TB-D5008
GMI-001

Universal Termination Board 8 positions for D5000 Series

Characteristics:

General description:

This Termination Board (TB) provides direct connection between the I/O Card of the system and D5000 / D6000 Series modules. The Intrinsically Safe protection and signal isolation between Safe and Hazardous Area, is provided by D5000 Series Associated Apparatus.
The 24 Vdc Power Supply of the TB is connected to two plug-in terminal blocks, for a redundant power supply. The power supply for modules is given by TB power bus.

Termination Board general characteristics:

Termination Board Model	*Number of positions*	*Features*
TB-D5008-GMI-001	8	1) Power Supply voltage redundancy; 2) HART multiplexing; 3) Abnormal supply voltage signaling; 4) Cumulative module fault signaling.

Supported GM Modules:

I/O signal Type	*Number of ch per board*	*Supported GM Modules**
Analog Input	8	D5011S, D5014S, D5072S, D6011S, D6014S, D6072S
	16	D5011D, D5014D, D5072D, D6011D, D6014D, D6072D
Analog Out	8	D5020S, D6020S
	16	D5020D, D6020D
Digital Input	8	D5031S, D5032S, D5037S, D5093S, D6031S
	16	D5031D, D5032D, D5037D, D5093D, D6031D
Digital Out	8	D5040S, D5040D
	16	D5048S, D5049S, D5090S, D5091S

* Do not mix D5000 Intrinsically Safe barriers with D5000 Relay modules or D6000 Isolators on same termination board.

Technical Data:

Supply:
24 Vdc nom (20 to 30 Vdc) reverse polarity protected, redundant terminal blocks, OR diodes to select higher supply source.
Connection: by polarized plug-in disconnect screw terminal blocks to accommodate terminations up to 2.5 mm^2.
2 LEDs indication: green color, one for supply 1 and one for supply 2.
Protection fuse: 2 A slow blow (spare fuse provided on Termination Board).

Fault detection:
1) Preventive - abnormal supply voltage: supply 1 or supply 2 is < 18 Vdc (Under Voltage, UV) or > 30 Vdc (Over Voltage, OV).
2)Critical - abnormal supply voltages or cumulative fault: both supplies are in under (< 18 Vdc) or over (> 30 Vdc) voltage condition *OR* cumulative fault indication (about presence of short or open field circuit for any DO channel).
LED fault signaling (for both case 1 and 2): 2 red LEDs (UV and OV of supply 1); 2 red LEDs (UV and OV of supply 2); a cumulative fault red LED.
Relay fault signaling (one for each case 1 or 2): a voltage free NE SPDT - 1 Form C relay contacts (de-energized in fault condition), with the following characteristics:
Contact material: AgCdO.
Contact rating: 2 A 250 Vac 500 VA, 2 A 250 Vdc 80 W (resistive load).
Mechanical / Electrical life: 30 * 10^6 / 1 * 10^5 operation, typical.
Connection: by polarized plug-in disconnect screw terminal blocks to accommodate terminations up to 2.5 mm^2.

I/O card interface:
Connection: one SUB D 37 poles male connector (requires female mating connector).

HART Multiplexing:
Connection: one 34 poles male connectors (requires female mating connector).

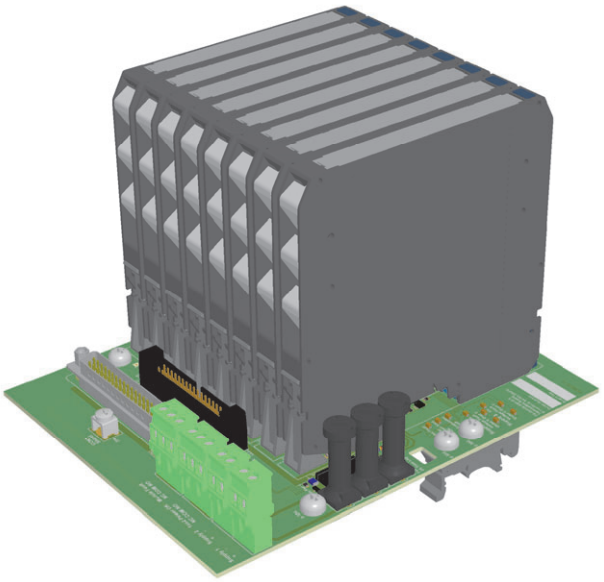
Environmental conditions:
Operating: temperature limits – 40 to + 70 °C, relative humidity max 90 % non condensing, up to 35 °C.
Storage: temperature limits – 45 to + 80 °C.

Mounting:
Hardware included for mounting on wall and single DIN rail.
Weight: about 400 g (excluding modules and mounting options).
Location: Safe Area / Ordinary locations.
Dimensions: Width 165 mm, Depth 185 mm, Height 125 mm.

Features:

- Universal I/O card interface.
- 8 positions Terminal Board for up to 16 channels.
- Lower cables installation and maintenance costs.
- Power supplies fault monitoring.
- Spare fuse provided.
- Includes hardware for Easy installation in three modes:
  Wall mounting, M4 Threads,
  Wall mounting, Self Threading,
  Din Rail mounting.

Image:



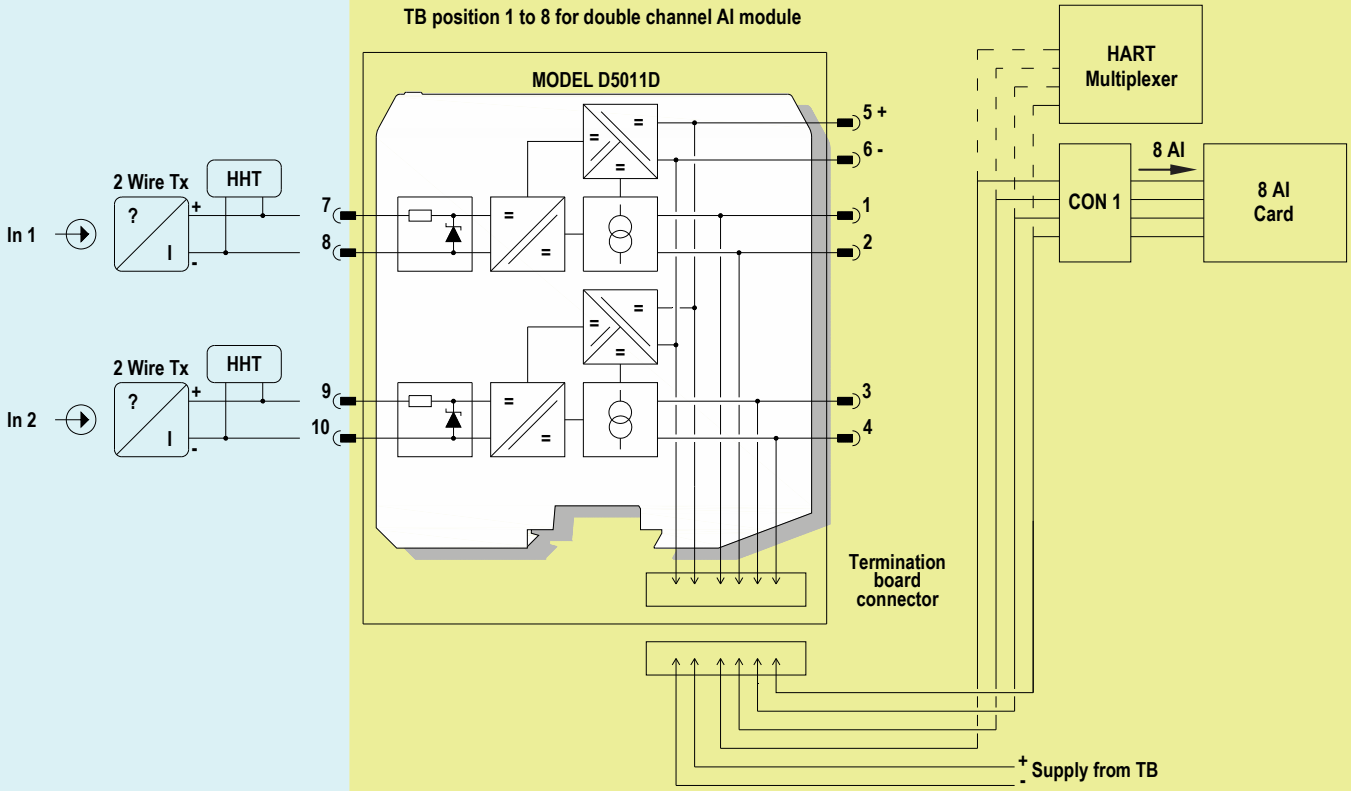
Ordering Information:

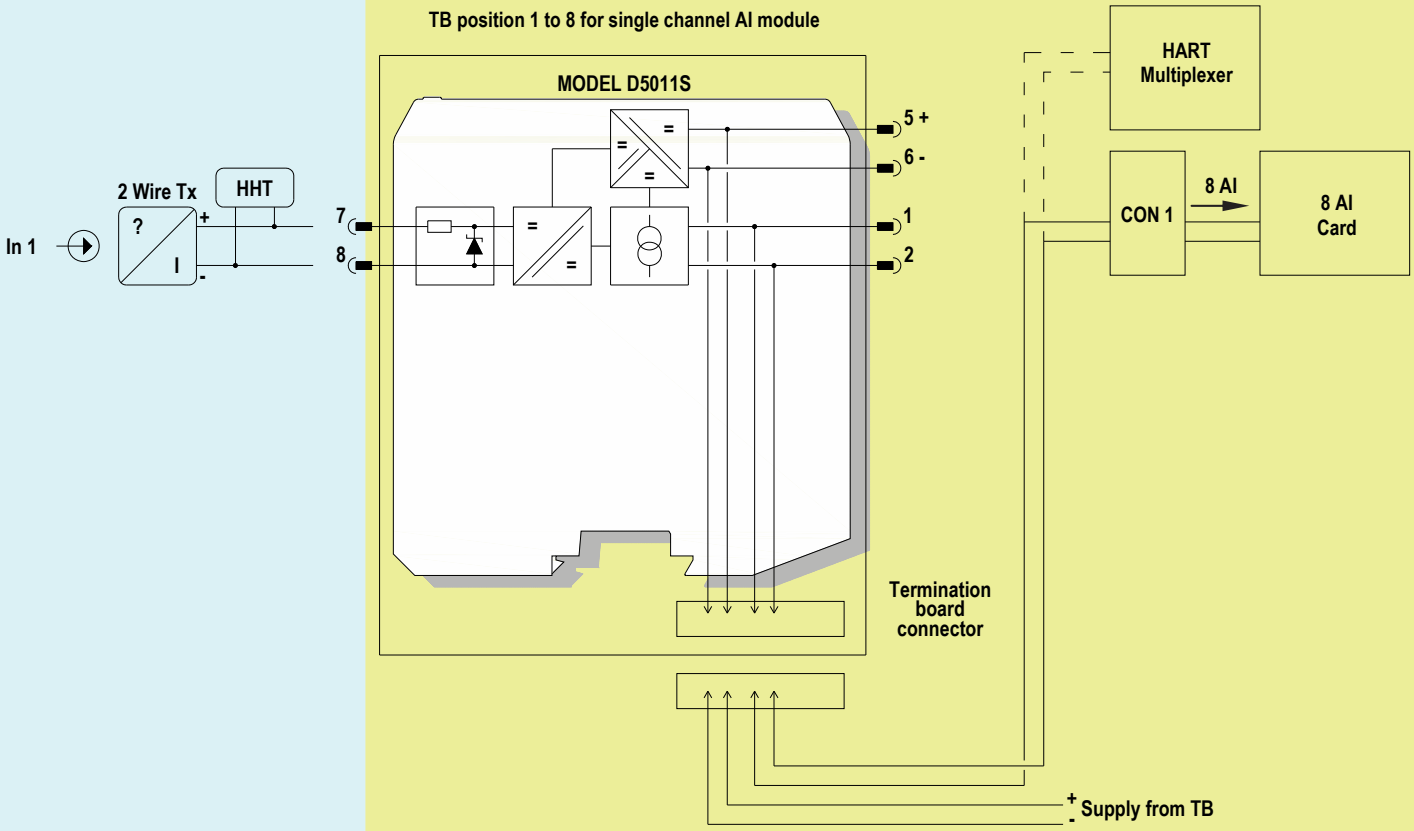
Model:	TB-D5008-GMI-001

Loop Diagrams for 8 AI Interface Card:

HAZARDOUS AREA | SAFE AREA

Note:
The D6000 isolators have the same function diagrams as the corresponding D5000 barriers, but they cannot be connected to the Hazardous Area





Loop Diagram for 8 AI Interface Card:

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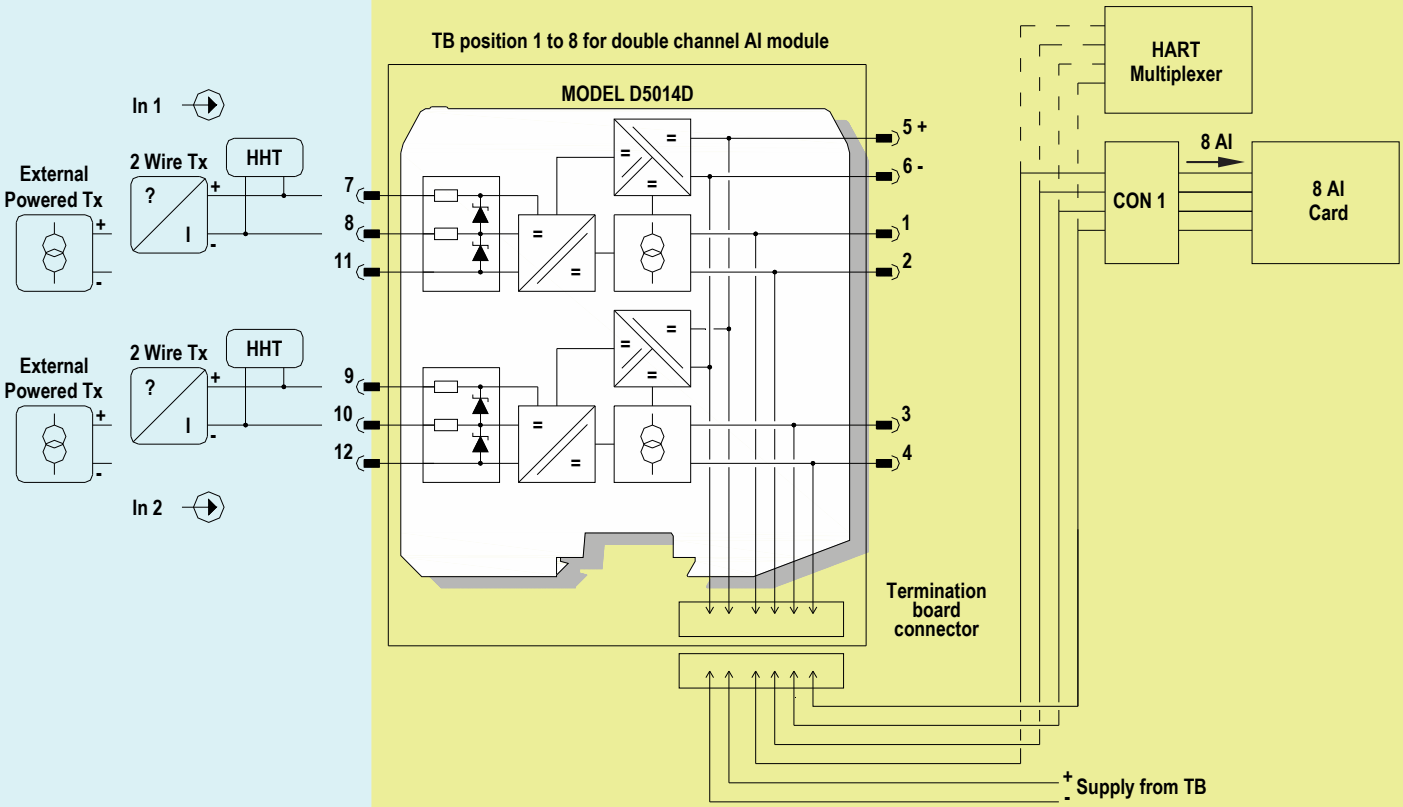

