SENSOR-1

**20.0** °C PV

PO                    22.5 SV

# Measurement & Control Instruments

Process Control
Temperature Control
Heating Cooling
Counters
Timers

**EMKO**

# Process Controllers

"Smart I/O Module" System
RS-232/485 Modbus RTU Serial Communication

| | |
|---|---|
| ESM-4450 | ESM-4950 |
| ESM-7750 | ESM-9450 ESM-9950 |

CE c**RU**us EAC

▶ 8 steps profile control (Ramp & Soak) function and start-hold-stop by using logic input module

▶ For process value and process control Retransmission feature

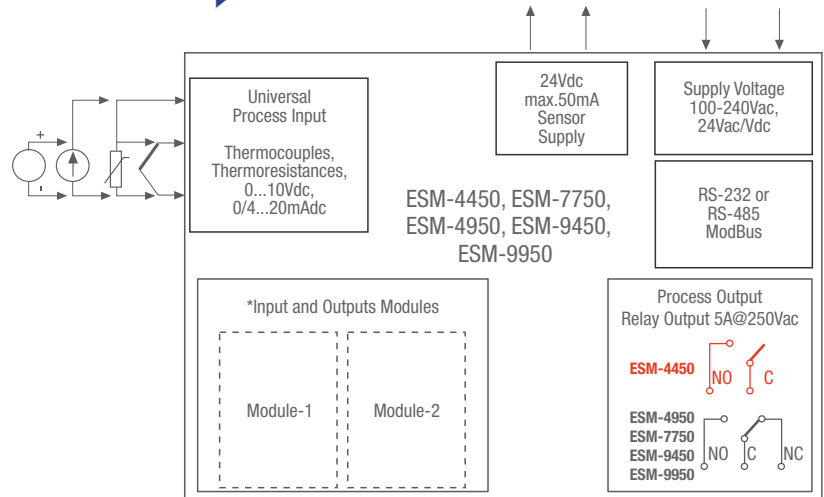▶ Detection of heater failure by using 0...5Adc CT input module

▶ Universal process input (TC, RTD, mVdc, Vdc, mAdc)

▶ Bumpless transfer

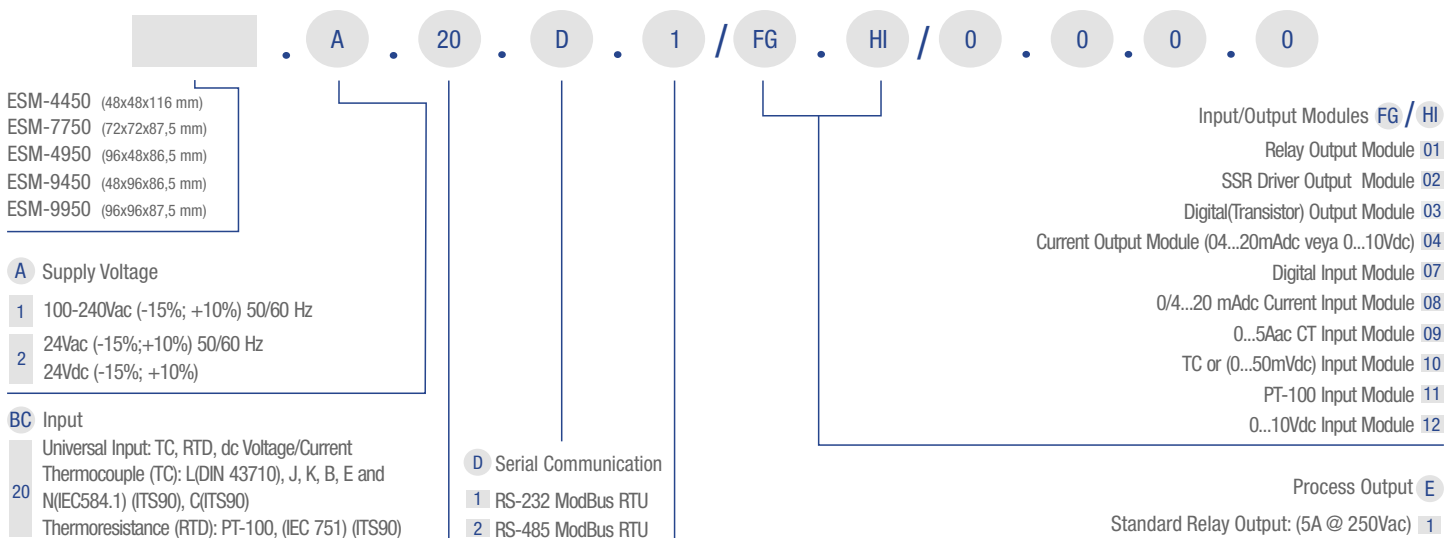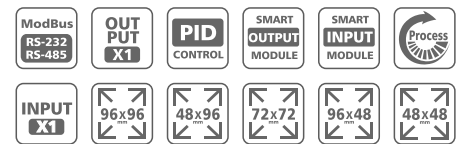▶ Motorized valve control function

## Specifications

4 Digits process (PV) and 4 Digits set (SV) display
Programmable heating, cooling and alarm functions for control outputs
Auto-tune and Self-tune PID
Dual or multi point calibration for dc Voltage/Current input
Configurable ON/OFF, P, PI, PD, and PID control forms

## Technical Specification

**Accuracy:** ±0.25%of full scale for thermocouple, thermoresistance, mV, V ±0.70% of full scale for mA input
**Cold Junction Compensation:** Automatically ± 0.1°C/1°C
**Line Compensation:** Maximum 10 Ohm
**Sensor Break Protection:** Upscale
**Sampling Cycle:** 3 samples per second
**Input Filter:** 0.0 to 900.0 seconds

Universal Process Input

Thermocouples, Thermoresistances, 0...10Vdc, 0/4...20mAdc

24Vdc max.50mA Sensor Supply

Supply Voltage 100-240Vac, 24Vac/Vdc

ESM-4450, ESM-7750, ESM-4950, ESM-9450, ESM-9950

RS-232 or RS-485 ModBus

*Input and Outputs Modules

Module-1   Module-2

Process Output Relay Output 5A@250Vac

**ESM-4450** NO C

ESM-4950
ESM-7750
ESM-9450    NO C NC
ESM-9950

* Input and output modules can be mounted each module sockets.
* Only one analog input module can connect to the device at the same time.

ModBus RS-232 RS-485 | OUT PUT X1 | PID CONTROL | SMART OUTPUT MODULE | SMART INPUT MODULE | Process

INPUT X1 | 96x96 | 48x96 | 72x72 | 96x48 | 48x48

A . 20 . D . 1 / FG . HI / 0 . 0 . 0 . 0

ESM-4450 (48x48x116 mm)
ESM-7750 (72x72x87,5 mm)
ESM-4950 (96x48x86,5 mm)
ESM-9450 (48x96x86,5 mm)
ESM-9950 (96x96x87,5 mm)

**A** Supply Voltage

| 1 | 100-240Vac (-15%; +10%) 50/60 Hz |
| 2 | 24Vac (-15%;+10%) 50/60 Hz / 24Vdc (-15%; +10%) |

**BC** Input

| 20 | Universal Input: TC, RTD, dc Voltage/Current Thermocouple (TC): L(DIN 43710), J, K, B, E and N(IEC584.1) (ITS90), C(ITS90) Thermoresistance (RTD): PT-100, (IEC 751) (ITS90) |

**D** Serial Communication

| 1 | RS-232 ModBus RTU |
| 2 | RS-485 ModBus RTU |

Input/Output Modules **FG / HI**

| Relay Output Module | 01 |
| SSR Driver Output Module | 02 |
| Digital(Transistor) Output Module | 03 |
| Current Output Module (04...20mAdc veya 0...10Vdc) | 04 |
| Digital Input Module | 07 |
| 0/4...20 mAdc Current Input Module | 08 |
| 0...5Aac CT Input Module | 09 |
| TC or (0...50mVdc) Input Module | 10 |
| PT-100 Input Module | 11 |
| 0...10Vdc Input Module | 12 |

Process Output **E**

| Standard Relay Output: (5A @ 250Vac) | 1 |

# Process Controllers
## Universal Input Dual SET PID

| ESM-7730 | ESM-4430 |
|---|---|
| ESM-9930 ESM-9430 | ESM-4930 |

CE c**RU**us EAC

▶ Auto-tune and Self-tune PID

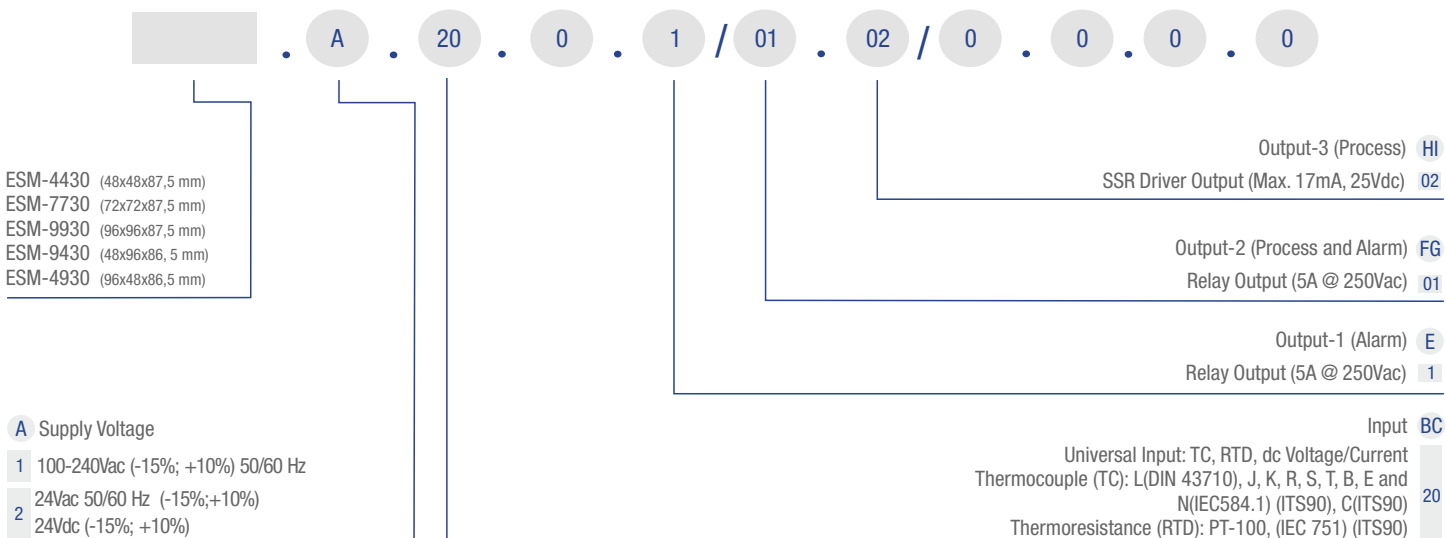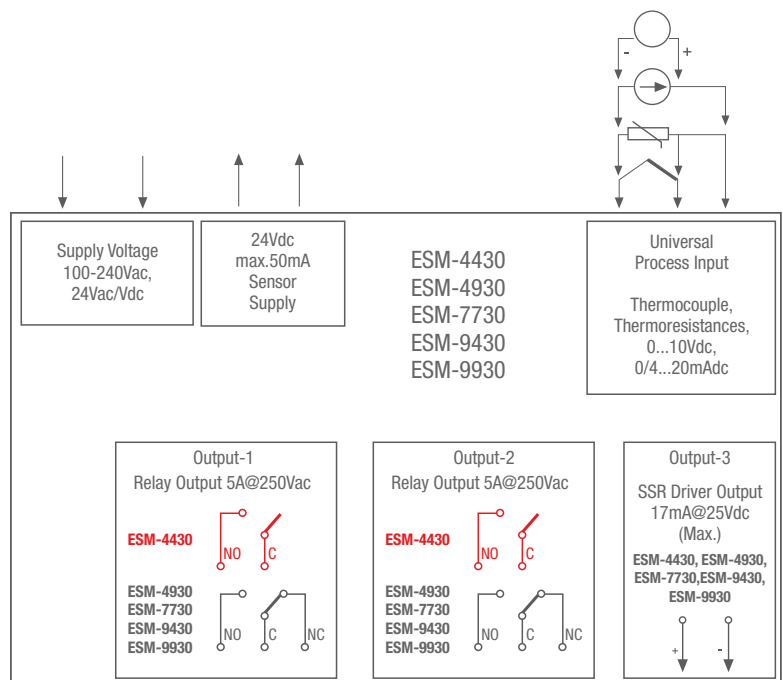▶ Dual or multi point calibration for dc Voltage/Current input

▶ Bumpless transfer

## Specifications

4 Digits process (PV) and 4 Digits set (SV) display

Universal process input (TC, RTD, mVdc, Vdc, mAdc)

Configurable ON/OFF, P, PI, PD, and PID control forms

Manual/Automatic mode selection for control outputs

Programmable heating, cooling and alarm functions for control outputs

## Technical Specification

**Accuracy:** ±0.25%of full scale for thermocouple, thermoresistance, mV, V ±0.70% of full scale for mA input

**Cold Junction Compensation:** Automatically ± 0.1°C/1°C

**Line Compensation:** Maximum 10 Ohm

**Sensor Break Protection:** Upscale

**Sampling Cycle:** 3 samples per second

**Input Filter:** 0.0 to 900.0 seconds

| Supply Voltage 100-240Vac, 24Vac/Vdc | 24Vdc max.50mA Sensor Supply | ESM-4430 ESM-4930 ESM-7730 ESM-9430 ESM-9930 | Universal Process Input Thermocouple, Thermoresistances, 0...10Vdc, 0/4...20mAdc |
|---|---|---|---|

| Output-1 Relay Output 5A@250Vac | Output-2 Relay Output 5A@250Vac | Output-3 SSR Driver Output 17mA@25Vdc (Max.) |
|---|---|---|
| **ESM-4430** NO C | **ESM-4430** NO C | ESM-4430, ESM-4930, ESM-7730,ESM-9430, ESM-9930 |
| ESM-4930 ESM-7730 ESM-9430 ESM-9930 NO C NC | ESM-4930 ESM-7730 ESM-9430 ESM-9930 NO C NC | + - |

INPUT X1 | OUTPUT X3 | Basic Process | PID CONTROL | ((🔔))

96x96 | 48x96 | 72x72 | 96x48 | 48x48

. A . 20 . 0 . 1 /01 . 02 /0 . 0 . 0 . 0

ESM-4430 (48x48x87,5 mm)
ESM-7730 (72x72x87,5 mm)
ESM-9930 (96x96x87,5 mm)
ESM-9430 (48x96x86, 5 mm)
ESM-4930 (96x48x86,5 mm)

Output-3 (Process) **HI**
SSR Driver Output (Max. 17mA, 25Vdc) **02**

Output-2 (Process and Alarm) **FG**
Relay Output (5A @ 250Vac) **01**

Output-1 (Alarm) **E**
Relay Output (5A @ 250Vac) **1**

Input **BC**
Universal Input: TC, RTD, dc 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, (IEC 751) (ITS90) **20**

| A | Supply Voltage |
|---|---|
| 1 | 100-240Vac (-15%; +10%) 50/60 Hz |
| 2 | 24Vac 50/60 Hz (-15%;+10%) 24Vdc (-15%; +10%) |

# Process Indicators

## "Smart Output Module'' System RS-232/485 Modbus RTU Serial Communication

| ESM-4400 | ESM-4900 |
|----------|----------|
| ESM-7700 | ESM-9900 |

▶ Smart Output Module System

▶ Dual or multi point calibration for dc Voltage/Current input

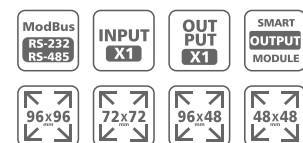▶ Retransmission of Process Value or Process Control by using 0/4...20 mAdc Current Output Module

| Supply Voltage 100-240Vac, 24Vac/Vdc | 24Vdc max.50mA Sensor Supply | Universal Process Input |
|---|---|---|
| RS-232 and RS-485 ModBus | ESM-4400, ESM-7700, ESM-4900, ESM-9900 | Thermocouple, Thermoresistances, 0...10Vdc, 0/4...20mAdc |

* Output Modules Sockets

Module-1    Module-2

Output Relay Output 5A@250Vac

**ESM-4400** NO C

**ESM-4900 ESM-7700 ESM-9900** NO C NC

* Output modules can be mounted each modules sockets.

## Specifications

4 Digit process (PV) display

Universal process input (TC, RTD, mVdc, Vdc, mAdc)

Programmable Alarm functions

RS-232 (standart) or RS-485(Optional) serial communication with Modbus RTU protocol

## Technical Specification

**Accuracy:** ±0.25%of full scale for thermocouple, thermoresistance, mV, V ±0.70% of full scale for mA input

**Cold Junction Compensation:** Automatically ± 0.1°C/1°C

**Line Compensation:** Maximum 10 Ohm

**Sensor Break Protection:** Upscale

**Sampling Cycle:** 3 samples per second

**Input Filter:** 0.0 to 900.0 seconds

ModBus RS-232 RS-485    INPUT X1    OUTPUT X1    SMART OUTPUT MODULE

96x96 mm    72x72 mm    96x48 mm    48x48 mm

      .  A  .  20  .  D  .  1 / FG  . HI / 0  .  0  .  0  .  0

ESM-4400 (48x48x116 mm)
ESM-7700 (72x72x87,5 mm)
ESM-4900 (96x48x86,5 mm)
ESM-9900 (48x96x87,5 mm)

**A** Supply Voltage

1  100-240Vac (-15%; +10%) 50/60 Hz

2  24Vac (-15%;+10%) 50/60 Hz
   24Vdc (-15%; +10%)

**BC** Input

20  Universal Input: TC, RTD, dc Voltage/Current
Thermocouple  (TC): L(DIN 43710), J, K, B, E and N(IEC584.1) (ITS90), C(ITS90)
Thermoresistance (RTD): PT-100, (IEC 751) (ITS90)

