

LET4***: Bi-directional wireless controller (868 MHz)

How energy efficiency is improved

Protected, intelligent solution for optimal energy use.

Areas of use

As a bi-directional receiving station for the signals from the analogue LRT410 room thermostats and the digital LRA420 and LRA450 room operating units, the LET4*** is used as a single-room controller for every channel and for activating thermal actuators in underfloor heating control systems. The individual controllers communicate using a bi-directional signal. The pulses of the radio thermostats can be individually assigned to the corresponding channels.

Features

- Intelligent bi-directional wireless controllers for heating/cooling
- Reception frequency: 868.3 MHz
- Versions with or without LAN connection
- LEDs for the functions, communication and operating modes
- One LED per channel for visualisation and confirmation of the channel assignment
- Emergency function when there is no signal reception
- Individual configuration for every channel accessible from the outside
- Integrated pump logic and potential-free output contact
- With heating/cooling input and potential-free and configurable output
- Input for monitoring the supply temperature
- Input for monitoring the relative humidity

Technical description

- Black housing (RAL9005) with transparent cover
- Versions with 4, 8 and 12 channels
- Including a transformer for the 24 V version
- Monitoring of the inputs and state of the controller with LEDs
- 24 V version with triac outputs for thermal actuators
- 230 V version with relay outputs for thermal actuators
- Automatic connection terminal, depending on the channel, 1 or 2 actuators/channel
- Maximum number of thermal actuators with 12-channel version: 16
- SD card for software update accessible from the outside



Y10167

Type	Number of channels	LAN interface	Power supply ¹⁾	Weight kg
LET 4104R K100	4	no	230 V~	0.560
LET 4108R K100	8	no	230 V~	0.760
LET 4112R K100	12	no	230 V~	0.960
LET 4204R K100	4	yes	230 V~	0.570
LET 4208R K100	8	yes	230 V~	0.780
LET 4212R K100	12	yes	230 V~	0.970
LET 4104R K102	4	no	24 V~	1.170
LET 4108R K102	8	no	24 V~	1.370
LET 4112R K102	12	no	24 V~	1.570
LET 4204R K102	4	yes	24 V~	1.300
LET 4208R K102	8	yes	24 V~	1.500
LET 4212R K102	12	yes	24 V~	1.700
Power supply	230 V~; ±10% 24 V~; ±15%		Pump connection	230 V~, max. 2.5 (1) A
Power consumption ²⁾			Heating/cooling output	230 V~, max. 2.5 (1) A
230 V, 4 channels	max. 12.5 W		Input for monitoring temperature limit	
230 V, 8 channels	max. 24.5 W		24 V variants	24...230 V (N + L)
230 V, 12 channels	max. 36.5 W		230 V variants	230 V
24 V, 4 channels ¹⁾	max. 14.6 W		Heating/cooling input	contacts detected
24 V, 8 channels ¹⁾	max. 26.6 W		ECO input	contacts detected
24 V, 12 channels ¹⁾	max. 38.6 W		230 V relay output	230 V 0.5(0.3) A~
Power consumption in stand-by mode	2.6 W		24 V Triac output	24 V 1 A~
Max. power consumption, idle	2.5 mA at 230 V		Perm. ambient temperature	0...55 °C
Max. power consumption, idle	250 mA at 24 V		Perm. ambient humidity	5...80% rh (non-condensing)
Number of actuators ³⁾	1 or 2 per channel		Ingress protection	IP 20 (EN 60529)
Max. perm. load	0.7 A / 24 V / channel		Protection class	
	1 A / 230 V / channel		230 V~	II (EN 60730)
Fuse rating 230 V	4 A slow		24 V~	II (EN 60730)
Fuse rating 24 V	2 A slow			
Radio frequency	868.3 MHz		Wiring diagram 230 V	A10701