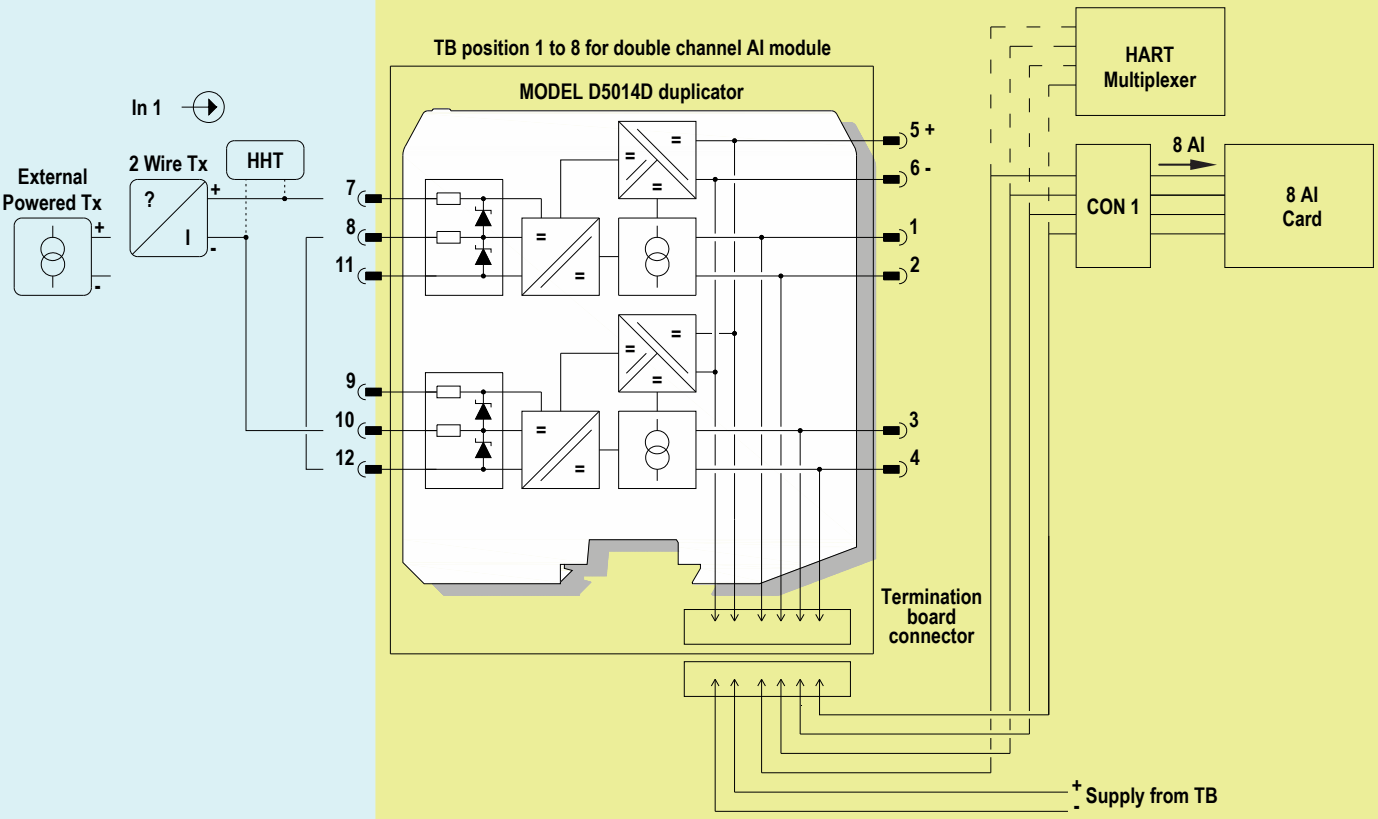

Loop Diagram for 8 AI Interface Card:

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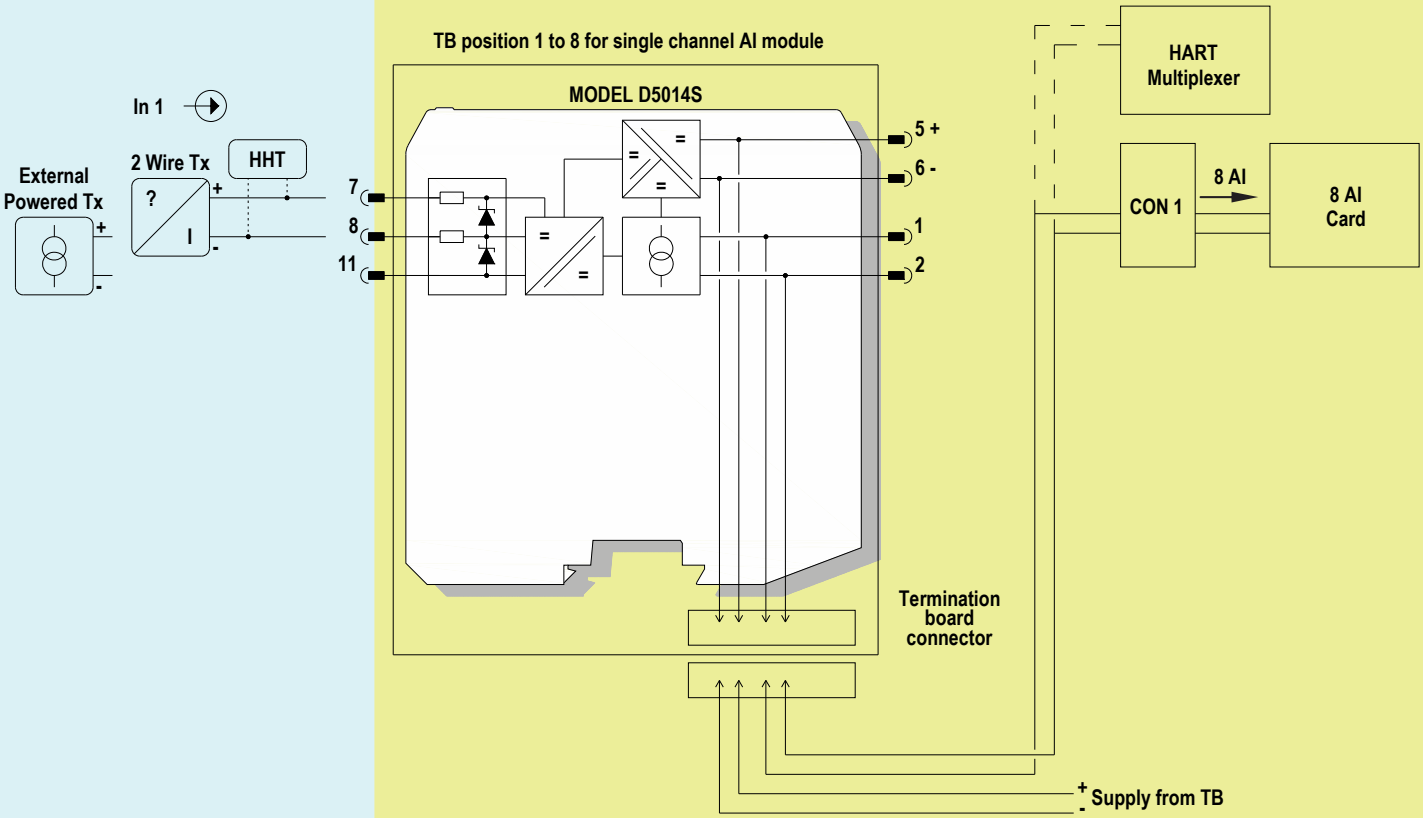
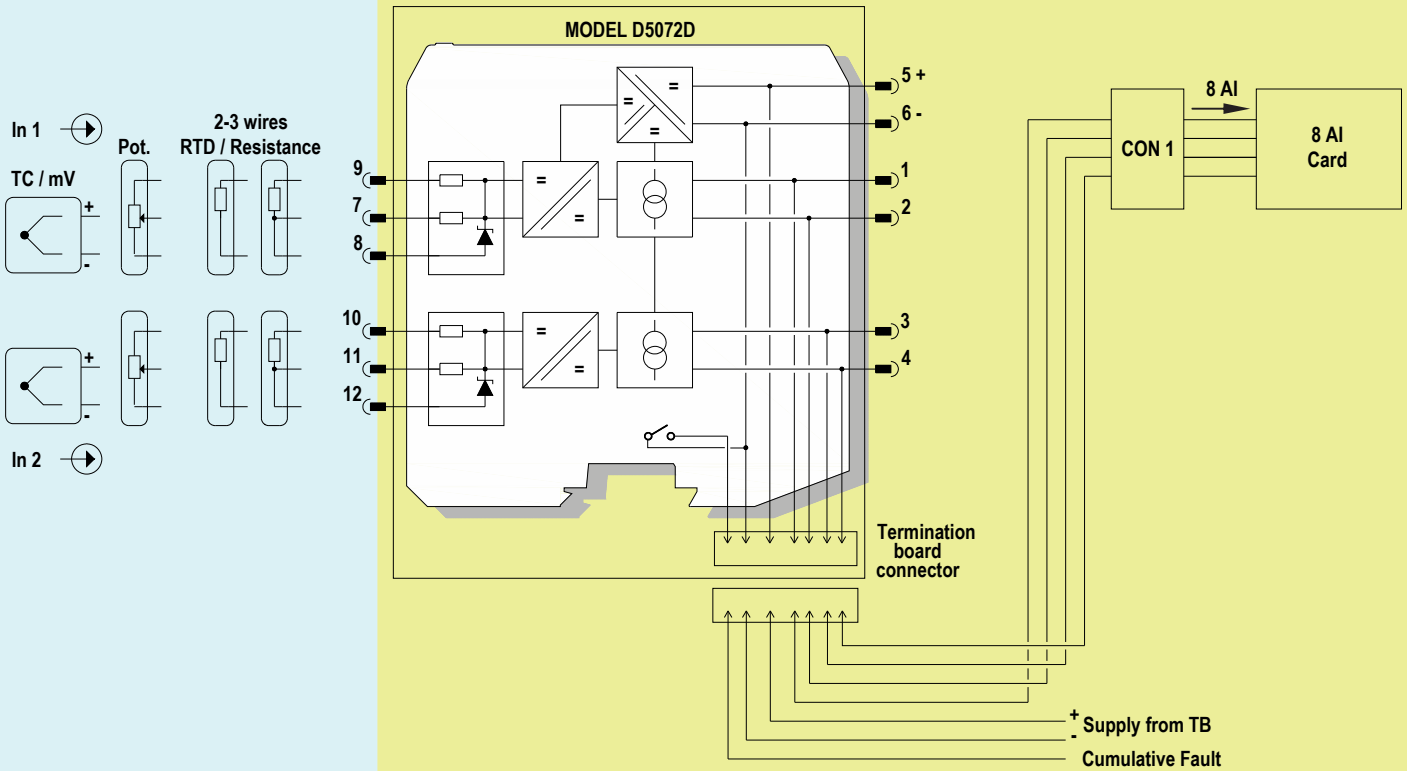


Loop Diagram for 8 AI - Temperature Interface Card:

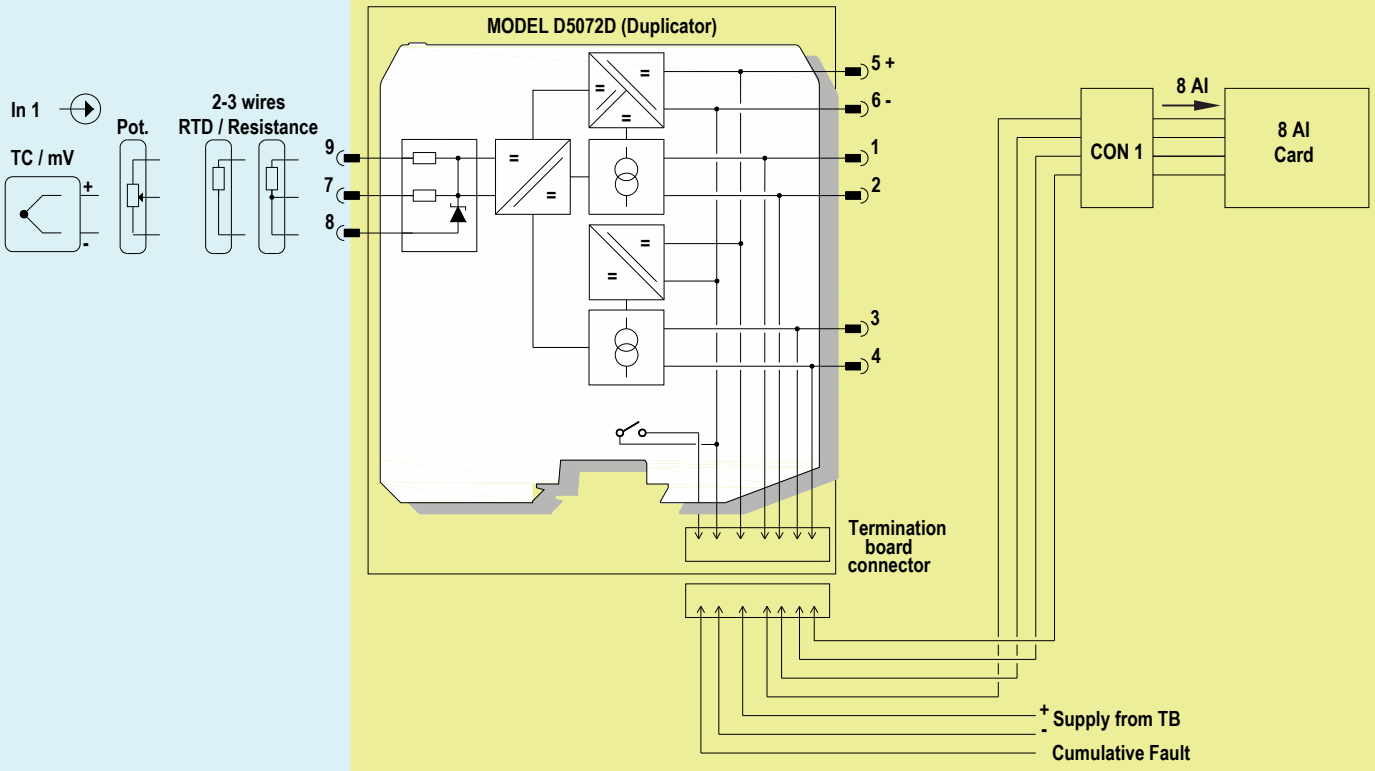
HAZARDOUS AREA | SAFE AREA

Note:
The D6000 isolators have the same function diagrams as the corresponding D5000 barriers, but they cannot be connected to the Hazardous Area

TB position 1 to 8 for double channel Temperature module



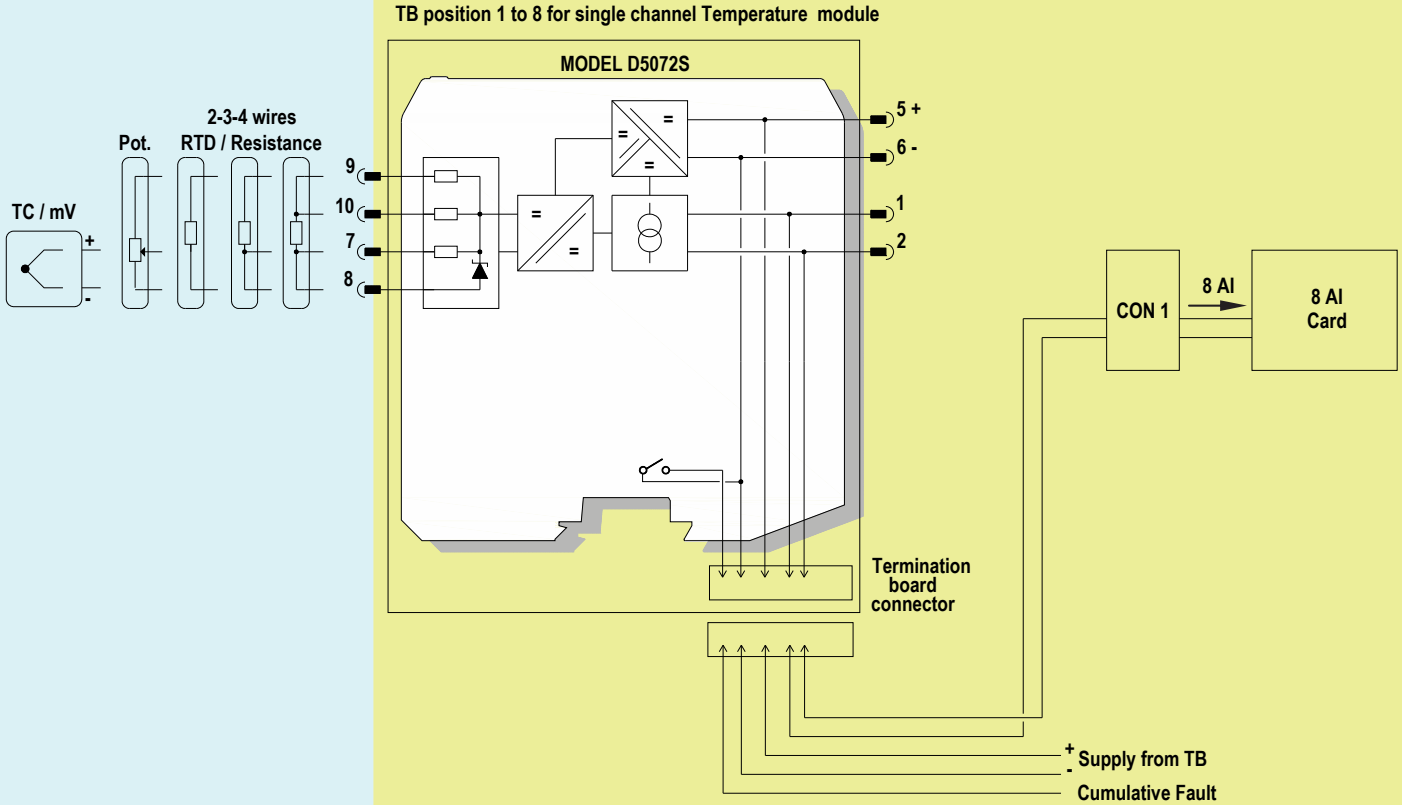
TB position 1 to 8 for double channel Temperature module