**D** Serial Communication

1  RS-232 ModBus RTU

2  RS-485 ModBus RTU

Output Modules **FG** / **HI**

None **00**

Relay Output Module **01**

SSR Driver Output Module (max.26mA @ 22Vdc) **02**

Digital (Transistor) Output Module (max.40mA@18Vdc) **03**

Current Output Module (04...20mAdc veya 0...10Vdc) **04**

Process Output **E**

Standard Relay Output: (5A @ 250Vac) **1**

# Process Indicators

## ESM 3700-N

CE EAC

▶ Adjustable decimal point

▶ 5 Stage analog input filter option

▶ Maximum and minimum measurement value are registered to the devices memory

▶ Maximum or minimum measurement value van be shown continuously on the display
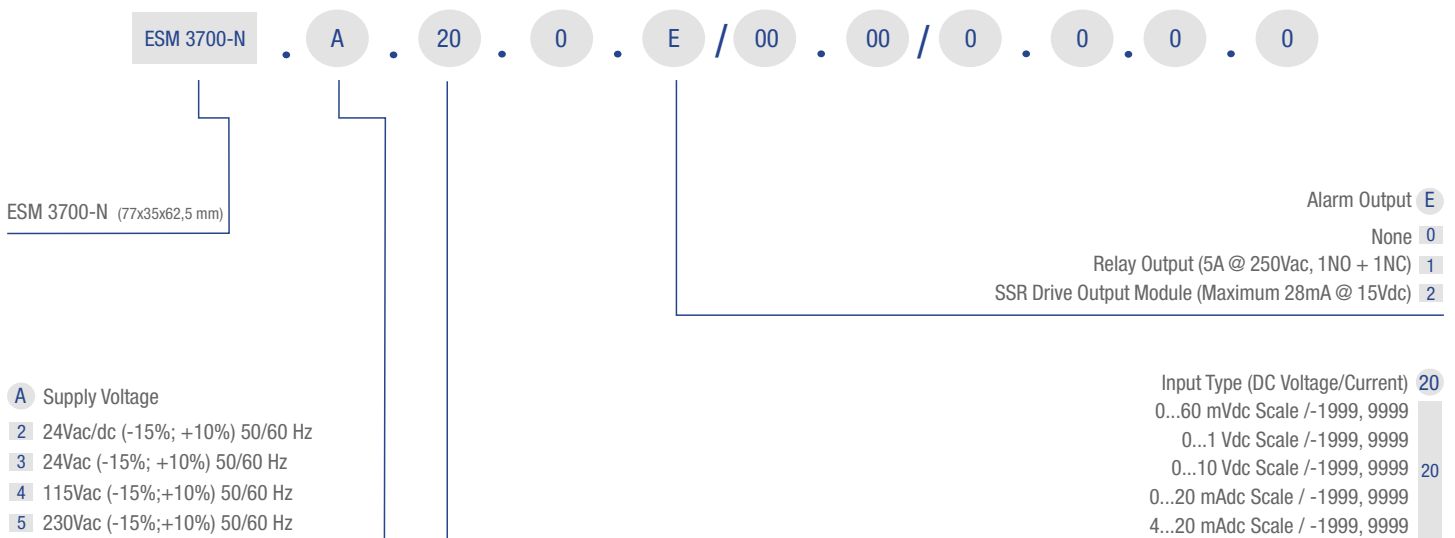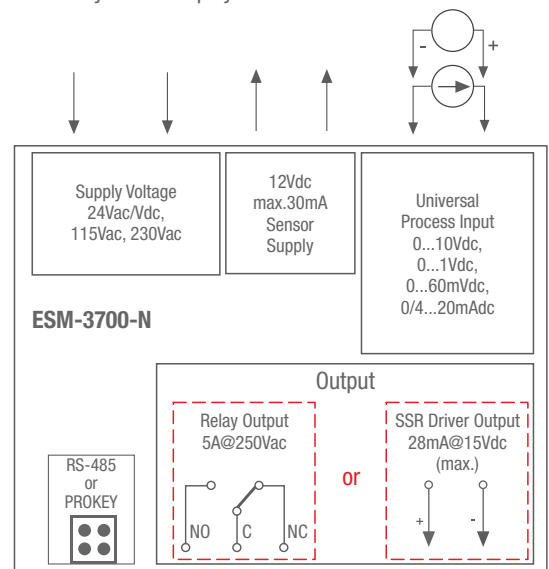
### Specifications

4 Digits display

Easily adjustable from front panel

Configurable display scale between -1999 and 9999

Selectable universal process Input
 (0-10Vdc, 0-1Vdc, 0-60mVdc, 0-20mAdc, 4-20mAdc)

User can be adjust device's reading value for selected input type

Alarm output, Relay or SSR driver output (It must be determined in order)

Adjustable alarm set value from front panel

Programming mode password protection

Installing parameters using ProkeyRemote acces, data collecting and controlling with Modbus RTU

### Technical Specification

**Accuracy:** ±0.5%of full scale

**Cold Junction Compensation:** Automatic ± 0.1°C/1°C

**Line Compensation:** Maximum 10 Ohm

**Sensor Break Protection:** Upscale

**Sampling Time:** 240 ms for 4...20 mAdc and 0...20 mAdc process input

130 ms for 0...60 mVdc process Input

100 ms for 0...1 Vdc and 0...10 Vdc process Input

**Input filter:** 0.0..900.0 selectable between seconds



Supply Voltage 24Vac/Vdc, 115Vac, 230Vac

12Vdc max.30mA Sensor Supply

Universal Process Input 0...10Vdc, 0...1Vdc, 0...60mVdc, 0/4...20mAdc

**ESM-3700-N**

Output

RS-485 or PROKEY

Relay Output 5A@250Vac — NO  C  NC

or

SSR Driver Output 28mA@15Vdc (max.)

INPUT X1 · OUTPUT X1 · Basic Process · ModBus RS-485 · 77x35

ESM 3700-N . A . 20 . 0 . E / 00 . 00 / 0 . 0 . 0 . 0

ESM 3700-N (77x35x62,5 mm)

Alarm Output | E

None | 0

Relay Output (5A @ 250Vac, 1NO + 1NC) | 1

SSR Drive Output Module (Maximum 28mA @ 15Vdc) | 2

| A | Supply Voltage |
|---|---|
| 2 | 24Vac/dc (-15%; +10%) 50/60 Hz |
| 3 | 24Vac (-15%; +10%) 50/60 Hz |
| 4 | 115Vac (-15%;+10%) 50/60 Hz |
| 5 | 230Vac (-15%;+10%) 50/60 Hz |

Input Type (DC Voltage/Current) | 20

0...60 mVdc Scale /-1999, 9999

0...1 Vdc Scale /-1999, 9999

0...10 Vdc Scale /-1999, 9999 | 20

0...20 mAdc Scale / -1999, 9999

4...20 mAdc Scale / -1999, 9999

# Process Controllers
Universal Input Dual SET PID

## ESM-4435

ESM-4435

CE EAC

▶ Universal process input (TC, RTD, mVdc, Vdc, mAdc)

▶ Dual or multi point calibration for dc Voltage/Current input
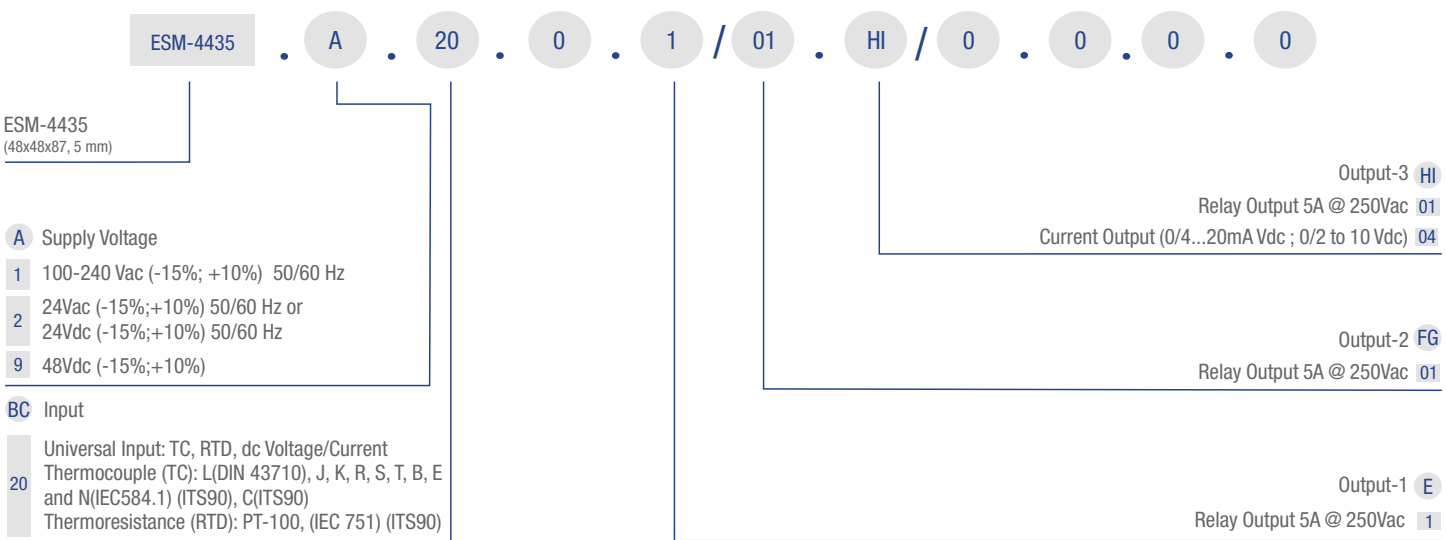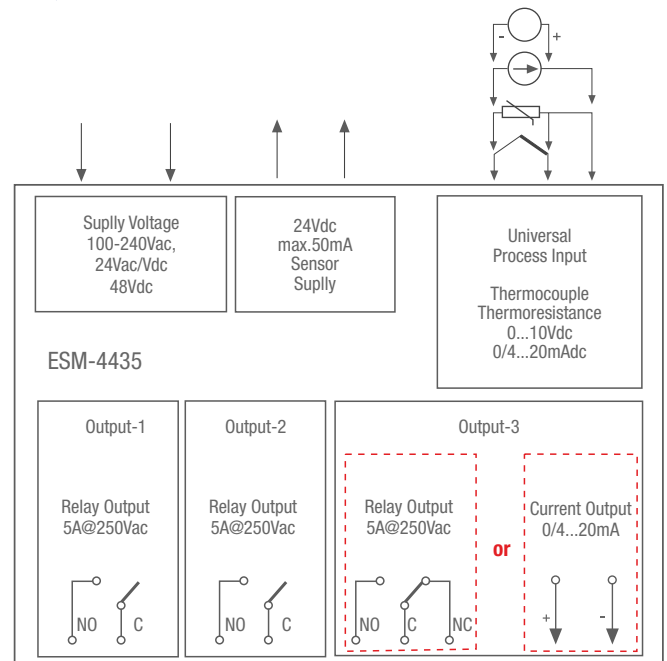
▶ Bumpless transfer

▶ Auto-tune ve Self-tune PID

## Specifications

4 Digits process (PV) and 4 Digits set (SV) display
Configurable ON/OFF, P, PI, PD, and PID control forms
Manual/Automatic mode selection for control outputs
Programmable heating, cooling and alarm functions for control outputs

## Technical Specification

**Accuracy:** ±0.25%of full scale for thermocouple, thermoresistance, mV, V ±0.70% of full scale for mA input

**Cold Junction Compensation:** Automatically ± 0.1°C/1°C

**Line Compensation:** Maximum 10 Ohm

**Sensor Break Protection:** Upscale

**Sampling Cycle:** 3 samples per second

**Input Filter:** 0.0 to 900.0 seconds



| | | |
|---|---|---|
| Suplly Voltage 100-240Vac, 24Vac/Vdc 48Vdc | 24Vdc max.50mA Sensor Suplly | Universal Process Input Thermocouple Thermoresistance 0...10Vdc 0/4...20mAdc |

ESM-4435

| Output-1 | Output-2 | Output-3 | |
|---|---|---|---|
| Relay Output 5A@250Vac | Relay Output 5A@250Vac | Relay Output 5A@250Vac | Current Output 0/4...20mA |
| NO  C | NO  C | NO  C  NC  or | + - |

INPUT X1 | OUTPUT X3 | PID CONTROL | 48x48 mm | Basic Process

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ESM-4435 ● A ● 20 ● 0 ● 1 / 01 ● HI / 0 ● 0 ● 0 ● 0

**ESM-4435**
(48x48x87, 5 mm)

| A | Supply Voltage |
|---|---|
| 1 | 100-240 Vac (-15%; +10%)  50/60 Hz |
| 2 | 24Vac (-15%;+10%) 50/60 Hz or 24Vdc (-15%;+10%) 50/60 Hz |
| 9 | 48Vdc (-15%;+10%) |

| BC | Input |
|---|---|
| 20 | Universal Input: TC, RTD, dc 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, (IEC 751) (ITS90) |

|  | Output-3 **HI** |
|---|---|
| Relay Output 5A @ 250Vac | 01 |
| Current Output (0/4...20mA Vdc ; 0/2 to 10 Vdc) | 04 |

|  | Output-2 **FG** |
|---|---|
| Relay Output 5A @ 250Vac | 01 |

|  | Output-1 **E** |
|---|---|
| Relay Output 5A @ 250Vac | 1 |

## Order Code

| A | BC | D | E | / | FG | HI | / | U | V | W | Z |
|---|----|----|----|----|----|----|----|----|----|----|----|
|   | 20 |   | 1 | / |   |   | / | 0 | 0 | 0 | 0 |

| | | ESM-4450 | ESM-4950 | ESM-7750 | ESM-9450 | ESM-9950 | ESM-4430 | ESM-4930 | ESM-7730 | ESM-9430 | ESM-9930 | ESM-4435 | ESM-4400 | ESM-4900 | ESM-7700 | ESM-9900 | ESM-3700-N |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **A** | **Supply Voltage** | | | | | | | | | | | | | | | | |
| 1 | 100...240 Vac (-15%,+10%)50/60Hz | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | - |
| 2 | 24Vdc/Vac (-15%,+15%) 50/60Hz | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| 3 | 24Vac (-15%,+15%) 50/60Hz | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | + |
| 4 | 115Vac (-15%,+15%) 50/60Hz | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | + |
| 5 | 230Vac (-15%,+15%) 50/60Hz | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | + |
| 9 | 48Vdc (-15%,+10%) 50/60Hz | - | - | - | - | - | - | - | - | - | - | + | - | - | - | - | - |
| **BC** | **Input Type** | | | | | | | | | | | | | | | | |
| 20 | Configurable Universal inputs | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| **D** | **Serial Communication** | | | | | | | | | | | | | | | | |
| 0 | None | | | | | | + | + | + | + | + | + | | | | | + |
| 1 | RS-232 ModBus RTU | + | + | + | + | + | - | - | - | - | - | - | + | + | + | + | - |
| 2 | RS-485 ModBus RTU | + | + | + | + | + | - | - | - | - | - | - | + | + | + | + | - |
| **E** | **Process Output** | | | | | | | | | | | | | | | | |
| 0 | None | | | | | | | | | | | | | | | | | + |
| 1 | Relay Output (At resistive load 5A@250Vac) | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| 2 | SSR Driver Output (Max. 20mA@12Vdc) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | + |
| **FG** | **Input/Output Modules-1** | | | | | | | | | | | | | | | | |
| 00 | None | + | + | + | + | + | | | | | | | + | + | + | + | + |
| 01 | Relay Output | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | - |
| 02 | SSR Driver Output (Max. 20mA@12Vdc) | + | + | + | + | + | - | - | - | - | - | - | + | + | + | + | - |
| 03 | Transistor Output (Max. 40mA@18Vdc) | + | + | + | + | + | - | - | - | - | - | - | + | + | + | + | - |
| 04 | Analogue (0/4...20mAdc or 0...10Vdc) | + | + | + | + | + | - | - | - | - | - | - | + | + | + | + | - |
| 07 | Digital Input | + | + | + | + | + | - | - | - | - | - | - | - | - | - | - | - |
| 08 | Analogue (0/4...20mAdc) | + | + | + | + | + | - | - | - | - | - | - | - | - | - | - | - |
| 09 | CT Input Module (0...5Aac) | + | + | + | + | + | - | - | - | - | - | - | - | - | - | - | - |
| 10 | Thermocouple Input (0...50mVdc) | + | + | + | + | + | - | - | - | - | - | - | - | - | - | - | - |
| 11 | Pt-100 Input | + | + | + | + | + | - | - | - | - | - | - | - | - | - | - | - |
| 12 | Analogue Input (0...10Vdc) | + | + | + | + | + | - | - | - | - | - | - | - | - | - | - | - |
| **HI** | **Input/Output Module - 2** | | | | | | | | | | | | | | | | |
| 00 | None | + | + | + | + | + | | | | | | | + | + | + | + | + |
| 01 | Relay Output | + | + | + | + | + | - | - | - | - | - | + | + | + | + | + | - |
| 02 | SSR Driver Output (Max. 20mA@12Vdc) | + | + | + | + | + | + | + | + | + | + | - | + | + | + | + | - |
| 03 | Transistor Output (Max. 40mA@18Vdc) | + | + | + | + | + | - | - | - | - | - | - | + | + | + | + | - |
| 04 | Analogue (0/4...20mAdc or 0...10Vdc) | + | + | + | + | + | - | - | - | - | - | + | + | + | + | + | - |
| 07 | Digital Input | + | + | + | + | + | - | - | - | - | - | - | - | - | - | - | - |
| 08 | Analogue (0/4...20mAdc) | + | + | + | + | + | - | - | - | - | - | - | - | - | - | - | - |
| 09 | CT Input Module (0...5Aac) | + | + | + | + | + | - | - | - | - | - | - | - | - | - | - | - |
| 10 | Thermocouple Input (0...50mVdc) | + | + | + | + | + | - | - | - | - | - | - | - | - | - | - | - |
| 11 | Pt-100 Input | + | + | + | + | + | - | - | - | - | - | - | - | - | - | - | - |
| 12 | Analogue Input (0...10Vdc) | + | + | + | + | + | - | - | - | - | - | - | - | - | - | - | - |
| **Specifications** | | | | | | | | | | | | | | | | | |
| | "Smart I/O Modül" system | + | + | + | + | + | - | - | - | - | - | - | - | - | - | - | - |
| | "Smart Output Modül" system | + | + | + | + | + | - | - | - | - | - | - | + | + | + | + | - |
| | Universal process (TC, RTD, mVdc, Vdc, mAdc) input | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | - |
| | Bumpless transfer | + | + | + | + | + | + | + | + | + | + | + | - | - | - | - | - |
| | Motorized valve control function | + | + | + | + | + | - | - | - | - | - | - | - | - | - | - | - |
| | 8 steps profile control | + | + | + | + | + | - | - | - | - | - | - | - | - | - | - | - |
| | Remote Set point function | + | + | + | + | + | - | - | - | - | - | - | - | - | - | - | - |
| | Re-transmission function | + | + | + | + | + | - | - | - | - | - | - | + | + | + | + | - |
| | Detection of heater failure by CT input module | + | + | + | + | + | - | - | - | - | - | - | - | - | - | - | - |
| **Dimension** | | | | | | | | | | | | | | | | | |
| | 77x35mm DIN | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | + |
| | 48x48mm DIN 1/16 | + | - | - | - | - | + | - | - | - | - | + | + | - | - | - | - |
| | 96x48mm DIN 1/8 | - | + | - | - | - | - | + | - | - | - | - | - | + | - | - | - |
| | 72x72mm DIN | - | - | + | - | - | - | - | + | - | - | - | - | - | + | - | - |
| | 48x96mm DIN 1/8 | - | - | - | + | - | - | - | - | + | - | - | - | - | - | - | - |
| | 96x96mm DIN 1/4 | - | - | - | - | + | - | - | - | - | + | - | - | - | - | + | - |

# Profile Control

## ESM-9990

CE EAC

- Universal process input (TC, RTD, mVdc, Vdc, mAdc)
- In ceramic furnace applications
- 8-step Profile Control (Ramp and Soak) and Start-Pause-Stop functions
- Textile, paint, ceramic oven applications

## Specifications

4 Digits proses (PV) ve 4 Digits set (SV) göstergesi
Hardware configuration with SSR and Current output module
Configurable ON/OFF, P, PI, PD and PID control forms
Heating function for control outputs
8 steps profile control ( Ramp & Soak ) function and Start-Pause-Stop
Power Down Back-up

| Supply Voltage 100-240Vac | 12Vdc max.50mA Sensor Supply | Universal Process Input Thermocouple Thermoresistance 0...10Vdc 0/4...20mAdc |
|---|---|---|

