ENGINEERING
TOMORROW

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Designed in Denmark

Data sheet

ECL Comfort 296 controller, Remote Control Units ECA 30 / 31 and Application Keys

Description

ECL Comfort 296
controller series

ECL Comfort 296 controller:

The ECL Comfort 296 is an electronic weather compensated temperature controller in the ECL Comfort controller family for use in district heating, central heating, cooling and ventilation systems.

Energy savings can be achieved by correct control of the flow temperature in heating and cooling systems. The controller has 2 control circuits and one additional thermostatic function.

The weather compensation function in the ECL Comfort controllers measures the outdoor temperature and controls the flow temperature to the heating system accordingly. In case it is available it also controls the domestic hotwater installation.

The weather compensated heating system increases the comfort level and saves energy.

The ECL Comfort 296 controller is configured with a selected application by means of an ECL Application Key.

The web-based Leanheat® Monitor communicates with the ECL Comfort 296 controller for an effective and easy-to-use turnkey SCADA (Supervisory Control And Data Acquisition) tool for all users, service personnel and at commissioning.
Service level can be increased and/or service costs reduced. The heating and/or cooling installation is made accessible from virtually anywhere at any time via i.e. laptops or Smartphones which increases service level and reduces response time to alarms.

The ECL Tool software for ECL Comfort 296 controller offers possibilities for an alternative remote control in relation to the Leanheat® Monitor and OPC server software.

The ECL Comfort 296 controller is designed for comfortable temperatures, optimum energy consumption, easy installation by means of the ECL Application Key (Plug-and-Play) and user-friendly operation.

Improved energy savings are facilitated by weather compensation, adjustment of temperature according to schedule, optimization as well as limitation of return temperature, flow and power.

The ECL Comfort 296 controller is easily operated by means of a dial (multi-functional knob) or a Remote Control Unit (RCU). The dial and the backlighted display guide the user through the text menus in the selected language.

The ECL Comfort 296 controller has electronic output for motorized valve control, relay output for circulation pump / changeover valve control among others, as well as alarm output.

Six Pt 1000 temperature sensors can be connected. In addition, two inputs are configured when uploading the application. The configuration can be Pt 1000 temperature sensor input, analogue input (0 – 10 V) or digital input.

Description (continued)

The enclosure is designed for panel mounting, on a wall and DIN rail.

The ECL Comfort 296 can work as a stand-alone controller and communicate with up to two RCUs.

The ECL Comfort 296 can also work with other ECL Comfort 296 / 210 / 310 controllers via the ECL 485 communication bus.

Ethernet connection is integrated in the controller. Furthermore, Modbus communication to SCADA systems (Supervisory Control And Data Acquisition) and M-bus communication to heat meters are integrated.

ECL Application Key and applications:

Different ECL Application Keys make it easy for the ECL Comfort 296 hardware to run different applications. The ECL Comfort 296 controller is loaded with the desired application by means of the ECL Application Key, which contains information about applications (basic application sketches are shown in the display), languages, factory settings and firmware.

The ECL Application Keys, series A2xx can be used in the ECL Comfort 296.

The application parameters are stored in the controller and are not affected by power break. The relevant ECL Application Keys for the ECL Comfort 296 controller can be found in the ordering section.

In addition to the above selected application keys can run and log a temperature / time controlled floor (screed) drying process for floor heating applications.

Remote Control Unit (RCU):

The RCUs ECA 30 and ECA 31 are used for room temperature control and override of the ECL Comfort 296. The display has backlight. The RCUs are connected to the ECL Comfort controllers by means of 2 × twisted pair cable for communication and power supply (ECL 485 communication bus).

The ECA 30 / 31 has a built-in room temperature sensor. An external room temperature sensor can be connected substituting the built-in temperature sensor.

Furthermore, the ECA 31 has a built-in humidity sensor and the relative humidity signal is used in relevant applications. It is possible to connect up to 2 RCUs on the ECL 485 communication bus. One RCU can monitor max. 10 ECL Comfort controllers (master / slave system).

ECL 296 controls 3-point based actuators:

If need for control of 0 - 10 Volt based actuators, the ECL 310 and extension module ECA 32 or ECA 35 is recommended for dedicated applications. Here the 0 - 10 Volt signal comes from the extension module.

Application keys, overview

Key	Subtypes usable in ECL Comfort 296:
A214	A214.1, A214.2, A214.3, A214.4, A214.5, A214.6
A217	A217.1, A217.2, A217.3
A230	A230.1 *, A230.2 *, A230.3 *, A230.4 *
A231	A231.1, A231.2
A232	A232.1
A237	A237.1, A237.2
A247	A247.1, A247.2, A247.3
A260	A260.1
A266	A266.1 *, A266.2 **, A266.9 *, A266.10 *
A267 DE	A267.1
A275	A275.1, A275.2, A275.3

*
When used in ECL 310 + ECA 32 / 35, 0 - 10 Volt controlled actuators can be used alternatively.

**
When used in ECL 310 + ECA 32 / 35 a 0 - 10 Volt controlled actuator can, alternatively, be used for the heating circuit.

This is an overview of currently available application keys which can work in the ECL Comfort 296.
The application keys can work in ECL Comfort 210 / 310 too.
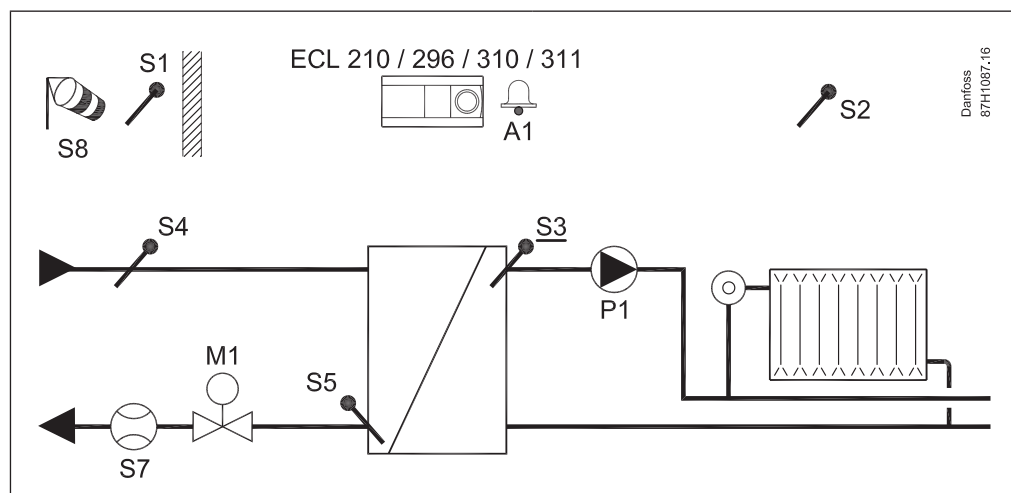Not all keys are marketed in all countries. Please contact your local Danfoss sales company.

