Specification for "MIKSTER MCC 050 FUTURE" Microprocessor Controller

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1. APPLICATION

The MIKSTER MCC 050 FUTURE Microprocessor Controller is designed for automatic operation and control of technological (manufacturing) processes in the smoking chamber.

Basic functions of the MIKSTER MCC 050 FUTURE Microprocessor Controller are as follows:

-   control and adjustment of temperature inside the smoking chamber
    - (range from -10° to 450°C),

-   temperature increment in function of the bar temperature
    - (delta_max=25.5°C),

-   "bar" temperature control
    - (range from -10° to 450°C),

-   impulsing of humidity,

-   control of actuators
    - (contactors, electro-valves, etc.),

-   analysis and signalling of emergency states,

-   automatic execution of operation program for smoking chamber and accessory equipment.

The MIKSTER MCC 050 FUTURE Microprocessor Controller provides possibility to program 49 (Numbers from 1 to 49) technological programs, which may be modified by users without limits, and has 49 programs stored permanently in the EPROM memory – programs (50 – 99), including the automatic chamber washing program (99). Power failure does not result in erasing of programs stored in controller memory. Execution of program stored in memory allows for fully automatic heat treatment of cured meat products and various types of meat in the smoking chamber.

The manual operation mode permits to check actuators by programming them from the controller keyboard (service operations), and carrying out simple technological process "beyond program".

2. THE CONSOLE OF MIKSTER MCC 050 FUTURE MICROPROCESSOR CONTROLLER

All operations related to controller activation, programming, manually entered modifications, etc. are initiated from its console (Fig.1).
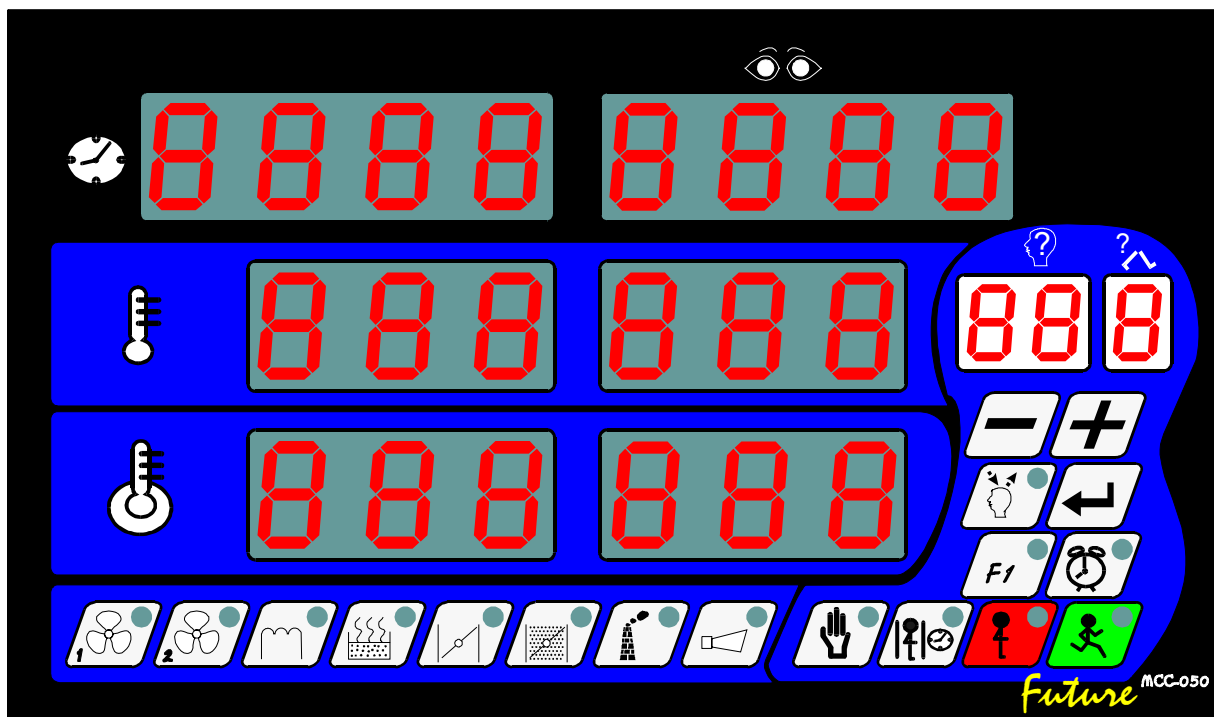

Fig. 1.

