ema®

Electronic Temperature Sensors

Analogue output

| T | ⬦♦♦ IP68 | CE | RoHS |

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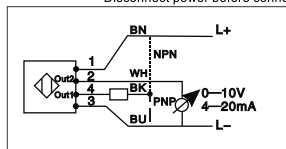## Display and visual indication

①	Out1	Out1 status;lights on under connecting to the output terminal
②	Out2	Out2 status;lights on under connecting to the output terminal
③	7-segment Display	System pressure display, Parameter and parameter value display
④	LEARN/SET	Setting of learn mode and parameter value
⑤	MODE/ENTER	Select on of parameter and acknowledgement of parameter value

Electrical connection

The unit must only be connected by an electrician. The national and international regulations for the installation of electrical equipment must be observed.
Voltage supply to EN50178,SELV,PELV.
Disconnect power before connecting the unit.

Core color:

1 = BN (brown);
2 = WH (white);
3 = BU (blue);
4 = BK (black)

❸

Functions and features

The unit detects current system temperature from temperature sensors , display the current system temperature (°C or °F),and generates 2 output signals according to the set output configuration.
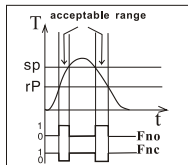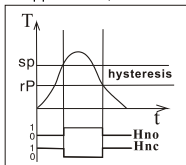
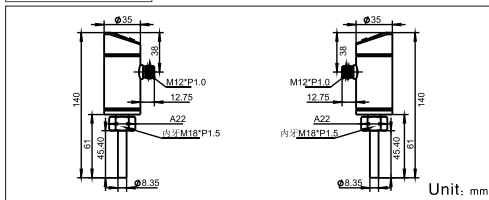| Output 1	Output 2	Measuring range	
Hysteresis function/N.O.(**Hno**)	Analogue 4...20 mA(**I**)	℃	-40...+150
Hysteresis function/N.C.(**Hnc**)			
window function/N.O.(**Fno**)	Analogue 0...10 V(**U**)	°F	-40...+302
window function/N.C.(**Fnc**)			

Hysteresis:

The hysteresis keeps the switching state of the outputs stable if the system temperature varies about the preset value.
When the system temperature is rising, the output switches when the switch-on point has been reached (SP1); when the system temperature is falling again, the output switch-off point (rP1) has been reached.
The hysteresis can be adjusted: First the switch-on point is set ,then the switch-on point with the requested difference.

Window function:

The window function enables the monitoring of a defined acceptable range.
When the system temperature varies between the switch-on point (Sp1) and the switch-off point (rP1) ,the output is switched (window function/NO) or not switched (window function/NC).
The width of the window can be set by means of the difference between SP1 and rP1.
SP1 = upper value, rP1=lower value.

Dimensions

Unit: mm

Operating modes

Run mode :
(Normal operating mode)
When the supply voltage has been applied, the unit is in the Run mode .it monitors and switches the transistor output according to the set parameters.
The value of the analogue output depends on the system temperature.
The LED display indicates the current system temperature,
The red LED indicates the switching state of the transistor output.

Display mode:
(Indication of the parameters and the set parameter values)
When the "MODE/ENTER" button is pressed briefly,the unit passes to the Display mode which allows parameter values to be read. The internal sensing ,processing and output functions of the unit continue as if in Run mode.
• The parameter names are scrolled with each pressing of the "MODE/ENTER" button.
• When the "LEARN/SET" button is pressed briefly, the corresponding parameter value is displayed for 5 sec.. After another 5 sec.the unit returns to the Run mode .

Programming mode:
(Setting of the parameter values)
The unit passes to the programming mode when after the selection of a parameter value（Display mode）the "LEARN/SET" button is pressed until the display of the parameter value is changed.
Internally the unit remains in the operating mode .It continues its monitoring function with the existing parameters until the change has been terminated.
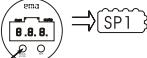You can change the parameter value by pressing the "LEARN/SET" button and confirm it by pressing the "MODE/ENTER" button. The unit returns to the Run mode when no button has been pressed for 5 sec.

