ENGINEERING TOMORROW

Operating Guide

ECL Comfort 210/296/310, application A214/A314

1.0 Table of Contents

1.1 Important safety and product information

1.1.1 Important safety and product information

This Operating Guide is associated with ECL Application Key A214 (order code no. 087H3811).

The ECL Application Key A214 contains the subtypes:
A214.1 … A214.6 (applicable in ECL Comfort 210, 296 and 310)
A314.1 … A314.7 (applicable in ECL Comfort 310)
A314.9 (applicable in ECL Comfort 310)

A214.1 is cooling related application
A214.2, A214.3 and A214.6 are heating related applications
A214.4 and A214.5 are basic heating / cooling applications

A314.1 and A314.2 are basic heating / cooling applications
A314.3 is a special heating application
A314.4 and A314.5 are advanced heating applications
A314.6 and A314.7 are advanced heating / cooling applications
A314.9 is an advanced heating application

The described functions are realized in ECL Comfort 210 for basic solutions and in ECL Comfort 310 for advanced solutions, e.g. M-bus, Modbus and Ethernet (Internet) communication.

The application Key A214 complies with ECL Comfort 210 and ECL Comfort 310 controllers as of software version 1.11 (visible at start-up of the controller and in 'Common controller settings' in 'System').

A Remote Control Unit, ECA 30 or ECA 31, can be connected and the built-in room temperature sensor can be utilized.

The applications A314.1 … A314.7 and A314.9 work with the Internal I/O module ECA 32 (order code no. 087H3202).
ECA 32 is placed in the base part for ECL Comfort 310.

ECL Comfort 210 is available as:

- ECL Comfort 210, 230 volt a.c. (087H3020)
- ECL Comfort 210B, 230 volt a.c. (087H3030)

ECL Comfort 296 is available as:

- ECL Comfort 296, 230 volt a.c. (087H3000)

ECL Comfort 310 is available as:

- ECL Comfort 310, 230 volt a.c(087H3040)
- ECL Comfort 310B, 230 volt a.c. (087H3050)
- ECL Comfort 310, 24 volt a.c. (087H3044)

The B-types have no display and dial. The B-types are operated by means of the remote control unit ECA 30 / 31:

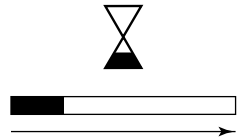
- ECA 30 (087H3200)
- ECA 31 (087H3201)

Base parts for ECL Comfort:

- for ECL Comfort 210, 230 volt (087H3220)
- for ECL Comfort 296, 230 volt a.c. (087H3240)
- for ECL Comfort 310, 230 volt and 24 volt (087H3230)

Additional documentation for ECL Comfort 210, 296 and 310, modules and accessories is available on *http://district-heating.danfoss.com/*.

Automatic update of controller software (firmware):
The software of the controller is updated automatically when the key is inserted (as of controller version 1.11 (ECL 210 / 310) and version 1.58 (ECL 296)). The following animation will be shown when the software is being updated:



Progress bar

During update:

- Do not remove the KEY
  If the key is removed before the hour-glass is shown, you have to start afresh.
- Do not disconnect the power
  If the power is interrupted when the hour-glass is shown, the controller will not work.

Safety Note
To avoid injury of persons and damages to the device, it is absolutely necessary to read and observe these instructions carefully.

Necessary assembly, start-up, and maintenance work must be performed by qualified and authorized personnel only.

Local legislations must be respected. This comprises also cable dimensions and type of isolation (double isolated at 230 V).

A fuse for the ECL Comfort installation is max. 10 A typically.

The ambient temperature ranges for ECL Comfort in operation are:
ECL Comfort 210 / 310: 0 - 55 °C
ECL Comfort 296: 0 - 45 °C.
Exceeding the temperature range can result in malfunctions.

Installation must be avoided if there is a risk for condensation (dew).

The warning sign is used to emphasize special conditions that should be taken into consideration.

This symbol indicates that this particular piece of information should be read with special attention.

Application keys might be released before all display texts are translated. In this case the text is in English.

As this Operating Guide covers several system types, special system settings will be marked with a system type. All system types are shown in the chapter: 'Identifying your system type'.

°C (degrees Celsius) is a measured temperature value whereas K (Kelvin) often is used for temperature differences.

The ID no. is unique for the selected parameter.

Example	First digit	Second digit	Last three digits
11174	1	1	174
	-	Circuit 1	Parameter no.
12174	1	2	174
	-	Circuit 2	Parameter no.

If an ID description is mentioned more than once, it means that there are special settings for one or more system types. It will be marked with the system type in question (e.g. 12174 - A266.9).

Parameters indicated with an ID no. like "1x607" mean a universal parameter.
x stands for circuit / parameter group.

Disposal Note
This product should be dismantled and its components sorted, if possible, in various groups before recycling or disposal.
Always follow the local disposal regulations.

2.0 Installation

2.1 Before you start

The Application Key **A214** contains several applications, mainly related to ventilation systems with heating or cooling or a combination of these. The applications in the A214 key offer a wide range of possibilities (see the examples).

The application **A214.1** is very flexible. These are the basic principles:

Cooling with room temperature control:

Typically, the air duct temperature is adjusted according to your requirements. The air duct temperature sensor S3 is the most important sensor. The desired temperature at S3 is set in the ECL Comfort controller as the 'Desired balance temperature'.

The motorized control valve M2 (controlling the cooling transfer) is opened gradually when the duct temperature is higher than the desired duct temperature and vice versa.

Room temperature:

If the measured room temperature (S4 or ECA 30) does not equal the desired room temperature, the desired temperature at S3 can be adjusted.

By means of a week schedule (up to 3 'Comfort' periods / day), the cooling circuit can be in 'Comfort' or 'Saving' mode (two different temperature values for desired room temperature).

The desired room temperature determines a correction of the desired temperature at S3.

If the room temperature is not measured, the desired room temperature equals (will be) the desired temperature at S3. In this case, the setting of the 'Balance temperature' is not considered (or: has no influence).

The fan (F1) is ON / OFF controlled according to the schedule and cooling demand. The damper (P2) is ON / OFF controlled according to schedule. The circulation pump (X3) is ON / OFF controlled according to cooling demand.

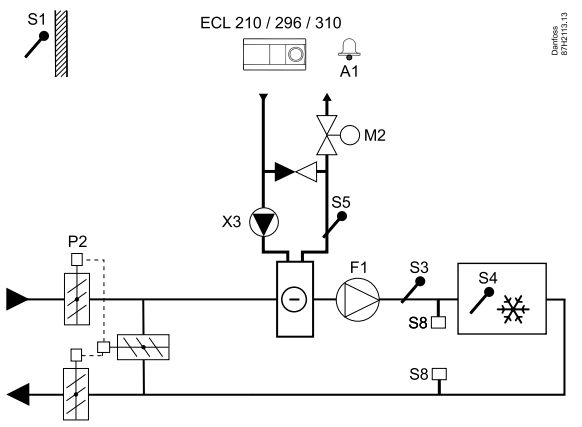
Return temperature (optional):

If the measured return temperature (S5) does not equal the limitation value (typically, the return temperature becomes lower than the limitation value), the desired temperature at S3 can be adjusted (typically to a higher value). This results in a gradual closing of the motorized control valve.

A simple frost protection (via S5) can be established. Furthermore, it is expected that the cooling exchanger (fan coil) circuit contains brine.

For a description of alarms and compensation temperature, please read the section 'A214 and A314 in general'.

Typical A214.1 application:



The shown diagram is a fundamental and simplified example and does not contain all components that are necessary in a system.

All named components are connected to the ECL Comfort controller.

List of components:

ECL 210 / 310	*Electronic controller ECL Comfort 210 or 310*
S1	*Outdoor temperature sensor*
S2	*(Optional) Compensation temperature sensor (not illustrated)*
S3	*Duct temperature sensor*
S4	*(Optional) Room temperature sensor**
S5	*(Optional) Return temperature sensor*
S8	*(Optional) Fire thermostat*
F1	*Fan (ON / OFF)*
P2	*Damper (ON / OFF)*
X3	*Circulation pump (ON / OFF)*
M2	*Motorized control valve, cooling (3-point controlled)*
A1	*Alarm*
	** Alternative: ECA 30*

The applications **A214.2** and **A214.3** are very flexible and almost identical. These are the basic principles:

A214.2: Heating with duct temperature control
A214.3: Heating with room temperature control

Typically, the heating temperature is adjusted according to your requirements. The temperature sensor S3 is the most important sensor. The desired temperature at S3 is set in the ECL Comfort controller as the 'Desired balance temperature'.

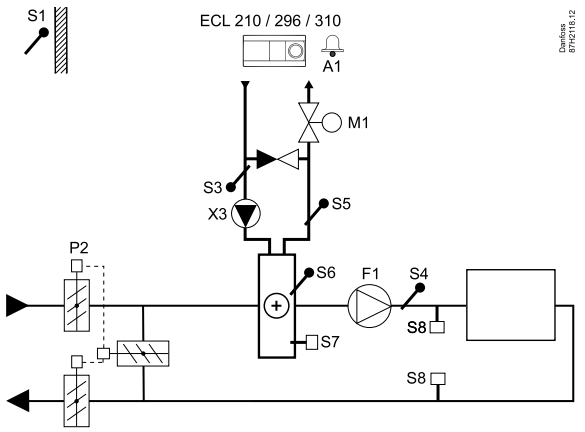
The motorized control valve M1 (controlling the heating supply temperature) is opened gradually when the S3 temperature is lower than the desired S3 temperature and vice versa.

S4 temperature:
If the measured S4 temperature does not equal the desired S4 temperature, the desired temperature at S3 can be adjusted.
By means of a week schedule (up to 3 'Comfort' periods / day), the heating circuit can be in 'Comfort' or 'Saving' mode (two different temperature values for desired S4 temperature). The desired S4 temperature determines a correction of the desired temperature at S3.

The fan (F1) is ON / OFF controlled according to the schedule and heating demand. The damper (P2) is ON / OFF controlled according to schedule. The circulation pump (X3) is ON / OFF controlled according to heating demand.

For a description of alarms, compensation temperature, return temperature limitation (S5) and frost protection (S6 and S7), please read the section 'A214 and A314 in general'.

Typical A214.2 application:



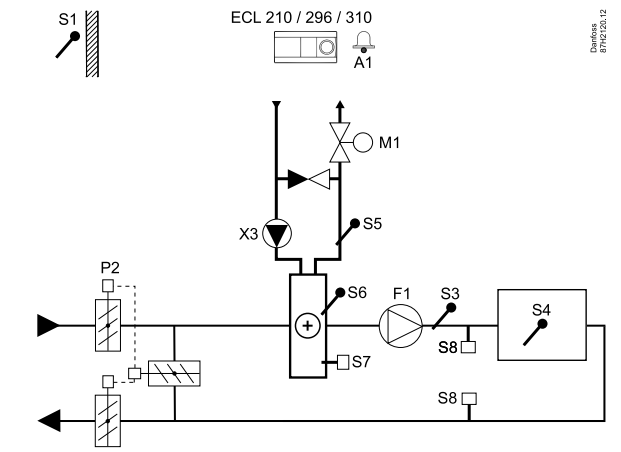
The shown diagram is a fundamental and simplified example and does not contain all components that are necessary in a system.

All named components are connected to the ECL Comfort controller.

List of components:

ECL 210 / 310	*Electronic controller ECL Comfort 210 or 310*
S1	*Outdoor temperature sensor*
S2	*(Optional) Compensation temperature sensor (not illustrated)*
S3	*Flow temperature sensor*
S4	*Duct temperature sensor*
S5	*(Optional) Return temperature sensor*
S6	*(Optional) Frost temperature sensor*
S7	*(Optional) Frost thermostat*
S8	*(Optional) Fire thermostat*
F1	*Fan (ON / OFF)*
P2	*Damper (ON / OFF)*
X3	*Circulation pump (ON / OFF)*
M1	*Motorized control valve, heating (3-point controlled)*
A1	*Alarm*

Typical A214.3 application:



The shown diagram is a fundamental and simplified example and does not contain all components that are necessary in a system.

All named components are connected to the ECL Comfort controller.

List of components:

ECL 210 / 310	*Electronic controller ECL Comfort 210 or 310*
S1	*Outdoor temperature sensor*
S2	*(Optional) Compensation temperature sensor (not illustrated)*
S3	*Duct temperature sensor*
S4	*Room temperature sensor**
S5	*(Optional) Return temperature sensor*
S6	*(Optional) Frost temperature sensor*
S7	*(Optional) Frost thermostat*
S8	*(Optional) Fire thermostat*
F1	*Fan (ON / OFF)*
P2	*Damper (ON / OFF)*
X3	*Circulation pump (ON / OFF)*
M1	*Motorized control valve, heating (3-point controlled)*
A1	*Alarm*
	** Alternative: ECA 30*

The application **A214.4** is very flexible. These are the basic principles:

Heating / cooling with air duct temperature control

Typically, the heating / cooling temperature is adjusted according to your requirements.

The flow temperature sensor S3 in the heating circuit is the most important sensor. The desired temperature at S3 is set in the ECL Comfort controller as the 'Desired balance temperature'.

The motorized control valve M1 (controlling the heating temperature) is opened gradually when the flow temperature is lower than the desired balance temperature and vice versa.

At cooling, the motorized control valve M2 controls the cooling temperature at S4.

Air duct temperature:
A too low air duct temperature S4 will activate the heating circuit M1, whereas a too high air duct temperature will activate the cooling circuit M2.

At heating demand, the air duct temperature S4 can adjust the desired temperature at S3. At cooling demand, the air duct temperature S4 is controlled according to the desired air duct temperature. A "Dead zone" (= number of degrees) can be set in order to avoid unstable shifts between heating and cooling operation.

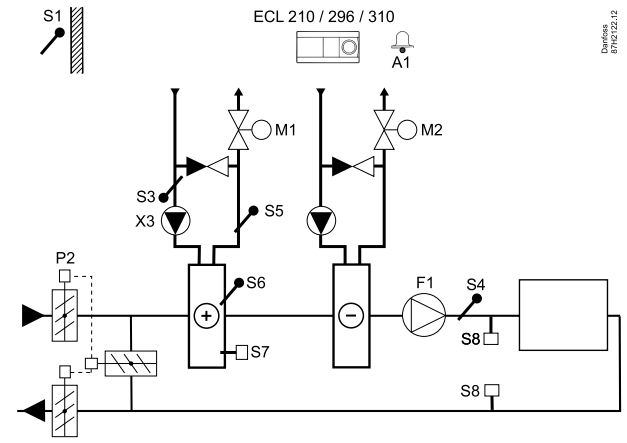
By means of a week schedule (up to 3 'Comfort' periods / day), the heating / cooling circuit can be in 'Comfort' or 'Saving' mode (two different temperature values for desired air duct temperature).

In 'Saving' mode the desired air duct temperature determines a correction of the desired temperature at S3 in heating mode. In cooling mode the cooling is OFF during 'Saving'.

The fan F1 is ON / OFF controlled according to the schedule and heating / cooling demand. The damper P2 is ON / OFF controlled according to schedule. The circulation pump X3 is ON / OFF controlled according to heating demand.

For a description of alarms, compensation temperature, return temperature limitation (S5) and frost protection (S6 and S7), please read the section 'A214 and A314 in general'.

Typical A214.4 application:



The shown diagram is a fundamental and simplified example and does not contain all components that are necessary in a system.

All named components are connected to the ECL Comfort controller.

List of components:

ECL 210 / 310	*Electronic controller ECL Comfort 210 or 310*
S1	*Outdoor temperature sensor*
S2	*(Optional) Compensation temperature sensor (not illustrated)*
S3	*Heating temperature sensor*
S4	*Air duct temperature sensor*
S5	*(Optional) Return temperature sensor*
S6	*(Optional) Frost temperature sensor*
S7	*(Optional) Frost thermostat*
S8	*(Optional) Fire thermostat*
F1	*Fan (ON / OFF)*
P2	*Damper (ON / OFF)*
X3	*Circulation pump, heating (ON / OFF)*
M1	*Motorized control valve, heating (3-point controlled)*
M2	*Motorized control valve, cooling (3-point controlled)*
A1	*Alarm*

The application **A214.5** is very flexible. These are the basic principles:

Heating / cooling with room temperature control

Typically, the heating / cooling temperature is adjusted according to your requirements.
The temperature sensor S3 in the air duct is the most important sensor. The desired temperature at S3 is set in the ECL Comfort controller as the 'Desired balance temperature'.

The motorized control valve M1 (controlling the heating temperature) is opened gradually when the air duct temperature is lower than the desired balance temperature and vice versa.
At cooling, the motorized control valve M2 controls the cooling temperature.

Room temperature:
A too low room temperature S4 will activate the heating circuit M1, whereas a too high room temperature will activate the cooling circuit M2. A "Dead zone" (= number of degrees) can be set in order to avoid unstable shifts between heating and cooling operation.

At heating / cooling demand, the room temperature S4 can adjust the desired temperature at S3.

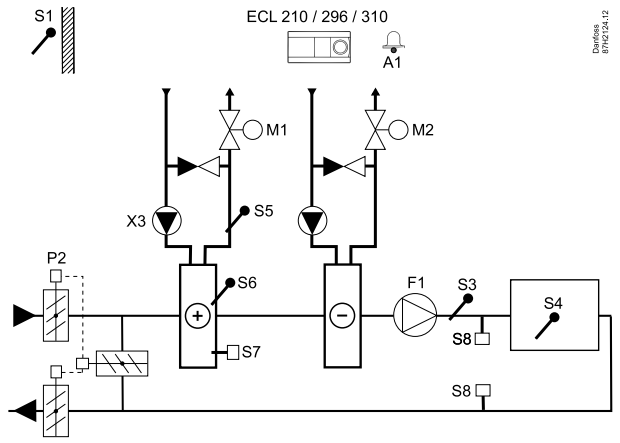
By means of a week schedule (up to 3 'Comfort' periods / day), the heating / cooling circuit can be in 'Comfort' or 'Saving' mode (two different temperature values for desired room temperature).

In 'Saving' mode the desired room temperature determines a correction of the desired temperature at S3 in heating mode. In cooling mode the cooling is OFF during 'Saving'.

The fan F1 is ON / OFF controlled according to the schedule and heating / cooling demand. The damper P2 is ON / OFF controlled according to schedule. The circulation pump X3 is ON / OFF controlled according to heating demand.

For a description of alarms, compensation temperature, return temperature limitation (S5) and frost protection (S6 and S7), please read the section 'A214 and A314 in general'.

Typical A214.5 application:



The shown diagram is a fundamental and simplified example and does not contain all components that are necessary in a system.

All named components are connected to the ECL Comfort controller.

List of components:

ECL 210 / 310	*Electronic controller ECL Comfort 210 or 310*
S1	*Outdoor temperature sensor*
S2	*(Optional) Compensation temperature sensor (not illustrated)*
S3	*Duct temperature sensor*
S4	*Room temperature sensor**
S5	*(Optional) Return temperature sensor*
S6	*(Optional) Frost temperature sensor*
S7	*(Optional) Frost thermostat*
S8	*(Optional) Fire thermostat*
F1	*Fan (ON / OFF)*
P2	*Damper (ON / OFF)*
X3	*Circulation pump, heating (ON / OFF)*
M1	*Motorized control valve, heating (3-point controlled)*
M2	*Motorized control valve, cooling (3-point controlled)*
A1	*Alarm*
	** Alternative: ECA 30*

The application **A214.6** is very flexible. These are the basic principles:

Heating with room temperature control:

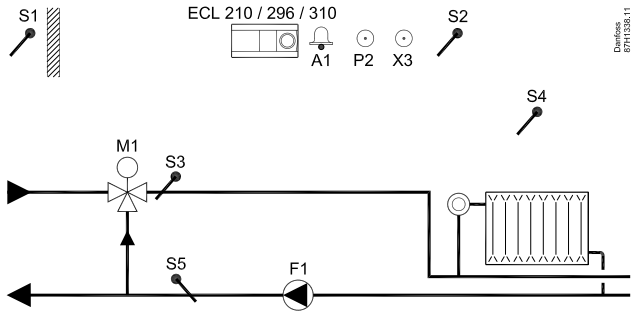
Typically, the flow temperature is adjusted according to your requirements. The flow temperature sensor S3 is the most important sensor. The desired temperature at S3 is set in the ECL Comfort controller as the 'Desired balance temperature'.
The motorized control valve M1 is opened gradually when the flow temperature is lower than the desired flow temperature and vice versa.

Room temperature:
If the measured room temperature (S4 or ECA 30) does not equal the desired room temperature, the desired temperature at S3 can be adjusted.
By means of a week schedule (up to 3 'Comfort' periods / day), the heating circuit can be in 'Comfort' or 'Saving' mode (two different temperature values for desired room temperature). The desired room temperature determines a correction of the desired temperature at S3.

The circulation pump (F1) is ON / OFF controlled according to the Schedule 1. The accessory (P2) is ON / OFF controlled according to Schedule 1 or 2.

For a description of alarms, compensation temperature, return temperature limitation (S5), frost protection (S6 and S7) and fire alarm please read the section 'A214 and A314 in general'.

Typical A214.6 application:



The shown diagram is a fundamental and simplified example and does not contain all components that are necessary in a system.

All named components are connected to the ECL Comfort controller.

List of components:

ECL 210 / 310	*Electronic controller ECL Comfort 210 or 310*
S1	*Outdoor temperature sensor*
S2	*(Optional) Compensation temperature sensor*
S3	*Flow temperature sensor*
S4	*Room temperature sensor**
S5	*(Optional) Return temperature sensor*
S6	*(Optional) Frost temperature sensor (not illustrated)*
S7	*(Optional) Frost thermostat (not illustrated)*
S8	*(Optional) Fire thermostat (not illustrated)*
F1	*Circulation pump (ON / OFF)*
P2	*Accessory output (ON / OFF)*
X3	*Optional output (ON / OFF)*
M1	*Motorized control valve, heating (3-point controlled)*
A1	*Alarm*
	** Alternative: ECA 30*

The application **A314.1** is very flexible. These are the basic principles:

Heating and (passive) cooling with air duct temperature control

Typically, the heating / cooling temperature is adjusted according to your requirements. The flow temperature sensor S3 is the most important sensor. The desired temperature at S3 is set in the ECL Comfort controller as the 'Desired balance temperature'.

The motorized control valve M1 (controlling the heating temperature) is opened gradually when the flow temperature is lower than the desired temperature and vice versa. At cooling, the motorized damper M2 controls the cooling temperature. The cooling section can be passive (re-circulation) or active.

Air duct temperature:
A too low temperature at S4 will activate the heating circuit (M1), whereas a too high duct temperature will activate the cooling circuit (M2).

At heating demand, the temperature at S4 can adjust the desired temperature at S3. At cooling demand, the S4 temperature is controlled according to the desired S4 temperature. A "Dead zone" (= number of degrees) can be set in order to avoid unstable shifts between heating and cooling operation.

M1 is 3-point controlled, whereas M2 is 0-10 V controlled.

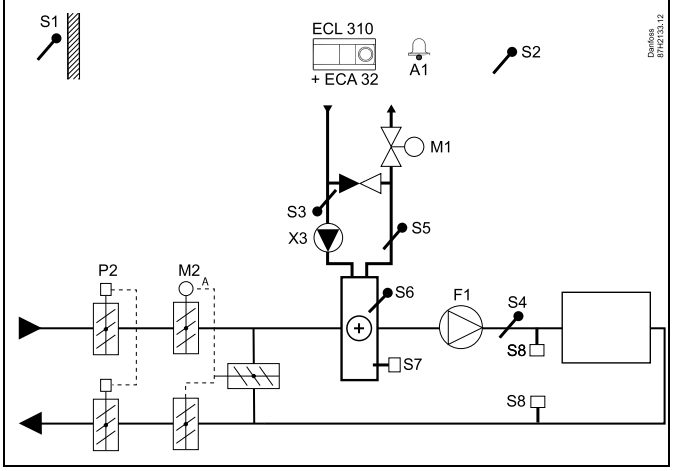
By means of a week schedule (up to 3 'Comfort' periods / day), the heating / cooling circuit can be in 'Comfort' or 'Saving' mode (two different temperature values for desired air duct temperature).

In 'Saving' mode the desired air duct temperature determines a correction of the desired temperature at S3 in heating mode. In cooling mode the cooling is OFF during 'Saving'.

The fan F1 is ON / OFF controlled according to the schedule and heating / cooling demand. The damper P2 is ON / OFF controlled according to schedule. The circulation pump X3 is ON / OFF controlled according to heating demand.

For a description of alarms, compensation temperature, return temperature limitation (S5) and frost protection (S6 and S7), please read the section 'A214 and A314 in general'.

Typical A314.1 application:



The shown diagram is a fundamental and simplified example and does not contain all components that are necessary in a system.

All named components are connected to the ECL Comfort controller.

List of components:

ECL 310	*Electronic controller ECL Comfort 310*
ECA 32	*Built-in extension module*
S1	*Outdoor temperature sensor*
S2	*(Optional) Compensation temperature sensor*
S3	*Flow temperature sensor*
S4	*Duct temperature sensor*
S5	*(Optional) Return temperature sensor*
S6	*(Optional) Frost temperature sensor*
S7	*(Optional) Frost thermostat*
S8	*(Optional) Fire thermostat*
F1	*Fan (ON / OFF)*
P2	*Damper (ON / OFF)*
X3	*Circulation pump, heating (ON / OFF)*
M1	*Motorized control valve, heating (3-point controlled)*
M2	*Motorized damper (0 - 10 volt controlled)*
A1	*Alarm*

The application **A314.2** is very flexible. These are the basic principles:

Heating and (passive) cooling with room temperature control

Typically, the heating / cooling temperature is adjusted according to your requirements. The air duct temperature sensor S3 is the most important sensor. The desired temperature at S3 is set in the ECL Comfort controller as the 'Desired balance temperature'.

The motorized control valve M1 (controlling the heating temperature) is opened gradually when the air duct temperature is lower than the desired temperature and vice versa. At cooling, the motorized damper M2 controls the cooling temperature. The cooling section can be passive (re-circulation) or active.

Room temperature:
A too low temperature at S4 will activate the heating circuit (M1), whereas a too high duct temperature will activate the cooling circuit (M2). A "Dead zone" (= number of degrees) can be set in order to avoid unstable shifts between heating and cooling operation.

At heating / cooling demand, the temperature at S4 can adjust the desired temperature at S3.

M1 is 3-point controlled, whereas M2 is 0-10 V controlled.

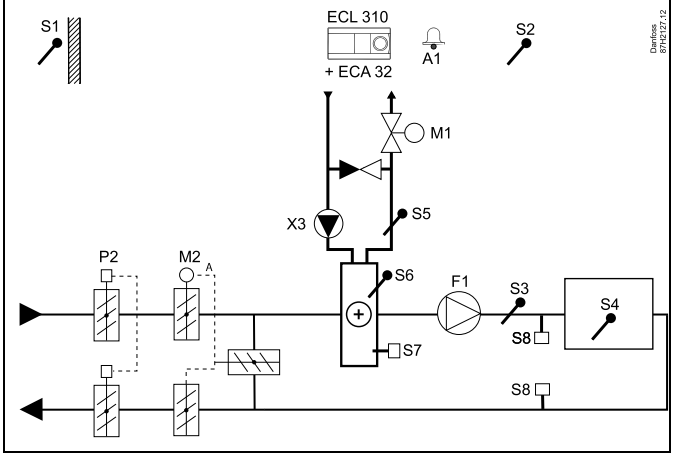
By means of a week schedule (up to 3 'Comfort' periods / day), the heating / cooling circuit can be in 'Comfort' or 'Saving' mode (two different temperature values for desired room temperature).

In 'Saving' mode the desired room temperature determines a correction of the desired temperature at S3 in heating mode. In cooling mode the cooling is OFF during 'Saving'.

The fan F1 is ON / OFF controlled according to the schedule and heating / cooling demand. The damper P2 is ON / OFF controlled according to schedule. The circulation pump X3 is ON / OFF controlled according to heating demand.

For a description of alarms, compensation temperature, return temperature limitation (S5) and frost protection (S6 and S7), please read the section 'A214 and A314 in general'.

Typical A314.2 application:



The shown diagram is a fundamental and simplified example and does not contain all components that are necessary in a system.

All named components are connected to the ECL Comfort controller.

List of components:

ECL 310	*Electronic controller ECL Comfort 310*
ECA 32	*Built-in extension module*
S1	*Outdoor temperature sensor*
S2	*(Optional) Compensation temperature sensor*
S3	*Duct temperature sensor*
S4	*Room temperature sensor**
S5	*(Optional) Return temperature sensor*
S6	*(Optional) Frost temperature sensor*
S7	*(Optional) Frost thermostat*
S8	*(Optional) Fire thermostat*
F1	*Fan (ON / OFF)*
P2	*Damper (ON / OFF)*
X3	*Circulation pump, heating (ON / OFF)*
M1	*Motorized control valve, heating (3-point controlled)*
M2	*Motorized damper (0 - 10 volt controlled)*
A1	*Alarm*
	** Alternative: ECA 30*

The application **A314.3** is very flexible. These are the basic principles:

Heating with room temperature control

Typically, the air duct temperature is adjusted according to your requirements. The air duct temperature sensor S3 is the most important sensor. The desired temperature at S3 is set in the ECL Comfort controller as the 'Desired balance temperature'.

The motorized control valve M1 (controlling the heating temperature) is opened gradually when the air duct emperature is lower than the desired air duct temperature and vice versa.

Room temperature:
If the room temperature (S4 or ECA 30) does not equal the desired room temperature, the desired temperature at S3 can be adjusted.

By means of a week schedule (up to 3 'Comfort' periods / day), the heating circuit can be in 'Comfort' or 'Saving' mode (two different temperature values for desired room temperature).

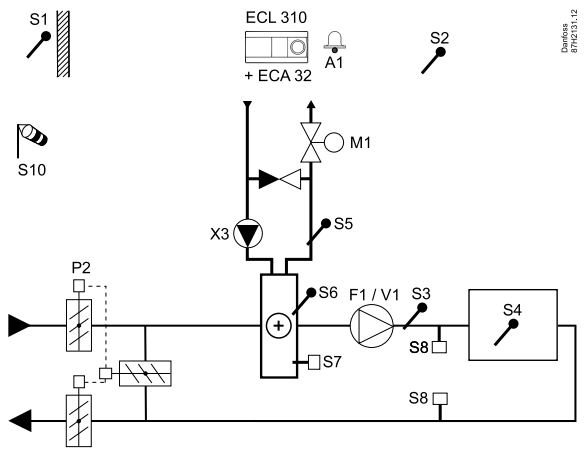
In 'Saving' mode the desired room temperature determines a correction of the desired temperature at S3.

The fan F1 is ON / OFF controlled according to the schedule and heating demand. The damper P2 is ON / OFF controlled according to schedule. The circulation pump X3 is ON / OFF controlled according to heating demand.

Variable fan speed (optional):
The fan V1 can be speed controlled in relation to the measured wind speed S10. The fan speed control signal is a 0–10 volt signal, generated by the internal input / output module ECA 32. A menu in the ECL Comfort 310 contains settings for relationship between actual wind speed and desired fan speed.

For a description of alarms, compensation temperature, return temperature limitation (S5) and frost protection (S6 and S7), please read the section 'A214 and A314 in general'.

Typical A314.3 application:



The shown diagram is a fundamental and simplified example and does not contain all components that are necessary in a system.

All named components are connected to the ECL Comfort controller.

List of components:

ECL 310	*Electronic controller ECL Comfort 310*
ECA 32	*Built-in extension module*
S1	*Outdoor temperature sensor*
S2	*(Optional) Compensation temperature sensor*
S3	*Duct temperature sensor*
S4	*Room temperature sensor**
S5	*(Optional) Return temperature sensor*
S6	*(Optional) Frost temperature sensor*
S7	*(Optional) Frost thermostat*
S8	*(Optional) Fire thermostat*
S10	*Wind speed signal (0 - 10 volt)*
F1	*Fan (ON / OFF)*
P2	*Damper (ON / OFF)*
X3	*Circulation pump, heating (ON / OFF)*
M1	*Motorized control valve, heating (3-point controlled)*
M2	*Motorized damper (0 - 10 volt controlled)*
V1	*Fan speed (0 - 10 volt controlled)*
A1	*Alarm*
	** Alternative: ECA 30*

The advanced heating application **A314.4** is very flexible. These are the basic principles:

Heating with room temperature and air pressure control

Typically, the heating temperature is adjusted according to your requirements. The air duct temperature sensor S3 is the most important sensor. The desired temperature at S3 is set in the ECL Comfort controller as the 'Desired inlet temperature'.

The recovery circuit, controlled by M2, is considered as the main circuit, whereas the heating circuit, controlled by M1, is the supplementary circuit.

The motorized control valve M1 (controlling the heating temperature) is opened gradually when the S3 temperature is lower than the desired S3 temperature and vice versa.

Room temperature:
If the room temperature (S4 or ECA 30) does not equal the desired room temperature, the desired temperature at S3 can be adjusted.

By means of a week schedule (up to 3 'Comfort' periods / day), the heating circuit can be in 'Comfort' or 'Saving' mode (two different temperature values for desired inlet temperature and two different temperature values for desired room temperature).

The fan F1 is ON / OFF controlled according to the schedule and heating demand. A damper P2 can be ON / OFF controlled according to schedule. The circulation pump X3 is ON / OFF controlled according to heating demand.

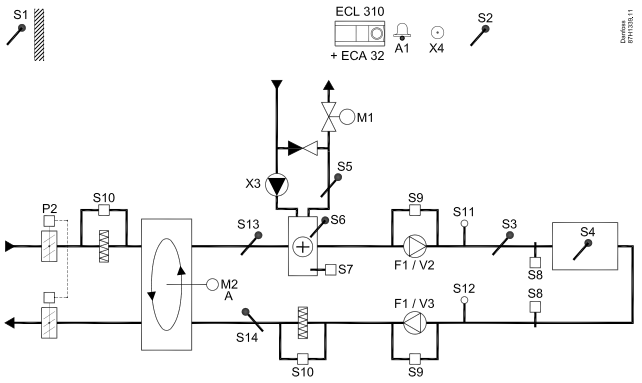
Air pressure control:
The fans V2 and V3 are speed controlled individually in relation to desired pressures (Pascal) at S11 and S12. The signals at S11 and S12 are measured as 0 - 10 volt and converted into Pascal in the ECL Comfort 310. Furthermore, the speed of the fans can be lowered at lower outdoor temperatures in order to reduce cold air inlet.

Heat recovery:
In order to utilize heat from the exit air duct, a rotating heat-exchanger, a cross heat-exchanger or a fluid battery can be controlled by M2. Based on the outdoor temperature S1, the entry duct temperature S13 and the exit duct temperature S14 the recovery efficiency (in %) can be indicated.

Night cooling:
During Saving mode a passive cooling (setting the fans ON) can be arranged, mainly under the following conditions:

- room temperature is higher than desired saving room temperature
- outdoor temperature is lower than the room temperature

Typical A314.4 application:



The shown diagram is a fundamental and simplified example and does not contain all components that are necessary in a system.

All named components are connected to the ECL Comfort controller.

List of components:

ECL 310	*Electronic controller ECL Comfort 310*
ECA 32	*Built-in extension module*
S1	*Outdoor temperature sensor*
S2	*(Optional) Compensation temperature sensor*
S3	*Duct temperature sensor*
S4	*Room temperature sensor**
S5	*(Optional) Return temperature sensor*
S6	*(Optional) Frost temperature sensor*
S7	*(Optional) Frost thermostat*
S8	*(Optional) Fire thermostat*
S9	*Fan monitor*
S10	*Filter monitor*
S11	*Inlet pressure sensor*
S12	*Outlet pressure sensor*
S13	*Entry duct temperature sensor*
S14	*Exit duct temperature sensor*
F1	*Fan (ON / OFF)*
P2	*Damper (ON / OFF)*
X3	*Circulation pump, heating (ON / OFF)*
X4	*Schedule 3*
P7	*Recovery circuit pump, ON / OFF, (not illustrated)*
P8	*Night damper, ON / OFF, (not illustrated)*
M1	*Motorized control valve, heating (3-point controlled)*
M2	*Rotating heat-exchanger (0 - 10 volt controlled)*
V2	*Fan speed (0 - 10 volt controlled)*
V3	*Fan speed (0 - 10 volt controlled)*
A1	*Alarm*

** Alternative: ECA 30*

Heating with room temperature and air pressure control (continued)

Ventilation during saving period:
A desired reduced pressure can be set.

- Room temperature signal must be present
- The night damper P8 will open
- The fan V2 will operate at reduced speed
- The fan V3 is OFF
- P2 is OFF
- M2 is OFF

Summer cut-out:
When outdoor temperature exceeds a selectable value, the heating system closes totally.

M1 is 3-point controlled, whereas M2 is 0-10 V controlled.

For a description of alarms, compensation temperature, return temperature limitation (S5) and frost protection (S6 and S7), please read the section 'A214 and A314 in general'.

The advanced heating application **A314.5** is very flexible. These are the basic principles:

Heating with room temperature and air quality control

Typically, the heating temperature is adjusted according to your requirements. The air duct temperature sensor S3 is the most important sensor. The desired temperature at S3 is set in the ECL Comfort controller as the 'Desired inlet temperature'.

The recovery circuit, controlled by M2, is considered as the main circuit, whereas the heating circuit, controlled by M1, is the supplementary circuit.

The motorized control valve M1 (controlling the heating temperature) is opened gradually when the S3 temperature is lower than the desired S3 temperature and vice versa.

Room temperature:
If the room temperature (S4 or ECA 30) does not equal the desired room temperature, the desired temperature at S3 can be adjusted.

By means of a week schedule (up to 3 'Comfort' periods / day), the heating circuit can be in 'Comfort' or 'Saving' mode (two different temperature values for desired inlet temperature and two different temperature values for desired room temperature).

The fan F1 is ON / OFF controlled according to the schedule and heating demand. A damper P2 can be ON / OFF controlled according to schedule. The circulation pump X3 is ON / OFF controlled according to heating demand.

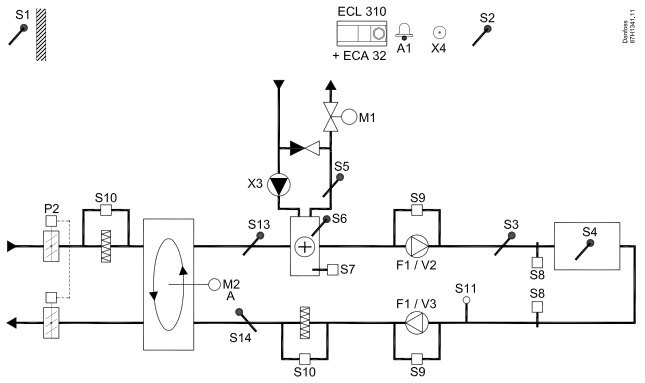
Air quality control (CO_2 measured in "ppm"):
The fans V2 and V3 are increased in speed when the ppm value (0 - 10 volt signal measured by S11) exceeds a selectable limit. Speed relation between V2 and V3 can be set. As an alternative, the S11 signal can express an RH signal (Relative Humidity).

Heat recovery:
In order to utilize heat from the exit air duct, a rotating heat-exchanger, a cross heat-exchanger or a fluid battery can be controlled by M2. Based on the outdoor temperature S1, the entry duct temperature S13 and the exit duct temperature S14 the recovery efficiency (in %) can be indicated.

Night cooling:
During Saving mode a passive cooling can be arranged, mainly under the following conditions:

- room temperature is higher than desired saving room temperature
- outdoor temperature is lower than the room temperature

Typical A314.5 application:



The shown diagram is a fundamental and simplified example and does not contain all components that are necessary in a system.

All named components are connected to the ECL Comfort controller.

List of components:

ECL 310	*Electronic controller ECL Comfort 310*
ECA 32	*Built-in extension module*
S1	*Outdoor temperature sensor*
S2	*(Optional) Compensation temperature sensor*
S3	*Duct temperature sensor*
S4	*Room temperature sensor**
S5	*(Optional) Return temperature sensor*
S6	*(Optional) Frost temperature sensor*
S7	*(Optional) Frost thermostat*
S8	*(Optional) Fire thermostat*
S9	*Fan monitor*
S10	*Filter monitor*
S11	*Air quality (CO_2) signal (ppm). Alternative: Relative Humidity signal.*
S13	*Entry duct temperature sensor*
S14	*Exit duct temperature sensor*
F1	*Fan (ON / OFF)*
P2	*Damper (ON / OFF)*
X3	*Circulation pump, heating (ON / OFF)*
X4	*Schedule 3*
P7	*Recovery circuit pump, ON / OFF, (not illustrated)*
P8	*Night damper, ON / OFF, (not illustrated)*
M1	*Motorized control valve, heating (3-point controlled)*
M2	*Rotating heat-exchanger (0 - 10 volt controlled)*
V2	*Fan speed (0 - 10 volt controlled)*
V3	*Fan speed (0 - 10 volt controlled)*
A1	*Alarm*

** Alternative: ECA 30*

Heating with room temperature and air quality control (continued)

Ventilation during saving period:
A desired fan speed can be set.

- Room temperature signal must be present
- The night damper P8 will open
- The fan V2 will operate at reduced speed
- The fan V3 is OFF
- P2 is OFF
- M2 is OFF

Summer cut-out:
When outdoor temperature exceeds a selectable value, the heating system closes totally.

M1 is 3-point controlled, whereas M2 is 0-10 V controlled.

For a description of alarms, compensation temperature, return temperature limitation (S5) and frost protection (S6 and S7), please read the section 'A214 and A314 in general'.

The advanced heating application **A314.6** is very flexible. These are the basic principles:

Heating / cooling with room temperature and air pressure control

Typically, the heating temperature is adjusted according to your requirements. The air duct temperature sensor S3 is the most important sensor. The desired temperature at S3 is set in the ECL Comfort controller as the 'Desired inlet temperature'.

The recovery circuit, controlled by M2, is considered as the main circuit, whereas the heating circuit (controlled by M1) and the cooling circuit (controlled by M3) are the supplementary circuits.

The motorized control valve M1 (controlling the heating temperature) is opened gradually when the air duct temperature is lower than the desired inlet temperature and vice versa.
At cooling, the motorized control valve M3 controls the cooling temperature.

Room temperature:
If the room temperature (S4 or ECA 30) does not equal the desired room temperature, the desired temperature at S3 can be adjusted.

A too low temperature at S4 will activate the heating circuit (M1), whereas a too high air duct temperature will activate the cooling circuit (M3). A "Dead zone" (= number of degrees) can be set in order to avoid unstable shifts between heating and cooling operation.

By means of a week schedule (up to 3 'Comfort' periods / day), the heating / cooling circuit can be in 'Comfort' or 'Saving' mode (two different temperature values for desired inlet temperature and two different temperature values for desired room temperature).

The fan F1 is ON / OFF controlled according to the schedule and heating demand. A damper P2 can be ON / OFF controlled according to schedule. The circulation pump X3 is ON / OFF controlled according to heating demand.

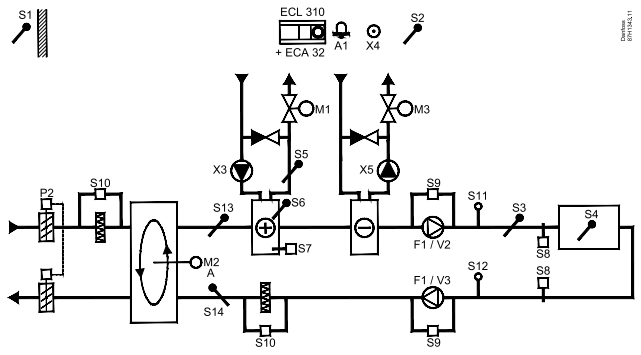
Air pressure control:
The fans V2 and V3 are speed controlled individually in relation to desired pressures (Pascal) at S11 and S12. The signals at S11 and S12 are measured as 0 - 10 volt and converted into Pascal in the ECL Comfort 310.

Heat recovery:
In order to utilize heat from the exit air duct, a rotating heat-exchanger, a cross heat-exchanger or a fluid battery can be controlled by M2. Based on the outdoor temperature S1, the entry duct temperature S13 and the exit duct temperature S14 the recovery efficiency (in %) can be indicated.

Night cooling:
During Saving mode a passive cooling can be arranged, mainly under the following conditions:

- room temperature is higher than desired saving room temperature
- outdoor temperature is lower than the room temperature
- schedule 3 is in Comfort mode

Typical A314.6 application:



The shown diagram is a fundamental and simplified example and does not contain all components that are necessary in a system.

All named components are connected to the ECL Comfort controller.

List of components:

ECL 310	*Electronic controller ECL Comfort 310*
ECA 32	*Built-in extension module*
S1	*Outdoor temperature sensor*
S2	*(Optional) Compensation temperature sensor*
S3	*Duct temperature sensor*
S4	*Room temperature sensor**
S5	*(Optional) Return temperature sensor*
S6	*(Optional) Frost temperature sensor*
S7	*(Optional) Frost thermostat*
S8	*(Optional) Fire thermostat*
S9	*Fan monitor*
S10	*Filter monitor*
S11	*Inlet pressure sensor*
S12	*Outlet pressure sensor*
S13	*Entry duct temperature sensor*
S14	*Exit duct temperature sensor*
F1	*Fan (ON / OFF)*
P2	*Damper (ON / OFF)*
X3	*Circulation pump, heating (ON / OFF)*
X4	*Schedule 3*
X5	*Circulation pump, cooling (ON / OFF)*
P7	*Recovery circuit pump, ON / OFF, (not illustrated)*
M1	*Motorized control valve, heating (3-point controlled)*
M2	*Rotating heat-exchanger (0 - 10 volt controlled)*
M3	*Motorized control valve, cooling (3-point controlled)*
V2	*Fan speed (0 - 10 volt controlled)*
V3	*Fan speed (0 - 10 volt controlled)*
A1	*Alarm*

** Alternative: ECA 30*

Heating / cooling with room temperature and air pressure control (continued)

M1 and M3 are 3-point controlled, whereas M2 is 0-10 V controlled.

For a description of alarms, compensation temperature, return temperature limitation (S5) and frost protection (S6 and S7), please read the section 'A214 and A314 in general'.

The advanced heating application **A314.7** is very flexible. These are the basic principles:

Heating / cooling with room temperature and air quality control

Typically, the heating temperature is adjusted according to your requirements. The air duct temperature sensor S3 is the most important sensor. The desired temperature at S3 is set in the ECL Comfort controller as the 'Desired inlet temperature'.

The recovery circuit, controlled by M2, is considered as the main circuit, whereas the heating circuit (controlled by M1) and the cooling circuit (controlled by M3) are the supplementary circuits.

The motorized control valve M1 (controlling the heating temperature) is opened gradually when the S3 temperature is lower than the desired S3 temperature and vice versa.
At cooling, the motorized control valve M3 controls the cooling temperature.

Room temperature:
If the room temperature (S4 or ECA 30) does not equal the desired room temperature, the desired temperature at S3 can be adjusted.

A too low temperature at S4 will activate the heating circuit (M1), whereas a too high air duct temperature will activate the cooling circuit (M3). A "Dead zone" (= number of degrees) can be set in order to avoid unstable shifts between heating and cooling operation.

By means of a week schedule (up to 3 'Comfort' periods / day), the heating circuit can be in 'Comfort' or 'Saving' mode (two different temperature values for desired inlet temperature and two different temperature values for desired room temperature).

The fan F1 is ON / OFF controlled according to the schedule and heating demand. A damper P2 can be ON / OFF controlled according to schedule. The circulation pump X3 is ON / OFF controlled according to heating demand.

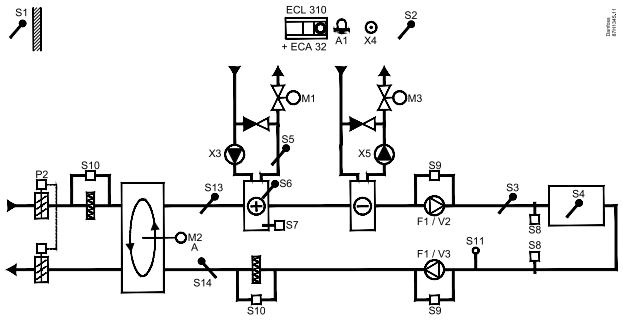
Air quality control (CO_2 measured in "ppm"):
The fans V2 and V3 are increased in speed when the ppm value (0 - 10 volt signal measured by S11) exceeds a selectable limit. Speed relation between V2 and V3 can be set. As an alternative, the S11 signal can express an RH signal (Relative Humidity).

Heat recovery:
In order to utilize heat from the exit air duct, a rotating heat-exchanger, a cross heat-exchanger or a fluid battery can be controlled by M2. Based on the outdoor temperature S1, the entry duct temperature S13 and the exit duct temperature S14 the recovery efficiency (in %) can be indicated.

Night cooling:
During Saving mode a passive cooling can be arranged, mainly under the following conditions:

- room temperature is higher than desired saving room temperature
- outdoor temperature is lower than the room temperature
- schedule 3 is in Comfort mode

Typical A314.7 application:



The shown diagram is a fundamental and simplified example and does not contain all components that are necessary in a system.

All named components are connected to the ECL Comfort controller.

List of components:

ECL 310	*Electronic controller ECL Comfort 310*
ECA 32	*Built-in extension module*
S1	*Outdoor temperature sensor*
S2	*(Optional) Compensation temperature sensor*
S3	*Duct temperature sensor*
S4	*Room temperature sensor**
S5	*(Optional) Return temperature sensor*
S6	*(Optional) Frost temperature sensor*
S7	*(Optional) Frost thermostat*
S8	*(Optional) Fire thermostat*
S9	*Fan monitor*
S10	*Filter monitor*
S11	*Air quality (CO_2) signal (ppm). Alternative: Relative Humidity signal*
S13	*Entry duct temperature sensor*
S14	*Exit duct temperature sensor*
F1	*Fan (ON / OFF)*
P2	*Damper (ON / OFF)*
X3	*Circulation pump, heating (ON / OFF)*
X4	*Schedule 3*
X5	*Circulation pump, cooling (ON / OFF)*
P7	*Recovery circuit pump ON / OFF, (not illustrated)*
M1	*Motorized control valve, heating (3-point controlled)*
M2	*Rotating heat-exchanger (0 - 10 volt controlled)*
M3	*Motorized control valve, cooling (3-point controlled)*
V2	*Fan speed (0 - 10 volt controlled)*
V3	*Fan speed (0 - 10 volt controlled)*
A1	*Alarm*

** Alternative: ECA 30*

Heating / cooling with room temperature and air quality control (continued)

M1 and M3 are 3-point controlled, whereas M2 is 0-10 V controlled.

For a description of alarms, compensation temperature, return temperature limitation (S5) and frost protection (S6 and S7), please read the section 'A214 and A314 in general'.

The advanced heating application **A314.9** is very flexible. These are the basic principles:

Heating with room temperature and air quality control

Typically, the heating temperature is adjusted according to your requirements. The air duct temperature sensor S3 is the most important sensor. The desired temperature at S3 is set in the ECL Comfort controller as the 'Desired inlet temperature'.

The air mixing circuit, controlled by M2, is considered as the main circuit, whereas the heating circuit, controlled by M1, is the supplementary circuit.

The motorized control valve M1 (controlling the heating temperature) is opened gradually when the S3 temperature is lower than the desired S3 temperature and vice versa.

Room temperature:
If the room temperature (S4 or ECA 30) does not equal the desired room temperature, the desired temperature at S3 can be adjusted.

By means of a week schedule (up to 3 'Comfort' periods / day), the heating circuit can be in 'Comfort' or 'Saving' mode (two different temperature values for desired inlet temperature and two different temperature values for desired room temperature).

The fan F1 is ON / OFF controlled according to the schedule and heating demand. A damper P2 can be ON / OFF controlled according to schedule. The circulation pump X3 is ON / OFF controlled according to heating demand.

Air quality control (CO_2 measured in "ppm"):
When the ppm value (0 - 10 volt signal measured by S11) exceeds a selectable limit, the damper M2 gradually opens in order to supply more fresh air.

When M2 is fully open, the fans V2 and V3 are gradually increased in speed until the ppm value is acceptable. Speed relation between V2 and V3 can be set.

As an alternative, the S11 signal can express an RH signal (Relative Humidity).

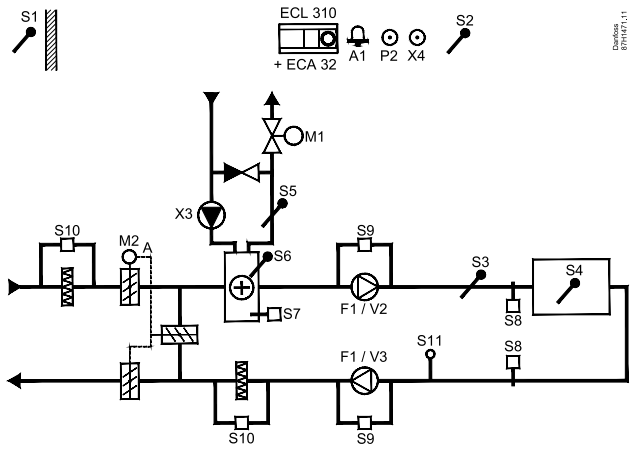
Ventilation during saving period:
A desired fan speed can be set.

- Room temperature signal must be present
- The night damper P8 will open
- The fan V2 will operate at reduced speed
- The fan V3 is OFF
- P2 is OFF
- M2 is OFF

M1 is 3-point controlled, whereas M2 is 0-10 V controlled.

For a description of alarms, compensation temperature, return temperature limitation (S5) and frost protection (S6 and S7), please read the section 'A214 and A314 in general'.

Typical A314.9 application:



The shown diagram is a fundamental and simplified example and does not contain all components that are necessary in a system.

All named components are connected to the ECL Comfort controller.

