EPM-XX90 CONTROL PANEL FOR V/F SPEED CONTROLLER

EPM-7790 EPM-3790

EPM-3790, EPM-7790
Control Panel For V/F Speed Controller
- 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
- Forward, Reverse direction outputs and error input
- 0/2...10V ⎓ Voltage output or 0/4...20mA⎓ Current output (It must be determined in order.)
- Password protection for Programming and Adjustment sections

EPM-xx90 series units are designed for controlling the speed and direction of the motor as a control panel for V/F Speed Controllers in industry. They can be used in many applications with their easy use and operation with their ramp properties.

SPECIFICATIONS

SCALE
Configurable between -1999 and 9999

OUTPUT
Analogue Output :
0/2...10V⎓ Voltage Output (Max. 10mA) or
0/4...20mA⎓ Current Output

Digital Outputs :
Forward Output (Max. 5mA@30V⎓)
Reverse Output (Max. 5mA@30V⎓)

INPUT
Digital Input :
Error Input (Max. 3mA@30V⎓)
Logic 1 Min. Level 7V⎓
Logic 0 Max. Level 5V⎓

RESOLUTION
12 bit

FLUCTUATION
Max. 30 mV

DISPLAY
Process Display : EPM-3790 : 10 mm Red 4 digits LED display
EPM-7790 : 14 mm Red 4 digits LED display

LED Indicators : For both EPM 3790 and EPM 7790;
Start(Red), Forward Direction(Red), Reverse Direction(Red), Error(Red), P(Red)

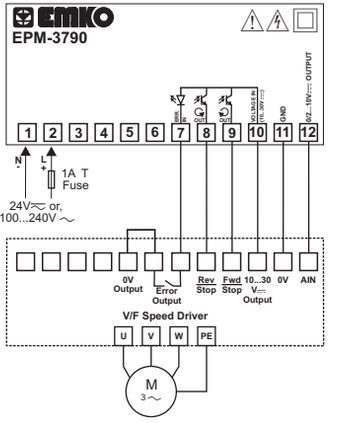
POWER SUPPLY
Supply Voltage :
100-240 V ~ (-%15; +%10) 50/60 Hz -2 VA
24 V ≂ (-%15; +%10) 50/60 Hz -2 VA
(It must be determined in oder.)

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

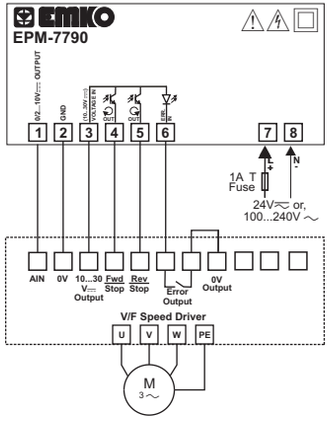
DEVICE	WEIGHT	DIMENSION	PANEL CUT-OUT
EPM-3790	90 gr	77x35 mm, Depth:62.5 mm	71 x 29 mm
EPM-7790	160 gr	72x72 mm, Depth:95.5 mm	69 x 69 mm

Electrical Wiring

EPM 3790 Device:

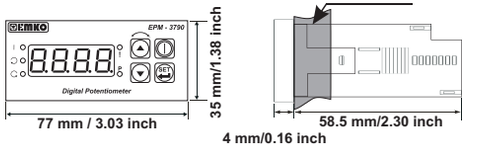


EPM 7790 Device:

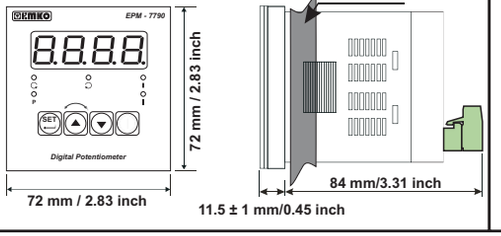


Dimensions

EPM 3790 Device:

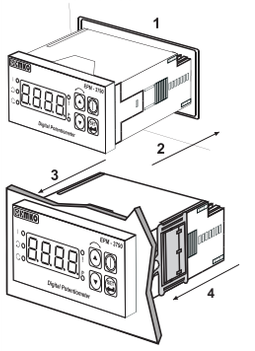


EPM 7790 Device:



Panel Mounting

EPM 3790 Device:



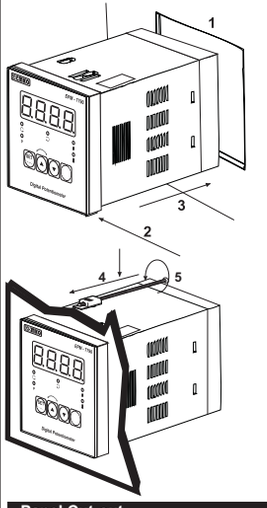
1-Before mounting the device in your panel, make sure that the cut-out is of the right size.

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

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

4- Insert the mounting clamps to the holes that located left and right sides of the device and make the unit completely immobile within the panel

EPM 7790 Device:



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

2-Check front panel gasket position

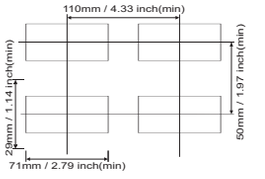
3-Insert the device through the cut-out. If the mounting clamps are on the unit, put out them before inserting the unit to the panel.

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

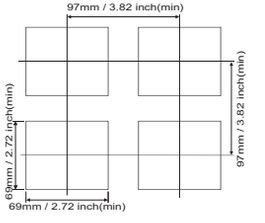
5- Insert the mounting clamps to the holes that located top and bottom sides of device and screw up the fixing screws until the unit completely immobile within the panel

Panel Cut-out

EPM-3790

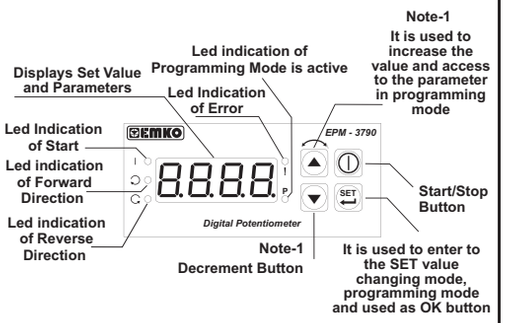


EPM-7790

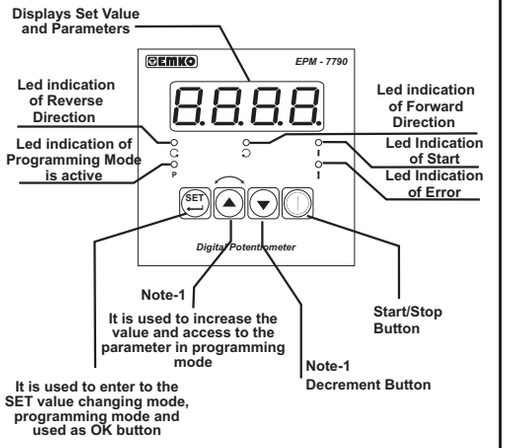


Front Panell Definition

EPM 3790 Device:



EPM 7790 Device:



Note-1: If increment or decrement button is pressed for 2 seconds continuously, increment and decrement number become 10, if pressed for 4 seconds continuously, increment and decrement number become 100, if pressed for 6 seconds continuously, increment and decrement number become 1000

Program Parameters

LoL **Scale Low Limit Parameter (Default = 0)**
It can be adjusted from -1999 to (uPL -1).
At this value analogue output becomes;
oAt = 0, according to the device type 0V ⎓ (1) or 0mA ⎓ (2)
oAt =1, according to the device type 2V ⎓ (1) or 4mA ⎓ (2)

uPL **Scale High Limit Parameter:(Default = 4000)**
It can be adjusted from (LoL +1) to 9999.
At this value analogue output becomes;
According to the device type10V ⎓ (1) or 20mA ⎓ (2)

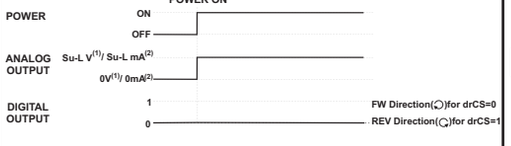
Su-L **Set Low Limit Parameter:(Default = 0)**
Set value can not be defined less than this value.
It can be adjusted from Scale low limit parameter LoL value to Set high limit parameter Su-u value.

