

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:

Number of positions	Features
16	1) Power Supply voltage redundancy; 2) Abnormal supply voltage signaling; 3) Cumulative module fault signaling. 4) HART Multiplexing.

Supported TMR I/O Cards:

I/O Card Type	I/O Card Model	Channels per I/O Card	I/O Cards per board	Channels per board	Supported GM Modules (*)
Analog In	3704E 3720	64	1/2	32	D5011D, D5014D, D5072D, D6011D, D6014D, D6072D

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

Features:

- Triconex TMR AI Cards board interfaces.
- 16 positions Termination Board for up to 32 channels, to be used in pairs to obtain 64 channels.
- HART connectors available.
- Lower cables installation and maintenance costs.
- Power supplies fault monitoring.
- Spare fuse provided.
- Mounting hardware provided for:
 - Wall mounting, M4 thread screw;
 - Wall mounting, M4 self tapping screw;
 - Single Din Rail mounting kit.

Ordering Information:

Model: TB-D5016-TRI-001

Technical Data:

Supply:

24 Vdc nom (20 to 30 Vdc) reverse polarity protected, double terminal blocks for redundant power supply, with OR diodes to mix supply voltages.
Connection: by polarized plug-in disconnect screw terminal blocks to accommodate terminations up to 2.5 mm².
2 LEDs indication: green color, one for supply 1 and one for supply 2.
Protection fuse: 4 A time lag (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 36 Vac 72 VA, 2 A 48 Vdc 80 W (resistive load).
Mechanical / Electrical life: 30 * 10⁶ / 1 * 10⁵ operation, typical.
Coil status LED indication: yellow color, turn on when coil is energized.
Connection: by polarized plug-in disconnect screw terminal blocks to accommodate terminations up to 2.5 mm².

I/O card interface:

Connection:
One ELCO 8016, 56 poles receptacle connector (require male mating connector).

HART Multiplexing:

Connection: Two 34 poles male connector (requires female mating connector).

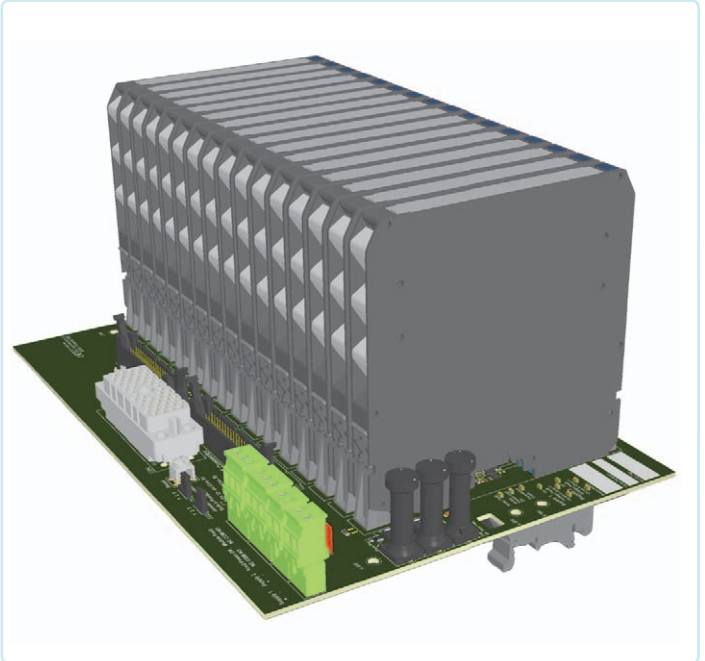
Environmental conditions:

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

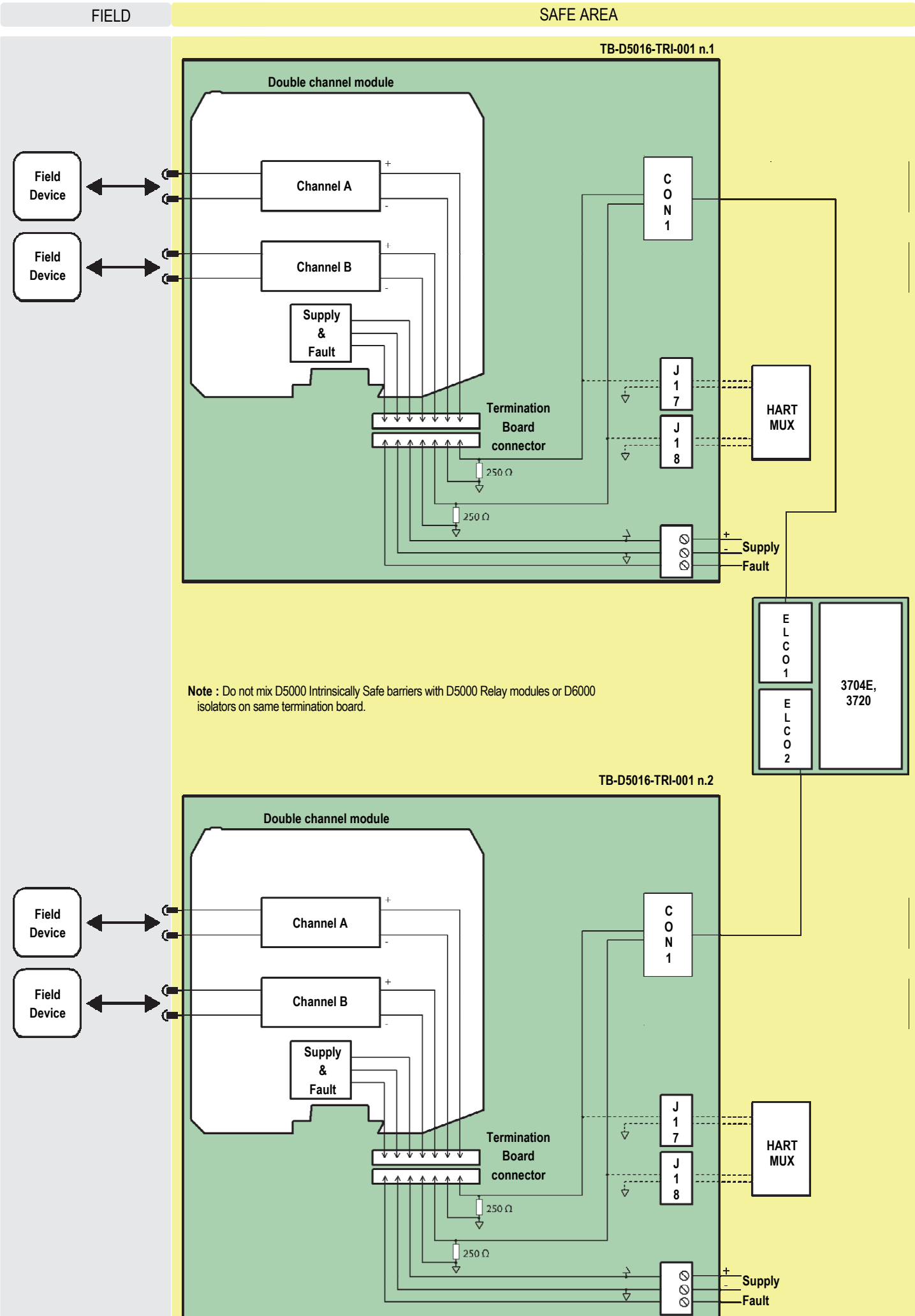
Mounting:

