

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 TRICON CX 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 | 3722X 3723X | 32 | 1/2 | 16 | D5011S, D5014S, D5072S, D6001S, D6011S, D6014S, D6072S |
| | | | 1 | 32 | D5011D, D5014D, D5072D, D6001D, D6011D, D6014D, D6072D |

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

Features:

- Tricon CX AI Cards board interfaces.
- 16 positions Termination Board for up to 32 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-011

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:

Two ELCO 8016, 56 poles receptacle connectors (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:

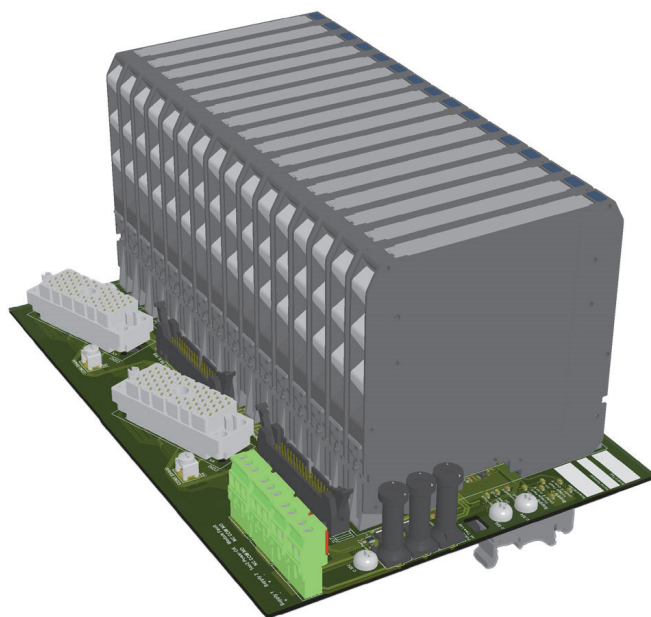
Hardware included for mounting on wall and single DIN rail.

Weight: about 400 g (excluding modules and mounting options).

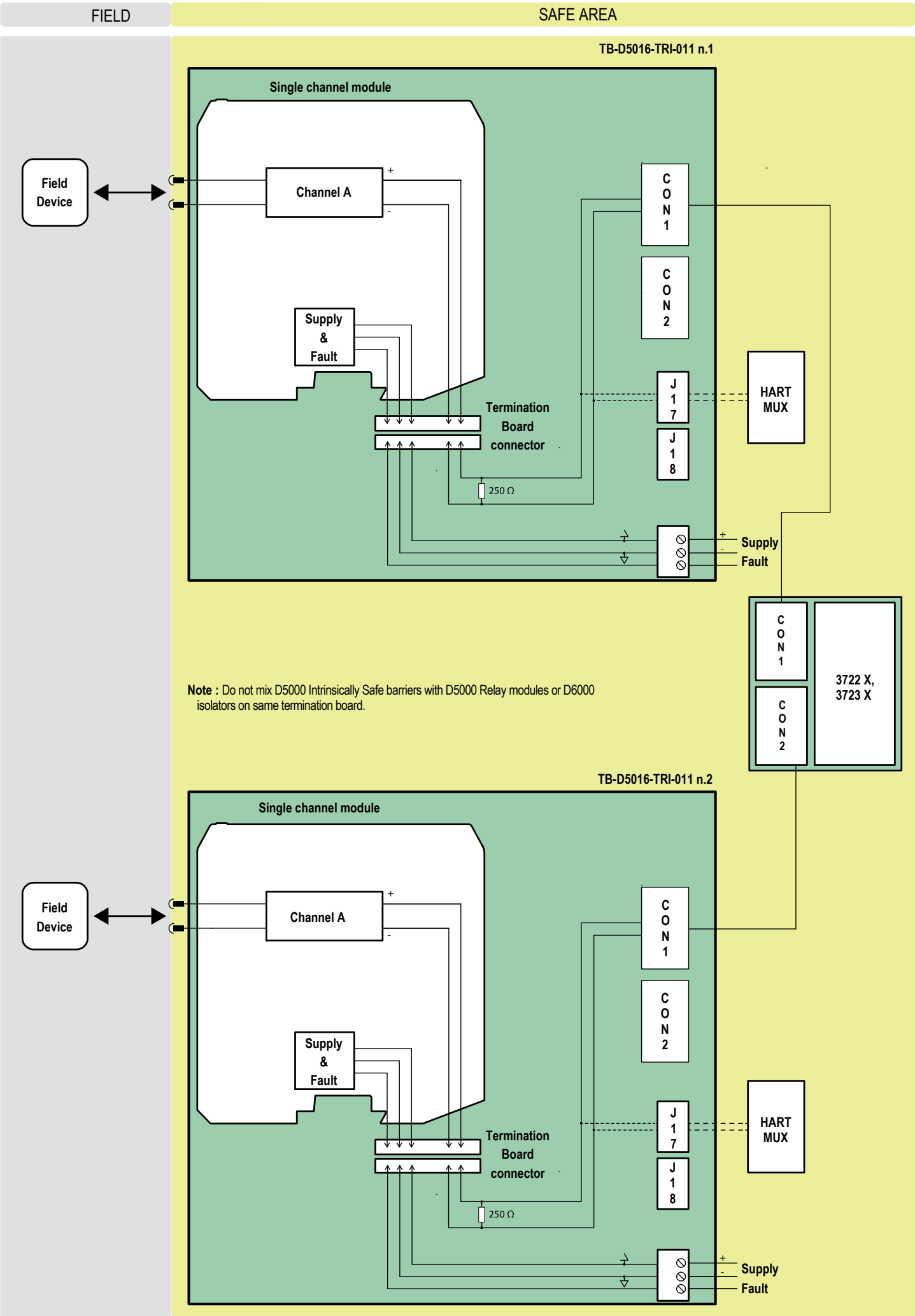
Location: Safe Area / Ordinary locations.

Dimensions: Width 267 mm, Depth 176 mm, Height 125 mm.

