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Technical Manual

Heating Actuator

Heating Actuator

HA-M-0.6.1 (6254/0.6)

HA-M-0.12.1 (6254/0.12)

Power and productivity
for a better world™

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1 Notes on the instruction manual

Please read this manual through carefully and adhere to the information contained therein. This will assist you in preventing damage to persons and property and ensure reliable operation and long service life of the device.

Please keep this manual in a safe place.

If you pass the device on, also include this manual.

If you require additional information or have questions about the device, please contact ABB STOTZ-KONTAKT GmbH or visit our Internet site at:

www.abb.com/freeathome

2 Safety

The device has been constructed according to the latest valid regulations governing technology and is operationally reliable. It has been tested and left the factory in a technically safe and reliable state.

However, residual hazards remain. Read and adhere to the safety instructions to prevent such hazards.

ABB STOTZ-KONTAKT GmbH accepts no liability for failure to observe the safety instructions.

2.1 Used symbols

The following symbols point to particular dangers involved in the use of the device and provide practical instructions.

Note
A notice indicates information or references to additional useful topics. This is not a signal word for a dangerous situation.

Examples
Examples for application, installation and programming

Important
This safety notice is used as soon as there is the danger of malfunction without the risk of damage to property or risk of injury.

Caution
This safety notice is used as soon as there is the danger of malfunction without the risk of damage to property or risk of injury.

 **Danger**
This safety notice is used as soon as there is a threat to life and limb due to improper handling.

 **Danger**
This safety notice is used as soon as there is a serious threat to life due to improper handling.

2.2 Intended use

The heating actuator must only be operated within the specified technical data.

The heating actuator is a rail mounting device for installing in distributors.

The heating actuator serves for the activation of valves via thermoelectric actuating drives for room temperature control.

The integrated bus coupler makes possible the connection to the free@home bus.

2.3 Improper use

The device is dangerous if used improperly. Any non-intended use is deemed improper use. The manufacturer is not liable for damages resulting from such improper use. The associated risk is borne exclusively by the user/operator.

The device must never be used outdoors or in bathroom areas. Do not push objects through the openings in the device.

The device has an integrated bus coupler. The use of an additional bus coupler is therefore not admissible.

2.4 Target group / qualification of personnel

Installation, commissioning and maintenance of the product must only be carried out by trained and properly qualified electrical installers. The electrical installer must have read and understood the manual and follow the instructions provided. The operator must adhere to the valid national regulations in his country governing the installation, functional test, repair and maintenance of electrical products.

2.5 Liability and warranty

Improper use, non-observance of this manual, the use of inadequately qualified personnel, as well as unauthorized modification excludes the liability of the manufacturer for the damages caused. It voids the warranty of the manufacturer.

3 Environment

Always dispose of the packaging material and electric devices and their components via the authorized collecting depots and disposal companies.

The products meet the legal requirements, in particular the laws governing electronic and electrical devices and the REACH ordinance.

(EU Directive 2006/96/EC, 2004/108/EC and 2011/65/EC RoHS)

(EU REACH ordinance and law for the implementation of the ordinance (EC) No.1907/2006)

4 Product description

The devices are heating actuators for installing on mounting rails. The devices have six or twelve channels and serve as actuators for the activation of heating systems via conventional thermal actuating drives.

Advantages:

» Six or twelve channels (depending on the type of device) for the activation of actuating drives.

» Per channel, each device supports voltages of 24 V AC up to 230 V AC (this makes the use of all conventional thermal actuating drives possible).

» Three channels can be protected together by a circuit-breaker.

Note
Basic information about system integration is contained in the system manual. It is available for downloading at www.abb.com/freeathome.

4.1 Scope of supply

The scope of supply contains the heating actuator including bus terminal for coupling to the free@home bus.

4.2 Overview of types

Type	Product name	Actuator channels	Device
HA-M-0.6.1	Heating actuator 6gang	6	
HA-M-0.12.1	Heating actuator 12gang	12	

Table 1: Overview of types

4.3 Function overview

The following table provides an overview of the possible functions and applications of the device:

Icon in the operating surface	Information
	**Name:** Heating actuator **Function:** For the activation of valves in heating circuits
	**Name:** Cooling actuator **Function:** For the activation of valves in cooling circuits
	**Name:** Actuator for heating and cooling **Function:** For the activation of valves in circuits that are used for heating and cooling

Table 2: Function overview

4.4 Description of functions

The control of heating and cooling systems is illustrated in Fig. 1. The object of such control is the adjustment of the actual temperature to the desired set-point temperature in a room. The set-point temperature for the room can be set by means of a free@home room temperature controller. It also measures the actual temperature. Depending on the difference between both temperatures (control deviation) the room temperature controller creates a control value that is transmitted to the heating actuator (HA-M-0.6.1 or HA-M-0.12.1). The heating actuator, in dependence of the control value, controls one or several thermal actuating drives which set the valves in the heating or cooling circuit.

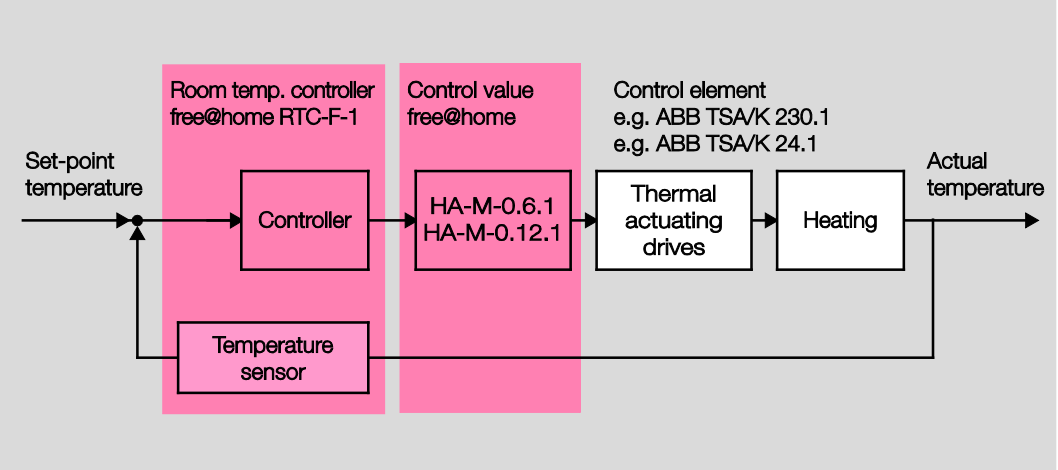


Fig. 1: Diagram of heating control

4.4.1 Heating actuator, heating valves

This function is to be selected if only one heating system (e.g. floor heating, heaters, etc.) is to be controlled (no cooling). The channel of the heating actuator, which sets the valve in the pre-run of the heating circuit, is to be linked with the room temperature controller in menu "Linking" in the main menu of the System Access Point. The thermal actuating drive is to be connected hardware-related to this channel. Control and setting of the valve occurs automatically as soon as the room temperature controller has been connected to the heating actuator.