Transmission power Range 4)	> 13 mW approx. 50 m	Wiring diagram 24 V Dimension drawing Fitting instructions	A10700 M11474 M07634 MV P100010808 MV P100010001
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- 1) 24 V version including separate transformer 230 V / 24 V, 42 VA. Power consumption including transformer output
 2) Power consumption depends on the number of thermal actuators connected
 4) In standard buildings or detached houses, depending on the ambient conditions

Accessories

0450231001	External active aerial including 5 m of cable with two RJ12 plugs. Only this aerial connection cable may be used. If a different or longer connecting cable is used, operation may be impaired. See fitting instructions P100011074.
LXR470RF100	Repeater for forwarding information either in the network of room operating units, between the room operating unit and the wireless controller or in the system network from wireless controller to wireless controller. Only one repeater may be used in each network. A micro-switch is used to select the network. See fitting instructions P100011073. Supplied ex works with integrated switched-mode power supply.
0450573001	Transformer 230 / 24 V, 36 VA

*) Dimension drawing or wiring diagram is available under the same number

General functional description

The LET4*** wireless controller, the LRA4** wireless room operating unit and the LRT4** room thermostat are components of a bi-directional control system for controlling panel heating and cooling systems. The wireless controller and wireless room operating unit communicate with each other reliably using radio signals. The wireless room operating unit uses an internal nickel temperature sensor to measure the room temperature. Individual parameters – such as the setpoint, limit value and the time programmes – can be set and altered using the sensor buttons.

The wireless controller has short-circuit-proof outputs, a standby mode and separate relays for the pumps and heating control. The actuators are controlled using either on/off control or pulse width modulation (PWM).

The system is equipped with a self-diagnosis function and a fault indicator. To ensure correct operation, it is easy to carry out radio connection tests. To address the wireless room operating unit and the wireless controller, various combination options are available. For example, several wireless room operating units can be assigned to one wireless controller, and up to three wireless controllers can be grouped together on each wireless communication system.

Energy-saving mode (reduced mode)

Using the time programme to select an individual temperature profile for each day provides the ideal comfort level with the minimum energy consumption. There are three different time programmes stored in the wireless room operating unit. The time programmes can be set according to requirements.

Additionally, an external timer signal can be connected to the 'ECO' (N/R) input. The timer signal can be used to reduce the setpoint temperature of the wireless room operating units by 3 K or more: set from 0 to 10 K using parameter P-44. In order to activate this input, parameter P-61 must be configured using the room operating unit. With this parameter, the input can be used to set the controller to standby mode or to activate the frost-protection facility.

Cooling mode

The cooling mode can be activated by an external signal, e.g. from a heat pump or via potential-free contacts. The 'C/O' input and the temp. limit input, parameterised with P-62 as the C/O input, are available for this function. Optionally, the C/O signal can be fed to a chiller via the integrated potential-free output.

Depending on the wireless room operating unit's parameter setting, cooling mode can be activated using a wireless room operating unit with master function or with any wireless room operating unit. This function can be set using parameter P-51.

Pump control

The integrated pump circuit with anti-jamming function allows a circulation pump to be activated as required.

Anti-jamming function for pump and valves

To prevent the pump and the valves from jamming, the anti-jamming function is started once a week. The function is started if one of the outputs has not been addressed for a week. The anti-blocking function switches on the pump for 3 minutes. The actuators are monitored on each channel and are switched on for 20 minutes. The pump and the actuators switch on automatically without advance warning.

Emergency mode

Emergency mode is intended as a frost-protection facility; for this reason it is active only in heating mode. If no radio signal has been transmitted between the wireless room operating unit and the wireless controller for 30 minutes, the corresponding channels on the wireless controller switch to emergency mode. When the emergency mode is active, the thermal actuators are switched on for 30% of the standard time and off for 70% of the standard time. The standard time is specified with the selected control algorithm. The channel's LED flashes. Emergency mode is indicated by a warning symbol on the display of the wireless room operating unit. To ensure that emergency mode works properly, the wireless controller must be supplied with power and should not be damaged by external influences, such as a lightning strike.

