



PROCESS CONTROL UNITS ESM-XX30



ESM-4430, ESM-7730, ESM-9930, ESM-4930, ESM-9430
Universal Input PID Process Controllers

- 4 digit process (PV) and 4 digit set (SV) display
- Universal process input (TC, RTD, mV, V, mA)
- Dual or multi point calibration for Voltage & current inputs
- Programmable ON/OFF, P, PI, PD and PID control forms
- Auto-tune and Self-tune PID
- Manual/Automatic mode selection for control outputs
- Bumpless transfer
- Programmable heating, cooling and alarm functions for control outputs

SPECIFICATIONS PROCESS INPUT

Universal Input: TC, RTD, Voltage/Current
Thermocouple (TC): L(DIN 43710), J, K, R, S, T, B, E and N (IEC584.1)(ITS90), C (ITS90)
Thermoresistance (RTD): PT-100 (IEC751)(ITS90)

Input: mV, V, mA
Measurement Range: Please refer to Table-1 for selection of input type and scale

Accuracy: $\pm 0.25\%$ of full scale for thermocouple, thermoresistance, mV, V and mA input.

Cold Junction Compensation: Automatically $\pm 0.1^\circ\text{C}/1^\circ\text{C}$

Line Compensation: Maximum 10 Ohm

Sensor break protection: Upscale

Sampling Cycle: 3 samples per second

Input Filter: 0.0 to 900.0 seconds

CONTROL

Control Form: ON/OFF, P, PI, PD or PID (Control form can be programmed by the user)

OUTPUT

Standard Relay Outputs: Two relays, 5A@250V~ (at resistive load) (They can be programmed as Control or Alarm output)

SSR Driver Output: Maximum 17mA, Max. 25V~

SUPPLY VOLTAGE

100-240 V ~ 50/60 Hz (-15%; +10%), - 6VA

24V ~ 50/60 Hz (-15%; +10%), - 6VA

24V ~ (-15%; +10%), - 6W

(Must be determined in order)

DISPLAY

Process Display:

ESM-4430 : 10.1 mm Red 4 Digits LED Display

ESM-4930 : 13.2 mm Red 4 Digits LED Display

ESM-7730 : 13.2 mm Red 4 Digits LED Display

ESM-9930 : 19 mm Red 4 Digits LED Display

ESM-9430 : 10.1 mm Red 4 Digits LED Display

Set Value Display:

ESM-4430 : 8 mm Green 4 Digits LED Display

ESM-4930 : 8 mm Green 4 Digits LED Display

ESM-7730 : 9.1 mm Green 4 Digits LED Display

ESM-9930 : 10.8 mm Green 4 Digits LED Display

ESM-9430 : 8 mm Green 4 Digits LED Display

LEDs: AT(Auto Tune), M (Manual Mode), A (Automatic Mode), PSET / ASET1 / ASET2 (Control or Alarm Set) Leds, PO, AO1, AO2 (Control or Alarm Status) $^\circ\text{C}$ / $^\circ\text{F}$ / V Leds

ENVIRONMENTAL RATINGS and PHYSICAL SPECIFICATIONS

Operating Temperature: 0...50 $^\circ\text{C}$

Humidity: 0-90%RH (none condensing)

Protection Class: IP65 at front, IP20 at rear

Mounting: Type-1 Enclosure Mounting

Installation: Fixed installation Category II

Over Voltage Category: II

Pollution Degree: II, office or workplace, none conductive pollution

Weight:

ESM-4430 : 170 gr.

ESM-4930 : 230 gr.

ESM-7730 : 230 gr.

ESM-9930 : 320 gr.

ESM-9430 : 230 gr.

Dimensions / Panel Cut-Out:

ESM-4430 : (48 x 48mm, Depth:87.5 mm) / (46 x 46mm)

ESM-4930 : (96 x 48mm, Depth:86.5 mm) / (92 x 46mm)

ESM-7730 : (72 x 72mm, Depth:87.5 mm) / (69 x 69mm)

ESM-9930 : (96 x 96mm, Depth:87.5 mm) / (92 x 92mm)

ESM-9430 : (48 x 96mm, Depth:86.5 mm) / (46 x 92mm)

Minimum Distance Between Panel Cut-Out Centers:

ESM-4430 : X=65mm, Y=65mm

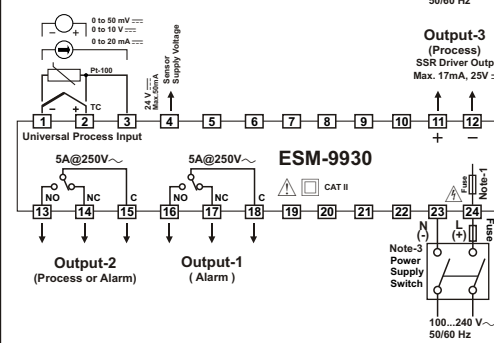
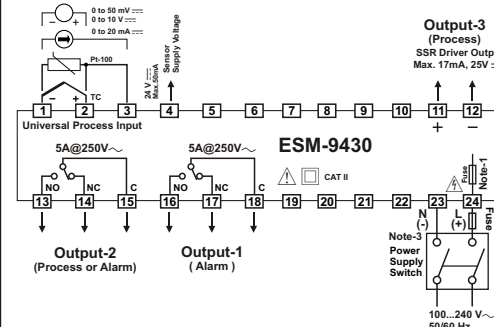
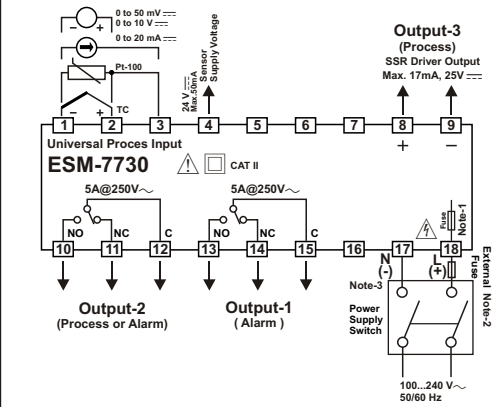
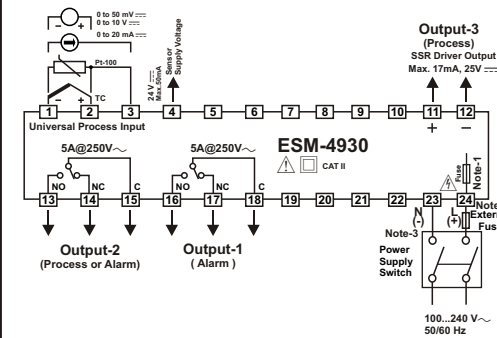
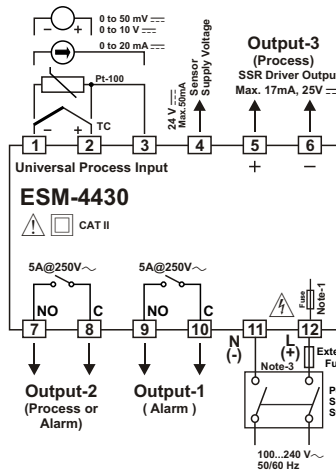
ESM-4930 : X=129mm, Y=65mm

ESM-7730 : X=97mm, Y=97mm

ESM-9930 : X=129mm, Y=129mm

ESM-9430 : X=65mm, Y=129mm

Electrical Wirings



Note-1: There is an internal fusible flameproof resistor.

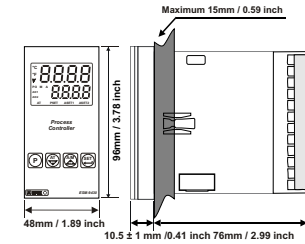
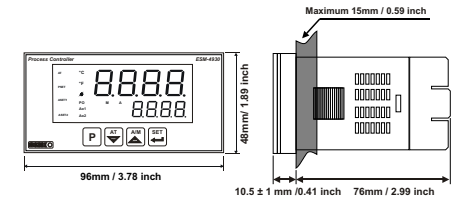
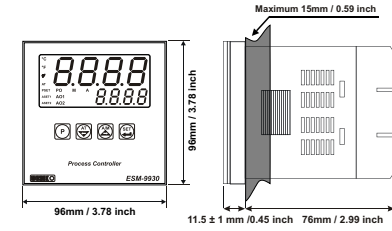
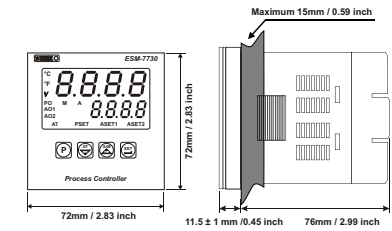
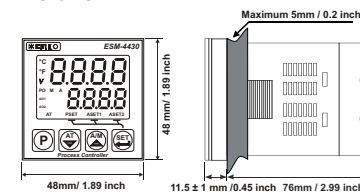
Note-2: External fuse is recommended.