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 267 mm, Depth 176 mm, Height 125 mm.

Image:



Loop Diagrams:



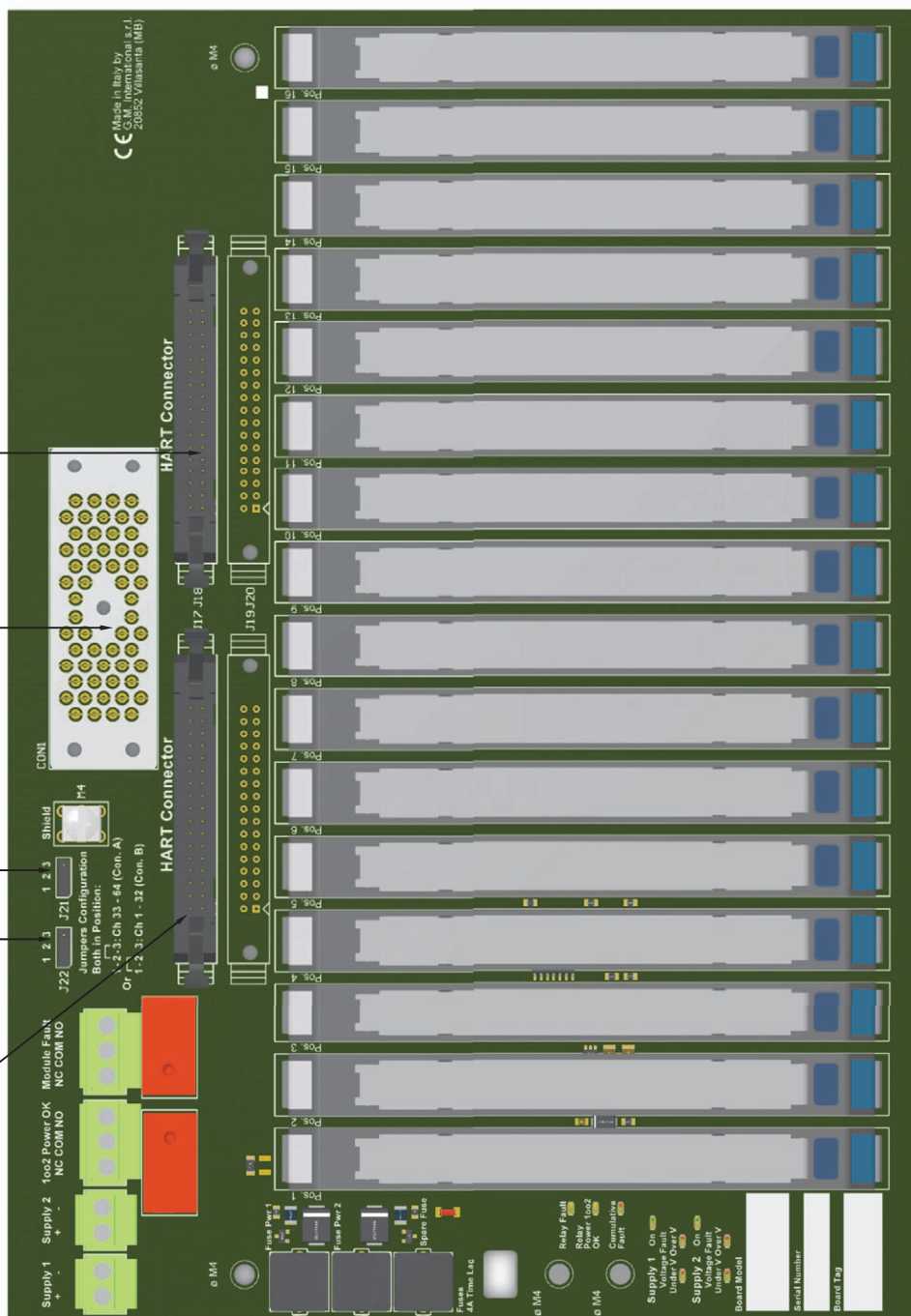
Flat 34 poles male HART connector (J18)

ELCO 8016, 56 poles female connector (CON1)

Small key Pos. 1
Large key Pos 5

	3704E 3720
TB n.1	J21 2-3 J22 2-3
TB n.2	J21 1-2 J22 1-2

Flat 34 poles male HART connector (J17)