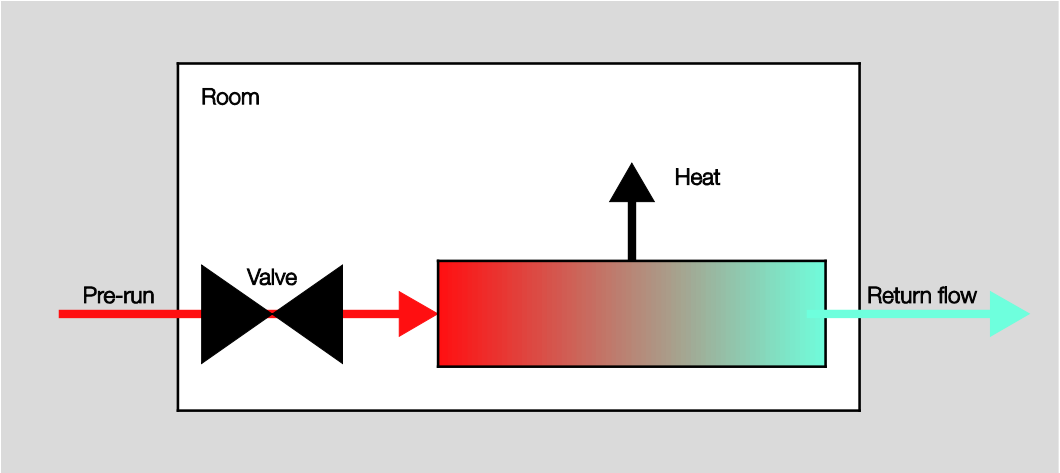


Fig. 2: Valve in the pre-run of a heating circuit

4.4.2 Cooling actuator, valve for cooling

This function is to be selected if only one cooling system (e.g. cooling ceiling) is to be controlled. The channel of the heating actuator, which sets the valve in the pre-run of the cooling circuit, is to be linked with the room temperature controller in menu "Linking" in the main menu of the System Access Point. The thermal actuating drive is to be connected hardware-related to this channel. Control and position of the valve occurs automatically as soon as the room temperature controller has been connected to the heating actuator.

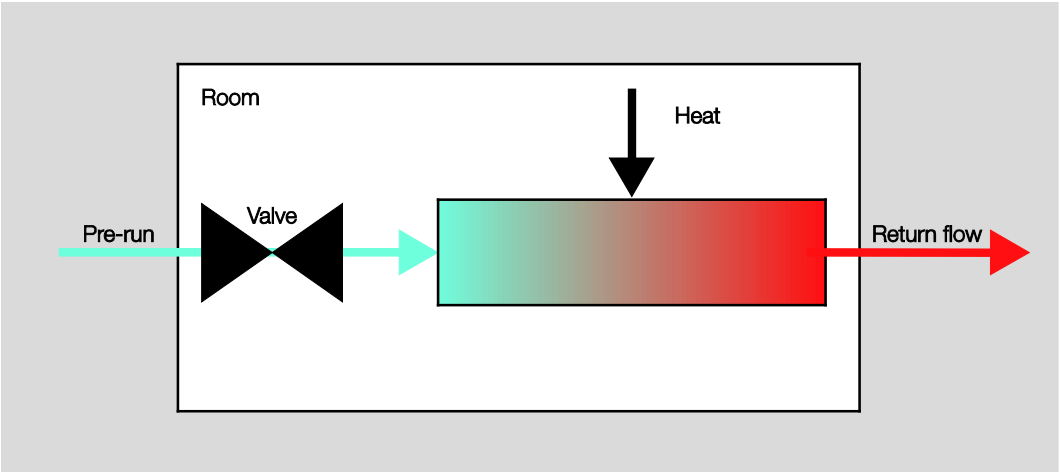


Fig. 3: Valve in the pre-run of a cooling circuit

4.4.3 Actuator for heating and cooling, valve for heating and cooling

This function is to be selected if a heating system is used for which the same circuit, e.g. dependent on the season, is used for heating or cooling. The respective control for heating or cooling and the position of the valve occurs automatically as soon as the room temperature controller has been connected to the heating actuator. The selection of the control value for heating or cooling, for example, occurs by means of reversing a switch which is to be linked with the heating actuator via a binary input in menu "Linking" in the main menu of the System Access Point. As alternative, a binary output of the associated thermal system (if available) can be used.

