Regulating and displaying unit

TC -41

Complete instruction

MRK s.r.o.
Mierové námestie 30/24
Nová Dubnica
018 51
tel./fax. +421 42 44 31 345
www.mrk.eu
mrk@mrk.eu

Contents

Introduction

Thank you for buying our product. For its faultless usage, read these instructions so that it works correctly to your complete satisfaction.

TC – 41 is an intelligent microprocessor unit, enabling regulation of measured process values according to required parameters. It can be entirely adjusted to your demands, however, that requires detailed knowledge of its system. Every user will not apply all the available functions, that's why this instruction consists of two parts

- *Quick user's manual*
- *Complete instructions for the TC – 41 system*

Quick manual contains basic information about TC – 41, survey and setting of the most important parameters, simple launch, stopping of the regulating process. The complete instruction will introduce you all the TC – 41 functions, enabling setting of the regulation parameters, displays, possibilities of connecting inputs and outputs, technical parameters.

Instructions were written for the usage of TC – 41 as a controller of temperature, stated principles and settings are applicable also for other possibilities of usage.

Attention : The device may be installed and operated only by people who are acquainted with these instructions, safety rules, and is authorized for installation of electrical devices in accordance with valid legislation.

We hope you'll be fully content with our product.

1.   Description and function

TC-41 is a compact regulating and displaying unit, enabling regulation, or displaying measured values of process values from the connected input probes. The controlling unit of TC-41 is determined to measure and display 1 or 2 input signals. Output controlling signal can be binary, analog with the possibility of galvanic separation.
TC-41 can be connected into larger regulating wholes (multizonal furnaces...) with the possibility of connection to the PC with a serial interface RS232, RS485, MODBUS, IrDA   (infrared communication). Controllers of visualisation in systems CONTROL WEB, CONTROL PANEL are available. Concerning the time reactions of the regulated complex, cascade connection of the regulators is also possible.

Both measured and required (set) value are showed on two LED displays (height of the segments is 14mm – good visibility even from a larger distance). On the front panel, there are also 4 keys that set and control the device. Input, output and supply clamps are placed on the back side of the unit. The electronics of the controller is placed in a plastic box in panel making with standard covering of IP40, or more .

All parameters are protected by a password against an unauthorized change. Basic parameters are available in the user's menu of 1st level (password 1) and more detailed setting is enabled by the user's menu of 2nd level (password 2).

2.   Mechanical installation

The device was constructed for the fitting into a panel and is equipped
with two holds with aretation. The procedure of the fitting is as follows:

- Cut an oblong opening {92 x 44 mm} into the panel, the width
  of the panel maximum 5 mm
- Insert the device into the opening and put the holds on both
  sides (the head of the screw is heading back to the connector
  of the device). Press back and that will fix the holds, then
  fasten the screws, which will fasten the whole device
- Connect all necessary conductors onto the connector and
 insert it into the back part of the controller
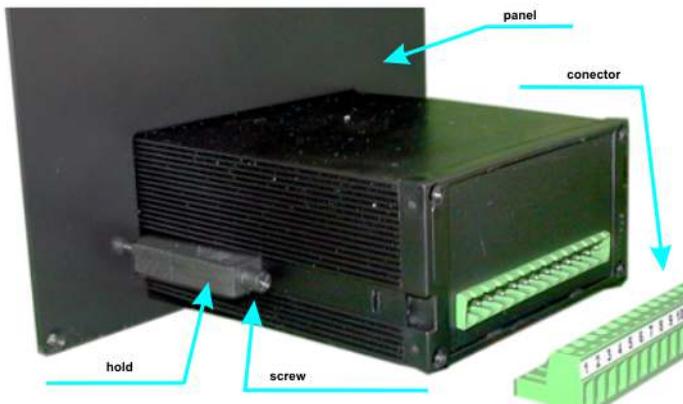
That will be the end of installation.

3.   Connection

Turn on the device in accordance with an enclosed scheme (at the end of the instructions). Use a tag stuck on the upper part of the device for an aid. Power supply, inputs and outputs are marked there.
Attention : the device may be connected and put into service only by a person with an appropriate qualification § 22 , 718 / 2003 Z.z.

