



Firma TMK sp.j. Września
Szosa Witkowska 105
tel./fax +48 61 437 97 60
www.tmk.com.pl

Universal microprocessor controller for pump

MTS 100

Installation and Operation Manual

Applications

MTS 100 is a controller designed for the control of circulating pumps used in central heating (CH) or tap water (TW) systems. The user has the option of selecting the operation mode of the controller.

The device is also suitable for all applications in which stable temperature must be maintained.

The controller is equipped with an “anti-stop” function which prevents the pump from “jam-stopping” caused by the build-up of scaling on the bearings.

MTS 100 has a broad range of hysteresis for pump activation and deactivation, and an option of forced operation.

SELECTION OF OPERATION MODE

To select the operation mode of the controller, make sure the controller is disconnected from the power supply , then press the  button and, without releasing it, switch on the controller.

 - control of CH pump (factory setting)

 - control of TW circulating pump

To change the operation mode, press either  or . To save the selected setting and exit, press the MENU button.

Forced pump activation

To switch on forced pump activation, press the button  START .
When the  indicator is on, forced pump operation is active.

To return to automatic pump operation, press the button  STOP .
When the  indicator is off, the pump operates in the automatic mode.

Note: After connecting the pump to the power supply, it operates by default in the automatic mode.

DESCRIPTION OF INDICATOR SYMBOLS – during controller operation

 - blinking of the indicator denotes low temperature alarm

  - TW circulating pump is activated

  - display of current TW temperature / active TW control

  - CH pump is activated

  - display of current CH temperature / active CH control

CENTRAL HEATING (CH) PUMP CONTROL

Applications

MTS 100 set to CH control is designed for the automatic activation and deactivation of the circulating pump in CH systems.

The controller can be used in central heating systems provided with a boiler fired by solid fuels or gas.

When the boiler is extinguished, the circulating pump switches off – with the exception of emergency situations (ANTI-FREEZE PROTECTION). As a result, radiators stay warm longer and energy consumption is lower.

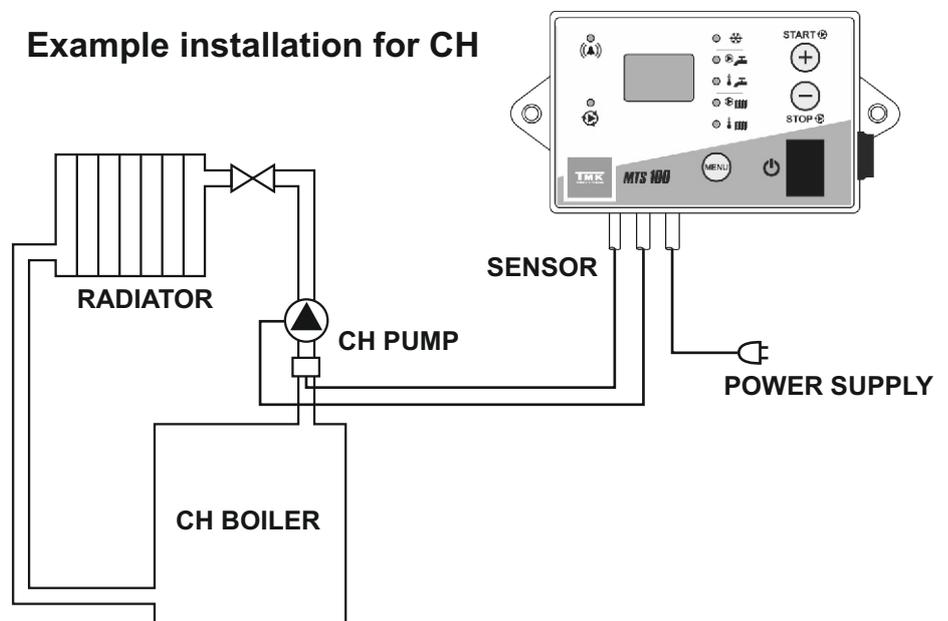
Technical specifications for CH:

- Supply voltage 230V/50Hz
- Maximum load of outputs 100VA
- Temperature measurement range 0 - 99 °C
- Temperature of activation of CH pump: (1-99°C, range limited by the value of the F3 function) __ 50 °C
- Hysteresis of CH pump: (1-80°C, range limited by P1 and F3 values) _____ 5 °C
- Low boiler temp. alarm threshold – ANTI-FREEZE PROTECTION (from inactive “-” to 50°C) _____ 8 °C
- High boiler temperature alarm threshold (60-99°C – “-” – alarm inactive) _____ 92 °C
- Lower threshold of CH pump deactivation (from inactive “-” to 95°C) _____ inactive
- Hysteresis of the lower threshold of pump deactivation (from 1°C to the value of the F3 function) __ 1 °C
- “Anti-stop” function (pump protection against “jam-stopping”) – activation for 30 sec every 14 days
- Reduced risk of system freeze – activation of CH pump below the alarm threshold

Factory settings

Installation

Example installation for CH



1. Controller mounting

Mount the controller on a suitable wall near the CH boiler, using 6 mm wall plugs (the plugs complete with screws are a part of the delivery set).