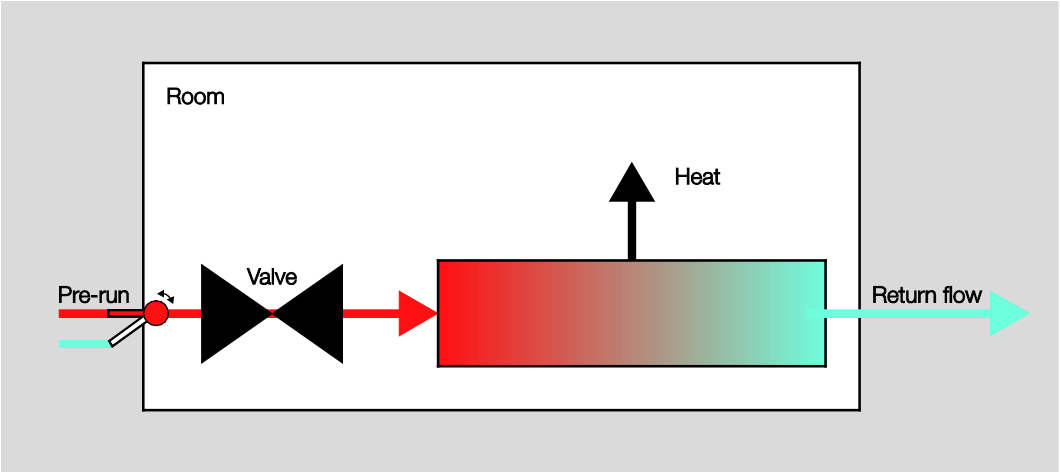


Fig. 4: Valve in the pre-run of a heating/cooling circuit

4.4.4 Control of several heating or cooling circuits

The control of several heating or cooling circuits becomes necessary, for example, for the control of several heaters in a room. In this case each heater is to be equipped with a thermal actuating drive. The actuating drives are to be connected either to a single channel of the heating actuator (the maximum nominal current is to be taken into consideration) or to several channels. The channels are to be configured as "Valve for heating" in the parameter settings of the heating actuator in the System Access Point. In menu "Linking" in the main menu of the System Access Point the associated room temperature controller is to be linked with all channels to which the actuating drives have been connected. The control occurs automatically following the linking in menu "Linking".

The procedure is to be applied analogous for cooling systems with the difference that the respective channels must be configured as "Valve for cooling".

4.4.5 Controlling parallel heating and cooling circuits

If several thermal systems which have appropriate heating and cooling circuits are operated parallel to heating and cooling, a thermal actuating drive is to be used for each valve of a circuit of a system. The corresponding channels are, depending on the connected heating or cooling system, to be configured as "Valve for heating" or "Valve for cooling". In menu "Linking" in the main menu of the System Access Point the associated room temperature controller is to be linked with all channels to which the actuating drives have been connected. The controls for heating and cooling occur automatically in dependence of the difference between the set-point and actual temperature.

Example

A room has two heaters and a cooling ceiling. All three systems are equipped with their own thermal actuating drive. The thermal actuating drives are to be connected to the heating actuator and are each to be linked in menu "Linking" of the main menu of the System access Point with any three channels of the heating actuator. The two channels to which the heaters are to be connected are to be configured as "Valve for heating". The channel to which the cooling ceiling is connected is to be configured as "Valve for cooling". The three valves in turn are to be linked with the associated room temperature controller. The control and the position of the valves on the two heaters and the cooling ceiling occur automatically.

4.5 Device overview of 6gang heating actuator HA-M-0.6.1

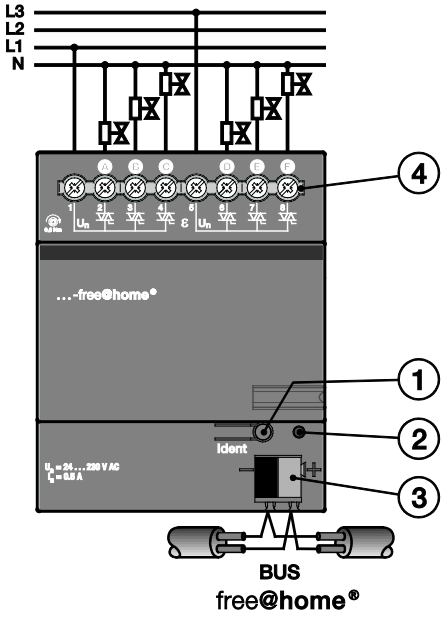


Fig. 5: Device overview of 6gang heating actuator

[1] Device identification during commissioning
[2] Identification LED
[3] Bus connection terminal
[4] Connecting terminals for thermal actuating drives

4.6 Device overview of 12gang heating actuator HA-M-0.12.1

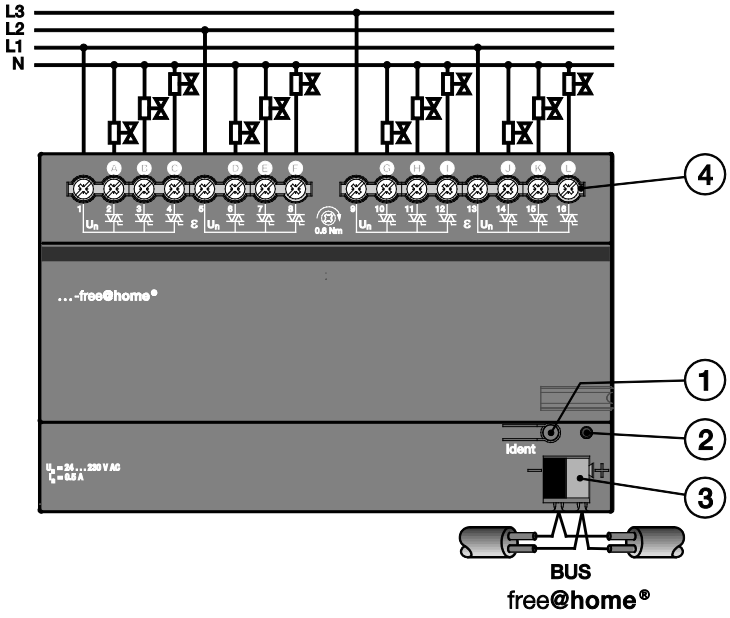


Fig. 6: Device overview of 12gang heating actuator

[1] Device identification during commissioning
[2] Identification LED
[3] Bus connection terminal
[4] Connecting terminals for thermal actuating drives