4.   Controlling
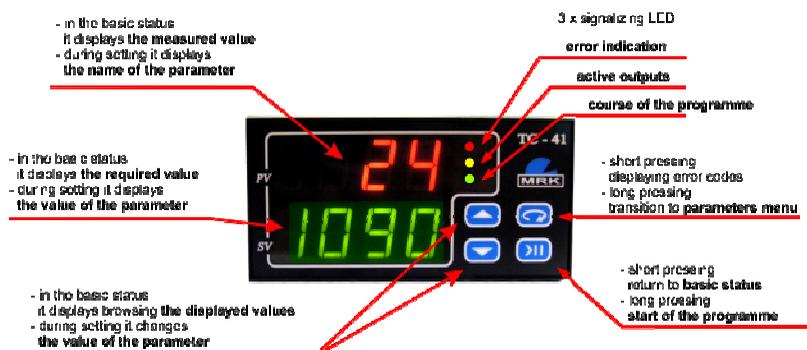
There are 4 keys for controlling :

⬆ ⬇ - browsing in displayed process values, increasing, lowering the value.

⟳ - accesing menu Parameters 1, displaying error codes.

▶II - start of the programme, return to the basic status.

The device displays three main offers <u>Basic status</u>, <u>Parameters 1</u>, <u>Parameters 2</u>, in which all the data can be set and viewed. To confirm the set value, push the ⟳ key which will also take you to the following parameter. When you press ▶II shortly, you'll also confirm the given value, and go back to the basic status. The return to the basic status will be realized also automatically after 30 seconds since you pressed the last key. The structure of the whole controlling menu is showed on the following picture number 2.

Basic status

Measured value
Set value

change Set Value

press for 3 sec

Parameters 1

▶ PAS1
SEtP
rAnP
HoLd
HdiF
ALAb
ALrE
PAS2

browsing the parameters
short pressing

incorrect code

correct code

Errors

ErrC
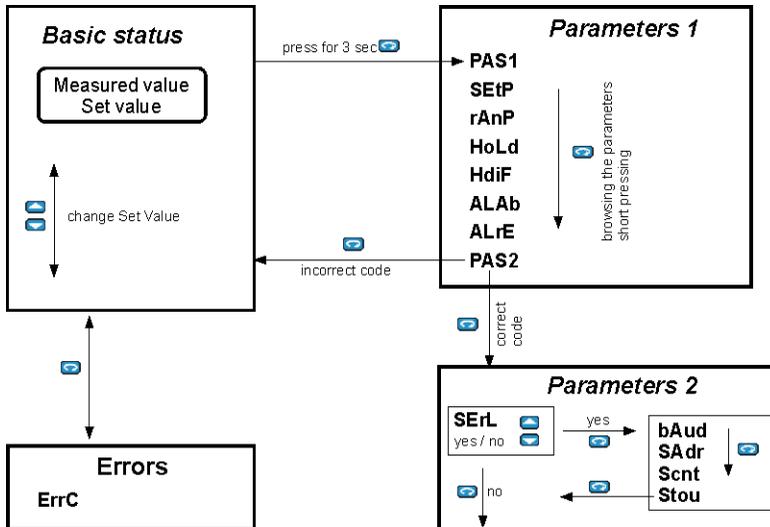
- longer holding (3 sek.) = **start of the program**

- short holding = exit from any menus to
  Basic status

Hint :
    press together
    jump to Parameters 2
Note :
    ACC3 - only for manufacturer

Warning :
    Some parameters can be hidden, or may be different
    menu structure.