SP1	Switch-on point: Upper limit value at which the output changes its switching status.	
	Setting range	In steps of
℃	−39.5...+150	0.5
℉	−39...+302	1

�P1	Switch-off point: Lower limit value at which the output changes its switching status.	
	Setting range	In steps of
℃	−40...+149.5	0.5
℉	−40...+301	1

rP1 is always lower than SP1. The unit only accepts values which are lower than SP1. Changing the switch-on point also changes the switch-off point (the hysteresis remains constant). If the hysteresis is higher than the new switch point, it is automatically Reduced(rP1 is set to the minimum setting value).

OU1

Configuration of the switching output
4 switching functions can be set:
Hno=hysteresis / normally open; **Hnc**=hysteresis / normally closed;
Fno=window function / normally open;
Fnc=window function / normally closed

n-P	Switching output selection	n Pn	NPN output
		P nP	PNP output

ASP	Lower end of analogue output: measured value for which the output signal is 4 mA/0V		
	Unit	Setting range	In steps of
	℃	−40...+140	0.5
	℉	−40...+284	1

AEP	Upper end of analogue output: measured value for which the output signal is 20 mA/ 10 V		
	Unit	Setting range	In steps of
	℃	−30...+150	0.5
	℉	−22...+302	1
	Minimum distance between ASP and AEP=10℃ /18℉		

AOU	Analogue outout selection	U	0–10V Voltage output
		I	4–20mA Current output

diS	Setting of the display: 4 options can be selected ℃=display in celsius; r℃=reverse display ℉=display in fahrenheit; r℉=reverse display		

Calibration offset
The internal measured value(operating value of the sensor)is offset against the real measured value

CAL	Unit	Setting range	In steps of
	℃	−9.9...+9.9	0.1
	℉	−17.5...+17.5	0.5

MIN–MAX memory for system temperature
• HI:display the highest measured temperature
• LO:display the lowest measured temperature
Erase the memory:
– Press the"MODE/ENTER"button until " HI " or " LO " is display
– Press the "LEARN/SET"button and keep it press until "−−−"is display
– Then press the "MODE/ENTER" button briefly.
it is recommended to erase the memory as soon as the unit starts working under normal operating conditions.

HI
LO

Programming

① ⇒ SP1
Press the "MODE/ENTER" button several times until the respective parameter is displayed.

② ⇒ 70 ⇕ 100
Press the "SET" button and keep it pressed the current parameter value is indicated for 5 sec.,then the value is increasing (incremental by pressing briefly or scrolling by holding pressed).

③ ⇒ SP1
Press the "MODE/ENTER" button briefly (=acknowledgement). The parameter is displayed again, the set parameter value becomes effective.

Wait 5 sec. (the unit passes to the operating mode and the current measured value is indicated again), or start again with step 1 to program other parameters.

Decrease parameter value: Make the parameter value displayed reach the highest of the parameter setting, and then recycle to the highest value from the lowest.

Lock/Unlock:
Lock:This unit features auto-lock function. When there is no button being pressed in 1 minute, it will be locked automatically. The mointor of the temperature is running normally.
Unlock: Keep pressing "LEARN/SET" button under the normal temperature display mode (run mode), and then press "MODE /ENTER" for 10 sec. until the "ULC" is displayed, meaning that it's unlock. The original setting is under lock mode.

Error status

Detecting safety of device if the operation works ineffective
Error status:

HI	Temperature value is too high
LO	Temperature value is too low
Sc1	Short-current in or excessive currentin the switching output;the output is switched on(Flashing).

Technical data

Operating voltage [V]	18...36DC
Load current[mA]	300
Voltage drop [V]	<2
Current consumption [mA]	<50
Switching output	PNP/NPN Programmable
Analogue output	4...20 mA/0...10V Programmable
Analogue output (4-20mA) load [Ohm]	Max. 500
Analogue output (0-10V) load [Ohm]	Min. 1000

Accuracy

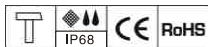|	
Switching output[°C /°F]	±0.2/±0.36
Analogue output [°C/°F]±(0.2/0.36+0.4% of the set measuring span)	
Display [°C/°F]	±(0.2/0.36+1/2 digit)

