

SIL 2 Temperature Converter and Trip Amplifiers DIN-Rail Model D1073S

Characteristics:

General Description:

The single channel DIN-Rail Temperature Converter and Trip Amplifiers D1073S converts a low level dc signal from millivolt, thermocouple or RTD Temperature sensor, located in Hazardous Area, into 4-20, 0-20 mA current or voltage output signal to drive a Safe Area load. Two independent Alarm Trip Amplifiers are also provided. Each Alarm energizes, or de-energizes, an SPST Relay for High, Low, Low-startup or Burnout Alarm functions. The two Alarm Relays Trip points are settable over the entire input signal range.

Function:

1 channel I.S. input for thermocouples or 3, 4 wire resistance thermometers or transmitting potentiometers, provides 3 port isolation (input/output/supply) and current or voltage output signal. In addition it provides two SPST Relay Alarm contacts with adjustable Alarm Trip Point. The programmable RTD line resistance compensation allows the use of 2 wire RTDs or error compensation for 3-4 wire RTDs. Cold Junction compensation can be automatic, with option 91, or fixed by software setting.

Signalling LEDs:

Power supply indication (green), Alarm A, Alarm B (red), Burnout (red).

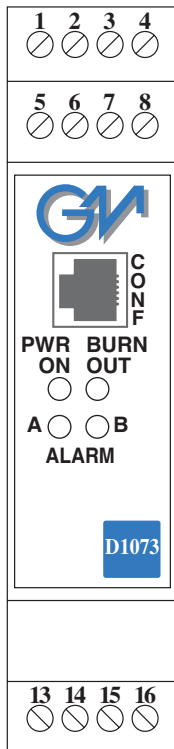
Configurability:

Totally Software configurable, no jumpers or switches, Input sensor, Connection mode, Burnout operation, mA or V output signal, Alarm Trip Point, High/Low/Low-startup, Burnout Alarm mode, NE/ND relay operation, Hysteresis, Delay time, by a GM Pocket Portable Configurator PPC1090, powered by the unit or via RS-232 Serial line with PPC1092 Adapter and SWC1090 Software Configurator. To operate PPC1090 refer to instruction manual.


EMC:

Fully compliant with CE marking applicable requirements.

Front Panel and Features:



- 1 2 3 4
mV, Thermocouples, RTD or Transmitting Potentiometers Input Signal.
- 5 6 7 8
0/4-20 mA, 0/1-5 V, 0/2-10 V Output Signal Temperature Linear or Reverse.
- Output for burnout detection.
- Software programmability.
- RTD line resistance compensation programmable.
- Cold Junction automatic or fixed.
- 16 characters Tag for each channel programmable.
- High Accuracy, μ P controlled A/D converter.
- Three port isolation, Input/Output/Supply.
- EMC Compatibility to EN61000-6-2, EN61000-6-4.
- ATEX, UL & C-UL, Russia and Ukraine Certifications.
- High Reliability, SMD components.
- High Density, 1 channel 2 Trips per unit.
- Simplified installation using standard DIN Rail with plug-in terminal blocks.
- 250 Vrms (Um) max. voltage applied to the instruments associated with barrier.

