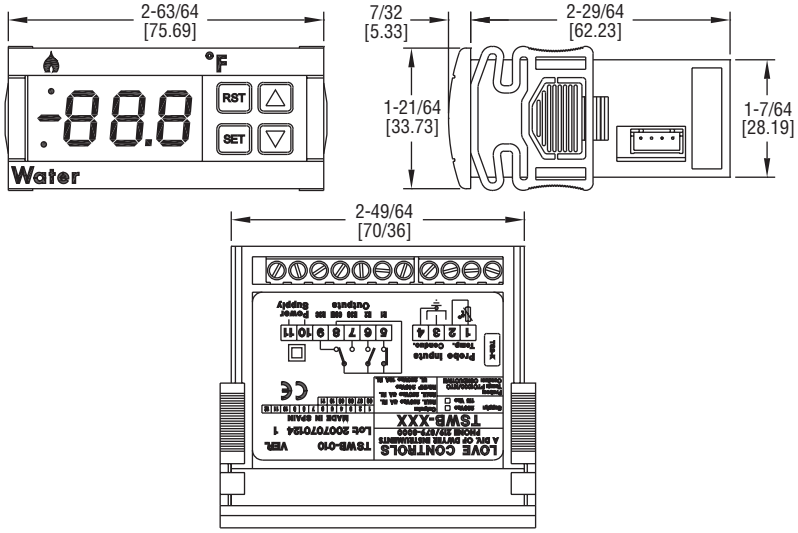
TSWB Digital Temperature/Water Level Switch

Specifications - Installation and Operating Instructions



The Series TSWB Digital Temperature Switch has a high and a low set point for controlling the water temperature. The low set point can either be manually or automatically reset. This control also has a conductivity probe input. This input supplies12 VAC to the probe to check for low water condition. There are three relay outputs which can be assigned in the field to the high temperature set point, low temperature set point or the low water level input. The Model TS2-K configuration key can make configuring multiple controls quick and easy.

Model References

TSWB - [ ] [ ] [ ]

Display Color
0 = Red
1 = Green

Units
0 = °F
1 = °C

Power Supply
1 = 115 VAC
2 = 230 VAC
3 = 12 VAC/VDC
4 = 24 VAC/VDC

Installation

NOTE: Unit must be mounted away from vibration, impacts, water and corrosive gases.

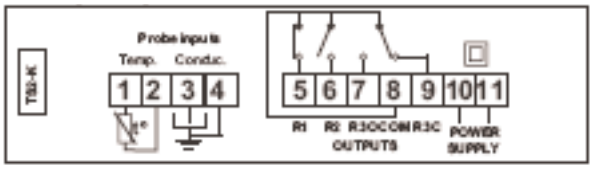
- Cut hole in panel 2.80 x 1.14 inches).
- Apply silicone (or rubber gasket) around the perimeter of the hole to prevent leakage.
- Insert unit into hole of panel.
- Slide removable fitting clips onto unit from the back until secure to panel.
- Wiring diagram is displayed on the top of the unit.

Note: DO NOT INSTALL PROBE CABLE NEAR POWER CABLES.

SPECIFICATIONS

Probe Range: PTC -58 to 302ºF (-50ºC to 150ºC); NTC -58 to 230ºF (-50ºC to 110ºC).
Probe Temperature Input: (Selectable by parameter) PTC1000 probes (25ºC-1000 Ohm) / NTC.
Probe Level Input: Conductivity Probe: max Voltage 12 VAC. Sensitivity established from factory at 100KOhm.
Output: R1 SPST NO Relay Resistive load 5A @ 250 VAC;
R2 SPST NC Relay Resistive load 5A @ 250 VAC;
R3 SPDT Relay Resistive load 16A @ 240 VAC.
Horsepower Rating: 1HP -- 10FLA, 60LRA 250 VAC.
Control Type: On/Off.
Power Requirement: 115 VAC ± 10%, 230 VAC ± 10%, 24 VAC/DC ± 10%, 12 VAC/DC ± 10%.
Power Consumption: 4VA (230V/115V) 1.5VA (24V/12V).
Accuracy: Better than 1% of full scale.
Display: 3-digit, red 1/2″ digits.
Resolution: 1º (3 digits).
Memory Backup: Nonvolatile memory.
Ambient Operating Temperature: 32 to 158ºF (-30 to 70ºC).
Storage Temperature: -4 to 176ºF (-30 to 80ºC).
Weight: 3.5 oz.
Front Protection: IP64.
Agency Approvals: CE, UL, cUL.

