



ESM-9995 96 x 96 DIN 1/4 Universal Input Profile Controller

- 100 program, 1000 step control
- Programmable relay functions per steps
- Universal process input (TC, RTD, mV $\frac{mV}{V}$, V $\frac{V}{V}$, mA $\frac{mA}{mA}$)
- 6 different electric cut-out behaviour
- ON/OFF, P, PI, PD, PID reverse and direct control
- Motorized valve control with feedback
- Motorized valve control floating control
- Auto-Tuning and Self-Tuning (automatic calculations of PID parameters)
- Automatic / Manual operating modes
- Bumpless transfer ability
- Sensor Error detection
- Remote Set control
- Re-transmission (for process, SET values)
- Operating with Real Time Clock (RTC)
- 8 set point which is selected with digital inputs
- ModBus ASCII/RTU communication protocol

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EU DECLARATION OF CONFORMITY

Manufacturer's Name : EMKO ELEKTRONIK A.S.
Manufacturer's Address : DOSAB, Karanfil Sk., No:6,
16369 Bursa, TURKEY

The manufacturer hereby declares that the product:

Product Name : Profile Controller Unit
Type Number : ESM-9995
Product Category : Electrical equipment for measurement, control and laboratory use

Conforms to the following directives :

2006 / 95 / EC The Low Voltage Directive

2004 / 108 / EC The Electromagnetic Compatibility Directive

has been designed and manufactured to the following specifications:

EN 61000-6-4:2007 EMC Generic Emission Standard for Industrial Environments

EN 61000-6-2:2005 EMC Generic Immunity Standard for Industrial Environments

EN 61010-1:2001 Safety Requirements for electrical equipment for measurement, control and laboratory use

When and Where Issued

02nd November 2010

Bursa-TURKEY

Authorized Signature

Name : Serpil YAKIN

Position : Quality Manager

1. Preface

ESM series process controllers are designed for measuring and controlling temperature and any process value. They can be used in many applications with their universal process input, multifunction control outputs, selectable alarm functions, serial communication unit and input/output modules.

Some application fields and applications which they are used are below:

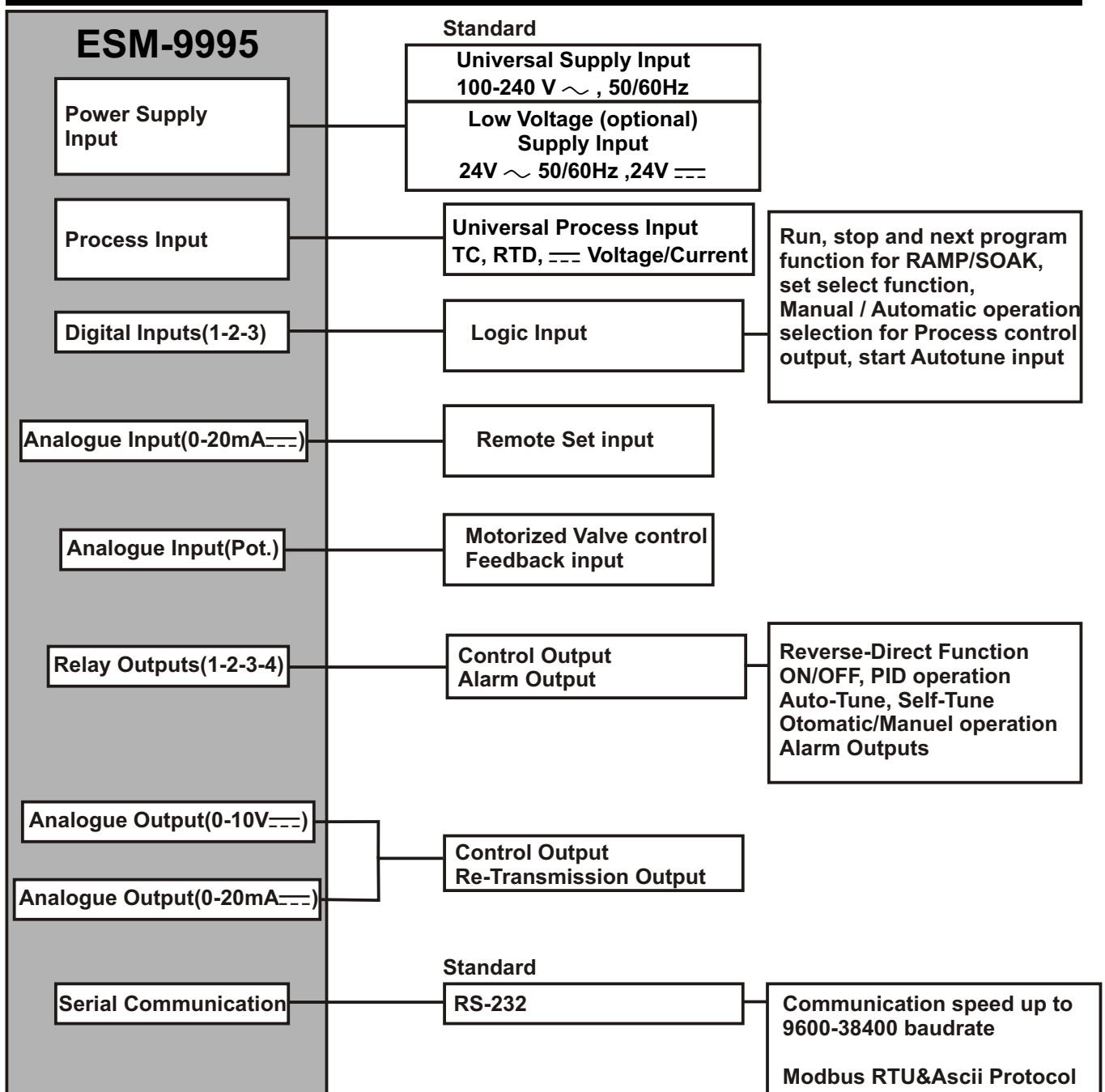
Application Fields

Glass
 Plastic
 Petro-Chemistry
 Textile
 Automative
 Machine production industries

Applications

Motorized valve control
 Profile Control
 PID Process Control
 Heater Failure detection

1.1 General Specifications



1.2 Ordering Information

ESM-9995 (96x96 1/4 DIN)	A	BC	D	E	/	FG	HI	/	U	V	W	Z
		20	1	1	/			/	0	0	0	0

A Power Supply
1 100-240V ~ (-%15;+%10) 50/60Hz
2 24 V ~ (-%15;+%10) 50/60Hz 24V === (-%15;+%10)

BC Input type	Scale
20 Configurable(Table-1)	Table-1

D Serial Communication
1 RS-232

E Output-1
1 4*Relay Output (5A@ 250V~ Resistive Load)

FG Analogue Output-1
04 0/4...20mA=== Current Output
05 0...10V=== Voltage Output

HI Analogue Output-2
04 0/4...20mA=== Current Output
05 0...10V=== Voltage Output

All order information of ESM-9995 are given on the table at left. User may form appropriate device configuration from information and codes that at the table and convert it to the ordering codes.

Firstly, supply voltage then input/output types and other specifications must be determined. Please fill the order code blanks according to your needs.

Please contact us, if your needs are out of the standards.

Table-1

BC	Input Type(TC)	Scale(°C)	Scale(°F)
21	L ,Fe Const DIN43710	-100°C,850°C	-148°F,1562°F
22	L ,Fe Const DIN43710	-100.0°C,850.0°C	-148.0°F,999.9°F
23	J ,Fe CuNi IEC584.1(ITS90)	-200°C,900°C	-328°F,1652°F
24	J ,Fe CuNi IEC584.1(ITS90)	-199.9°C,900.0°C	-199.9°F,999.9°F
25	K ,NiCr Ni IEC584.1(ITS90)	-200°C,1300°C	-328°F,2372°F
26	K ,NiCr Ni IEC584.1(ITS90)	-199.9°C,999.9°C	-199.9°F,999.9°F
27	R ,Pt13%Rh Pt IEC584.1(ITS90)	0°C,1700°C	32°F,3092°F
28	S ,Pt10%Rh Pt IEC584.1(ITS90)	0°C,1700°C	32°F,3092°F
29	T ,Cu CuNi IEC584.1(ITS90)	-200°C,400°C	-328°F,752°F
30	T ,Cu CuNi IEC584.1(ITS90)	-199.9°C,400.0°C	-199.9°F,752.0°F
31	B ,Pt30%Rh Pt6%Rh IEC584.1(ITS90)	44°C,1800°C	111°F,3272°F
32	B ,Pt30%Rh Pt6%Rh IEC584.1(ITS90)	44.0°C,999.9°C	111.0°F,999.9°F
33	E ,NiCr CuNi IEC584.1(ITS90)	-150°C,700°C	-238°F,1292°F
34	E ,NiCr CuNi IEC584.1(ITS90)	-150.0°C,700.0°C	-199.9°F,999.9°F
35	N ,Microsil Nisil IEC584.1(ITS90)	-200°C,1300°C	-328°F,2372°F
36	N ,Microsil Nisil IEC584.1(ITS90)	-199.9°C,999.9°C	-199.9°F,999.9°F
37	C , (ITS90)	0°C,2300°C	32°F,3261°F
38	C , (ITS90)	0.0°C,999.9°C	32.0°F,999.9°F

BC	Input Type(RTD)	Scale(°C)	Scale(°F)
39	PT 100 , IEC751(ITS90)	-200°C,650°C	-328°F,1202°F
40	PT 100 , IEC751(ITS90)	-199.9°C,650.0°C	-199.9°F,999.9°F

BC	Input Type(=== Voltage and Current)	Scale
41	0...50 mV ===	-1999,9999
42	0...5 V ===	-1999,9999
43	0...10 V ===	-1999,9999
44	0...20 mA ===	-1999,9999
45	4...20 mA ===	-1999,9999

1.3 Warranty

EMKO Elektronik warrants that the equipment delivered is free from defects in material and workmanship. This warranty is provided for a period of two years. The warranty period starts from the delivery date. This warranty is in force if duty and responsibilities which are determined in warranty document and instruction manual performs by the customer completely.

1.4 Maintenance

Repairs should only be performed by trained and specialized personnel. Cut power to the device before accessing internal parts.

Do not clean the case with hydrocarbon-based solvents (Petrol, Trichlorethylene etc.). Use of these solvents can reduce the mechanical reliability of the device. Use a cloth dampened in ethyl alcohol or water to clean the external plastic case.

2. Installation



Before beginning installation of this product, please read the instruction manual and warnings below carefully.

In package ,

- One piece unit
- Two pieces mounting clamps
- One piece instruction manual

A visual inspection of this product for possible damage occurred during shipment is recommended before installation. It is your responsibility to ensure that qualified mechanical and electrical technicians install this product.

