



AFRISO sp. z o.o.

Szalsza, ul. Kościelna 7
42-677 Czekanów
POLAND

Telefon +48 32 330 33 55

Fax +48 32 330 33 51

zok@afriso.pl

www.afriso.pl

Operation and installation manual

PrimoBox ACB 910 mixing unit for condensing boilers

- + Read the manual before using the device
- + Pay attention to all information regarding safety
- + Keep the Operation and installation manual



Table of Contents

1	Explanations to the installation and operation manual	3
1.1	Safety messages and hazard categories	3
2	Information on safety	3
2.1	Intended use	3
2.2	Quality control.....	3
2.3	Qualification of personnel	4
2.4	Modifications to the product.....	4
2.5	Using additional parts and accessories.....	4
2.6	Liability.....	4
3	Product description	5
3.1	Construction	6
3.2	Operation	7
3.3	Hydraulic diagram of the ACB 910 unit	9
3.4	Application scheme	10
4	Specification.....	11
4.1	Approvals.....	11
4.2	Available pressure chart.....	12
5	Transport and storage	12
6	Installation and commissioning.....	13
6.1	Wall mounting.....	13
6.2	Flush mounting	14
6.3	Hydraulic connections	14
6.3.1	Connection to the heat source	14
6.3.2	Connection of individual heating circuits	15
	(direct circuit and mixing circuit)	15
6.4	Differential pressure relief valve DU	15
6.5	Electrical connections.....	15
6.6	Filling and venting.....	17
7	Assembly of the ARM ProClick actuator.....	18
8	Switching the actuator to manual operation	19
9	Maintenance	19
10	Decommissioning, scrapping.....	20
11	Warranty	20
12	Copyright.....	20
13	Customer satisfaction	20
14	Addresses	20

1 Explanations to the installation and operation manual

Installation and operating instructions are an important part of the delivery. That is why we recommend:

- ▶ Read the installation and operating instruction before installing the device.
- ▶ Keep the installation and operating instruction for the entire life of the device.
- ▶ Hand over the installation and operating instructions to any subsequent owner or user of the device.

1.1 Safety messages and hazard categories

DANGER Specifies the type and source of the threat.



- ▶ Describes what to do to avoid a hazard.

Threats have 3 levels:

Danger	Importance
DANGER	DANGER indicates a hazardous situation, which, if not avoided, will result in death or serious injury.
WARNING	WARNING indicates a potentially hazardous situation, which, if not avoided, can result in serious injury or equipment damage.
NOTICE	NOTICE indicates a hazardous situation, which, if not avoided, can result in equipment damage.

2 Information on safety

2.1 Intended use

The PrimoBox ACB mixing unit for condensing boilers is a compact, prefabricated solution enabling quick and convenient connection of a radiator system and a underfloor heating, working in a closed system in accordance with PN-EN 12828.

Any other application than indicated in point 2.1 is forbidden.

2.2 Quality control

Construction of the PrimoBox ACB mixing unit for condensing boilers complies with the current state of the technical standards regarding safety. Each device is checked for safety before shipment.

- ▶ The product should only be used if it is in a qualified technical condition. Read the instructions for assembly and use as well as observe the relevant safety regulations.

**WARNING****Mains voltage (230 V AC) can cause serious injury or death.**

- ▶ Do not allow the device cover to come into contact with water.
- ▶ Disconnect the device from the mains before opening the cover.
- ▶ Disconnect the device from the mains before servicing.
- ▶ Do not make any changes to the device.

2.3 Qualification of personnel

Mixing unit PrimoBox ACB 910 may only be installed, commissioned, shut down and disassembled by suitably qualified and trained personnel. Work on electrical circuits should only be carried out by an authorized electrician.

2.4 Modifications to the product

Changes and modifications carried out by unauthorized persons may cause hazards and are prohibited for safety reasons.

2.5 Using additional parts and accessories

Improper additional parts and accessories may damage the device.

- ▶ Use only original spare parts and accessories from the manufacturer.