Wiring Diagram



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List of Parameters

	Description	Units	Range
HSP	High Set Point	Degrees	r1 to r2
LSP	Low Set Point	Degrees	r3 to r4
r0h	Differential or hysteresis for HS	Degrees	1 to 99
roL	Differential or hysteresis for LS	Degrees	1 to 99
r1	Lower value for HS	Degrees	-58 to r2
r2	Higher value for HS	Degrees	r1 to 302
r3	Lower value for LS	Degrees	-58 to r4
r4	Higher value for LS	Degrees	r3 to 302
t1	Time for revalue LS condition	Minutes	0 to 999
A0	Reset of alarms	Range	Auto/hoL/Bot
A1	LS is High or Low Set Point	Range	Low/High
Out	Relay Output State	Numeric	1 to 7
P1	Ambient probe adjustment	Degrees	-30 to 30
P5	Ambient probe type	Range	PTC/NTC
H5	Access code to parameters	Numeric	0 to 255
H6	Blinking of Low Fuel LED	Range	On/Off

Parameters Descriptions

HSP = High Set Point. (variable from r1 to r2).
Temperature of probe > HSP -->relay excites.
Temperature of probe < HSP-r0 -->relay de-excites.

LSP = Low Set Point. (variable from r3 to r4).
Temperature of probe < LSP -->relay de-excites.
Temperature of probe > LSP+r0 -->relay excites.

r0h = Differential or hysteresis for HSP.

l01 = Differential or hysteresis for LSP.

r1 = Lower value for HSP.

r2 = Higher value for HSP.

r3 = Lower value for HSP.

r4 = Higher value for LSP.

t1 = Time for revalue LSP condition.

If A0 = HoL when reset button is pressed the relay LSP is excited for t1 minutes. The process of the user pressing the manual reset button would continue until the process temperature is above LSP.

A0 = Reset of alarms.
Aut = Disabled manual reset.
Bot = Enable manual reset and automatic reset.
HoL = Enabled manual reset.

Out = Relay Output State.

Profile	High Set Point	Low Set Point	Water Probe
1	SPST NC (R1)	SPST NO (R2)	SPDT (R3)
2	SPST NO (R2)	SPST NC (R1)	SPDT (R3)
3	SPST NC (R1)	SPDT (R3)	SPST NO (R2)
4	SPST NO (R2)	SPDT (R3)	SPST NC (R1)
5	SPDT (R3)	SPST NO (R2)	SPST NC (R1)
6	SPDT (R3)	SPDT NC (R1)	SPST NO (R2)
7	SPDT (R3)	-	SPST NO (R2) + SPST NC (R1)

P1 = Ambient probe adjustment. Offset degrees to be added to probe.

P5 = Ambient probe type. PTC or NTC.

H5 = Access code to parameters. (It is set to 00 from factory).

H6 = Blinking of fuel LED.
ON = If temperature of probe < LSP the fuel LED on the display starts to blink. When Temperature of probe > LSP+r0 the fuel LED is turned off.
OFF = fuel LED blinking disabled.

(*) Relay selection given by Out paramter.

Parameter Programming

Programming the High and Low Set Point (HSP and LSP).

• Press SET HSP text will appear on the display.
• Press SET again. The value of HSP is shown on the display.
• The value can be modified with the UP and DOWN arrows.
• Press SET to enter any new value and exit to HSP label.
• Press the UP or DOWN arrows to go a LSP label.
• Press SET again. The value of LSP is shown on the display.
• The value can be modified with the UP and DOWN arrows.
• Press SET to enter any new value and exit to LSP label.
• Press SET and DOWN at the same time to exit programming or wait one minute and the display will automatically exit programming mode.

Access to all code protected parameters.

• Press SET for 8 seconds. The access code value 0 is shown on the display (unit comes with code set at 0 from factor).
• With the UP and DOWN arrows, code can be set to user needs.
• Press SET to enter code. If code correct, the first parameter label is shown on the display (HSP).
• Move to the desired parameter with the UP and DOWN Keys.
• Press SET to view the value on the display.
• The value can be modified with the UP and DOWN arrows.
• Press SET to enter the value and exit.
• Repeat until all necessary parameters are modified.
• Press SET and DOWN at the same time to quit programming or wait one minute and the display will automatically exit programming mode.

* The keyboard code can be reset to ZERO by turning off the controller and turning it on again while keeping the SET pressed.

Water Control

A water level sensor can be connected to the digital input. When the control detects an open signal, the unit is low on water. In this case the water LED on the face of the control lights and the relay given by Out is excited. When the control detects a closed signal, it indicates the presence of water and the water LED is switched off and the correspondent relay is de-excited.

Default Working

In case of probe error or memory error:
the relay output R1 will remain Open.
the relay outout R2 will remain Close.
the relay outout R3 will remain Open.

LED Indication and Display Messages

Fuel LED indicates the stove is out of wood or corn.
Water LED indicates the unit is low on water.
In normal operation, the probe temperature will be shown on the display.
In case of alarm or error, the following messages can be shown:
• Erl = Memory Error
• ooo = Open Probe Error
• --- = Short Circuit Probe Error

Maintenance, Cleaning and Repair

After final installation of the unit, no routine maintenance is required. Clean the surface of the display controller with a soft and damp cloth. Never use abrasive detergents, petrol, alcohol or solvents. All repairs must be made by authorized personnel.

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