Resolution

Switching output[℃/℉]	0.5/1
Analogue output[℃/℉]	0.125/0.23
Display[℃/℉]	0.5/0.5
Temperature drift[% of value of measuring range/10K]	±0.1
Measuring/diaplay cycle[ms]	200
Power-on delay time[s]	1.5
operating Temperature[℃/℉]	-40...+150/-40...+302
Ambient Temperature[℃/℉]	-25...+80/-13...+176
storage Temperature[℃/℉]	-40...+100/-40...+212
Insulation resistance[MΩ]	>100(500V DC)
Shock resistance[g]	50
Vibration resistance[g]	20
Housing material	stainless steel304
Probe material	high-class stainless steel316L
protection classification	IP68
ESD	6KV
Pulse	2KV
Walkie talkie experiment	IM

Mounting and maintenance

1.The probe is not allowed to touch the wall of pipe.
2.This product should be mounted in the position which can sense the temperature.
3.When this product is mounted in the bottom of the pipe, please clean the sediments; when installed on the top of the pipe, please make the medium full of the pipe.
4.Please inspect the probe of the sensor regularly. If necessary, use vinegar to clean the sediments stuck on the probe.
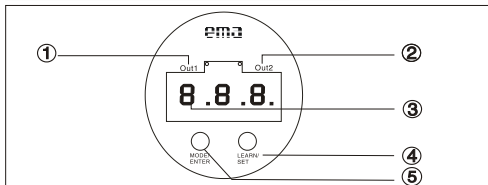
Electronic Temperature Sensors

Switching output

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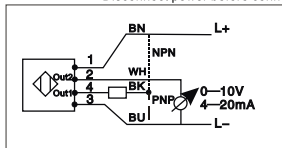## Display and visual indication

①	Out1	Out1 status;lights on under connecting to the output terminal
②	Out2	Out2 status;lights on under connecting to the output terminal
③	7-segment Display	System pressure display, Parameter and parameter value display
④	LEARN/SET	Setting of learn mode and parameter value
⑤	MODE/ENTER	Select on of parameter and acknowledgement of parameter value

Electrical connection

The unit must only be connected by an electrician.
The national and international regulations for the installation of electrical equipment must be observed.
Voltage supply to EN50178,SELV,PELV.
Disconnect power before connecting the unit.

Core color:

1 = BN (brown);
2 = WH (white);
3 = BU (blue);
4 = BK (black)

⑪

Functions and features

The unit detects current system temperature from temperature sensors , display the current system temperature (^{o}C or ^{o}F),and generates 2 output signals according to the set output configuration.

Output 1	Output 2	Measuring range	
Hysteresis function/N.O.(**Hno**)	Analogue 4...20 mA(**I**)	$^{\circ}C$	$-40...+150$
Hysteresis function/N.C.(**Hnc**)			
window function/N.O.(**Fno**)	Analogue 0...10 V(**U**)	$^{\circ}F$	$-40...+302$
window function/N.C.(**Fnc**)			

Hysteresis:

The hysteresis keeps the switching state of the outputs stable if the system temperature varies about the preset value.
When the system temperature is rising, the output switches when the switch-on point has been reached (SP1); when the system temperature is falling again, the output switch-off point (rP1) has been reached.
The hysteresis can be adjusted: First the switch-on point is set ,then the switch-on point with the requested difference.
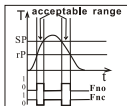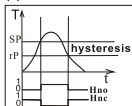
Window function:

The window function enables the monitoring of a defined acceptable range.
When the system temperature varies between the switch-on point (Sp1) and the switch-off point (rP1) ,the output is switched (window function/NO) or not switched (window function/NC).
The width of the window can be set by means of the difference between SP1 and rP1.
SP1 = upper value, rP1=lower value.

Diagnostic function

If OUT2=dEs,OUT2 wil be use for diagnostic output.(1)I fthere is no error . OUT2output UB+(OUT1=PNP),(2)If there is error ,OUT2 output invalid, maybe has the following problems;measurement of small defects;OUT1 overload or short circuit;exceed or not meet the limitation of measurement range;EEPRON error;RAM error;CPU error.

Operating modes

Run mode :
(Normal operating mode)
When the supply voltage has been applied, the unit is in the Run mode .it monitors and switches the transistor output according to the set parameters.
The value of the analogue output depends on the system temperature.
The LED display indicates the current system temperature, The red LED indicates the switching state of the transistor output.

Display mode:
(Indication of the parameters and the set parameter values)
When the "MODE/ENTER" button is pressed briefly,the unit passes to the Display mode which allows parameter values to be read. The internal sensing ,processing and output functions of the unit continue as if in Run mode.
· The parameter names are scrolled with each pressing of the "MODE/ENTER" button.
· When the "LEARN/SET" button is pressed briefly, the corresponding parameter value is displayed for 5 sec.. After another 5 sec.the unit returns to the Run mode .

