Application guide for ECL Comfort controllers

Get your job done swiftly
Easy selection of your application is the key

The ECL Comfort series offers an optimum range of electronic controllers for temperature control in heating and domestic hot water systems.

In this guide, you will find the full range of applications, intuitively described and illustrated for you to plan and design systems with confidence.

Electronic controllers from Danfoss:

Only a few products for an endless number of applications

Based on the success and benefits of previous generations, the Danfoss ECL Comfort 210 and 310 controllers ensure comfort and convenience for heating, cooling and domestic hot water systems.

The components of ECL Comfort

The ECL Comfort range consists of ECL Comfort 110, 210 and 310 – each in an elegant and timeless Scandinavian design.

ECL Comfort 110 is the choice for simple heating systems, for which the installer or user prefer a traditional operation.

ECL Comfort 210 appeals to users who prefer an increased number of options. The series offers many functional options and can be used for commercial installations. Two control circuits + thermostatic function, optimizer function, 3-point control of actuators, Modbus communication for smaller SCADA systems etc.

ECL Comfort 310 is the advanced controller with a large number of functions, such as: Three control circuits + thermostatic function, optimizer function, 3-point control of actuators, Modbus/M-bus/Ethernet communication etc.

The intelligent key concept for ECL Comfort 210/310 ensures optimum user-friendliness of these advanced controllers.

The ECL Comfort range also comprises an elegantly designed remote control in two versions, which can access all parameters in the controller.

The future is in the keys

The ECL Comfort range and its advanced software key not only meet your present demands but also the future requirements you might have for heating control.

With ECL Comfort 210/310 new demands are covered by new keys with new settings. The few basic models and the large variety of ECL keys give you a considerably better and quicker overview of the unique application opportunities offered by the ECL Comfort range. Menus are available in multiple languages.

By means of the chosen key, it is easy to set the controller and simple to change the factory settings precisely to the relevant type of system and required settings.

The schedule in the ECL Comfort can be programmed for each day in the week. The building will be heated in the comfort periods you request; also holidays can be scheduled on beforehand. This is environmentally sound and saves money.

Some features of ECL Comfort:

- Optimizer and boost function
- Return temperature limitation based on outdoor temperature
- Frost protection
- Heating cut–out function
- Year clock and automatic change-over between summer and winter time
- Copy function to/from the intelligent ECL key
- Anti-bacteria function (DHW circuit)
- Communication via the standardized RS485/TCP/IP, M-bus and Modbus options
- Motor protection
- Automatic saving
- Menus in multiple languages
- Master/slave functions
- Log and alarm
- Holiday program
- Analog input/output
- Refill water function
- Two pump control


Temp.
Mode
21°
COMFORT


ECL Comfort 210


ECL Comfort 310
14:21


ECL Comfort 310


20.01.2010
13:37
22.0°C
MENU

Automatic setup of DHW parameters

A precondition for a well functioning heating system is that the correct settings are made before it is put to use. Adjustments are necessary to preset the control parameters.

Presetting gives the following benefits:

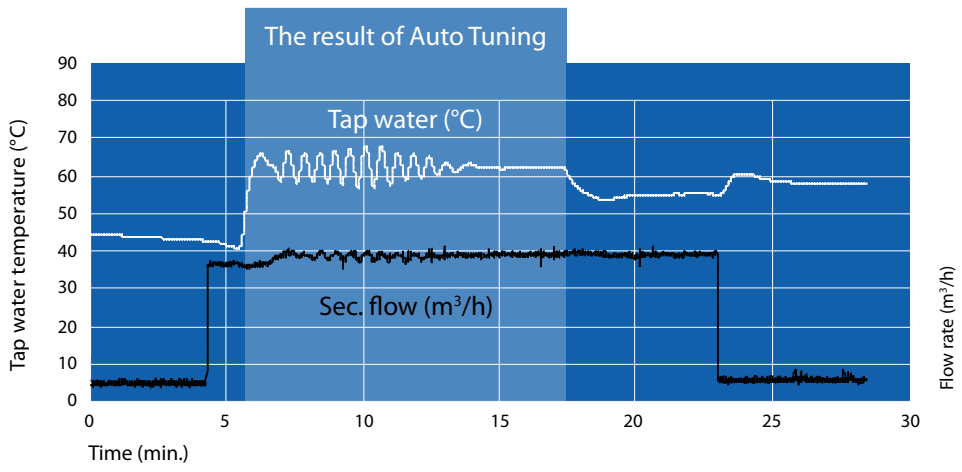
- A high degree of comfort
- Improved protection against lime deposits in DHW heat exchangers
- Energy saving
- Long operating life
- Minimum service

The introduction of automatic setting of control parameters on the controller itself, i.e. auto tuning and motor protection, gives optimum control of the DHW system. This ensures a high degree of comfort, stable control during idle operation and, subsequently, longer motor life.

The setting of control parameters can thus be reduced to one simple and reliable procedure. Auto tuning is especially necessary in DHW systems.

How to do auto tuning with ECL Comfort?

- Open for the tap water to get a constant tapping load
- Activate auto tuning by pushing a button
- Wait 7-25 minutes to complete the tuning



Intelligent communication solutions

Our solutions are wide-ranging – in every respect. We cover almost every area of application. From busy cities and suburbs to idyllic villages – as well as from public or commercial buildings to residential homes.

Intelligent solutions – intelligent communication

Danfoss communication solutions provide the ultimate in control. We don't just supply controllers, but unique software which facilitates remote monitoring and control of district heating systems. Our offering ranges from standard software fully integratable with the existing plant and buildings, to complete systems with full support.

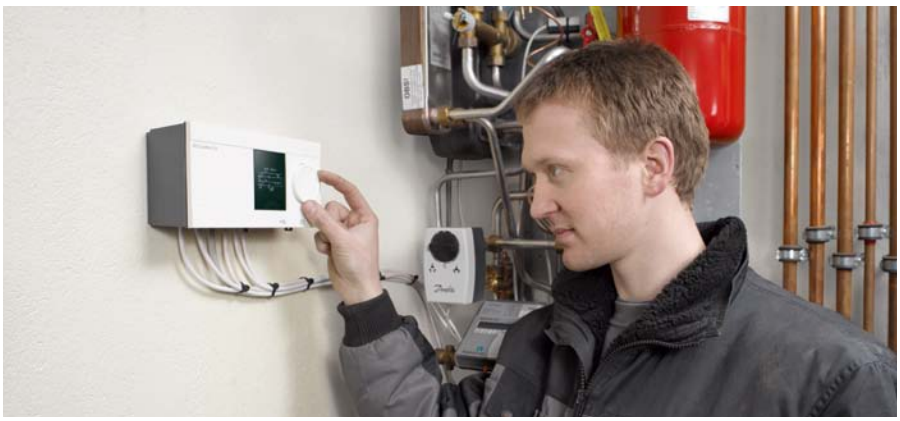
There are many good reasons to choose a solution which allows you to monitor, control – and therefore service – your system remotely, regardless of whether the system services buildings in urban areas or rural communities. Danfoss has – and will supply – an advantageous solution for you.

Your future communication platform

Remote monitoring and communication is the future as of today. Our solutions cover traditional forms of district heating and alternatives, such as biomass plants. A Danfoss platform will provide better, and simplified control over a system, which not only optimizes the control processes, but also yields savings and protects the environment. In some networks you have large pumps and large controllers leading to substantial energy usage. Here it is important with an optimized district heating network. An electronic controller will not only simplify plant management, it will also save energy.

Act proactive to service

Danfoss communication solutions enable you to act pro-actively to provide better service. Thanks to efficient monitoring and alarm systems, they can isolate and remedy problems – even before the customer knows they exist. For example; if the flow temperature is incorrect, the system will automatically activate an alarm, to warn about excessive energy consumption.



For optimum control in any system

Your requirements have been combined with our know-how to extend and innovate our product range. Danfoss markets a comprehensive range of motorized control valves with features that give an optimum fit with the ECL Comfort controller. Our control valves are available in multiple sizes, different materials and with a variety of connections. The range of motorized control valves meet the requirements in any of these applications:

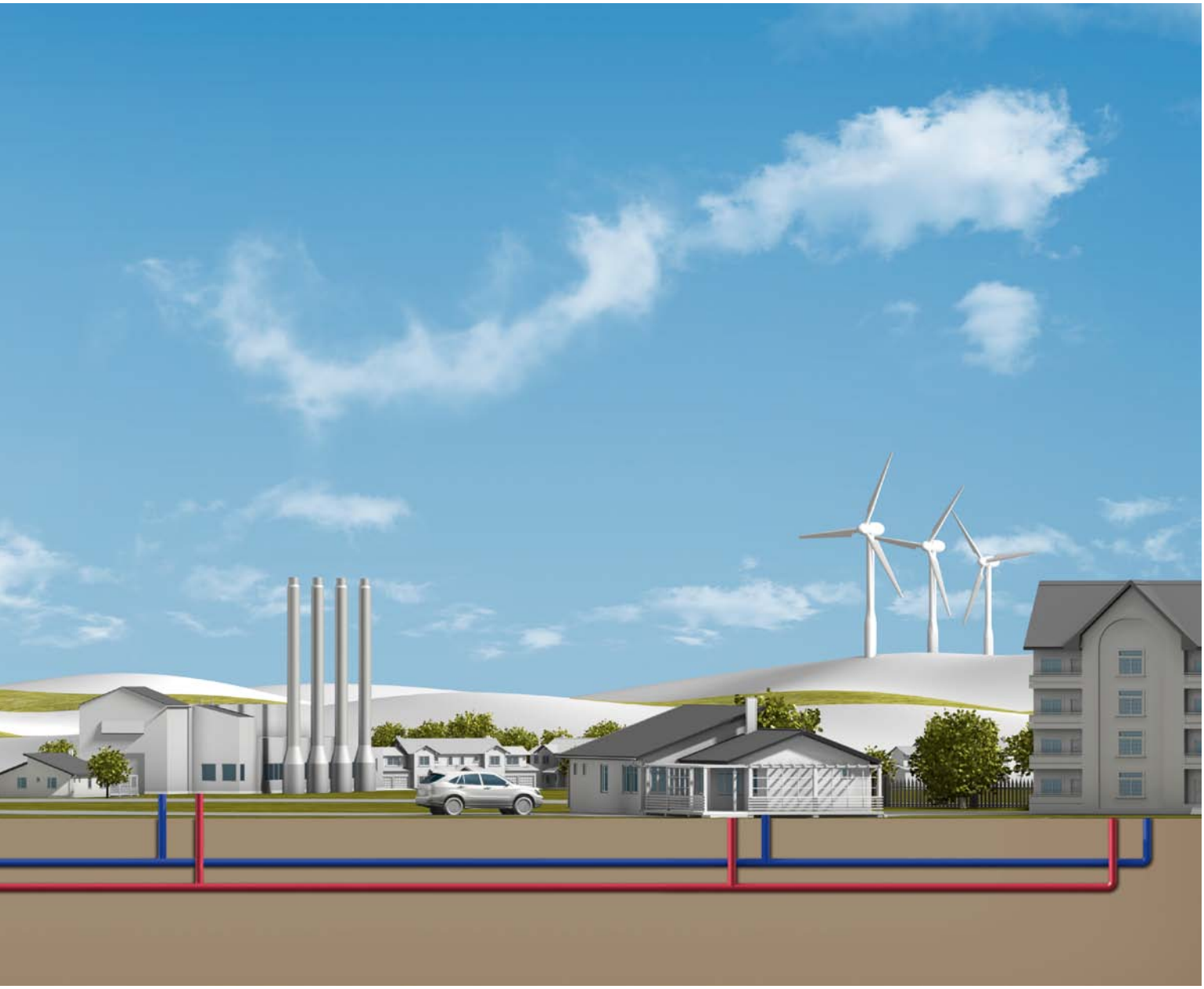
- Terminal and zone
- Heating and cooling
- District heating
- Steam

ENERGY SAVING AND COMFORT IS A MATTER OF OPTIMUM ENERGY CONTROL

When you look at urban and rural areas with varying housing densities, the selection of heat sources for each individual building will differ. Where available, district heating will most often be a part of the solution. District heating benefits the individual homeowner or tenant as well as the society at large. Where district heating is not available, individual solutions will be used – preferably in combination with renewable energy sources.

One of the solutions for achieving energy savings in any building is the use of electronic controllers for weather compensation. By letting the flow in the heating system of the house reflect outdoor temperatures, optimum operation and performance of the heating installation is obtained.

In a recently published COWI report, the advantages of weather compensation are sound and clear: In one family houses, the expected energy saving is on average 10% – and in some cases up to 40%.



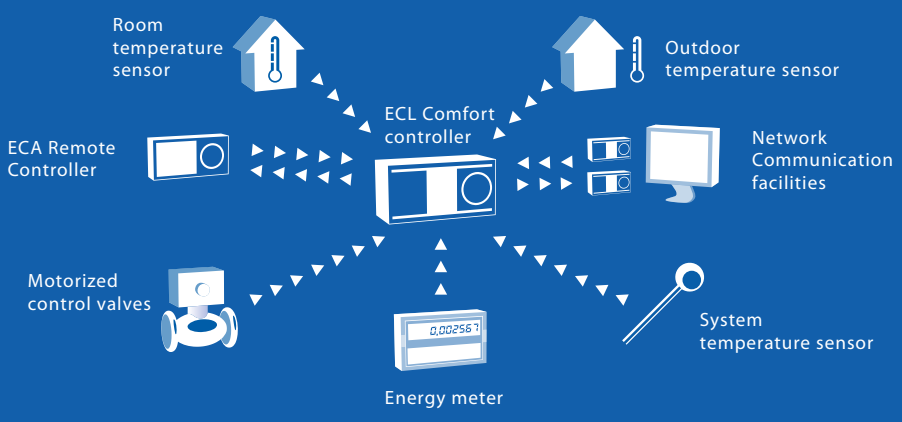
What role does the ECL Comfort play?

The ECL Comfort is an electronic controller for weather compensation. By fitting typical applications for district heating, cooling and micro network systems including communication, it enables you easily to optimize system performance and operation. This leads to energy savings and longer system life.

A correctly installed and commissioned electronic controller is the prerequisite for a stable and well-functioning heating system. Simple installation and an intuitive interface makes sure that the ECL Comfort controller is always installed correctly for the maximum benefit.

The house owners/tenants favorite

For the end-user, ECL Comfort controllers are first and foremost equal to energy savings. Lower energy consumption, registered by the Sonometer™ connected to the ECL Comfort, and a smaller heat bill will always be popular. The comfort level is of course still the same, and operation is made easy with the single dial interface which features a modern design.



A few steps of commissioning that put you...

Countless advantages

For successful commissioning of the Danfoss ECL Comfort controller only a few steps are required. It is very straightforward, and in fact you don't need any special programming knowledge.

- Elegant no-fuss user interface
- Intuitive software makes operation a breeze
- Instant feedback displayed in your own language
- Access to user data, alarms, logs and settings
- User-friendly technical documentation

Setup wizard
– Language selection
After wiring and connecting system components, such as pumps, actuators and temperature sensors, you can insert the ECL Application Key. Use the turn/push dial to select your preferred language and follow the setup progress on the display.

Setup wizard
– Application selection
Select your application from the system application range included on the ECL Application Key.
You can choose from application-specific factory settings or user-specific settings if they have been stored on the key.

The key to easy installation

The ECL Comfort controller is matched with a full range of ECL Application Keys. Each Application Key is programmed with specific parameters for a particular district heating or cooling application.

The ingenious ECL Application Key makes it easier than ever to install and set up your heating system application in the ECL controller, all without any need for advanced programming. This makes it easy to manage and adjust your application settings.

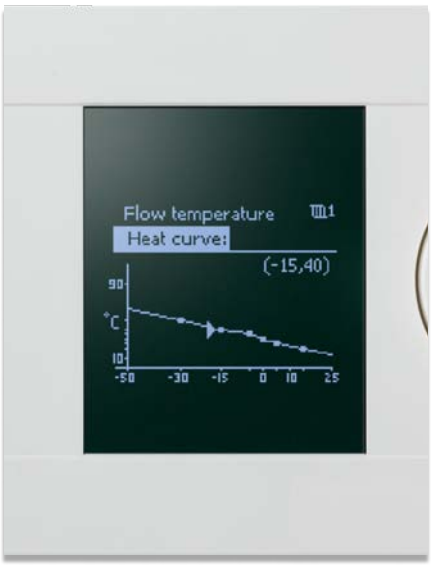
In the event of malfunction in the heating system the application parameters won't be affected by e.g. power failure since they are stored in the controller. Besides the data logging facility in the ECL controller facilitates troubleshooting and keeps system maintenance at a minimum.

The Application Key also facilitates copying of settings to other ECL controllers in the system. This makes it easy to adjust settings and helps ensure smooth operation and energy optimisation for years to come.

...one step ahead of schedule

Main controller settings

The main control parameters should be configured for optimum commissioning. They are located in the "settings" menu. Room heating and DHW flow temperatures are set in the user menus.



Heating curve

With six configurable coordinates for the flexible heating curve, the ECL Comfort 210/310 controller meets all requirements for achieving an accurate comfort temperature level in the system.

Favorite display

Select your favorite display from a set of pre-defined displays in order to get a quick system overview. Using your favorite display, you can perform functions such as selecting the controller mode (scheduled, comfort, saving or frost protection mode) and desired comfort temperature level (room and DHW).

One key

100% application expertise

The data programmed in every ECL Application Key incorporates dedicated and applied expertise from worldwide experience with district heating applications. This is your best guarantee for optimum system performance.

No

unplanned service visits

With correct commissioning, the lasting durability of ECL leads to full customer satisfaction and no unplanned service visits.

ECL COMFORT 210

Stand-alone controller without communication interface for applications with up to 2½ circuits

- 2½ control circuits + thermostatic function
- Intelligent ECL Application Keys, series A2xx
- Turn/push dial navigation
- Large graphical display with backlight
- More room for cabling
- Cable box and user interface can be separated
- Two 3-point control outputs optimised for actuators
- 8 inputs: 6 Pt 1000, 2 configurable
- 4 relay outputs
- Data logging readout on display or via USB interface
- USB port for service
- Modbus RS485 for short cable distances
- Master/slave option
- Optimised for substations and operation in a system using Danfoss actuators, control valves, Pt 1000 sensors and pressure transmitters

ECL 210 summary:

Basic requirements, high performance in district heating systems.

ECL COMFORT 310

Controller with communication interfaces for applications with up to 3½ circuits

In addition to the features of the ECL Comfort 210, the ECL Comfort 310 gives you:

- Integrated communication interfaces:
  - USB interface for service
  - Modbus RS485 for longer distances
  - M-bus master dedicated for heat meters
  - Modbus TCP
- 10 input: 6 Pt 1000, 4 configurable
- Three 3-point output optimised for actuators
- 6 relay outputs
- Data logging readout on display or via communication interface

ECL 310 summary:

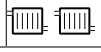
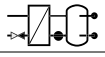
For high requirements – with communication and extension options, without programming.