1A~T for power supply 100...240 V~ or 24V~

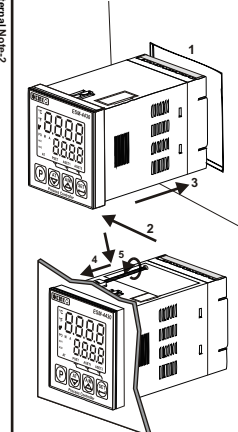
1A~T for power supply 24V~

Note-3: "L" is (+), "N" is (-) for 24V~ supply voltage

DIMENSIONS



PANEL MOUNTING



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

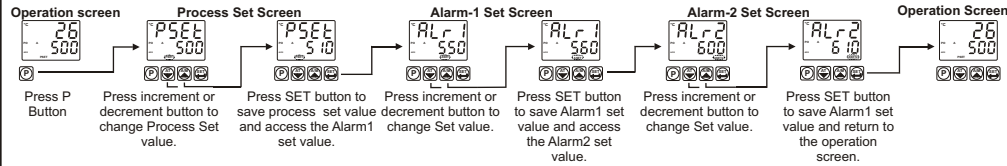
2-Check front panel gasket position

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

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

5- 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

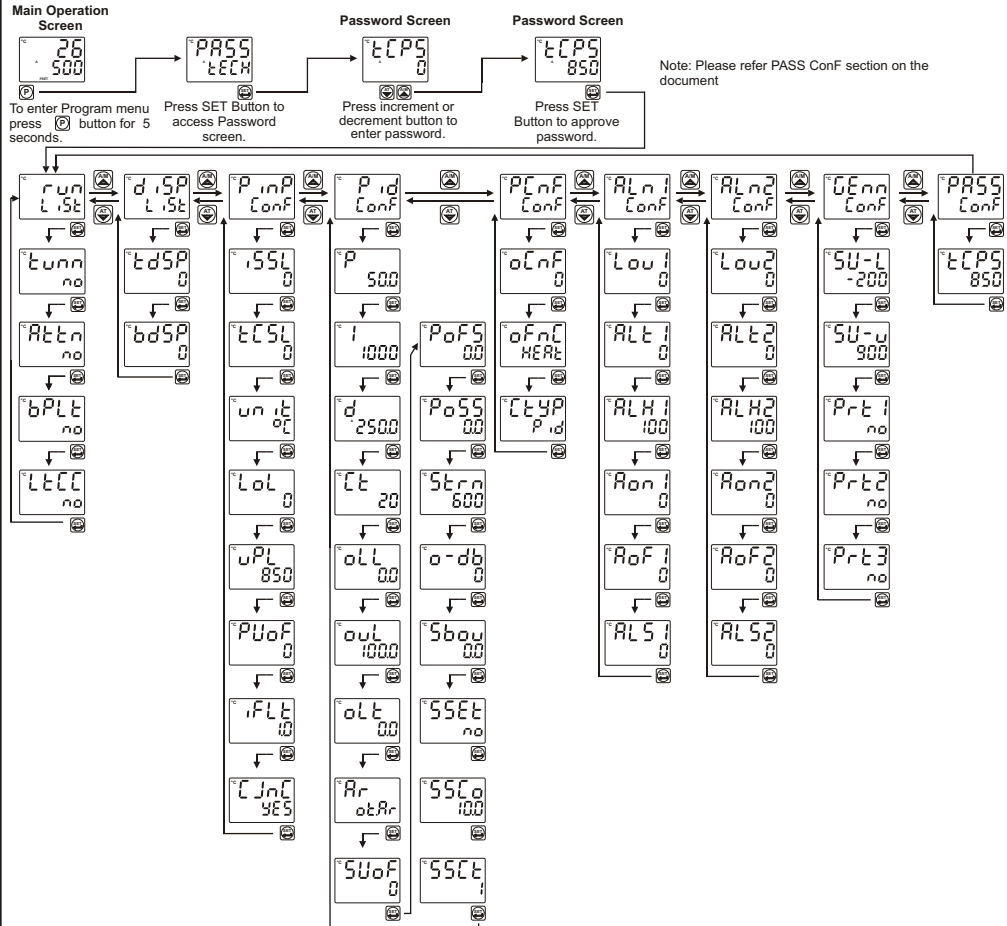
Access and change Set values



Note: User can exit from Set Value section without saving the values by pressing button.

If no operation for 120 seconds, device automatically exits from Set Value section.

