

**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.

**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 (*)
Digital In	3504E 3564	64	1/2	32	D5031D, D5032D, D5037D, D5093D, D6031D

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

**Features:**

- Triconex TMR DI Cards board interfaces.
- 16 positions Termination Board for up to 32 channels, to be used in pairs to obtain 64 channels.
- 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-004

**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 mm<sup>2</sup>.  
**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 \* 10<sup>6</sup> / 1 \* 10<sup>5</sup> 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 mm<sup>2</sup>.

**I/O card interface:**

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

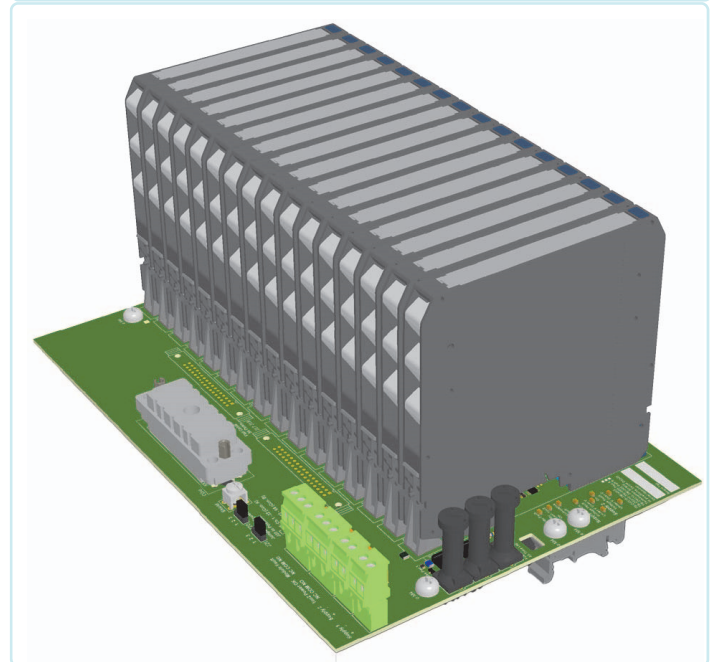
**Environmental conditions:**

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

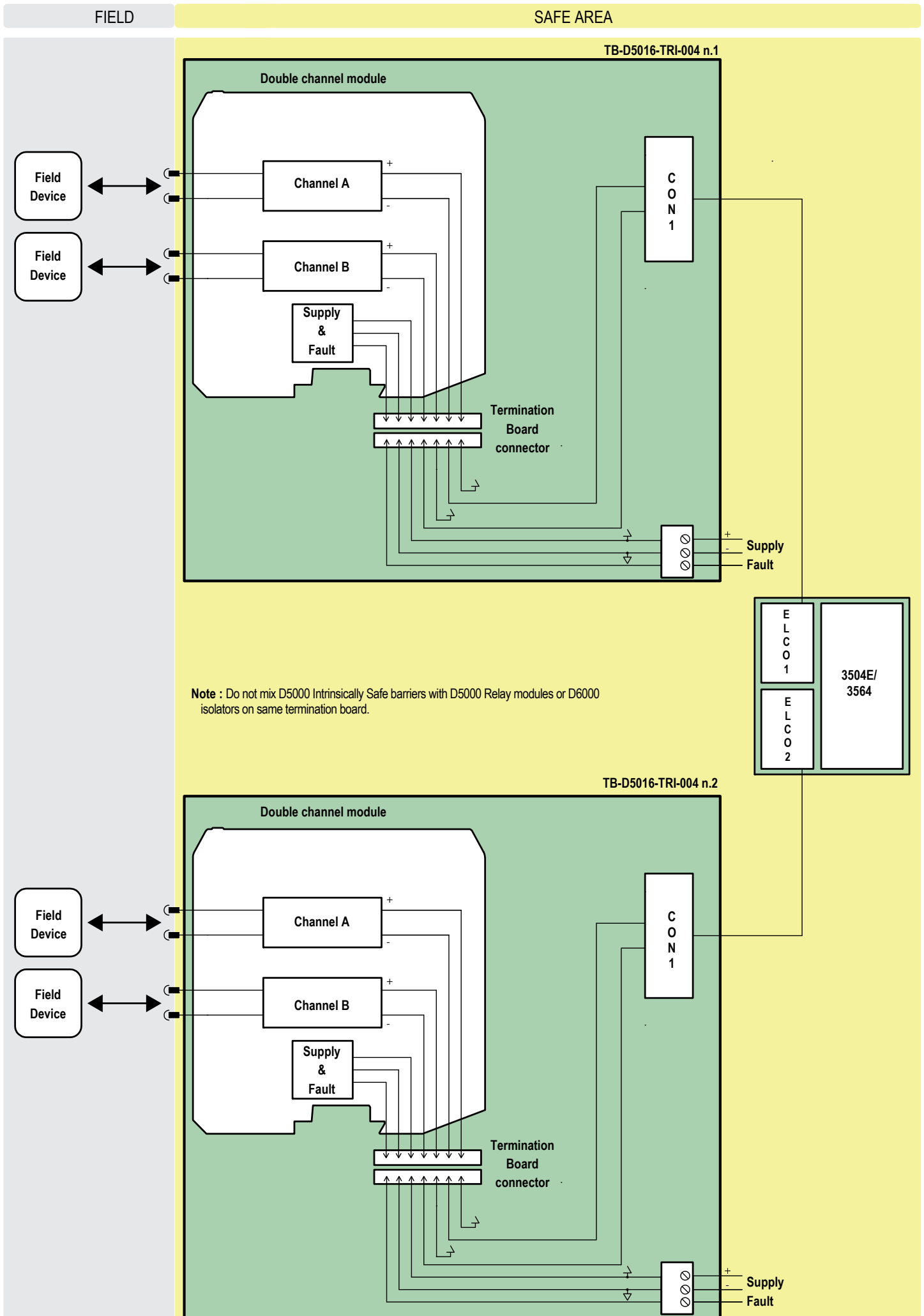
**Mounting:**

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:

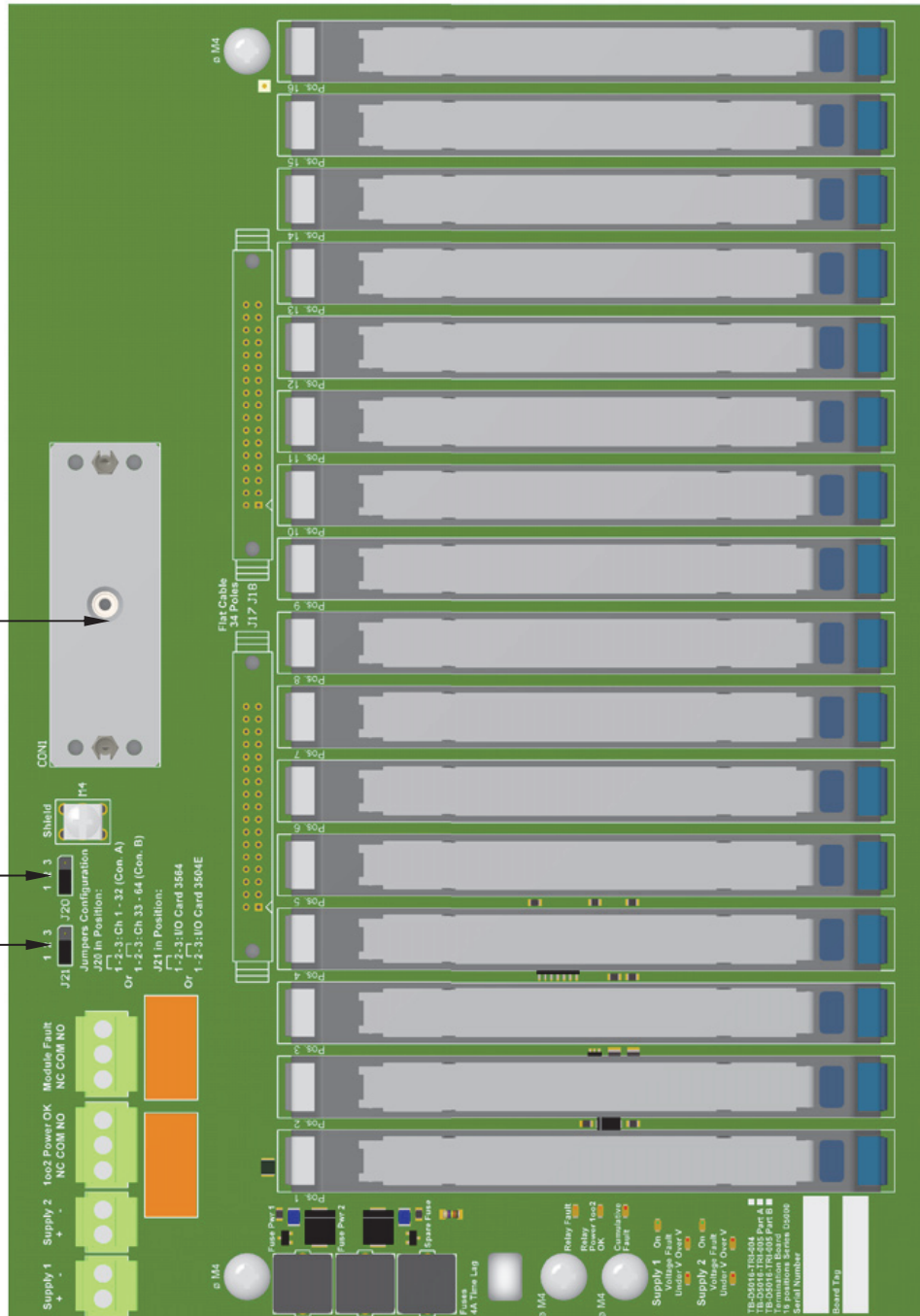


# Termination Board Description:

ELCO 8016, 56 poles female connector (CON1)

Small key Pos. 1  
Large key Pos 3

	3504E	3564
TB n.1	J20 1-2 J21 2-3	J20 1-2 J21 1-2
TB n.2	J20 2-3 J21 2-3	J20 2-3 J21 1-2



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

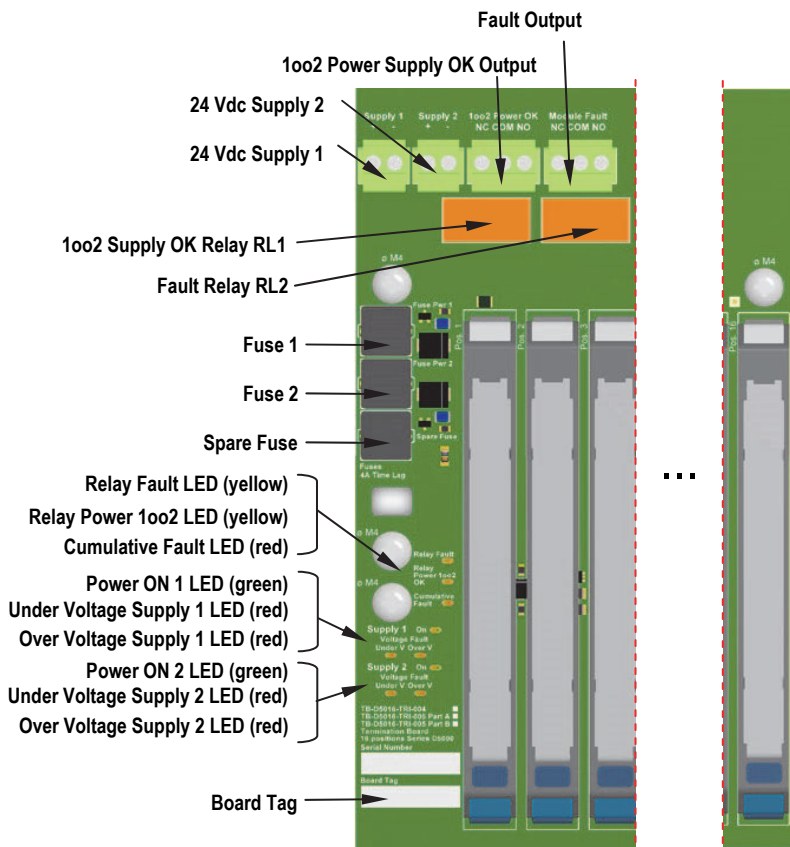
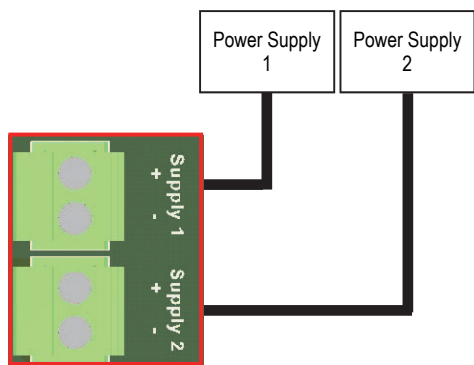
**Connections table to Interface Cards:**

