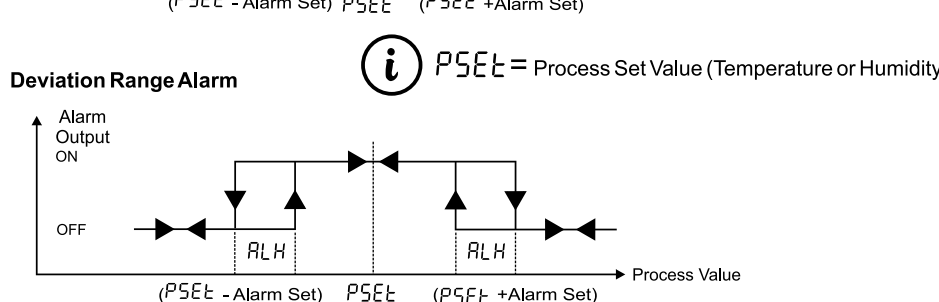
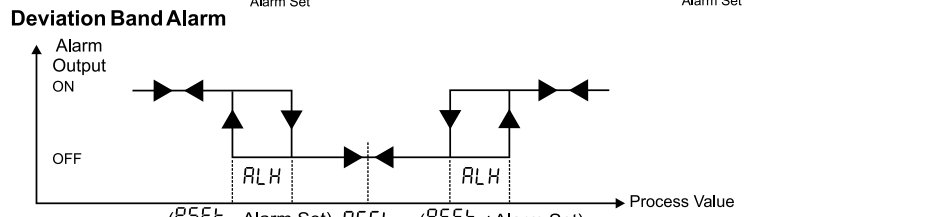
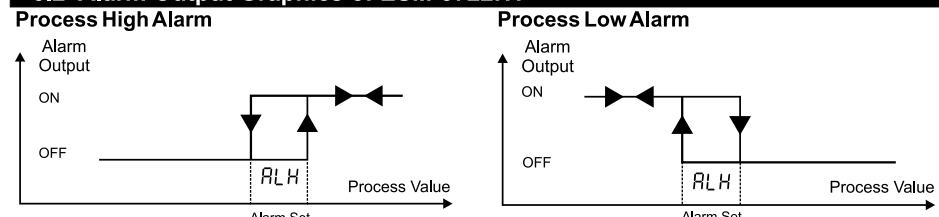
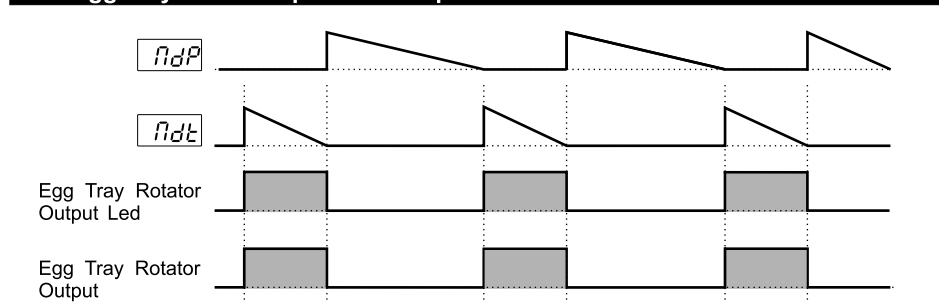


5.2 Alarm Output Graphics of ESM-3722HT



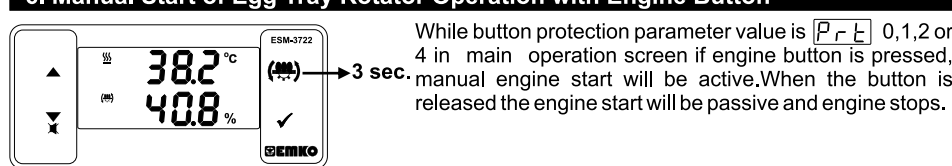
5.3 Egg Tray Rotator Operation Graphics of ESM-3722HT



5.4 Failure Messages in ESM 3722 Hatcher Controller

- Screen Blinking Temperature Sensor failure. Sensor connection is wrong or there is no sensor connection. While this message shown on this display, if buzzer function selection [b u f] is 3, 5, 7 or 8 internal buzzer starts to operate.
- Screen Blinking Humidity Sensor failure. Sensor connection is wrong or there is no sensor connection. While this message shown on this display, if buzzer function selection [b u f] is 4, 6, 7 or 8 internal buzzer starts to operate.
- In main operating screen if the upper display is blinking, it means that temperature alarm exits and alarm output is active, if buzzer function selection [b u f] is 1, 5 or 8 internal buzzer starts to operate.
- In main operating screen if the lower display is blinking, it means that humidity alarm exits and alarm output is active, if buzzer function selection [b u f] is 2, 6 or 8 internal buzzer starts to operate.
- Self Tune temperature error. [E r r] Appears on the main screen, this fault occurs when the temperature read from the sensor is closer to the Process Set value than 5% of the scale (5 ° C for the ProNem Mini PMI-P sensor). Self tune operation is not allowed.

6. Manual Start of Egg Tray Rotator Operation with Engine Button



7. Self Tune Method

Self Tune method is used for determining PID parameters used by the device.

Starting Self Tune (Step Response Tuning) Operation by the user:

- Adjust temperature control on/off or PID parameter ([P r t] = 1)
- Adjust self tune selection parameter ([E t n] = [Y E S])
- In the main screen "Tune" and Temperature value are should alternately.