List of components:

ECL 310	*Electronic controller ECL Comfort 310*
ECA 32	*Built-in extension module*
S1	*Outdoor temperature sensor*
S2	*(Optional) Compensation temperature sensor*
S3	*Duct temperature sensor*
S4	*Room temperature sensor**
S5	*(Optional) Return temperature sensor*
S6	*(Optional) Frost temperature sensor*
S7	*(Optional) Frost thermostat*
S8	*(Optional) Fire thermostat*
S9	*Fan monitor*
S10	*Filter monitor*
S11	*Air quality (CO_2) signal (ppm). Alternative: Relative Humidity signal*
F1	*Fan (ON / OFF)*
P2	*Damper (ON / OFF), not illustrated*
X3	*Circulation pump, heating (ON / OFF)*
X4	*Schedule 3*
P8	*Night damper, not illustrated*
M1	*Motorized control valve, heating (3-point controlled)*
M2	*Motorized damper (0 - 10 volt controlled)*
V2	*Fan speed (0 - 10 volt controlled)*
V3	*Fan speed (0 - 10 volt controlled)*
A1	*Alarm*

** Alternative: ECA 30*

A214 and A314 in general:

Compensation temperature (optional):

If the measured compensation temperature (S1 or S2) is higher or lower than the limitation value, the desired temperature at S3 can be adjusted. The compensation temperature can be measured by the outdoor temperature sensor or for example an additional room temperature sensor.

Override possibilities:

Unused input can, by means of an override switch, be used to override the schedule to a fixed 'Comfort' or 'Saving' mode.

Alarm functions:

The alarm (relay 4 in ECL 210, relay 6 in ECL 310) is activated:

1. If an unaccepted deviation between the desired and actual S3 temperature occurs.
2. If a frost thermostat (S7) is activated.
3. If a frost temperature is detected at S5 or S6.
4. If the fire alarm (S8) is activated.
5. If a temperature sensor or its connection disconnects / short circuits.

A214.2, A214.3, A214.4, A214.5, A314.1, A314.2 and A314.3:

Return temperature (optional):

If the measured return temperature (S5) does not equal the limitation value (typically, the return temperature becomes higher than the limitation value), the desired temperature at S3 can be adjusted (typically to a lower value). This results in a gradual closing of the motorized control valve.

Frost protection (optional):

Temperature sensor S6 and / or frost thermostat S7 can protect the heat exchanger against frost.

Furthermore, if the S5 temperature becomes too low, it also can enable the frost protection.

An activated frost protection will start the alarm, stop the fan F1, close the damper P2 and fully open the motorized control valve M1.

Fire alarm (optional):
An activated fire alarm input will start the alarm, stop the fan F1, close the damper P2 and close the motorized control valves.

A314.4, A314.5, A314.6 and A314.7:

Efficiency calculation:

$$\frac{(\text{Entry duct} - \text{Outdoor}) \times 100}{(\text{Exit duct} - \text{Outdoor})} = \%$$

Example:

Outdoor (S1) = 7 °C
Entry duct (S13) = 16 °C
Exit duct (S14) = 24 °C

$$\frac{(16 - 7) \times 100}{(24 - 7)} = 53\ \%$$

A314.4, A314.5, A314.6 and A314.7:

Circuit 1's overview display shows output status for M1.
An approximate %-value for M1's position is also indicated in order to follow the control procedure.

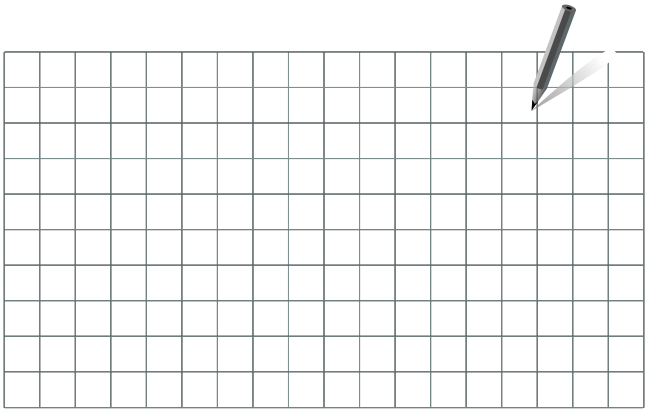
The controller is pre-programmed with factory settings that are shown in the 'Parameter ID overview' appendix.

2.2 Identifying the system type

Sketch your application

The ECL Comfort controller series is designed for a wide range of heating, domestic hot-water (DHW) and cooling systems with different configurations and capacities. If your system differs from the diagrams shown here, you may want to make a sketch of the system about to be installed. This makes it easier to use the Operating Guide, which will guide you step-by-step from installation to final adjustments before the end-user takes over.

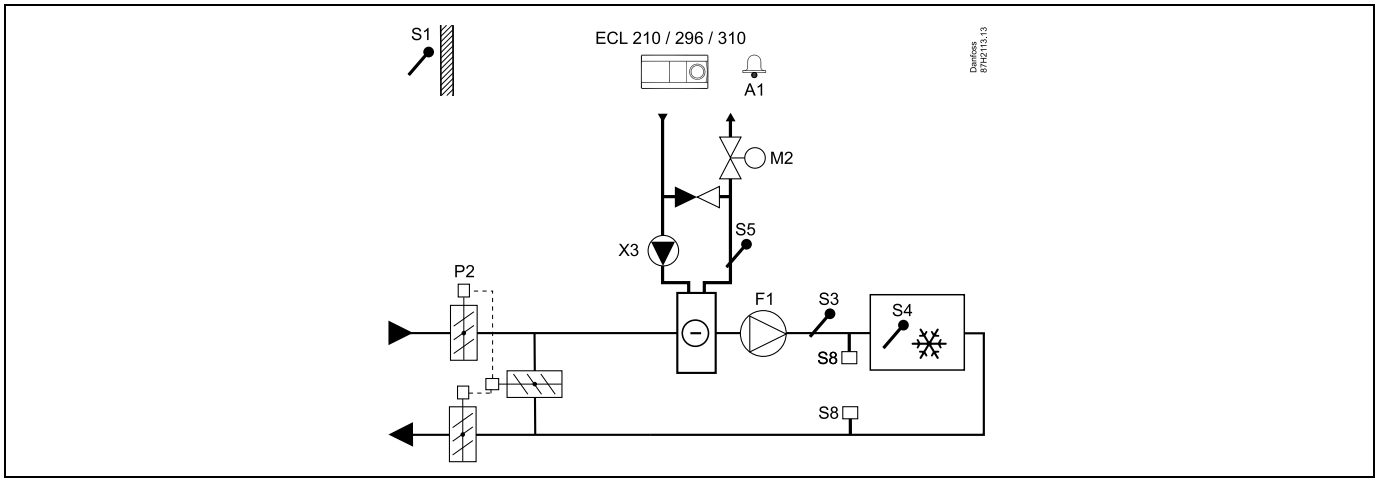
The ECL Comfort controller is a universal controller that can be used for various systems. Based on the shown standard systems, it is possible to configure additional systems. In this chapter you find the most frequently used systems. If your system is not quite as shown below, find the diagram which has the best resemblance with your system and make your own combinations.



The circulation pump(s) in heating circuit(s) can be placed in the flow as well as the return. Place the pump according to the manufacturer's specification.

A214.1 example a

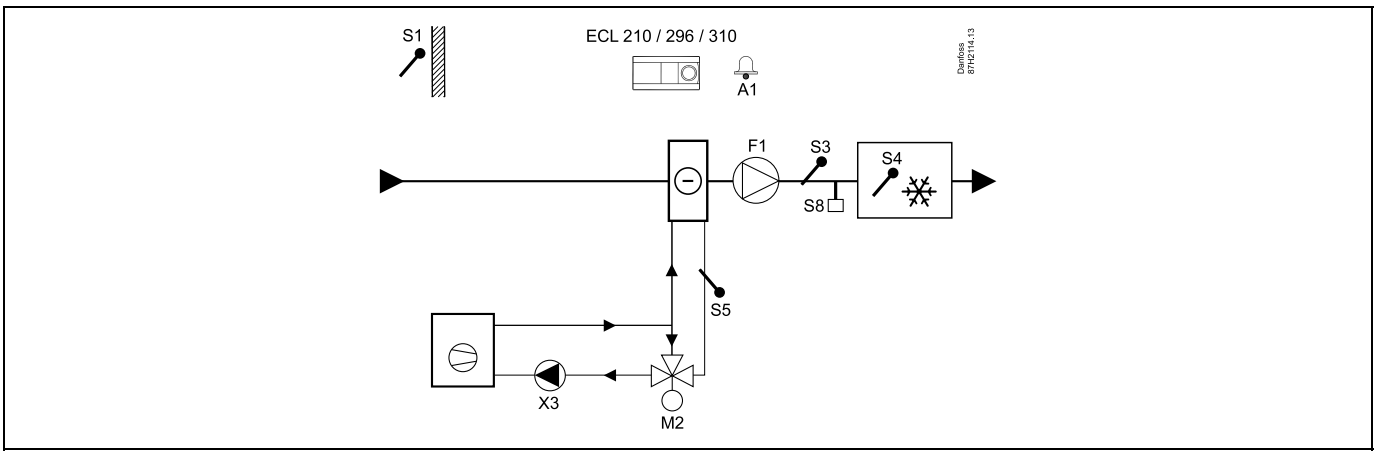
Ventilation system with cooling and constant room temperature control



Setting advice:
Set desired room temperature, for example 20 °C.
Set desired balance temperature, for example 12 °C.
If a room temperature sensor is not connected, the desired duct temperature at S3 will correspond to the desired room temperature.

A214.1 example b

Ventilation system with cooling and constant room temperature control. Chiller has constant flow.

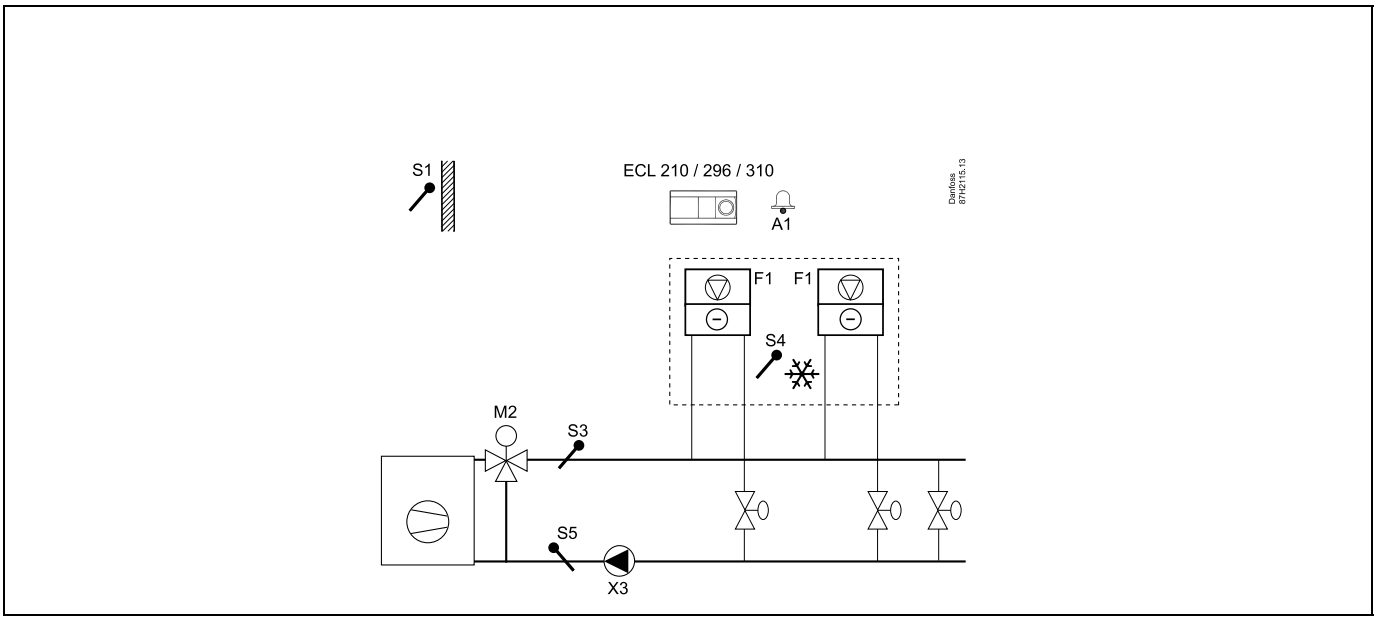


Setting advice:

Set desired room temperature, for example 20 °C.
Set desired balance temperature, for example 12 °C.
If a room temperature sensor is not connected, the desired duct temperature at S3 will correspond to the desired room temperature.

A214.1 example c

Ventilation system (fan coils) with cooling and constant room temperature control

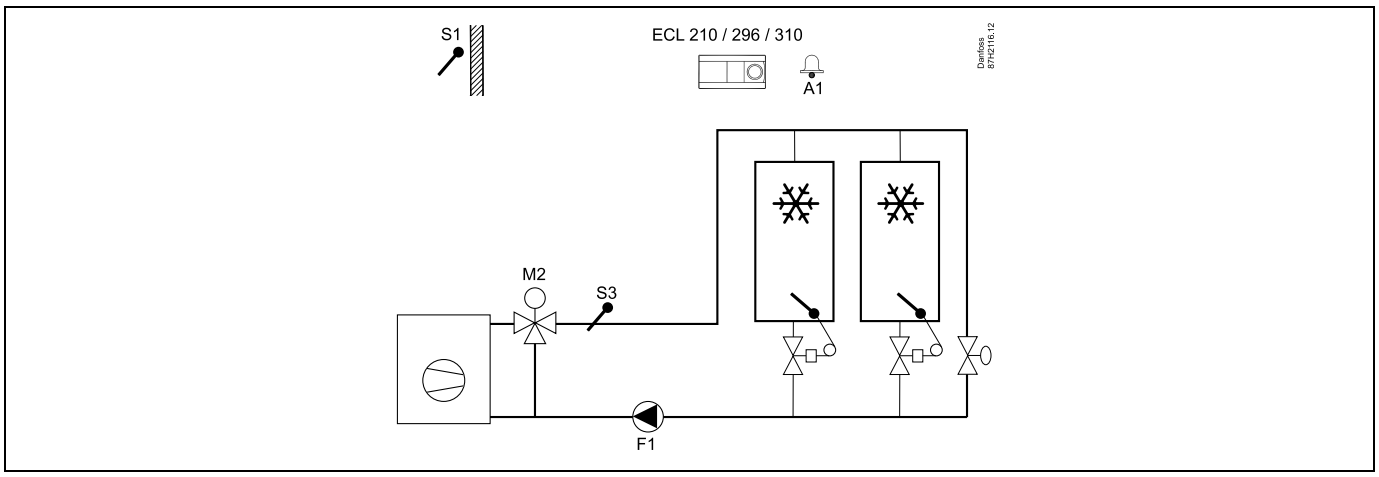


Setting advice:

Set desired room temperature, for example 5 °C.
Set desired balance temperature, for example 1 °C.
If a room temperature sensor is not connected, the desired flow temperature at S3 will correspond to the desired room temperature.

A214.1 example d

Cooling system with constant flow temperature control



Setting advice:

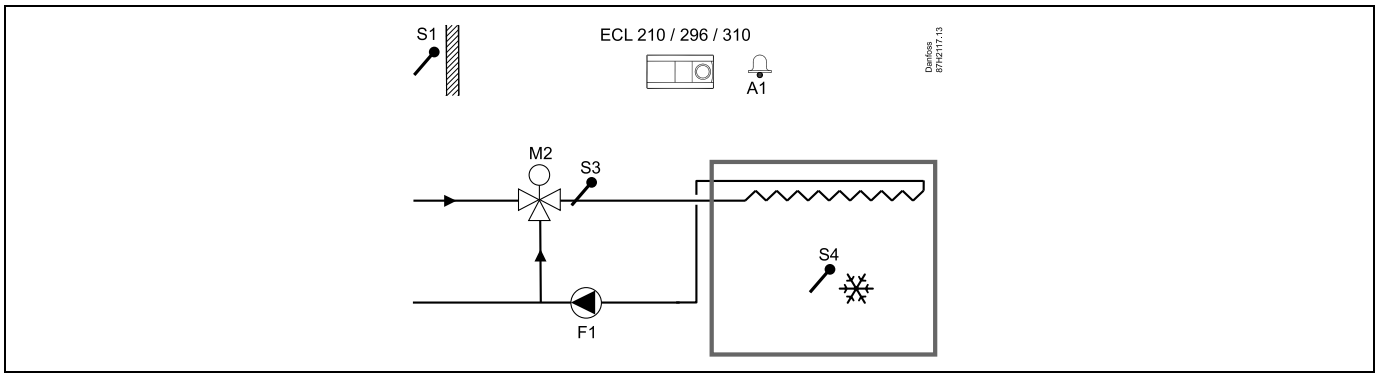
Set desired room temperature, for example 1 °C.

If a room temperature sensor is not connected, the desired flow temperature at S3 will correspond to the desired room temperature.

Set 'Fan cut-in delay' (ID no. 11086 — 'Settings', 'Fan / acc. control') to 0 seconds.

A214.1 example e

Cooling system in ceiling and constant room temperature control in for example a wine cellar



Setting advice:

Set desired room temperature, for example 14 °C.

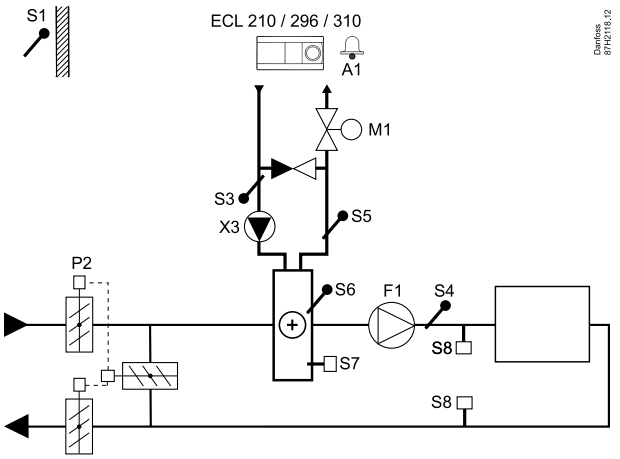
Set desired balance temperature, for example 10 °C.

If a room temperature sensor is not connected, the desired flow temperature at S3 will correspond to the desired room temperature.

Set 'Fan cut-in delay' (ID no. 11086 — 'Settings', 'Fan / acc. control') to 0 seconds.

A214.2 example a

Ventilation system with heating and constant duct temperature control



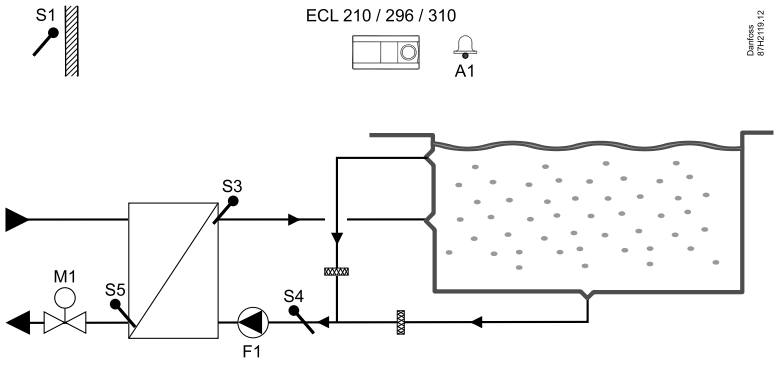
Sensor advice:

Sensor S3 and S4 must be connected. If not, the fan (F1) stops, the damper (P2) and motorized control valve (M1) close.

Navigation: **Special settings for sensors / thermostats used as frost protection:**	**ID no.:**	**Recommended setting:**
S6* frost temperature sensor — MENU \ Alarm \ Frost T \ Alarm value	11676	5 °C
S5 return temperature sensor — MENU \ Alarm \ Limit T frost \ Alarm value	11656	5 °C
Closing contact of the S7* frost thermostat — MENU \ Alarm \ Frost thermostat \ Alarm value	11616	0
Opening contact of the S7* frost thermostat — MENU \ Alarm \ Frost thermostat \ Alarm value	11616	1
* both frost protection methods, by means of S6 and / or S7, can be used		
Special settings for thermostats used as fire alarm:		
Closing contact of the S8 fire thermostat — MENU \ Alarm \ Fire safety \ Alarm value	11636	0
Opening contact of the S8 fire thermostat — MENU \ Alarm \ Fire safety \ Alarm value	11636	1

A214.2 example b

Heating of a swimming pool, constant water temperature control



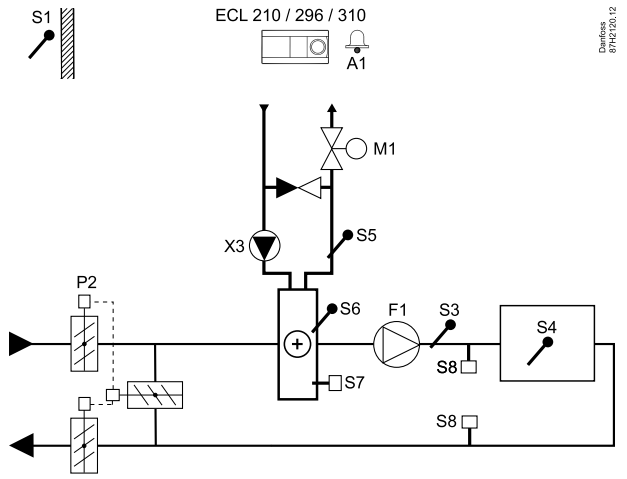
Sensor advice:

Sensor S3 and S4 must be connected. If not, the pump (F1) stops and motorized control valve (M1) closes.

Navigation: **Special settings for sensors / thermostats used as frost protection:**	**ID no.:**	**Recommended setting:**
S6* frost temperature sensor — MENU \ Alarm \ Frost T \ Alarm value	11676	5 °C
S5 return temperature sensor — MENU \ Alarm \ Limit T frost \ Alarm value	11656	5 °C
Closing contact of the S7* frost thermostat — MENU \ Alarm \ Frost thermostat \ Alarm value	11616	0
Opening contact of the S7* frost thermostat — MENU \ Alarm \ Frost thermostat \ Alarm value	11616	1
* both frost protection methods, by means of S6 and / or S7, can be used		
Special settings for thermostats used as fire alarm:		
Closing contact of the S8 fire thermostat — MENU \ Alarm \ Fire safety \ Alarm value	11636	0
Opening contact of the S8 fire thermostat — MENU \ Alarm \ Fire safety \ Alarm value	11636	1
Other settings:		
Fan cut-in delay — MENU \ Settings \ Fan / acc. control	11086	0

A214.3 example a

Ventilation system with heating and constant room temperature control



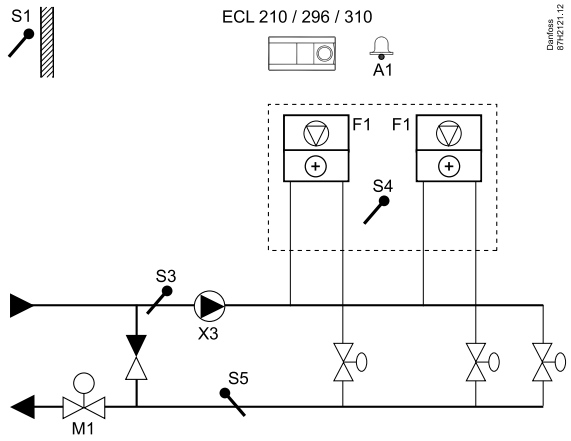
Setting advice:

Set desired room temperature, for example 20 °C.
Set desired balance temperature, for example 20 °C.
If a room temperature sensor is not connected, the desired duct temperature at S3 will correspond to the desired room temperature.

Navigation: **Special settings for sensors / thermostats used as frost protection:**	**ID no.:**	**Recommended setting:**
S6* frost temperature sensor — MENU \ Alarm \ Frost T \ Alarm value	11676	5 °C
S5 return temperature sensor — MENU \ Alarm \ Limit T frost \ Alarm value	11656	5 °C
Closing contact of the S7* frost thermostat — MENU \ Alarm \ Frost thermostat \ Alarm value	11616	0
Opening contact of the S7* frost thermostat — MENU \ Alarm \ Frost thermostat \ Alarm value	11616	1
* both frost protection methods, by means of S6 and / or S7, can be used		
Special settings for thermostats used as fire alarm:		
Closing contact of the S8 fire thermostat — MENU \ Alarm \ Fire safety \ Alarm value	11636	0
Opening contact of the S8 fire thermostat — MENU \ Alarm \ Fire safety \ Alarm value	11636	1

A214.3 example b

Ventilation system (fan coils) with heating and constant room temperature control



Setting advice:

Set desired room temperature, for example 20 °C.

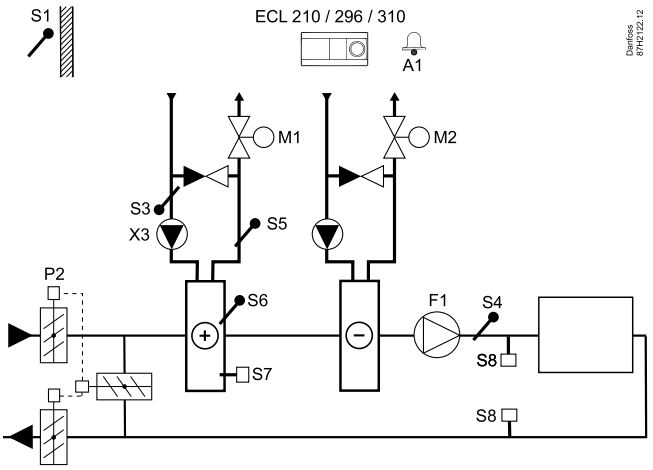
Set desired balance temperature, for example 35 °C.

If a room temperature sensor is not connected, the desired flow temperature at S3 will correspond to the desired room temperature.

Navigation: **Special settings for sensors / thermostats used as frost protection:**	**ID no.:**	**Recommended setting:**
S6* frost temperature sensor — MENU \ Alarm \ Frost T \ Alarm value	11676	5 °C
S5 return temperature sensor — MENU \ Alarm \ Limit T frost \ Alarm value	11656	5 °C
Closing contact of the S7* frost thermostat — MENU \ Alarm \ Frost thermostat \ Alarm value	11616	0
Opening contact of the S7* frost thermostat — MENU \ Alarm \ Frost thermostat \ Alarm value	11616	1
* both frost protection methods, by means of S6 and / or S7, can be used		
Special settings for thermostats used as fire alarm:		
Closing contact of the S8 fire thermostat — MENU \ Alarm \ Fire safety \ Alarm value	11636	0
Opening contact of the S8 fire thermostat — MENU \ Alarm \ Fire safety \ Alarm value	11636	1

A214.4 example a

Ventilation system with heating, cooling and constant duct temperature control



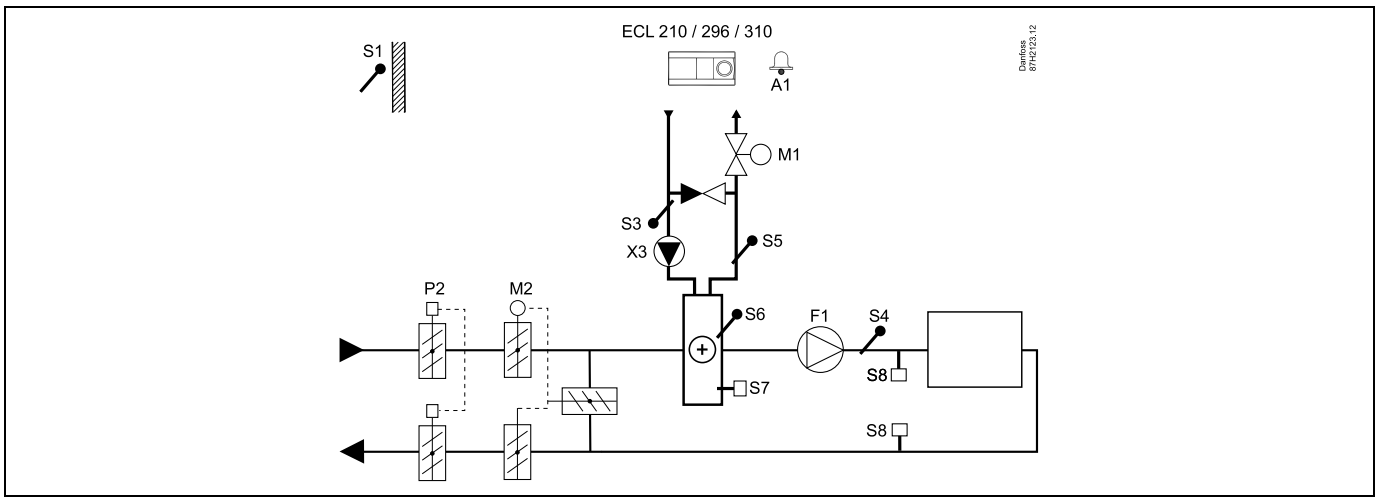
Sensor advice:

Sensor S3 and S4 must be connected. If not, the fan (F1) stops, the damper (P2) and motorized control valves (M1 / M2) close.

Navigation: **Special settings for sensors / thermostats used as frost protection:**	**ID no.:**	**Recommended setting:**
S6* frost temperature sensor — MENU \ Alarm \ Frost T \ Alarm value	11676	5 °C
S5 return temperature sensor — MENU \ Alarm \ Limit T frost \ Alarm value	11656	5 °C
Closing contact of the S7* frost thermostat — MENU \ Alarm \ Frost thermostat \ Alarm value	11616	0
Opening contact of the S7* frost thermostat — MENU \ Alarm \ Frost thermostat \ Alarm value	11616	1
* both frost protection methods, by means of S6 and / or S7, can be used		
Special settings for thermostats used as fire alarm:		
Closing contact of the S8 fire thermostat — MENU \ Alarm \ Fire safety \ Alarm value	11636	0
Opening contact of the S8 fire thermostat — MENU \ Alarm \ Fire safety \ Alarm value	11636	1

A214.4 example b

Ventilation system with heating, passive cooling (outside air) and constant duct temperature control



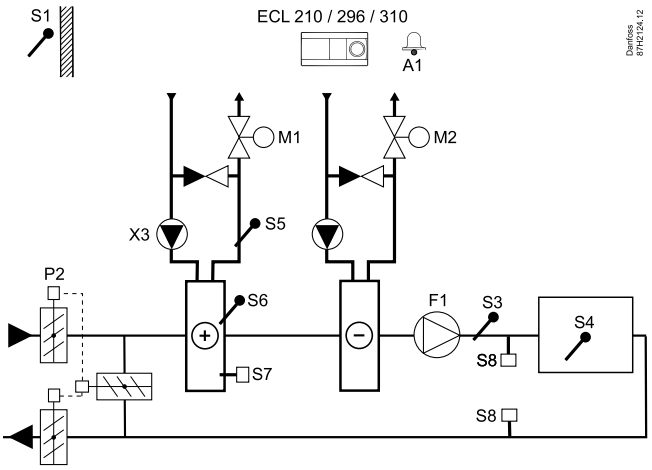
Sensor advice:

Sensor S3 and S4 must be connected. If not, the fan (F1) stops, the damper (P2) and motorized control valves (M1 / M2) close.

Navigation: **Special settings for sensors / thermostats used as frost protection:**	**ID no.:**	**Recommended setting:**
S6* frost temperature sensor — MENU \ Alarm \ Frost T \ Alarm value	11676	5 °C
S5 return temperature sensor — MENU \ Alarm \ Limit T frost \ Alarm value	11656	5 °C
Closing contact of the S7* frost thermostat — MENU \ Alarm \ Frost thermostat \ Alarm value	11616	0
Opening contact of the S7* frost thermostat — MENU \ Alarm \ Frost thermostat \ Alarm value	11616	1
* both frost protection methods, by means of S6 and / or S7, can be used		
Special settings for thermostats used as fire alarm:		
Closing contact of the S8 fire thermostat — MENU \ Alarm \ Fire safety \ Alarm value	11636	0
Opening contact of the S8 fire thermostat — MENU \ Alarm \ Fire safety \ Alarm value	11636	1

A214.5 example a

Ventilation system with heating, cooling and constant room temperature control



Setting advice:

Set desired room temperature, for example 20 °C.

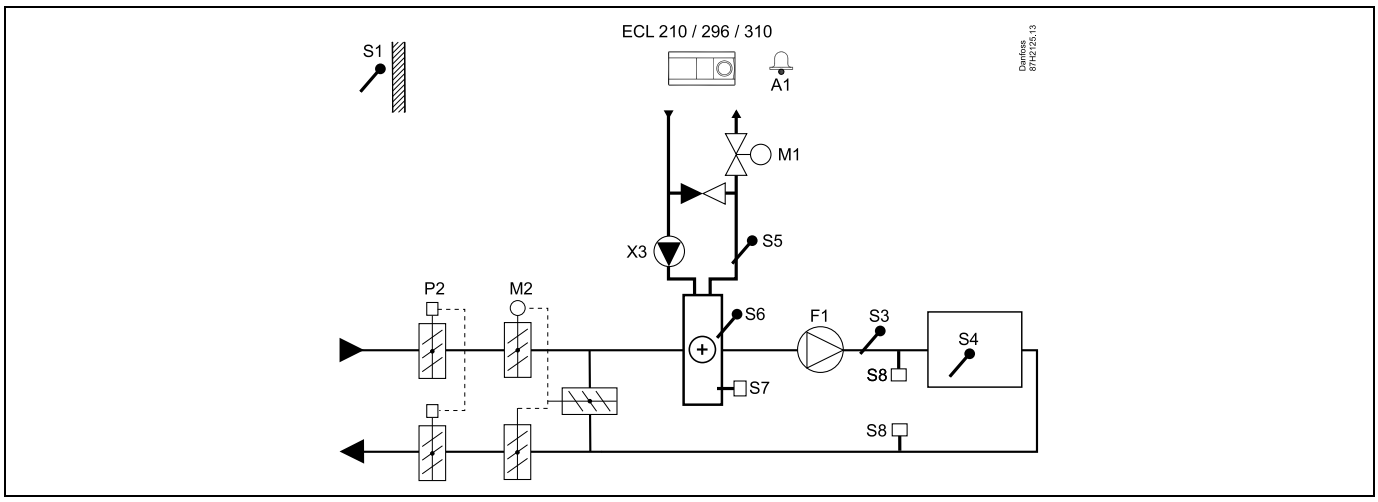
Set desired balance temperature, for example 20 °C.

If a room temperature sensor is not connected, the desired duct temperature at S3 will correspond to the desired room temperature.

Navigation: **Special settings for sensors / thermostats used as frost protection:**	**ID no.:**	**Recommended setting:**
S6* frost temperature sensor — MENU \ Alarm \ Frost T \ Alarm value	11676	5 °C
S5 return temperature sensor — MENU \ Alarm \ Limit T frost \ Alarm value	11656	5 °C
Closing contact of the S7* frost thermostat — MENU \ Alarm \ Frost thermostat \ Alarm value	11616	0
Opening contact of the S7* frost thermostat — MENU \ Alarm \ Frost thermostat \ Alarm value	11616	1
* both frost protection methods, by means of S6 and / or S7, can be used		
Special settings for thermostats used as fire alarm:		
Closing contact of the S8 fire thermostat — MENU \ Alarm \ Fire safety \ Alarm value	11636	0
Opening contact of the S8 fire thermostat — MENU \ Alarm \ Fire safety \ Alarm value	11636	1

A214.5 example b

Ventilation system with heating, passive cooling (outside air) and constant room temperature control



Setting advice:

Set desired room temperature, for example 20 °C.

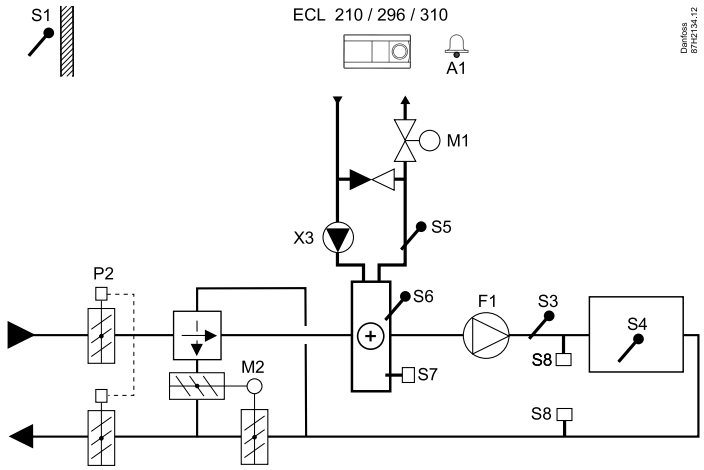
Set desired balance temperature, for example 20 °C.

If a room temperature sensor is not connected, the desired duct temperature at S3 will correspond to the desired room temperature.

Navigation: **Special settings for sensors / thermostats used as frost protection:**	**ID no.:**	**Recommended setting:**
S6* frost temperature sensor — MENU \ Alarm \ Frost T \ Alarm value	11676	5 °C
S5 return temperature sensor — MENU \ Alarm \ Limit T frost \ Alarm value	11656	5 °C
Closing contact of the S7* frost thermostat — MENU \ Alarm \ Frost thermostat \ Alarm value	11616	0
Opening contact of the S7* frost thermostat — MENU \ Alarm \ Frost thermostat \ Alarm value	11616	1
* both frost protection methods, by means of S6 and / or S7, can be used		
Special settings for thermostats used as fire alarm:		
Closing contact of the S8 fire thermostat — MENU \ Alarm \ Fire safety \ Alarm value	11636	0
Opening contact of the S8 fire thermostat — MENU \ Alarm \ Fire safety \ Alarm value	11636	1

A214.5 example c

Ventilation system with heating, cross-flow heat exchanger control and constant room temperature control



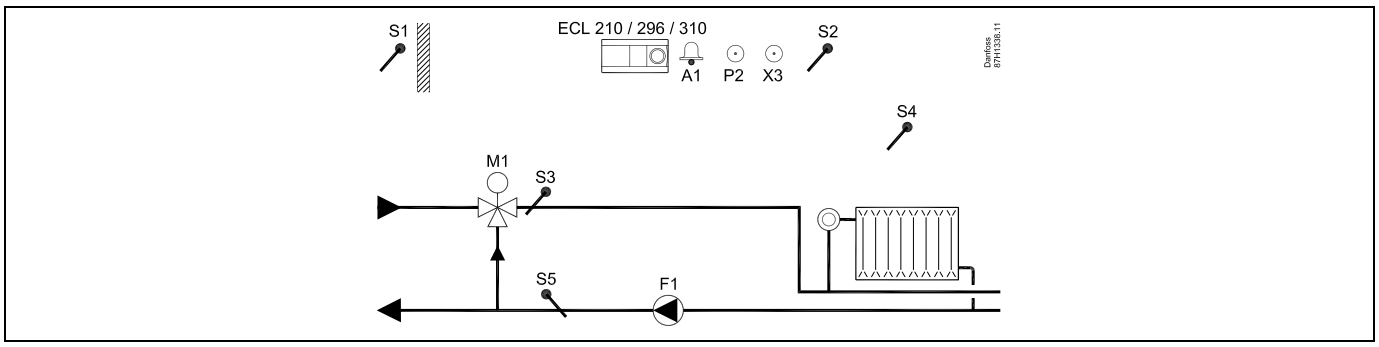
Setting advice:

Set desired room temperature, for example 20 °C.
Set desired balance temperature, for example 20 °C.
If a room temperature sensor is not connected, the desired duct temperature at S3 will correspond to the desired room temperature.

Navigation: **Special settings for sensors / thermostats used as frost protection:**	**ID no.:**	**Recommended setting:**
S6* frost temperature sensor — MENU \ Alarm \ Frost T \ Alarm value	11676	5 °C
S5 return temperature sensor — MENU \ Alarm \ Limit T frost \ Alarm value	11656	5 °C
Closing contact of the S7* frost thermostat — MENU \ Alarm \ Frost thermostat \ Alarm value	11616	0
Opening contact of the S7* frost thermostat — MENU \ Alarm \ Frost thermostat \ Alarm value	11616	1
* both frost protection methods, by means of S6 and / or S7, can be used		
Special settings for thermostats used as fire alarm:		
Closing contact of the S8 fire thermostat — MENU \ Alarm \ Fire safety \ Alarm value	11636	0
Opening contact of the S8 fire thermostat — MENU \ Alarm \ Fire safety \ Alarm value	11636	1

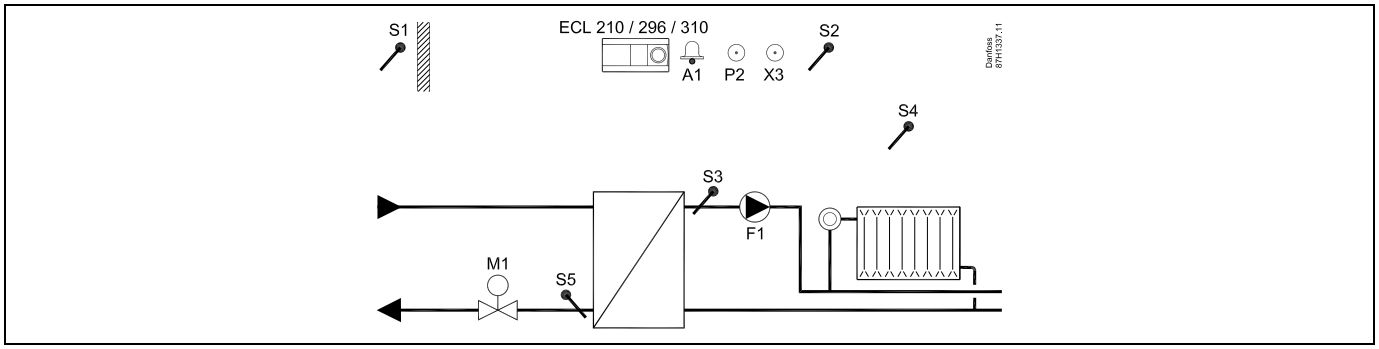
A214.6 example a

Heating system with 3–port mixing valve



A214.6 example b

Heating system with heat exchanger

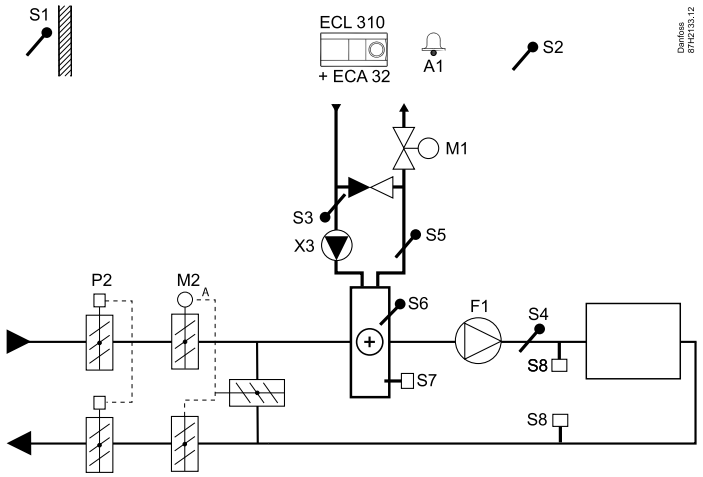


Setting advice:

Sensor S3 must be connected. If not, the pump (F1) stops and motorized control valve (M1) closes.

A314.1 example a

Ventilation system with heating, passive cooling (outside air) and constant duct temperature control. Analog controlled passive cooling (M2).



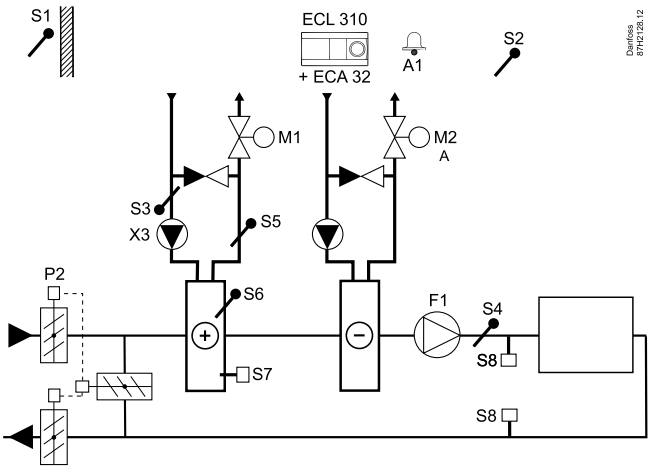
Sensor advice:

Sensor S3 and S4 must be connected. If not, the fan (F1) stops, the damper (P2) and motorized control valves (M1 / M2) close.

Navigation: **Special settings for sensors / thermostats used as frost protection:**	**ID no.:**	**Recommended setting:**
S6* frost temperature sensor — MENU \ Alarm \ Frost T \ Alarm value	11676	5 °C
S5 return temperature sensor — MENU \ Alarm \ Limit T frost \ Alarm value	11656	5 °C
Closing contact of the S7* frost thermostat — MENU \ Alarm \ Frost thermostat \ Alarm value	11616	0
Opening contact of the S7* frost thermostat — MENU \ Alarm \ Frost thermostat \ Alarm value	11616	1
* both frost protection methods, by means of S6 and / or S7, can be used		
Special settings for thermostats used as fire alarm:		
Closing contact of the S8 fire thermostat — MENU \ Alarm \ Fire safety \ Alarm value	11636	0
Opening contact of the S8 fire thermostat — MENU \ Alarm \ Fire safety \ Alarm value	11636	1

A314.1 example b

Ventilation system with heating, cooling and constant duct temperature control. Analog controlled cooling (M2).



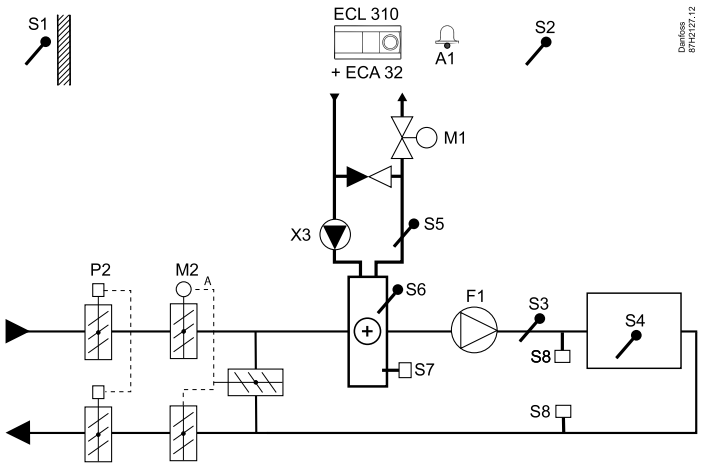
Sensor advice:

Sensor S3 and S4 must be connected. If not, the fan (F1) stops, the damper (P2) and motorized control valves (M1 / M2) close.

Navigation: **Special settings for sensors / thermostats used as frost protection:**	**ID no.:**	**Recommended setting:**
S6* frost temperature sensor — MENU \ Alarm \ Frost T \ Alarm value	11676	5 °C
S5 return temperature sensor — MENU \ Alarm \ Limit T frost \ Alarm value	11656	5 °C
Closing contact of the S7* frost thermostat — MENU \ Alarm \ Frost thermostat \ Alarm value	11616	0
Opening contact of the S7* frost thermostat — MENU \ Alarm \ Frost thermostat \ Alarm value	11616	1
* both frost protection methods, by means of S6 and / or S7, can be used		
Special settings for thermostats used as fire alarm:		
Closing contact of the S8 fire thermostat — MENU \ Alarm \ Fire safety \ Alarm value	11636	0
Opening contact of the S8 fire thermostat — MENU \ Alarm \ Fire safety \ Alarm value	11636	1

A314.2 example a

Ventilation system with heating, passive cooling (outside air) and constant room temperature control. Analog controlled passive cooling (M2).



Setting advice:

Set desired room temperature, for example 20 °C.

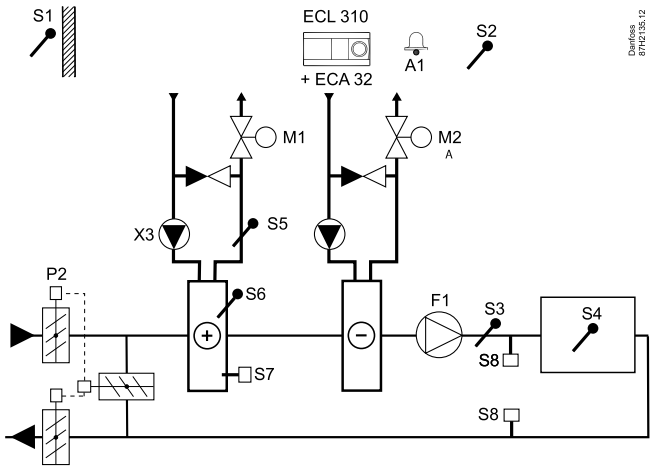
Set desired balance temperature, for example 20 °C.

If a room temperature sensor is not connected, the desired duct temperature at S3 will correspond to the desired room temperature.

Navigation: **Special settings for sensors / thermostats used as frost protection:**	**ID no.:**	**Recommended setting:**
S6* frost temperature sensor — MENU \ Alarm \ Frost T \ Alarm value	11676	5 °C
S5 return temperature sensor — MENU \ Alarm \ Limit T frost \ Alarm value	11656	5 °C
Closing contact of the S7* frost thermostat — MENU \ Alarm \ Frost thermostat \ Alarm value	11616	0
Opening contact of the S7* frost thermostat — MENU \ Alarm \ Frost thermostat \ Alarm value	11616	1
* both frost protection methods, by means of S6 and / or S7, can be used		
Special settings for thermostats used as fire alarm:		
Closing contact of the S8 fire thermostat — MENU \ Alarm \ Fire safety \ Alarm value	11636	0
Opening contact of the S8 fire thermostat — MENU \ Alarm \ Fire safety \ Alarm value	11636	1

A314.2 example b

Ventilation system with heating, cooling and constant room temperature control. Analog controlled cooling (M2).



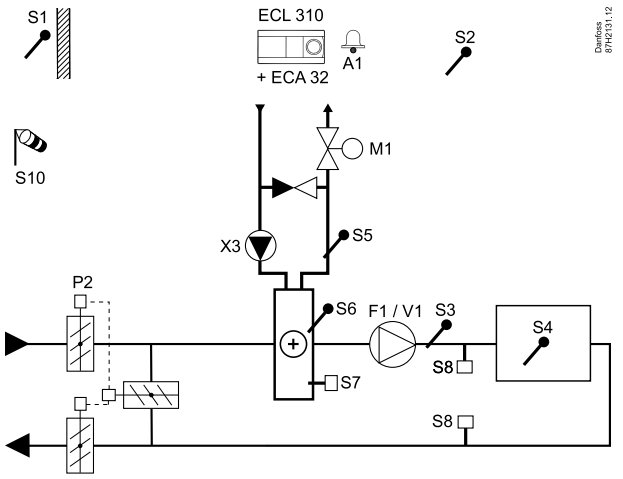
Setting advice:

Set desired room temperature, for example 20 °C.
Set desired balance temperature, for example 20 °C.
If a room temperature sensor is not connected, the desired duct temperature at S3 will correspond to the desired room temperature.

Navigation: **Special settings for sensors / thermostats used as frost protection:**	**ID no.:**	**Recommended setting:**
S6* frost temperature sensor — MENU \ Alarm \ Frost T \ Alarm value	11676	5 °C
S5 return temperature sensor — MENU \ Alarm \ Limit T frost \ Alarm value	11656	5 °C
Closing contact of the S7* frost thermostat — MENU \ Alarm \ Frost thermostat \ Alarm value	11616	0
Opening contact of the S7* frost thermostat — MENU \ Alarm \ Frost thermostat \ Alarm value	11616	1
* both frost protection methods, by means of S6 and / or S7, can be used		
Special settings for thermostats used as fire alarm:		
Closing contact of the S8 fire thermostat — MENU \ Alarm \ Fire safety \ Alarm value	11636	0
Opening contact of the S8 fire thermostat — MENU \ Alarm \ Fire safety \ Alarm value	11636	1

A314.3 example a

Ventilation system with heating and constant room temperature control. Analog controlled fan speed (V1) based on outdoor wind speed.



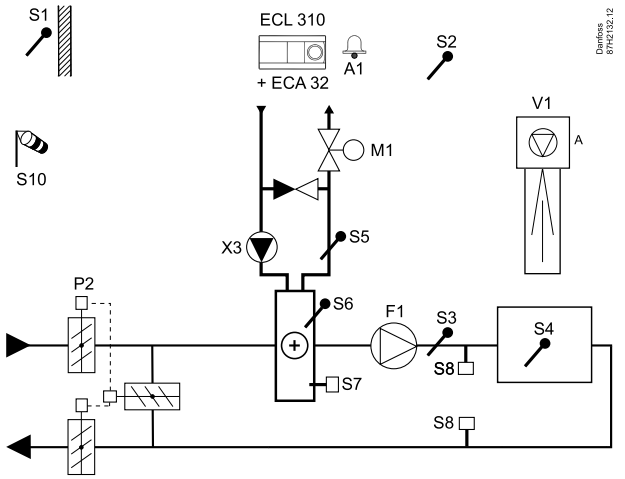
Setting advice:

Set desired room temperature, for example 20 °C.
Set desired balance temperature, for example 35 °C.
If a room temperature sensor is not connected, the desired duct temperature at S3 will correspond to the desired room temperature.

Navigation: **Special settings for sensors / thermostats used as frost protection:**	**ID no.:**	**Recommended setting:**
S6* frost temperature sensor — MENU \ Alarm \ Frost T \ Alarm value	11676	5 °C
S5 return temperature sensor — MENU \ Alarm \ Limit T frost \ Alarm value	11656	5 °C
Closing contact of the S7* frost thermostat — MENU \ Alarm \ Frost thermostat \ Alarm value	11616	0
Opening contact of the S7* frost thermostat — MENU \ Alarm \ Frost thermostat \ Alarm value	11616	1
* both frost protection methods, by means of S6 and / or S7, can be used		
Special settings for thermostats used as fire alarm:		
Closing contact of the S8 fire thermostat — MENU \ Alarm \ Fire safety \ Alarm value	11636	0
Opening contact of the S8 fire thermostat — MENU \ Alarm \ Fire safety \ Alarm value	11636	1

A314.3 example b

Ventilation system with heating and constant room temperature control. Analog controlled air curtain (V1) speed based on outdoor wind speed.

