



EMKO DIFFERENTIAL CONTROLLER

- 3 Digits display
- 2 PTC inputs
- 2 Relay outputs
- ON/OFF control form
- Limitation of setpoint
- Hysteresis adjustment
- Programming mode password protection
- Easy access to setpoint changing the screen
- Boiler water over-temperature protection
- Collector frost protection

Instruction Manual. ENG DT-9910 01 V02 07/14

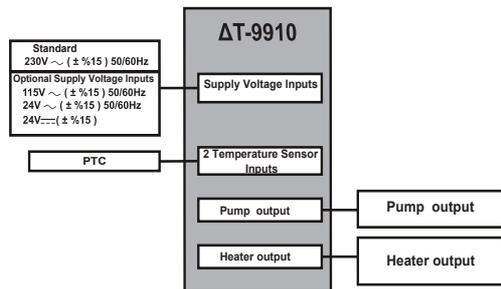
1.Introduction

Differential controller gives output to calculate temperature difference between two sensor. Easy access to the screen to adjust the setpoint and code protected the parameter menu for parameter settings. If temperature difference between two sensor becomes equals or more according to adjust setpoint and hysteresis parameter, the relay output is activated, otherwise the relay output is disabled.

1.1 Environmental Ratings

	Operating Temperature : 0 to 50 °C
	Max. Operating Humidity %90 Rh (non-condensing)
	Altitude : 2000 m'ye kadar
	Forbidden Conditions : Corrosive atmosphere Explosive atmosphere

1.2. General Specifications



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1.3 Installation

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

A visual inspection of this product for possible damage occurred during shipment is recommend before installation. It is your responsibility to ensure that qualified mechanical and electrical technicians install this product.

If there is danger of a 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 the 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 prevent.

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 metal panel while mechanical installation some metal burrs can cause injury on hands, you must be careful.

Montage on the product on a system must be done with it's fixing clamps. Do not to the montage of the device with inappropriate fixing clamb. Be sure that the device will not fall while doing the montage. It is your responsibility if this equipment is used in 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 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.

1.5 Maintenance

Repairs should only be performed by trained and specialized personnel. Cut power to the device before accessing internal parts.

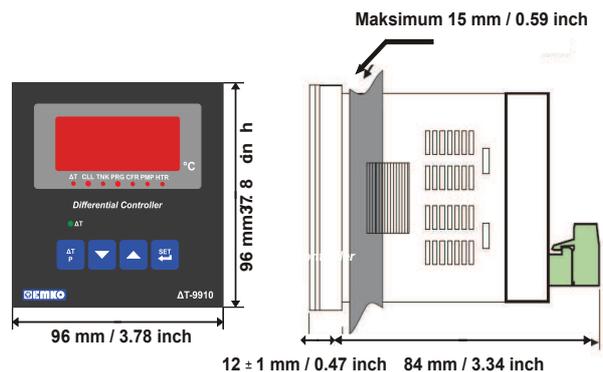
Do not clean the case with hydrocarbon-based solvents (Petrol, Trichlorethylene etc.). Use of these solvents can reduce the mechanical reliability of the device. Use cloth dampened in ethyl alcohol or water to clean the external plastic case. Average lifetime of the device 10 years.

1.6 Manufacturer

Manufacturer Information:
Emko Elektronik Sanayi ve Ticaret AŞ.
Demirtaş Organize Sanayi Bölgesi Karanfil Sk.No:6 16369 BURSA
Tel : (224) 261 19 00 Fax : (224) 261 19 12
Repair and Maintenance Service Information:
Emko Elektronik Sanayi ve Ticaret AŞ.
Demirtaş Organize Sanayi Bölgesi Karanfil Sk.No:6 16369 BURSA
Tel : (224) 261 19 00 Fax : (224) 261 19 12

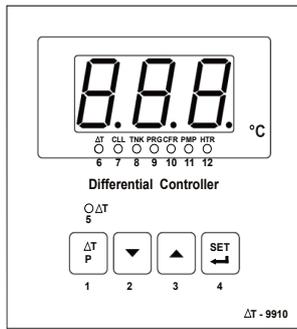
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2. Front View and Dimensions of DT-9910 differential Controller with Two Relays



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3. Description of The Front Panel