**ESM-9990**

| Control Output Optional Analog Output 0/4...20mAdc | Control and Alarm Output Relay Output 5A@250Vac NO  C  NC | Control Output SSR Driver Output 20mA@12Vdc (max.) |
|---|---|---|
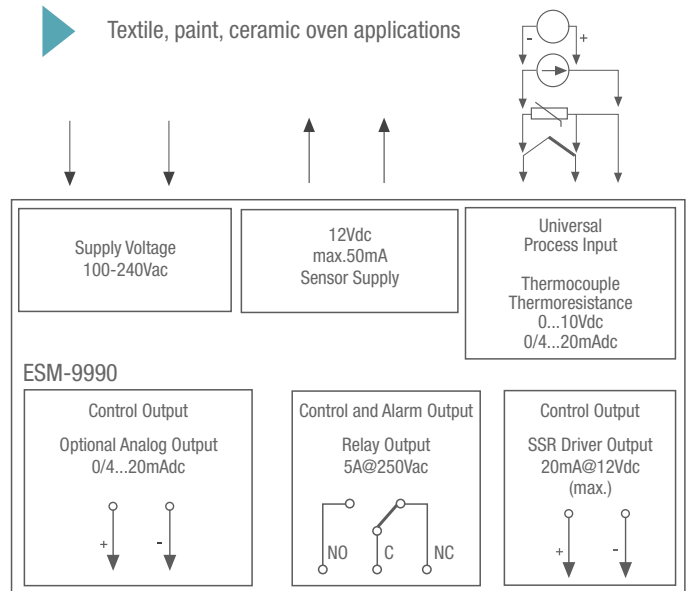
## Technical Specification

**Accuracy:** ± 0,25% of FS for thermocouple

**Cold Junction Compensation:** Automatically ± 0.1°C/1°C.

**Sensor Break Protection:** Upscale

**Sampling Cycle:** 3 samples per second

INPUT X1   OUTPUT X2   CONTROL   96x96

| ESM-9990 | 1 | 20 | 0 | 1 | / 02 | HI | / 1 | 0 | 0 | 0 |

ESM-9990
( 96x96x96 mm )

**A** Supply Voltage

1 100-240Vac (-15%;+10%) 50/60 Hz

**BC** Input

20 Universal Input: TC, RTD, dc 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, (IEC 751) (ITS90)

Control Output HI
None 0
Current Output Module (0/4...20mA Vdc) 02

Control Output FG
SSR Driver Output Module (Max.20mA @18Vdc) 02

Control and Alarm Output E
Relay Output 5A @ 250Vac 1
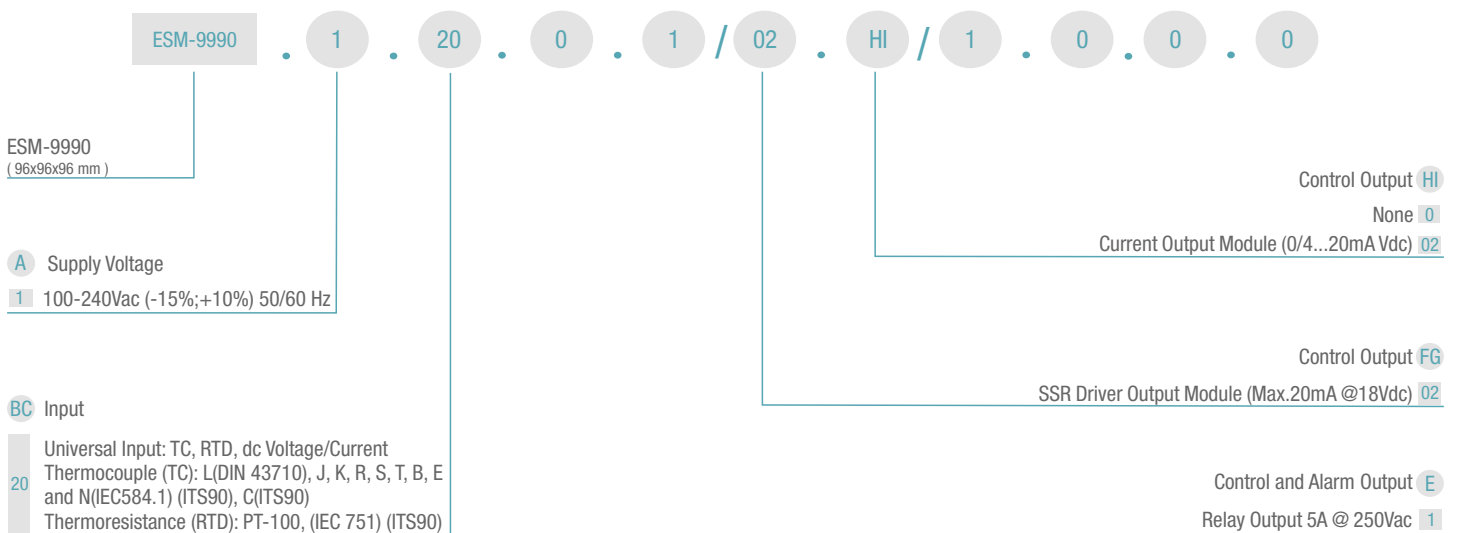
# Digital Potantiometer

## EPM-3790N / EPR-3790N



EPM-3790N
Forward, Reverse direction outputs and error input
for V/F Speed Controller

EPR-3790N
Fault input or (Remote start-stop)

CE EAC

## Specifications

Operation at Adjustable Set Value

Ramp Function

Economical

Easy to User

4 Digits Display

Easily adjustable set value from front panel

Configurable display scale between -1999 and 9999

Adjustable decimal point

Set value low limit and set value high limit boundaries

Adjustable ramp up and ramp  down time

0/2...10Vdc Voltage output or 0/4...20mAdc Current output

(It must be determined in order.)

Password protection for programming and adjustment sections

## Technical Specification

**Digital Input:** Error input (max. 3mA@30Vdc)

**Resolution:** 12 bits

**Fluctuation:** Max. 30 mV

**Scale:** Between-1999 and 9999



EPM-3790N

EPR-3790N

## Ordering code

. A . BC . 0 . E /00 . 00 /1 . 0 . 0 . 0 . 0
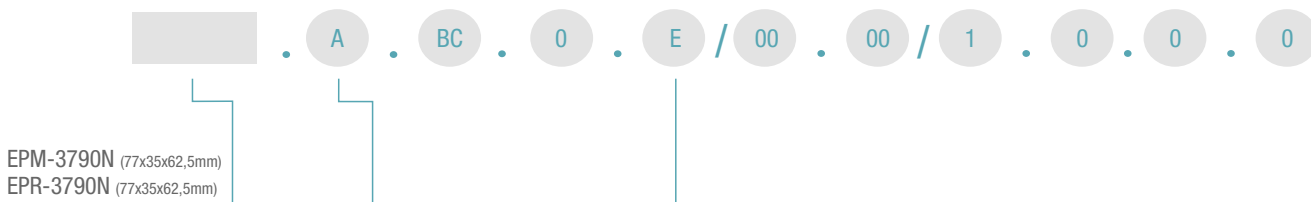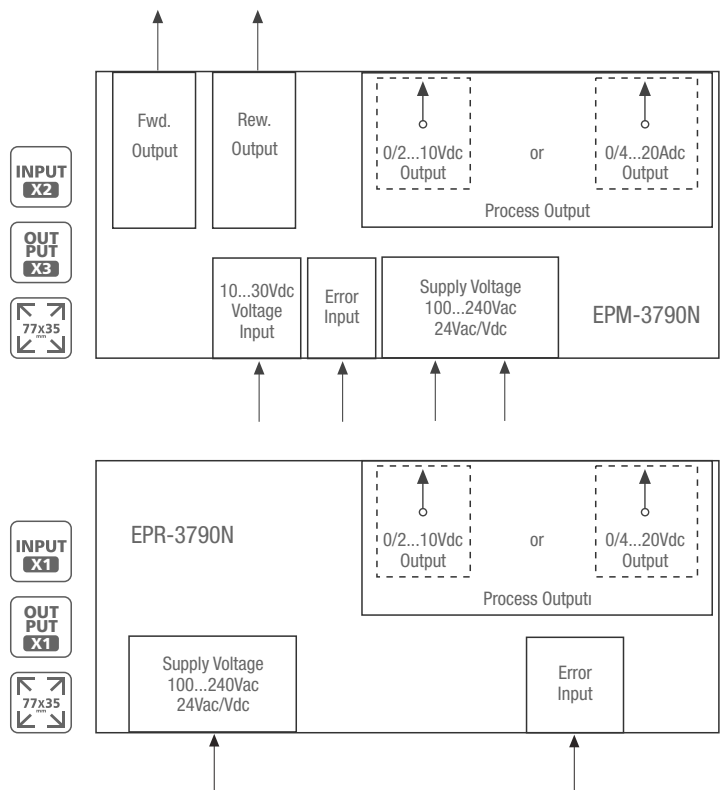
EPM-3790N (77x35x62,5mm)
EPR-3790N (77x35x62,5mm)

**A** Power Supply

2  24Vac/dc (±15%) 50/60Hz

3  24Vac (±15%) 50/60Hz

4  115Vac (±15%) 50/60Hz

5  230Vac (±15%) 50/60Hz

8  10 - 30Vdc

Output **E**

Current Output (0/4...20mA ) 4

Voltage Output (0/2...10V Maks. 10mA) 5

# 8 Channel Scanner

## Channel 8N - Channel 8AN

CE EAC

▸ 320 x 240 Pixel TFT LCD screen

▸ 3 Different alarm and pre-alarm types for each channel
(High, Low and Band Alarms)

▸ ModBus RTU communication protocol
(RS-232, RS-485 and Ethernet communication)

▸ Relay or (pnp "source") transistor output

## Specifications

8 Analogue inputs
8 PT-100 input with two wires
ON-OFF control
Sensor error detection
Adjustable offset
User defined channel labels
Display scan modes
Operating with Real Time Clock (RTC)
Data Logging to USB Flash Memory
Adjustable data logging time interval
Password protection for programming mode

## Technical Specification

**Accuracy:** ± 0,25% of full scale
**Line Compensation:** Maximum 10 Ohm
**Sensor Break Protection:** Upscale
**Sampling Time:** 400msecs

### Channel 8N

CH-8 CH-7 CH-6 CH-5 CH-4 CH-3 CH-2 CH-1
Temperature Sensor Inputs 8 X PT-100

Supply Voltage 100-240Vac, 24Vac/Vdc

USB 2.0 Data Record

Ethernet or RS-485 ModBus communication

Relay Output 10 X 5A@250ac

CH-1 Alarm Output | CH-2 Alarm Output | CH-3 Alarm Output | CH-4 Alarm Output | CH-5 Alarm Output | CH-6 Alarm Output | CH-7 Alarm Output | CH-8 Alarm Output | Genel Alarm Output | Genel Önalarm Output

C NO NO NO NO NO C NO NO NO NO NO

RS-232 ModBus communication

### Channel 8AN

ModBus RS-232 RS-485
INPUT X8
OUTPUT X10

CH-8 CH-7 CH-6 CH-5 CH-4 CH-3 CH-2 CH-1
Process Sensor Inputs 8 X 4-20mAdc/0-20mAdc or 0-10Vdc

Supply Voltage 100-240Vac, 24Vac/Vdc

USB 2.0 Data Record

Ethernet or RS-485 ModBus communication

Relay Output 10 X 5A@250ac

CH-1 Alarm Output | CH-2 Alarm Output | CH-3 Alarm Output | CH-4 Alarm Output | CH-5 Alarm Output | CH-6 Alarm Output | CH-7 Alarm Output | CH-8 Alarm Output | Genel Alarm Output | Genel Önalarm Output

C NO NO NO NO NO C NO NO NO NO NO

RS-232 ModBus communication

96x96

---

[ ] . A . B . 2 . D . E

**Channel 8N** (96x96x96 mm)
**Channel 8AN** (96x96x96 mm)

**A** Supply Voltage
1 100-240Vac 50/60 Hz (-15%; +10%)-6VA Universal
2 24Vac 50/60 Hz (-15%;+10%) 24Vdc (-15%; +10%)

**B** Outputs
R 10 Relay outputs with 2 common
for each NO contact 5A max. (5A@250V at resistive load)
for each Common contact 15A max (15A@250V at resistive load)

Optional Communication-2 **E**
None 0
USB (USB2.0 "for temperature data logging") U

Optional Communication-1 **D**
None 0
RS-485 (up to 115200 baudrate, "500VAC isolation") 4
ETHERNET (10Mbit/s, "1500VAC isolation") E

Standard Serial Communication **C**
USB (USB2.0 "for temperature data logging") 2

# 4 Zone PID Control

## PID QUADRO



CE EAC

▶ Auto-Tuning and Self-Tuning
(Automatic calculations of PID parameters)

▶ Data Logging to USB Flash Memory

▶ Soft-Start (Ramp action during power on) specification

▶ 3 Different alarm types for each channel
(High, Low and Band Alarms)

## Specifications

128 x 64 Graphical LCD display

- 4 Thermocouple (J, K, L, R or S type) sensor inputs
- Configurable P, PI, PD and PID control forms
- Relay or (pnp "source") transistor outputs

Sensor error detection

Adjustable temperature offset for each channel

User defined channel labels

Operating with Real Time Clock (RTC)

ModBus RTU communication protocol

(RS-232, RS-485 and Ethernet communication)

Adjustable data logging time interval
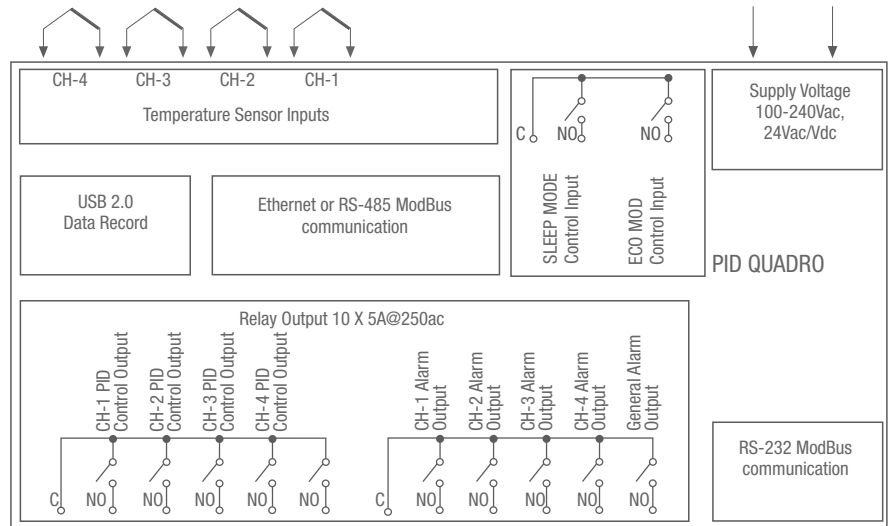
Password protection for programming mode

## Technical Specification

**Accuracy:** ± 0,25% of full scale

**Line Compensation:** Maximum 10 Ohm

**Sensor Break Protection:** Upscale

**Sampling Time:** 1400msecs



### PID QUADRO . A . B . C . D . E

PID QUADRO ( 96x96x96 mm )

**A** Supply Voltage

1 100-240Vac 50/60 Hz (-15%; +10%)-6VA Universal

2 24Vac 50/60 Hz (-15%;+10%) 24Vdc (-15%; +10%)

**B** Outputs

R 10 Relay outputs with 2 common
for each NO contact 5A max. (5A@250V at resistive load)
for each Common contact 15A max (15A@250V at resistive load)

Optional Communication-2 **E**

None 0

USB ( USB2.0 'for temperature data recording') U

Optional Communication-1 **D**

None 0

RS-485 (maximum 115200 baudrate, '500VAC isolation') 4

ETHERNET ( 10Mbit/s, '1500VAC isolation') E

Standard Serial Communication **C**

RS-232 (maximum 115200 baudrate, 'isolation') 2

10

# Temperature and Humidity Controller

## ESM-3723



▶ Temperature Sensor Input
(NTC, PTC, PT-100 and ProNem Mini PMI-P)

▶ Auto-Tune PID

▶ Humidity Sensor Input
(0/2..10V, 0/4..20mA or ProHumidity Mini PMI-D)

▶ 4 Digits Temperature and 4 Digit Humidity Display

## Specifications

Heating Control Output, Heating Alarm Output

Humidity Control Output, Humidity Alarm Output

PID or ON/OFF selectable temperature control

Set Value Boundaries

Alarm parameters and alarm status can be adjusted

according to the audible alert (internal buzzer functions for alarm conditions)

Password protection for programming section

## Technical Specification

**ESM-3723 Measurement range**

0°C...100°C (PTC, NTC, Pt-100),

0°C...100°C (PT100),

-20°C...80°C(ProNem Mini PMI-P)

**Accuracy:** Scale ±%1, **Sensor Break Protection:** Upscale

**Sampling Cycle:** 3 samples per second  **Conrol Form:** ON/OFF, PID

**Pronem Mini  Measurement range**

Measurement range (RH): 0...100 %RH

Measurement range (T): -20°C...+80°C

**Accuracy (RH):** +/-2 %RH (Typ)@23°C

**Accuracy (T):** +/-0,3°C  (Typ)@23°C

# Digital Ammeter

EDA-3700



EDA-3700

CE EAC

▶ AC, DC or True RMS measuring feature

▶ Remote access, data collecting and controlling with Modbus RTU

## Specifications

Easily changeable from front panel

5A or 60 mV AC, DC, AC/DC input

Programmable scale from 5A to 9999A

Alarm parameters

Password protection for programming mode

Having CE mark according to European Norms

## Technical Specification

**Physical properties:** 76 mm x 34.5 mm x71 mm Plastic for panel mounting protection. Panel section 71 x 29 mm.

**Protection Class :** NEMA 4X (Ip65 at front, Ip20 at rear)

**Accuracy:** Scale ±%1,

**Reading frequency :** According to parameter value, **Control Form:** ON/OFF

**Storage / Operating Temperature :**-30 °C to +80 °C / -20 °C to +70°C

**Storage / Operating Humidity :** 90 % max. (None condensing)

**Environmental Ratings :** Standard, indoor at an altitude of less than 2000 meters with none condensing humidity.

**Scale :** AC ve RMS 0 - 9999 / DC (-1999) - 9999

**Display :** 14 mm Red 4 digits LED Display



EDA-3700

RS - 485 ModBUS

AC ∼
DC ═
AC/DC ≋

Current Input 0-5A
Voltage Input 0-60mV

Relay Output
8A@250V
NO+NC

NC C NO

Supply Voltage
230Vac, 115Vac
24Vac, 10-30Vdc

ModBus RS-485 | INPUT X1 | OUTPUT X1 | 77x35



EDA-3700 . A . 09 . D . E / 00 . 00 / 0 . 0 . 0 . 0

EDA - 3700
(76x34,5x71 mm)

| | |
|---|---|
| Relay Output | E |
| Alarm Output None | 0 |
| Relay Output: (8A @ 250Vac) | 1 |
| Input | D |
| None | 0 |
| RS-485 (insulated) ModBus RTU | 1 |
| Input | BC |
| Analog Input Type | 09 |

| A | Supply Voltage | |
|---|---|---|
| 3 | 24Vac 50/60 Hz 1,5V | |
| 4 | 115Vac 50/60 Hz 1,5V | |
| 5 | 230Vac 50/60 Hz 1,5V | |
| 8 | 10 /30 Vdc | |

# Temperature Controllers
## Single SET Digital On/Off

### ESM-3710-N

**ESM3710-N**

°C °F  S P

With Buzzer

CE EAC

▶ Installing parameters using Prokey

▶ Password protection for programming section

▶ Remote acces, data collecting and controlling with Modbus RTU

▶ Adjustable internal buzzer according to sensor defect status

## Specifications

4 Digits Display

NTC Input or PTC Input or

J type thermocouple Input or Ktype thermocouple Input or

2-Wire PT-100 Input ori 2-Wire PT-1000 Input (Must be determined in order.)