Su-u **Set High Limit Parameter:(Default = 4000)**
Set value can not be defined greater than this value.
It can be adjusted from Set low limit parameter Su-L value to Scale high limit parameter uPL value.

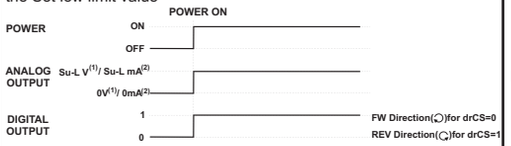
dPnt **Decimal Point Position Parameter:(Default = 0)**
Decimal point position is determined with this parameter.
It can be adjusted from 0 to 3.

Strt **Power On Output Control Parameter: (Default = 3)**
When power on firstly, Analogue and digital outputs status can be determined with this parameter. It can be adjusted from 0 to 3.

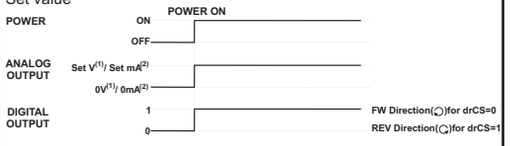
Strt = 0 Motor doesn't starts to operate, Analogue output is equal to the Set low limit value.



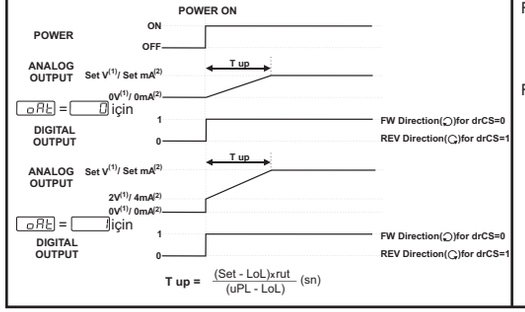
Strt = 1 Motor starts to operate, Analogue output is equal to the Set low limit value



Strt = 2 Motor starts to operate, Analogue output is equal to the Set value



Strt = 3 Motor starts to operate, Analogue output is increase from the Scale low limit to Set value according to the ramp up time.



$$T\,up = \frac{(Set - LoL) \times rut}{(uPL - LoL)}\ (sn)$$

drCS **Direction Selection:(Default = 0)**
Direction of the movement is determined with this parameter.
0 Forward Direction (↻)
1 Reverse Direction (↺)

drCt **Direction Change Delay Time Parameter:**
(Default = 200msec)
In direction changes, when motor stopped, this time must be expire to operate again in other direction. It can be adjusted from 1 to 9999msec.

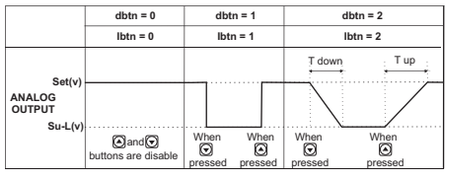
rut **Ramp Up Time Parameter:(Default = 10sec)**
Increasing time of the analogue output from 0V ⎓ (1) value to 10V ⎓ (1) value or from 0mA ⎓ (2) value to 20mA ⎓ (2) value is determined with this parameter.
It can be adjusted from 1 to 999sec.

rdt **Ramp Down Time Parameter:(Default = 10sec)**
Decreasing time of the analogue output from 10V ⎓ (1) value to 0V ⎓ (1) value or from 20mA ⎓ (2) value to 0mA ⎓ (2) value is determined with this parameter.
It can be adjusted from 1 to 999sec.