5 Technical data

5.1 Overview of HA-M-0.6.1 and HA-M-0.12.1

Parameters	Value	
Power supply	24 V DC (via the bus)	
Bus subscribers	1 (12 mA)	
Connection (free@home)	Bus connection terminal: 0.4 - 0.8 mm	
Line type	J-Y(St)Y, 2 x 2 x 0.8 mm	
Outputs	6 or 12 semiconductor outputs	3 non-floating outputs each in the group Protected against short-circuit and overload
	Rated voltage U_N	24 to 230 V AC 50/60 Hz
	Nominal current I_N per output	160 mA resistive load at T_U to 45°C
	Inrush current per output	Maximum 750 mA for 10 s at T_U to 60°C
	Caution For the parallel connection of actuating drives (e.g. TSA/K) the technical data of the respective actuating drive is to be observed! The inrush current (750 mA) and nominal current (160 mA) of the output must not be exceeded.	
Connecting terminals	Combi-head screw-type terminal (PZ 1)	Connection cross section: 0.2 - 4.0 mm² fine-wire, 2 x 0.2…2.5 mm² 0.2 - 6.0 mm² single-wire, 2 x 0.2…4.0 mm²
	Tightening torque	0.6 Nm
Ambient temperature	Operation	-5°C to +45°C
	Storage	-25°C to +55°C
	Transport	-25°C to +70°C
Environmental conditions	Maximum humidity	93%, no dew permissible
Protection type	IP20	Acc. to DIN EN 60 529
Protection class	II	Acc. to DIN EN 61 140
Insulation category	Over voltage category	III acc. to DIN EN 60 664-1
	Degree of contamination	2 acc. to DIN EN 60 664-1
Mounting	On 35 mm mounting rail	Acc. to DIN EN 60 715
Built-in position	Any	

Design	Rail mounting device (MDRC)	Modular installation device, Pro *M*
	Installation width	4 or 8 modules à 18 mm
	Installation depth	64.5 mm
	Housing, colour	Plastic, basalt grey (RAL 7012)
Dimensions	72 x 90 x 64.5 mm (W x H x D) 144 x 90 x 64.5 mm (W x H x D)	
Weight	0.14 kg 0.24 kg	
CE marking	According to EMC and low-voltage guidelines	

Table 3: Technical data

5.2 Dimensions

Note
All dimensions are in mm.