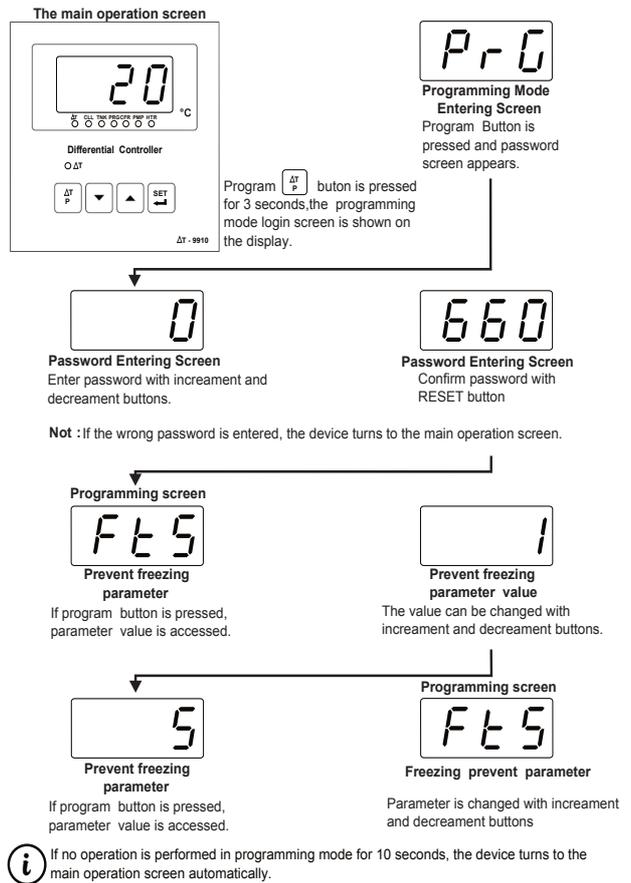


BUTTON DESCRIPTIONS

- 1.Program Button** : The program button is used to change the set value in program menu. When pressed for 10 seconds to enter the program menu, Less than 10 seconds to access the setting value.
- 2.Decrease Button** : It is used to decrease the setting parameters in programming mode.
- 3.Increase Button** : It is used to increase the setting parameters in programming mode.
- 4.SET Button** : When setting this value is used to save the set values. Also on the main screen, push this button so can see values of temperature sensors.
- 5. ΔT Led(Green)** : Setting the value to set the screen lights up as long overdue.
- 6. ΔT Led (Red)** : If the LED lights on, the temperature difference is shown on the main Operation screen.
- 7.CLL Led** : If temperature of collector shown on the display, the light is on.
- 8.TNK Led** : If temperature of tank shown on the display, the light is on.
- 9.PRG Led** : Entering the program menu the led starts blinking.
- 10.CFR Led** : If collector temperature less than collector value which is set on the program menu for to prevent freezing on the Collector, the light is on and Pump output is activated.
- 11.PMP Led** : If pump output is active, the light is on.
- 12.HTR Output** : If heater output is active, the light is on.

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4.1 Enter Programming Mode, Change and Save the Hidden Parameters

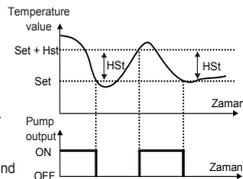


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4.2. Program parameters

FtS Freezing prevent parameter(Default= 4)
Range : -10 to +10 °C
if collector temperature less than this value ,Pump output is activated.

HSt Hysteresis Parameter
Range : 1°C to+10 °C
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.



oFr Boiler temperature Offset parameter (Default = 0)
Range : -10°C to +10 °C
if necessary this parameter, the value is added tank temperature.

oFc Collector temperature Offset parameter (Default = 0)
Range : -10°C to +10 °C
if necessary this parameter, the value is added collector temperature.

StH Heater Set Setting Parameter (Default = 0)
Range:0 to +90 °C
If temperature is less than this parameter value, the heater output will be on. Otherwise the heater output will be off.

HSH Heater Set Hysteresis Parameter (Default = 4)
Range :0 to +10
This value is added heater set parameter.

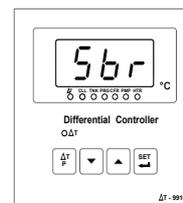
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tnt Tank Maximum Temperature Parameter(Default=60)
Range:0 to +95 °C
This parameter is used to avoid tank overheating , all controller disabled for safety. Temperature output becomes active when the value falls below two degrees .If tank temperature becomes maximum temperature,the screen starts blinking.

CLL Collector Minimum Temperature Parameter(Default=10)
Range:0 to +95 °C
When the temperature of the collector decreases less than this parameter ,differential control is disabled and pump closed. if the temperature becomes greater 3 ° C than this parameter, differential control is activated again.
Not: Freeze protection and temperature parameters is not affected by this parameter

PAS Programming Mode Accessing Password
It is used for accessing to the programming mode. It can be adjusted from '0' to '999'. If the value equals to '0',the program does not enter password entry programming menu

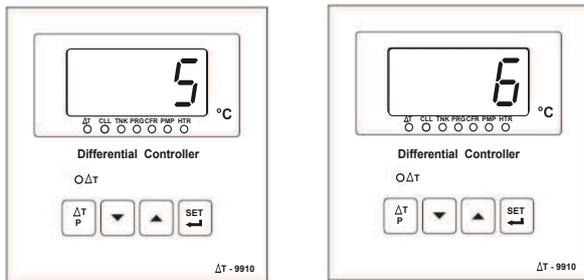
5. Error Messages



5br This message gives sensor error or not connected. Controller stops and can not see sensor value. CLL led does not blink for collector sensor error. TNK led does not blink for tank sensor error.