Version SPmo1 :

Basic status

Measured value
Set Value

tEnd
SPin
trEF
SEtP
tn2
tn1

ver. SPmo1

Parameters 2

SErL
yes / no   yes

bAud
SAdr
Scnt
Stou

no

Pid1
yes / no   yes

diFl
PbA1
Int1
dEr1
b1
SAn1
Lin1
HYS1

no

Pid2
yes / no   yes

detto PID1

no

Pid3
yes / no

no

inPS
yes / no   yes

CAL1
CAL2
rEF1
rEF2
dcPt

no

SYSt
yes / no   yes

OPEr
SPLo
SPHi
Acc1
Acc2
Acc3

Základný stav ◀ no
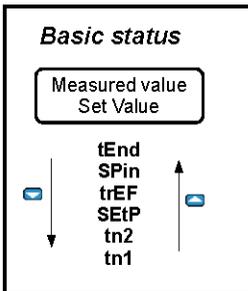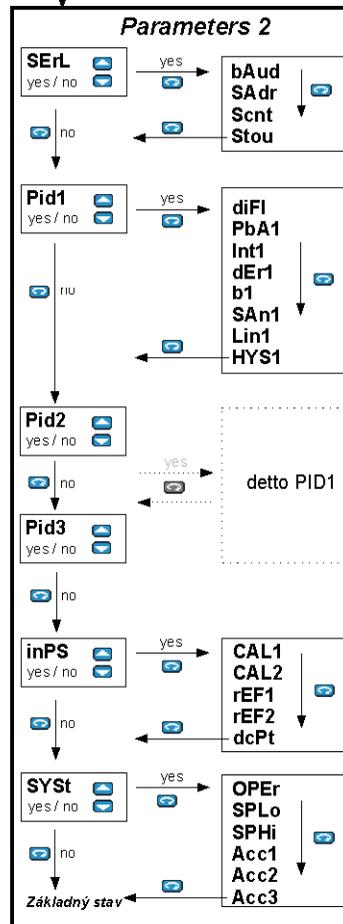
Transition to menu Parameters 1 :
From the basic status: press the 🔁 key for 3 seconds, provide the access password 1 🔼 🔽 (default = 1) and confirm 🔁.

Transition to menu Parameters 2 :
On the menu Parameters 1, provide the access password 2 on the item **PAS2** (default = 2) and confirm with 🔁 . There is also a quicker way to get from the basic status directly to the menu Parameters 2. Press both keys 🔼 🔽 at the same time and let go. The device will go on straight to **PAS2 part,** where you have to provide the access password 2 and confirm 🔁. Menu Parameters 2 contains more levels. The names of individual levels are standardly showed on the red display, the green display shows inscription **no** or **YES** . These inscriptions show whether to enter the appropriate level or not. If there is for example the **no** inscription in the **SErL** part, the device will go on to the next part **out1**, after you press the 🔁 key**.** If there's **YES,** after pressing 🔁 it enters the level **SErL,** and displays the first parameter, in our case it's **bAud**.

5.   Putting into practice

After you turn on the device, the version number will be shown for a moment, and followingly it will go on to the basic status. The upper red display will show measured value, the lower green one will show the set value. The red display cyclically shows the value of the 1.input (the number is displayed) and the 2. input (it flickers – if it is being used).
If the device had been active before (green or yellow signalizing LED is displayed), it continues with the programme in course. Otherwise it waits for launching and the outputs are turned off.

6.   Launching and stopping the process of regulation

When you hold the ⏸ key for a little longer {3 seconds}, you will starts the process of regulation. It can be stopped in the same way. With standard settings, the controller tries to achieve the set value as fast as possible {green display}. When that happens, it will stay regulating on that value until you stop the regulation.

7.   Changing the set value - SEtP

Set the value with the ⬆⬇ keys in the Basic status.

There is an option to set the device so that anyone could so easily change the set value. In this case, setting the set value moves to menu Parameters 1, where the input is via password. This function enables the manufacturer.

When you hold the 🔄 key for some longer time (3 sec), it will take you to the user's menu of setting the parameters. Accessing this menu is subject to awareness of the password. The password has been number **1** since production. With the ⬆ key you'll set 1 on the green display and confirm with 🔄. The system will go on to the user's menu and it will show the title of the first parameter **SEtP** – set value on the red display. Set the value with the ⬆⬇ keys. Confirm ⏸ and that will bring you back to basic status. The lower green display now shows the required value which was set by you.

Attention : after 30 seconds since the last push, the device itself will return to the basic status.

