INDU WRC-200 Controller
User's Manual

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1. STRUCTURE, APPLICATIONS, POTENTIAL

The INDU WRC-200 Controller is a unit designed to control those industrial processes, in which temperature is the most important element, such as: thumblers, etc. Thumblers control is the main purpose, for which this controller has been built, and this is reflected in the type of data being shown, controller operation procedure, etc. The controller consists of modules - users may fit their number and type to their own needs. The main module is the "Control Panel", indispensable in any controller, which allows to:

- configure the whole controller
- set parameters controlling the process
- observe current measurements

Other modules, which may be added to the controller (in brackets: maximum number of modules of a given type):

- analog input module (2 modules – 12 input lines) – temperature measurements using the PT100
- digital input module (1 module – 11 input lines) – inputs signaling alarm, or additional external control signals
- relay output modules (6 modules – 32 output lines [1 module has 6 lines]) - relays to control executive equipment
- communication module (1 module) – allows to communicate with the PC computer, and stores recordings of process course parameters
- power supply module (1 module) – the controller power supply – indispensable

Modules may be put together in any configuration.

2. "INDU WRC-200" - CONTROL PANEL

All operations related to the controller activation, programming, etc., are executed through the control panel.

Keys on the control panel are arranged in the following keypads:

- numeric display keypad (1) – displays process preset parameters [green], and current measurements [red]
- graphic display (2) - displays all information related to the panel configuration and operation
- NUMERIC keys with FUNCTION keys (3) – allow to operate the controller
- diodes signaling OUTPUT EQUIPMENT STATUS (4) – show status of output relays

Process control is divided into stages referred to as process cycles, each process may consist of 30 cycles, and each cycle is characterized by:

- currently executed process step
- preset chamber temperature
- preset bar temperature
- preset humidity
- preset cycle duration time

Process step is the information stored in the controller stating which outputs are to be active, and what is the condition for particular cycle termination. 16 process steps may be stored in the INDU WRC-200 memory.

Information regarding status of working controller, as process number and name, or process step number and name, is shown on graphic display.

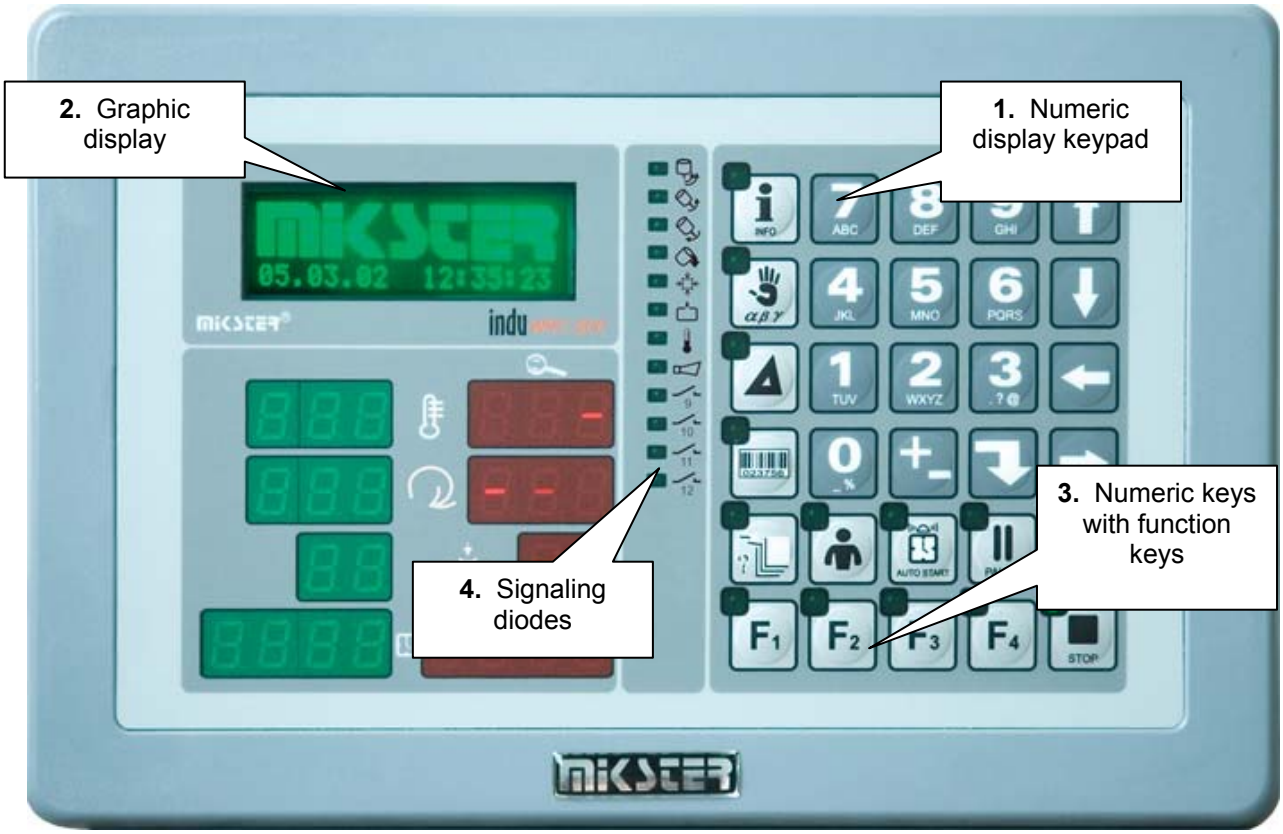


Fig. 1
The INDU WRC-200 Controller "control panel"

3. "INDU WRC-200" - START OF OPERATION

As soon as power is turned on, all numeric displays and diodes will light, and graphic display will show "WRC-200 Init". After some time displays and diodes will be switched off, which proves correct work of the system. The controller will switch to stand-by mode. Graphic display will show request to enter operator's number, and then password. Before operators are entered, it is enough to press "Enter" key twice.

In the case when did not become elaborate all cards/modules connected to the device or remained changed configuration remaining shown announcement:

Go to pts. 5.3.4

4. PROCESS PROGRAMS

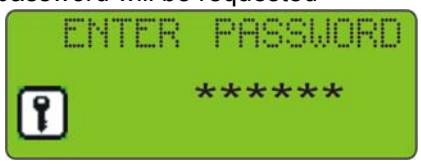
4.1. Manufacturing process programming

Do the following in order to create a new program or edit an already existing one:

- press the "Configuration" key
- using arrows "left" - "right", position the cursor so as to make the figure blink and to have the word "*Programowanie*" ["Programming"] displayed

press the "Enter" key

- password will be requested



enter the code "003011" and press "Enter"

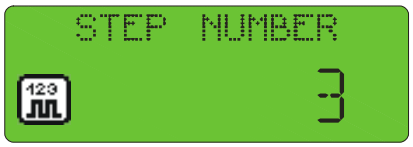
- program selection list will be displayed

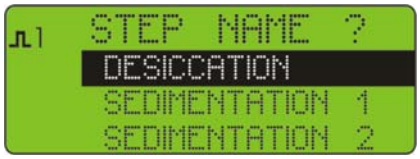
- using arrows “up” - “down”, select the program you wish to enter or modify
- selected program blinks

- press “Enter” key to edit the program
- first enter program name

(enter letter in position by pressing key with selected letter as many times as required, move to next position by pressing right arrow)

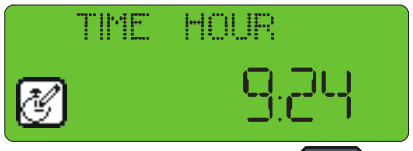
- press “Enter” key
- start process cycle editing
- enter the number of cycle you wish to edit and press “Enter”
- select step number to be executed during the cycle





(using arrows “up” - “down”), and press “Enter”

- enter the cycle duration,



first hours, press “Enter”, then minutes, and press “Enter” again

- enter preset chamber temperature

and press "Enter" 

- enter preset vaccum

and press "Enter" 

- enter preset revolutions

and press "Enter" 

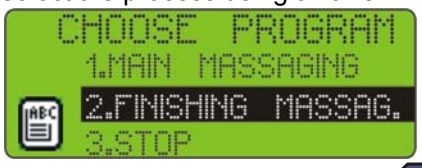
- shift between data you are entering with arrows 
- this ends editing of a single process; if you wish to edit another cycle, enter its number and then proceed as before, whereas if all cycles in a given program have been edited, then press "Stop" key 
- thus you have completed program editing, now you can select another program for editing, or:
- press "Stop" key  and thus end manufacturing process programming
- **DELTA STATUS** - 0 - "delta" OFF, 1 - delta bar-chamber, 2 - "delta" temperature rise in time

4.2. Execution of program stored in memory

Do the following in order to execute any program previously saved in the controller memory:

- press "Start" key 

- select the process using arrows  "up" - "down"



  to be executed and press "Enter" 

- enter product identification data by using numeric keys and arrows

- press "Start" key  again

4.3. Program execution interruption

We are able to interrupt program execution any time without possibility to resume it; in order to do that press "Stop" key  .