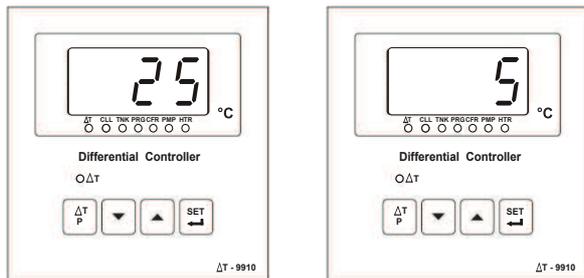
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6. Entering To The Programming Mode, Changing and Saving Parameter



When ΔT button is pressed, set value blinks and ΔT led (green) lights and increment and decrement buttons are changed value. After press set button for saving, if do not touch for 3 second, saving cancelled and returns to the main screen. ΔT led blinks, the set value can be adjusted from 0 -20. Set value how many degrees the collector temperature greater than tank temperature for activating the pump.

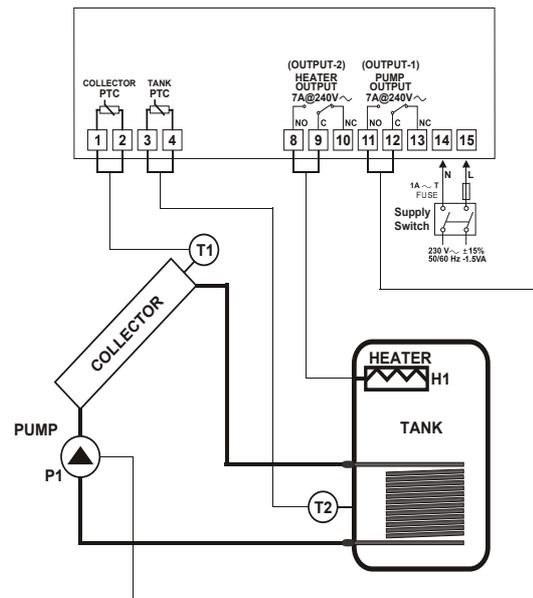
7. Sensor Value on Main Screen



Set button is pressed once, sensor led lights which one shows on the screen. if difference between the temperature sensors on the screen, ΔT LED (red) light is on.

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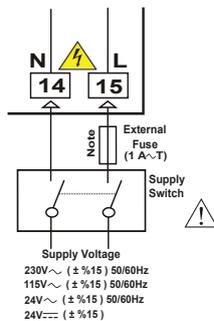
8. Electrical Wiring Diagram



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9. Supply Voltage Input Connection of the Device

Supply Input Connection



Note: External fuse is recommended.



Make sure that the power supply voltage is the same indicated on the instrument.
Switch on the power supply only after that all the electrical connections have been completed.
Supply voltage range must be determined in order. While installing the unit, supply voltage range must be controlled and appropriate supply voltage must be applied to the unit.



There is no power supply switch on the device. So a power supply switch must be added to the supply voltage input. Power switch must be two poled for separating phase and neutral. On/Off condition of power supply switch is very important in electrical connection.
External fuse that on V power supply inputs must be on phase connection.
External fuse that on Z power supply inputs must be on (+) connection.

Ordering Information

DT-9910 (96x96 1/4 DIN)	A	BC	D	E	/	FG	HI	/	U	V	W	Z
	12	0	1	/	01	00	/	2	2	2	0	

A	Supply Voltage
2	24V ~ 50/60Hz veya 24V --- (± %15)
3	24V ~ (± %15) 50/60Hz
4	115V ~ (± %15) 50/60Hz
5	230V ~ (± %15) 50/60Hz
9	Customer

BC	InputType	Scale (°C)
12	PTC (Not-1)	-50 ile 150°C

Note-1: Temperature sensor is given with the device. Therefore, the sensor type code (V = 0, 2) must be selected.

D	Serial Communication
0	Yok

E	Output-1(Pump Output)
1	Relay Output (7A@240V~Resistive Load, 1NO + 1NC)

FG	Output-2(Heater Output)
1	Relay Output (7A@240V~Resistive Load, 1NO + 1NC)

V	Temp. Sensor which is given with Controller
0	None
2	PTCR-M7.5-L0.50-K1.5



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

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