MODULE POSITION	MODULE CHANNEL NUMBER	INTERFACE CARD(S) CHANNEL NUMBER	MODULE CHANNEL POSITIVE (+) CONNECTION (CON1)	MODULE CHANNEL NEGATIVE (-) CONNECTION (CON1)	NOTES
1	1A	1	+24 Vdc	AA	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 3564 card): DD, k, R. • Ground available on poles (only 3504E card): DD, k, R.
	1B	17	+24 Vdc	BB	
2	2A	2	+24 Vdc	LL	
	2B	18	+24 Vdc	MM	
3	3A	3	+24 Vdc	z	
	3B	19	+24 Vdc	CC	
4	4A	4	+24 Vdc	EE	
	4B	20	+24 Vdc	HH	
5	5A	5	+24 Vdc	p	
	5B	21	+24 Vdc	t	
6	6A	6	+24 Vdc	v	
	6B	22	+24 Vdc	x	
7	7A	7	+24 Vdc	h	
	7B	23	+24 Vdc	j	
8	8A	8	+24 Vdc	l	
	8B	24	+24 Vdc	m	
9	9A	9	+24 Vdc	e	
	9B	25	+24 Vdc	f	
10	10A	10	+24 Vdc	b	
	10B	26	+24 Vdc	c	
11	11A	11	+24 Vdc	W	
	11B	27	+24 Vdc	Z	
12	12A	12	+24 Vdc	S	
	12B	28	+24 Vdc	U	
13	13A	13	+24 Vdc	L	
	13B	29	+24 Vdc	P	
14	14A	14	+24 Vdc	F	
	14B	30	+24 Vdc	J	
15	15A	15	+24 Vdc	M	
	15B	31	+24 Vdc	N	
16	16A	16	+24 Vdc	B	
	16B	32	+24 Vdc	C	

## 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.

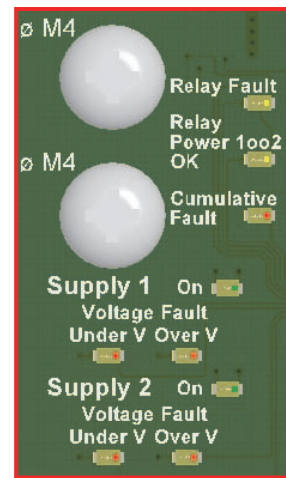
### Power Supply redundancy:



### LED Signaling:

Meaning of LEDs on termination boards:

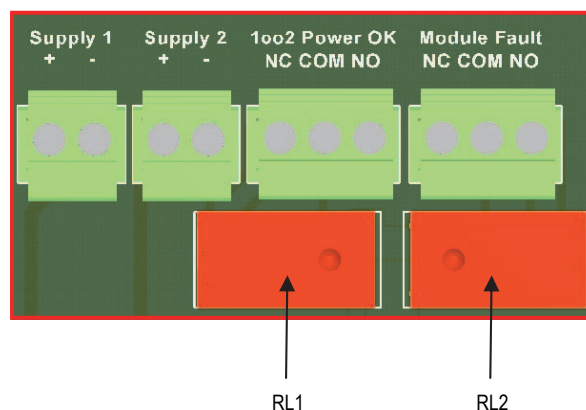
TAG	LED COLOR	MEANING
Supply 1 On	GREEN	The LED is on when the Supply 1 is present, regardless of its voltage
Supply 1 Under V	RED	The LED is on when the Supply 1 is under-voltage (<18 V)
Supply 1 Over V	RED	The LED is on when the Supply 1 is over-voltage (>30 V)
Supply 2 On	GREEN	The LED is on when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

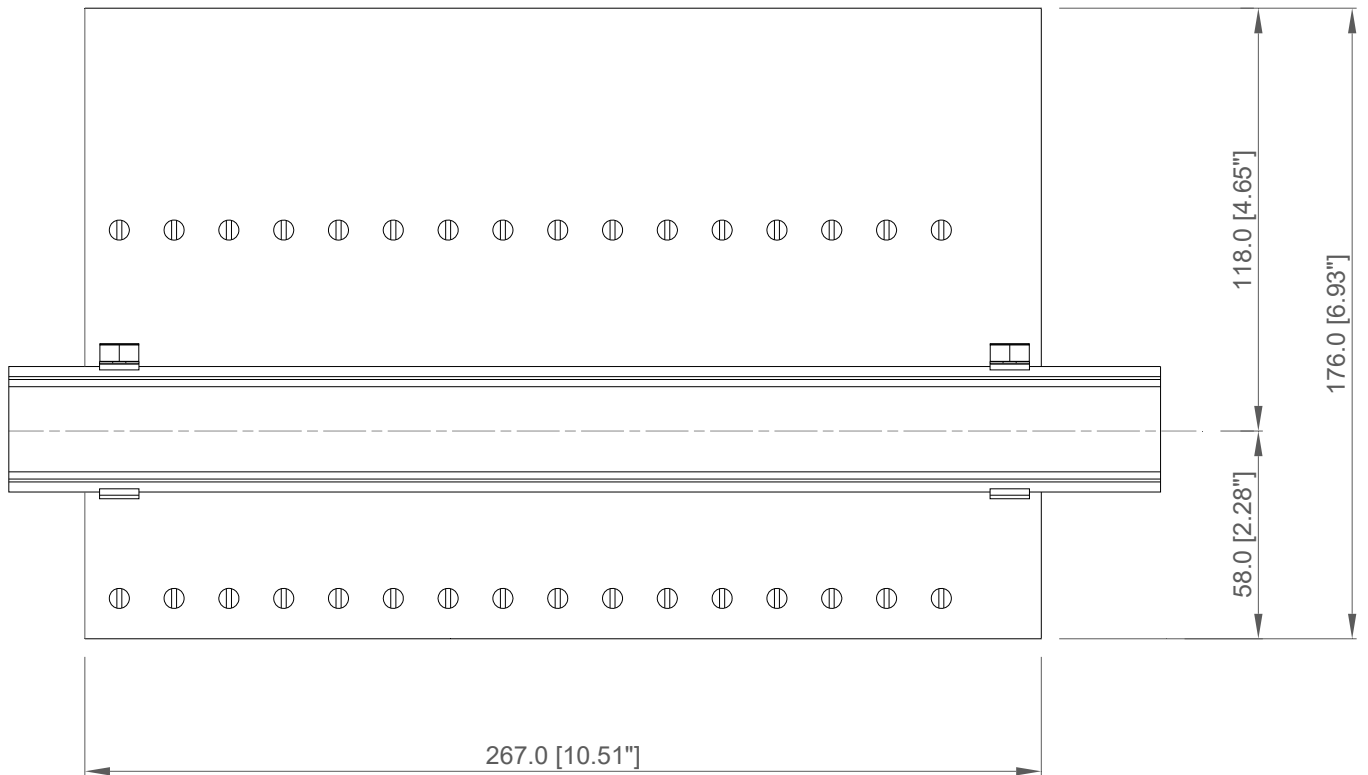
The two relays are activated according to the following rules:

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.

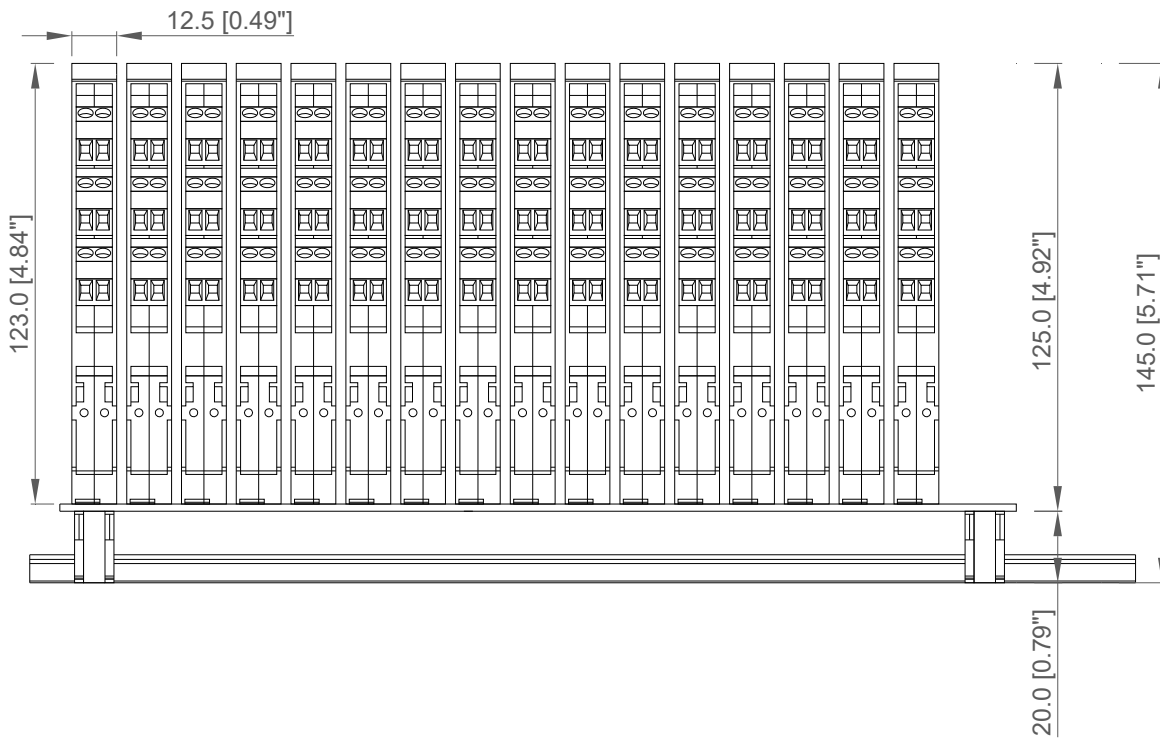


**DIN Rail mounting overall dimensions:**

**Bottom view**

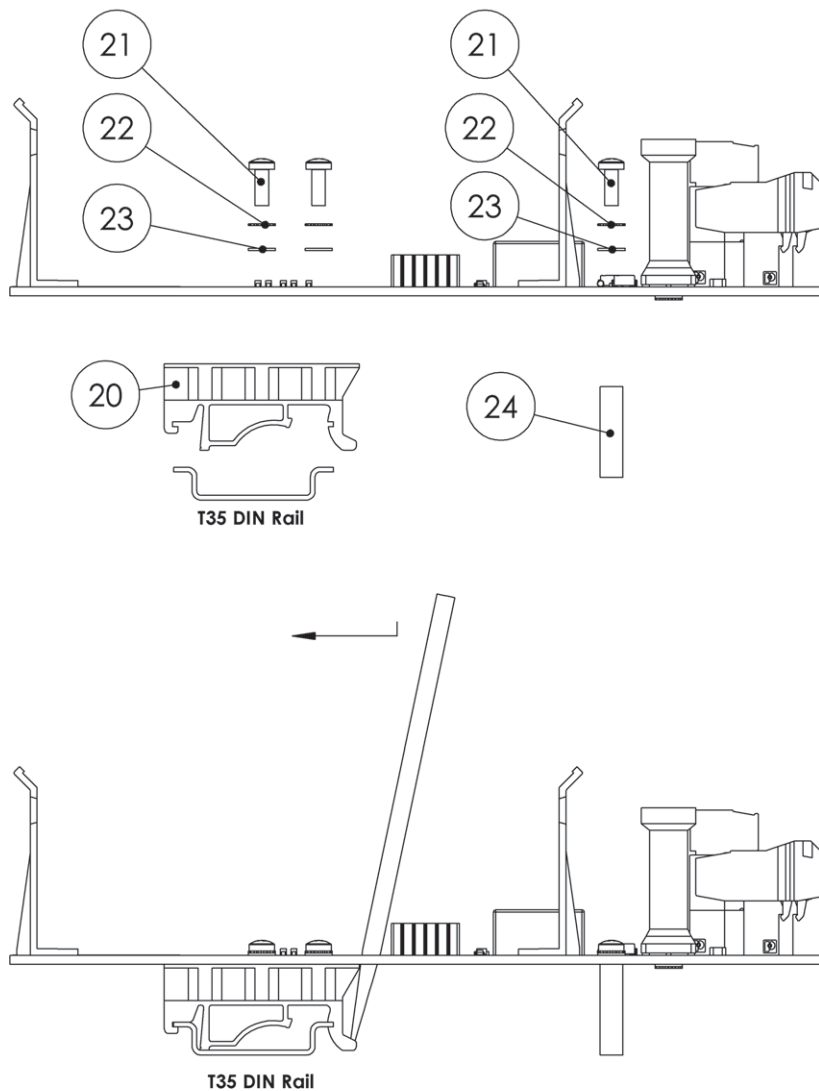


**Side view**



All dimensions are expressed in millimeters [inches]

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

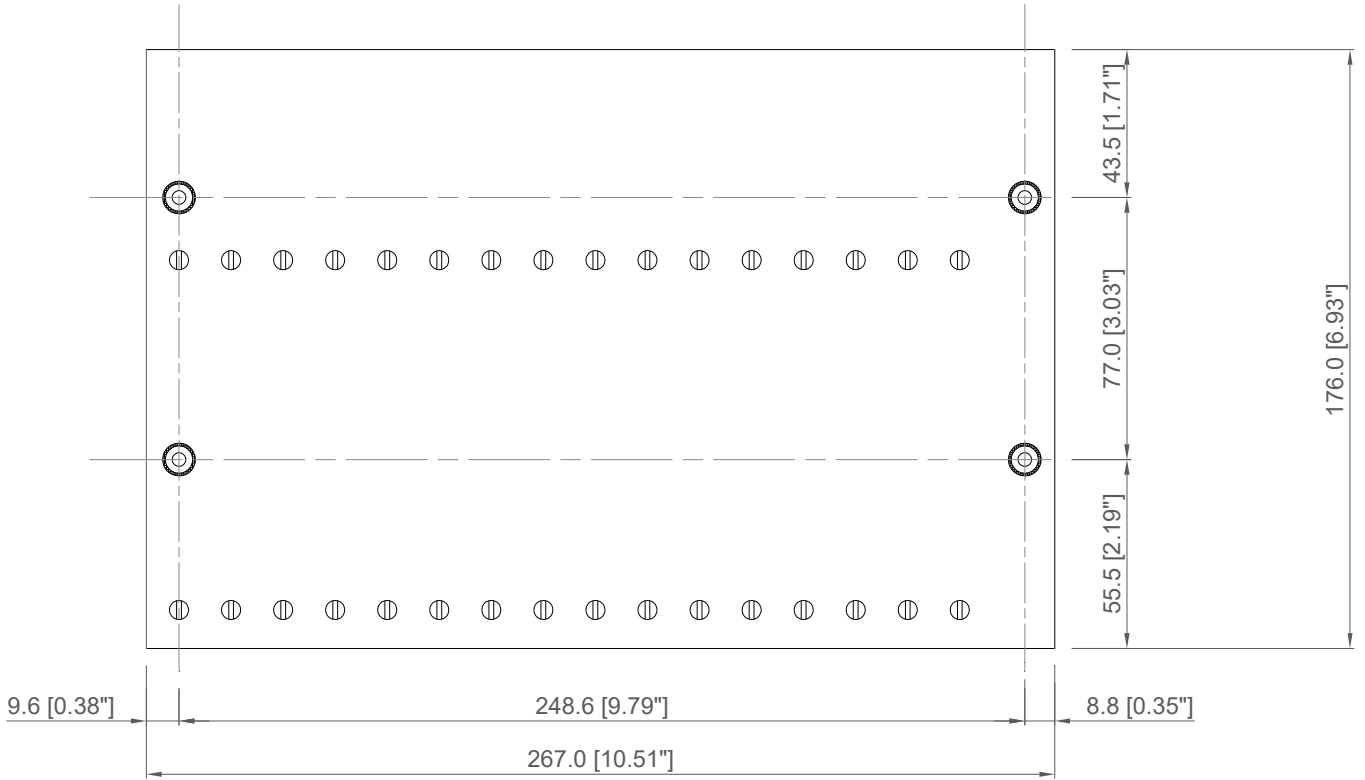


### 1. T35 DIN RAIL MOUNTING

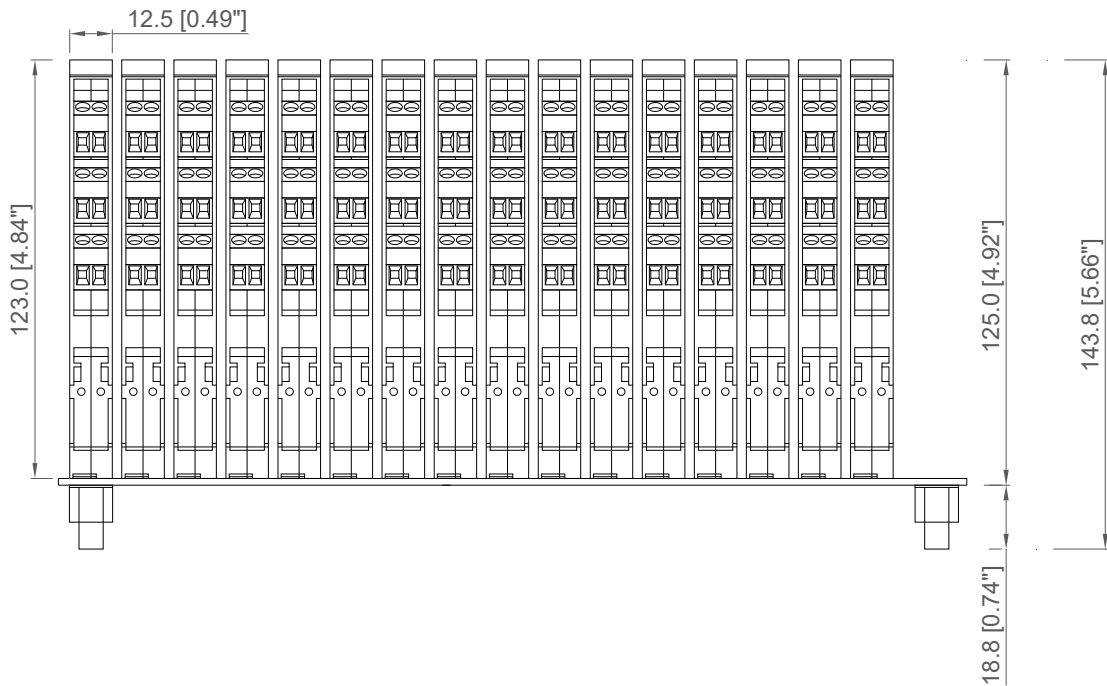
Item	Ref.Nr.	Q.ty	Description	Material
1	20	2	T35 Din Rail Adapter	PA
2	21	6	3.5x9.5 Self Tapping Screw	Stainless Steel
3	22	6	M3 External Tooth lock Washer	Stainless Steel
4	23	6	M3 Washer	Stainless Steel
5	24	2	6x20 Spacer	PA

**Wall mounting overall dimensions for M4 self tapping screw:**

**Bottom view**



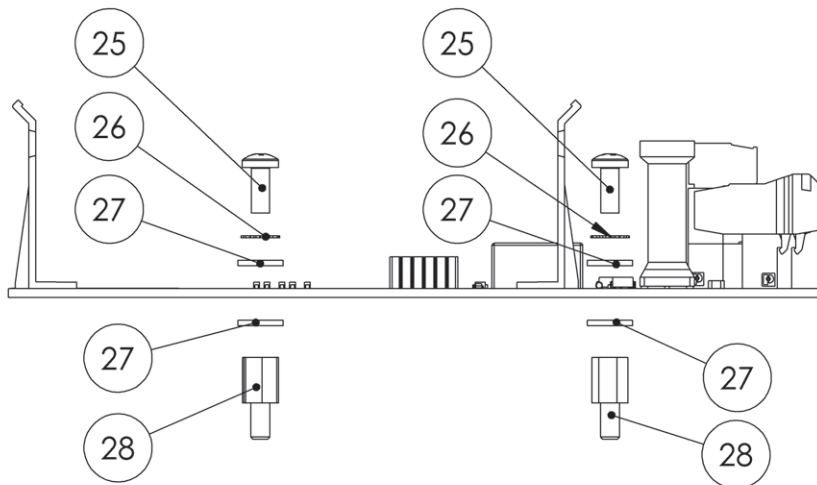
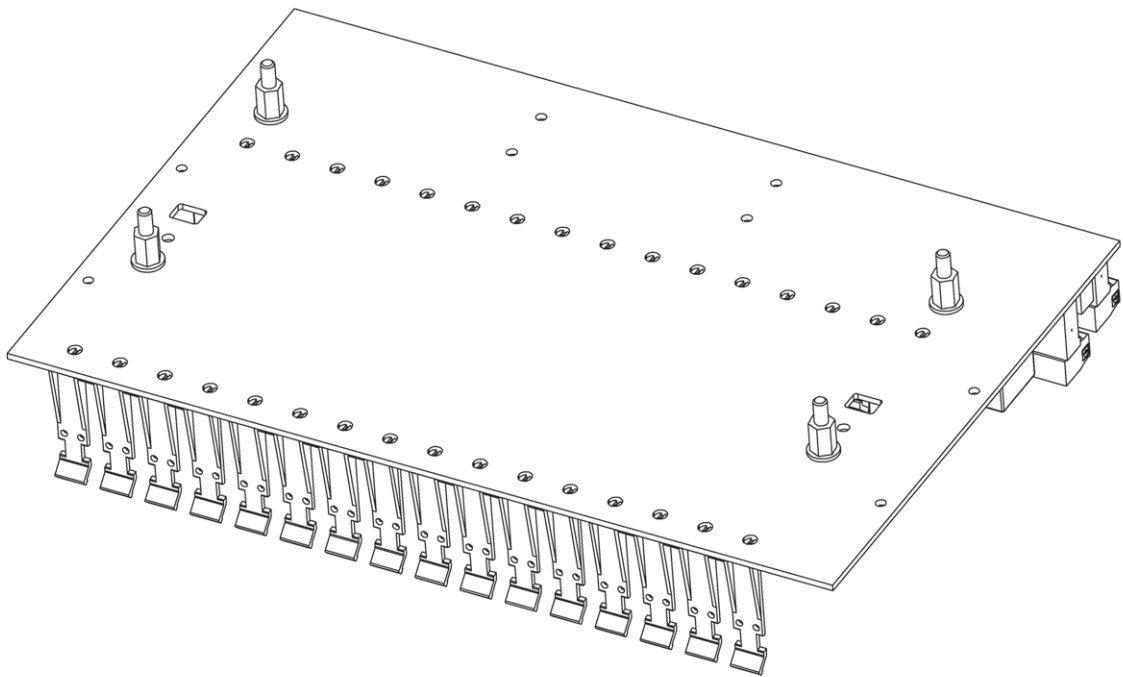
**Side view**



All dimensions are expressed in millimeters [inches]



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

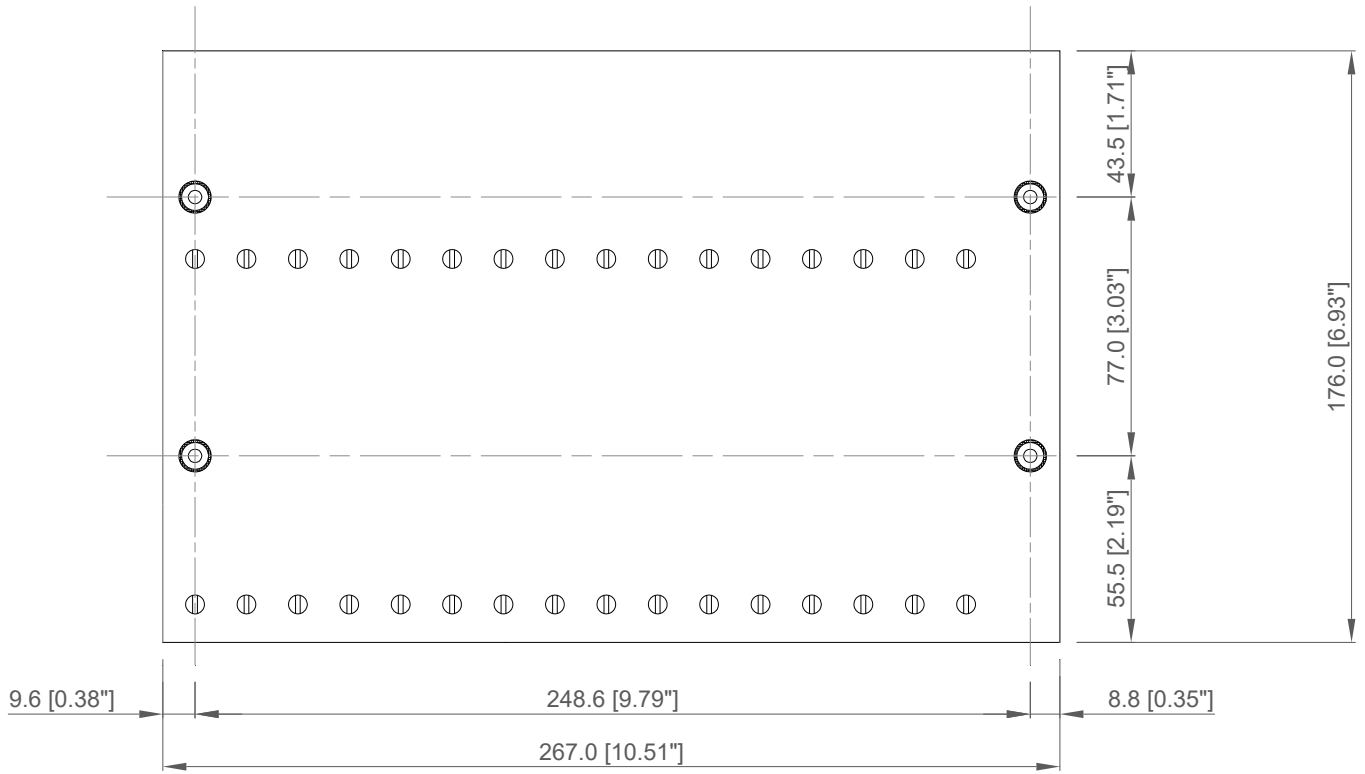


### 2. WALL MOUNTING WITH SELF TAPPING SCREW

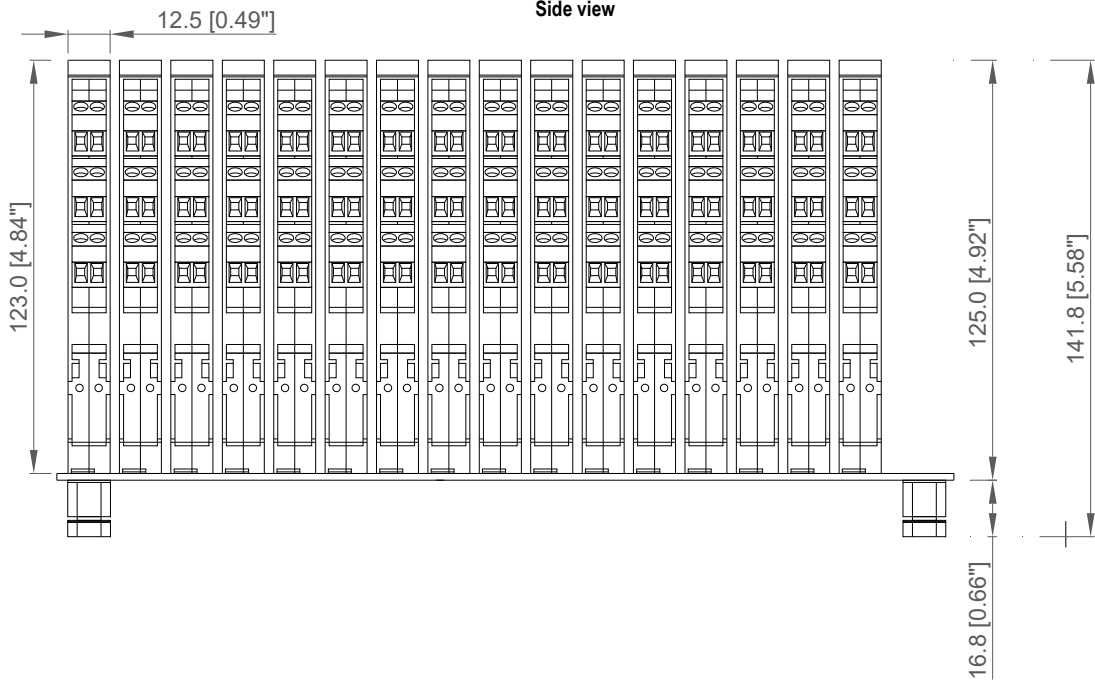
Item	Ref.Nr.	Q.ty	Description	Material
6	25	4	M4x8 Screw	Stainless Steel
7	26	4	M4 External Tooth lock Washer	Stainless Steel
8	27	8	M4 Washer	Stainless Steel
9	28	4	Self Tapping Spacer	Ni-Plated Brass

**Wall mounting overall dimensions for M4 thread screw:**

**Bottom view**

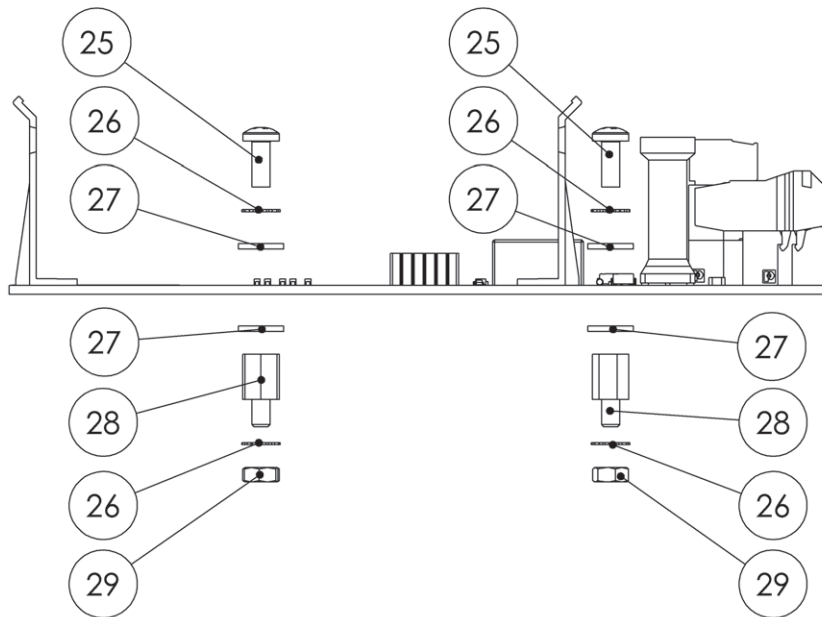
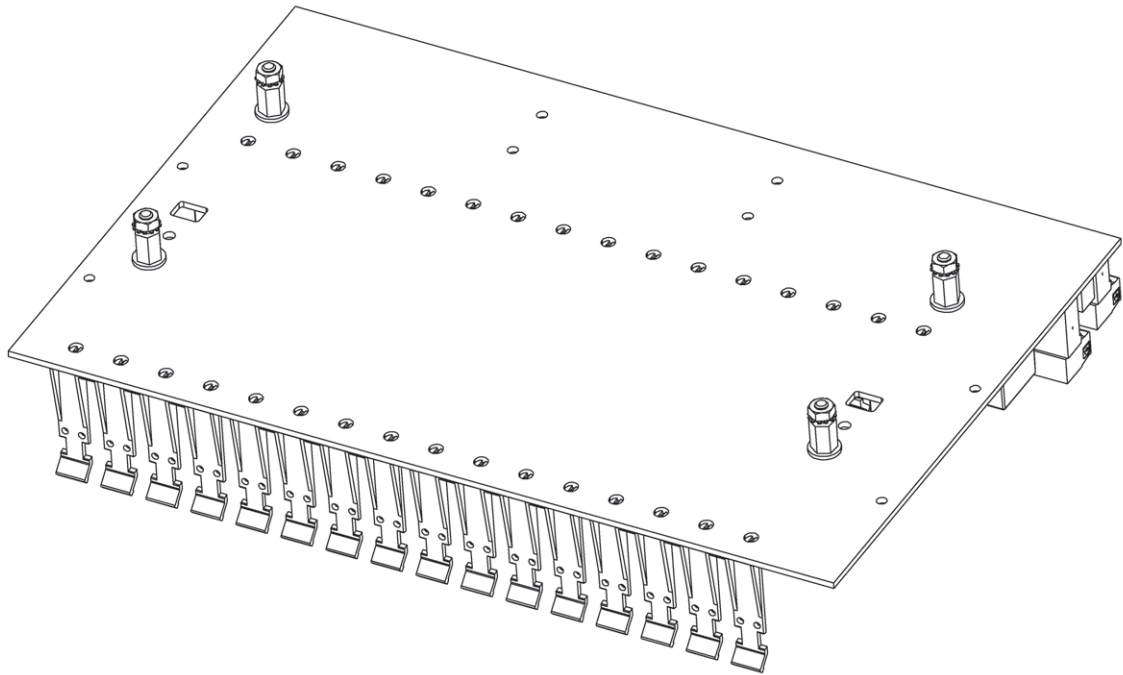


**Side view**



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