Easy access diagram for Program Parameters



Run LiSt: Selection of PID Tune and Operation Form

TUNE SELECTION: By selecting one of the methods below, device can determine the PID parameters.

☐ Device operates according to the defined PID parameters

☐ Auto tune (Limit Cycle Tuning) operation

☐ Self tune (Step Response Tuning) operation

☐ Auto-Self Tune Tuning methods are performed according to system conditions by itself.

AUTOMATIC TUNE SELECTION

☐ Device does not perform tuning.

☐ Device does perform tuning.

BUMPLESS TRANSFER

☐ When automatic mode changes to manual mode, the process output will be last saved manual mode output percentage. Process output value in manual control is not taken into consideration while passing from manual control to automatic control. New control output that is measured in automatic control is applied to process output.

☐ When automatic mode changes to manual mode, the process output will be last automatic mode output percentage. While passing from manual control to automatic control, last process output value in manual control is accepted as first process output value in automatic control.

ALARM LATCH CANCELING

☐ Alarm latch canceling is not performed.

☐ If there is an alarm output with latching and there is no alarm status, latching operation will be finished by the device. This parameter becomes ☐ automatically.

diSP LiSt: Function Selection for Top and Bottom Display

Top Display Function

This parameter determines which value is shown in top display.

☐ Process value (PV) is shown in top display.

☐ Difference between process set value and process value (SV-PV) is shown in top display.

Bottom display Function

This parameter determines which value is shown in bottom display.

☐ Process set value (SV) is shown in bottom display.

☐ %Output value that is applied to process control output is shown in bottom display.

P.inP ConF: Process Input Type and Relevant Parameters

Process Input Type

☐ TC input type selection

☐ RTD input type selection

☐ ---Voltage / Current input type selection.

TC Input Selection

This parameter is active if TC input type is selected.

☐ L (-100°C;850°C) or (-148°F;1562°F)

☐ L (-100.0°C;850.0°C) or (-148.0°F;999.9°F)

☐ J (-200°C;900°C) or (-328°F;1652°F)

☐ J (-199.9°C;900.0°C) or (-199.9°F;999.9°F)

☐ K (-200°C;1300°C) or (-328°F;2372°F)

☐ K (-199.9°C;999.9°C) or (-199.9°F;999.9°F)

☐ R (0°C;1700°C) or (32°F;3092°F)

☐ R (0.0°C;999.9°C) or (32.0°F;999.9°F)

☐ S (0°C;1700°C) or (32°F;3092°F)

☐ S (0.0°C;999.9°C) or (32.0°F;999.9°F)

☐ T (-200°C;400°C) or (-328°F;752°F)

☐ T (-199.9°C;400.0°C) or (-199.9°F;752.0°F)

☐ B (44°C;1800°C) or (111°F;3272°F)

☐ B (44.0°C;999.9°C) or (111.0°F;999.9°F)

☐ E (-150°C;700°C) or (-238°F;1292°F)

☐ E (-150.0°C;700.0°C) or (-199.9°F;999.9°F)

☐ N (-200°C;1300°C) or (-328°F;2372°F)

☐ N (-199.9°C;999.9°C) or (-199.9°F;999.9°F)

☐ C (0°C;2300°C) or (32°F;3261°F)

☐ C (0.0°C;999.9°C) or (32.0°F;999.9°F)

RTD Input Selection

This parameter is active if RTD input is selected.

☐ PT-100 (-200°C;650°C) or (-328°F;1202°F)

☐ PT-100 (-199.9°C;650.0°C) or (-199.9°F;999.9°F)

---voltage / Current Input Selection

This parameter is active if ---Voltage / Current is selected.

☐ 0...50mV --- (-1999;9999)

☐ 0...5V --- (-1999;9999)

☐ 0...10V --- (-1999;9999)

☐ 0...20mA --- (-1999;9999)

☐ 4...20mA --- (-1999;9999)

Display Point Position

Active if ---Voltage / Current input is selected.

☐ No point

☐ Between first and second digits "0.0"

☐ Between second and third digits "0.00"

☐ Between third and fourth digits "0.000"

Display Value Adjustment Type

Active if ---Voltage / Current input is selected.

☐ Fixed dual point display adjustment. Display adjustment low point value is fixed to -1999, display adjustment high point value is fixed to 9999.

☐ User can do dual point display adjustment with tPoL and tPoH.

☐ User can do defined 16 display adjustment points.

Low Point Display adjustment (-1999,9999)Unit

Active if ---Voltage / Current input is selected.

