

# Cooling Controller



## ESM-3770-D

### Digital ON / OFF Cooling Controller

- Cooling Applications
- Economic
- Easy to Use
- 3 Digit display
- NTC input or PTC input or 2-wire PT-100 Input or 2-wire PT-1000 Input (It must be determined in order)
- ON / OFF Temperature Control
- Compressor, Fan and Defrost outputs
- Evaporator and Cabinet sensor inputs
- Compressor OK digital input
- Adjustable hysteresis value
- Determine compressor working period in case of Cabinet probe defect
- Defrost output controlling parameters
- Fan output controlling parameters
- Password protection for programming mode

### SPECIFICATIONS

#### INPUT

NTC : NTC (10 k @25 °C)  
 PTC : PTC (1000 @25 °C)  
 Thermoresistance (RTD) : 2-wire PT 100, PT 1000 (IEC 751)(ITS90)

Measurement Range : It is in ordering information  
 Accuracy : ±1% of scale

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

Sensor Break Protection : Upscale  
 Sampling Cycle : 3 samples per second

#### CONTROL

Control Form : ON/OFF  
 ON/OFF hysteresis : It can be configured by the user

#### OUTPUTS

Control Output :  
 Compressor Out Relay (10A@250V~ at resistive load)  
 Defrost Out Relay (5A@250V~ at resistive load)  
 Fan Out Relay (5A@250V~ at resistive load)

#### DISPLAY

Process Display :  
 ESM-3770-D : 14 mm Red 3 digits LED Display

#### LED Indicators :

SV (Red), Compressor Output Active (Red), Error (Red), Fan Output Active (Red), Defrost Output Active (Red),

#### POWER SUPPLY

Supply Voltage :  
 24 V ~ (-%15, +%10) 50/60 Hz -1.5 VA

### ENVIRONMENTAL RATINGS and PHYSICAL SPECIFICATIONS

Operating Temperature : 0...50°C  
 Humidity : 0-90%RH (none condensing)  
 Protection Class : IP65 at front, IP20 at rear

#### Weight :

ESM-3770-D : 150 gr

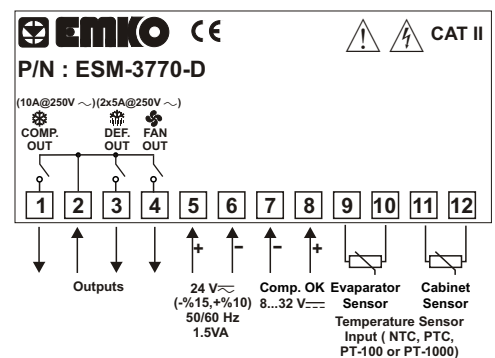
#### Dimension :

ESM-3770-D : 77 x 35 mm, Depth : 62.5 mm

#### Panel Cut-Out :

ESM-3770-D : 71 x 29 mm

### Electrical Wiring



### Ordering Information

ESM-3770-D	A	BC	D	E	/	FG	HI	/	UV	W	Z
(77x35 DIN)	2	0	/	/	1	0	0				

A	Supply Voltage
2	24 V ~ (-%15, +%10) 50/60 Hz

BC	Input Type	Scale(°C)
11	PT 100, IEC751(ITS90)	-50°C 400°C
09	PT 100, IEC751(ITS90)	-19.9°C 99.9°C
12	PTC (Note-1)	-50°C 150°C
15	PTC (Note-1)	-19.9°C 99.9°C
14	PT 1000, IEC751(ITS90)	-50°C 400°C
13	PT 1000, IEC751(ITS90)	-19.9°C 99.9°C
18	NTC (Note-1)	-50°C 100°C
19	NTC (Note-1)	-19.9°C 99.9°C

Note-1 : If input type is selected PTC or NTC (BC = 12, 15, 18, 19), 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.