It is also possible to interrupt currently executed program, and then return to its execution; follow the procedure below to do that:

- press "Pause" key 
- the controller will interrupt program execution and diode at "Pause" key  will go on
- the program will be resumed when "Pause" key  is pressed again, or when pause time passes (value set during controller configuration, which is described later in this Manual).

4.4. Automatic process activation

The INDU WRC-200 Controller allows to activate a program at any previously set hour. Follow the procedure below to allow for automatic activation of the controller:

- press "Clock" key 

- select program, which is to be activated

and press "Enter" 

- enter process start hour

- enter process start date (current date is prompted by default)

- press "Start" 

- graphic display will show program name, date and program activation time, as well as current date and time, the lamp at "Clock" key  will go on

At specified hour the controller will automatically start execution of appropriate program from the first step. While the controller waits for process start, it is impossible to introduce any modification of settings.

You may cancel automatic process start by pressing "Stop" key 

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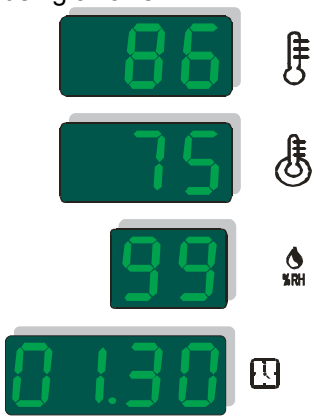
4.5. Editing of parameters set during controller operation

It is possible to correct previously set parameters while the controller executes a program. Follow the procedure below (during program execution) to do that:

- press "Configuration" key 

- using arrows  "up" - "down", select parameter that you wish to change (selected parameter blinks)



- enter the new value using numeric keys

and confirm with "Enter" key 

- if it is necessary, modify next parameters

- press "Start" key 

after having introduced all changes

ATTENTION !!!

Alterations introduced during controller operation are valid only until the end of manufacturing process. After closing the program, the controller "remembers" program with data set during the programming process. During the program data edition the time count as well as the control of condition of the cycle end – are stopped. The controller automatically returns to the normal mode of operation if no key was pressed for one minute.

5. CONTROLLER CONFIGURATION

The controller possesses very highly developed configuration functions, which allow to adjust its parameters and way of working to user's individual needs. Suitable settings entered through the configuration menu are stored in the controller memory and used during its work.

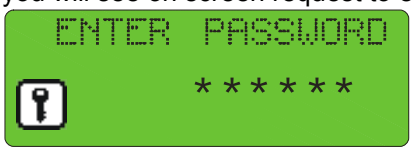
Controller configuration has been divided into the following functions:

- user's functions
- service functions 1
- service functions 2
- access control

Follow the procedure below to start editing selected functions:

- press "Configuration" key 
- using arrows  "left" - "right", select functions you wish to edit

- press "Enter" key 
- you will see on screen request to enter password for access to selected functions



- enter right code and press "Enter" 

5.1. User's functions

These functions allow to set the following:

- time and date
- menu language
- so far other functions are inactive

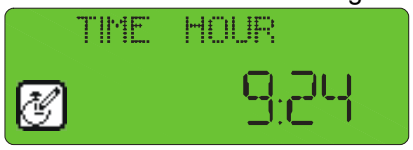
5.1.1. Time and date setting

Follow the procedure below to set time and date:

- select function "Set clock"

- press "Enter" 

enter time and then date using numeric keys

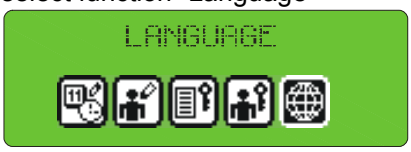


- as soon as you enter each item, press "Enter" 
- press "Stop" key  after entering all items

5.1.2. Setting menu language

Follow the procedure below to set language:

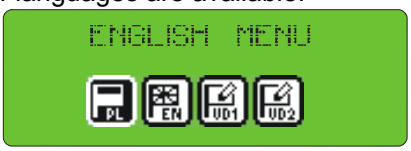
- select function "Language"



- press "Enter"
- select one of 4 languages using arrow keys "left" - "right"

  press "Enter"

4 languages are available:



- Polish
- English
- two languages defined by user and transferred to the controller via PC computer – instruction how to do this is enclosed to the program for PC.

5.2. Service functions 1

In these functions it is possible to set the following:

- controller parameters
- step parameters
- alarms
- STOP and PAUSE mode parameters, and parameters of key functions F1..F4
- I/O output parameters
- washing parameters

5.2.1. Controller parameter setting

Follow the procedure below to set controller parameters:

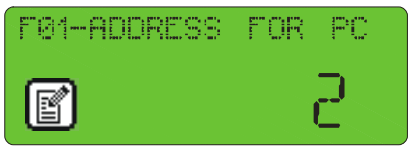
- select function "Controller parameters"

- press "Enter"

Now begin editing controller parameters (parameters are stored in cells numbered from F01):

- select cell, which you wish to set using arrow keys "up" - "down"

- press "Enter" 
- enter proper value for a given cell



- press "Enter" 

Repeat the procedure shown before until required values are set in each cell. The table below shows the meaning of individual cells:

CELL NO.	CELL NAME	FACTORY-SET VALUE	RANGE	DESCRIPTION
F 01	ADDRESS FOR PC	1	1..32	Number in the RS - 485 network, by which the PC computer recognizes the controller
F 02	V.tr. TO PC	0	0..1	Baud rate RS - 485 – connection with PC: 0 - 9600, 1 – 19200
F 03	MENU INFO	1	0..11	Display MENU
F 04	END COND.TIME	1	0..99	Additional time to process end
F 05	PAUSE STATUS	0	0..1	edition of the working period and the pause of the device
F 06	NOT USED			
F 07	TEMP. UNIT	0	0..1	Temperature measurement unit 0 – ^{0}C 1 – ^{0}F
F 08	'PLATE' TEMP.	380	-99..999	Smoke temperature
F 09	'SMOKE' TEMP.	250	-99..999	Smoke-generator plate temperature
F 10	DELTA STATUS	0	0..2	0 - "delta" OFF, 1 - delta bar-chamber, 2 - "delta" temperature rise in time
F 11	REC. FREQ.	1	0..99	Recording frequency
F 12	TIME FOR RESTART	40	0..200	
F 13	MAX. SET CHAMBER TEMP.	200	-99..999	Maximum preset chamber temperature

F 14	MAX. SET BAR TEMP.	200	-99..999	Maximum preset bar temperature
F 15	HUMIDITY MEASUREMENT TYPE	0	0..1	Moisture measurement type: 0 – psychrometric method 1 – with current detector 4...20 mA
F 16	TIME TO WASHING	40	0..999	Allowable number of hours between washing processes
F 17	START FROM PC	0	0..1	Process activation from computer 0 – off 1 – on
F 18	ID ON/OFF	0	0..1	Process ID 0 – off 1 – on
F 19	OPERATOR ON/OFF	0	0..1	Operator logging in 0 – off 1 – on
F 20	KEY "CLICK"	2	0..20	Sound level after pressing the 0 key - audio signaling off
F 21	MAX.CHAMBER TEMP.	100	-99..999	Maximum allowable chamber temperature
F 22	MAX.ROT. SPEED	90	-99..999	Maximum allowable rotation speed
F 23	MAX.CHANNEL4	800	-99..999	Maximum allowable smoke temperature
F 24	MAX.CHANNEL5	800	-99..999	Maximum allowable smoke-generator plate temperature
F 25	MAX. VACCUM	99	0..99	Maximum allowable vaccum
F 26	WEIGHT-OFFSET	0	-200..200	Weight correction value
F 27	TCH-OFFSET (W)	0	-200..200	Chamber temperature correction value – wet sensor
F 28	VACCUM OFFSET	0	-200..200	Vaccum correction value
F 29	CHANNEL3- OFFSET	0	-200..200	Channel 3 correction value
F 30	CHANNEL4- OFFSET	0	-200..200	Channel 4 correction value
F 31	CHANNEL5 OFFSET	0	0..99	Channel 5 correction value
F 32	TYPE OF DIGIT.INPUT	0	0..1	Type of voltage delivered to control inputs: 0 – constant voltage 1 – variable voltage
F 33	STAT. REL.FOR END	0	0..1	Type of input signal for cycle termination condition: 0 – input signal from control input 1 - input signal from relay output
F 34	REL. NO. FOR END	1	1..32	Number of control input or relay for cycle termination condition