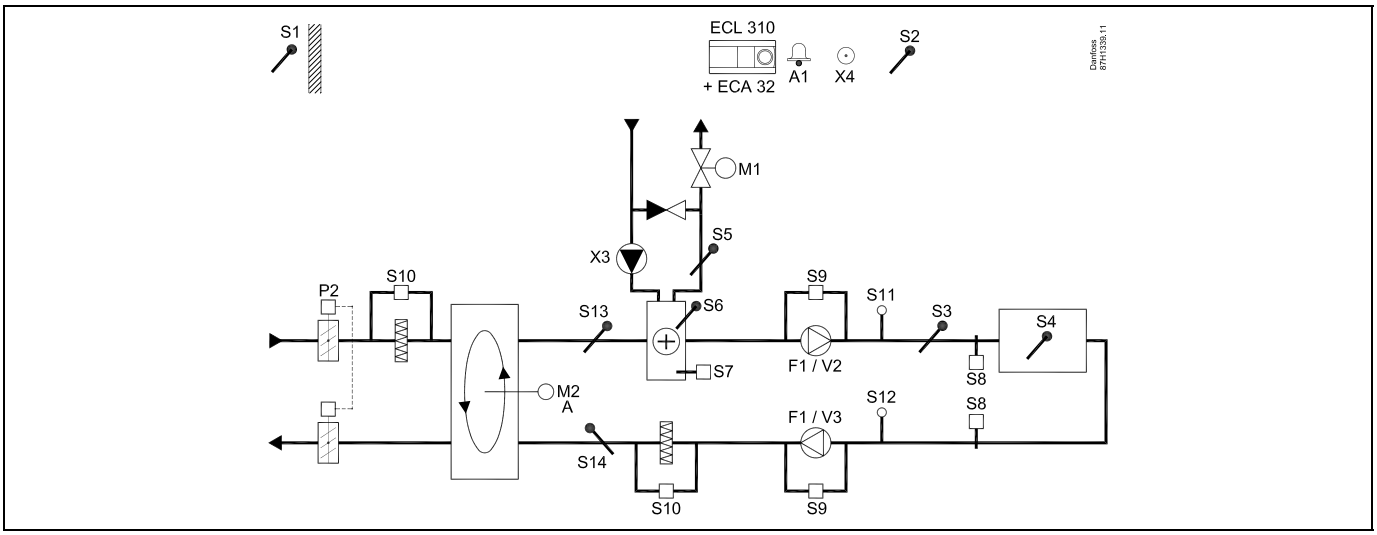


Setting advice:
Set desired room temperature, for example 20 °C.
Set desired balance temperature, for example 35 °C.
If a room temperature sensor is not connected, the desired duct temperature at S3 will correspond to the desired room temperature.

Navigation: **Special settings for sensors / thermostats used as frost protection:**	**ID no.:**	**Recommended setting:**
S6* frost temperature sensor — MENU \ Alarm \ Frost T \ Alarm value	11676	5 °C
S5 return temperature sensor — MENU \ Alarm \ Limit T frost \ Alarm value	11656	5 °C
Closing contact of the S7* frost thermostat — MENU \ Alarm \ Frost thermostat \ Alarm value	11616	0
Opening contact of the S7* frost thermostat — MENU \ Alarm \ Frost thermostat \ Alarm value	11616	1
* both frost protection methods, by means of S6 and / or S7, can be used		
Special settings for thermostats used as fire alarm:		
Closing contact of the S8 fire thermostat — MENU \ Alarm \ Fire safety \ Alarm value	11636	0
Opening contact of the S8 fire thermostat — MENU \ Alarm \ Fire safety \ Alarm value	11636	1

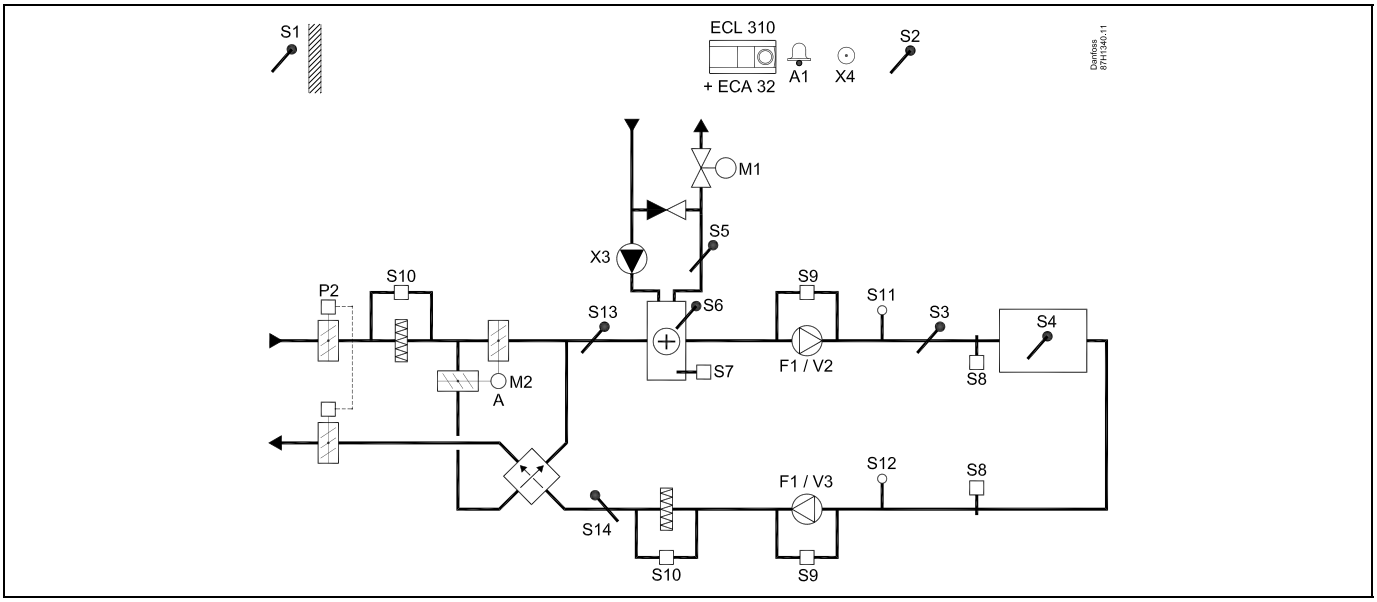
A314.4 example a

Ventilation system with heating, passive cooling (outside air) and room temperature control. Analog controlled speed of fans in relation to pressures. Analog controlled speed of rotary heat exchanger (M2) for heat recovery.



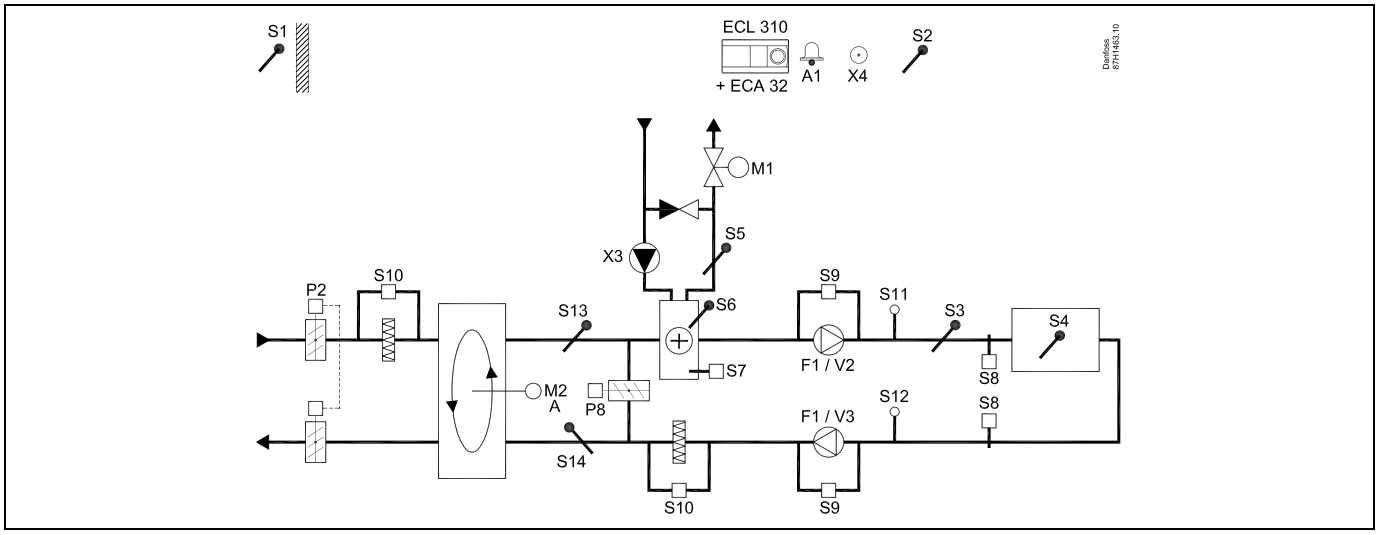
A314.4 example b

Ventilation system with heating, passive cooling (outside air) and room temperature control. Analog controlled speed of fans in relation to pressures. Analog controlled damper (M2) for heat recovery by means of a cross heat exchanger.



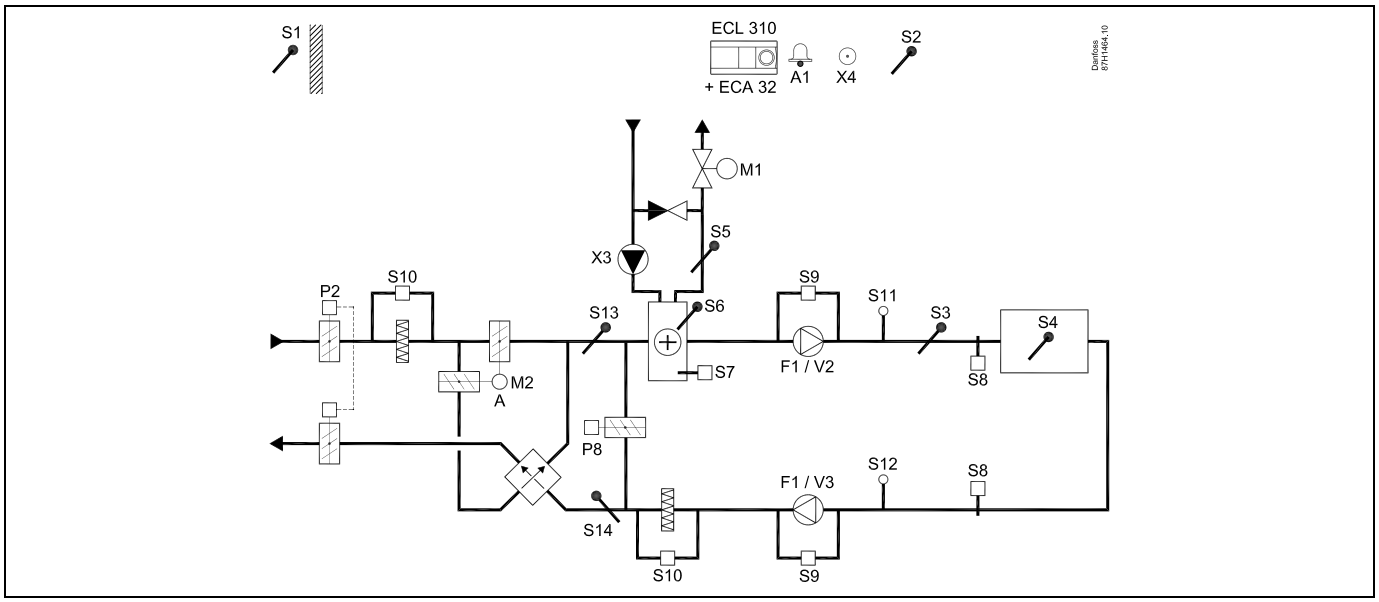
A314.4 example c

Ventilation system with heating, passive cooling (outside air) and room temperature control. Analog controlled speed of fans in relation to pressures. Analog controlled speed of rotary heat exchanger (M2) for heat recovery. Control of Night damper P8 for reduced ventilation during saving periods.



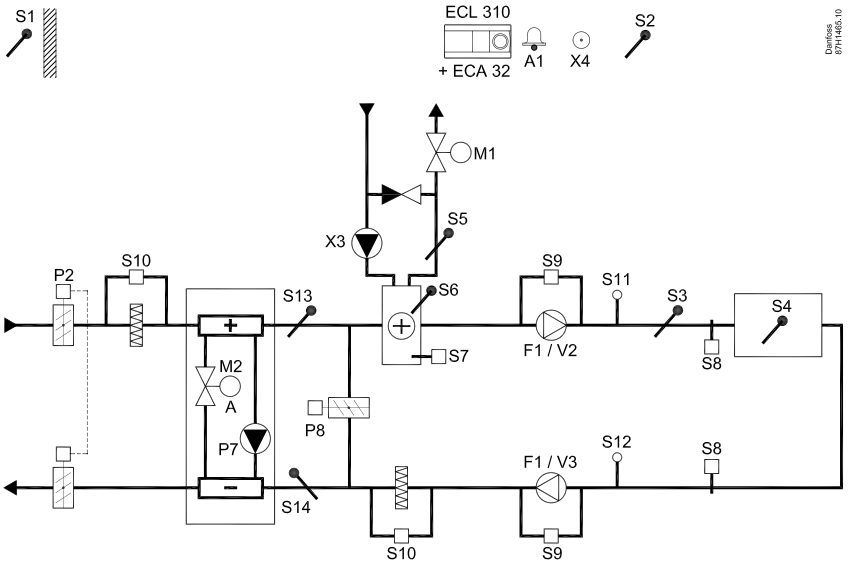
A314.4 example d

Ventilation system with heating, passive cooling (outside air) and room temperature control. Analog controlled speed of fans in relation to pressures. Analog controlled damper (M2) for heat recovery by means of a cross heat exchanger. Control of Night damper P8 for reduced ventilation during saving periods.



A314.4 example e

Ventilation system with heating, passive cooling (outside air) and room temperature control. Analog controlled speed of fans in relation to pressures. Analog controlled valve (M2) for heat recovery by means of a Fluid battery. Control of Night damper P8 for reduced ventilation during saving periods.

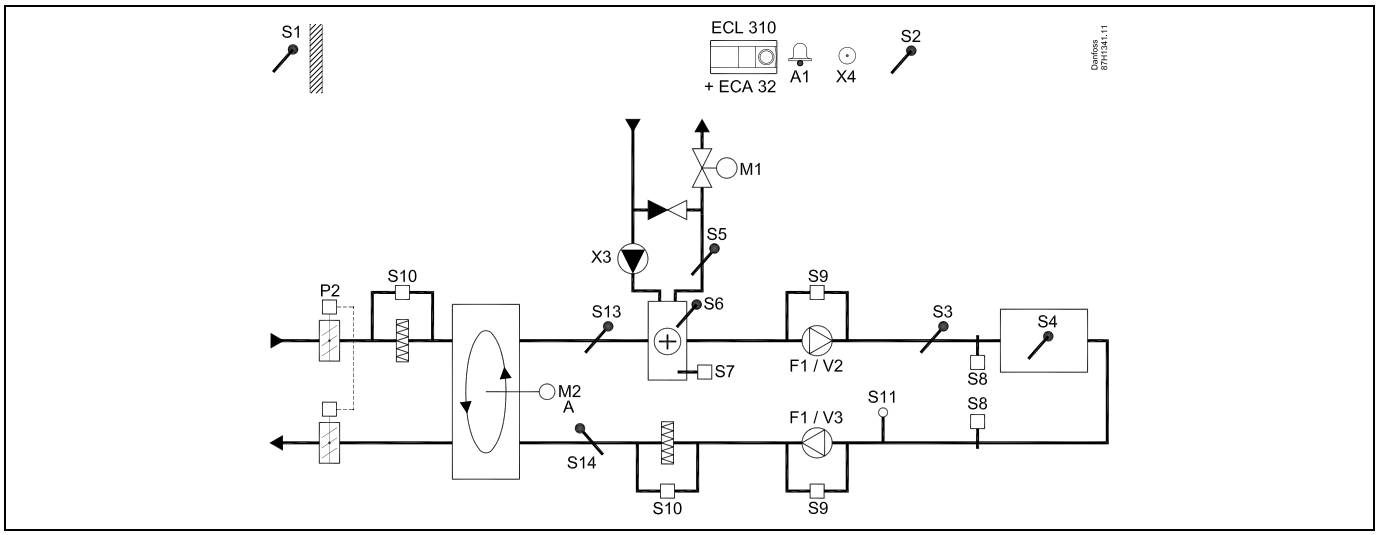


Sensor advice:
Sensor S3 must be connected. If not, the fan F1 stops and motorized control valve M1 closes.
S1, S13 and S14 must be connected in order to calculate the recovery efficiency.

Navigation: **Special settings for sensors / thermostats used as frost protection:**	**ID no.:**	**Recommended setting:**
S6* frost temperature sensor — MENU \ Alarm \ Frost T \ Alarm value	11676	5 °C
S5 return temperature sensor — MENU \ Alarm \ Limit T frost \ Alarm value	11656	5 °C
Closing contact of the S7* frost thermostat — MENU \ Alarm \ Frost thermostat \ Alarm value	11616	0
Opening contact of the S7* frost thermostat — MENU \ Alarm \ Frost thermostat \ Alarm value	11616	1
* both frost protection methods, by means of S6 and / or S7, can be used		
Special settings for thermostats used as fire alarm:		
Closing contact of the S8 fire thermostat — MENU \ Alarm \ Fire safety \ Alarm value	11636	0
Opening contact of the S8 fire thermostat — MENU \ Alarm \ Fire safety \ Alarm value	11636	1

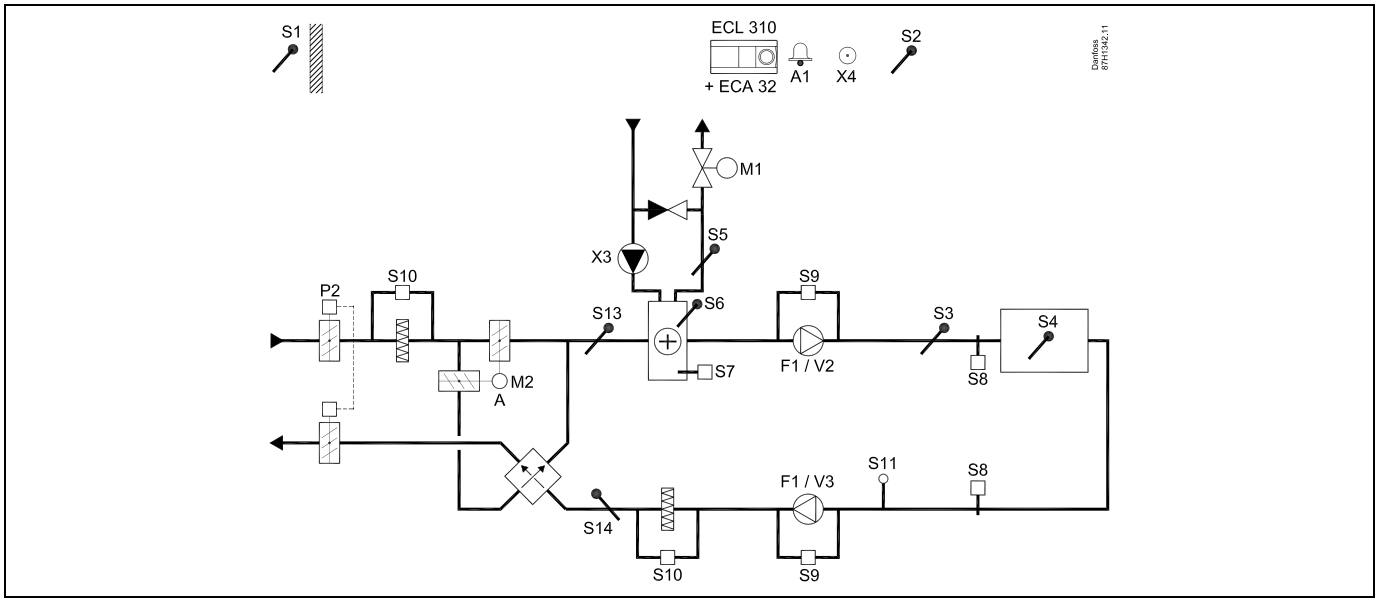
A314.5 example a

Ventilation system with heating, passive cooling (outside air) and room temperature control. Analog controlled speed of fans in relation to air quality (CO_2). Analog controlled speed of rotary heat exchanger (M2) for heat recovery.



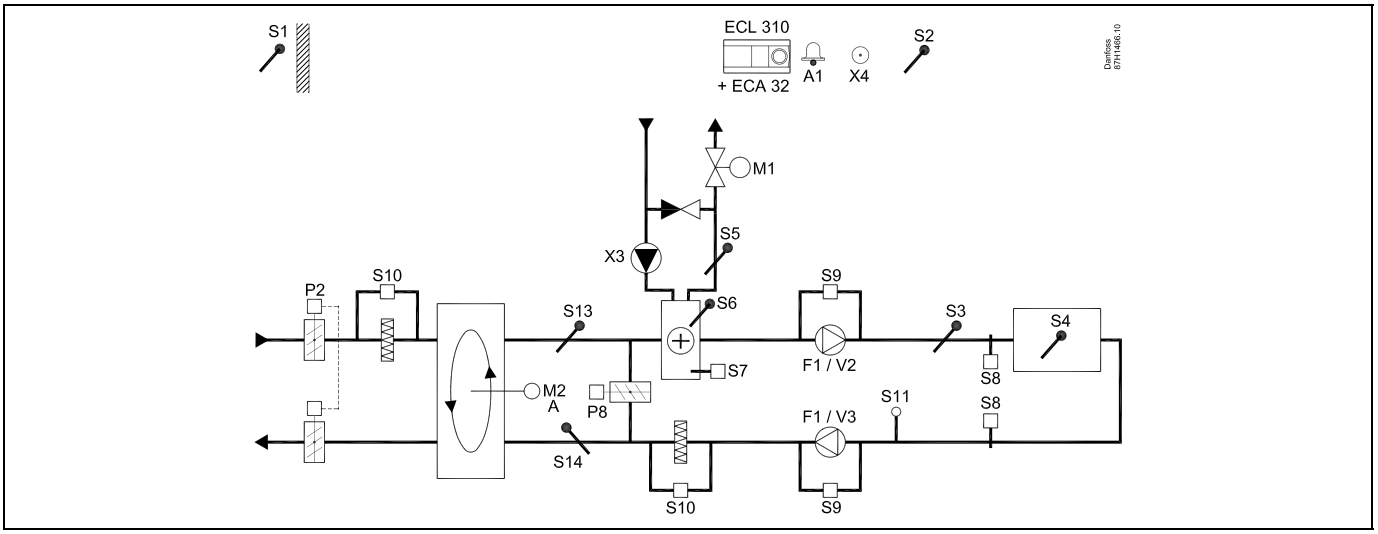
A314.5 example b

Ventilation system with heating, passive cooling (outside air) and room temperature control. Analog controlled speed of fans in relation to air quality (CO_2). Analog controlled damper (M2) for heat recovery by means of a cross heat exchanger.



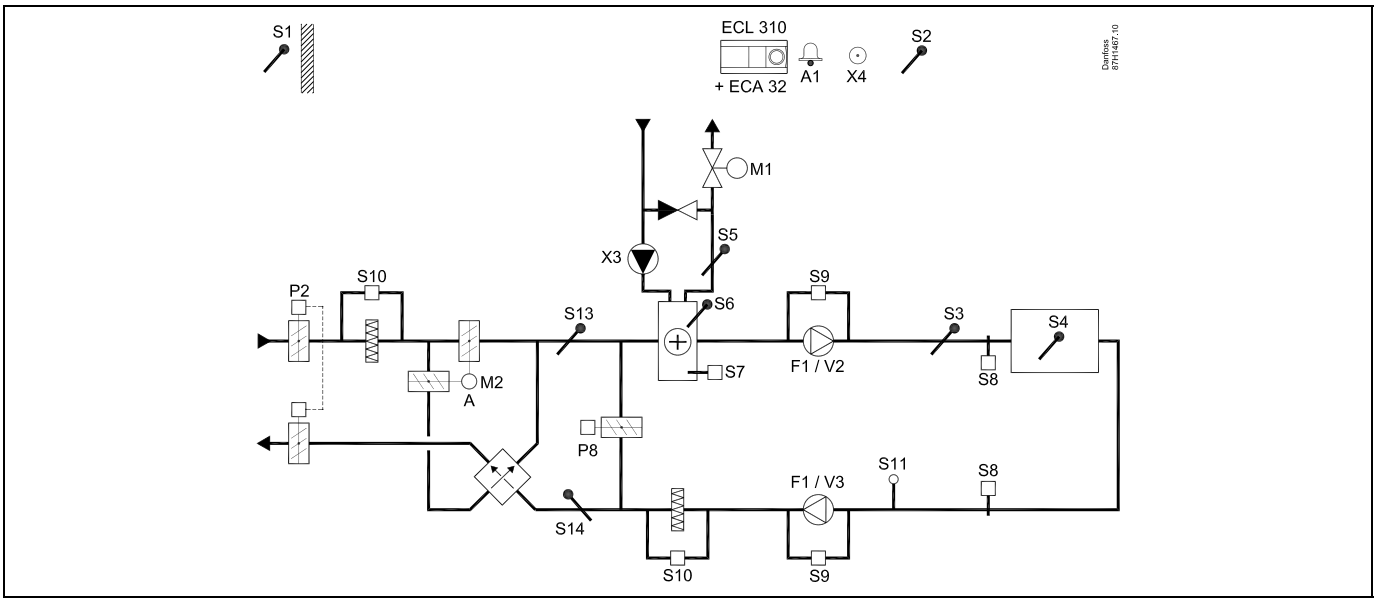
A314.5 example c

Ventilation system with heating, passive cooling (outside air) and room temperature control. Analog controlled speed of fans in relation to air quality (CO_2). Analog controlled speed of rotary heat exchanger (M2) for heat recovery. Control of Night damper P8 for reduced ventilation during saving periods.



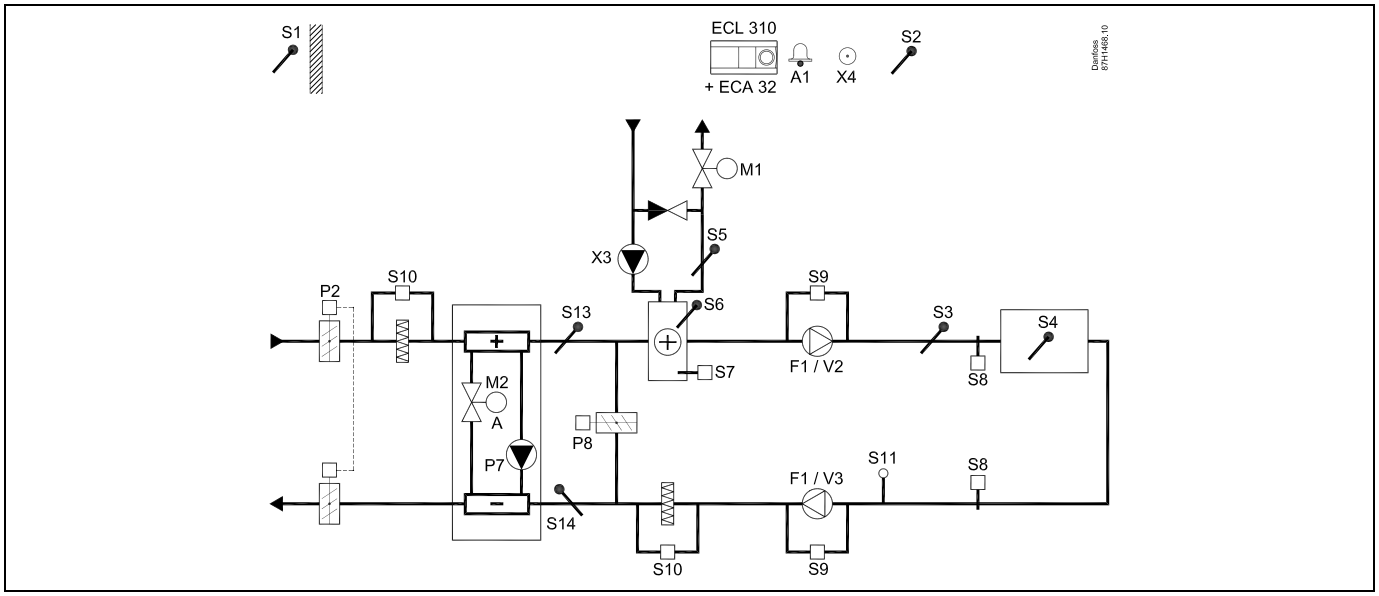
A314.5 example d

Ventilation system with heating, passive cooling (outside air) and room temperature control. Analog controlled speed of fans in relation to air quality (CO_2). Analog controlled damper (M2) for heat recovery by means of a cross heat exchanger. Control of Night damper P8 for reduced ventilation during saving periods.



A314.5 example e

Ventilation system with heating, passive cooling (outside air) and room temperature control. Analog controlled speed of fans in relation to air quality (CO_2). Analog controlled valve (M2) for heat recovery by means of a Fluid battery. Control of Night damper P8 for reduced ventilation during saving periods.

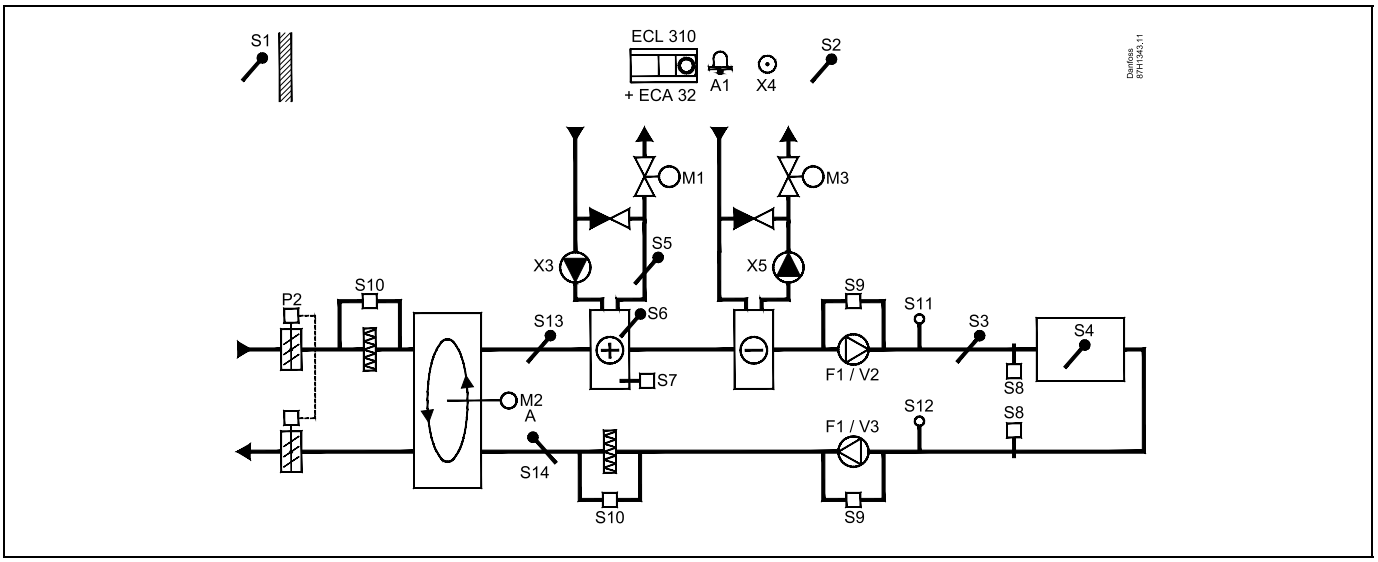


Sensor advice:
Sensor S3 must be connected. If not, the fan F1 stops and motorized control valve M1 closes.
S1, S13 and S14 must be connected in order to calculate the recovery efficiency.

Navigation: **Special settings for sensors / thermostats used as frost protection:**	**ID no.:**	**Recommended setting:**
S6* frost temperature sensor — MENU \ Alarm \ Frost T \ Alarm value	11676	5 °C
S5 return temperature sensor — MENU \ Alarm \ Limit T frost \ Alarm value	11656	5 °C
Closing contact of the S7* frost thermostat — MENU \ Alarm \ Frost thermostat \ Alarm value	11616	0
Opening contact of the S7* frost thermostat — MENU \ Alarm \ Frost thermostat \ Alarm value	11616	1
* both frost protection methods, by means of S6 and / or S7, can be used		
Special settings for thermostats used as fire alarm:		
Closing contact of the S8 fire thermostat — MENU \ Alarm \ Fire safety \ Alarm value	11636	0
Opening contact of the S8 fire thermostat — MENU \ Alarm \ Fire safety \ Alarm value	11636	1

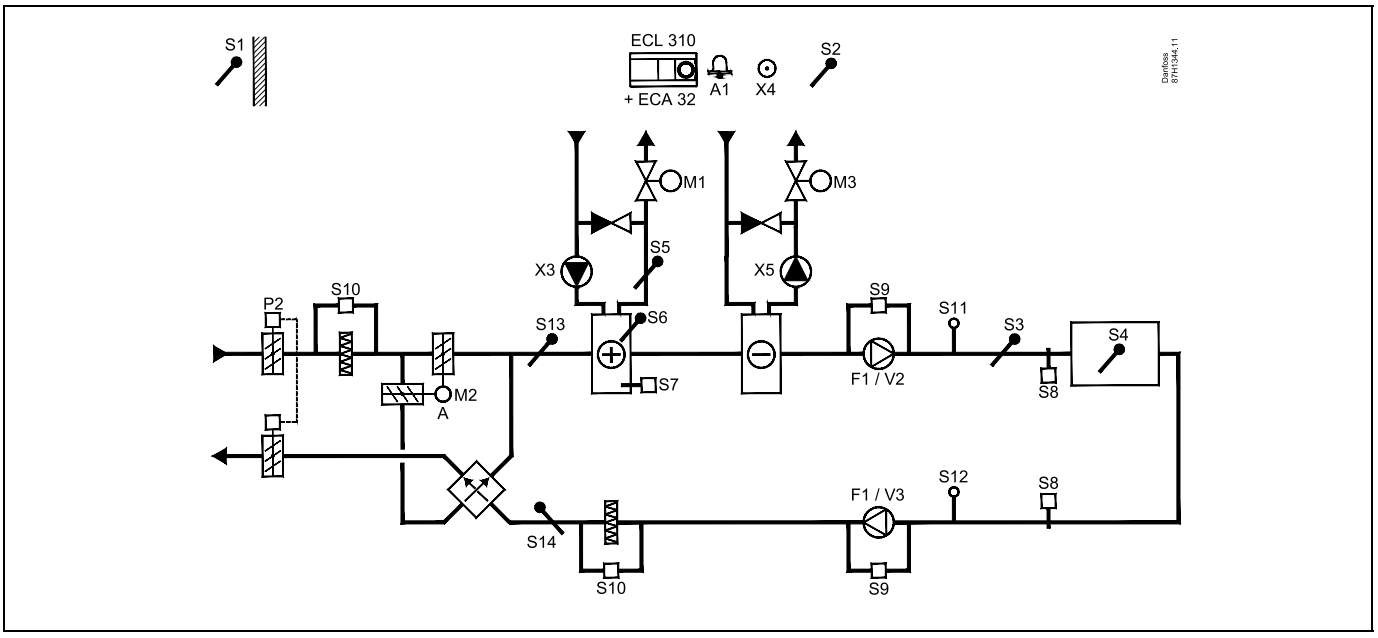
A314.6 example a

Ventilation system with heating, cooling and room temperature control. Analog controlled speed of fans in relation to pressures. Analog controlled speed of rotary heat exchanger (M2) for heat recovery.



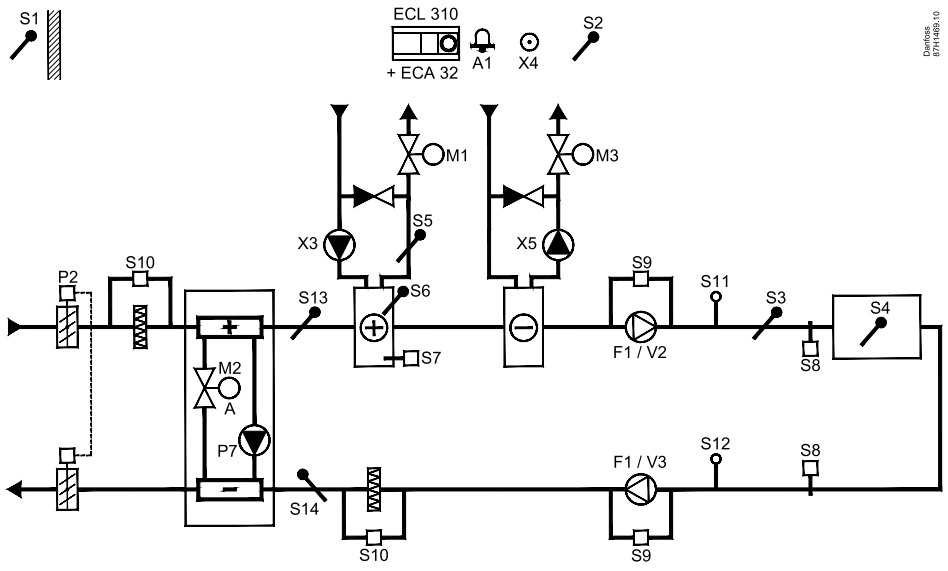
A314.6 example b

Ventilation system with heating, cooling and room temperature control. Analog controlled speed of fans in relation to pressures. Analog controlled damper (M2) for heat recovery by means of a cross heat exchanger.



A314.6 example c

Ventilation system with heating, cooling and room temperature control. Analog controlled speed of fans in relation to pressures. Analog controlled valve (M2) for heat recovery by means of a Fluid battery.



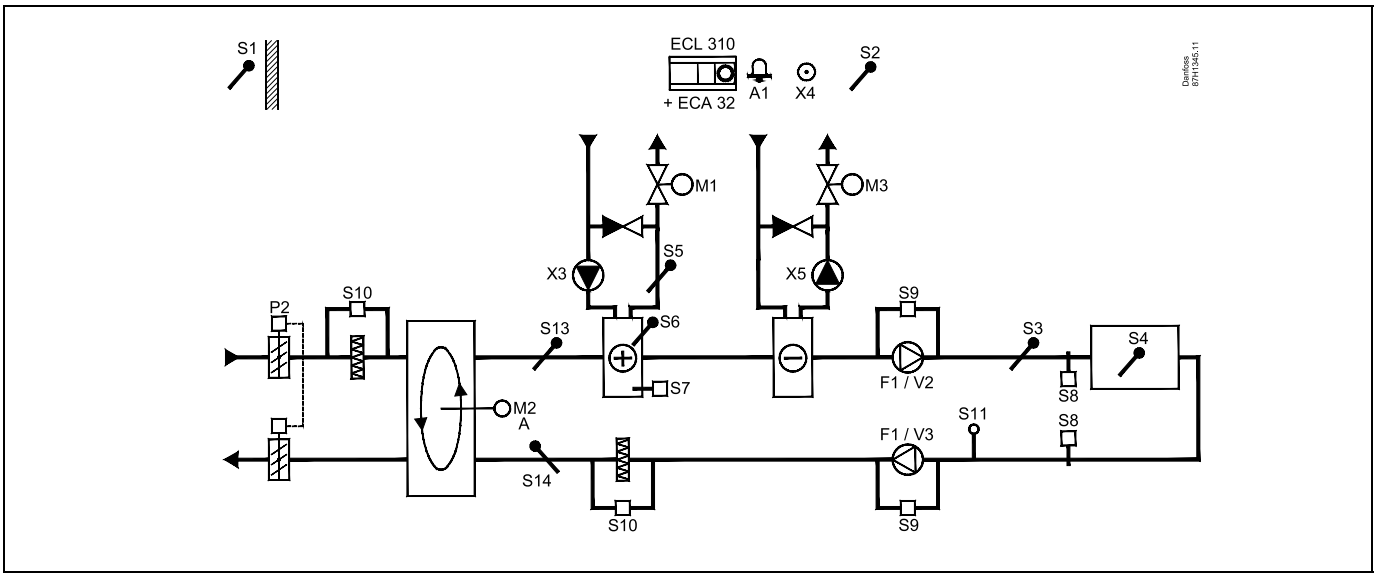
Sensor advice:

Sensor S3 must be connected. If not, the fan F1 stops and motorized control valve M1 closes.
S1, S13 and S14 must be connected in order to calculate the recovery efficiency.

Navigation: **Special settings for sensors / thermostats used as frost protection:**	**ID no.:**	**Recommended setting:**
S6* frost temperature sensor — MENU \ Alarm \ Frost T \ Alarm value	11676	5 °C
S5 return temperature sensor — MENU \ Alarm \ Limit T frost \ Alarm value	11656	5 °C
Closing contact of the S7* frost thermostat — MENU \ Alarm \ Frost thermostat \ Alarm value	11616	0
Opening contact of the S7* frost thermostat — MENU \ Alarm \ Frost thermostat \ Alarm value	11616	1
* both frost protection methods, by means of S6 and / or S7, can be used		
Special settings for thermostats used as fire alarm:		
Closing contact of the S8 fire thermostat — MENU \ Alarm \ Fire safety \ Alarm value	11636	0
Opening contact of the S8 fire thermostat — MENU \ Alarm \ Fire safety \ Alarm value	11636	1

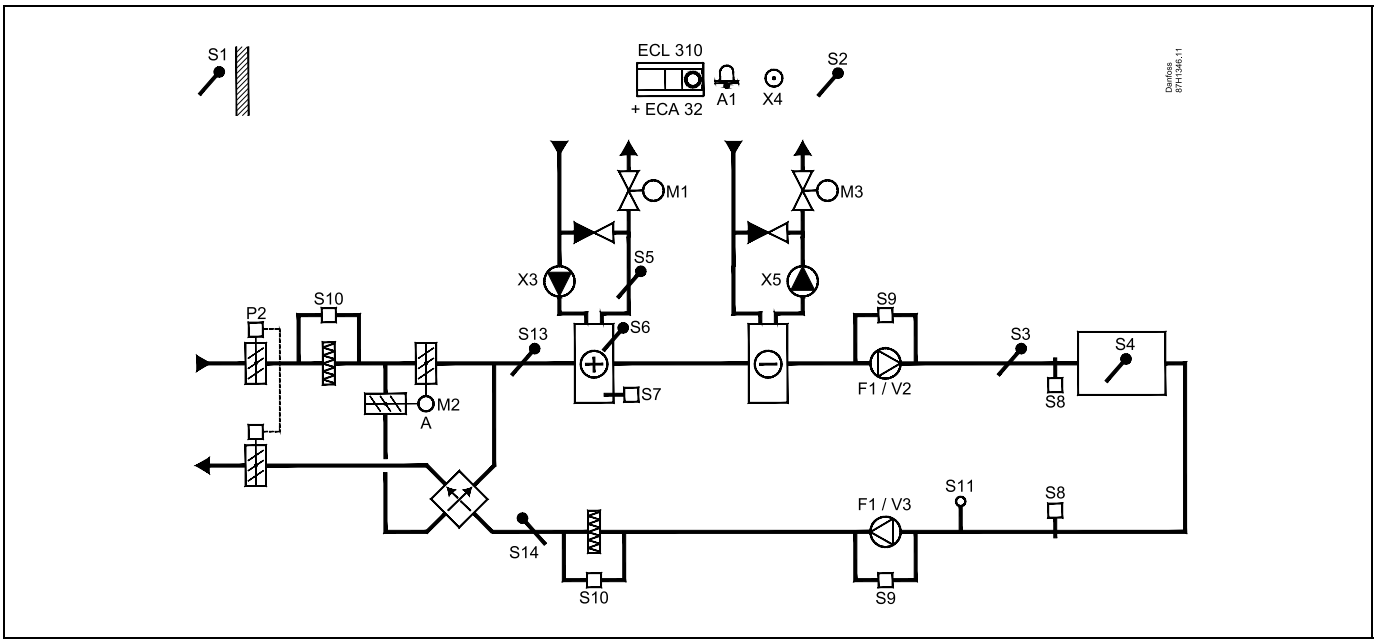
A314.7 example a

Ventilation system with heating, cooling and room temperature control. Analog controlled speed of fans in relation to air quality (CO_2). Analog controlled speed of rotary heat exchanger (M2) for heat recovery.



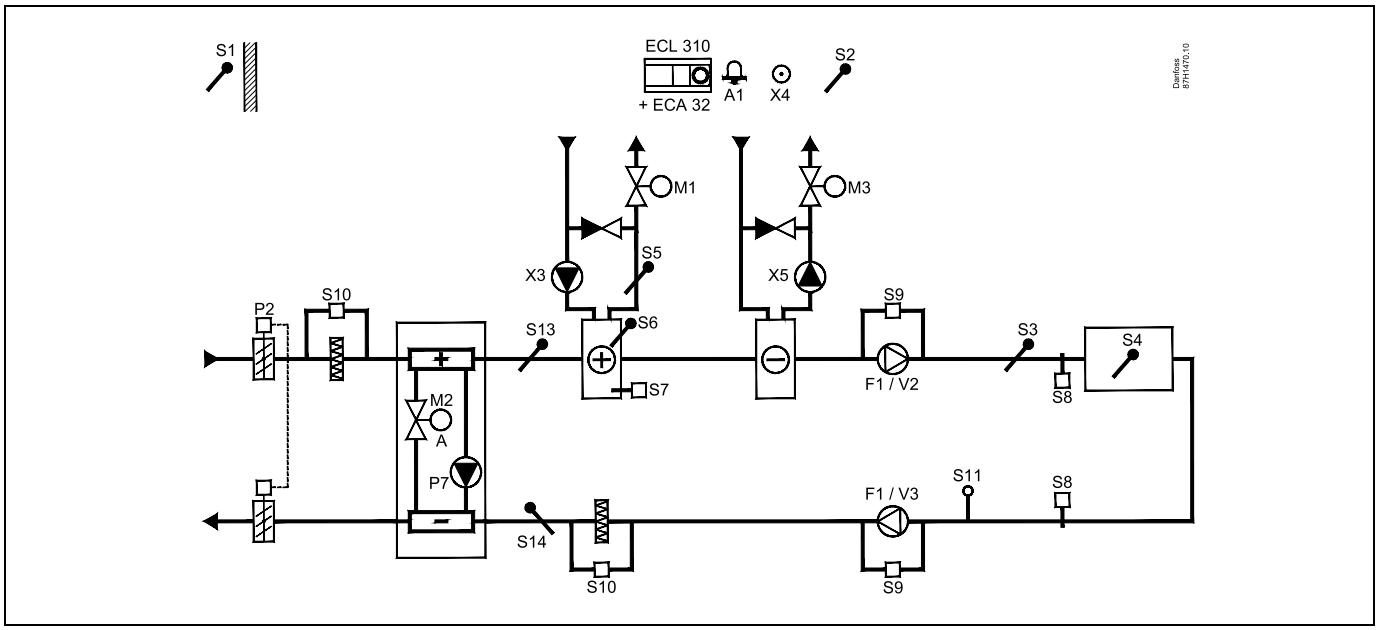
A314.7 example b

Ventilation system with heating, cooling and room temperature control. Analog controlled speed of fans in relation to air quality (CO_2). Analog controlled damper (M2) for heat recovery by means of a cross heat exchanger.



A314.7 example c

Ventilation system with heating, cooling and room temperature control. Analog controlled speed of fans in relation to air quality (CO_2). Analog controlled valve (M2) for heat recovery by means of a Fluid battery.



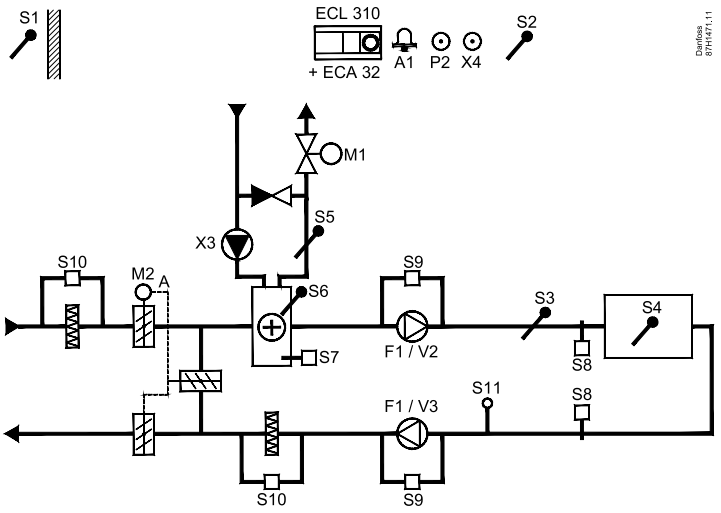
Sensor advice:

Sensor S3 must be connected. If not, the fan F1 stops and motorized control valve M1 closes.
S1, S13 and S14 must be connected in order to calculate the recovery efficiency.

Navigation: **Special settings for sensors / thermostats used as frost protection:**	**ID no.:**	**Recommended setting:**
S6* frost temperature sensor — MENU \ Alarm \ Frost T \ Alarm value	11676	5 °C
S5 return temperature sensor — MENU \ Alarm \ Limit T frost \ Alarm value	11656	5 °C
Closing contact of the S7* frost thermostat — MENU \ Alarm \ Frost thermostat \ Alarm value	11616	0
Opening contact of the S7* frost thermostat — MENU \ Alarm \ Frost thermostat \ Alarm value	11616	1
* both frost protection methods, by means of S6 and / or S7, can be used		
Special settings for thermostats used as fire alarm:		
Closing contact of the S8 fire thermostat — MENU \ Alarm \ Fire safety \ Alarm value	11636	0
Opening contact of the S8 fire thermostat — MENU \ Alarm \ Fire safety \ Alarm value	11636	1

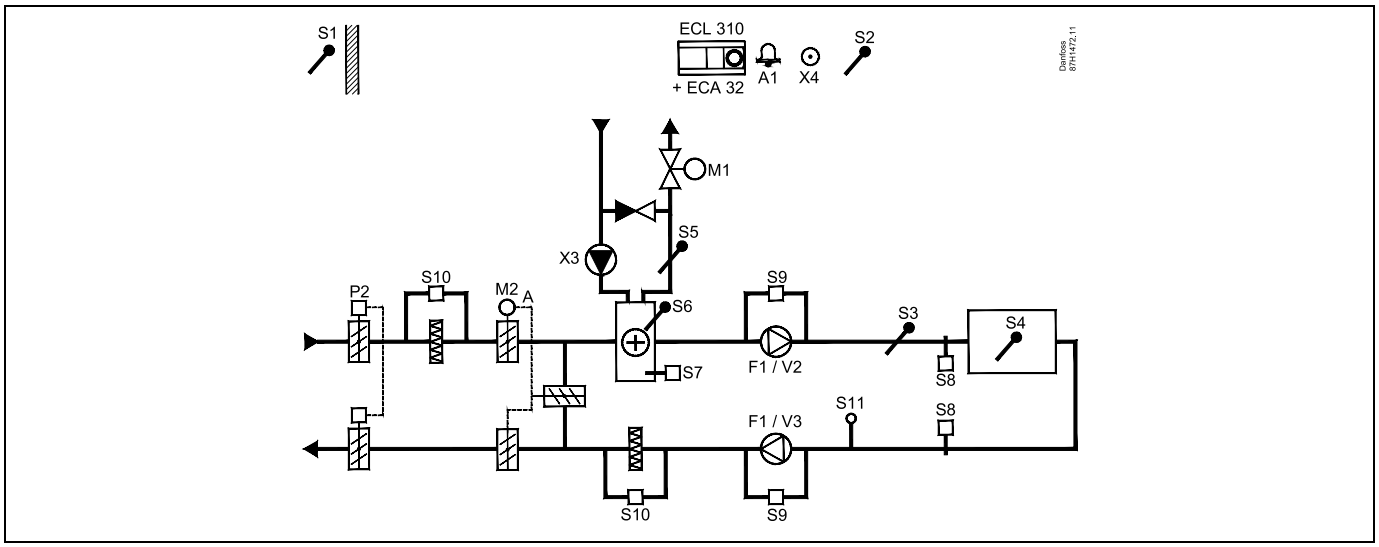
A314.9 example a

Ventilation system with heating and room temperature control. Analog controlled speed of fans in relation to air quality (CO_2).



A314.9 example b

Ventilation system with heating and room temperature control. Analog controlled speed of fans in relation to air quality (CO_2). ON-OFF control of damper P2.



Sensor advice:

Sensor S3 must be connected. If not, the fan F1 stops and motorized control valve M1 closes.
S1, S13 and S14 must be connected in order to calculate the recovery efficiency.

Navigation: **Special settings for sensors / thermostats used as frost protection:**	**ID no.:**	**Recommended setting:**
S6* frost temperature sensor — MENU \ Alarm \ Frost T \ Alarm value	11676	5 °C
S5 return temperature sensor — MENU \ Alarm \ Limit T frost \ Alarm value	11656	5 °C
Closing contact of the S7* frost thermostat — MENU \ Alarm \ Frost thermostat \ Alarm value	11616	0
Opening contact of the S7* frost thermostat — MENU \ Alarm \ Frost thermostat \ Alarm value	11616	1
* both frost protection methods, by means of S6 and / or S7, can be used		
Special settings for thermostats used as fire alarm:		
Closing contact of the S8 fire thermostat — MENU \ Alarm \ Fire safety \ Alarm value	11636	0
Opening contact of the S8 fire thermostat — MENU \ Alarm \ Fire safety \ Alarm value	11636	1

2.3 Mounting

2.3.1 Mounting the ECL Comfort controller

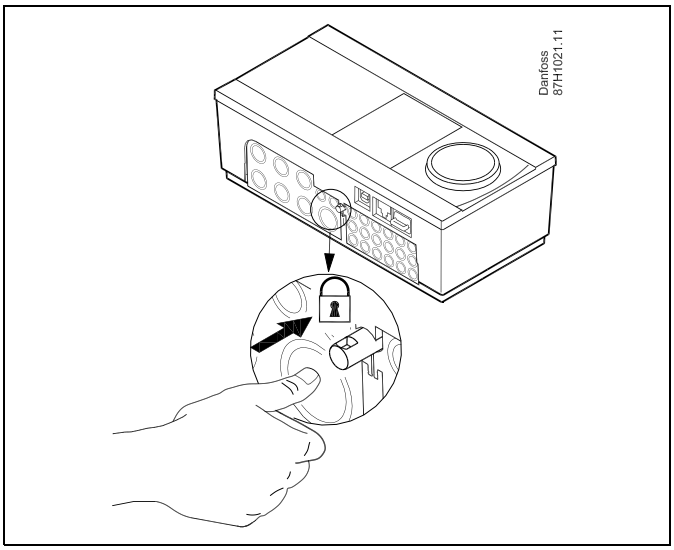
For easy access, you should mount the ECL Comfort controller near the system. Select one of the following methods using the same base part (code no. 087H3230):

- Mounting on a wall
- Mounting on a DIN rail (35 mm)

The ECL Comfort 310 can only be mounted in the ECL Comfort 310 base part.

