

72186100-00N

Modulating Outdoor Reset Control

AM10

For the contractor

Please read these instructions carefully

7218 6100 (07/2010) US/CA



US-listed

Buderus

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1 Installation manual

1.1 Description of Module

Product description

The AM10 is a modulating control for Buderus boilers equipped with the EMS bus. It sets the supply water temperature based on outdoor temperature. The boiler fires, runs and modulates based on the information received from the AM10, and the delta temperature between supply and return.

An ON/OFF signal from 3th party room thermostats or zone controllers is used to communicate a heat demand.

The AM10 offers warm weather shutdown when the outdoor temperature rises above an adjustable temperature. To control and stage multiple boilers, combine the AM10 with an MCM10 module.

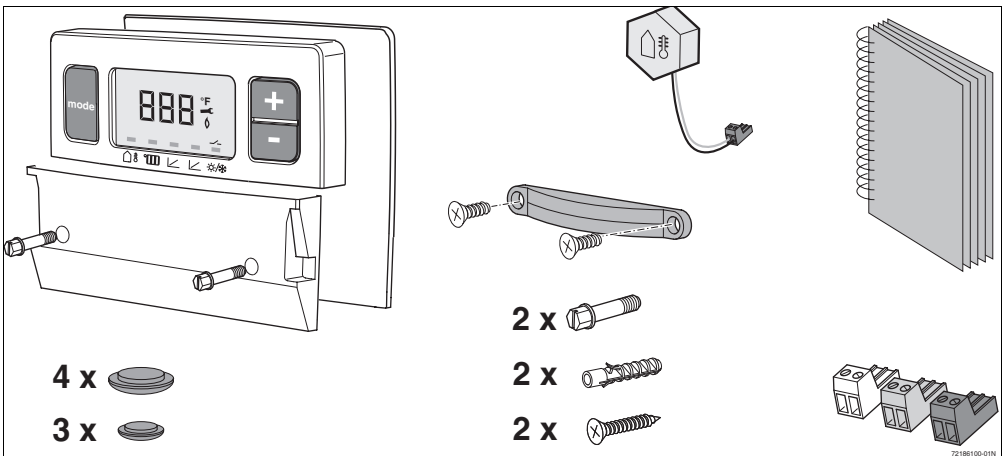


Fig. 1 Included items

1.2 Outdoor reset

Outdoor reset is a smart way to economically control space heating based on outdoor temperature. It functions based on the fact that the colder the weather the greater the heat loss of a structure, and the higher the supply water temperature needed to heat the house. On a warmer day with smaller losses a lower water temperature will be able to heat the house.

Outdoor reset is the preferred control when using multiple zones, as the boiler supply water temperature is not dictated by a master or largest zone, but solely based on the heat loss of the structure.

Heating curve

The AM10 has a built in linear heating curve that sets the supply water temperature in relation to the outdoor temperature.

The maximum supply water temperature is set on the boiler dial works as a high limit. The boiler will follow the heating curve in the AM10 up to the high limit.

Setting	Outside temperature [°F]	Supply temperature [°F]
Default	14	167
Example 1	0	170
Example 2	-10	175
Example 3	-20	180

Tab. 1 Heating curve

1.3 Mounting of the AM10

Mount the AM10 module inside a Buderus boiler. For detailed instructions see the installation manual of your boiler.

For connecting the AM10 to the EMS-Bus: (→fig. 5).