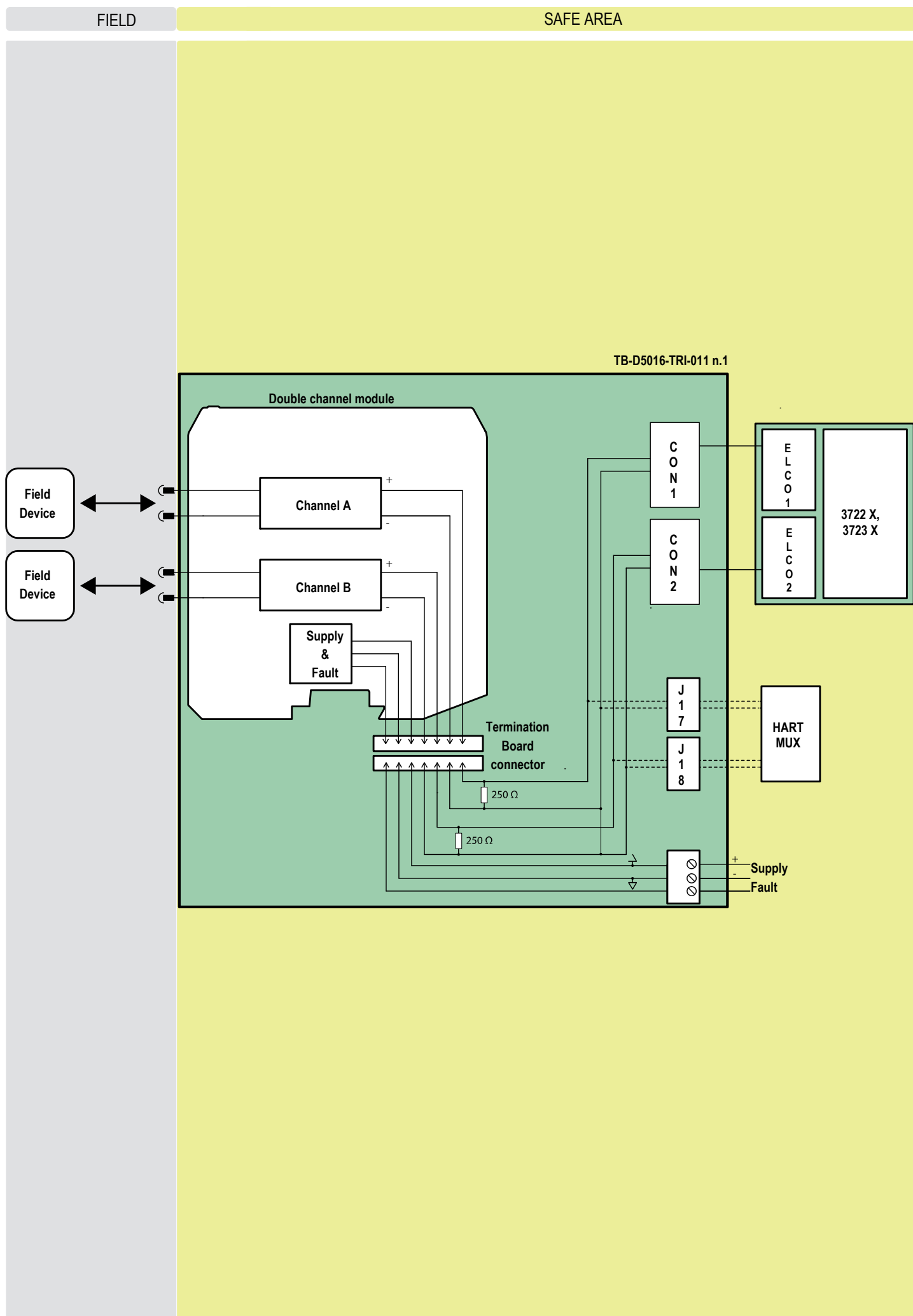
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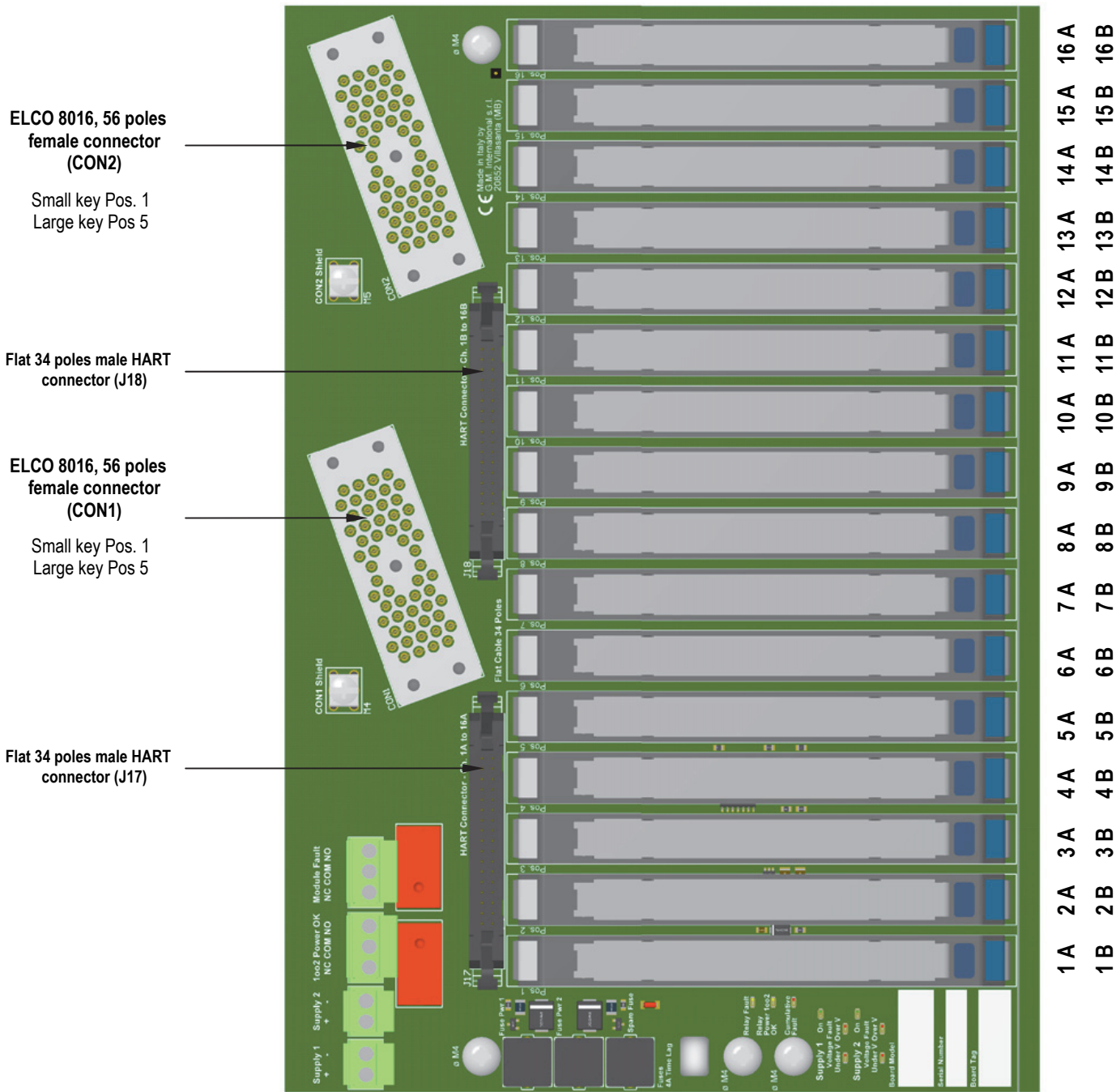


Loop Diagrams:



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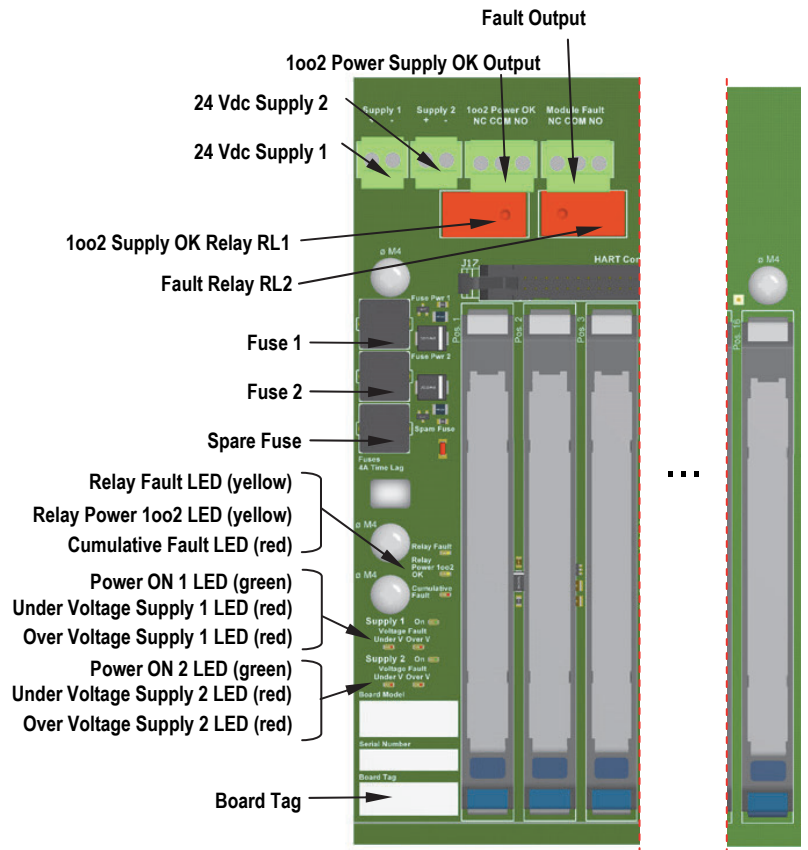
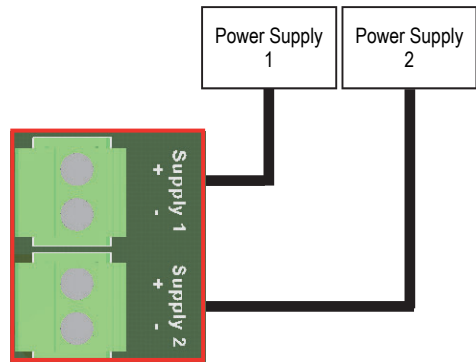
Connections table to Interface Cards:

| MODULE POSITION | MODULE CHANNEL NUMBER | INTERFACE CARD(S) CHANNEL NUMBER | MODULE CHANNEL POSITIVE (+) CONNECTION | MODULE CHANNEL NEGATIVE (-) CONNECTION | HART MULTIPLEXING CONNECTOR POSITIVE (+) PIN NUMBER | HART MULTIPLEXING CONNECTOR NEGATIVE (-) PIN NUMBER | NOTES |
|-----------------|-----------------------|----------------------------------|--|--|---|---|---|
| 1 | 1A | 1 | AA (CON1) | RTN | 1 (J17) | 2 (J17) | CON1, CON2: • Chassis Ground provided on poles: T, H, w, FF. • Unconnected poles: KK, u, a, DD, k, R, E, A, NN, JJ, y, n, d, V, K, D • RTN is connected to: LL, EE, v, l, b, S, F, B, MM, HH, x, m, c, U, J, C |
| | 1B | 17 | AA (CON2) | RTN | 1 (J18) | 2 (J18) | |
| 2 | 2A | 2 | z (CON1) | RTN | 3 (J17) | 4 (J17) | |
| | 2B | 18 | z (CON2) | RTN | 3 (J18) | 4 (J18) | |
| 3 | 3A | 3 | p (CON1) | RTN | 5(J17) | 6 (J17) | |
| | 3B | 19 | p (CON2) | RTN | 5 (J18) | 6 (J18) | |
| 4 | 4A | 4 | h (CON1) | RTN | 7 (J17) | 8 (J17) | |
| | 4B | 20 | h (CON2) | RTN | 7 (J18) | 8 (J18) | |
| 5 | 5A | 5 | e (CON1) | RTN | 9 (J17) | 10 (J17) | |
| | 5B | 21 | e (CON2) | RTN | 9 (J18) | 10 (J18) | |
| 6 | 6A | 6 | W (CON1) | RTN | 11 (J17) | 12 (J17) | |
| | 6B | 22 | W (CON2) | RTN | 11 (J18) | 12 (J18) | |
| 7 | 7A | 7 | L (CON1) | RTN | 13 (J17) | 14 (J17) | |
| | 7B | 23 | L (CON2) | RTN | 13 (J18) | 14 (J18) | |
| 8 | 8A | 8 | M (CON1) | RTN | 15 (J17) | 16 (J17) | |
| | 8B | 24 | M (CON2) | RTN | 15 (J18) | 16 (J18) | |
| 9 | 9A | 9 | BB (CON1) | RTN | 17 (J17) | 18 (J17) | |
| | 9B | 25 | BB (CON2) | RTN | 17 (J18) | 18 (J18) | |
| 10 | 10A | 10 | CC (CON1) | RTN | 19 (J17) | 20 (J17) | |
| | 10B | 26 | CC (CON2) | RTN | 19 (J18) | 20 (J18) | |
| 11 | 11A | 11 | t (CON1) | RTN | 21 (J17) | 22 (J17) | |
| | 11B | 27 | t (CON2) | RTN | 21 (J18) | 22 (J18) | |
| 12 | 12A | 12 | j (CON1) | RTN | 23 (J17) | 24 (J17) | |
| | 12B | 28 | j (CON2) | RTN | 23 (J18) | 24 (J18) | |
| 13 | 13A | 13 | f (CON1) | RTN | 25 (J17) | 26 (J17) | |
| | 13B | 29 | f (CON2) | RTN | 25 (J18) | 26 (J18) | |
| 14 | 14A | 14 | Z (CON1) | RTN | 27 (J17) | 28 (J17) | |
| | 14B | 30 | Z (CON2) | RTN | 27 (J18) | 28 (J18) | |
| 15 | 15A | 15 | P (CON1) | RTN | 29 (J17) | 30 (J17) | |
| | 15B | 31 | P (CON2) | RTN | 29 (J18) | 30 (J18) | |
| 16 | 16A | 16 | N (CON1) | RTN | 31 (J17) | 32 (J17) | |
| | 16B | 32 | N (CON2) | RTN | 31 (J18) | 32 (J18) | |

Termination Board Description:

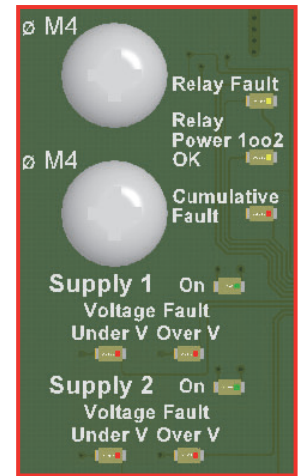
Note:
Relay contact is defined Normally Closed (NC) or Normally Open (NO) when RL1 or RL2 relays are de-energized (that is, coil status LED is turned off).
Relay is de-energized in fault status.

Power Supply redundancy:



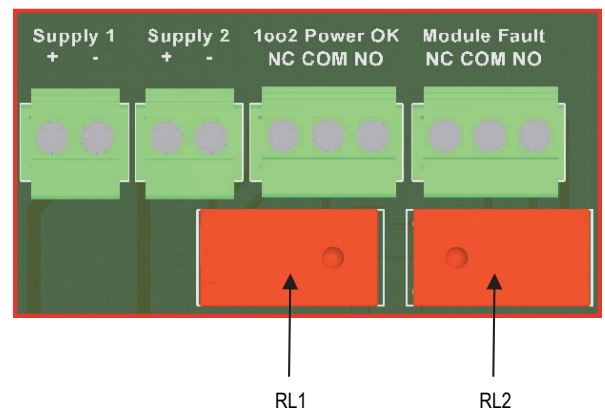
LED Signaling:
Meaning of LEDs on termination boards:

| 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 |

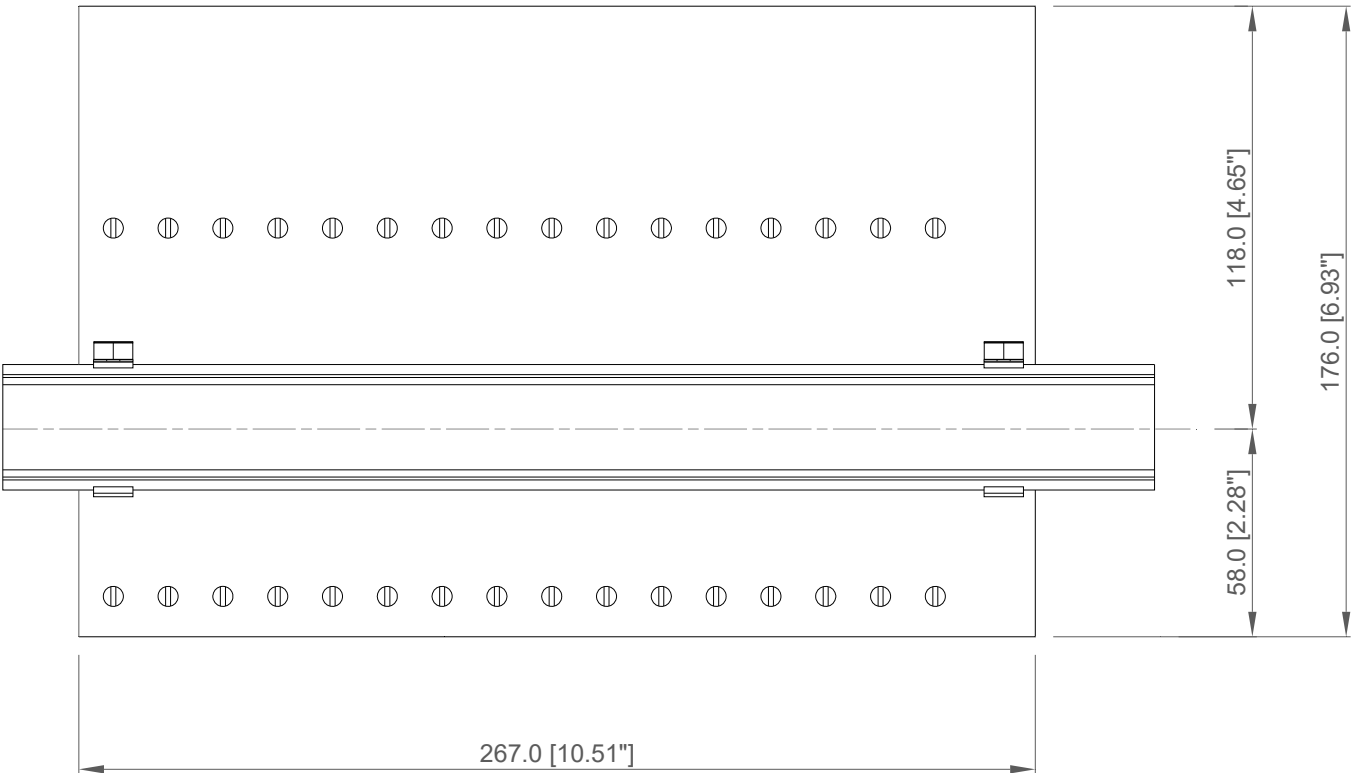


Relay Activation Conditions:
The two relays are activated according to the following rules:

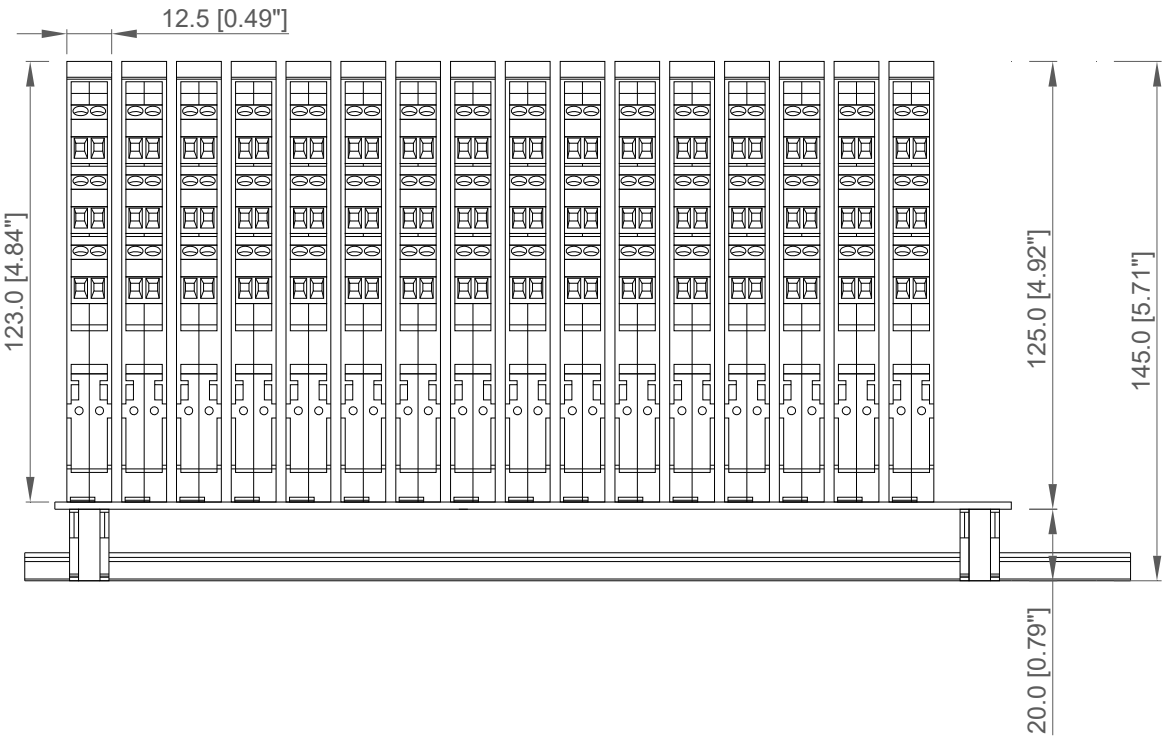
| TAG | ACTIVATION |
|---------------------|--|
| 1002 Power OK (RL1) | The relay is energized when both supply voltages are within the regular range (>18 V and <30 V), i.e. when "Relay 1002 Power OK" yellow LED is on. |
| Module Fault (RL2) | The relay is energized when the following two conditions 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. |



Bottom view

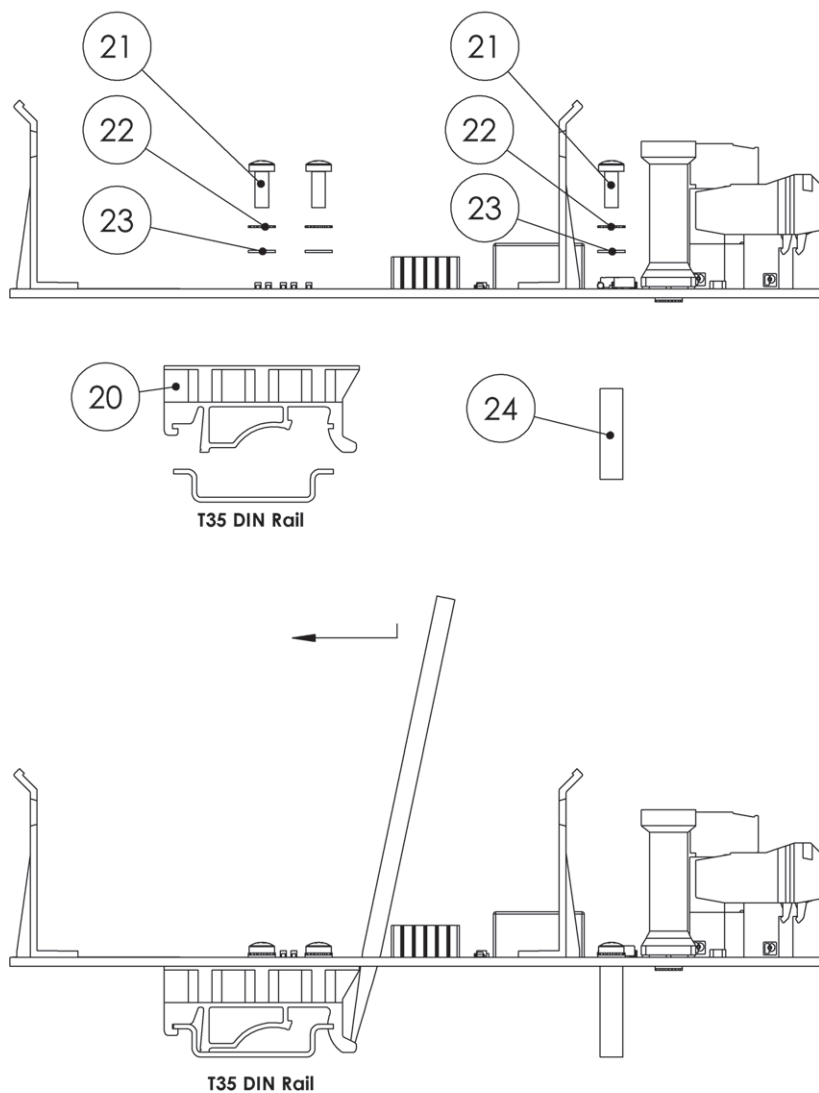


Side view



All dimensions are expressed in millimeters [inches]

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

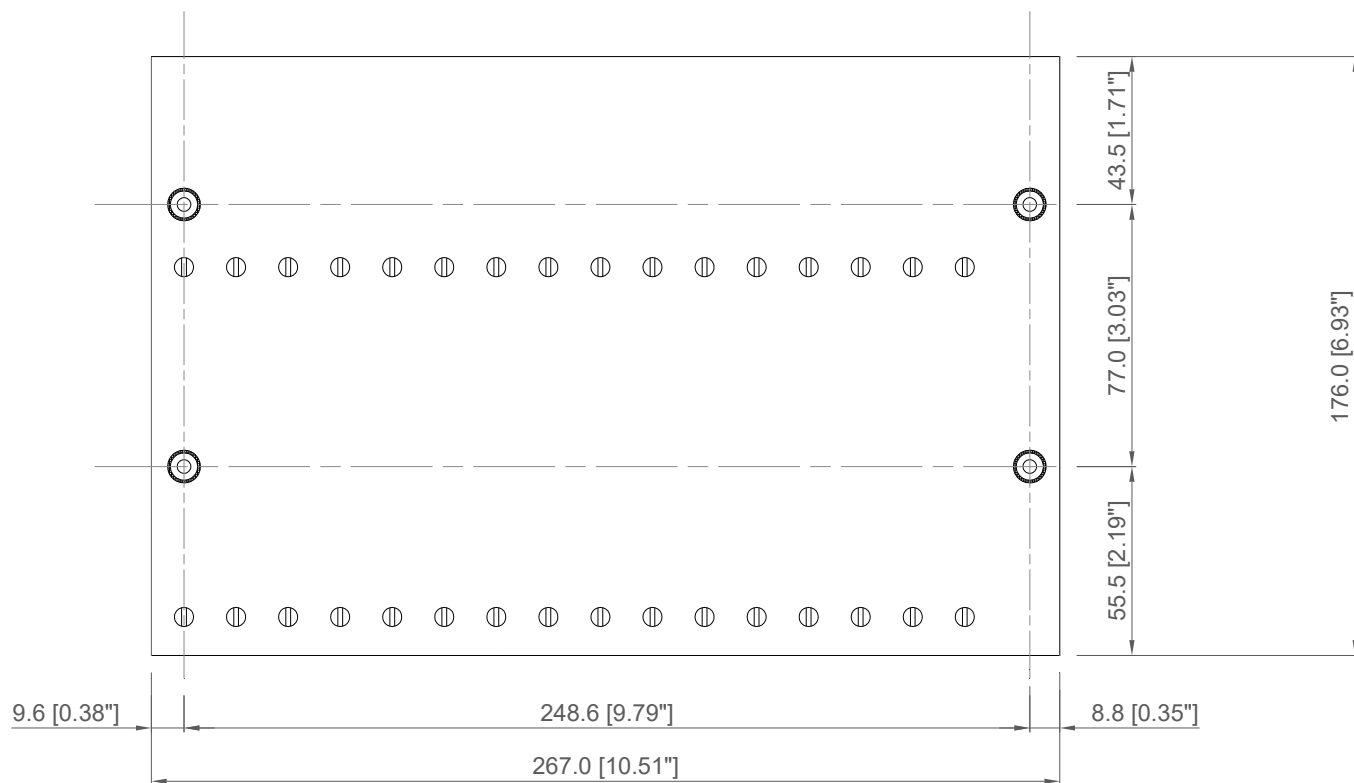


1. T35 DIN RAIL MOUNTING

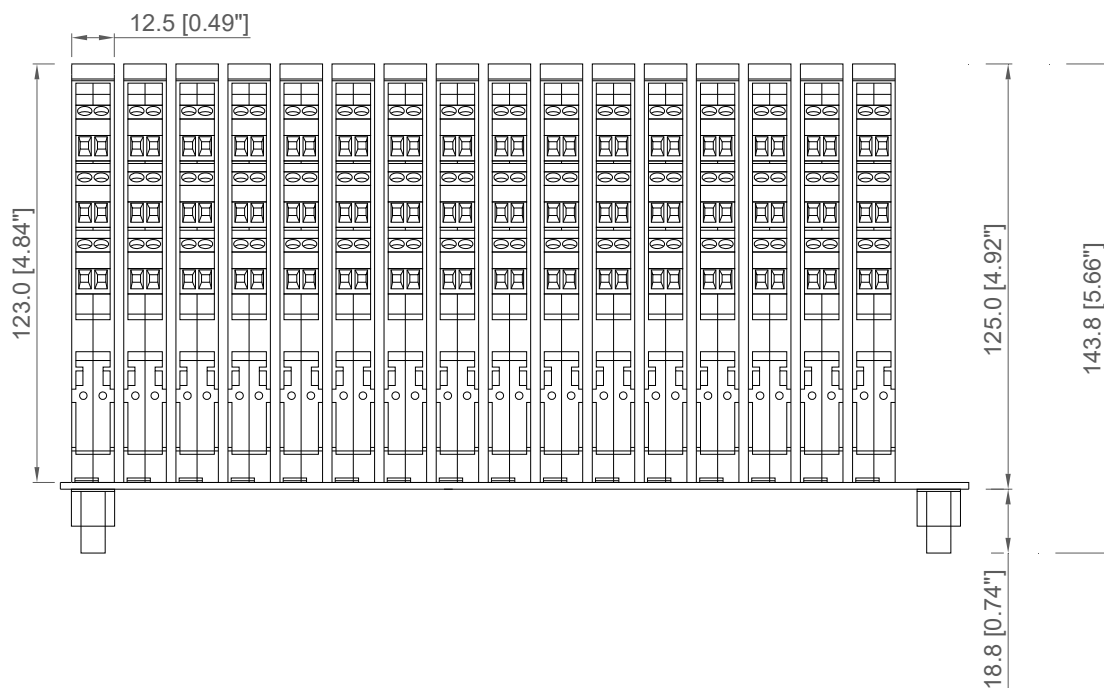
| Item | Ref.Nr. | Q.ty | Description | Material |
|------|---------|------|-------------------------------|-----------------|
| 1 | 20 | 2 | T35 Din Rail Adapter | PA |
| 2 | 21 | 6 | 3.5x9.5 Self Tapping Screw | Stainless Steel |
| 3 | 22 | 6 | M3 External Tooth lock Washer | Stainless Steel |
| 4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

Wall mounting overall dimensions for M4 self tapping screw:

Bottom view

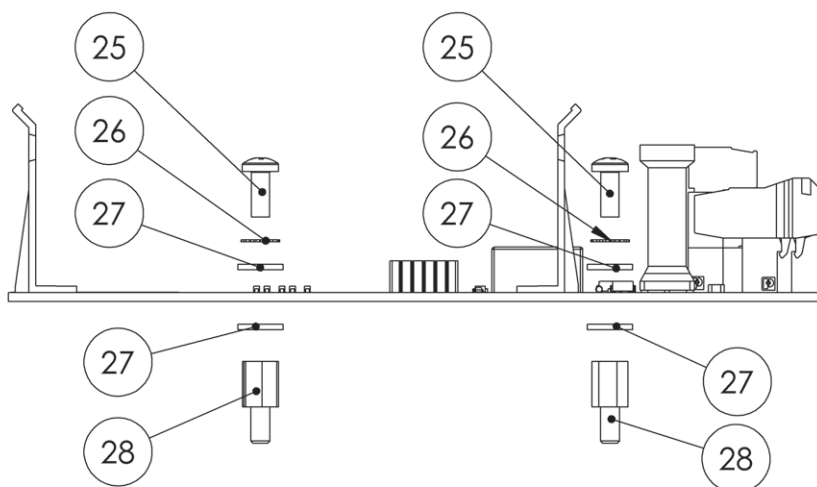
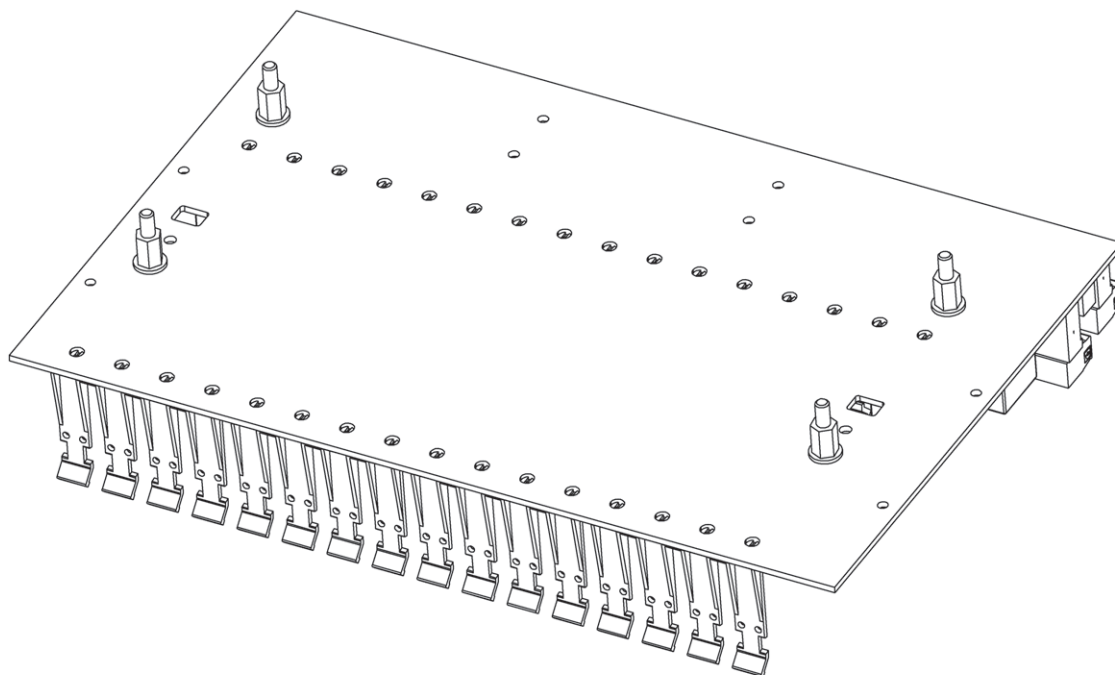


Side view



All dimensions are expressed in millimeters [inches]

