controller with heater, cooler and heat exchanger



RDT828: Cascade controller with heater, cooler. Heat exchanger with CO<sub>2</sub> control



RDT828: Cascade control with heater, cooler, recirculation air dampers and humidity control



## Control models

The flexotron®800 controllers have the following control models:

Ventilation control:

- Supply-air control
- Outside-temperature-based supply-air control
- Room supply-air cascade control
- Return-air/supply-air cascade control
- Outside-temperature-based switching between room- and supply-air control
- Outside-temperature-based switching between return- and supply-air control

## Function overview for ventilation

### Communication

All flexotron®800 controllers have a serial interface. This can be used to communicate with the devices via Modbus RTU.

For devices with a TCP/IP interface, this RS485 connection is omitted, but these devices can be connected to a network via the integrated Web server. This Web server can also be set up and configured using the configuration tool.

### Alarm handling

If there is an alarm, the alarm LED flashes on the front of devices with a display. The LED keeps flashing as long as there are unacknowledged alarms. Alarms are logged in the alarm list, which shows the last 40 alarms.

Three classes of alarms are available, two of which have to be acknowledged and reset before operation can continue.

### Time programme

Flexotron®800 controllers have a year function in which weekly plans, including days off and holidays, for a whole year can be set. The switch between summertime and wintertime is performed automatically.

Every day has up to two separate periods of use. For two-level ventilators and pressure-controlled ventilators, daily schedules are available for two levels, each with up to two periods of use.

### Clock channels

Up to 5 digital outputs can be used as time-controlled outputs. Each of the 5 clock channels has a separate schedule with two periods of use for each weekday. These can be used to control lighting, doors, etc.

### Access rights

The devices have various access rights, which are activated using passwords.

Admin – for all read/write access for all settings and parameters in all menus.

Service – access to all menus apart from the configuration of the inputs/outputs and the system.

Operator – read access for all settings and parameters and write access for settings and parameters apart from the configuration.

### Manual/automatic mode

To check individual functions of the controller, the configurable outputs can be adjusted manually. Controller and analogue outputs can be set to values between 0% and 100%, and digital outputs to ON or OFF.

### Temperature control:

The temperature control can be performed with sequences for heating/cooling/heat recovery dampers. Here the individual elements for various model variants can be configured:

- Heater: water, electric
- Heat recovery: plate heat exchanger, rotation heat exchanger, circuit compound system, mixed-air dampers. The heat recovery can also be controlled in an outside temperature function.
- Cooler: water

The control signals of a sequence can be divided between two different outputs.

- Extra sequences: These are two additional independent sequences for the temperature control.

In the sequence setting the user can define how and in which area the controller output affects the existing sequences.

The temperature control for heaters or coolers can also be controlled in levels. Up to four heater and three cooler levels can be configured.

### Frost protection function

If the controller is set to OFF or manual control and the outside temperature is below the set value, a minimum supply temperature is maintained and the pump is in operation.

### Back-up mode

For cascade control with an activated room-temperature sensor, the back-up mode is activated for heating and cooling. The minimum running time for back-up mode can be set, along with the switching-on and switching-off temperature.

### Free cooling

This function is used in the summer to cool the building with the cold night air.

The starting and stopping values and the running time can be set.

### Cold recovery

If the return-air temperature is lower than the outside temperature, the cold recovery can be activated.

### Enthalpy control

If the enthalpy value of the outside air is greater than the enthalpy value of the inside air, the mix damper signal to increase the recirculated air proportion can be disabled.

This function is not active for free cooling.

### External setpoint

It is possible to use an external setpoint transmitter with Ni1000 characteristic for the temperature setpoint. Minimum and maximum values can be set.

### Humidity control

The humidity control can be configured as

- Humidification
- Dehumidification
- Humidification/dehumidification

Two humidity sensors can be connected: one sensor for the room humidity and one sensor for the channel humidity for the maximum limitation.

The control is by means of a PI-controller and controls the humidifier via an analogue signal or a digital signal.

### Ventilator control

The control of the ventilators can be configured on one or two levels, or via frequency converters.

