HTM TSTB THREE STAGE TRANSIENT BARRIER

INTRODUCTION

During lightning strikes, large electrical surges are induced in long instrument cables as a result of the collapse of electric field in the vicinity. These surges may be of the magnitude of several thousand amperes and the voltage between the lines and ground may be several thousand volts. Any equipment connected to the lines that are unprotected will be invariably damaged.

HTM TSTB is a compact transient barrier designed for the protection of solid state components in instruments that employ overhead or underground cables for signal transmission against these lightning surges. Standard units are housed in compact housing and are suitable for DIN rail mounting to achieve space-saving in instrument panels. HTM TSTB is particularly suitable for the protection of 4-20mA instrument signals and DC power supply for instruments.

PRINCIPLE OF OPERATION

The HTM TSTB consists of three stages of surge protection devices. When lightning surge occurs to the lines connected, a three element gas discharge tube (GDT) will conduct and divert major part of the lightning surge to the earth connected to the unit. In addition, three high speed varistors connected between the lines and earth will clamp the voltages across the lines and earth to a safe voltage. The residual voltage of the lines will then be further clamped by a transient voltage suppressor across the lines to a very safe voltage that will not damage the instruments connected to the unit. This effectively protects the instruments from external surges. However, since inductors are used as surge

limiting device between the three stages, HTM TSTB is not suitable for AC applications.

APPLICATIONS

HTM TSTB is suitable for the protection of all solid state instruments operating at a continuous DC voltage not exceeding 33V. It is particularly suitable for the protection of level sensors, transmitters, flowmeters, indicators and PLC where electrical signal transmission is used.

FEATURES

20kA Surge Rating for 8/20µs Pulse

The first stage of the HTM TSTB is designed to divert a surge current of up to 20kA, which is the normal magnitude of lightning surges in tropical countries.

Compact and Low Cost

HTM TSTB is constructed from robust and compact housing for DIN rail mounting. It can be mounted together with terminal blocks for greater cost effectiveness.

Self Resetting

HTM TSTB is a self resetting transient barrier, no replacement of fuse or manual reset of switches is required.

Dual Mode Protection

HTM TSTB provides both common mode and differential mode protection during lightning surges. This means more comprehensive protection is achieved.

Low Loop Resistance

HTM TSTB has practically zero ohm across the terminals. Only inductors are used between the different stages in the unit.

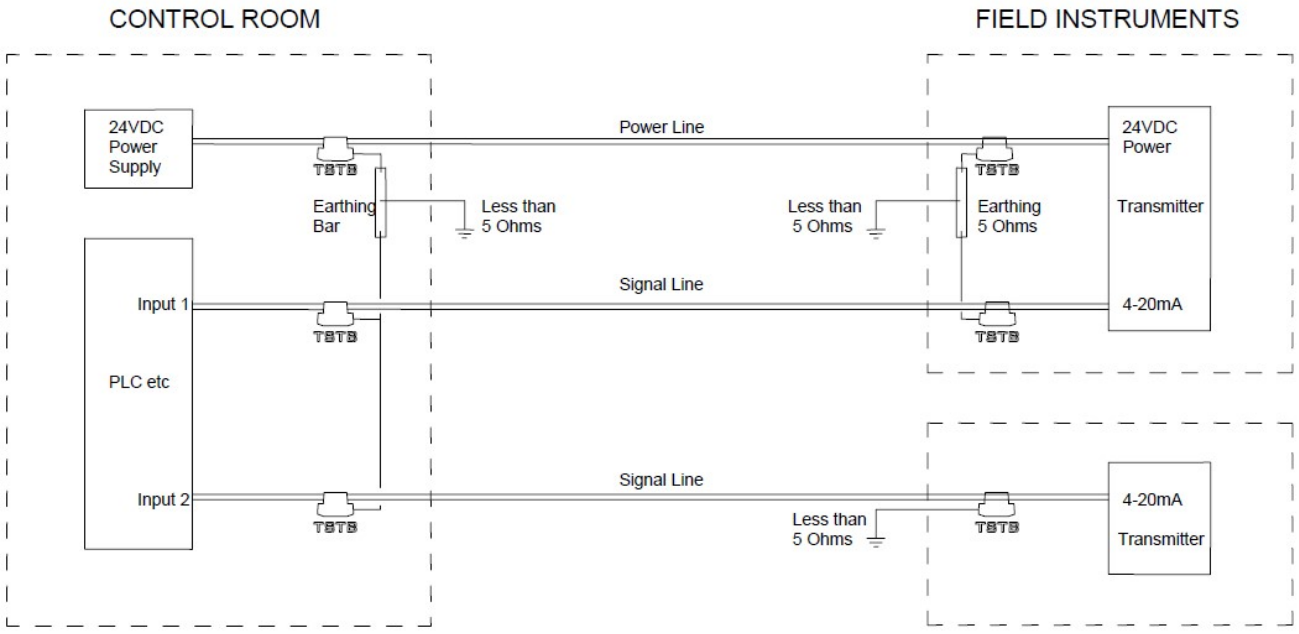
No External Power Required

HTM TSTB is a passive transient barrier and no external power supply is required.