Adjustable temperature offset

ON/OFF temperature control

Selectable heating or cooling function

Selection of operation with hysteresis

Adjustable temperature offset

Set value low limit and set value high limit boundaries

Operation selection of compressor operates continously, stops or operates periodically in case of sensor defect

Compressor protection delays

## Technical Specification

**Accuracy:** ±1%of scale

**Cold Junction Compensation:** Automatically ± 0.1°C/1°C

**Sensor Break Protection:** Upscale

**Sampling Cycle:** 3 samples per second

Temperature Measurement Input

"J'' Fe-CuNi, "K'' NiCr-Ni, Pt-100, Pt-1000 PTC veya NTC

NC   C   NO
Relay Output 16(8)A@250Vac

**or**

SSR Driver Output 20mA@17Vdc (maximum)

Process Output

Supply Voltage 230Vac,115Vac 24Vac/Vdc

**ESM-3710-N**

RS-485 or PROKEY

INPUT X1   OUTPUT X1   ModBus RS-485   77x35

| ESM-3710-N | . | A | . | BC | . | 0 | . | E | / | 00 | . | 00 | / | 1 | . | V | . | 0 | . | 0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**ESM-3710-N** (76x34,5x71 mm)

**A** Supply Voltage
- **2** 24Vac/dc (-15%;+10%) 50/60 Hz -1.5VA
- **3** 24Vac (±15%) 50/60 Hz -1.5VA
- **4** 115Vac (±15%) 50/60 Hz -1.5VA
- **5** 230Vac (±15%) 50/60 Hz -1.5VA
- **8** 10-30Vdc(±15%) 50/60 Hz

**BC** Input
- **05** J, Fe CuNi IEC584.1(ITS90)
- **10** K, NiCr Ni IEC584.1(ITS90)
- **11** Pt 100, (-50...400°C)
- **09** Pt 100, (-19.9...99.9°C)
- **12** PTC (-50....150°C)
- **14** Pt 1000, (-50...400°C)
- **13** Pt 1000, (-19.9...99.9°C)
- **18** NTC (-50...100°C)

**V**
- **1** PTC-M6L40.K1.5 (PTC Air Probe with 1.5 m silicon cable)
- **2** PTCS-M6L30.K1.5.1/8" (PTC Liquid Probe with 1.5 m silicon cable)
- **3** NTC-M5L20.K1.5 (NTC Probe, thermoplastic moulded with 1.5 m cable for cooling application)
- **4** NTC-M6L50.K1.5 (Metal protective tubular, 1.5 m wired NTC probe)

**E** Process Output
- **1** Relay Output: (16(8)A @ 250Vac)
- **2** SSR Driver Output (Maximum 20mA @ 17Vdc)
- **3** Relay Output (30(15)A@240Vac,1 NO (Only for NTC input type devices.)

# Temperature Controller

DIN RAIL Mounting Digital On/Off

## ESM-1510-N

CE EAC

▶ DIN RAIL Mounting

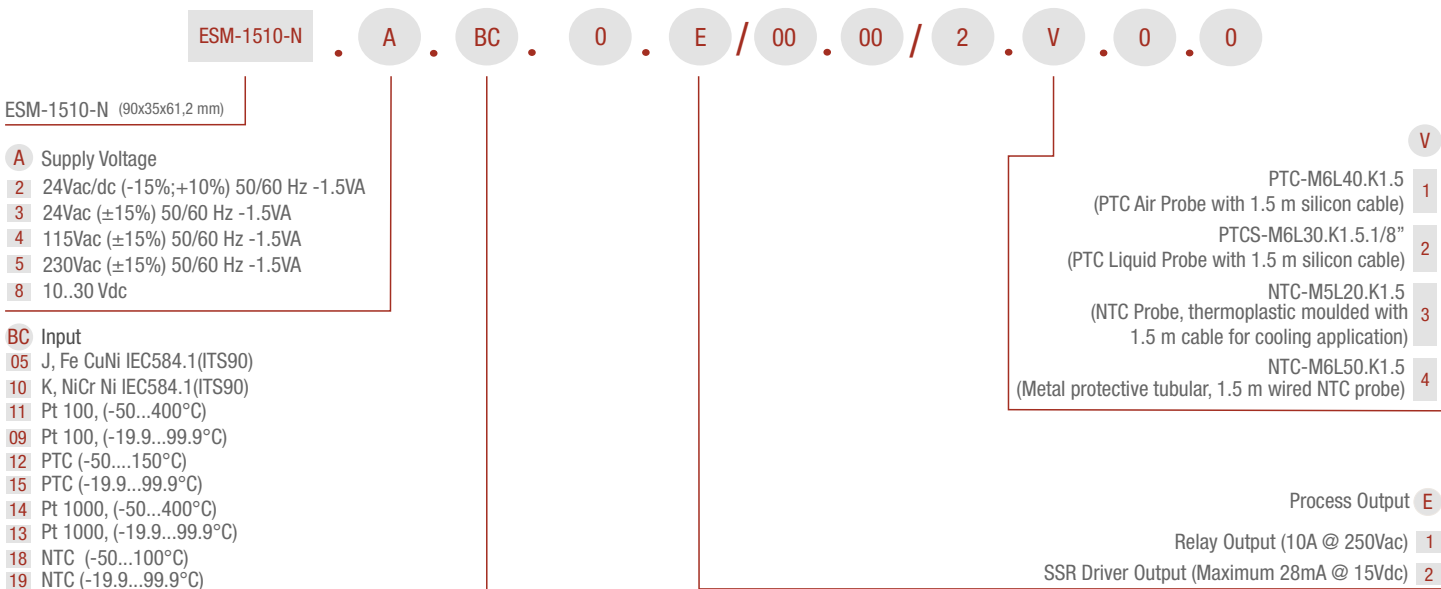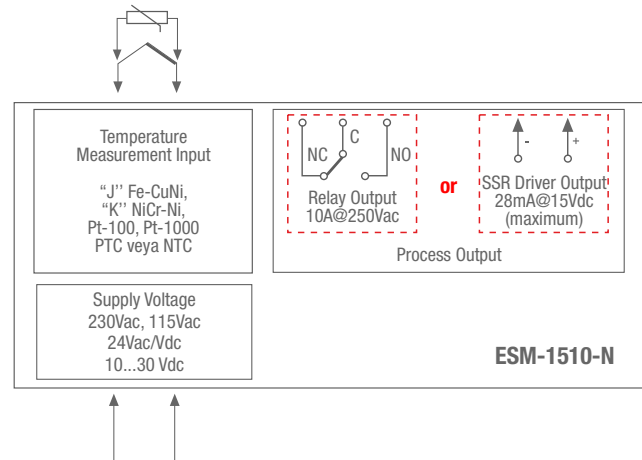▶ Heating / Cooling Applications

## Specifications

3 Digits display

PTC, NTC PT-100, PT-1000 thermoresesistances input types

Fe-Const (J), NiCr-Ni (K) thermocouples input types (Must be determined in order)

ON/OFF Temperature Control

Selectable Heating or Cooling Function

Adjustable Temperature Offset Value

Set Value Boundaries

Relay or SSR Driver Output

Operation selection of compressor operates continuously, stops or operates periodically in case of probe defect

Compressor Protection Times

Password Protection for Programming Section

## Technical Specification

**Accuracy:** ±1%of scale

**Cold Junction Compensation:** Automatically ± 0.1°C/1°C

**Sensor Break Protection:** Upscale

**Sampling Cycle:** 3 samples per second

Temperature Measurement Input

"J" Fe-CuNi, "K" NiCr-Ni, Pt-100, Pt-1000 PTC veya NTC

Relay Output 10A@250Vac

SSR Driver Output 28mA@15Vdc (maximum)

Process Output

Supply Voltage 230Vac, 115Vac 24Vac/Vdc 10...30 Vdc

**ESM-1510-N**

INPUT X1  OUTPUT X1  DIN RAIL

ESM-1510-N . A . BC . 0 . E / 00 . 00 / 2 . V . 0 . 0

ESM-1510-N (90x35x61,2 mm)

**A Supply Voltage**
- 2 24Vac/dc (-15%;+10%) 50/60 Hz -1.5VA
- 3 24Vac (±15%) 50/60 Hz -1.5VA
- 4 115Vac (±15%) 50/60 Hz -1.5VA
- 5 230Vac (±15%) 50/60 Hz -1.5VA
- 8 10..30 Vdc

**BC Input**
- 05 J, Fe CuNi IEC584.1(ITS90)
- 10 K, NiCr Ni IEC584.1(ITS90)
- 11 Pt 100, (-50...400°C)
- 09 Pt 100, (-19.9...99.9°C)
- 12 PTC (-50....150°C)
- 15 PTC (-19.9...99.9°C)
- 14 Pt 1000, (-50...400°C)
- 13 Pt 1000, (-19.9...99.9°C)
- 18 NTC (-50...100°C)
- 19 NTC (-19.9...99.9°C)

**V**
- 1 PTC-M6L40.K1.5 (PTC Air Probe with 1.5 m silicon cable)
- 2 PTCS-M6L30.K1.5.1/8" (PTC Liquid Probe with 1.5 m silicon cable)
- 3 NTC-M5L20.K1.5 (NTC Probe, thermoplastic moulded with 1.5 m cable for cooling application)
- 4 NTC-M6L50.K1.5 (Metal protective tubular, 1.5 m wired NTC probe)

**Process Output E**
- 1 Relay Output (10A @ 250Vac)
- 2 SSR Driver Output (Maximum 28mA @ 15Vdc)

# Heating Controller
## Single SET ON/OFF

### ESM-3711-HN

With Buzzer

CE EHC

▶ Remote access, data collecting and controlling wiht Modbus RTU

▶ Installing parameters using Prokey

▶ User can select to start cooking time (Timer) when temperature reaches to the set value

▶ Adjustable temperature offset

▶ Functional Internal Buzzer

▶ ON / OFF temperature control

## Specifications

4 Digits display

User can select to start Cooking Time when Temperature reaches to the Set Value

PTC, NTC, PT-100, PT-1000 thermoresistances input types

Fe-Const (J), NiCr-Ni (K) thermocouples input types

Temperature Control Output and Alarm Output

Relay or SSR Driver Output

Adjustable Cooking Time from Front Panel

Digital Input (Start/Stop Input for Cooking Time)

Temperature Control According to the Cooking Time

Adjustable Internal Buzzer According to Cooking Time,

Probe Defect and Alarm Status

## Technical Specification

**Accuracy:** ±1%of scale

**Cold Junction Compensation:** Automatically ± 0.1°C/1°C

**Sensor Break Protection:** Upscale

**Sampling Cycle:** 3 samples per second

| Temperature Measurement Input "J'' Fe-CuNi, "K'' NiCr-Ni, Pt-100, Pt-1000 PTC veya NTC | NC ⚬ C ⚬ NO  Relay Output 16(8)A@250Vac | or | - + SSR Driver Output 20mA@17Vdc (maximum) |
|---|---|---|---|
| | | Process Output | |

**ESM-3711-HN**

| Supply Voltage 230Vac, 115Vac 24Vac/Vdc 10 - 30 Vdc | Cooking Time Start / Stop Input |
|---|---|

Door switch

INPUT X1  OUTPUT X1  🌡+  ⏱  77x35

## Ordering Information
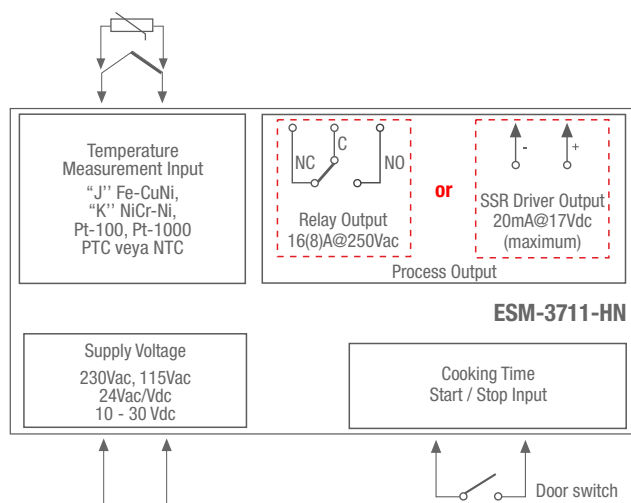
ESM-3711-HN . A . BC . 0 . E / 00 . 00 /. 1 . V . 0 . 0

ESM-3711-HN
(76x34,5X71 mm)

**A — Supply Voltage**
- 2  24Vac/dc (±15%) 50/60 Hz
- 3  24Vac (±15%) 50/60 Hz
- 4  115Vac (±15%) 50/60 Hz
- 5  230Vac (±15%) 50/60 Hz
- 8  10...30Vdc

**BC — Input**
- 05  J, Fe CuNi IEC584.1(ITS90)
- 10  K, NiCr Ni IEC584.1(ITS90)
- 11  Pt 100, (-50...400°C)
- 09  Pt 100, (-19.9...99.9°C)
- 12  PTC (-50....150°C)
- 14  Pt 1000, (-50...400°C)
- 13  Pt 1000, (-19.9...99.9°C)
- 18  NTC  (-50...100°C)

**V**
- 1  PTC-M6L40.K1.5 (PTC Air Probe with 1.5 m silicon cable)
- 2  PTCS-M6L30.K1.5.1/8" (PTC Liquid Probe with 1.5 m silicon cable)
- 3  NTC-M5L20.K1.5 (NTC Probe, thermoplastic moulded with 1.5 m cable for cooling application)
- 4  NTC-M6L50.K1.5 (Metal protective tubular, 1.5 m wired NTC probe)

**E — Process Output**
- 1  Relay Output: (16(8)A @ 250Vac)
- 2  SSR Driver Output: (Max.20mA, Max.17Vdc)

# Cooling Controller Devices

Single & Duel SET

## ESM-3711-CN   ESM-3712-CN

With Buzzer

CE EAC

- ▶ 3 Output for compressor, defrost and fan controls
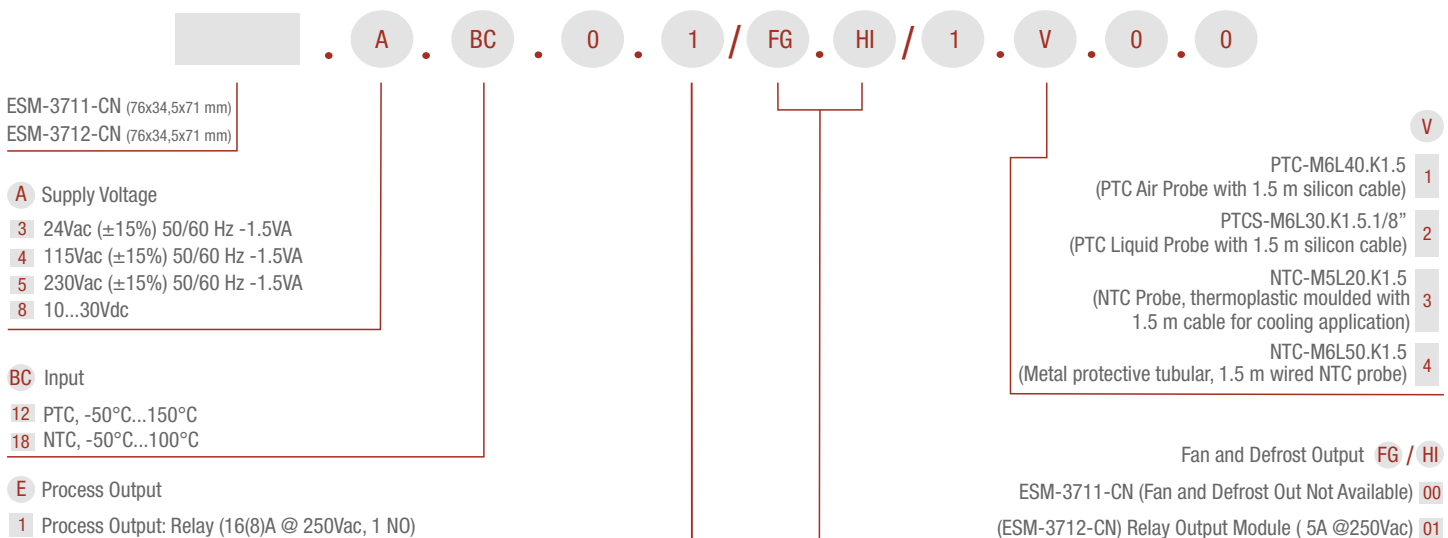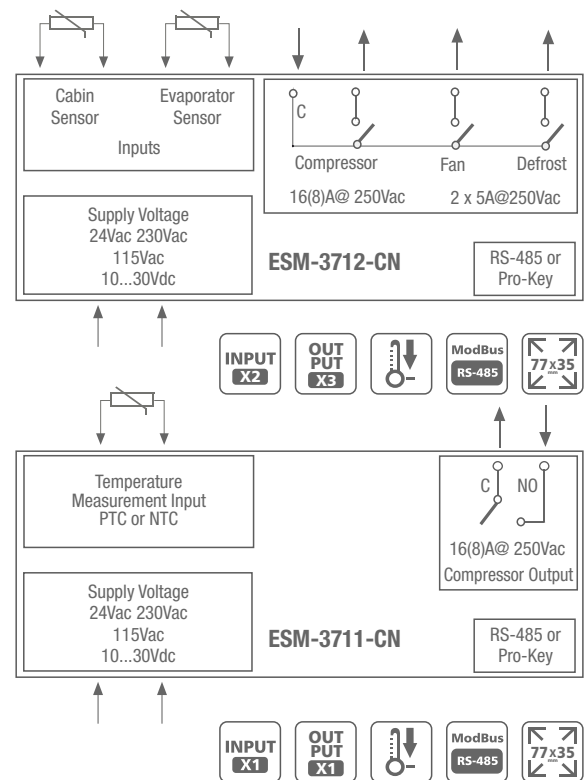- ▶ Separately adjustable 2 offset value for cabinet and evaporator sensor

- ▶ Operation selection of compressor operate continously, stops or operates periodically in case of cabinet probe defect
- ▶ Fan can be operated depending on compressor and defrost

## Specifications

Cooling Application

NTC Input or PTC Input (Must be determined in order.)

