

# INSTRUCTION MANUAL

## Termination Boards GMI type



## General description

This instruction manual refers to the following termination boards GMI type:

MODEL	PAGE
TBE-D5016-GMI-001	8
TBE-D5008-GMI-001	50

## Common specifications

### Power supplies and faults

For the following termination boards:

- TBE-D5016-GMI-001;
- TBE-D5008-GMI-001.

Redundant power supply connections and LED indications are shown here below.

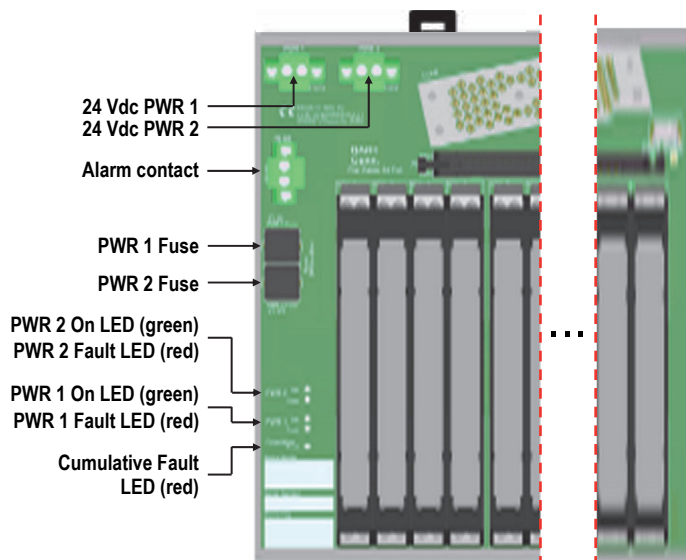
#### LED Signaling:

Meaning of LEDs on termination boards:

TAG	LED COLOR	MEANING
PWR 1 On	GREEN	The LED is on when the PWR 1 is within range
PWR 1 Fault	RED	The LED is on when the PWR 1 is out of range
PWR 2 On	GREEN	The LED is on when the PWR 2 is within range
PWR 2 Fault	RED	The LED is on when the PWR 2 is out of range
Cumulative Fault	RED	The LED is on when at least one connected module returns a fault

#### Alarm contact:

Alarm contact is closed in normal operation, while it opens in case of any fault.



### Start-up

Before powering the unit check that all wires are properly connected, particularly supply conductors and their polarity.

Check conductors for exposed wires that could touch each other causing dangerous unwanted shorts.

Turn on power, the "PWR 1" and/or "PWR 2" green LED must be lit.

### Warning

Termination Boards are installed onto standard EN/IEC60715 TH 35 DIN-Rail located in Safe Area within the specified operating temperature limits Tamb -40 to +70 °C. Termination Boards must be installed, operated and maintained only by qualified personnel, in accordance to the relevant national/international installation standards, following the established installation rules.

Failure of a proper installation or use of the equipment may risk to damage the unit or severe personal injury.

Termination boards cannot be repaired by the end user and must be returned to the manufacturer or his authorized representative. Any unauthorized modification must be avoided.

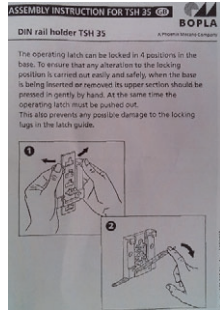
## DIN-Rail clip installation on termination board enclosure

The Termination Board is already provided with plastic DIN-rail clips. Metal clips, replacement plastic clips as well as conformal coating must be ordered as a separate accessory. Should customer need different or additional clips, they can be ordered as TBE-FIX-PL-001 (plastic) or TBE-FIX-MT-001 (metal). Customer can add also TBE-MNT-001 code (for each DIN-Rail clip) to request further DIN-Rail clip factory mounting. Otherwise, customer follows DIN-Rail clip installation procedure.

For termination board with 1x or 2x Plastic DIN-Rail clips TBE-FIX-PL-001, extract each clip and related instruction sheet from plastic bag. Follow the instruction sheet and the following figures to change lever position (from default to specific for TBE-D50xx-GMI-xxx) on each clip:



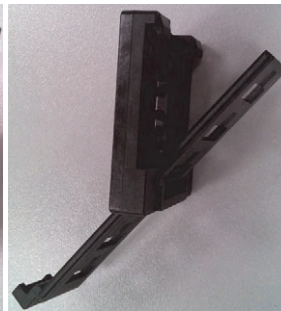
Default position



Instruction sheet

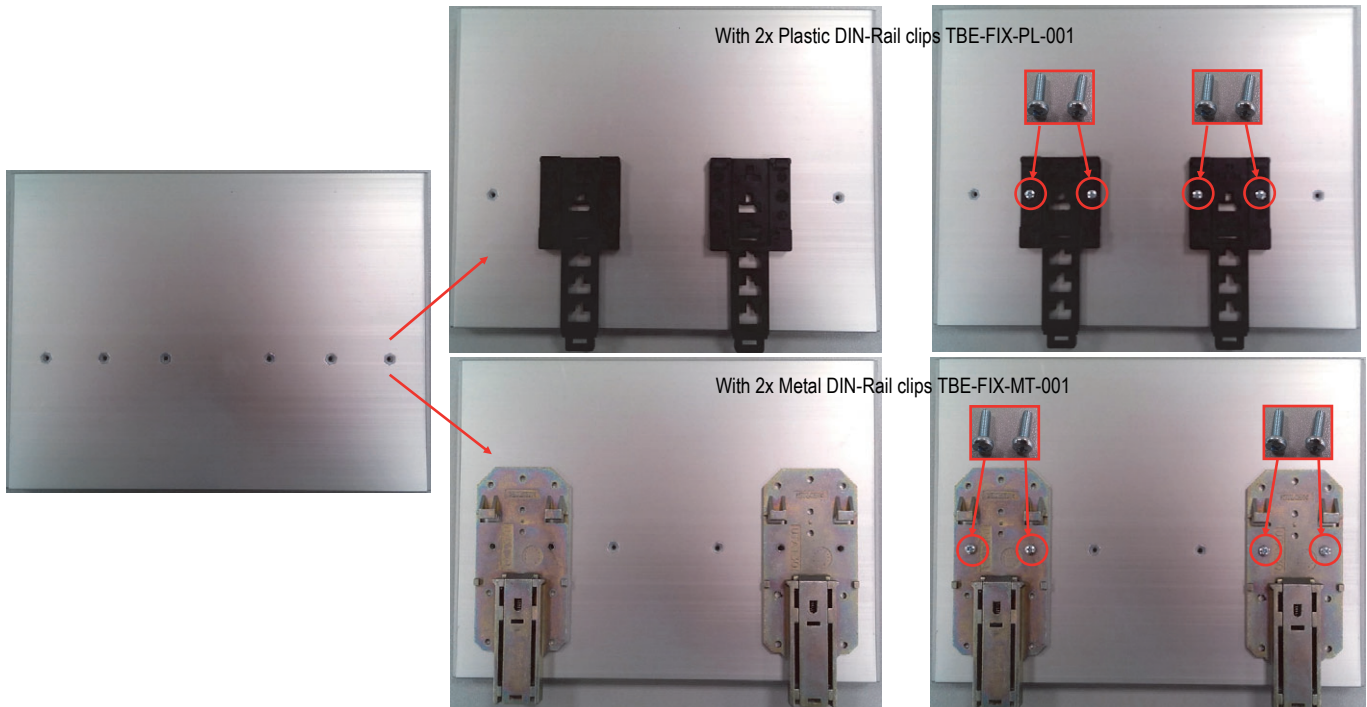


Changing lever position



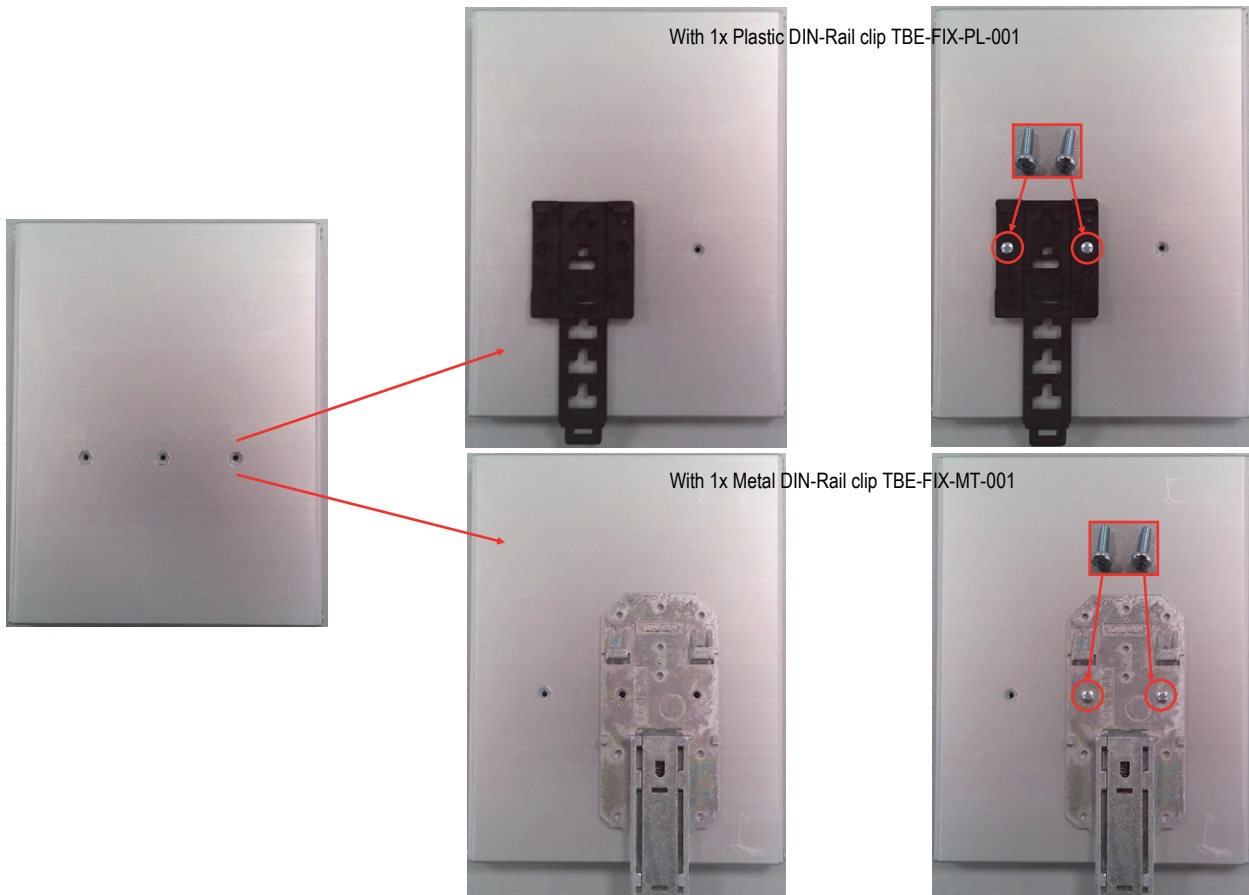
Specific position for TBE-D50xx-GMI-xxx

For the termination boards **TBE-D5016-GMI-001**, place the enclosure as shown in the following figures and fix each Plastic or Metal DIN-Rail clip to enclosure by 2 x M3 (10 mm) screws included on TBE-FIX set:



## DIN-Rail clip installation on termination board enclosure

For the termination board **TBE-D5008-GMI-001**, place the enclosure as shown in the following figures and fix Plastic or Metal DIN-Rail clip to enclosure by 2 x M3 (10 mm) screws included on TBE-FIX set:



## TBE with Conformal Coating

On TBE order, customer can add one of the following codes to request Conformal Coating applied on TBE by factory process:

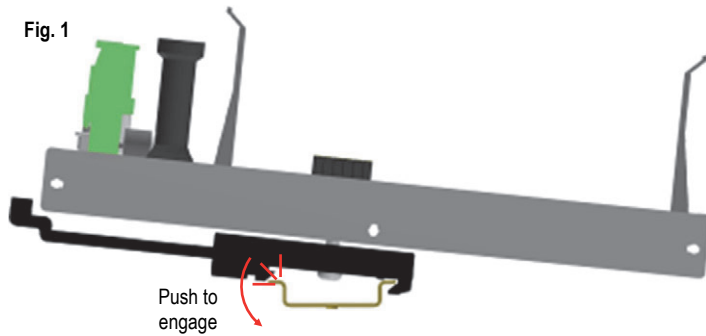
- 1) TBE-CTG-001 code for TBE-D5008-GMI-001;
- 2) TBE-CTG-002 code for TBE-D5016-GMI-001.

For termination board with 1 x or 2 x Plastic DIN-Rail clips TBE-FIX-PL-001:

**Mounting:**

To mount termination board on 35 mm DIN-Rail, hook one side of the mounting foot over the rail's lip and press the Termination Board down firmly until fixed (see Fig.1).

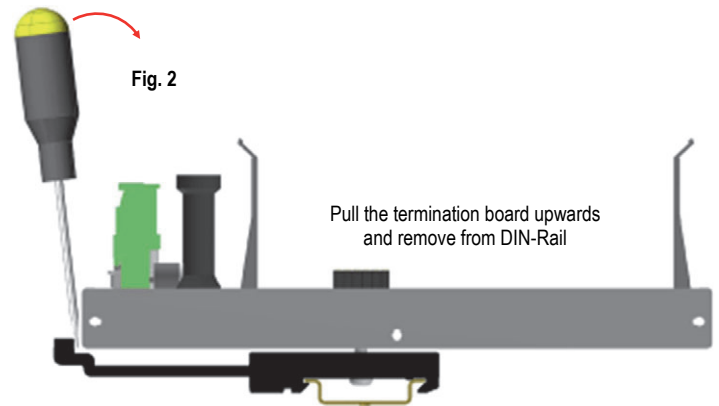
Fig. 1



**Removing:**

To remove a termination board from the mounting rail, insert a blade screwdriver in the mounting foot and lever (see Fig. 2).

Fig. 2

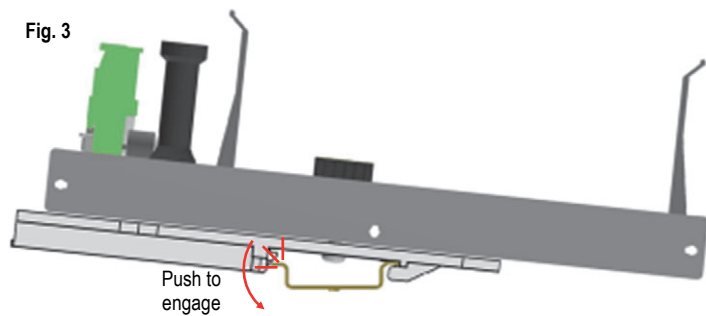


For termination board with 1 x or 2 x Metal DIN-Rail clips TBE-FIX-MT-001:

**Mounting:**

To mount termination board on 35 mm DIN-Rail, hook one side of the mounting foot over the rail's lip and press the Termination Board down firmly until fixed (see Fig.3).

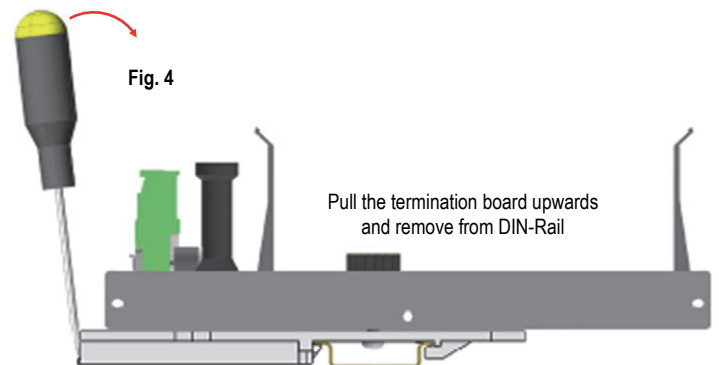
Fig. 3



**Removing:**

To remove a termination board from the mounting rail, insert a blade screwdriver in the mounting foot and lever (see Fig. 4).