1A 2A 3A 4A 5A 6A 7A 8A 9A 10A 11A 12A 13A 14A 15A 16A
1B 2B 3B 4B 5B 6B 7B 8B 9B 10B 11B 12B 13B 14B 15B 16B

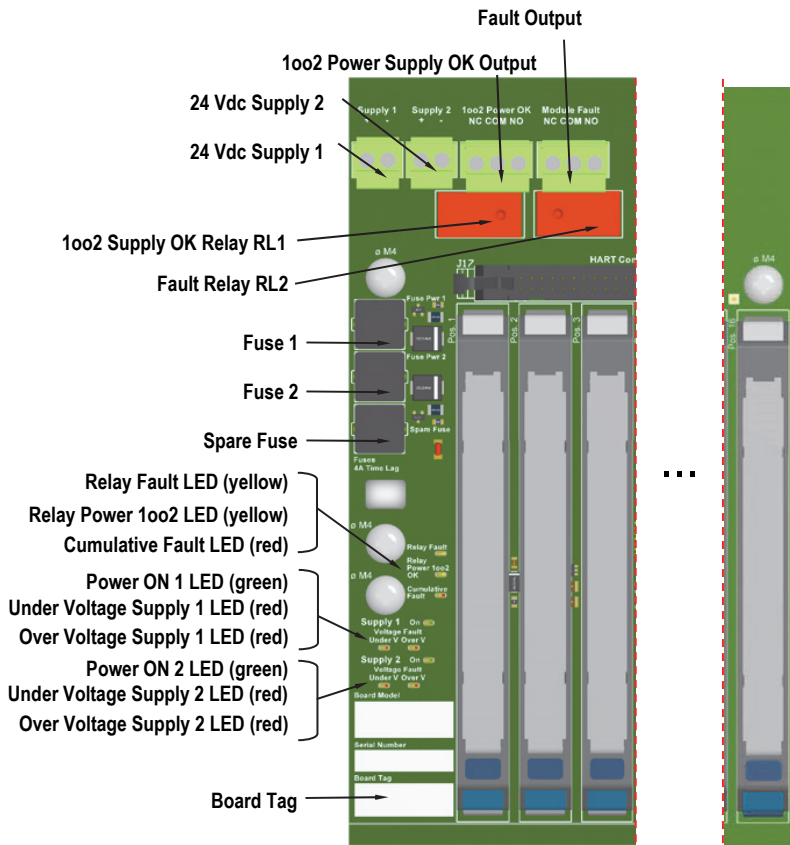
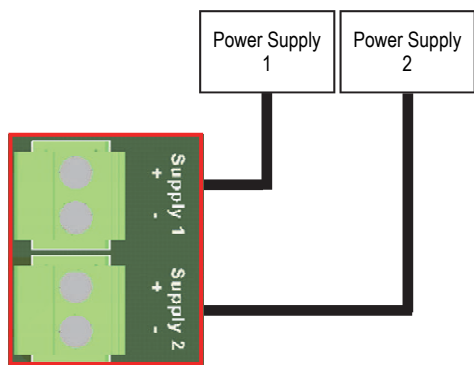
Connections table to Interface Cards:

MODULE POSITION	MODULE CHANNEL NUMBER	INTERFACE CARD(S) CHANNEL NUMBER	MODULE CHANNEL POSITIVE (+) CONNECTION (CON1)	MODULE CHANNEL NEGATIVE (-) CONNECTION	HART MULTIPLEXING CONNECTOR POSITIVE (+) PIN NUMBER	HART MULTIPLEXING CONNECTOR NEGATIVE (-) PIN NUMBER	NOTES
1	1A	1	AA	GND	1 (J17)	2 (J17)	CON1: • Chassis Ground provided on poles: T, H, w, FF. • Ground available on poles: E, A, NN, JJ, y, n, d, V, K, D • +24 Vdc available on poles (only ELCO 1): DD, k, R. • Ground available on poles (only ELCO 2): DD, k, R, KK, u, a.
	1B	2	LL	GND	1 (J18)	2 (J18)	
2	2A	3	z	GND	3 (J17)	4 (J17)	
	2B	4	EE	GND	3 (J18)	4 (J18)	
3	3A	5	p	GND	5(J17)	6 (J17)	
	3B	6	v	GND	5 (J18)	6 (J18)	
4	4A	7	h	GND	7 (J17)	8 (J17)	
	4B	8	l	GND	7 (J18)	8 (J18)	
5	5A	9	e	GND	9 (J17)	10 (J17)	
	5B	10	b	GND	9 (J18)	10 (J18)	
6	6A	11	W	GND	11 (J17)	12 (J17)	
	6B	12	S	GND	11 (J18)	12 (J18)	
7	7A	13	L	GND	13 (J17)	14 (J17)	
	7B	14	F	GND	13 (J18)	14 (J18)	
8	8A	15	M	GND	15 (J17)	16 (J17)	
	8B	16	B	GND	15 (J18)	16 (J18)	
9	9A	17	BB	GND	17 (J17)	18 (J17)	
	9B	18	MM	GND	17 (J18)	18 (J18)	
10	10A	19	CC	GND	19 (J17)	20 (J17)	
	10B	20	HH	GND	19 (J18)	20 (J18)	
11	11A	21	t	GND	21 (J17)	22 (J17)	
	11B	22	x	GND	21 (J18)	22 (J18)	
12	12A	23	j	GND	23 (J17)	24 (J17)	
	12B	24	m	GND	23 (J18)	24 (J18)	
13	13A	25	f	GND	25 (J17)	26 (J17)	
	13B	26	c	GND	25 (J18)	26 (J18)	
14	14A	27	Z	GND	27 (J17)	28 (J17)	
	14B	28	U	GND	27 (J18)	28 (J18)	
15	15A	29	P	GND	29 (J17)	30 (J17)	
	15B	30	J	GND	29 (J18)	30 (J18)	
16	16A	31	N	GND	31 (J17)	32 (J17)	
	16B	32	C	GND	31 (J18)	32 (J18)	

Termination Board Description:

Note:
 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).
 Relay is de-energized in fault status.

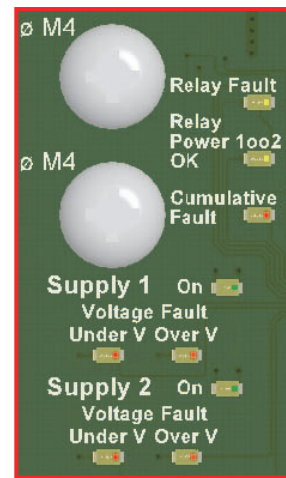
Power Supply redundancy:



LED Signaling:

Meaning of LEDs on termination boards:

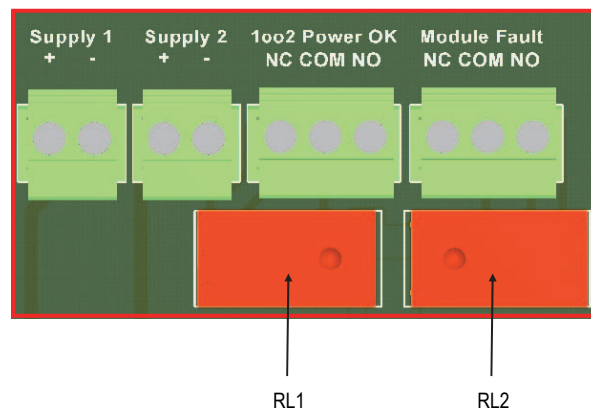
TAG	LED COLOR	MEANING
Supply 1 On	GREEN	The LED is on when the Supply 1 is present, regardless of its voltage
Supply 1 Under V	RED	The LED is on when the Supply 1 is under-voltage (<18 V)
Supply 1 Over V	RED	The LED is on when the Supply 1 is over-voltage (>30 V)
Supply 2 On	GREEN	The LED is on when 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 1002 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:

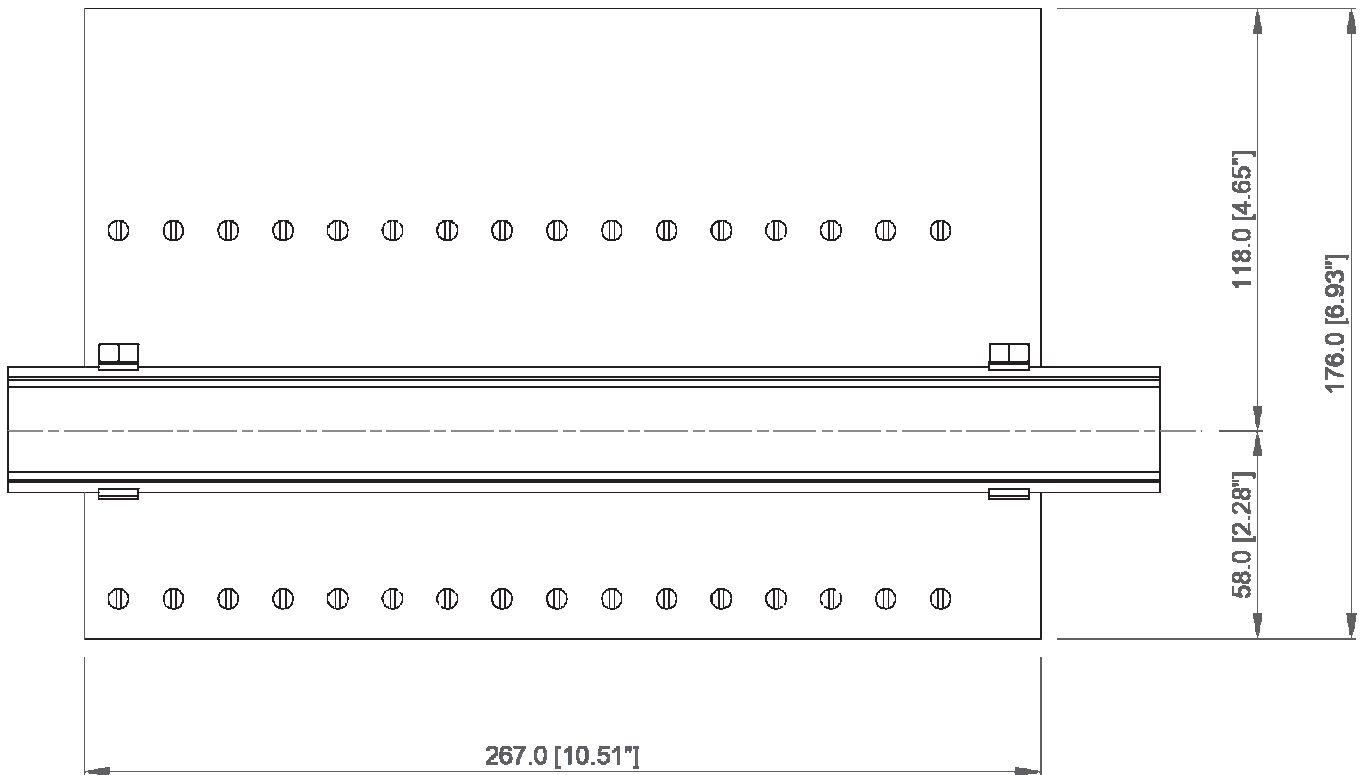
The two relays are activated according to the following rules:

TAG	ACTIVATION
1002 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 1002 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.

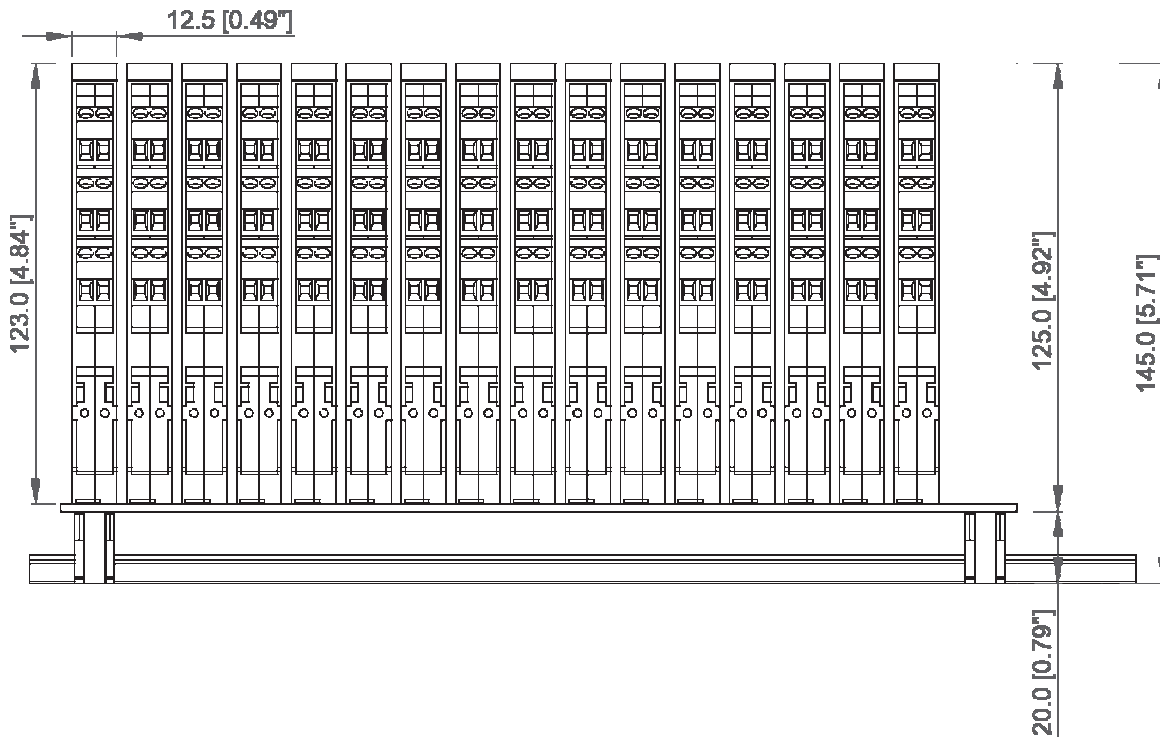


DIN Rail mounting overall dimensions:

Bottom view

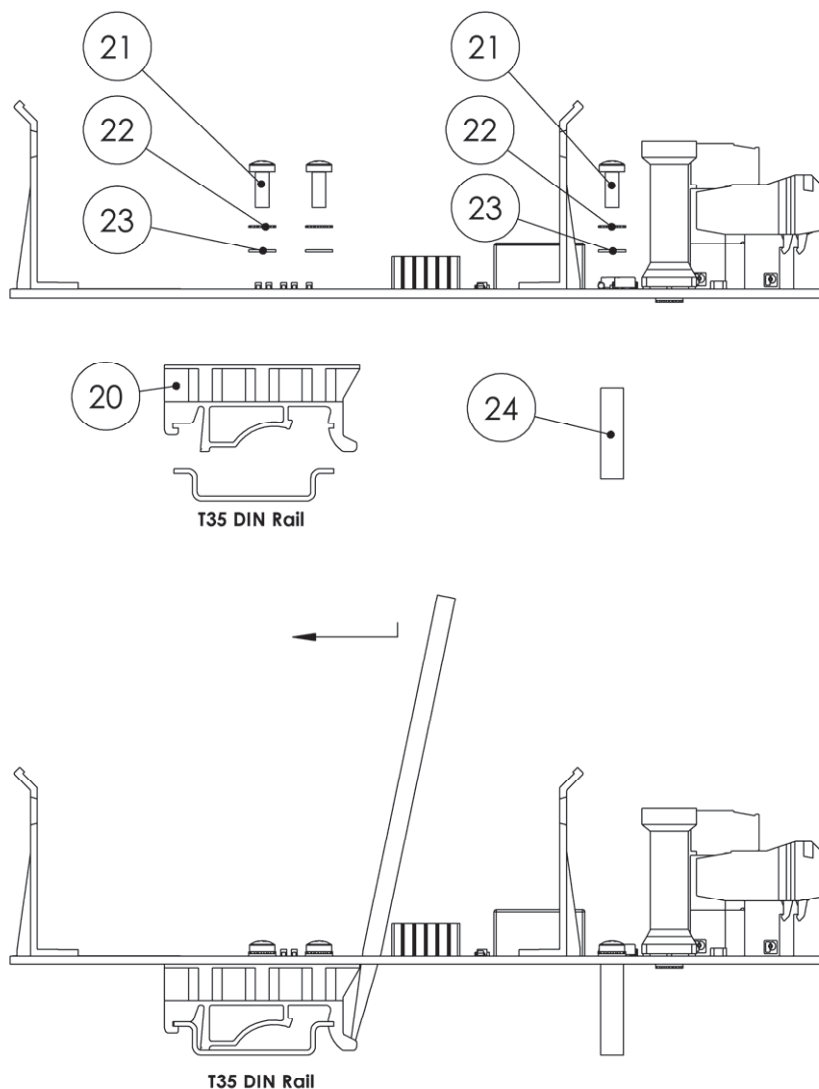


Side view



All dimensions are expressed in millimeters [inches]