ON/OFF Control

Adjustable °C and°F

Set value boundaries

2 sensor input for cabinet and evaporator

Configurable digital input

Selectable defrost function (hot gas or electric)

Adjustable defrost time from front panel

Fan can be operated depending on evaporator temperature or (cabinet-evaporator) temperature

Defrost time and/or manuel defrost and/or temperature set value protection

Installing parameters using Prokey

Remote access, data collecting and controlling with ModBus RTU

Password protection for programming mode

## Technical Specification

**Accuracy:** ±1%of scale

**Sensor Break Protection:** Upscale

**Sampling Cycle:** 3 samples per second

Cabin Sensor    Evaporator Sensor

Inputs

Compressor    Fan    Defrost

16(8)A@ 250Vac    2 x 5A@250Vac

**ESM-3712-CN**

RS-485 or Pro-Key

Supply Voltage
24Vac 230Vac
115Vac
10...30Vdc

INPUT X2    OUTPUT X3    ModBus RS-485    77x35

Temperature Measurement Input PTC or NTC

C    NO

16(8)A@ 250Vac
Compressor Output

Supply Voltage
24Vac 230Vac
115Vac
10...30Vdc

**ESM-3711-CN**

RS-485 or Pro-Key

INPUT X1    OUTPUT X1    ModBus RS-485    77x35

. A . BC . 0 . 1 / FG . HI / 1 . V . 0 . 0

ESM-3711-CN (76x34,5x71 mm)
ESM-3712-CN (76x34,5x71 mm)

**A** Supply Voltage

| 3 | 24Vac (±15%) 50/60 Hz -1.5VA |
| 4 | 115Vac (±15%) 50/60 Hz -1.5VA |
| 5 | 230Vac (±15%) 50/60 Hz -1.5VA |
| 8 | 10...30Vdc |

**BC** Input

| 12 | PTC, -50°C...150°C |
| 18 | NTC, -50°C...100°C |

**E** Process Output

| 1 | Process Output: Relay (16(8)A @ 250Vac, 1 NO) |

**V**

| PTC-M6L40.K1.5 (PTC Air Probe with 1.5 m silicon cable) | 1 |
| PTCS-M6L30.K1.5.1/8" (PTC Liquid Probe with 1.5 m silicon cable) | 2 |
| NTC-M5L20.K1.5 (NTC Probe, thermoplastic moulded with 1.5 m cable for cooling application) | 3 |
| NTC-M6L50.K1.5 (Metal protective tubular, 1.5 m wired NTC probe) | 4 |

Fan and Defrost Output **FG / HI**

| ESM-3711-CN (Fan and Defrost Out Not Available) | 00 |
| (ESM-3712-CN) Relay Output Module ( 5A @250Vac) | 01 |

# Temperature Controller

Dual SET On/Off Heating and Cooling Controller

## ESM-3712-HCN

▶ Installing parameters using Prokey

▶ 2 Output for compressor and alarm controls

▶ Remote access, data collecting and controlling with Modbus RTU

▶ Process Set value and Alarm Set value low limit and set value high limit boundaries

## Specifications

4 Digits Display

NTC Inputor PTC Input (Must be determined in order)

ON/OFF temperature control

Selectable heating or cooling function

Selection of operation with hysteresis

Adjustable temperature offset

Alarm parameters

Operation selection of compressor operates continously,

stops or operates periodically in case of sensor defect

Compressor protection delays

Password protection for programming section

Adjustable Alarm Set Value from front panel

Adjustable internal buzzer according to Sensor prob defect and Alarm status

## Technical Specification

**Accuracy:** ±1%of scale

**Cold Junction Compensation:** Automatically ± 0.1°C/1°C

**Sensor Break Protection:** Upscale

**Sampling Cycle:** 3 samples per second

Temperature Measurement Input

"J'' Fe-CuNi,
"K'' NiCr-Ni,
Pt-100, Pt-1000
PTC veya NTC

**ESM-3712-HCN**

Supply Voltage
24Vac/Vdc
100...240Vac

RS-485
or
PROKEY

Process Output 16(8)A@250Vac

Alarm Output 5A@250Vac

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ModBus RS-485 | INPUT X1 | OUT PUT X2 | | | | | 77x35 |

## Ordering Information
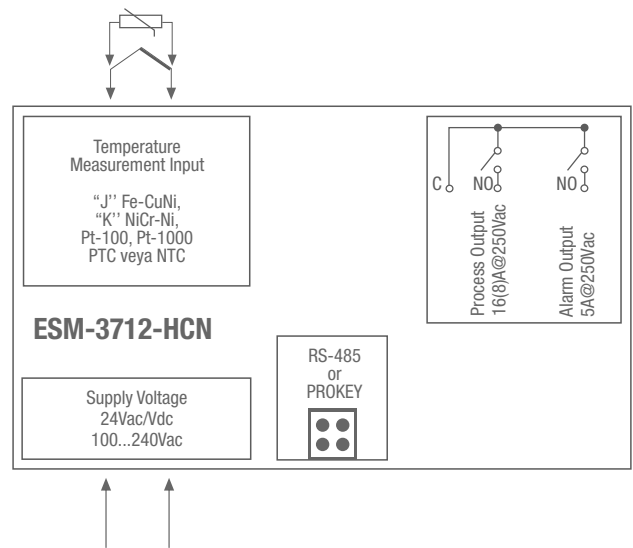
ESM-3712-HCN . A . BC . 0 . 1 / 1 . 00 / 1 . V . 0 . 0

ESM-3712-HCN
(76x34,5x71 mm)

**A** Supply Voltage
- 2 — 24Vac/dc (±15%) 50/60 Hz
- 3 — 24Vac (±15%) 50/60 Hz
- 4 — 115Vac (±15%) 50/60 Hz
- 5 — 230Vac (±15%) 50/60 Hz
- 8 — 10...30Vdc

**BC** Input
- 05 — J, Fe CuNi IEC584.1(ITS90)
- 10 — K, NiCr Ni IEC584.1(ITS90)
- 11 — Pt 100, (-50...400°C)
- 9 — Pt 100, (-19.9...99.9°C)
- 12 — PTC (-50...150°C)
- 18 — NTC (-50...100°C)
- 14 — Pt 1000,(-50...400°C)
- 13 — Pt 1000, (-19.9...99.9°C)

**V**
- 1 — PTC-M6L40.K1.5 (PTC Air Probe with 1.5 m silicon cable)
- 2 — PTCS-M6L30.K1.5.1/8" (PTC Liquid Probe with 1.5 m silicon cable)
- 3 — NTC-M5L20.K1.5 (NTC Probe, thermoplastic moulded with 1.5 m cable for cooling application)
- 4 — NTC-M6L50.K1.5 (Metal protective tubular, 1.5 m wired NTC probe)

Alarm Output **FG**
- 1 — (5A @ 250Vac,1 NO)

Process Output **E**
- 1 — Relay (16(8)A @ 250Vac, 1 NO)

17

# Temperature Controllers
## Single & Dual ON/OFF

**ESM-4410   ESM-7710   ESM-9910**

CE cRUus EAC

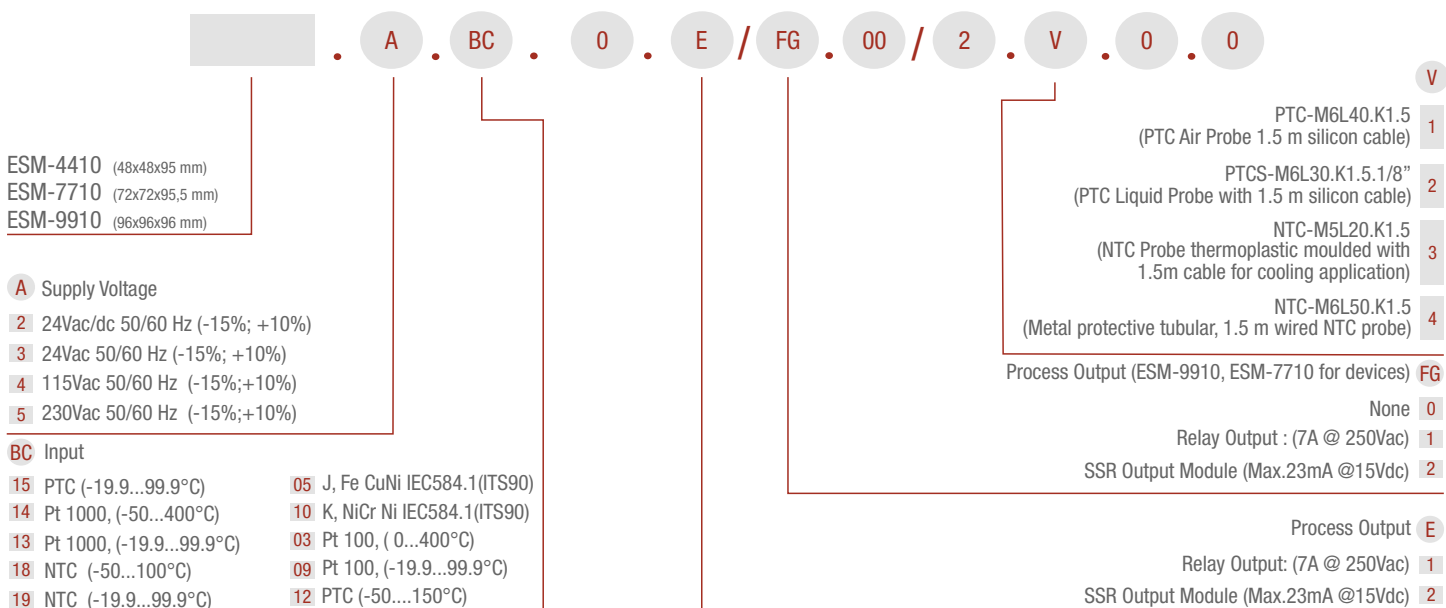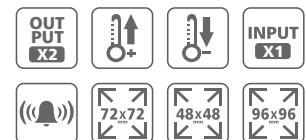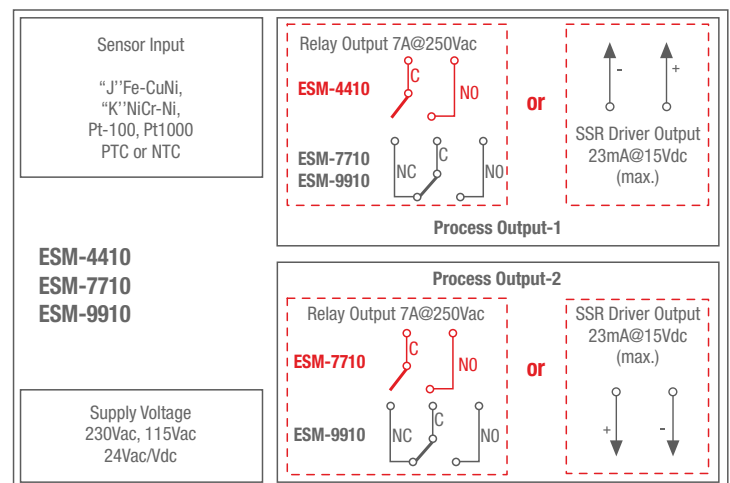ON/OFF Control Form

Selectable Heating and Cooling Function
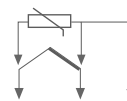
## Specifications

PTC, NTC, PT-100, PT-1000 thermoresesistances input types

Fe-Const (J), NiCr-Ni (K) thermocouples input types (Must be determined in order)

Operating Type Selection with Hysteresis

Adjustment of Temperature Offset Value

Minimum Pulling Time Adjustment for Control Outputs

Password Protection for Programming Section

Sensor Input

"J''Fe-CuNi,
"K''NiCr-Ni,
Pt-100, Pt1000
PTC or NTC

Relay Output 7A@250Vac

ESM-4410      C       NO

ESM-7710      NC   C
ESM-9910           NO

or

SSR Driver Output
23mA@15Vdc
(max.)

Process Output-1

**ESM-4410**
**ESM-7710**
**ESM-9910**

Process Output-2

Relay Output 7A@250Vac

ESM-7710      C       NO

ESM-9910      NC   C
                  NO

or

SSR Driver Output
23mA@15Vdc
(max.)

Supply Voltage
230Vac, 115Vac
24Vac/Vdc

## Technical Specification

**Accuracy:** ±1%of scale

**Cold Junction Compensation:** Automatically ± 0.1°C/1°C

**Sensor Break Protection:** Upscale

**Sampling Cycle:** 3 samples per second

OUTPUT X2 | INPUT X1 | 72x72 | 48x48 | 96x96

| | A | . | BC | . | 0 | . | E | / | FG | 00 | / | 2 | . | V | . | 0 | . | 0 |

ESM-4410 (48x48x95 mm)
ESM-7710 (72x72x95,5 mm)
ESM-9910 (96x96x96 mm)

**A  Supply Voltage**

| 2 | 24Vac/dc 50/60 Hz (-15%; +10%) |
| 3 | 24Vac 50/60 Hz (-15%; +10%) |
| 4 | 115Vac 50/60 Hz (-15%;+10%) |
| 5 | 230Vac 50/60 Hz (-15%;+10%) |

**BC  Input**

| 15 | PTC (-19.9...99.9°C) | 05 | J, Fe CuNi IEC584.1(ITS90) |
| 14 | Pt 1000, (-50...400°C) | 10 | K, NiCr Ni IEC584.1(ITS90) |
| 13 | Pt 1000, (-19.9...99.9°C) | 03 | Pt 100, ( 0...400°C) |
| 18 | NTC (-50...100°C) | 09 | Pt 100, (-19.9...99.9°C) |
| 19 | NTC (-19.9...99.9°C) | 12 | PTC (-50....150°C) |

**V**

| 1 | PTC-M6L40.K1.5 (PTC Air Probe 1.5 m silicon cable) |
| 2 | PTCS-M6L30.K1.5.1/8" (PTC Liquid Probe with 1.5 m silicon cable) |
| 3 | NTC-M5L20.K1.5 (NTC Probe thermoplastic moulded with 1.5m cable for cooling application) |
| 4 | NTC-M6L50.K1.5 (Metal protective tubular, 1.5 m wired NTC probe) |

Process Output (ESM-9910, ESM-7710 for devices) **FG**

| 0 | None |
| 1 | Relay Output : (7A @ 250Vac) |
| 2 | SSR Output Module (Max.23mA @15Vdc) |

Process Output **E**

| 1 | Relay Output: (7A @ 250Vac) |
| 2 | SSR Output Module (Max.23mA @15Vdc) |

# Temperature Controllers
## Dual SET PID

### ESM-3720

**With Buzzer**

CE EAC

▶ Remote acces, data collecting and controlling with Modbus RTU

▶ Installing parameters using Prokey

▶ PID or ON/OFF selectable temperature control

▶ Password protection for programming section

▶ Having CE mark according to European Norms

▶ Adjustable internal buzzer according to sensor defect status

## Specifications

4 Digits Display

NTC Input or PTC Input or

J type thermocouple Input or Ktype thermocouple Input or

2-Wire PT-100 Input ori 2-Wire PT-1000 Input (Must be determined in order.)

Adjustable temperature offset

Selection of operation with hysteresis

Adjustable temperature offset

Set value low limit and set value high limit boundaries

Operation selection of compressor operates continously,

stops or operates periodically in case of sensor defect

Compressor protection delays

## Technical Specification

**Accuracy:** ±1%of scale

**Cold Junction Compensation:** Automatically ± 0.1°C/1°C

**Sensor Break Protection:** Upscale

**Sampling Cycle:** 3 samples per second



| | Temperature Measurement Input "J" Fe-CuNi, "K" NiCr-Ni, Pt-100, Pt-1000 PTC veya NTC | C NO Relay Output 16(8)A@250Vac **or** SSR Sürücü Çıkışı 20mA@17Vdc (maksimum) Process Output |
|---|---|---|
| **ESM-3720** | Supply Voltage 230Vac, 115Vac, 24Vac/Vdc 10 - 30 Vdc | Alarm Çıkışı Relay Output 5A@250Vac NO C | RS-485 or PROKEY |

INPUT X1  OUTPUT X2  🌡↓  🌡↑  77x35  ModBus RS-485



ESM-3720 . A . BC . 0 . E / 01 . 00 / 1 . V . 0 . 0

**ESM-3720** (76x34,5x71mm)

**A Supply Voltage**
- **2** 24Vac/dc (±15%) 50/60 Hz
- **3** 24Vac (±15%) 50/60 Hz
- **4** 115Vac (±15%) 50/60 Hz
- **5** 230Vac (±15%) 50/60 Hz
- **8** 10-30Vdc

**BC Input**
- **05** J, Fe CuNi IEC584.1(ITS90)
- **10** K, NiCr Ni IEC584.1(ITS90)
- **11** Pt 100, (-50...400°C)
- **09** Pt 100, (-19.9...99.9°C)
- **12** PTC (-50....150°C)
- **14** Pt 1000, (-50...400°C)
- **13** Pt 1000, (-19.9...99.9°C)
- **18** NTC (-50...100°C)

**V**
- **1** PTC-M6L40.K1.5 (PTC Air Probe with 1.5 m silicon cable)
- **2** PTCS-M6L30.K1.5.1/8" (PTC Liquid Probe with 1.5 m silicon cable)
- **3** NTC-M5L20.K1.5 (NTC Probe, thermoplastic moulded with 1.5 m cable for cooling application)
- **4** NTC-M6L50.K1.5 (Metal protective tubular, 1.5 m wired NTC probe)

**Alarm Output FG**
- **01** 5A@250 Vac, 1 NO

**Process Output E**
- **1** Relay Output: (16(8)A @ 250Vac)
- **2** SSR Driver output (Maximum 20mA @ 17Vdc)

# PID Temperature Controllers

| ESM-4420 | ESM-4920 |
|----------|----------|
| ESM-7720 | ESM-9420 | ESM-9920 |

CE EAC

▶ Universal process input (TC,RTD)

▶ Self-Tune (Step Response Tuning)
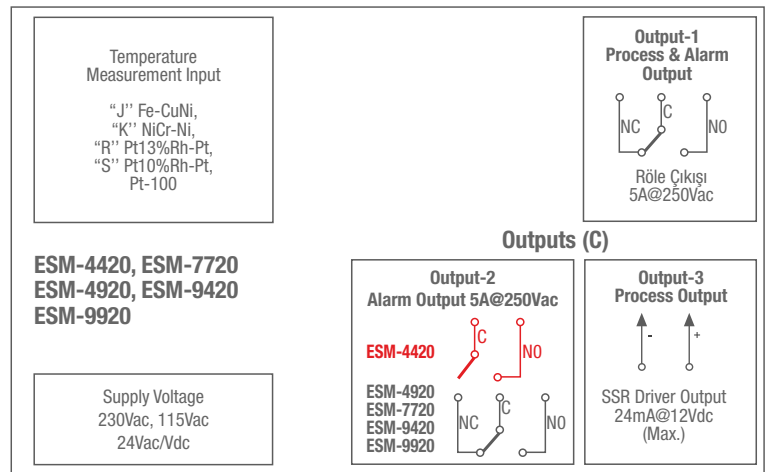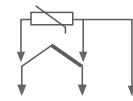automatic adaptation of the coefficients to the system

▶ 2 Relays and 1 SSR drive output

▶ Soft Start Output For Resistance Durability

## Specifications

4 Digits process (PV) and 4 Digits set value (SV) display
Configurable ON/OFF, P, PI, PD, and PID control forms
Programmable Heating or Cooling Functions for Control Output
Alarm Functions for Alarm Output
SET Value Limitation For System Protection
Sensor Break Protection

## Technical Specification

**Accuracy:** ±0.25%of full scale for thermocouple, thermoresistance
**Cold Junction Compensation:** Automatically ± 0.1°C/1°C
**Line Compensation:** Maximum 10 Ohm
**Sensor Break Protection:** Upscale
**Sampling Cycle:** 3 samples per second
**Input Filter:** 1.0 second

### Temperature Measurement Input

"J'' Fe-CuNi,
"K'' NiCr-Ni,
"R'' Pt13%Rh-Pt,
"S'' Pt10%Rh-Pt,
Pt-100

ESM-4420, ESM-7720
ESM-4920, ESM-9420
ESM-9920

Supply Voltage
230Vac, 115Vac
24Vac/Vdc

### Output-1 Process & Alarm Output

NC  C  NO

Röle Çıkışı
5A@250Vac

### Outputs (C)

**Output-2 Alarm Output 5A@250Vac**

ESM-4420
ESM-4920
ESM-7720
ESM-9420
ESM-9920

NC  C  NO

**Output-3 Process Output**

SSR Driver Output
24mA@12Vdc
(Max.)