8.   Ramp function - rAmP

Technology often requires gradual growth of temperature so that the products are not destroyed. That's why TC – 41 enables setting the maximum rate of increasement in temperature. Go through to the user's menu (in the same way as you did when setting the required value). The 🔄 key will take you to the following parameter **rAmP**, again with ⬆⬇ keys, set the rate of increasement within a minute. The **oFF** value is set standardly, that means: ramp turned off = maximum rate.

9.   HoLd function - HoLd, HdiF

HoLd serves for automatic ending of the programme (turning off the outputs) after a set time. In the user's menu, go on to the **HoLd** parameter, where you set the required hold in terms of minutes. When the controller achieves the set value, it will starts counting down the time remaining until regulation is turned off, meanwhile it still keeps teh

achieved status in required tolerance. The red display cyclically shows the inscription **tEnd** – time remaining till the end of the process, the green display shows time in terms of minutes. When the time is over, the device beeps and turns off the outputs. Standardly, the **- - -** value is set, which means infinite time, i.e. the device will be still keeping the achieved value until it is turned off manually with the ⏸️key. Setting hold is related to the following parameter **HdiF** – difference for launching hold. In fact it determines the tolerance zone, when the counting down of the rate can be started.

Example : **SEtP = 300 °C**

      HoLd = 60 min

      HdiF = 10,0 °C

      When turned on, the controller tries to reach 300 ° C. The temperature increases until it reaches 290 ° C (en trance to the tolerance zone), the device beeps and starts counting down the time remaining until the end of hold. But still it tries to reach 300 ° C and it will keep regulating on this value until the hold time is over. Then it ends the programme and turns off the outputs.

10. Setting communication with the PC , RS485 – SerL, bAud, SAdr, Scnt

TC – 41 can contain serial interface for communication with a superior system, or even with other controllers TC – 41. Setting of the communication rates, addresses and other parameters is transferred in the menu Parameters 2, part **SErL**. According to the structure of the menu (pic.number 2) go to the menu Parameters 2 to the item **SErL** (see pg. 7 – transition to menu Parameters 2).

Enter **SErL** and on the item **bAud** set the communication rate. Standardly. The value of 57.6 kBaud is set. Another item is **SAdr** – address of the device. Every device on the line has to have a unique address, while address 0 is a label of the superior (MASTER) device. Master has also following item **Scnt** which determines the number of the subordinate (SLAVE) devices. This item is not displayed if the controller has some other address than 0. What follows is **Stou** which is maximum time for answering the question from other devices on the line. If there is no answer within that time, TC – 41 reports error of the line. Used communication protocol – MODBUS.

11.   Configuration of the regulation outputs – PID1, 2, 3

In a standard version, the device contains 3 outputs. Out 2 is usually relay, Out 1, Out 3 differ according to individual models of TC - 41. They are usually adapted for controlling the semiconductors, SSR, by means of analog signals etc. Type of used outputs is stated on the tag at the lower part of the device.

Each output can be assigned to different input. The controller allows you to assign any of inputs (In1, In 2) to the any of output. This option performed the manufacturer. The standard is as follows:
- The version with one input - all three outputs respond to In1
- The version with two inputs - Out 1 and Out 2 respond to the input signal # 1 (In 1). Out 3 responds to input # 2 (In 2).

This can be different in accordance with requierements.

The controller also allows each output manage its own PID parameters. These are marked on the menu PID1, PID2, PID3. Parameters can also be allocated to different outputs. The default setting is:
- PID 1 controls the OUT 3 - terminals 8, 9
- PID 2 controls the OUT 2 - terminals 5, 6, 7
- PID 3 controls the OUT 1 - terminals 3, 4

Explaining in detail the control parameters is beyond the scope of this manual. The controller complies with the international standards of The International Association of Automation Standard (www.isa.org). This provides for setting up of the regulatory process parameters P, I, D, B. Briefly explain the importance of these and other parameters that are directly linked together.
We'll state only one example of setting for Out3, in the remaining two the parameters and their function is identical.
According to the structure of the menu (pic.no.2) go to menu Parameters 2, item **PID1** (see pg. 9 – Transition to the Parameters 2).
Now there's **PID1** on the red display and **no** on the green one. The system offers us a possibility to go on to setting individual parameters for Out 3. Therefore we choose **YES** (or) and confirm .