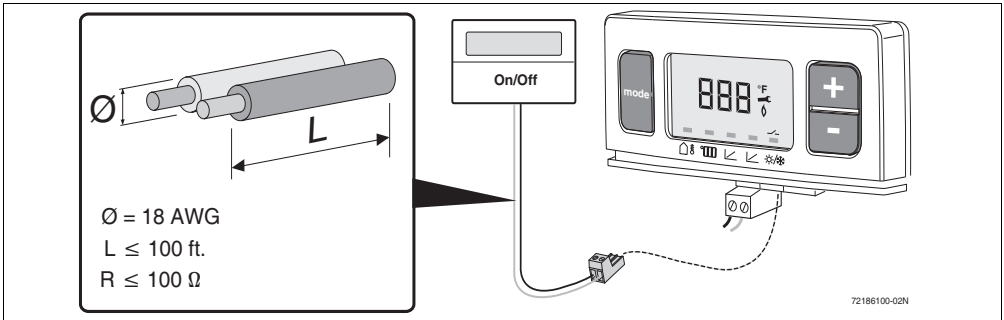


Fig. 2 Thermostat

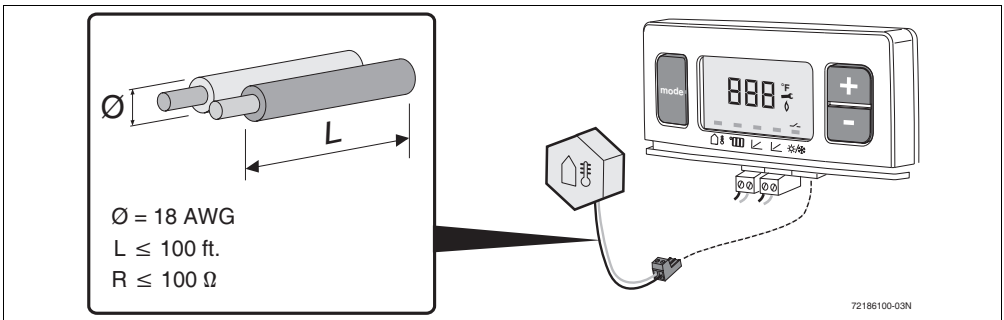


Fig. 3 Outdoor sensor

[°F]	[k Ω]	[°F]	[k Ω]	[°F]	[k Ω]	[°F]	[k Ω]
-40	336.5	5	72.9	50	19.9	95	6.5
-31	242.6	14	55.3	59	15.7	104	5.3
-22	177.0	23	42.3	68	12.5	113	4.4
-13	130.4	32	32.7	77	10.0	122	3.6
-4	97.1	41	25.4	86	8.1		

Tab. 2 Sensor resistance table

1.4 Positioning outdoor sensor

For best performance the outdoor sensor is to be positioned where the sun can never reach it. Mount only on a north facing wall of the building, out of the sunlight, with at least 1 foot (30 cm) above snow line. Keep the sensor away from heat sources like dryer, water heater, or boiler vents, windows, etc.

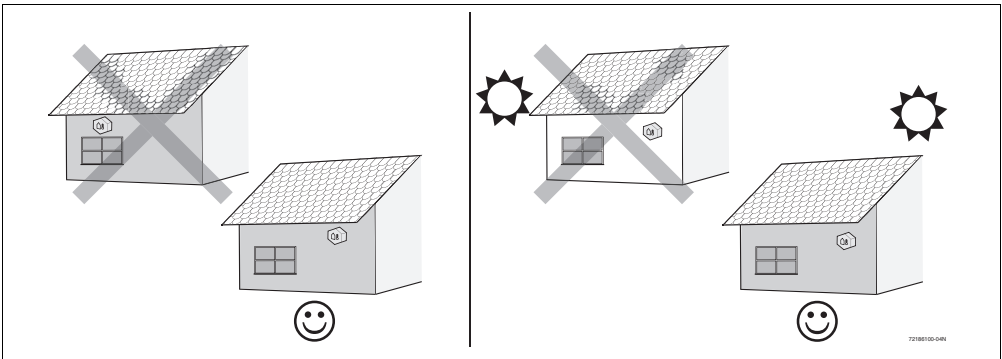


Fig. 4 Sensor location

1.5 Single Boiler Control

To equip a single Buderus with outdoor reset control, required items are:

- ON/OFF thermostat for every heating zone with individual zone pump or zone valve
- Pump relay
- Wiring