16 POSITION TERMINAL BOARD D5000 SERIES MOUNTING FEATURES KIT TB-OPT-001

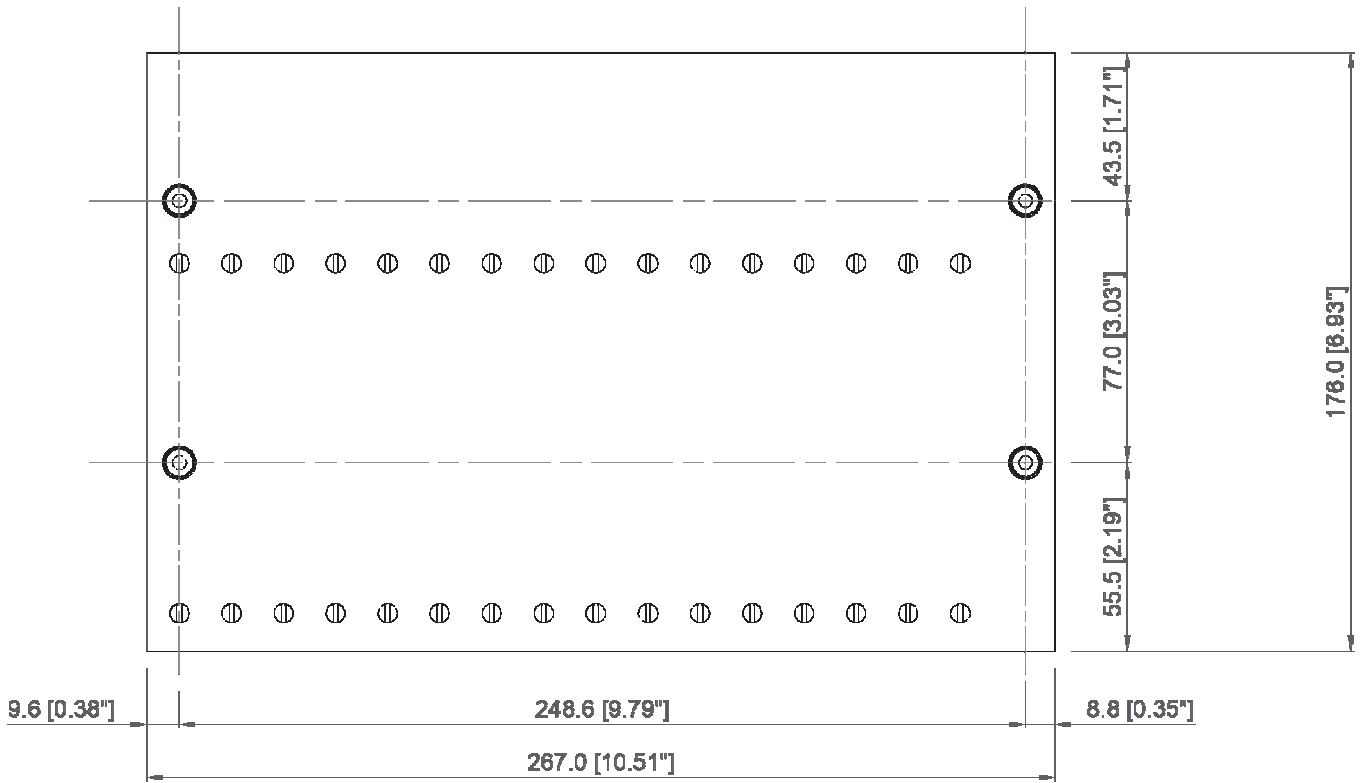


1. T35 DIN RAIL MOUNTING

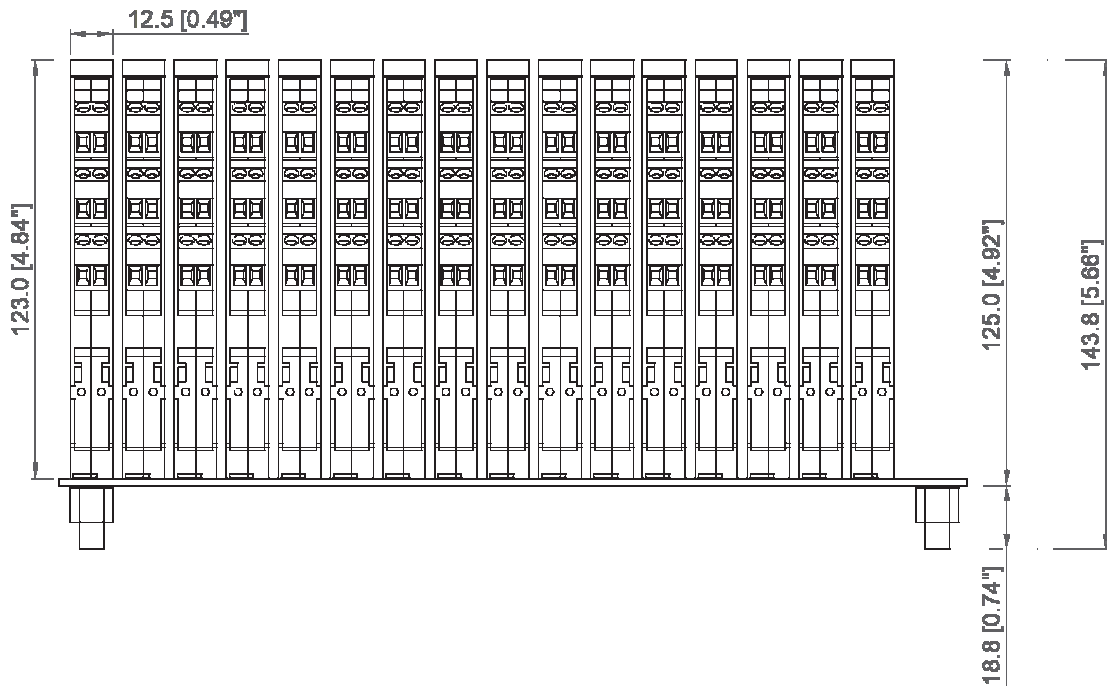
Item	Ref.Nr.	Q.ty	Description	Material
1	20	2	T35 Din Rail Adapter	PA
2	21	6	3.5x9.5 Self Tapping Screw	Stainless Steel
3	22	6	M3 External Tooth lock Washer	Stainless Steel
4	23	6	M3 Washer	Stainless Steel
5	24	2	6x20 Spacer	PA

Wall mounting overall dimensions for M4 self tapping screw:

Bottom view

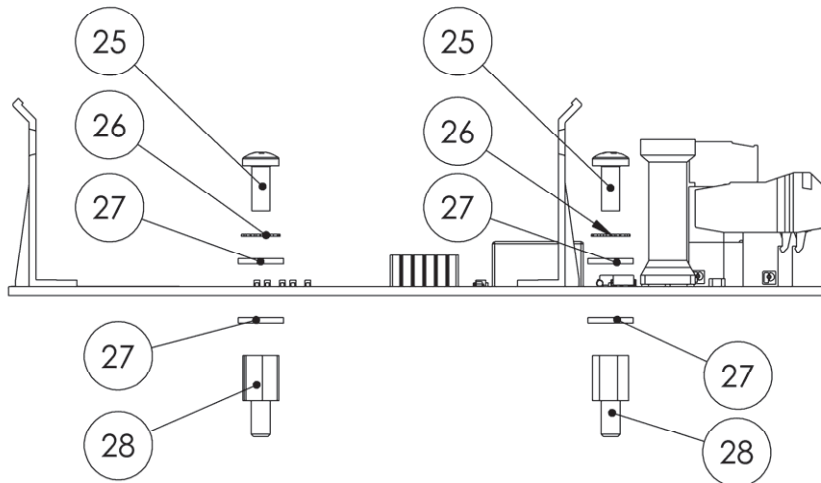
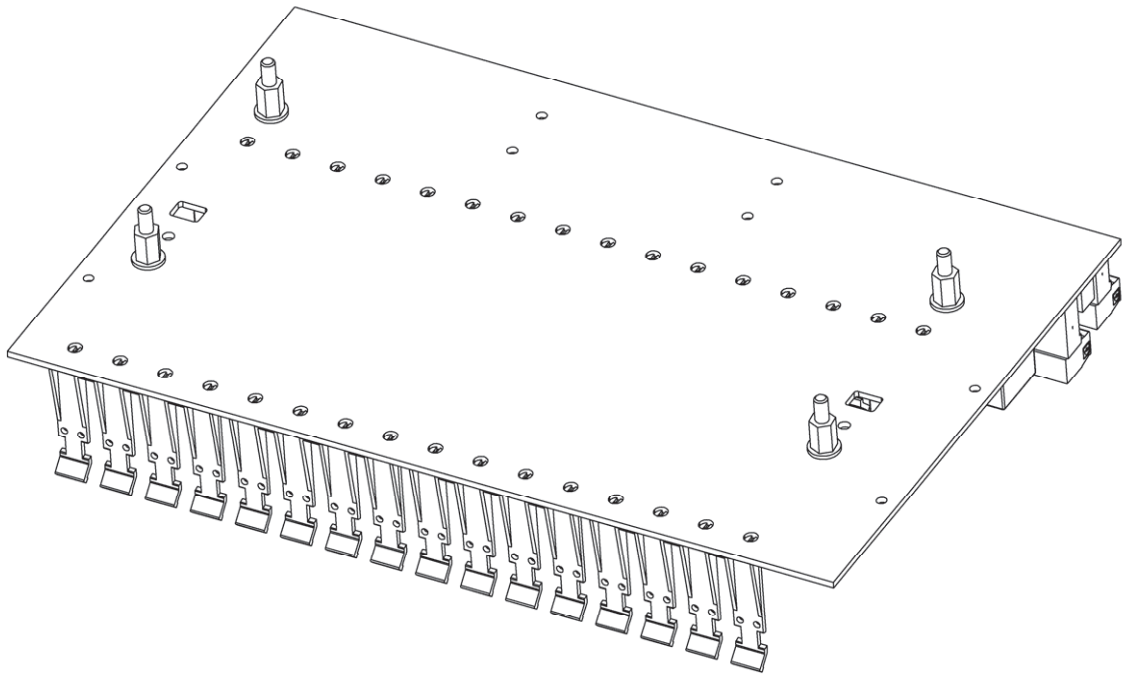