Loop Diagram for 8 AI - Temperature Interface Card:

HAZARDOUS AREA | SAFE AREA

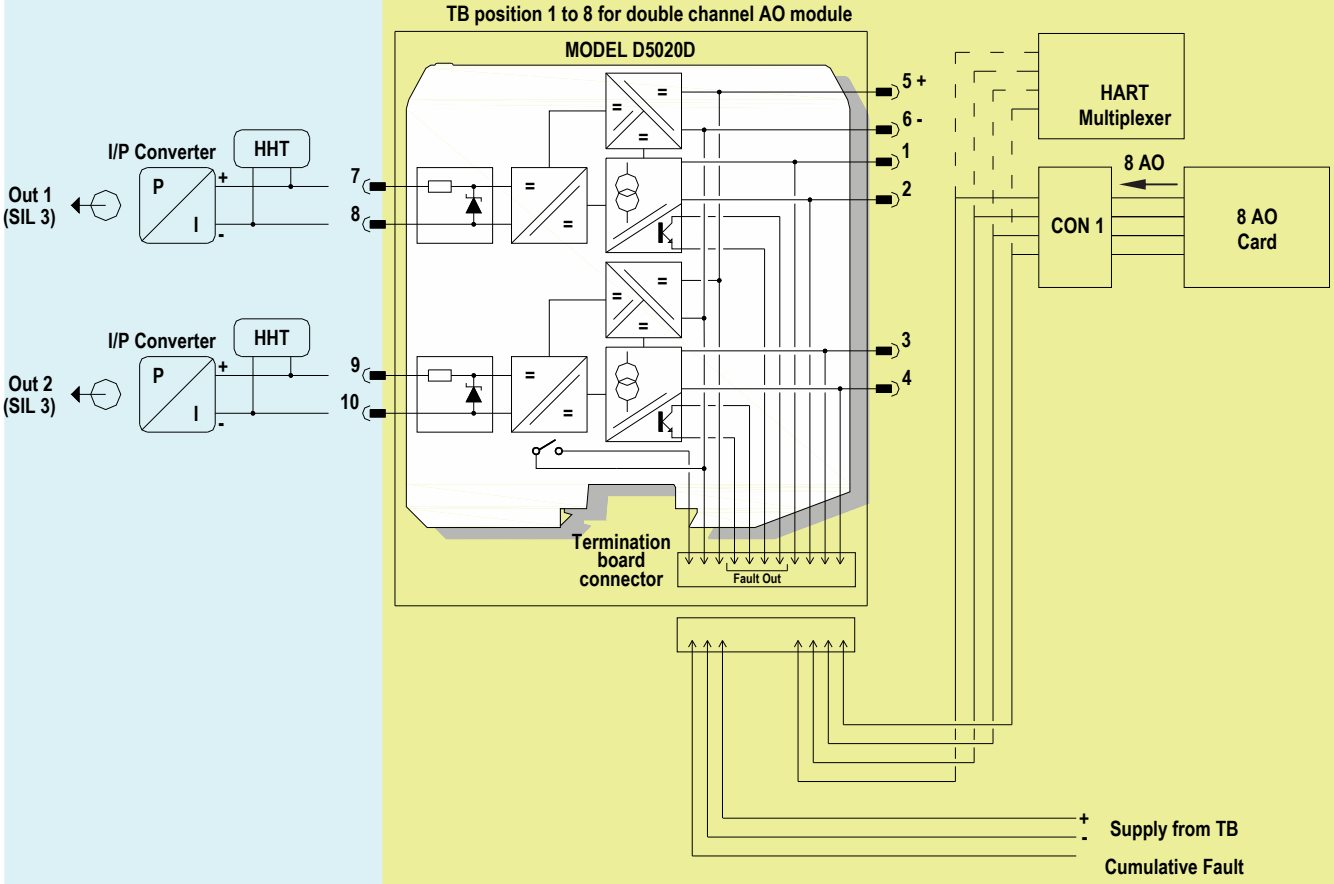
Note:
The D6000 isolators have the same function diagrams as the corresponding D5000 barriers, but they cannot be connected to the Hazardous Area

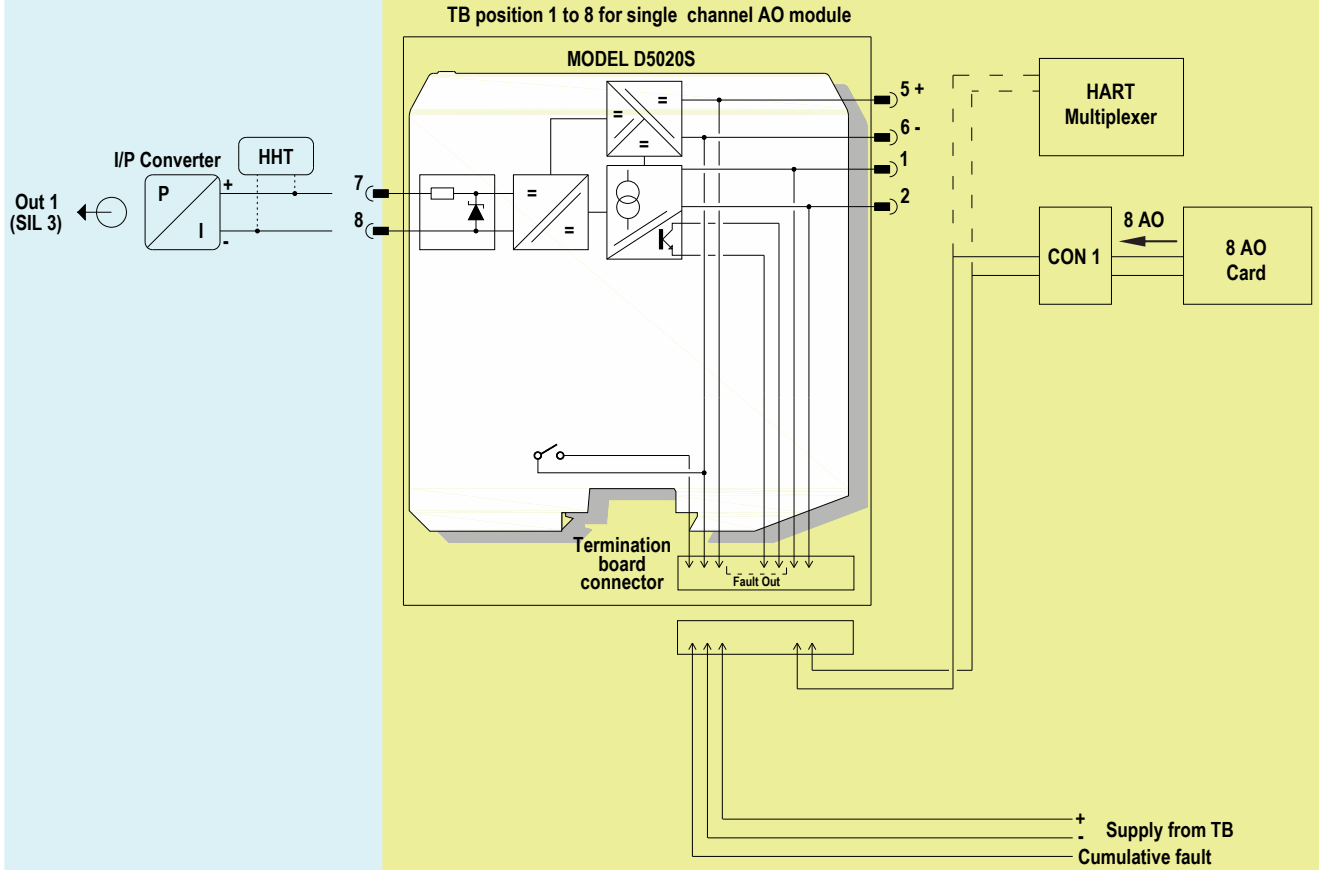


Loop Diagram for 8 AO Interface Card:

HAZARDOUS AREA | SAFE AREA

Note:
The D6000 isolators have the same function diagrams as the corresponding D5000 barriers, but they cannot be connected to the Hazardous Area





Loop Diagram for 8 DI Interface Card:

HAZARDOUS AREA | SAFE AREA

Note:
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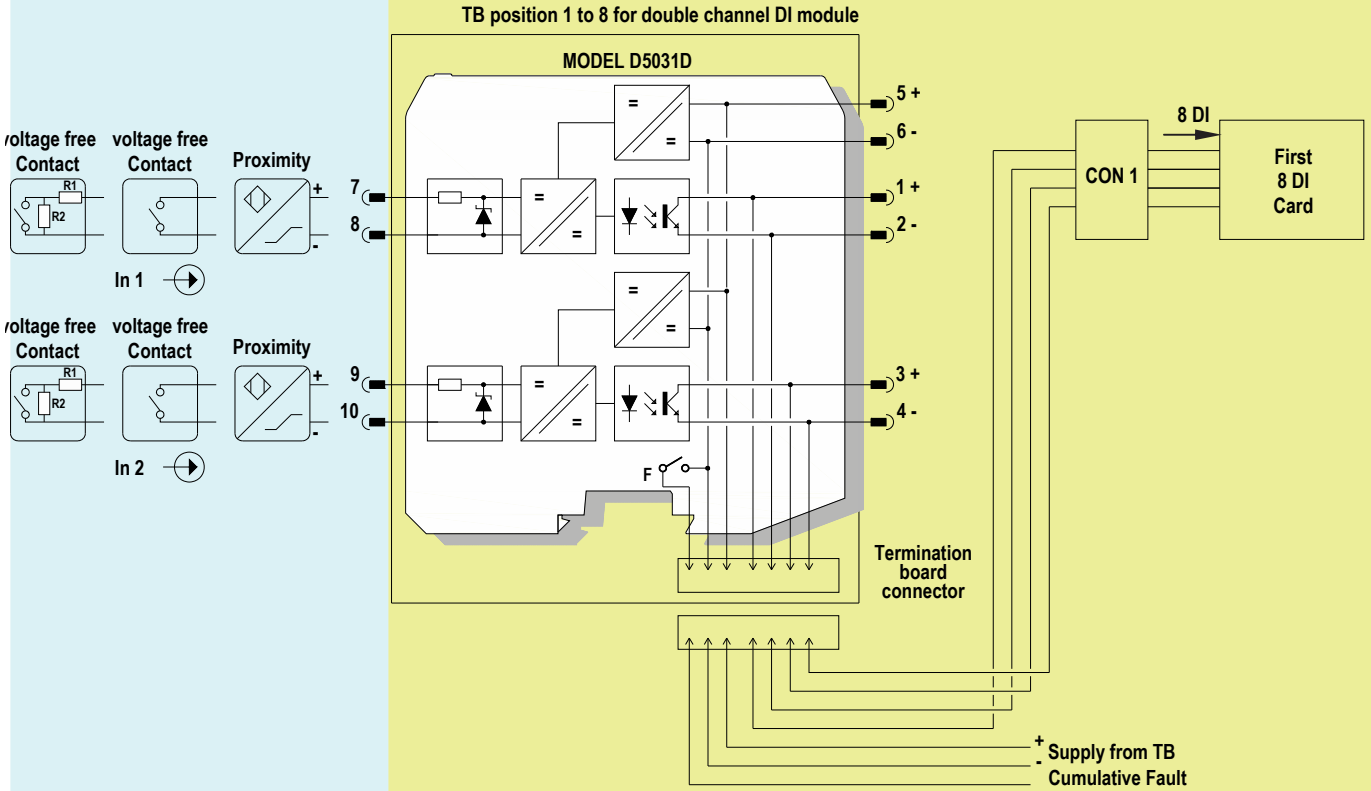
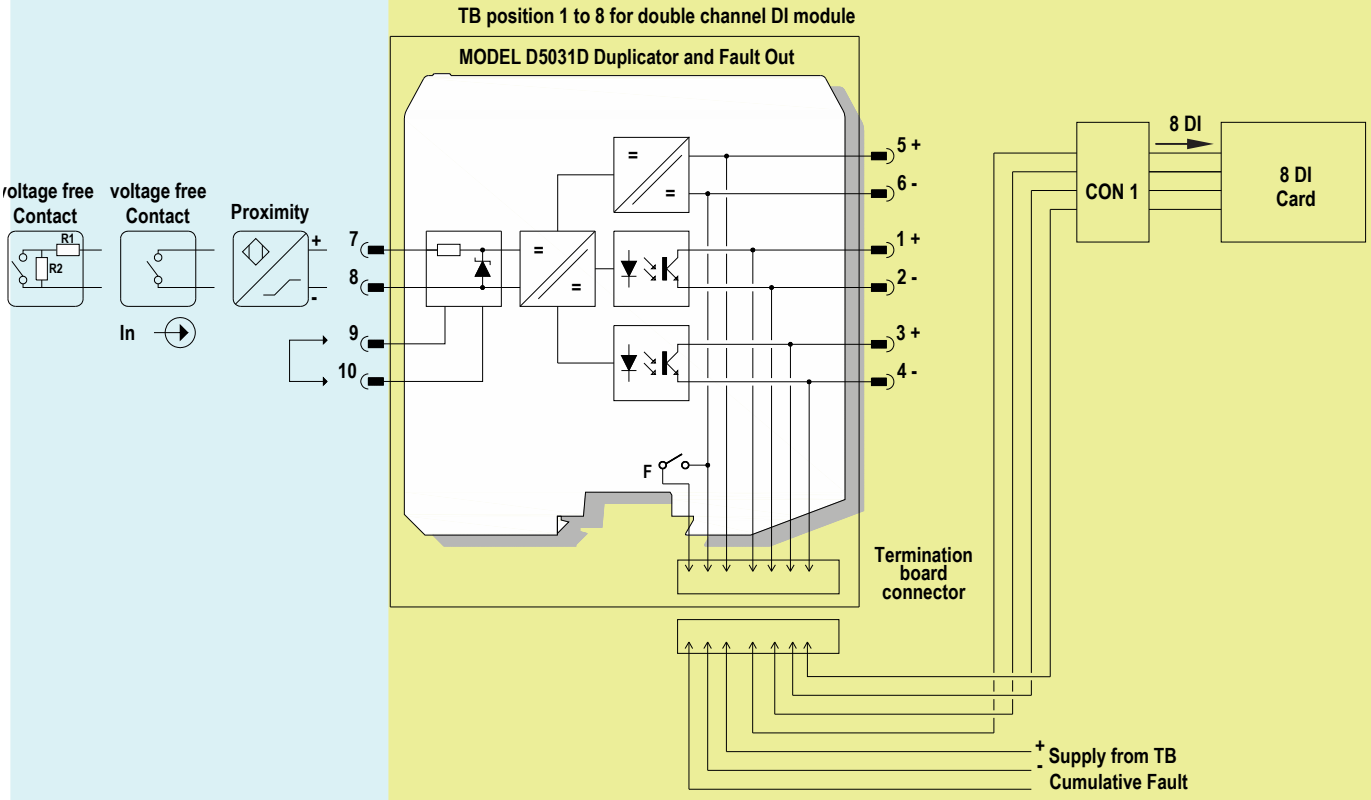
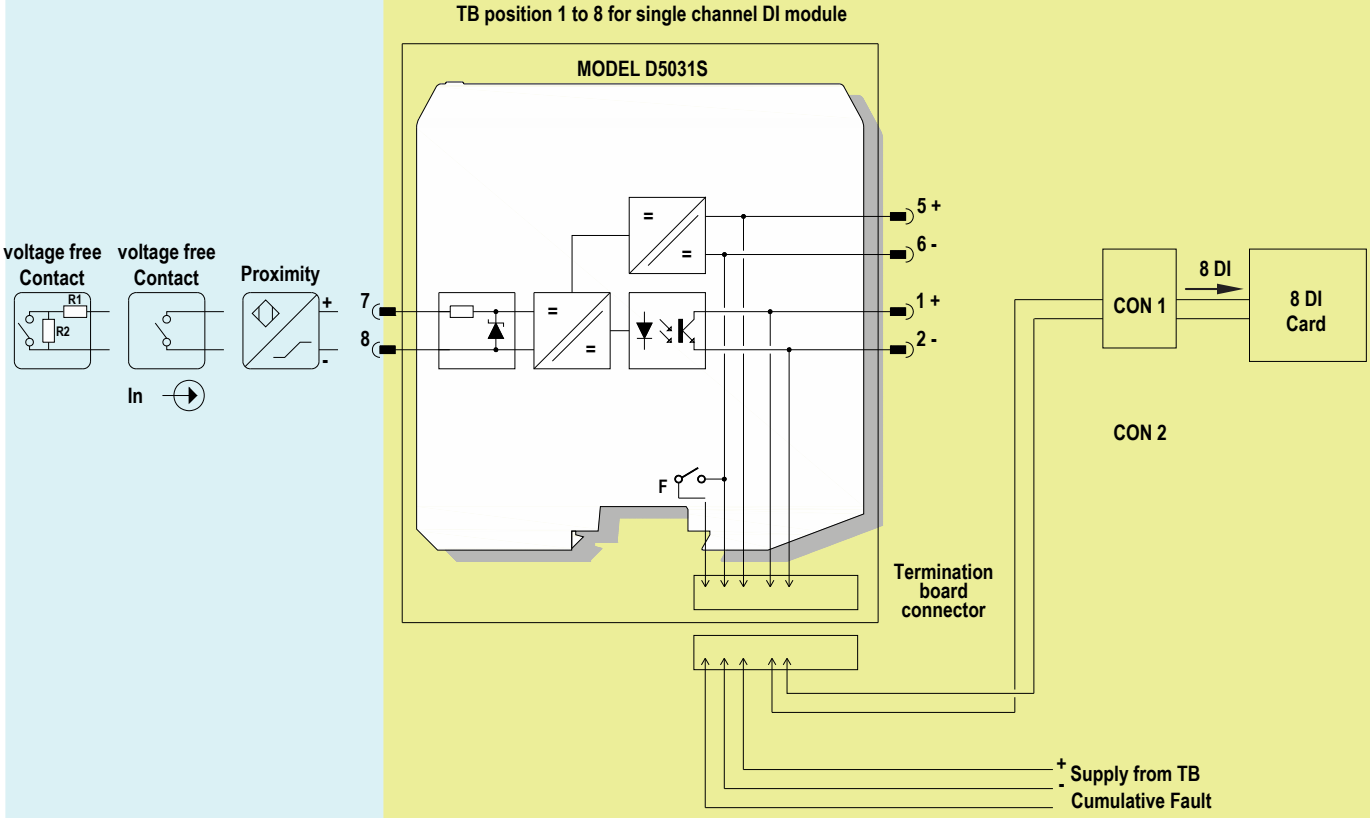