Application examples

All mentioned components (S = temperature sensor, P = pump, M = Motorized control valve) are wired to the ECL Comfort controller.
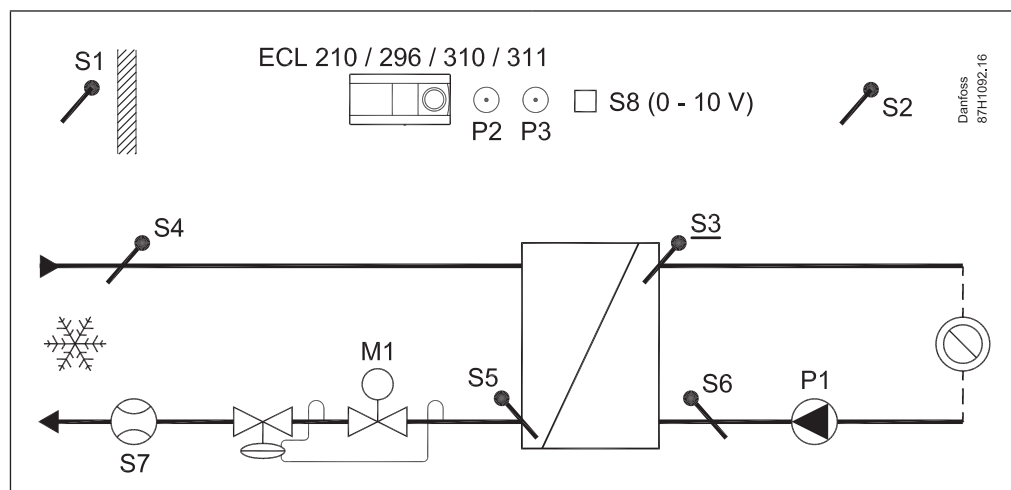
A217.1:
DHW tank charging application
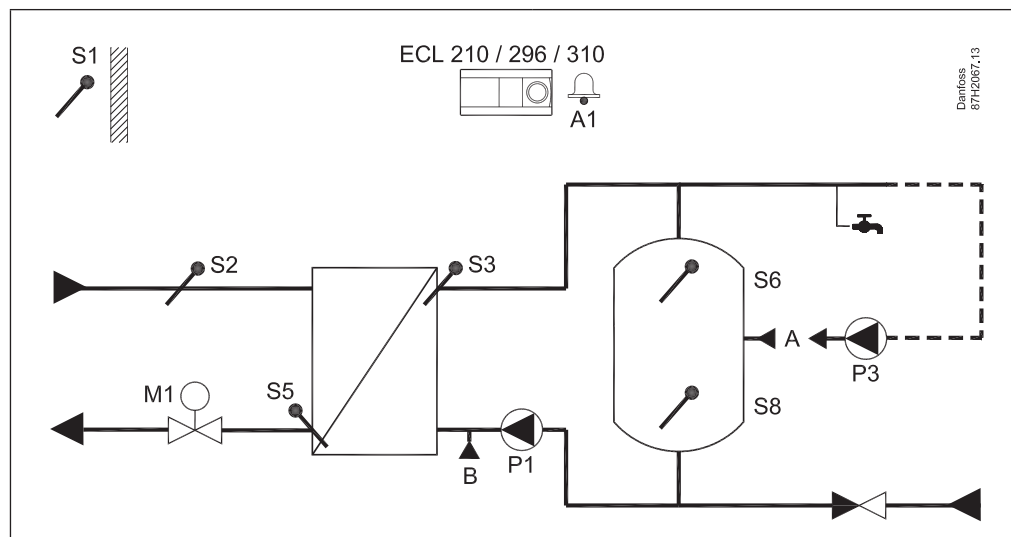
A230.1:
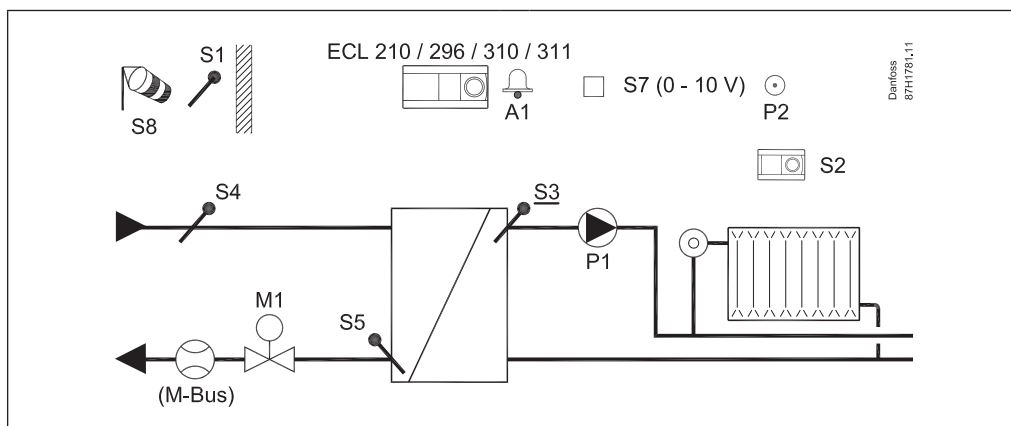Indirectly connected heating system. Wind compensation as option

A230.2:
Indirectly connected cooling system (district cooling)
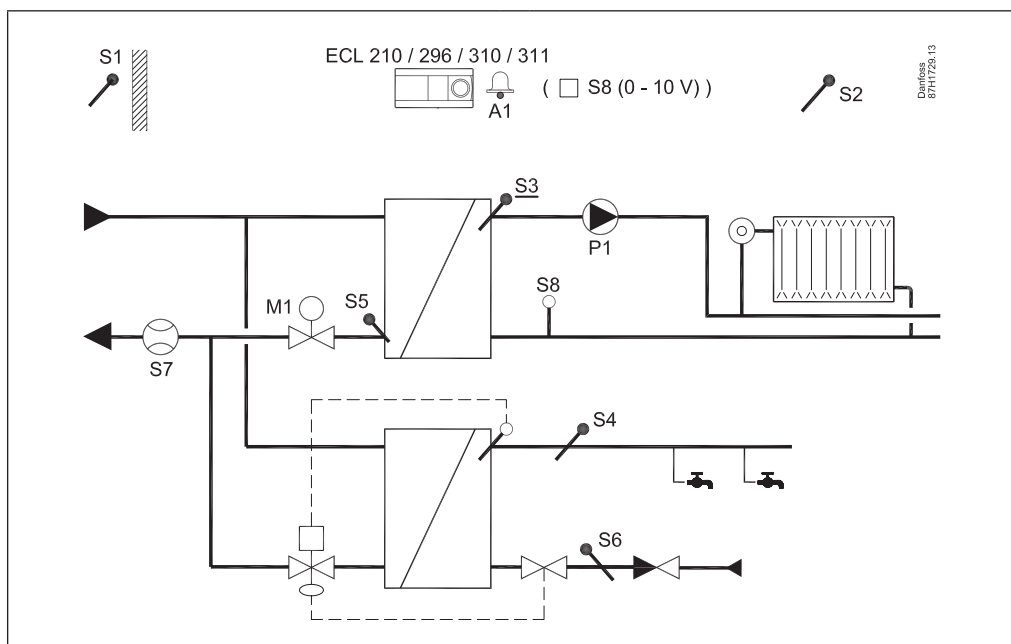
AI183286470028en-010501

A230.3:
Indirectly connected heating system. Compensation for too high Relative Humidity (measured by ECA 31). Wind compensation as option.
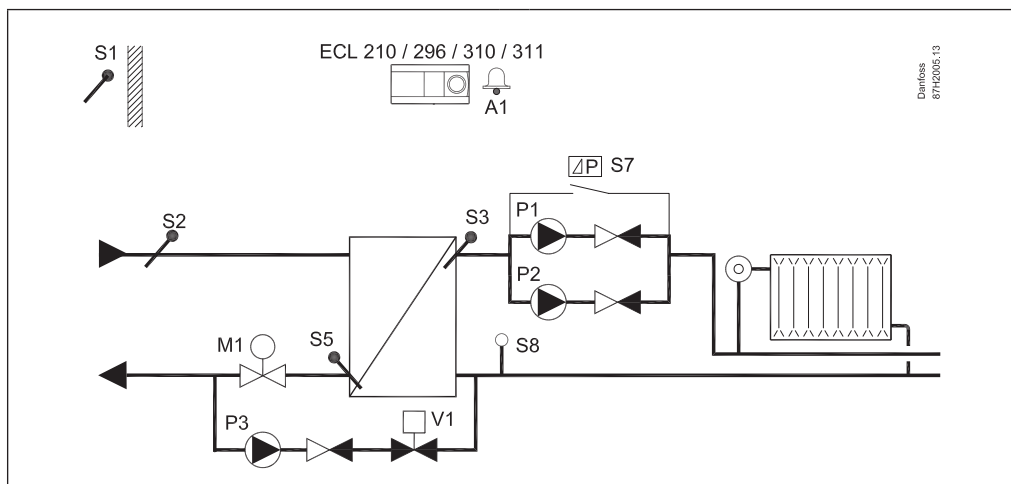