If there is danger of serious accident resulting from a failure or defect in this unit, power off the system and separate the electrical connection of the device from the system.

The unit is normally supplied without a power switch or a fuse. Use power switch and fuse as required.

Be sure to use the rated power supply voltage to protect the unit against damage and to prevent failure.

Keep the power off until all of the wiring is completed so that electric shock and trouble with the unit can be prevented.

Never attempt to disassemble, modify or repair this unit. Tampering with the unit may results in malfunction, electric shock or fire.

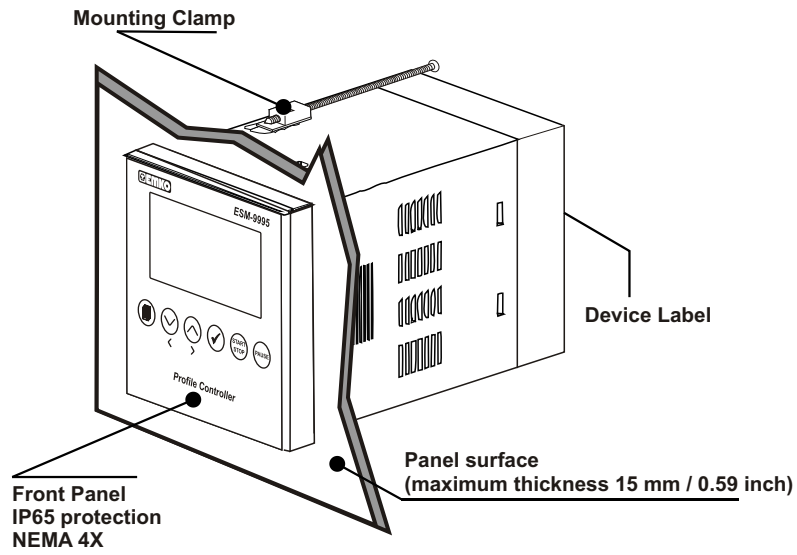
Do not use the unit in combustible or explosive gaseous atmospheres.

During the equipment is putted in hole on the metal panel while mechanical installation some metal burrs can cause injury on hands, you must be careful.

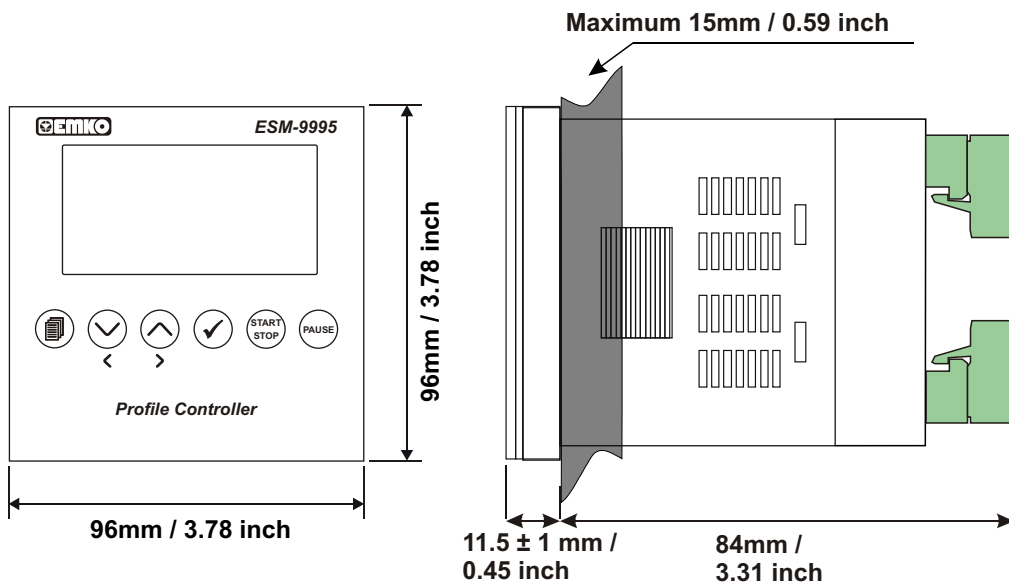
Montage of the product on a system must be done with it's fixing clamps. Do not do the montage of the device with inappropriate fixing clamp. Be sure that device will not fall while doing the montage.

It is your responsibility if this equipment is used in a manner not specified in this instruction manual.

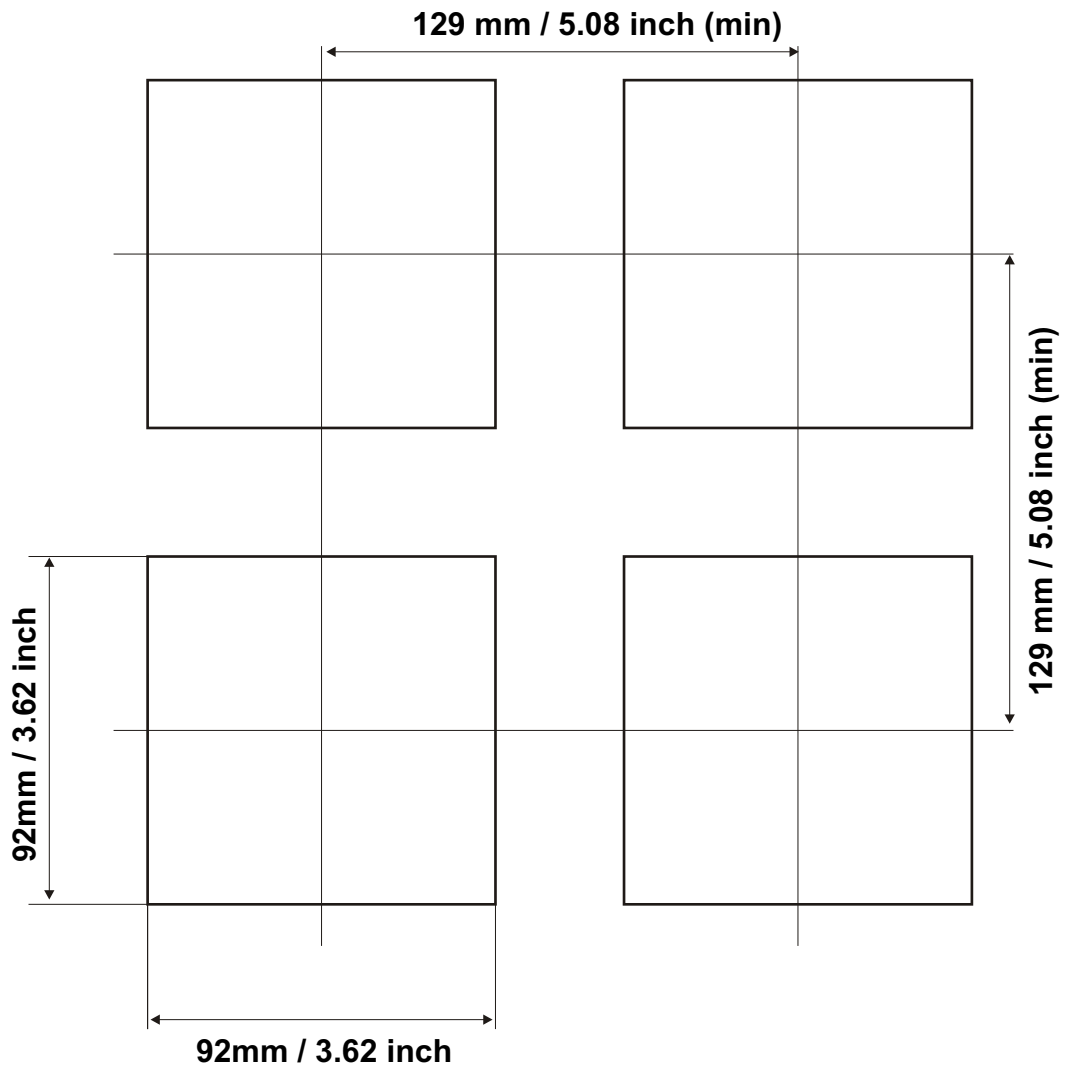
2.1 General Description



2.2 Dimensions



2.3 Panel Cut-out



2.4 Environmental Ratings

Operating Conditions



Operating Temperature : 0 to 50 °C



Max. Operating Humidity : 90% Rh (non-condensing)



Altitude : Up to 2000m.



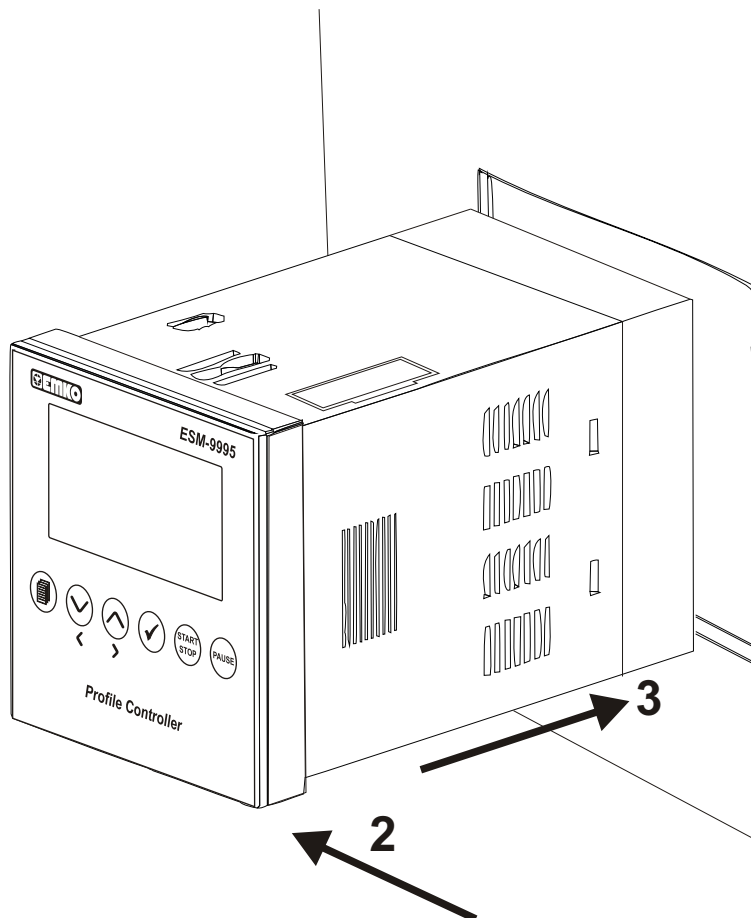
Forbidden Conditions:

Corrosive atmosphere

Explosive atmosphere

Home applications (The unit is only for industrial applications)

2.5 Panel Mounting



1-Before mounting the device in your panel, make sure that the cut-out is of the right size.