Temperature control

The wireless room operating unit measures the room temperature with the internal or external NTC sensor, or in combination with a floor sensor. The setpoint temperature is set via the wireless room operating unit. The measured room temperature and the setpoint temperature are transmitted automatically to the wireless controller every 10 minutes. If the setpoint is changed, the new setpoint and the measured temperature are transmitted to the wireless controller immediately.

To ensure efficient temperature control, there are three different control algorithms, plus optimised actuator control. There is a choice of control: either on/off control or one of two control systems with different periods.

With on/off control, the heating is switched on or off if the temperature difference is greater than 0.2 K. If the setpoint is above the measured temperature, the valves are opened. The valves close when the setpoint is below the measured temperature.

Each channel forms its own control loop. If a wireless room operating unit is assigned to multiple wireless controllers, these channels are grouped into one control loop. Up to three zones may be formed for functions such as 'master' room operating unit, 'common setpoint use of several room operating units' or 'operating mode adjustment of several room operating units'.

Optimised control of SAUTER thermal actuators

Optimised actuator control is a specially-developed control system for the SAUTER thermal actuators in order to save energy. Firstly, the thermal actuator is fully activated for a defined period. The actuator is then activated via a pulse/pause signal, which requires very little energy. This function can be activated with parameter P-66 and may be used only:

- with 24 V versions
- at an ambient temperature of at least 10 °C during operation

Temperature control via underfloor temperature sensor

With a wireless room operating unit to which an underfloor temperature sensor is connected, a comfortable floor temperature is maintained by measuring the floor temperature. Under normal conditions, the room temperature is regulated using the setpoint and the current room temperature. If the current room temperature is above the setpoint, the comfort control for the floor is activated. The comfort temperature of the floor can be adjusted using parameter P-02. Parameter P-43 can be used to control the maximum temperature. This function is used as a safety limiter of the floor temperature. No liability can be demanded in the event of a temperature that is too high or in the event of defective components in the heating system. If a safety limiter is required, this must be realised using an external safety temperature limiter (STB).

Humidity control

The wireless room operating unit determines the humidity difference based on the measured humidity and the setpoint. The signal is sent to an optional single-channel I/O box via the wireless controller. Either a humidifier or a dehumidifier is connected to this I/O box.

Initial controlled floor heating

For a newly-installed underfloor heating system, we recommend heating up the floor slowly. This heating-up period is 36 hours and is divided into three steps.

- 1st step for 12 hours with a setpoint of 7 °C
- 2nd step with a setpoint of 12 °C
- 3rd step with a setpoint of 15 °C

If the room temperature is above the setpoint for the corresponding step, the valves are closed.

Cooling lock and/or bypass

The cooling lock can be activated with parameter P-45. When it is active, this room operating unit (or the room) is not switched to cooling when the system is switched from heating to cooling. The cooling lock can be combined with the bypass function.

The bypass function is used to discharge heat safely. When all the channels are closed, this channel (or multiple channels selected for this function) is opened, or remains open.

For applications with a heat pump, and if the heat pump is not protected against positive pressure, we recommend equipping a room – and, if applicable, two pipe runs – with the bypass function.

For applications that can lead to high temperatures, such as with solar heating systems, we recommend that the 'bypass heating' function is not activated. The wireless channel is not closed by the temperature limiter in the event of an alarm.

Addressing

When addressing is being carried out, a wireless room operating unit is assigned to a radio channel. The addressing, and the deletion of the addressing, can be performed separately on each channel. There is an addressing button for each channel. Single or multiple channels can be addressed or deleted at the same time.

The following combinations are possible between the wireless controller and the wireless room operating unit:

- Assign a wireless room operating unit to one channel.
- Assign a wireless room operating unit to multiple channels.
- Assign a wireless room operating unit and up to four room operating units in sensor mode to one channel.
- Combine up to three wireless controllers into a system using a wireless protocol.
- Combine multiple channels into one zone; a maximum of three zones can be formed for each wireless controller.
- Up to 8 wireless room units can be assigned to a wireless controller, 4-, 8- or 12-channel variant.
- It is possible to assign one wireless room operating unit and four additional wireless room operating units in sensor mode to one wireless controller. Before they are assigned to the radio channel, the wireless room operating units must be set as sensors.