2. CH sensor mounting

- Mount the sensor on a non-insulated pipe going out of the CH boiler.
- Fasten the sensor to the pipe using two clamps (included in the delivery set) so that it adheres properly to the pipe.
- It is advisable to wrap the pipe with the sensor with a thermal insulation material.

Note: The sensor is not suited for being used directly in the liquid!

3. Connection of power supply cable to the pump

- Connect the green-yellow wire (protective neutral conductor) of the 3-wire supply cable to the protective neutral terminal of the motor (marked with an appropriate symbol);
- Connect the brown and blue wires to the L and N terminals of the motor;

Note: Always ensure that regulator installation is performed by a properly qualified electrician.

4. Controller connection.

Connect the supply cable to a 230 V, 50 Hz power outlet with an earth contact.

The ambient temperature in the controller mounting location may not exceed 40°C.

Note: The connection cable of the regulator may only be replaced by the manufacturer.

Note: MTS controller is only able to operate when the system is filled with water. If the system is empty, the controller must be disconnected from the power supply. Otherwise the pump may become damaged.

OPERATION OF CH PUMP CONTROLLER

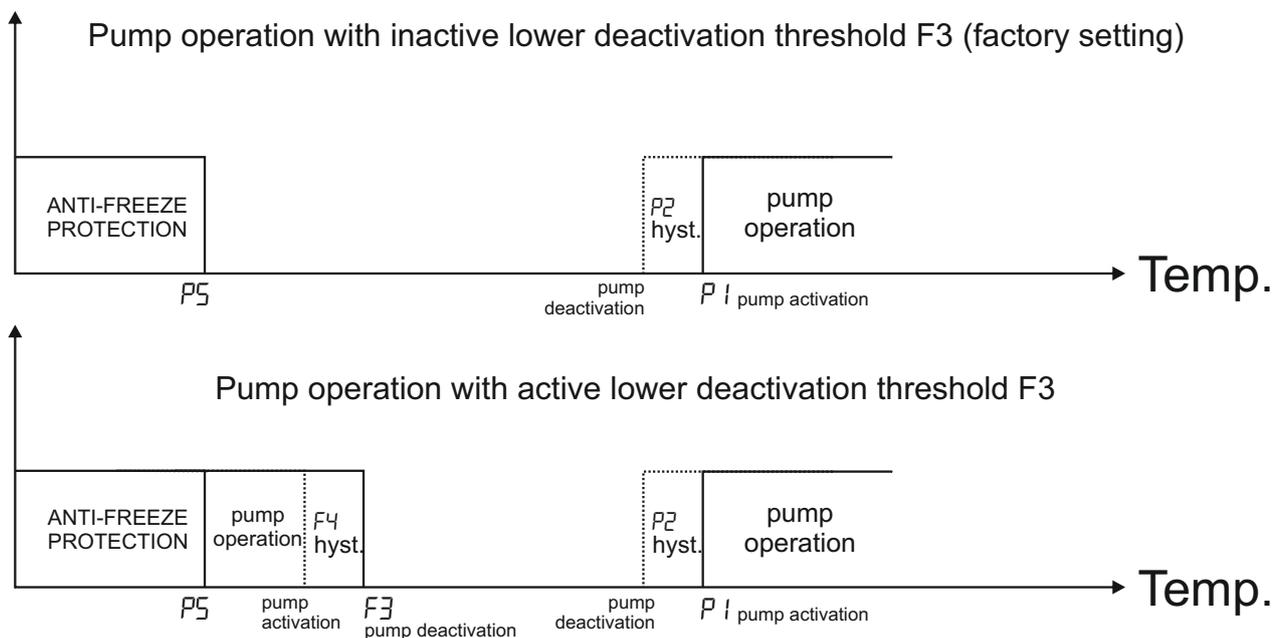
The controller activates the CH pump when the temperature in the boiler achieves the P1 value, and deactivates the pump when the temperature drops by the value of hysteresis P2.

In addition, the pump is activated below the low boiler temperature alarm threshold – ANTI-FREEZE PROTECTION (P5). The user has the option to switch off the pump below the low temperature alarm threshold, leaving just the sound and visual alarm – ANTI-FREEZE PROTECTION INACTIVE (F1).

Irrespective of anti-freeze protection, the user can activate pump operation in a low temperature range. The pump switches off at the preset F3 value (the function is inactive by default).

The controller is also provided with “anti-stop” functionality to prevent “jam-stopping” of the pump caused by the build-up of scaling on the bearings: the pump is activated for 30 seconds every 14 days.