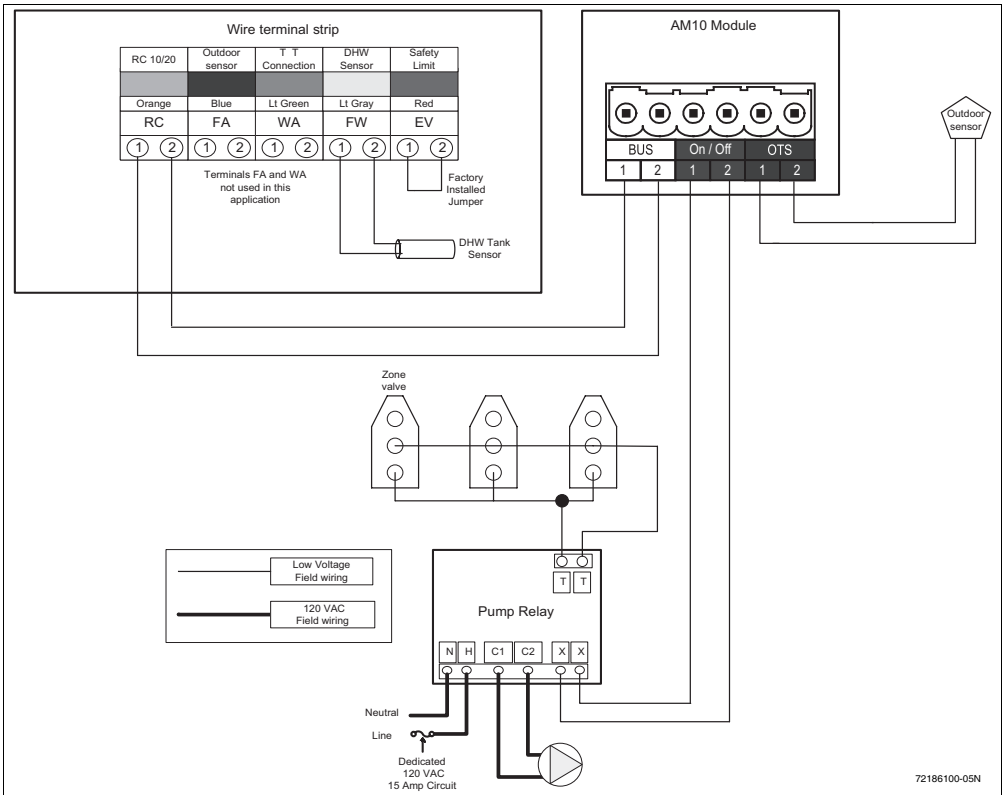


Fig. 5 Wiring detail

If there are multiple zones, wire all thermostats in parallel for calls for heat from any thermostat to produce a heat demand.



Do not install RC10 module when using this configuration.

1.6 Cascade Boiler Control

In a Buderus cascade with an MCM10 the AM10 is used as a modulating control based on outdoor temperature. The MCM10 will determine which boiler or boilers need to fire and at what modulation. The MCM10 also rotates the boilers for equal run time. For details on the MCM10 module, consult the MCM10 manual.



Do not install RC10 module when using this configuration.

2 User Manual

2.1 Introduction

The AM10 is an outdoor temperature-dependent controller with a linear heating curve. The heat demand is communicated using a dry contact input.

2.2 Heating curve

The heating curve indicates the relationship between the outdoor temperature and the supply temperature. This concerns a straight line which can be described by 2 points (**A** and **B**). Point **A** is the supply temperature at an outdoor temperature of 14 °F and point **B** is the supply temperature at an outdoor temperature of 68 °F. **C** is the high limit supply temperature set on the boiler (→fig. 6).

The supply temperature requested by the AM10 can never be higher than the high limit supply temperature of the boiler. For this reason it is recommended to set the supply temperature on the boiler (line **C**) to the maximum value, unless you deliberately want to compensate the heating curve, for example for a radiant floor heating system.