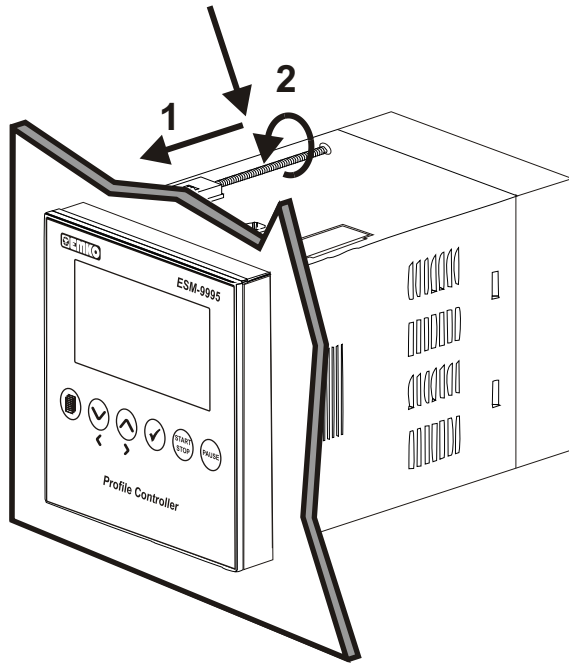
2-Check front panel gasket position

3-Insert the device through the cut-out. If the mounting clamps are on the unit, put out them before inserting the unit to the panel.



During installation into a metal panel, care should be taken to avoid injury from metal burrs which might be present. The equipment can loosen from vibration and become dislodged if installation parts are not properly tightened. These precautions for the safety of the person who does the panel mounting.

2.6 Installation Fixing Clamp



The unit is designed for panel mounting.

1-Insert the unit in the panel cut-out from the front side.

2- Insert the mounting clamps to the holes that located top and bottom sides of device and screw up the fixing screws until the unit completely immobile within the panel

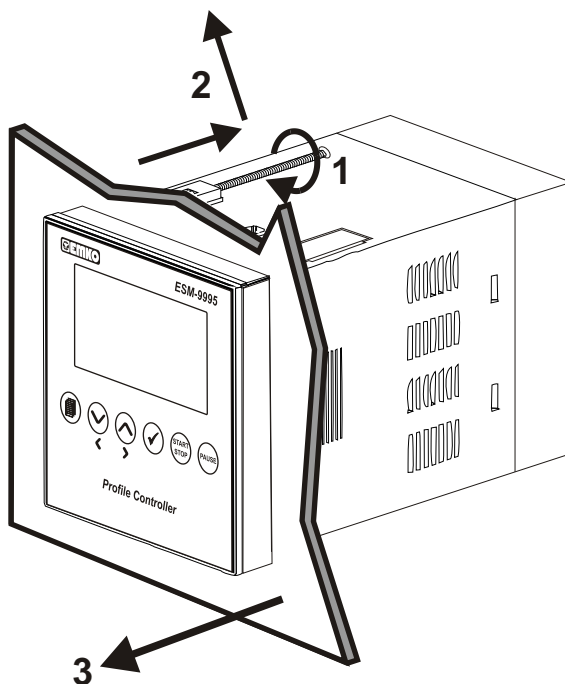


Montage of the unit to a system must be done with it's own fixing clamps. Do not do the montage of the device with inappropriate fixing clamps. Be sure that device will not fall while doing the montage.

2.7 Removing from the Panel



Before starting to remove the unit from panel, power off the unit and the related system.



1-Loosen the screws.

2-Pull mounting clamps from top and bottom fixing sockets.

3-Pull the unit through the front side of the panel

3. Electrical Wirings



You must ensure that the device is correctly configured for your application. Incorrect configuration could result in damage to the process being controlled, and/or personal injury. It is your responsibility, as the installer, to ensure that the configuration is correct.

Device parameters has factory default values. These parameters must be set according to the system's needs.



Only qualified personnel and technicians should work on this equipment. This equipment contains internal circuits with voltage dangerous to human life. There is severe danger for human life in the case of unauthorized intervention.

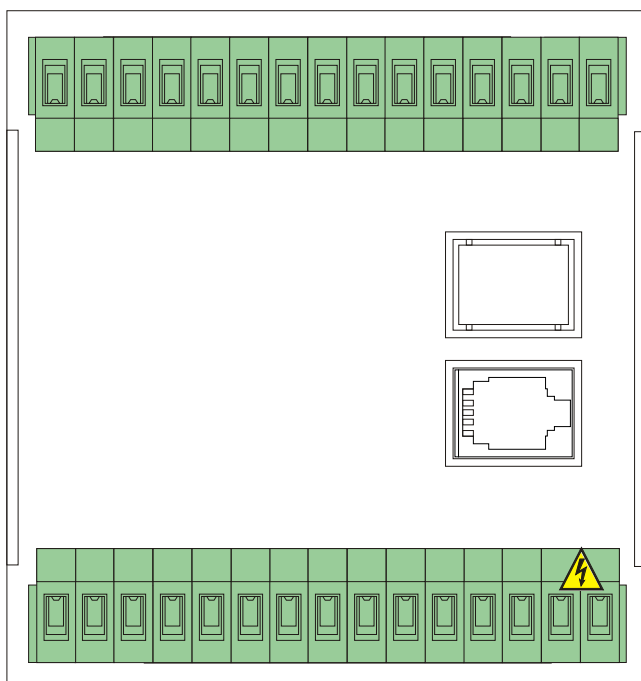


Be sure to use the rated power supply voltage to protect the unit against damage and to prevent failure.

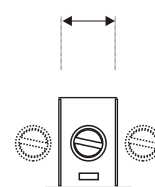


Keep the power off until all of the wiring is completed so that electric shock and trouble with the unit can be prevented.

3.1 Terminal Layout and Connection Instructions



Max. 2.5mm / 0.098 inch
Wire Size:
18AWG/1mm²
Solid /Stranded



Torque
0,5Nm



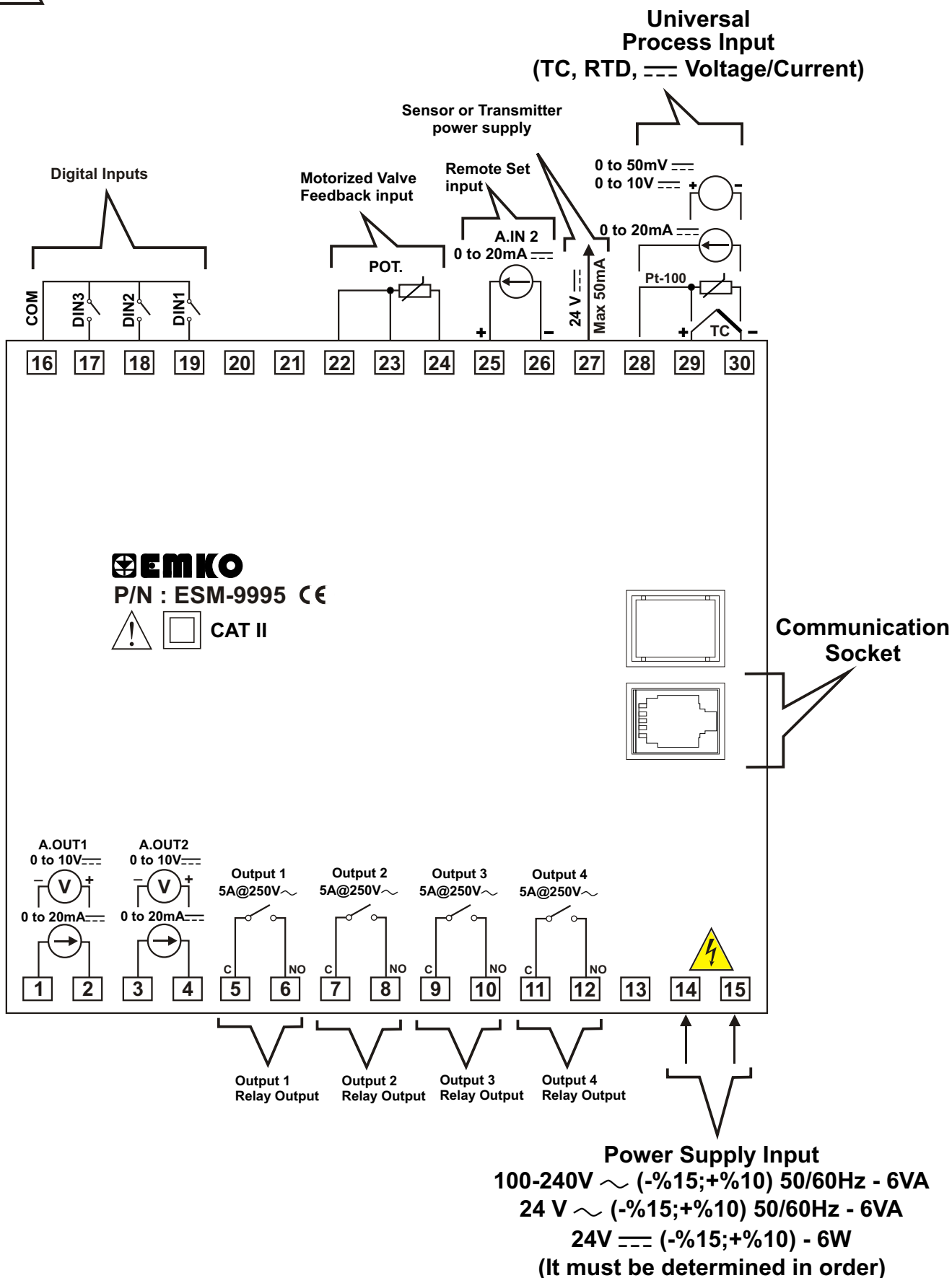
Screw driver
0,8 x3mm



3.2 Electrical Wiring Diagram



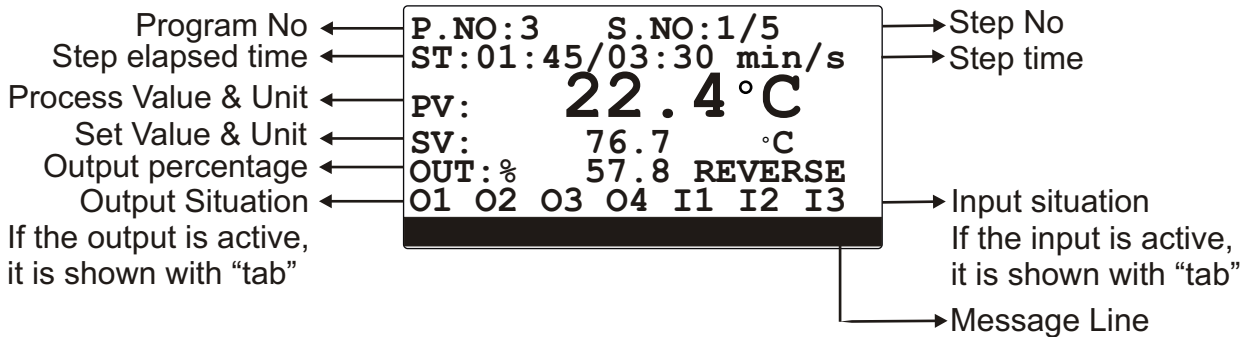
Electrical wiring of the device must be the same as 'Electrical Wiring Diagram' below to prevent damage to the process being controlled and personnel injury.