ECA Remote controller – Remote Control Unit (RCU):

In case of limited access to the basement or heating system, the ECL Comfort controller can be supplemented with a remote control unit, ECA 30/31, which can be placed at any desired location in the building.

This enables room temperature monitoring and control, easy interfacing, and remote access for overriding all the functions of the ECL Comfort controller.

Select ECL Comfort for your application

ECL COMFORT		ECL Application Key designation	Application and system type	Circuit types			Domestic hot water (DHW)			Reference to current ECL cards
ECL 210	ECL 310			Heating	Cooling	DHW	Storage with internal heat exchanger	Storage with charging	DHW control with HEX	(ECL Comfort 200/300)
■	■	A214	DH/DC (Vent)							C14
■	■	A217	DH							P16, P17, C17
■	■	A230	DH/DC	 (1	 (1					P30, C12, C30, L10 (2
■	■	A231	DH							NEW
■	■	A232 (2	DH/DC							L32
■	■	A237	DH							C35, C37
■	■	A247	DH							C47
■	■	A260	DH							C60, C62
■	■	A266	DH							C66, F11
■	■	A275	BOILER							P20, C25, C55, C75
	■	A361	DH							NEW (incl. L62)
	■	A367	DH							C67
	■	A368	DH							NEW (incl. L66)
	■	A376	DH							L76
	■	A377 (2	DH							NEW

Legend for ECL Application Key designation:
A = Application Key
2 = Suitable for ECL Comfort 210 and 310
3 = Only suitable for ECL Comfort 310
xx = Specific application type

Abbreviations: DH (district heating); DC (district cooling)
Notes: (1 = Either heating or cooling
(2 = Coming later

ECL extension options

For applications with extended requirement additional I/O extension modules will be available.

- For refill water and two pump function an internal I/O module can be used
- For analog (0 - 10 V) control of motorized control valves
- Extra signal inputs

ECL accessories and temperature sensors

- Base part for mounting on wall or DIN rail
- Temperature sensors (Pt 1000)
  - Outdoor and room
  - Surface and immersion

Index for applications keys

ECL Comfort 110	Application	Description	Page
■	116	Electronic temperature control of DHW circuits	13
	130	Electronic temperature controller for weather compensated flow temperature control of directly or indirectly connected heating systems	14

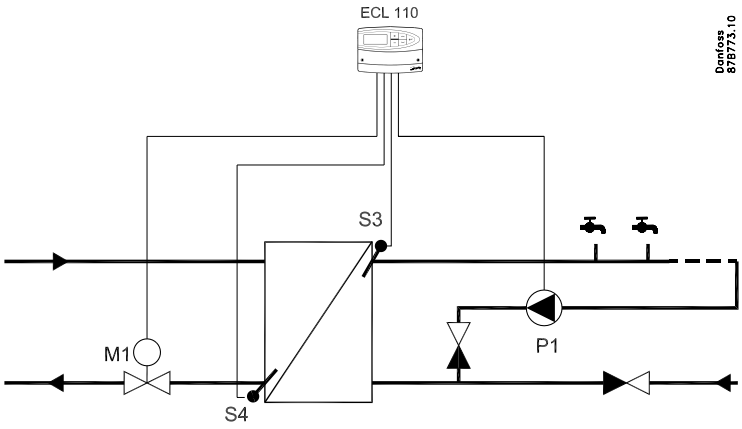
ECL Comfort 210	ECL Comfort 310	Application	Description	Page
■	■	A214	Multi purpose application. Temperature control of, for example, ventilation systems with heating or cooling or a combination of these. Outdoor temperature based compensation, return temperature limitation, frost and fire protection. Optional analog control of cross-flow or rotary heat exchanger. Alarm function related to duct / flow temperature, fire and frost.	15
■	■	A217	Advanced temperature control of DHW circuit with storage tank, directly heated or charging system. Return temperature limitation. Optional control of pre-heating circuit. Alarm function related to flow temperature.	24
■	■	A230.1 Heating	Outdoor temperature compensated control of flow temperature in a heating circuit. Room temperature and wind speed compensation. Sliding return temperature limitation. Alarm function related to flow temperature.	26
■	■	A230.2 Cooling	Control of flow temperature in a cooling circuit. Room and outdoor temperature compensation. Return temperature limitation.	28
■	■	A231	Outdoor temperature compensated control of flow temperature in a heating circuit. Sliding return temperature limitation. Control of one or two circulation pumps. Optional control of flow temperature related to supply temperature. Refill water function. Alarm function related to flow temperature, pressure and circulation pumps operation. Additional function in A331: Control of one or two pumps for refill water function.	30
■	■	A237	Outdoor temperature compensated control of flow temperature in heating circuit. Room temperature compensation and sliding return temperature limitation. Temperature control in DHW circuit with storage tank, directly heated or charging system. Return temperature limitation. Possibility for DHW priority. Alarm function related to flow temperatures.	32
■	■	A247	Outdoor temperature compensated control of flow temperature in heating circuit. Room temperature compensation and sliding return temperature limitation. Temperature control in DHW circuit with storage tank, directly heated or charging system. Return temperature limitation. Possibility for sliding DHW priority. Alarm function related to flow temperatures.	34
■	■	A260	Outdoor temperature compensated control of flow temperature in two heating circuits. Room temperature compensation and sliding return temperature limitation. Circuits independent in parallel or circuit 2 after circuit 1. Alarm function related to flow temperatures.	38
■	■	A266	Outdoor temperature compensated control of flow temperature in heating circuit. Room temperature compensation and sliding return temperature limitation. Flow temperature control in DHW circuit. Return temperature limitation. Sliding DHW priority possibility. Optional DHW temperature control related to DHW flow detection. Alarm function related to flow temperatures.	40
	■	A361	Outdoor temperature compensated control of flow temperature in two heating circuits. Sliding return temperature limitation. Control of one or two circulation pumps in each heating circuit. Optional control of flow temperature related to supply temperature. Refill water function. Alarm function related to flow temperature, pressure and circulation pumps operation.	42
	■	A367	Outdoor temperature compensated control of flow temperature in two heating circuits. Room temperature compensation and sliding return temperature limitation. Heating circuits work independent in parallel or circuit 2 after circuit 1. Temperature control in DHW circuit with storage tank, directly heated or charging system. Return temperature limitation. DHW priority. Alarm function related to flow temperatures.	43
	■	A368	Outdoor temperature compensated control of flow temperature in heating circuit. Sliding return temperature limitation. Control of one or two circulation pumps. Optional control of flow temperature related to supply temperature. Refill water function for one or two pumps. Flow temperature control in DHW circuit. Return temperature limitation. Sliding DHW priority possibility. Control of one or two circulation pumps. Alarm function related to flow temperature, pressure and circulation pumps operation.	46
	■	A376	Outdoor temperature compensated control of flow temperature in two heating circuits. Room temperature compensation and sliding return temperature limitation. Heating circuits work independent in parallel or circuit 2 after circuit 1. Flow temperature control in DHW circuit. Return temperature limitation. Sliding DHW priority possibility. Optional DHW temperature control related to DHW flow detection. Alarm functions related to flow temperatures, pressures and extra alarm input. Optional control of motorized control valves by means of analog signal (0 - 10 volt).	48

Electronic temperature control of DHW circuits.

116

Example a

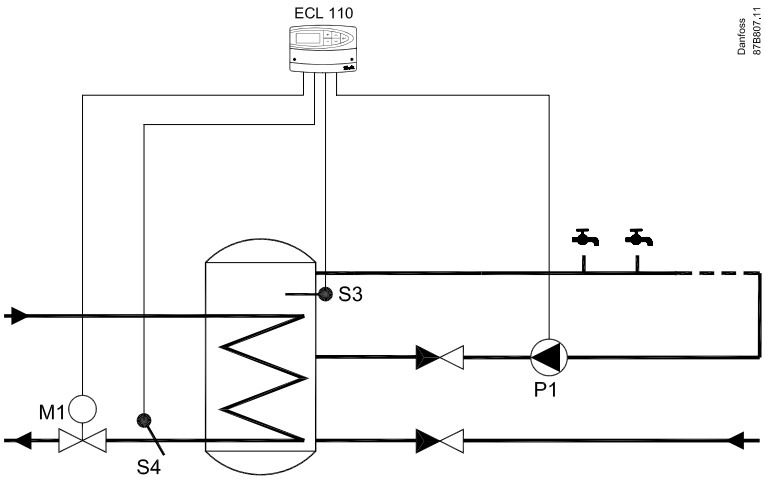
Constant DHW temperature control with heat exchanger.



116

Example b

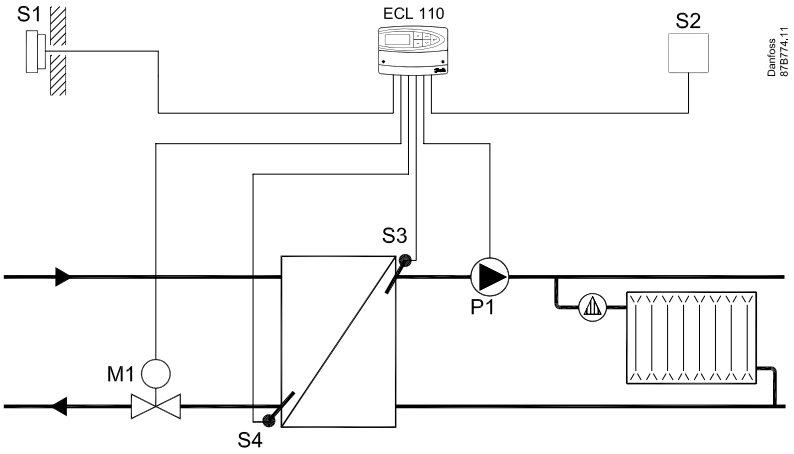
Constant temperature control of DHW circuit with storage tank with built-in heating coil.



ECL Comfort 110 Application 130

Electronic temperature controller for weather compensated flow temperature control of directly or indirectly connected heating systems.

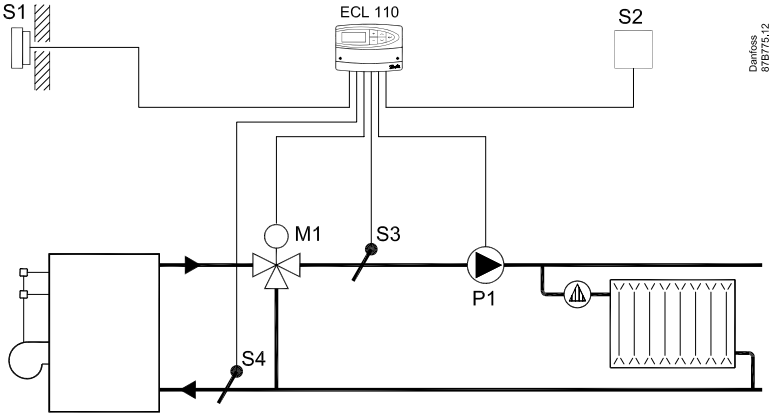
130



Example a

Distric heating circuit with heat exchanger.

130



Example b

Boiler based heating circuit.

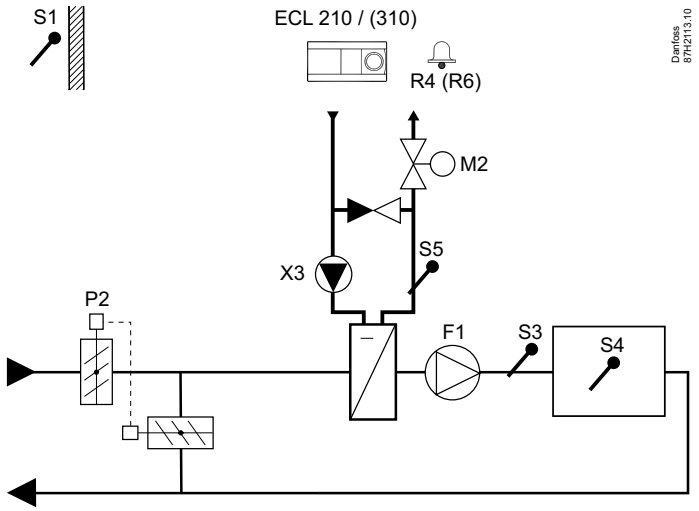
ECL Comfort 210/310 Application A214/A314

Multi purpose application. Temperature control of, for example, ventilation systems with heating or cooling or a combination of these. Outdoor temperature based compensation, return temperature limitation, frost and fire protection. Optional analog control of cross-flow or rotary heat exchanger.
Alarm function related to duct / flow temperature, fire and frost.

A214.1

Example a

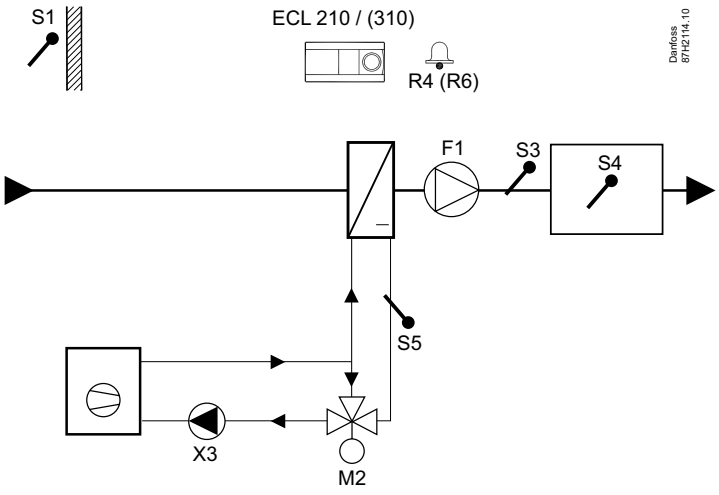
Ventilation system with cooling and constant room temperature control.



A214.1

Example b

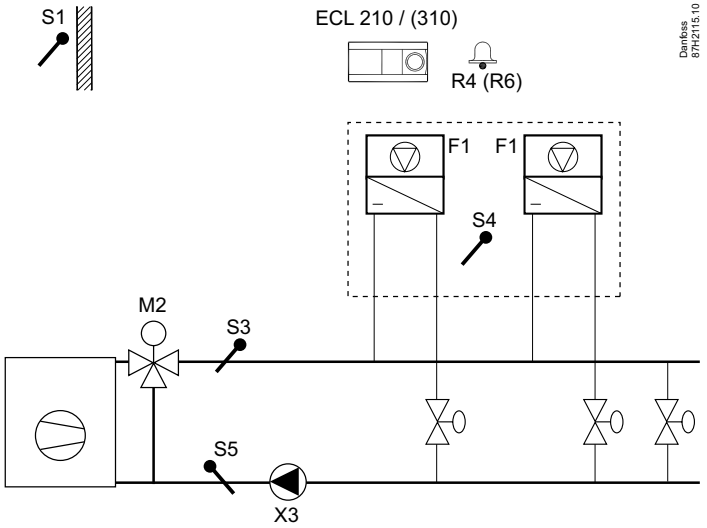
Ventilation system with cooling and constant room temperature control. Chiller has constant flow.



A214.1

Example c

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



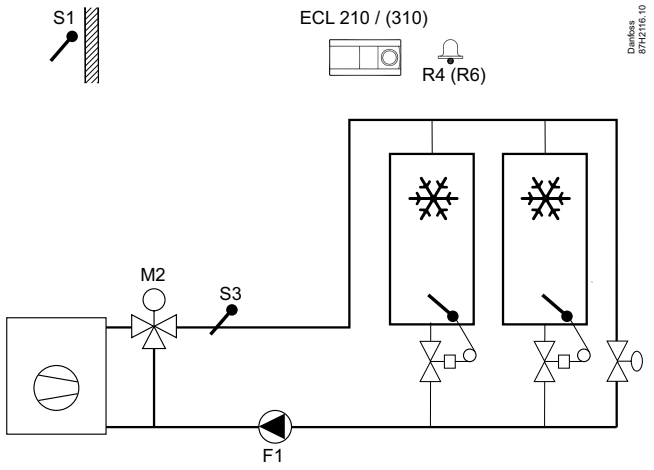
ECL Comfort 210/310 Application A214/A314

Multi purpose application. Temperature control of, for example, ventilation systems with heating or cooling or a combination of these. Outdoor temperature based compensation, return temperature limitation, frost and fire protection. Optional analog control of cross-flow or rotary heat exchanger.
Alarm function related to duct / flow temperature, fire and frost.

A214.1

Example d

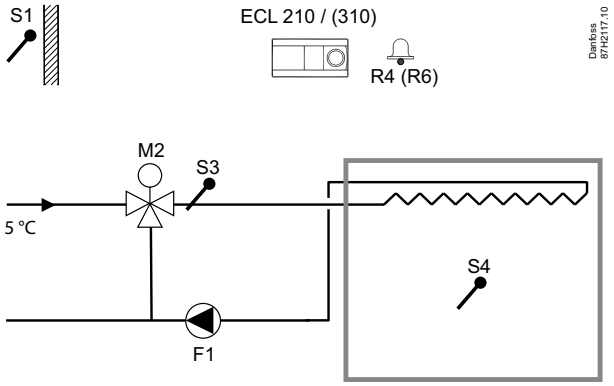
Cooling system with constant flow temperature control.



A214.1

Example e

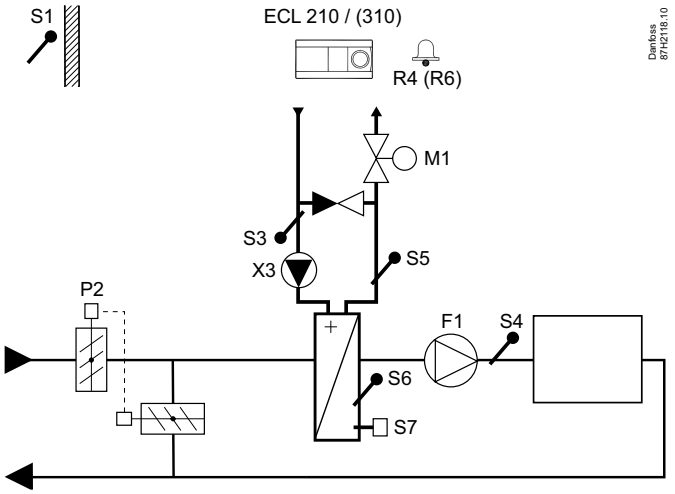
Cooling system in ceiling and constant room temperature control in for example a wine cellar.