- Supply:** 24 V nom (20 to 30 V) reverse polarity protected ripple within voltage limits ≤ 5 Vpp.
- Current consumption @ 24 V:** 65 mA with 20 mA output and relays energized.
- Max. power consumption:** 2.20 W with 30 V supply voltage, overload condition, relays energized and PPC1090 connected.
- Isolation (Test Voltage):** I.S. In/Out 1.5 KV; I.S. In/Supply 1.5 KV; Analog Out/Alarm Out 1500 V; Analog Out/Supply 500 V. Alarm Out/Alarm Out 1500 V; Alarm Out/Supply 1500 V.
- Input:** millivolt or thermocouple type A1, A2, A3, B, E, J, K, L, N, R, S, T, U, Lr or 3, 4 wire RTD Pt 100, Pt 200, Pt 300 to DIN43760, Pt100 (0.3916), Ni 100 or Pt100, Pt50, Cu100, Cu53, Cu50 (russian standard) or 3 wire transmitting potentiometer (50 Ω to 20 K Ω).
- Integration Time:** 500 ms.
- Resolution:** 5 μ V on mV or thermocouple, 1 μ V thermocouple type B, R or S, 20 m Ω on RTD, 0.05 % on Potentiometer.
- Visualization:** 0.1 $^{\circ}$ C on temperature, 10 μ V on mV, 0.1 % on Potentiometer
- Input range:** within rated limits of sensor (-10 to + 80 mV).
- Measuring current:** ≤ 0.5 mA.
- Line resistance compensation:** ≤ 10 Ω .
- RTD line resistance compensation programmable:** - 5 to + 20 Ω .
- Thermocouple Reference junction compensation:** automatic, by externally connected sensor (option 91 separately ordered), or fixed programmable from - 60 to + 100 $^{\circ}$ C.
- Burnout:** enabled or disabled. Analog output can be programmed to detect burnout condition with downscale or highscale forcing. Alarm can be programmed to detect burnout condition. Burnout condition signalled by red front panel LED.
- Output:** 0/4 to 20 mA, on max. 600 Ω load source mode, current limited at 22 mA or 0/1 to 5 V or 0/2 to 10 V signal, limited at 11 V.
- Resolution:** 2 μ A current output or 1 mV voltage output.
- Transfer characteristic:** linear or reverse on mV or transmitting potentiometer, temperature linear or reverse on temperature sensors.
- Response time:** 100 ms (10 to 90 % step change).
- Output ripple:** ≤ 20 mV rms on 250 Ω load.
- Alarm: Trip Point range:** within rated limits of sensor (see input visualization parameters for step resolution).
- ON-OFF delay time:** 0 to 1000 s, 100 ms step programmable.
- Hysteresis:** 0 to 5 $^{\circ}$ C for temperature sensor input. 0 to 50 mV for mV input, 0 to 50% for potentiometer input. (see input visualization parameters for step resolution).
- Output:** Voltage free 1 + 1 SPST relay contact.
- Contact rating:** 2 A, 250 V, 100 VA or 2 A, 250 V, 80 W (resistive load).
- Performance:** Ref. Conditions 24 V supply, 250 Ω load, 23 ± 1 $^{\circ}$ C ambient temp.
- Input: Calibration and linearity accuracy:** $\leq \pm 40$ μ V on mV or thermocouple, 200 m Ω on RTD, 0.2 % on Potentiometer or $\pm 0.05\%$ of input value.
- Temperature influence:** $\leq \pm 2$ μ V, 20 m Ω , 0.02 % or ± 0.01 % of input value for a 1 $^{\circ}$ C change.
- Ref. junction compensation influence:** $\leq \pm 1$ $^{\circ}$ C (thermocouple sensor).
- Analog Output: Calibration accuracy:** $\leq \pm 0.1$ % of full scale.
- Linearity error:** $\leq \pm 0.05$ % of full scale.
- Supply voltage influence:** $\leq \pm 0.05$ % of full scale for a min to max supply voltage change.
- Load influence:** $\leq \pm 0.05$ % of full scale for a 0 to 100 % load resistance change.
- Temperature influence:** $\leq \pm 0.01$ % on zero and span for a 1 $^{\circ}$ C change.
- Compatibility:**
 -  CE mark compliant, conforms to 94/9/EC Atex Directive and to 89/336/CEE EMC Directive.
- Environmental conditions: Operating:** Temperature limits -20 to + 60 $^{\circ}$ C, relative humidity max 90 % non condensing, up to 35 $^{\circ}$ C.
- Storage:** Temperature limits -40 to + 80 $^{\circ}$ C.

Safety Description:



II (1) G D [EEx ia] IIC or I M2 [EEx ia] I associated electrical apparatus.

Uo/Voc = 10.8 V, Io/Isc = 9 mA, Po/Po = 24 mW at terminals 13-14-15-16.



Um = 250 Vrms, -20 °C ≤ Ta ≤ 60°C.

Approvals: DMT 01 ATEX E 042 X conforms to EN50014, EN50020, UL & C-UL E222308 conforms to UL913 (Div.1), UL 60079-0 (General, All Zones), UL60079-11 (Intrinsic Safety i Zones 0 & 1), for UL and CSA-C22.2 No.157-92 (Div.1), CSA-E60079-0 (General, All Zones), CSA-E60079-11 (Intrinsic Safety i Zones 0 & 1) for C-UL, TCCEXEE (Russia) Nr.665 according to GOSTR 51330.0-99, 51330.10-99 [Exia]IIC X, TCCEXEE (Ukraine) Nr.665 according to GOST 12.2.007.0, 22782.0, 22782.5 ExiaIIC X, Gosgortekhnadzor of Russia Permit Nr. PPC 04-11284.