SPECIFICATIONS

Rated surge current	20kA (8.20μs)
Impulse spark-over voltage	500V (100V/μs)
Compliance	ANSI/IEEE C62.41
Minimum insulation resistance	10^4 MΩ
Maximum capacitance	15nF
DC loop resistance	Less than 0.5Ω
Nominal voltage	24VDC
Maximum continuous voltage	33VDC
Maximum continuous current	1.2A
Clamping voltage	48V
Response time	10ns
Inductance	20mH per phase
Materials of construction	ABS
Enclosure	IP45
Terminal size	2.5mm² cable
Operating temperature	-10 to 60°C
Mounting	DIN rail or panel
Weight	51g

TYPICAL WIRING DIAGRAM

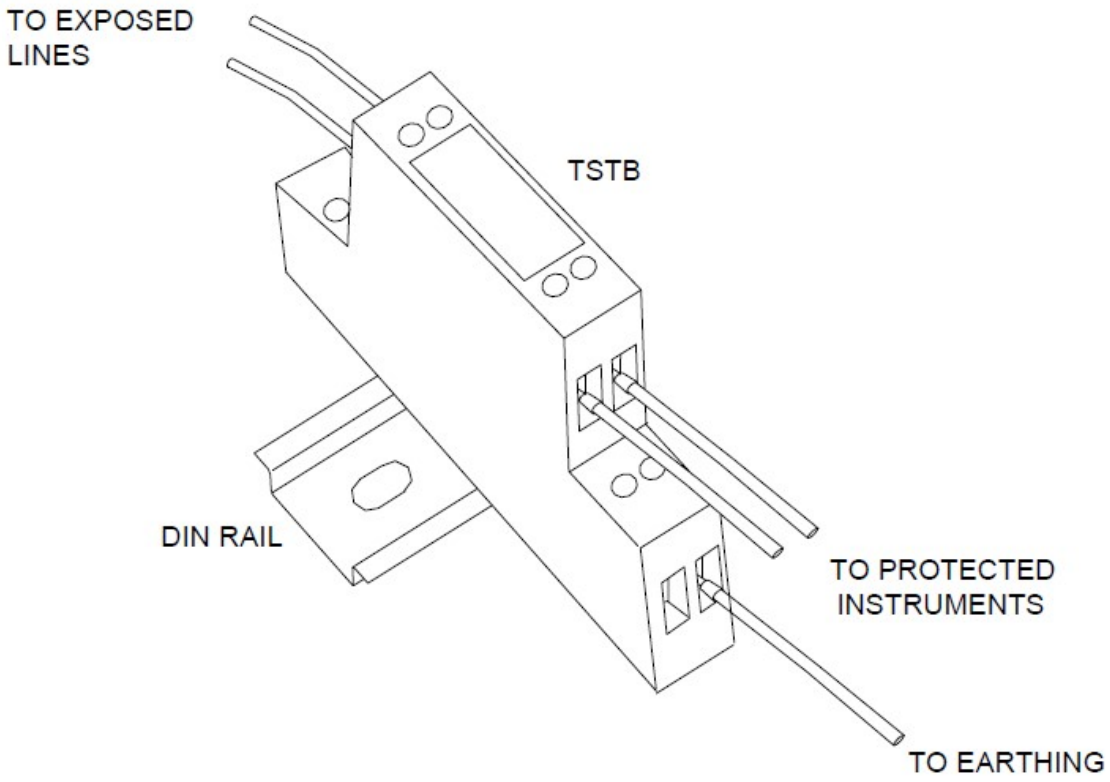


INSTALLATION REQUIREMENTS

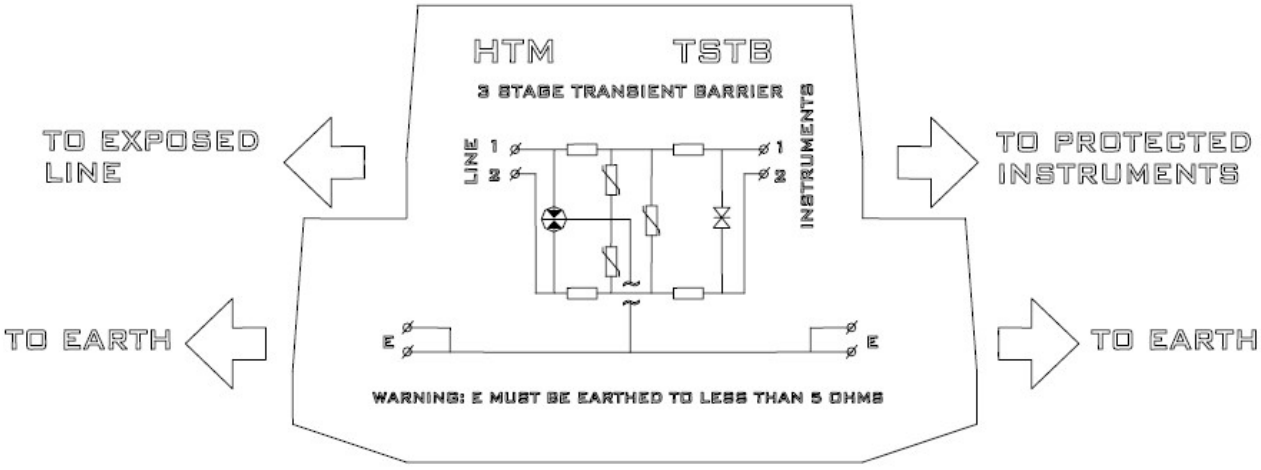