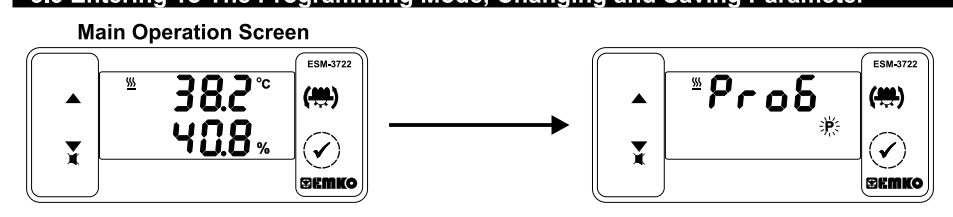
If Self Tune operation is finished without any problem, the device saves the new PID coefficients to memory and continue to run. [E t n] Parameter is adjusted [o n] automatically.

NOT: The temperature value read from the sensor must be less than 5% of the process set value in order to start the self tune operation (5 ° C for the ProNem Mini PMI-P sensor).

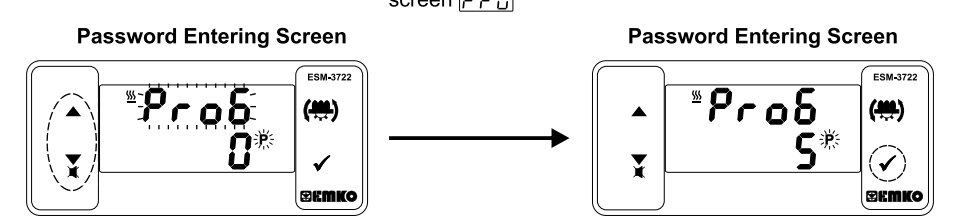
8. Specifications

Device Type	: Hatcher Controller
Housing&Mounting	: 76 mm x 34.5 mm x 71 mm Plastic housing for panel Panel cut out is 71 x 29 mm.
Protection Clas	: Ip65 at front, Ip20 at rear.
Weight	: Approximately 0.2 Kg
Environmental Ratings	: Standart, indoor at an altitude of less than 2000 meters with none condensing humidity. -30 °C to +80 °C / -20 °C to +70 °C : 90 % max. (None condensing) : Fixed installation
Storage / Operating Temperature	: -30 °C to +80 °C / -20 °C to +70 °C
Storage / Operating Humidity	: 90 % max. (None condensing)
Installation	: II, office or workplace, none conductive pollution
Overvoltage Category	: Continuous
Pollution Degree	: II
Operating Conditions	: II, office or workplace, none conductive pollution
Supply Voltage and Power	: 230V~ (±15%) 50/60Hz - 1.5VA : 115V~ (±15%) 50/60Hz - 1.5VA : 24V~ (±15%) 50/60Hz - 1.5VA : 24V~ (±15%) 50/60Hz - 1.5VA : 10 - 30V= 1.5W
Temperature Sensor Input	: NTC, PTC, PT-100, 0/2...10V=, 0/4...20mA= or ProNem Mini PMI-P

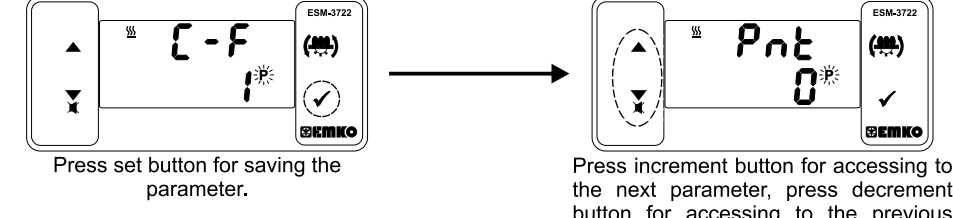
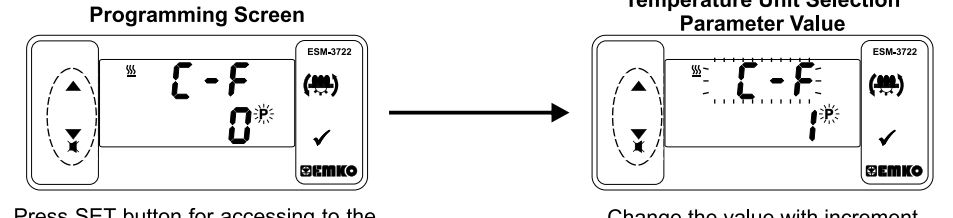
5.5 Entering To The Programming Mode, Changing and Saving Parameter



Note1: If programming mode accessing password is 0, Temperature Unit screen [C - F] is observed instead of programming screen [P r t].



Note2: If programming mode accessing password is 0, only three parameters are accessible, and the parameter values can be changed.



Information: If no operation is performed in programming mode for 20 seconds, device turns to main operation screen automatically.

NTC input type	: NTC (10 kΩ @25 °C)
PTC input type	: PTC (1000 Ω @25 °C)
Thermoresistance input type	: PT-100 IEC751 (ITS90)
Humidity input type	: 0/2...10V=, 0/4...20mA= or ProNem Mini PMI-P
Accuracy	: ± 1 % of full scale
Sensor Break Protection Control Form	: Upscale : PID or ON / OFF
Relay Outputs	: 5 A@250 V ~ at Resistive Load (Heating Output) : 3 A@250 V ~ at Resistive Load (Humidifying, Alarm and Egg tray rotator Output)
Optional SSR Driver Output	: Maximum 30mA, Maximum 15V
Temperature Display	: 8 mm Red 4 digit LED Display
Humidity Display	: 8 mm Green 4 digit LED Display
LED Displays	: P (Green), % (Green), °C (Red), °F (Red), Alarm (Red), Humidifier Output (Red), Egg tray rotator Output (Red) Heating Output (Red),
Internal Buzzer Approvals	: ≥83dB : CE ENEC