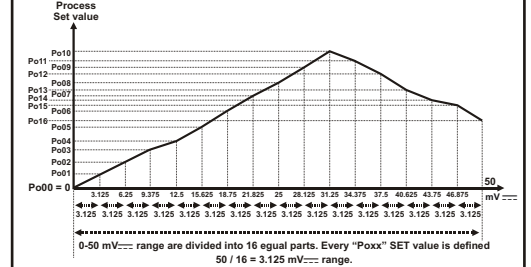
High Point Display adjustment (-1999,9999)Unit

Active if ---Voltage / Current input is selected.

Display adjustment points (-1999,9999)Unit

This parameter is active if ---Voltage / Current is selected. In multi point display adjustment operation, defined scale is divided into 16 adjustment points.

For example: is ☐ (0-50 mV---).



Coefficient value (1.000,9.999)

Process value is multiplied with this value.

Active if ---Voltage / Current input is selected.

Unit selection

☐ Unit is °C

☐ Unit is °F

☐ Unit is Voltage. Active if ---Voltage / Current input is selected

☐ No unit. Active if ---Voltage / current input is selected

Operating Scale Minimum Value

(Scale Low Point, Scale High Point)Unit

Used for Proportional band calculation and display blink.

Operating Scale Maximum Value

(Scale Low Point, Scale High Point)Unit

Used for Proportional band calculation and display blink.

Display offset for process value (Scale -10%, Scale +10%)Unit This parameter value is added to the process value.

Filter Time (0.0,900.0)Second

Defines filter time for display value.

Cold Junction Compensation

This parameter is active if process input is selected TC input.

☐ Cold junction compensation is active.

☐ Cold junction compensation is not active.

Scale: The difference, between high point and low point of the process input type. Example: If tCSL = 2 (low point is -200, high point is 900), then scale is 1100. If input type is Voltage/Current, then the scale is difference between tPoH and tPoL parameters.

Pid ConF: PID Configuration Parameters	
P	PROPORTIONAL BAND (0.0, 999.9)% If $\frac{[uP]}{[Lo]} = 1000\text{ }^{\circ}\text{C}$, $[Lo] = 0\text{ }^{\circ}\text{C}$ and $P = 50.0$ then, Proportional Band = $(\frac{[uP]}{[Lo]} - [Lo]) * P / 100.0$ Proportional Band = $(1000.0) * 50.0 / 100.0 = 500\text{ }^{\circ}\text{C}$
I	INTEGRAL TIME (0, 3600)Second Can be changed by the user. After completed the tuning correctly, integral time value changes automatically. If it is 0, integral control is deactivated.
d	DERIVATIVE TIME (0.0, 999.9)Second Can be changed by the user. After completed the tuning correctly, integral time value changes automatically. If it is 0, derivative control is deactivated.
[t]	CONTROL PERIOD TIME (1, 150)Second Process output period time
[oLL]	MINIMUM CONTROL OUTPUT (0.0, [oUL])% Even as a result of the PID calculation device calculates the %output value less than this parameter, heating or cooling output is active minimum for OLL parameter.
[oUL]	MAXIMUM CONTROL OUTPUT ([oLL], 100.0)% Even as a result of the PID calculation device calculates the %output value greater than this parameter, heating or cooling output is active maximum for OUL parameter.
[oLT]	MINIMUM CONTROL OUTPUT TIME (0.0, [t])Second Heating or cooling output can not be active less than this parameter. Even if this parameter is 0, this parameter is accepted as 50 msecs.
[Rr]	ANTI-RESET WINDUP (0, SCALE HIGH POINT)Unit While PID operation is running if $[PSEt] - [Rr] \leq \text{process value} \leq [PSEt] + [Rr]$ condition is true, integral value is calculated. If the condition is not true, integral value is not calculated and last calculated integral value is used. If Ar Parameter is selected $[ARr]$, heating proportional band is used for heating PID process instead of Ar Parameter and cooling proportional band is used for cooling PID process instead of Ar Parameter.
[SUoF]	SET VALUE OFFSET ((-SCALE HIGH POINT / 2), (SCALE HIGH POINT / 2))Unit $[PSEt] + [SUoF]$ is used as set value in PID calculations. This parameter is used for shifting the proportional band.
[PoFS]	PID OUTPUT OFFSET (FOR HEATING PID 0.0, 100.0)% (FOR COOLING PID -100.0, 0.0)% This parameter is added to "Output %" which is calculated at the end of the PID.
[PoSS]	OUTPUT OFFSET RELATED TO PID SET (FOR HEATING PID 0.0, 100.0)% (FOR COOLING PID -100.0, 0.0)% This parameter is added to the %process output that is calculated at the end of the PID according to process set value. $[PoSS] * [PSEt] / ([uPL] - [Lo])$
[Stcrn]	PROCESS VALUE STABILIZATION (1, SCALE HIGH POINT)Unit It is used for controlling if process value oscillates or not when $[uon]$ Parameter is $[Rtcrn]$ or $[RtSc]$ If: $[PSEt] - [Stcrn] \leq \text{Process Value} \leq [PSEt] + [Stcrn]$ condition is not true, then device start tunning operation automatically. SCALE LOW POINT : Minimum process input value in Pt-100 and Tc inputs. -1999 for fixed dual point display adjustment used inputs, Scale low point is the lowest one from $[tPoL]$ or $[tPoH]$ for selectable dual point display adjustment used inputs Scale low point is the lowest one from $[PoLo]$ or $[PoHi]$ for multi point display adjustment used inputs