A214.2

Example a

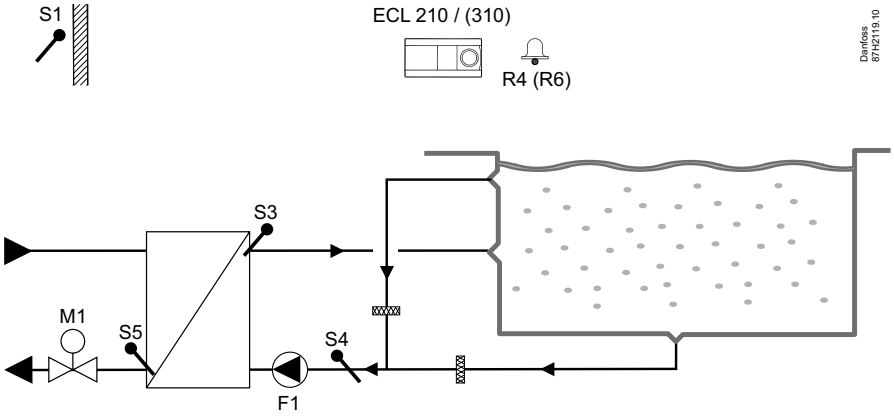
Ventilation system with heating and constant duct temperature control.



A214.2

Example b

Heating of a swimming pool, constant water temperature control.



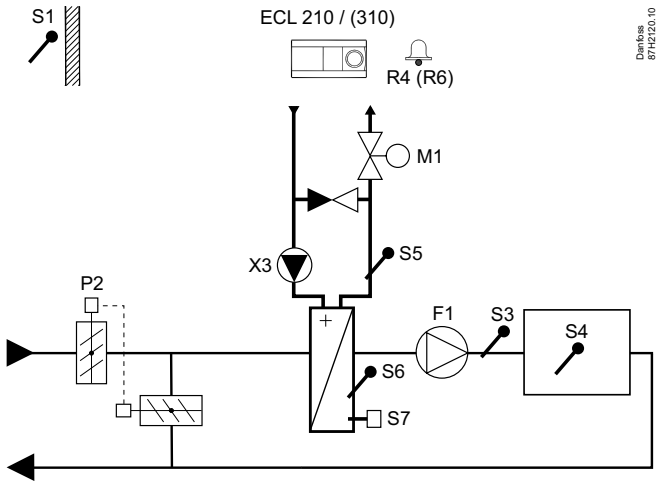
ECL Comfort 210/310 Application A214/A314

Multi purpose application. Temperature control of, for example, ventilation systems with heating or cooling or a combination of these. Outdoor temperature based compensation, return temperature limitation, frost and fire protection. Optional analog control of cross-flow or rotary heat exchanger.
Alarm function related to duct / flow temperature, fire and frost.

A214.3

Example a

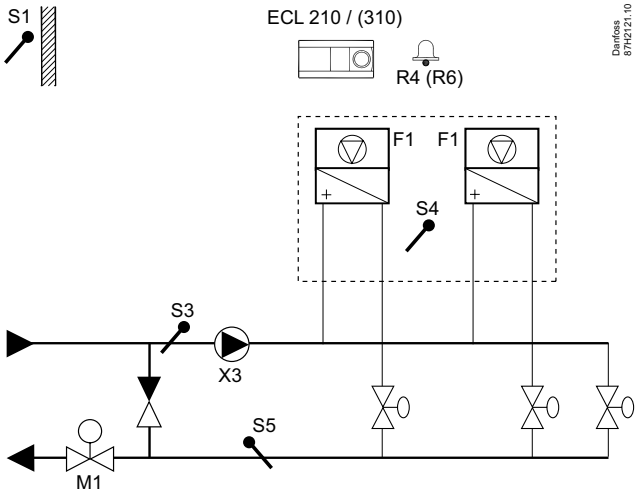
Ventilation system with heating and constant room temperature control.



A214.3

Example b

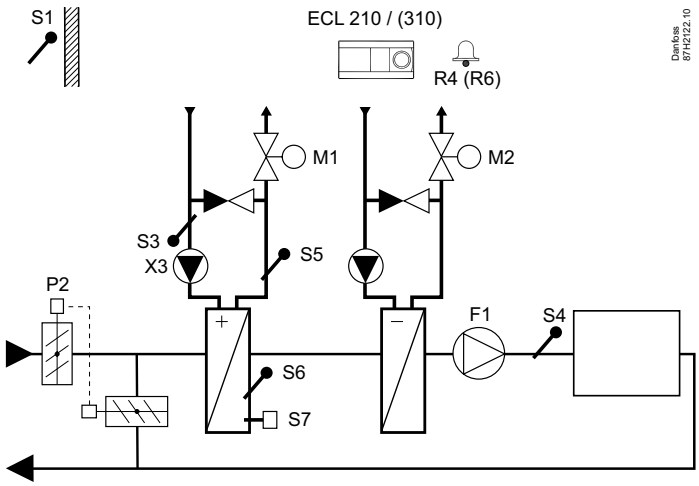
Ventilation system (fan coils) with heating and constant room temperature control.



A214.4

Example a

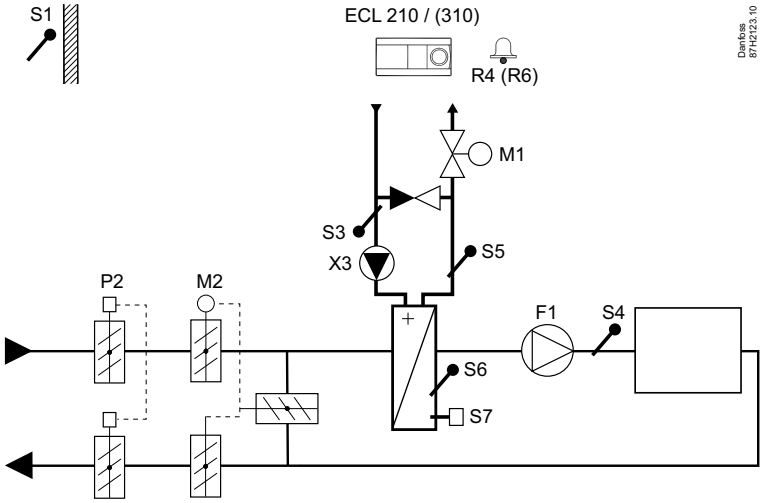
Ventilation system with heating, cooling and constant duct temperature control.



A214.4

Example b

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



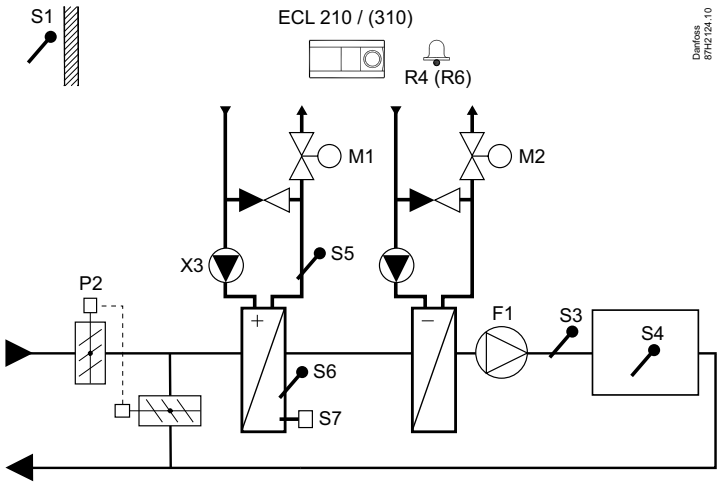
ECL Comfort 210/310 Application A214/A314

Multi purpose application. Temperature control of, for example, ventilation systems with heating or cooling or a combination of these. Outdoor temperature based compensation, return temperature limitation, frost and fire protection. Optional analog control of cross-flow or rotary heat exchanger.
Alarm function related to duct / flow temperature, fire and frost.

A214.5

Example a

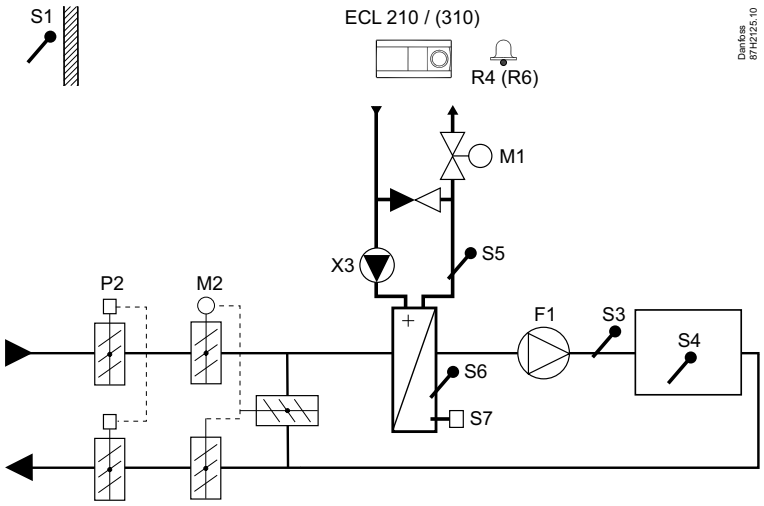
Ventilation system with heating, cooling and constant room temperature control.



A214.5

Example b

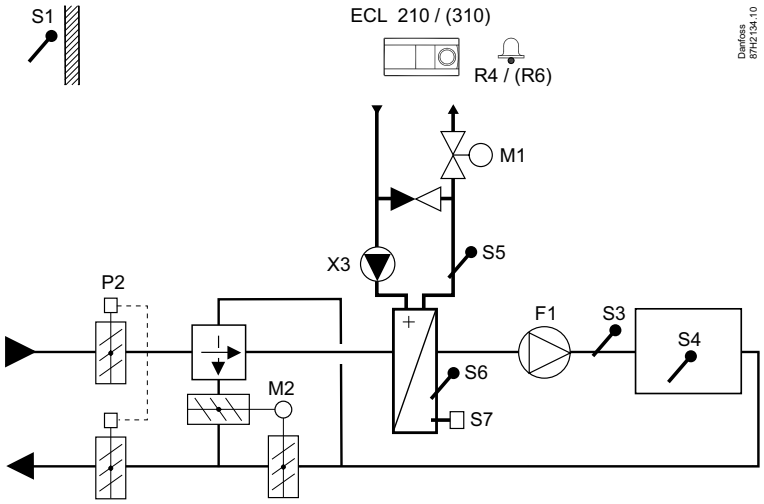
Ventilation system with heating, passive cooling (outside air) and constant room temperature control.



A214.5

Example c

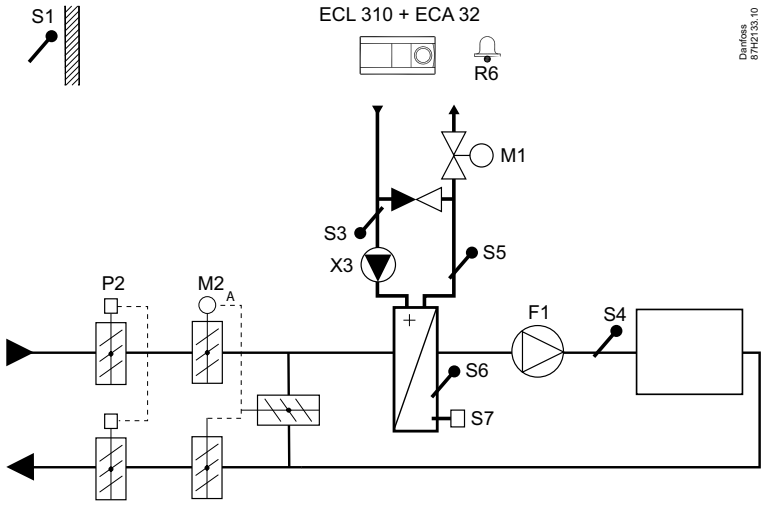
Ventilation system with heating, cross-flow heat exchanger control and constant room temperature control.



A314.1

Example a

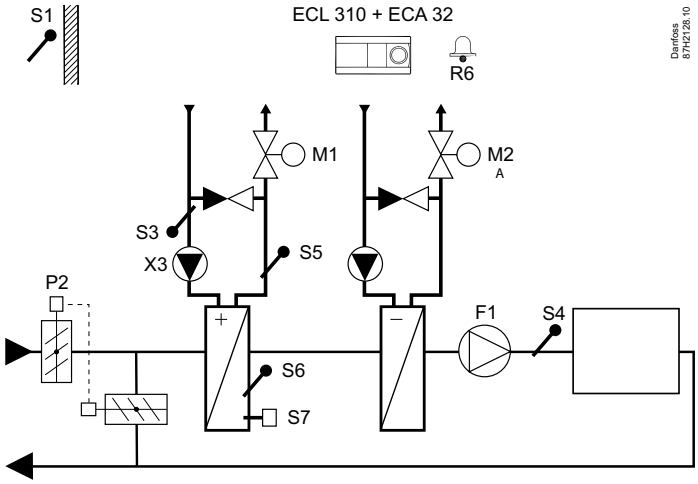
Ventilation system with heating, passive cooling (outside air) and constant duct temperature control. Analog controlled passive cooling (M2).



A314.1

Example b

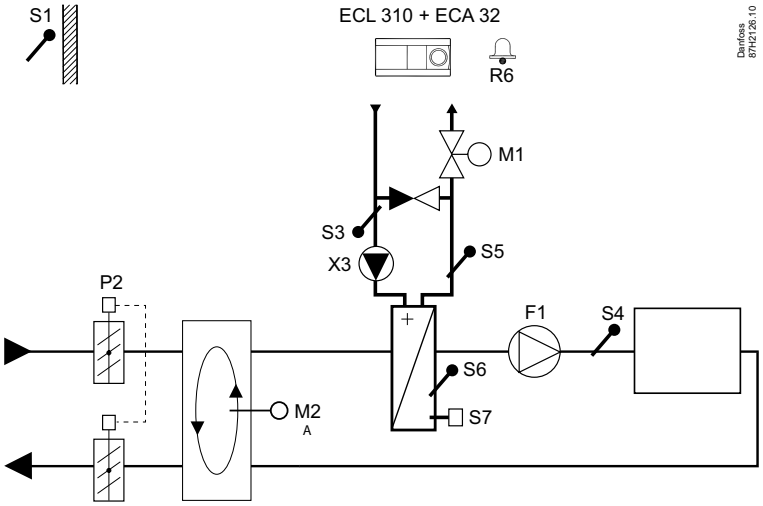
Ventilation system with heating, cooling and constant duct temperature control. Analog controlled cooling (M2).



A314.1

Example c

Ventilation system with heating, passive cooling (outside air) and constant duct temperature control. Analog controlled speed of rotary heat exchanger (M2) for heat recovery.



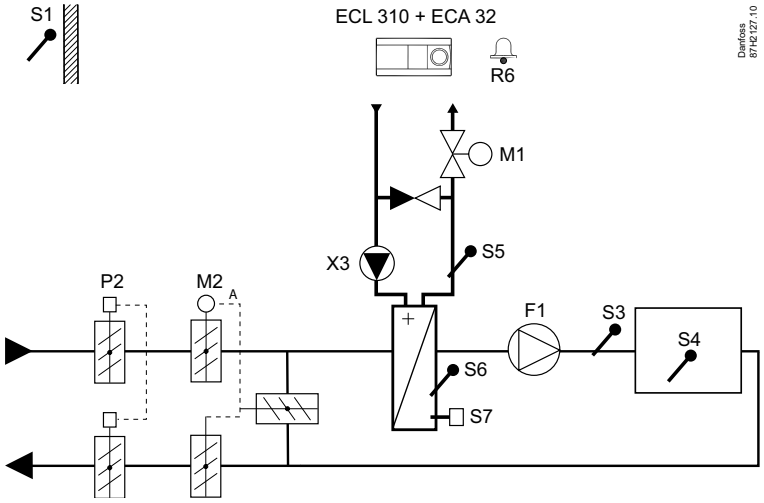
ECL Comfort 210/310 Application A214/A314

Multi purpose application. Temperature control of, for example, ventilation systems with heating or cooling or a combination of these. Outdoor temperature based compensation, return temperature limitation, frost and fire protection. Optional analog control of cross-flow or rotary heat exchanger.
Alarm function related to duct / flow temperature, fire and frost.

A314.2

Example a

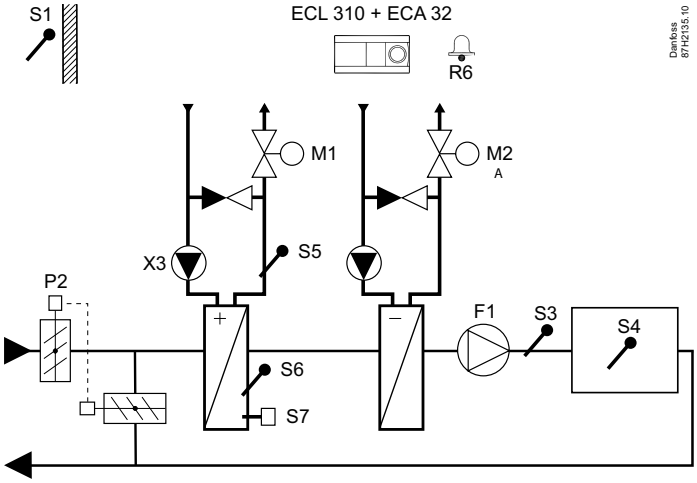
Ventilation system with heating, passive cooling (outside air) and constant room temperature control. Analog controlled passive cooling (M2).



A314.2

Example b

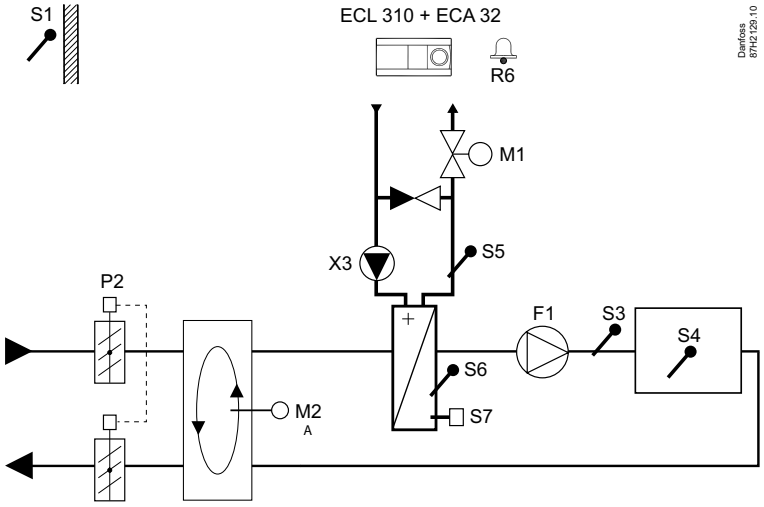
Ventilation system with heating, cooling and constant room temperature control. Analog controlled cooling (M2).