Fig. 4



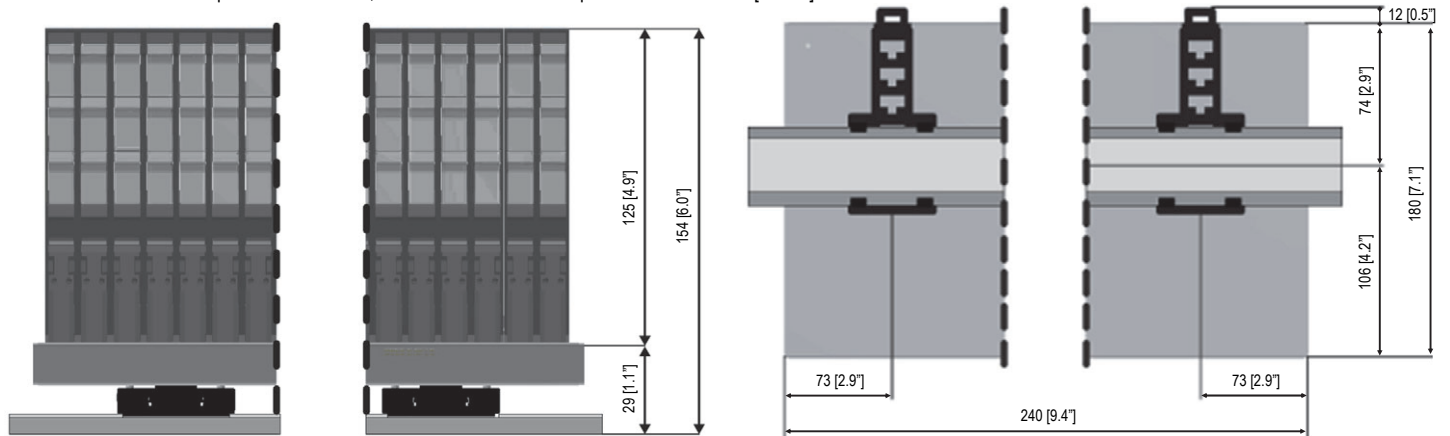


## Overall dimensions

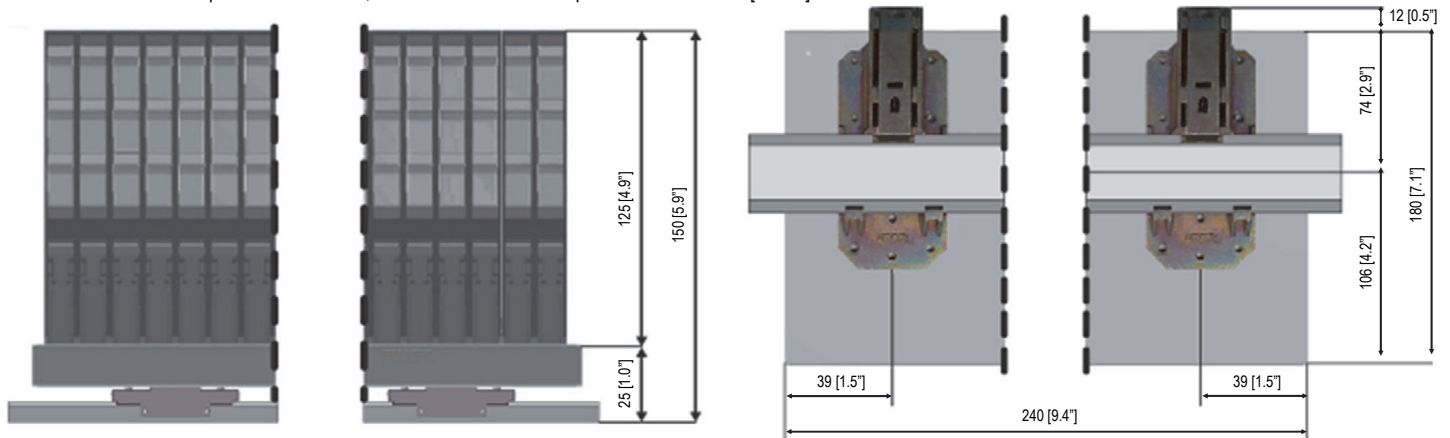
For the following termination boards:

- TBE-D5016-GMI-001.

With 2 x Plastic DIN-Rail clips TBE-FIX-PL-001, with all dimensions are expressed in millimeters [inches]:



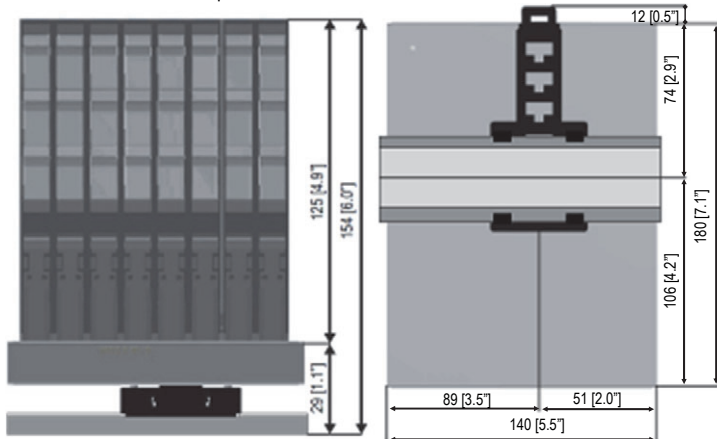
With 2 x Metal DIN-Rail clips TBE-FIX-MT-001, with all dimensions are expressed in millimeters [inches]:



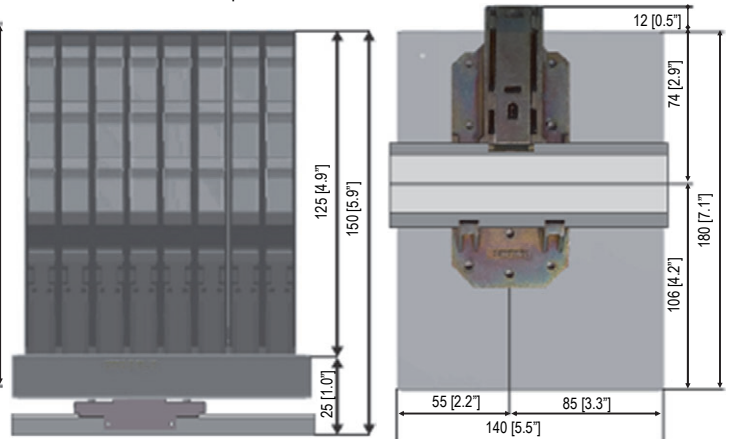
For the following termination board:

- TBE-D5008-GMI-001.

With 1 x Plastic DIN-Rail clip TBE-FIX-PL-001:



With 1 x Metal DIN-Rail clip TBE-FIX-MT-001:



All dimensions are expressed in millimeters [inches]

**Characteristics:****General description:**

This Termination Board with Enclosure (TBE) 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 TBE is connected to two plug-in terminal blocks, for a redundant power supply.

**Termination Board general characteristics:**

Number of positions	Features
16	Power Supply voltage redundancy; Abnormal supply voltage signaling; Cumulative module fault signaling; HART Multiplexing.

**Supported I/O Cards and D5000 / D6000 Series modules:**

Refer to DTS1689.

**Installation:**

TBE-D5016-GMI-001 is a Termination Board supported by an aluminum shell suitable for installation on EN/IEC60715 TH 35 DIN-Rail.

TBE-D5016-GMI-001 unit can be mounted with any orientation over the entire ambient temperature range.

Electrical connections are the following:

- ALARM, PWR1, PWR 2: polarized plug-in removable screw terminal blocks for conductors up to 2.5 mm<sup>2</sup> (13 AWG) with a torque of 0.5-0.6 Nm.
- CON1 SHIELD, CON2 SHIELD: screw terminal blocks for conductors up to 2 mm<sup>2</sup> (14 AWG) fully tight.
- CON1, CON2: SUB-D 37 poles connectors with screws retaining method.
- J17, J18 HART: 34 poles male connectors.

Electrical connection can be plugged in/out into a powered unit without suffering or causing any damage. Connect only one individual conductor per each clamping point.

Wiring has to be sized according to the current and the length of the cables. On the section "Function Diagram" a block diagram identifies all connections.

Installation and wiring must be in accordance to the relevant national/international installation standards, make sure that conductors are well isolated from each other and do not produce any unintentional connection.

The unit shall be installed in an area of not more than pollution degree 2 according to EN/IEC60664-1. The end user is responsible to ensure that the operating temperature of the module is not exceeded in the end use application.

Units must be protected against dirt, dust, extreme mechanical (e.g. vibration, impact and shock) and thermal stress, and casual contacts. If enclosure needs to be cleaned use only a cloth lightly moistened by a mixture of detergent in water.

Any penetration of cleaning liquid must be avoided to prevent damage to the unit.

Any unauthorized card modification must be avoided.

According to EN/IEC61010, TBE-D5016-GMI-001 unit must be connected to SELV or PELV supplies.

All circuits connected to TBE-D5016-GMI-001 unit must comply with the overvoltage category II (or better) according to EN/IEC60664-1.

**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.

**Max allowed current consumption:** 1.5 A (as total supply).

**Connection:** by polarized plug-in disconnect screw terminal blocks to accommodate terminations up to 2.5 mm<sup>2</sup>.

**Protection fuse:** 4 A time lag.

**Fault detection:**

The on-board diagnostic monitors both power supplies integrity and the module cumulative fault. Any malfunction is reported by deactivating a solid-state relay and activating the corresponding LEDs.

Alarm is issued if:

- 1) Power supply 1 or 2 < 17 Vdc or
- 2) Power supply 1 or 2 > 33 Vdc or
- 3) Module cumulative fault ON.

Alarm is removed if:

- 1) 20 Vdc < Power supply 1 and 2 < 30 Vdc and
- 2) No module cumulative fault.

**Connection:** by polarized plug-in disconnect screw terminal blocks to accommodate terminations up to 2.5 mm<sup>2</sup>.

**Output rating:** 100 mA 35 V ( $\leq 1$  V voltage drop)

**I/O Card Interface:****Connection:**

2 x SUB-D 37 poles male connectors (require male mating connector).

**Cable:** CABF034/xx, where "xx" indicates the length expressed in meters (5, 10, 20, 30 available).

**HART Mux Interface:**

**Connection:** 2 x 34-poles receptacle connector (require female mating connector).

**Cable:** flat cable CABF032.

**Compatibility:**

CE mark compliant, conforms to Directive:  
2014/30/EU EMC, 2014/35/EU LVD, 2011/65/EU RoHS.

**Environmental conditions:**

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

**Max altitude:** 2000 m a.s.l.

**Storage:** temperature limits – 45 to + 80 °C.

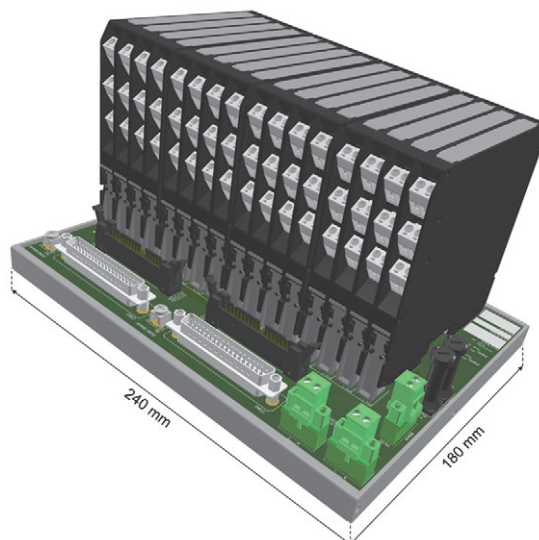
**Mounting:**

Hardware included for mounting on single DIN rail 35 mm.

**Weight:** about 1 kg, excluding modules (+ 50 g plastic clips or 380 g metal clips).

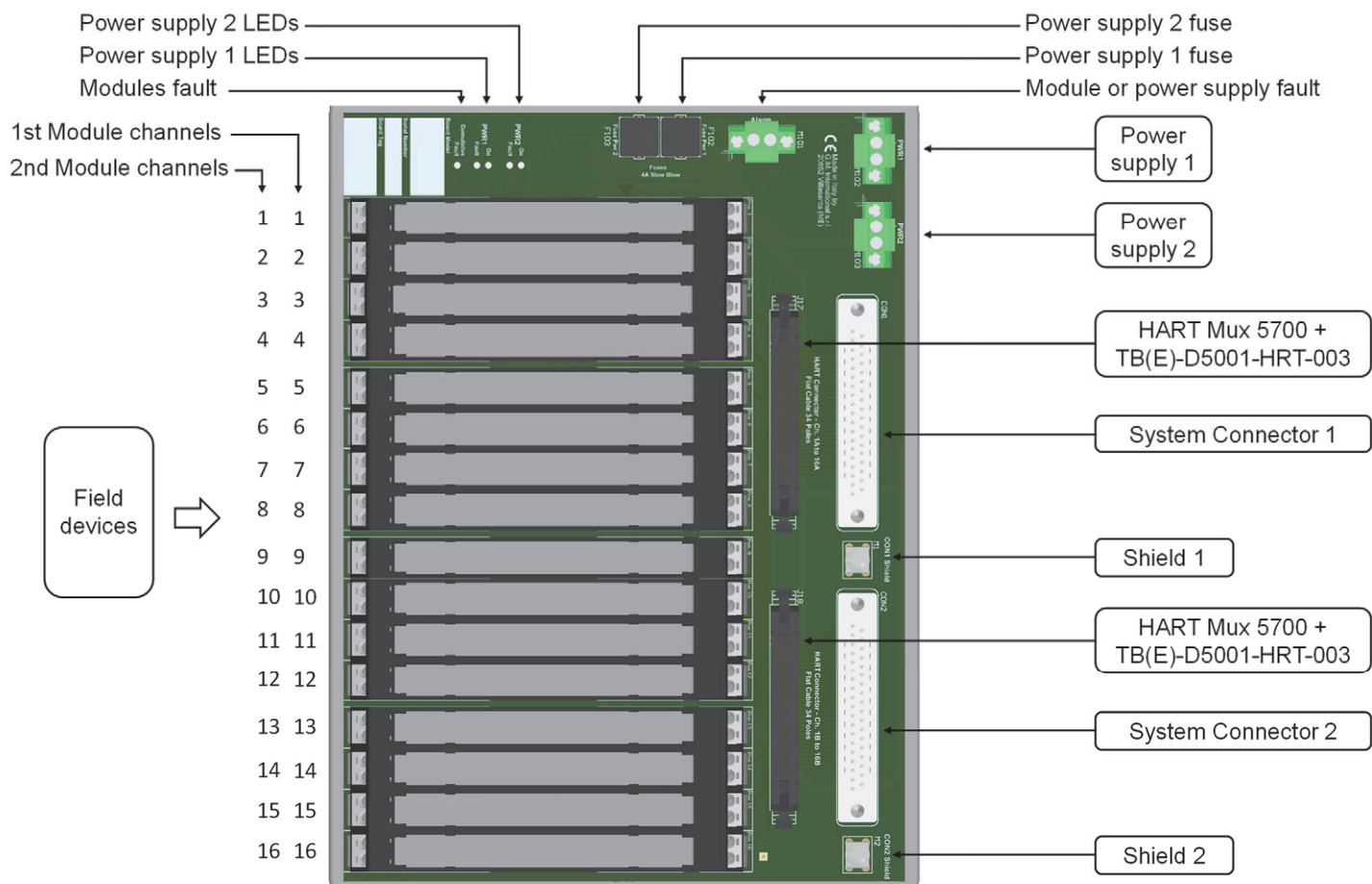
**Location:** installation in Safe Area.