A230.4:
Indirectly connected heating system. Static pressure measurement / alarm. Monitoring of DHW - and DHW circulation return temperatures.
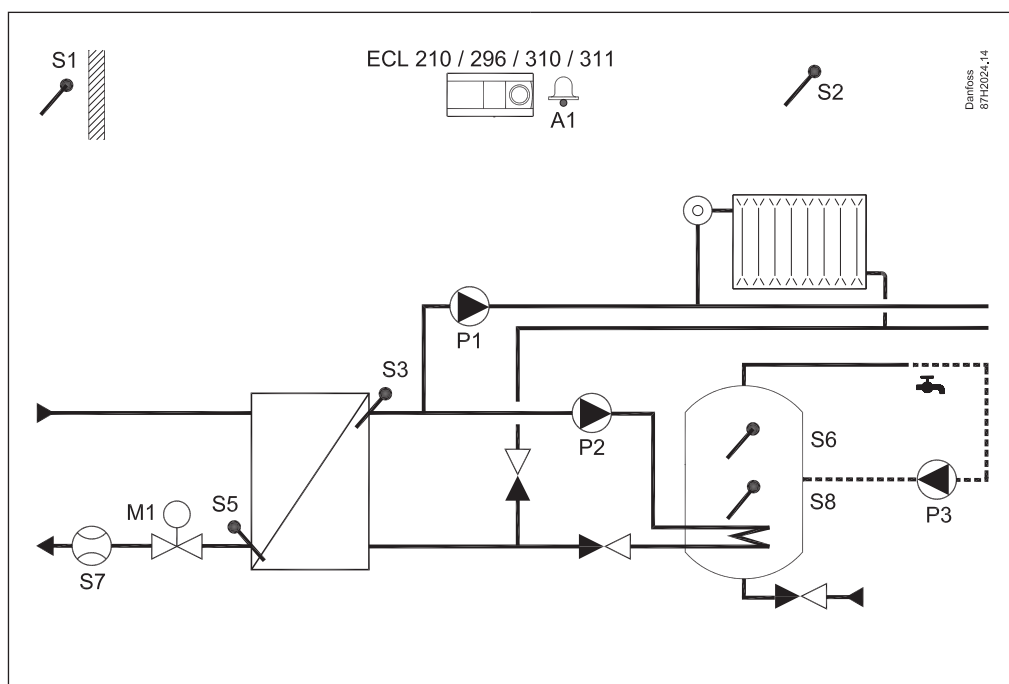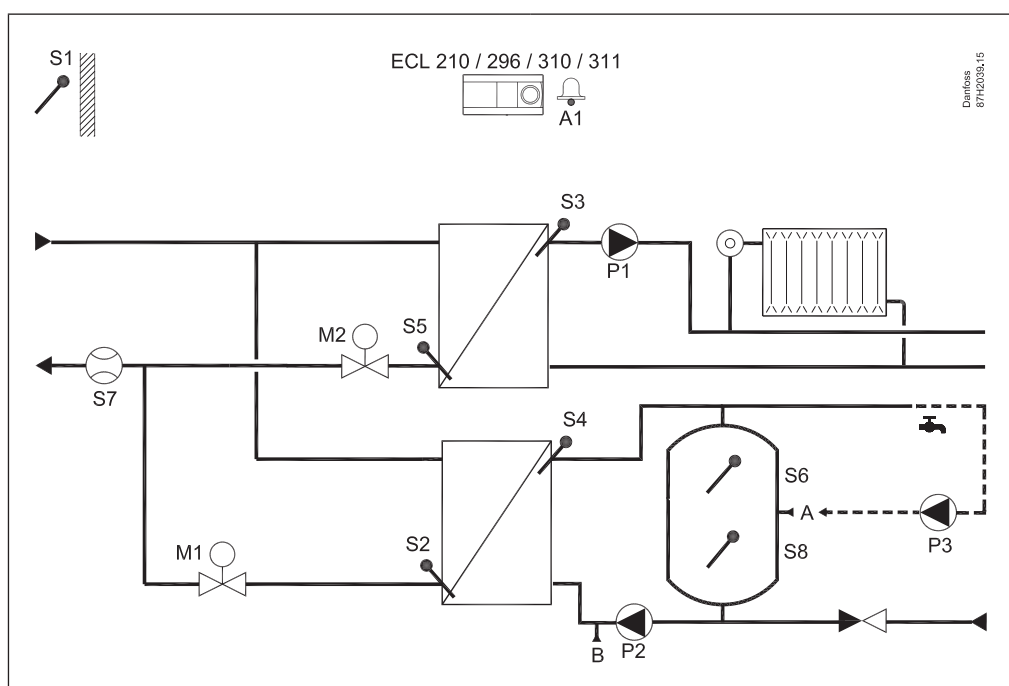

A231.2:
Indirectly connected heating system with 2-pump control and refill water function.
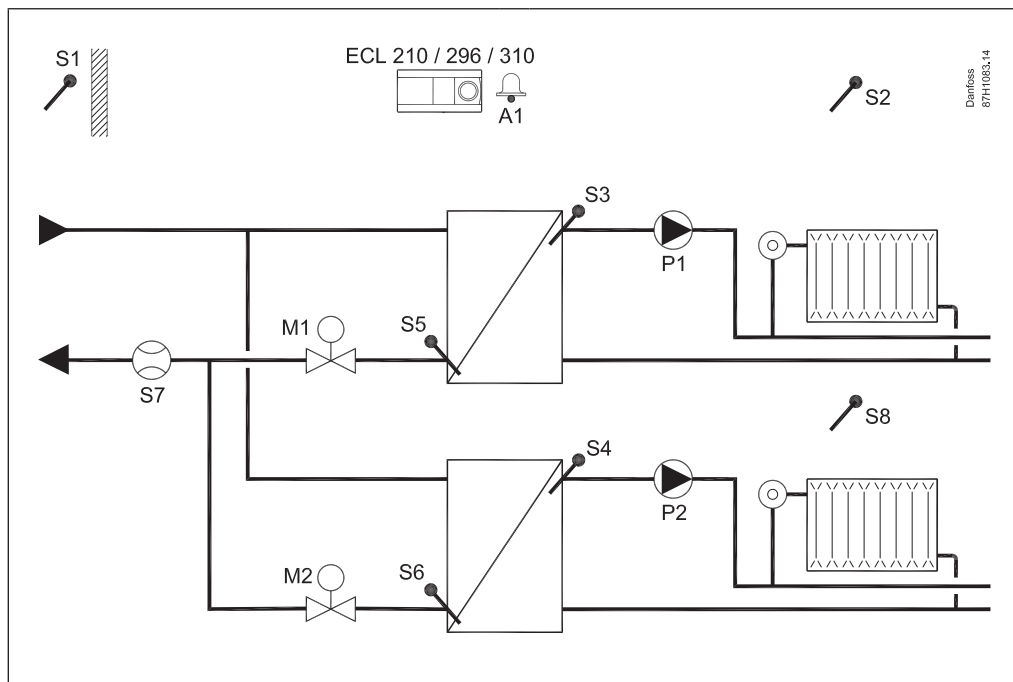
A237.1:
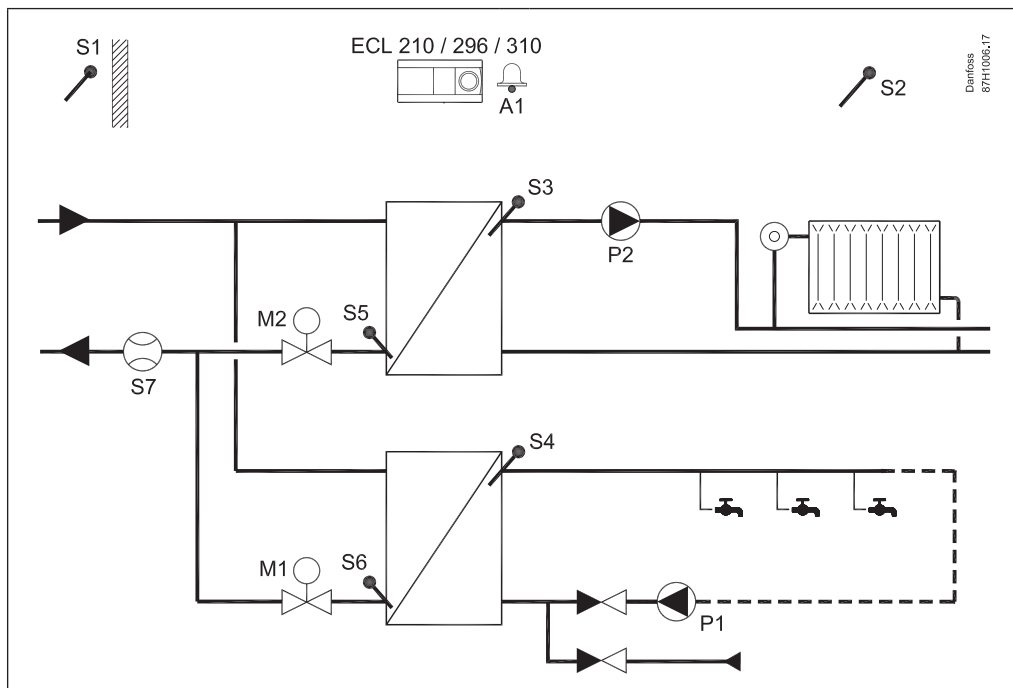Typical heating and DHW system (district heating)