INPUT X1  OUTPUT X3  PID CONTROL  ((🔔))

96x48  48x96  72x72  48x48  96x96

---

A  .  20  .  0  .  E / 01  .  02 / 0  .  0  .  0  .  0

ESM-4420 (48x48x95 mm)
ESM-7720 (72x72x95,5 mm)
ESM-4920 (96x48x94,5 mm)
ESM-9420 (48x96x94,5 mm)
ESM-9920 (96x96x96 mm)

**A  Supply Voltage**
2  24Vac/Vdc  (-15%; +10%)50/60 Hz
3  24Vac (-15%; +10%)50/60 Hz
4  115Vac (-15%; +10%)50/60 Hz
5  230Vac (-15%; +10%)50/60 Hz

**BC  Input**
Universal Input: TC, RTD
Thermocouple (TC): L(DIN 43710), J, K, B, E and
20  N(IEC584.1) (ITS90), C(ITS90)
Thermoresistance (RTD): PT-100, (IEC 751) (ITS90)

Output-3 **HI**
SSR Driver Output (max.24mA @ 12Vdc) **02**

Output-2 **FG**
Alarm Output :Relay (5A @250Vac) **01**

Output-1 **E**
Standard Relay Output: (5A @ 250Vac) **1**

# PID Temperature Controllers

## ESD-9950-N

- Adjustable temperature offset
- Programmable control and alarm functions for control outputs
- Programmable ON-OFF, P, PI, PD, PID control forms
- With Auto Tune / Self Tune operation, the PID coefficients adaptation to the system

## Specifications

4 Digits display
J type Thermocouple Input or
K type Thermocouple Input or
R type Thermocouple Input or
S type Thermocouple Input or
2 or 3 wire PT 100 Input
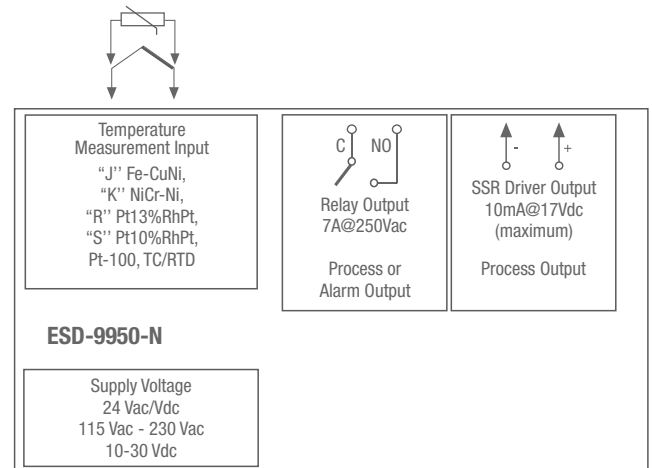
## Technical Specification

**Accuracy:** ±25%of scale
**Cold Junction Compensation:** Automatically ± 0.1°C/1°C
**Sensor Break Protection:** Upscale
**Sampling Cycle:** 10 samples per second

| Temperature Measurement Input "J" Fe-CuNi, "K" NiCr-Ni, "R" Pt13%RhPt, "S" Pt10%RhPt, Pt-100, TC/RTD | Relay Output 7A@250Vac Process or Alarm Output | SSR Driver Output 10mA@17Vdc (maximum) Process Output |
|---|---|---|

**ESD-9950-N**

| Supply Voltage 24 Vac/Vdc 115 Vac - 230 Vac 10-30 Vdc |
|---|

ESD-9950-N . A . 20 . 0 . 1/02 . 00/ . 0 . 0 . 0 . 0

ESD-9950-N (96x96x100 mm)

**A Supply Voltage**
- 2  24Vac/dc (±15%) 50/60 Hz
- 3  24Vac (±15%) 50/60 Hz
- 4  115Vac (±15%) 50/60 Hz
- 5  230Vac (±15%) 50/60 Hz
- 8  10 - 30 Vdc

**BC Input**
- 20  Universal Input: TC, RTD
  Thermocouple (TC): J, K, R, S and N(IEC584.1) (ITS90), C(ITS90)
  Thermoresistance (RTD): PT-100, (IEC 751) (ITS90)

Process Output **FG**
SSR Driver Output (Max. 10mA,Max.17Vdc) **02**

Process or Alarm Output **E**
Relay Output (7A @ 250Vac) (NO,NC,C) **1**

21

**Order Code**

```
A  BC  D  E  /  FG  HI  /  U  V  W  Z
[ ][  ] 0 [ ] / [ ] [ ] / 1 [ ] 0  0
```

| | | ESM-3710-N | ESM-1510-N | ESM-3711-HN | ESM-3711-CN | ESM-3712-CN | ESM-3712-HCN | ESM-4410 | ESM-7710 | ESM-9910 | ESM-3720 | ESM-4420 | ESM-9420 | ESM-7720 | ESM-9420 | ESM-9920 | ESD-9950-N |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **A** | **Supply Voltage** | | | | | | | | | | | | | | | | |
| 2 | 24Vac/Vdc (-15%, +10%) 50/60Hz | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| 3 | 24Vac (-15%, -15%) 50/60Hz | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| 4 | 115Vac (-15%, -15%) 50/60Hz | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| 5 | 230Vac (-15%, -15%) 50/60Hz | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| 8 | 10 - 30 Vdc | + | + | + | + | + | + | - | - | - | + | - | - | - | - | - | + |
| **BC** | **Input Type** | | | | | | | | | | | | | | | | |
| 20 | Universal (TC or RTD) | - | - | - | - | - | - | - | - | - | + | + | + | + | + | + | + |
| 05 | J, Fe-CuNi, 0...800 ºC | + | + | + | - | - | - | + | + | + | - | - | - | - | - | - | - |
| 10 | K, NiCr-Ni, 0...999 ºC | + | + | + | - | - | - | + | + | + | - | - | - | - | - | - | - |
| 03 | Pt-100, 0...400 ºC | - | - | - | - | - | - | + | + | + | - | - | - | - | - | - | - |
| 11 | Pt-100 -50...400 ºC | + | + | + | - | - | - | + | - | - | - | - | - | - | - | - | - |
| 09 | Pt-100, -19.9...99.9 ºC | + | + | + | - | - | - | + | + | + | - | - | - | - | - | - | - |
| 12 | PTC, -50...150 ºC | + | + | + | + | + | + | + | + | + | - | - | - | - | - | - | - |
| 15 | PTC, -19.9...99.9 ºC | - | + | - | - | - | - | + | + | + | - | - | - | - | - | - | - |
| 14 | Pt-1000, -50...400 ºC | + | + | + | - | - | - | + | + | + | - | - | - | - | - | - | - |
| 13 | Pt-1000, -19.9...99.9 ºC | + | + | + | - | - | - | + | + | + | - | - | - | - | - | - | - |
| 18 | NTC, -50...100 ºC | + | + | + | + | + | + | + | + | + | - | - | - | - | - | - | - |
| 19 | NTC, -19.9...99.9 ºC | - | + | - | - | - | - | + | + | + | - | - | - | - | - | - | - |
| **E** | **Output 1** | | | | | | | | | | | | | | | | |
| 1 | Relay Output | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| 2 | SSR Driver Output (max. 20mA@12Vdc) | + | + | + | - | - | - | + | + | + | + | - | - | - | - | - | - |
| 3 | Relay Output (30(15)A@240Vac) | + | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **FG** | **Output 2** | | | | | | | | | | | | | | | | |
| 01 | Relay Output | - | - | - | - | + | + | - | + | + | + | + | + | + | + | + | - |
| 02 | SSR Driver Output (max. 20mA@12Vdc) | - | - | - | - | - | - | - | + | + | - | - | - | - | - | - | + |
| **HI** | **Output 3** | | | | | | | | | | | | | | | | |
| 02 | SSR Driver Output (max. 20mA@12Vdc) | - | - | - | - | - | - | - | - | - | - | + | + | + | + | + | - |
| **V** | **PTC and NTC Temperature Sensor Selections** | | | | | | | | | | | | | | | | |
| 0 | Without Sensor | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| 1 | PTC-M6L40.K1,5 — PTC Air probe, 1,5 m silicon cable | + | + | + | + | + | + | + | + | + | + | - | - | - | - | - | - |
| 2 | PTCS-M6L30.K1,5.1/8'' — PTC Liquid probe with, 1,5 m silicon cable, 1/8'' fittingnut | + | + | + | + | + | + | + | + | + | + | - | - | - | - | - | - |
| 3 | NTC-M5L20.K1,5 — Thermoplastic covering for cooling application 1,5 m cable NTC probe | + | + | + | + | + | + | + | + | + | + | - | - | - | - | - | - |
| **Specifications** | | | | | | | | | | | | | | | | | |
| | Dimension (mm) | 77x35 | DIN Rail | 77x35 | 77x35 | 77x35 | 77x35 | 48x48 | 72x72 | 96x96 | 77x35 | 48x48 | 96x48 | 72x72 | 48x96 | 96x96 | 96x96 |
| | Password protection for programming mode | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| | Set value boundaries | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| | Adjustable temperature offset | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| | ON/OFF Temperature control | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| | Adjustable P, PD, PI ve PID Control forms | - | - | - | - | - | - | - | - | - | + | + | + | + | + | + | + |
| | Adjustable Compressor delay times | + | + | - | - | + | + | - | - | - | - | - | - | - | - | - | - |
| | Alarm functions for alarm output | - | - | - | - | - | - | + | - | - | - | + | + | + | + | + | - |
| | Adaptation of PID coefficients to the system with Self-Tune operation | - | - | - | - | - | - | - | - | - | + | + | + | + | + | + | + |
| | Universal Thermocouple and thermoresistances process input | - | - | - | - | - | - | - | - | - | + | + | + | + | + | + | + |
| | Programmable Heating or Cooling functions for control outputs | + | + | - | - | - | - | + | + | + | + | + | + | + | + | + | + |
| | Adjustable hysteresis value | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| | Adjustable re-activation time for control outputs | + | + | - | - | - | - | + | + | + | + | - | - | - | - | - | - |
| | Functional Internal Buzzer | + | + | + | + | + | + | - | - | - | + | - | - | - | - | - | - |
| | Installing Parameters vie Prokey | + | + | + | + | + | + | - | - | - | + | - | - | - | - | - | - |
| | Data collecting & controlling with Modbus RTU | + | + | + | + | + | + | - | - | - | + | - | - | - | - | - | - |

**EMKO**

| Order Code | | Eco LITE | Eco PID | Eco HR |
|---|---|---|---|---|
| A   Dimension | | | | |
| 4 | 48x48mm | + | + | + |
| B   Supply Voltage | | | | |
| 1 | 100-240Vac (±%15) 50/60Hz | + | + | + |
| 3 | 115Vac (-15%, +10%) 50/60Hz | + | + | + |
| 5 | 230Vac (-15%, +10%) 50/60Hz | + | + | + |
| 6 | 10-30Vdc | + | + | + |
| C   Output-1 | | | | |
| 0R | None | − | − | + |
| 1R | 1xRelay Output (NO+C) 5A@250Vac | + | + | + |
| 2R | 2xRelay Output (NO+C) 5A@250Vac | + | + | + |
| D   Output-2 | | | | |
| S | SSR driver output (Maks. 10mA, 12Vdc) | − | + | + |
| E   Communication | | | | |
| 0 | Without Communication | + | + | + |
| 485 | RS-485 ModBus | − | + | + |
| DI | Digital Input (220Vac) for secondary set value | − | − | + |
| Specifications | | | | |
| Universal Thermocouples (TC) & Thermoresistances (RTD) input | | + | + | + |
| ON-OFF control form | | + | + | + |
| P, PI, PID, control form | | − | + | + |
| Adaptation of PID coefficients to the system with Self-Tune and Auto-Tune operation | | − | + | + |
| Selectable heating and cooling function | | + | + | + |
| Adjustable temperature offset value | | + | + | + |
| Adjustable hysteresis value | | + | + | + |
| Minimum pulling time adjustment for control outputs | | + | + | + |
| Saving and Recovery of user parameters | | + | + | + |
| Return to Factory settings | | + | + | + |
| RS-485ModBus (RTU) communication option | | − | + | + |
| Digital or RS-485 input for activate the 2nd Set value | | − | − | + |

Order Code: A B C D E

# Temperature Controllers

## ECO LITE



CE

▶ TC (J,K,R,S,T Input Types) and
RTD inputs selectable by parameter

▶ Low Power Consumption, Energy
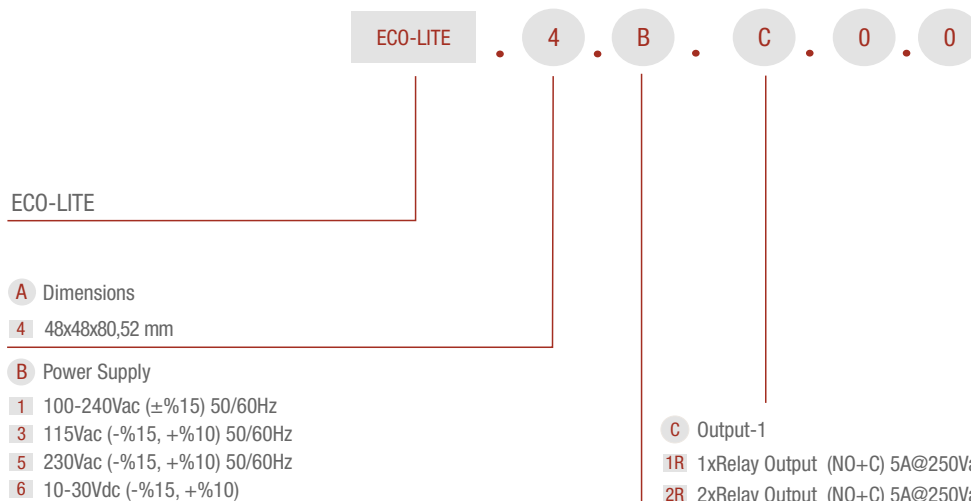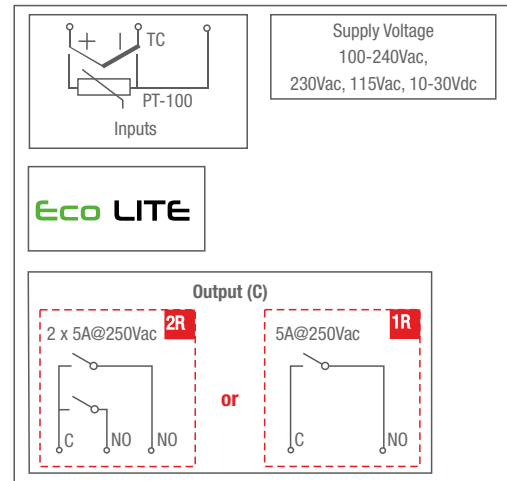saving and Environmentally Friendly with 2VA

▶ Saving and Recovery of user parameters

▶ Return to Factory Settings

## Specifications

3 Digits Process (PV) and 4 Digits Set (SV) display

Process input ( TC, RTD )

ON-OFF control form

Selectable heating and cooling function

Selectable temperature offset value

Operation type selection with hysteresis

Minimum pulling time adjustment

for control outputs

Password protection for programming mode

## Technical Specification

**Accuracy:** ±0.25%of full scale

**Cold Junction Compensation:** Automatically ± 0.1°C/1°C

**Line Compensation:** Maximum 10 Ohm

**Sensor Break Protection:** Upscale

**Sampling Cycle:** 0.1 second



| | ECO-LITE | . | 4 | . | B | . | C | 0 | . | 0 |

### ECO-LITE

**A** Dimensions

**4** 48x48x80,52 mm

**B** Power Supply

**1** 100-240Vac (±%15) 50/60Hz
**3** 115Vac (-%15, +%10) 50/60Hz
**5** 230Vac (-%15, +%10) 50/60Hz
**6** 10-30Vdc (-%15, +%10)

**C** Output-1

**1R** 1xRelay Output (NO+C) 5A@250Vac
**2R** 2xRelay Output (NO+C) 5A@250Vac
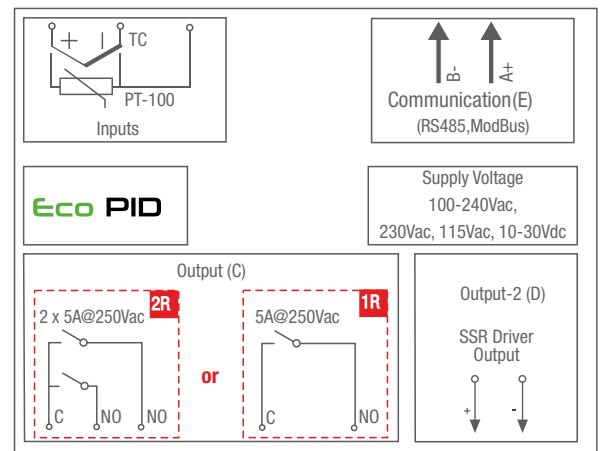
# PID Temperature Controllers

## ECO PID

CE

- High Resolution Sensitive PID control
- TC (J,K,R,S,T Input Types) and RTD inputs selectable by parameter
- Low Power Consumption, Energy saving and Environmentally Friendly with 2VA
- Saving and Recovery of user parameters
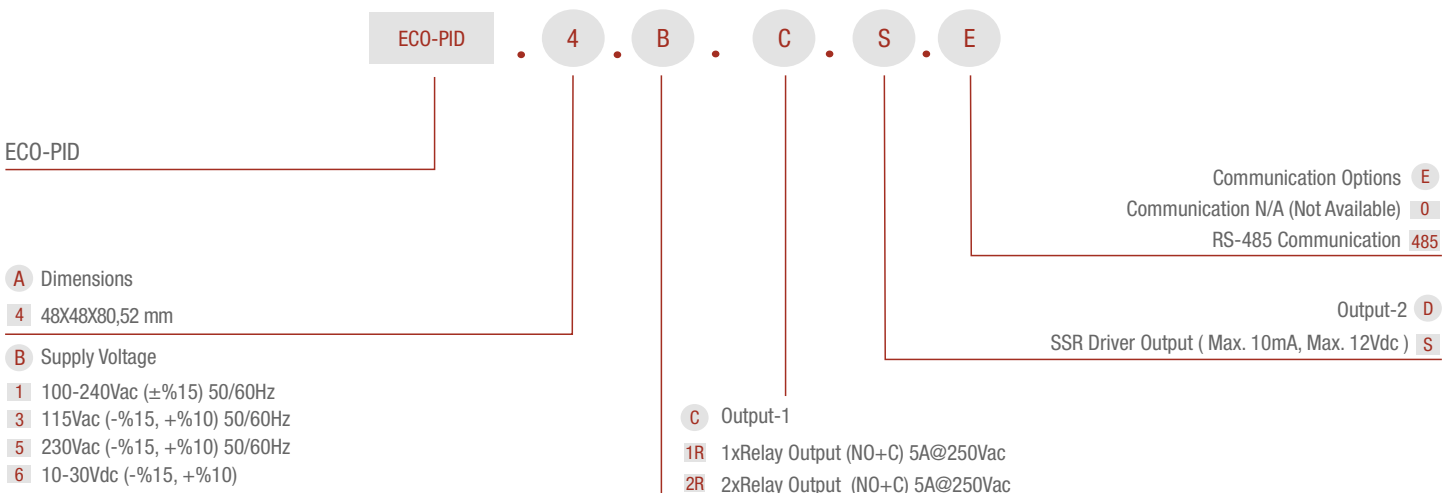- RS-485 Modbus (RTU) communication option
- Return to Factory Settings