2.6 Liability

The manufacturer is not responsible for direct damages or their consequences resulting from inaccurate reading of assembly and usage instructions and recommendations.

The manufacturer and the company selling the device are not responsible for damages and costs incurred by the user or third parties using the device, in particular for damage resulting from improper use indicated in chapter 2.1 of assembly and use instructions, improper or faulty connection or maintenance and non-compliant operation with manufacturer's recommendations.

AFRISO sp. z o.o. makes every effort to ensure that the information materials do not contain errors. If errors or inaccuracies are found in the following installation and operation instructions, please contact: zok@afriso.pl, tel. +48 32 330 33 55.



3 Product description

PrimoBox ACB is a hydraulic unit for managing two heating zones with different supply temperatures in a system with a condensing boiler.

The PrimoBox ACB mixing unit consists of connections for a gas condensing boiler, connections for a direct heating circuit, connections for a circuit with reduced flow temperature and a pump that supply reduced temperature circuit. The most important element is the special 4-way valve with 6 ports with a disproportionate valve sleeve. Hydraulic components are connected with copper pipes. Everything is enclosed in a compact, steel housing.

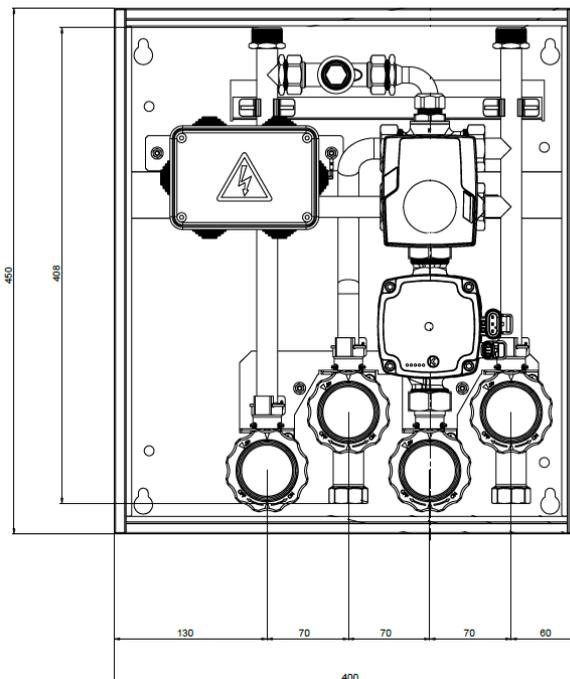
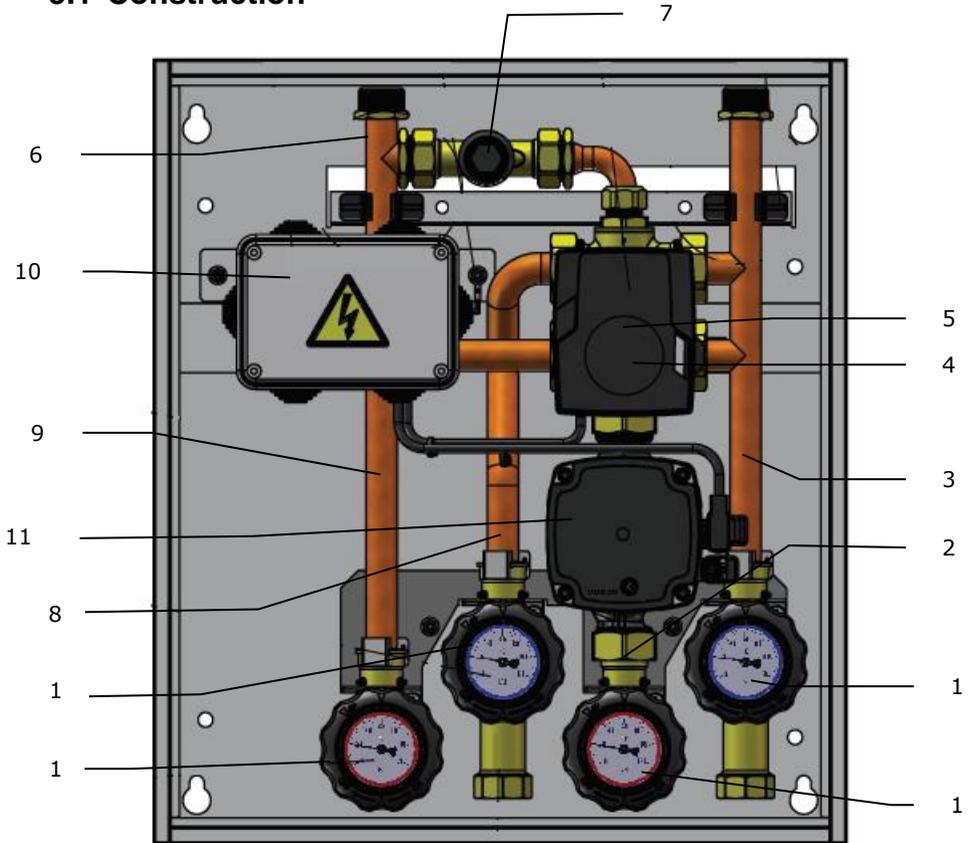