A247.1:
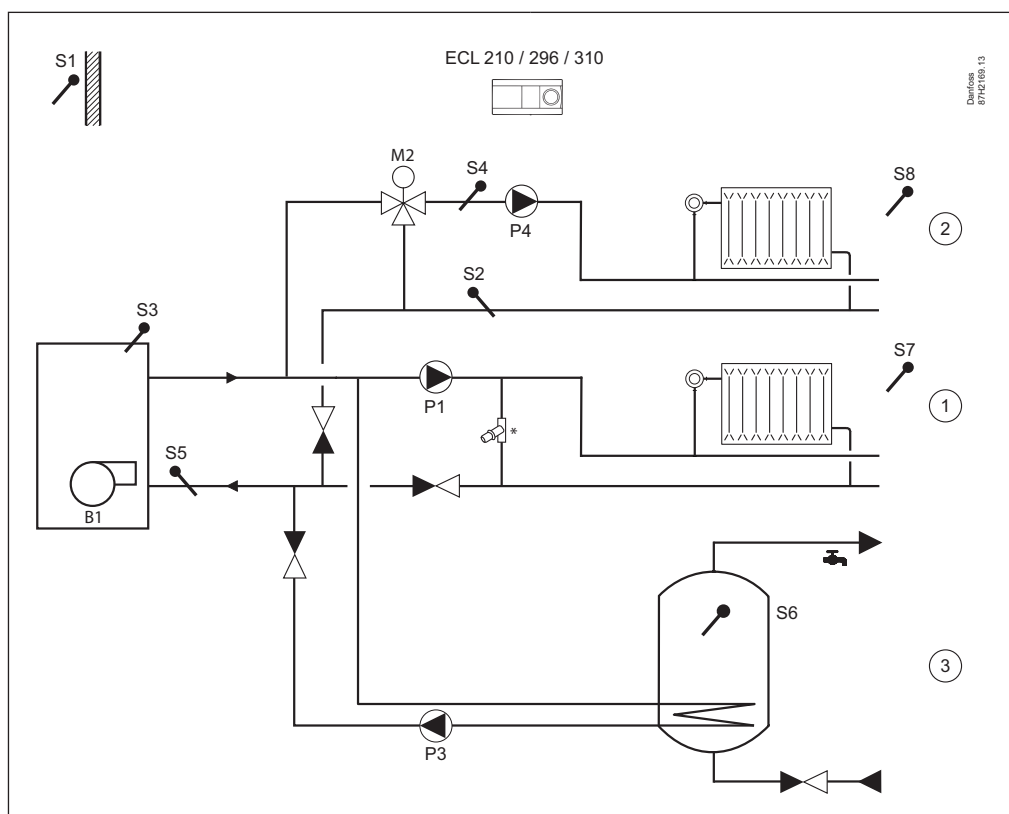Typical heating and DHW storage tank system (district heating)

A260.1:
Typical heating system (district heating)

A266.1:
Typical heating and DHW system (district heating). Remote Control Unit ECA 30 replaces a room temperature sensor.

A275.3:
Boiler-based heating system

Ordering

Controller, base parts and accessories:

Type	Designation	Code no.
ECL Comfort 296	Universal hardware - 230 V a.c. For mounting on base part or in panel cut-out. Base part and panel mounting kit are not included. Installation guide (no text) is included.	087H3000
ECL Comfort 296 base part	For mounting on wall or DIN rail (35 mm). Installation guide (no text) is included.	087H3240
Panel mounting kit	Set of connectors for panel mounted ECL Comfort 296. Installation guide (no text) is included.	087H3242

Remote Control Units and accessories:

Type	Designation	Code no.
ECA 30	Remote Control Unit with an integrated temperature sensor and possibility for connecting an external Pt 1000 temperature sensor. Base part for mounting on wall included.	087H3200
ECA 31	Remote Control Unit with an integrated temperature sensor and a humidity sensor. Possibility for connecting an external Pt 1000 temperature sensor. Base part for mounting on wall included.	087H3201
ECA 30 / 31 frame kit for mounting in panel front	For mounting in a cut-out. Format 144 × 96 mm, actual cut-out 139 × 93 mm.	087H3236

ECL Application Keys for ECL 210, 296 and 310

Type	Application type description	Controller output signals	Code no.
A214*	Constant temperature control (heating / cooling) of ventilation systems.	2 x 3-point, 2 x 2-point	087H3811
A217*	Advanced temperature control of DHW (domestic hot-water) circuit with / without storage charging system.	1 x 3-point, 3 x 2-point	087H3807
A230	• Weather compensated or constant flow temperature control of heating systems with sliding return temperature limitation and with / without wind compensation. • Weather compensated or constant flow temperature control of district cooling based systems. • Weather compensated flow temperature control of boiler based heating systems and minimum boiler temperature. • Since 1st quarter of 2016, the application key contains floor (screed) drying program.	1 x 3-point, 2 x 2-point	087H3802
A231*	Weather compensated flow temperature control with twin-pump control for circulation and make-up water.	1 x 3-point, 4 x 2-point	087H3805
A232*	Weather compensated flow temperature control in combined heating and cooling systems, typically floor systems. The slab temperature can be limited. In addition, the dew point temperature will limit the flow temperature at cooling (temperature and humidity are measured by ECA 31).	1 x 3-point, 3 x 2-point	087H3812
A237*	Weather compensated flow temperature control of systems with sliding return temperature limitation. Constant temperature control of secondarily connected DHW circuits with storage tank charging system or storage tank with internal heat exchanger. Optional ON / OFF control of the DHW circuit in connection with primarily connected storage tank with internal heat exchanger. Since 1st quarter of 2016, the application key contains floor (screed) drying program.	1 x 3-point, 3 x 2-point	087H3806
A247*	Weather compensated flow temperature control of systems with sliding return temperature limitation. Constant temperature control of DHW circuits with storage tank charging system. Since 1st quarter of 2016, the application key contains floor (screed) drying program.	2 x 3-point, 3 x 2-point	087H3808

*: Application key also contains subtypes for ECL Comfort 310.

Each of the above-mentioned code nos. comprises: ECL Application key, installation guide and user guides.

ECL Application Keys for ECL 210, 296 and 310 (continued):

Type	Application type description	Controller output signals	Code no.
A260	Weather compensated flow temperature control of heating systems with sliding return temperature limitation for two independent heating circuits. Since 1st quarter of 2016, the application key contains floor (screed) drying program.	2 x 3-point, 2 x 2-point	087H3801
A266	Weather compensated flow temperature control of heating systems with sliding return temperature limitation. Constant temperature control of DHW circuits with flow system. Since 1st quarter of 2016, the application key contains floor (screed) drying program.	2 x 3-point, 4 x 2-point	087H3800
A267 DE	Weather compensated flow temperature control of 2 heating circuits. • Temperature control of secondarily connected DHW circuit with storage tank charging system or storage tank with internal heat exchanger. • Optional ON / OFF control of the DHW circuit in connection with primarily connected storage tank with internal heat exchanger. • DHW circulation pump control. Frost protection and alarm function • Since 1st quarter of 2016, the application key contains floor (screed) drying program.	2 x 3-point, 4 x 2-point	087H3828
A275*	Boiler controller with constant temperature control of DHW circuit and weather compensated flow temperature control of a mixed and an unmixed heating circuit.	1 x 3-point, 3 x 2-point	087H3814

*: Application key also contains subtypes for ECL 310.

Each of the above-mentioned code nos. comprises: ECL application key, installation guide and user guides.

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

| Type	Designation	Code No.
ESMT	Outdoor temperature sensor	084N1012
ESM-10	Room temperature sensor	087B1164
ESM-11	Surface temperature sensor	087B1165
ESMB-12	Universal temperature sensor	087B1184
ESMC	Surface temperature sensor incl. 2 m cable	087N0011
ESMU-100	Immersion sensor, 100 mm, copper	087B1180
ESMU-250	Immersion sensor, 250 mm, copper	087B1181
ESMU-100	Immersion sensor, 100 mm, stainless steel	087B1182
ESMU-250	Immersion sensor, 250 mm, stainless steel	087B1183
Accessories and spare parts:		
Pocket	Immersion, stainless steel 100 mm, for ESMU-100, Cu (087B1180)	087B1190
Pocket	Immersion, stainless steel 250 mm, for ESMU-250, Cu (087B1181)	087B1191
Pocket	Immersion, stainless steel 100 mm, for ESMB-12, (087B1184)	087B1192
Pocket	Immersion, stainless steel 250 mm, for ESMB-12, (087B1184)	087B1193

Typical ordering, types:

ECL Comfort Controller	Mounting	Appl. key	Optional: Remote Control Unit	Temperature sensors	Actuators / valves
ECL Comfort 296	Base part or Panel kit	A2xx	ECA 30 ECA 31	ESMT (outdoor) ESM-11 (pipe surface) ESMC (pipe surface) ESMU (immersion) ESM-10 (room) ESMB-12 (universal)	see dedicated literature

Reference, additional products / software:

| Leanheat® Monitor	Internet-based communication. Access to the ECL Comfort 296 via a web browser. After having arranged an account, access to the ECL Comfort 296 can also be done via a smartphone.	See separate data sheet
ECL Tool	Software for PC or laptop. Connect the ECL Comfort 296 directly to a PC or laptop for e.g. parameter lists, commissioning reports.	Download from Internet
OPC server	Software for communication between SCADA system and ECL Comfort 296 (Modbus or TCP Ethernet connection).	See separate data sheet and download from Internet