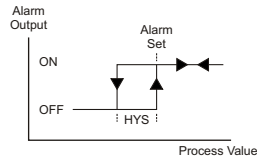
[o-db]	SCALE HIGH POINT : Maximum process input value in Pt-100 and Tc inputs. 9999 for fixed dual point display adjustment used inputs. Scale high point is the biggest one from $[tPoL]$ or $[tPoH]$ for selectable dual point display adjustment used inputs Scale high point is the biggest one from $[PoLo]$ or $[PoHi]$ for multi point display adjustment used inputs PROPORTIONAL BAND SHIFTING ((-SCALE HIGH POINT / 2), (SCALE HIGH POINT / 2))Unit If cooling function is performed ; Cooling process set value is calculated by adding set value $[PSEt]$ with parameter $[o-db]$ Control form can be ON/OFF or PID. If set value for heating = $[PSEt] + [SUoF]$; Then set value for cooling = $[PSEt] + [SUoF] + [o-db]$
[Sbov]	SENSOR BREAK OUTPUT VALUE (FOR HEATING PID 0.0, 100.0)% (FOR COOLING PID -100.0, 0.0)% When sensor breaks, controlling of the process can continue by entering %output value to $[Sbov]$ parameter. If this parameter 0.0, process control output does not perform an output when sensor breaks.
[SSEt]	Soft Start Set value (0, 9999)Unit If parameter is selected $[no]$, Soft start function becomes inactive. When the device power on, if the Soft start set value different from $[no]$ and temperature value is lower than soft start value on processes, device starts soft start operation, until temperature reaches soft start set value. On soft start device output period will be SSCo parameter value and device control output will be SSCo parameter value.
[SSCo]	Soft Start Control Output (10.0, 90.0)% Soft Start Control Period (1, 100)Second
PCnF ConF: Process Output Configuration Parameters	
[oCnF]	Output Configuration Determines if Process Output (SSR Driver Output) and Alarm-2 Output operates together or not. <input type="checkbox"/> Process Output (SSR Driver Output) and Alarm-2 Output operates separately. <input checked="" type="checkbox"/> Process Output (SSR Driver Output) and Alarm-2 Output operates together. Alarm functions of Alarm-2 Output can not be used
[oFnL]	Process Output Function <input checked="" type="checkbox"/> Heating <input type="checkbox"/> Cooling
[tCyP]	Process Output Control Type <input checked="" type="checkbox"/> ON/OFF control algorithm <input type="checkbox"/> PID control algorithm
[HYS]	Hysteresis of Process Output (Scale 0%, Scale 50%)Unit Active if ON/OFF control is selected.
[Hyn]	Operation form of hysteresis Active if ON/OFF control is selected. <input type="checkbox"/> SV + HYS/2 and SV - HYS/2 <input checked="" type="checkbox"/> SV and SV+HYS or SV and SV-HYS
[oFFt]	OFF Time (0.0, 100.0)Second In ON/OFF operation, this time must be passed for the output to be energised again. (Active if ON/OFF control is selected)
Aln1 ConF: Alarm Output-1 Configuration Parameters	
[Lou1]	Logic Output-1 Determines logic output function for Alarm-1 Output <input type="checkbox"/> Alarm output <input type="checkbox"/> Manual / Automatic selection output <input checked="" type="checkbox"/> Sensor break alarm output <input type="checkbox"/> Output is active when the process value is out of the band which is defined with minimum value of operating scale $[Lo]$ and maximum value of operating scale $[uPL]$