Heating Actuator HA-M-0.6.1

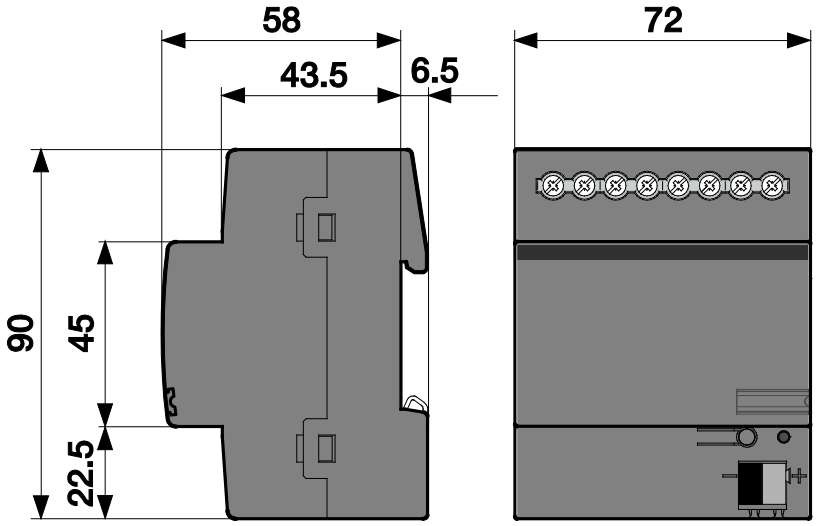


Fig. 7: Dimensions of 6gang heating actuator

Heating Actuator HA-M-0.12.1

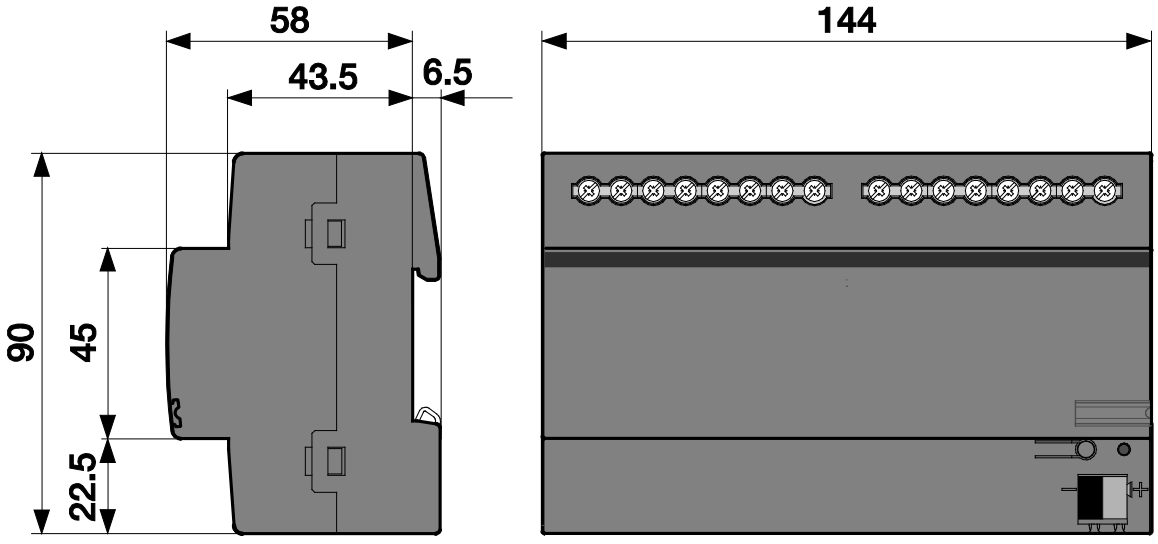


Fig. 8: Dimensions of 12gang heating actuator

5.3 Connection diagram

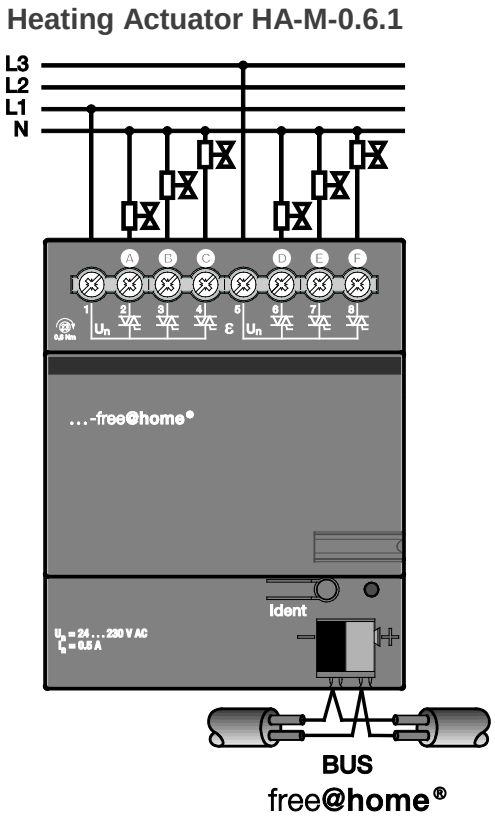


Fig. 9: Electrical connection of 6gang heating actuator

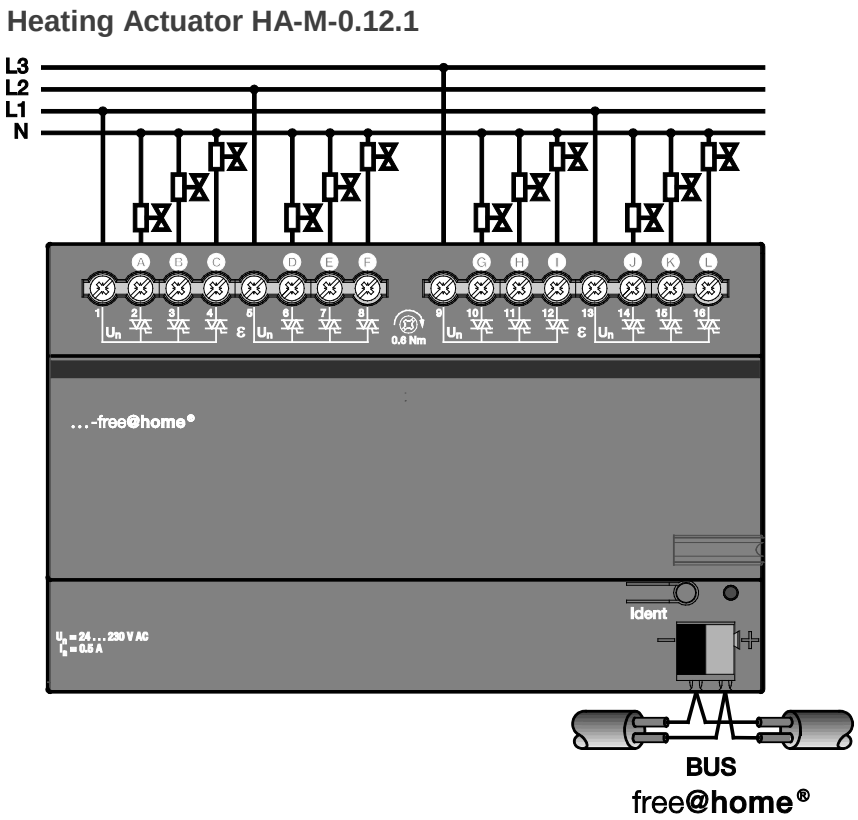


Fig. 10: Electrical connection of 12gang heating actuator

6 Mounting

6.1 Safety instructions for mounting

Danger

Risk of death due to electrical voltage

Dangerous currents flow through the body when coming into direct or indirect contact with live components. This results in electric shock, burns or even death.

Work improperly carried out on electrical systems is a hazard to one's own life and that of the user. Also fires and serious damage to property can result.

» Observe the relevant standards.

» Apply at least the "five safety rules" (DIN VDE 0105, EN 50 110):

1. Disconnect
2. Secure against being re-connected
3. Ensure there is no voltage
4. Connect to earth and short-circuit
5. Cover or barricade adjacent live parts

» Install the device only if you have the necessary electrical engineering knowledge and experience (see chapter 2.4).

» Use suitable personal protective clothing.

» Use suitable tools and measuring devices.

» Check the supply network type (TN system, IT system, TT system) to secure the following power supply conditions (classic connection to ground, protective earthing, necessary additional measures, etc.).

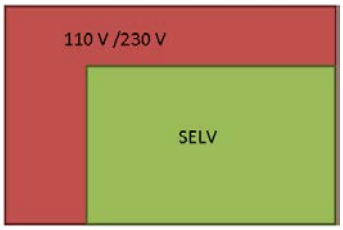
Danger

Risk of death due to short-circuit

Risk of death due to electrical voltage of 230 V during short-circuit in the low-voltage line.

» During mounting observe the spatial division (> 10 mm) of SELV electric circuits to other electric circuits.

» Observe the spatial division of SELV electric circuits and other electric circuits. Otherwise short-circuits can occur.



» If the minimum distance is insufficient, use electronic boxes or insulating tubes.

» Observe the correct polarity.

6.2 Installation/mounting

The device is a rail mounting device for installing in distributors for easy installation on 35 mm mounting rails according to DIN EN 60 715.

The device can be mounted in any position.

The stick-on label is to be removed and glued into the list (see system manual System Access Point).

The bus connection is established by means of the enclosed bus connection terminal.

The device is ready for operation after the bus voltage and, if required, an auxiliary voltage has been applied.

The description of the terminals is found on the housing.

Access to the device must be guaranteed for operation, testing, inspection, maintenance and repairs according to DIN VDE 0100-520.

Requirements for commissioning

A System Access Point is required to make the device operational. The device is ready when the bus voltage is applied.

6.3 Electrical connection

» The electrical connection is made via screw terminals. The bus connection is established by means of the enclosed bus connection terminal. The terminal designation is located on the housing.

» The bus line connection is established by means of the enclosed bus connection terminal (red/black).

» Three outputs each (A-C, D-F, etc.) are protected together and are supplied via one phase.

» Several thermoelectric actuating drives can be connected in parallel to one output. When connecting several actuating drives in parallel it should ensured that the maximum inrush current or nominal current is not exceeded.

» The technical data of the actuating drives must be observed!

- The device is ready for operation after the bus voltage has been applied.

Mounting and commissioning must only be carried out by qualified electrical installers. When planning and setting up electrical systems and security-related systems for the detection of intrusion and of fires, the relevant standards, guidelines, rules and regulations of the respective country are to be observed.