A314.2

Example c

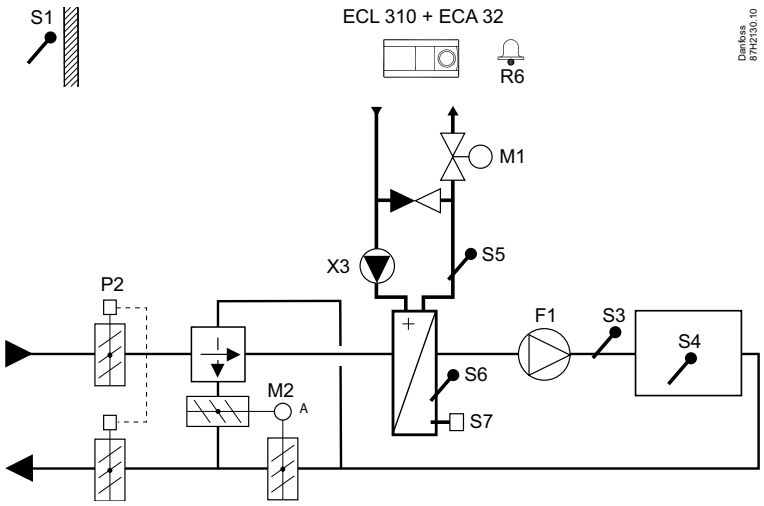
Ventilation system with heating, passive cooling (outside air) and constant room temperature control. Analog controlled speed of rotary heat exchanger (M2) for heat recovery.



A314.2

Example d

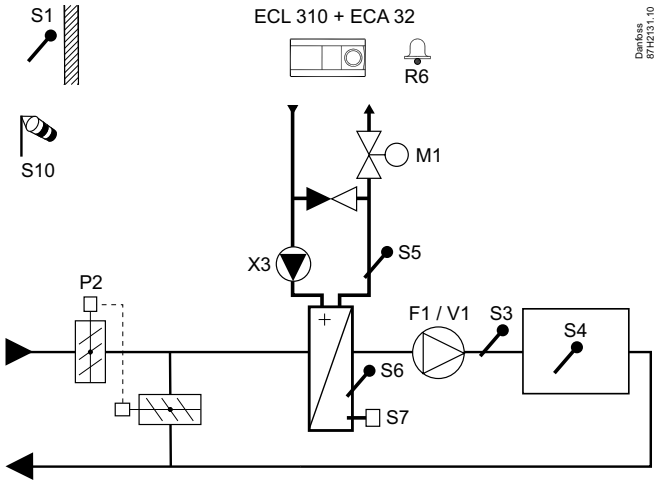
Ventilation system with heating, analog controlled cross-flow heat exchanger (M2) and constant room temperature control.



A314.3

Example a

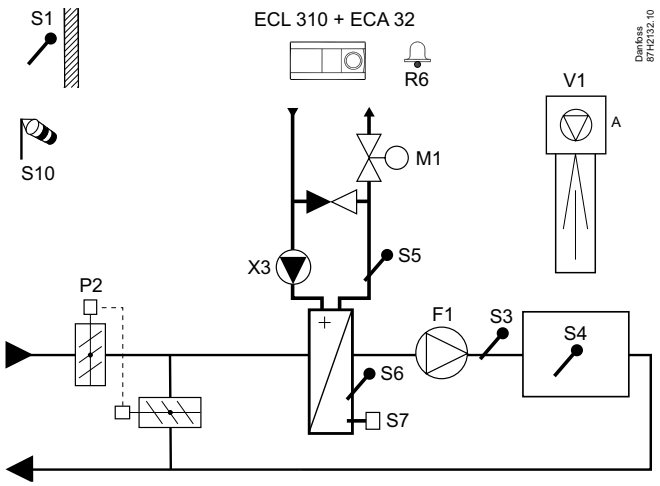
Ventilation system with heating and constant room temperature control. Analog controlled fan speed (V1) based on outdoor wind speed.



A314.3

Example b

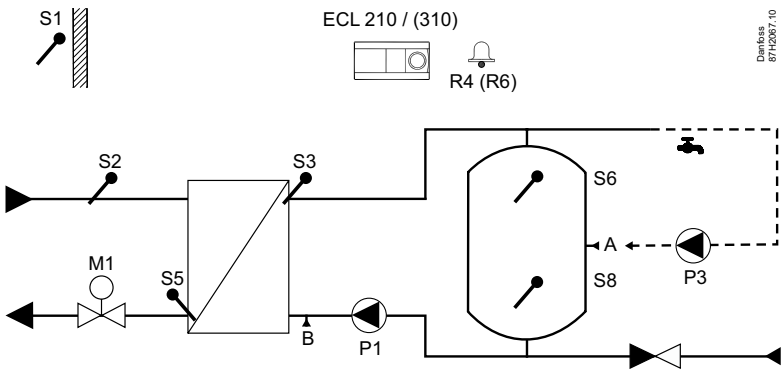
Ventilation system with heating and constant room temperature control. Analog controlled air curtain (V1) speed based on outdoor wind speed.



ECL Comfort 210/310 Application A217/A317

Advanced temperature control of DHW circuit with storage tank, directly heated or charging system. Return temperature limitation. Optional control of pre-heating circuit.
Alarm function related to flow temperature.

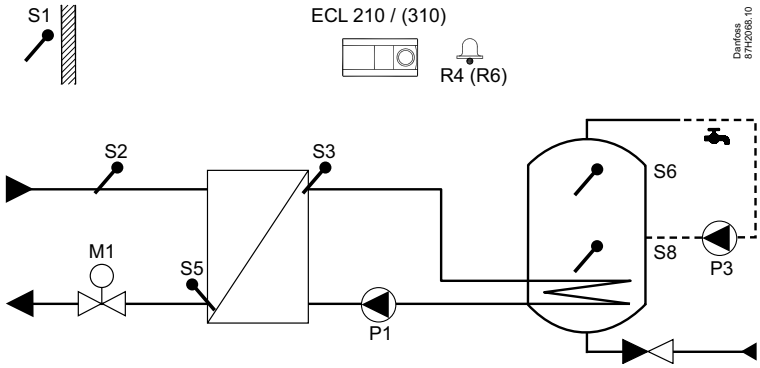
A217.1 / A317.1



Example a

Indirectly connected DHW charging system. DHW circulation through DHW tank (A) or heat exchanger (B).

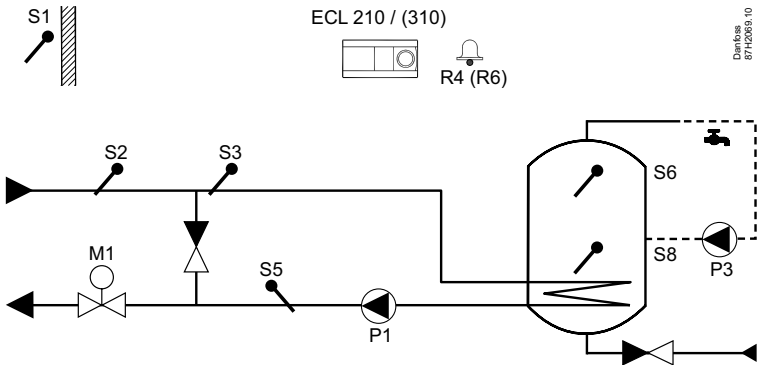
A217.1 / A317.1



Example b

Indirectly connected DHW heating system.

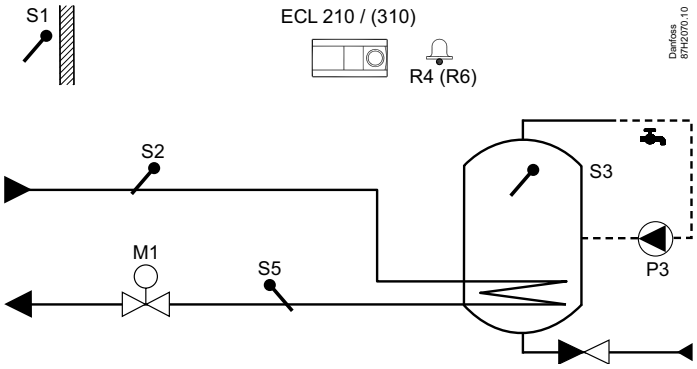
A217.1 / A317.1



Example c

Directly connected DHW heating system.

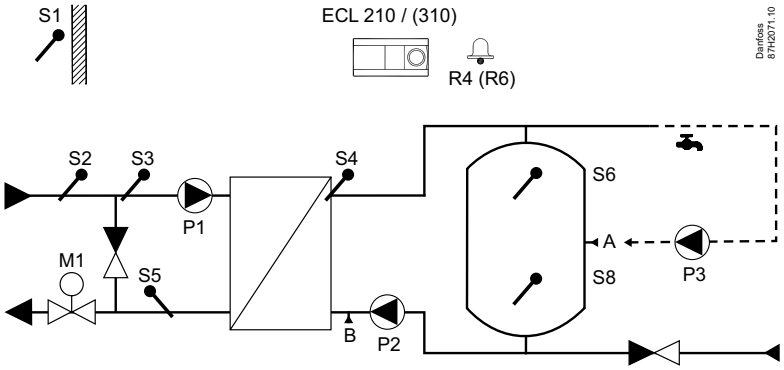
A217.1 / A317.1



Example d

Directly connected DHW heating system.

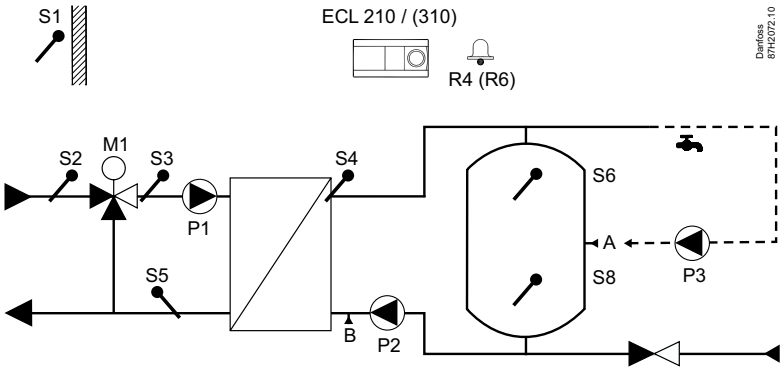
A217.2 / A317.2



Example a

Indirectly connected DHW charging system with controlled heating temperature. DHW circulation through DHW tank (A) or heat exchanger (B).

A217.2 / A317.2

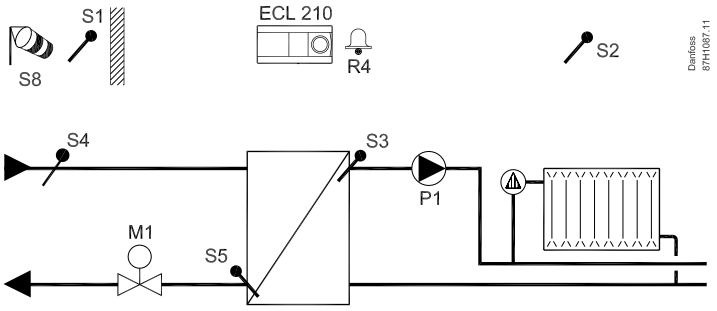


Example b

Indirectly connected DHW charging system with controlled heating temperature. DHW circulation through DHW tank (A) or heat exchanger (B).

Heating or Cooling
Heating – Application A230.1
Outdoor temperature compensated control of flow temperature in a heating circuit. Room temperature and wind speed compensation. Sliding return temperature limitation. Alarm function related to flow temperature.

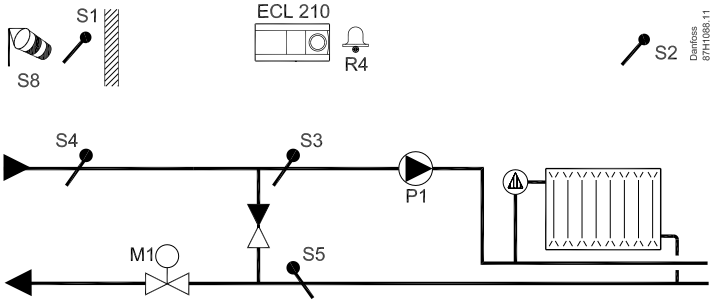
A230.1



Example a

Indirectly connected heating system (typically district heating).

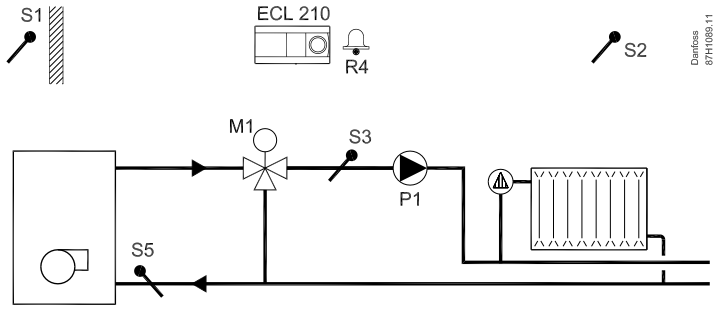
A230.1



Example b

Directly connected heating system.

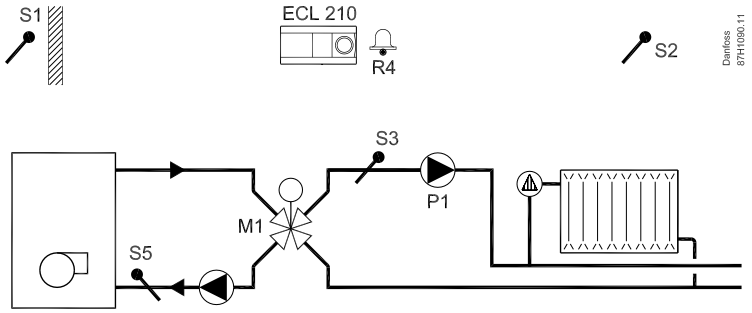
A230.1



Example c

Boiler heating system with 3–port valve.

A230.1

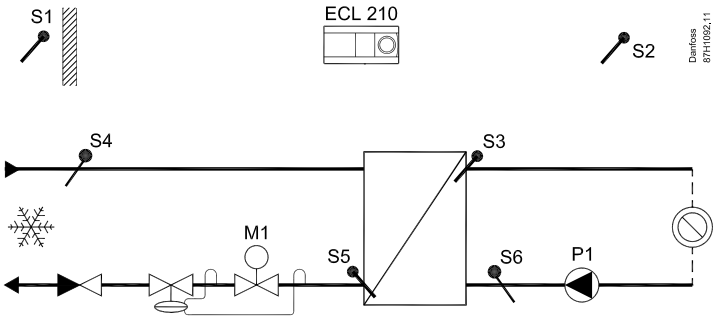


Example d

Boiler heating system with 4–port rotary valve.

Heating or Cooling
Cooling – Application A230.2
Control of flow temperature in a cooling circuit. Room and outdoor temperature compensation. Return temperature limitation.

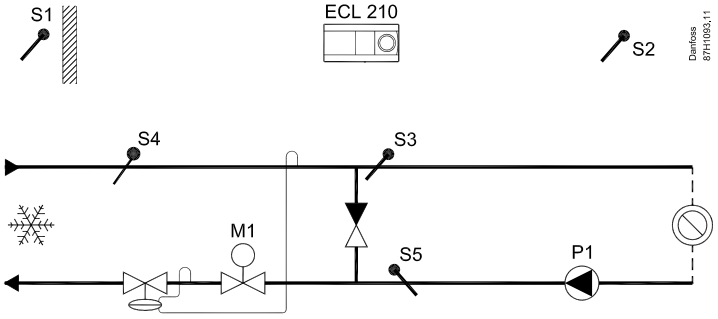
A230.2



Example a

Indirectly connected cooling system (typically district cooling).

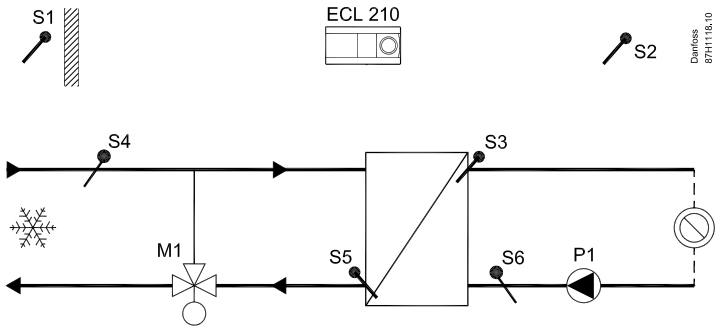
A230.2



Example b

Directly connected cooling system.

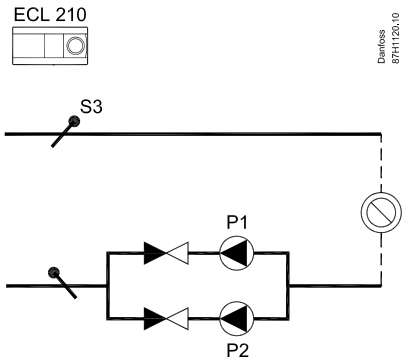
A230.2



Example c

Indirectly connected cooling system, constant flow on cooling supply side.

A230.2



Example d

Two circulation pumps in sequence, controlled by schedule 2.

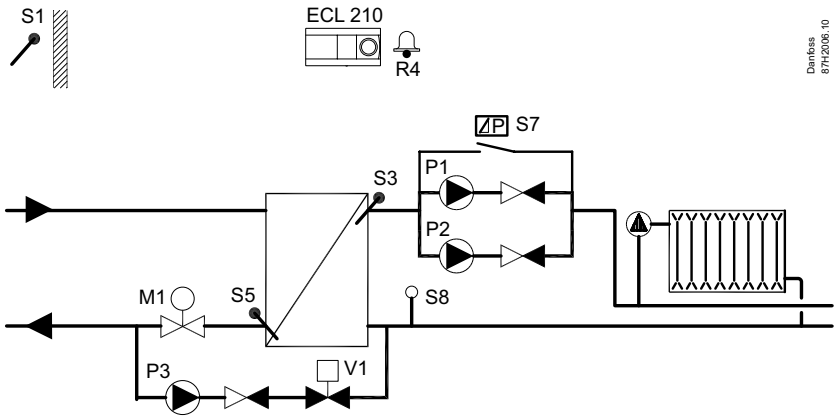
ECL Comfort 210/310 Application A231/A331

Outdoor temperature compensated control of flow temperature in a heating circuit. Sliding return temperature limitation. Control of one or two circulation pumps. Optional control of flow temperature related to supply temperature. Refill water function. Alarm function related to flow temperature, pressure and circulation pumps operation. Additional function in A331: Control of one or two pumps for refill water function.

A231.1

Example a

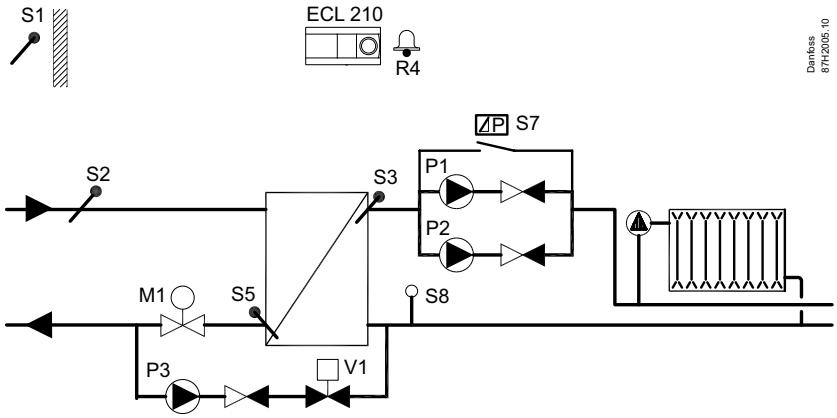
Indirectly connected heating system with two-pump control and refill water function.