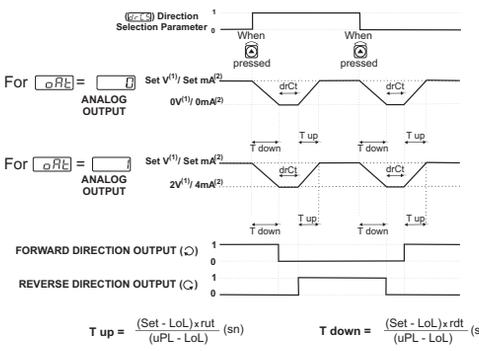
Ibtn **Increment Button Parameter for Functional Usage :**
(Default = 3)
Usage of the Increment button While the motor is running and the unit is on operation screen
0 Increment button is disable
1 Analogue output is directly adjusted to Set value when increment button is pressed.
2 Analogue output is increased to Set value according to the ramp up time when increment button is pressed.
3 Direction of the movement is changed when increment button is pressed.

dbtn **Decrement Button Parameter for Functional Usage:**
(Default = 2)
Usage of the Decrement button While the motor is running and the unit is on operation screen
0 Decrement button is disabled
1 Analogue output is directly adjusted to minimum Set value when decrement button is pressed.
2 Analogue output is decreased to minimum Set value according to the ramp down time when decrement button is pressed.

Increment and Decrement Button Functional Usage



Motor Direction Change (Ibtn=3)



$$T\,up = \frac{(Set - LoL) \times rut}{(uPL - LoL)}\ (sn) \qquad T\,down = \frac{(Set - LoL) \times rdt}{(uPL - LoL)}\ (sn)$$

SIdt **Set Changing Value Parameter:(Default = 3)**
Changing value for Set value is determined with this parameter.
0 Set changing value become one(1)
1 Set changing value become ten(10)
2 Set changing value become hundred(100) for each pressing the Increment, Decrement button
3 Set changing value become incremental. (Note-1)

oAt **Analogue Output Range Selection Parameter:**
(Default = 0)
Analogue output range is determined with this parameter
0 According to the device type 0...10V ⎓ (1) or 0...20mA ⎓ (2)
1 According to the device type 2...10V ⎓ (1) or 4...20mA ⎓ (2)

APAS **Adjustment Section Accessing Password:**
Required password is entered via this parameter for accessing to the adjustment section. If the parameter value is entered as 3083, AUAL screen is accessed, otherwise PASS parameter is seen

AUAL **Adjustment Value Parameter:**
Adjustment value for Analogue output. It can be adjusted from 0 to 4095.

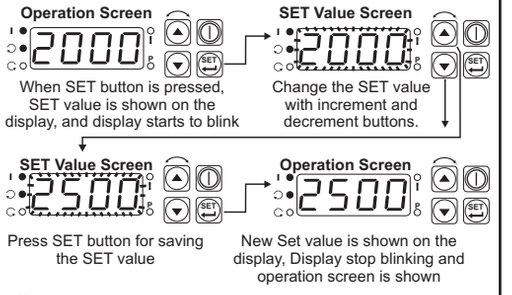
When pressing ▲ button on AUAL screen, adjustment value is seen on screen. The value on the screen should be adjusted with Incremet and decrement button until 10.00V ⎓ (1) or 20.00mA ⎓ (2) is obtained from the analogue output.
After getting the 10.00V ⎓ or 20.00mA ⎓ on analogue output, press ↵ button for saving this value as an adjustment value

PASS **Programming Section Accessing Password:**
(Default =0)
It is used for entering to the programming section.
It can be adjusted from 0 to 9999. If this password is 0, programming section can be accessed without entering the password.

Note-1: If increment or decrement button is pressed for 2 seconds continuously, increment and decrement number become 10, if pressed for 4 seconds continuously, increment and decrement number become 100, if pressed for 6 seconds continuously, increment and decrement number become 1000.