What follows is the list of parameters in **PID1** :

- **diF1** – difference of the turning on of the output (°C)
  It is in fact a shift of the set value
  Example : required value is 300 °C, **diF1** = 5.0
  Out 1 will be turned on until the measured temperature reaches 305 °C.

- **PbA1** – width of the proportional band (°C)
  In this band, the controller controls the output so that it reaches the required value. This „fine-tuning" is realized by shortening, or prolonging the time of turning on the output, according to the magnitude of the aberrance between the required and the measured value and other parameters.
  Setting the parameter on the **off** value means that the output will behave as a two-status output. That means that the measured value is lower than the required value – still turned on, and the other way around.
  Example : Required temperature = 300 °C, **PbA1** = 10
  Out 3 will be turned on until the measured temperature reaches 290 °C, then it starts turning on and off systematically, until it reaches the required temperature.

- **Int1** – integrating time constant (sec)
  Determines the share of the integrating component of the controller. It is in terms of seconds. Thise parameter only makes sense if the **PbA1** is set. i.e. **PbA1** is not **off**.

- **dEr1** – derivational time constant (sec)
  determines the share of the derivational component of the controller. It is in terms of seconds. This parameter only makes sens if the **PbA1** is set, i. e. **PbA1** is not **off**.
- **b1** – default = 1.
  Ratio regulation constants for the transition to the set value and maintaining the set value.

Note : setting the PID parameters is a complicated process which requires deeper knowledge of the question of regulation. The aim of this document is not to make a detailed description of the theory of regulators, we recommend to read appropriate expert literature, or visit http://www.mrk.eu/, where you'll find simple method of determination of the PID constants.

- **SAn1** – sampling interval (sec)

    It's a frequency of calculating the action interference for the PID regulator. It is about how often should the particular PID regulator calculate its interference and turn on/off the output accordingly.

- **Lin1** – limit output. Limiting temperature setpoint for the output. In practice, this means that the controller to regulate the output never above this value even when the required value in the Basic state higher.

- **HYS1** – hysteresis (°C) – only when **PbA1 = off**

    It is the area around the required value, where the controller does not react to change of the regulated process value, so- called zone of insensitivity.

    Example : Required temperature = 300 ℃, **PbA1 = off** , **HYS1 = 10**

    Out 3 will be turned on until the measured temperature reaches 300 ℃, that's when it turns off, then turn s on again when the temperature goes below 290 ℃.

Values of the parameters, set by the producer for each output, as well as all the other parameters set by the producer, are stated in the back part of these instructions.

12. Type of the input probe

Set by the producer, according to requirements.

13. Number of the input probes

Set by the producer, according to requirements.

14.   Shifting the measured value − CAL1, CAL2

TC – 41 enables to set „deception" of the measured value. This function is usable especially in case of measuring temperatures when it's impossible to place the probe where demanded. The difference of the temperatures between the required and actually measured place can be set in the items **CAL1** and **CAL2** for the first and second output. These items are in the menu Parameters 2, part **inPS**. i 🔼, 🔽 keys will set the required shift and confirm with 🔘.

15.   Setting the cold temperature − rEF1, rEF2

This function is used in case of measuring temperatures by a thermocouple probe. There is a difference between temperatures in the place of measurement and the place where the measuring device is placed, and it influences the exactness of measuring. This inaccuracy can be eliminated when you use thermocouple cables, or cold junction box. In case of using thermocouple cables (of the same type as the temperature probe), the cold temperature is automatically measured by TC – 41. When using thermocouple box, it is necessary to set the temperature of the cold junction box on TC – 41. It can be set in the items **rEF1** and **rEF2**, for the first and the second input. These items are in the menu Parameters 2, part **inPS**. Keys 🔼, 🔽 will set the temperature of the cold junction box, or you can set **Aut** for automatic measuring (decrease value to -1) and confirm with 🔘.

16.   Displaying decimal places - dcPt

To display the measured value more precisely you can allow displaying of the decimal places. In the menu Parameters 2, part **inpS**, there is an item **dcPt**, which determines the number of the displayed decimal places. Choose the required number and confirm with 🔘.