A231.2

Example a

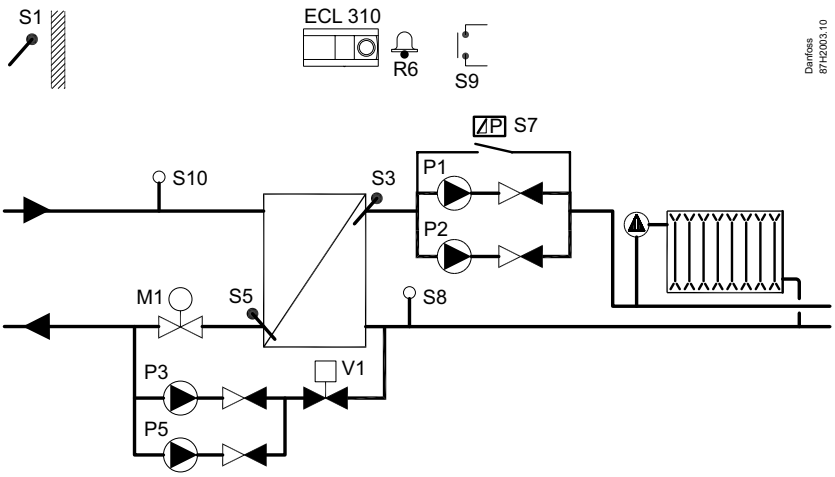
Indirectly connected heating system with two-pump control and refill water function (supply temperature measurement gives further control / limitation possibilities).



A331.1

Example a

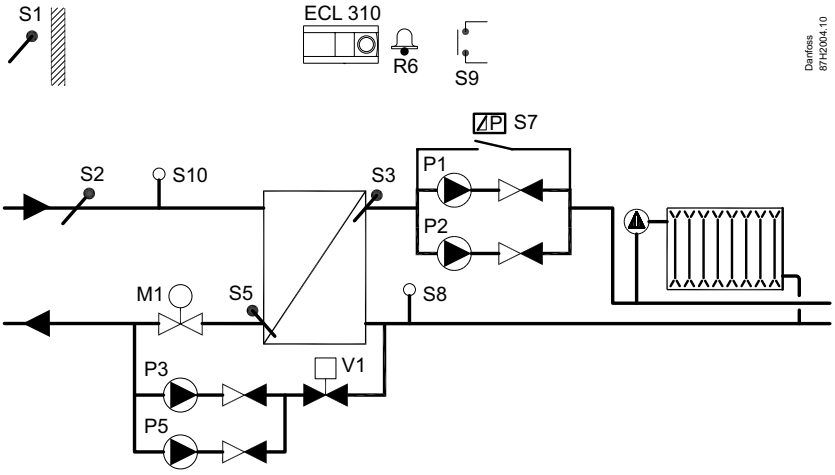
Indirectly connected heating system with two-pump control and refill water function.



A331.2

Example a

Indirectly connected heating system with two-pump control and refill water function (supply temperature measurement gives further control / limitation possibilities).



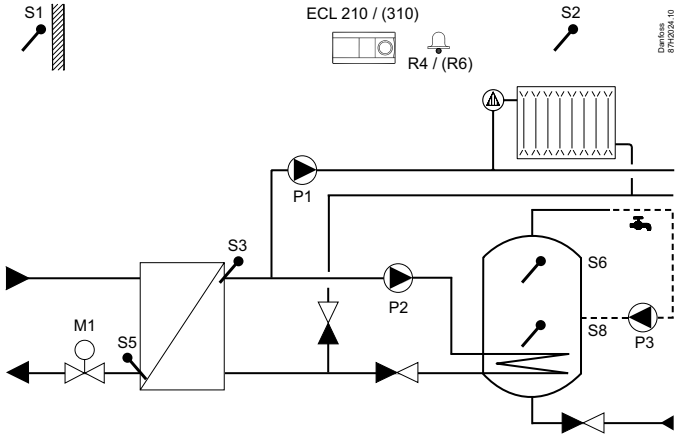
ECL Comfort 210/310 Application A237/A337

Outdoor temperature compensated control of flow temperature in heating circuit. Room temperature compensation and sliding return temperature limitation. Temperature control in DHW circuit with storage tank, directly heated or charging system. Return temperature limitation. Possibility for DHW priority.
Alarm function related to flow temperatures.

A237.1 / A337.1

Example a

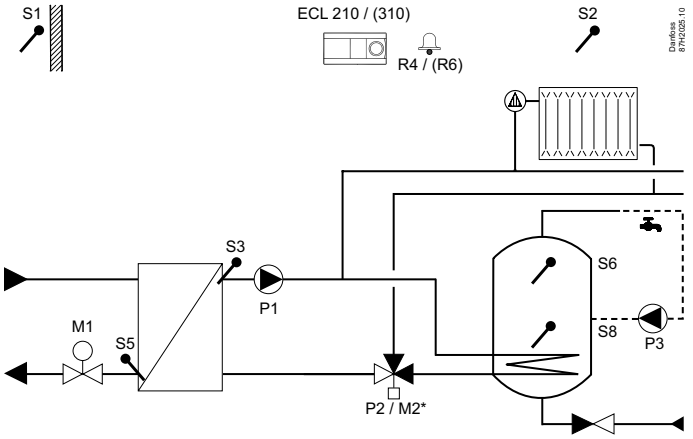
Indirectly connected system and secondarily connected DHW tank with internal heat exchanger (optional DHW priority).



A237.1 / A337.1

Example b

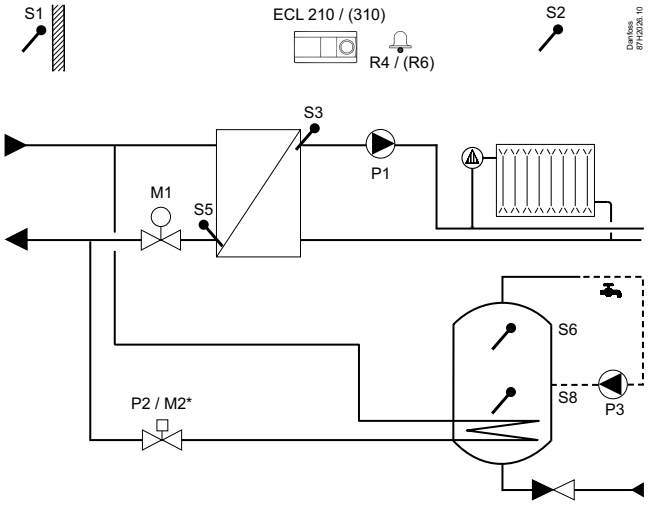
Indirectly connected system and secondarily connected DHW tank with internal heat exchanger (DHW priority).



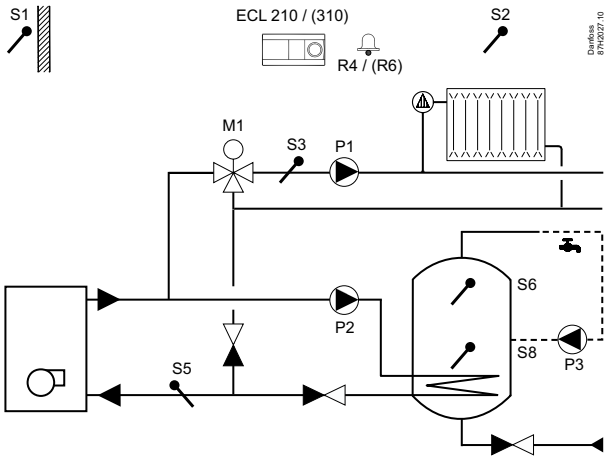
A237.1 / A337.1

Example c

Indirectly connected system and primarily connected DHW tank with internal heat exchanger (optional DHW priority).



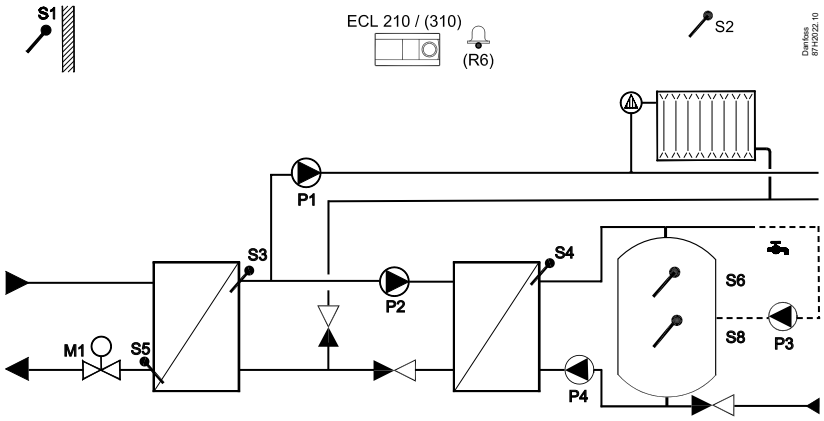
A237.1 / A337.1



Example d

Directly connected system and DHW tank with internal heat exchanger (optional DHW priority).

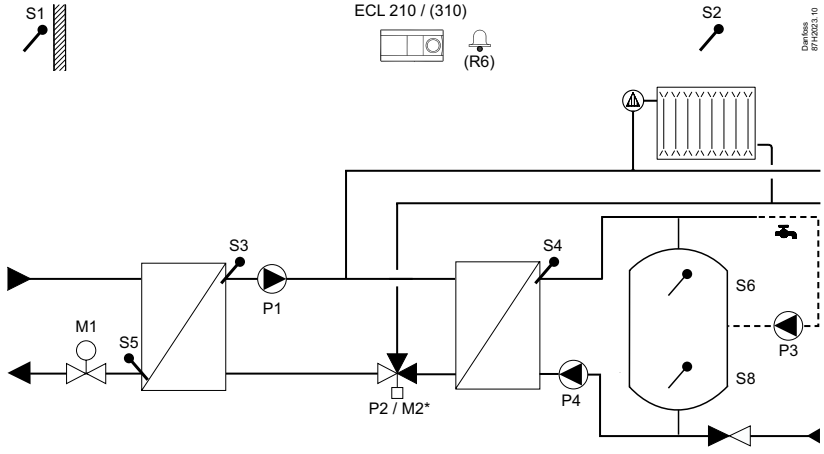
A237.2 / A337.2



Example a

Indirectly connected system and secondarily connected DHW charging system (optional DHW priority).

A237.2 / A337.2



Example b

Indirectly connected system and secondarily connected DHW charging system (DHW priority).

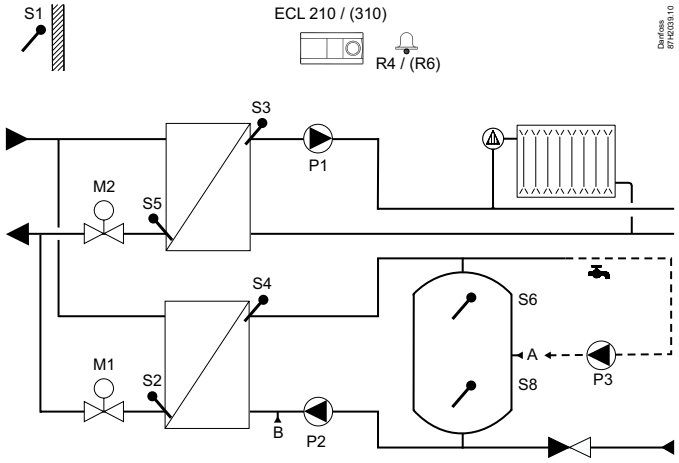
ECL Comfort 210/310 Application A247/A347

Outdoor temperature compensated control of flow temperature in heating circuit. Room temperature compensation and sliding return temperature limitation. Temperature control in DHW circuit with storage tank, directly heated or charging system. Return temperature limitation. Possibility for sliding DHW priority. Alarm function related to flow temperatures.

A247.1 / A347.1

Example a

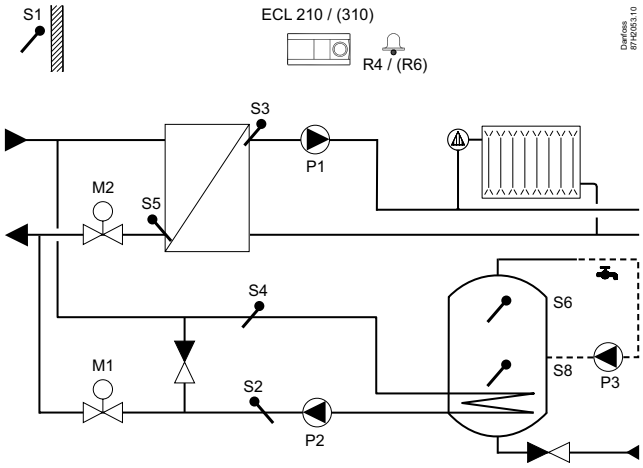
Indirectly connected heating system and DHW charging system (optional DHW priority).



A247.1 / A347.1

Example b

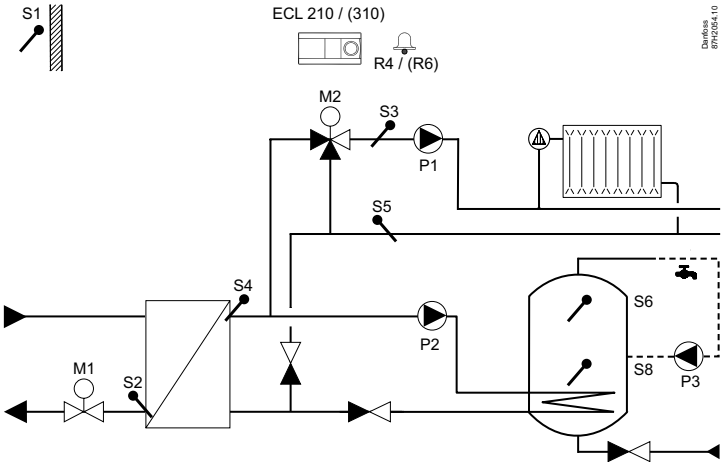
Indirectly connected heating system and directly connected DHW tank heating system. (Pre-controlled circuit and optional DHW priority).



A247.1 / A347.1

Example c

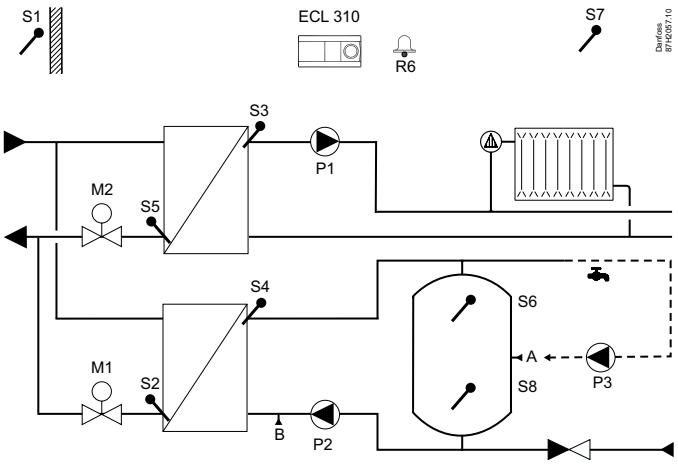
Indirectly connected heating and DHW system (optional DHW priority).



A347.1

Example d

Indirectly connected heating system and DHW charging system (optional DHW priority).



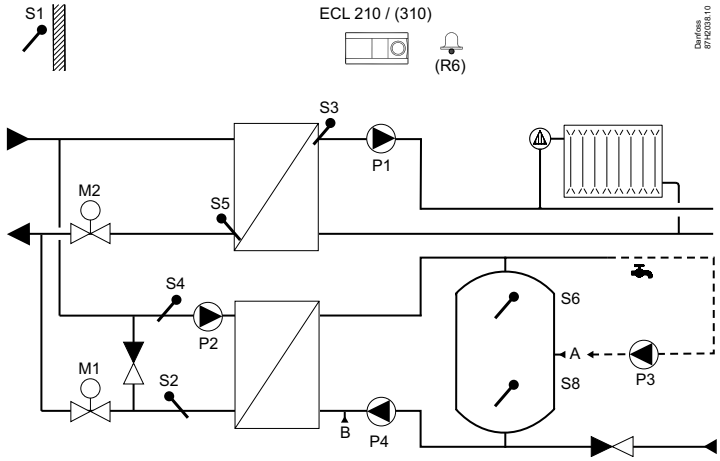
ECL Comfort 210/310 Application A247/A347

Outdoor temperature compensated control of flow temperature in heating circuit. Room temperature compensation and sliding return temperature limitation. Temperature control in DHW circuit with storage tank, directly heated or charging system. Return temperature limitation. Possibility for sliding DHW priority. Alarm function related to flow temperatures.

A247.2 / A347.2

Example a

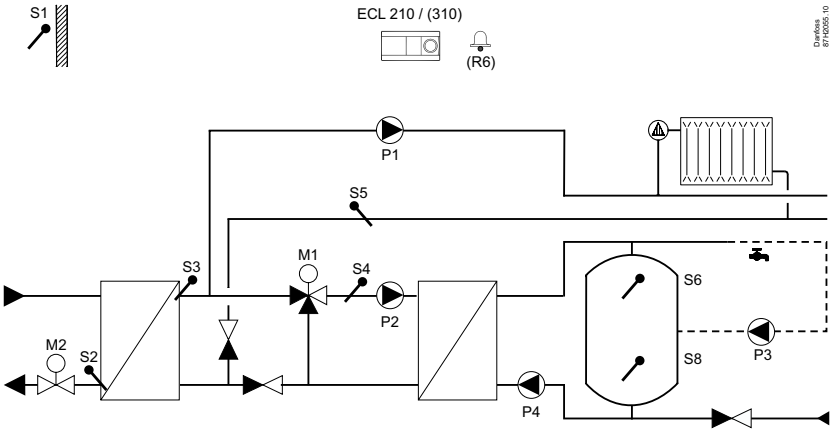
Indirectly connected heating system and DHW tank charging system with pre-controlled charging temperature.