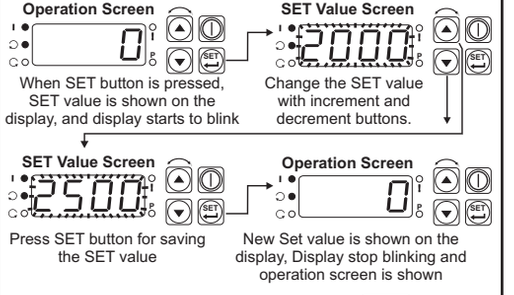
Changing and Saving Set Value

Changing and Saving Set Value While the Motor is Running



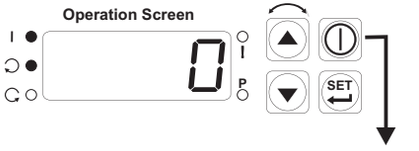
İf Set value is changed while the motor is running, analogue output is affected simultaneously by change on the set value. Analogue output is increase or decrease to the new value according to the rut and rdt parameters.

Changing and Saving Set Value While the Motor is not Running



SET Value can be adjusted from minimum set value Su-L parameter to maximum set value Su-u parameter , they can be accessed from programming parameters.

Motor Start / Stop Operation



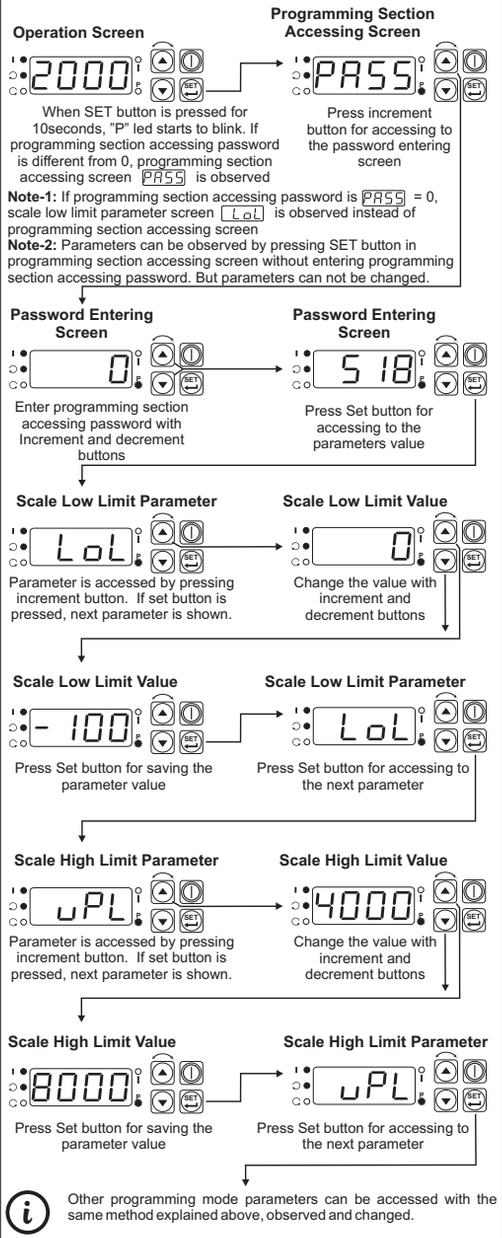
When Start/Stop button is pressed, Set value is seen on display, Start led lights on, selected digital output is being active and analogue output starts to increase from the set low limit value to set value during **Tup(sec)** time with ramp.

While the motor is running if Start/Stop button is pressed again set low limit value is seen on display, Start led lights off, analogue output starts to decrease from set value to set low limit value.during **Tdown(sec)** time. When analogue output is equal to set low limit value selected digital output is being inactive.

(1) It is valid, if the device type 0/2...10V ⎓ analogue output.
(2) It is valid, if the device type 0/4...20mA ⎓ analogue output.
If no operation is performed in programming mode for 20 seconds, device turns to operation screen automatically.