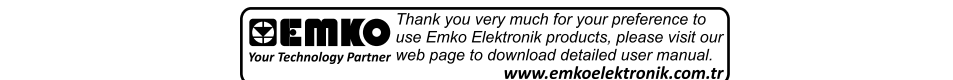
10. Other Informations

A Power Supply Voltage	1 24V~ (±15%) 50/60Hz - 1.5VA 2 24V~ (±15%) 50/60Hz - 1.5VA 4 115V~ (±15%) 50/60Hz - 1.5VA 5 230V~ (±15%) 50/60Hz - 1.5VA 8 10 - 30 V = 1.5W
B Temperature Sensor Input	1 PT 100, IEC751(ITS90) 0°C/32°F - 100°C/212°F 2 PTC (NiCr-1) 0°C/32°F - 100°C/212°F 3 NTC (NiCr-1) 0°C/32°F - 100°C/212°F 4 0/2...10Vdc Voltage Input User defined 5 0/4...20mA Current Input User defined 6 ProNem Mini PMI-P -20°C/-4°F - 80°C/176°F
C Humidity Sensor Input	4 0/2...10Vdc Voltage Input 0% - 100% 5 0/4...20mA Current Input 0% - 100% 6 ProNem Mini PMI-P 0% - 100%
E Heating Output	1 Relay Output (5 A@250 V ~, at Resistive Load 1NC , 1 NO) 2 SSR Drive Output (Maximum 30mA, Maximum 15V)
FG Humidifier Output	01 Relay Output (3 A@250 V ~, at Resistive Load , 1 NO)
HI Egg Tray Rotator Output	01 Relay Output (3 A@250 V ~, at Resistive Load , 1 NO)
J Alarm Output	1 Relay Output (3 A@250 V ~, at Resistive Load , 1 NO)
V Temp. Sensor which is given with ESM-3722	0 None 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 cooking application) 4 PTC-M6L50.K1.5 (NTC Probe stainless steel housing with 1.5m cable for cooling application) 6 ProNem Mini PMI-P (2.5m cable for Temperature and Humidity application) 9 Customer

All order information of ESM-3722 Hatcher Controller are given on the table at above. User may form appropriate device configuration from information and codes that at the table and convert it to the ordering codes. Firstly, supply voltage then other specifications must be determined. Please fill the order code blanks according to your needs. Please contact us, if your needs are out of the standards.

Note-1: If input type is selected PTC or NTC (B = 2, 3), Temperature sensor is given with the device. For this reason, if input type is selected as PTC, sensor type (V = 0, 1 or 2) or if input type is selected as NTC, sensor type (V = 0, 3 or 4) must be declared in ordering information.

Before commissioning the device, parameters must be set in accordance with desired use. Incomplete or incorrect configuration can cause dangerous situations. Because of limited mechanical life of relay output contact, SSR output is recommended which the device use PID control algorithm. The device with ON/OFF control algorithm, hysteresis parameter must be set a suitable value for your system, to avoid too much relay switching.



Hatcher Controller



ESM-3722 77 x 35 DIN Size Digital Hatcher Controller

CE ENEC

Instruction Manual. ENG ESM-3722 01 V07 05/19

1.3 Installation

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 supply switch or a fuse. Use power switch and fuse as required.

Be sure to use the rated power supply voltage to protect the unit against damage and to prevent failure. Keep the power off until all of the wiring is completed so that electric shock and trouble with the unit can be prevented.

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

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

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

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

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

1.4 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 perform by the customer completely.

1.5 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.

1.6 Manufacturer Company

Manufacturer Information:
Emko Elektronik Sanayi ve Ticaret A.Ş.
Demirtaş Organize Sanayi Bölgesi Karanfil Sk. No:6 16369 BURSA/TURKEY
Phone : +90 224 261 1900
Fax : +90 224 261 1912

Repair and maintenance service information:
Emko Elektronik Sanayi ve Ticaret A.Ş.
Demirtaş Organize Sanayi Bölgesi Karanfil Sk. No:6 16369 BURSA/TURKEY
Phone : +90 224 261 1900
Fax : +90 224 261 1912

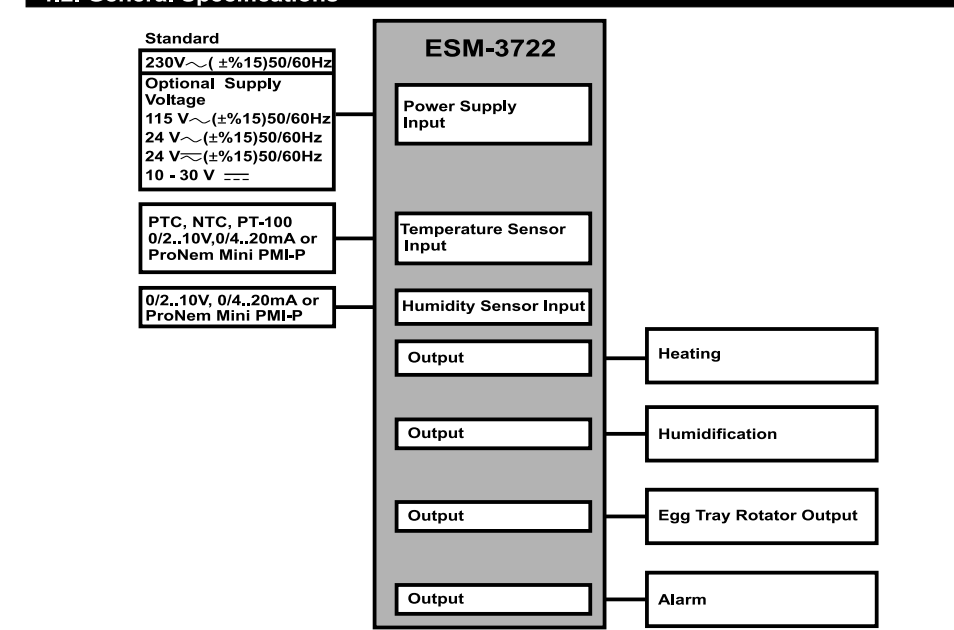
1. Preface

ESM 3722-HT series Hatcher controllers are designed for controlling hatcher process. Device can be used easily with PID or On-Off control form and manual start of egg tray rotator properties.