The factory setting of the high boiler temperature alarm is 92°C. As soon as the temperature exceeds the preset threshold, the sound and visual alarm is activated. Parameter P6 makes it possible to change the value of the alarm threshold, and to switch it off.



BASIC CH PARAMETERS MENU

Pressing and holding the **MENU** button for one (1) second displays the P1 symbol on the screen. To change parameter number, use the ⊕ or the ⊖ button. To edit a selected parameter, press the **MENU** button. The following parameters are available:

- P1 – CH pump activation temperature (1-99°C, the lower value of the range is limited by the value of the F3 function).
- P2 – CH pump hysteresis (1-80°C, the upper value of the range is limited by P1 and F3 values).
- P5 – low boiler temperature alarm threshold – ANTI-FREEZE PROTECTION (from inactive “-” to 50°C).
- P6 – high boiler temperature alarm threshold (60-99°C – “-” alarm inactive).
- exit from the **MENU** with saving of changes (after pressing the **MENU** button)

To change parameter values, use the ⊕ or the ⊖ button. Pressing the **MENU** button during the editing of a parameter causes the display to return to the number of the edited parameter. The controller exits the **MENU** and saves any changes that have been made if no other button is pressed during the following 60 seconds.

CH SERVICE FUNCTIONS MENU

In order to edit SERVICE FUNCTIONS, make sure the controller is disconnected from the main power supply ⏻, press the **MENU** button and, without releasing it, switch on the controller. The screen displays F1. Menu functions are the same as in the **BASIC PARAMETERS MENU**.

- The following functions are available:
- F1 – pump operation below the low temperature alarm threshold: 1-YES, 0-NO (PROTECTION INACTIVE)
NOTE: despite inactive PROTECTION the pump can operate if the lower deactivation threshold F3 is active.
 - F2 – “anti-stop” function – pump protection from “jam-stopping”: 0-NO, 1-YES (factory setting)
 - F3 – lower CH pump deactivation threshold – from inactive “-” (factory setting) to 95°C.
The upper value of the range is limited by the value of the parameter P1 minus P2.
 - F4 – hysteresis of the F3 function (from 1°C to the value of the F3 function)
 - F7 – controller software version number (read-only)
 - exit from the **MENU** with saving of changes (after pressing the **MENU** button)

OPERATION OF TW CIRCULATING PUMP CONTROLLER

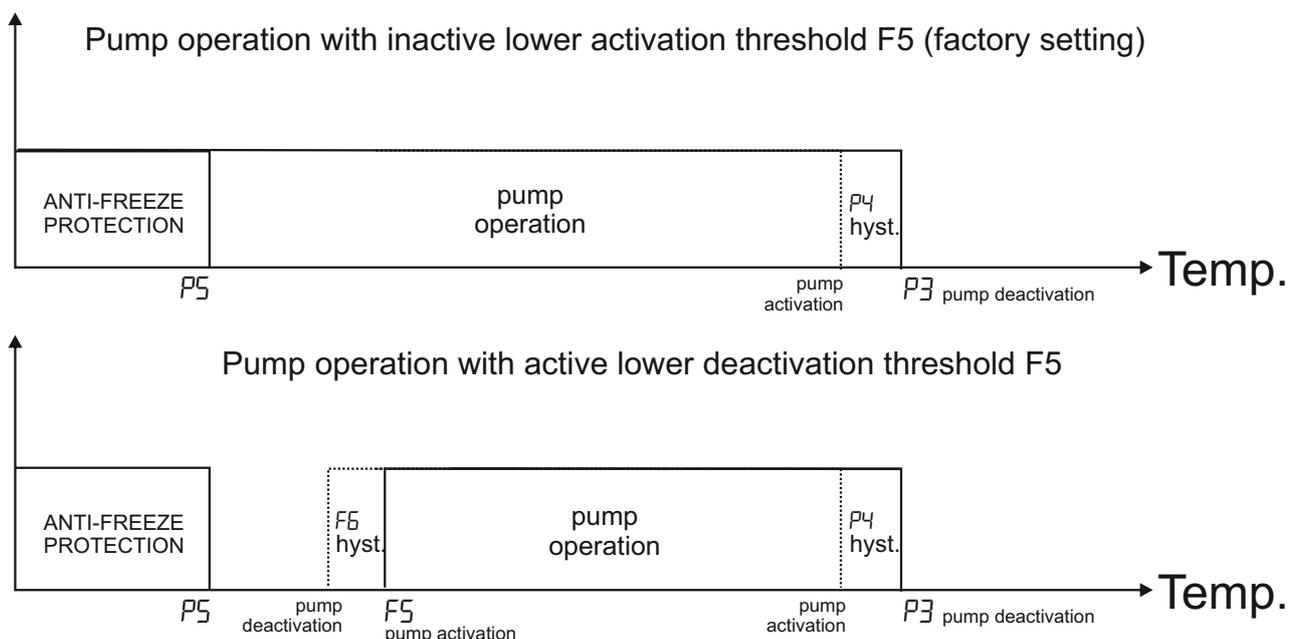
The controller deactivates the TW pump when hot water temperature achieves the P3 value, and activates the pump when the temperature drops by the value of hysteresis P4.