Screws, PG cable glands and rawlplugs are not supplied.

Locking the ECL Comfort 210 / 310 controller
In order to fasten the ECL Comfort controller to its base part, secure the controller with the locking pin.



⚠

To prevent injuries to persons or the controller, the controller has to be securely locked into the base. For this purpose, press the locking pin into the base until a click is heard and the controller no longer can be removed from the base.

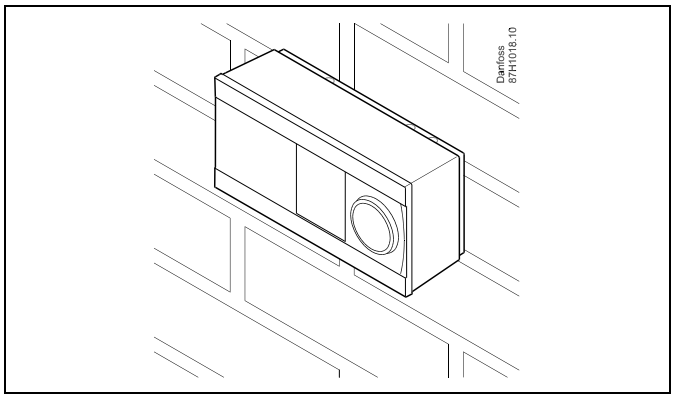
⚠

If the controller is not securely locked into the base part, there is a risk that the controller during operation can unlock from the base and the base with terminals (and also the 230 V a.c. connections) are exposed. To prevent injuries to persons, always make sure that the controller is securely locked into its base. If this is not the case, the controller should not be operated!

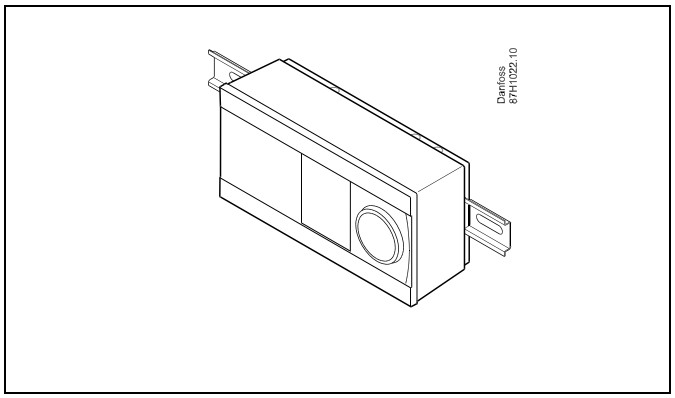
⚠

The easy way to lock the controller to its base or unlock it is to use a screw driver as lever.

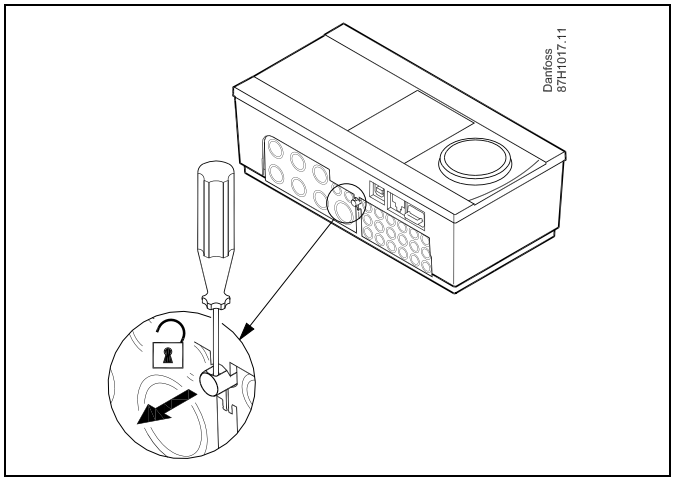
Mounting on a wall
Mount the base part on a wall with a smooth surface. Establish the electrical connections and position the controller in the base part. Secure the controller with the locking pin.



Mounting on a DIN rail (35 mm)
Mount the base part on a DIN rail. Establish the electrical connections and position the controller in the base part. Secure the controller with the locking pin.



Dismounting the ECL Comfort controller
In order to remove the controller from the base part, pull out the locking pin by means of a screwdriver. The controller can now be removed from the base part.



⚠

The easy way to lock the controller to its base or unlock it is to use a screw driver as lever.

⚠

Before removing the ECL Comfort controller from the base part, ensure that the supply voltage is disconnected.

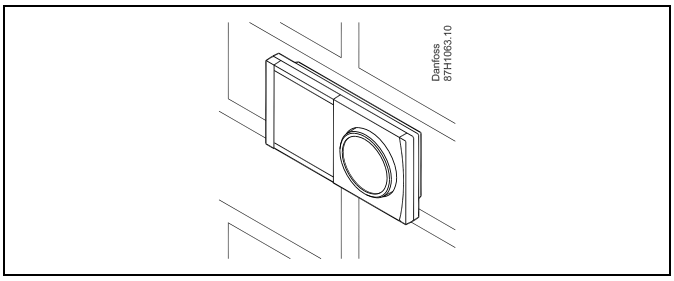
2.3.2 Mounting the Remote Control Units ECA 30 / 31

Select one of the following methods:

- Mounting on a wall, ECA 30 / 31
- Mounting in a panel, ECA 30

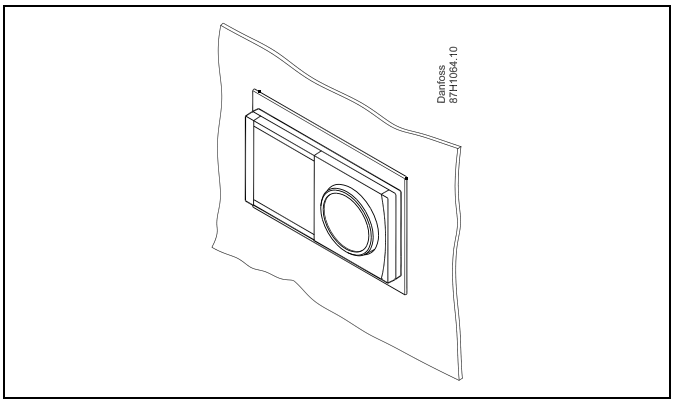
Screws and rawlplugs are not supplied.

Mounting on a wall
Mount the base part of the ECA 30 / 31 on a wall with a smooth surface. Establish the electrical connections. Place the ECA 30 / 31 in the base part.



Mounting in a panel
Mount the ECA 30 in a panel using the ECA 30 frame kit (order code no. 087H3236). Establish the electrical connections. Secure the frame with the clamp. Place the ECA 30 in the base part. The ECA 30 can be connected to an external room temperature sensor.

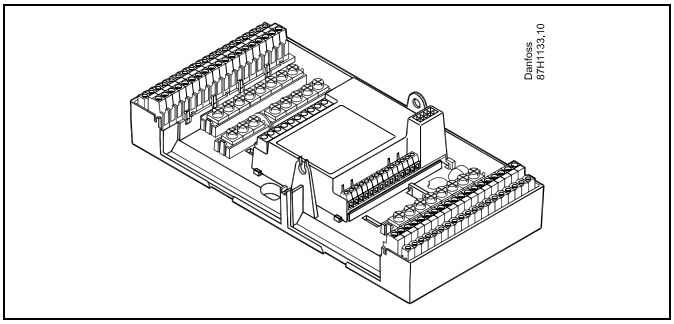
The ECA 31 must not be mounted in a panel if the humidity function is to be used.

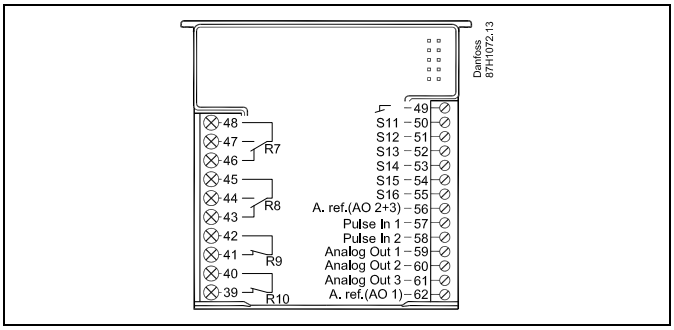


2.3.3 Mounting the internal I/O module ECA 32

Mounting of the internal I/O module ECA 32
The ECA 32 module (order code no. 087H3202) must be inserted into the ECL Comfort 310 / 310B base part for additional input and output signals in relevant applications.

The connection between the ECL Comfort 310 / 310B and ECA 32 is a 10-pole (2 x 5) connector. The connection is automatically established when the ECL Comfort 310 / 310B is placed on the base part.





2.4 Placing the temperature sensors

It is important that the sensors are mounted in the correct position in your system.

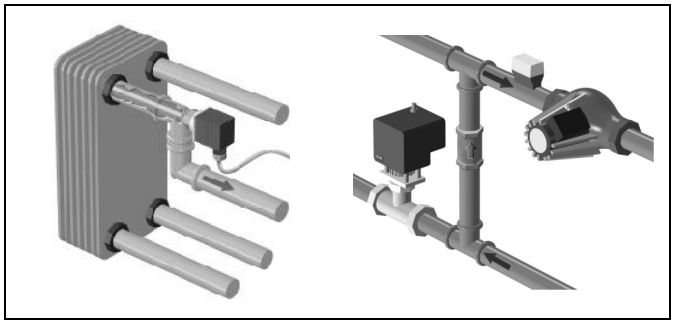
The temperature sensor mentioned below are sensors used for the ECL Comfort 210 / 296 / 310 series which not all will be needed for your application!

Outdoor temperature sensor (ESMT)
The outdoor sensor should be mounted on that side of the building where it is less likely to be exposed to direct sunshine. It should not be placed close to doors, windows or air outlets.

Flow temperature sensor (ESMU, ESM-11 or ESMC)
Place the sensor max. 15 cm from the mixing point. In systems with heat exchanger, Danfoss recommends that the ESMU-type to be inserted into the exchanger flow outlet.

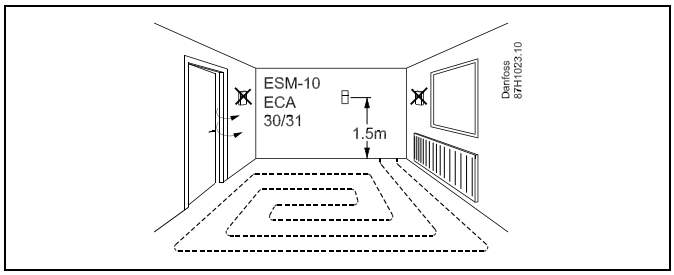
Make sure that the surface of the pipe is clean and even where the sensor is mounted.

Return temperature sensor (ESMU, ESM-11 or ESMC)
The return temperature sensor should always be placed so that it measures a representative return temperature.



Room temperature sensor
(ESM-10, ECA 30 / 31 Remote Control Unit)

Place the room sensor in the room where the temperature is to be controlled. Do not place it on outside walls or close to radiators, windows or doors.



Boiler temperature sensor (ESMU, ESM-11 or ESMC)
Place the sensor according to the boiler manufacturer's specification.

Air duct temperature sensor (ESMB-12 or ESMU types)
Place the sensor so that it measures a representative temperature.

DHW temperature sensor (ESMU or ESMB-12)
Place the DHW temperature sensor according to the manufacturer's specification.

Slab temperature sensor (ESMB-12)
Place the sensor in a protection tube in the slab.

ESM-11: Do not move the sensor after it has been fastened in order to avoid damage to the sensor element.

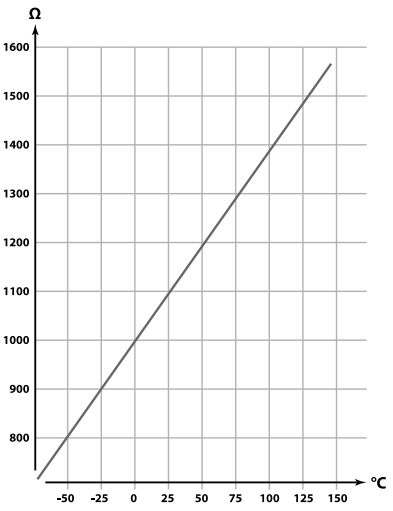
ESM-11, ESMC and ESMB-12: Use heat conducting paste for quick measurement of the temperature.

ESMU and ESMB-12: Using a sensor pocket to protect the sensor will, however, result in a slower temperature measurement.

Pt 1000 temperature sensor (IEC 751B, 1000 Ω / 0 °C)

Relationship between temperature and ohmic value:

°C	Ω
-50	803
-40	843
-30	882
-20	922
-10	961
0	1000
10	1039
20	1078
30	1117
40	1155
50	1194
60	1232
70	1271
80	1309
90	1347
100	1385
110	1423
120	1461
130	1498
140	1535
150	1573



2.5 Electrical connections

2.5.1 Electrical connections 230 V a.c.

Safety Note
Necessary assembly, start-up, and maintenance work must be performed by qualified and authorized personnel only.

Local legislations must be respected. This comprises also cable size and isolation (reinforced type).

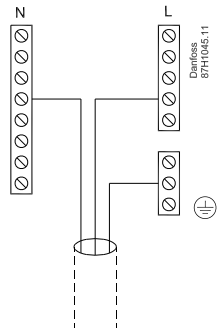
A fuse for the ECL Comfort installation is max. 10 A typically.

The ambient temperature range for the ECL Comfort in operation is 0 - 55 °C. Exceeding this temperature range can result in malfunctions.

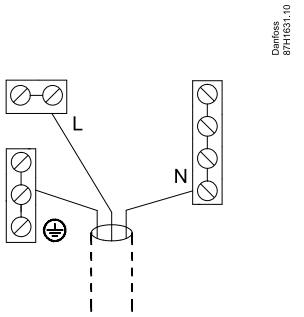
Installation must be avoided if there is a risk for condensation (dew).

The common ground terminal is used for connection of relevant components (pumps, motorized control valves).

ECL 210 / 310



ECL 296



Factory established jumpers in the base part:
5 to 8, 9 to 14, L to 5 and L to 9, N to 10

See also the A214 Installation Guide (delivered with the application key) for application specific connections.

Electrical connections, 230 V a.c., power supply, pumps, dampers, motorized control valves etc.

Connections, in general:

See also the A214 Mounting Guide (delivered with the application key) for application specific connections.

2.5.2 Electrical connections, 230 V a.c., power supply, pumps, dampers, motorized control valves etc.

Connections, in general.

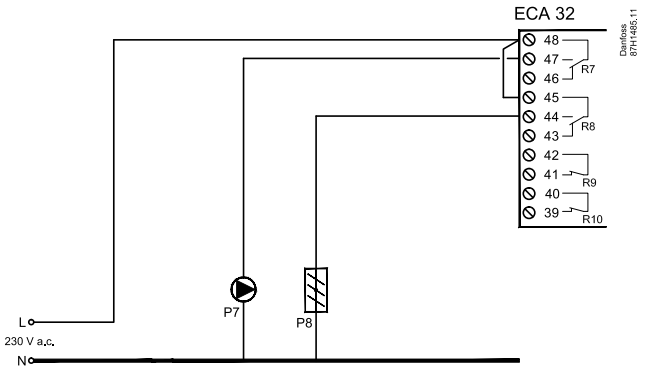
See also the Installation Guide (delivered with the application key) for application specific connections.

Terminals			Max. load
ECL 210	ECL 310		
	19		
	18		4 (2) A / 230 V a.c. *
	17		4 (2) A / 230 V a.c. *
16	16		
15	15		4 (2) A / 230 V a.c. *
14	14		
13	13		4 (2) A / 230 V a.c. *
12	12		4 (2) A / 230 V a.c. *
11	11		4 (2) A / 230 V a.c. *
10	10	230 V a.c., Neutral (N)	
9	9	230 V a.c., Live (L)	
8	8		
7	7		0,2 A / 230 V a.c.
6	6		0,2 A / 230 V a.c.
5	5		
4	4		0,2 A / 230 V a.c.
3	3		0,2 A / 230 V a.c.
	2		0,2 A / 230 V a.c.
	1		0,2 A / 230 V a.c.
* 4 A for ohmic load, 2 A for inductive load			

Factory established jumpers in the base part:
5 to 8, 9 to 14, L to 5 and L to 9, N to 10

Electrical connections, ECA 32

Connections, in general.
See also the A214 Installation Guide (delivered with the application key) for application specific connections.



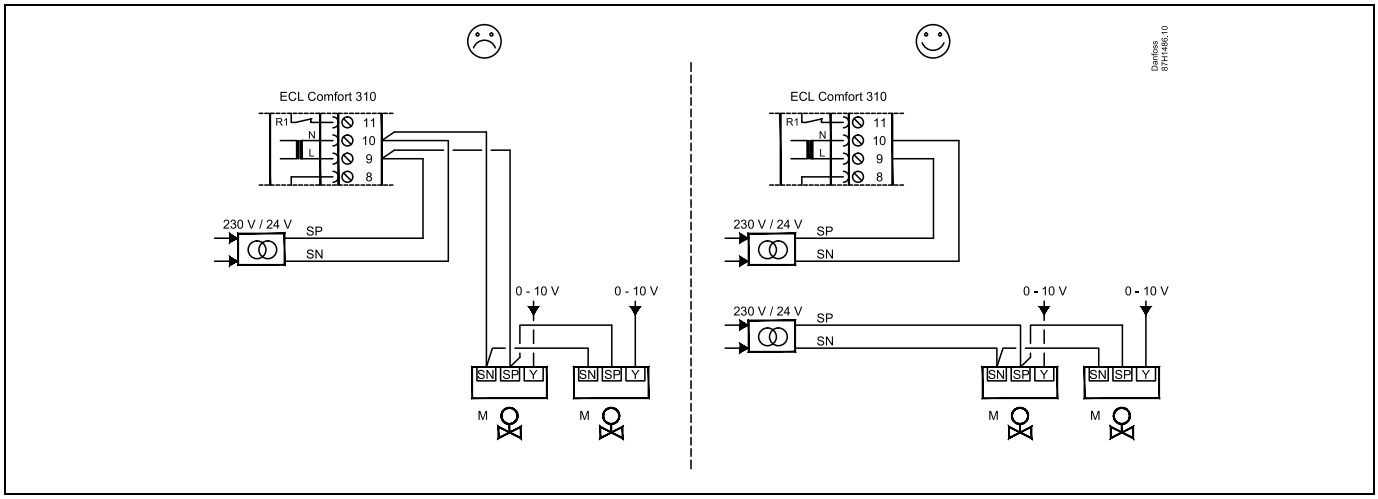
Terminals		Max. load
ECA 32		
48		
47		4 (2) A / 230 V a.c. *
46		4 (2) A / 230 V a.c. *
45		
44		4 (2) A / 230 V a.c. *
43		4 (2) A / 230 V a.c. *
42		
41		4 (2) A / 230 V a.c. *
40		
39		4 (2) A / 230 V a.c. *
* 4 A for ohmic load, 2 A for inductive load		

Wire cross section: 0.5 - 1.5 mm^2
Incorrect connection can damage the electronic outputs.
Max. 2 x 1.5 mm^2 wires can be inserted into each screw terminal.

2.5.3 Electrical connections, 24 V a.c., power supply, pumps, dampers, motorized control valves etc.

Connections, in general.
See also the A214 Installation Guide (delivered with the application key) for application specific connections.

Do not use a common transformer for ECL Comfort 310 and motorized valve / damper control. Use separate transformers.



Terminals		Max. load
ECA 310		
19		
18		4 (2) A / 24 V a.c. *
17		4 (2) A / 24 V a.c. *
16		
15		4 (2) A / 24 V a.c. *
14		
13		4 (2) A / 24 V a.c. *
12		4 (2) A / 24 V a.c. *
11		4 (2) A / 24 V a.c. *
10	24 V a.c., (SN)	
9	24 V a.c., (SP)	
8		
7		1 A / 24 V a.c.
6		1 A / 24 V a.c.
5		
4		1 A / 24 V a.c.
3		1 A / 24 V a.c.
2		1 A / 24 V a.c.
1		1 A / 24 V a.c.
* 4 A for ohmic load, 2 A for inductive load		

Factory established jumpers in the base part:
5 to 8, 9 to 14, L (SP) to 5 and L (SP) to 9, N (SN) to 10

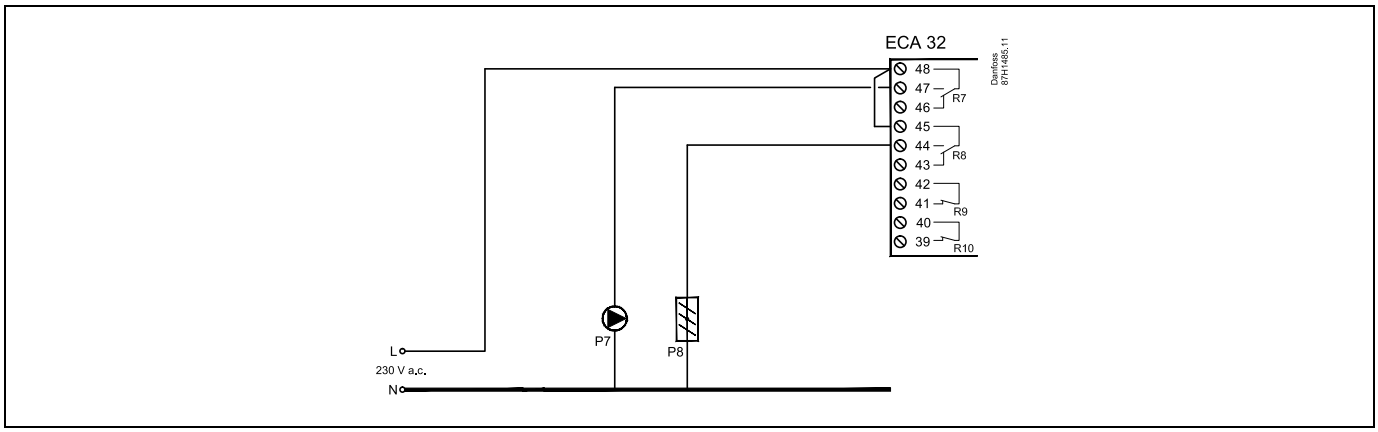
⚠

Do not connect 230 V a.c. powered components to a 24 V a.c. power supplied controller directly. Use auxilliary relays (K) to separate 230 V a.c. from 24 V a.c.

Wire cross section: 0.5 - 1.5 mm^2
Incorrect connection can damage the electronic outputs.
Max. 2 x 1.5 mm^2 wires can be inserted into each screw terminal.

Electrical connections, ECA 32

Connections, in general.
See also the A214 Installation Guide (delivered with the application key) for application specific connections.



Terminals		Max. load
ECA 32		
48		
47		4 (2) A / 230 V a.c. *
46		4 (2) A / 230 V a.c. *
45		
44		4 (2) A / 230 V a.c. *
43		4 (2) A / 230 V a.c. *
42		
41		4 (2) A / 230 V a.c. *
40		
39		4 (2) A / 230 V a.c. *
* 4 A for ohmic load, 2 A for inductive load		

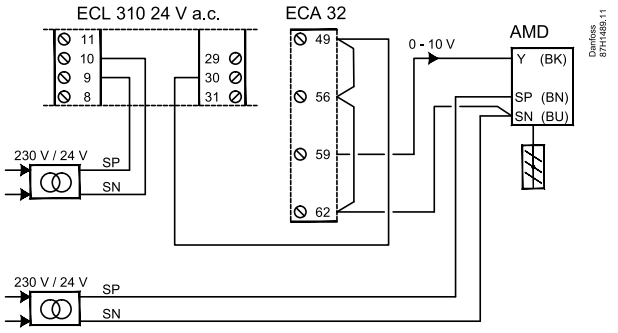
Electrical connections, ECA 32

Connections, in general.
See also the A214 Installation Guide (delivered with the application key) for application specific connections.

The transformers for supplying the actuators must be double-isolated versions.

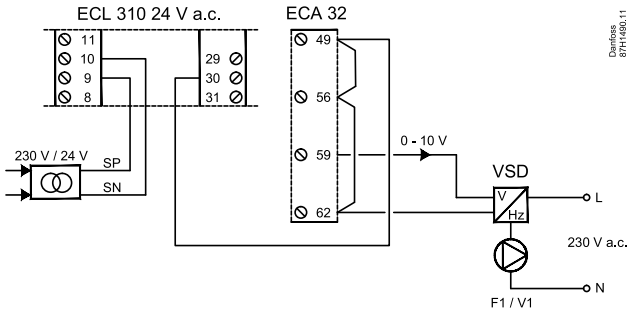
Terminals		Max. load
ECA 32		
56		
57		
58		
59		47 kΩ *
60		47 kΩ *
61		47 kΩ *
62		
* The value must be 47 kΩ as a minimum.		

Example showing separate transformers for ECL 310 supply and output connections:



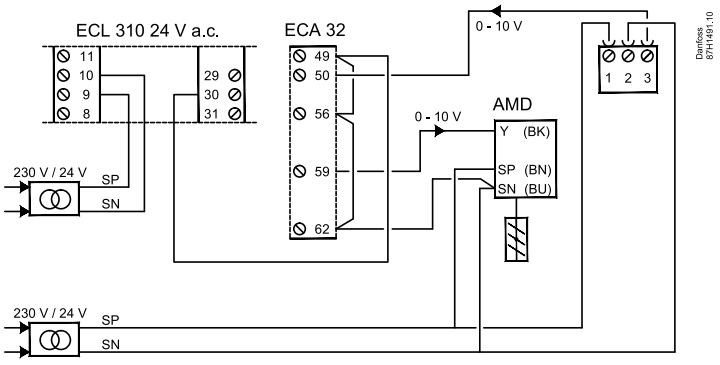
AMD = Danfoss damper actuator

Example showing supply for ECL 310 and output connections:



VSD = Variable Speed Drive

Example showing supply for ECL 310, 24 V a.c.
Separate transformer for supply of transmitter (for input) and output connections:

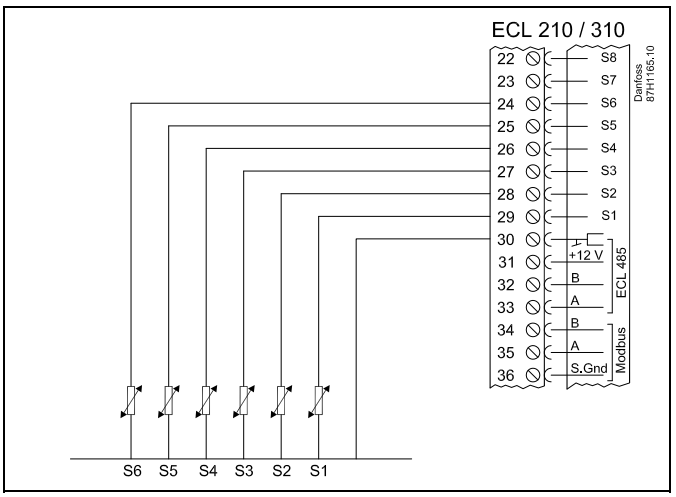


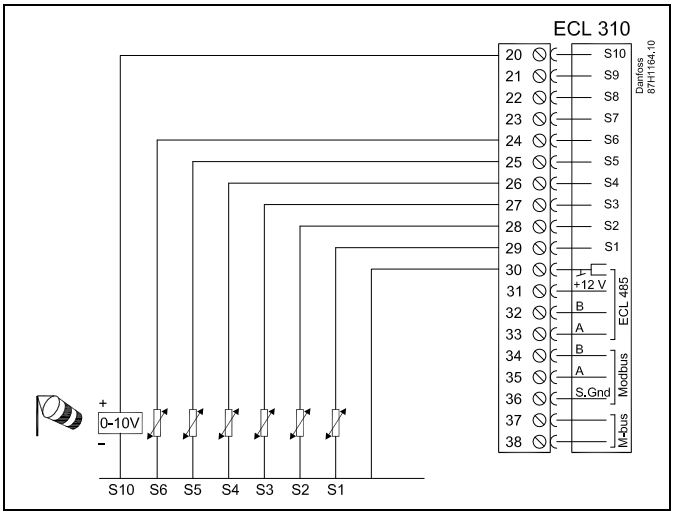
AMD = Danfoss damper actuator

2.5.4 Electrical connections, Pt 1000 temperature sensors

A214/ A314:

Terminal	Sensor / description		Type (recomm.)
29 and 30	S1	Outdoor temp. sensor *	ESMT
28 and 30	S2	Compensation temp. sensor **	ESM-11 / ESMB / ESMC / ESMU / ESMT
27 and 30	S3	Air duct / flow temp. sensor ***	ESM-11 / ESMB / ESMC / ESMU
26 and 30	S4	A214.1, A214.3, A214.5, A214.6, A314.2 - A314.9: Room temp. sensor. A214.2, A214.4, A314.1: Flow temp. sensor.	ESM-10 ESM-11 / ESMB / ESMC / ESMU
25 and 30	S5	Return temp. sensor	ESM-11 / ESMB / ESMC / ESMU
24 and 30	S6	Frost temp. sensor **** (not used in A214.1)	ESMB
23 and 30	S7	Frost thermostat *****	
22 and 30	S8	Fire thermostat *****	
21 and 30	S9	ECL 310 only. A314.4 - A314.9: Fan monitor	
20 and 30	S10	ECL 310 only. A314.3: Wind speed signal (0 - 10 V). A314.4 - A314.9: Filter monitor	





* If the outdoor temperature sensor is not connected or the cable is short-circuited, the controller assumes that the outdoor temperature is 0 (zero) °C.

** Could for example be an extra room temperature sensor.

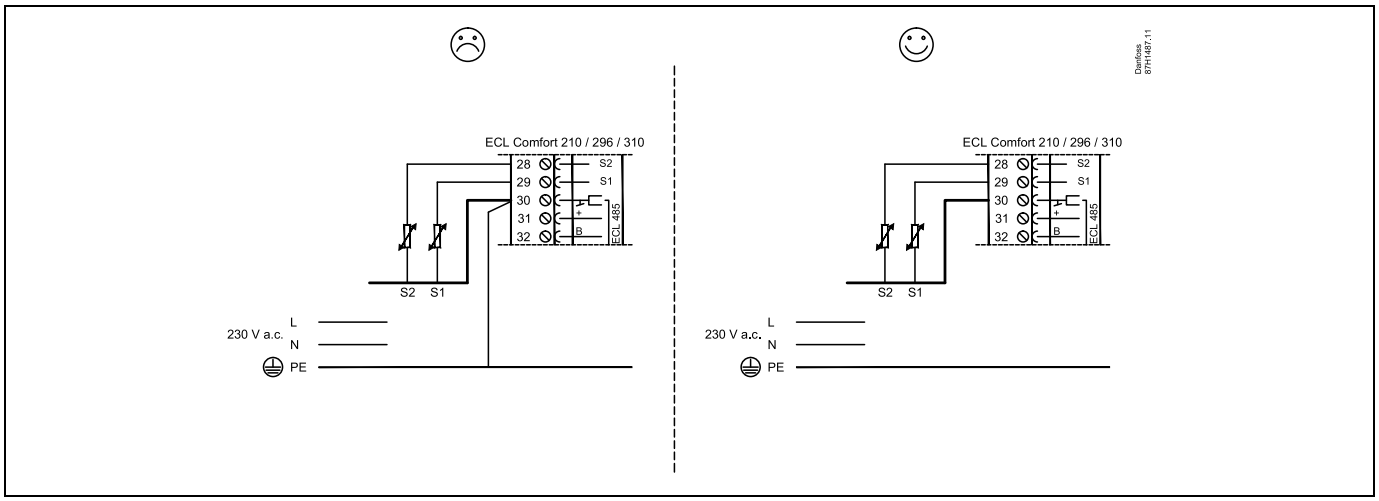
*** If the sensor is not connected or the cable is short-circuited, the motorized control valve closes (safety function).

**** Both frost protection methods can be used.

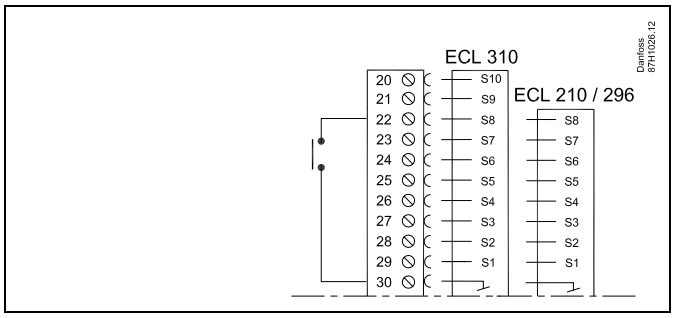
***** Can be set up to react on a closing or an opening contact.

Factory established jumper:
30 to common terminal.

Override contact

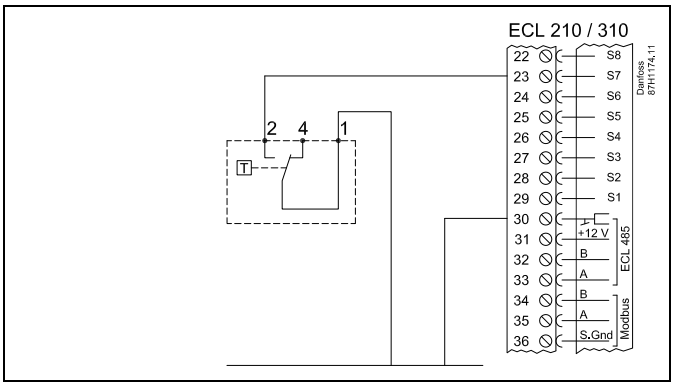


Example of override contact, connected to S8:

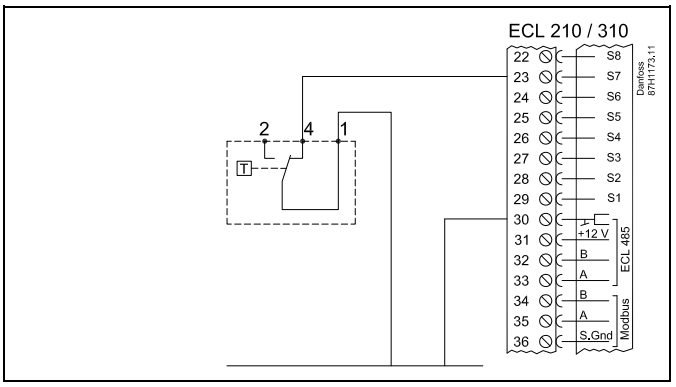


Connection of frost thermostats, S7

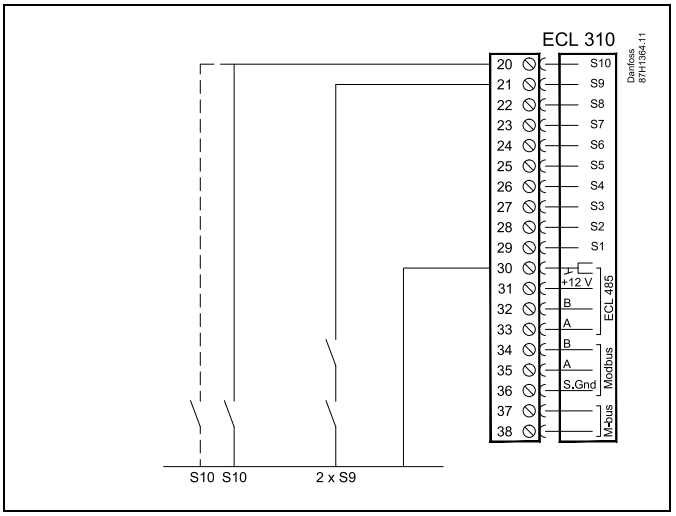
When frost (too low temperature) is detected, contacts 1-2 close.



When frost (too low temperature) is detected, contacts 1-4 open.

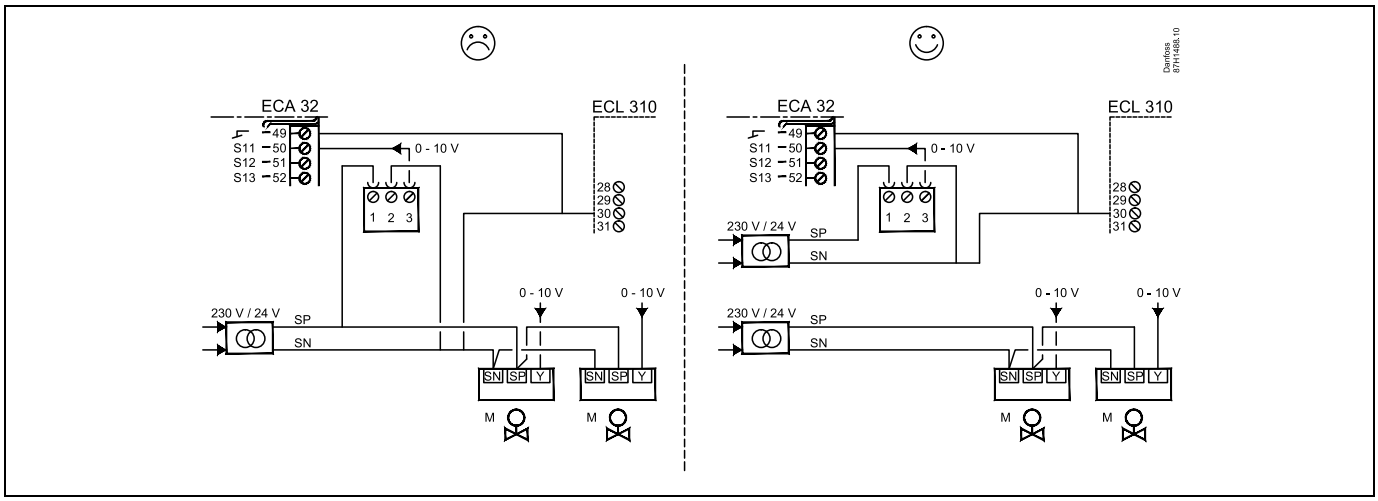


Connections of Fan and Filter monitor (S9 and S10):

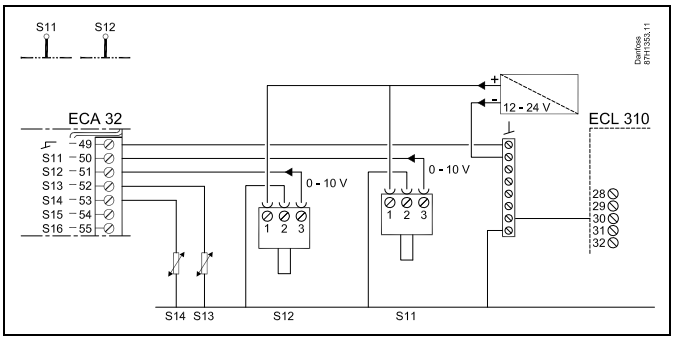


Wire cross section: 0.5 - 1.5 mm²
Incorrect connection can damage the electronic outputs.
Max. 2 x 1.5 mm² wires can be inserted into each screw terminal.

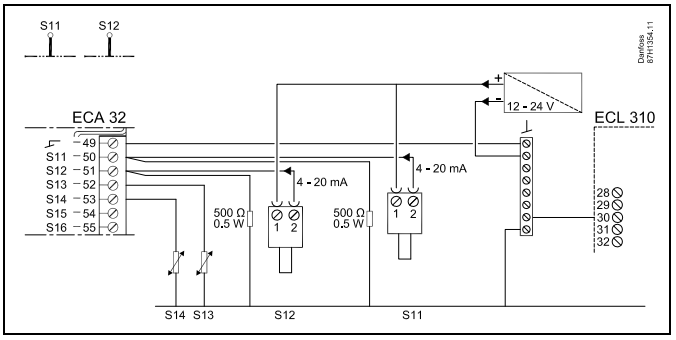
Do not use common transformer when pressure transmitters are supplied by 24 V a.c.:



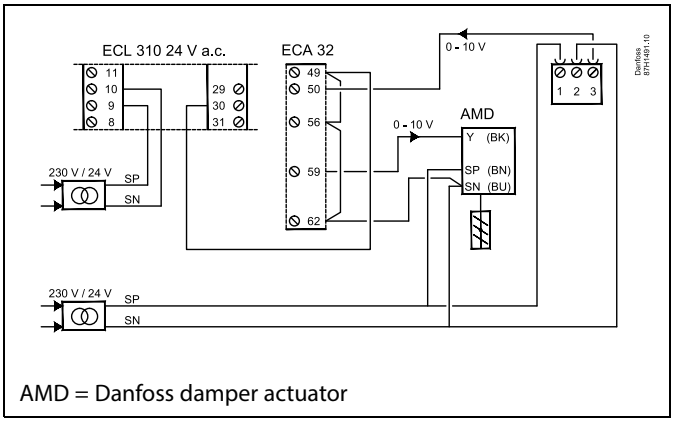
Connections of inputs S11, S12, S13 and S14
(S11 and S12 transmitters generate 0 - 10 V)



(S11 and S12 transmitters generate 4 - 20 mA)



Example showing supply for ECL 310, 24 V a.c.
Separate transformer for supply of transmitter (for input) and output connections.



AMD = Danfoss damper actuator

2.5.5 Electrical connections, ECA 30 / 31

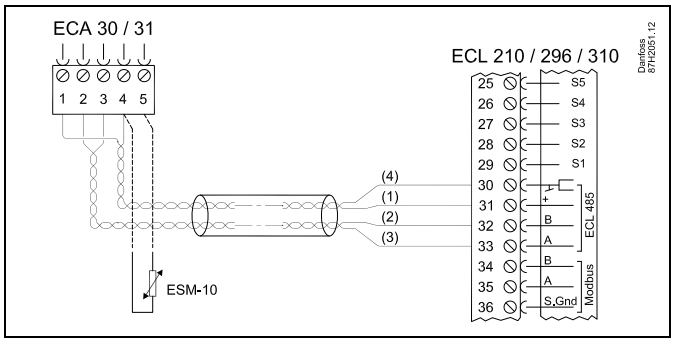
Terminal ECL	Terminal ECA 30 / 31	Description	Type (recomm.)
30	4	Twisted pair	Cable 2 x twisted pair
31	1		
32	2	Twisted pair	
33	3		
	4	Ext. room temperature sensor*	ESM-10
	5		

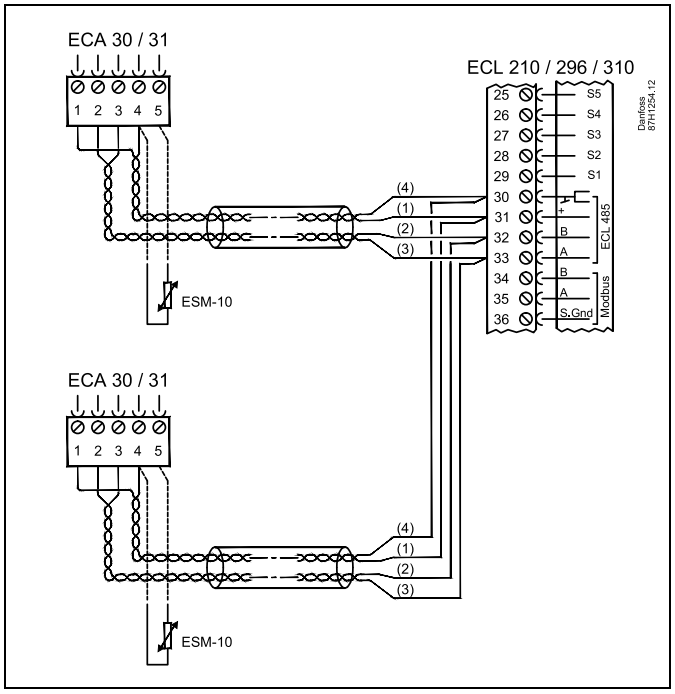
* After an external room temperature sensor has been connected, ECA 30 / 31 must be repowered.

The communication to the ECA 30 / 31 must be set up in the ECL Comfort controller in 'ECA addr.'

The ECA 30 / 31 must be set up accordingly.

After application setup the ECA 30 / 31 is ready after 2–5 min. A progress bar in the ECA 30 / 31 is displayed.





Max. 2 ECA 30 / 31 can be connected to an ECL Comfort 310 controller or to ECL Comfort 210 / 296 / 310 controllers in a master-slave system.

Setup procedures for ECA 30 / 31: See section 'Miscellaneous'.

ECA information message:
'Application req. newer ECA':
The software (firmware) of your ECA does not comply with the software (firmware) of your ECL Comfort controller. Please contact your Danfoss sales office.

Some applications do not contain functions related to actual room temperature. The connected ECA 30 / 31 will only function as remote control.

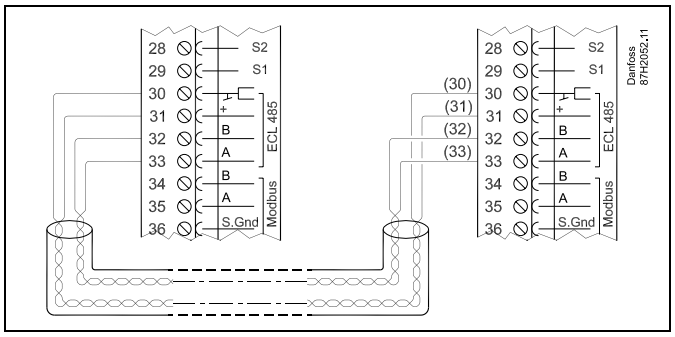
Total cable length: Max. 200 m (all sensors incl. internal ECL 485 communication bus).
Cable lengths of more than 200 m may cause noise sensibility (EMC).

2.5.6 Electrical connections, master / slave systems

The controller can be used as master or slave in master / slave systems via the internal ECL 485 communication bus (2 x twisted pair cable).

The ECL 485 communication bus is not compatible with the ECL bus in ECL Comfort 110, 200, 300 and 301!

Terminal	Description	Type (recomm.)
30	Common terminal	Cable 2 x twisted pair
31*	+12 V*, ECL 485 communication bus	
32	B, ECL 485 communication bus	
33	A, ECL 485 communication bus	
* Only for ECA 30 / 31 and master / slave communication		

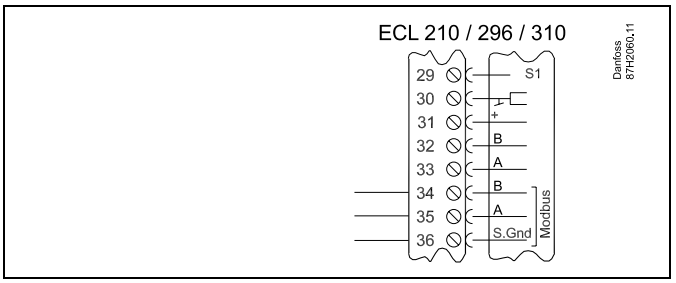


Total cable length: Max. 200 m (all sensors incl. internal ECL 485 communication bus).
Cable lengths of more than 200 m may cause noise sensibility (EMC).

2.5.7 Electrical connections, communication

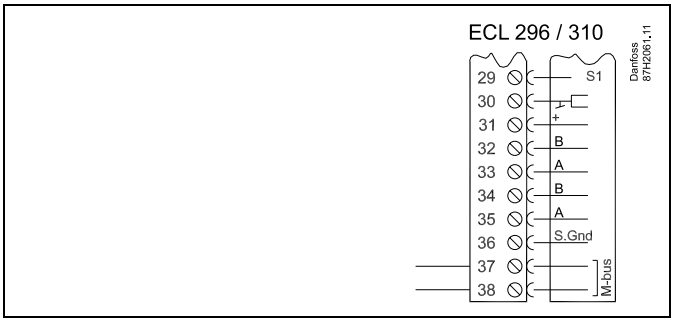
Electrical connections, Modbus

ECL Comfort 210: Non-galvanic isolated Modbus connections
ECL Comfort 296: Galvanic isolated Modbus connections
ECL Comfort 310: Galvanic isolated Modbus connections



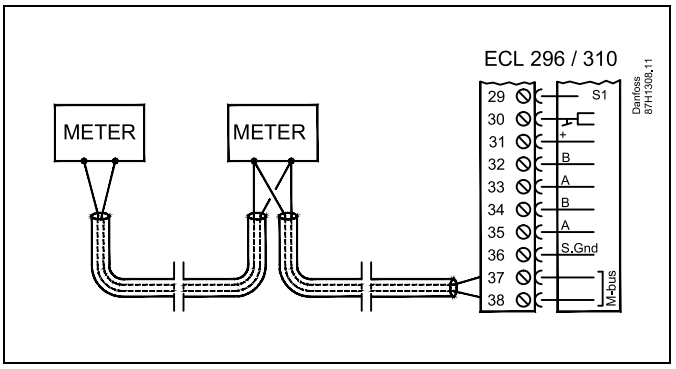
Electrical connections, M-bus

ECL Comfort 210: Not implemented
ECL Comfort 296: On board
ECL Comfort 310: On board



Example, M-bus connections

(ECL Comfort 296 / 310 and 310 B only)



2.6 Inserting the ECL Application Key

2.6.1 Inserting the ECL Application Key

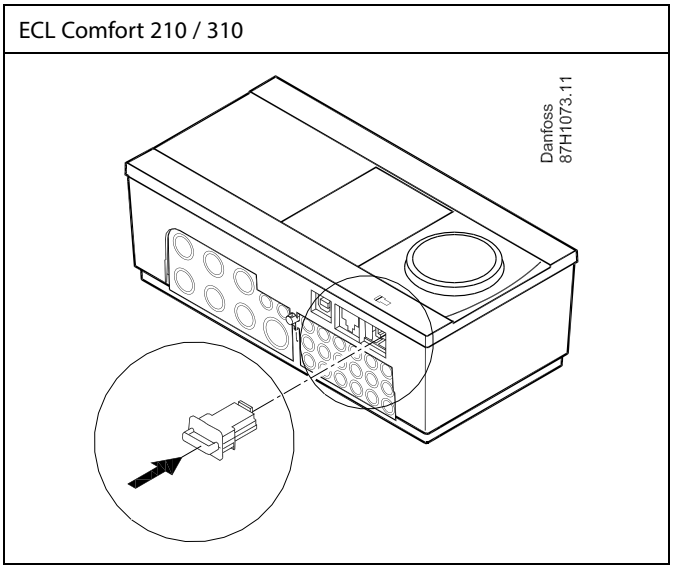
The ECL Application Key contains

- the application and its subtypes,
- currently available languages,
- factory settings: e.g. schedules, desired temperatures, limitation values etc. It is always possible to recover the factory settings,
- memory for user settings: special user / system settings.

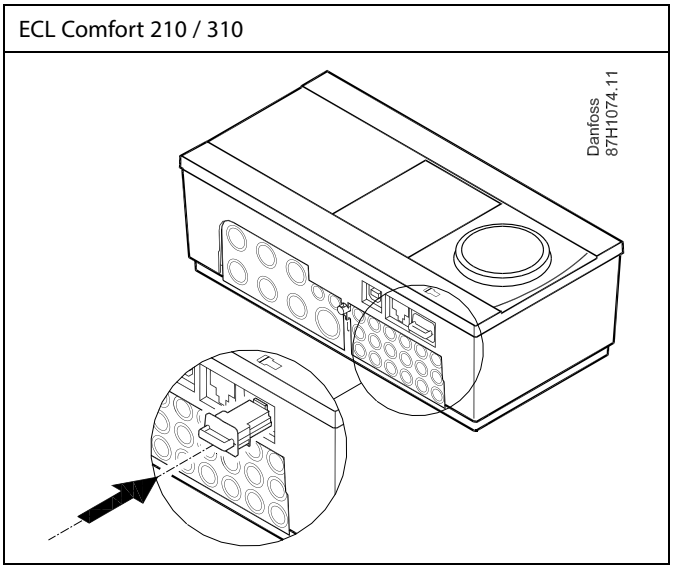
After having powered-up the controller, different situations might be existing:

1. The controller is new from the factory, the ECL Application Key is not inserted.
2. The controller already runs an application. The ECL Application Key is inserted, but the application needs to be changed.
3. A copy of the controllers settings is needed for configuring another controller.

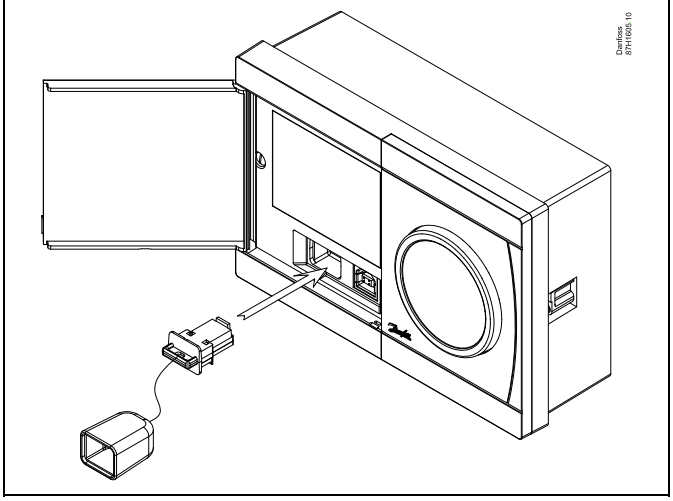
ECL Comfort 210 / 310



ECL Comfort 210 / 310



ECL Comfort 296



User settings are, among others, desired room temperature, desired DHW temperature, schedules, heat curve, limitation values etc.