When frequency converters are used, the following options are available:

- Constant pressure: The pressure signal of a pressure transmitter is kept constant by means of the frequency-controlled ventilator.
- Constant volume flow: The volume flow is calculated using a signal from the pressure transmitter and kept constant by means of the frequency-controlled ventilator.
- Output manually set to defined values: The output signal of the frequency converter is set to a fixed value or is set using the measured value of a CO<sub>2</sub>/VOC sensor for demand-led ventilation.
- External control signal: Direct control using external 0...10V control signals for incorporation in VAV systems.
- SAV frequency control with RAV slave: The output of the RAV follows the output of the SAV.
- SAV frequency control with volume flow-controlled RAV: Frequency- and pressure-controlled SAV. The volume flow of the RAV is controlled by means of the volume flow of the SAV.

### Pump control

Digital inputs and outputs can be configured for the pump control: heaters, heat control, coolers. For all pumps, operating or fault indicators can be connected by means of a digital input, and an anti-jamming function can also be configured. The deactivation delay can also be set.

#### Damper control

The following control options can be configured:

- Shut-off dampers
- Exhaust-air damper
- Return-air damper
- Fire-protection dampers, and activating the test run of the fire-protection dampers

The shut-off damper can be controlled individually or together with the exhaust-air/return-air dampers; it is also possible to set a minimum position for the dampers during operation.

Recirculated air control to distribute the room air using the SAV can also be configured, with or without temperature control.

A minimum position for the dampers can be set.

#### Change-over

The change-over function enables the user to change between heating and cooling control in 2-pipe systems. A digital input signal is used to change over the function.

#### Additional control loop

The controller has a separate, additional control loop with a PI characteristic, with both a sensor input and an analogue and digital output signal for controlling, for example, a post-treatment device.

#### Fire alarm

In the fire alarm function, the controller has various options. It can be activated via a digital input; the ventilators can be switched off individually or collectively, as required; the direction of operation of the fire protection damper can be set.

#### Blocking the automatic restart when the power is restored

The restart after a power failure can be blocked. The standard setting is set to automatic start.

### Special functions

#### Devices without a display

The device models without an integrated display can be connected to an external RDB800F001 display via an RJ12 connector. The functions of this module are identical to those of the integrated display. Only one controller can be operated using an external display.

#### Web server

The devices are available with a serial RS485 interface or an Ethernet interface. In the latter case, the devices have an integrated Web server. This can be used to easily integrate the devices into networks, and all the device functions are available apart from the configuration.

The CASE flexotron® configuration software can also access the device with its full range of functions via the Ethernet interface.

### Accessory RDB800F001: external display for flexotron®800

#### Features

- Display: 4 lines of 20 characters each
- Illumination and character height 4.75 mm
- Clear operation using buttons
- Menus in 20 languages
- Functions identical to the integrated display/buttons of the flexotron®800
- Electrical power supply internally via communication cable