Entering to the Programming Mode, Changing and Saving Parameters

EPM 3790 Device:

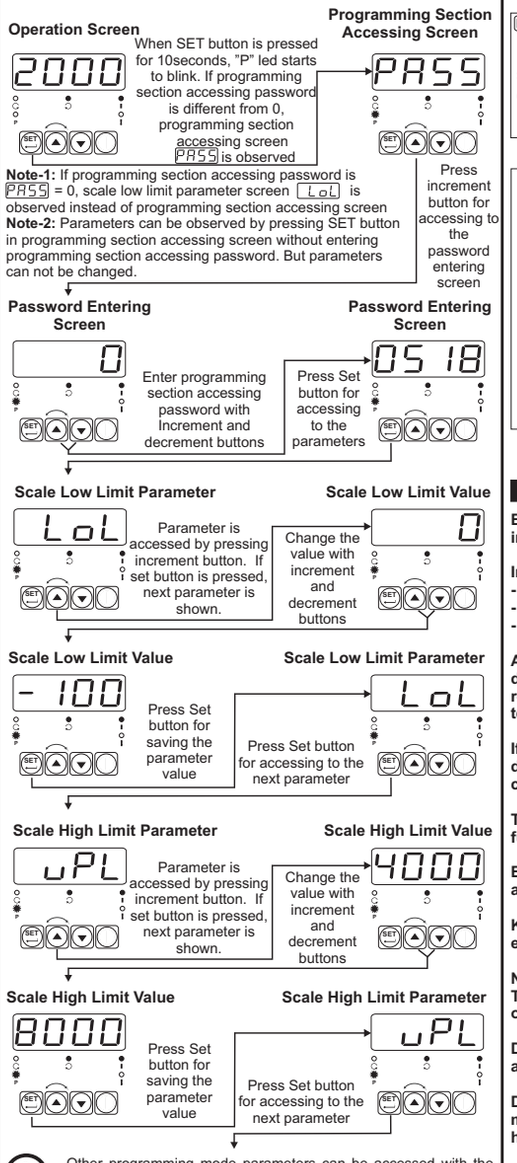


Note-1: If programming section accessing password is PASS = 0, scale low limit parameter screen LoL is observed instead of programming section accessing screen

Note-2: Parameters can be observed by pressing SET button in programming section accessing screen without entering programming section accessing password. But parameters can not be changed.

Other programming mode parameters can be accessed with the same method explained above, observed and changed.

EPM 7790 Device:

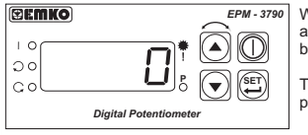


Note-1: If programming section accessing password is PASS = 0, scale low limit parameter screen LoL is observed instead of programming section accessing screen

Note-2: Parameters can be observed by pressing SET button in programming section accessing screen without entering programming section accessing password. But parameters can not be changed.

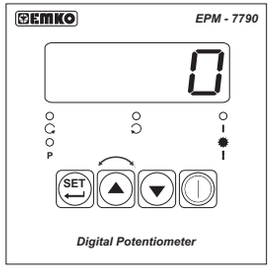
Other programming mode parameters can be accessed with the same method explained above, observed and changed.

Failure Message in EPM xx90 Unit



When Error input is being active, Error led starts to blink .

The Unit passes to the stop position.



Installation

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

In package ,
- One piece unit
- Two pieces mounting clamps
- One piece instruction manual

A visual inspection of this product for possible damage occured 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 results in malfunction, electric shock or fire.

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

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

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

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

Warranty

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

Maintenance

Repairs should only be performed by trained and specialized personnel. Cut power to the device before accessing internal parts.
Do not clean the case with hydrocarbon-based solvents (Petrol, Trichlorethylene etc.). Use of these solvents can reduce the mechanical reliability of the device. Use a cloth dampened in ethyl alcohol or water to clean the external plastic case.

Other Informations

Manufacturer Information:

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

Ordering Information

EPM-3790 (77x35 DIN Boyutlu)
EPM-7790 (72x72 DIN)

A	BC	D	E	/	FG	HI	/	U	V	W	Z
	0	0		/	00	00	/	1	0	0	0

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

E	Output
4	Current Output (0/4...20mA ⎓)
5	Voltage Output (0/2...10V ⎓ Max. 10mA)

EMKO Your Technology Partner

Thank you very much for your preference to use Emko Elektronik products, please visit our web page to download detailed user manual.
www.emkoelektronik.com.tr