System settings are, among others, communication set-up, display brightness etc.

Automatic update of controller software (firmware):
The software of the controller is updated automatically when the key is inserted (as of controller version 1.11 (ECL 210 / 310) and version 1.58 (ECL 296)). The following animation will be shown when the software is being updated:

Progress bar

During update:

- Do not remove the KEY
  If the key is removed before the hour-glass is shown, you have to start afresh.
- Do not disconnect the power
  If the power is interrupted when the hour-glass is shown, the controller will not work.

The "Key overview" does not inform — through ECA 30 / 31 — about the subtypes of the application key.

Key inserted / not inserted, description:

ECL Comfort 210 / 310, controller versions lower than 1.36:

- Take out the application key; for 20 minutes settings can be changed.
- Power up the controller **without** the application key inserted; for 20 minutes settings can be changed.

ECL Comfort 210 / 310, controller versions 1.36 and up:

- Take out the application key; for 20 minutes settings can be changed.
- Power up the controller **without** the application key inserted; settings cannot be changed.

ECL Comfort 296 , controller versions 1.58 and up:

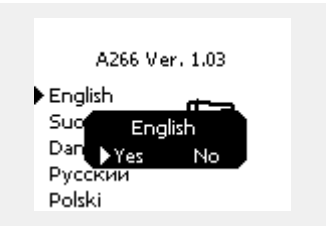
- Take out the application key; for 20 minutes settings can be changed.
- Power up the controller **without** the application key inserted; settings cannot be changed.

Application Key: Situation 1
The controller is new from the factory, the ECL Application Key is not inserted.

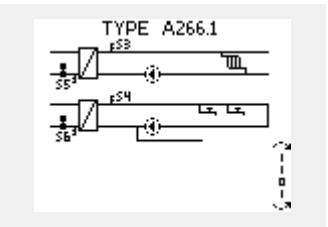
An animation for the ECL Application Key insertion is displayed. Insert the Application Key .

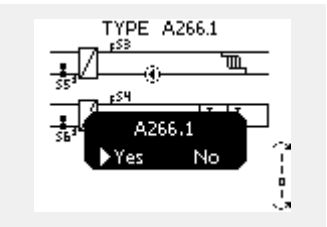
Application Key name and Version is indicated (example: A266 Ver. 1.03).

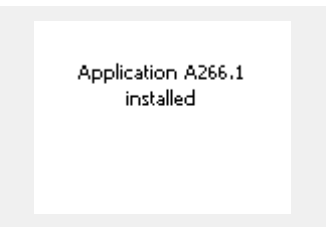
If the ECL Application Key is not suitable for the controller, a "cross" is displayed over the ECL Application Key-symbol.



Action:	Purpose:	Examples:
	Select language	
	Confirm	
	Select application (subtype) Some keys have only one application.	
	Confirm with 'Yes'	
	Set 'Time & Date' Turn and push the dial to select and change 'Hours', 'Minutes', 'Date', 'Month' and 'Year'.	
	Choose "Next'	
	Confirm with 'Yes'	
	Go to 'Aut. daylight'	
	Choose whether 'Aut. daylight' * should be active or not	YES or NO





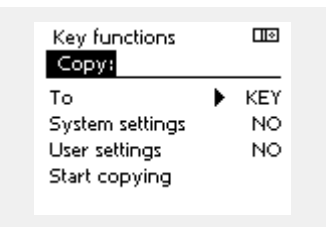


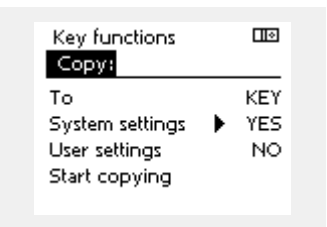
* 'Aut. daylight' is the automatic changeover between summer and winter time.

Depending on the contents of the ECL Application Key, procedure A or B is taking place:

A
The ECL Application key contains factory settings:
The controller reads / transfers data from the ECL Application Key to ECL controller.

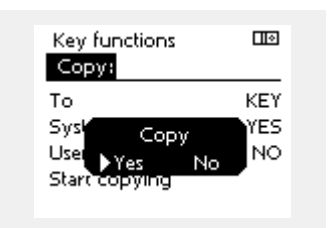
The application is installed, and the controller resets and starts up.

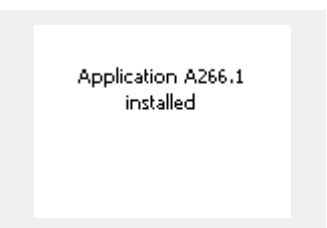




B
The ECL Application key contains changed system settings:
Push the dial repeatedly.

'NO': Only factory settings from the ECL Application Key will be copied to the controller.
'YES*: Special system settings (differing from the factory settings) will be copied to the controller.





If the key contains user settings:
Push the dial repeatedly.

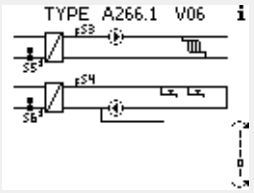
'NO: Only factory settings from the ECL Application Key will be copied to the controller.
'YES*: Special user settings (differing from the factory settings) will be copied to the controller.

* If 'YES' cannot be chosen, the ECL Application Key does not contain any special settings.

Choose 'Start copying' and confirm with 'Yes'.

(Example):

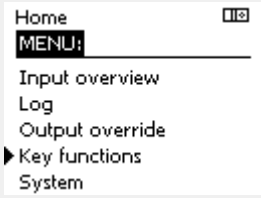
The "**i**" in the upper right corner indicates that - besides the factory settings - the subtype also contains special user / systems settings.

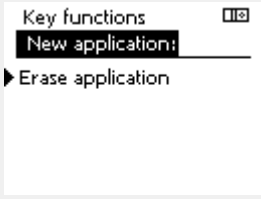


Application Key: Situation 2
The controller already runs an application. The ECL Application Key is inserted, but the application needs to be changed.

To change to another application on the ECL Application Key, the current application in the controller must be erased (deleted).

Be aware that the Application Key must be inserted.





Action:	Purpose:	Examples:
	Choose 'MENU' in any circuit	MENU
	Confirm	
	Choose the circuit selector at the top right corner in the display	
	Confirm	
	Choose 'Common controller settings'	
	Confirm	
	Choose 'Key functions'	
	Confirm	
	Choose 'Erase application'	
	Confirm with 'Yes'	

The controller resets and is ready to be configured.

Follow the procedure described in situation 1.

Application Key: Situation 3
A copy of the controllers settings is needed for configuring another controller.

This function is used

- for saving (backup) of special user and system settings
- when another ECL Comfort controller of the same type (210, 296 or 310) must be configured with the same application but user / system settings differ from the factory settings.

How to copy to another ECL Comfort controller:

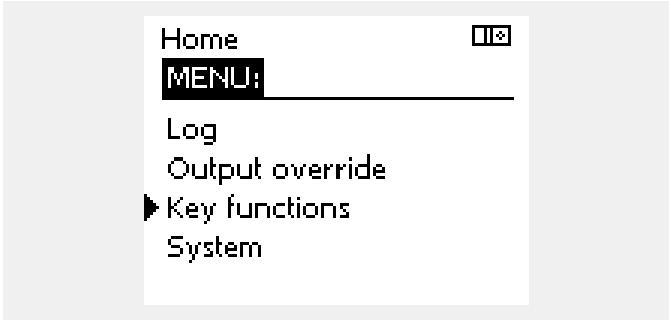
Action:	Purpose:	Examples:
	Choose 'MENU'	MENU
	Confirm	
	Choose the circuit selector at the top right corner in the display	
	Confirm	
	Choose 'Common controller settings'	
	Confirm	
	Go to 'Key functions'	
	Confirm	
	Choose 'Copy'	
	Confirm	
	Choose 'To'. 'ECL' or 'KEY' will be indicated. Choose 'ECL' or KEY'	* 'ECL' or 'KEY'.
	Push the dial repeatedly to choose copy direction	
	Choose 'System settings' or 'User settings'	** 'NO' or 'YES'
	Push the dial repeatedly to choose 'Yes' or 'No' in 'Copy'. Push to confirm.	
	Choose 'Start copying'	
	The Application Key or the controller is updated with special system or user settings.	

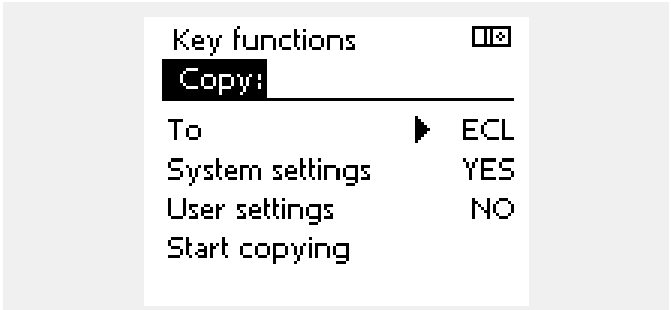
*

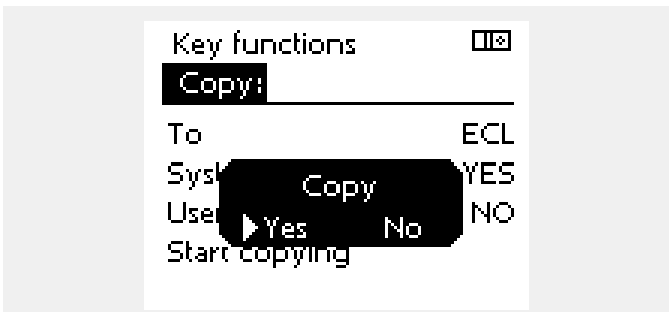
'ECL': Data will be copied from the Application Key to the ECL Controller.
'KEY': Data will be copied from the ECL Controller to the Application Key.

**

'NO': The settings from the ECL controller will not be copied to the Application Key or to the ECL Comfort controller.
'YES': Special settings (differing from the factory settings) will be copied to the Application Key or to the ECL Comfort controller. If YES can not be chosen, there are no special settings to be copied.







2.6.2 ECL Application Key, copying data

General principles
When the controller is connected and operating, you can check and adjust all or some of the basic settings. The new settings can be stored on the Key.

How to update the ECL Application Key after settings have been changed?
All new settings can be stored on the ECL Application Key.

How to store factory setting in the controller from the Application Key?
Please read the paragraph concerning Application Key, Situation 1: The controller is new from the factory, the ECL Application Key is not inserted.

How to store personal settings from the controller to the Key?
Please read the paragraph concerning Application Key, Situation 3: A copy of the controllers settings is needed for configuring another controller

As a main rule, the ECL Application Key should always remain in the controller. If the Key is removed, it is not possible to change settings.

Factory settings can always be restored.

Make a note of new settings in the 'Settings overview' table.

Do not remove the ECL Application Key while copying. The data on the ECL Application Key can be damaged!

It is possible to copy settings from one ECL Comfort controller to another controller provided that the two controllers are from the same series (210 or 310).
Furthermore, when the ECL Comfort controller has been uploaded with an application key, minimum version 2.44, it is possible to upload personal settings from application keys, minimum version 2.14.

The “Key overview” does not inform — through ECA 30 / 31 — about the subtypes of the application key.

Key inserted / not inserted, description:

ECL Comfort 210 / 310, controller versions lower than 1.36:

- Take out the application key; for 20 minutes settings can be changed.
- Power up the controller **without** the application key inserted; for 20 minutes settings can be changed.

ECL Comfort 210 / 310, controller versions 1.36 and up:

- Take out the application key; for 20 minutes settings can be changed.
- Power up the controller **without** the application key inserted; settings cannot be changed.

ECL Comfort 296 , controller versions 1.58 and up:

- Take out the application key; for 20 minutes settings can be changed.
- Power up the controller **without** the application key inserted; settings cannot be changed.

2.7 Check list

Is the ECL Comfort controller ready for use?

- ☐ Make sure that the correct power supply is connected to terminals 9 and 10 (230 V or 24 V).
- ☐ Make sure the correct phase conditions are connected:
  230 V: Live = terminal 9 and Neutral = terminal 10
  24 V: SP = terminal 9 and SN = terminal 10
- ☐ Check that the required controlled components (actuator, pump etc.) are connected to the correct terminals.
- ☐ Check that all sensors / signals are connected to the correct terminals (see 'Electrical connections').
- ☐ Mount the controller and switch on the power.
- ☐ Is the ECL Application Key inserted (see 'Inserting the Application Key').
- ☐ Does the ECL Comfort controller contain an existing application (see 'Inserting the Application Key').
- ☐ Is the correct language chosen (see 'Language' in 'Common controller settings').
- ☐ Is the time & date set correctly (see 'Time & Date' in 'Common controller settings').
- ☐ Is the right application chosen (see 'Identifying the system type').
- ☐ Check that all settings in the controller (see 'Settings overview') are set or that the factory settings comply with your requirements.
- ☐ Choose manual operation (see 'Manual control'). Check that valves open and close, and that required controlled components (pump etc.) start and stop when operated manually.
- ☐ Check that the temperatures / signals shown in the display match the actual connected components.
- ☐ Having completed the manual operation check, choose controller mode (scheduled, comfort, saving or frost protection).

2.8 Navigation, ECL Application Key A214 / A314

Navigation, A214, applications A214.1, A214.2, A214.3, A214.4, A214.5 and A214.6

Home		Applications A214							
MENU		ID no.	Function	A214.1	A214.2	A214.3	A214.4	A214.5	A214.6
Schedule			Selectable						
Settings	Flow temperature	11008	Desired balance T	●	●	●	●	●	●
		11178	Temp. max.	●	●	●	●	●	●
		11177	Temp. min.	●	●	●	●	●	●
		11009	Dead zone				●	●	
	Room limit	11182	Infl. - max.	●		●		●	●
		11183	Infl. - min.	●		●		●	●
		11015	Adapt. time	●		●		●	●
	Duct T limit	11182	Infl. - max.		●		●		
		11183	Infl. - min.		●		●		
		11015	Adapt. time		●		●		
	Return limit	11030	Limit	●	●	●	●	●	●
		11035	Infl. - max.	●	●	●	●	●	●
		11036	Infl. - min.	●	●	●	●	●	●
		11037	Adapt. time	●	●	●	●	●	●
	Limit T safety	11108	Limit T frost		●	●	●	●	●
		11105	Infl. - min.		●	●	●	●	●
		11107	Adapt. time		●	●	●	●	●
	Compensation 1	11139	Actual comp. T	●	●	●	●	●	●
		11060	Limit	●	●	●	●	●	●
		11062	Infl. - max.	●	●	●	●	●	●
		11063	Infl. - min.	●	●	●	●	●	●
		11061	Adapt. time	●	●	●	●	●	●
	Compensation 2	11139	Actual comp. T	●	●	●	●	●	●
		11064	Limit	●	●	●	●	●	●
		11066	Infl. - max.	●	●	●	●	●	●
		11067	Infl. - min.	●	●	●	●	●	●
		11065	Adapt. time	●	●	●	●	●	●
	Control par. (1)	11174	Motor pr.	●	●	●	●	●	●
		11184	Xp	●	●	●	●	●	●
		11185	Tn	●	●	●	●	●	●
		11186	M run	●	●	●	●	●	●
		11187	Nz	●	●	●	●	●	●
		11189	Min. act. time	●	●	●	●	●	●

Navigation, A214, applications A214.1, A214.2, A214.3, A214.4, A214.5 and A214.6 continued

Home		Applications, A214							
MENU		ID no.	Function	A214.1	A214.2	A214.3	A214.4	A214.5	A214.6
Settings	Control par. 2	12174	Motor pr.				●	●	
		12184	Xp				●	●	
		12185	Tn				●	●	
		12186	M run				●	●	
		12187	Nz				●	●	
		12189	Min. act. time				●	●	
	Fan / acc. control	11088	Fan output func.	●	●	●	●	●	●
		11086	Fan cut-in delay	●	●	●	●	●	●
		11137	Fan function		●	●	●	●	●
		11089	Acc. output func.	●	●	●	●	●	●
		11087	Acc. cut-in delay	●	●	●	●	●	●
		11091	Acc. time control	●	●	●	●	●	●
		11090	Optional function	●	●	●	●	●	●
		11077	P frost T		●	●	●	●	●
		11027	Room T diff.			●			●
		11194	Stop difference						●
	Application	11010	ECA addr.	●		●		●	●
		11500	Send desired T	●	●	●	●	●	●
		11021	Total stop	●	●	●	●	●	●
		11140	Comp. T select	●	●	●	●	●	●
		11093	Frost pr. T		●		●		●
		10304	S4 filter		●		●		
		11082	Accum. filter				●	●	
		11141	Ext. input	●	●	●	●	●	●
		11142	Ext. mode	●	●	●	●	●	●

Navigation, A214, applications A214.1, A214.2, A214.3, A214.4, A214.5 and A214.6 continued

Home		Applications A214							
MENU		ID no.	Function	A214.1	A214.2	A214.3	A214.4	A214.5	A214.6
Holiday			Selectable	●	●	●	●	●	●
Alarm	Frost T	11676	Alarm value	●	●	●	●	●	●
	Limit T frost	11656	Alarm value		●	●	●	●	●
	Frost thermostat	11616	Alarm value		●	●	●	●	●
		11617	Alarm time-out		●	●	●	●	●
	Fire safety	11636	Alarm value	●	●	●	●	●	●
		11637	Alarm time-out	●	●	●	●	●	●
	Temp. monitor.	11147	Upper difference		●	●	●	●	●
		11148	Lower difference		●	●	●	●	●
		11149	Delay		●	●	●	●	●
		11150	Lowest temp.		●	●	●	●	●
	Alarm overview		Frost T	●	●	●	●	●	●
			Limit T frost		●	●	●	●	●
			Frost thermostat		●	●	●	●	●
			Fire safety	●	●	●	●	●	●
			Temp. monitor.		●	●	●	●	●
			Flow T sensor	●	●	●	●	●	●
Influence overview	Des. flow T		Return lim.	●	●	●	●	●	●
			Room lim.	●		●		●	●
			Duct T limit		●		●		
			Compensation 1	●	●	●	●	●	●
			Compensation 2	●	●	●	●	●	●
			Limit T safety		●	●	●	●	●
			Holiday	●	●	●	●	●	●
			Ext. override	●	●	●	●	●	●
			ECA override	●		●		●	●
			SCADA offset	●	●	●	●	●	●

Navigation, A214, applications A214.1, A214.2, A214.3, A214.4, A214.5 and A214.6, Common controller settings

Home		Applications A214, Common controller settings							
MENU		**ID no.**	**Function**	**A214.1**	**A214.2**	**A214.3**	**A214.4**	**A214.5**	**A214.6**
Time & Date			Selectable	●	●	●	●	●	●
Schedule			Selectable	●	●	●	●	●	●
Input overview			Outdoor T	●	●	●	●	●	●
			Compensation T	●	●	●	●	●	●
			Flow T	●	●	●	●	●	●
			Room T	●		●		●	●
			Duct T		●		●		
			Return T	●	●	●	●	●	●
			Frost T	●	●	●	●	●	●
			Accumulated T				●	●	
			Frost thermostat		●	●	●	●	●
			Fire safety	●	●	●	●	●	●
Log (sensors)	Log today		Outdoor T	●	●	●	●	●	●
	Log yesterday		Flow T & desired	●	●	●	●	●	●
	Log 2 days		Duct T & desired		●		●		
	Log 4 days		Room T & desired	●		●		●	●
			Return T & limit	●	●	●	●	●	●
			Compensation T	●	●	●	●	●	●
			Frost T	●	●	●	●	●	●
Output override			M1		●	●	●	●	●
			F1	●	●	●	●	●	●
			M2	●			●	●	
			P2	●	●	●	●	●	●
			X3	●	●	●	●	●	●
			A1	●	●	●	●	●	●

Navigation, A214, applications A214.1, A214.2, A214.3, A214.4, A214.5 and A214.6, Common controller settings, continued

Home		Applications A214, Common controller settings							
MENU		ID no.	Function	A214.1	A214.2	A214.3	A214.4	A214.5	A214.6
Key functions	New application		Erase application	●	●	●	●	●	●
	Application			●	●	●	●	●	●
	Factory setting		System settings	●	●	●	●	●	●
			User settings	●	●	●	●	●	●
			Go to factory	●	●	●	●	●	●
	Copy		To	●	●	●	●	●	●
			System settings	●	●	●	●	●	●
			User settings	●	●	●	●	●	●
			Start copying	●	●	●	●	●	●
	Key overview			●	●	●	●	●	●
System	ECL version		Code no.	●	●	●	●	●	●
			Hardware	●	●	●	●	●	●
			Software	●	●	●	●	●	●
			Build no.	●	●	●	●	●	●
			Serial no.	●	●	●	●	●	●
			Production date	●	●	●	●	●	●
	Extension			●	●	●	●	●	●
	Ethernet			●	●	●	●	●	●
	Portal config			●	●	●	●	●	●
	M-bus config			●	●	●	●	●	●
	Energy Meters			●	●	●	●	●	●
	Raw input overview			●	●	●	●	●	●
	Alarm		T sensor defect	●	●	●	●	●	●
	Display	60058	Backlight	●	●	●	●	●	●
		60059	Contrast	●	●	●	●	●	●
	Communication	2048	ECL 485 addr.	●	●	●	●	●	●
		38	Modbus addr.	●	●	●	●	●	●
		39	Baud	●	●	●	●	●	●
		2150	Service pin	●	●	●	●	●	●
		2151	Ext. reset	●	●	●	●	●	●
	Language	2050	Language	●	●	●	●	●	●

Navigation, A314, applications A314.1, 314.2 and A314.3

Home		Application A314				
MENU		**ID no.**	**Function**	**A314.1**	**A314.2**	**A314.3**
Schedule			Selectable			
Settings	Flow temperature	11008	Desired balance T	●	●	●
		11178	Temp. max.	●	●	●
		11177	Temp. min.	●	●	●
		11009	Dead zone	●	●	
	Room limit	11182	Infl. - max.		●	●
		11183	Infl. - min.		●	●
		11015	Adapt. time		●	●
	Duct T limit	11182	Infl. - max.	●		
		11183	Infl. - min.	●		
		11015	Adapt. time	●		
	Return limit	11030	Limit	●	●	●
		11035	Infl. - max.	●	●	●
		11036	Infl. - min.	●	●	●
		11037	Adapt. time	●	●	●
	Limit T safety	11108	Limit T frost	●	●	●
		11105	Infl. - min.	●	●	●
		11107	Adapt. time	●	●	●
	Compensation 1	11139	Actual comp. T	●	●	●
		11060	Limit	●	●	●
		11062	Infl. - max.	●	●	●
		11063	Infl. - min.	●	●	●
		11061	Adapt. time	●	●	●
	Compensation 2	11139	Actual comp. T	●	●	●
		11064	Limit	●	●	●
		11066	Infl. - max.	●	●	●
		11067	Infl. - min.	●	●	●
		11065	Adapt. time	●	●	●
	Control par. (1)	11174	Motor pr.	●	●	●
		11184	Xp	●	●	●
		11185	Tn	●	●	●
		11186	M run	●	●	●
		11187	Nz	●	●	●
		11189	Min. act. time	●	●	●

Navigation, A314, applications A314.1, A314.2 and A314.3 continued

Home		Applications A314				
MENU		**ID no.**	**Function**	**A314.1**	**A314.2**	**A314.3**
Settings	Control par. 2	12174	Motor pr.	●	●	
		12184	Xp	●	●	
		12185	Tn	●	●	
		12187	Nz	●	●	
		12165	V out max.	●	●	
		12167	V out min.	●	●	
		12171	Reverse out	●	●	
	Fan / acc. control	11098	Wind actual			●
		11081	Filter constant			●
		11104	Control voltage			●
		11088	Fan output func.	●	●	●
		11086	Fan cut-in delay	●	●	●
		11137	Fan function	●	●	●
		11089	Acc. output func.	●	●	●
		11087	Acc. cut-in delay	●	●	●
		11091	Acc. time control	●	●	●
		11090	Optional function	●	●	●
		11077	P frost T	●	●	●
		11027	Room T diff.			●
	Application	11010	ECA addr.		●	●
		11500	Send desired T	●	●	●
		11021	Total stop	●	●	●
		11140	Comp. T select	●	●	●
		11093	Frost pr. T	●		
		10304	S4 filter	●		
		11082	Accum. filter	●	●	
		11141	Ext. input	●	●	●
		11142	Ext. mode	●	●	●

Navigation, A314, applications A314.1, A314.2 and A314.3 continued

Home		Applications A314				
MENU		**ID no.**	**Function**	**A314.1**	**A314.2**	**A314.3**
Holiday			Selectable	●	●	●
Alarm	Frost T	11676	Alarm value	●	●	●
	Limit T frost	11656	Alarm value	●	●	●
	Frost thermostat	11616	Alarm value	●	●	●
		11617	Alarm time-out	●	●	●
	Fire safety	11636	Alarm value	●	●	●
		11637	Alarm time-out	●	●	●
	Temp. monitor.	11147	Upper difference	●	●	●
		11148	Lower difference	●	●	●
		11149	Delay	●	●	●
		11150	Lowest temp.	●	●	●
	Alarm overview		Frost T	●	●	●
			Limit T frost	●	●	●
			Frost thermostat	●	●	●
			Fire safety	●	●	●
			Temp. monitor.	●	●	●
			Flow T sensor	●	●	●
Influence overview	Des. flow T		Return lim.	●	●	●
			Room lim.		●	●
			Duct T limit	●		
			Compensation 1	●	●	●
			Compensation 2	●	●	●
			Limit T safety	●	●	●
			Holiday	●	●	●
			Ext. override	●	●	●
			ECA override		●	●
			SCADA offset	●	●	●

Navigation, A314, applications A314.1, A314.2 and A314.3, Common controller settings

Home		Applications A314, Common controller settings				
MENU		**ID no.**	**Function**	**A314.1**	**A314.2**	**A314.3**
Time & Date			Selectable	●	●	●
Schedule			Selectable	●	●	●
Input overview			Outdoor T	●	●	●
			Compensation T	●	●	●
			Flow T	●	●	●
			Room T		●	●
			Duct T	●		
			Return T	●	●	●
			Frost T	●	●	●
			Accumulated T	●	●	
			Frost thermostat	●	●	●
			Fire safety	●	●	●
Log (sensors)	Log today		Outdoor T	●	●	●
	Log yesterday		Flow T & desired	●	●	●
	Log 2 days		Duct T & desired	●		
	Log 4 days		Room T & desired		●	●
			Return T & limit	●	●	●
			Compensation T	●	●	●
			Frost T	●	●	●
			Wind speed			●
Output override			M1	●	●	●
			F1	●	●	●
			V1			●
			M2	●	●	
			P2	●	●	●
			X3	●	●	●
			A1	●	●	●

Navigation, A314, applications A314.1, A314.2 and A314.3, Common controller settings, continued

Home		Applications A314, Common controller settings				
MENU		**ID no.**	**Function**	**A314.1**	**A314.2**	**A314.3**
Key functions	New application		Erase application	●	●	●
	Application			●	●	●
	Factory setting		System settings	●	●	●
			User settings	●	●	●
			Go to factory	●	●	●
	Copy		To	●	●	●
			System settings	●	●	●
			User settings	●	●	●
			Start copying	●	●	●
	Key overview			●	●	●
System	ECL version		Code no.	●	●	●
			Hardware	●	●	●
			Software	●	●	●
			Build no.	●	●	●
			Serial no.	●	●	●
			Production date	●	●	●
	Extension			●	●	●
	Ethernet			●	●	●
	Portal config			●	●	●
	M-bus config			●	●	●
	Energy Meters			●	●	●
	Raw input overview			●	●	●
	Alarm		T sensor defect	●	●	●
	Display	60058	Backlight	●	●	●
		60059	Contrast	●	●	●
	Communication	2048	ECL 485 addr.	●	●	●
		38	Modbuss addr.	●	●	●
		39	Baud	●	●	●
		2150	Service pin	●	●	●
		2151	Ext. reset	●	●	●
	Language	2050	Language	●	●	●

Navigation, A314, applications A314.4, A314.5, A314.6, A314.7 and A314.9, circuit 1

Home		Applications 314						
MENU		ID no.	Function	A314.4	A314.5	A314.6	A314.7	A314.9
Schedule			Selectable					
Settings	Inlet temperature	11018	Des. T comfort	●	●	●	●	●
		11019	Des. T saving	●	●	●	●	●
		11178	Temp. max.	●	●	●	●	●
		11177	Temp. min.	●	●	●	●	●
		11009	Dead zone			●	●	
	Room limit	11182	Infl. - max.	●	●	●	●	●
		11183	Infl. - min.	●	●	●	●	●
		11015	Adapt. time	●	●	●	●	●
	Return limit	11030	Limit	●	●	●	●	●
		11035	Infl. - max.	●	●	●	●	●
		11036	Infl. - min.	●	●	●	●	●
		11037	Adapt. time	●	●	●	●	●
	Limit T safety	11108	Limit T frost	●	●	●	●	●
		11105	Infl. - min.	●	●	●	●	●
		11107	Adapt. time	●	●	●	●	●
	Compensation 1	11139	Actual comp. T	●	●	●	●	●
		11060	Limit	●	●	●	●	●
		11062	Infl. - max.	●	●	●	●	●
		11063	Infl. - min.	●	●	●	●	●
		11061	Adapt. time	●	●	●	●	●
	Compensation 2	11139	Actual comp. T	●	●	●	●	●
		11064	Limit	●	●	●	●	●
		11066	Infl. - max.	●	●	●	●	●
		11067	Infl. - min.	●	●	●	●	●
		11065	Adapt. time	●	●	●	●	●
	Control par. (1)	11174	Motor pr.	●	●	●	●	●
		11184	Xp	●	●	●	●	●
		11185	Tn	●	●	●	●	●
		11186	M run	●	●	●	●	●
		11187	Nz	●	●	●	●	●
		11189	Min. act. time	●	●	●	●	●

Navigation, A314, applications A314.4, A314.5, A314.6 , A314.7 and A314.9, circuit 1, continued

Home		Applications, A314						
MENU		ID no.	Function	A314.4	A314.5	A314.6	A314.7	A314.9
Settings	Control par. 2	12368	1. step level					●
		12369	2. step level					●
		12184	Xp	●	●	●	●	●
		12185	Tn	●	●	●	●	●
		12187	Nz	●	●	●	●	●
		12165	V out max.	●	●	●	●	●
		12167	V out min.	●	●	●	●	●
	Fan / acc. control	11088	Fan output func.	●	●	●	●	●
		11086	Fan cut-in delay	●	●	●	●	●
		11137	Fan function	●	●	●	●	●
		11089	Acc. output func.	●	●	●	●	●
		11087	Acc. cut-in delay	●	●	●	●	●
		11091	Acc. time control	●	●	●	●	●
	Application	11010	ECA addr.	●	●	●	●	●
		11021	Total stop	●	●	●	●	●
		11093	Frost pr. T	●	●	●	●	●
		11140	Comp. T select	●	●	●	●	●
		11368	1. step level	●	●	●	●	
		11369	2. step level	●	●	●	●	
		11179	Summer, cut-out	●	●			
		11082	Accum. filter			●	●	
		11141	Ext. input	●	●	●	●	●
		11142	Ext. mode	●	●	●	●	●

Navigation, A314, applications A314.4, A314.5, A314.6 , A314.7 and A314.9, circuit 1, continued

Home		Applications A314						
MENU		ID no.	Function	A314.4	A314.5	A314.6	A314.7	A314.9
Holiday			Selectable	●	●	●	●	●
Alarm	Frost T	11676	Alarm value	●	●	●	●	●
	Limit T frost	11656	Alarm value	●	●	●	●	●
	Frost thermostat	11616	Alarm value	●	●	●	●	●
		11617	Alarm time-out	●	●	●	●	●
	Fire safety	11636	Alarm value	●	●	●	●	●
		11637	Alarm time-out	●	●	●	●	●
	Digital S9	10656	Alarm value	●	●	●	●	●
		10657	Alarm time-out	●	●	●	●	●
		12390	Clear alarm	●	●	●	●	●
	Digital S10	10696	Alarm value	●	●	●	●	●
		10697	Alarm time-out	●	●	●	●	●
	Inlet pressure	13614	Alarm high	●	●	●	●	●
		13615	Alarm low	●	●	●	●	●
		13617	Alarm time-out	●	●	●	●	●
		13390	Clear alarm	●		●		
	Outlet pressure	14614	Alarm high	●		●		
		14615	Alarm low	●		●		
		14617	Alarm time-out	●		●		
		14390	Clear alarm	●		●		
	Air quality	13614	Alarm high		●		●	●
		13615	Alarm low		●		●	●
		13617	Alarm time-out		●		●	●
	Temp. monitor.	11147	Upper difference	●	●	●	●	●
		11148	Lower difference	●	●	●	●	●
		11149	Delay	●	●	●	●	●
		11150	Lowest temp.	●	●	●	●	●
	Heat recovery	12615	Alarm low	●	●	●	●	
		12617	Alarm time-out	●	●	●	●	

Navigation, A314, applications A314.4, A314.5, A314.6 , A314.7 and A314.9, circuit 1, continued

Home		Applications A314						
MENU		ID no.	Function	A314.4	A314.5	A314.6	A314.7	A314.9
	Alarm overview		Frost T	●	●	●	●	●
			Limit T frost	●	●	●	●	●
			Frost thermostat	●	●	●	●	●
			Fire safety	●	●	●	●	●
			Temp. monitor.	●	●	●	●	●
			Inlet T sensor	●	●	●	●	●
			Digital S9	●	●	●	●	●
			Digital S10	●	●	●	●	●
			Air quality		●		●	●
			Inlet pressure	●		●		
			Outlet pressure	●		●		
			Heat recovery	●	●	●	●	
			T sensor defect	●	●	●	●	●
Influence overview	Desired inlet T		Return lim.	●	●	●	●	●
			Room lim.	●	●	●	●	●
			Compensation 1	●	●	●	●	●
			Compensation 2	●	●	●	●	●
			Limit T safety	●	●	●	●	●
			Holiday	●	●	●	●	●
			Ext. override	●	●	●	●	●
			SCADA offset	●	●	●	●	●

Navigation, A314, applications A314.4, A314.5, A314.6 , A314.7 and A314.9, circuit 2

Home		Applications, A314						
MENU		ID no.	Function	A314.4	A314.5	A314.6	A314.7	A314.9
Settings	Control par., inlet	13600	Pressure	●		●		
		13113	Filter constant	●		●		
		13406	X1	●		●		
		13407	X2	●		●		
		12321	Pressure, des.	●		●		
		11168	Max. Pressure	●		●		
		11169	Min. Pressure	●		●		
		13184	Xp	●		●		
		13185	Tn	●		●		
		13187	Nz	●		●		
		13165	V out max.	●		●		
		13167	V out min.	●		●		
		13357	Fan speed, red.	●				
	Control par., outlet	13600	Pressure	●		●		
		14113	Filter constant	●		●		
		14406	X1	●		●		
		14407	X2	●		●		
		12321	Pressure, des.	●		●		
		12168	Max. Pressure	●		●		
		12169	Min. Pressure	●		●		
		14184	Xp	●		●		
		14185	Tn	●		●		
		14187	Nz	●		●		
		14165	V out max.	●		●		
		12167	V out min.	●		●		

Navigation, A314, applications A314.4, A314.5, A314.6 , A314.7 and A314.9, circuit 2, continued

Home		Applications, A314						
MENU		ID no.	Function	A314.4	A314.5	A314.6	A314.7	A314.9
Settings	Control par., fan	13339	Air quality		●		●	●
		13113	Filter constant		●		●	●
		13406	X1		●		●	●
		13407	X2		●		●	●
		13111	Limit		●		●	●
		13184	Xp		●		●	●
		13185	Tn		●		●	●
		13187	Nz		●		●	●
		13165	V out max.		●		●	●
		13167	V out min.		●		●	●
		13357	Fan speed, red.		●			●
		13356	Outlet fan, offset		●		●	●
	Control par., cool.	15184	Xp			●	●	
		15185	Tn			●	●	
		15186	M run			●	●	
		15187	Nz			●	●	
		15189	Min. act. time			●	●	
	Application	11038	Stop at T out	●	●	●	●	●
		11194	Stop difference	●	●	●	●	●
		11077	P frost T	●	●	●	●	●

Navigation, A314, applications A314.4, A314.5, A314.6, A314.7 and A314.9, Common controller settings

Home		Applications A314, Common controller settings						
MENU		**ID no.**	**Function**	**A314.4**	**A314.5**	**A314.6**	**A314.7**	**A314.9**
Time & Date			Selectable	●	●	●	●	●
Schedule			Selectable	●	●	●	●	●
Input overview			Outdoor T	●	●	●	●	●
			Outdoor acc. T	●	●			
			Accumulated T			●	●	●
			Compensation T	●	●	●	●	●
			Inlet T	●	●	●	●	●
			Room T	●	●	●	●	●
			Return T	●	●	●	●	●
			Frost T	●	●	●	●	●
			Entry duct T	●	●	●	●	
			Exit duct T	●	●	●	●	
			Frost thermostat	●	●	●	●	●
			Fire safety	●	●	●	●	●
			Digtial S9	●	●	●	●	●
			Digtial S10	●	●	●	●	●
			Inlet pressure	●		●		
			Outlet pressure	●		●		
			Air quality		●		●	●
Log (sensors)	Log today		Outdoor T	●	●	●	●	●
	Log yesterday		Inlet T & desired	●	●	●	●	●
	Log 2 days		Room T & desired	●	●	●	●	●
	Log 4 days		Return T & limit	●	●	●	●	●
			Compensation T	●	●	●	●	●
			Frost T	●	●	●	●	●
			Press. inlet & des.	●		●		
			Press. outlet & des.	●		●		
			Air quality & limit		●		●	●
Output override			M1	●	●	●	●	●
			F1	●	●	●	●	●
			M2	●	●	●	●	●
			P2		●			●
			X3		●			●
			A1		●			●
			V2	●	●	●	●	●
			V3		●			●
			X4		●			●
			P7	●	●	●	●	
			P8	●	●			●
			M3			●	●	

Navigation, A314, applications A314.4, A314.5, A314.6 , A314.7 and A314.9, Common controller settings, continued

Home		Applications A314, Common controller settings						
MENU		**ID no.**	**Function**	**A314.4**	**A314.5**	**A314.6**	**A314.7**	**A314.9**
Key functions	New application		Erase application	●	●	●	●	●
	Application			●	●	●	●	●
	Factory setting		System settings	●	●	●	●	●
			User settings	●	●	●	●	●
			Go to factory	●	●	●	●	●
	Copy		To	●	●	●	●	●
			System settings	●	●	●	●	●
			User settings	●	●	●	●	●
			Start copying	●	●	●	●	●
	Key overview			●	●	●	●	●
System	ECL version		Code no.	●	●	●	●	●
			Hardware	●	●	●	●	●
			Software	●	●	●	●	●
			Build no.	●	●	●	●	●
			Serial no.	●	●	●	●	●
			Production date	●	●	●	●	●
	Extension			●	●	●	●	●
	Ethernet			●	●	●	●	●
	Portal config			●	●	●	●	●
	M-bus config			●	●	●	●	●
	Energy Meters			●	●	●	●	●
	Raw input overview			●	●	●	●	●
	Alarm		T sensor defect	●	●	●	●	●
	Display	60058	Backlight	●	●	●	●	●
		60059	Contrast	●	●	●	●	●
	Communication	2048	ECL 485 addr.	●	●	●	●	●
		38	Modbus addr.	●	●	●	●	●
		39	Baud	●	●	●	●	●
		2150	Service pin	●	●	●	●	●
		2151	Ext. reset	●	●	●	●	●
	Language	2050	Language	●	●	●	●	●

3.0 Daily use

3.1 How to navigate

You navigate in the controller by turning the dial left or right to the desired position (↻).

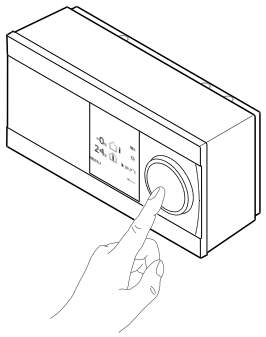
The dial has a built-in accellerator. The faster you turn the dial, the faster it reaches the limits of any wide setting range.

The position indicator in the display (▶) will always show you where you are.

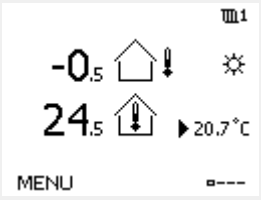
Push the dial to confirm your choices (☝).

The display examples are from a two-circuit application: One heating circuit (▥) and one domestic hot-water (DHW) circuit (🚿). The examples might differ from your application.

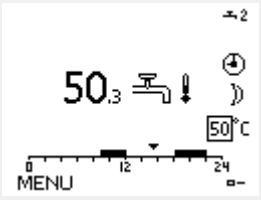
Example shows ECL 210 / 310



Heating circuit (▥):



DHW circuit (🚿);

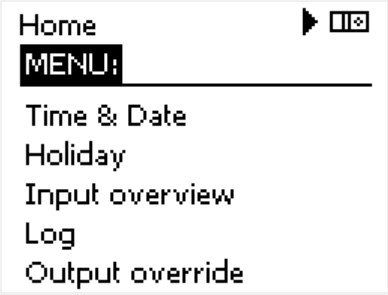


Some general settings which apply to the entire controller are located in a specific part of the controller.

To enter 'Common controller settings':

Action:	Purpose:	Examples:
↻	Choose 'MENU' in any circuit	MENU
☝	Confirm	
↻	Choose the circuit selector at the top right corner in the display	
☝	Confirm	
↻	Choose 'Common controller settings'	▯▯
☝	Confirm	

Circuit selector



3.2 Understanding the controller display

This section describes the function in general for the ECL Comfort 210 / 296 / 310 series. The shown displays are typical and not application related. They might differ from the displays in your application.

Choosing a favorite display
Your favorite display is the display you have chosen as the default display. The favorite display will give you a quick overview of the temperatures or units that you want to monitor in general.

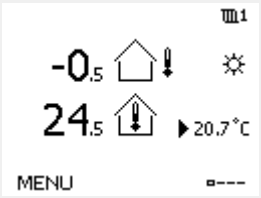
If the dial has not been activated for 20 min., the controller will revert to the overview display you have chosen as favorite.

To shift between displays: Turn the dial until you reach the display selector (▫---) at the bottom right side of the display. Push the dial and turn to choose your favorite overview display. Push the dial again.

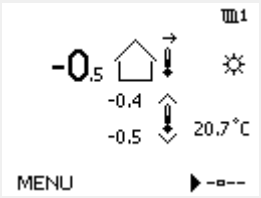
Heating circuit
Overview display 1 informs about:
actual outdoor temperature, controller mode,
actual room temperature, desired room temperature.

Overview display 2 informs about:
actual outdoor temperature, trend in outdoor temperature, controller mode, max. and min. outdoor temperatures since midnight as well as desired room temperature.

Overview display 1:



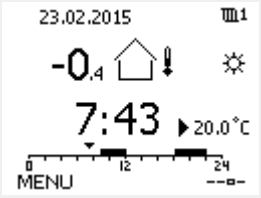
Overview display 2:



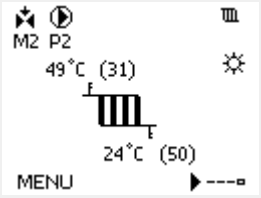
Overview display 3 informs about:
date, actual outdoor temperature, controller mode, time, desired room temperature as well as shows the comfort schedule of the current day.

Overview display 4 informs about:
state of the controlled components, actual flow temperature, (desired flow temperature), controller mode, return temperature (limitation value), influence on desired flow temperature.

Overview display 3:

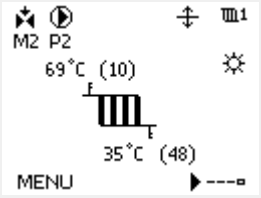


Overview display 4:



Note:
An actual flow temperature value must be present, otherwise the circuit's control valve will close.

Example of overview display with Influence indication:



Dependent on the chosen display, the overview displays for the heating circuit inform you about:
- actual outdoor temperature (-0.5)
- controller mode (☼)
- actual room temperature (24.5)
- desired room temperature (20.7 °C)
- trend in outdoor temperature (↗ → ↘)
- min. and max. outdoor temperatures since midnight (◊)
- date (23.02.2010)
- time (7:43)
- comfort schedule of the current day (0 - 12 - 24)
- state of the controlled components (M2, P2)
- actual flow temperature (49 °C), (desired flow temperature (31))
- return temperature (24 °C) (limitation temperature (50))

The setting of the desired room temperature is important even if a room temperature sensor / Remote Control Unit is not connected.

If the temperature value is displayed as

"- -" the sensor in question is not connected.

"- - -" the sensor connection is short-circuited.

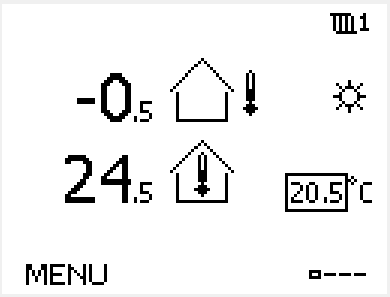
Setting the desired temperature

Depending on the chosen circuit and mode, it is possible to enter all daily settings directly from the overview displays (see also the next page concerning symbols).

Setting the desired room temperature

The desired room temperature can easily be adjusted in the overview displays for the heating circuit.

Action:	Purpose:	Examples:
	Desired room temperature	20.5
	Confirm	
	Adjust the desired room temperature	21.0
	Confirm	



This overview display informs about outdoor temperature, actual room temperature as well as desired room temperature.

The display example is for comfort mode. If you want to change the desired room temperature for saving mode, choose the mode selector and select saving.

The setting of the desired room temperature is important even if a room temperature sensor / Remote Control Unit is not connected.

Setting the desired room temperature, ECA 30 / ECA 31

The desired room temperature can be set exactly as in the controller. However, other symbols can be present in the display (please see 'What do the symbols mean?').

With the ECA 30 / ECA 31 you can override the desired room temperature set in the controller temporarily by means of the override functions:

3.3 A general overview: What do the symbols mean?

Symbol	Description	
	Outdoor temp.	Temperature
	Relative humidity indoor	
	Room temp.	
	DHW temp.	
	Position indicator	
	Scheduled mode	Mode
	Comfort mode	
	Saving mode	
	Frost protection mode	
	Manual mode	
	Standby	
	Cooling mode	
!	Active output override	
	Optimized start or stop time	
	Heating	Circuit
	Cooling	
	DHW	
	Common controller settings	
	Pump ON	Controlled component
	Pump OFF	
	Actuator opens	
	Actuator closes	
42	Actuator, analogue control signal	
45	Pump speed	

Symbol	Description
	Alarm
	Letter
!	Event
	Monitoring temperature sensor connection
	Display selector
	Max. and min. value
	Trend in outdoor temperature
	Wind speed sensor
--	Sensor not connected or not used
---	Sensor connection short-circuited
7-23	Fixed comfort day (holiday)
	Active influence
	Heating active
	Cooling active

Additional symbols, ECA 30 / 31:

Symbol	Description
	ECA Remote Control Unit
15	Connection address (master: 15, slaves: 1 - 9)
	Day off
	Holiday
	Relaxing (extended comfort period)
	Going out (extended saving period)

In ECA 30 / 31 only the symbols that are relevant to the application in the controller are displayed.

3.4 Monitoring temperatures and system components

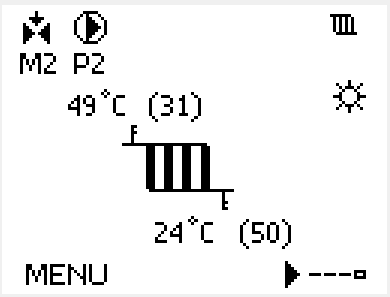
This section describes the function in general for the ECL Comfort 210 / 296 / 310 series. The shown displays are typical and not application related. They might differ from the displays in your application.

Heating circuit

The overview display in the heating circuit ensures a quick overview of the actual and (desired) temperatures as well as the actual state of the system components.

Display example:

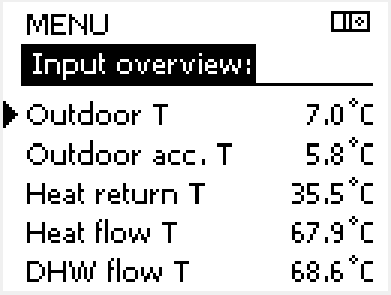
49 °C	Flow temperature
(31)	Desired flow temperature
24 °C	Return temperature
(50)	Return temperature limitation



Input overview

Another option to get a quick overview of measured temperatures is the 'Input overview' which is visible in the common controller settings (how to enter the common controller settings, see 'Introduction to common controller settings'.)

As this overview (see display example) only states the measured actual temperatures, it is read-only.



3.5 Influence overview

This section describes the function in general for the ECL Comfort 210 / 296 / 310 series. The shown displays are typical and not application related. They might differ from the displays in your application.

The menu gives an overview of the influences on the desired flow temperature. It differs from application to application which parameters are listed. It can be helpful in a service situation to explain unexpected conditions or temperatures among others.

If the desired flow temperature is influenced (corrected) by one or more parameters, it is indicated by a small line with arrow-down, arrow-up or double-arrow:

Arrow-down:
The parameter in question reduces the desired flow temperature.

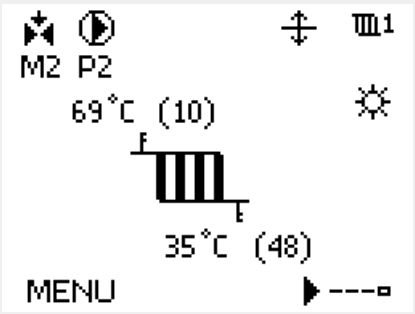
Arrow-up:
The parameter in question increases the desired flow temperature.

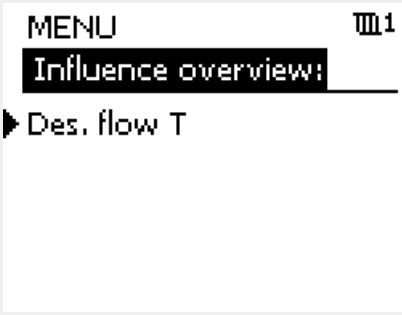
Double-arrow:
The parameter in question creates an override (e.g. Holiday).

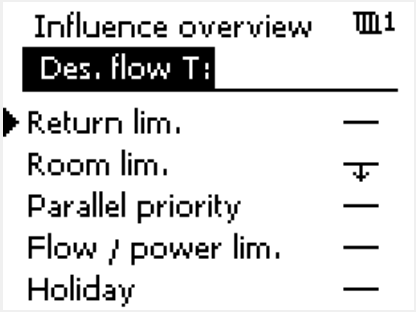
Straight line:
No active influence.

In the example, the arrow in the symbol points downwards for 'Room lim.'. This means that the actual room temperature is higher than the desired room temperature which again results in a decrease of the desired flow temperature.

Example of overview display with Influence indication:







3.6 Manual control

This section describes the function in general for the ECL Comfort 210 / 296 / 310 series. The shown displays are typical and not application related. They might differ from the displays in your application.

It is possible to manually control the installed components.

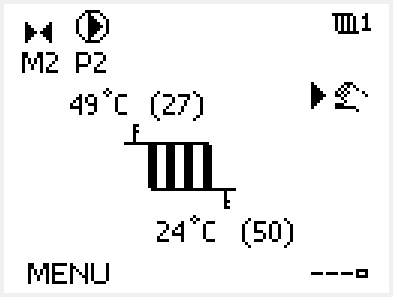
Manual control can only be selected in favorite displays in which the symbols for the controlled components (valve, pump etc.) are visible.

Action:	Purpose:	Examples:
	Choose mode selector	
	Confirm	
	Choose manual mode	
	Confirm	
	Choose pump	
	Confirm	
	Switch ON the pump	
	Switch OFF the pump.	
	Confirm pump mode	
	Choose motorized control valve	
	Confirm	
	Open the valve	
	Stop opening the valve	
	Close the valve	
	Stop closing the valve	
	Confirm valve mode	

To leave manual control, use the mode selector to select the desired mode. Push the dial.

Manual control is typically used when commisioning the installation. The controlled components, valve, pump etc., can be controlled for correct function.

Controlled components *Circuit selector*



During manual operation:

- All control functions are deactivated
- Output override is not possible
- Frost protection is not active

When manual control is selected for one circuit, it is automatically selected for all circuits!

Manual control of 0 – 10 volt controlled actuator:
The actuator symbol has a value (in %) which can be changed. The % value is corresponding to a voltage in the range 0 – 10 volt.

Manual control of 0 – 10 volt controlled fan speed:
The V1 and V2 symbols have a value (in %) which can be changed. The % value is corresponding to a voltage in the range 0 – 10 volt.

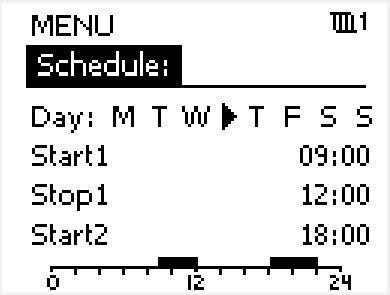
3.7 Schedule

3.7.1 Set your schedule

This section describes the schedule in general for the ECL Comfort 210 / 296 / 310 series. The shown displays are typical and not application related. They might differ from the displays in your application. In some applications, however, there might be more than one schedule. Additional schedules can be found in 'Common controller settings'.

The schedule consists of a 7-day week:

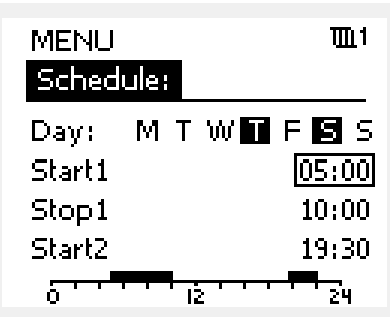
M = Monday
T = Tuesday
W = Wednesday
T = Thursday
F = Friday
S = Saturday
S = Sunday

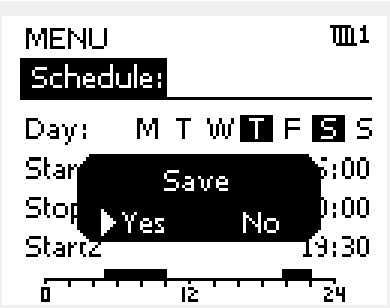


The schedule will day-by-day show you the start and stop times of your comfort periods (heating / DHW circuits).