HTM TSTB is surge diverting type of transient barrier. Therefore, a good earthing of less than 5Ω must be connected to one of the four earthing terminals located at the power part of the unit. Protection will not be achieved if the earthing is not connected or is higher than 5Ω.

It is also important that the *Line* and *Instruments* sides of the TSTB are connected to exposed line and instruments to be protected correctly. Reversed connection will result in damage of the TSTB and instruments during surge condition.

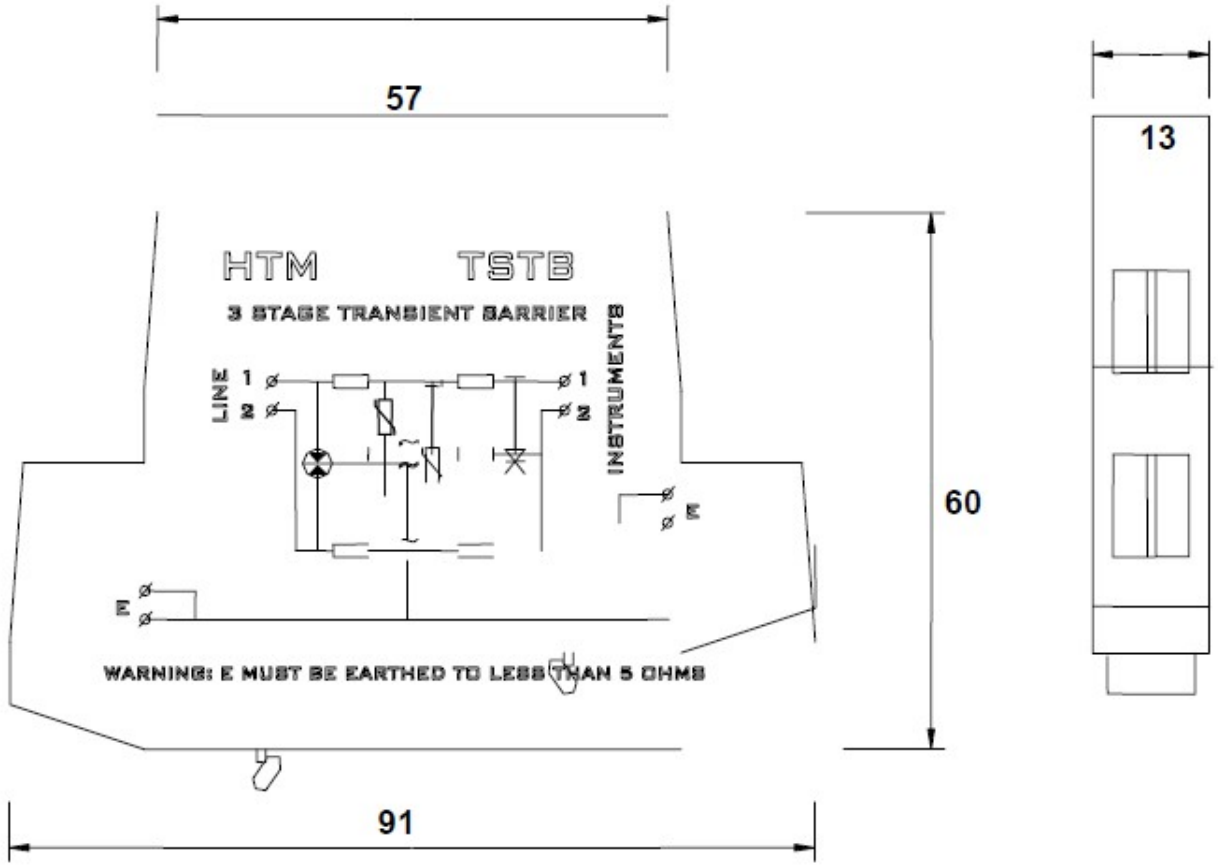
TYPICAL INSTALLATION



BLOCK DIAGRAM



DIMENSIONS



All dimensions in mm

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