**Dimensions:** Width 240 mm, Depth 180 mm, Height 154 mm.

**Image:**

## Termination Board Description

**Note :** Do not mix D5000 Intrinsically Safe barriers with D6000 isolators on same termination board.





# Connections Table to Interface Cards

MODULE POSITION	MODULE CHANNEL NUMBER	INTERFACE CARD(S) CONNECTOR POSITIVE (+) PIN NUMBER	INTERFACE CARD(S) CONNECTOR NEGATIVE (-) PIN NUMBER	HART MULTIPLEXING CONNECTOR POSITIVE (+) PIN NUMBER	HART MULTIPLEXING CONNECTOR NEGATIVE (-) PIN NUMBER	NOTES
1	1A	37 (CON1)	19 (CON1)	1 (J17)	2 (J17)	CON1, CON2: • Shield terminal block pole: 21. • 24V pole: 1. • Ground pole: 20. • Unconnected poles: 2, 3.  J17, J18: • Unconnected poles: 33, 34.
	1B	37 (CON2)	19 (CON2)	1 (J18)	2 (J18)	
2	2A	36 (CON1)	18 (CON1)	3 (J17)	4 (J17)	
	2B	36 (CON2)	18 (CON2)	3 (J18)	4 (J18)	
3	3A	35 (CON1)	17 (CON1)	5 (J17)	6 (J17)	
	3B	35 (CON2)	17 (CON2)	5 (J18)	6 (J18)	
4	4A	34 (CON1)	16 (CON1)	7 (J17)	8 (J17)	
	4B	34 (CON2)	16 (CON2)	7 (J18)	8 (J18)	
5	5A	33 (CON1)	15 (CON1)	9 (J17)	10 (J17)	
	5B	33 (CON2)	15 (CON2)	9 (J18)	10 (J18)	
6	6A	32 (CON1)	14 (CON1)	11 (J17)	12 (J17)	
	6B	32 (CON2)	14 (CON2)	11 (J18)	12 (J18)	
7	7A	31 (CON1)	13 (CON1)	13 (J17)	14 (J17)	
	7B	31 (CON2)	13 (CON2)	13 (J18)	14 (J18)	
8	8A	30 (CON1)	12 (CON1)	15 (J17)	16 (J17)	
	8B	30 (CON2)	12 (CON2)	15 (J18)	16 (J18)	
9	9A	29 (CON1)	11 (CON1)	17 (J17)	18 (J17)	
	9B	29 (CON2)	11 (CON2)	17 (J18)	18 (J18)	
10	10A	28 (CON1)	10 (CON1)	19 (J17)	20 (J17)	
	10B	28 (CON2)	10 (CON2)	19 (J18)	20 (J18)	
11	11A	27 (CON1)	9 (CON1)	21 (J17)	22 (J17)	
	11B	27 (CON2)	9 (CON2)	21 (J18)	22 (J18)	
12	12A	26 (CON1)	8 (CON1)	23 (J17)	24 (J17)	
	12B	26 (CON2)	8 (CON2)	23 (J18)	24 (J18)	
13	13A	25 (CON1)	7 (CON1)	25 (J17)	26 (J17)	
	13B	25 (CON2)	7 (CON2)	25 (J18)	26 (J18)	
14	14A	24 (CON1)	6 (CON1)	27 (J17)	28 (J17)	
	14B	24 (CON2)	6 (CON2)	27 (J18)	28 (J18)	
15	15A	23 (CON1)	5 (CON1)	29 (J17)	30 (J17)	
	15B	23 (CON2)	5 (CON2)	29 (J18)	30 (J18)	
16	16A	22 (CON1)	4 (CON1)	31 (J17)	32 (J17)	
	16B	22 (CON2)	4 (CON2)	31 (J18)	32 (J18)	

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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 TBE is connected to two plug-in terminal blocks, for a redundant power supply.

**Termination Board general characteristics:**

Number of positions	Features
8	Power Supply voltage redundancy; Abnormal supply voltage signaling; Cumulative module fault signaling; HART Multiplexing.

**Supported I/O Cards and D5000 / D6000 Series modules:**

Refer to DTS1719.

**Installation:**

TBE-D5008-GMI-001 is a Termination Board supported by an aluminum shell suitable for installation on EN/IEC60715 TH 35 DIN-Rail.

TBE-D5008-GMI-001 unit can be mounted with any orientation over the entire ambient temperature range.

Electrical connections are the following:

- ALARM, PWR1, PWR 2: polarized plug-in removable screw terminal blocks for conductors up to 2.5 mm<sup>2</sup> (13 AWG) with a torque of 0.5-0.6 Nm.
- CON1 SHIELD: screw terminal block for conductors up to 2 mm<sup>2</sup> (14 AWG) fully tight.
- CON1: SUB-D 37 poles connector with screws retaining method.
- J9 HART: 34 poles male connector.

Electrical connection can be plugged in/out into a powered unit without suffering or causing any damage. Connect only one individual conductor per each clamping point. Wiring has to be sized according to the current and the length of the cables. On the section "Function Diagram" a block diagram identifies all connections.

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Any penetration of cleaning liquid must be avoided to prevent damage to the unit.

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According to EN/IEC61010, TBE-D5008-GMI-001 unit must be connected to SELV or PELV supplies.

All circuits connected to TBE-D5008-GMI-001 unit must comply with the overvoltage category II (or better) according to EN/IEC60664-1.

**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.

**Max allowed current consumption:** 1 A (as total supply).

**Connection:** by polarized plug-in disconnect screw terminal blocks to accommodate terminations up to 2.5 mm<sup>2</sup>.

**Protection fuse:** 4 A time lag.

**Fault detection:**

The on-board diagnostic monitors both power supplies integrity and the module cumulative fault. Any malfunction is reported by deactivating a solid-state relay and activating the corresponding LEDs.

Alarm is issued if:

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**Cable:** flat cable CABF032.