Operation
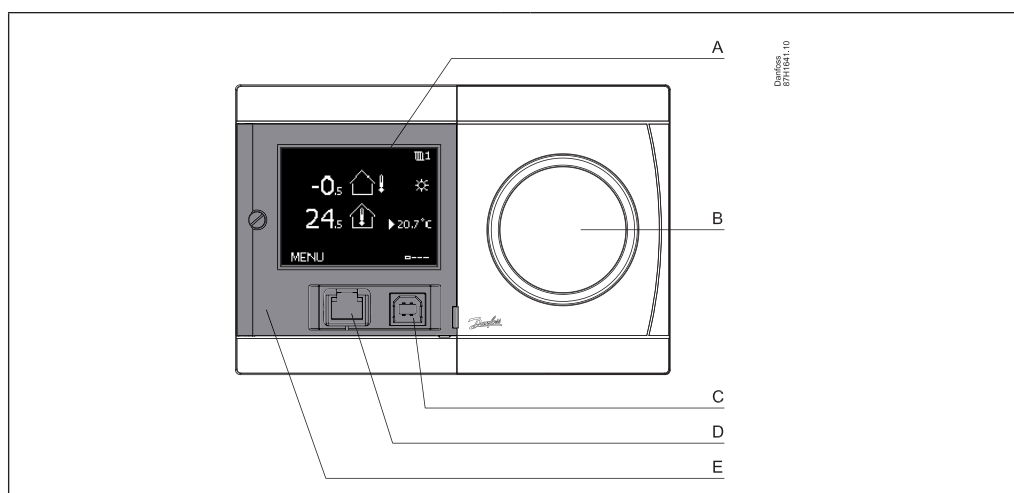

A: Display
B: Dial
C: Slot for ECL Tool connection
D: Slot for application key
E: Front door, transparent

The graphical monochrome display (A) shows all temperature values as well as status information and is used for the setting of control parameters. The display has backlight. Different favorite displays can be selected. Navigation, browsing and selecting the current item in the menus is done by means of the dial (multi-functional knob (B)).
A transparent front door covers the display and slots for application key and ECL Tool connection.

The RCUs ECA 30 / 31 are used for remote setting and override of ECL Comfort controller. By means of the built-in room temperature sensor, the flow temperature can be corrected to keep a constant room temperature at comfort or saving temperature. The ECA 30 / 31 is operated as an ECL Comfort 296 with dial and backlighted display.

Examples of favorite displays:
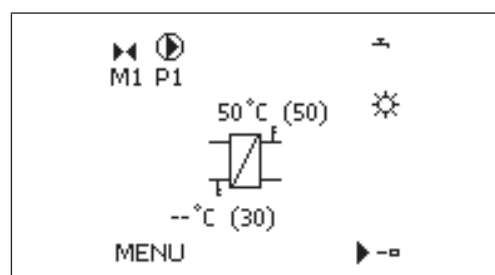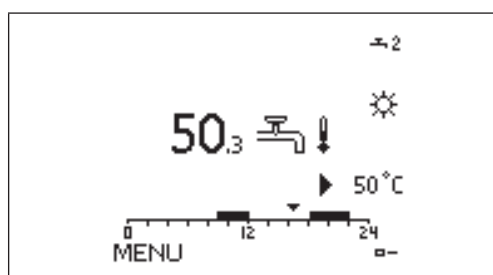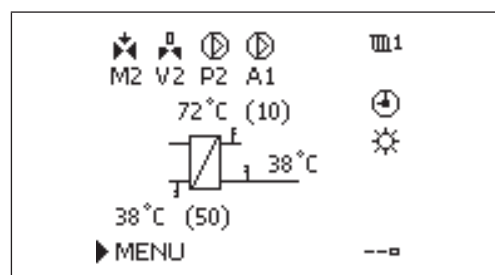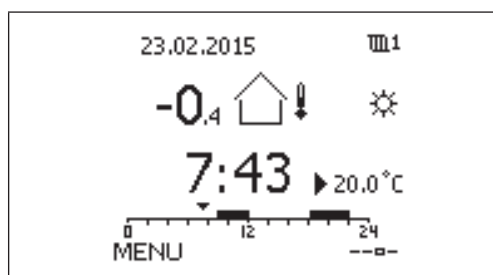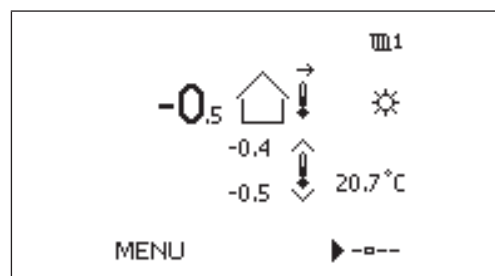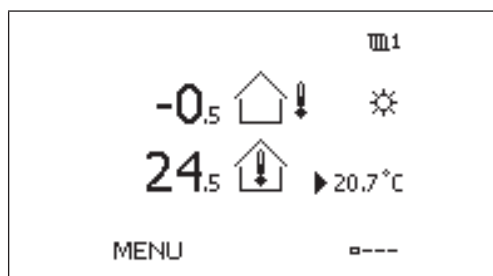
Functions

General functions:

- The ECL Comfort 296 has all the required functions of a modern electronic temperature controller for heating, cooling and DHW applications.
- The controller can be used as master or slave in systems with master / slave ECL Comfort 296 / 210 /310 controllers.
- The ECL Application Key contains the application software for flexible configuration. Furthermore, an update of the controller software is done automatically, if required.
- The ECL Comfort 296 contains, besides the standard functions, log and alarm functions.
- The built-in Real Time Clock gives automatic summer / winter time changeover, week and holiday schedule.
- Motor protection, which ensures stable control and a long life of the motorized control valve, is available for most of the applications. In periods without heat demand, the motorized control valve is exercised to avoid blocking.
- Scheduled control (Comfort and Saving mode) is based on a week program. A holiday program gives the possibility to select days with comfort or saving mode.
- If applicable in the application key the ECL Comfort 296 can receive pulses from a heat or flow meter to limit the power or the flow. Alternatively, the data can come from heat or flow meter via the M-bus connection.
- In many applications analogue input (0 – 10 V) is configured for pressure measuring among others. The scaling is set in the controller.
- Some applications are configured to handle digital input. This function can be used to have an external switch to run comfort or saving mode or react on a flow switch signal.
- The control parameters, proportional band (Xp), integration time (Tn), running time of the motorized control valve and neutral zone (Nz) can be set individually for each output (3-point control).
- Dedicated applications fulfil the demand for refill water function and / or 2-pump control.

Heating functions:

- The heat curve (relationship between outdoor temperature and desired flow temperature) is set by means of 6 coordinate points or a slope value. Max. / min. limitation of the desired flow temperature can be set.
- The return temperature limitation can work in relation to the outdoor temperature or be a set value.
- The heating cut-out function can switch OFF the heating and stop the circulation pump at high outdoor temperatures.
- Based on the room temperature the ECL Comfort 296 can correct the desired flow temperature in order to increase the comfort level.
- The optimizer function ensures heating in the desired periods (the lower outdoor temperature, the earlier cut-in of the heating).
- The ramping function makes a smooth cut-in of the heating valuable (district heating installations).
- The boost function makes a powerful cut-in of the heating (boiler based installations).
- The circulation pump is controlled in relation to heat demand and frost protection. In periods without heat demand, the circulation pump is exercised to avoid blocking.
- The saving function gives two possibilities:
  - reduced flow temperature with set reduction or reduction in relation to outdoor temperature (the lower the outdoor temperature, the less the reduction),
 - heating off, still with active frost protection.

DHW functions:

- The Auto Tuning function with automatic setting of control parameters for constant DHW temperature is integrated in the applications A217 and A266. However, Auto Tuning is only applicable with valves that are approved for Auto Tuning, i.e. the Danfoss types VB 2 and VM 2 with split characteristic as well as logarithmic valves such as VF and VFS.
- The anti-bacteria function can follow a week schedule.
- The DHW circuit can have full or sliding priority.