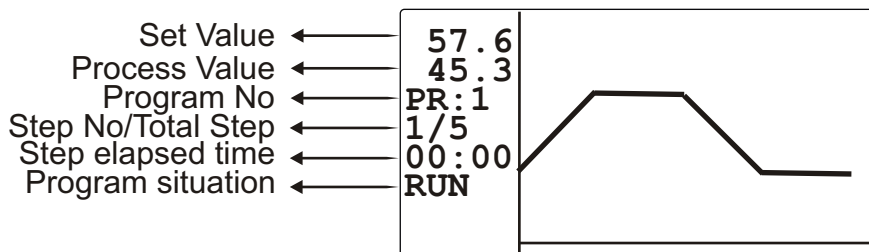
4. Definition of Front Panel and Accessing to the Parameters

4.1 Definition of Front Panel

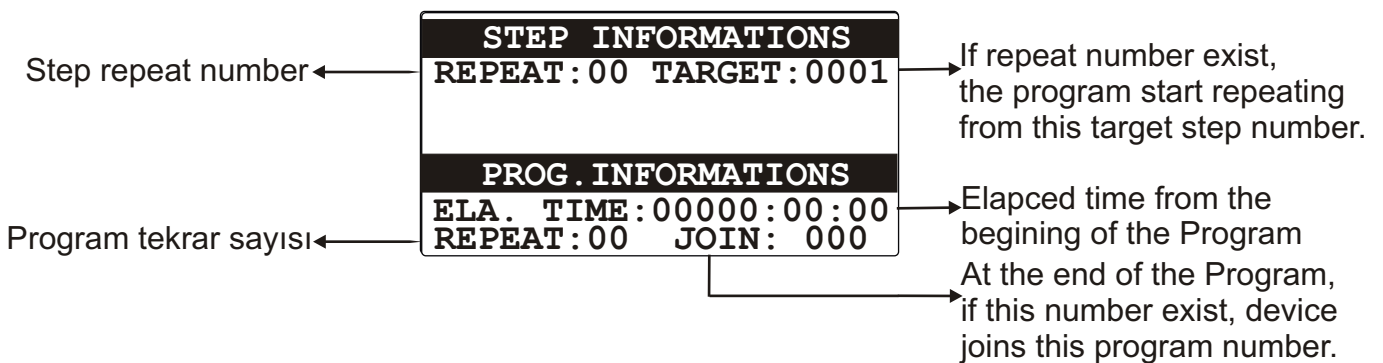
MAIN OPERATION SCREEN VIEW



GRAPHIC PAGE VIEW

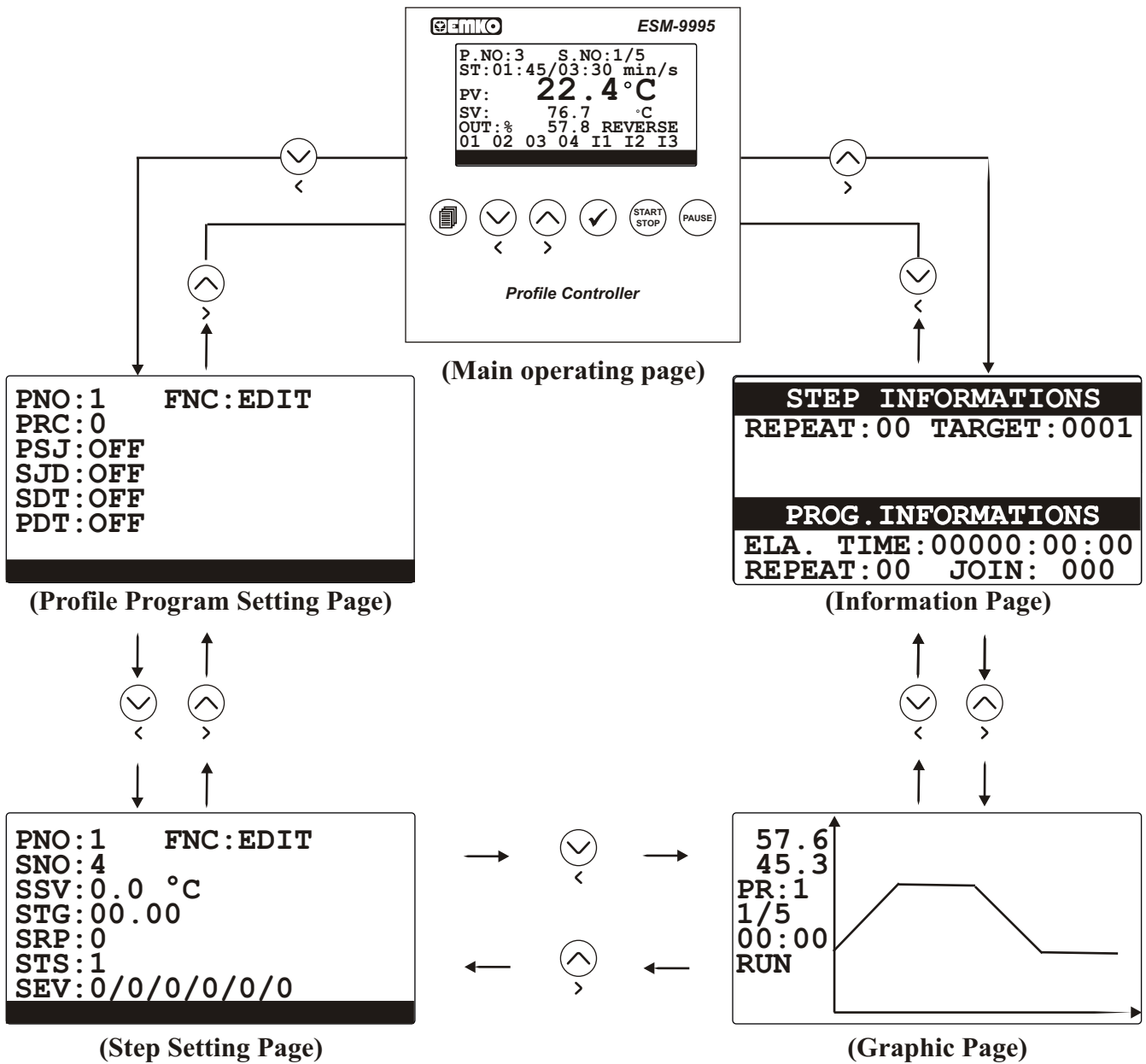


INFORMATION PAGE VIEW

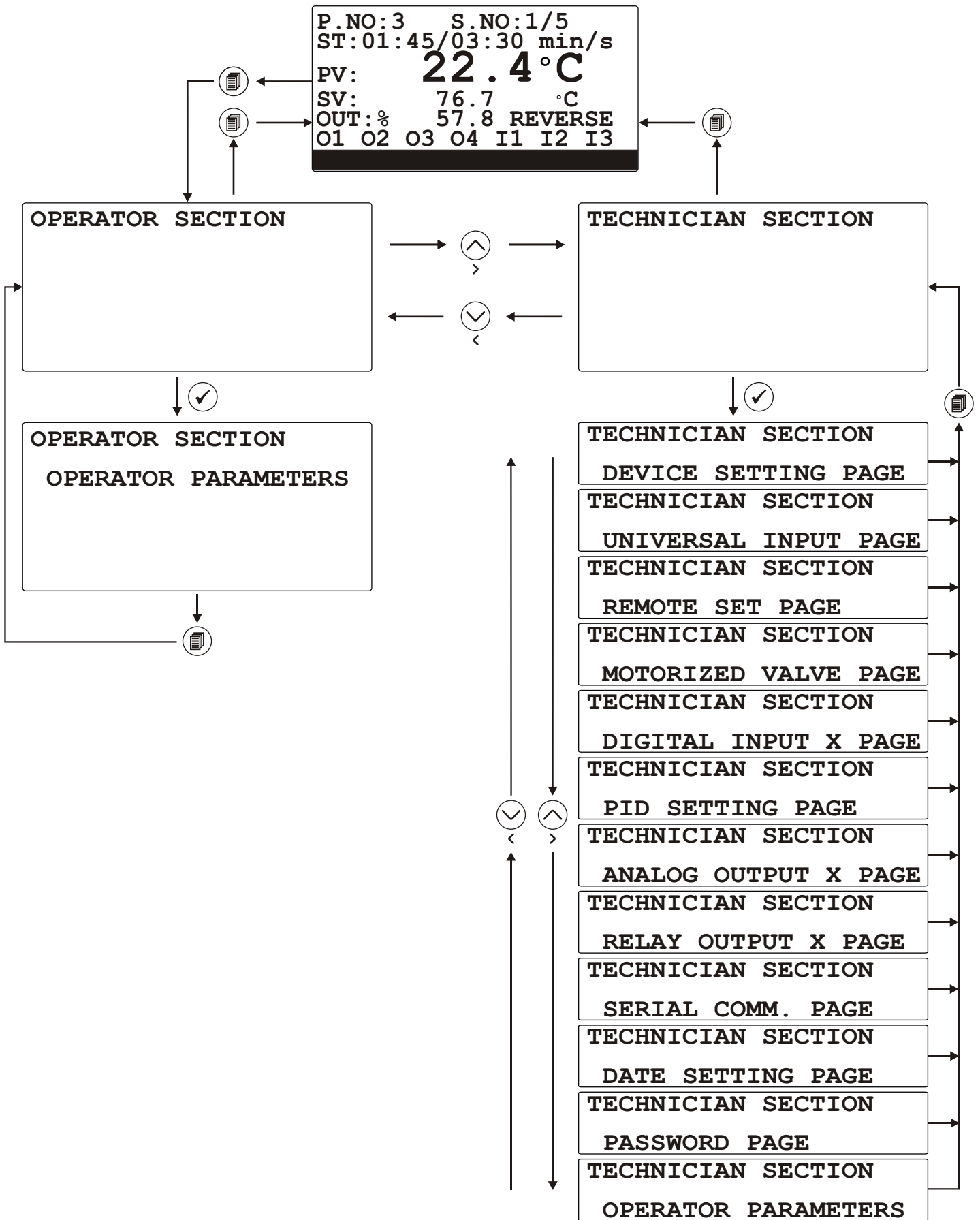


4.2. Access the Step Settings Pages

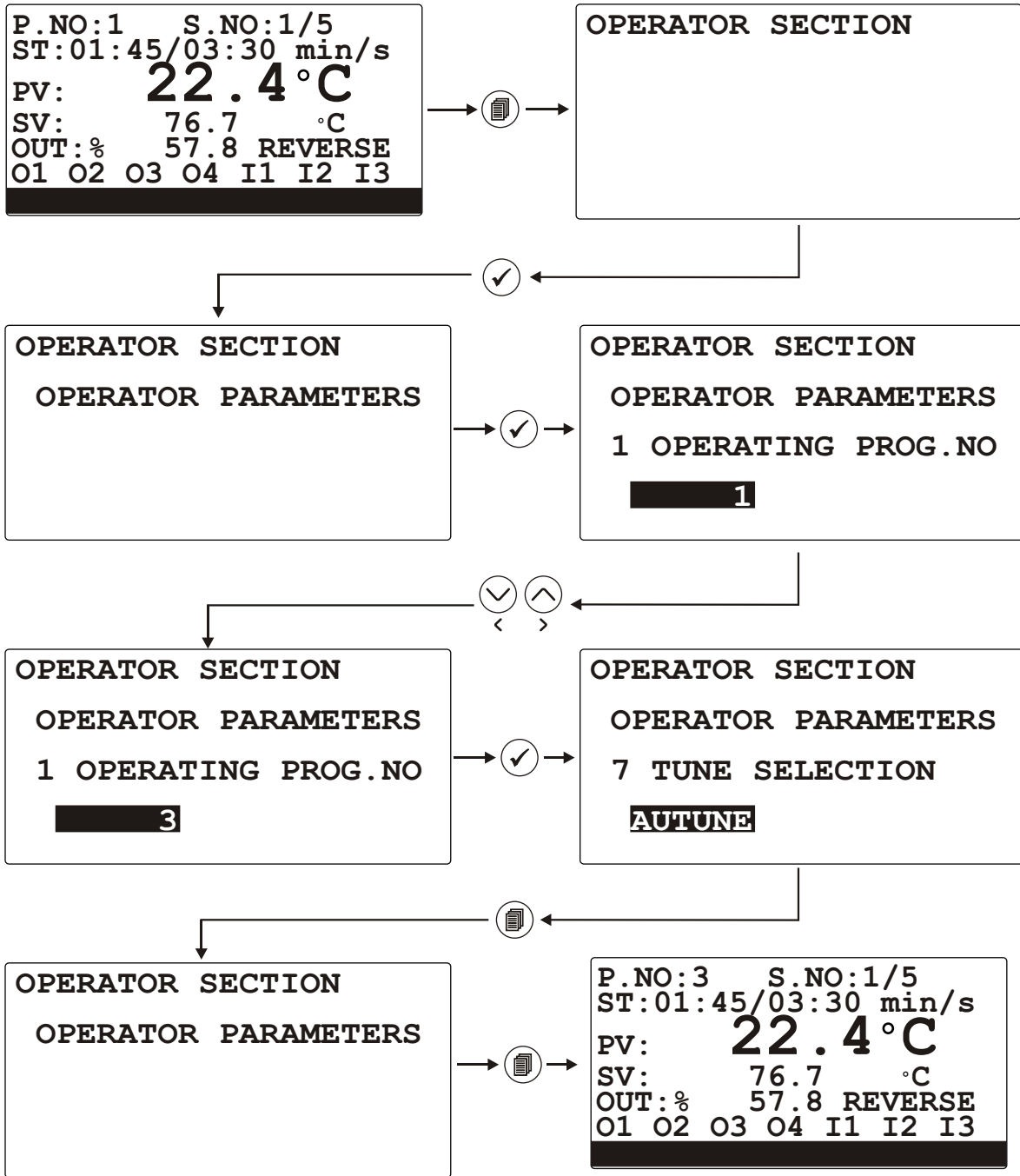
OPERATING PAGES VIEW



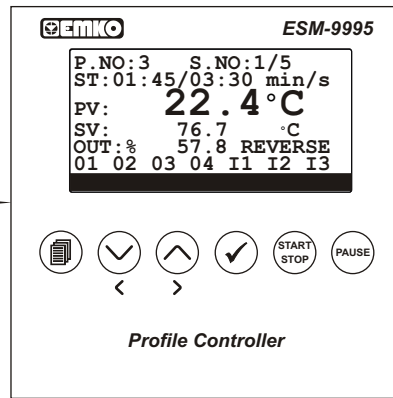
4.3. Access to Menus



4.4. Changing the Parameter values



4.5. Adjusting the Profile Program



```
PNO: 1   FNC: EDIT
PRC: 0
PSJ: OFF
SJD: OFF
SDT: OFF
PDT: OFF
```



If OK button is pressed, program setting page is entered and “FNC” tab becomes active. If decrement button is pressed, step setting page is shown.

```
PNO: 1   FNC: EDIT
PRC: 0
PSJ: OFF
SJD: OFF
SDT: OFF
PDT: OFF
```

EDIT : To adjust and observe Program setting parameters or step parameters
 COPY : To copy Programs or steps
 DEL : To Delete Programs or steps

```
PNO: 1   FNC: EDIT
PRC: 0
PSJ: OFF
SJD: OFF
SDT: OFF
PDT: OFF
```

PNO: Program **NO**
 It can be adjusted from 1 to **Max Program Number** parameter value.

```
PNO: 1   FNC: EDIT
PRC: 1
PSJ: OFF
SJD: OFF
SDT: OFF
PDT: OFF
```

PRC: Program **Repeat Cycle**
 It can be adjusted from INF to 99. INF term means that, program repeats infinite.

Any of the Program and Step setting changing is accepted that, program is written.

If user want to change any of the program or step setting with the EDIT function or choose COPY, DEL, INS function, device ask password for once, until user exit from program and step setting pages. It is optional that, password exits or not. It can be adjusted from technician parameters section.



To change values, use increment or decrement buttons



To confirm and observe the settings, use OK button.

```
PNO:1 FNC:EDIT
PRC:1
PSJ:OFF
SJD:OFF
SDT:OFF
PDT:OFF
```

PSJ:Program Select Join

At the end of the Program, if this number exist, device joins this program number. It can be adjusted from OFF to 100.

```
PNO:1 FNC:EDIT
PRC:1
PSJ:OFF
SJD:OFF
SDT:OFF
PDT:OFF
```

SJD:Start Program Join with Digital input
At the end of the Program, joining program starts with digital input signal.

```
PNO:1 FNC:EDIT
PRC:1
PSJ:OFF
SJD:OFF
SDT:OFF
PDT:OFF
```

SDT:Program Start Date & Time
To start program on a certain month and hour and minute of a certain day.

```
PNO:1 FNC:EDIT
PRC:1
PSJ:OFF
SJD:OFF
SDT:OFF
PDT:OFF
```

PDT:Program Delay Time
Delay time for start of the Program. Type is Hour/Minute.

After user confirm the last program parameter, step setting page is shown on the screen.