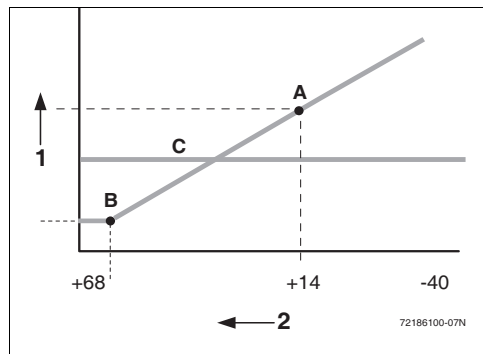


Fig. 6 Heating curve

- 1 Supply temperature [°F]
- 2 Outdoor temperature [°F]

2.3 Operation

Use the Mode key (→ fig. 7, [1]) to go through the various menu items(→ fig. 7, [4]) ; a line (→ fig. 7, [2]) on the display indicates the active menu item.

The value of a menu item which can be set will flash. The value can then be changed using the plus + and minus - (→ fig. 7, [3]) keys. The settings will not be lost if there is a power outage.

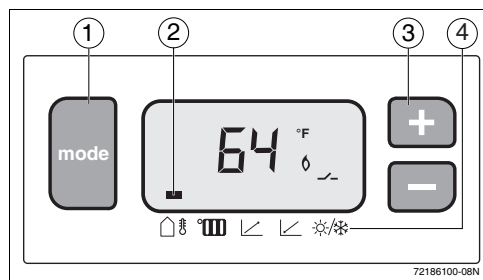


Fig. 7 Display view

If the display receives no user's input for 10 seconds, it will automatically switch over to its idle display (outdoor temperature). The display code is shown (flashing) when the appliance is locked. Otherwise the following symbols are implemented:

Symbol	Icon	Meaning
Flame	🔥	Appliance in heating mode
Switch contact	🔌	AM10 received a heat demand
Engineer's wrench	🔧	Appliance locked

Tab. 3 Mode key icons

2.4 Settings description

2.4.1 1st menu, idle display

The current outdoor temperature is shown (64 °F); the corresponding symbol 🏠🌡️ is marked. A heat demand 🔌 has been registered on the AM10; the appliance is in heating mode 🔥.

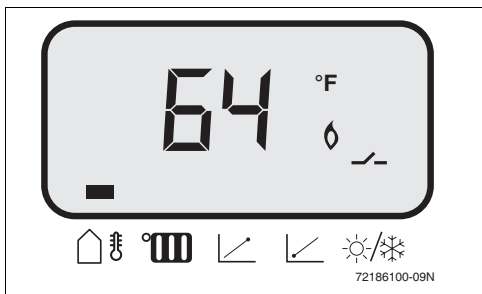


Fig. 8 Idle display

2.4.2 2nd menu, supply temperature set point

Use the Mode key to select the 2nd menu item: the supply temperature setpoint 🌡️.

Range: 32 - 194 °F.

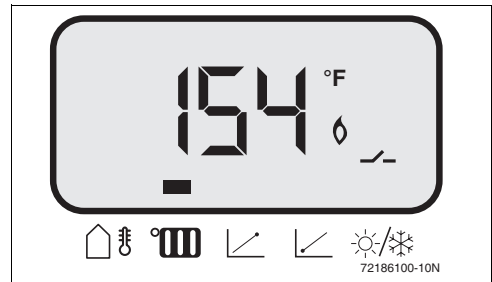


Fig. 9 Supply temperature on the boiler

2.4.3 3rd menu, target point of heating curve

Use the Mode key to select the 📈 icon. This concerns the target point of the heating curve corresponding with an outdoor temperature of 14 °F. The value will flash and can be changed using the + and - keys.

Adjustment range: 68 - 194 °F.

Factory setting: 167 °F.

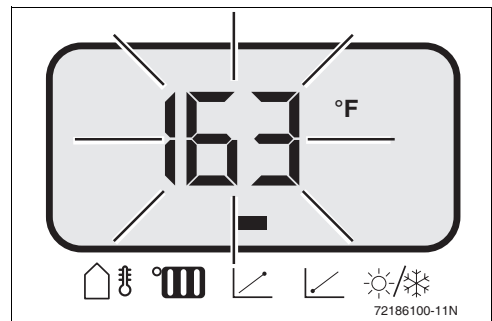


Fig. 10 Target point of heating curve

2.4.4 4th menu, base point of heating curve

Use the Mode key used to select the ↙ symbol. This concerns the base point of the heating curve corresponding with an outdoor temperature of 68 °F. The value will flash and can be changed using the plus + and minus - keys.