F 35	MIN. SET TEMP	0	-99..999	Minimum temperature set
F 36	MIN SET R. SPEED	0	-99..999	Minimum rotation set
F 37	MIN VACCUM SET	0	-99..999	Minimum vaccum set
F 38	MAX VACCUM SET	0	-99..999	Maximum vaccum set
F 39	MIN ADDITION1 SET	0	-199..999	Minimum addition set 1
F 40	MAX ADDITION1 SET	0	-199..999	Maximum addition set 1
F 41	MIN ADDITION2 SET	0	-199..999	Minimum addition set 2
F 42	MAX ADDITION2 SET	0	-199..999	Maximum addition set 2
F43	RELAY S.G. ON	0	1..32	Number of smoking relay – the relay for time count in between consecutive washings of the chamber
F44	CH6 REG. SET.	0	-99..99	Set value for channel 6
F45	CH7 REG. SET.	0	-200..200	Set value for channel 7
F46	CH8 REG. SET.	0	-200..200	Set value for channel 8
F47	CH9 REG. SET.	0	-200..200	Set value for channel 9
F48	CH10 REG. SET.	0	-200..200	Set value for channel 10
F49	CH11 REG. SET.	0	-200..200	Set value for channel 11
F50	CH12 REG. SET.	0	-200..400	CH12 REG SET
F51	CH6 OFFSET	0	-200..200	Set value for channel 6
F52	CH7 OFFSET	0	-200..200	Set value for channel 7
F53	CH8 OFFSET	0	-200..200	Set value for channel 8
F54	CH9 OFFSET	0	-200..200	Set value for channel 9
F55	CH10 OFFSET	0	-200..200	Set value for channel 10
F56	CH11 OFFSET	0	-200..200	Set value for channel 11
F57	CH12 OFFSET	0	-200..200	Set value for channel 12
F58	DISPLAY TIME TYPE	0	0..1	Display time type
F59	MAN. MODE ON/OFF	0	0..1	Manual work
F60	ADDITIONAL SET	0	0..1	Additional set1 and additional set2 during program editing
F61	NOT USED			
F62	NOT USED			
F63	NOT USED			
F64	MAX CARD ERROR	1	0..9	Maximum card error
F65	WEITHT TAR.	0	0..3	**0**-tare off **1**-tare on F4 pressed **2**-automatic tare on start every step **3**- automatic tare on start every step or F4 pressed

F66	COUNTER TAR.	0	0..5	**0**- tare off **1**- tare on F4 pressed **2**- automatic tare on start every step **3**- automatic tare on start every step or F4 pressed **4**- tare on F3 pressed **5**- automatic tare on start every step or F3 pressed
F67	VACUM IMPULSE TIME (s)	0		Value set for INDU WRC-200
F68	VACUM IMPULSE DELAY	0		Value set for INDU WRC-200
F69	COUNTER CONST.	0	0…9999	Counter constans - regulator devider for impulses counter
F70	LOOP PROG STEPS.	0	-1..200	-1 program loop 0 i 1-program executing once 2 do 200 – program loop set
F71	FILTER RH1	0	0..20	„the depth" filtration of the psychrometry for regulators, 0-the filter switched turned off.
F72	FILTER RH2	2	0..5	„the depth" filtration of the psychrometry of shown and registered 0-the filter switched turned off.
F73	NOT USED			
F74	NOT USED			
F75	NOT USED			
F76	NOT USED			
F77	NOT USED			
F78	NOT USED			
F79	NOT USED			
F80	NOT USED			
F81	NOT USED			
F82	NOT USED			
F83	NOT USED			
F84	NOT USED			
F85	NOT USED			
F86	NOT USED			
F87	NOT USED			
F88	NOT USED			
F89	NOT USED			
F90	NOT USED			
F91	NOT USED			
F92	NOT USED			
F93	NOT USED			

F94	NOT USED			
F95	NOT USED			
F96	NOT USED			
F97	NOT USED			
F98	NOT USED			
F99	NOT USED			

5.2.2. Setting of step parameters

Each process controlled by INDU WRC-200 consists of steps executed in a sequence. The controller may store settings for 16 steps. Define the following elements for each step:

- name
- relay status
- step termination condition

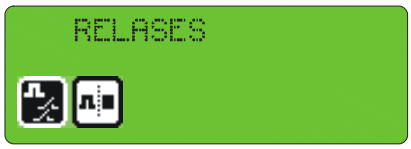
Follow the procedure below in order to set these parameters:

- select function "Step parameters"

- press "Enter"
- the list of all steps will be displayed,

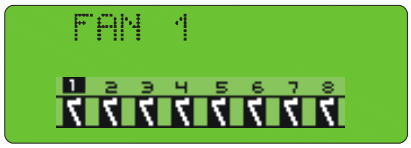
select step that you wish to edit and press "Enter"

- enter name – same as at programming, and press "Enter"
- select function "Relay status"



and press "Enter"

- symbols indicating individual relays are displayed

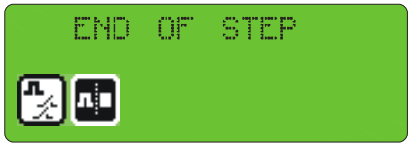


(the symbol informs that in a given step the relay will be on, whereas the symbol informs that the relay will be off), do the following in order to alter relay status:

- move the arrows "left" - "right" so as to have digit indicating selected relay blink
- then, using arrow "up", switch on relay , or, using arrow "down", switch off relay

- after having set statuses of all relays press "Stop" key 

- select function "Step end"



and press "Enter" 

- using arrows  "up" - "down" select appropriate step termination condition; all available step termination conditions are shown in the table below:

Symbol	Step termination condition
CZo>CZz	cycle end after reaching preset time value
Tko>TKz	cycle end after exceeding preset value of temperature inside chamber
Tbo>TBz	cycle end after exceeding preset value of bar temperature
Wo>Wz	cycle end after exceeding preset humidity value
CZo>CZz or Tko>TKz	cycle end after reaching preset time value, or after exceeding preset value of temperature inside chamber
CZo>CZz or Tbo>TBz	cycle end after reaching preset time value, or after exceeding preset value of bar temperature
CZo>CZz or Wo>Wz	cycle end after reaching preset time value, or after exceeding preset moisture value
CZo>CZz and Tko>TKz	cycle end after reaching preset time value and after exceeding preset value of temperature inside chamber
CZo>CZz and Tbo>TBz	cycle end after reaching preset time value and after exceeding preset value of bar temperature
CZo>CZz and Wo>Wz	cycle end after reaching preset time value and after exceeding preset humidity value
Tko<TKz	cycle end after drop of temperature inside chamber below preset value
Tbo<TBz	cycle end after drop of temperature in bar below preset value
Wo<Wz	cycle end after drop of humidity below preset value
CZo>CZz or Tko<TKz	cycle end after reaching preset time value, or after drop of temperature inside chamber below preset value
CZo>CZz or Tbo<TBz	cycle end after reaching preset time value, or after drop of temperature in bar below preset value

CZo>CZz or Wo<Wz	cycle end after reaching preset time value, or after drop of humidity below preset value
CZo>CZz and Tko<TKz	cycle end after reaching preset time value and after drop of temperature inside chamber below preset value
CZo>CZz and Tbo<TBz	cycle end after reaching preset time value and after drop of temperature in bar below preset value
CZo>CZz and Wo<Wz	cycle end after reaching preset time value and after drop of humidity below preset value
INn=1	cycle end when "end release" is on
CZo>CZz and INn=1	cycle end after reaching preset time value, and "end release" must be on
CZo>CZz or INn=1	cycle end after reaching preset time value, or after switching on "end release"
INn=0	cycle end when "end release" is off
CZo>CZz and INn=0	cycle end after reaching preset time value, and "end release" must be off
CZo>CZz or INn=0	cycle end after reaching preset time value, or after switching off "end release"

- press "Enter" 
- complete setting of parameters for one step by pressing "Stop" key 

- select next step to edit, or press "Stop" 

and finish editing step parameters

5.2.3. Alarm setting

21 alarms my be activated in the controller:

- 11 from control inputs
- 5 from sensors
- 5 when measurements exceed allowable values