```
PNO:1 FNC:EDIT
STN:1/50
SSV:0.0 °C
STG:00.00
SRP:0
STS:1
SEV:0/0/0/0/0/0
```

Edit function is using for observing and changing the step settings.

```
PNO:1 FNC:EDIT
STN:1/50
SSV:0.0 °C
STG:00.00
SRP:1
STS:1
SEV:0/0/0/0/0/0
```

Program No

Program number is chosen.

 While user having operation on program or step setting page, if program button is pressed, then TAB is passive and pages can be change with increment or decrement buttons.

```
PNO:1   FNC:EDIT
SNO:1
SSV:0.0 °C
STG:00.00
SRP:0
STS:1
SEV:0/0/0/0/0/0
```

Step NO

Step number is chosen.

```
PNO:1   FNC:EDIT
SNO:1
SSV:0.0 °C
STG:00.00
SRP:0
STS:1
SEV:0/0/0/0/0/0
```

Step Set Value

Step Set Value is entering.

```
PNO:1   FNC:EDIT
SNO:1
SSV:23.8 °C
STG:00.00
SRP:0
STS:1
SEV:0/0/0/0/0/0
```

Step Time/Gradient

Step Time or Gradient is entering.

```
PNO:1   FNC:EDIT
SNO:1
SSV:23.8 °C
STG:11.45
SRP:0
STS:1
SEV:0/0/0/0/0/0
```

Step Repeat Cycle

Step Repeat Cycle is entering.

```
PNO:1   FNC:EDIT
SNO:1
SSV:23.8 °C
STG:11.45
SRP:1
STS:1
SEV:0/0/0/0/0/0
```

Step Target Step

Repeat action will be done from this step number.

```
PNO:1   FNC:EDIT
SNO:1
SSV:23.8 °C
STG:11.45
SRP:1
STS:1
SEV:1/0/0/0/0/0
```

Step Events

The Events that relates with the steps is chosen from this parameter.

A/B/C/D/E/F is chosen "0" means "OFF", "1" means "ON".

```
PNO:1   FNC:EDIT
SNO:2
SSV:45.7 °C
STG:20.30
SRP:0
STS:1
SEV:0/1/0/0/0/0
```

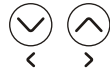
After last event situation is adjusted, cursor return to "SNO:". If you want to exit this loop press program button.

4.6. Copy Profile Program

```
PNO: 1   FNC: EDIT
PRC: 0
PSJ: OFF
SJD: OFF
SDT: OFF
PDT: OFF
```

COPY : To Copy Program to another program area.

```
PNO: 1   FNC: COPY
PRC: 0
PSJ: OFF
SJD: OFF
SDT: OFF
PDT: OFF
```



Change Function using increment and decrement button. Select "COPY".

```
PNO: 1 FNC: COPY
PRC: 0
PSJ: OFF
SJD: OFF
SDT: OFF
PDT: OFF
```



Press OK button and cursor position becomes "PNO:" to select source program no.

```
PNO: 4 FNC: COPY
PRC: 0
PSJ: OFF
SJD: OFF
SDT: OFF
PDT: OFF
```



Change source program no using increment and decrement buttons.

```
PNO: 4   FNC: COPY 1
PRC: 0
PSJ: OFF
SJD: OFF
SDT: OFF
PDT: OFF
```



Press OK button and cursor position becomes "COPY" to select target program no.

```
PNO: 4   FNC: COPY 12
PRC: 0
PSJ: OFF
SJD: OFF
SDT: OFF
PDT: OFF
```



Change target program no using increment and decrement buttons.



Press OK button to copy program, that is near the PNO tab to another program, that is near the COPY tab. After copy operation, the message will appear bottom of the screen.