A247.2 / A347.2

Example b

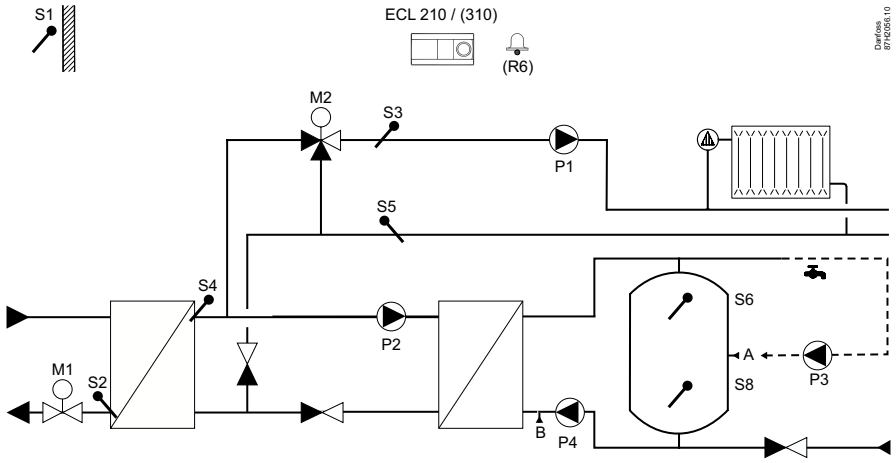
Indirectly connected heating system and DHW system. The DHW tank charging has pre-controlled charging temperature.



A247.2 / A347.2

Example c

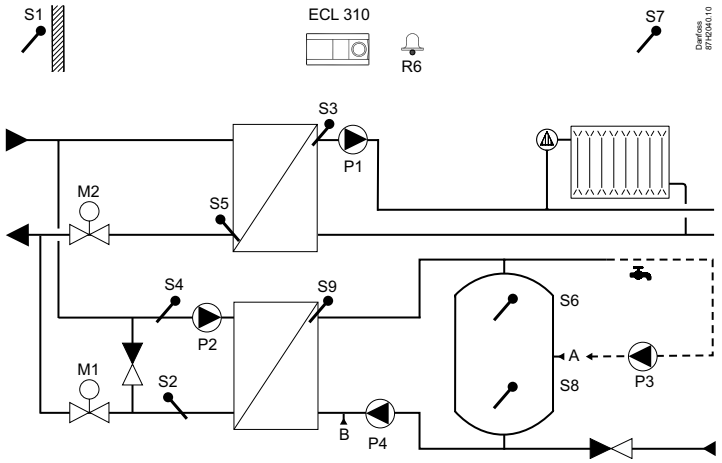
Indirectly connected heating system and DHW system. The DHW tank charging has pre-controlled charging temperature. Optional DHW priority.



A347.2

Example d

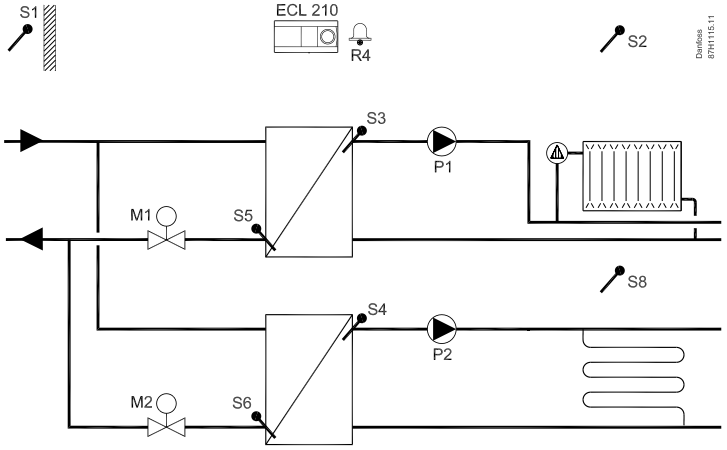
Indirectly connected heating system and DHW system. The DHW tank charging has direct connected and pre-controlled charging temperature. Optional DHW priority.



ECL Comfort 210/310 Application A260

Outdoor temperature compensated control of flow temperature in two heating circuits. Room temperature compensation and sliding return temperature limitation. Circuits independent in parallel or circuit 2 after circuit 1.
Alarm function related to flow temperatures.

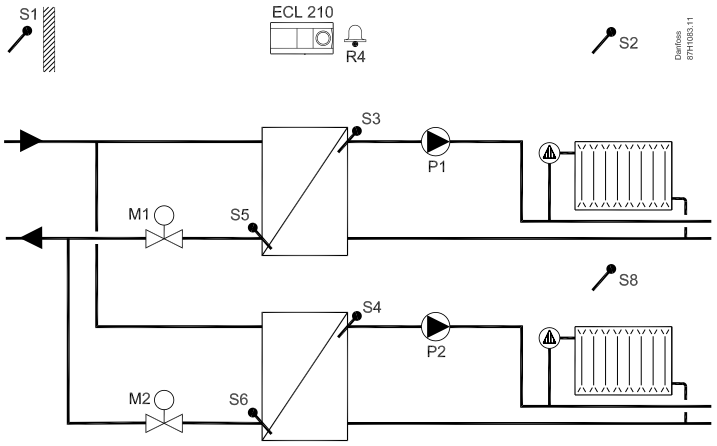
A260.1



Example a

Indirectly connected heating systems (typically district heating). Circuit 2 is floor heating.

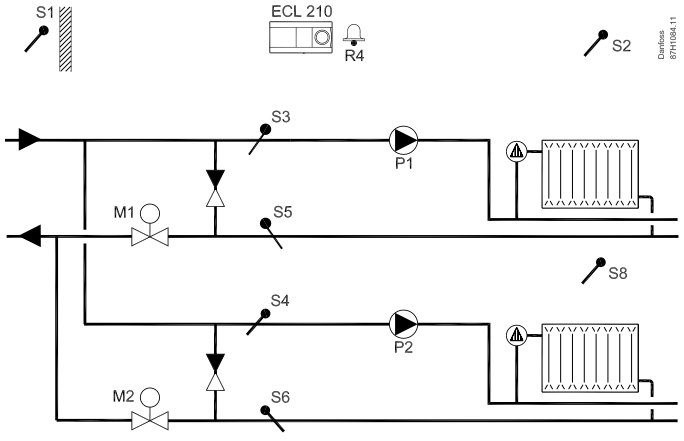
A260.1



Example b

Indirectly connected heating systems (typically district heating).

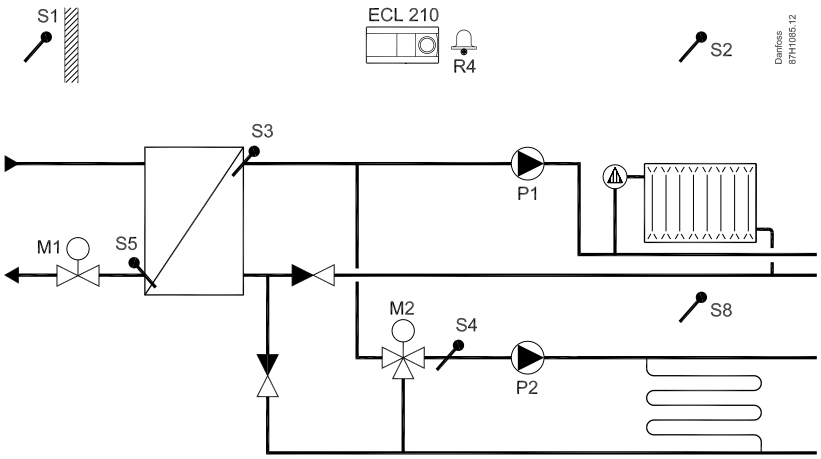
A260.1



Example c

Directly connected heating systems (typically district heating).

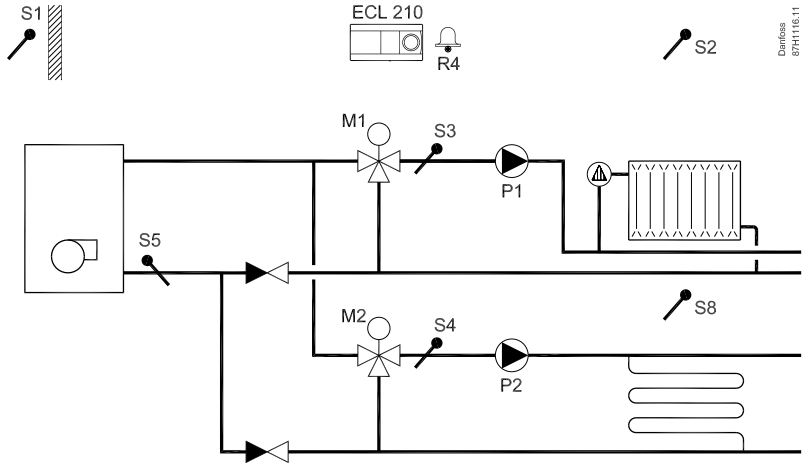
A260.1



Example d

Indirectly connected heating systems (typically district heating). Circuit 2 is floor heating.

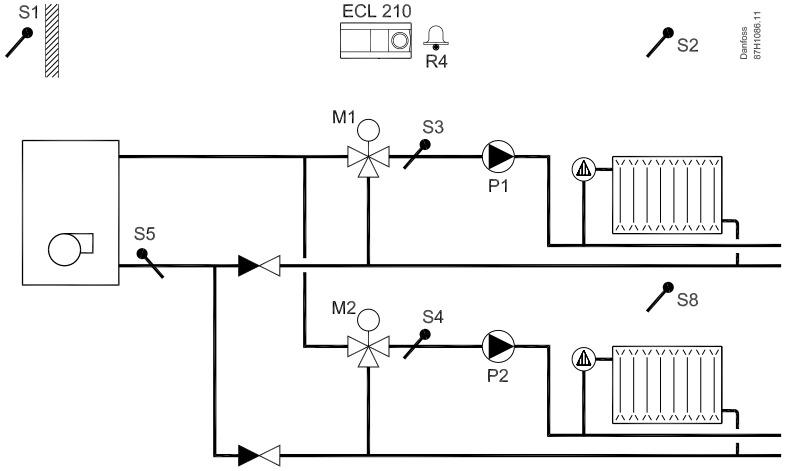
A260.1



Example e

Directly connected heating systems (boiler-based). Circuit 2 is floor heating.

A260.1



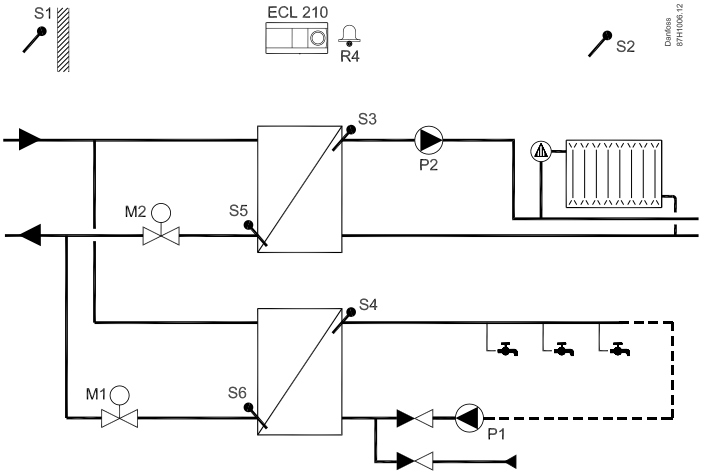
Example f

Directly connected heating systems (boiler-based).

ECL Comfort 210/310 Application A266

Outdoor temperature compensated control of flow temperature in heating circuit. Room temperature compensation and sliding return temperature limitation. Flow temperature control in DHW circuit. Return temperature limitation. Sliding DHW priority possibility. Optional DHW temperature control related to DHW flow detection.
Alarm function related to flow temperatures.

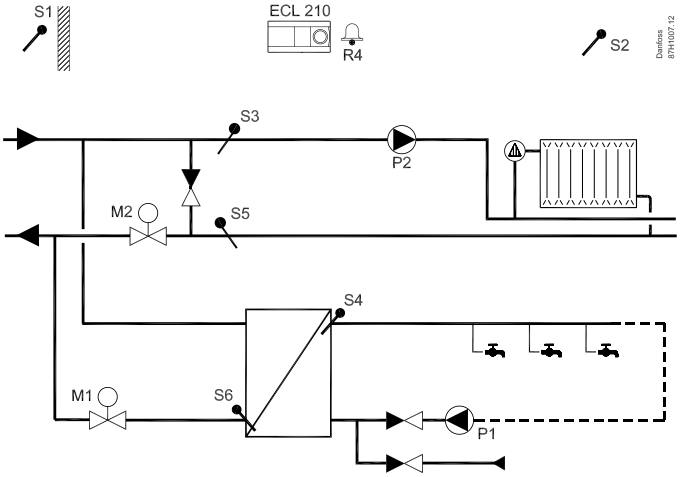
A266.1



Example a

Indirectly connected heating and DHW system (typically district heating).

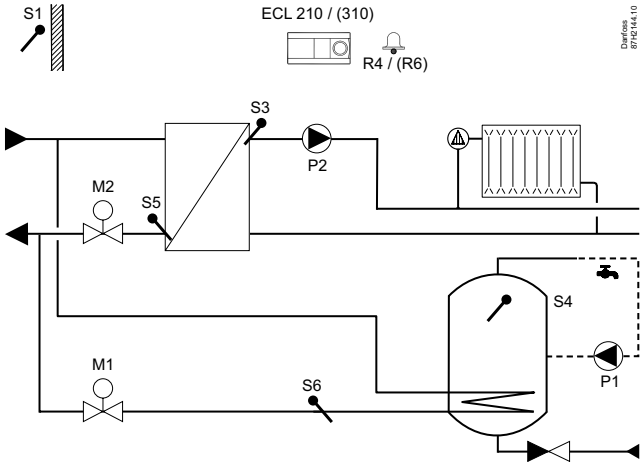
A266.1



Example b

Directly connected heating and indirectly connected DHW system.

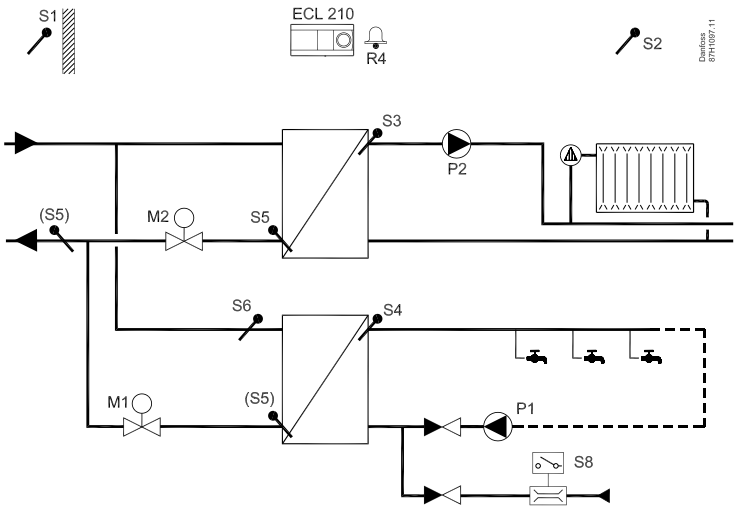
A266.1



Example c

Indirectly connected heating system and directly connected DHW tank heating.

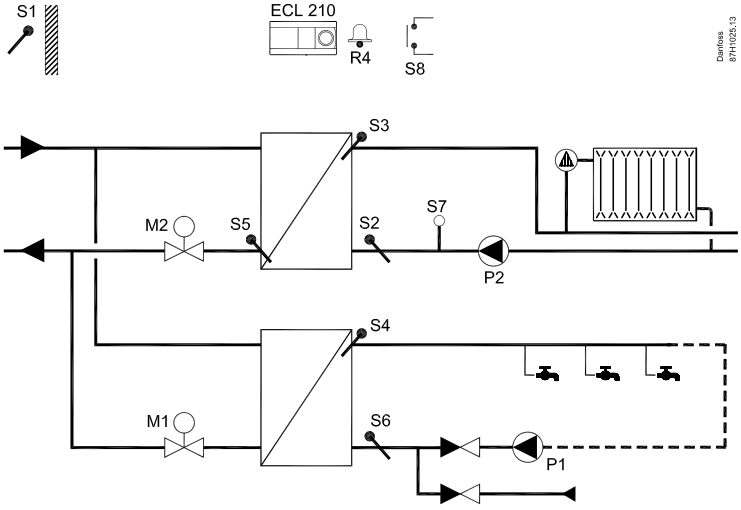
A266.2



Example a

Indirectly connected heating and DHW system with flow switch.

A266.9



Example a

Indirectly connected heating and DHW system with pressure transmitter and universal alarm switch.

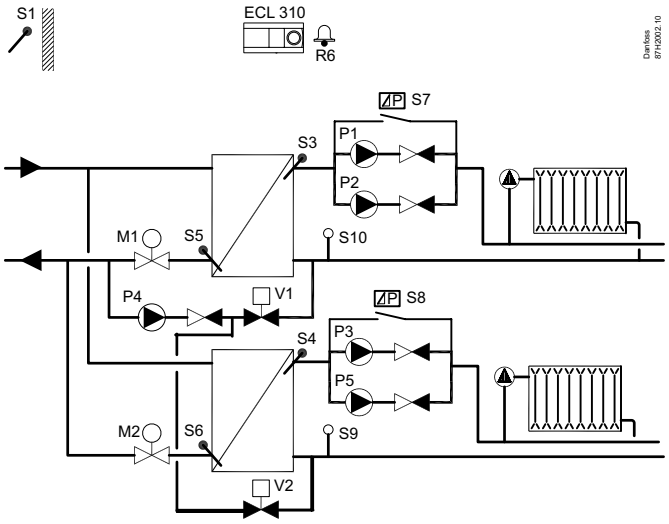
ECL Comfort 310 Application A361

Outdoor temperature compensated control of flow temperature in two heating circuits. Sliding return temperature limitation. Control of one or two circulation pumps in each heating circuit. Optional control of flow temperature related to supply temperature. Refill water function.
Alarm function related to flow temperature, pressure and circulation pumps operation.

A361.1

Example a

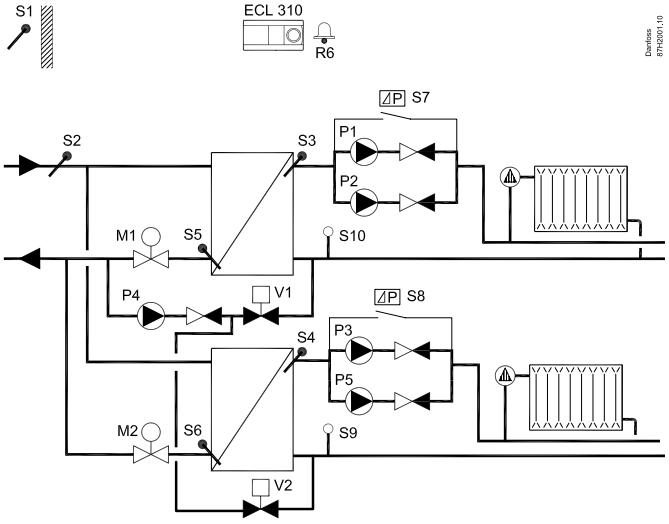
Indirectly connected heating systems with two-pump control and refill water function.