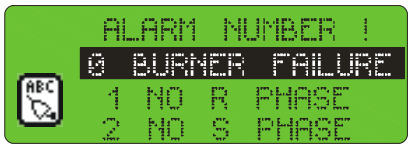
The following items may be defined for each alarm:

- name
- relay status
- alarm delay time – time from alarm detection to its activation
- logics of outputs
- alarm status

Follow the procedure below to set alarm parameters:

- select function "Alarm settings"

- press "Enter"
- the list of all alarms will be displayed



select an alarm to set its parameters and press "Enter"

- enter name

analogically as when programming, and press "Enter"

- one by one, select functions:
  - "Outputs when alarm"

and press "Enter"

  - set relay statuses analogically as when setting parameters for steps – additionally properly set the function "Alarm output logics"
  - press "Stop"
  - "Alarm delay"

and press "Enter"

  - enter time, after which the controller should react to alarm occurrence

- time is given in seconds
- press "Enter"

- "Alarm output logics"

and press "Enter" - this function specifies how to link status preset in function "Outputs when alarm" with relays; the following options are possible:

- "Status setting" – symbol - exactly those relays will be switched on, which have been set in function "Outputs when alarm"
- "Status adding" – symbol - those relays will be switched on, which result from regular controller operation, and additionally relays set in function "Outputs when alarm"
- "Status removal" – symbol - those relays will be removed from working relays, which (regular controller operation) are set in function "Outputs when alarm"
- set right symbol using arrows "left" - "right"
- press "Enter"

- "Alarm status"

and press "Enter" – this function specifies, how the controller should react if a given alarm occurs; the following options are possible:

- "Alarm off" – symbol - the controller will ignore particular alarm
- "Process interruption" – symbol - if the controller is in process execution phase and an alarm will occur, the process will be interrupted
- "Process continuation" – symbol - if the controller is in process execution phase and an alarm will occur, the controller will adequately set relays, and the process will be continued
- set right symbol using arrows "left" - "right"
- press "Enter"

- as soon as you set all functions for a given alarm, press "Stop"
- if you wish, select another alarm to set its parameters, and repeat the procedure specified before, otherwise press "Stop"

5.2.4. Parameter setting for pause mode, stop mode and key functions F1..F4

The controller has two special modes: 

stop and 

pause; you may set the following for each of them:

- which outputs are to be active
- how long should particular mode last
- logics of output setting in relation to relays being set by any process in progress

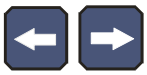
Moreover, the controller has 4 key functions 

F1..F4. These functions are activated by pressing keys F1..F4. Should these functions be activated, they allow for additional relay control during process execution. These functions are described by the same parameters as stop and pause modes, thus setting procedure for these parameters is exactly the same, and so it will be described together.

Follow the procedure below to set these parameters:

- select function "Stop/Pause Setting" from menu **SERVICE FUNCTIONS 1**

- press "Enter" 
- select function or mode, for which parameters

are to be set (arrows  "left" - "right") and press "Enter" 

- one by one, select functions:
  - "Outputs when ..."

and press "Enter" 

  - set, which relays are selected for particular function
  - press "Stop" 

- "End time ..."

and press "Enter"

  - enter time, after which function or mode operation will be terminated – in seconds
  - press "Enter"

- "Output logics ..."

and press "Enter"

  - select logics for mode – analogically as described for alarms
  - press "Enter"

- press "Stop"
- if you wish to set parameters for another function, select it and repeat the procedure specified before, and if parameters for all functions are set, press "Stop" .

5.2.5. I/O output parameter setting

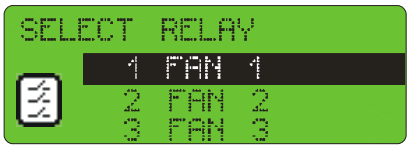
Each of the 32 relays possesses individually set working parameters. Operation of each relay is described by the following:

- name
- time type, and time values Ta, Tb
- regulator type and regulator measurement channel
- regulator set value shift in relation to the value set in program
- shift of operation level for algorithm with dynamic set value
- "lower" hysteresis
- "upper" hysteresis

Follow the procedure below to set these parameters:

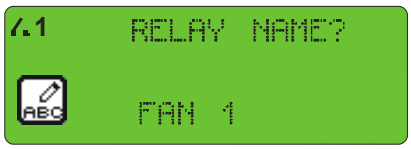
- select function "Parameters of outputs 0/1"

- press "Enter" 
- the list of all relays will be displayed



select the relay to se tits parameters, and press "Enter" 

- enter name



analogically as for programming, and press "Enter" 

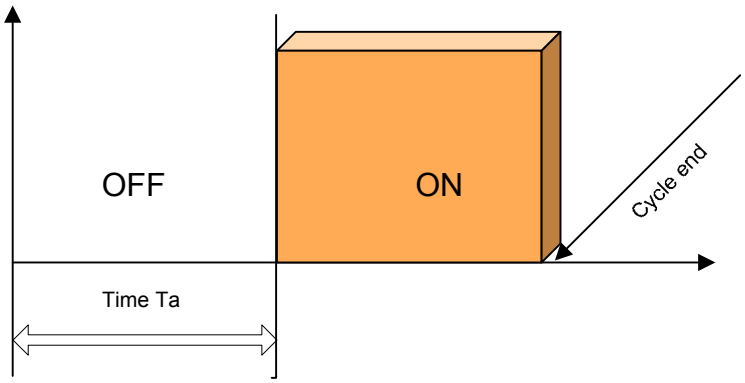
- the controller will go to next settings after pressing "Enter" 
- set time mode first; available modes:
  - **always off**

  – the relay unconditionally off

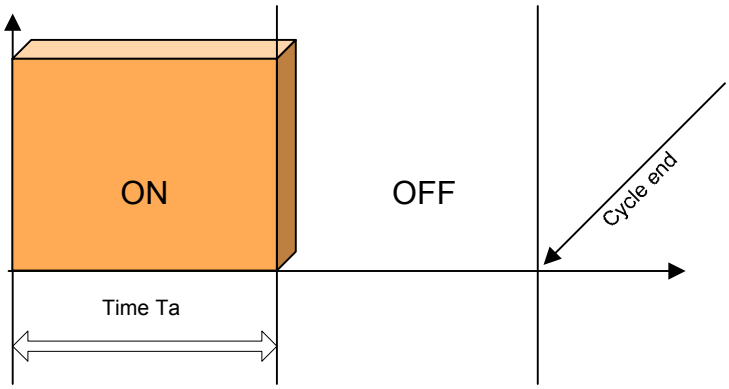
  - **always on**

  – the relay activated according to definition for currently executed step; if during particular step the relay is on, then it is on throughout that step