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CE mark compliant, conforms to Directive:  
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**Environmental conditions:**

**Operating:** temperature limits – 40 to + 70 °C,  
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**Max altitude:** 2000 m a.s.l.

**Storage:** temperature limits – 45 to + 80 °C.

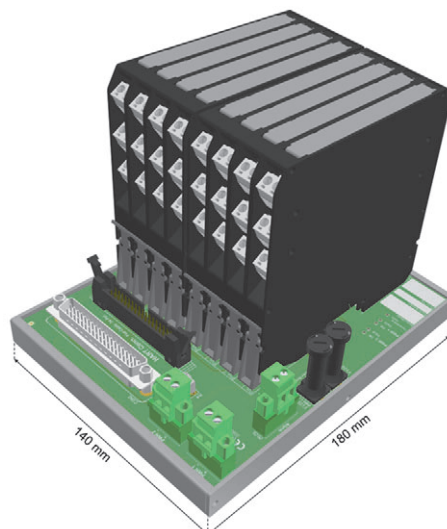
**Mounting:**

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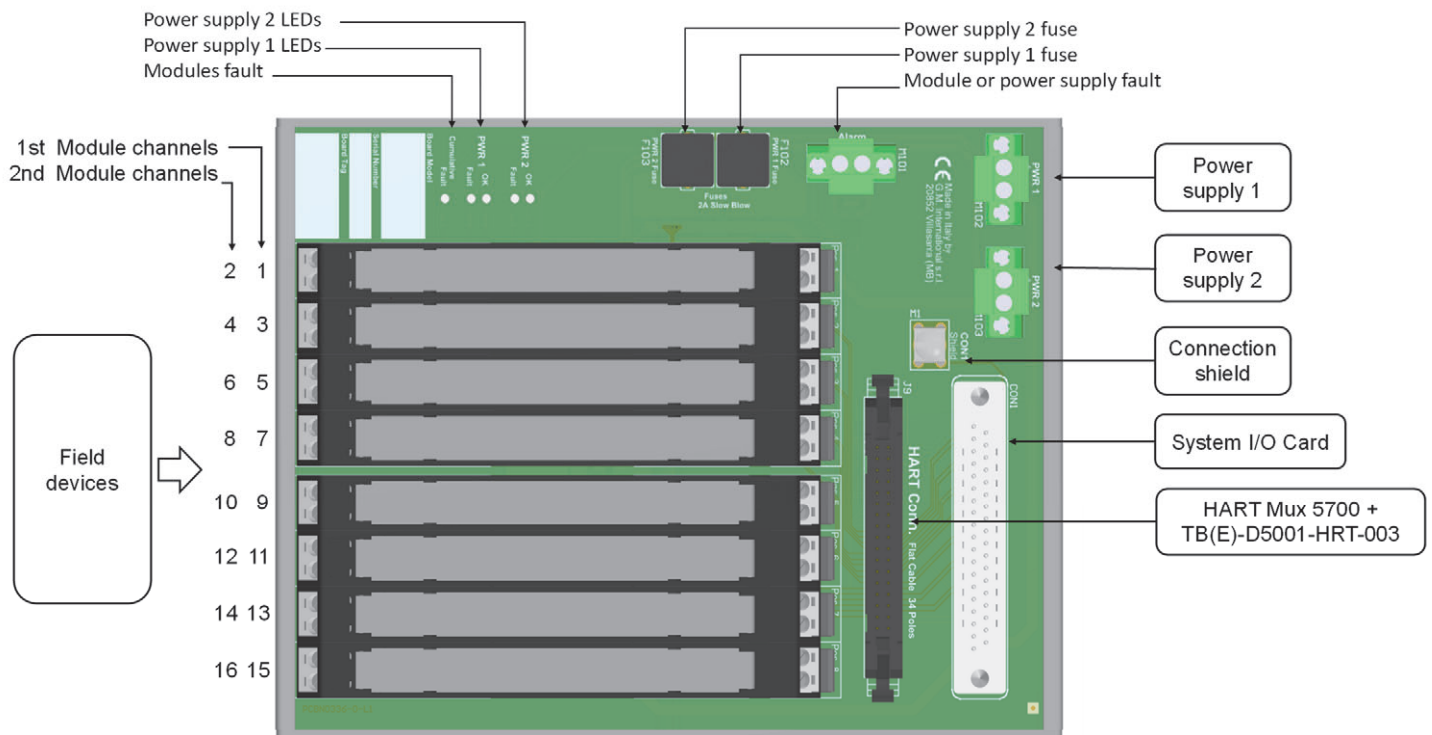
**Weight:** about 450 g, excluding modules (+ 50 g plastic clips or 380 g metal clips).

**Location:** installation in Safe Area.

**Dimensions:** Width 140 mm, Depth 180 mm, Height 154 mm.

**Image:**

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1	1A	37	19	1	2	CON1: • Shield terminal block pole: 21. • 24V pole: 1. • Ground pole: 20. • Unconnected poles: 2, 3.  J9: • Unconnected poles: 33, 34.
	1B	36	18	17	18	
2	2A	35	17	3	4	
	2B	34	16	19	20	
3	3A	33	15	5	6	
	3B	32	14	21	22	
4	4A	31	13	7	8	
	4B	30	12	23	24	
5	5A	29	11	9	10	
	5B	28	10	25	26	
6	6A	27	9	11	12	
	6B	26	8	27	28	
7	7A	25	7	13	14	
	7B	24	6	29	30	
8	8A	23	5	15	16	
	8B	22	4	31	32	