EXIDA Report No. GM04/10-27 R003, SIL 2 according to IEC 61508, IEC 61511.

Please refer to functional safety manual for SIL applications.

Mounting: T35 DIN Rail according to EN50022.

Weight: about 160 g.

Connection: By polarized plug-in disconnect screw terminal blocks to accommodate terminations up to 2.5 mm².

Location: Safe Area / Non Hazardous Locations installation.

Protection class: IP 20.

Dimensions: Width 22.5 mm, Depth 99 mm, Height 114.5 mm.



Parameters Table:

Safety Description	Maximum External Parameters			
	Group Cenelec	Co/Ca (μF)	Lo/La (mH)	Lo/Ro (μH/Ω)
Terminals 13-14-15-16				
Uo/Voc = 10.8 V	II C	2.14	477	1530
Io/Isc = 9 mA	II B	15.00	1909	6130
Po/Po = 24 mW	II A	66.00	3819	12260

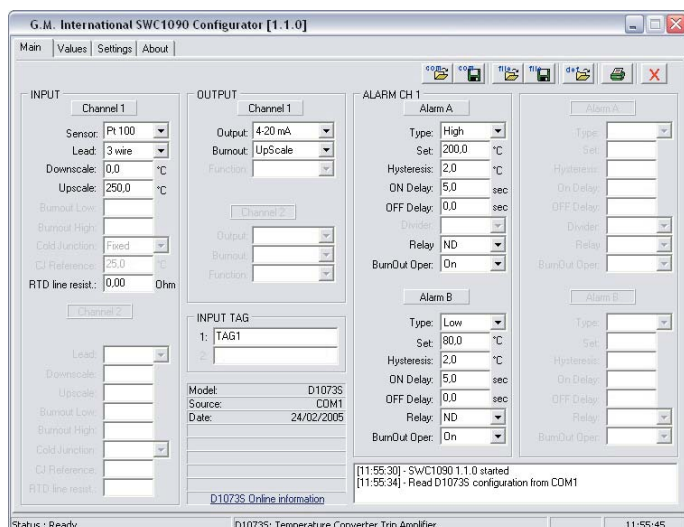
NOTE for USA and Canada:

II C equal to Gas Groups A, B, C, D, E, F and G.

II B equal to Gas Groups C, D, E, F and G.

II A equal to Gas Groups D, E, F and G.

Friendly Configuration with PC and PPC1092 Adapter



SWC1090 Software Configurator is downloadable for free on our web site www.gminternationalsrl.com.

Ordering Information:

Model: D1073S

Power Bus enclosure

/B

Input types, burnout conditions, output types, output range, alarm set point, conditions High/Low/Low-startup, Burnout, hysteresis, delay, relay NE/ND are programmable by the GM Pocket Portable Configurator type PPC 1090 or via RS-232 Serial line with PPC1092 Configurator. If the above information are provided with the Purchasing Order, the unit will be configured accordingly, otherwise the unit will be supplied, by default, with the following parameters:

Input Type: -10 to +80 mV.

Output Type: 4-20 mA.

Burnout: highscales.

Set: 50%.

Alarm mode: High.

Relay: ND.

Hysteresis: 4 mV.

Alarm Delay: 1 sec.

The plate will record the unit type, serial number, function diagram and terminal block layout for connections.