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

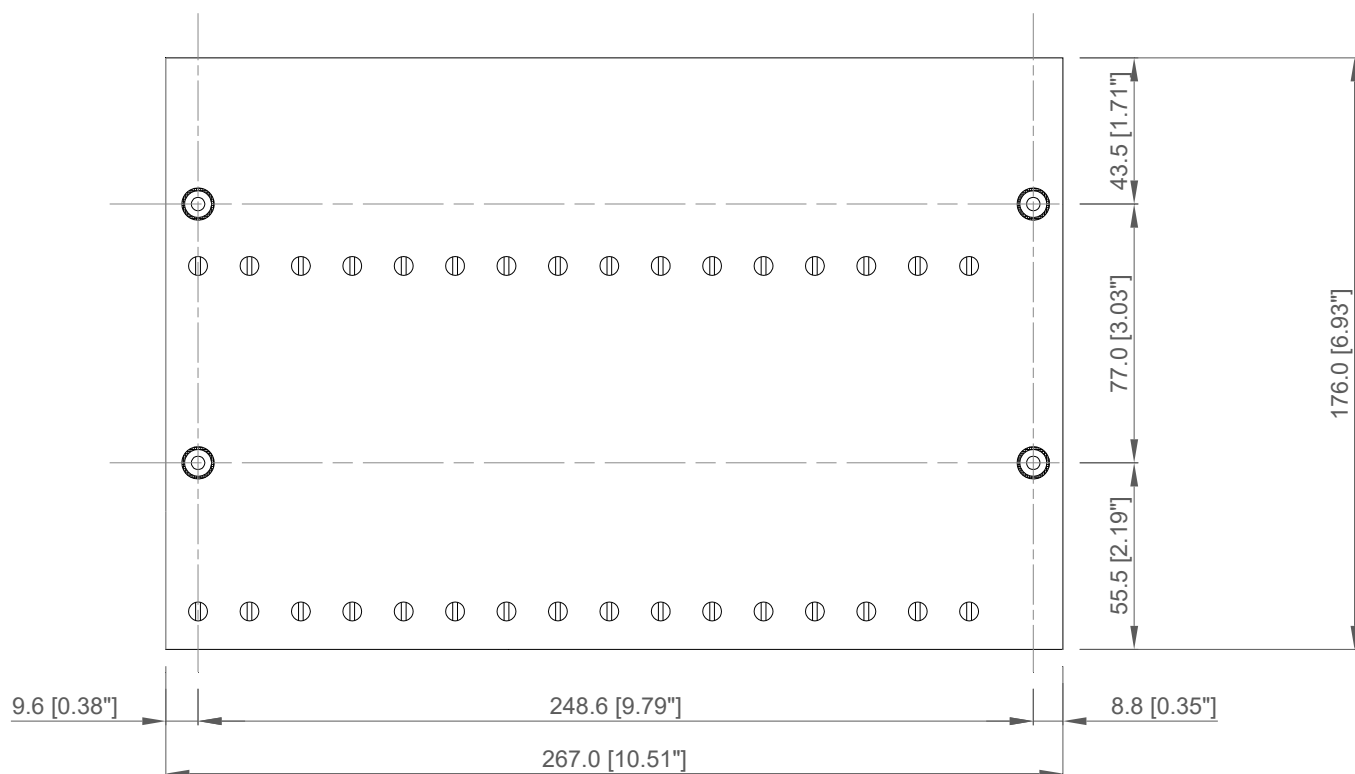


2. WALL MOUNTING WITH SELF TAPPING SCREW

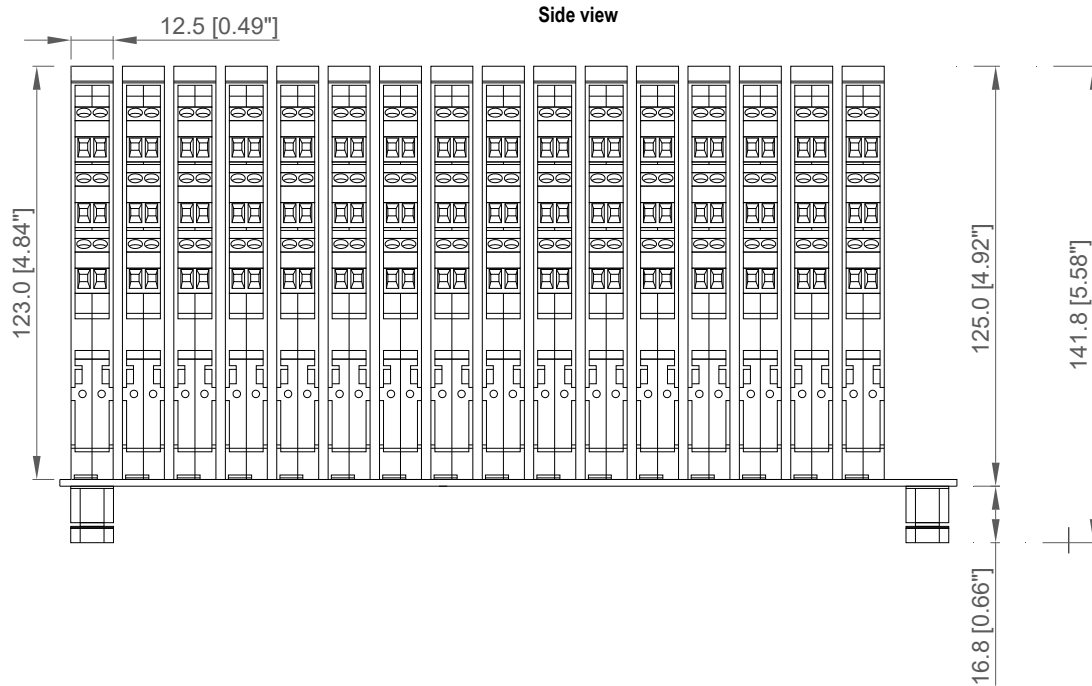
| Item | Ref.Nr. | Q.ty | Description | Material |
|------|---------|------|-------------------------------|-----------------|
| 6 | 25 | 4 | M4x8 Screw | Stainless Steel |
| 7 | 26 | 4 | M4 External Tooth lock Washer | Stainless Steel |
| 8 | 27 | 8 | M4 Washer | Stainless Steel |
| 9 | 28 | 4 | Self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

Wall mounting overall dimensions for M4 thread screw:

Bottom view

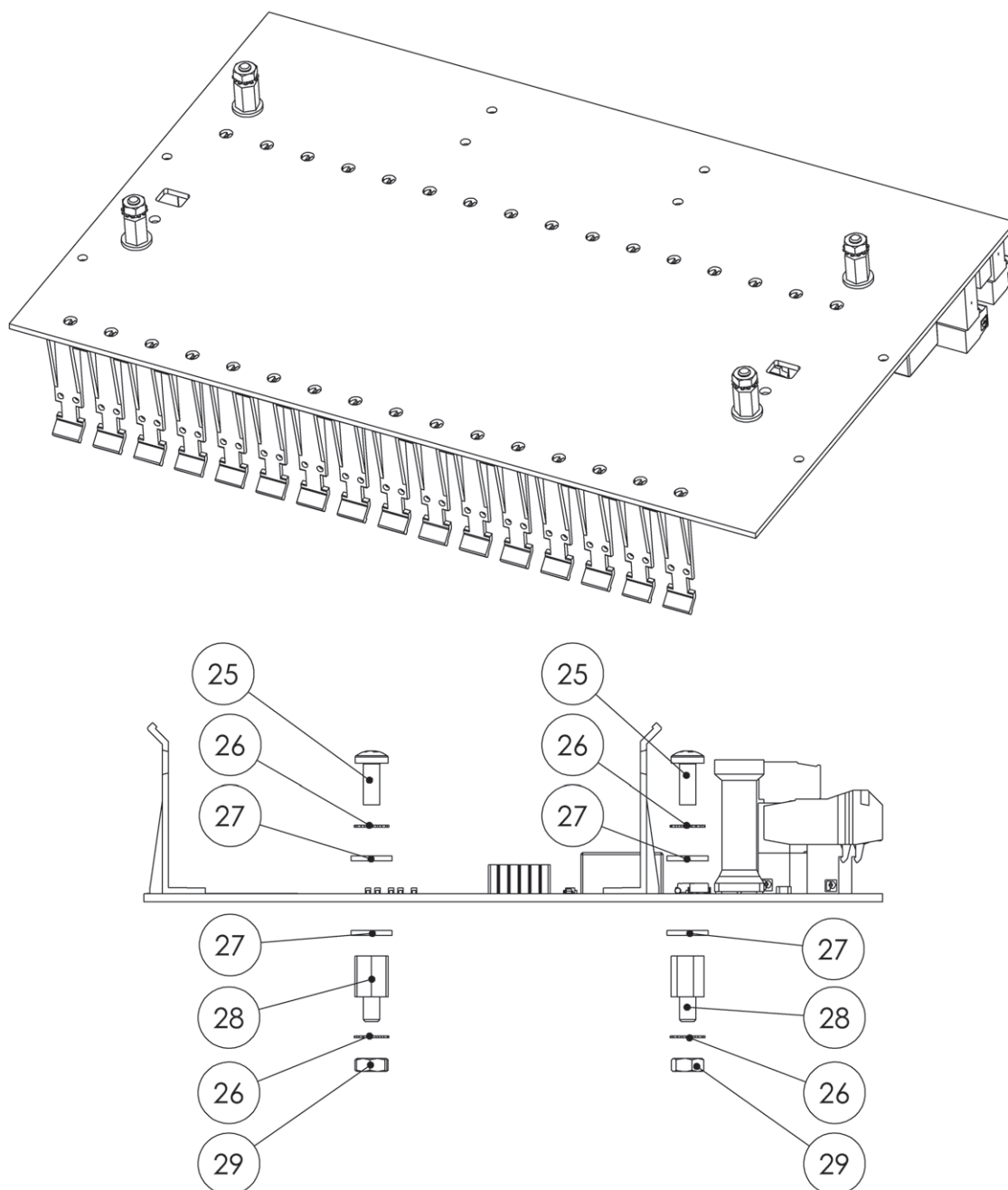


Side view



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 |