Changing your schedule:

Action:	Purpose:	Examples:
	Choose 'MENU' in any of the overview displays	MENU
	Confirm	
	Confirm the choice 'Schedule'	
	Choose the day to change	▶
	Confirm*	T
	Go to Start1	
	Confirm	
	Adjust the time	
	Confirm	
	Go to Stop1, Start2 etc. etc.	
	Return to 'MENU'	MENU
	Confirm	
	Choose 'Yes' or 'No' in 'Save'	
	Confirm	





* Several days can be marked

The chosen start and stop times will be valid for all the chosen days (in this example Thursday and Saturday).

You can set max. 3 comfort periods a day. You can delete a comfort period by setting start and stop times to the same value.

Each circuit has its own schedule. To change to another circuit, go to 'Home', turn the dial and choose the desired circuit.

The start and stop times can be set in half-hourly (30 min.) intervals.

4.0 Settings overview

For factory settings and setting range, see appendix “Parameter ID overview”.
Parameters indicated with an ID no. like "1x607" mean a universal parameter. x stands for circuit / parameter group.

Setting	ID	Page	Factory settings in circuit(s)	
			1	2
Pressure, des. (desired pressure)		133		
Pressure		135		
Wind actual		142		
Alarm overview, in general		163		
Desired balance T	1x008	117		
Dead zone	1x009	117		
ECA addr. (ECA address, choice of Remote Control Unit)	1x010	144		
Adapt. time (adaption time)	1x015	119		
Des. T Comfort	1x018	117		
Des. T Saving	1x019	118		
Total stop	1x021	145		
Room T diff.	1x027	137		
Limit (return temp. limitation)	1x030	121		
Infl. - max. (return temp. limitation - max. influence)	1x035	121		
Infl. - min. (return temp. limitation - min. influence)	1x036	122		
Adapt. time (adaptation time)	1x037	122		
Stop at T out	1x038	149		
Limit (compensation temp., 1. point)	1x060	124		
Adapt. time (adaptation time)	1x061	124		
Infl. - max. (compensation temp., 1. point)	1x062	124		
Infl. - min. (compensation temp., 1. point)	1x063	125		
Limit (compensation temp., 2. point)	1x064	126		
Adapt. time (adaptation time)	1x065	126		
Infl. - max. (compensation temp., 2. point)	1x066	126		
Infl. - min. (compensation temp., 2. point)	1x067	126		
P frost T (circulation pump, frost protection temp.)	1x077	138		
P frost T (circulation pump, frost protection temp.)	1x077	149		
Filter constant	1x081	142		
Accum. filter (Accummulation filter)	1x082	149		
Fan cut-in delay (relay 1, F1)	1x086	138		
Acc. cut-in delay (Accessory cut-in delay, relay 2, P2)	1x087	138		
Fan output func. (Fan output function, relay 1, F1)	1x088	138		
Acc. output func. (Accessory output function, relay 2, P2)	1x089	139		
Optional function (relay 3, X3)	1x090	139		
Acc. time control (Accessory time control, relay 2, P2)	1x091	140		
Frost pr. T (frost protection temp.)	1x093	150		
Control voltage	1x104	142		
Infl. - min. (min. influence)	1x105	123		

Setting	ID	Page	Factory settings in circuit(s) 1	2
Adapt. time (adaptation time)	1x107	123		
Limit T frost (sliding frost protection)	1x108	123		
Limit (limitation value)	1x111	130		
Filter constant	1x113	130		
Fan function	1x137	140		
Comp. T select (Compensation temperature selection)	1x140	150		
Ext. input (external override)	1x141	150		
Ext. mode (external override mode)	1x142	151		
Upper difference	1x147	158		
Lower difference	1x148	159		
Delay, example	1x149	159		
Lowest temp.	1x150	160		
V out max.	1x165	131		
V out min.	1x167	131		
Max. pressure	1x168	131		
Min. pressure	1x169	131		
Reverse out	1x171	131		
Motor pr. (motor protection)	1x174	132		
Temp. min.	1x177	118		
Temp. max.	1x178	118		
Summer, cut-out (limit for heating cut-out)	1x179	153		
Infl. - max. (room temp. limitation, max.)	1x182	119		
Infl. - min. (room temp. limitation, min.)	1x183	120		
Xp (proportional band)	1x184	132		
Tn (integration time constant)	1x185	132		
M run (running time of the motorized control valve)	1x186	132		
Nz (neutral zone)	1x187	133		
Min. act. time (min. activation time gear motor)	1x189	133		
Stop difference	1x194	140		
Stop difference	1x194	154		
S4 filter	1x304	155		
Air quality	1x339	133		
Outlet fan, offset	1x356	134		
Fan speed, red. (reduced fan speed)	1x357	134		
1. step level	1x368	134		
1. step level	1x368	156		
2. step level	1x369	134		
2. step level	1x369	156		
Clear alarm	1x390	160		
X1	1x406	134		
X2	1x407	135		
Send desired T	1x500	156		

Setting	ID	Page	Factory settings in circuit(s) 1	2
Alarm high	1x614	160		
Alarm low	1x615	160		
Alarm value	1x616	161		
Alarm time-out	1x617	161		
Alarm value	1x636	161		
Alarm time-out	1x637	161		
Alarm value	1x656	162		
Alarm time-out	1x657	162		
Alarm value	1x676	162		
Alarm value	1x696	162		
Alarm time-out	1x697	163		

5.0 Settings

5.1 Introduction to Settings

Descriptions of settings (parameter's functions) are divided into groups as used in the ECL Comfort 210 / 296 / 310 controller's menu structure. Examples: "Flow temperature", "Room limit" and so on. Each group starts with a general explanation.

The descriptions of each parameter are in numeric order, related to the parameter's ID numbers. You might come across differences between the order in this Operating Guide and the ECL Comfort 210 / 296 / 310 controllers.
You might also come across navigation hints which are not present in your application.

The note "See Appendix …" refers to the Appendix at the end of this Operating Guide, where parameter's setting ranges and factory settings are listed.

The navigation hints (for example MENU > Settings > Return limit …) cover multiple subtypes.

5.2 Flow temperature / Inlet temperature

The temperature, measured by S3, can be a flow or an air duct temperature.

The desired temperature at S3 in the subtypes A214.1 - A214.6 and A314.1 - A314.3 is indicated as 'Desired balance T'.

The desired temperature at S3 in the subtypes A314.4 - A314.7 and A314.9 is indicated as 'Desired T comfort' / 'Desired T saving'.

Parameters indicated with an ID no. like "1x607" mean a universal parameter.
x stands for circuit / parameter group.

MENU > Settings > Flow temperature / Inlet temperature

Desired balance T	**1x008**

See Appendix “Parameter ID overview”

Set the desired temperature at S3.

In all applications, the S3 temperature sensor is the most important sensor and must always be connected.

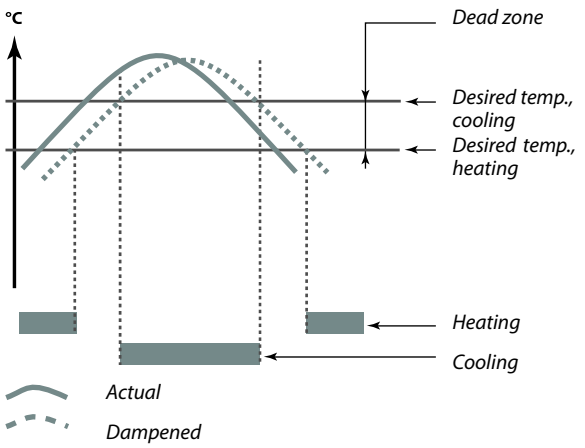
MENU > Settings > Flow temperature / Inlet temperature

Dead zone	**1x009**
When the application runs in combined heating / cooling mode or as 2-stage heating, the desired duct or room temperature is increased with the dead zone value when in cooling mode. This setting prevents unexpected changes (instability) between heating and cooling operation.	

See Appendix “Parameter ID overview”

OFF: No dead zone between heating and cooling operation or 2-stage heating.

Value: The number of degrees between the desired duct or room temperature in heating mode and the desired duct or room temperature in cooling mode.



Example

Desired duct / room temperature: 20 °C

Dead zone: 5 K

When the duct / room temperature rises above 20 °C, heating stops.
When the duct / room temperature rises above 25 °C, cooling starts.
When the duct / room tempeture falls below 25 °C, cooling stops.
When the duct / room tempeture falls below 20 °C, heating starts.

MENU > Settings > Flow temperature / Inlet temperature

Des. T Comfort	**1x018**
Setting of desired flow temperature when the ECL controller is in comfort mode.	

See Appendix “Parameter ID overview”

This setting has no influence if the controller receives an external value for the desired flow temperature.

MENU > Settings > Flow temperature / Inlet temperature

Des. T Saving	**1x019**
Setting of desired flow temperature when the ECL controller is in saving mode.	

See Appendix “Parameter ID overview”

This setting has no influence if the controller receives an external value for the desired flow temperature.

MENU > Settings > Flow temperature / Inlet temperature

Temp. min.	**1x177**

See Appendix “Parameter ID overview”

Set the min. duct / flow / inlet temperature for the system. The desired duct / flow / inlet temperature will not be lower than this setting. Adjust the factory setting, if required.

‘Temp. min.’ is overruled if 'Total stop' is active in Saving mode or 'Cut-out' is active.
‘Temp. min.’ can be overruled by the influence from the return temperature limitation (see 'Priority').

The setting for ‘Temp. max.’ has higher priority than ‘Temp. min.’.

MENU > Settings > Flow temperature / Inlet temperature

Temp. max.	**1x178**

See Appendix “Parameter ID overview”

Set the max. flow / duct / inlet temperature for the system. The desired temperature will not be higher than this setting. Adjust the factory setting, if required.

The setting of ‘heat curve’ is possible for heating circuits only.

The setting for ‘Temp. max.’ has higher priority than ‘Temp. min.’.

5.3 Duct T limit / Room limit

The following section is a general description for Room temperature limitation.
The actual application might not have both limitation types.

This section is only relevant if you have installed a room temperature sensor or a Remote Control Unit for utilizing the room temperature signal.

In the following description is referred to "flow temperature" in general.

The controller adjusts the desired flow temperature to compensate for the difference between the desired and the actual room temperature.

If the room temperature is higher than the desired value, the desired flow temperature can be reduced.

The 'Infl. -max.' (Influence, max. room temp.) determines how much the desired flow temperature should be reduced.

Use this influence type to avoid a too high room temperature. The controller will allow for free heat gains, i.e. solar radiation or heat from a fire place etc.

If the room temperature is lower than the desired value, the desired flow temperature can be increased.

The 'Infl. -min.' (Influence, min. room temperature) determines how much the desired flow temperature should be increased.

Use this influence type to avoid a too low room temperature. This could e.g. be caused by windy surroundings.

A typical setting will be -4.0 for 'Infl. -max.' and 4.0 for 'Infl. -min.'

Parameters indicated with an ID no. like "1x607" mean a universal parameter.
x stands for circuit / parameter group.

MENU > Settings > Duct T limit / Room limit

Adapt. time (adaption time)	**1x015**
Controls how fast the actual room temperature adapts to the desired room temperature (I control).	

See Appendix “Parameter ID overview”

OFF: The control function is not influenced by the 'Adapt. time'.

Minor value: The desired room temperature is adapted quickly.

Major value: The desired room temperature is adapted slowly.

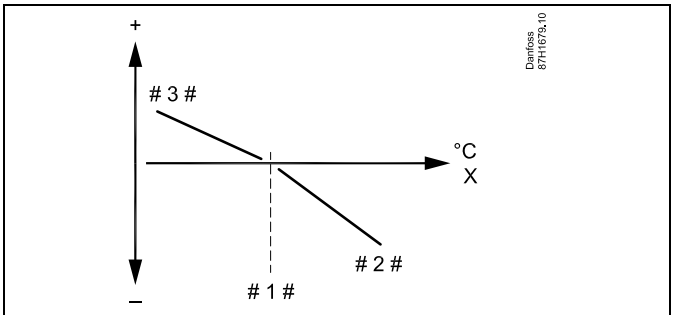
The adaptation function can correct the desired room temperature with max. 8 K x heat curve slope value.

MENU > Settings > Duct T limit / Room limit

Infl. - max. (room temp. limitation, max.)	**1x182**
Determines how much the desired flow temperature will be influenced (decreased) if the actual room temperature is higher than the desired room temperature (P control).	

See Appendix "Parameter ID overview"

0.0: No influence
-2.0: Minor influence
-5.0: Medium influence
-9.9: Maximum influence



X = *Room temperature*

 # 1# = *Desired room temperature*

 # 2 # = *Negative influence (1x082) when actual room temp. gets higher than desired room temp.*

 # 3 # = *Positive influence (1x083) when actual room temp. gets lower than desired room temp.*

The 'Infl. - max.' and 'Infl. - min.' determine how much the room temperature should influence the desired flow temperature.

If the 'Infl.' factor is too high and / or the 'Adapt. time' too low, there is a risk of unstable control.

Example
The actual room temperature is 2 degrees too high.
The 'Infl. - max.' is set to -4.0.
The heat curve slope is 1.8 (see 'Heat curve' in 'Flow temperature').
Result:
The desired flow temperature is changed by (2 x -4.0 x 1.8)
–14.4 degrees.

MENU > Settings > Duct T limit / Room limit

Infl. - min. (room temp. limitation, min.)	**1x183**
Determines how much the desired flow temperature will be influenced (increased) if the actual room temperature is lower than the desired room temperature (P control).	

See Appendix "Parameter ID overview"

9.9: Maximum influence
5.0: Medium influence
2.0: Minor influence
0.0: No influence

Example
The actual room temperature is 2 degrees too low.
The 'Infl. - min.' is set to 4.0.
The heat curve slope is 1.8 (see 'Heat curve' in 'Flow temperature').
Result:
The desired flow temperature is changed by (2 x 4.0 x 1.8)
14.4 degrees.

5.4 Return limit

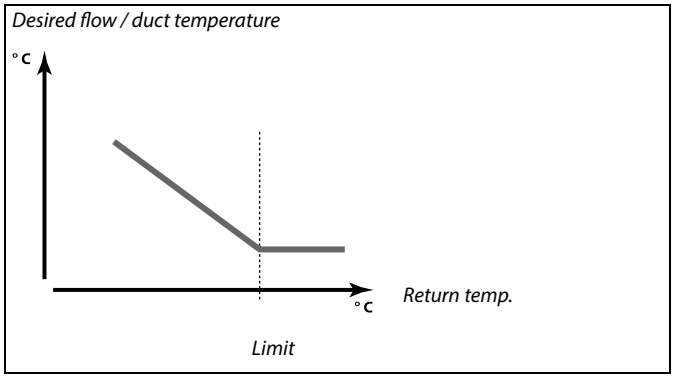
Parameters indicated with an ID no. like "1x607" mean a universal parameter.
x stands for circuit / parameter group.

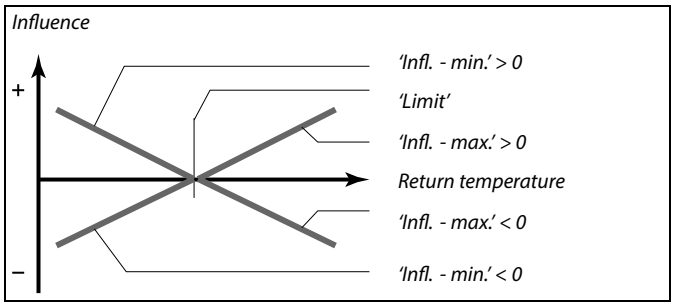
The return temperature limitation is based on a selectable temperature value. The controller automatically changes the desired flow / duct temperature to obtain an acceptable return temperature when the return temperature falls below or gets higher than the set limit.

This limitation is based on a PI regulation where P ('Infl.' factor) responds quickly to deviations and I ('Adapt. time') responds slower and over time removes the small offsets between the desired and actual values. This is done by changing the desired flow / duct temperature.

Typical for heating systems is that the return temperature must be as low as possible.

Typical for cooling systems is that the return temperature must be as high as possible.





If the 'Infl.' factor is too high and / or the 'Adapt. time' too low, there is a risk of unstable control.

MENU > Settings > Return limit

Limit (return temp. limitation)	**1x030**
Set the return temperature value you accept for the system.	

See Appendix "Parameter ID overview"

When the return temperature falls below or gets higher than the set value, the controller automatically changes the desired flow / duct temperature to obtain an acceptable return temperature. The influence is set in 'Infl. - max.' and 'Infl. - min.'.

MENU > Settings > Return limit

Infl. - max. (return temp. limitation - max. influence)	**1x035**
Determines how much the desired flow temperature will be influenced if the return temperature is higher than the set limit.	

See Appendix "Parameter ID overview"

Influence higher than 0:
The desired flow temperature is increased, when the return temperature gets higher than the set limit.

Influence lower than 0:
The desired flow temperature is decreased, when the return temperature gets higher than the set limit.

Example
The return limit is active above 50 °C.
The influence is set to 0.5.
The actual return temperature is 2 degrees too high.
Result:
The desired flow temperature is changed by 0.5 x 2 = 1.0 degree.

MENU > Settings > Return limit

Infl. - min. (return temp. limitation - min. influence)	**1x036**
Determines how much the desired flow temperature will be influenced if the return temperature is lower than the calculated limit.	

See Appendix "Parameter ID overview"

Influence higher than 0:
The desired flow temperature is increased, when the return temperature gets below the calculated limit.

Influence lower than 0:
The desired flow temperature is decreased, when the return temperature gets below the calculated limit.

Example
The return limit is active below 50 °C.
The influence is set to -3.0.
The actual return temperature is 2 degrees too low.
Result:
The desired flow temperature is changed by -3.0 x 2 = -6.0 degrees.

Normally, this setting is 0 in district heating systems because a lower return temperature is acceptable.
Typically, this setting is higher than 0 in boiler systems to avoid a too low return temperature (see also 'Infl. - max.').

MENU > Settings > Return limit

Adapt. time (adaptation time)	**1x037**
Controls how fast the return temperature adapts to the desired return temperature limit (Integration control).	

See Appendix "Parameter ID overview"

OFF: The control function is not influenced by the 'Adapt. time'.

Minor value: The desired temperature is adapted quickly.

Major value: The desired temperature is adapted slowly.

The adaptation function can correct the desired flow temperature with max. 8 K.

5.5 Limit T safety

The temperature sensor S5 can, besides operating as return temperature limitation sensor, act as frost protection sensor. When the S5 temperature becomes lower than the set limitation value, the desired flow / duct temperature will be increased (the motorized control valve opens gradually). The influence can be set.

Parameters indicated with an ID no. like "1x607" mean a universal parameter.
x stands for circuit / parameter group.

MENU > Settings > Limit T safety

Infl. - min. (min. influence)	**1x105**
Determines how much the desired flow / duct temperature will be increased if the S5 temperature is lower than the set value for 'Limit T frost'.	

Example
The sliding frost protection is active below 10 °C.
The influence is set to 3.0.
The actual S5 temperature is 2 degrees too low.
Result:
The desired flow / duct temperature is increased with 3.0 x 2 = 6.0 degrees.

See Appendix “Parameter ID overview”

0.0: The desired flow / duct temperature will not be increased if the S5 temperature is lower than 'Limit T frost'

Value: The desired flow / duct temperature will be increased if the S5 temperature is lower than 'Limit T frost'.

MENU > Settings > Limit T safety

Adapt. time (adaptation time)	**1x107**
Controls how fast the S5 temperature adapts to the desired 'Limit T frost' (I control).	

The adaptation function can correct the desired flow / duct temperature with max. 8 K.

See Appendix “Parameter ID overview”

OFF: The control function is not influenced by the ‘Adapt. time’.

Minor value: The desired temperature is adapted quickly.

Major value: The desired temperature is adapted slowly.

MENU > Settings > Limit T safety

Limit T frost (sliding frost protection)	**1x108**

See Appendix “Parameter ID overview”

OFF: Sliding frost protection, based on the temperature at sensor S5, is inactive.

Value: Temperature at which the sliding frost protection is active.

5.6 Compensation 1

A limit value for the compensation temperature makes it possible to change the desired flow / duct temperature.
The influence from the compensation temperature can result in an increase or a decrease desired flow / duct temperature. The compensation temperature is often the outdoor temperature but could for example be a room temperature.
This application contains 2 compensation temperature limits: Compensation 1 (Comp. 1) and Compensation 2 (Comp. 2).
In the parameter descriptions "Sx"is used for the compensation temperature.

A214.1 - A214.6 and A314.1 - A314.3:
The desired flow / duct temperature can be influenced by a compensation temperature, measured by S1 or S2. The choice between S1 and S2 is made by the parameter "Comp. T select".

A314.4 - A314.7 and A314.9:
The desired flow / duct temperature can be influenced by a compensation temperature, measured by one of the temperature sensors S1 . . . S16.
The choice of compensation sensor is made by the parameter "Comp. T select".

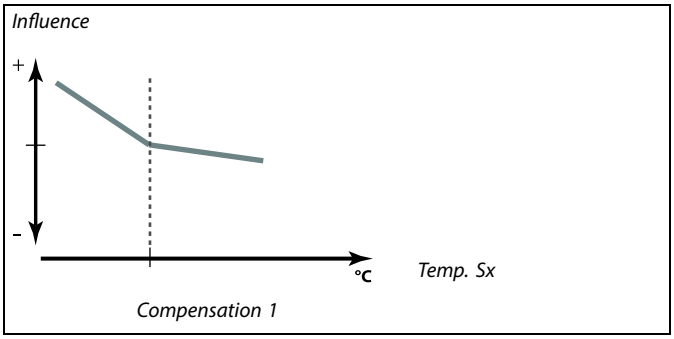
Parameters indicated with an ID no. like "1x607" mean a universal parameter.
x stands for circuit / parameter group.

MENU > Settings > Compensation 1

Limit (compensation temp., 1. point)	**1x060**
Set the compensation temperature limit point 1.	

See Appendix “Parameter ID overview”

When the compensation temperature measured by Sx falls below or gets higher than the set value, the controller automatically changes the desired flow / duct temperature. The influence is set in 'Infl. - max.' and 'Infl. - min.'.



Compensation 1

MENU > Settings > Compensation 1

Adapt. time (adaptation time)	**1x061**
Controls how fast the compensation / surface temperature influences the desired flow / duct temperature.	

See Appendix “Parameter ID overview”

OFF: The control function is not influenced by the ‘Adapt. time’.
Minor value: The desired flow / duct temperature is adapted quickly.
Major value: The desired flow / duct temperature is adapted slowly.
Value: Set the adaptation time

The adaptation function can correct the desired flow / duct temperature with max. 8 K.

MENU > Settings > Compensation 1

Infl. - max. (compensation temp., 1. point)	**1x062**
Determines how much the desired flow / duct temperature will be influenced if the compensation temperature is higher than the set limit.	

See Appendix "Parameter ID overview"

Influence higher than 0:
The desired flow / duct temperature is increased, when the compensation temperature gets above the set limit.

Influence lower than 0:
The desired flow / duct temperature is decreased, when the compensation temperature gets above the set limit.

Example
The limit value is set to 5 °C.
'Infl. max.' is set to -1.5.
The actual compensation temperature is 7°C (2 degrees above the limit value).
Result:
The desired flow / duct temperature is changed by -1.5 x 2 = -3.0 degrees.

MENU > Settings > Compensation 1

Infl. - min. (compensation temp., 1. point)	**1x063**
Determines how much the desired flow / duct temperature will be influenced if the compensation temperature is lower than the set limit.	

See Appendix "Parameter ID overview"

Influence higher than 0:
The desired flow / duct temperature is increased, when the compensation temperature gets below the set limit.

Influence lower than 0:
The desired flow / duct temperature is decreased, when the compensation temperature gets below the set limit.

Example
The limit value is set to 5 °C.
'Infl. min.' is set to 2.5.
The actual compensation temperature is 2°C (3 degrees below the limit value).
Result:
The desired flow / duct temperature is changed by 2.5 x 3 = 7.5 degrees.

5.7 Compensation 2

This extra compensation temperature limit setting makes it possible to change the desired flow / duct temperature in relation to a second temperature limitation point. The measured compensation temperature is the same as in section "Compensation 1".
In the parameter descriptions "Sx"is used for the compensation temperature.

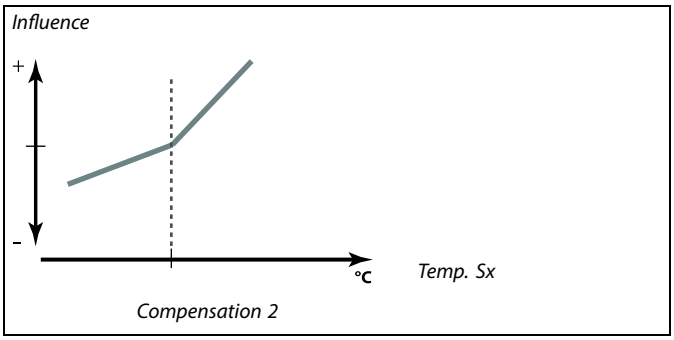
Parameters indicated with an ID no. like "1x607" mean a universal parameter.
x stands for circuit / parameter group.

MENU > Settings > Compensation 2

Limit (compensation temp., 2. point)	**1x064**
Set the compensation temperature limit point 2.	

See Appendix “Parameter ID overview”

When the compensation temperature measured by Sx falls below or gets higher than the set value, the controller automatically changes the desired flow / duct temperature. The influence is set in 'Infl. - max.' and 'Infl. - min.'.



Compensation 2

MENU > Settings > Compensation 2

Adapt. time (adaptation time)	**1x065**
Controls how fast the compensation temperature influences the desired flow / duct temperature.	

See Appendix “Parameter ID overview”

OFF: The control function is not influenced by the ‘Adapt. time’.
Minor value: The desired flow / duct temperature is adapted quickly.
Major value: The desired flow / duct temperature is adapted slowly.

The adaptation function can correct the desired flow / duct temperature with max. 8 K.

MENU > Settings > Compensation 2

Infl. - max. (compensation temp., 2. point)	**1x066**
Determines how much the desired flow / duct temperature will be influenced if the compensation temperature is higher than the set limit.	

See Appendix “Parameter ID overview”

Influence higher than 0:
The desired flow / duct temperature is increased, when the compensation temperature gets above the set limit.

Influence lower than 0:
The desired flow / duct temperature is decreased, when the compensation temperature gets above the set limit.

Example
The limit value is set to 25 °C.
‘Infl. max.' is set to 2.5.
The actual compensation temperature is 28 °C (3 degrees above limit value).
The desired flow / duct temperature is changed by 2.5 x 3 = 7.5 degrees.

MENU > Settings > Compensation 2

Infl. - min. (compensation temp., 2. point)		**1x067**
Circuit	*Setting range*	*Factory setting*
Determines how much the desired flow / duct temperature will be influenced if the compensation temperature is lower than the set limit.		

See Appendix "Parameter ID overview"

Influence higher than 0:
The desired flow / duct temperature is increased, when the compensation temperature gets below the set limit.

Influence lower than 0:
The desired flow / duct temperature is decreased, when the compensation temperature gets below the set limit.

Example
The limit value is set to 25 °C.
'Infl. min.' is set to 0.5.
The actual compensation temperature is 23 °C (2 degrees below the limit value).
Result:
The desired flow / duct temperature is changed by 0.5 x 2= 1.0 degree.

Combination of two compensation temperature limit points:

Compensation 1 and 2 can be combined to give a compensation at 2 different compensation temperatures. This can for instance be used to avoid a too big difference between the indoor and outdoor temperatures.

The example below shows that below Comp. 1 and above Comp. 2, the desired flow / duct temperature will be increased, but with different values.

Example :

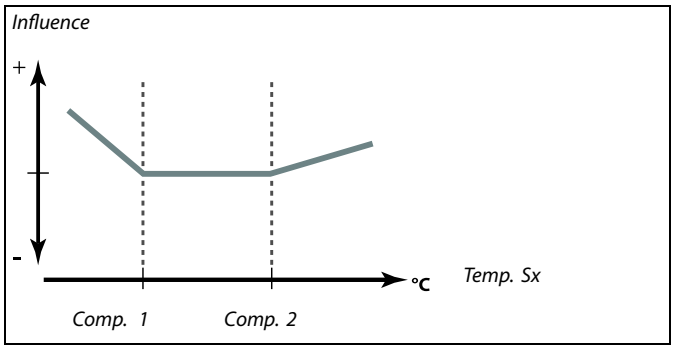
Comp. 1 value is set to 21 °C and Comp. 2 value is set to 25 °C.

'Infl. min.' for Comp. 1 is set to 2.5 and 'Infl. max.' for Comp. 1 is set to 0.0.

'Infl. min.' for Comp. 2 is set to 0.0 and 'Infl. max.' for Comp. 2 is set to 1.5.

The desired flow / duct temperature is kept on a constant level as long as the compensation temperature is between 21 and 25 °C, but the desired flow / duct temperature will rise if the the compensation temperature gets above 25 °C or below 21 °C.

Example 1:



5.8 Control parameters

Control of valves / dampers / cross- / rotating heat-exchangers / fluid batteries

The motorized control valves / dampers are controlled by means of either 3-point control or a 0 - 10 volt control signal or a mix of these.

Valve control:
The motorized control valve is opened gradually when the flow temperature is lower than the desired flow temperature and vice versa.
The water flow through the control valve is managed by means of an electric actuator. The combination "actuator" and "control valve" is also called motorized control valve. The actuator can in this way gradually increase or decrease the flow in order to change the supplied energy. Different types of actuators are available.

Damper control (typical M2):
The motorized controlled damper(s) is(are) opened gradually when the air duct temperature is lower than the desired duct temperature and vice versa.
The air flow through the damper(s) is managed by means of an electric actuator.

Rotating heat-exchanger, cross heat-exchanger or fluid battery (typical M2):
In order to utilize the heat of the exit air different devices can be controlled.

3-point controlled actuator:
The electric actuator contains a reversible gear-motor. Electric "open" and "close" signals come from the electronic outputs of the ECL Comfort controller in order to manage the control valve. The signals are in the ECL Comfort controller expressed as "Arrow-up" (open) and "Arrow-down" (close) and displayed at the valve symbol. When the flow temperature (for example at S3) is lower than the desired flow temperature, short open-signals come from the ECL Comfort controller in order to gradually increase the flow. By this, the flow temperature will align with the desired temperature. Oppositely, when the flow temperature is higher than the desired flow temperature, short close-signals come from the ECL Comfort controller in order to gradually reduce the flow. Again, the flow temperature aligns with the desired temperature.
Neither open-signals nor close-signals will come as long as the flow temperature corresponds to the desired temperature.

0 - 10 volt controlled actuator or damper (ECL Comfort 310):

This actuator type is indicated in the application diagrams with an "A". This electric actuator contains a reversible gear-motor. A control voltage between 0 and 10 volt comes from the extension module ECA 32 in order to manage the control valve. The voltage in the ECL Comfort controller is expressed as a % value and displayed at the valve symbol. Example: 45 % corresponds to 4.5 volt.
When the flow temperature (for example at S3) is lower than the desired flow temperature, the control voltage is gradually increased in order to gradually increase the flow. By this, the flow temperature will align with the desired temperature.
The control voltage remains on a constant value as long as the flow temperature corresponds to the desired temperature.
Oppositely, when the flow temperature is higher than the desired flow temperature, the control voltage is gradually reduced in order to reduce the flow. Again, the flow temperature aligns with the desired temperature.

A314.1 and A314.2: The 0 - 10 volt output signal can be reversed.

Control of fan speed

The fans V2 and V3 can be individually speed controlled by means of 0 - 10 volt signals. Each speed control signal comes from the analog outputs of the ECA 32 module.
The control voltage is expressed as a % value and displayed at the V1 and V2 symbols.

Control of fan speed

A314.3:
The fan speed is controlled in relation to measured wind speed (S10). When the wind speed gets higher, the control voltage is gradually increased in order to increase the speed of the fan V1.

A314.4 and A314.6:
The desired pressures (Pascal) at S11 and S12 can be set individually in relation to the outdoor temperature (S1).
When the pressure gets lower than the desired pressure, the control voltage is gradually increased in order to increase the speed of the fan more than the moment before. By this, the pressure difference aligns with the desired pressure. A too high pressure results in opposite procedure.
The control voltage remains on a fixed value as long as the pressure corresponds to the desired pressure.
The desired pressure can be limited to a maximum and a minimum pressure value.
The control voltage can be limited to a maximum and a minimum % value.

When the ECL controller is in Saving mode:.

- the fan velocity of V2 is controlled in relation to a desired pressure at S11
- V3 is OFF

The pressures at S11 and S12 are measured in Pascal and represented as a 0 - 10 volt signal. Conversion of the 0 - 10 volt signal into pressure is done in a conversion (scale) menu. Two different voltages (X1 and X2) and the related pressure values can be set.

A314.5, A314.7 and A314.9:
The limitation value for air quality (ppm) at S11 can be set.
When the air quality (ppm) gets higher than the set limit, the control voltage is gradually increased in order to increase the speed of the fan(s). Fan V3 is speed controlled by means of an off-set in relation to fan V2.
The control voltage can be limited to a maximum and a minimum % value.

When the ECL controller is in Saving mode:

- the fan velocity of V2 can be controlled in relation to a desired pressure at S11
- V3 is OFF

The air quality at S11 is measured in ppm and represented as a 0 - 10 volt signal. The higher ppm value, the less air quality. Conversion of the 0 - 10 volt signal into ppm is done in a conversion (scale) menu. Two different voltages (X1 and X2) and the related ppm values can be set.

MENU > Settings > Control parameters

Limit (limitation value)	**1x111**
This value is in some applications a calculated limitation value, based on the actual outdoor temperature. *In other applications the value is a selectable limitation value.*	

See Appendix “Parameter ID overview”

MENU > Settings > Control parameters

Filter constant		**1x113**
Circuit	*Setting range*	*Factory setting*
The value of the filter constant determines the dampening of the measured value. *The higher the value, the more dampening.* *By this, a too quick change of the measured value can be avoided.*		

See Appendix "Parameter ID overview"

Minor value: Lower dampening

Major value: Higher dampening

MENU > Settings > Control parameters

V out max.	**1x165**
The output voltage can be limited to a maximum value.	

See Appendix "Parameter ID overview"

The value in % expresses the maximum voltage for the output in question.

Example
A setting of 60% means that the output voltage will be 6 volt as a maximum.

MENU > Settings > Control parameters

V out min.	**1x167**
The output voltage can be limited to a minimum value.	

See Appendix "Parameter ID overview"

The value in % expresses the minimum voltage for the output in question.

Example:
A setting of 20% means that the output voltage will be 2 volt as a minimum.

The setting 'Reverse out' has no influence on the 'V out max' or 'V out min' settings.

The 'V out min' setting has higher priority than 'V out max'.

MENU > Settings > Control parameters

Max. pressure	**1x168**
The desired pressure at the inlet can be in relation to the outdoor temperature. In order to limit the desired pressure, the max. limit is set here.	

See Appendix "Parameter ID overview"

MENU > Settings > Control parameters

Min. pressure	**1x169**
The desired pressure at the inlet can be in relation to the outdoor temperature. In order to limit the desired pressure, the min. limit is set here.	

See Appendix "Parameter ID overview"

MENU > Settings > Control parameters

Reverse out	**1x171**
The analog output (0-10 volt) can be a rising or a falling voltage for rising cooling demand.	

See Appendix "Parameter ID overview"

OFF: The analog output voltage will fall at a rising cooling demand.

ON: The analog output voltage will rise at a rising cooling demand.

MENU > Settings > Control parameters

Motor pr. (motor protection)	**1x174**
Prevents the controller from unstable temperature control (and resulting actuator oscillations). This can occur at very low load. The motor protection increases the lifetime of all involved components.	

See Appendix "Parameter ID overview"

OFF: Motor protection is not activated.

Value: Motor protection is activated after the set activation delay in minutes.

Recommended for duct systems with variable load.

MENU > Settings > Control parameters

Xp (proportional band)	**1x184**

See Appendix "Parameter ID overview"

Set the proportional band. A higher value will result in a stable but slow control of the flow / duct temperature.

MENU > Settings > Control parameters

Tn (integration time constant)	**1x185**

See Appendix "Parameter ID overview"

Set a high integration time constant (in seconds) to obtain a slow but stable reaction to deviations.

A low integration time constant will make the controller react fast but with less stability.

MENU > Settings > Control parameters

M run (running time of the motorized control valve)	1x186
'M run' is the time in seconds it takes the controlled component to move from fully closed to fully open position.	

See Appendix "Parameter ID overview"

Set the 'M run' according to the examples or measure the running time by means of a stop watch.

How to calculate the running time of a motorized control valve
The running time of the motorized control valve is calculated using the following methods:

Seated valves

Running time = Valve stroke (mm) x actuator speed (sec. / mm)

Example: 5.0 mm x 15 sec. / mm = 75 sec.

Rotating valves

Running time = Turning degrees x actuator speed (sec. / degr.)

Example: 90 degr. x 2 sec. / degr. = 180 sec.

MENU > Settings > Control parameters

Nz (neutral zone)	1x187
When the actual flow / duct temperature is within the neutral zone, the controller does not activate the motorized control valve.	

See Appendix "Parameter ID overview"

Set the acceptable flow /duct temperature deviation.

Set the neutral zone to a high value if you can accept a high variation in flow temperature.

The neutral zone is symmetrical around the desired flow / duct temperature value, i.e. half the value is above and half the value is below this temperature.

MENU > Settings > Control parameters

Min. act. time (min. activation time gear motor)	1x189
The min. pulse period of 20 ms (milliseconds) for activation of the gear motor.	

See Appendix "Parameter ID overview"

Setting example	Value x 20 ms
2	40 ms
10	200 ms
50	1000 ms

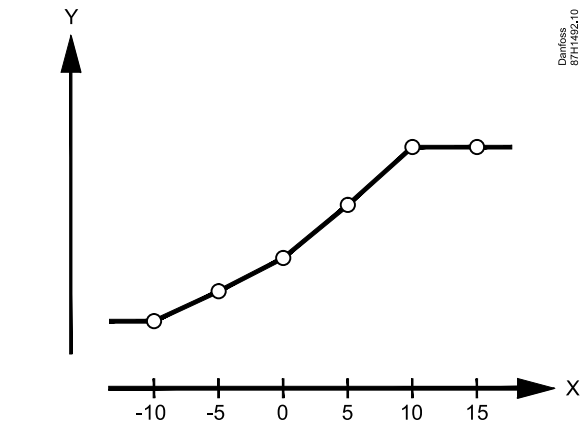
The setting should be kept as high as acceptable to increase the lifetime of the actuator (gear motor).

MENU > Settings > Control parameters

Pressure, des. (desired pressure)
Read out of the calculated desired pressure at the inlet / outlet. Access to conversion (scale) settings: Push dial.

See Appendix "Parameter ID overview"

Set the relationship between outdoor temperature and desired pressure.



X = *Outdoor temperature*

Y = *Desired pressure (Pascal)*

MENU > Settings > Control parameters

Air quality	**1x339**
Setting the limitation value for air quality (ppm).	

See Appendix “Parameter ID overview”

MENU > Settings > Control parameters

Outlet fan, offset	**1x356**
Setting an offset value for the relationship between two fan speeds.	

See Appendix “Parameter ID overview”

MENU > Settings > Control parameters

Fan speed, red. (reduced fan speed)	**1x357**
When the ECL Comfort 310 controller is in active saving mode, the fan speed can be reduced.	

See Appendix “Parameter ID overview”

OFF: Fan is OFF during Saving mode

Value: Fan is ON during Saving mode, but at set, reduced speed

MENU > Settings > Control parameters

1. step level	**1x368**
The total control range is covered by M2 within the set % value.	

See Appendix “Parameter ID overview”

MENU > Settings > Control parameters

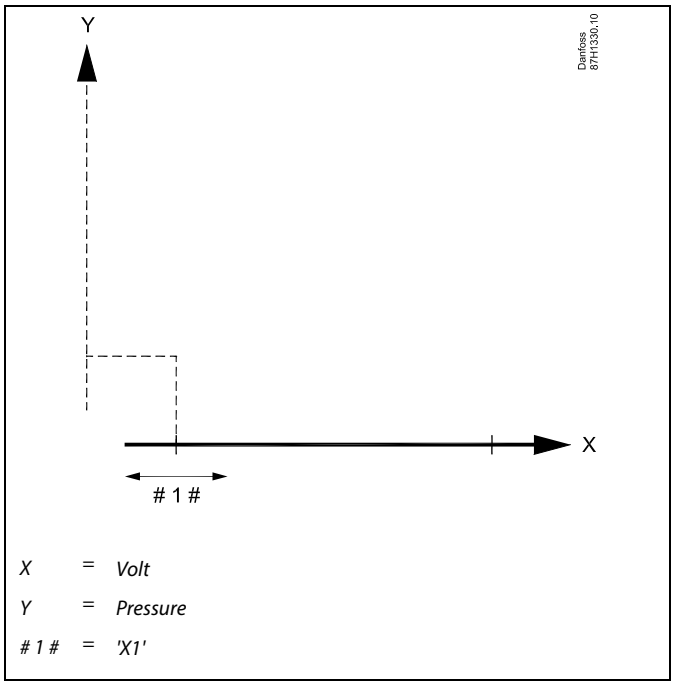
2. step level	**1x369**
From the set % value and up to 100 %, the control is covered by M1.	

See Appendix “Parameter ID overview”

MENU > Settings > Control parameters

X1	1x406
Definition of which voltage value corresponds to which pressure value. The voltage (as a 0 - 10 volt signal) comes from a pressure transmitter and is applied to the relevant input. This input voltage is converted to display a pressure value (in Pascal). See also "Pressure" and "X2".	

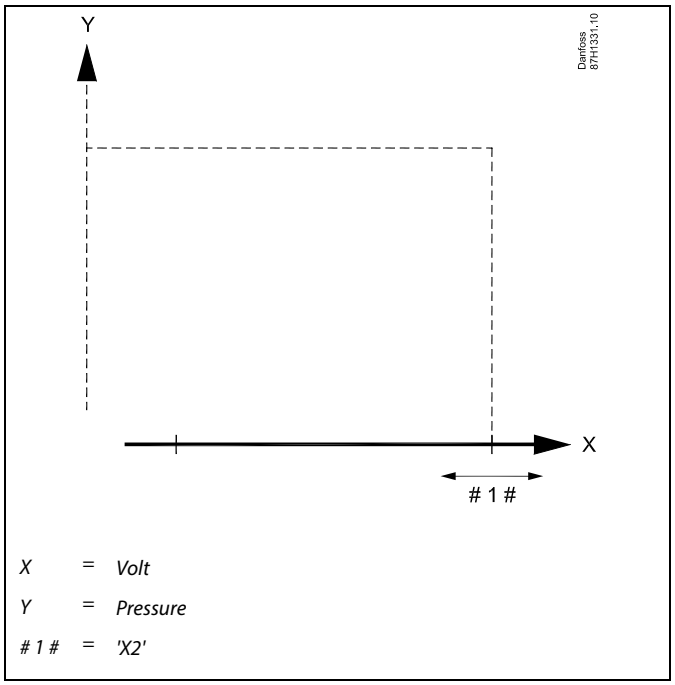
See Appendix “Parameter ID overview”



MENU > Settings > Control parameters

X2	1x407
Definition of which voltage value corresponds to which pressure value. The voltage (as a 0 - 10 volt signal) comes from a pressure transmitter and is applied to the relevant input. This input voltage is converted to display a pressure value (in Pascal). See also "Pressure" and "X1".	

See Appendix “Parameter ID overview”



MENU > Settings > Control parameters

Pressure
The actual pressure, measured in Pascal. *A 0 - 10 volt signal comes from a pressure transmitter and is applied to related input.* *This input voltage is converted to the displayed pressure value.* *Access to conversion (scale) settings: Push dial.*

See Appendix “Parameter ID overview”

The pressure is measured by means of a 0 - 10 volt signal.
The measured voltage must be converted to a pressure value by the controller.

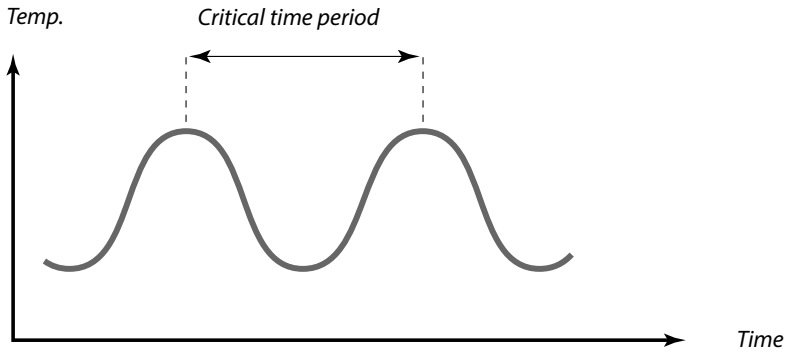
The following procedure sets up the conversion:
Push the dial to see the graph and enter the value sets for the 2 input voltages and related pressure values.
Pressure value range: 0 … 1999 pascal

The factory set voltage values can be changed in the two separate menus "X1" and "X2".

Typically, the higher the voltage, the higher the displayed pressure.

If you want to tune the PI regulation precisely, you can use the following method:

- Set the ‘Tn’ (integration time constant) to its max. value (999 sec.).
- Decrease the value for the ‘Xp’ (proportional band) until the system starts hunting (i.e. gets unstable) with a constant amplitude (it might be necessary to force the system by setting an extreme low value).
- Find the critical time period on the temperature recorder or use a stop watch.



This critical time period will be characteristic for the system, and you can evaluate the settings from this critical period.

‘Tn’ = 0.85 x critical time period

‘Xp’ = 2.2 x proportional band value in the critical time period

If the regulation seems to be too slow, you can decrease the proportional band value by 10%. Make sure there is a consumption when you set the parameters.

5.9 Fan / acc. control (fan / accessory control)

This section describes the function possibilities for relay 1 (F1), relay 2 (P2), relay 3 (X3), relay 4 (X4), relay 5 (X5), relay 7 (P7) and relay 8 (P8).

Schedule 1 is set in circuit 1, whereas Schedule 2 (and 3) are set in circuit 2 or "Common controller".
When the ECL Comfort controller is in Saving mode, the system can be totally stopped or work in Saving conditions.

The output X3 ('Optional function', ID 1x090) is flexible and has different options, depending on application. See the table at the parameter description.

A214.6 and A314.3:
The parameter "Fan function" (ID 11137) has no functionality. The parameter is prepared for future use.

A314.4 … A314.7 and A314.9:
The output X4 is controlled from Schedule 3.
Comfort = relay closed; Saving = relay open.

The output X5 is used in A314.6 and A314.7. X5 is ON at cooling demand.

The output P7 (in ECA 32) is used in A314.4 . . . A314.7 for control of the circulation pump in the Fluid battery.

The output P8 (in ECA 32) is used in A314.4, A314.5 and A314.9 for control of the "Night damper".

The parameter 'Stop difference' (ID 1x194) is used differently, depending on application:

- A214.6: When X3 is set to act as room thermostat.
- A314.4 … A314.7:

  When utilizing the "Night cooling" function. The room temperature must be "Stop difference" higher than the outdoor temperature for enabling "Night cooling".

Parameters indicated with an ID no. like "1x607" mean a universal parameter.
x stands for circuit / parameter group.

MENU > Settings > Fan / acc. control (fan / accessory control)

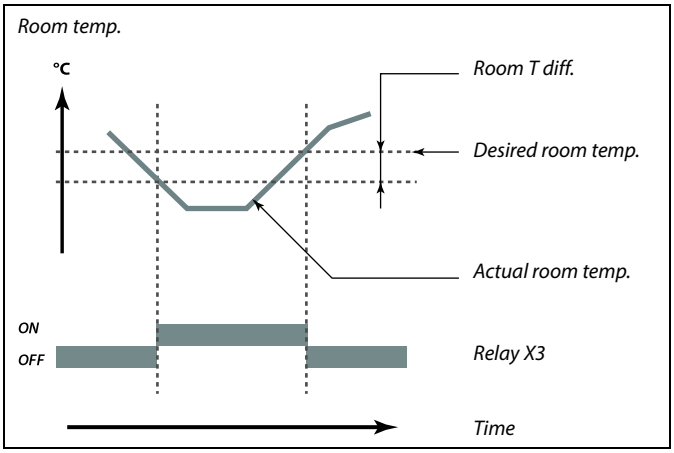
Room T diff.	**1x027**
The relay 3 (X3) can be activated when the room temperature gets lower than the desired room temperature. Relay X3 is activated when the difference between the actual room temperature and the desired room temperature is bigger than the set value. Relay X3 is deactivated when the actual room temperature becomes higher than the desired room temperature.	

See Appendix "Parameter ID overview"

OFF: Function disabled

Value: Set the desired temperature difference

In order to activate the relay X3 in relation to room temperature difference, the code setting in 'Optional function' must be "3".



MENU > Settings > Fan / acc. control (fan / accessory control)

P frost T (circulation pump, frost protection temp.)	**1x077**
Frost protection, based on the outdoor temperature. When the outdoor temperature gets below the set temperature value in 'P frost T', the controller automatically switches ON the circulation pump (for example P1 or X3) to protect the system.	

See Appendix "Parameter ID overview"

OFF: No frost protection.

Value: Circulation pump is ON when the outdoor temperature is below the set value.

Under normal conditions, your system is not frost protected if your setting is below 0 °C or OFF.
For water-based systems, a setting of 2 °C is recommended.

If the outdoor temperature sensor is not connected and the factory setting has not been changed to 'OFF', the circulation pump is always ON.

MENU > Settings > Fan / acc. control (fan / accessory control)

Fan cut-in delay (relay 1, F1)	**1x086**
Delay for activating the fan.	

See Appendix "Parameter ID overview"

Value: Set the delay (in seconds).

A delay in fan cut-in can prevent frost damages in the heat exchanger.

MENU > Settings > Fan / acc. control (fan / accessory control)

Acc. cut-in delay (Accessory cut-in delay, relay 2, P2)	**1x087**
Set the delay for activating the damper (relay 2, P2).	

See Appendix "Parameter ID overview"

0 ... 900: Set the delay (in seconds).

A delay in opening the damper can prevent frost damages in the heat exchanger.

MENU > Settings > Fan / acc. control (fan / accessory control)

Fan output func. (Fan output function, relay 1, F1)	**1x088**
Desired function for relay 1 (F1). F1 is typically the fan. The codes have different meanings.	

See Appendix "Parameter ID overview"

Code:	Description (relay 1 (F1)):		
	Comfort mode	Saving mode	Frost alarm
0			
1			
2			
3			

 The connected unit is switched OFF

 The connected unit is switched ON

Example, code = 1:
The fan is ON during Comfort mode. In case of frost alarm, the fan is switched OFF.

Depending on application, the control of fan F1 can furthermore be related to:
- Saving mode with or without 'Total stop'
- Setting of 'Fan function'

MENU > Settings > Fan / acc. control (fan / accessory control)

Acc. output func. (Accessory output function, relay 2, P2)	**1x089**
Desired function for relay 2 (P2). P2 is typically the damper. The codes have different meanings.	

See Appendix "Parameter ID overview"

Code:	Description (relay 2 (P2)):		
	Comfort mode	Saving mode	Frost alarm
0			
1			
2			
3			

 The connected unit is switched OFF

 The connected unit is switched ON

Example, code = 1:
The damper is open (switched ON) during Comfort mode. In case of frost alarm, the damper is closed (switched OFF).

MENU > Settings > Fan / acc. control (fan / accessory control)

Optional function (relay 3, X3)	**1x090**
Desired function for relay 3 (X3). The codes have different meanings.	

See Appendix "Parameter ID overview"

Code:	0	1	2	3	4
A214.1	Pu-cool	Sch-1	Sch-2	Cool dem.	
A214.2	Pu-heat	Sch-1	Sch-2		
A214.3	Pu-heat	Sch-1	Sch-2	Room stat.	
A214.4	Pu-heat	Sch-1	Sch-2	Cool dem.	Pu-cool
A214.5	Pu-heat	Sch-1	Sch-2	Cool dem.	Pu-cool
A214.6	Pu-heat	Sch-1	Sch-2	Room stat.	
A314.1	Pu-heat	Sch-1	Sch-2	Cool dem.	Pu-cool
A314.2	Pu-heat	Sch-1	Sch-2	Cool dem.	Pu-cool
A314.3	Pu-heat	Sch-1	Sch-2	Room stat.	

Pu-cool: Control of circulation pump in cooling circuit

Pu-heat: Control of circulation pump in heating circuit

Sch-1: Follows Schedule 1

Sch-2: Follows Schedule 2

Cool-dem.: ON at cooling demand

Room stat.: Room thermostat function

MENU > Settings > Fan / acc. control (fan / accessory control)

Acc. time control (Accessory time control, relay 2, P2)	**1x091**
The connected unit can follow schedule 1 or schedule 2.	

See Appendix "Parameter ID overview"

1: Relay 2 follows schedule 1.

2: Relay 2 follows schedule 2.

MENU > Settings > Fan / acc. control (fan / accessory control)

Fan function	**1x137**
The fan can remain switched ON even if saving mode is active.	

See Appendix "Parameter ID overview"

OFF: The fan is switched OFF during saving mode.

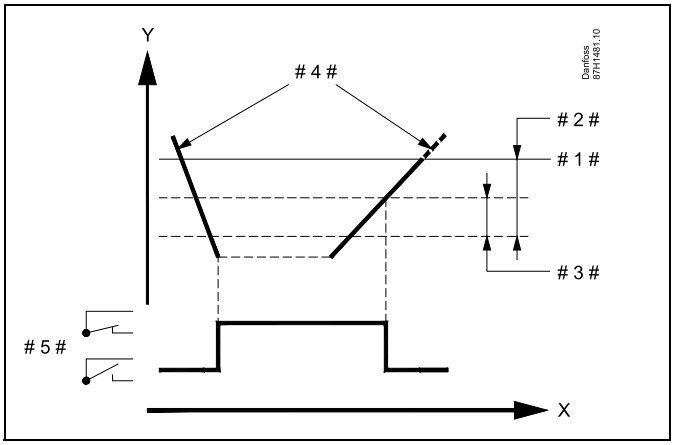
ON: The fan is switched ON also during saving mode.