If target program is full, then "FIRSTLY DELETE TARGET" message is shown.

```
PNO:12  FNC: COPY
PRC:0
PSJ:OFF
SJD:OFF
SDT:OFF
PDT:OFF
PROG. COPY SUCCESFUL
```

```
PNO:4  FNC: COPY
PRC:0
PSJ:OFF
SJD:OFF
SDT:OFF
PDT:OFF
FIRSTLY DELETE TARGET
```

- ✓ Device is wait for OK button pressed to confirm the operation status. Both of the situation, after OK button press, the displays are as follows.

```
PNO:12  FNC:EDIT
PRC:0
PSJ:OFF
SJD:OFF
SDT:OFF
PDT:OFF
```

```
PNO:4  FNC:EDIT
PRC:0
PSJ:OFF
SJD:OFF
SDT:OFF
PDT:OFF
```

4.7. Delete Profile Program

```
PNO:1    FNC:EDIT
PRC:0
PSJ:OFF
SJD:OFF
SDT:OFF
PDT:OFF
```

```
PNO:1    FNC:DEL
PRC:0
PSJ:OFF
SJD:OFF
SDT:OFF
PDT:OFF
```



Change Function using increment and decrement button. Select "DEL".

```
PNO: 1 FNC:DEL
PRC:0
PSJ:OFF
SJD:OFF
SDT:OFF
PDT:OFF
```



Press OK button and cursor position becomes "PNO:" tab. Select program number, that you want to delete.

```
PNO: 4 FNC:DEL
PRC:0
PSJ:OFF
SJD:OFF
SDT:OFF
PDT:OFF
```



Change program no, that you want to delete, using increment and decrement buttons.

```
PNO:5    FNC:DEL
PRC:0
PSJ:OFF
SJD:OFF
SDT:OFF
PDT:OFF
```



After OK button is pressed, the deleting program number is confirmed and cursor goes to "FNC" tab.



Press OK button again to delete the chosen program and next program will appear on the screen.

```
PRG. DELETE SUCCESSFUL
```

```
PNO:5    FNC:EDIT
PRC:0
PSJ:OFF
SJD:OFF
SDT:OFF
PDT:OFF
```



After message is observed, press OK button to confirm. Cursor position becomes function select parameter and EDIT is shown.


4.8. Delete Step

```
PNO:1    FNC:EDIT
SNO:1
SSV:23.8 °C
STG:11.45
SRP:1
STS:1
SEV:1/0/0/0/0/0
```



```
PNO:1    FNC:DEL
SNO:1
SSV:23.8 °C
STG:11.45
SRP:1
STS:1
SEV:1/0/0/0/0/0
```

  Choose “DEL” function using increment and decrement buttons.


```
PNO:1    FNC:DEL
SNO:1
SSV:23.8 °C
STG:11.45
SRP:1
STS:1
SEV:1/0/0/0/0/0
```

 If OK button is pressed, cursor position becomes “PNO:” tab to select which program’s step will be deleted. Choose program no using increment and decrement buttons and press OK button.


```
PNO:1    FNC:DEL
SNO:1    FNC:DEL
SSV:23.8 °C
STG:11.45
SRP:1
STS:1
SEV:1/0/0/0/0/0
```


  Press increment and decrement buttons to select step number.

```
PNO:1    FNC:DEL
SNO:1
SSV:23.8 °C
STG:11.45
SRP:1
STS:1
SEV:1/0/0/0/0/0
```

 If OK button is pressed, cursor position becomes function select tab again. If OK button is pressed on “DEL” tab, step is deleted.

```
PNO:1    FNC:DEL
SNO:1
SSV:42.9 °C
STG:10.30
SRP:0
STS:1
SEV:0/0/1/0/0/0
STEP DELETE SUCCESSFUL
```

 After this step is deleted, next step settings is moved to deleted step. So following steps is moved previous steps one by one.

 After message is observed, press OK button to confirm. The cursor position becomes function select parameter and “EDIT” is shown.

4.9. Copy Step

```
PNO:1   FNC:EDIT
SNO:1
SSV:23.8 °C
STG:11.45
SRP:1
STS:1
SEV:1/0/0/0/0/0
```

```
PNO:1   FNC:COPY
SNO:1
SSV:23.8 °C
STG:11.45
SRP:1
STS:1
SEV:1/0/0/0/0/0
```

⏴ ⏵ Choose "COPY" function using increment and decrement buttons.

```
PNO:1   FNC:COPY
SNO:1
SSV:23.8 °C
STG:11.45
SRP:1
STS:1
SEV:1/0/0/0/0/0
```

✓ If OK button is pressed, cursor position becomes "PNO:" tab to select source program number.

⏴ ⏵ Change source program no using increment and decrement buttons.

```
PNO:1   FNC:COPY
SNO:1
SSV:23.8 °C
STG:11.45
SRP:1
STS:1
SEV:1/0/0/0/0/0
```

✓ If OK button is pressed, cursor position becomes "SNO:" tab to select source step number.

⏴ ⏵ Change source step no using increment and decrement buttons.

```
PNO:1   FNC:COPY 12
SNO:1
SSV:23.8 °C
STG:11.45
SRP:1
STS:1
SEV:1/0/0/0/0/0
```

✓ If OK button is pressed, cursor position becomes near "COPY" tab to select target step number.

⏴ ⏵ Change target step no using increment and decrement buttons.

```
PNO:1   FNC:COPY
SNO:1
SSV:23.8 °C
STG:11.45
SRP:1
STS:1
SEV:1/0/0/0/0/0
STEP COPY SUCCESSFUL
```

✓ If OK button is pressed, copy operation come true and related message is shown on the screen.

✓ Press OK button again and message will disappear and tab return to EDIT.

4.10. Insert Step

```
PNO:1   FNC:EDIT
SNO:1
SSV:23.8 °C
STG:11.45
SRP:1
STS:1
SEV:1/0/0/0/0/0
```

```
PNO:1   FNC:INS
SNO:1
SSV:23.8 °C
STG:11.45
SRP:1
STS:1
SEV:1/0/0/0/0/0
```

⏪ ⏩ Choose "INS" function using increment and decrement buttons.

```
PNO:1   FNC:INS
SNO:1
SSV:23.8 °C
STG:11.45
SRP:1
STS:1
SEV:1/0/0/0/0/0
```

✓ If OK button is pressed, cursor position becomes "PNO:" tab to select source program number.

⏪ ⏩ Change source program no using increment and decrement buttons.

```
PNO:1   FNC:INS
SNO:1
SSV:23.8 °C
STG:11.45
SRP:1
STS:1
SEV:1/0/0/0/0/0
```

✓ If OK button is pressed, cursor position becomes "SNO:" tab to select source step number.

⏪ ⏩ Change source step no using increment and decrement buttons.

```
PNO:1   FNC:INS
SNO:1
SSV:23.8 °C
STG:11.45
SRP:1
STS:1
SEV:1/0/0/0/0/0
```

✓ If OK button is pressed, cursor position becomes "INS" tab.

```
PNO:1   FNC:INS
SNO:2
SSV:23.8 °C
STG:11.45
SRP:1
STS:1
SEV:1/0/0/0/0/0
STEP INSERT SUCCESSFUL
```

✓ If OK button is pressed again, following steps after the SNO number is shifted the next steps. The source step settings is copied to opened area and related message is shown.

✓ Press OK button again and message will disappear and tab return to EDIT.

5. Parameters

5.1. Operator Parameters

OPERATOR PARAMETERS		Min	Max	Default	Unit
A01 OPERATING PR. NO	Operating Program number	1	100	1	
A02 PROCESS SETVALUE	Process Set value	-9999	9999	0	°C
A03 ALARM 1 SETVALUE	Alarm 1 Set value	-9999	9999	0	°C
A04 ALARM 2 SETVALUE	Alarm 2 Set value	-9999	9999	0	°C
A05 ALARM 3 SETVALUE	Alarm 3 Set value	-9999	9999	0	°C
A06 ALARM 4 SETVALUE	Alarm 4 Set value	-9999	9999	0	°C
A07 TUNE SELECTION	Tune type selection	NOTUNE	ASTUNE	NOTUNE	
A08 AUTOMTC. TUNE SL	Otomatik tune selection	NO	YES	NO	
A09 OPERAT. FORM SEL	Operating form selection	AUTO.	MANUAL	AUTO.	
A10 BUMPLESS TRAN.SL	Bumpless Transfer selection	NO	YES	NO	
A11 ALARM LATCHCANCL	Alarm Latch Cancel	NO	YES	NO	
A12 SLCTABLE 1.SET	Selectable Set 1 value	-9999	9999	0	°C
A13 SLCTABLE 2.SET	Selectable Set 2 value	-9999	9999	0	°C
A14 SLCTABLE 3.SET	Selectable Set 3 value	-9999	9999	0	°C
A15 SLCTABLE 4.SET	Selectable Set 4 value	-9999	9999	0	°C
A16 SLCTABLE 5.SET	Selectable Set 5 value	-9999	9999	0	°C
A17 SLCTABLE 6.SET	Selectable Set 6 value	-9999	9999	0	°C
A18 SLCTABLE 7.SET	Selectable Set 7 value	-9999	9999	0	°C
A19 SLCTABLE 8.SET	Selectable Set 8 value	-9999	9999	0	°C
A20 MOTORIZD CONTROL	Motorized Valve Control	NO	YES	NO	
A21 PWR.FAIL.BEHAVIO	Power Fail behaviour	1	6	1	
A22 PWR.FAIL.PERCENT	Power Fail Percent	0	100	0	%
A23 MSG. DISP. TIME	Message display time	1	10	1	Second

Note-1: A21-PWR.FAIL.BEHAVIO parameter operating types:

- 1- Program is stopped.
- 2- Program continues remaining step and time.
- 3- Program wait for start approval on remaining step and time. Control output is off.
- 4- Program continues from the beginning of the step.
- 5- Program returns the beginning of the step and wait for approval. Control output is off.
- 6- If the difference, between process value(before power fail) and process value(after power on), is lower than PWR.FAIL.PERCENT parameter, then process continuous its remainig position, otherwise operates 5. entry item.

Note-2: A01 parameter is shown, if the device is configured as profile control.

Note-3: A12, A13, A14, A15, A16, A17, A18 and A19 parameters are shown, if the device is configured as process control.