Adjustment range: 68 - 194 °F.

Factory setting: 86 °F.

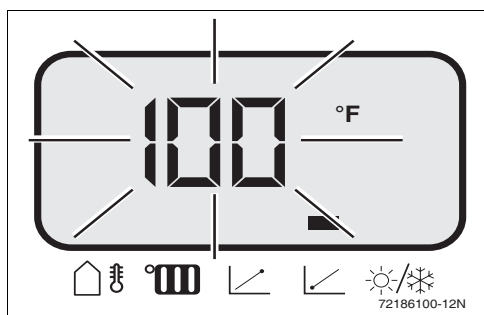


Fig. 11 Display of 4th menu item

2.4.5 5th menu, warm weather shut down

Use the Mode key to select the warm weather shut down temperature ☀/❄. This concerns the maximum outdoor temperature at which the heating is still operational. The value will flash and can be changed using the plus + and minus - keys.

Adjustment range: 32 - 86 °F.

Factory setting: 70 °F.

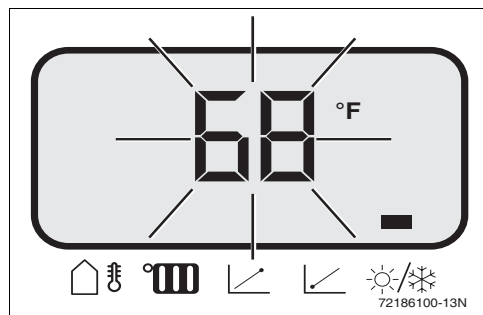


Fig. 12 Display of 5th menu item

2.5 Faults

The appliance is locked. When the appliance is in idle mode, a flashing appliance display code is shown instead of the outdoor temperature and the key symbol 🔑 is displayed. Adjustments can still be made by selecting the relevant parameter using the Mode key. However, the appliance will be in idle mode and the display code will show for as long as the system detects a fault.

The meanings of the various codes and the relevant troubleshooting procedures are detailed in the boiler's installation instructions.

2.5.1 Fault code 5H

This is a communication fault. Check the connection to the boiler.

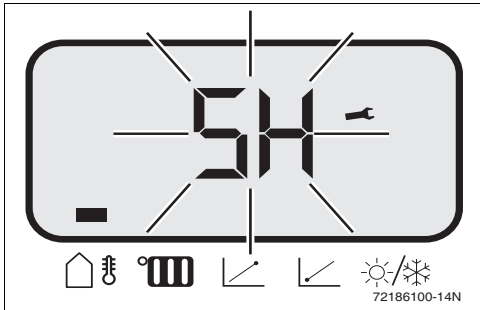


Fig. 13 Fault indication

2.5.2 Sensor fault/emergency operation

If no sensor is detected on the AM10, dashes are shown in the numerical field instead of the outdoor temperature.

If there is a heat request (the display will show ↗), the AM10 will request 122 °F, if this is permitted by the high limit.

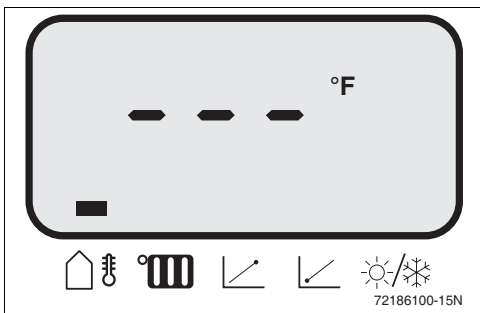


Fig. 14 Sensor fault display

Notes

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United States and Canada

Bosch Thermotechnology Corp.
50 Wentworth Avenue
Londonderry, NH 03053
Tel. 603-552-1100
Fax 603-584-1681
www.buderus.us
U.S.A.

Products manufactured by
Bosch Thermotechnik GmbH
Sophienstrasse 30-32
D-35576 Wetzlar
www.buderus.com

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