MENU > Settings > Fan / acc. control (fan / accessory control)

Stop difference	**1x194**
When the difference between outdoor temperature and room temperature gets higher than the set value, the related function is enabled.	

See Appendix “Parameter ID overview”

Application A214.6:



X = Time

Y = Temperature

1 # = Desired room temperature

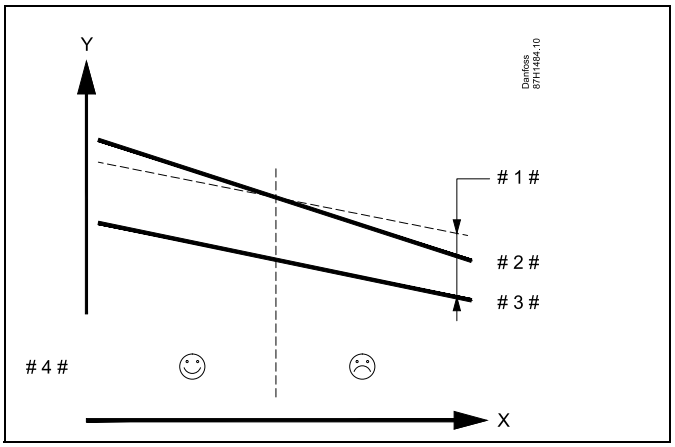
2 # = 'Room T diff.' (ID 1x027)

3 # = 'Stop diff.' (ID 1x194)

4 # = Room temperature

5 # = X3 status

Application A314.4 . . . A314.7:



X = Time

Y = Temperature

1 # = 'Stop diff.' (ID 1x194)

2 # = Room temperature

3 # = Outdoor temperature

4 # = Night cooling possible / not possible

A314.3:

Wind influence on fan speed

A wind speed sensor can be connected to the ECL controller in order to control the fan speed. Typically, the more windy, the higher the fan speed.

The signal from the wind speed sensor is a 0-10 volt signal which is applied directly to input S10. The voltage rises at higher wind speed.

The measured voltage on input S10 must be converted to a wind speed value by the controller.

The following procedure sets up the scaling.

MENU > Settings > Fan / acc. control (fan / accessory control)

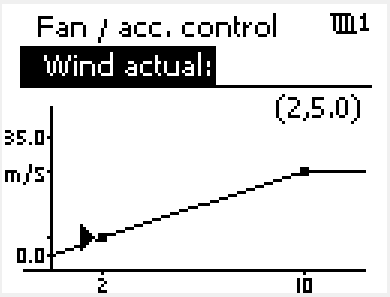
Wind actual
The actual wind speed is indicated by the unit 'm/s' (meter per second).

Push the dial to see the graph and enter the value sets for the input voltage (2 and 10 volt) and displayed wind speed.

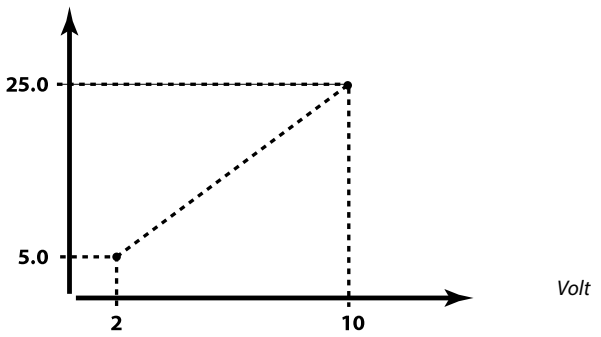
Wind speed:	0.0 ... 75.0 m/s
Fixed voltage settings:	2 V and 10 V
Factory settings:	(2 , 5.0) and (10 , 25.0)

This means that the 'Wind actual' is 5.0 m/s at 2.0 volt and 25.0 m/s at 10 volt.

Typically, the higher the voltage, the higher the displayed wind speed.



Example: Relationship between input voltage and displayed wind speed



This example shows that 2 volt correspond to 5.0 m/s and 10 volt correspond to 25.0 m/s.

MENU > Settings > Fan / acc. control (fan / accessory control)

Filter constant	**1x081**
The filter constant dampens the measured input data by the set factor.	

See Appendix "Parameter ID overview"

Minor value: Minor dampening (low filter constant)

Major value: Major dampening (high filter constant)

MENU > Settings > Fan / acc. control (fan / accessory control)

Control voltage	**1x104**
Output voltage in relation to measured wind speed.	

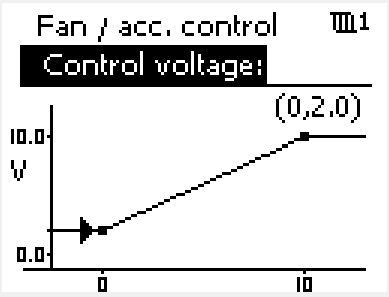
See Appendix “Parameter ID overview”

The measured and converted wind speed signal controls the output signal 'Control voltage'. Typically, the higher the wind speed, the higher the 'control voltage' for the fan speed.

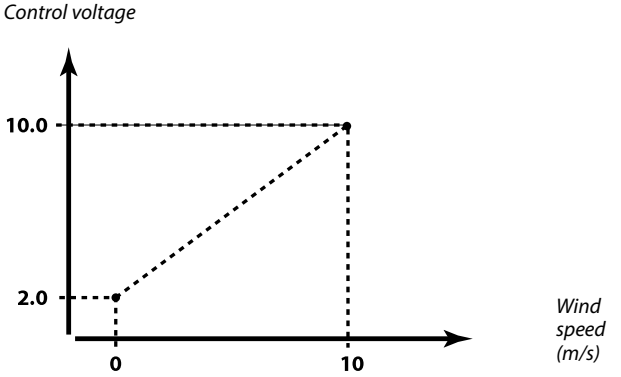
Push the dial to see the graph and enter the value sets for the wind speed values (0 and 10 m/s) and control voltage.

Control voltage: 0.0 ... 10.0 V
Fixed wind speed settings: 0 (zero) m/s and 10 m/s.
Factory settings: (0 , 2.0) and (10 , 10.0).
This means that the ‘Control voltage’ is 2.0 volt at 0 m/s and 10.0 volt at 10 m/s.

Typically, the higher the wind speed, the higher the 'Control voltage'.



Example: Relationship between displayed wind speed and control voltage



This example shows that 0 (zero) m/s corresponds to 2.0 volt and 10 m/s corresponds to 10.0 volt.

The 'Control voltage' is only available from the internal module ECA 32.

5.10 Application

The section "Application" describes specific application related issues.

"Total stop" (ID 1x021) works differently, depending on actual subtype. In relation to the parameter "Fan function" (ID 11137), selected subtype and controller mode, different functionalities are present. See the related tables.

"Stop at T out" (ID 1x038) is used for the "Night cooling" function. Outdoor temperature must be higher than set value in order to activate "Night cooling".

"Comp. T select" (ID 1x140) is a universal parameter:

A214.1 - A214.6 and A314.1 - A314.3:
The desired flow / duct temperature can be influenced by a compensation temperature, measured by S1 or S2. The choice between S1 and S2 is made by the parameter "Comp. T select".

A314.4 - A314.7 and A314.9:
The desired flow / duct temperature can be influenced by a compensation temperature, measured by one of the temperature sensors S1 . . . S16.
The choice of compensation sensor is made by the parameter "Comp. T select".

"Summer, cut-out" (ID 1x179) is present in A314.4 and A314.5.
When outdoor temperature gets higher than cut-out value + 0.5 K, the heating is stopped.
Falling outdoor temperature: When actual - and "accumulated outdoor temperature" come below cut-out value - 0.5 K, the heating will start. The time constant for "accumulated outdoor temperature" is a fixed value and corresponds to an average building's time constant.

The parameter 'Stop difference' (ID 1x194) is used differently, depending on application:
A214.6: When X3 is set to act as room thermostat.
A314.4 … A314.7: When utilizing the "Night cooling" function.
The room temperature must be "Stop difference" higher than the outdoor temperature for enabling "Night cooling".

"S4 filter" is present in the subtypes A214.2, A214.4 and A314.1.

"1. step level" and "2. step level" are used for smooth transition between recovery stage and heating / cooling stage.

"Send desired T" (ID 1x500) is present in some of the subtypes.

Parameters indicated with an ID no. like "1x607" mean a universal parameter.
x stands for circuit / parameter group.

MENU > Settings > Application

ECA addr. (ECA address, choice of Remote Control Unit)	**1x010**
Decides the room temperature signal transfer and communication with the Remote Control Unit.	

See Appendix "Parameter ID overview"

OFF: No Remote Control Unit. Only room temperature sensor, if any.

A: Remote Control Unit ECA 30 / 31 with address A.

B: Remote Control Unit ECA 30 / 31 with address B.

The Remote Control Unit must be set accordingly (A or B).

MENU > Settings > Application

Total stop	**1x021**
Setting the 'Total stop' to OFF or ON gives different results, depending on the actual application (subtype). The conditions, among others, are: *- Room temperature controlled applications* *- Controllers mode* *- Desired "Fan function" (ID 11137)*	

See Appendix "Parameter ID overview"

OFF: **No total stop**

Heating applications in general:

Saving mode: The desired flow / duct temperature is reduced according to desired duct / room temperature.

Cooling applications in general:

Saving mode: The cooling is stopped.

ON: **Total stop**

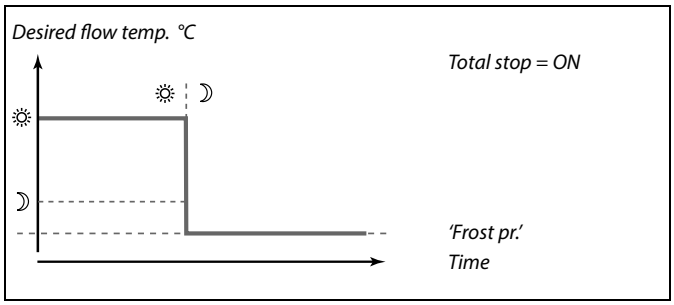
Heating applications in general:

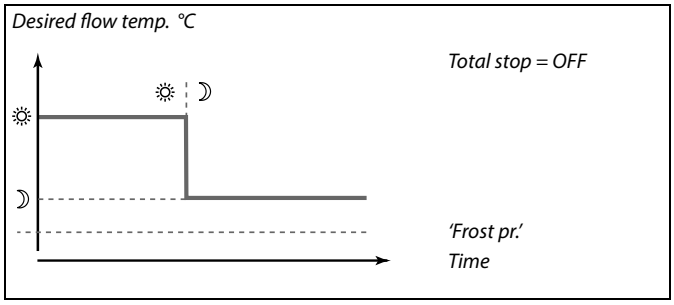
Saving mode: The desired flow / duct temperature is reduced to the Frost protection value.

Cooling applications in general:

Saving mode: The cooling is stopped.

The examples below are related to heating applications:





The min. flow temperature limitation ('Temp. min.') is overruled when 'Total stop' is ON.

Fan control related to actual application (subtype), Total stop, Fan function and mode:

A214.1, A214.6 and A314.3
(with and without room temperature signal):

	Total stop (ID 11021)	Fan (F1)
Mode:		
Comfort	OFF	
	ON	
Saving	OFF	
	ON	

 = Fan OFF

 = Fan ON

A214.2, A214.3, A314.4, A314.5 and A314.9
(with room temperature signal):

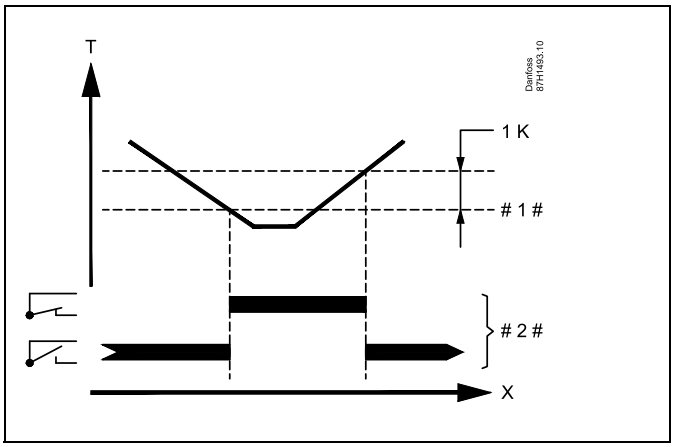
	Total stop (ID 11021)	Fan function (ID 11137)	Fan (F1)
Mode:			
Comfort	OFF	OFF	
	ON	OFF	 *
	OFF	ON	
	ON	ON	
Saving	OFF	OFF	 *
	ON	OFF	 *
	OFF	ON	
	ON	ON	

 = Fan OFF

 = Fan ON

* See the function diagram "Fan stop", heating applications.

Function diagram "Fan function", heating applications:



X = Time

T = Room temperature

1 # = Desired room temperature

2 # = Output status

A214.2, A214.3, A314.4, A314.5 and A314.9
(without room temperature signal):

	Total stop (ID 11021)	Fan function (ID 11137)	Fan (F1)
Mode:			
Comfort	OFF	OFF	
	ON	OFF	
	OFF	ON	
	ON	ON	
Saving	OFF	OFF	
	ON	OFF	
	OFF	ON	
	ON	ON	

= Fan OFF

= Fan ON

A214.4, A214.5, A314.1, A314.2, A314.6 and A314.7
(with and without room temperature signal):

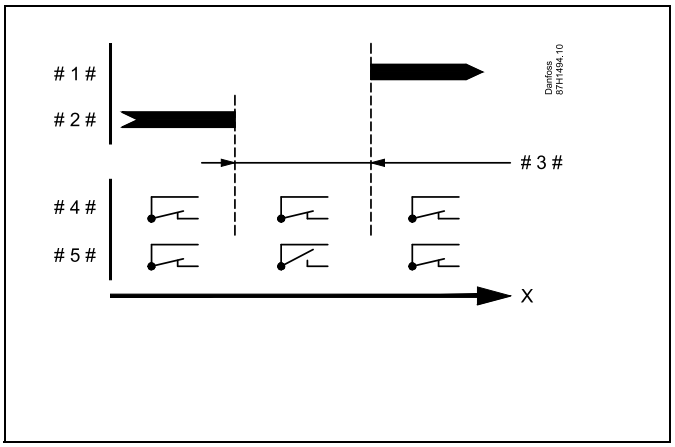
	Total stop (ID 11021)	Fan function (ID 11137)	Fan (F1)
Mode:			
Comfort	OFF	OFF	*
	ON	OFF	*
	OFF	ON	*
	ON	ON	*
Saving	OFF	OFF	
	ON	OFF	
	OFF	ON	
	ON	ON	

= Fan OFF

= Fan ON

* See the function diagram "Fan function", heating / cooling applications

Function diagram "Fan function", heating / cooling applications:



X = Time

1 # = Cooling mode

2 # = Heating mode

3 # = Dead zone Dz (ID 11009)

4 # = Fan function (ID 11137) = ON

5 # = Fan function (ID 11137) = OFF

MENU > Settings > Application

Stop at T out	**1x038**
When the outdoor temperature gets higher than set limit, the related function is enabled.	

See Appendix “Parameter ID overview”

Value: Limit for outdoor temperature dependent functionality.
OFF: The 'Stop at T out' function is not active.

MENU > Settings > Application

P frost T (circulation pump, frost protection temp.)	**1x077**
Frost protection, based on the outdoor temperature. *When the outdoor temperature gets below the set temperature value in 'P frost T', the controller automatically switches ON the circulation pump (for example P1 or X3) to protect the system.*	

See Appendix “Parameter ID overview”

OFF: No frost protection.

Value: Circulation pump is ON when the outdoor temperature is below the set value.

⚠

Under normal conditions, your system is not frost protected if your setting is below 0 °C or OFF.
For water-based systems, a setting of 2 °C is recommended.

⚠

If the outdoor temperature sensor is not connected and the factory setting has not been changed to 'OFF', the circulation pump is always ON.

MENU > Settings > Application

Accum. filter (Accummulation filter)	**1x082**
The value determines the filtering of the desired flow / duct temperature in order to change correctly from heating to cooling mode or vice versa. The set value is an indirect time constant. The resulting time constant is listed in the examples below.	

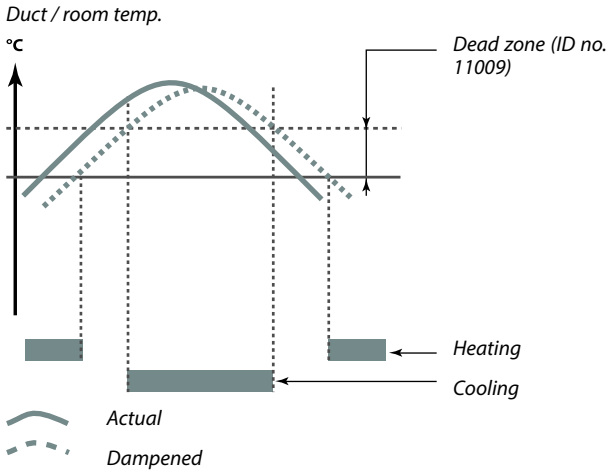
See Appendix "Parameter ID overview"

Low value: Minor dampening.

High value: Major dampening.

The setting values (examples) give the following approximate time constants:

Set value (examples):	Resulting time constant:
1:	80 sec
2:	160 sec
5:	~ 7 min
10:	~ 14 min
20:	~ 25 min
50:	~ 1 hour
100:	~ 2 hours
200:	~ 4 hours
250:	~ 5.5 hours



The setting of 'Accum. filter' prevents unexpected changes between heating and cooling or changes between heating and passive cooling.

MENU > Settings > Application

Frost pr. T (frost protection temp.)	**1x093**
Set the desired flow temperature at temperature sensor S3 to protect the system against frost (at heating cut-out, total stop etc.). When the temperature at S3 gets lower than the setting, the motorized control valve opens gradually.	

See Appendix "Parameter ID overview"

The frost protection temperature can also be set in your favorite display when the mode selector is in frost protection mode.

MENU > Settings > Application

Comp. T select (Compensation temperature selection)	**1x140**
Selection of compensation temperature.	

See Appendix "Parameter ID overview"

OFF: The compensation temperature is measured by S1 or the S1 value is received from the ECL 485 bus.

ON: The compensation temperature is measured by S2.

Sx-value: The compensation temperature.

Override mode functions:

The following settings describe the function in general for the ECL Comfort 210 / 296 / 310 series. The explained modes are typical and not application related. They might differ from the override modes in your application.

MENU > Settings > Application

Ext. input (external override)	**1x141**
Choose the input for 'Ext. input' (external override). By means of a switch the controller can be overridden to 'Comfort', 'Saving', 'Frost protection' or 'Constant temperature' mode.	

See Appendix "Parameter ID overview"

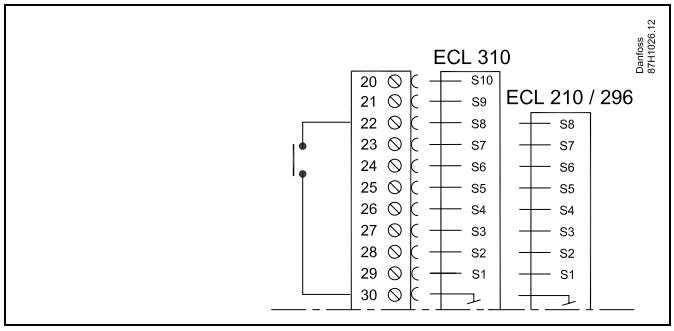
OFF: No inputs have been selected for external override.

S1 ... S16: Input selected for external override.

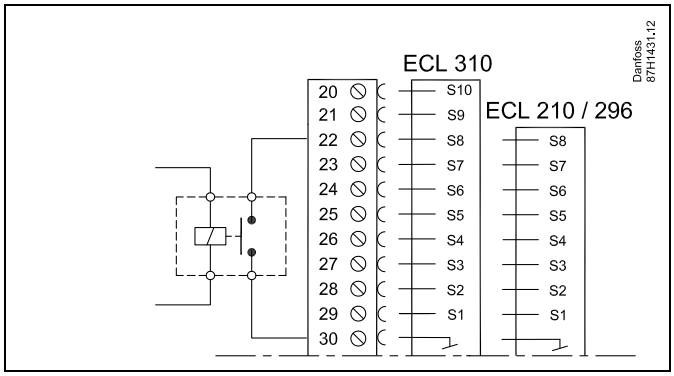
If S1... S6 is chosen as override input, the override switch must have gold-plated contacts.
If S7 ... S16 is chosen as override input, the override switch can be a standard contact.

See the drawings for connection examples of override switch and override relay to input S8.

Example: Connection of an override switch



Example: Connection of an override relay



Choose only an unused input for override. If an already used input is applied for override, the functionality of this input is also neglected.

See also 'Ext. mode'.

MENU > Settings > Application

Ext. mode (external override mode)	**1x142**
The mode override can be activated for Saving, Comfort, Frost pr. or Constant T mode. *For override, the controller mode must be in scheduled mode.*	

Choose an override mode:

SAVING: The circuit in question is in saving mode when the override switch is closed.

COMFORT: The circuit in question is in comfort mode when the override switch is closed.

FROST PR.: The heating or DHW circuit closes, but is still frost protected.

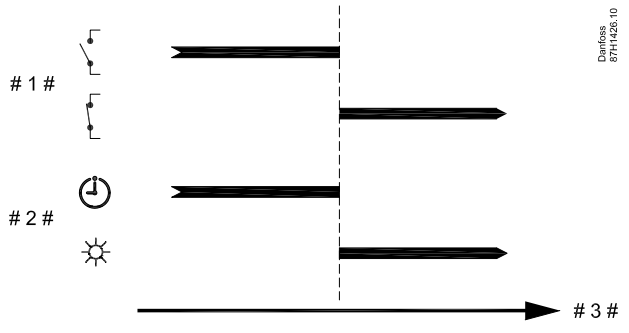
CONSTANT T: The circuit in question controls a constant temperature *)

*) See also 'Desired T' (1x004), setting of desired flow temperature (MENU > Settings > Flow temperature)
See also ' Con. T, ret. T lim.' (1x028), setting of return temperature limitation (MENU > Settings > Return limit)

The process diagrams show the functionality.

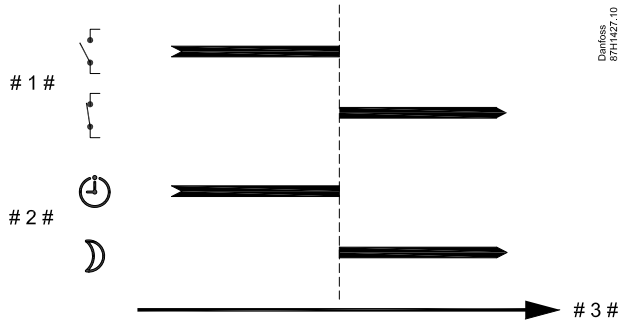
See also 'Ext. input'.

Example: Override to Comfort mode



1 # = Override switch (not activated / activated)
2 # = Function mode (Schedule / Comfort)
3 # = Time

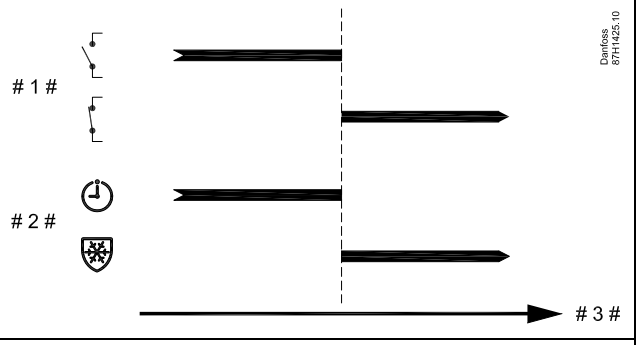
Example: Override to Saving mode



1 # = Override switch (not activated / activated)
2 # = Function mode (Schedule / Saving)
3 # = Time

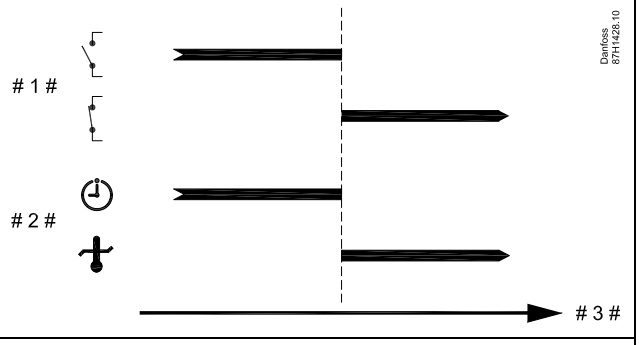
The result of override to 'Saving' mode depends on the setting in 'Total stop'.
Total stop = OFF: Heating reduced
Total stop = ON: Heating stopped

Example: Override to Frost protection mode



1 # = Override switch (not activated / activated)
2 # = Function mode (Schedule / Frost pr.)
3 # = Time

Example: Override to Constant temperature mode



1 # = Override switch (not activated / activated)
2 # = Function mode (Schedule / Const. T)
3 # = Time

The "Const. T" value can be influenced by:

- temp. max.
- temp. min.
- room temp. limit
- return temp. limit
- flow / power limit

MENU > Settings > Application

Summer, cut-out (limit for heating cut-out)	**1x179**

See Appendix “Parameter ID overview”

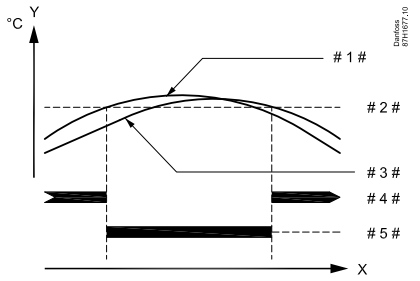
The heating can be switched OFF when the outdoor temperature is higher than the set value. The valve closes and after the post-run time, the heating circulation pump stops. ‘Temp. min.’ will be overruled.

The heating system switches ON again when the outdoor temperature and the accumulated (filtered) outdoor temperature become lower than the set limit.

This function can save energy.

Set the value for outdoor temperature at which you want the heating system to switch OFF.

Summer, cut-out



X = *Time*

Y = *Temperature*

 # 1# = *Actual outdoor temperature*

 # 2 # = *Cut-out temperature (1x179)*

 # 3 # = *Accummulated (filtered) outdoor temperature*

 # 4 # = *Heating enabled*

 # 5 # = *Heating disabled*

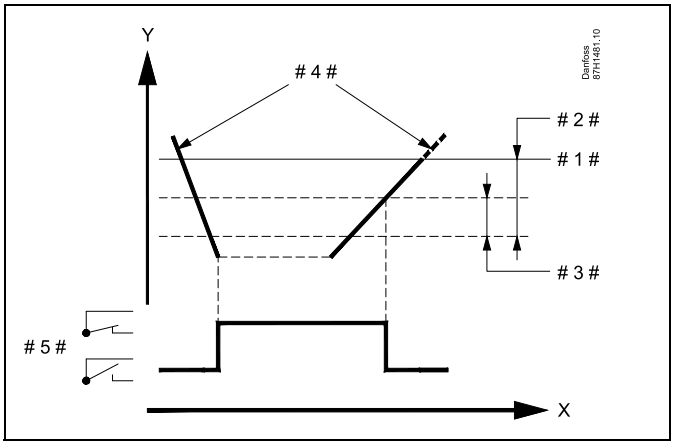
The heating cut-out is only active when the controller mode is in scheduled operation. When the cut-out value is set to OFF, there is no heating cut-out.

MENU > Settings > Application

Stop difference	**1x194**
When the difference between outdoor temperature and room temperature gets higher than the set value, the related function is enabled.	

See Appendix “Parameter ID overview”

Application A214.6:



X = Time

Y = Temperature

1 # = Desired room temperature

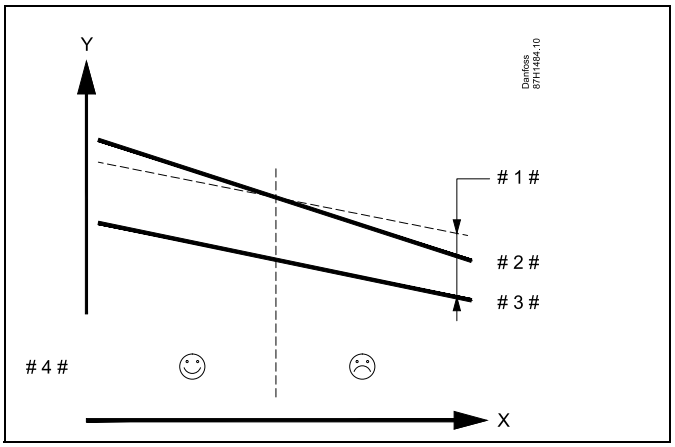
2 # = 'Room T diff.' (ID 1x027)

3 # = 'Stop diff.' (ID 1x194)

4 # = Room temperature

5 # = X3 status

Application A314.4 . . . A314.7:



X = Time

Y = Temperature

1 # = 'Stop diff.' (ID 1x194)

2 # = Room temperature

3 # = Outdoor temperature

4 # = Night cooling possible / not possible

MENU > Settings > Application

S4 filter	**1x304**
The filtering of the measured temperature at S4 prevents instability in the control of the duct temperature. *The set value is an indirect time constant. The resulting time constant is listed in the examples below.*	

See Appendix "Parameter ID overview"

Low value: Low filtering (minor dampening)

High value: High filtering (major dampening)

The setting values (examples) give the following approximate time constants:

Set value (examples):	Resulting time constant:
1	1 sec
2	1.5 sec
5	4 sec
10	7 sec
20	14 sec
50	35 sec
100	70 sec

MENU > Settings > Application

1. step level	**1x368**
The total control range is covered by M2 within the set % value.	

See Appendix "Parameter ID overview"

MENU > Settings > Application

2. step level	**1x369**
From the set % value and up to 100 %, the control is covered by M1.	

See Appendix "Parameter ID overview"

MENU > Settings > Application

Send desired T	**1x500**
When the controller acts as a slave controller in a master / slave system, information about the desired flow temperature can be sent to the master controller via the ECL 485 bus. *Stand-alone controller:* *Sub-circuits can send the desired flow temperature to the master circuit.*	

See Appendix “Parameter ID overview”

OFF: Information about the desired flow temperature is not sent to the master controller.

ON: Information about the desired flow temperature is sent to the master controller.

In the master controller, 'Demand offset' must be set to a value in order to react on a desired flow temperature from a slave controller.

When the controller acts as a slave, its address must be 1, 2, 3 ... 9 in order to send the desired temperature to the master (see the section ‘Miscellaneous’, ‘Several controllers in the same system’).

5.11 Alarm

Many applications in the ECL Comfort 210 and 310 series have an alarm function. The alarm function activates relay 4 (A214 applications in ECL Comfort 210 or 310) or relay 6 (A314 applications in ECL Comfort 310).

The alarm relay can activate a lamp, a horn, an input to an alarm transmitting device etc.

Typical alarms, type 1:

- S3 defective
- Actual S3 temperature differs from the desired S3 temperature
- Fire alarm (S8)
- Filter monitor S10 (Digital 10)
- Heat recovery
- Activation of a frost thermostat (S7)
- Detection of frost temperature at S5 or S6

Type 1 alarms are present as long as the alarm reason is present.

Typical alarms, type 2:

- Fan monitor S9 (Digital 9)
- Inlet pressure
- Outlet pressure
- Disconnection or short-circuiting of a temperature sensor or its connection.

Type 2 alarms are present even if the alarm reason no longer is present. To remove the alarm indications, the alarms must be cleared.

When an alarm is activated, the 🔔 appears in the favorite displays.

To find the reason for alarm:

- select MENU
- select 'Alarm'
- select 'Alarm overview'. A 🔔 will be shown at the alarm in question.

Some alarms are generated if a measured value gets higher or lower than set values.

Parameters indicated with an ID no. like "1x607" mean a universal parameter.
x stands for circuit / parameter group.

MENU > Settings > Alarm

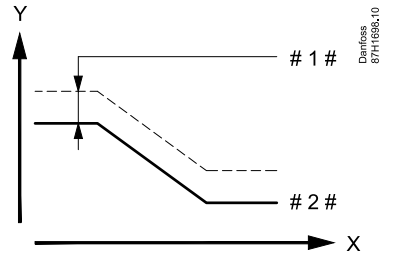
Upper difference	**1x147**
The alarm is activated if the actual flow / duct temperature increases more than the set difference (acceptable temperature difference above the desired flow / duct temperature). See also 'Delay'.	

See Appendix "Parameter ID overview"

OFF: The related alarm function is not active.

Value: The alarm function is active if the actual temperature gets above the acceptable difference.

Upper difference



X = *Time*
Y = *Temperature*
 # 1 # = *Upper difference*
 # 2 # = *Desired flow temperature*

MENU > Settings > Alarm

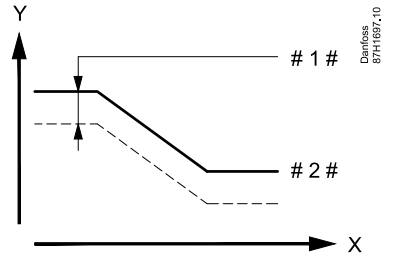
Lower difference	**1x148**
The alarm is activated if the actual flow / duct temperature decreases more than the set difference (acceptable temperature difference below the desired flow / duct temperature). See also 'Delay'.	

See Appendix "Parameter ID overview"

OFF: The related alarm function is not active.

Value: The alarm function is active if the actual temperature gets below the acceptable difference.

Lower difference



X = *Time*
Y = *Temperature*
 # 1 # = *Lower difference*
 # 2 # = *Desired flow temperature*

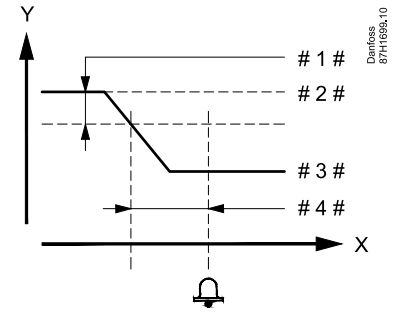
MENU > Settings > Alarm

Delay, example	1x149
If an alarm condition from either 'Upper difference' or 'Lower difference' is present for a longer time than the set delay (in minutes), the alarm function is activated.	

See Appendix “Parameter ID overview”

Value: The alarm function will be activated if the alarm condition remains after the set delay.

Delay, example



X = *Time*
Y = *Temperature*
 # 1 # = *Lower difference*
 # 2 # = *Desired flow temperature*
 # 3 # = *Actual flow temperature*
 # 4 # = *Delay (ID 1x149)*

MENU > Settings > Alarm

Lowest temp.	1x150
The alarm function will not be activated if the desired flow / duct temperature is lower than the set value.	

See Appendix “Parameter ID overview”

If the cause of the alarm disappears, the alarm indication and output also disappear.

MENU > Settings > Alarm

Clear alarm	1x390
Alarm types 2 (requiring manual reset) can be reset here.	

See Appendix “Parameter ID overview”

An alarm can be cleared (to "OFF").
If the alarm reason still exists, the "OFF" changes to "ON" after 10 seconds (alarm types without delay) or the alarm's delay time (alarm types with delay).

OFF: No alarm present

ON: Resetting the alarm

MENU > Settings > Alarm

Alarm high	1x614
When the measured value gets higher than the set value, the alarm will be activated.	

See Appendix “Parameter ID overview”

Value: Set the alarm value

MENU > Settings > Alarm

Alarm low	1x615
When the measured value gets lower than the set value, the alarm will be activated.	

See Appendix “Parameter ID overview”

Value: Set the alarm value

MENU > Settings > Alarm

Alarm value	1x616
A frost thermostat can be connected to the frost thermostat sensor input. When the temperature, measured by the frost thermostat, gets below the set value, the S7 input will be activated. *The frost alarm can be activated when the contacts in the frost thermostat open or close.*	

See Appendix “Parameter ID overview”

0: The frost alarm is activated when the contacts in the frost thermostat close.

1: The frost alarm is activated when the contacts in the frost thermostat open.

An activated frost alarm opens the control valve fully, closes the damper, starts the circulation pump and stops the fan.

'Alarm value' = 0:
An active frost alarm is indicated by a 🔔 in the display and as OFF in favorite display no. 3.

'Alarm value' = 1:
An active frost alarm is indicated by a 🔔 in the display and as ON in favorite display no. 3.

See also 'Alarm time-out', parameter 1x617.

MENU > Settings > Alarm

Alarm time-out	1x617
The alarm is activated when the alarm reason has been present for a longer time (in seconds) than the set value.	

See Appendix “Parameter ID overview”

Value: Set the alarm time-out

MENU > Settings > Alarm

Alarm value	1x636
A fire thermostat can be connected to the S8 input. When the temperature, measured by the fire thermostat, gets above the set value, the S8 input will be activated. *The fire alarm can be activated when the contacts in the fire thermostat open or close.*	

See Appendix “Parameter ID overview”

0: The fire alarm is activated when the contacts in the fire thermostat close.

1: The fire alarm is activated when the contacts in the fire thermostat open.

An active fire alarm is indicated by a 🔔 in the display.

S8 input status:
MENU > Common controller > System > Raw input overview > S8:
0 = Input activated. 1 = input not activated

See also 'Alarm time-out', parameter 1x637.

MENU > Settings > Alarm

Alarm time-out	1x637
The alarm is activated when the alarm reason has been present for a longer time (in seconds) than the set value.	

See Appendix “Parameter ID overview”

Value: Set the alarm time-out

MENU > Settings > Alarm

Alarm value	1x656
ID 10656 (Digital S9): *A differential pressure switch can be connected to the S9 input. When the differential pressure, measured by the differential pressure switch, gets below the set value, the S9 input will be activated.* *The alarm can be activated when the contacts in the differential pressure switch open or close.* ***ID 11656 (Limit T frost):*** *When the actual temperature, measured by the return temperature sensor, gets below the set value, the frost alarm will be activated.*	

See Appendix “Parameter ID overview”

ID 10656 (Digital 9):

0: The alarm is activated when the contacts in the differential pressure switch close.

1: The alarm is activated when the contacts in the differential pressure switch open.

ID 11656 (Limit T frost):
When the actual temperature, measured by the return temperature sensor, gets below the set value, the frost alarm will be activated.

ID 10656 (Digital 9):
An active fan alarm is indicated by a 🔔 in the display.

S9 input status:
MENU > Common controller > System > Raw input overview > S9:
0 = Input activated. 1 = input not activated

ID 11656 (Limit T frost):
An active frost alarm is indicated by a 🔔 in the display.

See also 'Alarm time-out', parameter 1x657.

An activated frost alarm opens the control valve fully, closes the damper, starts the circulation pump and stops the fan.

MENU > Settings > Alarm

Alarm time-out	1x657
The alarm is activated when the alarm reason has been present for a longer time (in seconds) than the set value.	

See Appendix “Parameter ID overview”

Value: Set the alarm time-out

MENU > Settings > Alarm

Alarm value	1x676
When the actual temperature, measured by S6, gets below the set value, the frost alarm will be activated.	

See Appendix “Parameter ID overview”

Value: Set the alarm value

An activated frost alarm opens the control valve fully, closes the damper, starts the circulation pump and stops the fan.

MENU > Settings > Alarm

Alarm value	**1x696**
A differential pressure switch can be connected to the S10 input. When the differential pressure, measured by the differential pressure switch, gets above the set value, the S10 input will be activated. The alarm can be activated when the contacts in the differential pressure switch open or close.	

See Appendix “Parameter ID overview”

0: The alarm is activated when the contacts in the differential pressure switch close.

1: The alarm is activated when the contacts in the differential pressure switch open.

MENU > Settings > Alarm

Alarm time-out	**1x697**
The alarm is activated when the alarm reason has been present for a longer time (in seconds) than the set value.	

See Appendix “Parameter ID overview”

Value: Set the alarm time-out

MENU > Settings > Alarm

Alarm overview, in general
Access to overview showing the alarm number / alarm type. The alarm number is entered into the alarm register and can be obtained from a SCADA system. Example: "5: Temp. monitor": If an alarm is activated because of conditions in 'Temp. monitor' the alarm number 5 is placed in the alarm register.

Alarm overview
1: Frost T
2: Limit frost T
3: Frost thermostat
4: Fire safety
5: Temp. monitor
6: Flow T sensor

6.0 Common controller settings

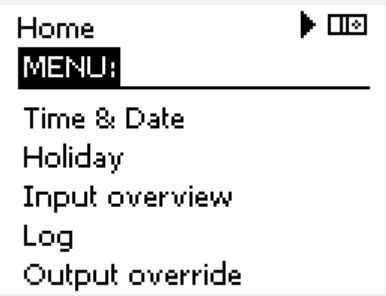
6.1 Introduction to 'Common controller settings'

Some general settings which apply to the entire controller are located in a specific part of the controller.

To enter 'Common controller settings':

Action:	Purpose:	Examples:
	Choose 'MENU' in any circuit	MENU
	Confirm	
	Choose the circuit selector at the top right corner in the display	
	Confirm	
	Choose 'Common controller settings'	
	Confirm	

Circuit selector



6.2 Time & Date

It is only necessary to set the correct date and time in connection with the first use of the ECL Comfort controller or after a power break of more than 72 hours.

The controller has a 24 hour clock.

Aut. daylight (Daylight saving time changeover)

YES: The controller's built-in clock automatically changes + / - one hour on the standardized days for daylight saving time changeover for Central Europe.

NO: You change manually between summer and winter time by setting the clock backward or forward.

When controllers are connected as slaves in a master / slave system (via ECL 485 communication bus), they will receive 'Time & Date' from the master.

How to set time and date:

Action:	Purpose:	Examples:
	Choose 'MENU'	MENU
	Confirm	
	Choose the circuit selector at the top right corner in the display	
	Confirm	
	Choose 'Common controller settings'	
	Confirm	
	Go to 'Time & Date'	
	Confirm	
	Place the cursor at the position to be changed	
	Confirm	
	Enter the desired value	
	Confirm	
	Move the cursor to the next position to be changed. Continue until 'Time & Date' has been set.	
	Finally move the cursor to 'MENU'	
	Confirm	
	Move the cursor to 'HOME'	
	Confirm	

6.3 Holiday

This section describes the holiday program in general for the ECL Comfort 210 / 310 series. The shown displays are typical and not application related. They might differ from the displays in your application. In A214 / A314 applications, however, the holiday program can only be found in circuit 1 but the general description is still valid.

There is a holiday program for each circuit and a holiday program for the common controller.

Each holiday program contains one or more schedules. Each schedule can be set to a start date and an end date. The set period starts on the start date at 00.00 and stops on the end date at 00.00.

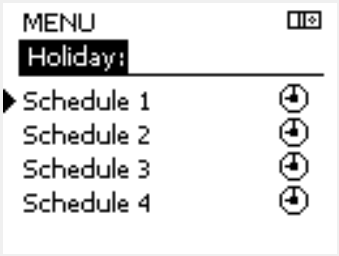
Selectable modes are Comfort, Saving, Frost protection or Comfort 7-23 (before 7 and after 23, the mode is scheduled).

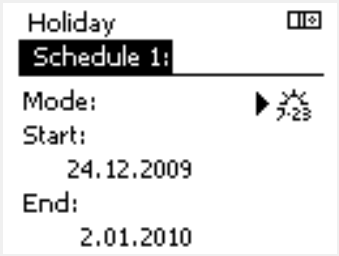
How to set your holiday schedule:

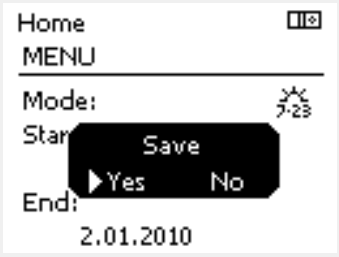
Action:	Purpose:	Examples:
	Choose 'MENU'	MENU
	Confirm	
	Choose the circuit selector at the top right corner in the display	
	Confirm	
	Choose a circuit or 'Common controller settings'	
	Heating	
	DHW	
	Common controller settings	
	Confirm	
	Go to 'Holiday'	
	Confirm	
	Choose a schedule	
	Confirm	
	Confirm choice of mode selector	
	Choose mode	
	· Comfort	
	· Comfort 7–23	
	· Saving	
	· Frost protection	
	Confirm	
	Enter the start time first and then the end time	
	Confirm	
	Go to 'Menu'	
	Confirm	
	Choose 'Yes' or 'No' in 'Save'. Choose the next schedule, if required	

The holiday program in the 'Common controller settings' is valid for all circuits. The holiday program can also be set individually in the heating or DHW circuits.

The end date must be at least be one day later than the start date.







Holiday, specific circuit / Common Controller

When setting one holiday program in specific circuit and another holiday program in Common Controller, a priority will be taken into account:

1. Comfort
2. Comfort 7 - 23
3. Saving
4. Frost protection

Holiday, deleting a set period:

- Choose the Schedule in question
- Change the mode to "Clock"
- Confirm

Example 1:

Circuit 1:
Holiday set to "Saving"

Common Controller:
Holiday set to "Comfort"

Result:
As long as "Comfort" is active in Common Controller, circuit 1 will be in "Comfort".

Example 2:

Circuit 1:
Holiday set to "Comfort"

Common Controller:
Holiday set to "Saving"

Result:
As long as "Comfort" is active in circuit 1, it will be in "Comfort".

Example 3:

Circuit 1:
Holiday set to "Frost protection"

Common Controller:
Holiday set to "Saving"

Result:
As long as "Saving" is active in Common Controller, circuit 1 will be in "Saving".

The ECA 30 / 31 cannot override the holiday schedule of the controller temporarily.

However, it is possible to make use of the following options from the ECA 30 / 31 when the controller is in scheduled mode:

 Day off

 Holiday

 Relaxing (extended comfort period)

 Going out (extended saving period)

Energy-saving trick:
Use 'Going out' (the extended saving period) for airing purposes (e.g. for ventilating the rooms by means of fresh air from open windows).

Connections and setup procedures for ECA 30 / 31:
See section 'Miscellaneous'.

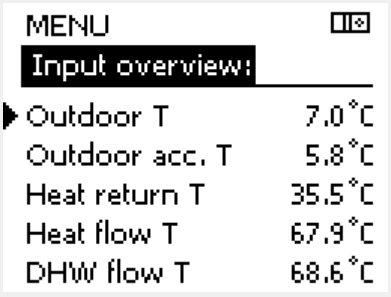
Quick guide "ECA 30 / 31 to override mode":
1. Go to ECA MENU
2. Move cursor to "Clock" symbol
3. Select the "Clock" symbol
4. Choose and select one of 4 override functions
5. Below the override symbol: Set hours or date

6.4 Input overview

This section describes the function in general for the ECL Comfort 210 / 296 / 310 series. The shown displays are typical and not application related. They might differ from the displays in your application.

The input overview is located in the common controller settings.

This overview will always show you the actual temperatures in the system (read-only).



"Outdoor acc. T" means "Accummulated outdoor temperature" and is a calculated value in the ECL Comfort controller.

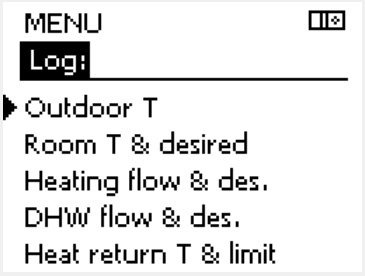
6.5 Log

This section describes the function in general for the ECL Comfort 210 / 296 / 310 series. The shown displays are typical and not application related. They might differ from the displays in your application.

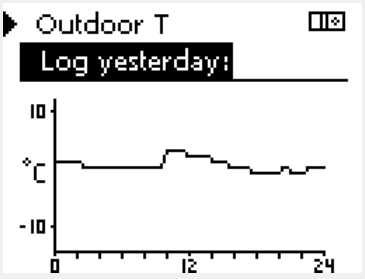
The log function (temperature history) allows you to monitor the logs of today, yesterday, the past 2 days as well as the past 4 days for the connected sensors.

There is a log display for the relevant sensor, showing the measured temperature.

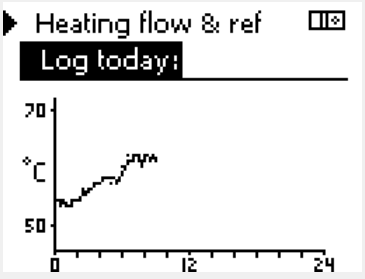
The log function is only available in the 'Common controller settings'.



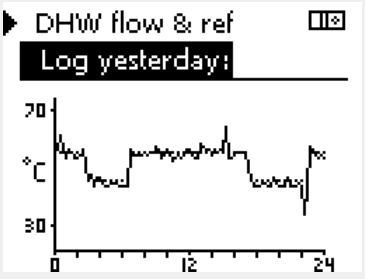
Example 1:
1 day log for yesterday showing the development in outdoor temperature during the past 24 hours.



Example 2:
Today's log for the actual heating flow temperature as well as the desired temperature.



Example 3:
Yesterday's log for the DHW flow temperature as well as the desired temperature.



6.6 Output override

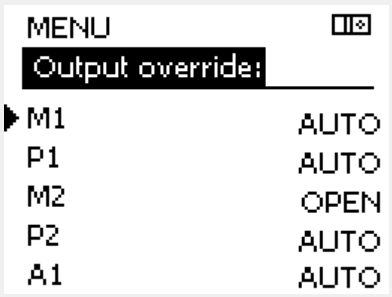
This section describes the function in general for the ECL Comfort 210 / 296 / 310 series. The shown displays are typical and not application related. They might differ from the displays in your application.

The output override is used to disable one or more of the controlled components. This could among others be useful in a service situation.

Action:	Purpose:	Examples:
	Choose 'MENU' in any of the overview displays	MENU
	Confirm	
	Choose the circuit selector at the top right corner in the display	
	Confirm	
	Choose common controller settings	
	Confirm	
	Choose 'Output override'	
	Confirm	
	Choose a controlled component	M1, P1 etc.
	Confirm	
	Adjust the status of the controlled component: Motorized control valve: AUTO, STOP, CLOSE, OPEN Pump: AUTO, OFF, ON	
	Confirm status change	

Remember to change the status back again as soon as an override is not required any longer.

Controlled components *Circuit selector*



"Manual control" has higher priority than "Output override".

When the selected controlled component (output) is not 'AUTO', the ECL Comfort controller does not control the component in question (pump or motorized control valve e.g.). Frost protection is not active.

When output override of a controlled component is active the symbol '**!**' is shown to the right of the mode indicator in the enduser displays.

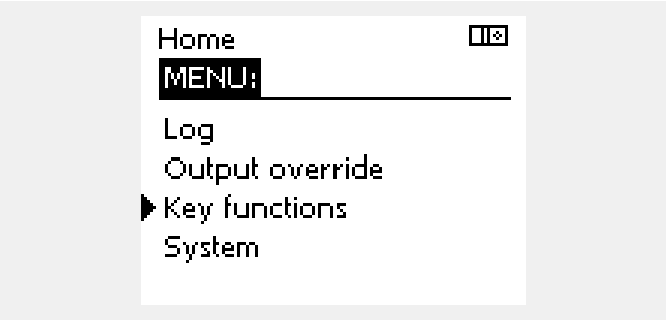
Valves (M), dampers (M) and Fans (V) are in some applications controlled by a 0–10 volt (0–100 %) signal. The control can be set to AUTO or ON.

AUTO: Normal control (0–100%).

ON: The 0–10 volt signal is set to the %-value, set below the indication 'ON'.

6.7 Key functions

New application	**Erase application:** Removes the existing application. As soon as the ECL key is inserted, another application can be chosen.
Application	Gives an overview over the actual application in the ECL controller. Push the dial again to exit the overview.
Factory setting	**System settings:** System settings are, among others, communication set-up, display brightness etc.
	User settings: User settings are, among others, desired room temperature, desired DHW temperature, schedules, heat curve, limitation values etc.
	Go to factory: Restores the factory settings.
Copy	**To:** Copy direction
	System settings
	User settings
	Start copying
Key overview	Gives an overview over the inserted ECL key. (Example: A266 Ver. 2.30). Turn the dial to see the subtypes. Push the dial again to exit the overview.



A more detailed description of how to use the individual 'Key functions' can also be seen in 'Inserting the ECL application key'.

The "Key overview" does not inform — through ECA 30 / 31 — about the subtypes of the application key.

Key inserted / not inserted, description:

ECL Comfort 210 / 310, controller versions lower than 1.36:

- Take out the application key; for 20 minutes settings can be changed.
- Power up the controller **without** the application key inserted; for 20 minutes settings can be changed.

ECL Comfort 210 / 310, controller versions 1.36 and up:

- Take out the application key; for 20 minutes settings can be changed.
- Power up the controller **without** the application key inserted; settings cannot be changed.

ECL Comfort 296 , controller versions 1.58 and up:

- Take out the application key; for 20 minutes settings can be changed.
- Power up the controller **without** the application key inserted; settings cannot be changed.

6.8 System

6.8.1 ECL version

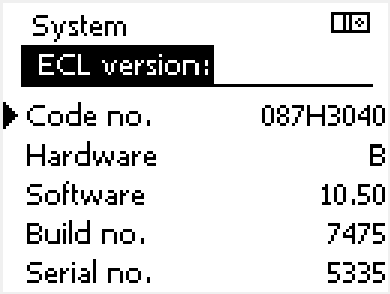
In 'ECL version' you will always be able to find an overview of the data related to your electronic controller.

Please have this information available if you need to contact your Danfoss sales organization concerning the controller.

Information about your ECL Application Key can be found in 'Key functions' and ' Key overview'.

Code no.:	The Danfoss sales and order no. for the controller
Hardware:	Hardware version of the controller
Software:	Software (firmware) version of the controller
Serial no.:	Unique number for the individual controller
Production week:	Week no. and year (WW.YYYY)

Example, ECL version



6.8.2 Extension

ECL Comfort 310 / 310B:
'Extension' will offer you information about additional modules, if any. An example could be the ECA 32 module.

6.8.3 Ethernet

ECL Comfort 296 / 310 / 310B have a Modbus/TCP communication interface that allows the ECL controller to be connected to an Ethernet network. This allows remote access to the ECL 296 / 310 / 310B controller based on standard communication infrastructures.