5.2. Technician Parameters

If the device is configured as Profile Control;

DEVICE SETTING PAGE		Min	Max	Default	Unit
B01 OPERATING MODE	Device Operating Type	PROCSS	PROFIL	PROFIL	
B02 MAX STEP NUMBER	Maximum Step Number	1	1000	1	
B03 MAX PROGRAM NUMB	Maximum Program Number	1	100	1	
B04 STEP TIME UNIT	Step time unit	Min/s	H/min	Min/s	
B05 PR.STEP RAMP TYP	Program Step Ramp Type	TIME	GRADI.	TIME	
B06 PR.TOLERAN. BAND	Program Tolerance Band	TIME	GRADI.	TIME	

If the device is configured as Process Control;

DEVICE SETTING PAGE		Min	Max	Default	Unit
B01 OPERATING MODE	Device Operating Type	PROCSS	PROFIL	PROFIL	

UNIVERSAL INPUT PAGE		Min	Max	Default	Unit
C01 INPUT TYPE	Input Type	TC	V/I	TC	
C02 TC TYPE	Termocouple type	L	N po	J	
C03 TC COLDJUNC.COMP	Cold junction compansation	NO	YES	YES	
C04 RTD TYPE	RTD type	0	1	0	
C05 V/I TYPE	Voltage/Current type	0-50mV	4-20mA	0-50mV	
C06 V/I DEC. DOT POS	Voltage/Current Decimal Point Pos.	NO P.	0.000	NO P.	
C07 V/I MULT. COEFF	Voltage/Current Coefficient	1000	9999	1000	
C08 V/I CALIBR. TYPE	Voltage/Current Calibration type	FIXED	16 P.	FIXED	
C09 V/I S.D.P. CAL.MN	Voltage/Current 2 point calibration min	-1999	9999	0	
C10 V/I S.D.P. CAL.MX	Voltage/Current 2 point calibration max	-1999	9999	0	
C11 V/I 16.PT.CAL.1PT	Voltage/Current 16 point calibration 1	-1999	9999	0	
C12 V/I 16.PT.CAL.2PT	Voltage/Current 16 point calibration 2	-1999	9999	0	
C13 V/I 16.PT.CAL.3PT	Voltage/Current 16 point calibration 3	-1999	9999	0	
C14 V/I 16.PT.CAL.4PT	Voltage/Current 16 point calibration 4	-1999	9999	0	
C15 V/I 16.PT.CAL.5PT	Voltage/Current 16 point calibration 5	-1999	9999	0	
C16 V/I 16.PT.CAL.6PT	Voltage/Current 16 point calibration 6	-1999	9999	0	
C17 V/I 16.PT.CAL.7PT	Voltage/Current 16 point calibration 7	-1999	9999	0	
C18 V/I 16.PT.CAL.8PT	Voltage/Current 16 point calibration 8	-1999	9999	0	
C19 V/I 16.PT.CAL.9PT	Voltage/Current 16 point calibration 9	-1999	9999	0	
C20 V/I 16.PT.CAL.10P	Voltage/Current 16 point calibration 10	-1999	9999	0	
C21 V/I 16.PT.CAL.11P	Voltage/Current 16 point calibration 11	-1999	9999	0	
C22 V/I 16.PT.CAL.12P	Voltage/Current 16 point calibration 12	-1999	9999	0	
C23 V/I 16.PT.CAL.13P	Voltage/Current 16 point calibration 13	-1999	9999	0	
C24 V/I 16.PT.CAL.14P	Voltage/Current 16 point calibration 14	-1999	9999	0	
C25 V/I 16.PT.CAL.15P	Voltage/Current 16 point calibration 15	-1999	9999	0	
C26 V/I 16.PT.CAL.16P	Voltage/Current 16 point calibration 16	-1999	9999	0	
C27 PRO.LOW PNT ADJ	Process Low Point Adjustment	-1999	9999	0	
C28 PRO.HIGH PNT ADJ.	Process High Point Adjustment	-1999	9999	0	
C29 UNIT SELECTION	Unit Selection	°C	°F	°C	
C30 OPER. SCALE MIN	Operation Scale minimum	-1999	9999	0	
C31 OPER. SCALE MAX	Operation Scale maximum	-1999	9999	0	
C32 PRO.DIS.OFST.	Process Display Offset	-9999	9999	0	
C33 FILTER TIME	Filter time	0.0	999.9	0	Second

REMOTE SET PAGE		Min	Max	Default	Unit
D01 REMOTE SET SELCT	Remote Set Selection	OFF	ON	OFF	
D02 INPUT TYPES	Input Type	0-20mA	4-20mA	0-20mA	
D03 CALIBR. TYPE	Calibration Type	FIXED	DUALP	FIXED	
D04 DUAL PO. CAL MIN	2 point calibration min	-1999	9999	0	
D05 DUAL PO. CAL MAX	2 point calibration max	-1999	9999	0	

MOTORIZED VALVE PAGE		Min	Max	Default	Unit
E01 FEEDBACK CONTROL	Feedback Control	FLOAT	FBACK	FLOAT	
E02 BOUNDL. MOV.TIME	Boundary limit moving time	5	600	5	Second
E03 VALVE DEAD BAND	Valve Dead Band	1	50	1	%

DIGITAL INPUT 1 PAGE		Min	Max	Default	Unit
F01 FUNCTION SELECT	Function Selection	NONE	SETSEL	NONE	

DIGITAL INPUT 2 PAGE		Min	Max	Default	Unit
G01 FUNCTION SELECT	Function Selection	NONE	SETSEL	NONE	

DIGITAL INPUT 3 PAGE		Min	Max	Default	Unit
H01 FUNCTION SELECT	Function Selection	NONE	SETSEL	NONE	

PID SETTING PAGE		Min	Max	Default	Unit
I01 REV.PROPOR. BAND	Reverse Proportional Band	0.0	999.9	0.0	
I02 REV.INTEGRAL T.	Reverse Integral Time	0	3600	0	Second
I03 REV.DERIVATI.T.	Reverse Derivative Time	0.0	9999	0.0	Second
I04 REV.CON.PERI.T.	Reverse Control Period Time	1	150	1	Second
I05 REV.MIN C.OUTT.	Reverse Min. Control Output Time	0.0	15.0	0.0	Second
I06 REV.MIN CN.OUTPT	Reverse Min. Control Output	0.0	100.0	0.0	%
I07 REV.MAX CN.OUTPT	Reverse Max. Control Output	0.0	100.0	100.0	%
I08 DIR.PRO.BANDCOEF	Direct Proportional Band Coefficient	0	1000	1	
I09 DIR.PROPOR. BAND	Direct Proportional Band	0.0	999.9	0.0	
I10 DIR.INTEGRAL T.	Direct Integral Time	0	3600	0	Second
I11 DIR.DERIVATI.T.	Direct Derivative Time	0.0	9999	0.0	Second
I12 DIR.CON.PERI.T.	Direct Control Period Time	1	150	1	Second
I13 DIR.MIN C.OUTT.	Direct Min. Control Output Time	0.0	15.0	0.0	Second
I14 DIR.MIN CN.OUTPT	Direct Min. Control Output	0.0	100.0	0.0	%
I15 DIR.MAX CN.OUTPT	Direct Max. Control Output	0.0	100.0	100.0	%
I16 ANTIRESET WINDUP	Antireset windup	OT.AR	9999	OT.AR	°C
I17 SETVALUE OFFSET	Set offset value	-9999	9999	0	°C
I18 PID OUTPUT OFFSET	PID output offset value	-100.0	100.0	0.0	%
I19 OU.OF.REL.PIDSET	Output offset related on PID set	-100.0	100.0	0.0	%
I20 PRO.VAL.STABIL.	Process value stabilization	0	9999	0	
I21 PROPR.BAND SHIFT	Proportional Band Shifting	-9999	9999	0	
I22 SENS.BRE.OUT VAL	Sensor Break Output Value	-100.0	100.0	0.0	%

ANALOG OUTPUT 1 PAGE		Min	Max	Default	Unit
J01 OUTPUT TYPE SEL.	Output Type selection	0-20MA	2-10V	0-20MA	
J02 FUNCTION SELECT	Function selection	REVERS	RETRAN	REVERS	
J03 RETRAN. TYPE SEL	Retransfer type selection	RTPROC	RTSET	RTPROC	

ANALOG OUTPUT 2 PAGE		Min	Max	Default	Unit
K01 OUTPUT TYPE SEL.	Output Type Selection	0-20MA	2-10V	0-20MA	
K02 FUNCTION SELECT	Function selection	REVERS	RETRAN	REVERS	
K03 RETRAN. TYPE SEL	Retransfer type selection	RTPROC	RTSET	RTPROC	

RELAY OUTPUT 1 PAGE		Min	Max	Default	Unit
L01 FUNCTION SELECT	Function selection	REVERS	LO.OUT	REVERS	
L02 CONTROL ALGORIT	Control Algorithm	ONOFF	PID	ONOFF	
L03 ON/OFF HYS.	ON/OFF Hysteresis	0	9999	0	°C
L04 ON/OFF HYS FUNC.	ON/OFF Hysteresis Function	0	1	0	
L05 ON/OFF ON DLY TI	ON/OFF On Delay time	0	9999	0	Second
L06 LOG.OUT.OPER.	Logic Output Operation	EVENT	PROEND	PROEND	
L07 REL. STEP EVENT	Related Step Event	A	D	A	
L08 ALARM NUMBER	Alarm Number	1	4	1	
L09 AL.1 TYPE	Alarm-1 type	HIGH	D.RANG	HIGH	
L10 AL.1 HYS	Alarm-1 Hysteresis	0	9999	0	°C
L11 AL.1 ON DELAY T.	Alarm-1 On Delay time	0	9999	0	Second
L12 AL.1 OFF DELAY T.	Alarm-1 Off Delay time	0	9999	0	Second
L13 AL.2 TYPE	Alarm-2 type	HIGH	D.RANG	HIGH	
L14 AL.2 HYS	Alarm-2 Hysteresis	0	9999	0	°C
L15 AL.2 ON DELAY T.	Alarm-2 On Delay time	0	9999	0	Second
L16 AL.2 OFF DELAY T.	Alarm-2 Off Delay time	0	9999	0	Second
L17 AL.3 TYPE	Alarm-3 type	HIGH	D.RANG	HIGH	
L18 AL.3 HYS	Alarm-3 Hysteresis	0	9999	0	°C
L19 AL.3 ON DELAY T.	Alarm-3 On Delay time	0	9999	0	Second
L20 AL.3 OFF DELAY T.	Alarm-3 Off Delay time	0	9999	0	Second
L21 AL.4 TYPE	Alarm-4 type	HIGH	D.RANG	HIGH	
L22 AL.4 HYS	Alarm-4 Hysteresis	0	9999	0	°C
L23 AL.4 ON DELAY T.	Alarm-4 On Delay time	0	9999	0	Second
L24 AL.4 OFF DELAY T.	Alarm-4 Off Delay time	0	9999	0	Second