Programming mode:
(Setting of the parameter values)
The unit passes to the programming mode when after the selection of a parameter value (Display mode) the "LEARN/SET" button is pressed until the display of the parameter value is changed.Internally the unit remains in the operating mode .It continues its monitoring function with the existing parameters until the change has been terminated.
You can change the parameter value by pressing the "LEARN/ SET" button and confirm it by pressing the "MODE/ENTER" button.The unit returns to the Run mode when no button has been pressed for 5 sec.

Menu setting

Menu	Function	Setting range			In steps of
OU1	output1 program	Sp1	Switch-on point :Higher limit value at which the output changes its switching status.		
			℃	-39.5...+150	0.5
			℉	-39...+302	1
		rp1	Switch-off point : Lower limit value at which the output changes its switching status.		
			℃	-40...+149.5	0.5
			℉	-40...+301	1
		rP1 is always lower than SP1.The unit only accepts values lower than SP1 to change switch-on and switch-off point .(The hysteres is constant).If the hysteresis is higher than the new switch point, it will reduced automatically (rP1 is the min.value of setting			
		FUn function setting	H n o Hysteresis/N.O.		
			H n c Hysteresis function/N.C.		
			F n o Window/N.O.		
			F n c Window/N.C.		
		n-P	n P n		
			P n P		

		Setting range			In steps of
Ou2	Output2 program	Sp2	Switch-on point :Higher limit value at which the output changes its switching status.		
			℃	-39.5...+150	0.5
			℉	-39...+302	1
		rp2	Switch-off point : Lower limit value at which the output changes its switching status.		
			℃	-40...+149.5	0.5
			℉	-40...+301	1
		rP2 is always lower than SP2.The unit only accepts values lower than SP2 to change switch-on and switch-off point .(The hysteres is constant).If the hysteresis is higher than the new switch point, it will reduced automatically (rP2 is the min.value of setting			
		FUn function setting	H n o Hysteresis/N.O.		
			H n c Hysteresis function/N.C.		
			F n o Window/N.O.		
			F n c Window/N.C.		
			dEs Diagnosis output (Normally Closed)		
		n - P	n P n		
			P n P		

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diS Display	Setting of the display: 4 options can be selected °C=display in °Celsius; r°C= reverse display °F=display in °Fahrenheit ;r°F= reverse diaplay		
		Setting range	In steps of
CAL	℃	-9.9...+9.9	0.1
	℉	-17.5...+17.5	0.5

EF	Advantaged Function		Min-Max memory for system temperature · HI: displays the highest measured temperature · LO: displays the lowest measured temperature Erase the memory:
		HI	-Press the "MODE/ENTER" button until HI or LO is displayed.
		LO	-Press the "LEARN/SET" button and keep it pressed until "--" is displayed -Then press the "MODE/ENTER" button briefly.
			It is recommended to erase the memory as soon as the unit starts working under normal operating conditions.

Programming

 ① Press the "MODE/ENTER" button several times until the respective parameter is displayed.

 ② Press the "LEARN/SET" button and keep it pressed the current parameter value is indicated for 5 sec.,then the value is increased (incremental by pressing briefly or scrolling by holding pressed).

 ③ Press the "MODE/ENTER" button briefly (=acknowledgement). The parameter is displayed again, the set parameter value becomes effective.

Wait 5 sec. (the unit passes to the operating mode and the current measured value is indicated again), or start again with step 1 to program other parameters.

Decrease parameter value: Make the parameter value displayed reach the highest of the parameter setting, and then recycle to the highest value from the lowest.

Lock/Unlock：
Lock:This unit features auto-lock function. When there is no button being pressed in 1 minute, it will be locked automatically. The monitor of the temperature is running normally.
Unlock: Keep pressing "LEARN/SET" button under the normal temperature display mode (run mode), and then press "MODE /ENTER" for 10 sec. until the "ULC" is displayed, meaning that it's unlock. The original setting is under lock mode.