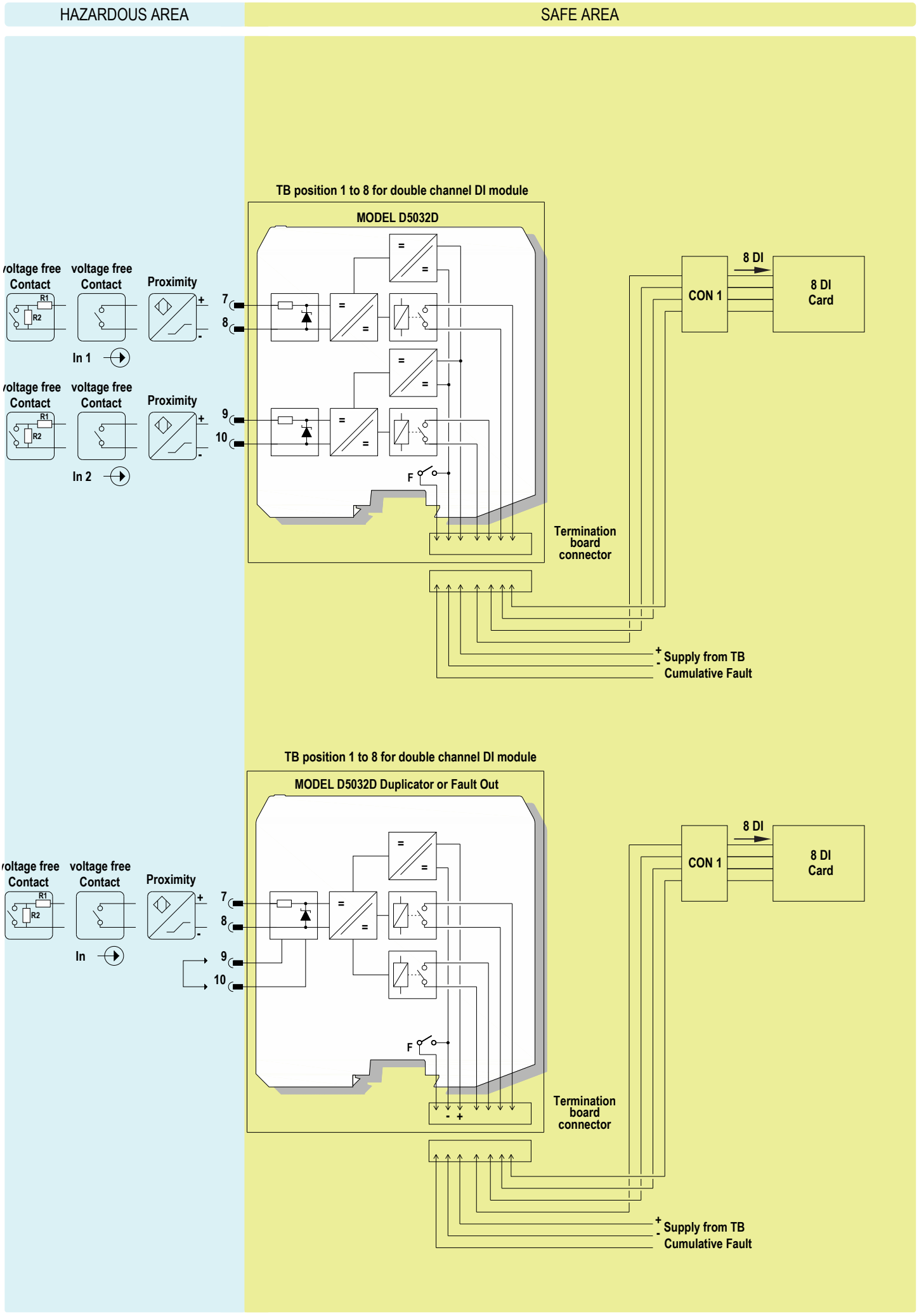
Loop Diagram for 8 DI Interface Card:

HAZARDOUS AREA | SAFE AREA

Note:
The D6000 isolators have the same function diagrams as the corresponding D5000 barriers, but they cannot be connected to the Hazardous Area

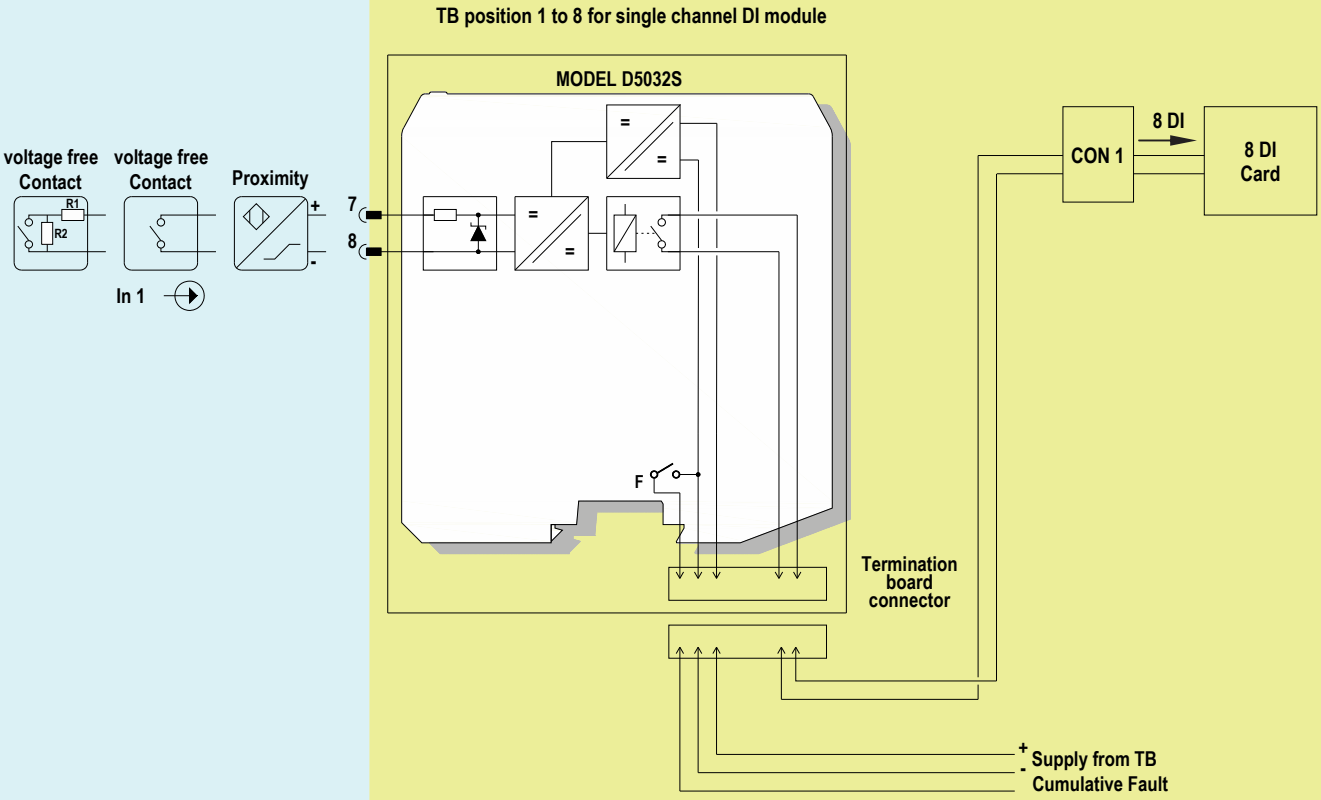


Loop Diagram for 8 DI Interface Card:



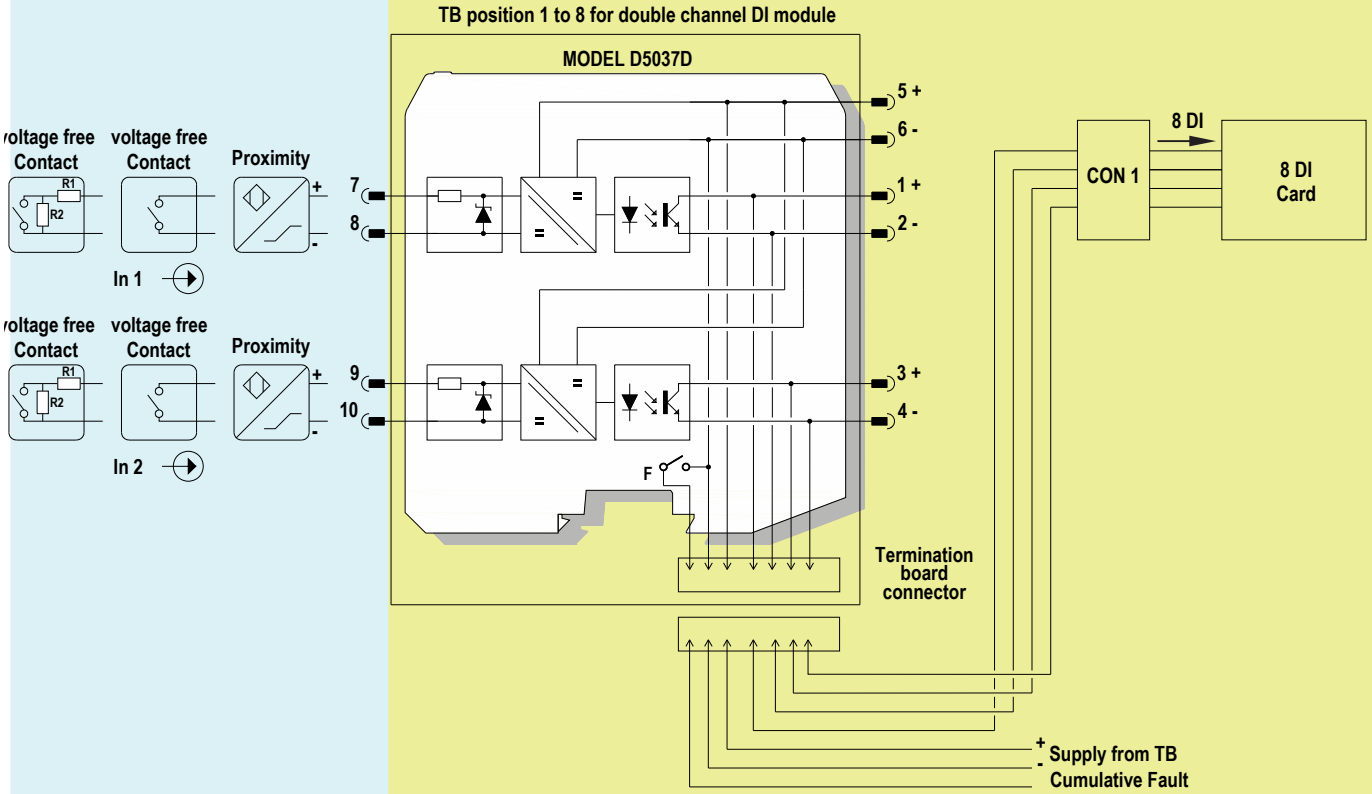
Loop Diagram for 8 DI Interface Card:

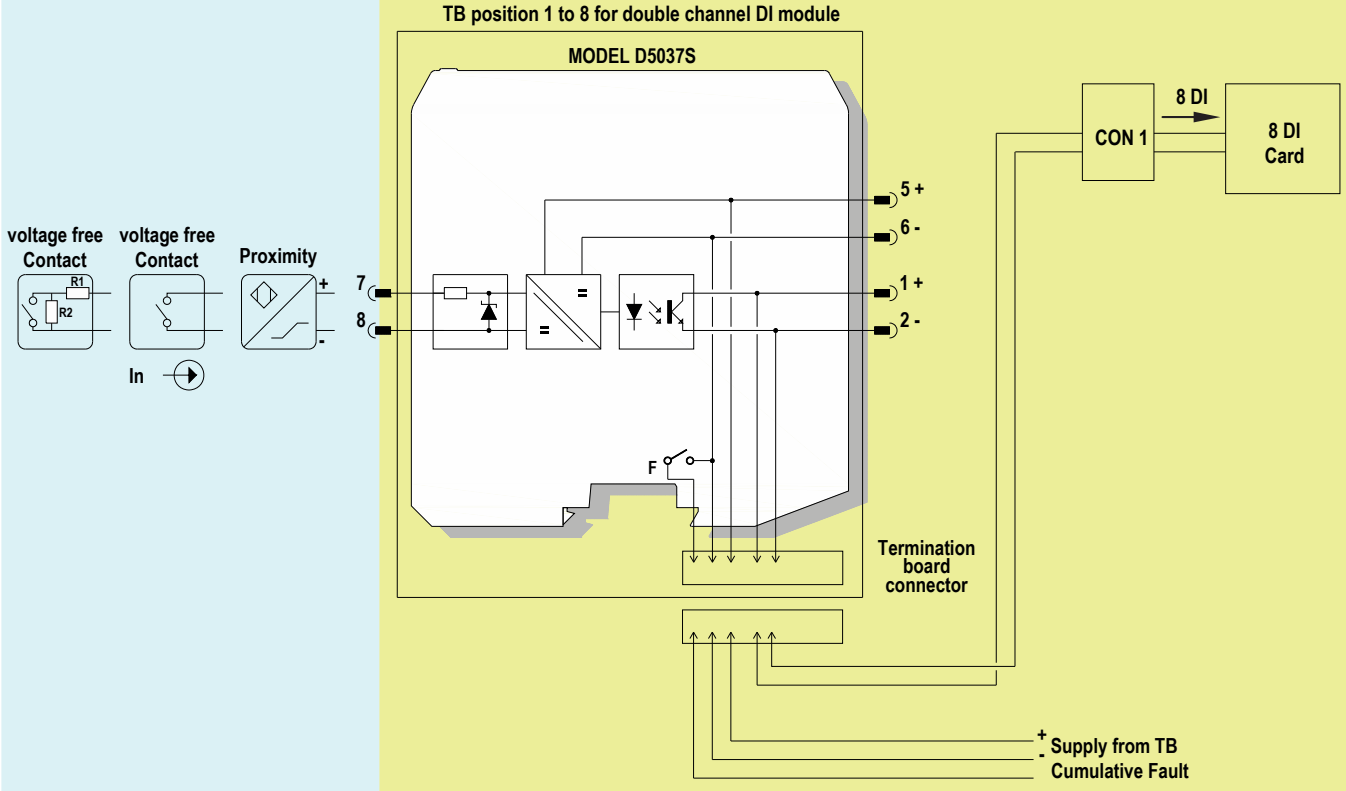
HAZARDOUS AREA | SAFE AREA



Loop Diagram for 8 DI Interface Card:

HAZARDOUS AREA | SAFE AREA

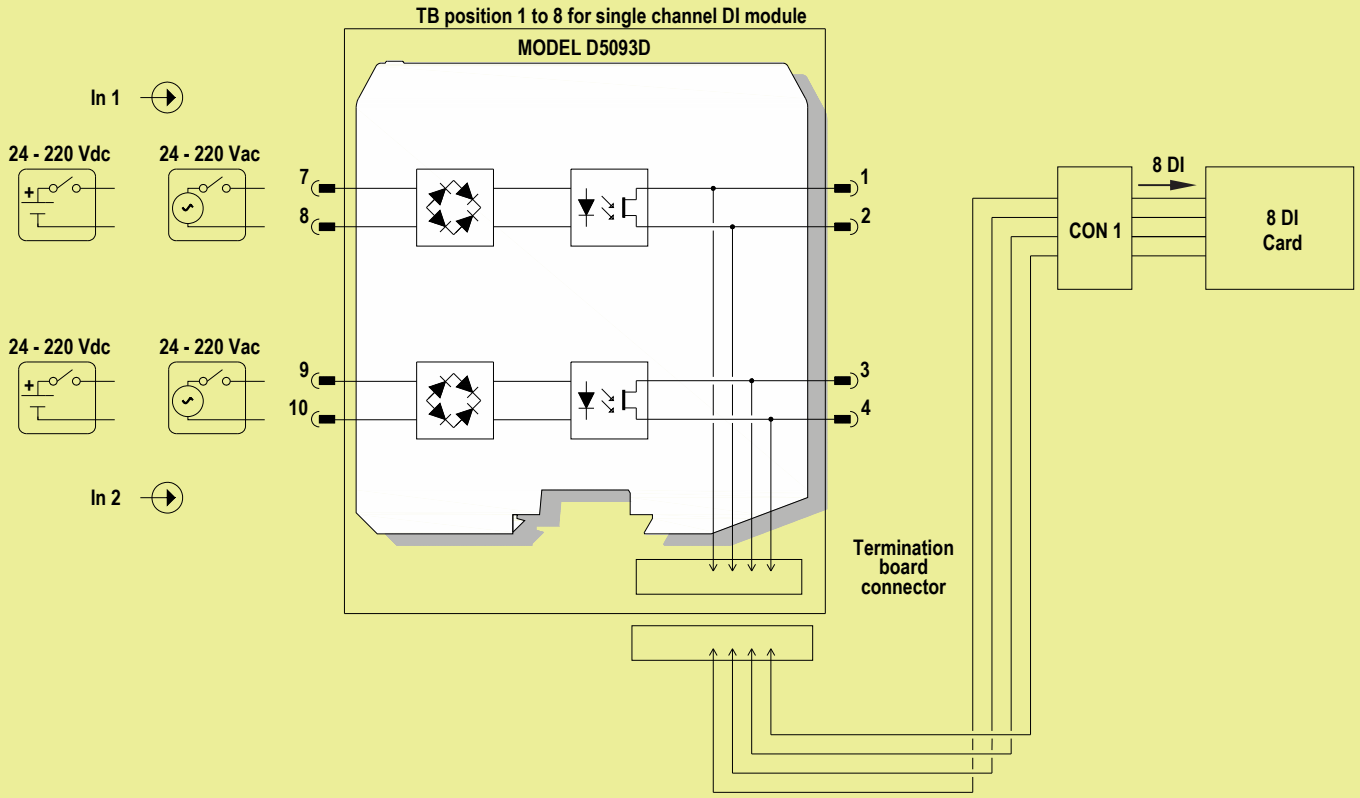


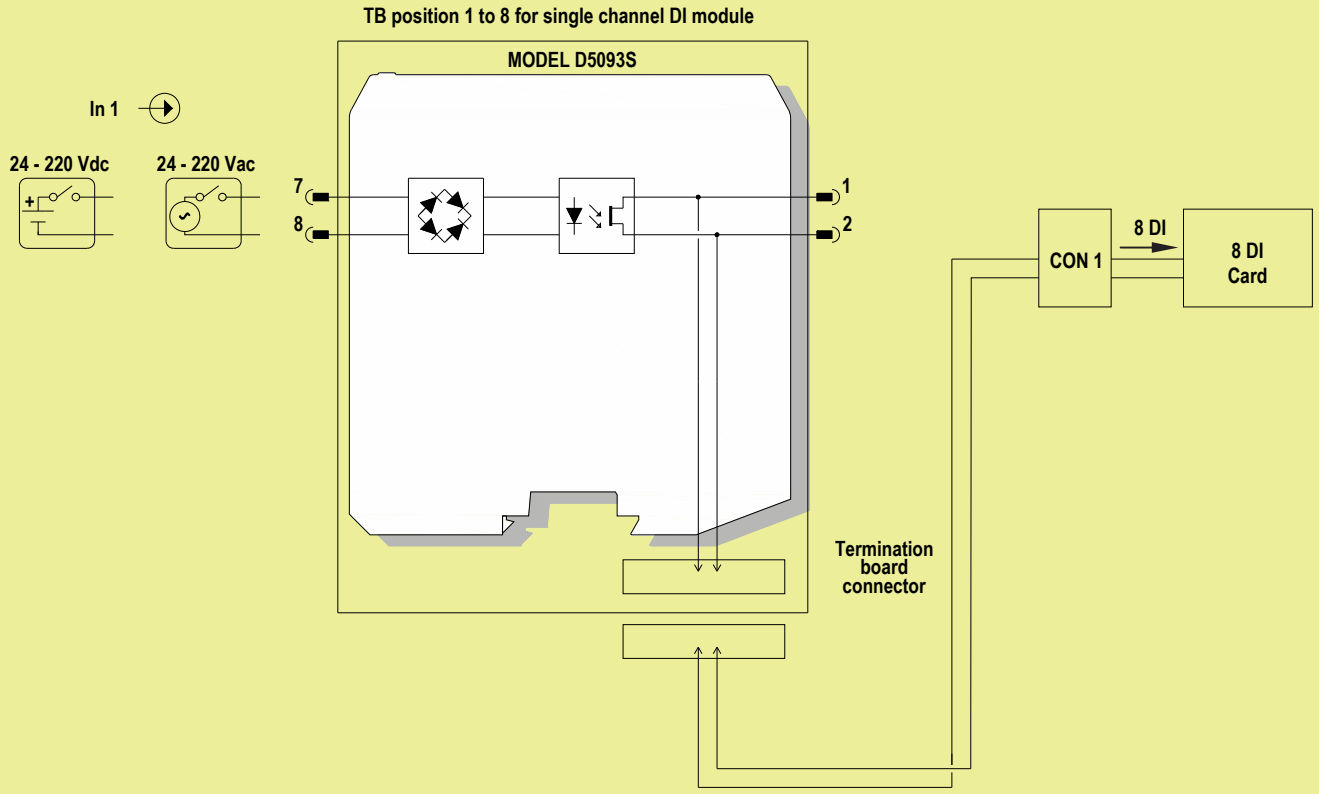


Loop Diagram for 8 DI Interface Card:

SAFE AREA

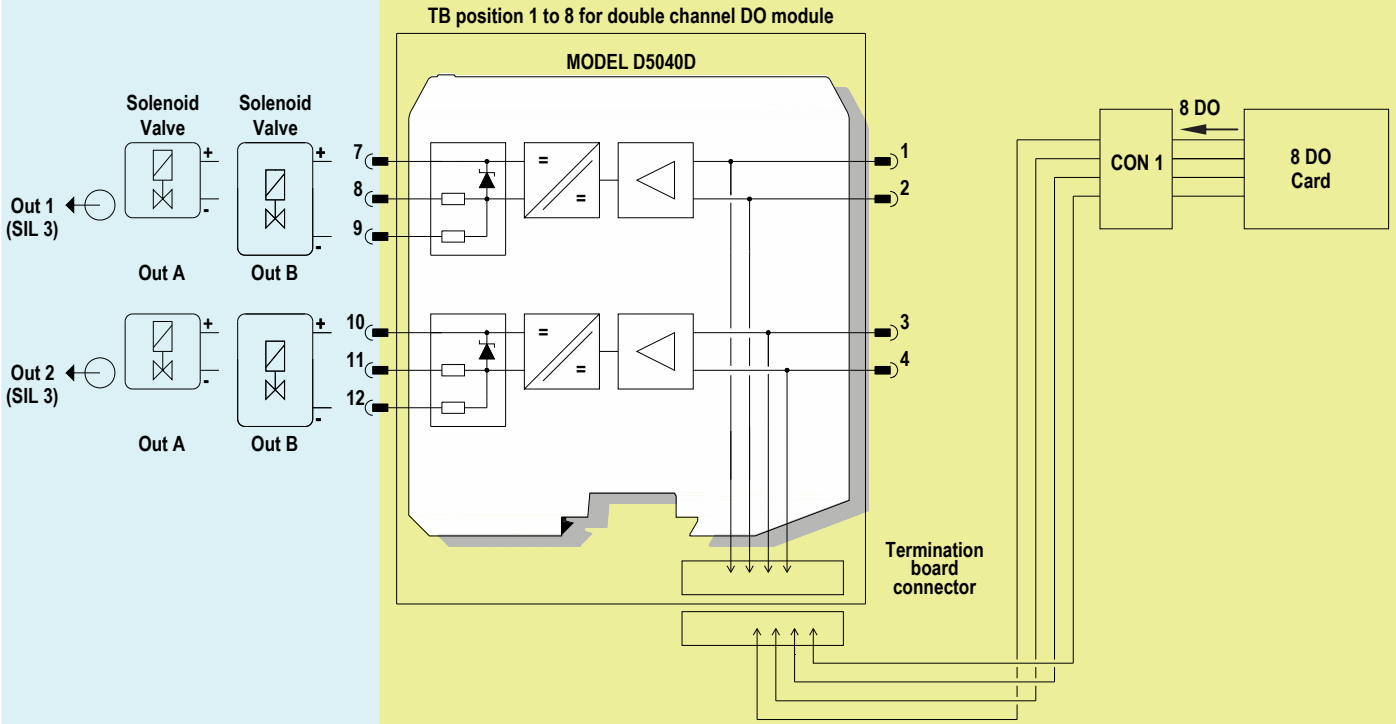
Note:
Model D5093 does not have Intrinsically safe outputs and therefore must not be placed on same board with D5000 IS barriers.

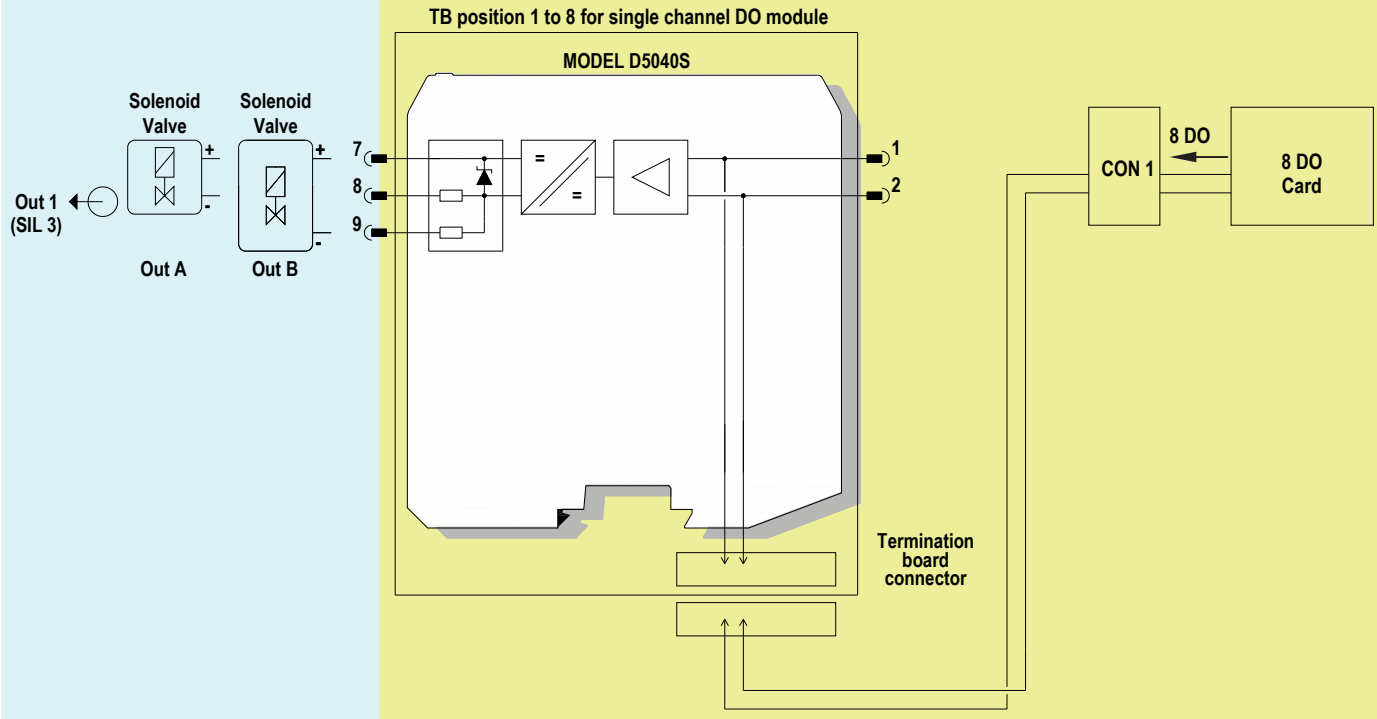




Loop Diagram for 8 DO Interface Card:

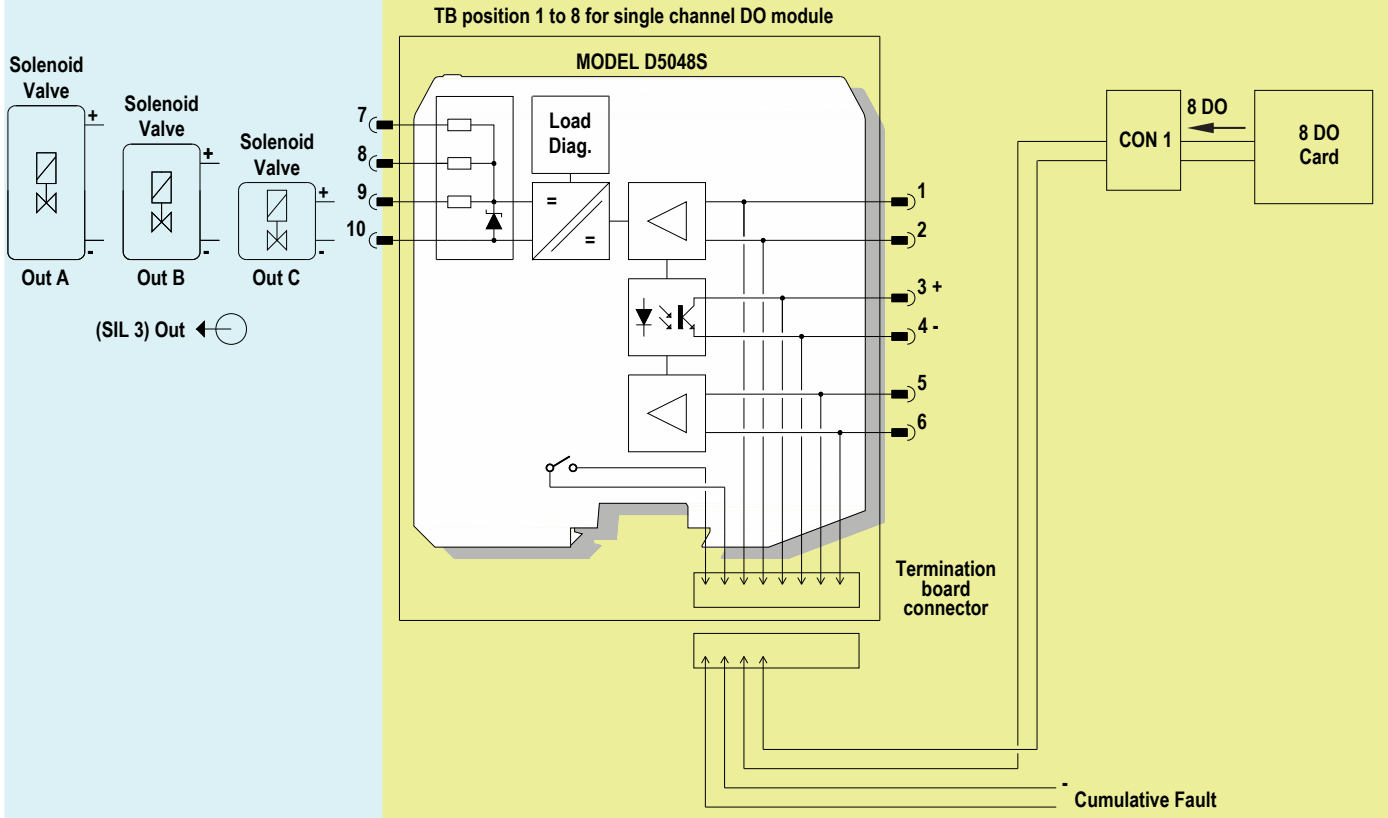
HAZARDOUS AREA | SAFE AREA

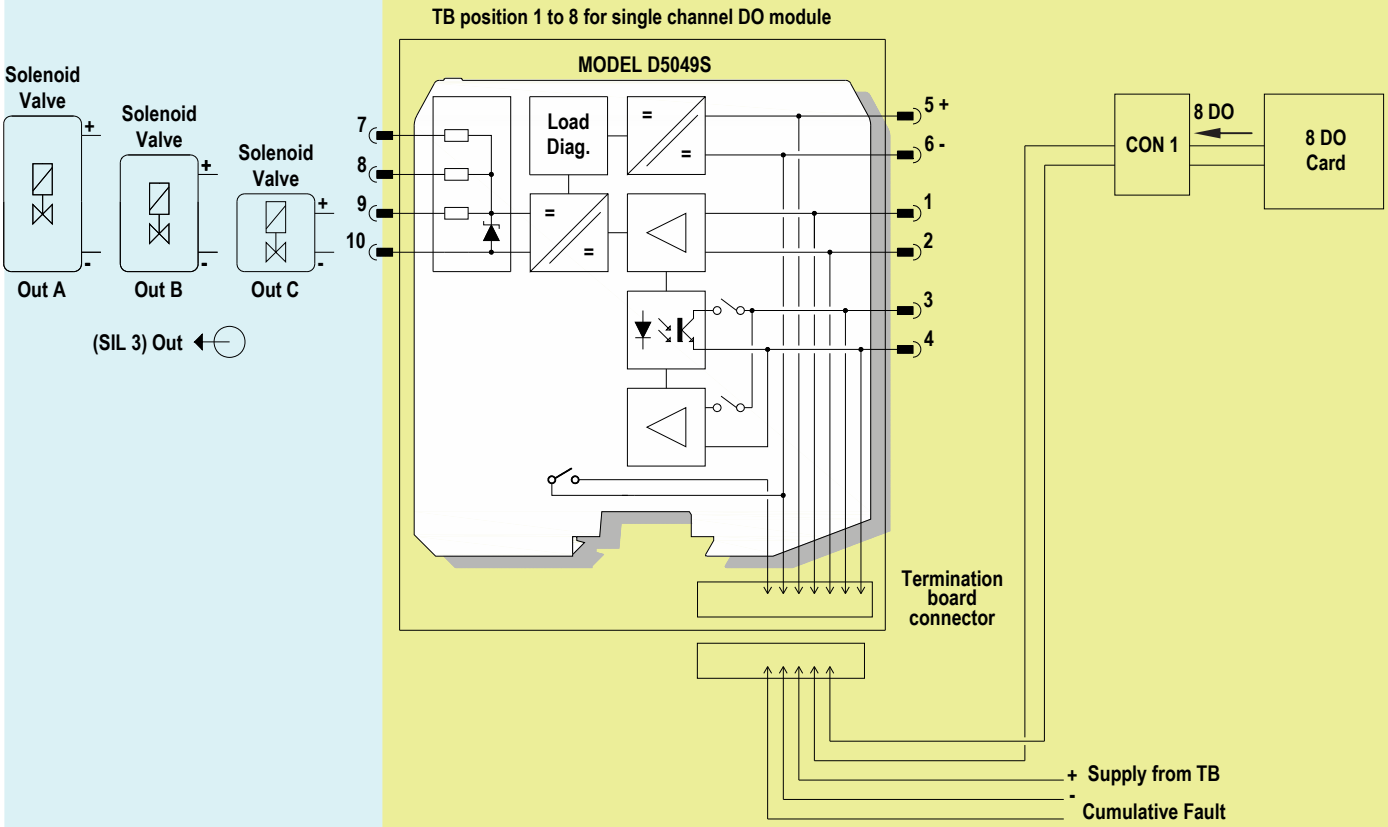




Loop Diagram for 8 DO Interface Card:

HAZARDOUS AREA | SAFE AREA

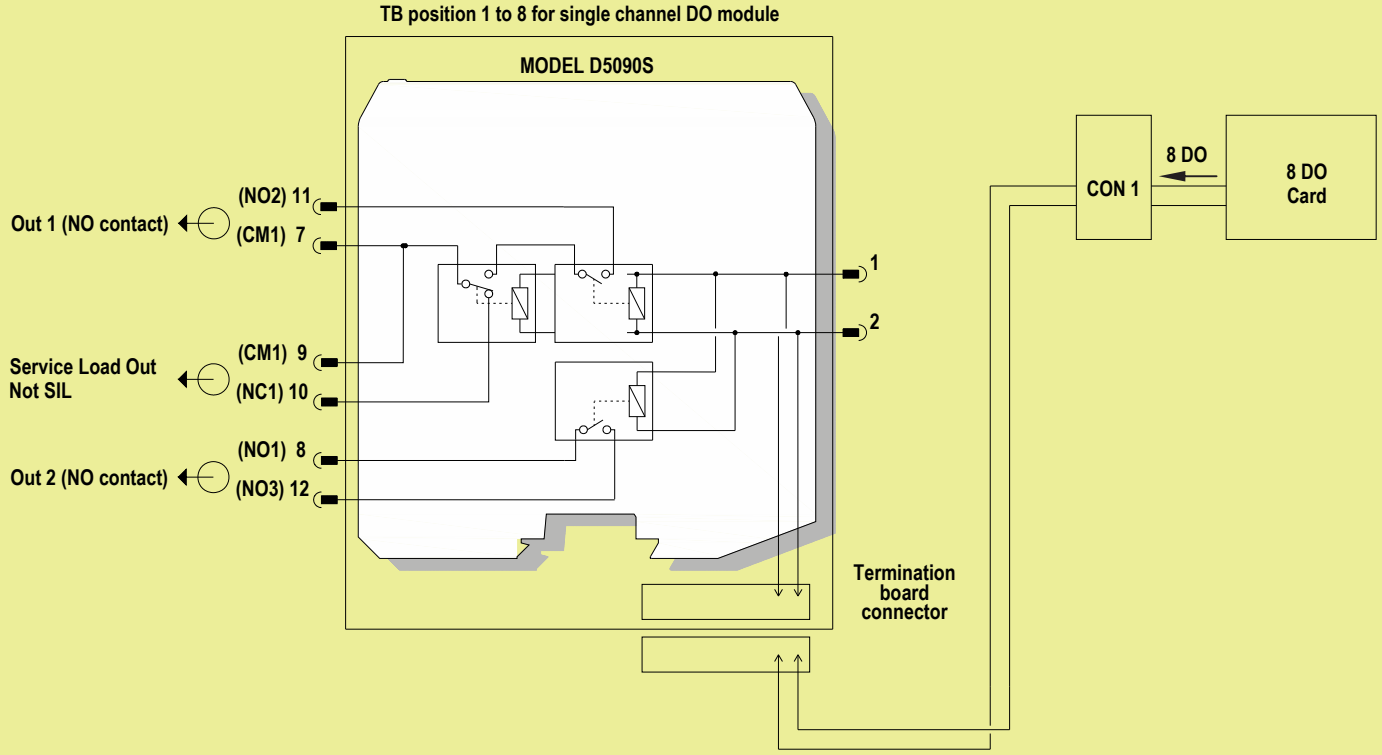


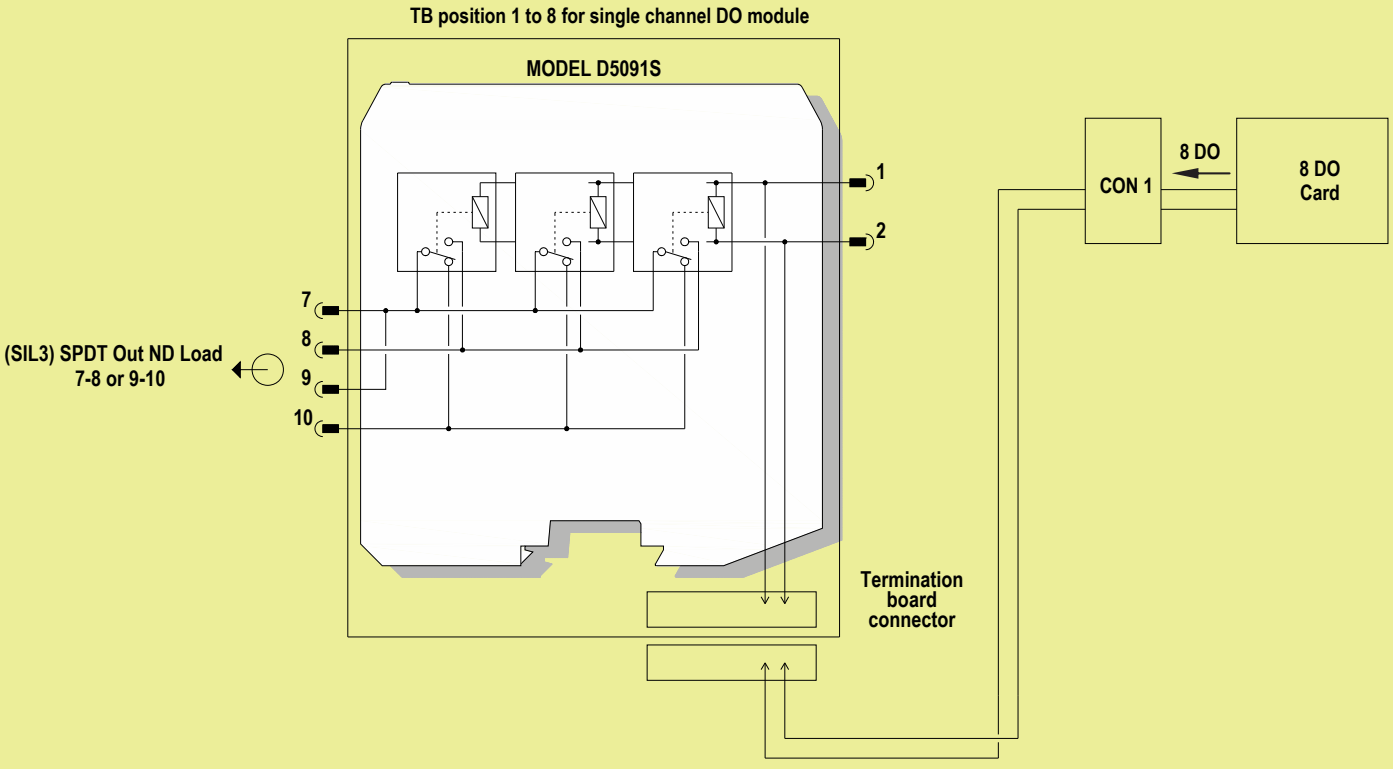


Loop Diagram for 8 DO Interface Card:

SAFE AREA

Note:
Models D5090S and D5091S SIL3 Relays do not have Intrinsically safe outputs and therefore must not be placed on same board with D5000 IS barriers.

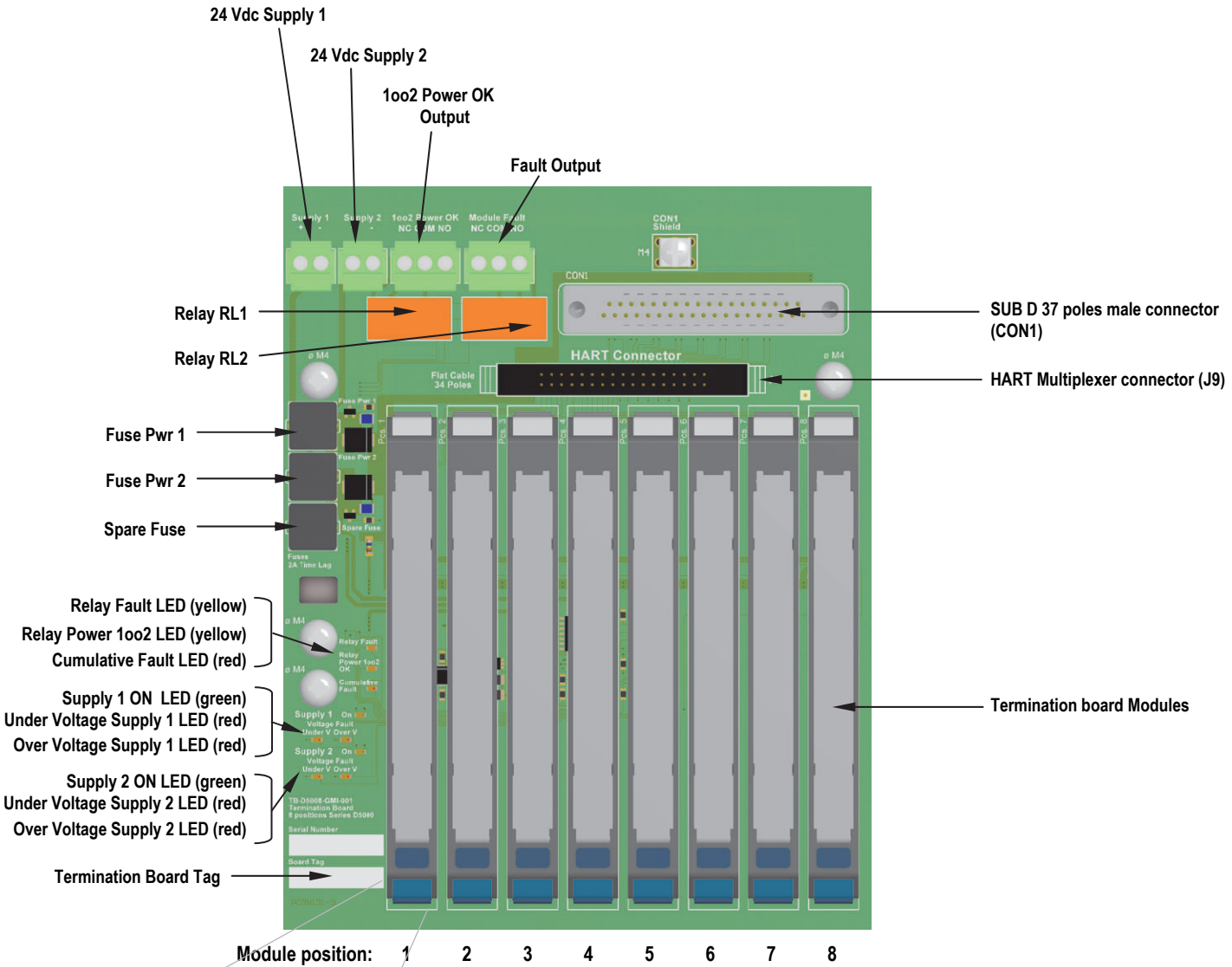




Termination Board Description:

SAFE AREA / ORDINARY LOCATION

Relay contact is defined Normally Closed (NC) or Normally Open (NO) when RL1 or RL2 relays are de-energized (that is, coil status LED is turned off)

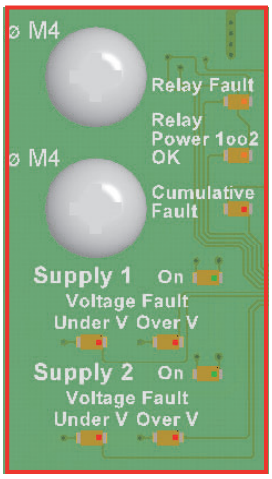


HAZARDOUS AREA / LOCATION

Termination Board Fault Logic:

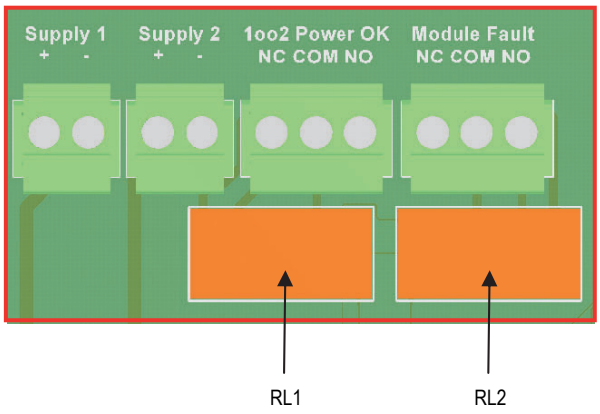
LED Signaling:
Meaning of LEDs on termination boards:

TAG	LED COLOR	MEANING
Supply 1 On	GREEN	The LED is on when the Supply 1 is present, regardless of its voltage
Supply 1 Under V	RED	The LED is on when the Supply 1 is under-voltage (<18 V)
Supply 1 Over V	RED	The LED is on when the Supply 1 is over-voltage (>30 V)
Supply 2 On	GREEN	The LED is on when the Supply 2 is present, regardless of its voltage
Supply 2 Under V	RED	The LED is on when the Supply 2 is under-voltage (<18 V)
Supply 2 Over V	RED	The LED is on when the Supply 2 is over-voltage (>30 V)
Cumulative Fault	RED	The LED is on when at least one module/barrier reported a fault
Relay Power 1oo2 OK	YELLOW	The LED is on when both supply voltages are within the regular range (>18 V and <30 V)
Relay Fault	YELLOW	The LED is on when the following two conditions hold: 1. at least one voltage supply is within the regular range (>18 V and <30 V) 2. no module/barrier fault is reported



Relay Activation Conditions:
The two relays are activated according to the following rules:

TAG	ACTIVATION
1oo2 Power OK (RL1)	The relay is energized when both supply voltages are within the regular range (>18 V and <30 V), i.e. when "Relay 1oo2 Power OK" yellow LED is on.
Module Fault (RL2)	The relay is energized when the following two conditions hold: 1. at least one voltage supply is within the regular range (>18 V and <30 V) 2. no module/barrier fault is reported Therefore, the relay is energized when the "Fault" yellow LED is on.