Fig. 1: Dimensions of the ACB mixing kit



3.1 Construction



- 1- Shut-off valve with thermometer
- 2- Reduced temperature zone supply
- 3- Reduced temperature zone return
- 4- ARM ProClick actuator
- 5- Specific 4-way valve with 6 connections
- 6- Supply from a condensing boiler
- 7- Differential pressure relief valve
- 8- Direct zone return
- 9- Direct zone supply
- 10- Electric box
- 11- Circulation pump

Fig. 2: Construction of the ACB mixing unit for the condensing boiler



3.2 Operation

PrimoBox ACB is a hydraulic unit for two heating zones with different supply temperatures, where one of the circuits is direct and on the other the temperature is lowered via the mixing valve. This is a solution dedicated only for condensing boilers.

The PrimoBox ACB mixing unit performs the following functions:

- Ensures a lower return temperature, which helps condensation in the gas boiler, increasing its efficiency
- Direct heating zone connection
- Connection for a zone with reduced temperature obtained by mixing

The PrimoBox ACB unit does not use a standard 3-way mixing valve, but a special 4-way valve with 6 ports and a disproportionate valve sleeve. The purpose of this special 4-way valve is to use the medium returning from the direct zone (without mixing) to supply the zone with reduced temperature.

Shut-off valves with thermometers

The ACB mixing units are supplied with shut-off valves to facilitate product maintenance. Check valves have been built into the shut-off valves and slot for temperature sensors has been prepared. The valve knobs contain thermometers to control the temperature of the heating medium. By turning the knob 45°, the non-return valve is forced to open for easy maintenance and system filling.

Grundfos UPM3 AUTO 15-70 circulation pumps

For the operation of the Grundfos UPM3 AUTO circulation pump included in the PrimoBox units, please refer to the attached operating instruction (also available on the pump manufacturer's website).