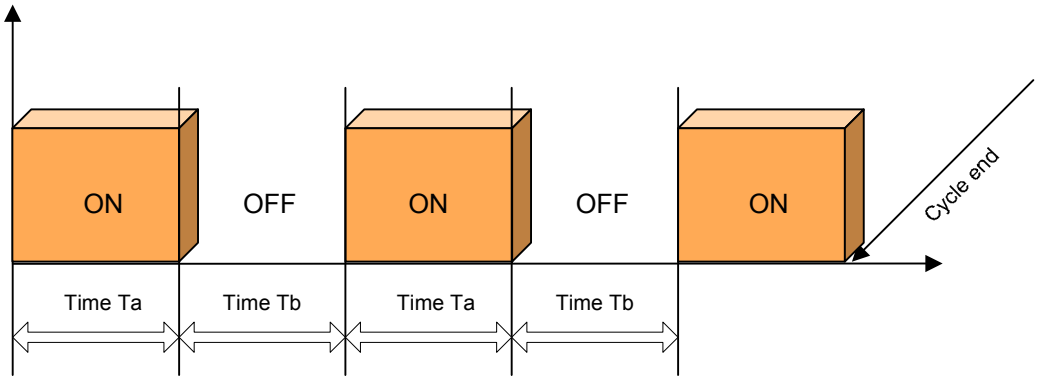
  - **delayed activation**



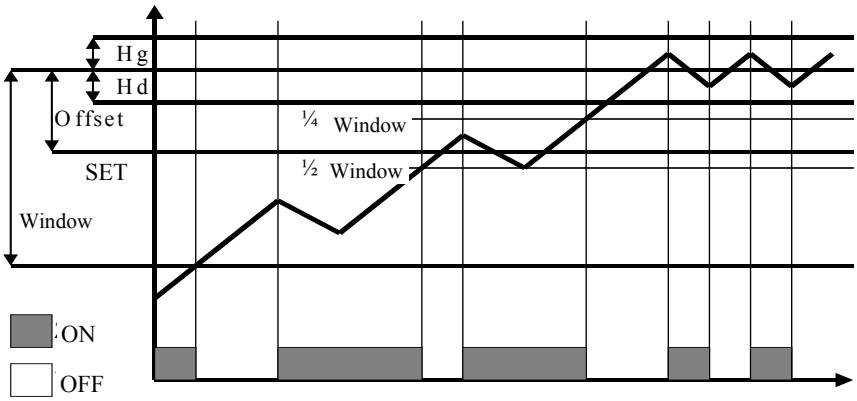
- delayed deactivation



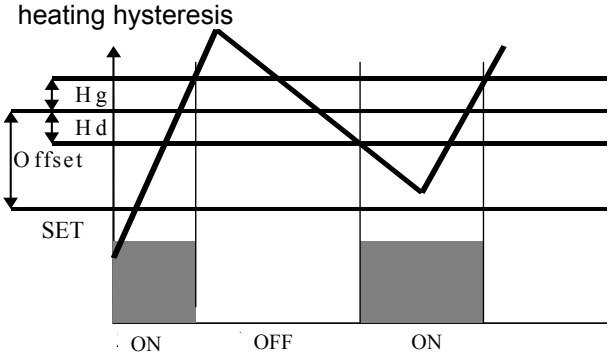
- pulse generator



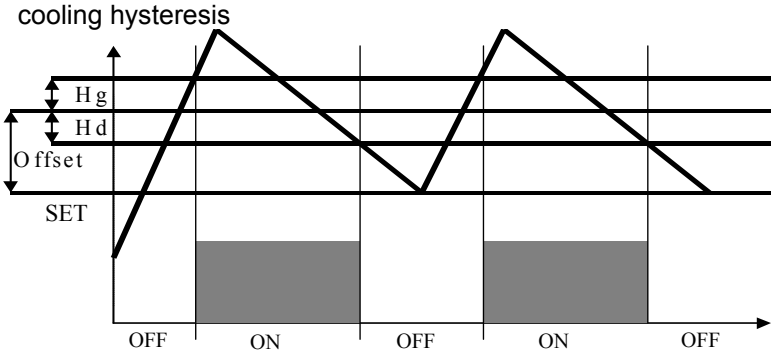
- then set times Ta and Tb – time value is given in seconds
- select regulator controlling particular relay, available regulator options:
  - regulator off
  - heating progress



- cooling progress
- heating hysteresis



- cooling hysteresis



- select channel, upon which the regulator will act
- enter offset
- enter "window"
- enter lower hysteresis
- enter upper hysteresis
- select next relay for parameter setting and repeat operations listed before,

  or press "Stop"  if all are set.

5.2.6. Washing parameter setting

The "Washing" program (described later in this manual) is executed on the basis of special process steps, for which parameters are set independently of process steps used in regular programs.
Follow the procedure below in order to set parameters for individual steps used in the "Washing" program:

- select function "Washing parameters"
- press "Enter"
- proceed analogically as when programming regular process steps (described in section 5.2.2.)

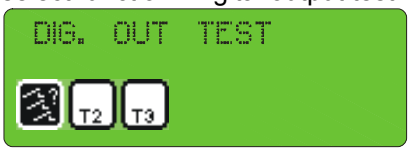
5.3. Service functions 2

These functions allow to test the controller.

5.3.1. Test for digital outputs

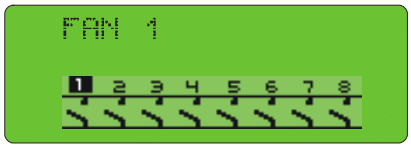
Follow the procedure below to test digital outputs (relay outputs):

- select function "Digital output test"



- press "Enter"

The screen will display output statuses numbered from 1 to 32



– the symbol „" indicates output on, and symbol „" indicates output off. Do the following operations to alter status of any output:

- using arrows "left" - "right", position cursor on the number of output, which status you wish to change
- switch on relay with arrow "up", and switch it off with arrow "down"

As soon as testing is complete, press the "Stop" key .

5.3.2. Key test

Follow the procedure below to test correct operation of keys:

- select function "T2"

- press "Enter" 

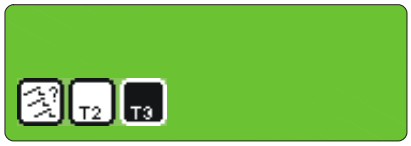
The display of "chamber temperature set value" shows the number attributed to the key pressed last; if any other key is pressed, displayed number will be changed.

Exit the test mode by pressing and holding down any key.

5.3.3. Diode test

Follow the procedure below to check whether all control panel diodes and displays operate correctly:

- select function "T3."



- press "Enter" 

First pressing down of any key switches on all diodes and all segments of each display. Next pressing of any key switches off all diodes.

Exit the test mode by pressing and holding down any key.

5.4. Washing

"Washing" is a special program hidden in the controller memory, independent of any other programs, and based on dedicated process steps, which is activated in a special way. According to its name, it is designed for automatic washing of units controlled by INDU WRC-200.

5.4.1. Washing programming

Follow the procedure below to set the "Washing" program configuration:

- select function "Wash programming"

- press "Enter" 
- proceed in the same way as when programming regular process steps (described in section 4.1.); the only difference is a possibility to select from among process steps designed specially for the "Washing" program, and described before.

5.4.2. Washing activation

Follow the procedure below in order to activate the "Washing" program:

- select function "Washing start"

- press "Enter" 
- enter access code and confirm with "Enter" 

- press "Start" key 

6. ADDITIONAL INFORMATION

6.1. Display of additional measurements

The LED displays the temperatures of the chamber and the meat-bar as well as moisture. To see the temperature values of: smoke, plate and the chamber moisture sensor the „Info" key should be pressed. The graphic display will show the current readings from those sensors. The values can be checked at „Stop" as well as during the program operation.