It is possible to assign up to 12, 16 or 20 wireless room operating units (room operating units, room operating units in sensor mode, window contacts etc.) to each wireless controller. If you want to set up a system with more than 20 wireless room operating units, you can spread the wireless room operating units across several wireless controllers. For example, if you need 12 radio channels, you can accomplish this using a wireless controller with 4 channels and a wireless controller with 8 channels, and let them communicate by radio signals. With this configuration, you can connect up to 28 wireless room operating units.

Zones and cases for forming zones

You can form three zones for each wireless controller. The zone button and three LEDs are available for this purpose. When the zone button is pressed, the first zone is activated, the green power LED flashes, and the blue LED for zone 1 lights up. For the LEDs of the channels, the LEDs that are not assigned to a zone start to flash. The red LED is available for zone 2, and the yellow LED is available for zone 3. Zones are divided into the following cases:

- Within one zone, the operating modes 'Off (frost-protection facility)', 'Eco', 'Normal operation' or time programme are always the same. The change can be carried out on every wireless room operating unit.

The master function is assigned to a wireless room operating unit outside a zone. The other room operating units are affiliated with one or more zones. The following options are available with this wireless room operating unit:

- Change the operating mode.
- Change the time programmes for the associated wireless controller.
- Select heating or cooling for the entire system.

Radio communication between controllers

Multiple wireless controllers can be combined into a system. A system can comprise a maximum of three wireless controllers. One of these wireless controllers must be defined as the master. The wireless controllers are set as slaves ex works. The communication between the master and slave controllers is performed every 3 minutes. For this function, there is a master button and a system button for addressing the controllers with one another.

Before the wireless controller is assigned to a wireless room operating unit, the wireless controller must be defined as the master. If the wireless controller is not defined as the master until afterwards, the settings may be lost.

The following signals are transferred:

- Pump signal: the parameter P-63 can be used to define whether the pump signal is local or central. If 'central' is selected, the central pump is connected to the master controller and switched on if there is a demand at any controller. The pump is switched on after approx. 3 minutes. With this configuration, the potential-free output for pump control is also active. If 'local' is selected, the relevant pump output becomes active on the controller. The master switches its pump only when there is a demand from itself, not when there is a demand at the slave.
- Heating/cooling signal: if the room operating unit is configured for heating/cooling change-over, this signal is also forwarded to the master. The master subsequently forwards it to the next slave.
- Alarm if temperature is too high
- The time

The following signals are not transferred:

- The Eco signal is local and is not forwarded to the slave controller.
- The humidity alarm is local.

Software update

A software update can be performed via the integrated SD card. The power supply must be disconnected before the SD card is removed and updated. The boot loader with the new software starts automatically.

Model with LAN








The model with a LAN interface has an integrated web application. Various applications can be started via this interface and in combination with a LAN router.

- Controlling the installation locally via a WLAN system.
- Using the SAUTER app, controlling the installation via an iPhone over the internet.

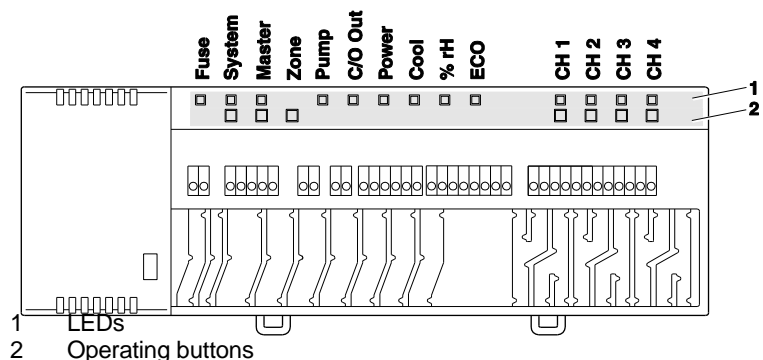
Details on this application can be found in the web application manual.