Error status

Detecting safety of device if the operation works ineffective
Error status:

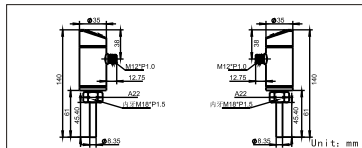| HI	Temperature value is too high
LO	Temperature value is too low
Sc1	Short-circuit or excessive current in the switching output;the output is switched on(Flashing).

Technical data

Operating voltage [V]	18...36DC
Load current[mA]	300
Voltage drop [V]	<2
Current consumption [mA]	<50
Switching output	PNP/NPN Programmable
Analogue output	4...20 mA/0...10V Programmable
Analogue output (4–20mA) load [Ohm]	Max. 500
Analogue output (0-10V) load [Ohm]	Min. 1000

Accuracy

Switching output[°C /°F]	±0.2/±0.36
Analogue output [°C/°F]	±(0.2/0.36+0.4% of the set measuring span)
Display [°C/°F]	±(0.2/0.36+1/2 digit)

Resolution	
Switching output[°C/°F]	0.5/1
Display[°C/°F]	0.5/0.5
Temperature drift[% of value of measuring range/10K]	±0.1
Measuring/diaplay cycle[ms]	200
Power–on delay time[s]	1.5
Operating Temperature[°C/°F]	−40...+150/−40...+302
Ambient Temperature[°C/°F]	−25...+80/−13...+176
Storage Temperature[°C/°F]	−40...+100/−40...+212
Insulation resistance[MΩ]	>100(500V DC)
Shock resistance[g]	50
Vibration resistance[g]	20
Housing material	stainless steel304
Probe material	high−class stainless steel316L
Protection classification	IP68
ESD	6KV
Pulse	2KV
Walkie talkie experiment	1M

Dimensions

Unit: mm

Mounting and maintenance

1.The probe is not allowed to touch the wall of pipe.
2.This product should be mounted in the position which can sense the temperature.
3.When this product is mounted in the bottom of the pipe, please clean the sediments; when installed on the top of the pipe, please make the medium full of the pipe.
4.Please inspect the probe of the sensor regularly. If necessary, use vinegar to clean the sediments stuck on the probe.
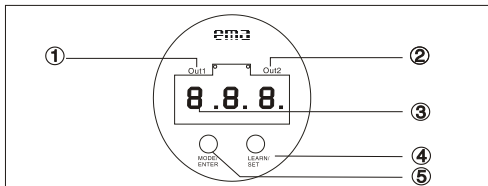
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TB /TD

IP68 CE RoHS
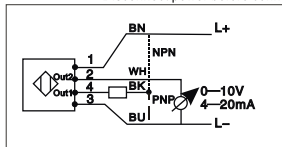
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Display and visual indication

①	Out1	Out1 status:lights up on under connecting to the output terminal
②	Out2	Out2 status:lights up on under connecting to the output terminal
③	7-segment Display	System pressure display, Parameter and parameter value display
④	LEARN/SET	Setting of learn mode and parameter value
⑤	MODE/ENTER	Select on of parameter and acknowledgement of parameter value

Electrical connection

The unit must only be connected by an electrician. The national and international regulations for the installation of electrical equipment must be observed.
Voltage supply to EN50178,SELV,PELV.
Disconnect power before connecting the unit.

Core color:

1 = BN (brown);
2 = WH (white);
3 = BU (blue);
4 = BK (black)

Functions and features

The unit detects current system temperature from temperature sensors , display the current system temperature ($^{\circ}$C or $^{\circ}$F),and generates 2 output signals according to the set output configuration.

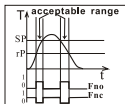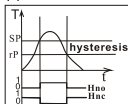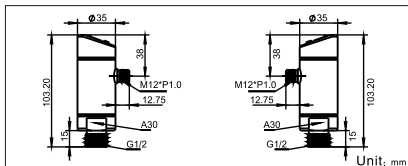| Output 1	Output 2	Measuring range	
Hysteresis function/N.O.(**Hno**)	Analogue 4...20 mA(**I**)	$^{\circ}$C	-40...+150
Hysteresis function/N.C.(**Hnc**)			
window function/N.O.(**Fno**)	Analogue 0...10 V(**U**)	$^{\circ}$F	-40...+302
window function/N.C.(**Fnc**)			

Hysteresis:

The hysteresis keeps the switching state of the outputs stable if the system temperature varies about the preset value.
When the system temperature is rising, the output switch on point has been reached (Sp1); when the system temperature is falling again, the output switch-off point(rP1) has been reached. The hysteresis can be adjusted: the switch-on point is set ,then the switch-on point with the requested difference.