Side view



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16 POSITION TERMINAL BOARD D5000 SERIES MOUNTING FEATURES KIT TB-OPT-001

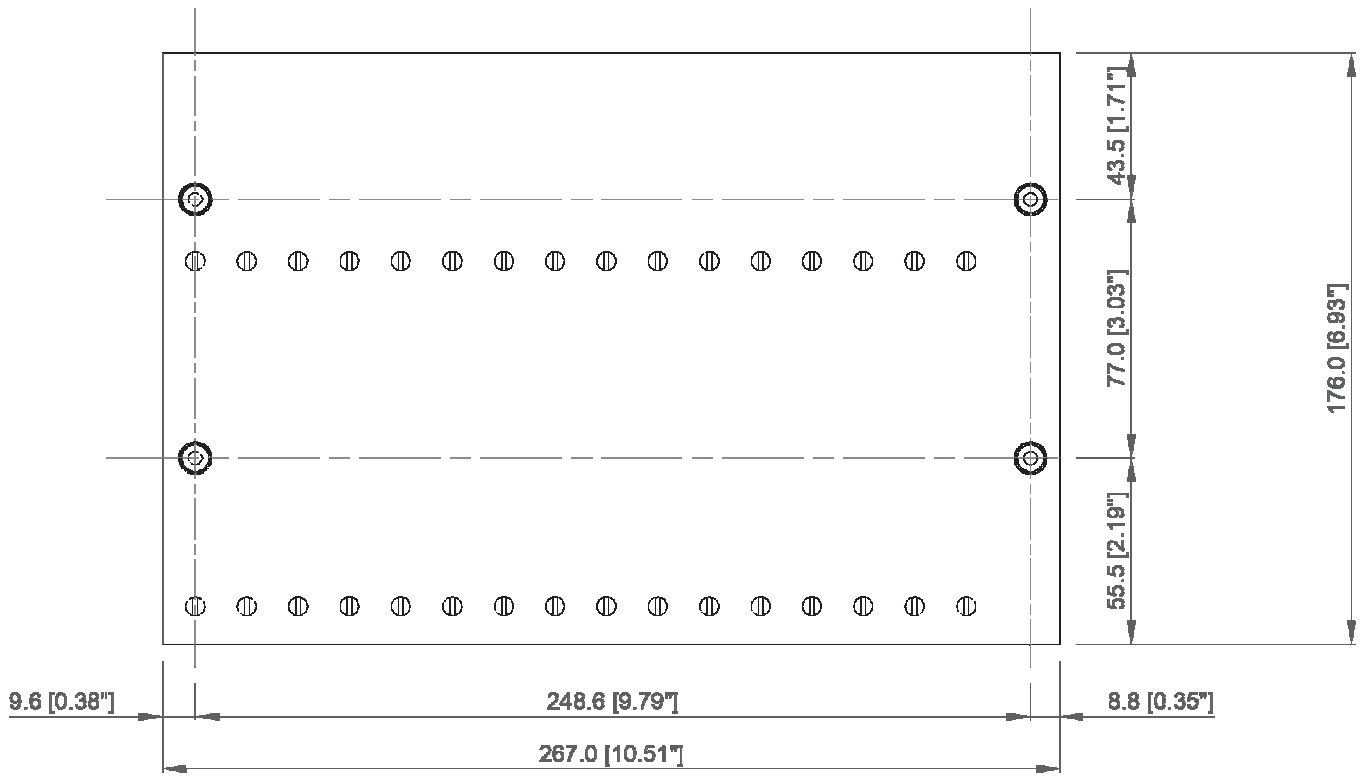


2. WALL MOUNTING WITH SELF TAPPING SCREW

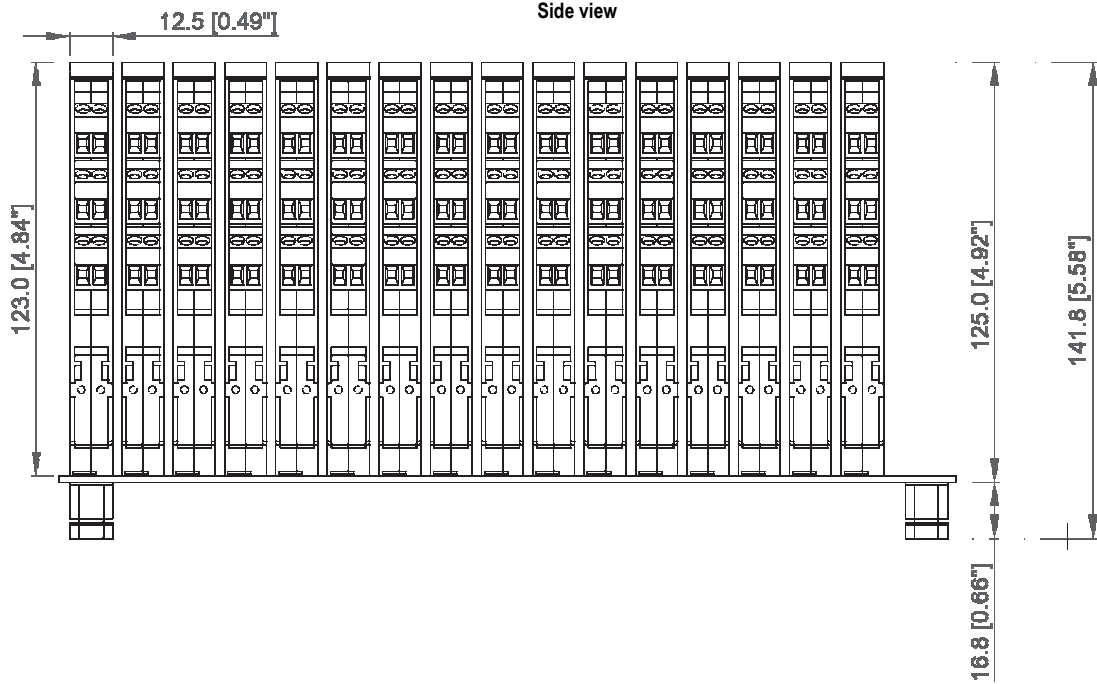
Item	Ref.Nr.	Q.ty	Description	Material
6	25	4	M4x8 Screw	Stainless Steel
7	26	4	M4 External Tooth lock Washer	Stainless Steel
8	27	8	M4 Washer	Stainless Steel
9	28	4	Self Tapping Spacer	Ni-Plated Brass

Wall mounting overall dimensions for M4 thread screw:

Bottom view

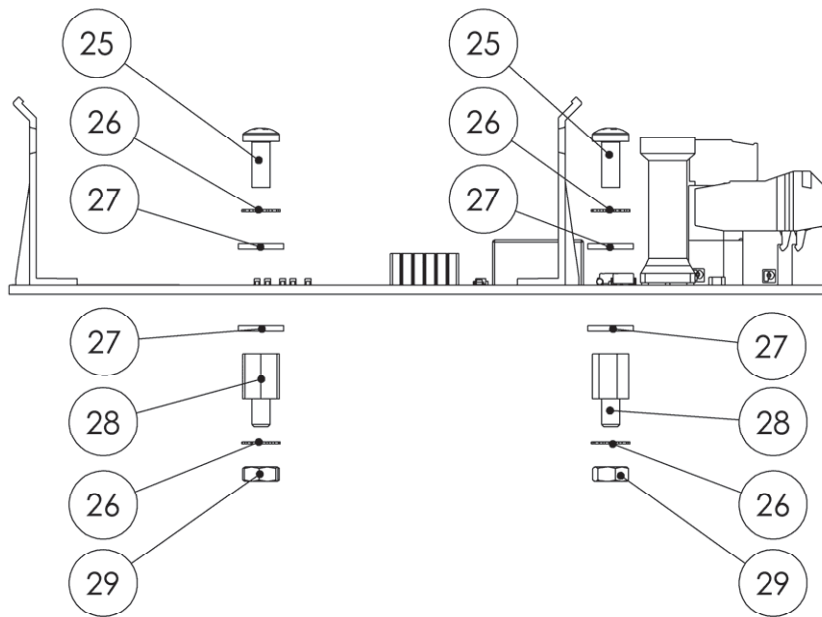
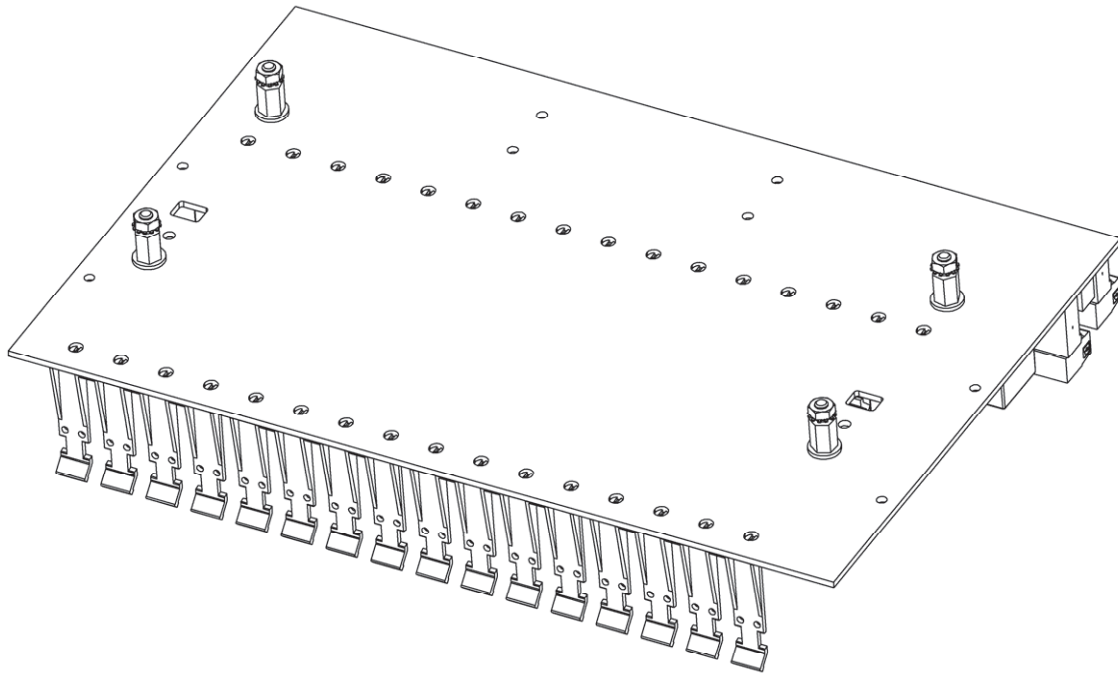


Side view



All dimensions are expressed in millimeters [inches]

16 POSITION TERMINAL BOARD D5000 SERIES MOUNTING FEATURES KIT TB-OPT-001



3. WALL MOUNTING WITH M4 SCREWS

Item	Ref.Nr.	Q.ty	Description	Material
10	25	4	M4x8 Screw	Stainless Steel
11	26	8	M4 External Tooth lock Washer	Stainless Steel
12	27	8	M4 Washer	Stainless Steel
13	28	4	Threaded Spacer	Ni-Plated Brass
14	29	4	M4 Nut	Stainless Steel