In 'Ethernet' it is possible to set up the required IP addresses.

6.8.4 Portal config

ECL Comfort 296 / 310 / 310B have a Modbus/TCP communication interface that allows the ECL controller to be monitored and controlled via the ECL Portal.

ECL Portal related parameters are set here.

Documentation for ECL Portal: See *http://ecl.portal.danfoss.com*

6.8.5 Energy meter and M-bus, general information

ECL Comfort 296 / 310 / 310B only

When using the Application Key in the ECL Comfort 296 / 310 / 310B, up to 5 energy meters can be connected to the M-bus connections.

Connection of energy meter can:

- limit the flow
- limit the power
- transfer energy meter data to the ECL Portal, via Ethernet, and / or a SCADA system, via Modbus.

Many applications with control of heating, DHW or cooling circuit have the possibility to react on energy meter data.
To verify if actual application key can be set to react on energy meter data:
See Circuit > MENU > Settings > Flow / power.

The ECL Comfort 296 / 310 / 310B can always be used for monitoring purpose of up to 5 energy meters.

The ECL Comfort 296 / 310 / 310B act as an M-bus master and must be set to communicate with connected energy meter(s).
See MENU > Common controller > System > M-bus config.

Technical info:

- The M-bus data are based on standard EN-1434.
- Danfoss recommends AC supplied energy meters in order to avoid battery draining.

Energy meter data acquisition from ECL Portal is possible without setting up the M-bus configuration.

MENU > Common controller > System > M-bus config.

State		**Read-out**
Circuit	*Setting range*	*Factory setting*
-	-	-
Information about the current M-bus activity.		

IDLE: Normal state

INIT: The command for initialization has been activated

SCAN: The command for scanning has been activated

GATEW: The command Gateway has been activated

The ECL Comfort 296 / 310 / 310B will return to IDLE when commands have been completed.
Gateway is used for read-out of energy meter via ECL Portal.

MENU > Common controller > System > M-bus config.

Baud (bits per second)		**5997**
Circuit	*Setting range*	*Factory setting*
-	300 / 600 / 1200 / 2400	300
The communication speed between ECL Comfort 296 / 310 / 310B and the connected energy meter(s).		

Typically, 300 or 2400 baud is used.
If ECL Comfort 296 / 310 / 310B are connected to the ECL Portal, a baud rate of 2400 is recommendable, provided the energy meter allows this.

MENU > Common controller > System > M-bus config.

Command		**5998**
Circuit	*Setting range*	*Factory setting*
-	NONE / INIT / SCAN / GATEW	NONE
The ECL Comfort 296 / 310 / 310B are M-bus masters. In order to verify connected energy meters, different commands can be activated.		

NONE: No command activated

INIT: Initialization is activated

SCAN: Scanning is activated in order to search for connected energy meters. The ECL Comfort 296 / 310 / 310B detect the M-bus addresses of up to 5 connected energy meters and place these automatically in the "Energy meters" section. The verified address is placed after "Energy meter 1 (2, 3, 4, 5)"

GATEW: The ECL Comfort 296 / 310 / 310B act as a gateway between energy meters and ECL Portal. Used only for service.

Scan time can take up to 12 minutes.
When all energy meters are found, the command can be changed to INIT or NONE.

MENU > Common controller > System > M-bus config.

M-bus address Energy meter 1 (2, 3, 4, 5)		**6000**
Circuit	*Setting range*	*Factory setting*
-	0 - 255	255
The set or verified address of energy meter 1 (2, 3, 4, 5).		

0: Normally not used

1 - 250: Valid M-bus addresses

251 - 254: Special functions. Use only M-bus address 254 when one energy meter is connected.

255: Not used

MENU > Common controller > System > M-bus config.

Type Energy meter 1 (2, 3, 4, 5)		**6001**
Circuit	*Setting range*	*Factory setting*
-	0 - 4	0
Selecting data range from the M-bus telegram..		

0: Small data set, small units

1: Small data set, large units

2: Large data set, small units

3: Large data set, large units

4: Volume and energy data only (example: HydroPort Pulse)

Data examples:

0:
Flow temp., return temp., flow, power, acc. volume, acc. energy.

3:
Flow temp., return temp., flow, power, acc. volume, acc. energy, tariff 1, tariff 2.

See also the "Instructions, ECL Comfort 210 / 310, communication description" for further details.

See also Appendix for detailed description of "Type".

MENU > Common controller > System > M-bus config.

Scan time **Energy meter 1 (2, 3, 4, 5)**		**6002**
Circuit	*Setting range*	*Factory setting*
-	1 - 3600 sec	60 sec
Setting the scanning time for acquiring data of connected energy meter(s).		

If the energy meter is battery powered, the scan time should be set to a high value to prevent a too fast battery draining.
Oppositely, if the flow / power limitation function is used in the ECL Comfort 310, the scan time should be set to a low value in order to have quick limitation.

MENU > Common controller > System > M-bus config.

ID **Energy meter 1 (2, 3, 4, 5)**		**Read-out**
Circuit	*Setting range*	*Factory setting*
-	-	-
Information about the energy meter's serial no.		

MENU > Common controller > System > Energy meters

Energy meter 1 (2, 3, 4, 5)		**Read-out**
Circuit	*Setting range*	*Factory setting*
-	0 - 4	0
Information from actual energy meter about, for example, ID, temperatures, flow / volume, power / energy. *The shown information depends on the settings made in the "M-bus config." menu.*		

6.8.6 Raw input overview

Measured temperatures, input status and voltages are displayed.

In addition, a detection of malfunctions can be chosen for activated temperature inputs.

Monitoring the sensors:
Choose the sensor which measures a temperature, for example the S5. When the dial is pressed, a magnifying glass appears in the selected line. The S5 temperature is now being monitored.

Alarm indication:
Should the connection to the temperature sensor be disconnected, short-circuited or the sensor itself be defective, the alarm function is activated.

In the "Raw input overview" an alarm symbol is shown at the defective temperature sensor in question.

Resetting the alarm:
Choose the sensor (S number) for which you want to clear the alarm. Press the dial. The magnifying glass and alarm symbols disappear.

When the dial is pressed again, the monitoring function is reactivated.

The temperature sensor inputs have a measuring range from -60 ... 150 ° C.

If a temperature sensor or its connection breaks, the value indication is " - - ".

If a temperature sensor or its connection is short-circuited, the value indication is " - - - ".

6.8.7 Display

Backlight (display brightness)		**60058**
Circuit	*Setting range*	*Factory setting*
☐|○	0 ... 10	5
Adjust the brightness of the display.		

0: Weak backlight.

10: Strong backlight.

Contrast (display contrast)		**60059**
Circuit	*Setting range*	*Factory setting*
☐|○	0 ... 10	3
Adjust the contrast of the display.		

0: Low contrast.

10: High contrast.

6.8.8 Communication

Modbus addr.		**38**
Circuit	*Setting range*	*Factory setting*
☐|○	1 ... 247	1
Set the Modbus address if the controller is part of a Modbus network.		

1 ... 247: Assign the Modbus address within the stated setting range.

The Application Key A214 (subtypes A214.1 . . . A214.6 and A314.1 . . . A314.3) is also able to communicate via Modbus to Danfoss ADAP-KOOL® Service Manager.

ECL 485 addr. (master / slave address)		2048
Circuit	*Setting range*	*Factory setting*
	0 ... 15	15
This settting is relevant if more controllers are working in the same ECL Comfort system (connected via the ECL 485 communication bus) and / or Remote Control Units (ECA 30 / 31) are connected.		

0: The controller works as slave.
The slave receives information about the outdoor temperature (S1), system time, and signal for DHW demand in the master.

1 ... 9: The controller works as slave.
The slave receives information about the outdoor temperature (S1), system time, and signal for DHW demand in the master. The slave sends information about the desired flow temperature to the master.

10 ... 14: Reserved.

15: The ECL 485 communication bus is active.
The controller is master. The master sends information about the outdoor temperature (S1) and system time.
Connected Remote Control Units (ECA 30 / 31) are powered.

The ECL Comfort controllers can be connected via the ECL 485 communication bus to perform a larger system (the ECL 485 communication bus can connect to max. 16 devices).

Each slave must be configured with its own address (1 ... 9).

However, more slaves can have the address 0 if they only have to receive information about outdoor temperature and system time (listeners).

Service Pin		2150
Circuit	*Setting range*	*Factory setting*
	0 / 1	0
This setting is only used in connection with set-up of Modbus communication. **Not applicable for the time being and reserved for future use!**		

Ext. reset		2151
Circuit	*Setting range*	*Factory setting*
	0 / 1	0
This setting is only used in connection with set-up of Modbus communication.		

0: Reset not activated.

1: Reset.

The total cable length of max. 200 m (all devices incl. the internal ECL 485 communication bus) should not be exceeded.
Cable lengths of more than 200 m may cause noise sensibility (EMC).

In a system with MASTER / SLAVE controllers, only one MASTER controller with address 15 is allowed.

If by mistake more MASTER controllers are present in an ECL 485 communication bus system, decide which controller is to be MASTER. Change the address in the remaining controllers. However, the system will operate but not be stable with more than one MASTER controller.

In the MASTER controller, the address in 'ECL 485 addr. (master / slave address)', ID no. 2048, must always be 15.

6.8.9 Language

Language		**2050**
Circuit	*Setting range*	*Factory setting*
☐◎	English / 'Local'	English
Choose your language.		

Local language is selected during installation. If you want to change to another local language, the application must be reinstalled. However, it is always possible to change between the local language and English.

7.0 Miscellaneous

7.1 ECA 30 / 31 setup procedures

ECA 30 (code no. 087H3200) is a remote control unit with built-in room temperature sensor.

ECA 31 (code no. 087H3201) is a remote control unit with built-in room temperature sensor and humidity sensor (relative humidity).

An external room temperature sensor can be connected to both types to substitute the built-in sensor.
An external room temperature sensor will be recognized at ECA 30 / 31 power-up.

Connections: See the section 'Electrical connections'.

Max. two ECA 30 / 31 can be connected to one ECL controller or a system (master-slave) consisting of several ECL controllers connected on the same ECL 485 bus. In the master-slave system only one of the ECL controllers is master. The ECA 30 / 31 can, among others, be set to:

- monitor and set the ECL controller remotely
- measure the room temperature and (ECA 31) humidity
- extend comfort / saving period temporarily

After application upload in the ECL Comfort controller, the remote control unit ECA 30 / 31 will after approx. one minute ask to 'Copy application'.
Confirm this in order to upload the application to the ECA 30 / 31.

Menu structure

The menu structure of ECA 30 / 31 is an "ECA MENU" and the ECL menu, copied from the ECL Comfort controller.

The ECA MENU contains:

- ECA settings
- ECA system
- ECA factory

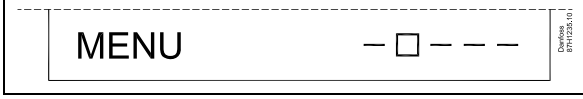
ECA settings: Offset adjustment of the measured room temperature.

Offset adjustment of relative humidity (ECA 31 only).

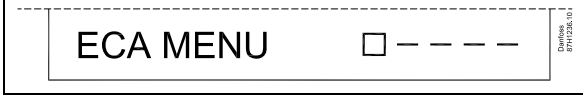
ECA system: Display, communication, override settings and version info.

ECA factory: Erase of all applications in the ECA 30 / 31, restore to factory settings, reset of ECL address and firmware update.

Part of the ECA 30 / 31 display in ECL mode:



Part of the ECA 30 / 31 display in ECA mode:



If only the "ECA MENU" is shown, it can indicate that the ECA 30 / 31 is not having correct communication address.
See ECA MENU > ECA system > ECA communication: ECL address.
In most cases the ECL address setting must be "15".

Regarding ECA settings:
When ECA 30 / 31 is not used as remote unit, the offset adjustments menu(s) are not present.

The ECL menus are as described for the ECL controller.

Most of the settings done directly in the ECL controller can be done via the ECA 30 / 31 too.

All settings can be seen even if the application key is not inserted in the ECL controller.
For changing settings, the application key must be inserted.

The Key overview (MENU > 'Common controller settings' > 'Key functions') does not show the applications of the key.

The ECA 30 / 31 will display this information (an X on the ECA 30 / 31 symbol) if the application in the ECL controller does not comply with the ECA 30 / 31:

In the example 1.10 is current version and 1.42 is desired version.

Display part of ECA 30 / 31:

This display indicates that an application has not been uploaded or the communication to the ECL controller (master) is not working properly. An X on the ECL controller symbol indicates wrong setup of communication addresses.

Display part of ECA 30 / 31:

Newer versions of ECA 30 / 31 indicate the address number of the connected ECL Comfort controller.
Address number can be changed in the ECA MENU.
A stand-alone ECL Controller has the address 15.

When ECA 30 / 31 is in ECA MENU mode, the date and measured room temperature is displayed.

ECA MENU > ECA settings > ECA sensor

Room T Offset	
Setting range	*Factory setting*
–10.0 ... 10.0 K	0.0 K
The measured room temperature can be corrected with a number of Kelvin. The corrected value is used by the heating circuit in the ECL controller.	

Example:

Room T offset:	0.0 K
Displayed room temperature:	21.9 °C
Room T offset:	1.5 K
Displayed room temperature:	23.4 °C

Minus value: The indicated room temperature is lower.

0.0 K: No correction of the measured room temperature.

Plus value: The indicated room temperature is higher.

ECA MENU > ECA settings > ECA sensor

RH offset (ECA 31 only)	
Setting range	*Factory setting*
–10.0 ... 10.0 %	0.0 %
The measured relative humidity can be corrected with a number of %-values. The corrected value is used by the application in the ECL controller.	

Example:

RH offset:	0.0 %
Displayed relative humidity:	43.4 %
RH offset:	3.5 %
Displayed relative humidity:	46.9 %

Minus value: The indicated relative humidity is lower.

0.0 %: No correction of the measured relative humidity.

Plus value: The indicated relative humidity is higher.

ECA MENU > ECA system > ECA display

Backlight (display brightness)	
Setting range	*Factory setting*
0 ... 10	5
Adjust the brightness of the display.	

0: Weak backlight.

10: Strong backlight.

ECA MENU > ECA system > ECA display

Contrast (display contrast)	
Setting range	*Factory setting*
0 ... 10	3
Adjust the contrast of the display.	

0: Low contrast.

10: High contrast.

ECA MENU > ECA system > ECA display

Use as remote	
Setting range	*Factory setting*
OFF / ON	*)
ECA 30 / 31 can act as a simple or normal remote control for the ECL controller.	

OFF: Simple remote control, no room temperature signal.

ON: Remote control, room temperature signal is available.

***):** Differently, depending on chosen application.

When set to OFF: The ECA menu shows date and time.

When set to ON: The ECA menu shows date and room temperature (and for ECA 31 relative humidity).

ECA MENU > ECA system > ECA communication

Slave addr. (Slave address)	
Setting range	*Factory setting*
A / B	A
The setting of 'Slave addr.' is related to the setting 'ECA address' in the ECL controller. In the ECL controller it is selected from which ECA 30 / 31 unit the room temperature signal is received.	

A: The ECA 30 / 31 has the address A.

B: The ECA 30 / 31 has the address B.

For installation of an application in an ECL Comfort 210 / 296 / 310 controller the 'Slave addr.' must be A.

If two ECA 30 / 31 are connected in the same ECL 485 bus system, the 'Slave addr.' must be "A" in the one ECA 30 / 31 unit and "B" in the other.

ECA MENU > ECA system > ECA communication

Connection addr. (Connection address)	
Setting range	*Factory setting*
1 … 9 / 15	15
Setting of the address to which ECL controller the communication must run.	

1 .. 9: Slave controllers.

15: Master controller.

An ECA 30 / 31 can in an ECL 485 bus system (master – slave) be set to communicate, one by one, with all addressed ECL controllers.

Example:

Connection addr. = 15:	The ECA 30 / 31 communicates with the ECL master controller.
Connection addr. = 2:	The ECA 30 / 31 communicates with the ECL controller with address 2.

There must be a master controller present in order to broadcast time and date information.

An ECL Comfort controller 210 / 310, type B (without display and dial) cannot be assigned to the address 0 (zero).

ECA MENU > ECA system > ECA override

Override addr. (Override address)	
Setting range	*Factory setting*
OFF / 1 … 9 / 15	OFF
The feature 'Override' (to extended comfort or saving period or holiday) must be addressed to the ECL controller in question.	

OFF: Override not possible.

1 .. 9: Address of slave controller for override.

15: Address of master controller for override.

Override functions:	Extended saving mode:	
	Extended comfort mode:	
	Holiday away from home:	
	Holiday at home:	

Override by means of settings in ECA 30 / 31 are cancelled if the ECL Comfort controller goes into holiday mode or is changed to another mode than scheduled mode.

The circuit in question for override in the ECL controller must be in scheduled mode.
See also the parameter 'Override circuit'.

ECA MENU > ECA system > ECA override

Override circuit	
Setting range	*Factory setting*
OFF / 1 … 4	OFF
The feature 'Override' (to extended comfort or saving period or holiday) must be addressed to the heating circuit in question.	

OFF: No heating circuit is selected for override.

1 … 4: The heating circuit number in question.

The circuit in question for override in the ECL controller must be in scheduled mode.
See also the parameter 'Override addr.'.

Example 1:

(One ECL controller and one ECA 30 / 31)		
Override of heating circuit 2:	Set 'Connection addr.' to 15	Set 'Override circuit' to 2

Example 2:

(Several ECL controllers and one ECA 30 / 31)		
Override of heating circuit 1 in ECL controller with the address 6:	Set 'Connection addr.' to 6	Set 'Override circuit' to 1

Quick guide "ECA 30 / 31 to override mode":

1. Go to ECA MENU
2. Move cursor to "Clock" symbol
3. Select the "Clock" symbol
4. Choose and select one of 4 override functions
5. Below the override symbol: Set hours or date
6. Below hours / date: Set desired room temperature for the override period

ECA MENU > ECA system > ECA version

ECA version (read-out only), examples	
Code no.	087H3200
Hardware	A
Software	1.42
Build no.	5927
Serial no.	13579
Production week	23.2012

The ECA version information is useful in service situations.

ECA MENU > ECA factory > ECA clear apps.

Erase all apps. (Erase all applications)
Erase all applications which are in the ECA 30 / 31. *After erasing, the application can be uploaded again.*

NO: The erase procedure is not done.

YES: The erase procedure is done (await 5 sec.).

After the erase procedure, a pop-up in the display indicates "Copy application". Choose "Yes".
Hereafter the application is uploaded from the ECL controller. An upload bar is shown.

ECA MENU > ECA factory > ECA default

Restore factory
The ECA 30 / 31 is set back to factory settings.
Affected settings by the restore procedure: • Room T offset • RH offset (ECA 31) • Backlight • Contrast • Use as remote • Slave addr. • Connection addr. • Override addr. • Override circuit • Override mode • Override mode end time

NO: The restore procedure is not done.

YES: The restore procedure is done.

ECA MENU > ECA factory > Reset ECL addr.

Reset ECL addr. (Reset ECL address)
If none of the connected ECL Comfort controllers has the address 15, the ECA 30 / 31 can set all connected ECL controllers on the ECL 485 bus back to address 15.

NO: The reset procedure is not done.

YES: The reset procedure is done (await 10 sec.).

The ECL 485 bus related address of the ECL controller is found:
MENU > 'Common controller settings' > 'System' > 'Communication' > 'ECL 485 addr.'

The "Reset ECL addr." cannot be activated if one or more of the connected ECL Comfort controllers has the address 15.

In a system with MASTER / SLAVE controllers, only one MASTER controller with address 15 is allowed.

If by mistake more MASTER controllers are present in an ECL 485 communication bus system, decide which controller is to be MASTER. Change the address in the remaining controllers. However, the system will operate but not be stable with more than one MASTER controller.

ECA MENU > ECA factory > Update firmware

Update firmware
The ECA 30 / 31 can be updated with new firmware (software). *The firmware comes with the ECL application key, when the key version is at least 2.xx.* *If no new firmware is available, a symbol of the application key is displayed with an X.*

NO: The updating procedure is not done.

YES: The updating procedure is done.

The ECA 30 / 31 automatically verifies if a new firmware is present on the application key in the ECL Comfort controller.
The ECA 30 / 31 is automatically updated at new application upload in the ECL Comfort controller.
The ECA 30 / 31 is not automatically updated when connected to an ECL Comfort controller with uploaded application. A manual update is always possible.

Quick guide "ECA 30 / 31 to override mode":

1. Go to ECA MENU
2. Move cursor to "Clock" symbol
3. Select the "Clock" symbol
4. Choose and select one of 4 override functions
5. Below the override symbol: Set hours or date
6. Below hours / date: Set desired room temperature for the override period

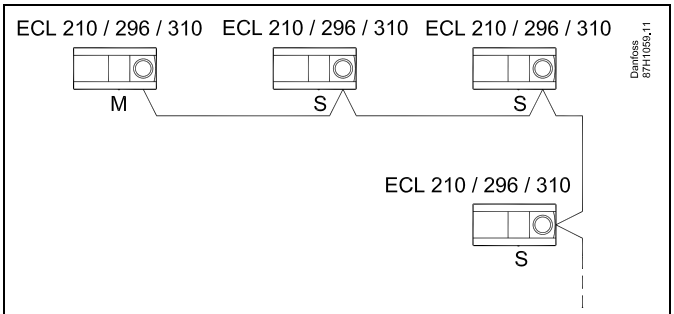
7.2 Several controllers in the same system

When ECL Comfort controllers are interconnected by means of the ECL 485 communication bus (cable type: 2 x twisted pair), the master controller will broadcast the following signals to the slave controllers:

- Outdoor temperature (measured by S1)
- Time and date
- DHW tank heating / charging activity

Furthermore, the master controller can receive information about:

- the desired flow temperature (demand) from slave controllers
- and (as from ECL controller version 1.48) DHW tank heating / charging activity in slave controllers



In a system with MASTER / SLAVE controllers, only one MASTER controller with address 15 is allowed.

If by mistake more MASTER controllers are present in an ECL 485 communication bus system, decide which controller is to be MASTER. Change the address in the remaining controllers. However, the system will operate but not be stable with more than one MASTER controller.

Situation 1:
SLAVE controllers: How to make use of the outdoor temperature signal sent from the MASTER controller

The slave controllers only receive information about outdoor temperature and date / time.

SLAVE controllers:
Change the factory set address from 15 to address 0.

- In ☐⊙, go to System > Communication > ECL 485 addr:

ECL 485 addr. (master / slave address)		**2048**
Circuit	Setting range	**Choose**
☐⊙	0 ... 15	**0**

In the MASTER controller, the address in 'ECL 485 addr. (master / slave address)', ID no. 2048, must always be 15.

'Demand offset' with a value is to be used in the Master controller only.

Situation 2:
SLAVE controller: How to react on a DHW tank heating / charging activity sent from the MASTER controller

The slave receives information about a DHW tank heating / charging activity in the master controller and can be set to close the selected heating circuit.

ECL controller versions 1.48 (as from August 2013):
The master receives information about DHW tank heating / charging activity in the master controller itself and also slaves in the system.
This status is broadcasted to all ECL controllers in the system and each heating circuit can be set to close the heating.

SLAVE controller:
Set the desired function:

- In circuit 1 / circuit 2, go to 'Settings' > 'Application' >'DHW priority':

DHW priority (closed valve / normal operation)		**11052 / 12052**
Circuit	Setting range	**Choose**
1 / 2	OFF / ON	**OFF / ON**

OFF: The flow temperature control remains unchanged during active DHW heating / charging in the master / slave system.

ON: The valve in the heating circuit is closed during active DHW heating / charging in the master / slave system.

Situation 3:
SLAVE controller: How to make use of the outdoor temperature signal and send information about the desired flow temperature back to the MASTER controller

The slave controller receives information about outdoor temperature and date / time. The master controller receives information about the desired flow temperature from slave controllers with an address from 1 ... 9:

SLAVE controller:

- In ☐⊙, go to System > Communication > ECL 485 addr.
- Change the factory set address from 15 to an address (1 ... 9). Each slave must be configured with its own address.

ECL 485 addr. (master / slave address)		**2048**
Circuit	Setting range	**Choose**
☐⊙	0 ... 15	**1 ... 9**

Furthermore, each slave can send information about the desired flow temperature (demand) in each circuit back to the master controller.

SLAVE controller:

- In the circuit in question, go to Settings > Application > Send desired T
- Choose ON or OFF.

Send desired T		**11500 / 12500**
Circuit	Setting range	**Choose**
1 / 2	OFF / ON	**ON or OFF**

OFF: Information about the desired flow temperature is not sent to the master controller.

ON: Information about the desired flow temperature is sent to the master controller.

In the MASTER controller, the address in 'ECL 485 addr. (master / slave address)', ID no. 2048, must always be 15.

7.3 Frequently asked questions

The definitions apply to the ECL Comfort 210 / 296 / 310 series. Consequently, you might come across expressions that are not mentioned in your guide.

The time shown in the display is one hour off?
See 'Time and Date'.

The time shown in the display is not correct?
The internal clock may have been reset, if there has been a power break for more than 72 hours.
Go to the 'Common controller settings' and 'Time & Date' to set the correct time.

The ECL Application Key is lost?
Switch the power off and on again to see the ECL controller type, version code (e.g. 1.52), code no. and application (e.g. A266.1) or go to 'Common controller settings' >'Key functions' > 'Application'. The system type (e.g. TYPE A266.1) and the system diagram is displayed.
Order a replacement from your Danfoss representative (e.g. ECL Application Key A266).
Insert the new ECL Application Key and copy your personal settings from the controller to the new ECL Application Key, if required.

The room temperature is too low?
Make sure that the radiator thermostat does not limit the room temperature.
If you still cannot obtain the desired room temperature by adjusting the radiator thermostats, the flow temperature is too low. Increase the desired room temperature (display with desired room temperature). If this does not help, adjust the 'Heat curve' ('Flow temp.').

The room temperature is too high during saving periods?
Make sure that the min. flow temperature limitation ('Temp. min.') is not too high.

The temperature is unstable?
Check that the flow temperature sensor is correctly connected and in the right place. Adjust the control parameters ('Control par.').
If the controller has a room temperature signal, see 'Room limit'.

The controller does not operate and the control valve is closed?
Check that the flow temperature sensor is measuring the correct value, see 'Daily use' or 'Input overview'.
Check the influence from other measured temperatures.

How to make an extra comfort period in the schedule?
You can set an additional comfort period by adding new 'Start' and 'Stop' times in 'Schedule'.

How to remove a comfort period in the schedule?
You can remove a comfort period by setting start and stop times to the same value.

How to restore your personal settings?
Please read the chapter concerning 'Inserting the ECL Application Key'.

How to restore the factory settings?
Please read the chapter concerning 'Inserting the ECL Application Key'.

Why can't the settings be changed?
The ECL Application Key has been removed.

Why can't an application be selected when inserting the ECL application key into the controller?
The actual application in the ECL Comfort controller must be deleted before a new application (subtype) can be selected.

How to react on alarms?
An alarm indicates that the system is not operating satisfactorily. Please contact your installer.

What does P and PI control mean?
P control: Proportional control.
By using a P control, the controller will change the flow temperature proportional to the difference between a desired and an actual temperature, e.g. a room temperature.
A P control will always have an offset which not will disappear over time.

PI control: Proportional and Integrating control.
A PI control does the same as a P control, but the offset will disappear over time.
A long 'Tn' will give a slow but stable control, and a short 'Tn' will result in a fast control but with a higher risk of unstability.

What does the "i" in the upper right corner of the display mean ?
When uploading an application (subtype) from the application key into the ECL Comfort controller, the "**i**" in the upper right corner indicates that - besides the factory settings - the subtype also contains special user / systems settings.

7.4 Definitions

The definitions apply to the ECL Comfort 210 / 296 / 310 series. Consequently, you might come across expressions that are not mentioned in your guide.

Accumulated temperature value
A filtered (dampened) value, typically for room and outdoor temperatures. Is calculated in the ECL controller and is used to express the heat stored in the walls of the house. The accumulated value does not change so rapidly as the actual temperature.

Air duct temperature
Temperature measured in the air duct where the temperature is to be controlled.

Alarm function
Based on the alarm settings, the controller can activate an output.

Anti-bacteria function
For a defined period, the DHW temperature is increased in order to neutralize dangerous bacteria, e.g. Legionella.

Balance temperature
This setpoint is the basis for the flow / air duct temperature. The balance temperature can be adjusted by the room temperature, the compensation temperature and the return temperature. The balance temperature is only active if a room temperature sensor is connected.

BMS
Building Management System. A supervisory system for remote control and monitoring.

Comfort operation
Normal temperature in the system controlled by the schedule. During heating the flow temperature in the system is higher to maintain the desired room temperature. During cooling the flow temperature in the system is lower to maintain the desired room temperature.

Comfort temperature
Temperature maintained in the circuits during comfort periods. Normally during daytime.

Compensation temperature
A measured temperature influencing the flow temperature reference / balance temperature.

Desired flow temperature
Temperature calculated by the controller on basis of the outdoor temperature and influences from the room and / or return temperatures. This temperature is used as a reference for the control.

Desired room temperature
Temperature which is set as the desired room temperature. The temperature can only be controlled by the ECL Comfort controller if a room temperature sensor is installed.
If a sensor is not installed, the set desired room temperature however still influences the flow temperature.
In both cases the room temperature in each room is typically controlled by radiator thermostats / valves.

Desired temperature
Temperature based on a setting or a controller calculation.

Dew point temperature
Temperature at which the humidity in the air condensates.

DHW circuit
The circuit for heating the domestic hot water (DHW).

Duct temperature
Temperature measured in the air duct where the temperature is to be controlled.

ECL Portal
A supervisory system for remote control and monitoring, locally and via Internet.

EMS
Energy Management System. A supervisory system for remote control and monitoring.

Factory settings
Settings stored on the ECL Application Key to simplify the set up of your controller the first time.

Firmware
is used by the ECL Comfort controller and ECA 30 / 31 to manage display, dial and program execution.

Flow temperature
Temperature measured in the water flow where the temperature is to be controlled.

Flow temperature reference
Temperature calculated by the controller on basis of the outdoor temperature and influences from the room and / or return temperatures. This temperature is used as a reference for the control.

Heat curve
A curve showing the relationship between actual outdoor temperature and desired flow temperature.

Heating circuit
The circuit for heating the room / building.

Holiday schedule
Selected days can be programmed to be in comfort, saving or frost protection mode. Besides this, a day schedule with comfort period from 07.00 to 23.00 can be selected.

Humidistat
A device, which reacts on the air's humidity. A switch can go ON if the measured humidity gets above a set point.

Humidity, relative
This value (stated in %) refers to the indoor moisture content compared to the max. moisture content. The relative humidity is measured by the ECA 31 and is used for the calculation of the dew point temperature.

Inlet temperature
Temperature measured in the inlet air flow where the temperature is to be controlled.

Limitation temperature
Temperature that influences the desired flow / balance temperature.

Log function
The temperature history is displayed.

Master / slave
Two or more controllers are interconnected on the same bus, the master sends out e.g. time, date and outdoor temperature. The slave receives data from master and sends e.g. desired flow temperature value.

Modulating control (0 - 10 V control)
Positioning (by means of a 0 - 10 V control signal) of the actuator for the motorized control valve in order to control the flow.

Optimization
The controller optimizes the start time of the scheduled temperature periods. Based on the outdoor temperature, the controller automatically calculates when to start in order to reach the comfort temperature at the set time. The lower the outdoor temperature, the earlier the start time.

Outdoor temperature trend
The arrow indicates the tendency, i.e. whether the temperature rises or falls.

Override mode
When ECL Comfort is in Scheduled mode, a switch or contact signal can be applied to an input in order to override to Comfort, Saving, Frost protection or Constant temperature. As long as the switch or contact signal is applied, the override is active.

Pt 1000 sensor
All sensors used with the ECL Comfort controller are based on the Pt 1000 type (IEC 751B). The resistance is 1000 ohm at 0 °C and it changes with 3.9 ohm / degree.

Pump control
One circulation pump is working and the other is the spare circulation pump. After a set time, the roles are exchanged.

Refill water function
If the measured pressure in the heating system is too low (e.g. due to a leakage), water can be supplemented.

Return temperature
The temperature measured in the return influences the desired flow temperature.

Room temperature
Temperature measured by the room temperature sensor or the Remote Control Unit. The room temperature can only be controlled directly if a sensor is installed. The room temperature influences the desired flow temperature.

Room temperature sensor
Temperature sensor placed in the room (reference room, typically the living room) where the temperature is to be controlled.

Saving temperature
Temperature maintained in the heating / DHW circuit during saving temperature periods. Typically, the Saving temperature is lower than the Comfort temperature in order to save energy.

SCADA
Supervisory Control And Data Acquisition. A supervisory system for remote control and monitoring.

Schedule
Schedule for periods with comfort and saving temperatures. The schedule can be made individually for each week day and may consist of up to 3 comfort periods per day.

Software
is used in the ECL Comfort controller to do the application related processes.

Weather compensation
Flow temperature control based on the outdoor temperature. The control is related to a user-defined heat curve.

2-point control
ON / OFF control, e.g. circulation pump, ON / OFF valve, change-over valve or damper control.

3-point control
Opening, closing or no action of the actuator for the motorized control valve. No action means that the actuator remains in its current position.

7.5 Type (ID 6001), overview

	Type 0	Type 1	Type 2	Type 3	Type 4
Address	✓	✓	✓	✓	✓
Type	✓	✓	✓	✓	✓
Scan time	✓	✓	✓	✓	✓
ID / Serial	✓	✓	✓	✓	✓
Reserved	✓	✓	✓	✓	✓
Flow temp. [0.01 °C]	✓	✓	✓	✓	-
Return temp. [0.01 °C]	✓	✓	✓	✓	-
Flow [0.1 l/h]	✓	✓	✓	✓	-
Power [0.1 kW]	✓	✓	✓	✓	-
Acc. Volume	[0.1 m3]	[0.1 m3]	[0.1 m3]	[0.1 m3]	-
Acc. Energy	[0.1 kWh]	[0.1 MWh]	[0.1 kWh]	[0.1 MWh]	-
Tariff1 Acc. Energy	-	-	[0.1 kWh]	[0.1 MWh]	-
Tariff2 Acc. Energy	-	-	[0.1 kWh]	[0.1 MWh]	-
Up time [days]	-	-	✓	✓	-
Current time [M-bus defined structure]	-	-	✓	✓	✓
Error status [energy meter defined bitmask]	-	-	✓	✓	-
Acc. Volume	-	-	-	-	[0.1 m3]
Acc. Energy	-	-	-	-	[0.1 kWh]
Acc. Volume2	-	-	-	-	[0.1 m3]
Acc. Energy2	-	-	-	-	[0.1 kWh]
Acc. Volume3	-	-	-	-	[0.1 m3]
Acc. Energy3	-	-	-	-	[0.1 kWh]
Acc. Volume4	-	-	-	-	[0.1 m3]
Acc. Energy4	-	-	-	-	[0.1 kWh]

7.6 Parameter ID overview

A214.x or A314.x — **x** refers to the subtypes listed in the column.

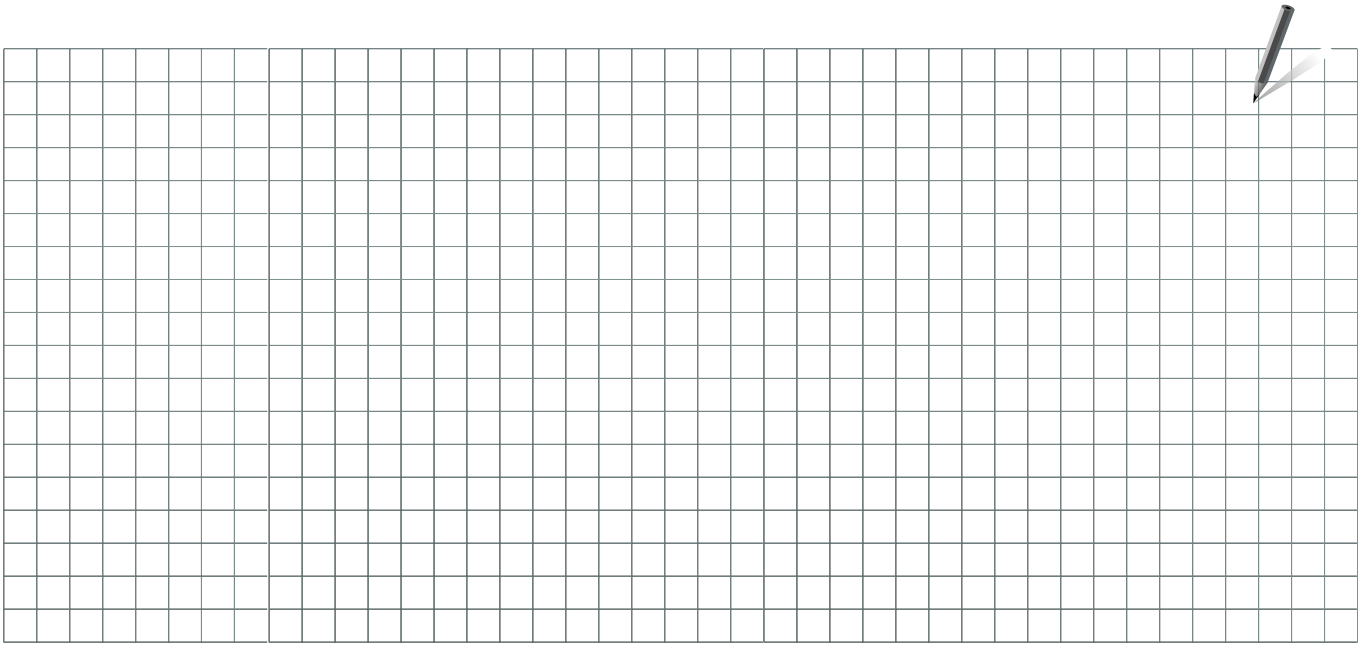
ID	Parameter Name	A214.x	A314.x	Setting range	Factory	Unit	Own settings	
10304	S4 filter	2, 4	1	1 ... 100	8			155
10643	Digital S9		4, 5, 6, 7, 9	OFF ; ON	OFF			
10656	Alarm value		4, 5, 6, 7, 9	0 ... 1	0			162
10657	Alarm time-out		4, 5, 6, 7, 9	0 ... 250	0	Sec		162
10683	Digital S10		4, 5, 6, 7, 9	OFF ; ON	OFF			
10696	Alarm value		4, 5, 6, 7, 9	0 ... 1	0			162
10697	Alarm time-out		4, 5, 6, 7, 9	0 ... 250	0	Sec		163
11008	Desired balance T	1		-20 ... 110	20	°C		117
	-||-	2, 3, 4, 5, 6	1, 2, 3	5 ... 110	20	°C		
11009	Dead zone	4, 5	1, 2, 6, 7	OFF, 0.5 ... 25.0	5.0	K		117
11010	ECA addr.	1, 3, 5, 6	2, 3, 4, 5, 6, 7, 9	OFF ; A ; B	OFF			144
11015	Adapt. time	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6, 7, 9	OFF, 1 ... 50	OFF	Sec		119
11018	Des. T comfort		4, 5, 6, 7, 9	5 ... 110	20	°C		117
11019	Des. T saving		4, 5, 6, 7, 9	5 ... 110	16	°C		118
11021	Total stop	1, 2, 3, 4, 5, 6	1, 2, 4, 5, 6, 7, 9	OFF ; ON	OFF			145
	-||-		3	OFF ; ON	ON			
11027	Room T diff.	3	3	-9.0 ... -0.5	-2.0	K		137
	-||-	6		-9.0 ... -0.5, OFF	OFF	K		
11030	Limit	1		-10 ... 110	10	°C		121
	-||-	2, 3, 4, 5, 6	1, 2, 3	10 ... 110	25	°C		
	-||-		4, 5, 6, 7, 9	10 ... 110	35	°C		
11035	Infl. - max.	1, 2, 3, 4, 5, 6	1, 2, 3	-9.9 ... 9.9	0.0			121
	-||-		4, 5, 6, 7, 9	-9.9 ... 9.9	-3.0			
11036	Infl. - min.	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6, 7, 9	-9.9 ... 9.9	0.0			122
11037	Adapt. time	1, 2, 3, 4, 5, 6	1, 2, 3	OFF, 1 ... 50	25	Sec		122
	-||-		4, 5, 6, 7, 9	OFF, 1 ... 50	OFF	Sec		
11038	Stop at T out		4, 5, 6, 7, 9	OFF, 5 ... 40	OFF	°C		149
11060	Limit	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6, 7, 9	-20 ... 80	5	°C		124
11061	Adapt. time	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6, 7, 9	OFF, 1 ... 50	OFF	Sec		124
11062	Infl. - max.	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6, 7, 9	-9.9 ... 9.9	0.0			124
11063	Infl. - min.	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6, 7, 9	-9.9 ... 9.9	0.0			125
11064	Limit	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6, 7, 9	-20 ... 80	25	°C		126
11065	Adapt. time	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6, 7, 9	OFF, 1 ... 50	OFF	Sec		126
11066	Infl. - max.	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6, 7, 9	-9.9 ... 9.9	0.0			126
11067	Infl. - min.	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6, 7, 9	-9.9 ... 9.9	0.0			126
11077	P frost T	2, 3, 4, 5, 6	1, 2, 3	OFF, -10 ... 20	2	°C		
	-||-		4, 5, 6, 7, 9	OFF, -10 ... 20	6	°C		
11081	Filter constant		3	1 ... 80	50			142

ID	Parameter Name	A214.x	A314.x	Setting range	Factory	Unit	Own settings	
11082	Accum. filter	4, 5	1, 2, 6, 7	1 ... 250	25	Sec		149
11086	Fan cut-in delay	1		0 ... 900	5	Sec		138
	-||-	2, 3, 4, 5	1, 2	0 ... 900	30	Sec		
	-||-	6		0 ... 900	0	Sec		
	-||-		3	0 ... 900	10	Sec		
	-||-		4, 5, 6, 7	0 ... 900	60	Sec		
	-||-		9	0 ... 900	20	Sec		
11087	Acc. cut-in delay	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6, 7, 9	0 ... 900	0	Sec		138
11088	Fan output func.	1, 2, 3, 4, 5	1, 2, 3, 4, 5, 6, 7, 9	0 ... 3	1			138
	-||-	6		0 ... 3	3			
11089	Acc. output func.	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6, 7, 9	0 ... 3	1			139
11090	Optional function	1, 3	3	0 ... 3	0			139
	-||-	2		0 ... 2	0			
	-||-	4, 5	1, 2	0 ... 4	0			
	-||-	6		0 ... 3	3			
11091	Acc. time control	1, 2, 3, 4, 5, 6	1, 2, 3	1 ... 2	1			140
	-||-		4, 5, 6, 7, 9	1 ... 3	1			
11093	Frost pr. T	2, 4	1	0 ... 40	6	°C		150
	-||-		4, 5, 6, 7, 9	5 ... 40	10	°C		
11105	Infl. - min.	2, 3, 4, 5	1, 2, 3, 4, 5, 6, 7, 9	0.0 ... 9.9	2.0			123
	-||-	6		0.0 ... 9.9	0.0			
11107	Adapt. time	2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6, 7, 9	OFF, 1 ... 50	OFF	Sec		123
11108	Limit T frost	2, 3, 4, 5, 6	1, 2, 3	0 ... 50	10	°C		123
	-||-		4, 5, 6, 7, 9	0 ... 50	12	°C		
11137	Fan function	2, 3, 4, 5, 6	1, 2	OFF ; ON	OFF			140
	-||-		3, 4, 5, 6, 7, 9	OFF ; ON	ON			
11140	Comp. T select	1, 2, 3, 4, 5, 6	1, 2, 3	OFF ; ON	ON			150
11141	Ext. input	1, 2, 3, 4, 5, 6	3	OFF ; S1 ; S2 ; S3 ; S4 ; S5 ; S6 ; S7 ; S8	OFF			150
	-||-		1, 2	OFF ; S1 ; S2 ; S3 ; S4 ; S5 ; S6 ; S7 ; S8 ; S9 ; S10	OFF			
	-||-		4, 5, 6, 7, 9	OFF ; S1 ; S2 ; S3 ; S4 ; S5 ; S6 ; S7 ; S8 ; S9 ; S10 ; S11 ; S12 ; S13 ; S14 ; S15 ; S16	OFF			
11142	Ext. mode	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6, 7, 9	COMFORT ; SAVING	COMFORT			151
11147	Upper difference	2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6, 7, 9	OFF, 1 ... 30	OFF	K		158
11148	Lower difference	2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6, 7, 9	OFF, 1 ... 30	OFF	K		159
11149	Delay	2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6, 7, 9	1 ... 99	10	Min		159
11150	Lowest temp.	2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6, 7, 9	10 ... 50	30	°C		160
11168	Max. Pressure		4, 6	0 ... 1999	400	pascal		131

ID	Parameter Name	A214.x	A314.x	Setting range	Factory	Unit	Own settings	
11169	Min. Pressure		4, 6	0 ... 1999	50	pascal		131
11174	Motor pr.	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6, 7, 9	OFF, 10 ... 59	OFF	Min		132
11177	Temp. min.	1		-20 ... 110	5	°C		118
	-||-	2, 3, 4, 5, 6	1, 2, 3	5 ... 150	10	°C		
	-||-		4, 5, 6, 7, 9	5 ... 150	15	°C		
11178	Temp. max.	1		-20 ... 110	40	°C		118
	-||-	2, 3, 4, 5, 6	1, 2, 3	5 ... 150	40	°C		
	-||-		4, 5, 6, 7, 9	5 ... 150	35	°C		
11179	Summer, cut-out		4, 5	OFF, 1 ... 50	OFF	°C		153
11182	Infl. - max.	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6, 7	-30.0 ... 0.0	-2.0			119
	-||-		9	-30.0 ... 0.0	0.0			
11183	Infl. - min.	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6, 7	0.0 ... 30.0	2.0			120
	-||-		9	0.0 ... 30.0	0.0			
11184	Xp	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6, 7, 9	5 ... 250	80	K		132
11185	Tn	1, 2, 3, 4, 5, 6	1, 2, 3, 5, 6, 7, 9	1 ... 999	30	Sec		132
	-||-		4	1 ... 999	100	Sec		
11186	M run	1, 2, 3, 4, 5, 6	1, 2, 3, 5, 6, 7, 9	5 ... 250	30	Sec		132
	-||-		4	5 ... 250	35	Sec		
11187	Nz	1, 2, 3, 4, 5, 6	1, 2, 3	1 ... 9	3	K		133
	-||-		4	0 ... 9	1	K		
	-||-		5, 6, 7, 9	0 ... 9	2	K		
11189	Min. act. time	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6, 7, 9	2 ... 50	3			133
11194	Stop difference	6		0.5 ... 9.0	1.0	K		
	-||-		4, 5, 6, 7	1 ... 15	3	K		
11301	High T max Y2		3	0.0 ... 75.0	25.0	m/s		
11303	Low T max Y1		3	0.0 ... 75.0	5.0	m/s		
11368	1. step level		4, 5, 6, 7	5 ... 95	80	%		
11369	2. step level		4, 5, 6, 7	5 ... 95	85	%		
11500	Send desired T	1, 2, 3, 4, 5, 6	1, 2, 3	OFF ; ON	ON			156
11609	Low Y		3	0.0 ... 10.0	2.0	V		
11610	High Y		3	0.0 ... 10.0	10.0	V		
11616	Alarm value	2, 3, 4, 5, 6	1, 2, 3	0 ... 1	0			161
	-||-		4, 5, 6, 7, 9	0 ... 1	1			
11617	Alarm time-out	2, 3, 4, 5, 6	1, 2, 3	0 ... 240	0	Sec		161
	-||-		4, 5, 6, 7, 9	0 ... 240	10	Sec		
11623	Digital	1, 2, 3, 4, 5, 6	1, 2	OFF ; ON	OFF			
11636	Alarm value	1, 2, 3, 4, 5, 6	1, 2, 3	0 ... 1	0			161
	-||-		4, 5, 6, 7, 9	0 ... 1	1			
11637	Alarm time-out	1, 2, 3, 4, 5, 6	1, 2, 3	0 ... 240	0	Sec		161
	-||-		4, 5, 6, 7, 9	0 ... 240	10	Sec		
11656	Alarm value	2, 3, 4, 5	1, 2, 3, 4, 5, 6, 7, 9	-20 ... 20	6	°C		162

ID	Parameter Name	A214.x	A314.x	Setting range	Factory	Unit	Own settings	
	-||-	6		-20 ... 20	-20	°C		
11676	Alarm value	1		-20 ... 20	2	°C		162
	-||-	2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6, 7, 9	-20 ... 20	-20	°C		
12140	Comp. T select		4, 5, 6, 7, 9	S1 ; S2 ; S3 ; S4 ; S5 ; S6 ; S7 ; S8 ; S9 ; S10 ; S11 ; S12 ; S13 ; S14 ; S15 ; S16	S1			150
12165	V out max.		1, 2, 4, 5, 6, 7, 9	0 ... 100	100	%		131
12167	V out min.		1, 2, 4, 5, 6, 7	0 ... 100	0	%		131
	-||-		9	0 ... 100	20	%		
12168	Max. Pressure		4, 6	0 ... 1999	400	pascal		131
12169	Min. Pressure		4, 6	0 ... 1999	50	pascal		131
12171	Reverse out		1, 2	OFF ; ON	ON			131
12174	Motor pr.	4, 5	1, 2	OFF, 10 ... 59	OFF	Min		132
12184	Xp	4, 5	1, 2, 5, 6, 7	5 ... 250	80	K		132
	-||-		4	5 ... 250	100	K		
	-||-		9	5 ... 250	60	K		
12185	Tn	4, 5	1, 2, 5, 6, 7	1 ... 999	30	Sec		132
	-||-		4	1 ... 999	90	Sec		
	-||-		9	1 ... 999	20	Sec		
12186	M run	4, 5		5 ... 250	30	Sec		132
12187	Nz	4, 5	1, 2	1 ... 9	3	K		133
	-||-		4, 5, 6, 7	1 ... 9	1	K		
	-||-		9	1 ... 9	2	K		
12189	Min. act. time	4, 5		2 ... 50	3			133
12368	1. step level		9	5 ... 95	80	%		
12369	2. step level		9	5 ... 95	85	%		
12390	Clear alarm		4, 5, 6, 7, 9	OFF ; ON	OFF			160
12615	Alarm low		4, 5, 6, 7	0 ... 100	40	%		160
12617	Alarm time-out		4, 5, 6, 7	0 ... 99	30	Min		161
13111	Limit		5, 7	0 ... 1999	900	ppm		130
	-||-		9	0 ... 1999	500	ppm		
13113	Filter constant		4	1 ... 250	40			130
	-||-		5, 6, 7, 9	1 ... 250	20			
13165	V out max.		4, 5, 6, 7, 9	0 ... 100	100	%		131
13167	V out min.		4, 5, 6, 7	0 ... 100	0	%		131
	-||-		9	0 ... 90	30	%		
13184	Xp		4, 5, 6, 7	5 ... 250	80			132
	-||-		9	5 ... 250	60			
13185	Tn		4, 5, 6, 7, 9	1 ... 999	30	Sec		132
13187	Nz		4	0.2 ... 20.0	2.0	pascal		133
	-||-		5, 7	1.0 ... 50.0	20.0	ppm		

ID	Parameter Name	A214.x	A314.x	Setting range	Factory	Unit	Own settings	
	-||-		6	0.2 ... 20.0	1.0	pascal		
	-||-		9	1.0 ... 50.0	10.0	ppm		
13356	Outlet fan, offset		5, 7	-50 ... 50	0	%		134
	-||-		9	-50 ... 50	10	%		
13357	Fan speed, red.		4	OFF, 1 ... 1999	OFF	pascal		134
	-||-		5, 9	OFF, 1 ... 100	OFF	%		
13390	Clear alarm		4, 6	OFF ; ON	OFF			160
13406	X1		4, 5, 7, 9	0.0 ... 10.0	0.0	V		134
	-||-		6	0.0 ... 10.0	2.0	V		
13407	X2		4, 5, 6, 7, 9	0.0 ... 10.0	10.0	V		135
13609	Low Y		4, 5, 6, 7, 9	0 ... 1999	0	pascal		
13610	High Y		4, 5, 7, 9	0 ... 1999	1000	pascal		
	-||-		6	0 ... 1999	200	pascal		
13614	Alarm high		4, 5, 6, 7, 9	0 ... 2000	2000	pascal		160
13615	Alarm low		4, 5, 6, 7, 9	0 ... 2000	0	pascal		160
13617	Alarm time-out		4, 5, 6, 7, 9	0 ... 30	3	Min		161
14113	Filter constant		4, 6	1 ... 250	20			130
14165	V out max.		4, 6	0 ... 100	100	%		131
14167	V out min.		4, 6	0 ... 100	0	%		131
14184	Xp		4, 6	5 ... 250	80			132
14185	Tn		4, 6	1 ... 999	30	Sec		132
14187	Nz		4, 6	0.2 ... 20.0	1.0	pascal		133
14390	Clear alarm		4, 6	OFF ; ON	OFF			160
14406	X1		4	0.0 ... 10.0	0.0	V		134
	-||-		6	0.0 ... 10.0	2.0	V		
14407	X2		4, 6	0.0 ... 10.0	10.0	V		135
14609	Low Y		4, 6	0 ... 1999	0	pascal		
14610	High Y		4	0 ... 1999	1000	pascal		
	-||-		6	0 ... 1999	200	pascal		
14614	Alarm high		4, 6	0 ... 2000	2000	pascal		160
14615	Alarm low		4, 6	0 ... 2000	0	pascal		160
14617	Alarm time-out		4, 6	0 ... 30	3	Min		161
15184	Xp		6, 7	5 ... 250	80	K		132
15185	Tn		6, 7	1 ... 999	30	Sec		132
15186	M run		6, 7	5 ... 250	30	Sec		132
15187	Nz		6, 7	1 ... 9	3	K		133
15189	Min. act. time		6, 7	2 ... 50	10			133



Installer: By: Date:

Operating Guide ECL Comfort 210/296/310, application A214/A314