Description of the operating modes

The following operating modes can be set using the room operating unit:

Symbol	Description
	Off (frost-protection facility)
	Reduced mode
	Normal mode
	Time programmes Pro1, Pro2 and Pro3
	Cooling mode, only when the wireless room operating unit has priority; otherwise only as an indicator
	Heating mode, only when the wireless room operating unit has priority; otherwise only as an indicator
 AUTO	Auto cooling mode; shown only when cooling mode is switched on via the external C/O input

Description of the operating buttons and LEDs



Operating buttons	Description
System	Combine up to three wireless controllers into one system. Additionally, I/O boxes and an outside-temperature sensor can be integrated into a system.
Master	Set a wireless controller as the master in a system with multiple wireless controllers. One master must be defined for each system.
Zone	Combine multiple wireless controller channels into one zone or up to a maximum of three zones.
Channels	Address a wireless room operating unit and a wireless controller. Delete addressing. Add channels to zones or delete them.

LEDs	Description
Fuse: red LED	Miniature fuse 2 A (slow) for power supply defective, 24 V version. Miniature fuse 4 A (slow) for power supply defective, 230 V version.
System: yellow LED	On: communication between two or three wireless controllers.
Master: green LED	On: wireless controller has been configured as master. Off: wireless controller has been configured as slave.
Zone display, green power LED flashes at the same time	Blue (Cool): Zone 1 Red (% rh): Zone 2 Yellow (NO): Zone 3
Pump: green LED	On: pump on Off: pump off
C/O Out: green LED	The function of the 'C/O Out' LED depends on the setting of parameter P-51. 'Burner' function active. On: heating demand. 'C/O' function active. On: cooling demand.
Power: green LED	On: power supply on Off: no power supply
Cool: blue LED	On: C/O contacts closed (cooling mode active) On: Temp. limit C/O 24...230 V input active (configured as C/O input) On: change-over via wireless room operating unit for heating/cooling (C/O output active) Off: wireless controller is in heating mode

LEDs	Description
% rh: red LED	On: dew point active only in cooling mode Flashing: Temp. limit active in heating mode or cooling mode
ECO: yellow LED	On: ECO input is active Off: ECO input is not active
CH 1...CH 12: green LEDs	On: addressing completed and output active Flashing: ready for addressing Flashing, followed by fast flashing: warning of deletion, or deleting Fast flashing: channel in emergency mode

Engineering and fitting notes

Installation

The receiver should be installed above or near the underfloor heating system's distributor. The location should be clean, protected from splash water and ventilated.

Additional technical data

CE conformity as per:	
Radio	EN 300220
RTTE immunity	EN 301489-3
RTTE emission	EN 300220-3

Accessories

0450231001 External active aerial

To improve reception – e.g. if the wireless controller is installed in a metal cabinet – an external aerial can be connected to the wireless controller.

The active aerial does not require an external power supply. It is powered by the wireless controller via the supplied communication cable. A communication cable (5 m long) with an RJ12 plug at both ends is included. If a different or longer connecting cable is used, operation may be impaired. The active aerial does not require addressing. When the aerial is connected to the wireless controller via the power cable, the internal aerial of the wireless controller is deactivated and the external active aerial takes over its function. If the five-metre cable supplied is not long enough, a repeater (available as an accessory) must be used.

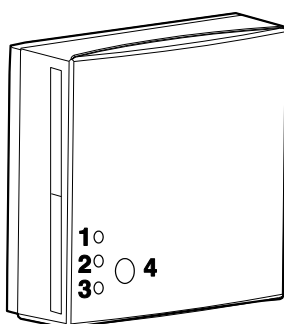
LXR470RF100 Repeater

If a radio connection cannot be set up between the wireless controller and the room operating unit, or between wireless controllers (in a system of two or three wireless controllers), a repeater can be used. This increases the range of transmission between the radio devices.