PrimoBox ACB unit connctions

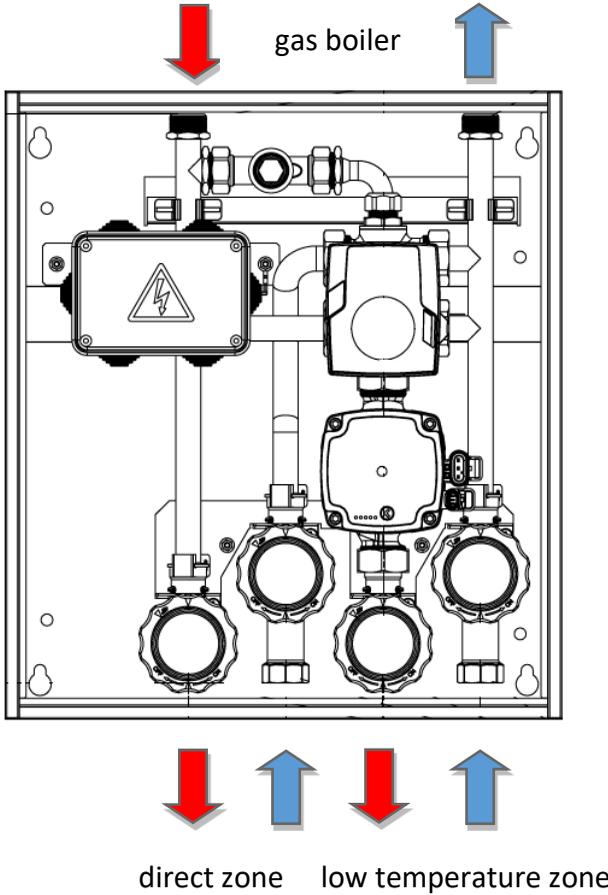


Fig. 3: Connections diagram of the ACB 910 mixing unit



3.3 Hydraulic diagram of the ACB 910 unit

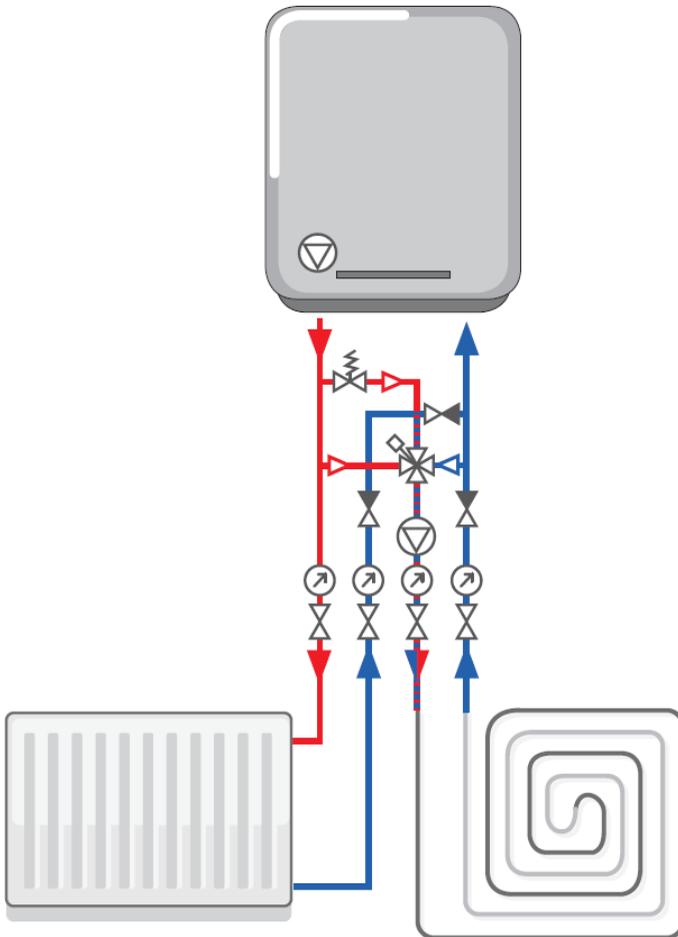


Fig. 4: Hydraulic diagram of the ACB 910 set



3.4 Application scheme

1. ACB mixing unit
2. Condensing gas boiler with pump
3. Radiator installation
4. Underfloor heating installation

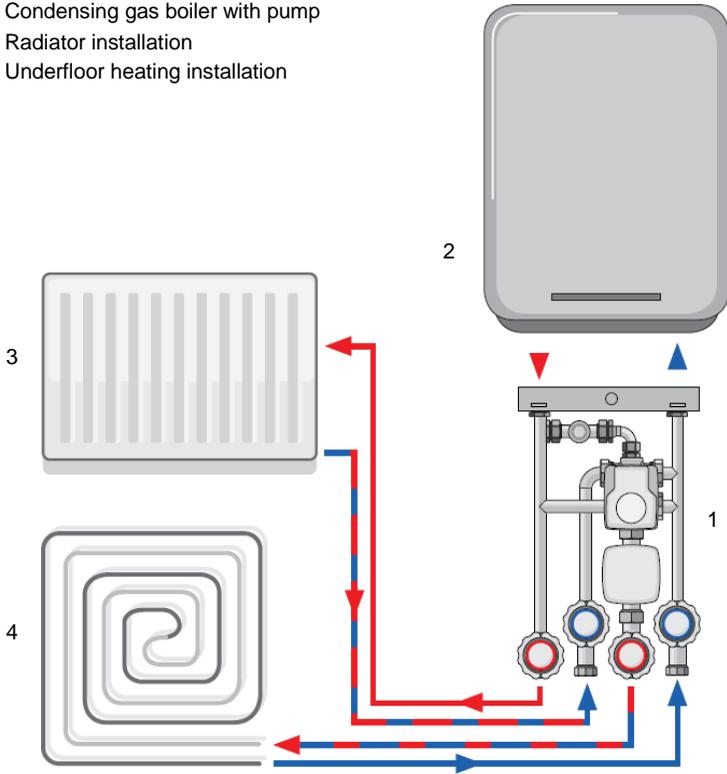


Fig. 5: Sample application diagram - underfloor heating system circuit and radiator system circuit



4 Specification

Table 1: Technical data of ACB 910 units

Parameter / part	Value / Description
General specification	
Dimensions (W x H x D)	400 x 450 x 160mm
Weight	11,7 kg
Circulation pump	Grundfos UPM 3 AUTO 15-70 130 mm
Rotary mixing valve	Kvs 3,6 with 3-point electric actuator ARM ProClick 230 V AC 50 Hz
Pressure	max 4,5 bar
Heat source connections	male G $\frac{3}{4}$ "
Connection of individual zones	female G $\frac{3}{4}$ "
Heating medium temperature	5°C + 95°C