Window function:

The window function enables the monitoring of a defined acceptable range.
When the system temperature varies between the switch on point (Sp1) and the switch-off point (rP1) ,the output is switched (window function/NO) or not switched (window function/NC). The width of the window can be set by means of the difference between SP1 and rP1.
SP1 = upper value, rP1=lower value.

Dimensions

Unit: mm

Operating modes

Run mode :
(Normal operating mode)
When the supply voltage has been applied, the unit is in the Run mode .It monitors and switches the transistor output according to the set parameters.
The value of the analogue output depends on the system temperature.The LED display indicates the current system temperature,The red LED indicates the switching state of the transistor output.

Display mode:
(Indication of the parameters and the set parameter values)
When the "MODE/ENTER" button is pressed briefly, the unit passes to the Display mode which allows parameter values to be read. The internal sensing ,processing and output functions of the unit continue as if in Run mode.
 · The parameter names are scrolled with each pressing of the "MODE/ENTER" button.
 · When the "LEARN/SET" button is pressed briefly, the corresponding parameter value is displayed for 5 sec.. After another 5 sec.
 the unit returns to the Run mode .
Programming mode:
(Setting of the parameter values)
The unit passes to the programming mode when after the selection of a parameter value (Display mode) the "LEARN/SET" button is pressed until the display of the parameter value is changed. Internally the unit remains in the operating mode .It continues its monitoring function with the existing parameters until the change has been terminated.
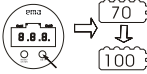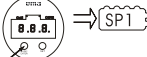You can change the parameter value by pressing the "LEARN/SET" button and confirm it by pressing the "MODE/ENTER" button. The unit returns to the Run mode when no button has been pressed for 5 sec.

Menu setting

SP1	**Switch-on point**: Upper limit value at which the output changes its switching status.		
		Setting range	In steps of
	℃	−39.5...+150	0.5
	℉	−39...+302	1

�P 1	**Switch-off point**: Lower limit value at which the output changes its switching status.		
		Setting range	In steps of
	℃	−40...+149.5	0.5
	℉	−40...+301	1
	rP 1 is always lower than SP1. the unit only accepts values which are lower than SP1.Changing the switch-on point also changes the switch-off point (the hysteteres is remains constant). If the hysteresis is higher than the new switch point, it is automaticallyReduced(rP1 is set to the minimum setting value).		

OU1	**Configuration of the switching output** 4 switching of the switching functions can be set: **Hno**=hysteresis / normally open;**Hnc**=hysteresis / normally closed; **Fno**=window function / normally open; **Fnc**=window function / normally closed		

n−P	Switching output selection	n Pn	NPN output
		P n P	PNP output

ASP	**Lower end of analogue output**: measured value for which the output signal is 4 mA/0V		
	Unit	Setting range	In steps of
	℃	−40...+140	0.5
	℉	−40...+284	1

AEP	**Upper end of analogue output**:measured value for which the output signal is 20 mA/ 10 V		
	Unit	Setting range	In steps of
	℃	−30...+150	0.5
	℉	−22...+302	1
	Minimum distance between ASP and AEP=10℃ /18℉		

AOU	Analogue outout selection	U	0~10V Voltage output
		I	4~20mA Current output

dıS	Setting of the display:4 options can be selected ℃=display in celsius ; r℃=reverse display ℉=display in fahrenheit ; r℉=reverse display		

CAL	**Calibration offset** The internal measured value(operating value of the sensor) is offset against the real measured value		
	Unit	Setting range	In steps of
	℃	−9.9...+9.9	0.1
	℉	−17.5...+17.5	0.5

HI LO	**MIN−MAX memory for system temperature** • HI:display the highest measured temperature • LO:display the lowest measured temperature Erase the memory: − Press the"MODE/ENTER"button until "HI" or "LO" is display − Press the "LEARN/SET"button and keep it press until "−−−"is display − Then press the "MODE/ENTER" button briefly. it is recommended to erase the memory as soon as the unit starts working under normal operating conditions.