Keys on the console are arranged in the following keypads :

- numeric displays   -1-
- signal diodes   -2-
- function keys   -3-
- equipment state keys   -4-

All information regarding the operation mode of "MIKSTER MCC 050 FUTURE" Microprocessor Controller (operation state, values of preset and read out parameters, equipment ON / OFF signalling) is displayed on digital displays and signalled by diodes.

If particular unit is in operation mode or a given function is active, a diode in proper field is on, on the other hand if the unit is off or a given function disabled, then the diode is off. It is necessary to press appropriate function keys and equipment state keys in order to save data in the "MIKSTER

MCC 050 FUTURE" Microprocessor Controller, to correct data and to call proper controller functions.

3.   SECURITY CODE

A security code was provided in order to protect data stored in the MIKSTER MCC 050 FUTURE Microprocessor Controller memory against access of unauthorized persons. The program demands entering the security code in case if user intends to introduce modifications in data regarding technological programs (see detailed description in point **4.1.**).

4.   MIKSTER MCC 050 FUTURE MICROPROCESSOR CONTROLLER - START OF OPERATION

After turning on power supply all displays of the controller will be activated; they should turn off after approximately 5 sec. Then STOP and real time value will be displayed – this confirms correct system operation.

At this moment it is possible to activate the following functions of the unit:

- programming technological (manufacturing) processes,

- setting constant SET-UP parameters (applies to service),

- manual control of chamber operation,

- activation of program executed by the MIKSTER MCC 050 FUTURE Microprocessor Controller.

4.1.   PROGRAMMING OF MANUFACTURING PROCESSES

User may program 49 technological programs in the MIKSTER MCC 050 FUTURE Microprocessor Controller (Numbers from 1 to 49).

 Each program consists of 10 steps, and user may program them freely, e.g.:

0 - HEATING

1 - DRYING

2 - SMOKING (CURING)

3 - VENTILATION

4 - SMOKING (CURING)

5 - VENTILATION

6 - SMOKING (CURING)

7 - VENTILATION

8 - BREWING (BAKING)

9 - VENTILATION

Proper setting of actuators during programming define the type of executed step.

Programming consists in entering appropriate data (chamber temperature, bar temperature, the delta, etc.) in steps that follow each other successively.

In order to activate MIKSTER MCC 050 FUTURE programming mode:

- press the ⬚ key;

(word CODE and symbol 000 000 will be displayed)

- using the ⬚ and ⬚ keys

set the first security code number (in the field of preset chamber temperature),

- press the ⬚ key,

- using the ⬚ and ⬚ keys

- set the second security code number (in the field of read out chamber temperature)

- press the ⬚ key in order to switch from one number to another.

When after having entered both safety code elements you are sure that the whole code is correct,

press the ⬚ key again.

If entered code is correct, the unit switches to the programming mode, the displays will show step number – 0, as well as number of a program that user intends to program. In case if entered code is wrong, the "MIKSTER MCC 050 FUTURE" Microprocessor Controller will return to the stand-by mode.

- use the following keys:

⬚ - increases displayed value

⬚ - reduces displayed value

in order to enter program number from 0 to 49 (currently edited field will be blinking)

- press the ⟨↵⟩ key.

- using the ⟨+⟩ , ⟨−⟩ and ⟨↵⟩ keys,

enter values of the following parameters: STEP NUMBER

STEP DURATION [h. min.]

"CHAMBER" TEMPERATURE [°C]

"BAR" TEMPERATURE [°C]
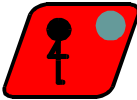
"DELTA"

- using the equipment state keys

preset units, which are to be turned on during program execution;

- in order to program next program press the ⟨ ⟩ key;

- in order to finish programming and save data in memory press the ⟨ ⟩ key

(the controller switches to the stand-by mode; word STOP will be displayed).

4.2.   IMMEDIATE START OF THE MIKSTER MCC 050 FUTURE TECHNOLOGICAL PROCESS OPERATION

Immediate activation of the automatic step (unit actuation) may take place, if the MIKSTER MCC 050 FUTURE Microprocessor Controller is in the stand-by mode (STOP is displayed).

In order to do that follow this procedure:

- press the ⟨ ⟩ key (program number display field blinks);

- using the [+] [−] [↵] keys

enter the number of program and step, which you intend to execute.