Glycol concentration	max 30%
Installation power	max 26 kW
Water capacity	1 l
Supply voltage	
Supply voltage	230 V AC \pm 10%, 50 Hz
Power consumption	max 52 W
Housing protection	IPX 0

4.1 Approvals

The PrimoBox ACB 910 mixing unit for condensing boilers is subject to the Pressure Directive 2014/68 / EU and in accordance with art. 4.3 (sound engineering practice) are not CE marked.

The circulating pump provided with the product has a declaration of conformity, which is available on the manufacturer's website. The ARM ProClick electric actuator used in the ACB unit complies with EU directives on LVD low voltage electrical equipment (2014/35/EU) and EMC electromagnetic compatibility (2014/31/EU).



4.2 Available pressure chart

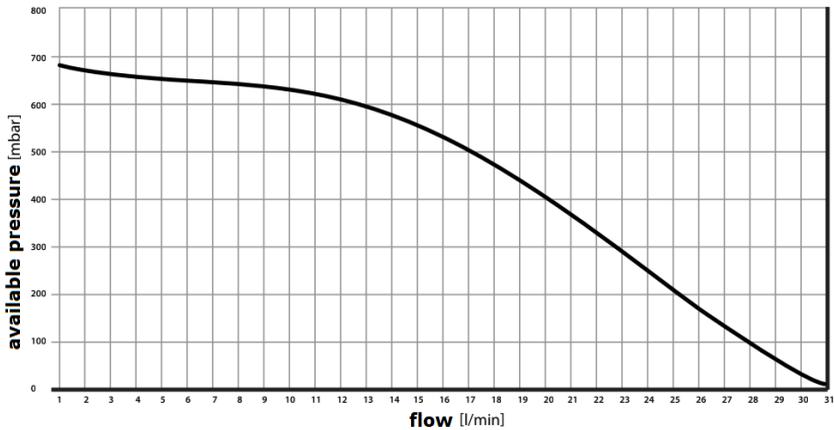


Fig. 6: Diagram of available pressure on the low temperature zone

5 Transport and storage

Possibility of damage to the device during improper transport.

ATTENTION



- ▶ Do not throw the device.
- ▶ Protect against water, moisture, dirt and dust.

Possibility of damage during incorrect storage.

ATTENTION



- ▶ Store the device in a dry and clean room.
 - ▶ Protect against water, moisture, dirt and dust.
-



6 Installation and commissioning

The PrimoBox ACB mixing unit installation location must provide weather protection. The ACB kit cannot not be installed outdoors. The ACB mixing unit cannot be mounted on stands or placed directly on the floor. If there is visible damage to the product, do not proceed with installation.

ATTENTION Possible damage to existing installations



- ▶ When drilling into walls, pay special attention not to damage electric cables or other existing cables.

6.1 Wall mounting

On the selected, straight wall, mark the places provided for the handles so that they coincide with the holes in the back of the PrimoBox ACB mixing unit. Drill holes in the wall and place the dowels (included in the delivery) in them. Hang the module on the dowels. Then check the correct leveling.

Possible need for other dowels

ATTENTION



- ▶ It is necessary to verify that the dowels provided are suitable for the selected wall.
- ▶ If the dowels provided are not suitable for the selected wall, replace them with others.
- ▶ Mounting the PrimoBox ACB unit on the improper dowels can lead to its breaking off the wall!

6.2 Flush mounting

Check whether the wall is strong and thick enough and that the PrimoBox ACB 910 mixing unit will fit in the place you choose. To install the PrimoBox AZB mixing unit in the wall, breach the fins placed in the housing and bend them with pliers so that they are outside the unit housing. Then create a space in the wall, at least 2 cm larger than the external dimensions of the housing of the ACB 910 mixing unit. Fasten the module in the hole in the wall with plaster or other suitable compound. Remember to level it carefully using a spirit level. After drying, if necessary, make an aesthetic finish of the wall.

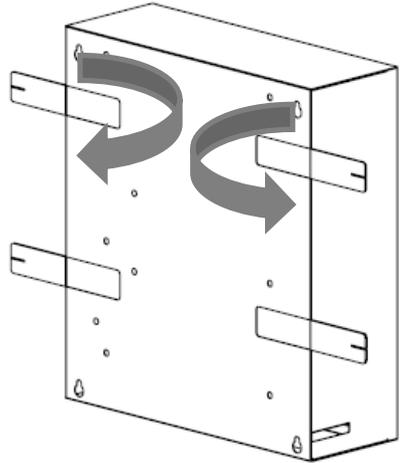


Fig. 7: *Bending of the housing fins*

6.3 Hydraulic connections

Before connecting the PrimoBox ACB mixing unit, flush the system thoroughly, paying special attention to removing residue from soldering, cutting pipes, etc. Make sure that the installation contains safety components necessary for proper and safe functioning. You should also check on the basis of flow charts whether the required flow on individual heating circuits will be guaranteed. We recommend installing strainers before inlet connections. The heating installation should also contain dirt separators or other similar filter elements. Make sure you can use the PrimoBox ACB mixing unit for the circuits connected to it. Remember that the ACB unit is intended for the distribution of the medium into the radiator installation (without mixing) and the underfloor heating installation (with qualitative temperature regulation by mixing).

6.3.1 Connection to the heat source

The connection between the ACB unit and the heat source is made via supply and return connections with G $\frac{3}{4}$ " male threads located in the upper part of the ACB unit.

6.3.2 Connection of individual heating circuits (direct circuit and mixing circuit)

The connection between the ACB unit and the heating system is made via supply and return connections with female G $\frac{3}{4}$ " threads located at the bottom of the ACB unit. The maximum length of underfloor heating pipes, resistance of flow, as well as the flow of medium by the circuit with mixing must comply with the permissible values of flows and resistances according to the chart presented in subsection 4.2.

6.4 Differential pressure relief valve DU

In a direct circuit with thermostatic valves or zone valves, it is necessary to use a pressure differential bypass valve (bypass). It is designed to maintain a constant pressure on the boiler pump, which also works as a direct zone (radiator zone) circulation pump. Recommended DU valve setting is 0.1-0.2 bar overpressure.



Fig. 8: Differential pressure relief valve AFRISO DU

If the direct installation is characterized by high hydraulic resistance and the relief valve opens too early (not allowing for adequate flow on the radiator furthest away from the heat source) the setting should be increased to 0.2-0.3 bar.

If thermostatic valves are not installed in the direct circuit next to the radiators and no zone valves are used, set the differential pressure relief valve DU to 0.5 bar overpressure.

6.5 Electrical connections

- Make sure that the power supply has been disconnected and protected against accidental switching on.
- Comply with the accident prevention regulations and other relevant accident prevention regulations.

The ACB mixing unit for condensing boilers is connected to 230V AC. The ACB mixing kit has a built-in electrical box. During assembly there is only a need to connect the pump and actuator dedicated cables to the electrical box. The connection between the electrical box and the pump and actuator is already made at the factory.

WARNING

Do not allow actuators, built-in electrical box and cables into contact with water.

Connecting the power cable to the device outside the built-in electrical box is prohibited.

Electrical connections must be made by experienced and qualified personnel in accordance with this instruction manual.

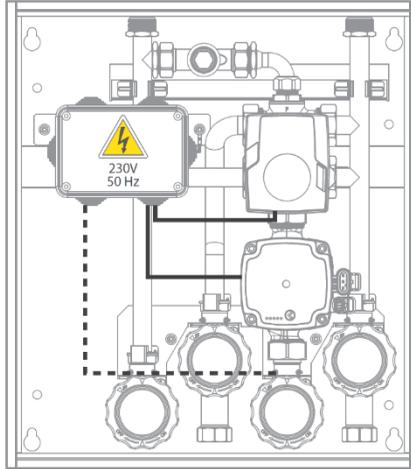


Fig. 9: Factory distribution of electric wires

the dotted line indicates the recommended routing of the mixed temperature sensor wire (not included)

Cables for connecting the pump and actuator controller to the ACB electrical box are not included.

The electrical connections should be made according to the diagram (Fig. 10).

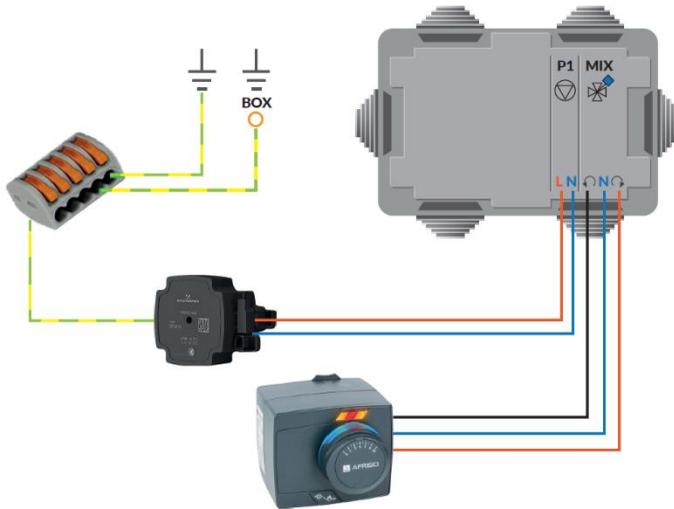


Fig. 10: Electrical diagram of the mixing set for condensing boiler

ARM ProClick actuators must be electrically connected to a suitable 3-point controller with a 230 V AC control signal.

The actuator power cord is detachable, which makes assembly easier. To remove the plug from the actuator, lift the lid latch lever (Fig. 11) and slide the cover off the actuator housing, then unplug the plug. The plug only fits into the socket in one position.

Fig. 11: Removing the lid



6.6 Filling and venting

After installation, fill the installation with heating medium. Ensure adequate venting during filling. Also remember to fill the installation slowly - this way you will reduce the amount of air remaining in the installation after it has been filled. If the gas boiler does not have sufficient pressure, the system must be vented again.

7 Assembly of the ARM ProClick actuator

The PrimoBox ACB condensing boiler mixing unit is equipped with ARM ProClick electric actuators. It is possible to easily disassemble and reassemble the actuator.

The ARM ProClick actuators are removed from the valve by pressing the button on the side of the actuator housing and pulling the actuator towards you.

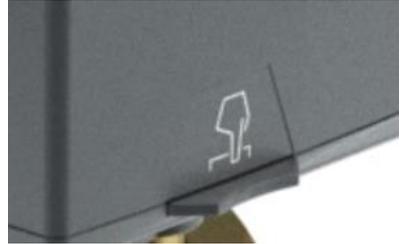


Fig. 12: Actuator latch release button on the valve

In order to mount the ARM ProClick actuator on the mixing valve of the ACB mixing unit, the mixing valve should be set to "50% open", i.e. the indicator of its cover (Fig. 13) is exactly halfway between the connection "C" and connection "B" of the four-way valve.

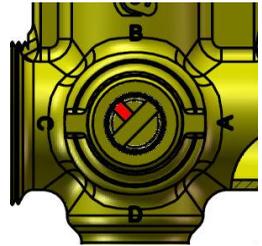


Fig. 13: Valve closing component indicator

Then slide the actuator onto the mixing valve until the actuator ProClick mechanism locks on it. When mounting the ProClick actuator on a rotary valve, pay attention to the current position of the valve indicator. The valve stem should be positioned as in Figure 13, and the actuator position indicator should show half the scale (vertical position).

If the valve is in a different position, it must be set manually (using a flat screwdriver, for example) as shown in Figure 13. If the indicator on the actuator does not indicate the center of the scale (it is not vertical), it should be switched to manual mode, set the actuator with an allen key so that the indicator is vertical and indicates the center of the scale. After putting the actuator on the valve, switch back to automatic mode.

8 Switching the actuator to manual operation

Switching from automatic to manual operation is carried out by means of the operating mode button.

Fig. 14: Actuator mode button



The pressed operating mode button enables manual operation, i.e. free operation of the actuator with an allen key.

9 Maintenance

WARNING **Mains voltage (230 V AC) can cause serious injury or death.**



- ▶ Disconnect the power supply with the external switch before each operation.

To ensure correct operation of the ACB unit for condensing boiler and other system components, keep the heating medium at the level of the smallest possible contamination and at the level of hardness and pH recommended by the boiler manufacturer. Due to the copper pipes included in the ACB unit, special attention should be paid to water hardness, scale and other deposits.

At least once a year, as a precautionary measure, check the condensing boiler (unless its manufacturer specifies otherwise), the primary circuit and heating circuits, and the ACB mixing kit. The following are crucial: visual tightness control, control of elements integrity, visual control of potential damages, control of electrical connections and condition of wires. Before the heating season, it is also recommended to check the circulation pump by making a test run. PrimoBox ACB mixing units do not require additional maintenance than those listed in chapter 9.



10 Decommissioning, scrapping



1. Disconnect the device's power supply.
2. Disassemble the device (see chapter 6, reverse order).
3. In the interests of environmental protection, do not dispose of the device when it is out of service with unsorted household waste. The device should be delivered to an appropriate recycling facility.

Mixing units for a condensing boilers are made of materials that can be recycled.

11 Warranty

The manufacturer's warranty for this product is 36 months counted from the date of purchase from AFRISO sp. z o.o. by the seller. In case of any alteration in the product or usage against this instruction manual, the warranty becomes void.

12 Copyright

Copyrights to the manual belong to AFRISO sp.z o.o. Reprinting, translation and reproduction, even partial, is prohibited without written permission. Changing technical details, both in writing and in the form of images, is prohibited by law. We reserve the right to make changes without prior notice.

13 Customer satisfaction

For AFRISO sp.z o.o. customer satisfaction is the most important thing. If you have questions, suggestions or problems with the product, please contact: zok@afriso.pl, phone number +48 32 330 33 55.

14 Addresses

The addresses of companies representing the AFRISO group around the world can be found at www.afriso.com.