Communication

The ECL Comfort 296 has:

- **ECL 485** bus, non-galvanic isolated, for closed communication between master, slave and RCUs.
- **RS 485** bus, galvanic isolated, for Modbus communication.
- **M-bus**, non-galvanic isolated, for M-bus communication with meters.
- **USB**, type B, for ECL Tool (software for PC / laptop).
- **Ethernet**, RJ 45, for TCP/IP communication to Internet (Leanheat® Monitor) and SCADA systems.
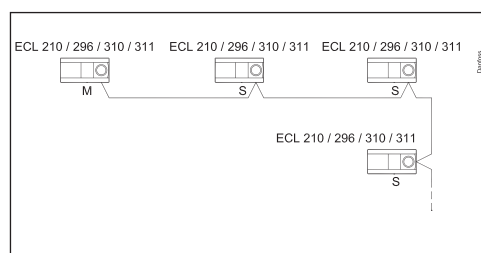
Master (M) / slave (S) connections

Languages

Most application keys contain up to 22 languages. See language list.

General data

ECL Comfort controller and RCU data:

	ECL Comfort 296	ECA 30 / 31
Ambient temperature	0 - 45 °C	
Storage and transportation temperature	-20 - 70 °C	
Installation	Installation must be avoided if there is a risk for condensation (dew)	
Mounting	To be mounted on a vertical wall and turned horizontally, on DIN rail (35 mm) or in a panel cut-out (138 x 92 mm)	To be mounted on a vertical wall and turned horizontally, or in a panel cut-out (138 x 92 mm)
Connections	Terminals in base part	Terminals in base part
Number of inputs	8 in total: 6 Pt 1000 temperature sensors. 2*) Pt 1000 temperature sensors, 0 - 10 V, pulse and digital.	-
Temperature sensor type	Pt 1000 (1000 ohm at 0 °C), IEC 751B Range: -60 – 150 °C	Alternative to built-in room temperature sensor: Pt 1000 (1000 ohm at 0 °C), IEC 751B
Digital input	12 V pull-up possible Activation of a digital input must be done with a potential free switch / contact.	-
Analog input	0 - 10 V, resolution 9 bits	-
Pulse input, frequency range (selected applications)	For monitoring: 0.01 - 200 Hz For limitation: Minimum 1 Hz (recommended) and regular pulses for having a stable control.	-
Weight	0.41 kg (ECL 296) 0.21 kg (base part)	0.14 kg
Display (ECL Comfort 296 and ECA 30 / 31)	Graphical monochrome with backlight 128 × 96 dots Display mode: Black background, white text	
Setting (ECL Comfort 296 and ECA 30 / 31)	Dial with intuitive push and turn function	
Data logging	Up to 10 days for 14 parameters	
Min. backup time for time and date	72 hours	-
Backup of settings and data	Flash memory	Flash memory
Grade of enclosure	IP 40 when mounted according to instructions	IP 20 when mounted according to instructions
$C\epsilon$-marking in accordance with the standards	EMC (ElectroMagnetic Compatibility Directive) LVD (Low Voltage Directive) RoHS (Restriction of Hazardous Substances Directive)	
Temperature control	Complies with EN 60730	

*) Configured at application upload.

ECL application key:

Storage type	Flash memory
Segmentation	Part 1: Application data, not changeable Part 2: Factory settings, not changeable Part 3: Updating SW for the ECL Comfort controller, not changeable Part 4: User settings, changeable
Applications	A2xx keys work in ECL Comfort 210, 296 and 310 A3xx keys work in ECL Comfort 310 only
Lock function	If not inserted in the ECL Comfort controller, all settings can be seen, but not changed
Menu languages	Menu languages are selectable among approx. 22 languages. See "Language list".

ECL 485 communication bus data:

Purpose	Only for internal connections between ECL Comfort 210 / 296 / 310 and ECA 30 / 31. (Danfoss proprietary bus)
Connection	Terminals in base part Non-galvanic isolated
Cable type	Shielded cable, 2 x twisted pair, Min. cross section: 0,22 mm (AWG 24). Examples: LiYCY 2 × 2 × 0.25 mm2 (AWG 24) or Ethernet CAT5
Max. total cable length (bus cable + sensor cables)	200 m in total (inclusive sensor cables)
Max. number of ECL slaves connected	Units with unique address (1 - 9): 9 Units with address "0": 5
Max. number of Remote Control Units connected	2
Data sent from master	Date Time Outdoor temperature Desired room temperature DHW-priority signal
Data sent from addressed slave controller	Desired flow temperature from each circuit
Data sent from ECA 30 / 31	• Actual and desired room temperature • Function selector mode • (ECA 31) Relative humidity

Modbus communication data:

Purpose	For SCADA system
Connection	Terminals 34 and 35 in base part. Modbus reference (terminal 36, S. Gnd) must be connected. Galvanic isolated (500 V).
Protocol	Modbus RTU
Cable type	Shielded cable, 2 x twisted pair + Signal GND. Min. cross section: 0,22 mm2 (AWG 24). Example: LiYCY 2 × 2 × 0.25 mm2 (AWG 24)
Max. bus cable length	1200 m (dependent on cable type and installation).
Communication speed	Half duplex. 9,6 Kbit/s (default) / 19.2 Kbit/s / 38.4 Kbit/s
Serial mode	8 data bit, even parity and 1 stop bit.
Network	According to the standard Modbus Serial Line Implementation Guide V1.0.

M-bus communication data:

Purpose	Connection to heat meters, max. 5 heat meters
Connection	Terminals 37 and 38 in base part. Non-galvanic isolated
M-Bus master according to	DS / EN 1434-3: 1997
Cable type	2 x 0,8 mm2 Example: JY(St)Y 2 x 0.8 mm2 (not twisted pair)
Max. cable length	50 m
Baud rate	300 baud (adjustable)
Update time	60 s (adjustable)
Gateway function	Allows the Leanheat® Monitor to read energy meters directly
Supported heat meters	Infocal 6 and many other marks and types. Information about other heat meters on request
Transmitted heat meter data	Heat meter type dependent: • Primary flow temperature • Primary return temperature • Actual flow / accumulated flow • Actual heat / power • Accumulated heat energy
Recommendations:	Danfoss recommends 230 V a.c. supplied heat meters

USB communication data:

USB CDC (Communication Device Class)	For service purposes (Windows driver is needed, to enable that Windows recognize the ECL as a virtual COM port)
Modbus over USB	Similar to the serial Modbus, but with relaxed timing
Connection, cable type	Standard USB cable (USB A -------- USB B)

Ethernet communication (Modbus / TCP) data:

Purpose	For Internet (Leanheat® Monitor) and SCADA
Connection	RJ45 female connector
Protocol	Modbus / TCP
Cable type	Standard Ethernet cable (CAT 5)
Max. Bus cable length	According to Ethernet standard
Auto cross-over detection	Enabled
Default Ethernet address (IP address)	192.168.1.100
Port number	502 (Modbus / TCP port)
Number of connections	1
Security	Must be provided by Ethernet infrastructure

A-B-C port

A port: USB (type B female plug)
B port: Ethernet (RJ45, female plug)
C port: ECL application key
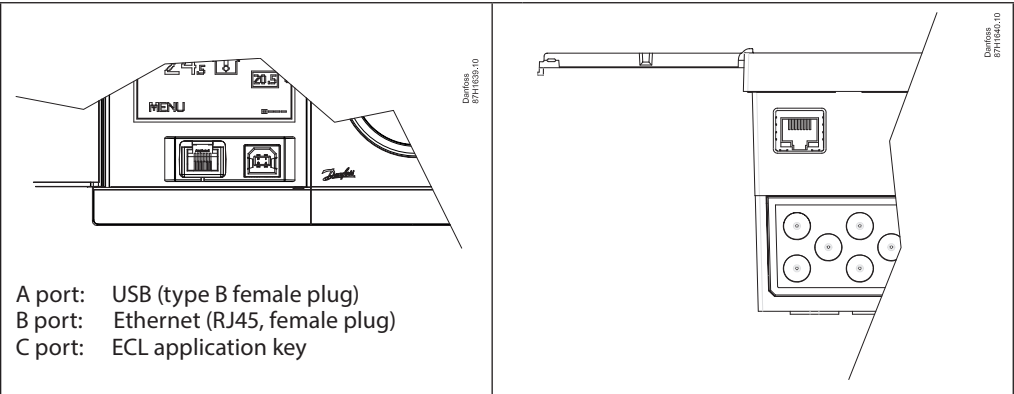
Language list

Bulgarian	Estonian	Latvian	Slovak
Croatian	Finnish	Lithuanian	Slovenian
Czech	French	Polish	Spanish
Danish	German	Romanian	Swedish
Dutch	Hungarian	Russian	
English	Italian	Serbian	

The selected language + English is uploaded at application upload.