## Specifications

3 Digits Process (PV) and 4 Digits Set (SV) display
Process input ( TC, RTD )
Programmable ON-OFF, P, PI, PD, PID control forms
Adaptation of PID Coefficients to the system
with Self-Tune operation (Step ResponseTuning) and
Auto-Tune (limitcycling-tuning)
Selectable heating and cooling function
Selectable temperature offset value
Operation type selection with hysteresis
Minimum pulling time adjustment for control outputs
Password protection for programming mode

## Technical Specification

**Accuracy:** ±0.25%of full scale

**Cold Junction Compensation:** Automatically ± 0.1°C/1°C

**Line Compensation:** Maximum 10 Ohm

**Sensor Break Protection:** Upscale

**Sampling Cycle:** 0.1 second

### Inputs / Communication / Supply / Output diagram

- TC / PT-100 — Inputs
- Communication(E) (RS485,ModBus)
- Eco PID
- Supply Voltage 100-240Vac, 230Vac, 115Vac, 10-30Vdc
- Output (C): 2R — 2 x 5A@250Vac ; or 1R — 5A@250Vac (C NO NO / C NO)
- Output-2 (D): SSR Driver Output

PID CONTROL | ModBus RS-485 | INPUT X1 | OUT PUT X3 | 48x48 | (bell icon)

## Ordering code

ECO-PID . 4 . B . C . S . E

**ECO-PID**

**A Dimensions**
4 — 48X48X80,52 mm

**B Supply Voltage**
1 — 100-240Vac (±%15) 50/60Hz
3 — 115Vac (-%15, +%10) 50/60Hz
5 — 230Vac (-%15, +%10) 50/60Hz
6 — 10-30Vdc (-%15, +%10)

**C Output-1**
1R — 1xRelay Output (NO+C) 5A@250Vac
2R — 2xRelay Output (NO+C) 5A@250Vac

**Output-2 D**
S — SSR Driver Output ( Max. 10mA, Max. 12Vdc )

**Communication Options E**
0 — Communication N/A (Not Available)
485 — RS-485 Communication

# PID Hot Runner

## ECO HR



CE

▶ High Resolution Sensitive PID control

▶ TC (J,K,R,S,T Input Types, PT-100) selectable by parameter

▶ Low Power Consumption, Energy saving and Environmentally Friendly with 2VA
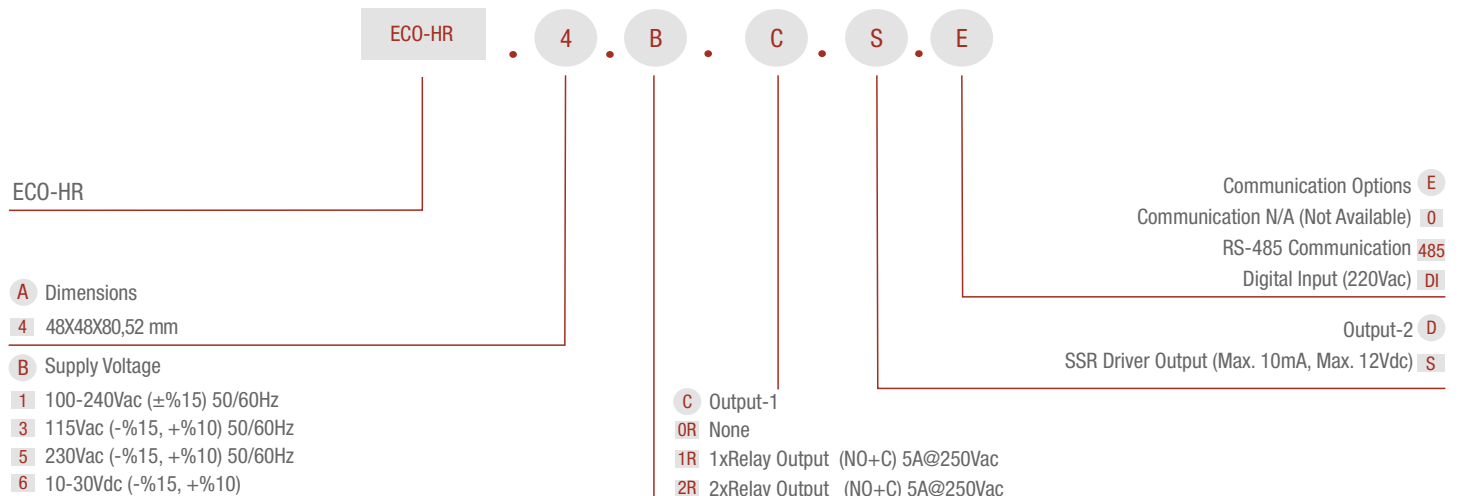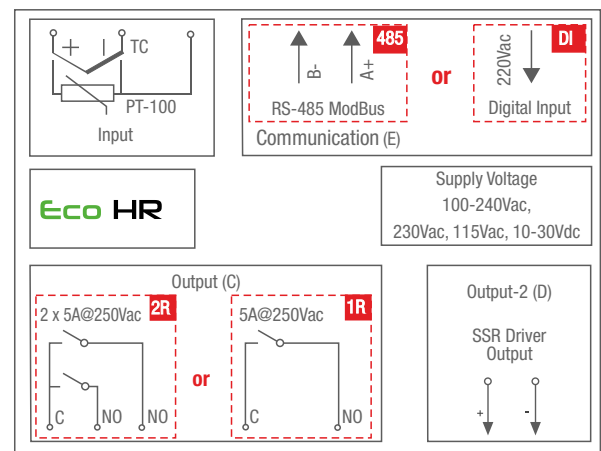
▶ Activate 2nd Set Value by front panel

▶ Saving and Recovery of user parameters

▶ RS-485 Modbus (RTU) communication option

▶ Return to Factory Settings

▶ Digital or RS-485 input for activate the 2nd Set Value (Optional)

## Specifications

3 Digits Process (PV) and 4 Digits Set (SV) display

Process input ( TC,RTD )

Programmable ON-OFF, P, PI, PD, PID control forms

Adaptation of PID Coefficients to the system
with Self-Tune operation (Step Response Tuning) and
Auto-Tune (limitcycling-tuning)

Selectable heating and cooling function

Selectable temperature offset value

Operation type selection with hysteresis

Minimum pulling time adjustment for control outputs

Password protection for programming mode

## Technical Specification

**Accuracy:** ±0.25%of full scale

**Cold Junction Compensation:** Automatically ± 0.1°C/1°C

**Line Compensation:** Maximum 10 Ohm

**Sensor Break Protection:** Upscale

**Sampling Cycle:** 0.1 second





## Ordering Information

ECO-HR . 4 . B . C . S . E

**ECO-HR**

**A** Dimensions
4 48X48X80,52 mm

**B** Supply Voltage
1 100-240Vac (±%15) 50/60Hz
3 115Vac (-%15, +%10) 50/60Hz
5 230Vac (-%15, +%10) 50/60Hz
6 10-30Vdc (-%15, +%10)

**C** Output-1
0R None
1R 1xRelay Output (NO+C) 5A@250Vac
2R 2xRelay Output (NO+C) 5A@250Vac

Output-2 **D**
SSR Driver Output (Max. 10mA, Max. 12Vdc) **S**

Communication Options **E**
Communication N/A (Not Available) **0**
RS-485 Communication **485**
Digital Input (220Vac) **DI**

EZM-XX50



- Configurable Counter, Totalizer Counter, Batch Counter, Timer, Chronometer, Frequencymeter and Tachometer
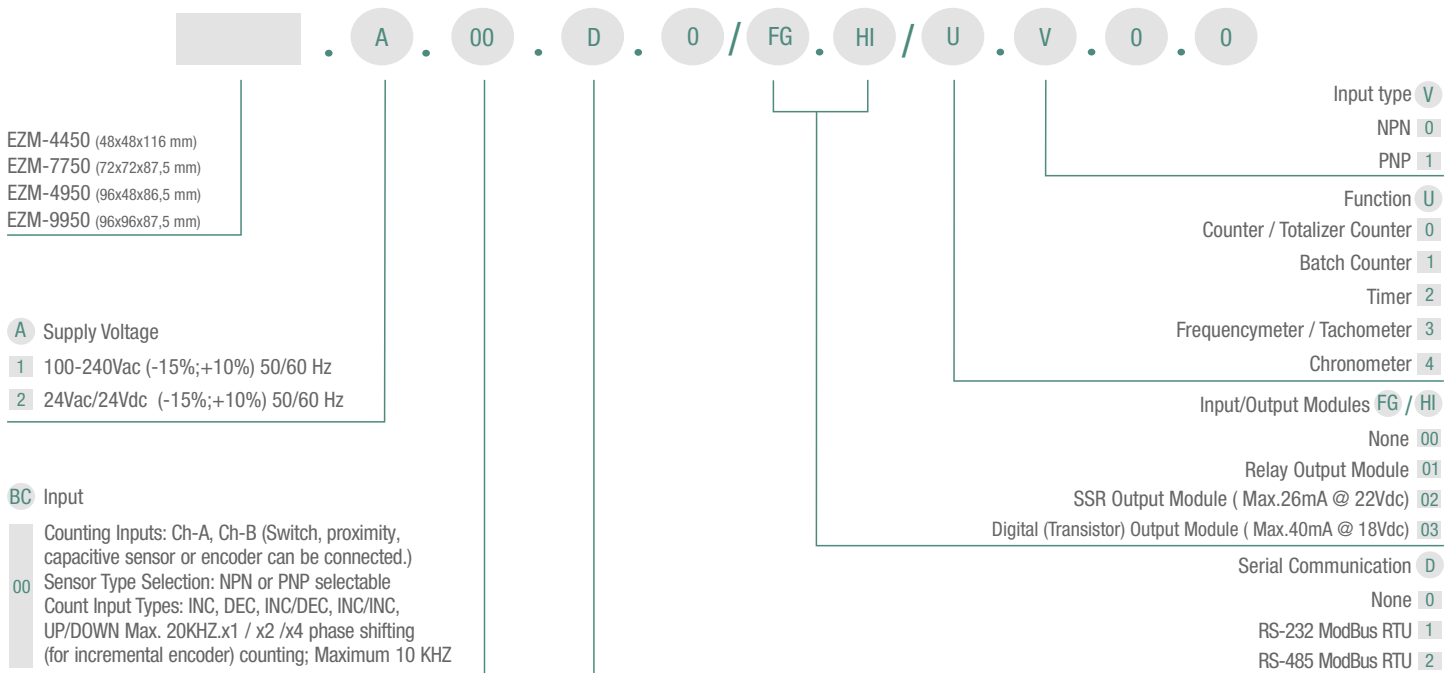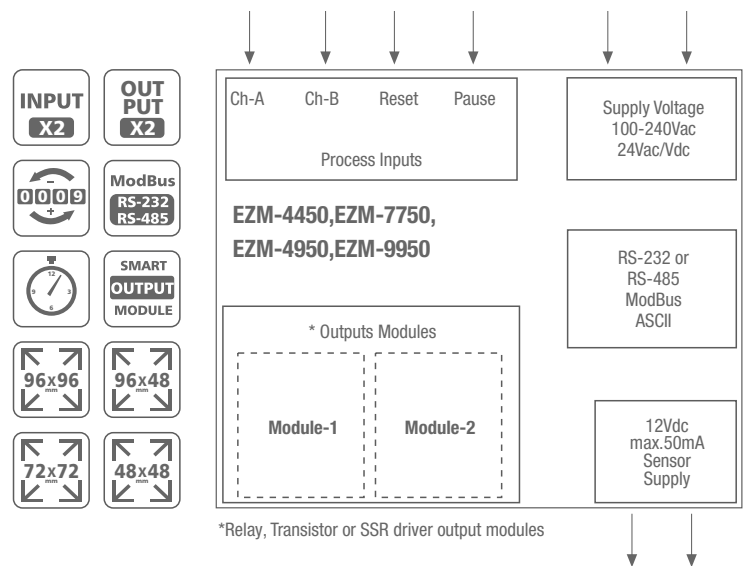- Operation with Automatic and Manuel Reset
- Programmable Time Bases for Timer and Chronometer
- Multiplication Coefficient and Decimal Point Position

## Specifications

6 Digits display

Reset, Pause and ChA-ChB Counting Inputs

Absolute or Offset Operation in Counter Function

Different Alarm Alternatives in Frequencymeter and

Cycle Measuring Functions

INC, DEC, INC/INC, INC/DEC, UP/DOWN,

x1 / x2 / x4 Counting with Phase Shifting Property in Counter

RS-232 (standard) or RS-485 (optional) Serial Communication

with Modbus ASCII or RTU Protocol

## Technical Specification

**Operating Temperature :** 0...50°C

**Humidity :** 0-90/RH (non condensing)

**Protection Class :** Ip65 at front, IP20 at rear



| INPUT X2 | OUTPUT X2 |
| ModBus RS-232 RS-485 |
| SMART OUTPUT MODULE |
| 96x96 mm | 96x48 mm |
| 72x72 mm | 48x48 mm |

EZM-4450, EZM-7750, EZM-4950, EZM-9950

Ch-A  Ch-B  Reset  Pause

Process Inputs

Supply Voltage 100-240Vac 24Vac/Vdc

RS-232 or RS-485 ModBus ASCII

* Outputs Modules

Module-1   Module-2

12Vdc max.50mA Sensor Supply

*Relay, Transistor or SSR driver output modules



. A . 00 . D . 0 / FG . HI / U . V . 0 . 0

EZM-4450 (48x48x116 mm)
EZM-7750 (72x72x87,5 mm)
EZM-4950 (96x48x86,5 mm)
EZM-9950 (96x96x87,5 mm)

**A** Supply Voltage
1  100-240Vac (-15%;+10%) 50/60 Hz
2  24Vac/24Vdc (-15%;+10%) 50/60 Hz

**BC** Input
00  Counting Inputs: Ch-A, Ch-B (Switch, proximity, capacitive sensor or encoder can be connected.) Sensor Type Selection: NPN or PNP selectable Count Input Types: INC, DEC, INC/DEC, INC/INC, UP/DOWN Max. 20KHZ.x1 / x2 /x4 phase shifting (for incremental encoder) counting; Maximum 10 KHZ

Input type **V**
NPN  0
PNP  1

Function **U**
Counter / Totalizer Counter  0
Batch Counter  1
Timer  2
Frequencymeter / Tachometer  3
Chronometer  4

Input/Output Modules **FG** / **HI**
None  00
Relay Output Module  01
SSR Output Module ( Max.26mA @ 22Vdc)  02
Digital (Transistor) Output Module ( Max.40mA @ 18Vdc)  03

Serial Communication **D**
None  0
RS-232 ModBus RTU  1
RS-485 ModBus RTU  2

# Counters

## Single SET Programmable Counters
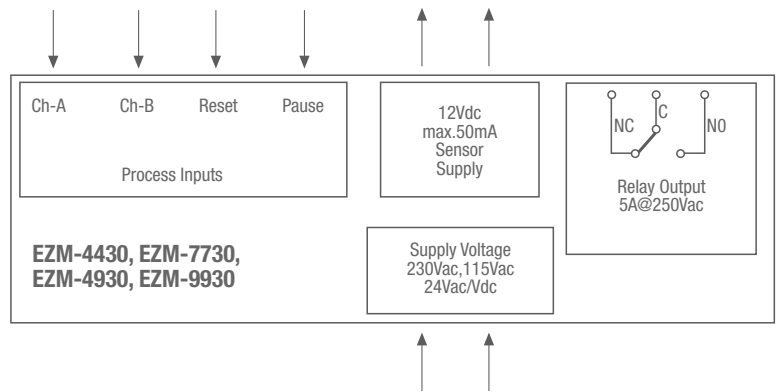
### EZM-XX30

CE EAC

▶ Reset, Pause and ChA-ChB Counting Inputs
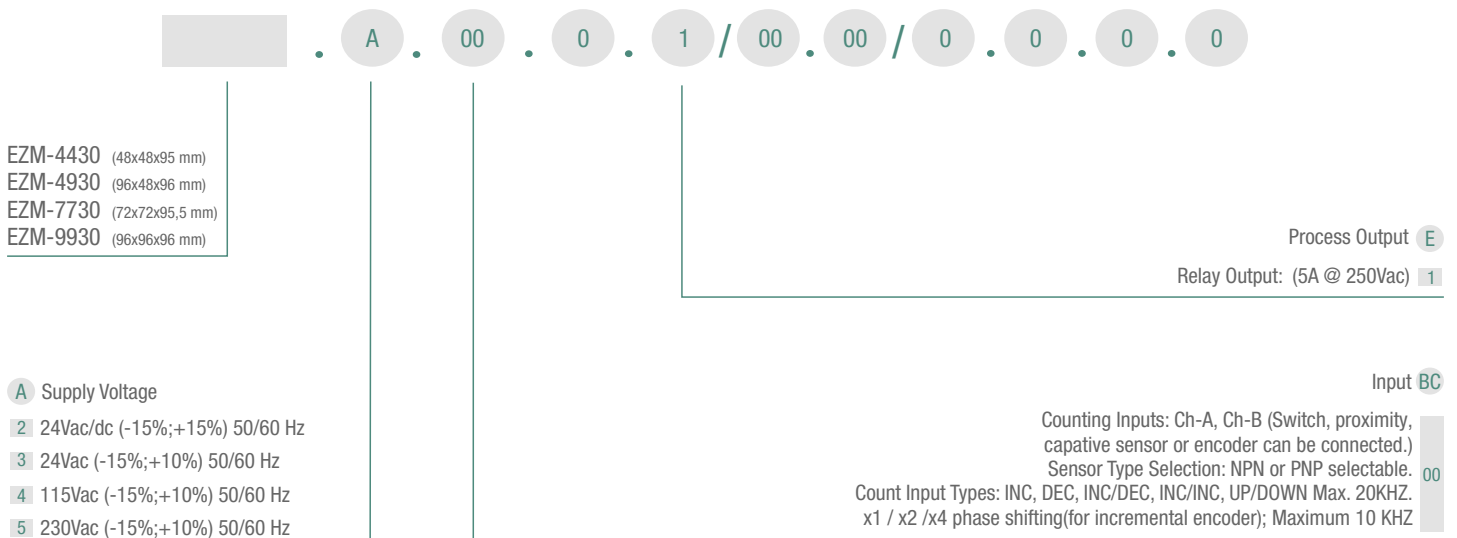
▶ Multiplication Coefficient and Decimal Point Position

## Specifications

6 Digits process (PV) and 6 digits Set (SV) Value Display
Operation with 1 Set Value
NPN/PNP Type Operation
Operation with Automatic and Manuel Reset
INC, DEC, INC/INC, INC/DEC, UP/DOWN,
x1 / x2 / x4 Counting with Phase Shifting Property



| Ch-A | Ch-B | Reset | Pause |
|------|------|-------|-------|
| | Process Inputs | | |

12Vdc
max.50mA
Sensor
Supply

Relay Output
5A@250Vac
NC — C — NO

**EZM-4430, EZM-7730,
EZM-4930, EZM-9930**

Supply Voltage
230Vac,115Vac
24Vac/Vdc

## Technical Specification

**Operating Temperature:** 0...50 °C
**Humadity:** 0-90%RH (none condensing)
**Protection:** Ip65 at front, Ip20 at rear.