» Protect the device against humidity, dirt and damage during transport, storage and operation!

» Operate the device only within the specified technical data!

» Operate the device only in a closed housing (distributor)!

» Prior to performing installation work the device is to be deactivated.

Danger

Danger to life

To prevent dangerous contact currents due to feedback from different external conductors, an all-pole deactivation is to be carried out when extending or changing the electric connection.

6.4 Dismantling

Dismantling is carried out in the reverse order.

7 Commissioning

Commissioning is always carried out via the Web-based surface of the System Access Point.

The System Access Point establishes the connection between the free@home participants and the smartphone, tablet or PC. It is used to identify and program the participants during commissioning.

Devices which are physically connected to the free@home bus, log themselves automatically into the System Access Point. They transmit information about their type and supported functions (see Table 2: Function overview, chapter 4.3).

During initial commissioning all devices are given a generic name (e.g. switch actuator 1, etc.). The user must change this name to a name practical for the system (Example: "Living room light" for an actuator in the living room.

Commissioning of the heating actuator is described in the following chapters. Here it is assumed that the basic commissioning steps of the overall system have already been carried out. General knowledge about the Web-based commissioning software of the System Access Point is assumed.

Note
General information about commissioning and parameterization is available in the system manual and the online Help of the "System Access Point" (www.abb.com/freeathome).

7.1 Allocation of devices and specifying channels

The devices connected to the system must be identified, i.e. they are allocated to a room according to their function and are given a descriptive name.

The allocation is made via the allocation function of the Web-based user interface of the System Access Point.

Device selection

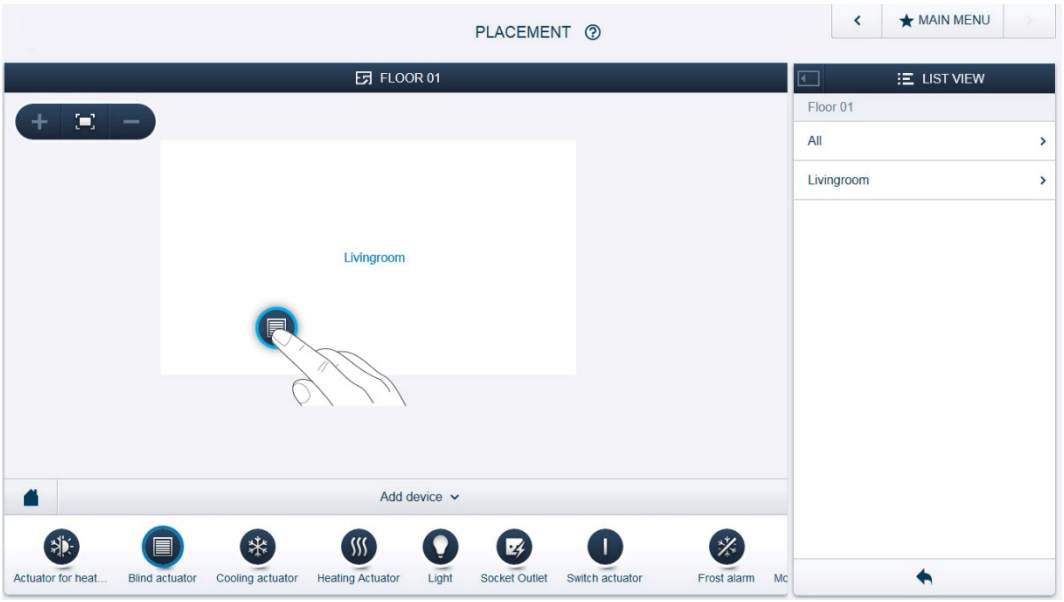


Fig. 11: Allocating devices

» In the "Add device" bar select the desired application and pull it via drag-and-drop onto the floor plan in the working area.

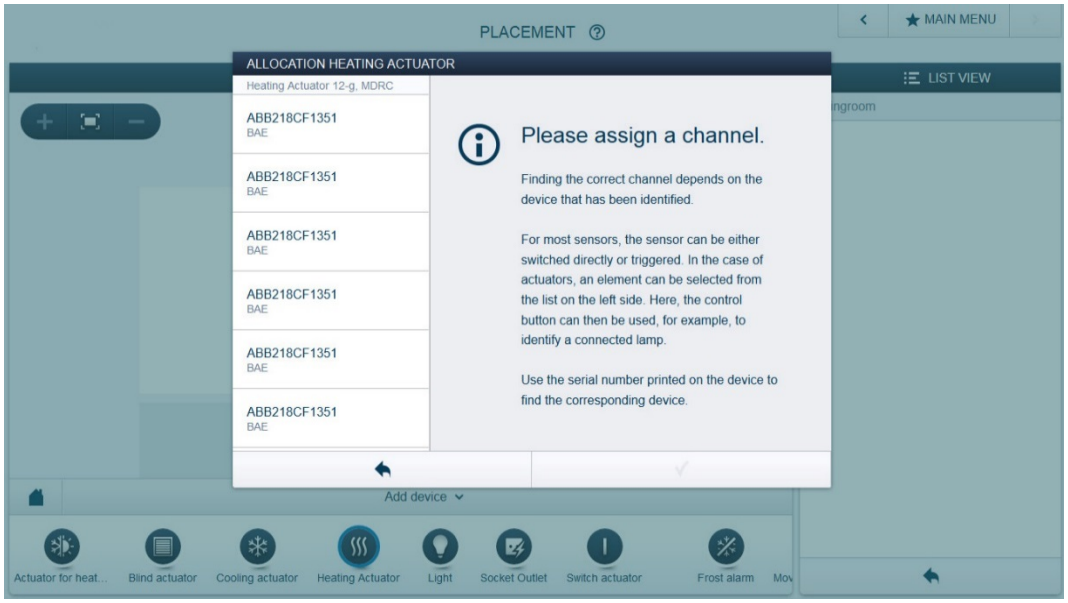


Fig. 12: Allocation

- A pop-up window opens automatically which lists all the devices suitable for the application selected.

The desired device can be identified in two ways.

Identification via serial number

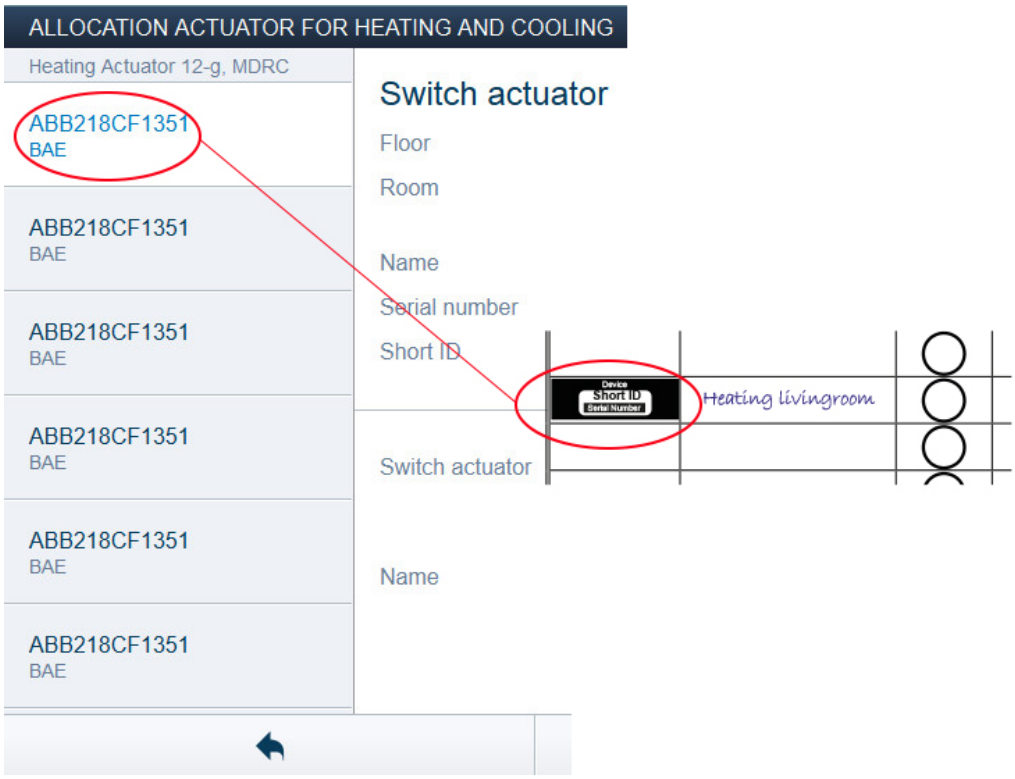


Fig. 13 Identification via serial number

» Compare the short 3-digit number of the identification label with the numbers in the list and in this way identify the device you are searching for and, if necessary, also the channel.

Identification by pressing the "Identification button"

» Press the identification button on the device which you wish to add.

- The desired device is faded in automatically.

» Select the desired channel.

Assigning a name

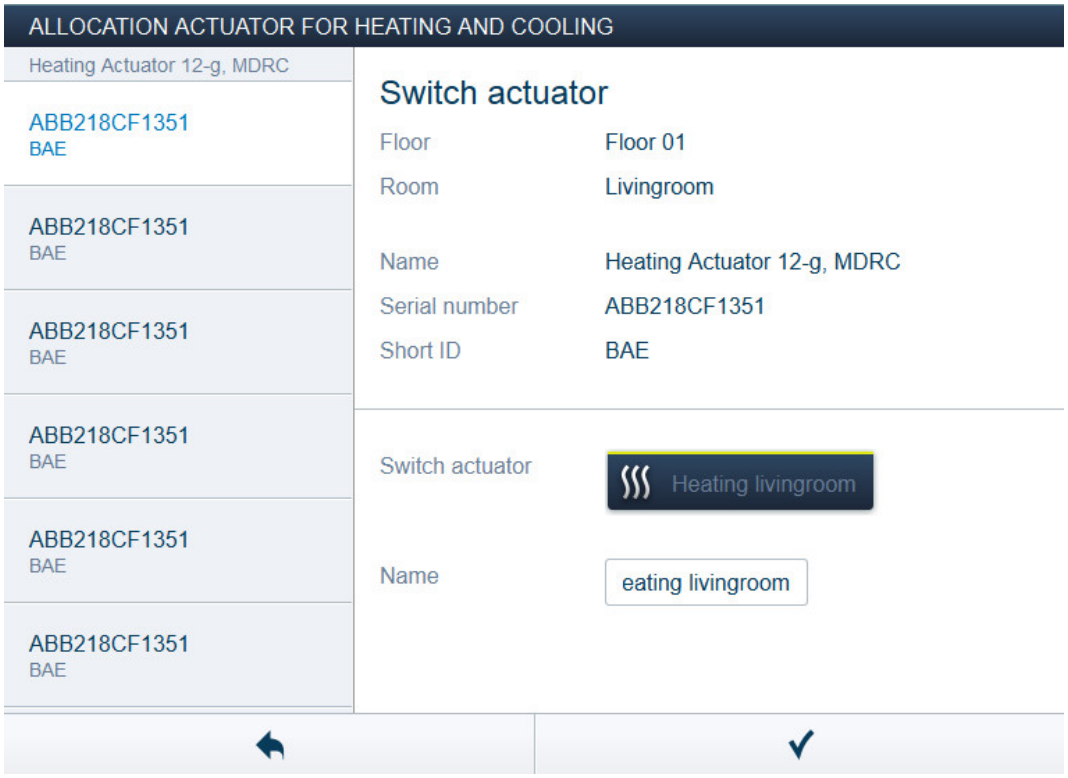


Fig. 14: Assigning a name

» Enter a name that is easy to understand and under which the application is to be displayed later (e.g. "Living room heating").

» Press the tick at the bottom right to take over the entry.

7.2 Setting options per channel

General settings and parameter settings can be made for each channel.

The settings are made via the allocation function of the Web-based user interface of the System Access Point.