7. HOW TO CONNECT THE CONTROLLER TO PC COMPUTER

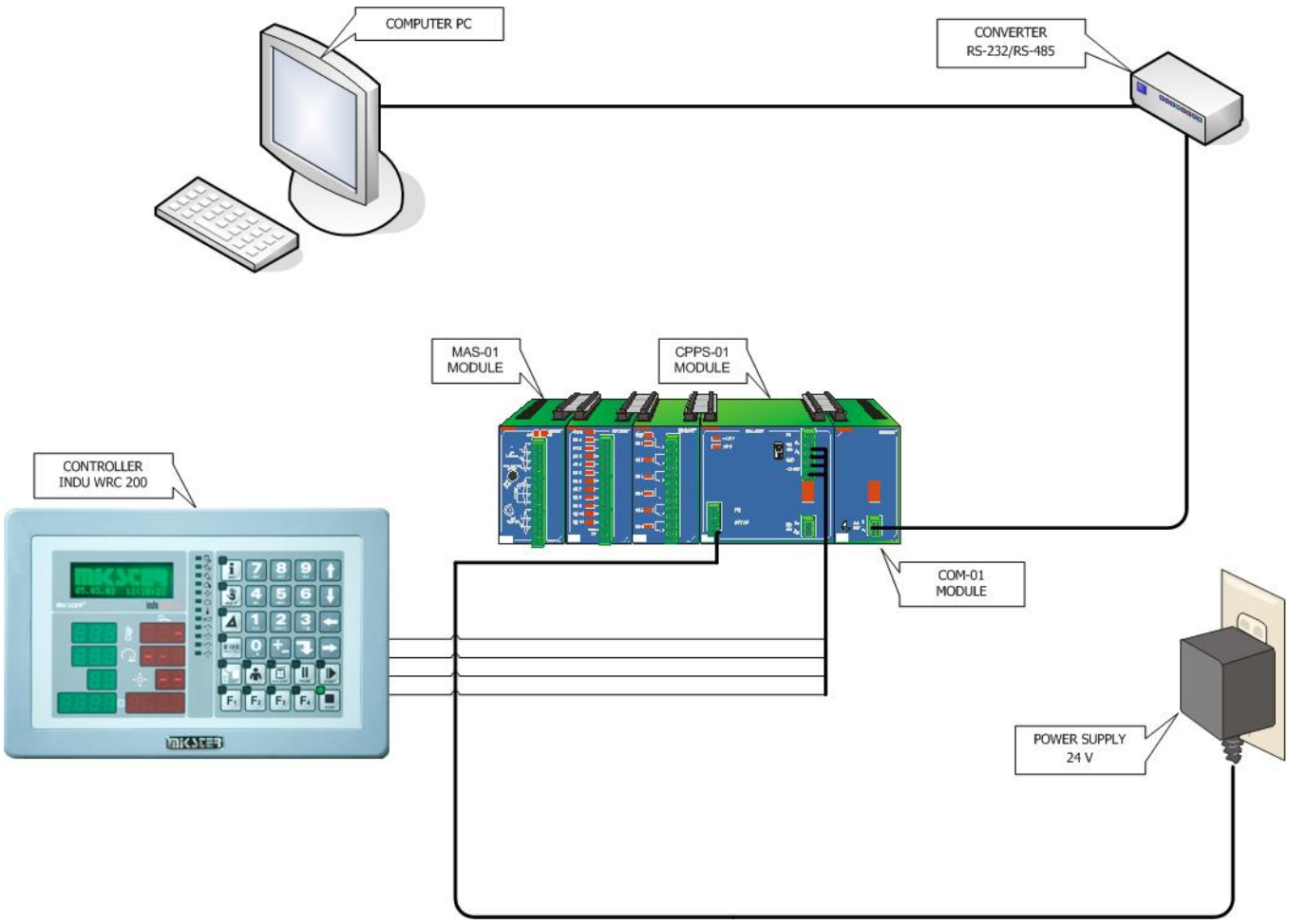


Fig. No. 2

INDU WRC-200 Controller connection to PC computer

8. TECHNICAL DATA

OVERALL DIMENSIONS:	Width 182 mm Height 324 mm
POWER SUPPLY:	12-24 V DC
CASING:	Single-element, "FRONT PANEL"-type
PROTECTION DEGREE:	from front IP 65
HUMIDITY:	0..75 % (relative humidity)
TEMPERATURE:	Ambient -20..+70 °C Working 0..+60 °C
DISPLAY:	Seven-segment LED displays, graphic display
KEYBOARD:	Foil-type, 42 keys
STATUS SIGNALLING:	26 LED diodes

II INDU WRC CPPS-01 MODULE

1. MODULE ASSEMBLING

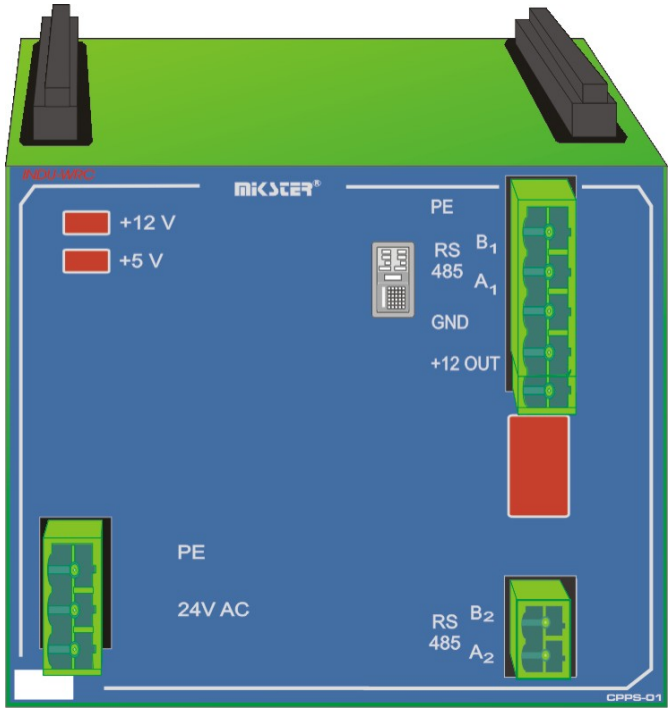
Module should be assembled on a rail and then connected with other modules by a belt (module of the power supply CPPS-01 is necessary for the module operation).Description of outputs for RS485 is on the casing. The upper connection RS A B is connected to the converter in the Rennon Slicer panel.Communication with the processor is done with the rate of 19200 bits/sec, while communicatin with the cards with the rate of 9600 bits/sec.When the panel and belt (eventually a computer) are connected the device is ready for operation.

2. MODULE FUNCTION

The module is used for controlling the operation of all modules and for the communication with the panel.

Only one CPPS-01 module can be connected to the system.

3. FIGURE



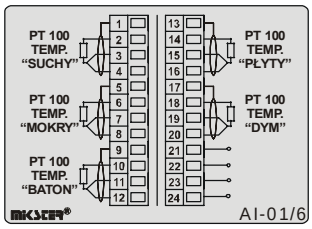
4. TECHNICAL DATA

POWER SUPPLY:	5 V DC, 12 V DC
CASING:	Dimensions: 45x75x105 mm for assembling on a rail TS 35 EG45 from the Phoenix Contact Company
PROTECTION DEGREE:	IP 30
TEMPERATURE:	Storage: -40..+80 °C Operation: -20..+65 °C
DISPLAY:	7 segments
KEYBOARD:	none
STATE SIGNALLISATION:	LED 7-segment display
BISTABLE OUTPUTS:	none
ANALOG OUTPUTS:	none
ANALOG INPUTS:	none
DIGITAL INPUTS:	none
COMMUNICATION:	• 1 x RS-485 optoinsulated • 1 x RS-485 • Communication bus with other modules

III. INDU WRC AI-01/6 MODULE

1. MODULE ASSEMBLING

Module should be assembled on a rail and then connected with other modules by a belt.

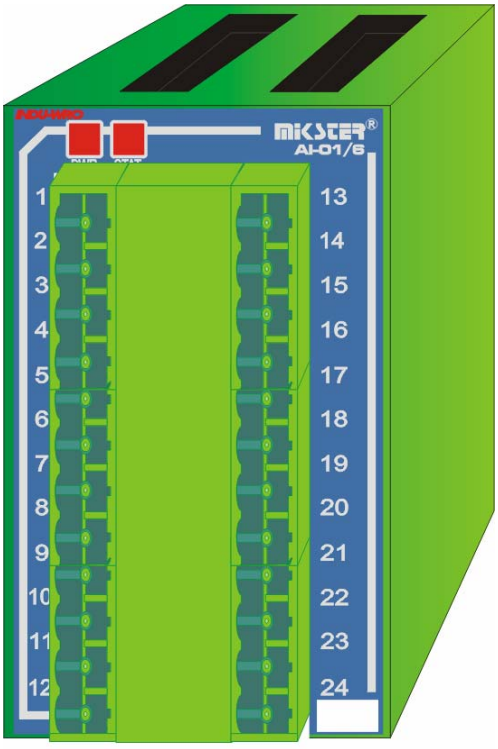


2. MODULE FUNCTION

Module serves for controlling by means of analogue outputs. Maximum output current ±5mA

The module is used for the temperature measurement by means of the resistance platinum sensors Pt100. Only one AI-01/6 module can be connected to the system.

3. FIGURE



4. TECHNICAL DATA

POWER SUPPLY:	5 V DC, 12 V DC
CASING:	Dimensions: 45x75x105 mm for assembling on a rail TS 35 EG45 from the Phoenix Contact Company
PROTECTION DEGREE:	IP 30
TEMPERATURE:	Storage: -40..+80 °C Operation: -20..+65 °C
DISPLAY:	none
KEYBOARD:	none
STATE SIGNALLISATION:	LED diode - status, LED diode ± 15V
BISTABLE OUTPUTS:	none
ANALOG OUTPUTS:	4 outputs ±10V, fun-out ±5mA
ANALOG INPUTS:	none
DIGITAL INPUTS:	none
COMMUNICATION:	Communication bus to other modules

IV. INDU WRC DI-01MODULE

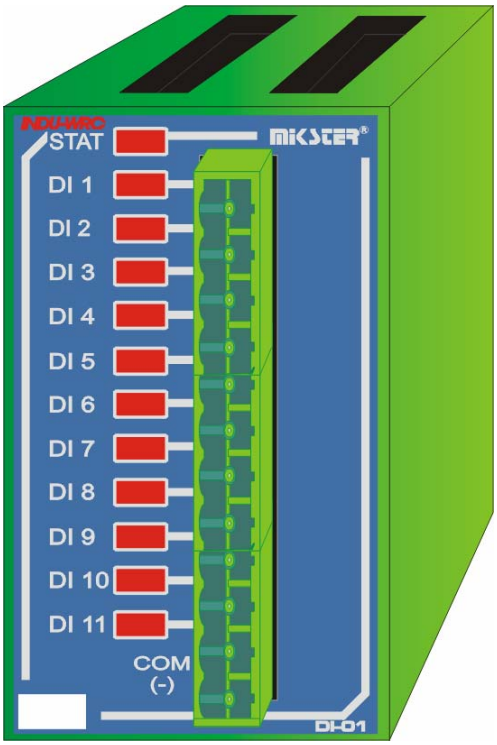
1. MODULE ASSEMBLING

Module should be assembled on a rail and then connected with other modules by a belt.