17.   Maximum rate of input reactions - OPEr

According to the used outputs which are controled by the device, It is possible to set the maximum rate of switching, by which you can increase the quality of regulation.

This setting is in the menu Parameters 2, part **SYSt** , item **OPEr**. Possible extent from 0,05 sec. – 10,0 sec. It is obvious that short times can be used only when the main output controls the semiconductor power device (triac, thyristor..). When using mechanical power devices (relay, contactor) it's necessary to set longer time .

18. Blocking the set values – SPLo, SPHi

TC-41 makes it possible to define the extent in which the required value can move. Ii is about determining the limits which cannot be crossed, otherwise the device won't let you to set the required value. This setting is in the menu Parameters 2, part **SYSt** , where are the items **SPLo** – minimum and **SPHi** – maximum. With , keys you can set the required limits and confirm with .

19. Setting the access passwords – Acc1, Acc 2

To access menu Parameters 1 and Parameters 2 you need to know the access passwords. These were set during production on the values **PAS1 = 1** a **PAS2 = 2** .
To change these, go to menu Parameters 2, part **SYSt**, items **Acc1** – password for access to menu Parameters 1 and **Acc2** – passowrd for access to menu Parameters 2.
With , keys set new passwords and confirm with .

20. Set alarm – ALAb, AlrE

Additional function. It is used for switching the alarm relay (OUT 2) in the case of exceeding defined values.
- **ALAb** – absolute value alarm. Output is activated when measure value exceeding this value. In practice, used as emergency signaling of temperature.
- **ALrE** – relative value of alarm. Output is activated when measure exceeding set value above this parameter. In practice, it is used to alert the operator if the measured temperature exceeds the tolerance **ALrE.**

Note : This feature is fixed to OUT 2, so the parameters **PID2** ignored.

21.   Complete list of parameters

Basic status :
- **tn1 –** measured value input 1
- **tn2 –** measured value input 2
- **SEtP –** required value
- **trEF –** reference temperature, cold junction (see pg.15)
- **SPin –** controlling temperature, ramp function (pg.10)
- **tEnd –** time till the end of hold (pg.11)

Parameters 1 :
- **PAS1 –** password of access to the part Parameters 1
- **SEtP –** required value (pg.10)
- **rAnP –** required rate - ramp (pg.10)
- **HoLd –** required hold (pg.11)
- **HdiF –** zone of tolerance for launching hold (pg.11)
- **ALAb –** absolute value alarm
- **ALrE –** relative value alarm
- **PAS2 –** password of access to the part Parameters 2

Parameters 2 :
- **SErL –** menu of serial line (pg.11)
  - o **bAud** – transfer rate
  - o **SAdr** – address of the device
  - o **Scnt** – number of devices on the line
  - o **Stou** –connection timeout
- **PID1** – menu of the third output configuration (pg.12)
  - o **diF1** – difference of turning on of the output
  - o **PbA1** – proportional band
  - o **Int1** – integrating component
  - o **dEr1** – derivational component
  - o **b1 –** ratio PID
  - o **SAn1** – sampling interval
  - o **Lin1 –** limit output
  - o **HYS1** – hysteresis
- **PID2** – menu of the second output configuration (pg.12)
  - o **diF2** – difference of the turning on of the output
  - o **PbA2** – proportional band
  - o **Int2** – integrating component
  - o **dEr2** – derivational component
  - o **b2 –** ratio PID

- o **SAn2** – sampling interval
- o **Lin2 –** limit output
- o **HYS2** – hysteresis
- **PID3** – menu of the first output configuration (pg.12)
    - o **diF3** – difference of the turning on of the output
    - o **PbA3** – proportional band
    - o **Int3** – integrating component
    - o **dEr3** – derivational component
    - o **b3 –** ratio PID
    - o **SAn3** – sampling interval
    - o **Lin3 –** limit output
    - o **HYS3** – hysteresis
- **inPS** – menu of inputs
    - o **CAL1** – shift of the measure value of input 1 (pg.14)
    - o **CAL2** –shift of the measure value of input 2 (pg.14)
    - o **rEF1** – cold temperature of input 1 (pg.15)
    - o **rEF2** – cold temperature of input 2 (pg.15)
    - o **dcPt** – number of decimal spaces (pg.15)
- **SYSt** – menu of system settings
    - o **OPEr** – sampling time of outputs čas (pg.15)
    - o **SPLo** – minimum set value (pg.16)
    - o **SPHi** – maximum set value (pg.16)
    - o **Acc1** – password of access to Parameters 1 (pg.16)
    - o **Acc2** – password of access to Parameters 2 (pg.16)
    - o **Acc3 –** reserved for the producer

Some of the parameters does not necessarily have to be displayed – it depends on the config. of the device and on the user's setting.