The repeater automatically assigns the required information to the wireless controller via the bi-directional radio system. A power supply of 230 V/5 V is required for this purpose. A plug-in power supply unit is included.

A maximum of one repeater can be incorporated into a wireless room operating network or system network (wireless controller). In a wireless room operating network, all the room operating units, room sensors and other accessories can transmit the signals to the wireless controller via a repeater. In a system network, only the two 'slave' wireless controllers can transmit the signals to the 'master' wireless controller via the repeater.

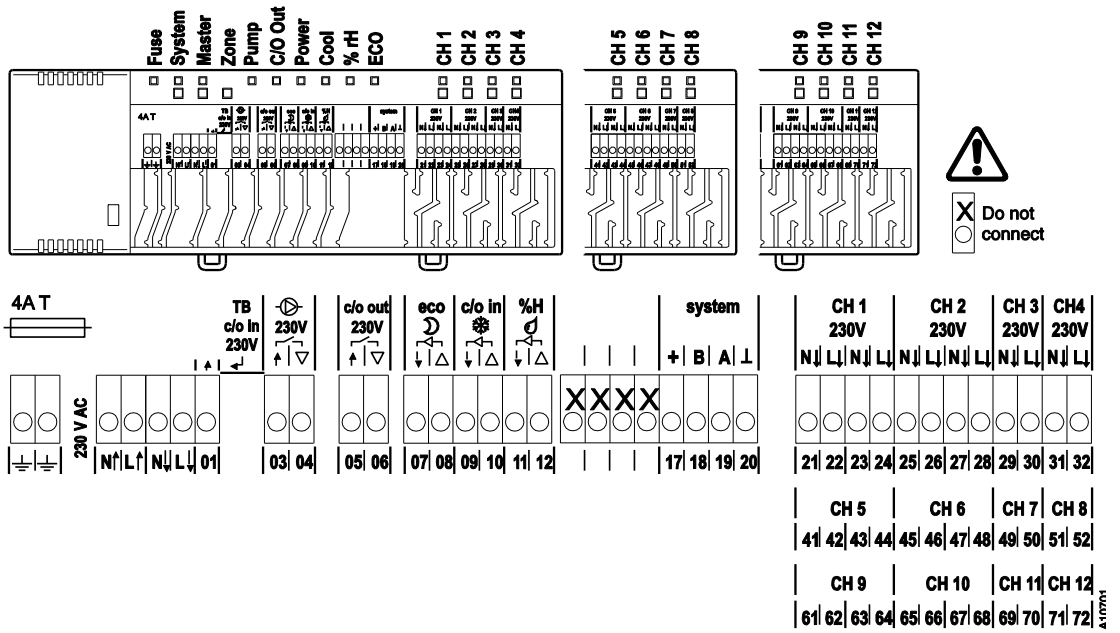
The repeater must be addressed with the controller, either with the room operating wireless network or with the system network. See the technical manual.