The user has the option to switch off pump operation in a low temperature range. The pump activates at the preset F5 value – the function is inactive by default.

When the lower limit of pump activation (F5 function) is active, it is possible to deactivate the pump below the low temperature alarm threshold, leaving only the sound and visual alarm – ANTI-FREEZE PROTECTION INACTIVE (F1).

The controller is also provided with the “anti-stop” functionality to prevent “jam-stopping” of the pump caused by the build-up of scaling on the bearings: the pump is activated for 30 seconds every 14 days.

The factory setting of the high boiler temperature alarm is 92°C. As soon as the temperature exceeds the preset threshold, the sound and visual alarm is activated. Parameter P6 makes it possible to change the value of the alarm threshold, and to switch it off.



BASIC TW PARAMETERS MENU

Pressing and holding the **MENU** button for one (1) second displays the P3 symbol on the screen. To change parameter number, use the ⊕ or the ⊖ button. To edit a selected parameter, press the **MENU** button. The following parameters are available:

- P3 – TW pump deactivation temperature (1-99°C, the lower value of the range is limited by the value of F5 function).
- P4 – TW pump hysteresis (1-80°C, the upper value of the range is limited by P3 and F5 values).
- P5 – low temperature alarm threshold – ANTI-FREEZE PROTECTION (from inactive “-” to 50°C).
- P6 – high temperature alarm threshold (60-99°C – “-” alarm inactive).
- exit from the **MENU** with saving of changes (after pressing the **MENU** button)

To change parameter values, use the ⊕ or the ⊖ button.

Pressing the **MENU** button during the editing of a parameter causes the display to return to the number of the edited parameter. The controller exits the **MENU** and saves any changes that have been made if no other button is pressed during the following 60 seconds.

TW SERVICE FUNCTIONS MENU

In order to edit **SERVICE FUNCTIONS**, make sure the controller is disconnected from the main power supply ⏻, press the **MENU** button and, without releasing it, switch on the controller. The screen displays F1.

Menu functions are the same as in the **BASIC PARAMETERS MENU**.

The following functions are available:

- F1 – pump operation below the low temperature alarm threshold: 1-YES, 0-NO (PROTECTION INACTIVE)
NOTE: despite inactive PROTECTION the pump operates if the lower activation threshold F5 is inactive.
- F2 – “anti-stop” function – pump protection from “jam-stopping”: 0-NO, 1-YES (factory setting)
- F5 – lower TW pump activation threshold – from inactive “-” (factory setting) to 95°C.
The upper value of the range is limited by the value of the parameter P1 minus P2.
- F6 – hysteresis of the F5 function (from 1°C to the value of the F5 function)
- F7 – controller software version number (read-only)
- exit from the **MENU** with saving of changes (after pressing the **MENU** button)

RESTORATION OF FACTORY SETTINGS

In order to restore factory settings, disconnect the controller from the main power supply  , press the  button and – without releasing it – switch on the controller.

Note: Restoration of factory settings activates CH control.

DELIVERY SET

- * controller
- * clamps (2 pcs.)
- * 6 mm wall plugs (2 pcs.)

SAFETY DEVICES

The pump and controller are protected by means of a 500 mA fuse which blows up in emergency situations (e.g. short-circuit in the pump or in the controller).

WARRANTY

TMK sp.j. grants the user a warranty for the MTS 100 controller. The warranty period is 3 years from the date of purchase of the device, however not longer than 4 years from the date of manufacture.

WARRANTY TERMS AND CONDITIONS

Warranty claims shall be accepted provided that the terms and conditions of warranty, and general rules of operation of electronic devices, are complied with as required. TMK sp.j. guarantees appropriate workmanship, high quality and reliable operation of the controller. In the event of any faults in the controller's operation, or defects which can be attributed to the manufacturer, TMK sp.j. shall repair or replace the faulty controller with a defect-free device within 14 working days from the date of returning the controller (in person or through post). The warranty scheme explicitly excludes all defects arising due to the user's fault and, particularly, defects caused by mechanical damage, faulty mounting, water ingress or operation of the device contrary to the general rules of operation of electronic devices.

The warranty is only valid with a proof of purchase.

DATE OF SALE:

day, month, year

MANUFACTURER:

TMK sp.j.

62-300 Września

Szosa Witkowska 105

tel./fax +48 61 437 97 60

www.tmk.com.pl

.....
Seller's stamp and signature

.....
DATE OF MANUFACTURE