22. Error reports

When there's an error on the TC-41, it beeps and the LED diode on the front panel flickers. Along with that, in the Basic status, part Erros, an error codes is displayed. Accordingly to the code you can identify the problem. This code is in form of a hexadecimal number.
Example : if **ErrC** = 1 – probe 1 error
if **ErrC** = 2 – probe 2 error
if **Errc** = 3 – both probe 1 and probe 2 error

The meanings of the codes, as well as way of removing them to solve the errrors are stated in the following chart.

Number X X X X	Meaning + removing
1	**Probe 1 error** (connector pins 16,17) - check the fitting of the clamps, wires, status of the probe, mechanical damage, with thermocouple probes the right polarity of the probe + compensating cables, burnt probe etc.
2	**Probe 2 error** (connector pins 14,15) - same procedure as with the previous error
4	**Measuring the reference temperature** – temperature inside the device is beyond the allowed tolerance– 50 °C, or the temperature probe inside the device is bad - replace the device prístroj into a warmer/ colder environment - in case of overheating turn off the device, don't turn on until it reaches the temperature of the environment - the probe inside is bad – error removed by the producer
8	**Calibration error** - removed by the producer
1 0	**Rewriting parameters** – because of EMI, supply errors, etc. Parameters could have been rewritten - check ALL parameters of the level 1 and levell 2, turn off. When you tur nit on again, the erro is removed.
4 0 0 0	**Communication error** –slave does not respond - check whether the second device is turned on, the address of the second device has to be different than 0 (0 = master), same communication rate of both devices, check the cables of serial line
8 0 0 0	**Slave erros** – defect on the subordinate device - see what error it is according to the error codes on the appropriate device and remove the defect

23. **Parameters set by the producer**

Level	Name of the parameter	Producer	User
Param. 1	**SEtP**		
	rAnP		
	HoLd		
	HdiF *		
	ALAb *		
	ALrE *		
Param. 2			
SErL	**bAud**		
	SAdr		
	Scnt *		
	Stou		
out 1	**diF1**		
	PbA1		
	Int1 *		
	dEr1 *		
	b1		
	SAn1		
	Lin1		
	HYS1 *		
out2	**diF2**		
	PbA2		
	Int2 *		
	dEr2 *		
	b2		
	SAn2		
	Lin2		
	HYS2 *		
out3	**diF3**		
	PbA3		
	Int3 *		
	dEr3 *		
	b3		
	SAn3		
	Lin3		
	HYS3 *		

inPS	CAL1 *		
	CAL2 *		
	rEF1 *		
	rEF2 *		
	dcPt		
SYSt	OPEr		
	SPLo		
	SPHi		
	Acc1		
	Acc2		
	Acc3	Reserved for the producer	

24. Warranty card

Product :   Temperature controller TC - 41

Type : TC- 41

Production number :

Warranty period : 24 months since the date of distribution

Date of distribution :

Date of installation :

Direct customer :

Final customer :

Probe :

Output:

Max.working temperature: °**C**

Warranty conditions :

The producer provides 24 months of guarantee for this product since the date of distribution, except the errors caused by a mechanical or electrical wear of the outputs. The guarantee does not apply to any defects caused by incorrect storing, transport, incorrect connecting, damage caused by outer influence(especially electrical voltage, unallowed temperature, chemicals, mechanical damage), electrical or mechanical overloading of the inputs and outputs.