Comparison with ECL Comfort 310 / 210

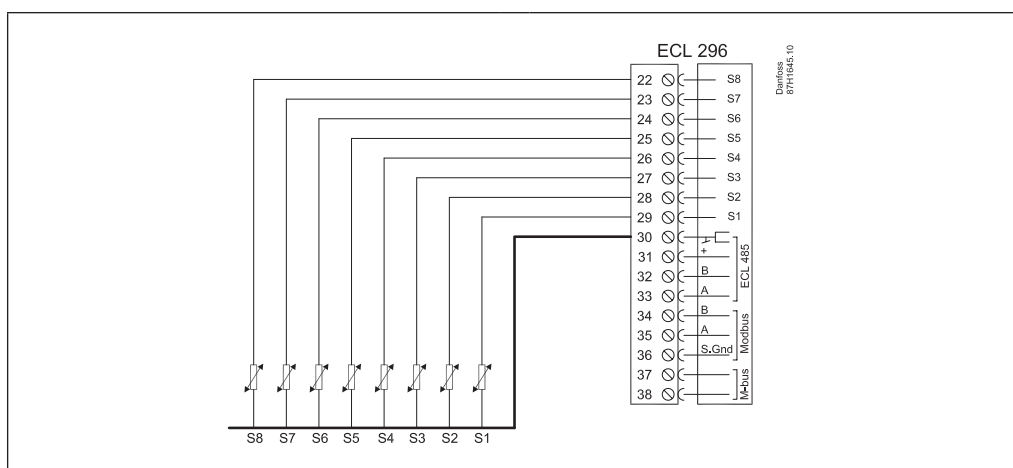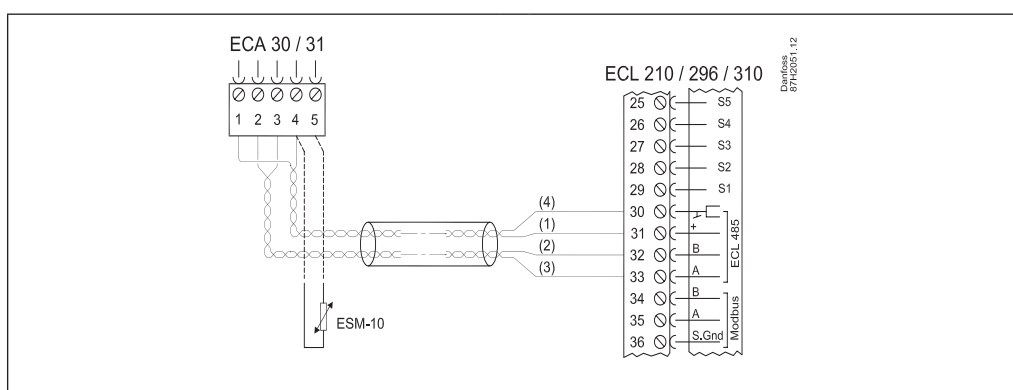|	ECL Comfort 296	ECL Comfort 310	ECL Comfort 210
M-bus communication	Yes	Yes	No
Modbus connection	Yes, galvanic isolated	Yes, galvanic isolated	Yes, non-galvanic isolated
Ethernet	Yes, RJ45 connection, Modbus / TCP. For SCADA solutions and Leanheat® Monitor	Yes, RJ45 connection, Modbus / TCP. For SCADA solutions and Leanheat® Monitor	No
Inputs	8	10	8
Relay outputs	4	6	4
Valve actuator outputs	2 x 3-point	3 x 3-point	2 x 3-point
Extension of inputs / outputs	No	Yes, ECA 32, placed in base part. • 6 inputs • 2 pulse inputs • 3 analogue outputs (0 - 10 V) • 4 relays	No
Application keys	A2xx	A2xx and A3xx	A2xx
Front dimensions (W x H, mm)	144 x 96	220 x 110	220 x 110
Supply voltage	230 V	230 V and 24 V	230 V

Wiring - 230 V a.c.
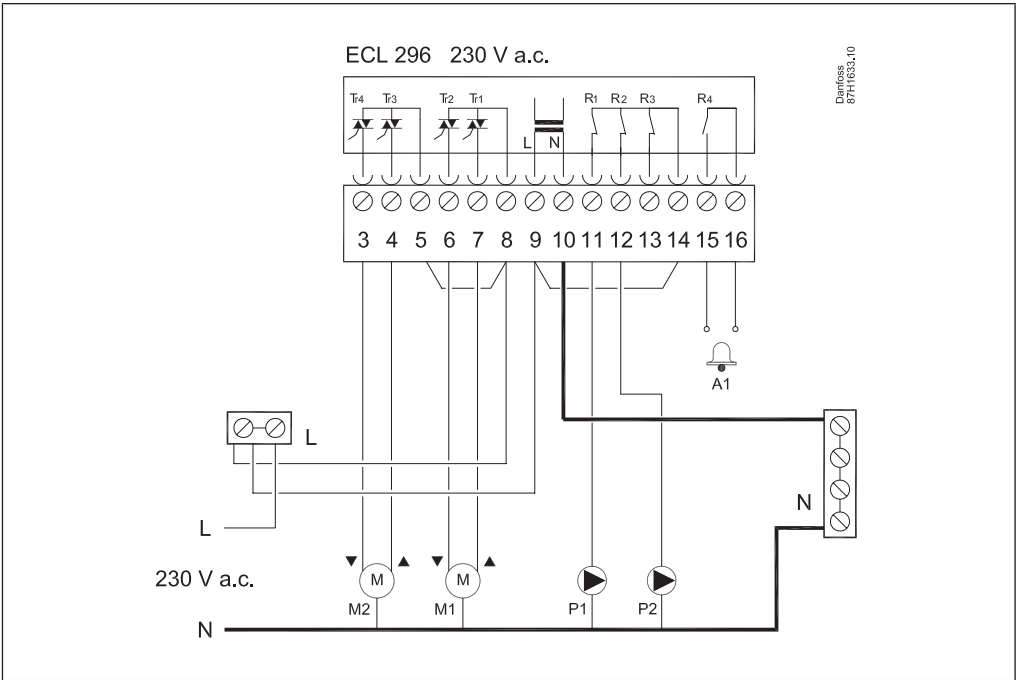
ECL Comfort 296 wiring example: Application A266.1

| Supply voltage	230 V a.c. - 50 Hz
Voltage range	207 to 244 V a.c. (IEC 60038)
Power consumption	5 VA
Max. load on relay outputs	4(2) A - 230 V a.c. (4 A for ohmic load, 2 A for inductive load)
Max. load on triac outputs for actuators	0.2 A - 230 V a.c.

Wiring - input

Wiring - ECA 30 / 31 Remote Control Unit

Wiring of ECL Comfort 296 and ECA 30 / 31

Supply voltage	From ECL 485 communication bus
Power consumption	1 VA
External room temperature sensor	Pt 1000 (ESM-10), substitutes the built-in room temperature sensor
ECA 31 only	Contains humidity sensor, used for special applications

Base part
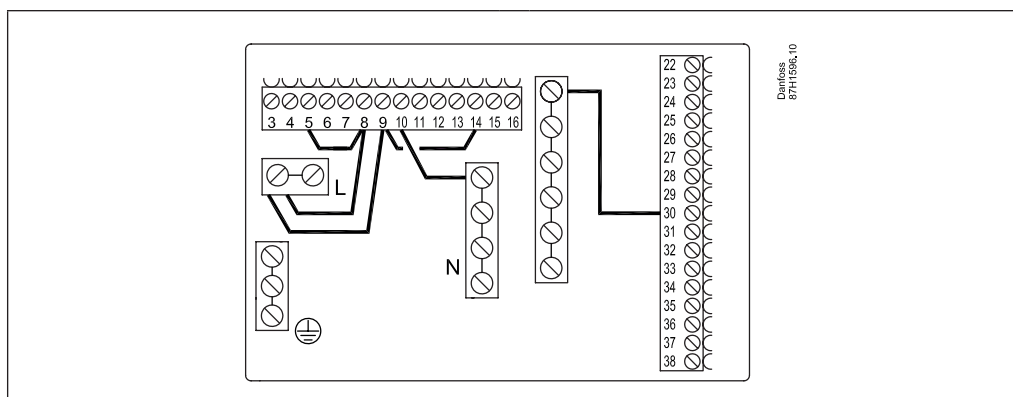
ECL Comfort 296 base part with pre-wirings