2. MODULE FUNCTIONS

DI-01 module is a bistable input module, which serves for controlling input signals (e.g. failure control).

3. FIGURE



4. TECHNICAL DATA

POWER SUPPLY:	5 V DC, 12 V DC
CASING:	Dimensions: 45x75x105 mm for assembling on a rail TS 35 EG45 from the Phoenix Contact Company
PROTECTION DEGREE:	IP 30
TEMPERATURE:	Storage: -40..+80 °C Operation: -20..+65 °C
DISPLAY:	none
KEYBOARD:	none
STATE SIGNALLISATION:	LED diode for each input, LED diode - status
BISTABLE OUTPUTS:	none
ANALOG OUTPUTS:	4 outputs ±10V, fun-out ±5mA
ANALOG INPUTS:	none
DIGITAL INPUTS:	11 inputs 24V (direct or alternating) logic levels: - 0-3 V law - 10-24 high
COMMUNICATION:	Communication bus to other modules

V. INDU WRC RO-01 MODULE

1. MODULE ASSEMBLING

Module should be assembled on a rail and then connected with other modules by a belt.

2. MODULE FUNCTIONS

Module serves for controlling by means of relay outputs. fan-out of a single output: 4A.

Maximum 6 RO-01 modules can be connected to the system.

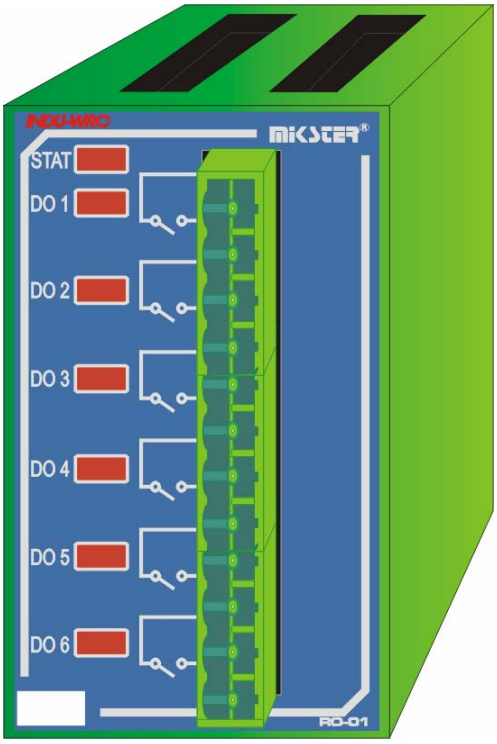
Note: cards of the same type must have different addresses!

(Altogether 32 outputs can be connected to the system – RO-01 and TO-01 can be connected)

RO-01 = 6 outputs

TO-01 = 8 outputs

3.FIGURE



4. TECHNICAL DATA

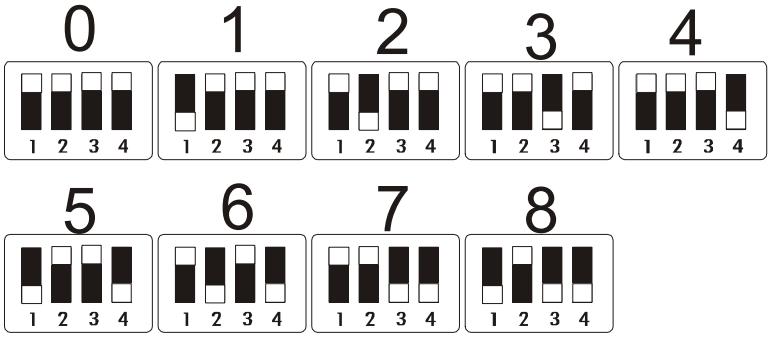
POWER SUPPLY:	5 V DC, 12 V DC
CASING:	Dimensions: 45x75x105 mm for assembling on a rail TS 35 EG45 from the Phoenix Contact Company
PROTECTION DEGREE:	IP 30
TEMPERATURE:	Storage: -40..+80 °C Operation: -20..+65 °C
DISPLAY:	none
KEYBOARD:	none
STATE SIGNALLISATION:	LED diode for each output, LED diode status
BISTABLE OUTPUTS:	6 relay outputs fan-out: - 4A 230 V AC - 4A 24 V DC
ANALOG OUTPUTS:	none
ANALOG INPUTS:	none
DIGITAL INPUTS:	none
COMMUNICATION:	Communication bus to other modules

5. Cards addressing in the system:

Output no 1 for the panel is the first output of the card with the lowest address.

Note: cards of the same type must have different addresses!

Address:



VI. INDU WRC TO-01 MODULE

1. MODULE ASSEMBLING

Module should be assembled on a rail and then connected with other modules by a belt.

2. MODULE FUNCTION

Module serves for controlling by means of transistor outputs. Fun-out of a single output 0.8A, total current of all outputs < 6.3A.

Maximum 4 TO-01 modules can be connected to the system.

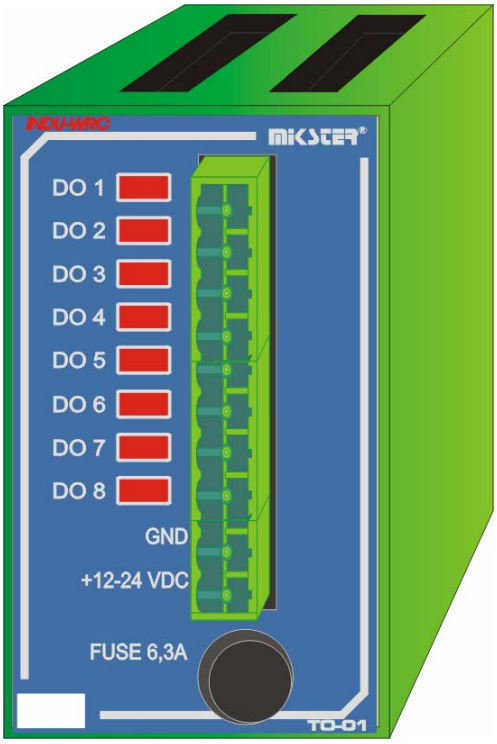
Note: cards of the same type must have different addresses!

(Altogether 32 outputs can be connected to the system – RO-01 and TO-01 can be connected)

RO-01 = 6 outputs

TO-01 = 8 outputs

3. FIGURE



4. TECHNICAL DATA

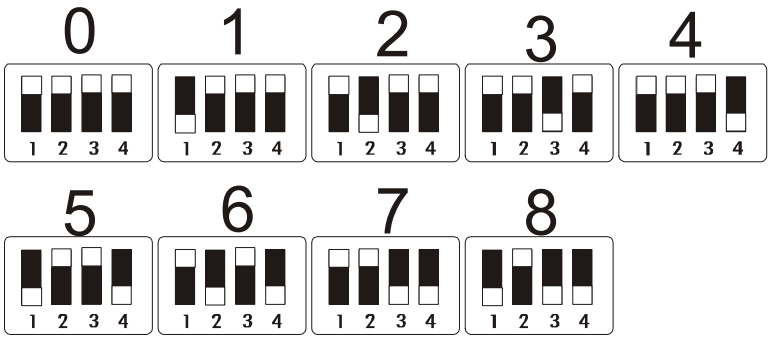
POWER SUPPLY:	5 V DC, 12 V DC
CASING:	Dimensions: 45x75x105 mm for assembling on a rail TS 35 EG45 from the Phoenix Contact Company
PROTECTION DEGREE:	IP 30
TEMPERATURE:	Storage: -40..+80 °C Operation: -20..+65 °C
DISPLAY:	none
KEYBOARD:	none
STATE SIGNALLISATION:	LED diode for each output, LED diode status
BISTABLE OUTPUTS:	8 transistor outputs fun-out: - 0.8A total current for all outputs < 6.3A
ANALOG OUTPUTS:	none
ANALOG INPUTS:	none
DIGITAL INPUTS:	none
COMMUNICATION:	Communication bus to other modules

5. Cards addressing in the system:

Output no 1 for the panel is the first output of the card with the lowest address.

Note: cards of the same type must have different addresses!