A361.2

Example a

Indirectly connected heating systems with two-pump control and refill water function (supply temperature measurement gives further control / limitation possibilities).



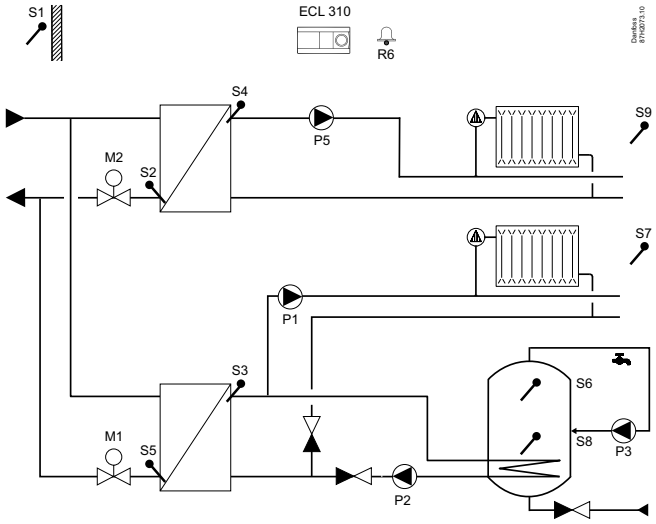
ECL Comfort 310 Application A367

Outdoor temperature compensated control of flow temperature in two heating circuits. Room temperature compensation and sliding return temperature limitation. Heating circuits work independent in parallel or circuit 2 after circuit 1.
Temperature control in DHW circuit with storage tank, directly heated or charging system. Return temperature limitation. DHW priority. Alarm function related to flow temperatures.

A367.1

Example a

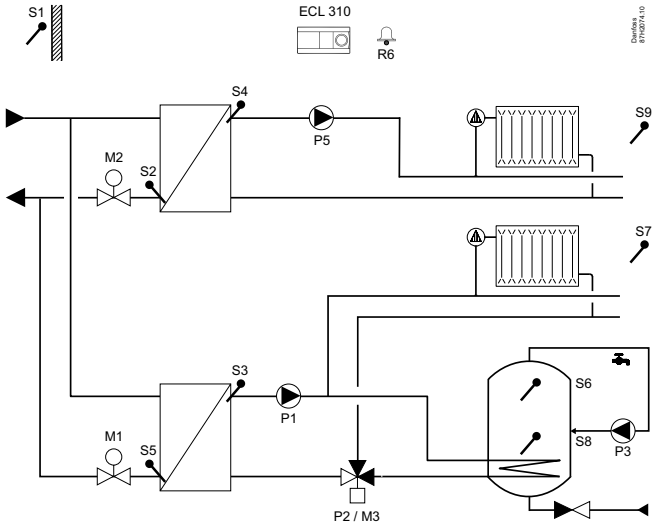
Indirectly connected system with 2 heating circuits and secondarily connected DHW tank with internal heat exchanger (optional DHW priority).



A367.1

Example b

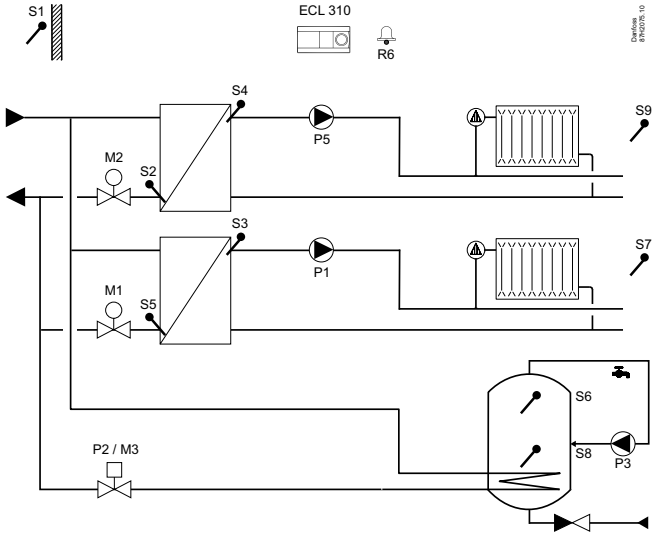
Indirectly connected system with 2 heating circuits and secondarily connected DHW tank with internal heat exchanger (DHW priority).



A367.1

Example c

Indirectly connected system with 2 heating circuits and primarily connected DHW tank with internal heat exchanger (optional DHW priority).



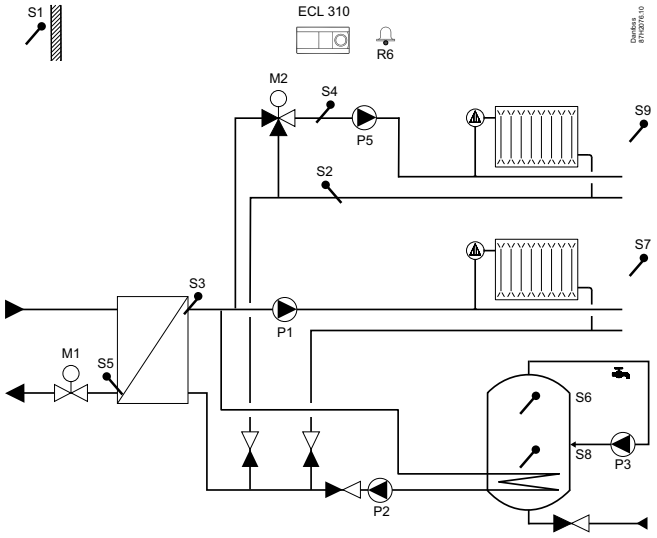
ECL Comfort 310 Application A367

Outdoor temperature compensated control of flow temperature in two heating circuits. Room temperature compensation and sliding return temperature limitation. Heating circuits work independent in parallel or circuit 2 after circuit 1.
Temperature control in DHW circuit with storage tank, directly heated or charging system. Return temperature limitation. DHW priority. Alarm function related to flow temperatures.

A367.1

Example d

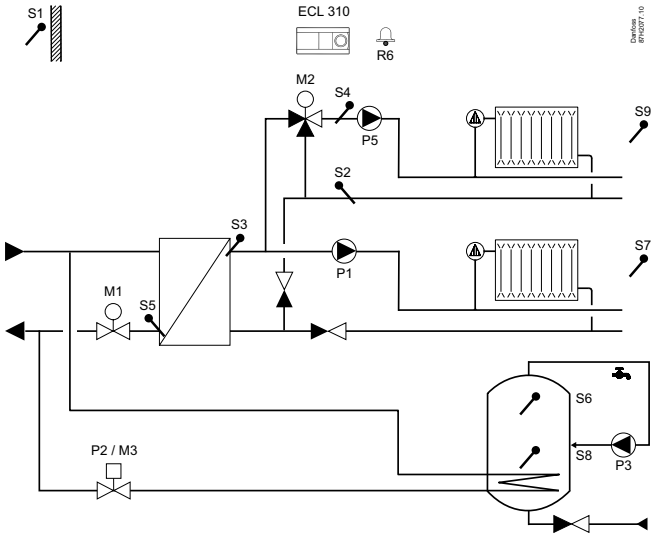
Indirectly connected system with 2 heating circuits (one connected as sub circuit) and secondarily connected DHW tank with internal heat exchanger (optional DHW priority).



A367.1

Example e

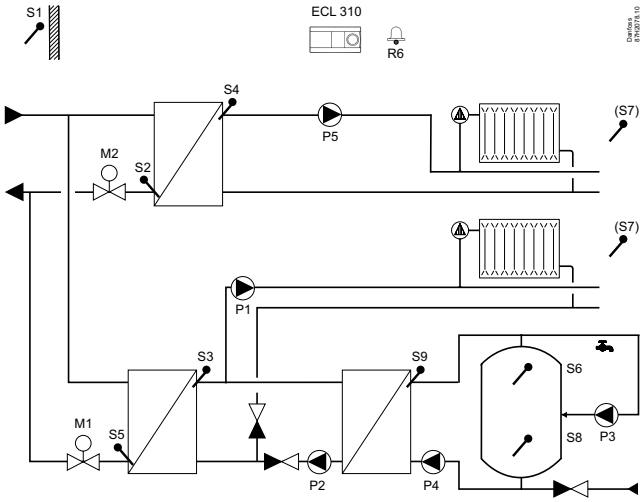
Indirectly connected system with 2 heating circuits (one connected as sub circuit) and primarily connected DHW tank with internal heat exchanger (optional DHW priority).



A367.2

Example a

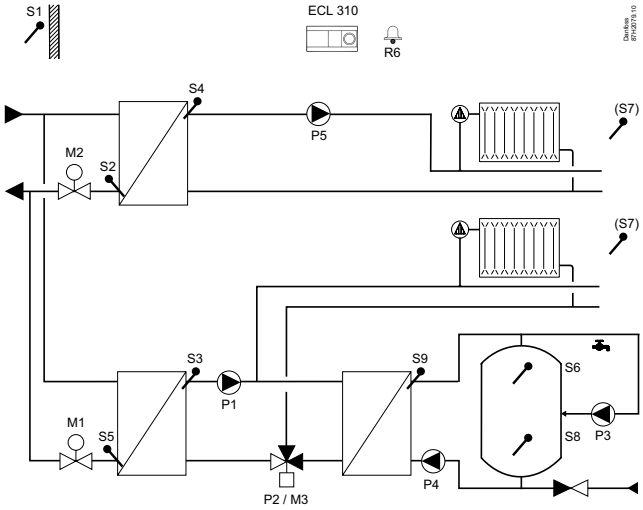
Indirectly connected system with 2 heating circuits and secondarily connected DHW charging system (optional DHW priority).



A367.2

Example b

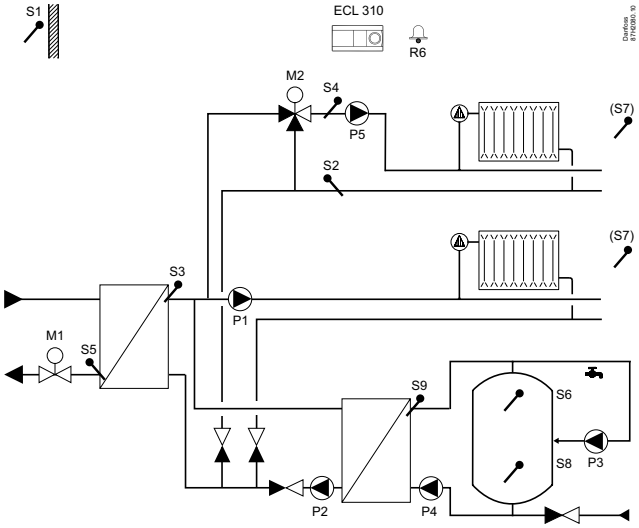
Indirectly connected system with 2 heating circuits and secondarily connected DHW charging system (DHW priority).



A367.2

Example c

Indirectly connected system with 2 heating circuits (one connected as sub circuit) and secondarily connected DHW charging system (optional DHW priority).



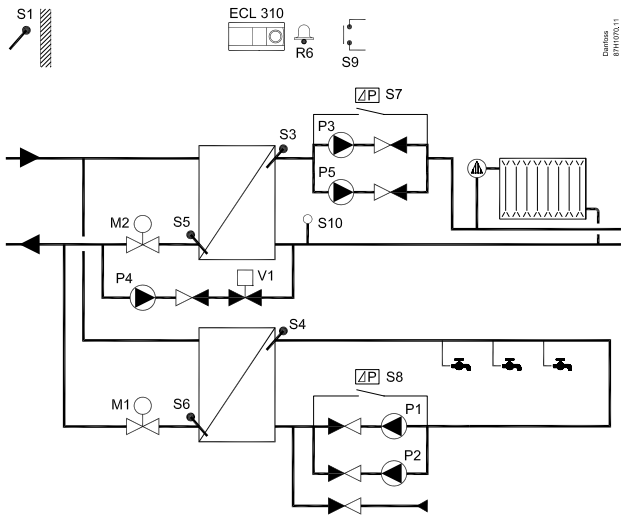
ECL Comfort 310 Application A368

Outdoor temperature compensated control of flow temperature in heating circuit. Sliding return temperature limitation. Control of one or two circulation pumps. Optional control of flow temperature related to supply temperature. Refill water function for one or two pumps. Flow temperature control in DHW circuit. Return temperature limitation. Sliding DHW priority possibility. Control of one or two circulation pumps.
Alarm function related to flow temperature, pressure and circulation pumps operation.

A368.1

Example a

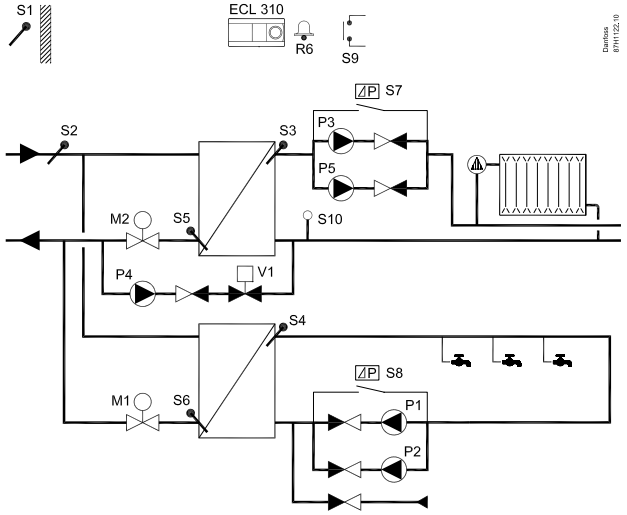
Indirectly connected heating and DHW system with two-pump control and refill water function.



A368.2

Example a

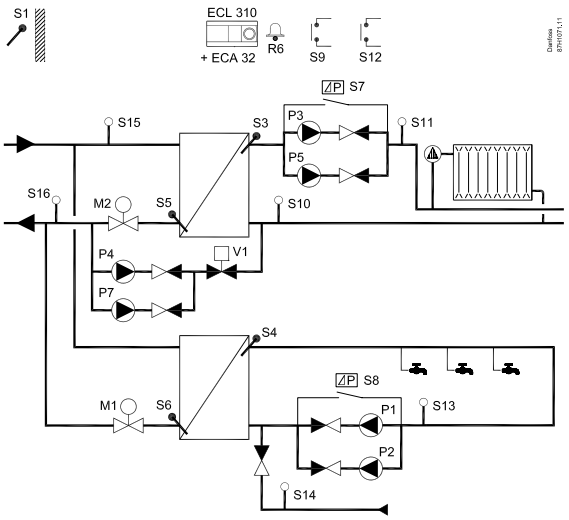
Indirectly connected heating and DHW system with two-pump control and refill water function (supply temperature measurement gives further control / limitation possibilities).



A368.3

Example a

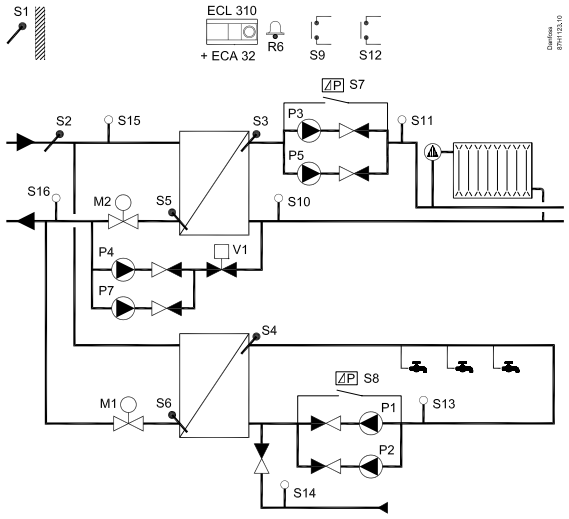
Indirectly connected heating and DHW system with two-pump control and refill water function. Pressure measurements in the system.



A368.4

Example a

Indirectly connected heating and DHW system with two-pump control and refill water function. Supply temperature measurement gives further control / limitation possibilities. Pressure measurements in the system.



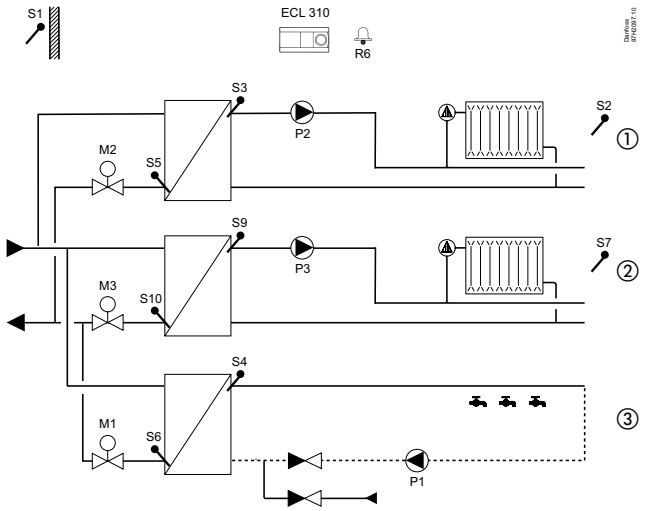
ECL Comfort 310 Application A376

Outdoor temperature compensated control of flow temperature in two heating circuits. Room temperature compensation and sliding return temperature limitation. Heating circuits work independent in parallel or circuit 2 after circuit 1. Flow temperature control in DHW circuit. Return temperature limitation. Sliding DHW priority possibility. Optional DHW temperature control related to DHW flow detection.
Alarm functions related to flow temperatures, pressures and extra alarm input.
Optional control of motorized control valves by means of analog signal (0-10 volt).

A376.1

Example a

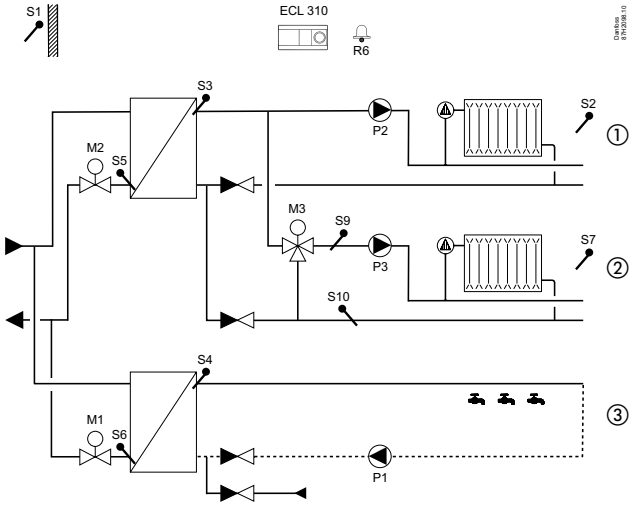
Indirectly connected heating and DHW system (typically district heating).