Dimensions ECL Comfort 296
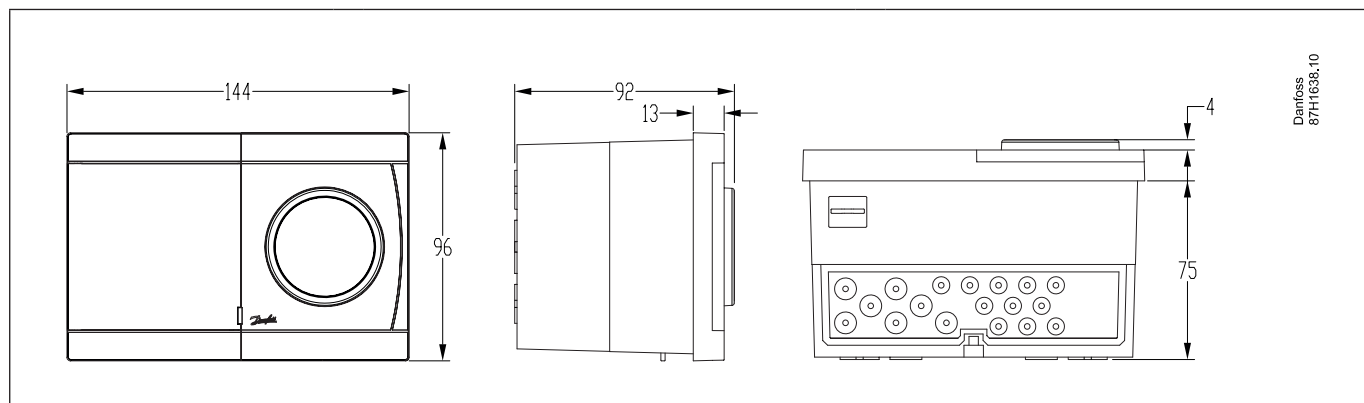
Dimensions including the base part. Depth of base part: 38 mm

Cut-out in panel for mounting

Panel kit for mounting, code no. 087H3242

The panel plate thickness A must not exceed 5 mm.
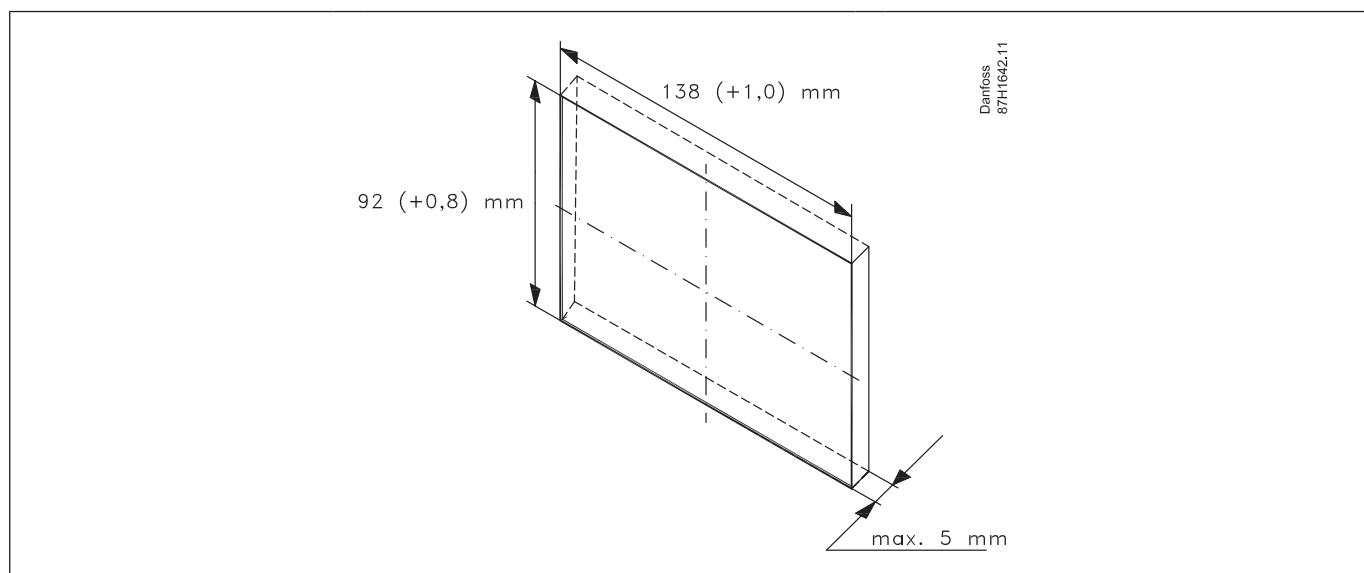
Dimensions ECA 30 / 31
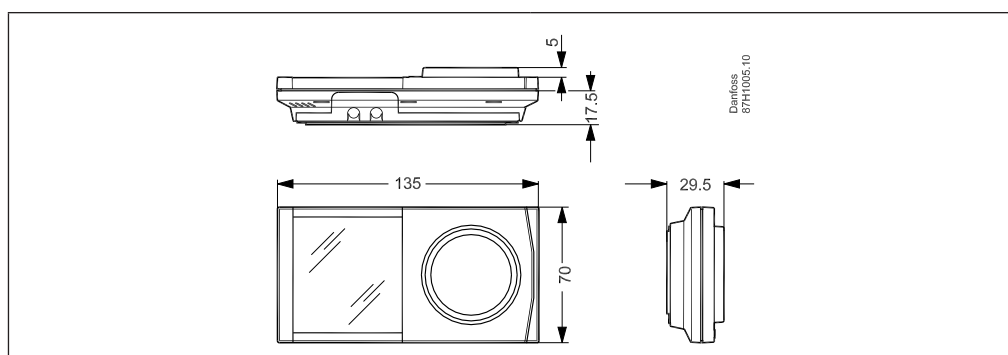
ECA 30 / 31 cut-out for mounting in panel front	A frame (code no. 087H3236) is placed in the cut-out (139 × 93 mm) in which the ECA 30 / 31 is placed.
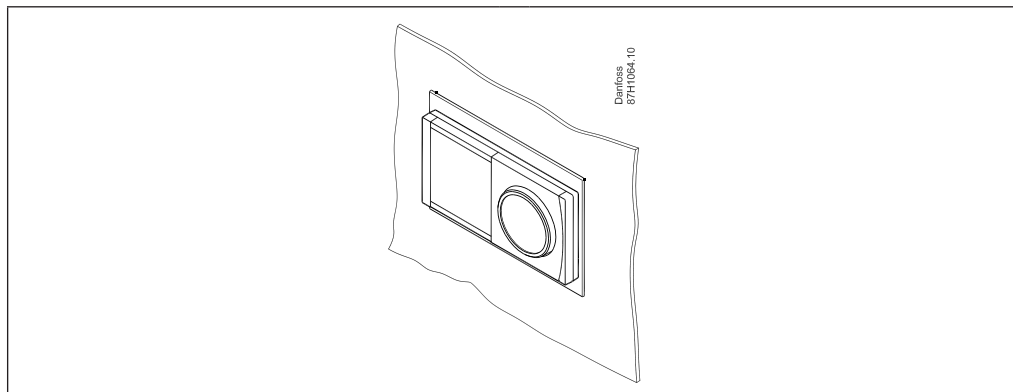
Tender text	**Electronic controller for heating and domestic hot water applications**

1a
Electronic weather compensator for flow temperature control in heating, domestic hot water and ventilation installations.
Turn-push dial, backlighted graphic display and menu-based operation in local languages.
The controller can operate multiple applications uploaded by means of application software keys.

1b
- Heat curve setting in 6 coordinates or as slope.
- Flow temperature limitations.
- Room temperature compensation and comfort / saving periods according to week schedule.
- Holiday schedule.
- Return temperature limitation as a set value (DHW) or in relation to outdoor temperature (heating).
- Pumps controlled in relation to heat demand and frost protection.
- Alarm functions and log pictures for all sensors.
- Manuel override of the individual outputs.
- Communication: M-bus (up to 5 meters), Modbus, Ethernet (e.g. internet connection to Leanheat® Monitor), ECL 485 (internal data bus).
- Connection for commissioning / service via PC
- 6 temperature sensor (Pt 1000) inputs.
- 2 application related and configured inputs.
- 4 relay outputs.
- 2 pairs of electronic output for noiseless operation of the motorized control valve.

Remote control unit ECA 30 / 31:
- Turn-push-dial, backlighted graphic display
- Integrated room temperature sensor
- Integrated humidity sensor (ECA 31 only)

1c
Main data:
- Supply voltage, 230 V a.c., 50 Hz
- Power consumption: max. 5 VA
- Ambient temperature: 0 – 45 °C
- Storage temperature: -20 – 70 °C

2
Product characteristics:
- Protection class: IP 40
- DIN rail adaptor integrated in base part
- Dimension (inclusive base part) L * W * H, 144 * 96 * 88 mm
- Ordering code no.: ECL Comfort 296, 230 V: 087H3000
- Ordering code no.: Base part for ECL Comfort 296: 087H3240
- Ordering code no.: ECA 30: 087H3200
- Ordering code no.: ECA 31: 087H3201
- Ordering code no. for application key depends on preferred application

Additional documentation for ECL Comfort 296, modules and accessories is available on *http://danfoss.com/* or *http://store.danfoss.com/*

Danfoss A/S

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