Programming

①	⇒ SP1	Press the "MODE/ENTER" button several times until the respective parameter is displayed.
②	⇒ 70 ⇩ 100	Press the "SET" button and keep it pressed the current parameter value is indicated for 5 sec.,then the value is changed (incremental by pressing briefly or scrolling by holding pressed).
③	⇒ SP1	Press the "MODE/ENTER" button briefly (=acknowledgement). The parameter is displayed again, the set parameter value becomes effective.

Wait 5 sec. (the unit passes to the operating mode and the current measured value is indicated again), or start again with step 1 to program other parameters.

Decrease parameter value: Make the parameter value displayed reach the highest of the parameter setting, and then recycle to the highest value from the lowest.

Lock/Unlock:
Lock:This unit features auto-lock funtion. When there is no button being pressed in 1 minute, it will be locked automatically. The detection of changes of the temperature is running normally.
Unlock: Keep pressing "LEARN/SET" button under the normal temperature display mode (runn mode), and then press "MODE /ENTER" for 10 sec. until the "ULC" is displayed, meaning that it's unlock. The original setting is under lock mode.

Error status

Detecting safety of device if the operation works ineffective
Error status:

HI	Temperature value is too high
LO	Temperature value is too low
Sc1	Short-circuit or excessive current in the switching output;the output is switched on(Flashing).
Err	No contact to the probe or internal error(Flashing)

Technical data

Operating voltage [V]	18...36DC
Load current[mA]	300
Voltage drop [V]	<2
Current consumption [mA]	<50
Switching output	PNP/NPN Programmable
Analogue output	4...20 mA/0...10V Programmable
Analogue output (4–20mA) load [Ohm]	Max. 500
Analogue output (0-10V) load [Ohm]	Min. 1000

Accuracy

Switching output[$^\circ$C / $^\circ$F]	$\pm 0.2/\pm 0.36$
Analogue output [$^\circ$C/ $^\circ$F]	$\pm(0.2/0.36+0.4\%$ of the set measuring span)
Display [$^\circ$C/ $^\circ$F]	$\pm(0.2/0.36+1/2$ digit)

Resolution

Switching output[℃/℉]	0.5/1
Display[℃/℉]	0.5/0.5
Temperature drift[% of value of measuring range/10K]	± 0.1
Measuring/diaplay cycle[ms]	200
Power–on delay time[s]	1.5
Operating temperature[℃/℉]	−40...+150/−40...+302
Ambient temperature[℃/℉]	−25...+80/−13...+176
storage temperature[℃/℉]	−40...+100/−40...+212
Insulation resistance[MΩ]	>100(500V DC)
Shock resistance[g]	50
Vibration resistance[g]	20
Housing material	stainless steel304
Probe material	high–class stainless steel316L
Protection classification	IP68
ESD	6KV
Pulse	2KV
Walkie talkie experiment	1M

Mounting and maintenance

1. The probe is not allowed to touch the wall of pipe.
2. This product should be mounted in the position which can sense the temperature.
3. When this product is mounted in the bottom of the pipe, please clean the sediments; when installed on the top of the pipe, please make the medium full of the pipe.
4. Please inspect the probe of the sensor regularly. If necessary, use vinegar to clean the sediments stuck on the probe.

Operating principle

It can detect ambient tempertaure by a tempertaure sensor with a PT1000 thermal resistance unit, and then transmit the information to intelligent unit to process.

Feature

1. Signal transmittion through a high quality cable.
2. Concise structure,easy installation,and easy-to-use.
3. Hign accurancy and great stability.
4. Resistant to shock, interference,and high tempertaure.
5. For temperature detection in a long distance.

How to assemble

① control monitor

+

② cable

+

③ probe unit
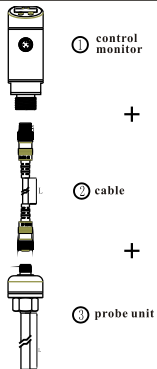
Technical parameters

| Specification / Item	TD Series
Application	Liquid and gas
Operating current [mA]	≤1
Sensing range[℃/℉]	−40...+150/−40...+302
Accurancy [° C]	0.1%
Ambient temperature[℃/℉]	−40...+150/−40...+302
Medium temperature[℃/℉]	−40...+200/−40...+392
Storage temperature[℃/℉]	−40...+150/−40...+302
Insulation resistance [M]	> 100 (500VDC)
Protection classification	IP68
Shock resistance [g]	50
Vibration resistance [g]	20
Pressure resistance [bar]	300
Housing material	stainless steel 304
Probe material	stainless steel 316L

Approval

1.CE.RoHS

2.UL(Insulation resistance,Hign pressure resistance,
electrostatic protection, Shock and vibration resistance.
Stability:Lifetime is over 15000 hours)

Notice

1.The probe can't touch on the wall of pipe.
2.It should be installed in the place where is the section
you want to detect.
3.The sediment should be cleared when this unit is installed
on the bottom of pipe.
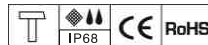4.Please inspect the probe regularly,and clean the sediment
adhered to it by vinegar.