Termination Board Connections:

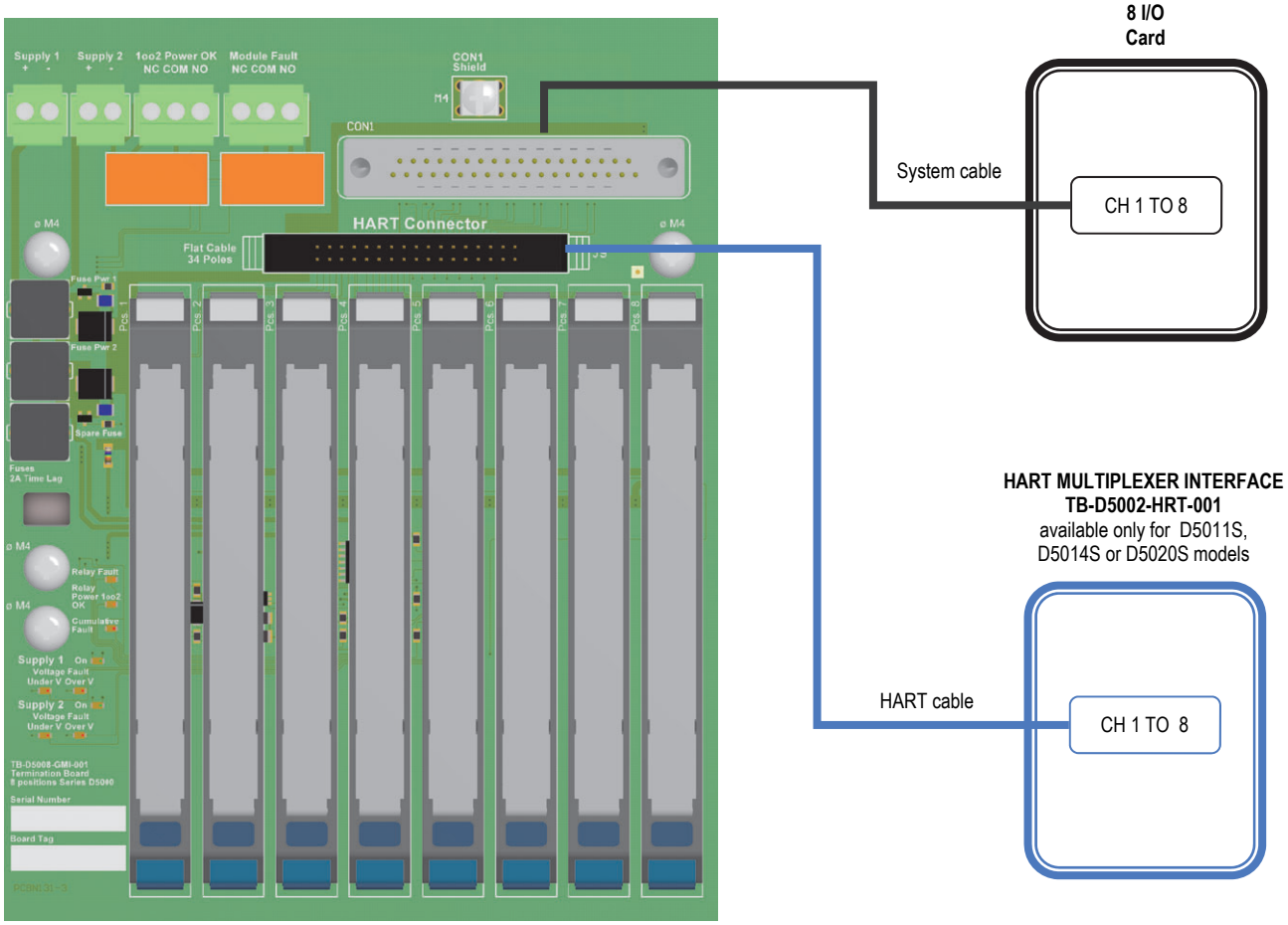


Diagram for single channel modules

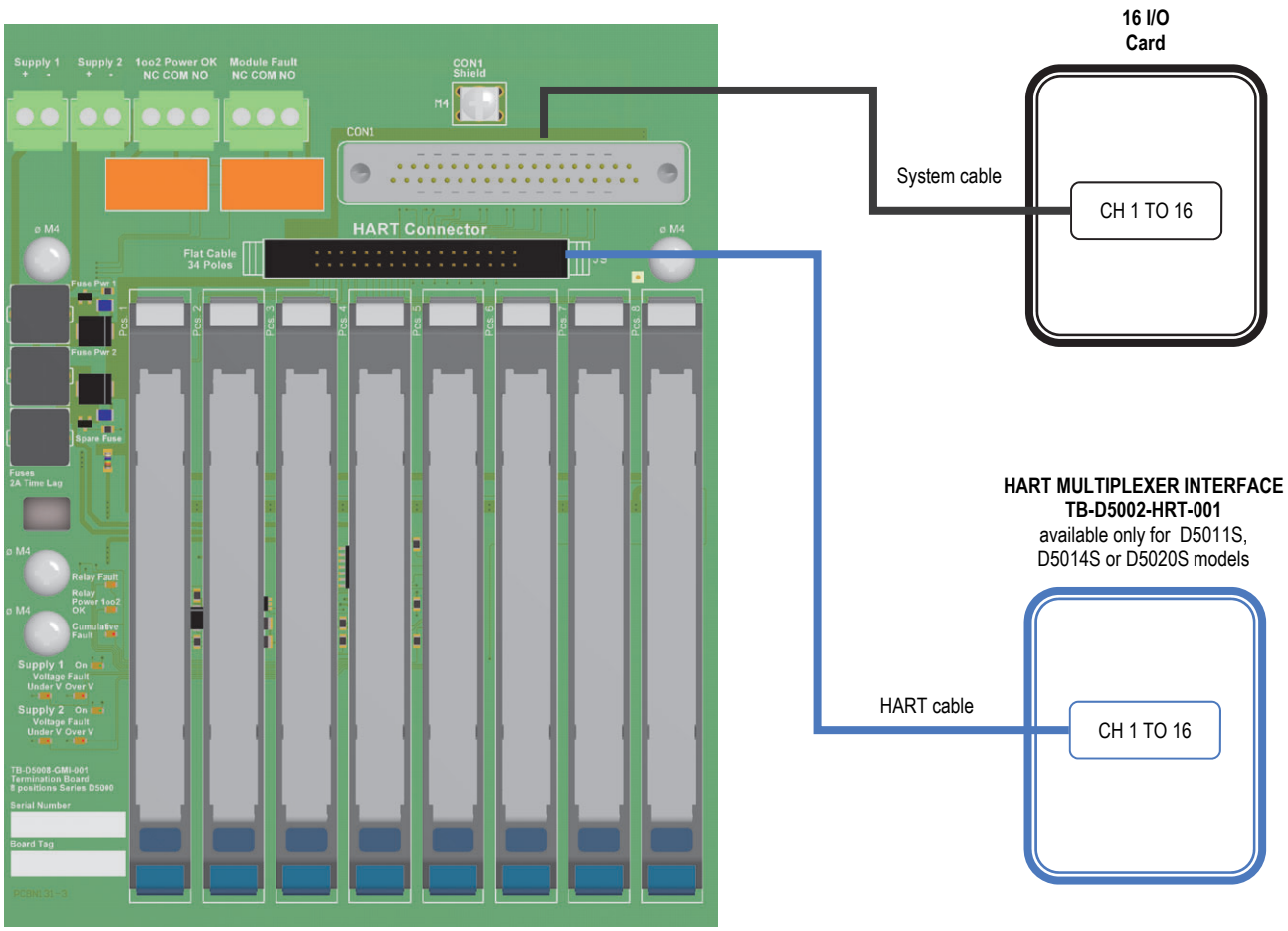
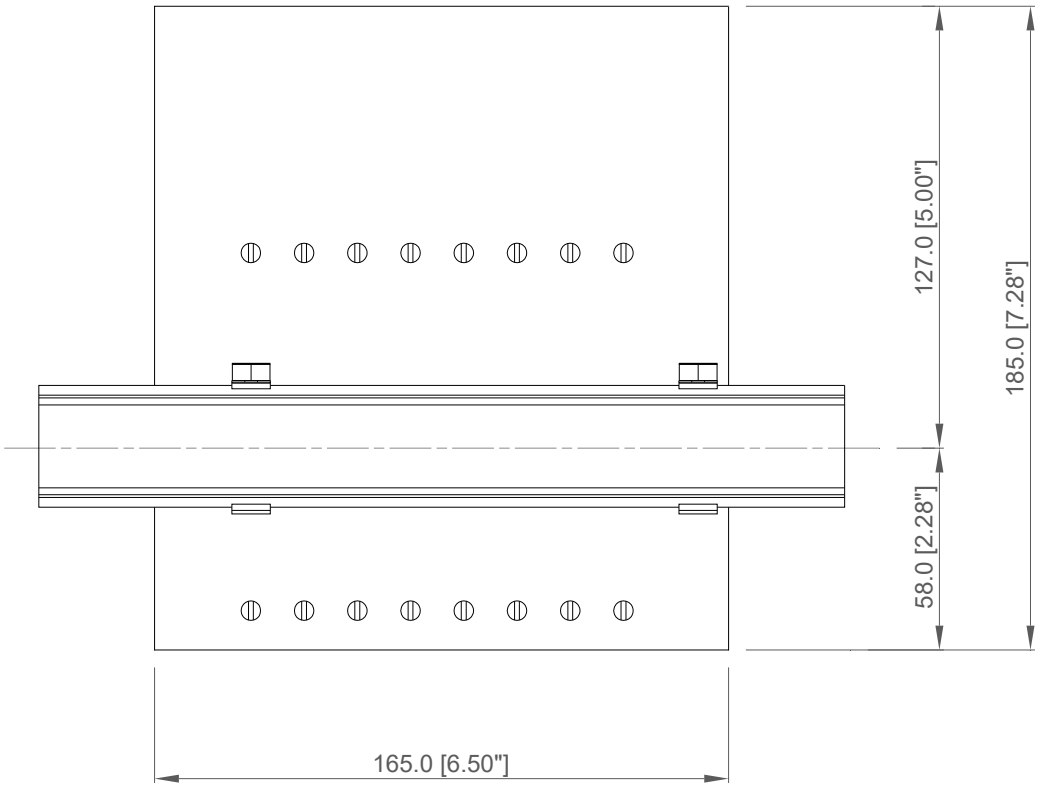


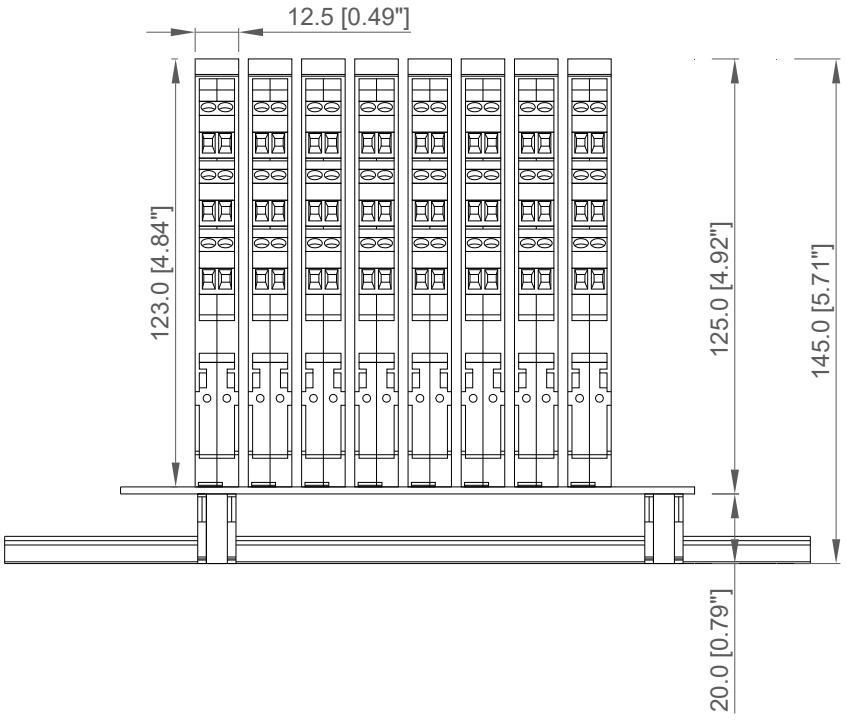
Diagram for double channel modules

Termination Board Single DIN Rail mounting and overall dimensions:

Bottom view

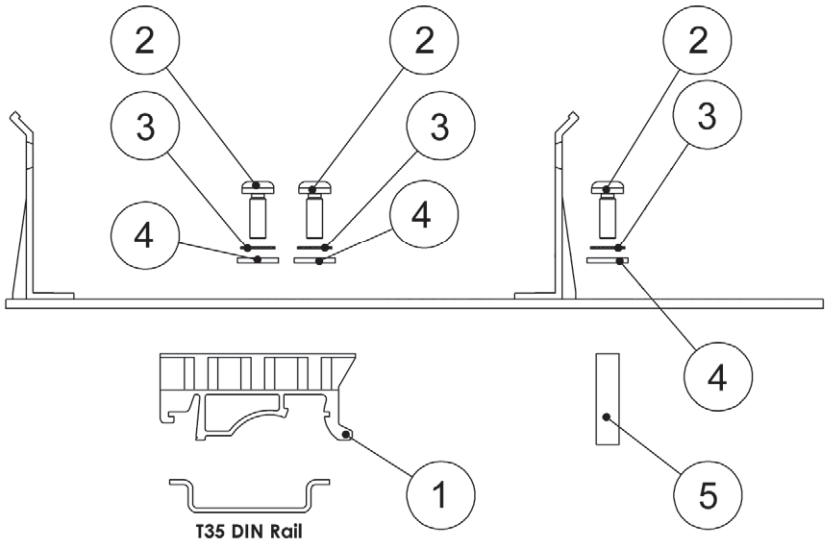


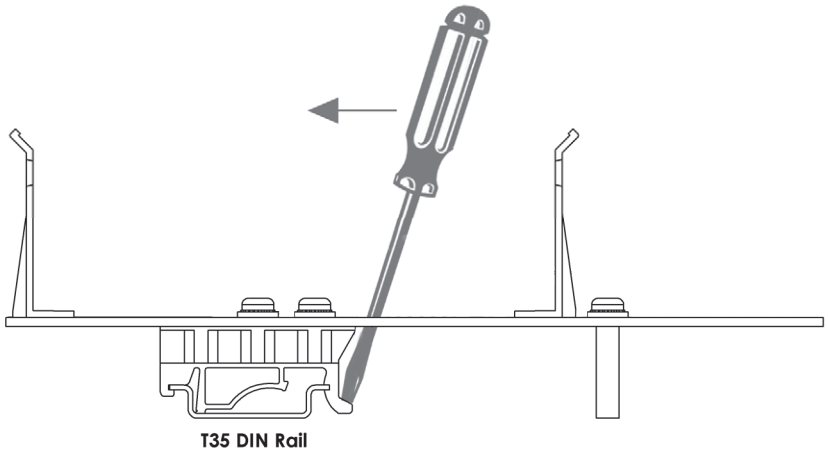
Side view



All dimensions are expressed in millimeters [inches]