Device selection

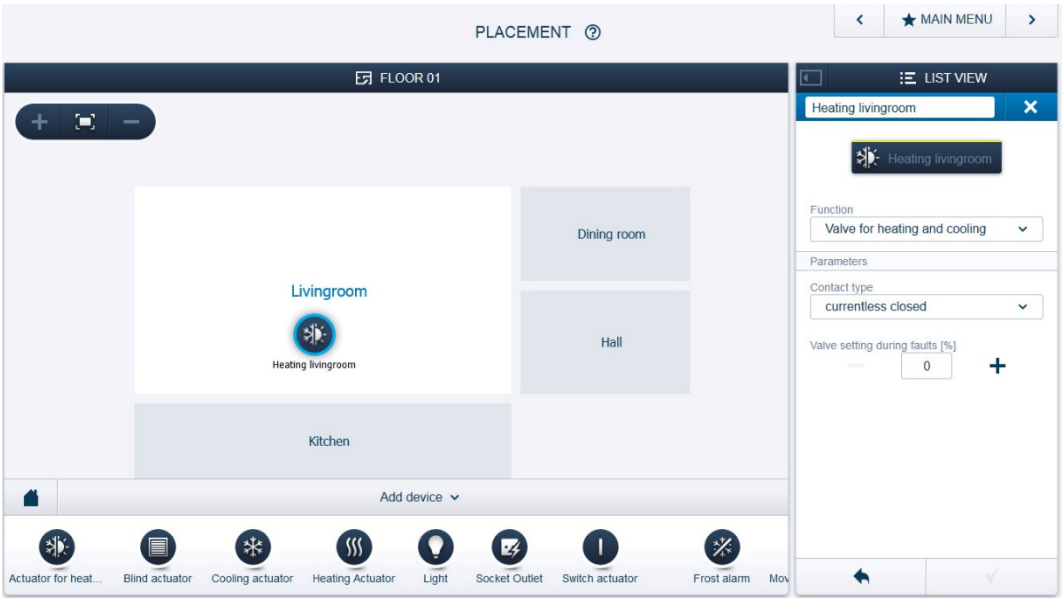


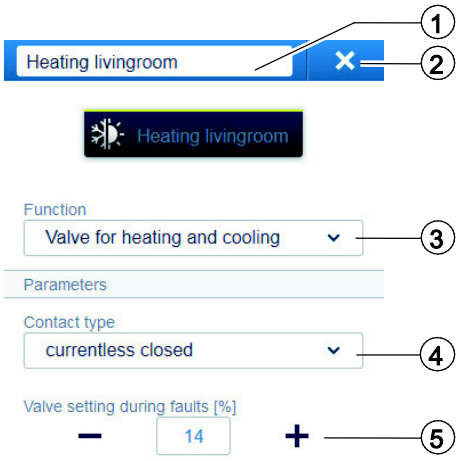
Fig. 15: Device selection

» Select the device icon in the floor plan of the working area view.

- All setting options for the respective channel are displayed in the list view.

The following settings are available.

7.2.1 Heating actuator settings



[1] Changing the name

[2] Deleting the channel via "X"

[3] Selection of function (see section 4.3)

[4] Selection of channel contact type

[5] Specifying the control value to be applied during a fault

7.3 Linking

The heating actuators created via the allocation function can now be linked with a second device (e.g. room temperature controller).

The linking in the list view is then made via the linking function of the Web-based user interface of the System Access Point.

Linking heating actuator and room temperature controller

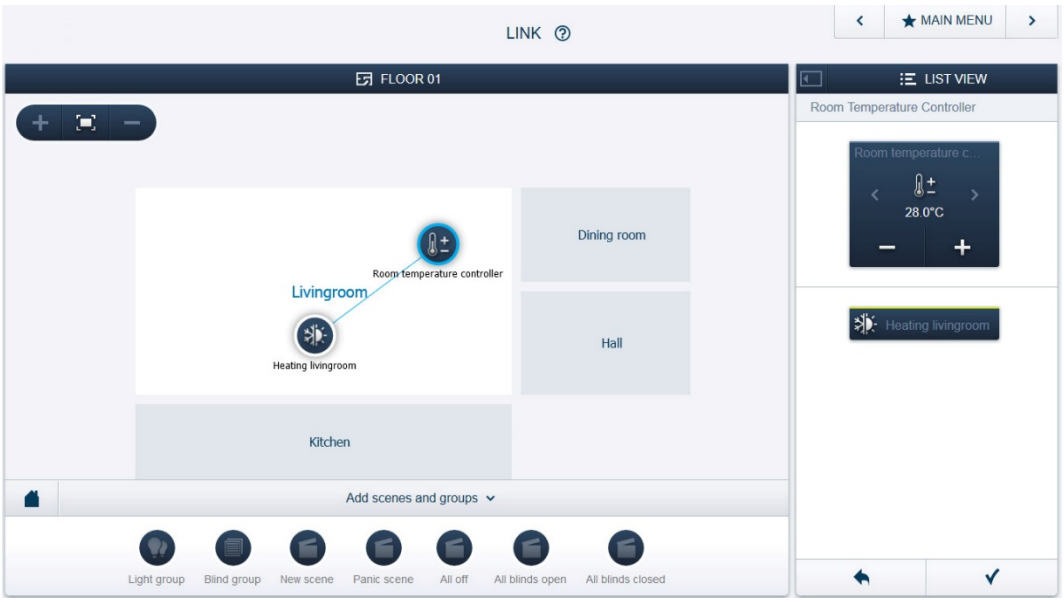


Fig. 16: Linking heating actuator and room temperature controller

» To link a heating actuator with a room temperature controller insert the corresponding channels of the heating actuator and room temperature controller into the same room.

- The room temperature controller is automatically linked with all heating actuator channels added to this room.

Note
The links can be changed manually at all times.

8 Updating options

A firmware update is carried out via the Web-based user interface of the System Access Point. For this, visit the free@home website www.abb.com/freeathome.

9 Maintenance

The device is maintenance-free. In case of damage (e.g., during transport or storage), do not perform repairs. Once the device is opened, the warranty is void!

Access to the device must be guaranteed for operation, testing, inspection, maintenance and repairs (according to DIN VDE 0100-520).

9.1 Cleaning

Dirty devices can be cleaned with a dry cloth. If this is not sufficient, a cloth slightly moistened with a soap solution can be used. Caustic cleaning agents or solvents must not be used.

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Further information and contact:

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