OUTPUT X1 | INPUT X2 | 0009 | 96x96 | 96x48 | 72x72 | 48x48

.A.00.0.1/00.00/0.0.0.0

EZM-4430 (48x48x95 mm)
EZM-4930 (96x48x96 mm)
EZM-7730 (72x72x95,5 mm)
EZM-9930 (96x96x96 mm)

Process Output **E**
Relay Output: (5A @ 250Vac) **1**

**A** Supply Voltage
2 24Vac/dc (-15%;+15%) 50/60 Hz
3 24Vac (-15%;+10%) 50/60 Hz
4 115Vac (-15%;+10%) 50/60 Hz
5 230Vac (-15%;+10%) 50/60 Hz

Input **BC**
Counting Inputs: Ch-A, Ch-B (Switch, proximity,
capative sensor or encoder can be connected.)
Sensor Type Selection: NPN or PNP selectable.
Count Input Types: INC, DEC, INC/DEC, INC/INC, UP/DOWN Max. 20KHZ.
x1 / x2 /x4 phase shifting(for incremental encoder); Maximum 10 KHZ
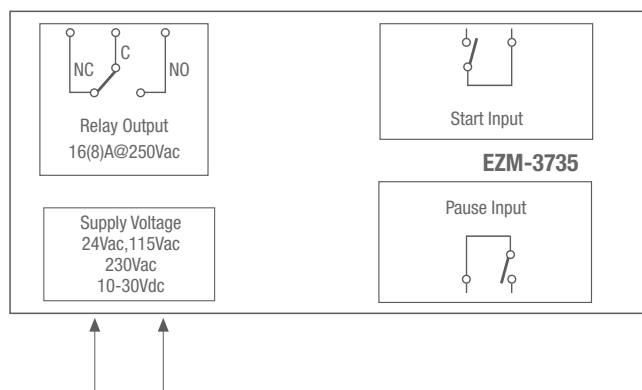
00

# Timer Relay

## EZM-3735

CE EAC

▶ Start and Stop Possibility by front Panel

▶ External Start and Pause Input

▶ Programmable Time Bases (Second, Minute, Hour)

▶ Adjustable internal buzzer according to Timer Stop status.

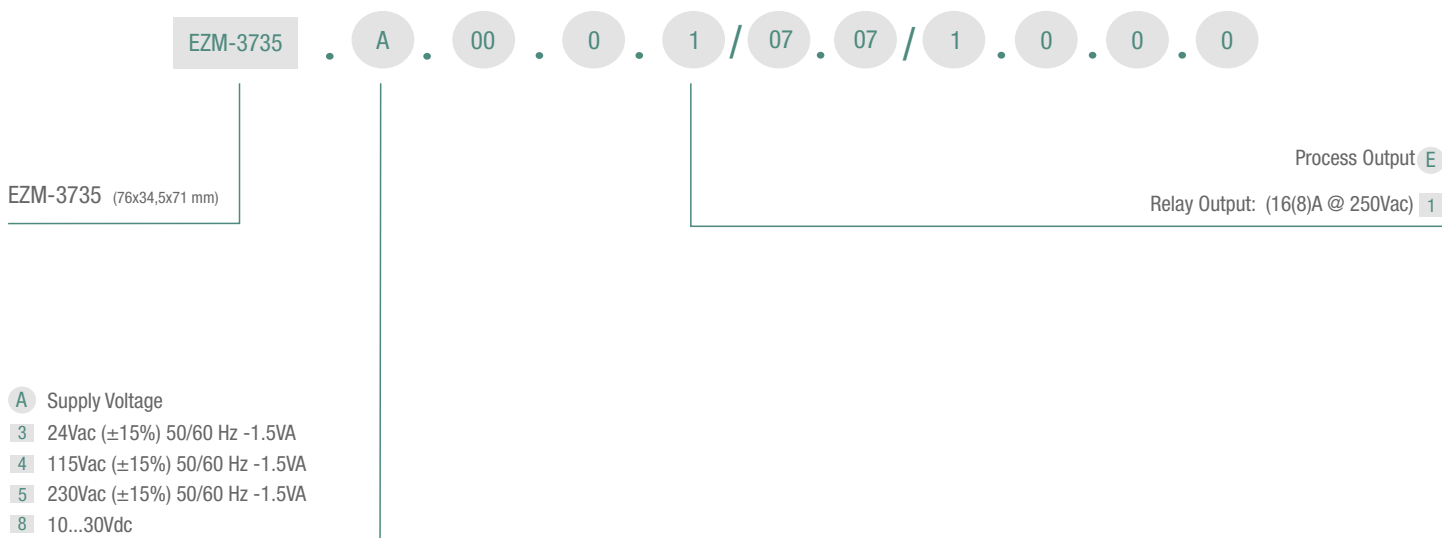## Specifications

4 Digits Display

Operation with One Set value

Single Contact Output for Timing control ( ON /OFF )

Pause possibility by front Panel

Set value high limit boundaries

Display can be adjusted to show Second, Minute and Hour

Password protection for programming section

Having CE mark according to European Norms



Relay Output 16(8)A@250Vac

Supply Voltage 24Vac,115Vac 230Vac 10-30Vdc

Start Input

**EZM-3735**

Pause Input

## Technical Specification

**Operating Temperature :** 0...50°C

**Humidity :** 0-90/RH (non condensing)

**Protection Class :** Ip65 at front, IP20 at rear

INPUT X1   OUTPUT X1   77x35

EZM-3735 . A . 00 . 0 . 1 / 07 . 07 / 1 . 0 . 0 . 0

Process Output E

Relay Output: (16(8)A @ 250Vac) 1

EZM-3735 (76x34,5x71 mm)

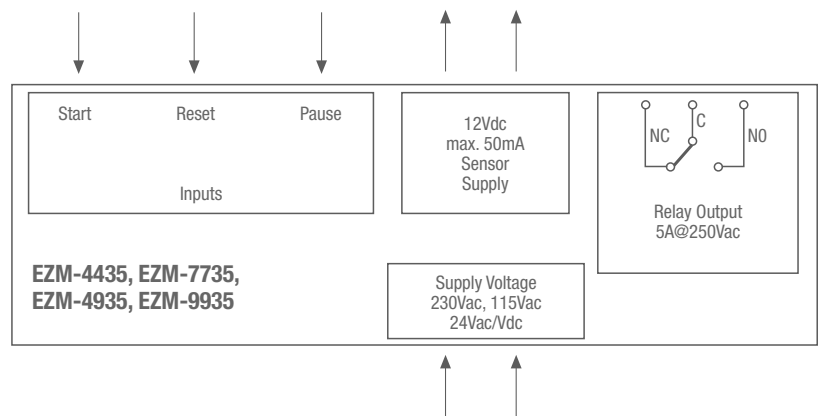| A | Supply Voltage |
|---|---|
| 3 | 24Vac (±15%) 50/60 Hz -1.5VA |
| 4 | 115Vac (±15%) 50/60 Hz -1.5VA |
| 5 | 230Vac (±15%) 50/60 Hz -1.5VA |
| 8 | 10...30Vdc |

# Timer Relays

CE EAC

▶ Operation with Automatic and Manuel Reset

▶ Programmable Time Bases (Second, Minute, Hour)

## Specifications

6 Digits process (PV) and 6 Digits Set (SV) Value Display

Single Contact Output for Timing control ( ON /OFF )

Operation with 1 Set Value

Reset, Pause and Start Inputs

Password protection for programming section

NPN/PNP Type Operation

| Start | Reset | Pause | 12Vdc max. 50mA Sensor Supply | NC C NO |
|-------|-------|-------|---------|---------|
| | Inputs | | | Relay Output 5A@250Vac |

**EZM-4435, EZM-7735, EZM-4935, EZM-9935**

Supply Voltage 230Vac, 115Vac 24Vac/Vdc

## Technical Specification

**Operating Temperature :** 0...50°C

**Humidity :** 0-90/RH (non condensing)

**Protection Class :** Ip65 at front, IP20 at rear

INPUT X1 | OUT PUT X1 | ⏱ | 96x96 | 96x48 | 72x72 | 48x48

```
_____ . Ⓐ . 00 . 0 . 1 / 00 . 00 / 0 . 0 . 0 . 0
```

EZM-4435 (48x48x95 mm)
EZM-4935 (96x48x96 mm)
EZM-7735 (72x72x95,5 mm)
EZM-9935 (96x96x96 mm)

Process Output ⓔ
Relay Output: (5A @ 250Vac) 1

Ⓐ Supply Voltage

2 24Vac/dc (-15%;+15%) 50/60 Hz

3 24Vac (-15%;+10%) 50/60 Hz

4 115Vac (-15%;+10%) 50/60 Hz

5 230Vac (-15%;+10%) 50/60 Hz

Input BC

Pause Input: Switch, proximity or capasitive sensor can be connected.

Start Input: Switch, proximity or capasitive sensor can be connected. 00

Sensor Type Selection: It can be selected NPN/PNP
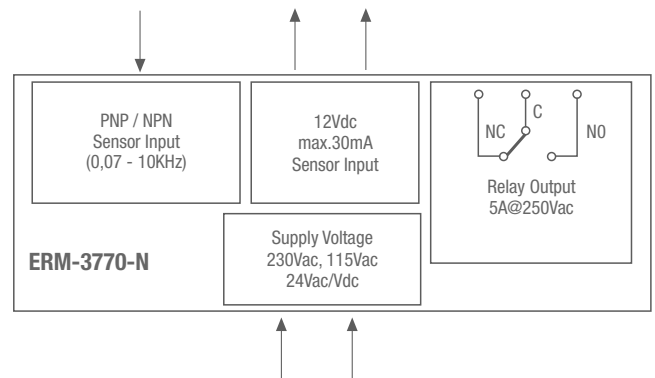
# Digital Tachometer

## ERM 3770-N

ERM3770-N



CE EHC

▶ 0.07Hz to 10000Hz input signal

▶ Set Decimal Point

▶ Working with Process Set and Alarm Set value
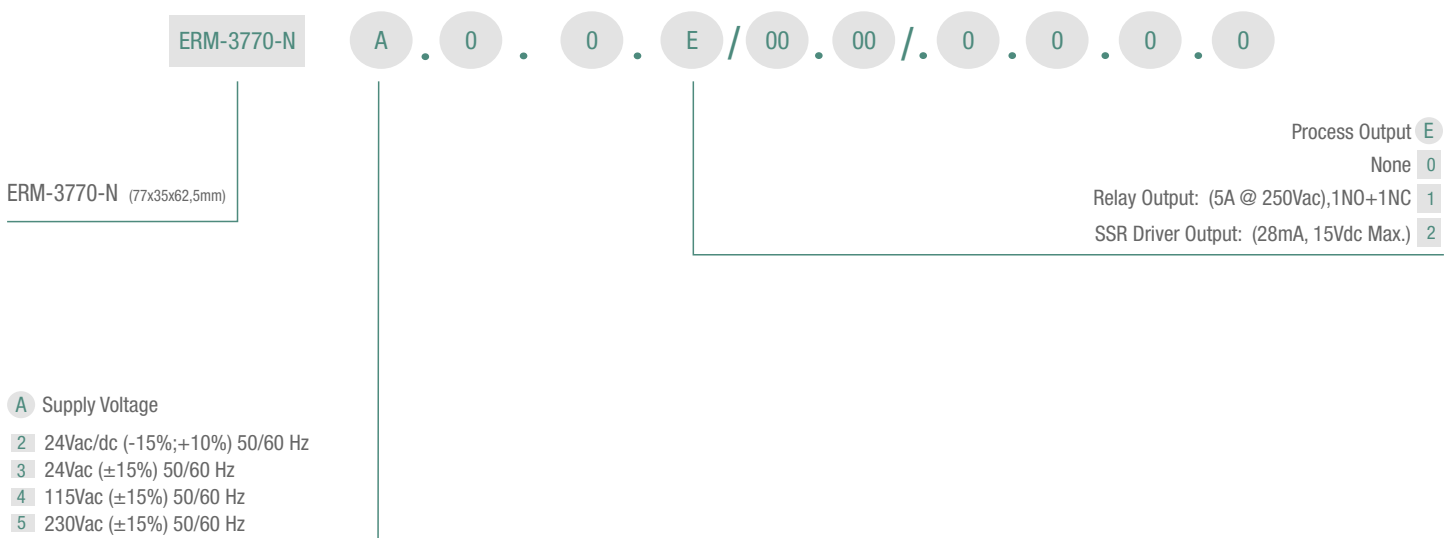
▶ Automatic sampling (1 sec to 16 sec)

## Specifications

4 Digits Display

Adjustable decimal point

Division rate

NPN or PNP input type

Alarm output

Relay or SSR driver output (It must be determined in order.)

Alarm Set value boundary

Programming mode password protection



| | | |
|---|---|---|
| PNP / NPN Sensor Input (0,07 - 10KHz) | 12Vdc max.30mA Sensor Input | NC  C  NO  Relay Output 5A@250Vac |
| **ERM-3770-N** | Supply Voltage 230Vac, 115Vac 24Vac/Vdc | |

## Technical Specification

**Accuracy:** 0.01% of scale

**Counting Inputs:** Ch-A, Ch-B (Switch, proximity, capacitive sensor or encoder can be connected.)

**Sensor Supply Voltage:** NPN or PNP selectable as

**Sensor Input Type:** INC, DEC, INC/DEC, INC/INC, UP/DOWN Max. 20KHZ.

x1 / x2 /x4 Counting for phase shift (for incremental encoder); Maximum 10 KHZ

INPUT X1   OUTPUT X1   77x35

ERM-3770-N  A . 0 . 0 . E / 00 . 00 / 0 . 0 . 0 . 0

| | |
|---|---|
| Process Output | E |
| None | 0 |
| Relay Output: (5A @ 250Vac),1NO+1NC | 1 |
| SSR Driver Output: (28mA, 15Vdc Max.) | 2 |

**ERM-3770-N** (77x35x62,5mm)

**A**  Supply Voltage

| | |
|---|---|
| 2 | 24Vac/dc (-15%;+10%) 50/60 Hz |
| 3 | 24Vac (±15%) 50/60 Hz |
| 4 | 115Vac (±15%) 50/60 Hz |
| 5 | 230Vac (±15%) 50/60 Hz |

**Order Code**

| A | BC | D | E | / | FG | HI | / | U | V | W | Z |
|---|----|---|---|---|----|----|---|---|---|---|---|
|   | 00 |   |   | / |    |    | / | 0 | 0 | 0 | 0 |

| | EZM-4450 | EZM-7750 | EZM-4950 | EZM-9950 | EZM-4430 | EZM-7730 | EZM-4930 | EZM-9930 | EZM-4931 | EZM-4435 | EZM-7735 | EZM-4935 | EZM-9935 | ERM-3770N | EZM-3735 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **A Supply Voltage** | | | | | | | | | | | | | | | |
| 1 100...240Vac (-15%,+10%)50/60Hz | + | + | + | + | - | - | - | - | - | - | - | - | - | - | - |
| 2 24Vac/Vdc (-15%, +10%) 50/60Hz | + | + | + | + | + | + | + | + | + | + | + | + | + | + | - |
| 3 24Vac (-15%, -10%) 50/60Hz | - | - | - | - | + | + | + | + | + | + | + | + | + | + | + |
| 4 115Vac (-15%, -10%) 50/60Hz | - | - | - | - | + | + | + | + | + | + | + | + | + | + | + |
| 5 230Vac (-15%, -10%) 50/60Hz | - | - | - | - | + | + | + | + | + | + | + | + | + | + | + |
| 8 10 - 30 Vdc | - | - | - | - | - | - | - | - | - | - | - | - | - | - | + |
| **D Serial Communication** | | | | | | | | | | | | | | | |
| 0 None | | | | | + | + | + | + | + | + | + | + | + | + | + |
| 1 RS-232 ModBus ASCII | + | + | + | + | - | - | - | - | + | - | - | - | - | - | - |
| 2 RS-485 ModBus ASCII | + | + | + | + | - | - | - | - | - | - | - | - | - | - | - |
| **E Process Output-1** | | | | | | | | | | | | | | | |
| 0 None | + | + | + | + | | | | | + | | | | | + | |
| 1 Relay Output | - | - | - | - | + | + | + | + | - | + | + | + | + | + | + |
| **FG Modules Output-1** | | | | | | | | | | | | | | | |
| 00 None | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| 01 Relay Output | + | + | + | + | - | - | - | - | + | - | - | - | - | - | - |
| 02 SSR Driver Output (max. 20mA@12Vdc) | + | + | + | + | - | - | - | - | + | - | - | - | - | - | - |
| 03 Digital (Transistor) Output (max. 40mA@18Vdc) | + | + | + | + | - | - | - | - | - | - | - | - | - | - | - |
| **HI Modules Output-2** | | | | | | | | | | | | | | | |
| 00 None | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| 01 Relay Output | + | + | + | + | - | - | - | - | + | - | - | - | - | - | - |
| 02 SSR Driver (max. 20mA@12Vdc) | + | + | + | + | - | - | - | - | + | - | - | - | - | - | - |
| 03 Digital (Transistor) Output (max. 40mA@18Vdc) | + | + | + | + | - | - | - | - | - | - | - | - | - | - | - |
| **Specifications** | | | | | | | | | | | | | | | |
| Counter | + | + | + | + | + | + | + | + | + | - | - | - | - | - | - |
| Total Counter | + | + | + | + | - | - | - | - | - | - | - | - | - | - | - |
| Batch Counter | + | + | + | + | - | - | - | - | - | - | - | - | - | - | - |
| Timer | + | + | + | + | - | - | - | - | - | + | + | + | + | - | + |
| Chronometer | + | + | + | + | - | - | - | - | - | - | - | - | - | - | - |
| Frequencymeter | + | + | + | + | - | - | - | - | - | - | - | - | - | - | - |
| Tachometer | + | + | + | + | - | - | - | - | - | - | - | - | - | + | - |
| Working with automatic and manual reset | + | + | + | + | + | + | + | + | + | + | + | + | + | - | - |
| Smart Output module system | + | + | + | + | - | - | - | - | - | - | - | - | - | - | - |
| Ch-A, Ch-B Encoder inputs | + | + | + | + | + | + | + | + | + | - | - | - | - | - | - |
| Multiplication coefficient and decimal point position | + | + | + | + | + | + | + | + | + | - | - | - | - | + | + |
| Process display | 6 digits | 6 digits | 6 digits | 6 digits | 6 digits | 6 digits | 6 digits | 6 digits | 6 digits | 6 digits | 6 digits | 6 digits | 6 digits | 4 digits | 4 digits |
| SET display | 6 digits | 6 digits | 6 digits | 6 digits | 6 digits | 6 digits | 6 digits | 6 digits | 6 digits | 6 digits | 6 digits | 6 digits | 6 digits | - | - |
| Start input | - | - | - | - | - | - | - | - | - | + | + | + | + | - | + |
| Reset and Pause input | + | + | + | + | + | + | + | + | + | + | + | + | + | - | - |
| Supply voltage for switch and proximity sensors | + | + | + | + | + | + | + | + | + | + | + | + | + | + | - |
| Operation with 2 Set values | + | + | + | + | - | - | - | - | + | - | - | - | - | - | - |
| Password protection for programming section | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| **Dimension** | | | | | | | | | | | | | | | |
| 77x35mm DIN | - | - | - | - | - | - | - | - | - | - | - | - | - | + | + |
| 48x48mm DIN 1/16 | + | - | - | - | + | - | - | - | - | + | - | - | - | - | - |
| 72x72mm DIN | - | + | - | - | - | + | - | - | - | - | + | - | - | - | - |
| 96x48mm DIN 1/8 | - | - | + | - | - | - | + | - | + | - | - | + | - | - | - |
| 96x96mm DIN 1/4 | - | - | - | + | - | - | - | + | - | - | - | - | + | - | - |

**EMKO**