#### Ambient conditions

Permissible ambient temperature: 0...50 °C

Storage and transport

temperature: -20...70°C

Permissible ambient humidity: 5...95% rh, no condensation

#### Structural design

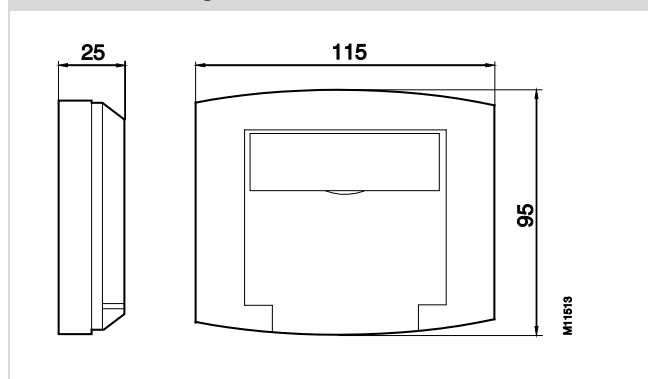
Dimensions W × H × D 115 × 95 × 25 mm

Connection cable 3m long with fixed connected RJ12 connector to flexotron®800

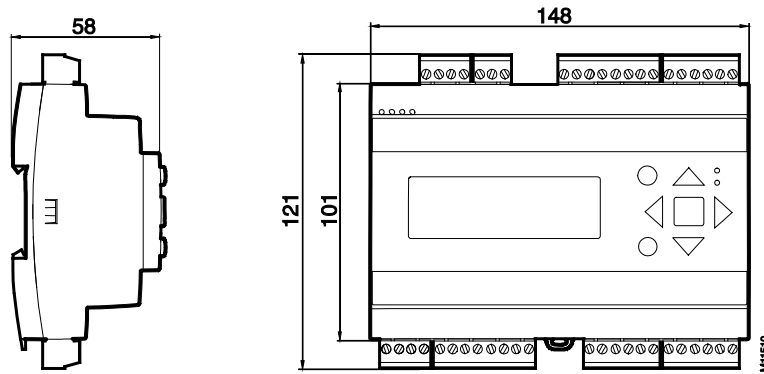
Installation wall installation on UP socket (hole spacing 60 mm) or on cabinet