A376.1

Example b

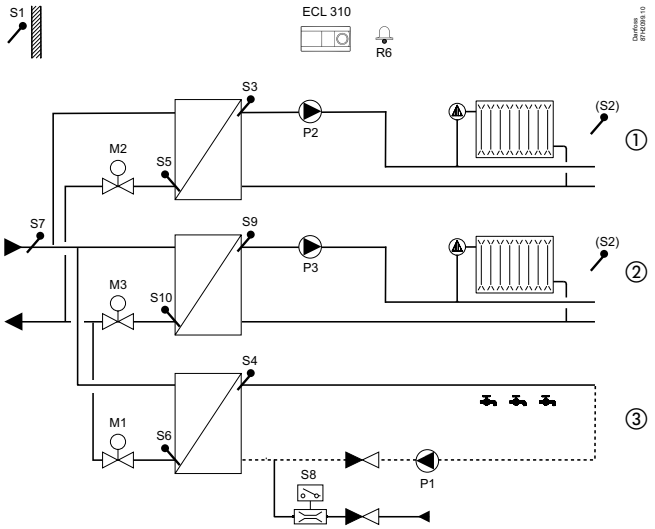
Indirectly connected heating and DHW system (typically district heating).
Heating circuit 2 is connected as a sub-circuit of heating circuit 1. Alternatively, heating circuit 2 can be a floor heating circuit.



A376.2

Example a

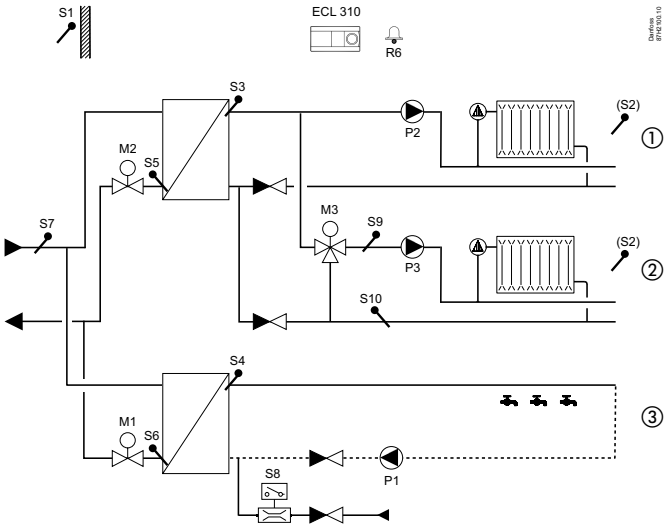
Indirectly connected heating and DHW system with flow switch (typically district heating).



A376.2

Example b

Indirectly connected heating and DHW system with flow switch (typically district heating). Heating circuit 2 is connected as a sub-circuit of heating circuit 1. Alternatively, heating circuit 2 can be a floor heating circuit.



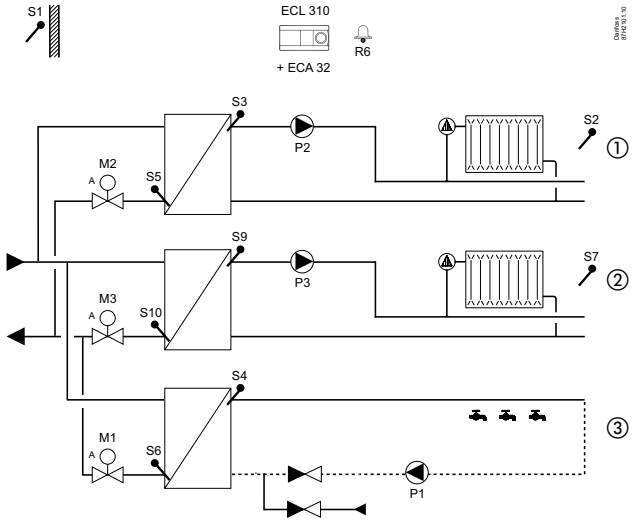
ECL Comfort 310 Application A376

Outdoor temperature compensated control of flow temperature in two heating circuits. Room temperature compensation and sliding return temperature limitation. Heating circuits work independent in parallel or circuit 2 after circuit 1. Flow temperature control in DHW circuit. Return temperature limitation. Sliding DHW priority possibility. Optional DHW temperature control related to DHW flow detection.
Alarm functions related to flow temperatures, pressures and extra alarm input.
Optional control of motorized control valves by means of analog signal (0-10 volt).

A376.3

Example a

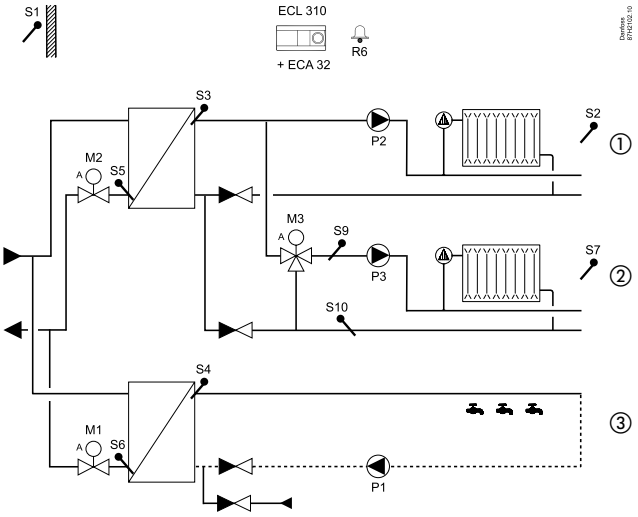
Indirectly connected heating and DHW system (typically district heating). Motorized control valves are controlled by means of analog signals (0–10 V).



A376.3

Example b

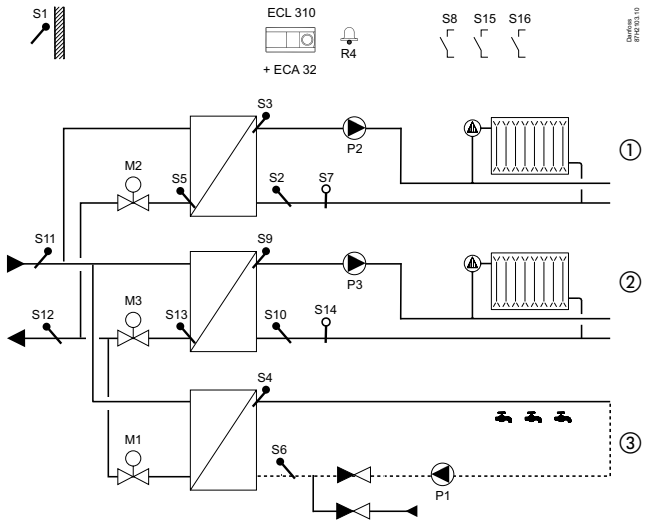
Indirectly connected heating and DHW system (typically district heating). Motorized control valves are controlled by means of analog signals (0–10 V). Heating circuit 2 is connected as a sub-circuit of heating circuit 1. Alternatively, heating circuit 2 can be a floor heating circuit.



A376.9

Example a

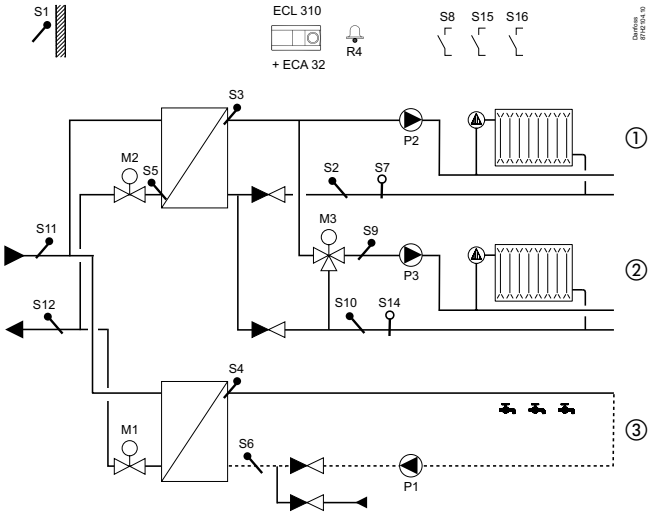
Indirectly connected heating and DHW system with pressure transmitters and alarm input (typically district heating).



A376.9

Example b

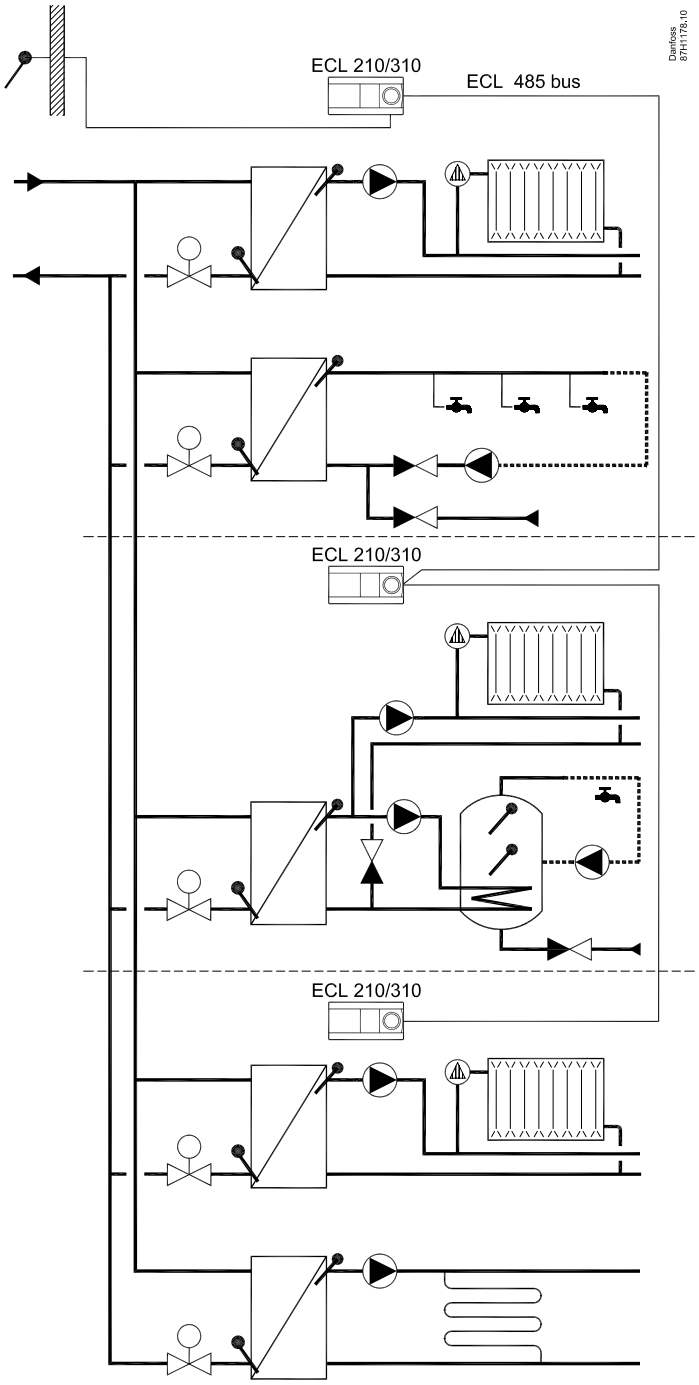
Indirectly connected heating and DHW system with pressure transmitters and alarm input (typically district heating). Heating circuit 2 is connected as a sub-circuit of heating circuit 1. Alternatively, heating circuit 2 can be a floor heating circuit.



Example showing connections between ECL 210 / 310 via the ECL 485 bus.
Only one outdoor temperature sensor is needed and is connected to the master. Via the ECL 485 bus the master broadcasts to other ECL 210 / 310 (slaves):
- Outdoor temperature signal
- Time and date
- DHW heating activity

Master/slave system 1

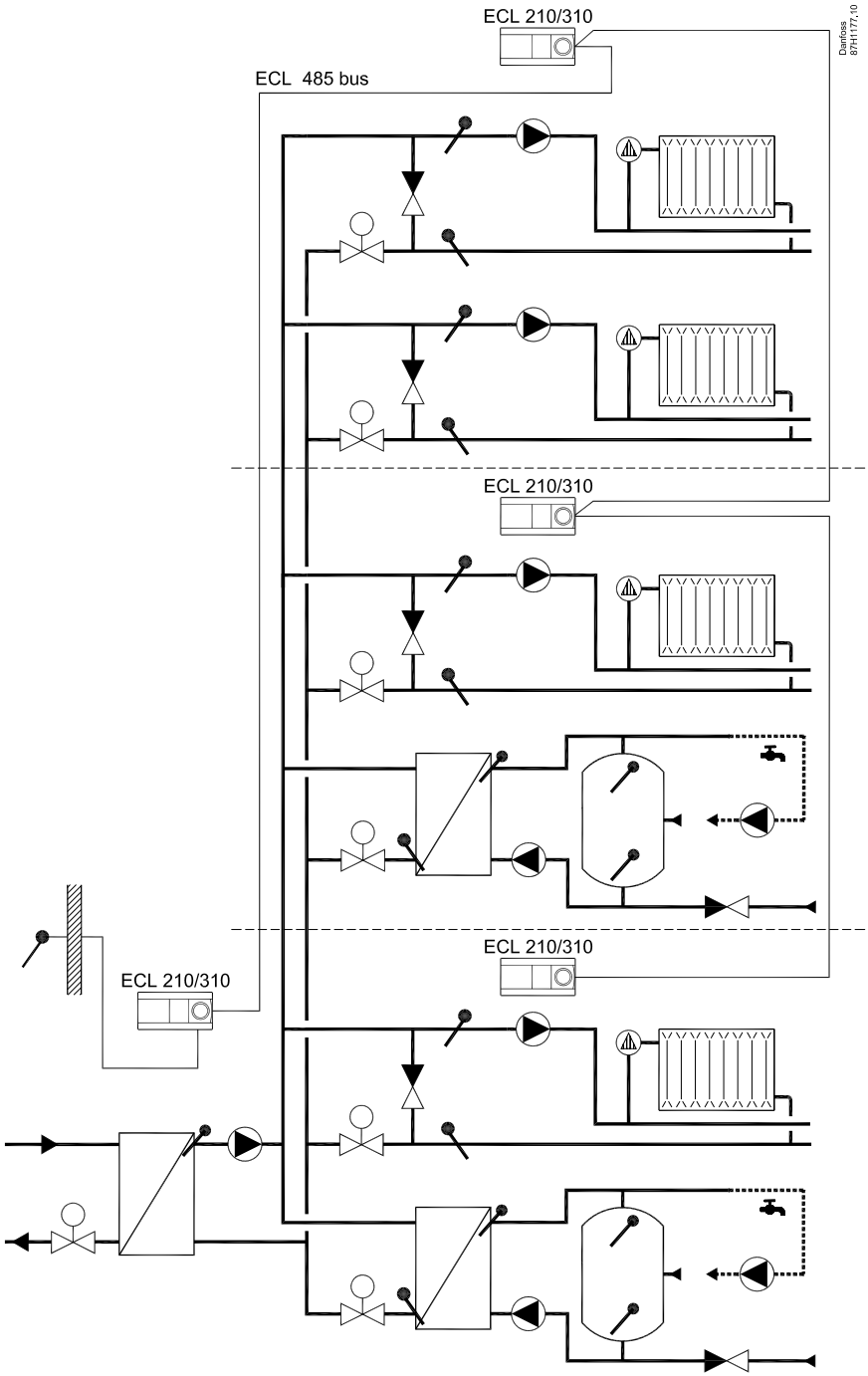
In this example the master is an A266 application. The slaves are applications A237 and A260.



Example showing ECL 210 / 310 as master, controlling the main heat supply. Outdoor temperature signal, time, date and DHW heating activity signals are broadcasted to the slaves (other ECL 210 / 310). Slaves having an address can for each circuit send its desired flow temperature to the master. The master ensures that the highest demand from the slaves is fullfilled. Each circuit in the slaves can be set to close when DHW heating activity is present in the master in order to prioritize the DHW heating.

Master/slave system 2

In this example the master is an A230 application. The slaves are applications A260 and twice A247.



ECL Comfort Code numbers

ECL Comfort controllers

Type	Designation	Code no.
ECL Comfort 110	Universal hardware – 230 V a.c.	087B1261
ECL Comfort 110	Universal hardware – 24 V a.c.	087B1251
ECL Comfort 110 w. timer program	Universal hardware – 230 V a.c.	087B1262
ECL Comfort 110 w. timer program	Universal hardware – 24 V a.c.	087B1252
ECL Comfort 210	Universal hardware – 230 V a.c. Base part is not included.	087H3020
ECL Comfort 210B	Universal hardware – 230 V a.c. Without display and dial. Requires a remote Control Unit. Base part is not included.	087H3030
ECL Comfort 310	Universal hardware – 230 V a.c. Base part is not included.	087H3040
ECL Comfort 310B	Universal hardware – 230 V a.c. Without display and dial. Requires a remote Control Unit. Base part is not included.	087H3050

ECL Comfort 210/310, 24 V a.c. versions will be introduced soon.

ECL Comfort accessories

Type	Designation	Code no.
ECL Comfort 210 base part	For mounting on wall or DIN rail (35 mm).	087H3220
ECL Comfort 310 base part	For mounting on wall or DIN rail (35 mm). ECL Comfort 210 can be mounted in an ECL Comfort 310 base part (for future upgrade).	087H3230
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 30/31 frame kit for mounting in panel front	For mounting in a cut-out. Format 144 x 96 mm, actual cut-out 139 x 93 mm.	087H3236
ECA 32	Internal I/O module for ECL Comfort 310.	087H3202
ECA 99	230 V a.c. to 24 V a.c. transformer (35 VA).	087B1156

ECL Comfort Instructions and application keys

ECL Comfort 110 instructions

Type	English Code no.	Danish Code no.	Swedish Code no.	Finnish Code no.	German Code no.
116	087B8151	087B8153	087B8155	087B8157	087B8159
130	087B8152	087B8154	087B8156	087B8158	087B8160

ECL Comfort 210 + 310 application keys

(All keys are available in mutiple languages)

Application type	Code no.
A266	087H3800
A260	087H3801
A230	087H3802
A368	087H3803
A361	087H3804
A231	087H3805
A237	087H3806
A217	087H3807
A247	087H3808
A376	087H3810
A214	087H3811
A367	087H3813

Please visit

ecl.doc.danfoss.com

and find all relevant documentation for the ECL Comfort series

We mind your business

Danfoss is more than a household name in heating. For more than 75 years we have been supplying our customers all over the world with everything from components to complete district heating system solutions. For generations, we have made it our business to help you mind yours, and that remains our goal both now and in the future.

Driven by our customers' needs, we build on years of experience to be at the forefront of innovation, continually supplying both components, expertise, and complete systems for climate and energy applications.

We aim to supply solutions and products which give you and your customers advanced, user-friendly technology, minimum maintenance, and environmental and financial benefits along with extensive service and support.

Feel free to contact us or visit ecl.danfoss.com for further information.

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