> **ATTENTION !**   At this moment it is possible to interrupt activation of smoking chamber by pressing the

key. As soon as it is pressed, the MIKSTER MCC 050 FUTURE Microprocessor Controller will return to the stand-by mode, STOP will be displayed.
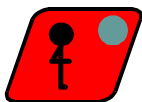
- When after having entered the number of program and step you are sure it is correct,

press the [▶] key (the chamber starts operation).

4.3.   DELAYED START OF THE PROGRAM [AUTO-START]

In order to actuate a unit with a delay follow this procedure:

(controller will be in the stand-by mode, STOP will be displayed)

- press the [⏰] key,

- using the [+] [−] [↵] keys

enter program number, step number, and program execution start hour and minute (unit activation time).

- press the [▶] key.

> *(the AUTO-START and START diode blinks, the controller is currently in the AUTOSTART mode, at the moment when programmed autostart time is reached, the controller starts to execute the program)*

- press the key in order to interrupt the AUTO-START function.

4.4.   PROGRAM EXECUTION METHOD

As soon as the program is activated, on the basis of preset parameters the MIKSTER MCC 050 FUTURE Microprocessor Controller will begin proper control of actuators and verification of program execution conditions, and according to them it will count down duration of successive steps.

The following conditions have to be met in order for the MIKSTER MCC 050 FUTURE Microprocessor Controller to finish a step:

Case 1

(Bar Temperaure (preset)>0 and Step Time (preset)>0) then step termination takes place if:

- Bar Temperaure (read out) >= Bar Temperaure (preset)

or

- Step Time (read out) >= Step Time (preset)

Case 2

(Bar Temperaure (preset)>0 and Step Time (preset)=0) then step termination takes place if:

- Bar Temperaure (read out) >= Bar Temperaure (preset)

Case 3

(Bar Temperaure (preset)=0 and Step Time (preset)>0) then step termination takes place if:

   - Step Time (read out) >= Step Time (preset)

Chamber operation will be terminated after completion of all program steps. If you want any step not to be executed, then set:

- Bar Temperaure (preset) = 0

- Step Time (preset) = 0

4.5.   MANUAL MODIFYING OF TECHNOLOGICAL PROCESS PARAMETERS WHILE CHAMBER IS IN OPERATION

During smoking chamber operation it is possible to manually introduce corrections in a previously programmed program. In order to do that follow the procedure below:

- press the key (all preset parameters of currently executed step will be displayed);

- introduce changes in the program in the same way as in point **4.1.**;

- during modification of step number, currently executed step is signalled by dot displayed in the step number display field;

- the operation of manual data correction will be completed after pressing the key again.

After completion of the above procedure all data will be copied to the controller memory and the device will respond to all introduced modifications.

If data input is terminated in other step than the one previously executed, the unit will execute that step, in which the operation of manual data correction was interrupted.

4.6.   "MANUAL" OPERATION

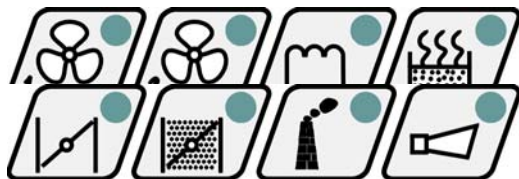In order to carry out manual control of the smoking chamber follow the procedure below:

(S.M."MIKSTER MCC 050 FUTURE" Microprocessor Controller shall be in the stand-by mode, STOP will be displayed)

- press the key

("zero-value" preset parameters will be displayed);

- press any actuator state key (e.g. for fan, air valve, smoke valve, etc.)

- set equipment, which is to be on after pressing the

 key (blinking diode signals any device "reported" to be turned on);

- proceed exactly as in point **4.1.** in order to set the preset parameters of a process, which is currently executed.

As soon as the key is pressed, the chamber will start operation and actuators will do their programmed tasks.

In manual operation mode conditions for program execution termination are same as those described in point **4.4.**

During execution of the manual operation program user may freely engage and disengage the smoking chamber actuators.
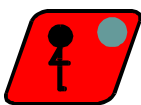
Press the key in order to interrupt automatic work program.

In order to continue interrupted program press the [key icon] key

- the unit will quit the manual operation mode as soon as the [key icon] key is pressed again.

5. SIGNALLING OF ERRORS AND FAILURES

All cases of emergency state occurrence, while the "MIKSTER MCC 050 FUTURE" Microprocessor Controller is in operation, will be announced by means of displaying proper message on the display and by sound signal.