[ALt1]	Alarm-1 Type Determines alarm type for Output-1. Active if logic output function of Alarm-1 Output is alarm output. <input type="checkbox"/> Process high alarm <input type="checkbox"/> Process low alarm <input checked="" type="checkbox"/> Deviation high alarm <input type="checkbox"/> Deviation low alarm <input type="checkbox"/> Deviation band alarm <input type="checkbox"/> Deviation range alarm
[ALH1]	Alarm-1 hysteresis value(Scale 0%, Scale 50%)Unit Active if logic output function of Alarm-1 Output is alarm output.
[Ron1]	Alarm-1 On Delay Time (0, 9999)Second Active if logic output function of Alarm-1 Output is alarm output.
[ROF1]	Alarm-1 Off Delay Time (0, 9998)Second When the value is greater than 9998, $[tCH]$ is seen on the screen. It means alarm latching output is selected. Active if logic output function of Alarm-1 Output is alarm output.
[ALS1]	Alarm-1 Stabilization Time (0, 99)Second Active if logic output function of Alarm-1 Output is alarm output. After the unit is power-on and Alarm Stabilisation Time is expired, if an alarm condition which is selected with Alt1 is present, then Alarm-1 output becomes active.
Aln2 ConF: Alarm-2 Output Configuration Parameters	
[i]	"Aln2 ConF" Menu is accessible if $[oCnF]$ parameter in "PCnF ConF" is <input type="checkbox"/>
[Lou2]	Logic Output-2 Determines logic output function for Alarm-2 Output <input type="checkbox"/> Alarm output <input type="checkbox"/> Manual / Automatic selection output <input checked="" type="checkbox"/> Sensor break alarm output <input type="checkbox"/> Output is active when the process value is out of the band which is defined with minimum value of operating scale $[Lo]$ and maximum value of operating scale $[uPL]$
[ALt2]	Alarm-2 Type Determines alarm type for Output-2. Active if logic output function of Alarm-2 Output is alarm output. <input type="checkbox"/> Process high alarm <input type="checkbox"/> Process low alarm <input checked="" type="checkbox"/> Deviation high alarm <input type="checkbox"/> Deviation low alarm <input type="checkbox"/> Deviation band alarm <input type="checkbox"/> Deviation range alarm
[ALH2]	Alarm-2 hysteresis value(Scale 0%, Scale 50%)Unit Active if logic output function of Alarm-2 Output is alarm output.
[Ron2]	Alarm-2 On Delay Time (0, 9999)Second Active if logic output function of Alarm-2 Output is alarm output.
[ROF2]	Alarm-2 Off Delay Time (0, 9998)Second When the value is greater than 9998, $[tCH]$ is seen on the screen. It means alarm latching output is selected. Active if logic output function of Alarm-2 Output is alarm output.
[ALS2]	Alarm-2 Stabilization Time (0, 99)Second Active if logic output function of Alarm-2 Output is alarm output. After the unit is power-on and Alarm Stabilisation Time is expired, if an alarm condition which is selected with Alt2 is present, then Alarm-2 output becomes active.

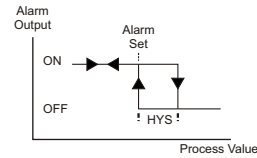
Gen ConF: General Parameters	
[SU-L]	Process Set Value Low Limit (Scale Low Point, [SU-u])Unit
[SU-u]	Process Set Value Up Limit ([SU-L], Scale High Point)Unit
[PrEt]	Alarm Set Values Protection <input type="checkbox"/> Alarm Set values can be changed <input checked="" type="checkbox"/> Alarm Set values can not be changed. Alarm set values parameters, $[ALr1]$ and $[ALr2]$, are not accessible
[PrEt2]	AUTO / MANUAL Selection Button Protection <input type="checkbox"/> Auto or Manual selection is possible with A/M button in Main Operation screen <input checked="" type="checkbox"/> Auto or Manual selection is not possible with A/M button in Main Operation screen
[PrEt3]	AT (AUTO TUNE) Button Protection <input type="checkbox"/> Limit Cycle Tuning operation can be activated or deactivated with AT (Auto Tune) Button in Operation screen <input checked="" type="checkbox"/> Limit Cycle Tuning operation can not be activated or deactivated with AT (Auto Tune) Button in Operation screen
PASS ConF: Password Parameters	
[tCP5]	Technician Password (0, 9999) Uses for protecting and accessing to the technician parameters. If this parameter is <input type="checkbox"/> ; there is no password protection while entering to the technician parameters. If this parameter is different from " 0" and user wants to access to the technician parameters; 1- If technician does not enter $[tCP5]$ password correctly: It turns to operation screen without entering to technician parameters. 2- When $[tCP5]$ in top display and <input type="checkbox"/> in bottom display, if technician presses SET button without entering $[tCP5]$ password (For observing parameter) Technician can see all menus and parameters except Technician Password menu ("Pass ConF"), but parameters can not be changed.