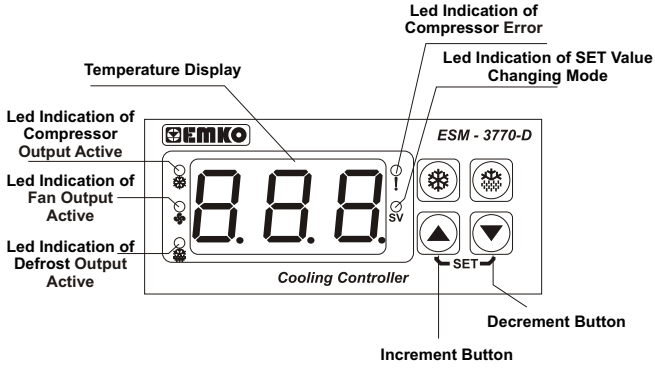
E	FG	HI	Outputs
1	01	01	Compressor Output(10 A@250 V ~ at resistive load, 1NO) Defrost Output( 5 A@250 V ~ at resistive load, 1NO) Fan Output(5 A@250 V ~ at resistive load, 1NO)

V	Temperature Sensor that is given with ESM-3770-D
0	None
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 (NTC Probe, stainless steel housing with 1.5 m cable for cooling application)
9	Customer

Introduction Brochure. ENG ESM-3770-D 01 V01 03/09



## Front Panel



- F1 Fan Stopping Temperature Parameter (Default : 10°C)**  
when the temperature value that is read from the cabinet sensor is lower than the this parameter value, then fan is stopped. It can be adjusted from minimum value to maximum value of device scale.
- F2 Hysteresis Parameter for Fan Output (Default : 2°C)**  
Hysteresis value for fan output is determined with this parameter. It can be adjusted from 1°C to 15°C
- F3 Fan Delay Time After Completion of Defrost Time Parameter (Default : 2 minutes)**  
It can be adjusted from 0 to 15 minutes.
- PR5 Programming Mode Accessing Password (Default : 0)**  
It is used for accessing to programming mode. It can be adjusted from 0 to 999. If it is 0, password is not entered for accessing to the parameters.

## Set Value Changing Mode

It can be accessed with or button that is on front panel. When whichever or button is pressed **SET** expression is shown on the display, after releasing the pressed button set value is shown on the display and SV led becomes active. Set value can be adjusted with and buttons.

Press button for exit from set value changing mode with saving set value or press button for exit from set value changing mode without saving set value

## Parameters

### Entering to Programming Mode

When both and button is pressed, **SEE** expression is shown on the display. After 5 secs pressing both buttons, programming mode accessing password **PR5** is shown on the display. After entering the programming mode accessing password, parameters can be accessing

Press button for showing parameter value and saving the parameter value, press button for exit from parameter section without saving parameter value.

- S1 Evaporator Sensor Selection Parameter (Default : 1)**  
 = Evaporator sensor is passive  
 = Evaporator sensor is active
- H1 Hysteresis Parameter for Compressor Output (Default : 4°C)**  
Hysteresis value for compressor output is determined with this parameter.  
It can be adjusted from 1°C to 10°C
- H2 Compressor Working Period In Case of Cabinet Probe Defect Parameter (Default : 10 minutes)**  
Compressor working period in case of cabinet probe defect is determined with this parameter.  
It can be adjusted from 1 to 240 minutes
- H3 Compressor Working Percentage In Case of Cabinet Probe Defect Parameter (Default : %70)**  
Compressor working percentage in case of cabinet probe defect is determined with this parameter.  
It can be adjusted from 0 to 100
- d1 Defrost Repeat Cycle Parameter (Default : 2 hours)**  
Defrost repeat cycle is determine with this parameter. When pressed the button for starting the device, this time is starts  
It can be adjusted from 1 to 99 hours.
- d2 Defrost Stopping Temperature Parameter (Default : 2°C)**  
For evaporator sensor selection parameter **S1**=0 (evaporator sensor is active) While the defrost operation is in progress, when the temperature value that is read from the evaporator sensor is higher than the this parameter value, then defrost operation is stopped. It can be adjusted from minimum value to maximum value of device scale.
- d3 Defrost Time Parameter (Default : 30 minutes)**  
Defrost time is determined with this parameter  
It can be adjusted from 0 to 99 minutes.