RELAY OUTPUT 2 PAGE		Min	Max	Default	Unit
M01 FUNCTION SELECT	Function Selection	REVERS	LO.OUT	REVERS	
M02 CONTROL ALGORIT	Control Algorithm	ONOFF	PID	ONOFF	
M03 ON/OFF HYS.	ON/OFF Hysteresis	0	9999	0	°C
M04 ON/OFF HYS FUNC.	ON/OFF Hysteresis Function	0	1	0	
M05 ON/OFF ON DLY TI	ON/OFF On delay time	0	9999	0	Second
M06 LOG.OUT.OPER.	Logic Output Operation	EVENT	PROEND	PROEND	
M07 REL. STEP EVENT	Related step event	A	D	A	
M08 ALARM NUMBER	Alarm Number	1	4	1	
M09 AL.1 TYPE	Alarm-1 type	HIGH	D.RANG	HIGH	
M10 AL.1 HYS	Alarm-1 Hysteresis	0	9999	0	°C
M11 AL.1 ON DELAY T.	Alarm-1 On delay time	0	9999	0	Second
M12 AL.1 OFF DELAY T.	Alarm-1 Off delay time	0	9999	0	Second
M13 AL.2 TYPE	Alarm-2 type	HIGH	D.RANG	HIGH	
M14 AL.2 HYS	Alarm-2 Hysteresis	0	9999	0	°C
M15 AL.2 ON DELAY T.	Alarm-2 On delay time	0	9999	0	Second
M16 AL.2 OFF DELAY T	Alarm-2 Off delay time	0	9999	0	Second
M17 AL.3 TYPE	Alarm-3 type	HIGH	D.RANG	HIGH	
M18 AL.3 HYS	Alarm-3 Hysteresis	0	9999	0	°C
M19 AL.3 ON DELAY T.	Alarm-3 On delay time	0	9999	0	Second
M20 AL.3 OFF DELAY T.	Alarm-3 Off delay time	0	9999	0	Second
M21 AL.4 TYPE	Alarm-4 type	HIGH	D.RANG	HIGH	
M22 AL.4 HYS	Alarm-4 Hysteresis	0	9999	0	°C
M23 AL.4 ON DELAY T.	Alarm-4 On delay time	0	9999	0	Second
M24 AL.4 OFF DELAY T.	Alarm-4 Off delay time	0	9999	0	Second

RELAY OUTPUT 3 PAGE		Min	Max	Default	Unit
N01 FUNCTION SELECT	Function Selection	REVERS	LO.OUT	REVERS	
N02 CONTROL ALGORIT	Control Algorithm	ONOFF	PID	ONOFF	
N03 ON/OFF HYS.	ON/OFF Hysteresis	0	9999	0	°C
N04 ON/OFF HYS FUNC.	ON/OFF Hysteresis Function	0	1	0	
N05 ON/OFF ON DLY TI	ON/OFF On delay time	0	9999	0	Second
N06 LOG.OUT.OPER.	Logic Output Operation	EVENT	PROEND	PROEND	
N07 REL. STEP EVENT	Related step event	A	D	A	
N08 ALARM NUMBER	Alarm Number	1	4	1	
N09 AL.1 TYPE	Alarm-1 type	HIGH	D.RANG	HIGH	
N10 AL.1 HYS	Alarm-1 Hysteresis	0	9999	0	°C
N11 AL.1 ON DELAY T.	Alarm-1 On delay time	0	9999	0	Second
N12 AL.1 OFF DELAY T.	Alarm-1 Off delay time	0	9999	0	Second
N13 AL.2 TYPE	Alarm-2 type	HIGH	D.RANG	HIGH	
N14 AL.2 HYS	Alarm-2 Hysteresis	0	9999	0	°C
N15 AL.2 ON DELAY T.	Alarm-2 On delay time	0	9999	0	Second
N16 AL.2 OFF DELAY T.	Alarm-2 Off delay time	0	9999	0	Second
N17 AL.3 TYPE	Alarm-3 type	HIGH	D.RANG	HIGH	
N18 AL.3 HYS	Alarm-3 Hysteresis	0	9999	0	°C
N19 AL.3 ON DELAY T.	Alarm-3 On delay time	0	9999	0	Second
N20 AL.3 OFF DELAY T.	Alarm-3 Off delay time	0	9999	0	Second
N21 AL.4 TYPE	Alarm-4 type	HIGH	D.RANG	HIGH	
N22 AL.4 HYS	Alarm-4 Hysteresis	0	9999	0	°C
N23 AL.4 ON DELAY T.	Alarm-4 On delay time	0	9999	0	Second
N24 AL.4 OFF DELAY T.	Alarm-4 Off delay time	0	9999	0	Second

RELAY OUTPUT 4 PAGE		Min	Max	Default	Unit
O01 FUNCTION SELECT	Function Selection	REVERS	LO.OUT	REVERS	
O02 CONTROL ALGORIT	Control Algorithm	ONOFF	PID	ONOFF	
O03 ON/OFF HYS.	ON/OFF Hysteresis	0	9999	0	°C
O04 ON/OFF HYS FUNC.	ON/OFF Hysteresis Function	0	1	0	
O05 ON/OFF ON DLY TI	ON/OFF On delay time	0	9999	0	Second
O06 LOG.OUT.OPER.	Logic Output Operation	EVENT	PROEND	PROEND	
O07 REL. STEP EVENT	Related step event	A	D	A	
O08 ALARM NUMBER	Alarm Number	1	4	1	
O09 AL.1 TYPE	Alarm-1 type	HIGH	D.RANG	HIGH	
O10 AL.1 HYS	Alarm-1 Hysteresis	0	9999	0	°C
O11 AL.1 ON DELAY T.	Alarm-1 On delay time	0	9999	0	Second
O12 AL.1 OFF DELAY T.	Alarm-1 Off delay time	0	9999	0	Second
O13 AL.2 TYPE	Alarm-2 type	HIGH	D.RANG	HIGH	
O14 AL.2 HYS	Alarm-2 Hysteresis	0	9999	0	°C
O15 AL.2 ON DELAY T.	Alarm-2 On delay time	0	9999	0	Second
O16 AL.2 OFF DELAY T.	Alarm-2 Off delay time	0	9999	0	Second
O17 AL.3 TYPE	Alarm-3 type	HIGH	D.RANG	HIGH	
O18 AL.3 HYS	Alarm-3 Hysteresis	0	9999	0	°C
O19 AL.3 ON DELAY T.	Alarm-3 On delay time	0	9999	0	Second
O20 AL.3 OFF DELAY T.	Alarm-3 Off delay time	0	9999	0	Second
O21 AL.4 TYPE	Alarm-4 type	HIGH	D.RANG	HIGH	
O22 AL.4 HYS	Alarm-4 Hysteresis	0	9999	0	°C
O23 AL.4 ON DELAY T.	Alarm-4 On delay time	0	9999	0	Second
O24 AL.4 OFF DELAY T.	Alarm-4 Off delay time	0	9999	0	Second

SERIAL COMM. PAGE		Min	Max	Default	Unit
P01 COMM. ACC. ADDR.	Communication Access Address	1	247	1	
P02 COMM. BAUD RATE	Communication Baud Rate	9600	38400	9600	
P03 PARITY SELECTION	Parity selection	NONE	EVEN	NONE	
P04 STOP BIT SELECT.	Stop Bit selection	0	1	0	
P05 MOD SELECT	Mode selection	ASCII	RTU	ASCII	

DATE SETUP PAGE		Min	Max	Default	Unit
Q01 DAY SETUP	Day Setup	1	31	1	
Q02 MONTH SETUP	Month Setup	1	12	1	
Q03 YEAR SETUP	Year Setup	0	99	10	
Q04 HOUR SETUP	Hour Setup	0	23	0	
Q05 MINUTE SETUP	Minute Setup	0	59	0	
Q06 SECOND SETUP	Second Setup	0	59	0	

PASSWORD PAGE		Min	Max	Default	Unit
R01 OPERATOR PASSW.	Operator Password	0	9999	0	
R02 TECHNICIAN PASS.	Technician Password	0	9999	0	

6. Specifications

Device Type	: Profile Controller unit
Housing & Mounting	: 96mm x 96mm x 87.5mm 1/4 DIN 43700 plastic housing for Panel mounting. Panel cut-out is 92x92mm.
Protection Class	: NEMA 4X (IP65 at front, IP20 at rear).
Weight	: Approximately 0.34 Kg.
Environmental Ratings	: Standard, indoor at an altitude of less than 2000 meters with none condensing humidity.
Storage/Operating Temperature	: -40 °C to +85 °C / 0 °C to +50 °C
Storage/Operating Humidity	: 90 % max. (None condensing)
Installation	: Fixed installation
Overvoltage Category	: II
Pollution Degree	: II, office or workplace, none conductive pollution
Operating Conditions	: Continuous
Supply Voltage and Power	: 100 - 240 V ~ (-%15 / +%10) 50/60 Hz. 6VA 24 V ~ (-%15 / +%10) 50/60 Hz. 6VA 24 V == (-%15 / +%10) 6W
Analogue input 1	: Universal input (TC, RTD, ==Voltage/Current)
Termocouple input types	: Selectable by parameters L (DIN43710) , J ,K ,R ,S ,T ,B ,E ,N (IEC584.1)(ITS90) , C (ITS90)
Thermoresistance Input Types	: PT 100 (IEC751) (ITS90)
==Voltage Input Types	: Selectable by parameters 0...50mV==, 0...5V==, 0...10V==
==Current Input Types	: Selectable by parameters 0...20mA==, 4...20mA==
Analogue input 2	: Remote Set input (0...20mA==, 4...20mA==)
Analogue input 3	: Motorized Valve Feedback Potentiometer input.(1K-10K)
Accuracy	: ± 0,25% of full scale for thermocouple, thermoresistance and voltage, ± 0,70% of full scale for current.
Cold Junction Compensation	: Automatically ± 0.1°C/1°C.
Line Compensation	: Maximum 10 .
Sensor Break Protection	: Upscale
Sampling Cycle	: 100 milisecond.
Input Filter	: 0.0 to 900.0 seconds
Giriş Resistance	: TC and RTD inputs >10M Current input 100 0...50mV >10M 0...10V >43K
Digital inputs	: 3 input with isolation
Transmitter Supply output	: 24V == ±%10 max. 50mA
Standard Relay Outputs	: 5A@250V~ (Programmable control or alarm output) (Electrical Life : 100.000 Operation (Full Load))
Analogue Outputs	: 2 output. Selectable 0-4...20mA== and/or 0-2...10V == Must be determined in order.
Profile Programs and Steps	: 100 Program to 1000 Step
Control Forms	: Programmable ON / OFF, P, PI, PD or PID.
Standard Communication	: RS-232 Communication
Communication Protocol	: MODBUS-RTU,ASCII
Display Type	: 128x64 graphic LCD with backlight