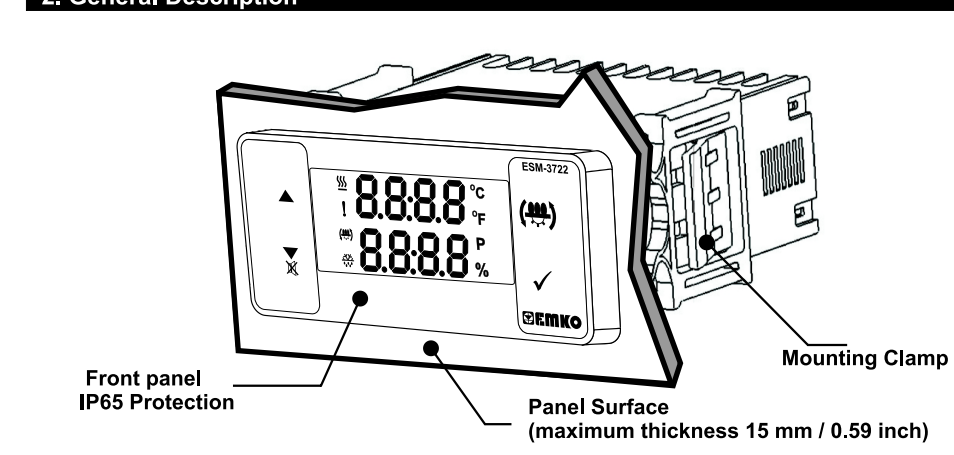
1.1 Environmental Ratings

- Operating Temperature** : -20 to 70 °C
- Max. Operating Humidity** : 90% Rh (non-condensing)
- Altitude** : Up to 2000 m.
- Forbidden Conditions:**
Corrosive atmosphere
Explosive atmosphere
Home applications (The unit is only for industrial applications)

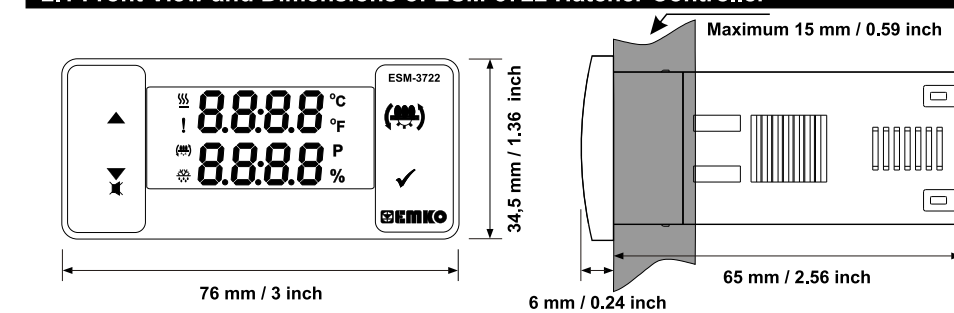
1.2. General Specifications



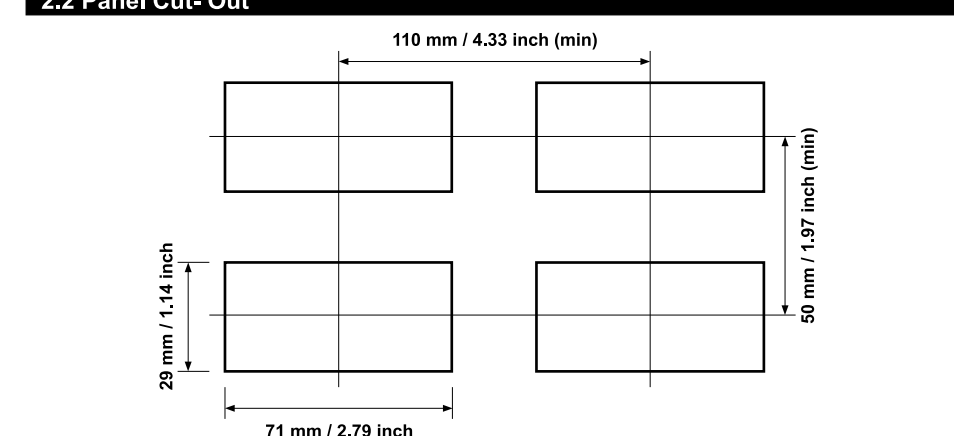
2. General Description



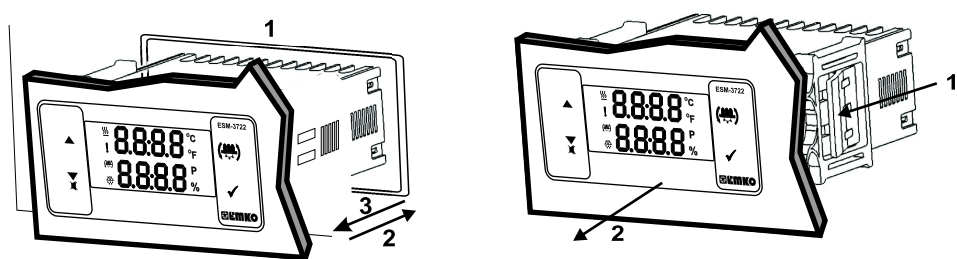
2.1 Front View and Dimensions of ESM-3722 Hatcher Controller