Mounting features kit TB-OPT-001

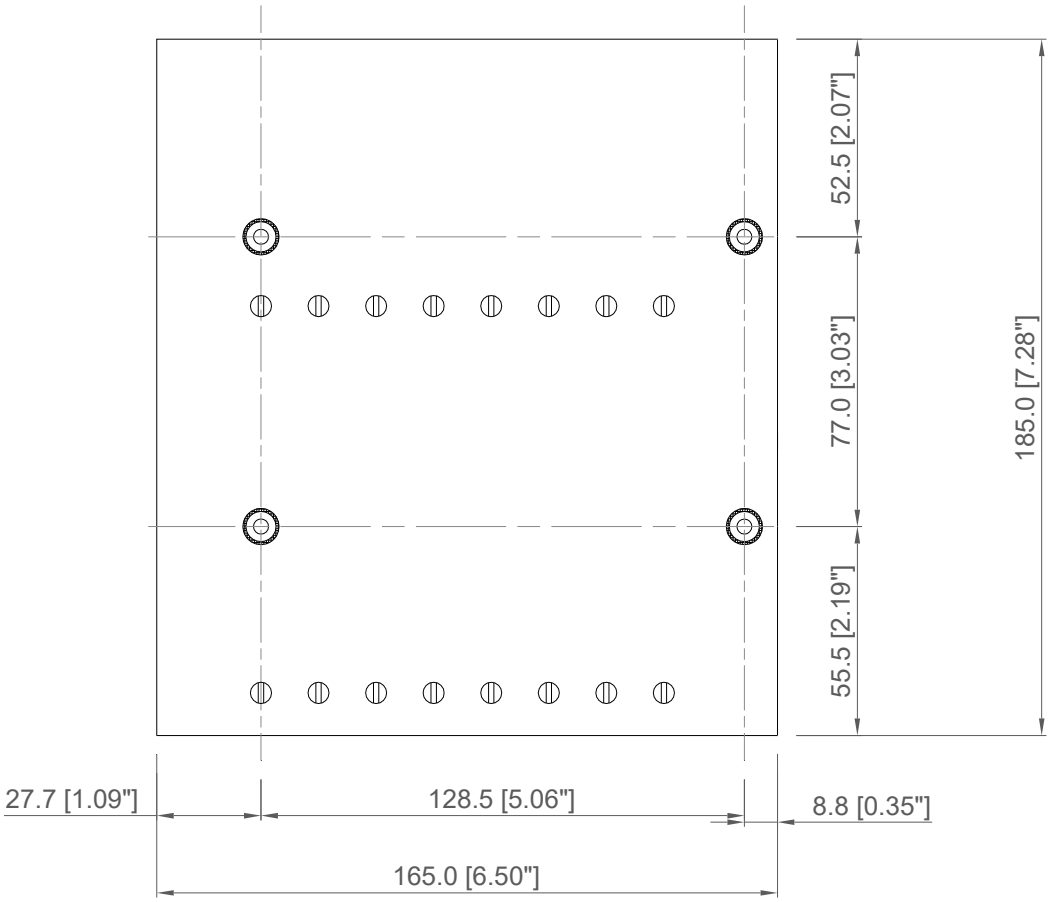




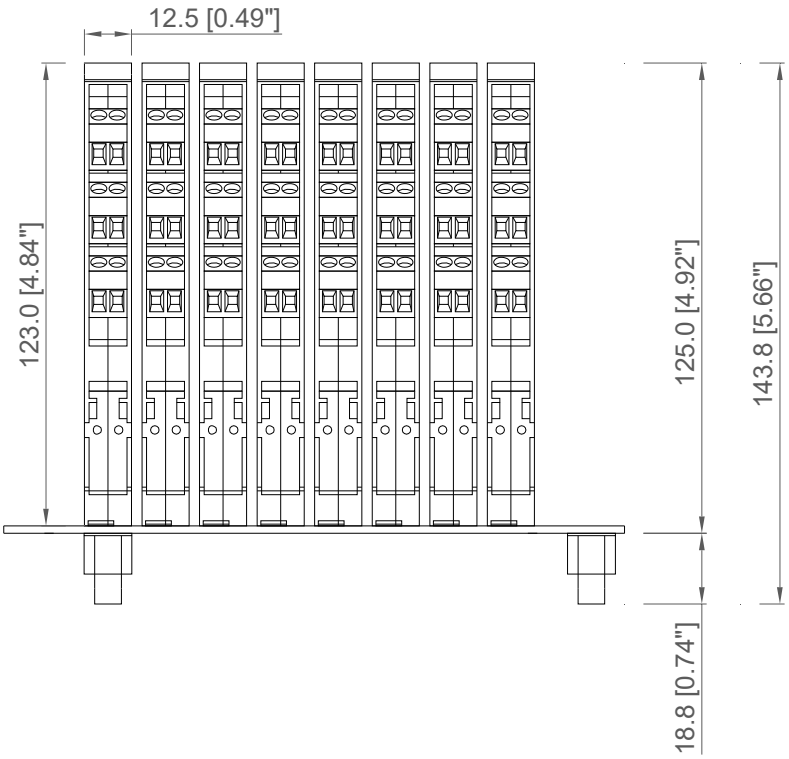
Ref. Nr	Q.ty	Description	Material
1	2	T35 Din Rail Adapter	PA
2	6	3.5 x 9.5 Self tapping screw	Stainless Steel
3	6	M3 External Tooth loch Washer	Stainless Steel
4	6	M3 Washer	Stainless Steel
5	2	6 c 20 Spacer	PA

Wall mounting overall dimensions for M4 self tapping screw:

Bottom view



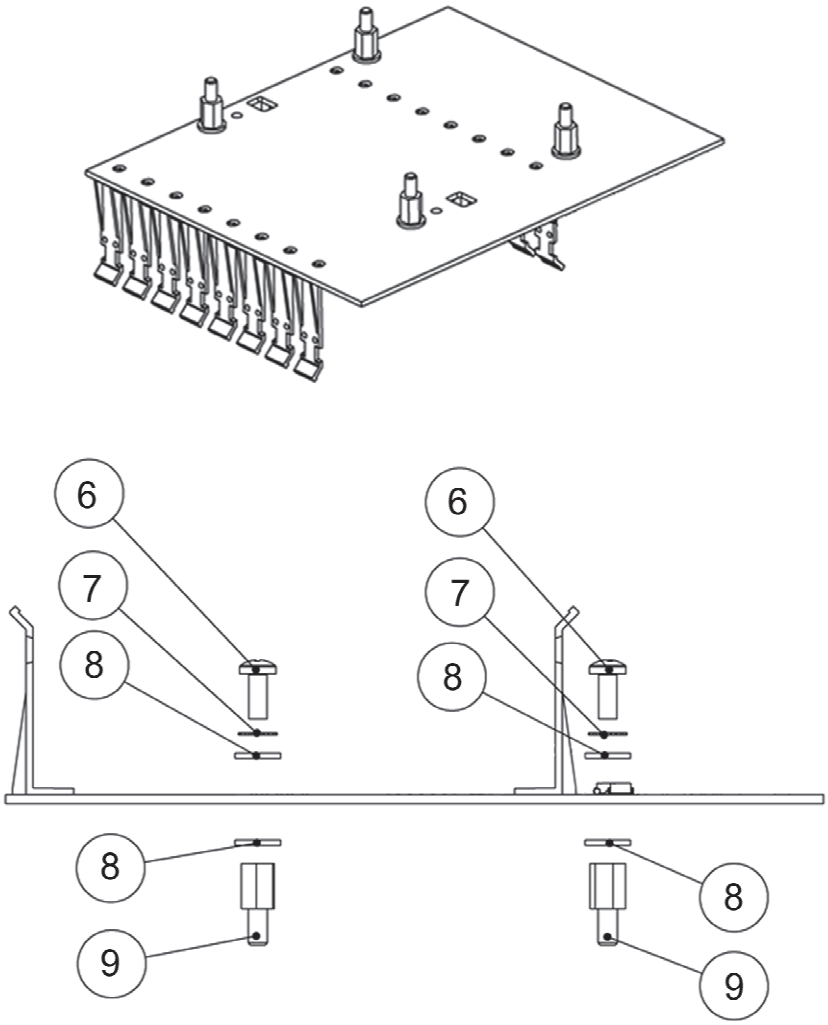
Side view



All dimensions are expressed in millimeters [inches]

Wall mounting features for M4 self tapping screw:

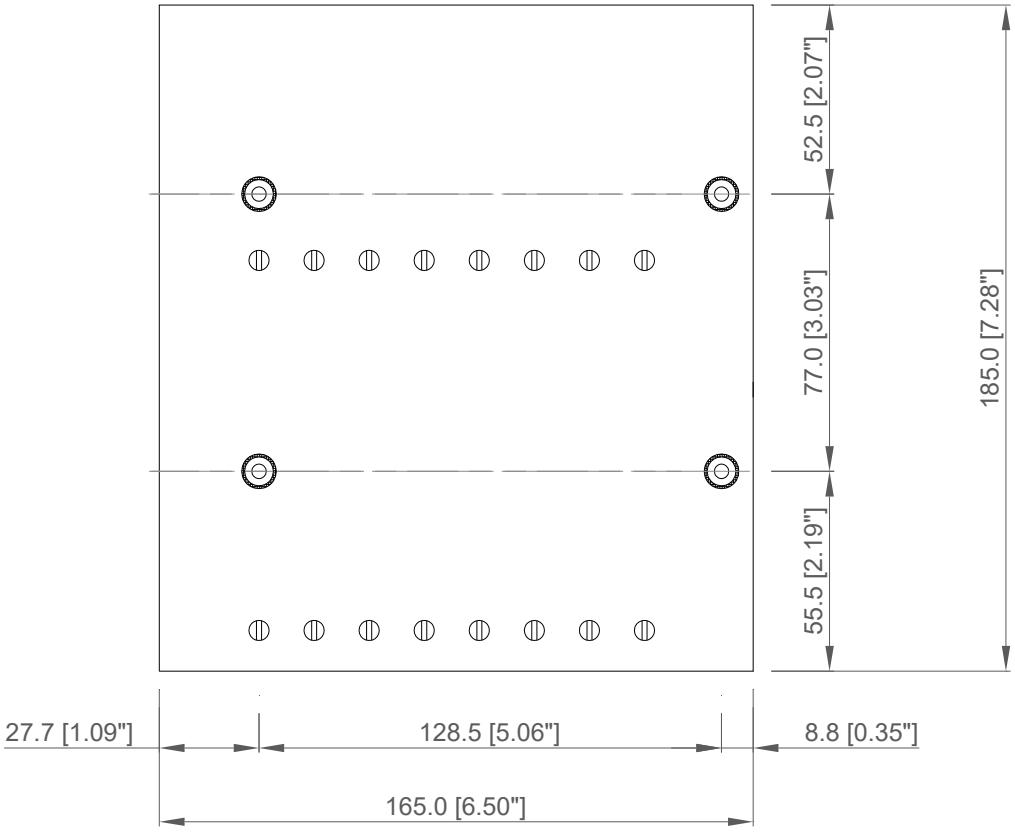
Mounting features kit TB-OPT-001



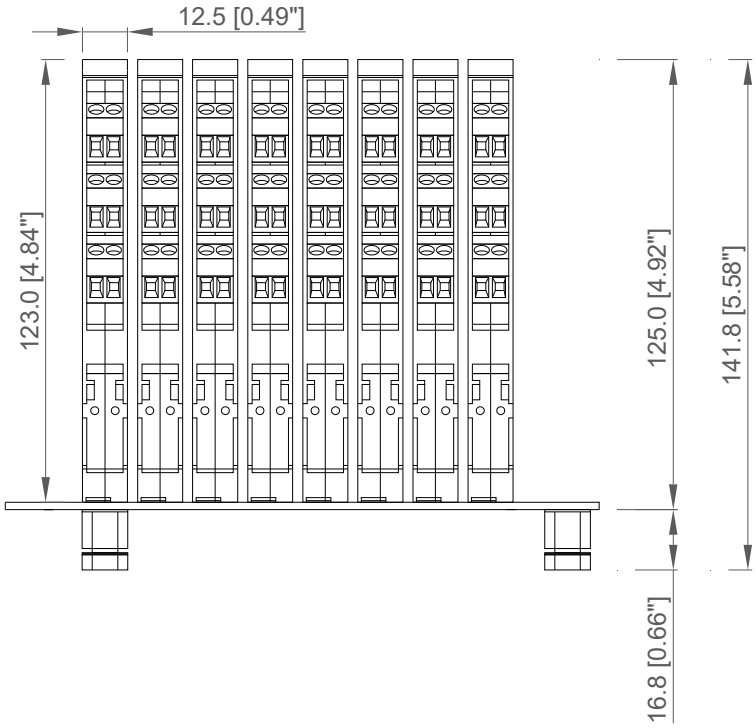
Ref. Nr	Q.ty	Description	Material
6	4	M4 x 8 Screw	Stainless Steel
7	4	M4 External Tooth lock Washer	Stainless Steel
8	8	M4 Washer	Stainless Steel
9	4	Self Tapping Spacer	NI - Plated Brass

Wall mounting overall dimensions for M4 thread screw:

Bottom view



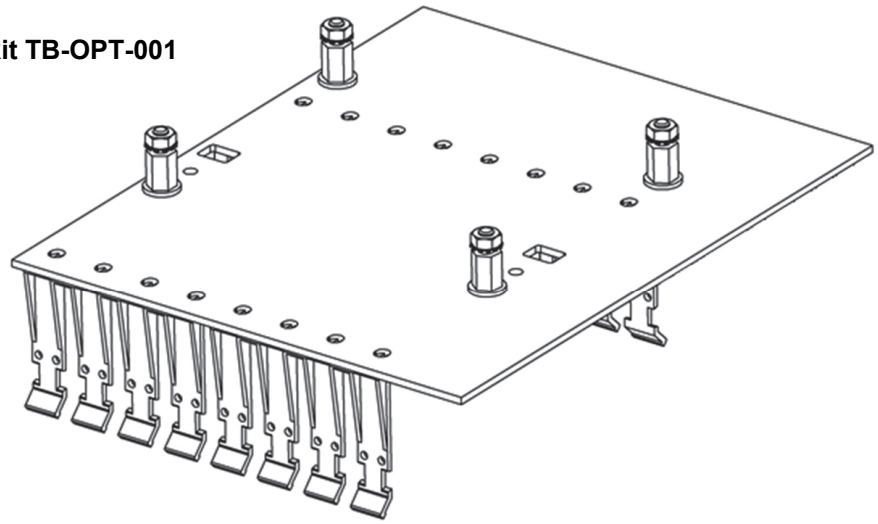
Side view

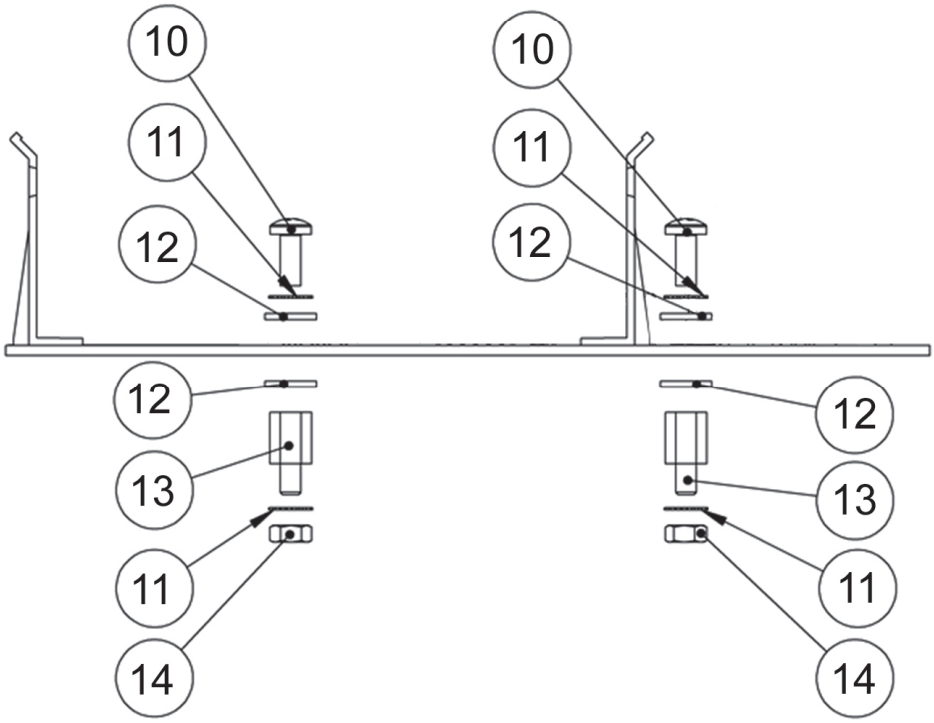


All dimensions are expressed in millimeters [inches]

Wall mounting features for M4 thread screw:

Mounting features kit TB-OPT-001





Ref. Nr	Q.ty	Description	Material
10	4	M4 x 8 Screw	Stainless Steel
11	8	M4 External Tooth lock Washer	Stainless Steel
12	8	M4 Washer	Stainless Steel
13	4	Threaded Spacer	NI - Plated Brass
14	4	M4 Nut	Stainless Steel

Connections table (16 / 8 AI - Temperature) Interface Card:

FIELD DEVICE	MODULE TYPE	MODULE FUNCTION	MODULE POSITION	MODULE CHANNEL NUMBER ("B" is only for Double channel)	INTERFACE CARD CONNECTOR CON 1.(37 poles) PIN NUMBER	HART MULTIPLEXING CONN. (34 poles) PIN NUMBER (D5011-14 -20 only)	NOTE
	D5011S, D5014S D6011S, D6014S (Single channel) D5011D, D5014D D6011D, D6014D (Double channel)	Analog IN	1	1A	(+) 37	(+) 1	
					(-) 19	(-) 2	
				1B	(+) 36	(+) 17	
					(-) 18	(-) 18	
	D5072S, D6072S (Single channel) D5072D, D6072D (Double channel)	Temperature IN	2	2A	(+) 35	(+) 3	
					(-) 17	(-) 4	
				2B	(+) 34	(+) 19	
					(-) 16	(-) 20	
			3	3A	(+) 33	(+) 5	
					(-) 15	(-) 6	
				3B	(+) 32	(+) 21	
	D5020S, D6020S (Single channel) D5020D, D6020D (Double channel)	Analog OUT			(-) 14	(-) 22	
			4	4A	(+) 31	(+) 7	
					(-) 13	(-) 8	
				4B	(+) 30	(+) 23	
					(-) 12	(-) 24	
	D5031S, D5032S D5037S, D6031S (Single channel) D5031D,D5032D D5037D, D6031D (Double channel)	Digital IN	5	5A	(+) 29	(+) 9	
					(-) 11	(-) 10	
				5B	(+) 28	(+) 25	
	D5093S (Single channel) D5093D (Double channel)				(-) 10	(-) 26	
			6	6A	(+) 27	(+) 11	
					(-) 9	(-) 12	
				6B	(+) 26	(+) 27	
					(-) 8	(-) 28	
			7	7A	(+) 25	(+) 13	
					(-) 7	(-) 14	
	D5040S, D5048S, D5049S (Single channel) D5040D (Double channel)	Digital OUT		7B	(+) 24	(+) 29	
					(-) 6	(-) 30	
	D5090S,D5091S (Single channel)		8	8A	(+) 23	(+) 15	
					(-) 5	(-) 16	
				8B	(+) 22	(+) 31	
					(-) 4	(-) 32	

- Interface Card Connector CON1: SUB D 37 poles male
- The poles No. 2 and No. 3 are not connected because not used.
- Shield terminal block provided on pin number 21
- 24V on pin 1.
- Ground on pin 20.
- Only for D5011S/D, D5014S/D, D5020S/D modules, HART Multiplexing Connector J9: 34 poles male.

Termination Board supply connection details: