



We Control Electrostatic

VITAL ENGINEERING INSTRUMENTS

Reg Office : Plot 746/1 Office-03 Makarpura GIDC, Vadodara, Gujarat - 390010

www.vitalengginstruments.in Mob : 8347269644 GST : 24DVPPP1558F1ZA.

FLP/WP - Human Body Static Dissipator – LAMP & DISPLAY Unit





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Introduction to Static Electricity

All physical objects are made up of atoms. Inside an atom are protons, electrons and neutrons. The protons are positively charged, the electrons are negatively charged, and the neutrons are neutral.

Therefore, all things are made up of charges. Opposite charges attract each other (negative to positive). Like charges repel each other (positive to positive or negative to negative). Most of the time, positive and negative charges are balanced in an object, which makes that object neutral.

Static electricity is the result of an imbalance between negative and positive charges in an object. These charges can build up on the surface of an object until they find a way to be released or discharged.

Human body gets static charge by scuffing shoes on a carpet, wollen cloth rubbed to skin etc. When human body attains the static voltage equal to breakdown voltage of air (3kV/mm approx.) and goes in vicinity of earthed objects, spark is generated between part of the body and earthed object to discharge the static voltage to the earthed object. Hence, when human body gets static charge and enters hazardous areas, spark could be generated due to discharge of electricity leading to fire hazard. The fastest way to get rid of static electricity in the body is to discharge the static charge from body into the ground.

Resistance of Human Body

In the winter season, due to the dry weather (less relative humidity), the resistance of human body is more and higher static charge is generated. When human body is charged, electrostatic voltage is developed in the body (static voltages of even 35,000 volts have been recorded).

Higher the resistance of the body, more is the static voltage developed. Hence, it can be inferred that, electrostatic voltage (V) developed due to static charge is directly proportional to the resistance (R) of human body i.e. $V \propto R$. The threshold current for pain in Human body is 1mA, so the current flowing through human body due to static voltage has to be restricted to less than 1mA. To maintain the static voltage (V) within safe

value of 1000V (considered as safe margin below the breakdown voltage of air) with limiting value of threshold current (I), the resistance (R) shall be as below:

$$R = V/I = 1000 \text{ Volts} / 1\text{mA} = 1000 \text{ K Ohms or } 1 \text{ Mega Ohm.}$$

Hence, the human body resistance below 1000 K Ohms is recommended in order to maintain the static voltage within safe limit.

Human Body Static Dissipator

To discharge the static charge developed in human body to the ground, human body static dissipator provides complete solution, by measuring the resistance of human body and providing conductive path for static charge dissipation to earth. It ensures that, the human body resistance is below 1000K Ohms and safe from risk of spark generated due to static discharge, prior to entering into hazardous area.

Operation Principle

Human body static dissipator measures the resistance of human body and displays 'Pass or Open' depending on the measured value of resistance. It also provides path for static charge of the human body to discharge to earth. When human body has static charge, the resistance is typically above 1 Mega Ohm. When the human body is discharged the resistance falls below 1 Mega Ohm. When the resistance is above 1 Mega Ohm, the device displays 'Open'. When the resistance is below 1 Mega ohm, the device displays 'Pass'. A relay output contact is available which can be used for annunciation or interlock with the access door or gate to restrict entry of people only after static charge dissipation.



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Technical specification

Power supply - FLP	230 V AC
Type of Ex protection	Ex"d"
Temperature Class	T4/T6
Interlock contact	YES – 02 NO/NC
Display	Resistance Display
LAMP	Green – Healthy Discharge Red – OPEN or Not Discharged
Present resistance value	750K-1 M ohm
Mounting	Wall mounting
Handles	Test & Ref. Ground handle/Plate – SS304
Power On/Off switch	06 Amp

General Flame Proof Enclosure Specifications

Flame proof (Explosion proof)	Ex-d
Area Classification	Zone 1 & 2
Gas Groups	IIA IB / IIC(Optional)
Certification	CIMFR / PESO (OPTIONAL)
Material	Touch handles SS304 / SS316(Optional)
Temperature Class	T6 (85 deg.C)



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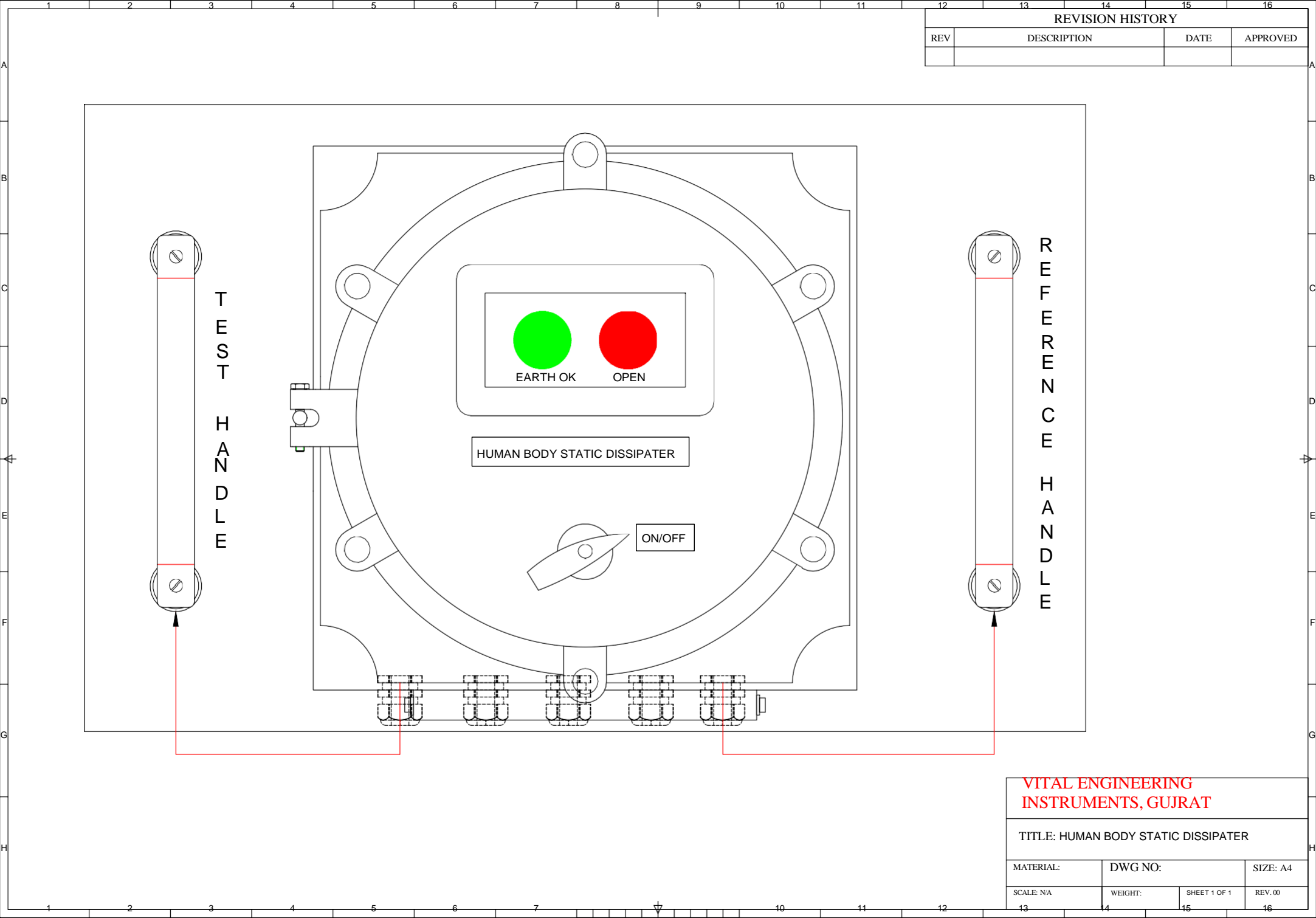
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Application Usage & Technical Guide Human Body Static Dissipator



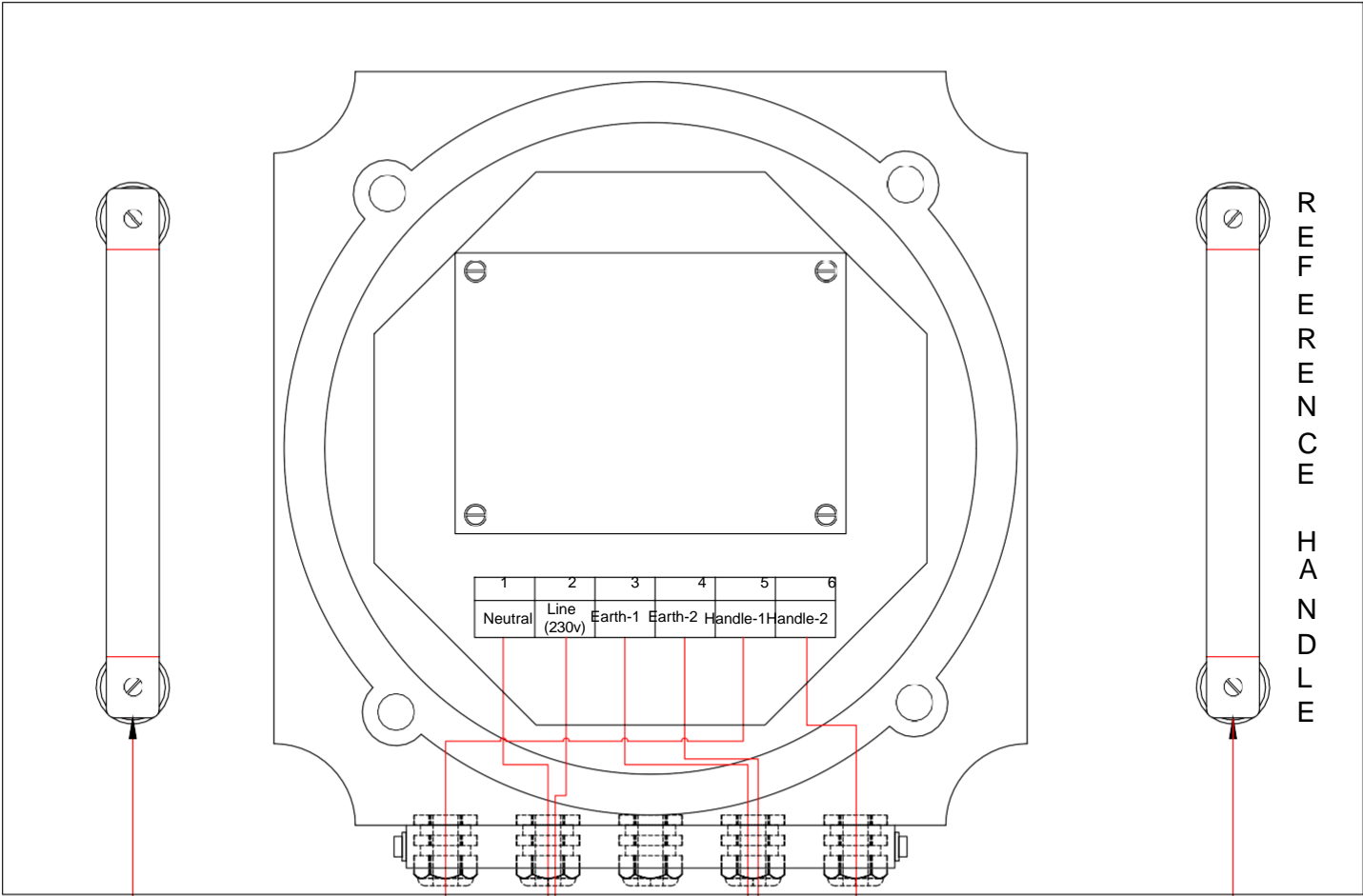
- Install the UNIT near to entrance or any exit in the plant area
- Install the UNIT and connect the Low Impedance earth path (i.e. Earth Pit)
- Touch the Static Discharge Poles for 3-10 Seconds and allow the GREEN indication to light up
- Kindly release the hand after GREEN Indication is ON
- Repeat the Process every time a person enters the Hazardous area



REVISION HISTORY			
REV	DESCRIPTION	DATE	APPROVED

VITAL ENGINEERING INSTRUMENTS, GUJRAT			
TITLE: HUMAN BODY STATIC DISSIPATER			
MATERIAL:	DWG NO:	SIZE: A4	
SCALE: N/A	WEIGHT:	SHEET 1 OF 1	REV. 00

REVISION HISTORY			
REV	DESCRIPTION	DATE	APPROVED



VITAL ENGINEERING
INSTRUMENTS, GUJRAT

Title: FLP Human Body Static Dissipator

MATERIAL:	DWG NO:	SIZE: A4
SCALE: NA	WEIGHT:	SHEET 1 OF 1
		REV. 00