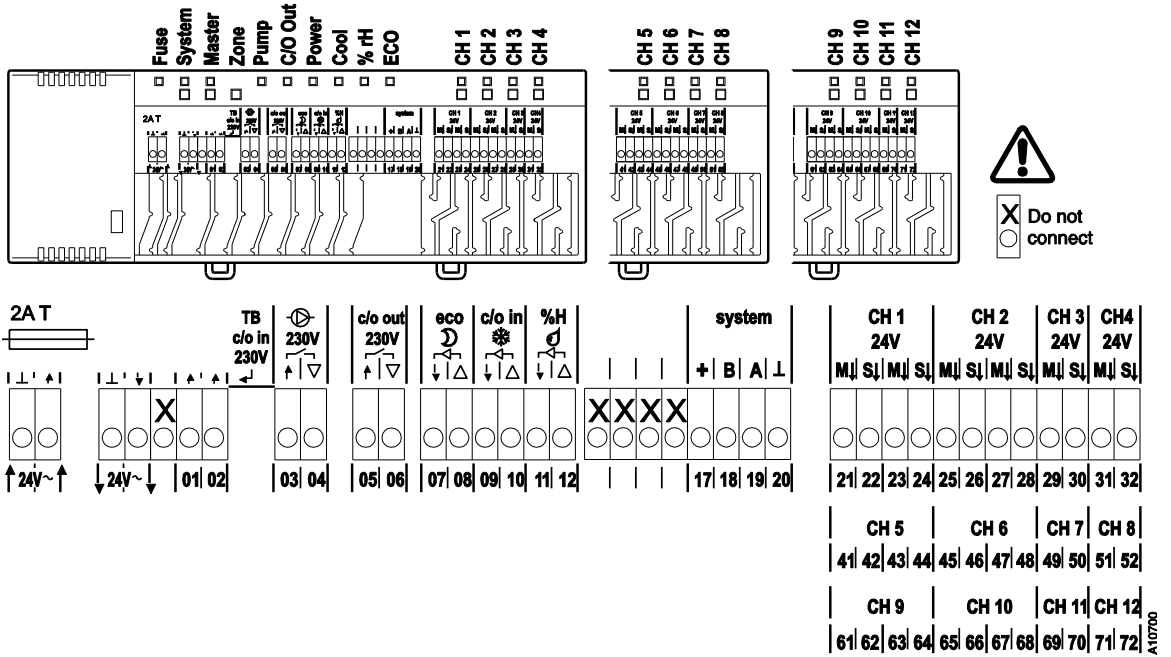
- 1 Red LED: no radio connection with wireless controller
- 2 Yellow LED: radio connection
- 3 Green LED: power
- 4 Button for addressing and for deleting the addressing

A second button is located under the cover. This button can be used to switch off the LEDs.

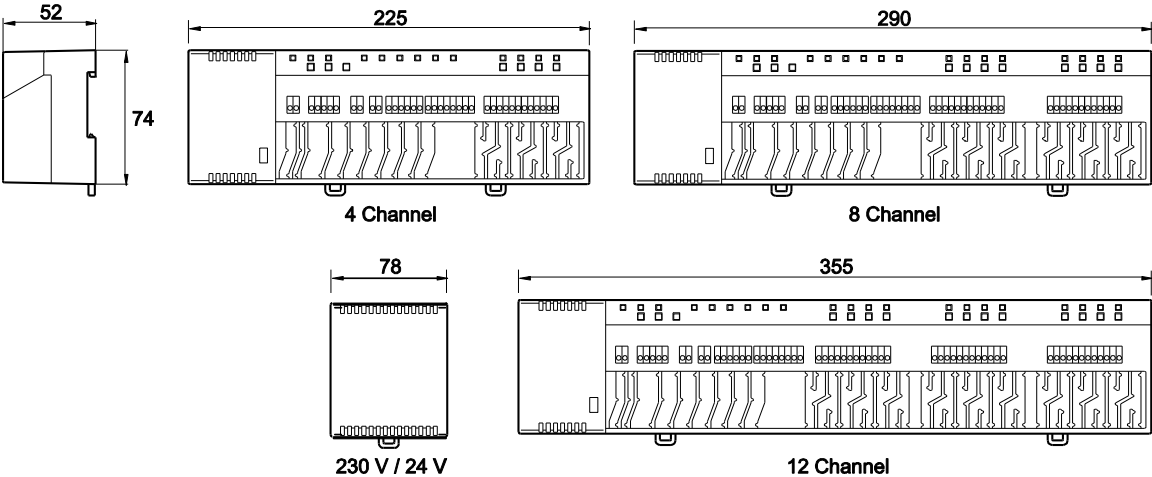
Wiring diagram, 230 V version



Wiring diagram, 24 V version



Dimension drawing



Accessories

External active aerial and repeater