Alarm Types

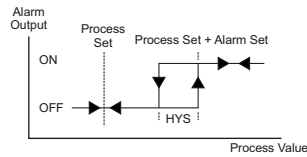
Process high alarm



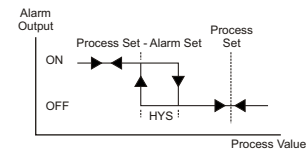
Process low alarm



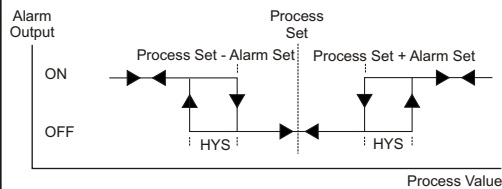
Deviation high alarm



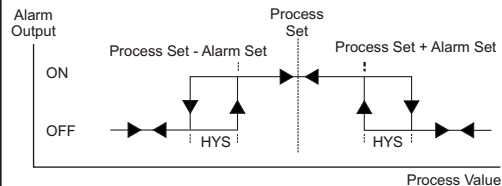
Deviation low alarm



Deviation Band Alarm



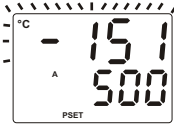
Deviation Range Alarm



Failure message in ESM-XX30 Process Controllers



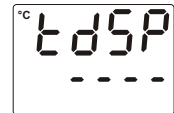
1 - Sensor failure in analogue input. Sensor connection is wrong or there is no sensor connection.



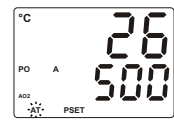
2 - If value on top display blinks : If analogue input value is less than minimum value of operating scale $\left[\frac{L}{\Delta} \right]$, display value on the top display starts to blink.



3 - If value on top display blinks : If analogue input value is greater than maximum value of operating scale $\left[\frac{U}{\Delta} \right]$, display value on the top display starts to blink.



4 - If technician password is different from "0" and technician accesses to the parameters by Set button without entering the technician password and wants to change a parameter, device does not allow to do any changes in parameters. If increment or decrement button is pressed, a warning message will appear on the bottom display as shown on the left.



5 - If tuning operation can not be completed in 8 hours, AT led starts to blink. Blinking can be canceled by pressing Enter button.

Installation



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

In package ,

- One piece unit
- Two pieces mounting clamp
- 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.

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 result 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 mounting clamp. Do not do the montage of the device with inappropriate mounting 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.

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.

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.

Other Informations

Manufacturer Information:

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Ordering Information

ESM-4430 (48x48 DIN 1/16)
ESM-4930 (96x48 DIN 1/8)
ESM-7730 (72x72 DIN Size)
ESM-9930 (96x96 DIN 1/4)
ESM-9430 (48x96 DIN 1/8)

A	B	C	D	E	/	F	G	H	I	/	U	V	W	Z

A Supply Voltage

1	100-240V ~ (-15%;+10%) 50/60Hz
2	24V ~ (-15%;+10%) 50/60Hz or 24V --- (-15%;+10%)
9	Customer (Maximum 240V ~ (-15%;+10%))50/60Hz

BC Input Type

20 Configurable(Table-1)

D Serial Communication

0 None

E Output-1 (Alarm)

1 Relay Output (5A@250V~ at resistive load)

FG Output-2 (Process or Alarm)

01 Relay Output (5A@250V~ at resistive load)

HI Output-3 (Process)

02 SSR Driver Output (Maximum 17mA, 25V ---)

Table-1

BC Input Type(TC)	Scale(°C)	Scale(°F)
21 L, Fe Const DIN43710	-100°C, 850.0°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, 900.0°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, 400.0°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, 700.0°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)

BC Input Type(RTD)	Scale(°C)	Scale(°F)
39 PT 100 , IEC751(ITS90)	-200°C, 650.0°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)

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



This symbol is used for safety warnings. User must pay attention to these warnings.



This symbol is used to determine the dangerous situations as a result of an electric shock. User must pay attention to these warnings definitely.



This symbol is used to determine the important notes about functions and usage of the device



Thank you very much for your preference to use Emko Elektronik products, please visit our Web page to download detailed user manual.

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