THE LIST OF POSSIBLE ERRORS

ERROR 17

Error cause – control input error signalling

Controller response – depending on the F12 function (SETUP)

if F12=0 – ERROR-17 error control off

if F12=1 – chamber operation continues, error message is displayed periodically and sound signal is generated

if F12=2 – chamber operation is interrupted, error message is displayed and sound signal is generated

ERROR 21

Error cause – permissible temperature value has been exceeded

Controller response – chamber operation is interrupted, error message is displayed and sound signal is generated

ERROR 30

Error cause – RAM check total error signalling

Controller response – error message is displayed periodically, impossible to activate the automatic operation mode

ATTENTION ! In case if the above-mentioned error occurs, it is strongly recommended to notify the service.

ERROR 40

Error cause – the unit signals interruption of the automatic operation mode, manual operation mode or AUTO-START execution, as a result of temporary power failure.

As soon as power is back, the controller checks power failure time. If it is shorter than value of the F23 function (SETUP), the device stops operation and returns to the stand-by mode (STOP will be displayed).

If power failure time is shorter than F23 value, the controller continues operation exactly from the moment of power failure occurrence.

Controller response – error message is displayed periodically.

ATTENTION ! Displaying of error message will be stopped by pressing the key.

Defects of temperature sensors are announced by displaying the symbol in the field of a damaged sensor.

6. SOUND SIGNALLING

During normal chamber operation the signalling device activates each time when switching to the next step. Sound signal duration is determined by the service and stored in the SET-UP memory. When switching to Step No. 09, signal duration is two times longer than earlier.

In case of emergency state occurrence the signalling device generates intermittent alarm signal

until it is manually switched off by pressing the key.

7. DISPLAYING OF EXTRA TEMPERATURE SENSOR READOUTS

ATTENTION ! THIS APPLIES ONLY TO THOSE DEVICES, IN WHICH SENSOR NO. 3 IS CONTROLLED

When the F1 key is pressed, the value of extra temperature sensor will be displayed.

The temperature value is displayed in the read out temperature display field of the bar, while the

- tc. - symbol is displayed in the read out temperature display field inside the chamber.

Press the F1 key in order to return to displaying of previous values.

8. -PAUSE- – INTERRUPTION OF PROGRAM EXECUTION

In case if it is necessary to open chamber door for momentary ventilation, user may engage the PAUSE function. As a result chamber operation will be interrupted (no matter if in automatic or manual operation mode). Press the [key icon] key in order to switch to the PAUSE mode.

Press the [key icon] key in order to disengage the PAUSE mode.

9. CHAMBER OPERATION END

Press the [key icon] key in order to stop the automatic process execution.

10. "DELTA"

The MIKSTER MCC 050 FUTURE Controller allows to execute the boiling process in function of temperature difference between "BAR" and chamber temperature (so-called DELTA). Turn on or turn off the boiling mode in function of temperature difference by entering the DELTA value during programming or manual operation mode.

If the 0.0 value is entered in the delta field, the boiling mode in function of temperature difference will be turned off, if any other value is entered, the boiling mode in function of temperature difference will be turned on.

ATTENTION ! THE SERVICE MAY INTERLOCK "DELTA" IN THE SETUP MEMORY.

11. RESPONSE IN CASE OF EXCEEDED ALLOWABLE TEMPERATURE VALUES

The controller supervises boundary temperature value, exceeding of which results in signalling of >ERROR 21<. Boundary temperature value is defined by the service in the SETUP memory.

12. THE CONTROLLER RESPONSE TO POWER DECAY DURING TECHNOLOGICAL PROCESS EXECUTION

In case of occurrence of power failure while the controller executes automatic operation mode, right after power is back the controller will either continue or stop execution of automatic or manual operation mode, depending on parameter settings in the SETUP memory.

Each time error occurrence message >ERROR 40< is displayed. If you want the unit to execute a program exactly from the moment when it it was interrupted (power failure occurred), press the

 key.

The controller will return to the step, which was interrupted and will continue the program.

Press the key in order to start the whole program from the beginning.

The controller will return to the stand-by mode; >STOP< will be displayed.

13.   REAL-TIME CLOCK SETTING

- press the key (the F1-key diode will blink);

- press the key (the controller will switch to the real-time clock setting mode);

- using the keys

set current hour and minute.

- press the key in order to complete the real-time clock setting.