Probe unit dimensions

Ø35

M12*P1.0

33.30

M18*P1.5

L

L+33.30

Unit:mm

❷❽
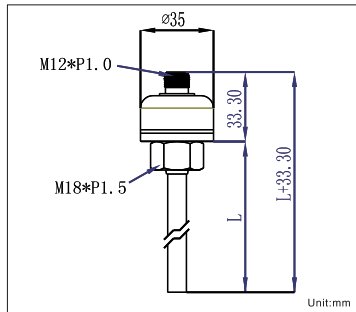
Electronic Temperature Transmitters

IP68 CE RoHS

www.ema-electronic.com

Operating principle

The sensor detects the operating temperature and then transmit the data to examing circuit. After processing, the temperature transfer the value set to analogue (4~20mA, 0~10V) output.

Features

1. The wide range rated voltage broadens the applications and reduce the stock effectively.
2. Compact structure without adjustment and easy installation.
3. Low power consumption, low temperature drift, high accuracy, and high stability.
4. Resistant to shock, to vibration, and to overload with one-piece design.
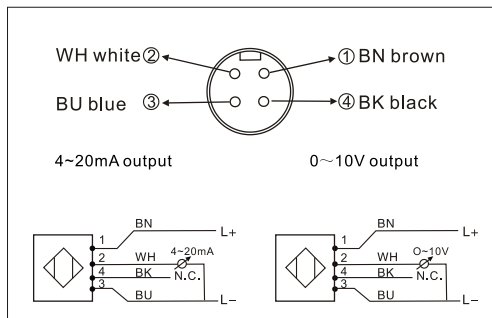5. Unique digital adjustment to ensure high accuracy.

Dimensions

Unit：mm
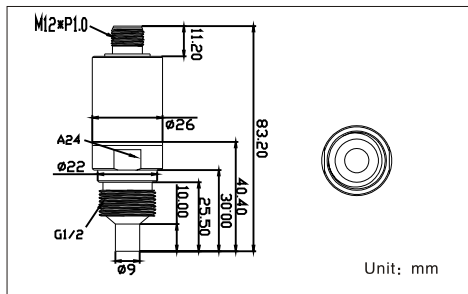
Funtions and features

1. 4~20mA output
2. 0~10V output

Wiring

WH white② → ①BN brown

BU blue ③ → ④BK black

4~20mA output   0~10V output

Certification

1. Meet CE directive
2. Meet UL directive

Technical data

Specification Parameter	TC Series Temperature Transmitter
Sensing substance	Gas and liquid
Voltage output[V]	18…36DC
Reverse polarity protection	Yes

Current consumption[mA]	< 40
Sensing range[°C/ ℉]	-40...+100/-40...+212
Output	4~20mA Output(TC0102)
	0~10V Output(TC0103)
4~20mA Output load [Ω]	Maximum500
0~10V Output load [Ω]	Minimum2000
Connection	M12
Accuracy [°C]	± 0.1
Ambient temperature [℃/℉]	-40...+100/-40...+212
Operating temperature[℃/℉]	-40...+100/-40...+212
Storage temperature[℃/℉]	-25...+80/-13...+176
Insulation resistor [MΩ]	> 100 (500 V DC)
Shock resistance [g]	50
Vibration resistance [g]	20
Housing material	Stainless steel 304
Probe material	High-class stainless steel 316L
Protection classification	IP68

Notice:
1.The prode is not allowed to touch the wall of pipe.
2.It should be installed in the location menifesting the temperature.
3.When it is installed in the bottom of pipe, the sediment should be cleared. When it is installed in the top of pipe, the length of insertion of the probe should not be smaller than 10mm or the medium should be full of pipe.
4.Please check the probe periodically. If required, please use vinegar as detergent to clean the sediment stuck on the probe.