2.2 Panel Cut-Out



2.3 Panel Mounting and Removing

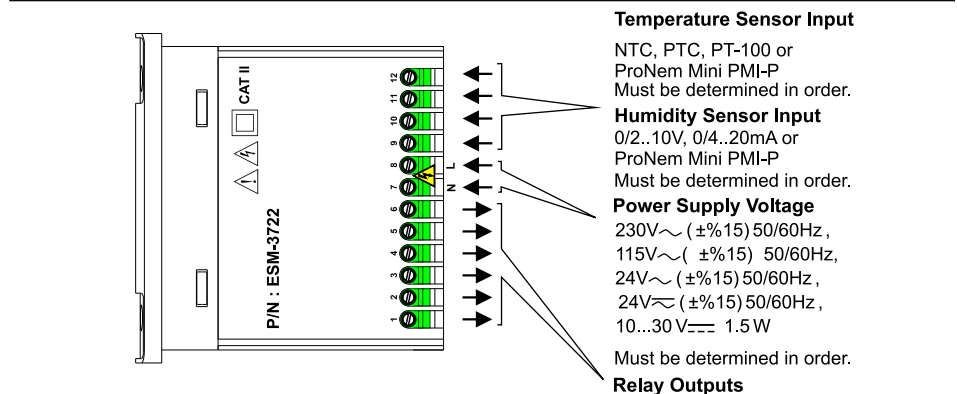


1-Before mounting the device in your panel, make sure that the cut-out is of the right size.
2-Insert the device through the cut-out. If the mounting clamps are on the unit, put them before inserting the unit to the panel.
3-Insert the mounting clamps to the fixing sockets that located left and right sides of device and make the unit completely immobile within the panel.

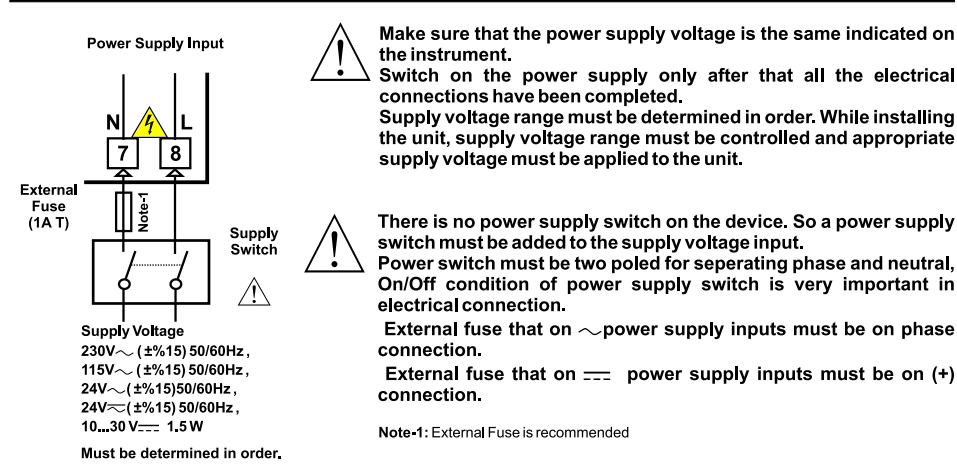
1-Pull mounting clamps from left and right fixing sockets.
2-Pull the unit through the front side of the panel

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

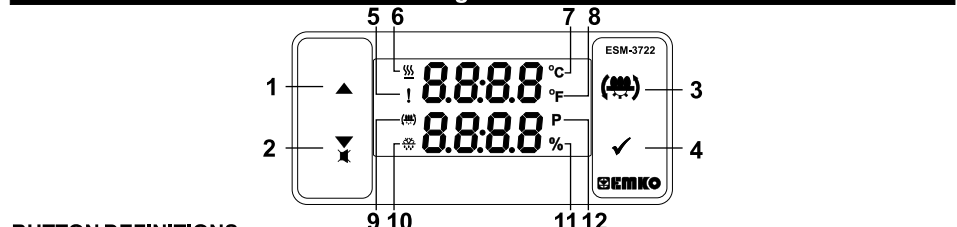
3. Electrical Wiring Diagram



3.1 Supply Voltage Input Connection of the Device



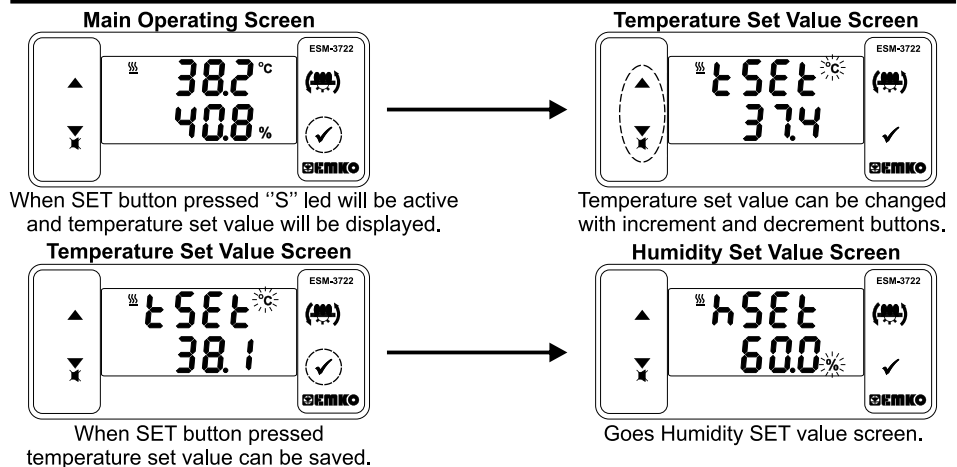
4. Front Panel Definition and Accessing to the Menus



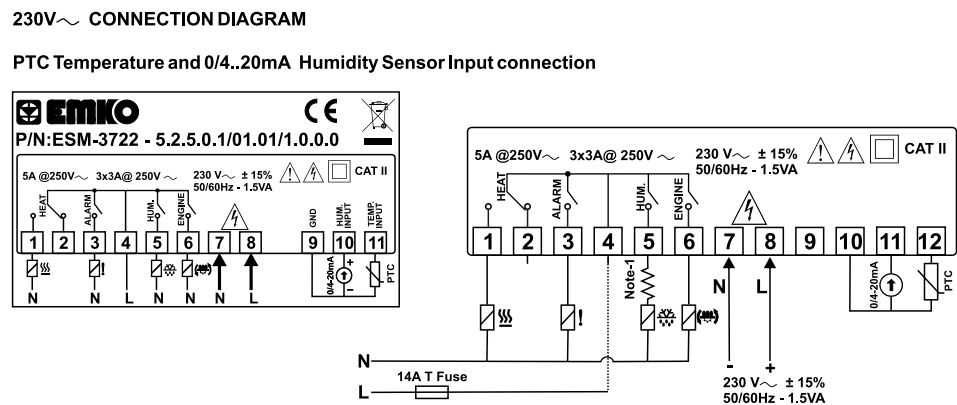
LED DEFINITIONS

- Alarm led**: ** It is active when alarm statuses.
- Heating Output Led**: ** This led indicates that heating output is active.
- Celcius led**: ** Indicates that device is in °C mode.
- Fahrenheit led**: ** Indicates that device is in °F mode.
- Egg Tray Rotator Output Led**: ** This led indicates that Egg Tray Rotator Output is active.
- Humidificating Output Led**: ** This led indicates that Humidity output is active.
- Precent Sign led**: ** Indicates that device is in Humidity Set screen.
- Program led**: ** Indicates that device is in programming mode.

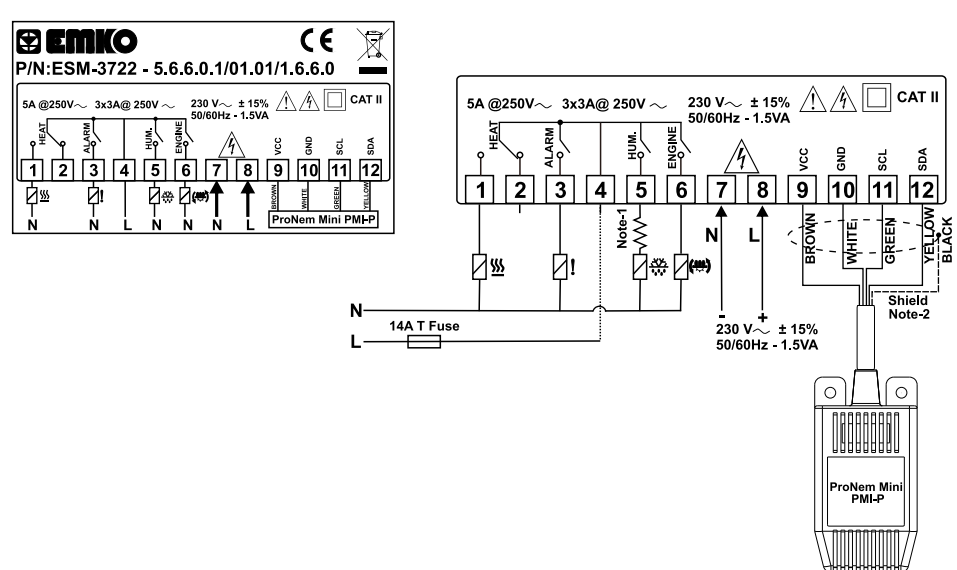
5. Changing and Saving Temperature and Humidity Set Value



3.2 Device Label and Connection Diagram



ProNem Mini PMI-P Temperature and Humidity Sensor Input



Note-1 : User must be connected the resistor which is inside the box serially as shown in connection diagram when use the ultrasonic humidifier(30W...50W power supply) to protect the relay output contact problem.

Note-2 : Shield (Black) pin must be connected to number 10 (GND) of the terminal block.

5.1 Programming Mode Parameter List

- P-o** Temperature Control Selection Parameter On/Off or PID (Default = 0)
 On - Off selected.
 PID selected.
- Note: If this parameter is select 0, PID parameters ($\overline{E\overline{U}N\overline{E}}$, \overline{P} , \overline{I} , \overline{D}) will be not observed. If this parameter select 1, $\overline{E\overline{U}N\overline{E}}$ parameter will be not observed.
- $\overline{E\overline{U}N\overline{E}}$** Self Tune (Step Response Tuning) Selection Parameter (Default = \overline{no})
 Device does not do(Step Response Tuning) operation.
 Device does operation.
- \overline{P}** PID - Proportional Control Parameter (Default = 1.0)
 This parameter value can be adjusted form 0.0 to 100.0.
- \overline{I}** PID - Integral Parameter (Default = 300)
 This parameter value can be adjusted from 0 to 3600.
- \overline{D}** PID - Derivative Parameter (Default = 60.0)
 This parameter value can be adjusted form 0 to 999.9.
- \overline{t}** PID - Period Time Parameter (Default = 1)
 This parameter value can be adjusted form 1 to 150 second.
- \overline{tSP}** PID - Temperature Protection Parameter (Default = \overline{OFF})
 When PID operation is performed, the heating output is switched off if the temperature value goes above the value defined by \overline{tSP} . When the value is 0 or 0.0, if the value decrease button is pressed, \overline{tSP} appears and this function is disabled.
 From 1 to 10°C for NTC, PTC, PT-100 (0°C, 100°C), From 1 to 18°F for NTC, PTC, PT-100 (32°F, 212°F). From 0.1 to 10.0°C for NTC, PTC, PT-100 (0.0°C, 100.0°C), From 0.1 to 18.0°F for NTC, PTC, PT-100 (32.0°F, 212.0°F). From 1 to 10°C for ProNem Mini PMI-P (-20°C, 80°C), From 1 to 18°F for ProNem Mini PMI-P (-4°F, 176°F). From 0.1 to 10.0°C for ProNem Mini PMI-P (-20.0°C, 80.0°C), From 0.1 to 18.0°F for ProNem Mini PMI-P (-4.0°F, 176.0°F).
- \overline{tHSt}** Hysteresis Parameter for Temperature (Default = 0.1 °C)
 From 1 to 10°C for NTC, PTC, PT-100 (0°C, 100°C), From 1 to 18°F for NTC, PTC, PT-100 (32°F, 212°F). From 0.1 to 10.0°C for NTC, PTC, PT-100 (0.0°C, 100.0°C), From 0.1 to 18.0°F for NTC, PTC, PT-100 (32.0°F, 212.0°F). From 1 to 10°C for ProNem Mini PMI-P (-20°C, 80°C), From 1 to 18°F for ProNem Mini PMI-P (-4°F, 176°F). From 0.1 to 10.0°C for ProNem Mini PMI-P (-20.0°C, 80.0°C), From 0.1 to 18.0°F for ProNem Mini PMI-P (-4.0°F, 176.0°F).
- In ON/OFF control algorithm, temperature value is tried to keep equal to set value by opening or closing the last control element. ON/OFF controlled system, temperature value oscillates continuously. Temperature value's oscillation period or amplitude around set value changes according to controlled system. For reducing oscillation period of temperature value, a threshold zone is formed below or around set value and this zone is named hysteresis.
- \overline{tSUL}** Minimum Temperature Set Value Parameter (Default = 10.0°C)
 Temperature set value can not be lower than this value. This parameter value can be adjusted from minimum value of device scale to maximum temperature set value parameter \overline{tSUH} .
- \overline{tSUH}** Maximum Temperature Set Value Parameter (Default = 40.0 °C)
 Temperature set value can not be greater than this value. This parameter value can be adjusted from minimum temperature set value parameter \overline{tSUL} to maximum value of the device scale.

- \overline{ndt}** Time of Automatic Egg Tray Rotator (Default = 00:00)
 This parameter value can be adjusted form 00:00 to 99:59 minute/second.
- \overline{ndp}** Repeat cycle of Automatic Egg Tray Rotator (Default = 00:00)
 This parameter value can be adjusted form 00:00 to 24:00 hour/minute.
- \overline{lowt}** Alarm Output Function Selection Parameter (Default = 0)
 Alarm is inactive.
 Alarm-Temperature sensor failures.
 Alarm-Humidity sensor failures.
 Alarm-Temperature or Temperature sensor failures.
 Alarm-Humidity or Humidity sensor failures.
 Alarm-Temperature sensor failures or Humidity sensor failures.
 Alarm-Temperature or Humidity or Temperature sensor failures or Humidity sensor failures.

Note : if $\overline{E\overline{owt}}$ parameter value is 3 or 6 $\overline{E\overline{RSt}}$, $\overline{E\overline{RSL}}$, $\overline{E\overline{RLH}}$, $\overline{E\overline{RUH}}$, $\overline{E\overline{RdL}}$ or $\overline{E\overline{RPd}}$ parameters are observed.

Note : if $\overline{E\overline{owt}}$ parameter value is 4 or 6 $\overline{E\overline{RSL}}$, $\overline{E\overline{RSL}}$, $\overline{E\overline{RLH}}$, $\overline{E\overline{RUH}}$, $\overline{E\overline{RdL}}$ or $\overline{E\overline{RPd}}$ parameters are observed.