Address:



VII. INDU WRC COM-01 MODULE

1. MODULE ASSEMBLING

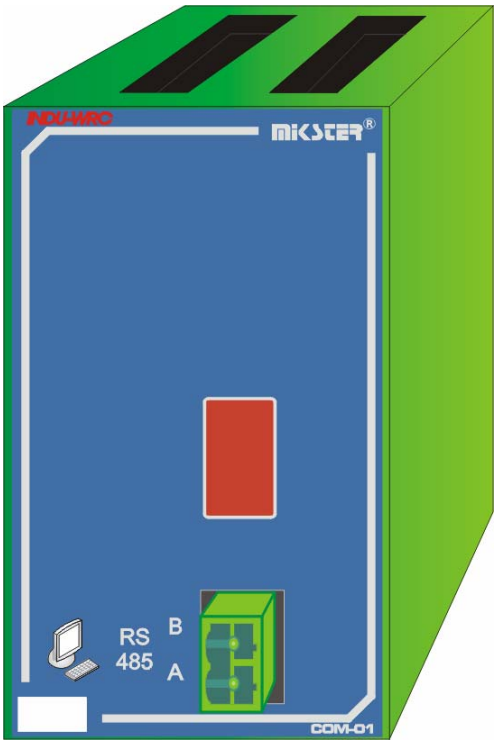
Module should be assembled on a rail and then connected with other modules by a belt.

2. MODULE FUNCTION

The module is used for communication between the INDU WRC set and the PC. Apart from storing the recordings the module enables readout of the set technological process parameters and values measured by controller's modules.

Only one COM-01 module can be connected to the system.

3. FIGURE



4. TECHNICAL DATA

POWER SUPPLY:	5 V DC, 12 V DC
CASING:	Dimensions: 45x75x105 mm for assembling on a rail TS 35 EG45 from the Phoenix Contact Company
PROTECTION DEGREE:	IP 30
TEMPERATURE:	Storage: -40..+80 °C Operation: -20..+65 °C
DISPLAY:	7 segments
KEYBOARD:	none
STATE SIGNALLISATION:	7 segments LED diode
BISTABLE OUTPUTS:	none
ANALOG OUTPUTS:	none
ANALOG INPUTS:	none
DIGITAL INPUTS:	RS-485
COMMUNICATION:	Communication bus to other modules

VIII. INDU WRC MAS-01 MODULE

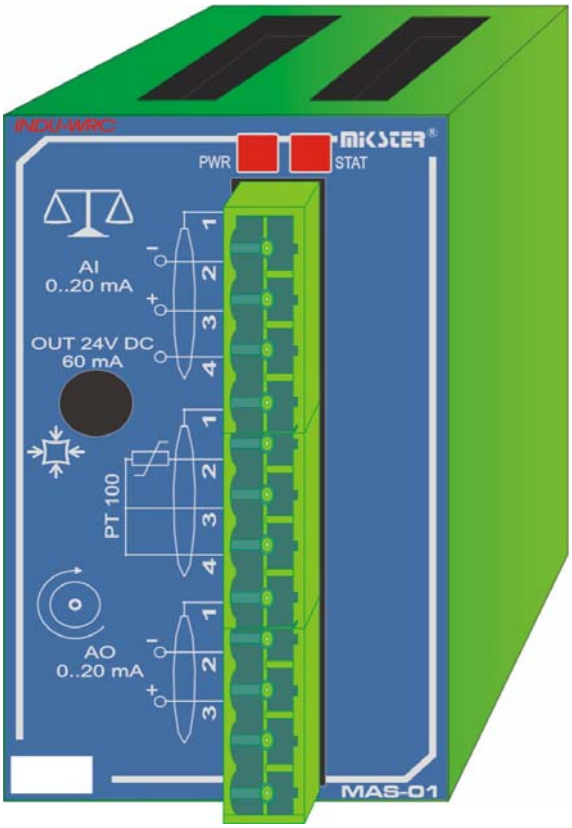
1. MODULE ASSEMBLING

Module should be assembled on a rail and then connected with other modules by a belt.

2. MODULE FUNCTION

Inputs: 1x current input 0 -20mA, the power supply of the external sensor max.60mA 24VDC,
1xPT 100,
the internal sensor of the hypotension (MPX2100D)
Outputs: 1x current output 0 -20mA, to the steering speed rotatory

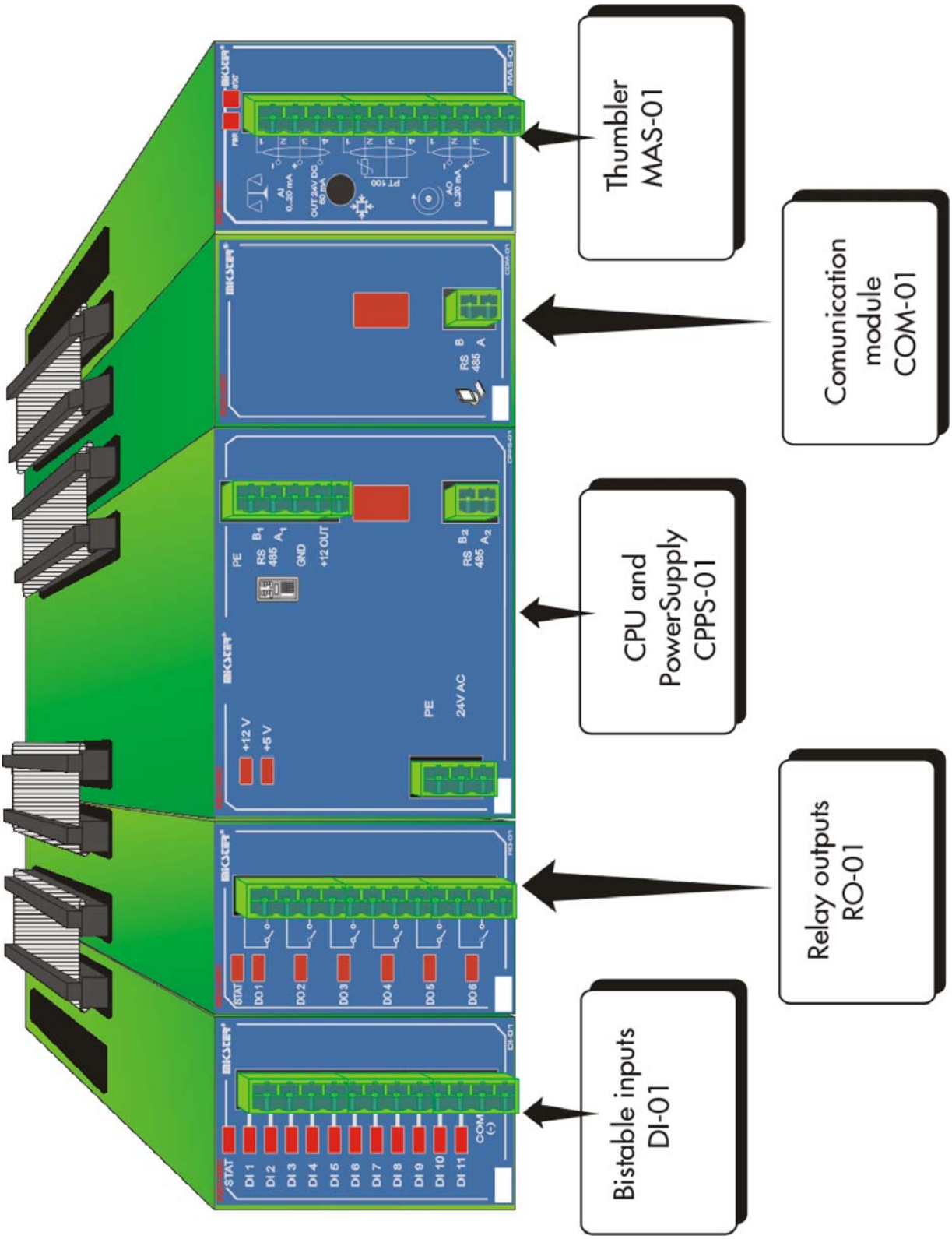
3. FIGURE



4. TECHNICAL DATA

POWER SUPPLY:	5 V DC, 12 V DC
CASING:	Dimensions: 45x75x105 mm for assembling on a rail TS 35 EG45 from the Phoenix Contact Company
PROTECTION DEGREE:	IP 30
TEMPERATURE:	Storage: -40..+80 °C Operation: -20..+65 °C
DISPLAY:	none
KEYBOARD:	none
STATE SIGNALLISATION:	LED for PWR LED for STAT
BISTABLE OUTPUTS:	none
ANALOG OUTPUTS:	none
ANALOG INPUTS:	none
DIGITAL INPUTS:	RS-485
COMMUNICATION:	Communication bus to other modules

Fig. Modules connection



THE ATTENTION!

For the diminution of disturbances at the assembly on the rail one ought to advert on the distribution of modules: after one side of the power supply should be exits and digital entries, instead after second remaining modules.