Service :

MRK s.r.o.
Mierové námestie 30 / 24
018 51 Nová Dubnica
tel. 00421 – 42 –443 1345   *rev.01/2013*

EVPÜ®

CERTIFIKÁT
č. 00037/101/1/2009
zo 16. februára 2009

Objednávateľ
MRK, s.r.o.
Mierové námestie 30/24, 018 51 Nová Dubnica, SR

Výrobca
MRK, s.r.o.
Mierové námestie 30/24, 018 51 Nová Dubnica, SR

IČO
36296783

Výrobok
Zobrazovací a riadiaci prístroj so zdrojom SP-41

Typ
TC-41

Technické údaje
1N 230 V~, 50 Hz / trieda II

Vzorka splnila základné bezpečnostné požiadavky nasledovných Smerníc EP a Rady, transponovaných do "Nariadení vlády SR" v znení neskorších predpisov:

      Smernica LVD 2006/95/EC   –   NV SR 308/2004 Z. z.
      Smernica EMC 2004/108/EC   –   NV SR 194/2005 Z. z.

Vzorka výrobku bola vyskúšaná a je v zhode s nasledovnými použitými normami a / alebo technickými špecifikáciami:

STN EN 61010-1: 2004

STN EN 61000-6-4: 2007
STN EN 61000-6-2: 2006
STN EN 61000-3-2: 2006
STN EN 61000-3-3: 2000 + A1: 2003 + A2: 2006

Výsledky skúšok a posúdení zhody vlastností uvedeného typu výrobku sú uvedené v protokole č. **00065/2009/C** zo dňa **16.02.2009**

Certifikát potvrdzuje, že zariadenie je v zhode so základnými požiadavkami a účelom použitia uvedených v Smerniciach EP a Rady / normami.

Certifikát je platný do: **15.02.2012**   Ing. Karol G l a m o š

Označenie **CE** môže byť použité iba v prípade, že je posúdená zhoda so všetkými príslušnými smernicami EP a Rady.

Akékoľvek významné zmeny v zhotovení alebo konštrukcii výrobku, systéme kvality a dodatky k hore uvedeným technickým a právnym predpisom môžu viesť k neplatnosti certifikátu. Zodpovednosť za výrobok zostáva na výrobcovi alebo jeho splnomocnenom zástupcovi.

EVPÜ a.s., Trenčianska 19, SK 018 51 Nová Dubnica, Slovenská republika, www.evpu.sk

017799

ES VYHLÁSENIE O ZHODE

Názov organizácie : MRK, s.r.o.

Adresa : Mierové námestie 30/24, 018 51 Nová Dubnica, SR

IČO : 36296783

Výrobca : MRK, s.r.o., Mierové námestie 30/24, 018 51 Nová Dubnica, SR

Výrobok : Zobrazovací a riadiaci prístroj so zdrojom SP-41
       TC-41

Základné technické údaje: 1N 230 V~, 50 Hz / trieda II

Horeuvedený výrobok bol posudzovaný podľa zákona č. 264/1999 Z. z. v znení neskorších predpisov a **je v zhode** s uvedenými technickými požiadavkami nasledovných vládnych nariadení a zákonov:

Číslo : 308/2004
Názov: Nariadenie vlády, ktorým sa ustanovujú podrobnosti o technických požiadavkách postupoch posudzovania zhody pre elektrické zariadenia, ktoré sa používajú v určitom rozsahu napätia
Číslo : 194/2005
Názov: Nariadenie vlády o elektromagnetickej kompatibilite

Pri posudzovaní zhody boli použité nasledovné technické normy:

Elektrická bezpečnosť:
STN EN 61010-1: 2004

EMC:
STN EN 61000-6-4: 2007
STN EN 61000-6-2: 2006
STN EN 61000-3-2: 2006
STN EN 61000-3-3: 2000 + A1: 2003 + A2: 2006

Identifikácia Notifikovanej osoby (NO) : **č. 1293, EVPÚ a.s.**
Adresa : **Trenčianska 19, 018 51 Nová Dubnica, SR**
IČO : **31562507**

Certifikát č. 00037/101/1/2009 zo dňa 16. 02. 2009

Vyhlasovateľ
      Meno :
      Funkcia:
      Adresa :
      Dátum :
      Podpis :

25. Notes