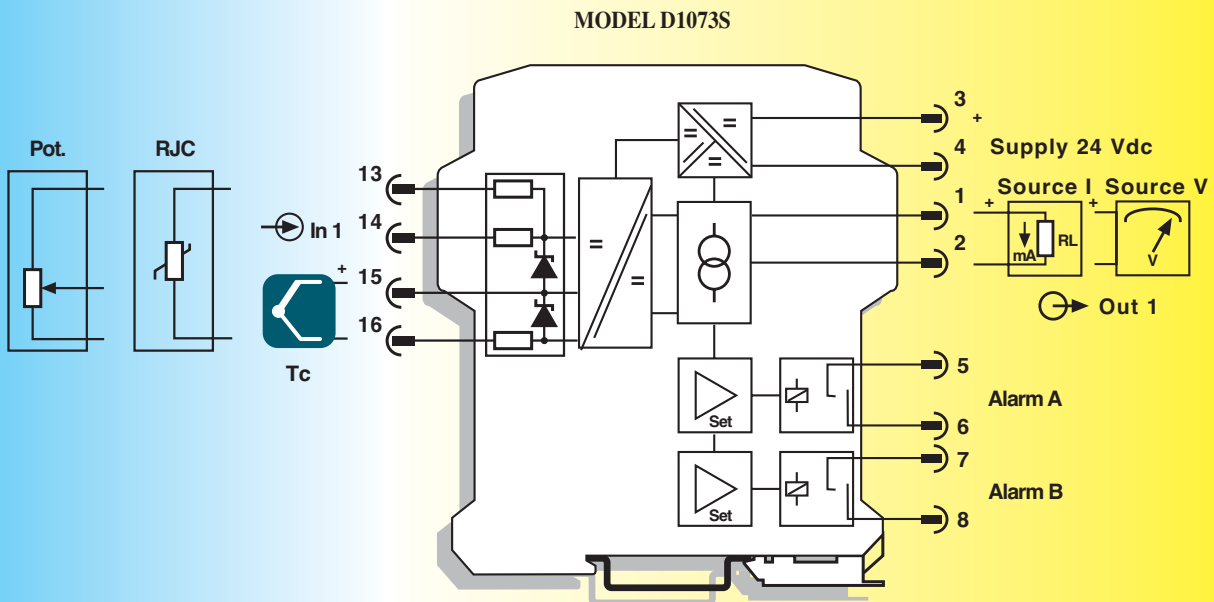
Note: for thermocouple sensor input, the Reference Junction Compensator is required for automatic ambient temperature compensation. It has to be ordered as Option 91.

It will be supplied separately and it has to be connected to the input Terminal Blocks as indicated in the function diagram.

Function Diagram:

HAZARDOUS AREA / HAZARDOUS LOCATIONS
 CLASS I, DIVISION 1, GROUPS A, B, C, D and
 CLASS II, DIVISION 1, GROUPS E, F, G or CLASS I, Zone 0, GROUP IIC

SAFE AREA / NON HAZARDOUS LOCATIONS



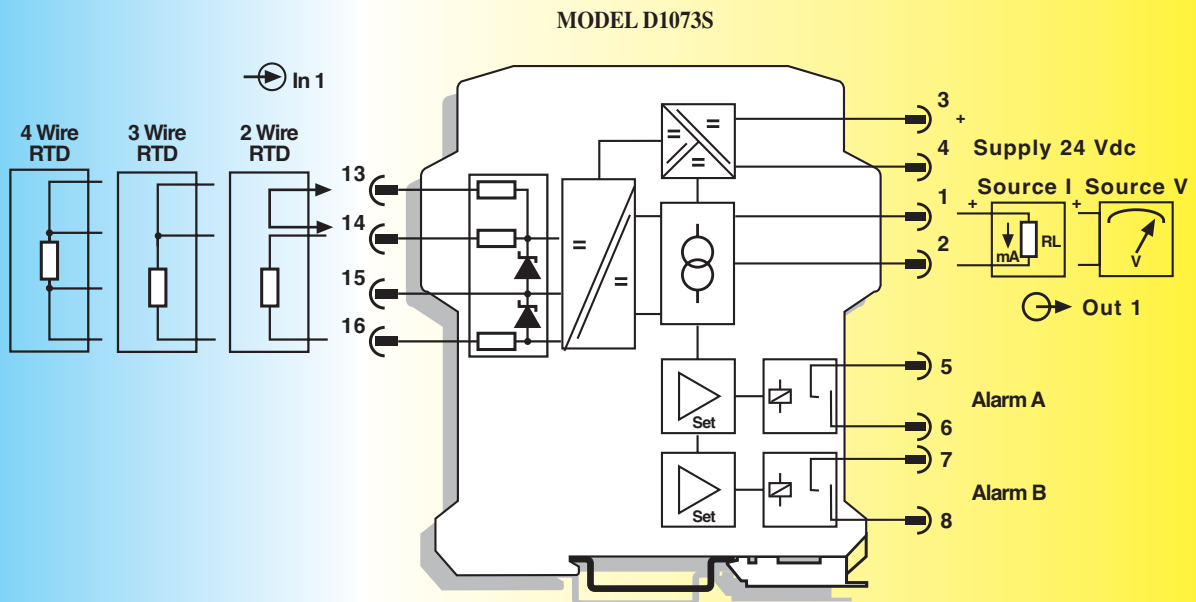
For SIL applications alarm contacts must be used in series with equal configuration.

Relay contact shown in de-energized position

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