Protection class IP 30

#### Dimension drawing for RDB800F001



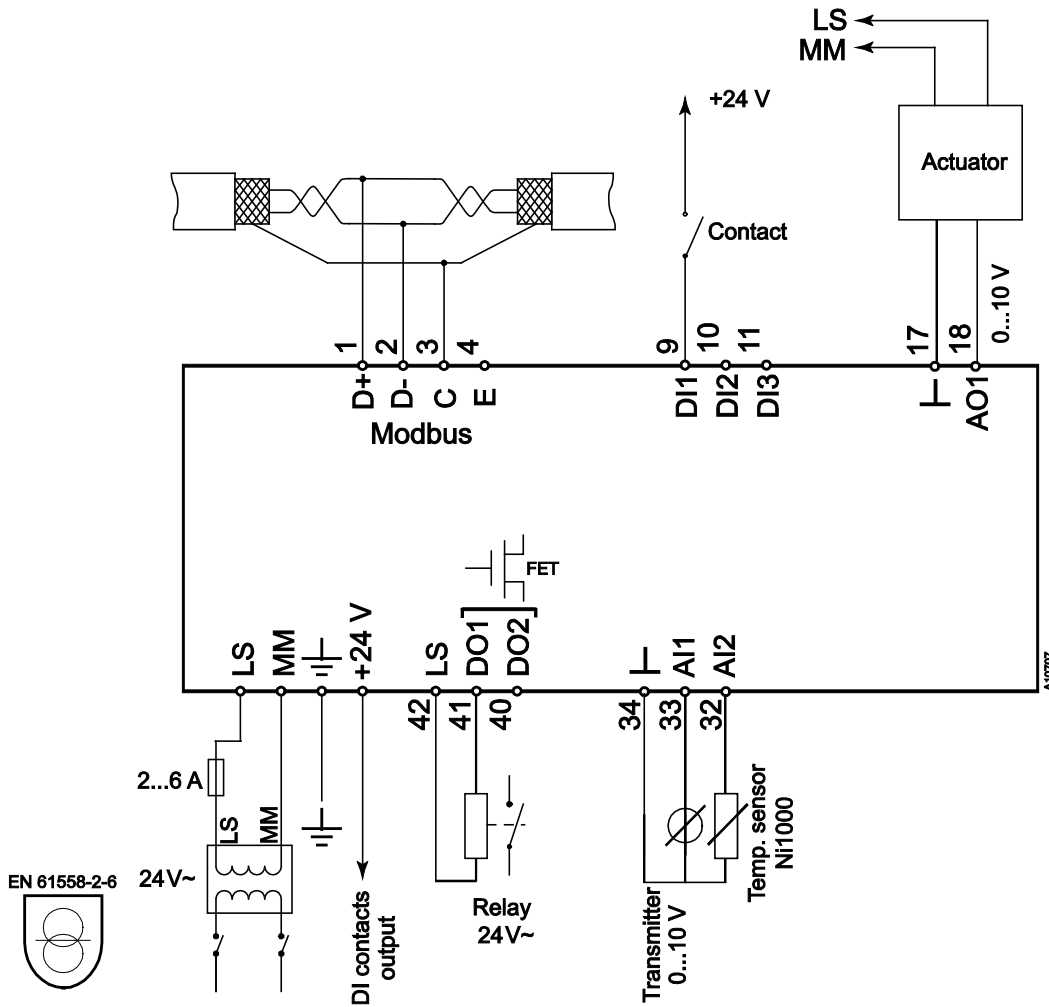
Dimension drawing



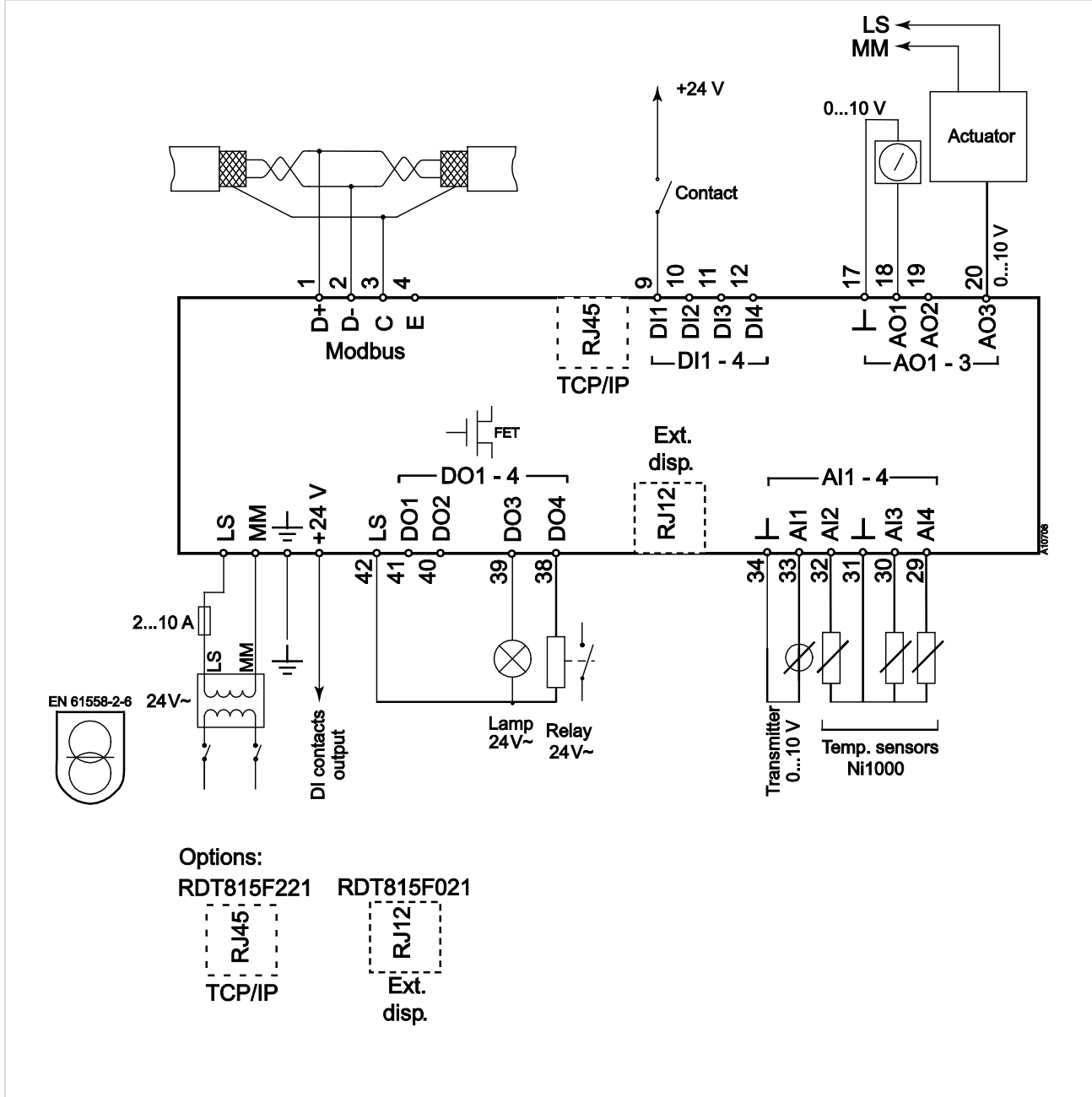
Note:  
To connect the digital outputs with 24 V= power supply, see manuals.

Connection diagrams with power supply 24 V~

RDT808



RDT815





RDT828

