GM INTERNATIONAL
TECHNOLOGY FOR SAFETY

D1072

Temperature Converter DIN-Rail Duplicator, Adder and Subtractor Models D1072S, D1072D

Characteristics:

General Description:

The single and dual channel DIN-Rail Temperature Converter D1072S and D1072D 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.
Duplicator function (before provided by D1072X) provides two independent outputs for the single sensor input.
Adder, subtractor, low/high selector functions (before provided by D1072Y) provide two independent outputs representing Input A, Input B, Input A plus Input B, Input A minus Input B, low/high selector.

Function:

1 or 2 channels I.S. input from millivolt, thermocouples or 3, 4 wire resistance thermometers or transmitting potentiometers, provides 3 port isolation (input/output/supply) and current or voltage output signal.
Duplicator, adder, subtractor, low/high selector.
The programmable RTD line resistance compensation allows 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 LED:

Power supply indication (green), Burnout condition (red).

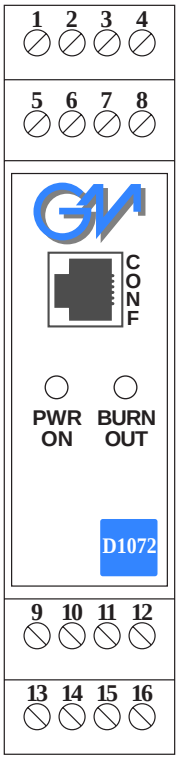
Configurability:

Totally Software configurable, no jumpers or switches, Input sensor, Connection mode, Burnout operation, mA or V output signal, 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. A 16 characters Tag can be inserted using software configuration.

EMC:

Fully compliant with CE marking applicable requirements.

Front Panel and Features:



- Duplicated output for single channel input.
- Adder, Subtractor, low/high Selector.
- mV, Thermocouples, RTD or Transmitting Potentiometers Input Signal.
- RTD line resistance compensation programmable.
- Cold Junction automatic or fixed.
- 0/4-20 mA, 0/1-5 V, 0/2-10 V Output Signal Temperature Linear or Reverse.
- Software programmability.
- 16 characters Tag for each channel.
- High Accuracy, µP 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, two channels 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.

Technical Data:

Supply: 12-24 V nom (10 to 30 V) reverse polarity protected ripple within voltage limits ≤ 5 Vpp.
Current consumption @ 24 V: 75 mA for 2 channels D1072D, 50 mA for 1 channel D1072S with 20 mA output typical.
Current consumption @ 12 V: 130 mA for 2 channels D1072D, 85 mA for 1 channel D1072S with 20 mA output typical.
Max. power consumption: 2.20 W for 2 channels, 1.50 W for 1 channel with 30 V supply voltage, overload condition and PPC1090 connected.

Isolation (Test Voltage): I.S. In/Out 1.5 KV; I.S. In/Supply 1.5 KV; I.S. In/I.S. In 500 V; Out/Out 500 V; Out/Supply 500 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 KΩ).
Integration Time: 500 ms.
Resolution: 5 µV on mV or thermocouple, 1 µV thermocouple type B, R or S, 20 mΩ on RTD, 0.05 % on Potentiometer.
Visualization: 0.1°C on temperature, 10 µV 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 °C.

Burnout: enabled or disabled. Analog output can be programmed to detect burnout condition with downscale or highscale forcing. 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 µA 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.

Performance: Ref. Conditions 24 V supply, 250 Ω load, 23 ± 1 °C ambient temp.
Input: Calibration and linearity accuracy: ≤ ± 40 µV on mV or thermocouple, 200 mΩ on RTD, 0.2 % on Potentiometer or ± 0.05% of input value, whichever is greater.
Temperature influence: ≤ ± 2 µV, 20 mΩ, 0.02 % or ± 0.01 % of input value for a 1 °C change.
Ref. junction compensation influence: ≤ ± 1 °C (thermocouple sensor).
Analog Output: Calibration accuracy: ≤ ± 0.1 % of full scale.
Linearity error: ≤ ± 0.05 % of full scale.
Supply voltage influence: ≤ ± 0.05 % of full scale for a min to max supply voltage change.
Load influence: ≤ ± 0.05 % of full scale for a 0 to 100 % load resistance change.
Temperature influence: ≤ ± 0.01 % on zero and span for a 1 °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 °C, relative humidity max 90 % non condensing, up to 35 °C.
Storage: Temperature limits – 40 to + 80 °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 and 9-10-11-12.
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), UL60079-15 (”n” Zone 2), UL 1604 (Div.2) 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), CSA-C22.2 No. 213-M1987 (Div. 2) and CSA-E60079-15 (”n” Zone 2) for C-UL,
TCCExEE (Russia) Nr.665 according to GOST R 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.

Mounting: T35 DIN Rail according to EN50022.
Weight: about 170 g D1072D, 140 g D1072S.
Connection: By polarized plug-in disconnect screw terminal blocks to accomodate terminations up to 2.5 mm^2.
Location: Safe Area / Non Hazardous Locations or Class I, Division 2, Groups A, B, C, D and Class I, Zone 2, Group IIC 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)	L/R / La/Ra (µH/Ω)
Terminals 13-14-15-16, 9-10-11-12				
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.

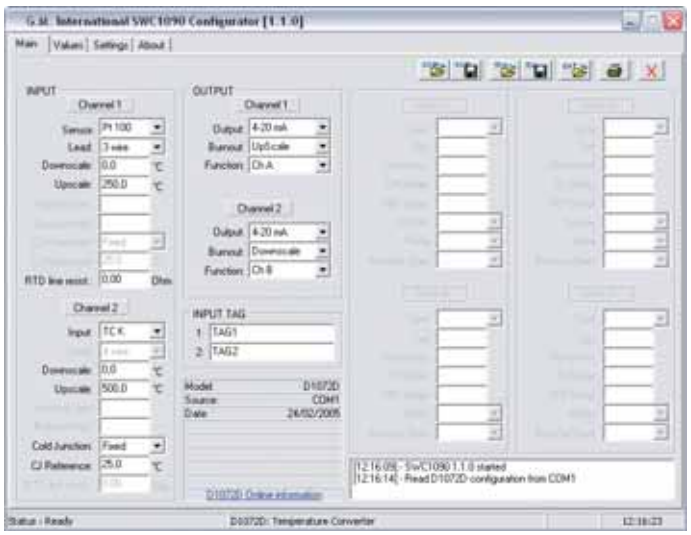
Ordering Information:

Model:	**D1072**	
1 channel	S	
2 channels	D	
Power Bus enclosure		/B

Input types, burnout conditions, output types, output range are programmable by the GM Pocket Portable Configurator type PPC1090 or via RS-232 Serial line with PPC1092 Adapter and SWC1090 software 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: highscale. 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.

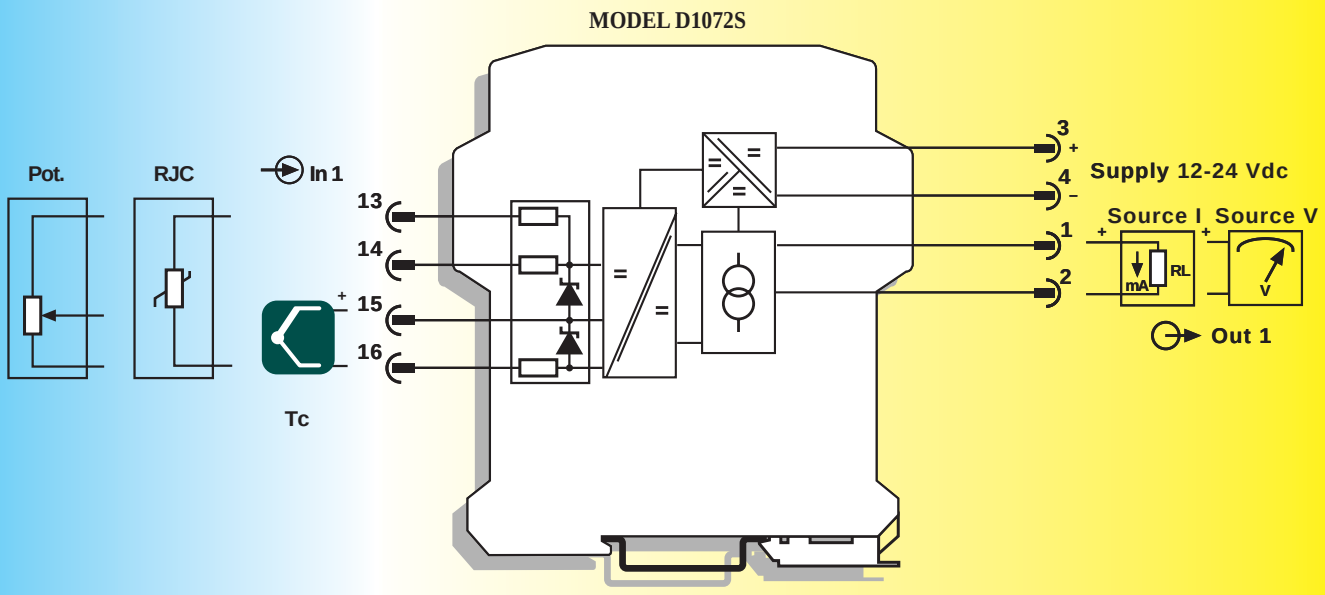
Friendly Configuration with PC and PPC1092 Adapter

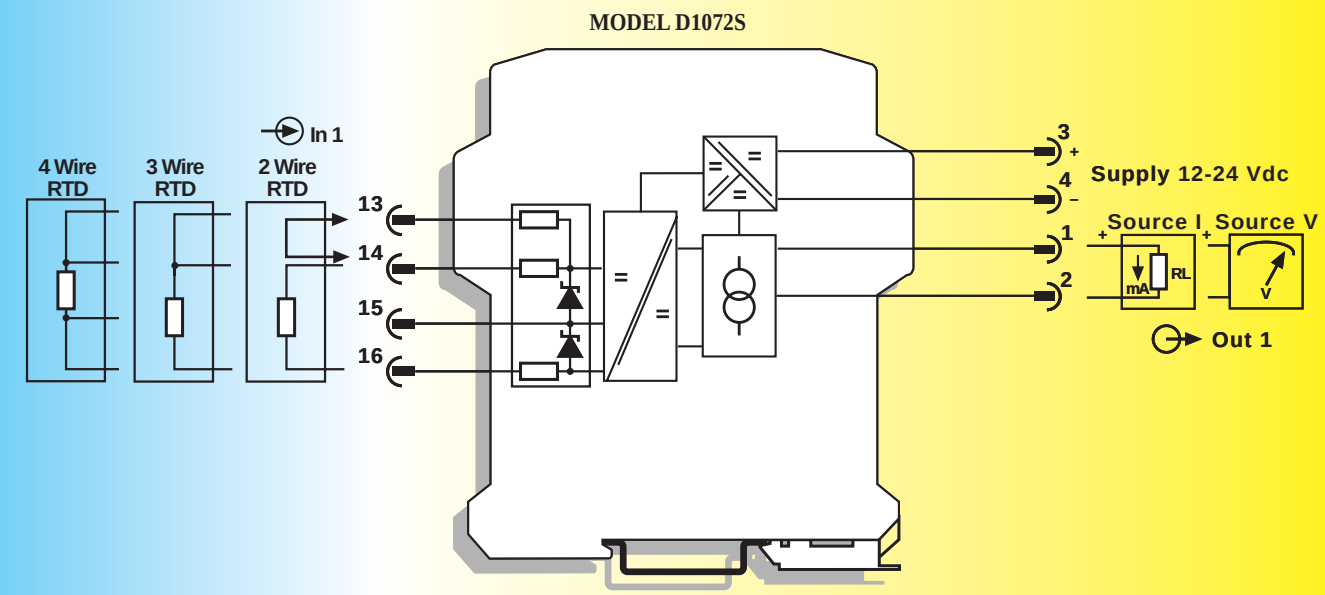


SWC1090 Software Configurator is downloadable for free on our web site www.gminternationalsrl.com.

Function Diagram:

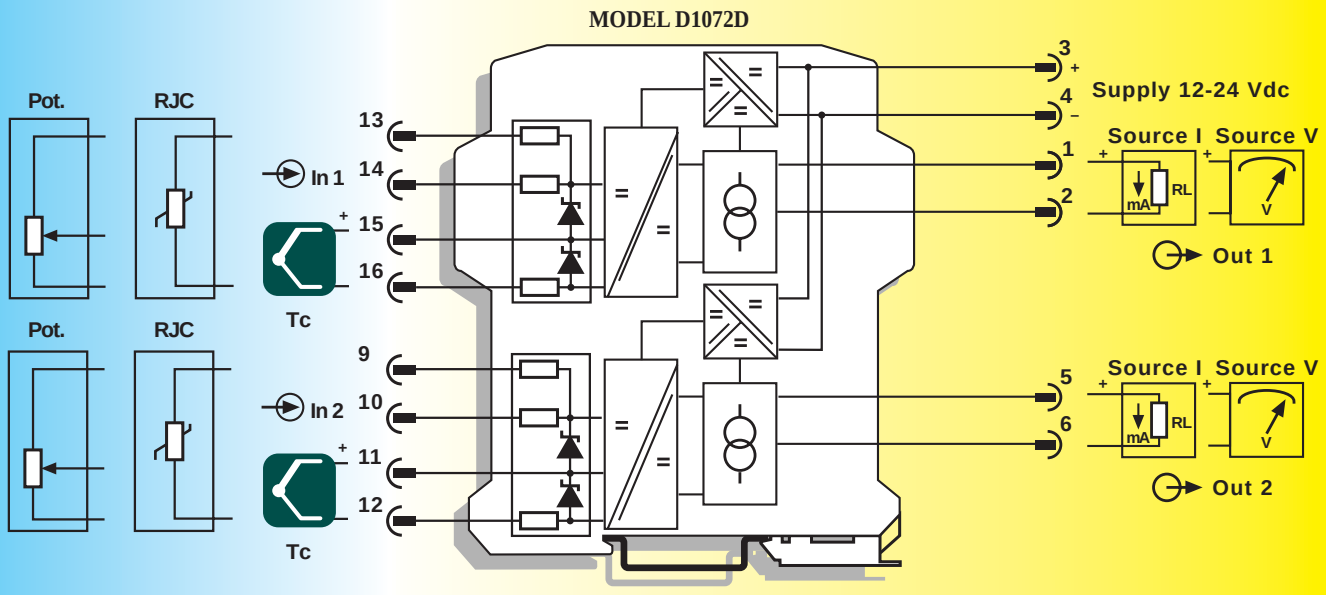
HAZARDOUS AREA / HAZARDOUS LOCATIONS CLASS I, DIVISION 1 and CLASS II, DIVISION 1 or CLASS I, Zone 0	SAFE AREA / NON HAZARDOUS LOCATIONS or CLASS I, DIVISION 2, GROUPS A, B, C, D or CLASS I, ZONE 2, GROUP IIC

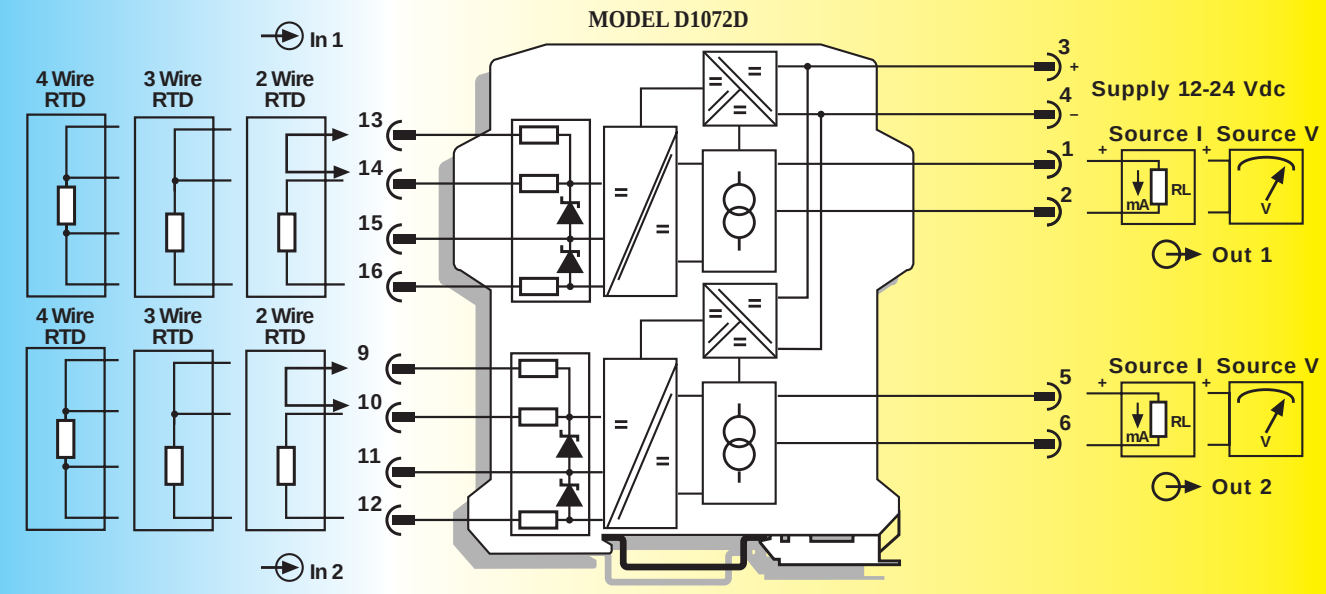




Function Diagram:

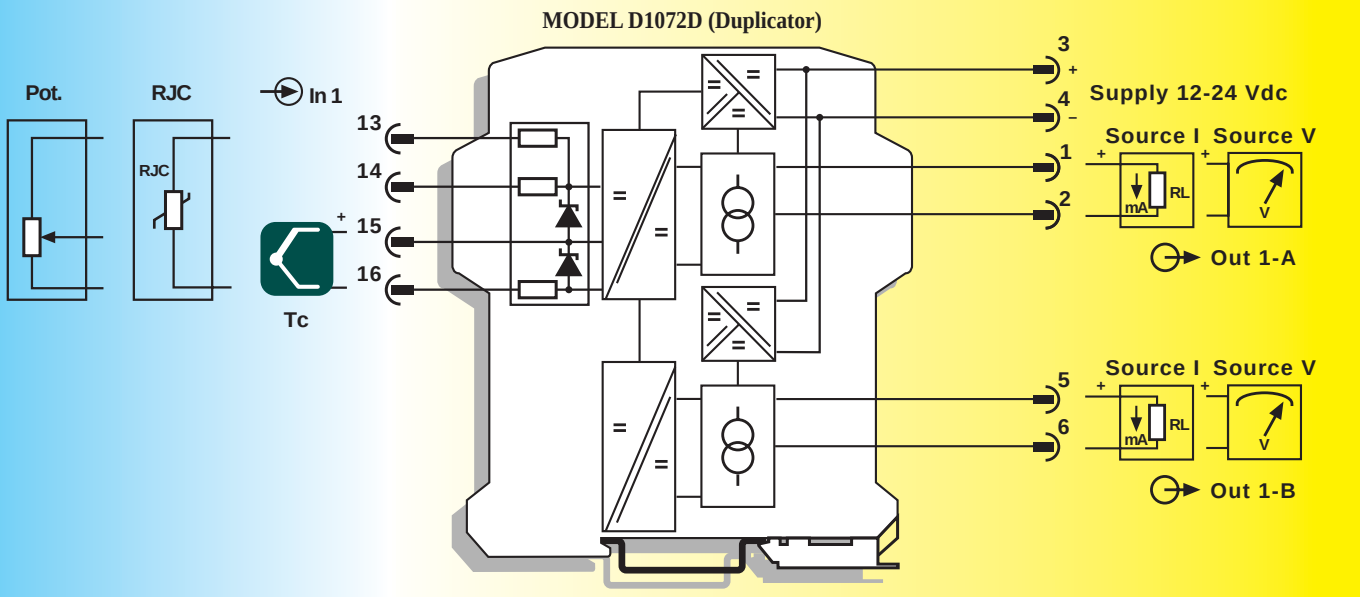
HAZARDOUS AREA / HAZARDOUS LOCATIONS CLASS I, DIVISION 1 and CLASS II, DIVISION 1 or CLASS I, Zone 0	SAFE AREA / NON HAZARDOUS LOCATIONS or CLASS I, DIVISION 2, GROUPS A, B, C, D or CLASS I, ZONE 2, GROUP IIC

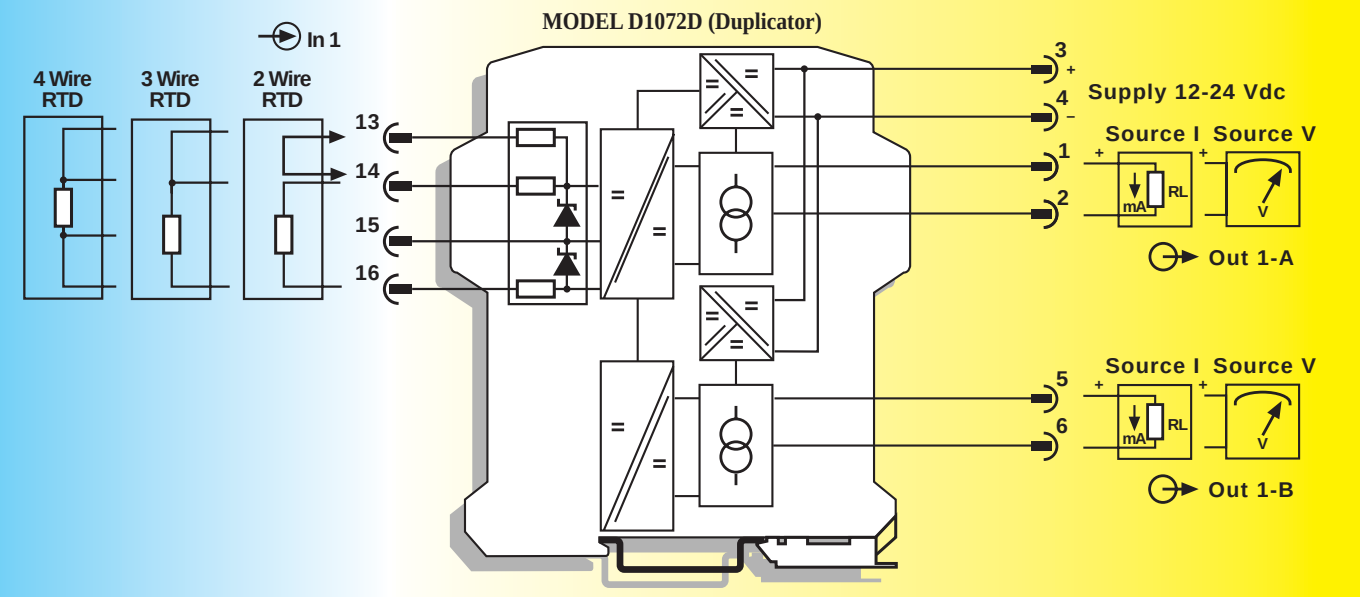




Function Diagram:

HAZARDOUS AREA / HAZARDOUS LOCATIONS CLASS I, DIVISION 1 and CLASS II, DIVISION 1 or CLASS I, Zone 0	SAFE AREA / NON HAZARDOUS LOCATIONS or CLASS I, DIVISION 2, GROUPS A, B, C, D or CLASS I, ZONE 2, GROUP IIC





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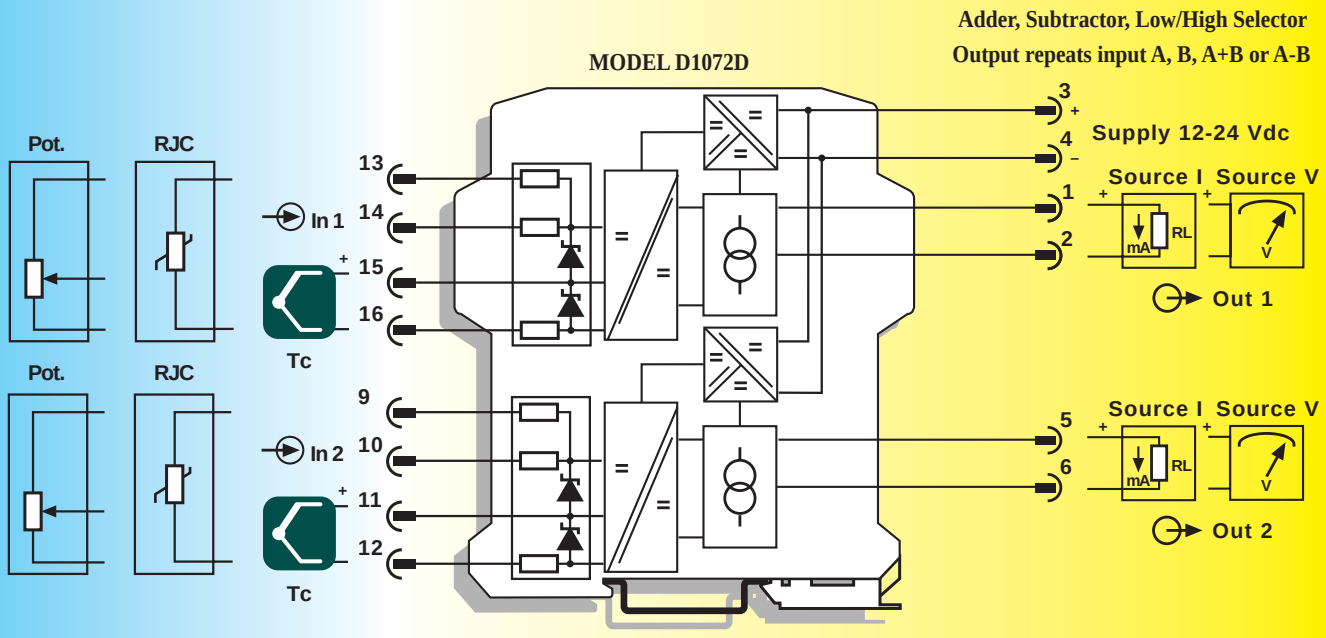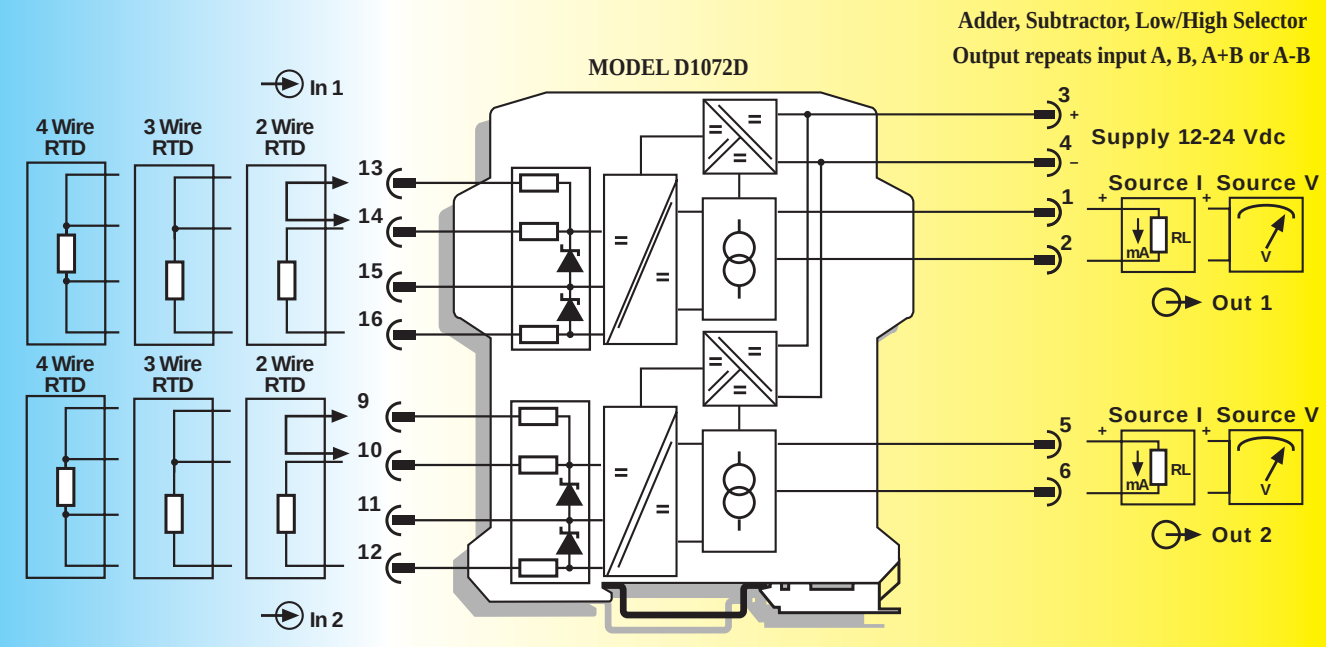
HAZARDOUS AREA / HAZARDOUS LOCATIONS CLASS I, DIVISION 1 and CLASS II, DIVISION 1 or CLASS I, Zone 0	SAFE AREA / NON HAZARDOUS LOCATIONS or CLASS I, DIVISION 2, GROUPS A, B, C, D or CLASS I, ZONE 2, GROUP IIC