- $\overline{E\overline{RSt}}$** Temperature Alarm Function Selection Parameter (Default = 1)
 Process High alarm selected.
 Process Low alarm selected.
 Deviation Band alarm selected.
 Deviation Range alarm selected.
- $\overline{E\overline{RSL}}$** Temperature Alarm Set Parameter (Default = 50.0 °C)
 This parameter value can be programmed between temperature minimum alarm set $\overline{E\overline{RUH}}$ parameter and temperature alarm set maximum $\overline{E\overline{RdL}}$ parameter.
- $\overline{E\overline{RLH}}$** Temperature Alarm Hysteresis Parameter (Default = 0)
 This parameter value can be adjusted form 0 to %50 of the device scale.
- $\overline{E\overline{RUH}}$** Alarm Set Minimum Parameter (Default = Minimum Value of Device Scale)
 if temperature alarm is active, this parameter value can be adjusted from minimum value of device scale to temperature alarm set maximum parameter value $\overline{E\overline{RdL}}$.
- $\overline{E\overline{RdL}}$** Alarm Set Maximum Parameter (Default = Maximum Value of Device Scale)
 if temperature alarm is active, this parameter value can be adjusted from temperature alarm set value parameter $\overline{E\overline{RUH}}$ to maximum value of the device scale.
- $\overline{E\overline{RPd}}$** Temperature Alarm On Delay Time Parameter (Default = 0)
 Temperature Alarm On Delay Time can be defined with this parameter. It can be adjusted from 0 to 99 minutes.
- $\overline{E\overline{RPd}}$** Temperature Alarm Delay After Power On Parameter (Default = 0)
 When power is first applied to the device, this time delay must be expired for activation of temperature alarm. It can be adjusted from 0 to 99 minutes.
- $\overline{E\overline{RdL}}$** Humidity Alarm Function Selection Parameter (Default = 0)
 Process High alarm selected.
 Process Low alarm selected.
 Deviation Band alarm selected.
 Deviation Range alarm selected.
- $\overline{E\overline{RSL}}$** Humidity Alarm Set Parameter (Default = 50)
 This parameter value can be programmed between humidity minimum alarm set $\overline{E\overline{RUH}}$ parameter and humidity alarm set maximum $\overline{E\overline{RdL}}$ parameter.

- $\overline{E\overline{ofE}}$** Temperature Sensor Offset Parameter (Default = 0)
 From -10 to 10°C, NTC, PTC, PT-100 (0°C, 100°C)
 From -18 to 18°F, NTC, PTC, PT-100 (32°F, 212°F)
 From -10.0 to 10.0°C, NTC, PTC, PT-100 (0.0°C, 100.0°C)
 From -18.0 to 18.0°F, NTC, PTC, PT-100 (32.0°F, 212.0°F)
 From -10 to 10°C, ProNem Mini PMI-P (-20°C, 80°C)
 From -18 to 18°F, ProNem Mini PMI-P (-4°F, 176°F)
 From -10.0 to 10.0°C, ProNem Mini PMI-P (-20.0°C, 80.0°C)
 From -18.0 to 18.0°F, ProNem Mini PMI-P (-4.0°F, 176.0°F)
- $\overline{E\overline{SSL}}$** Humidity Sensor Scale Selection Parameter (Default = 0)
 Analogue input range is determined with this parameter.
 0..10V $\frac{(1)}{=}$ or 0..20mA $\frac{(2)}{=}$
 2..10V $\frac{(1)}{=}$ or 4..20mA $\frac{(2)}{=}$
- Note : $\overline{E\overline{SSL}}$ parameter ProNem Mini PMI-P type device are not observed.
- $\overline{E\overline{hSt}}$** Hysteresis Parameter for Humidity (Default = 1)
 From 1 to 10 for Humidity Sensor (0%RH, 100%RH)
 From 0.1 to 10.0 for Humidity Sensor (0.0%RH, 100.0%RH)
- In ON/OFF control algorithm, Humidity value is tried to keep equal to set value by opening or closing the last control element. ON/OFF controlled system, temperature value oscillates continuously. Temperature value's oscillation period or amplitude around set value changes according to controlled system. For reducing oscillation period of temperature value, a threshold zone is formed below or around set value and this zone is named hysteresis.
- $\overline{E\overline{SUL}}$** Minimum Humidity Set Value Parameter (Default = Minimum Value of Device Scale)
 Humidity set value can not be lower than this value. This parameter value can be adjusted from minimum value of device scale to maximum Humidity set value parameter $\overline{E\overline{SUH}}$.
- $\overline{E\overline{SUH}}$** Maximum Humidity Set Value Parameter (Default = Maximum Value of Device Scale)
 Humidity set value can not be greater than this value. This parameter value can be adjusted from minimum humidity set value parameter $\overline{E\overline{SUL}}$ to maximum value of the device scale.
- $\overline{E\overline{ofE}}$** Humidity Sensor Offset Parameter (Default = 0)
 From -10 to 10 for Humidity Sensor (0%RH, 100%RH)
 From -10.0 to 10.0 for Humidity Sensor (0.0%RH, 100.0%RH)
- $\overline{E\overline{dd}}$** Humidity Decrease Amount Parameter for Door Opened Control (Default = \overline{OFF})
 To detect that the door is opened, the humidity must be reduced in the amount defined by the $\overline{E\overline{dd}}$ parameter in the time defined by the $\overline{E\overline{dct}}$ parameter.
 From -5 to 20 for Humidity Sensor (0%RH, 100%RH)
 From 5.0 to 20.0 for Humidity Sensor (0.0%RH, 100.0%RH)
 If the value decrease button is pressed while the parameter value is 5 or 5.0, $\overline{E\overline{off}}$ is displayed and this function is disabled and the parameters $\overline{E\overline{dct}}$ and $\overline{E\overline{ddt}}$ are not observed.
- $\overline{E\overline{dct}}$** Humidity Decrease Amount Control Time Parameter for Door Opened Control (Default = 20)
 To detect that the door is opened, the humidity must be reduced in the amount defined by the $\overline{E\overline{dd}}$ parameter in the time defined by the $\overline{E\overline{dct}}$ parameter.
- $\overline{E\overline{ddt}}$** Off Time of Humidity Output Parameter for Door Opened Control (Default = 60)
 When it is detected that the door is opened, the humidity output is switched off for the time defined by the $\overline{E\overline{dct}}$ parameter.
 This parameter can be between 10 seconds and 999 seconds.
- (1) It is valid, if the device type 0/2..10V = Humidity Sensor Input.
 (2) It is valid, if the device type 0/4..20mA = Humidity Sensor Input.