

**Railway Energy Components**  
Voltage limiting device  
ME-VLD series



## GENERAL INFORMATION

In DC traction systems, impermissible touch voltages may occur between the return circuit and the earth structure; they can be caused both by currents due to trains' operations and by short-circuit currents due to faults.

The persistence of these voltages must be prevented by means of a voltage limiting device in accordance with IEC 62128-1 / EN 50122-1. For this reason, Mont-Ele Voltage Limiting Device (ME-VLD) has been designed to protect persons against dangerous touch voltages; the ME-VLD system detects and removes hazardous voltage conditions by shorting the track DC return circuit of railway, tramway, trolleybus and underground systems to the ground system in a timely, effective and safe manner.

## FEATURES

- **Maximum protection for personnel and equipment due to rapid response time**
- **Operational safety and reliability due to high current carrying capacity and verification by type testing**
- **Simple installation**
  - No commissioning required as the system is supplied ready for operation
  - High functionality and ease of use due to programmable controller with display
  - Possibility of VLD class selection, parameterization through the display, according to operating conditions
- **Designed according to EN 50526-2 / IEC 62848-2 and fulfills all the criteria according to IEC 62128-1 / EN 50122-1 standard**

## PRODUCT VERSIONS

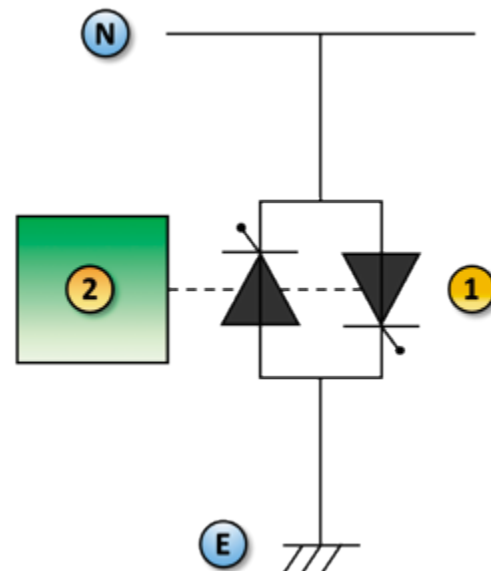
The Mont-Ele Voltage Limiting Device ME-VLD, according to table 1 of the reference standard EN 50526-2, is available in 3 different versions / classes:

Version	Class EN 50526-2 Tab. 1	Switching method	Polarity	Response time TR
ME-VLD-A	2.2	Triggering of Thyristors	Unidirectional Bidirectional	Instantaneous
ME-VLD-B	4.2	Combination of thyristors and contactor	Unidirectional Bidirectional	Instantaneous and according to EN 50122-1
ME-VLD-C	4.3 Custom application	Combination of thyristors and contactor	Unidirectional Bidirectional	Instantaneous, according to EN 50122-1 and client request

## ME-VLD-A THYRISTORS

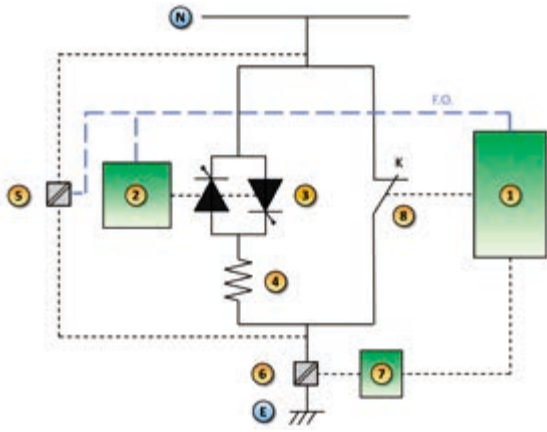


ME-VLD-A makes negative to earth connection using anti-parallel connected thyristors; they are controlled by a dedicated trigger board and control unit.



N°	OBJECT
1	Anti-parallel thyristor unit (SCR)
2	MEPSEL0047: Mont-Ele THYRISTORS drive board unit
N	Negative
E	Earth

## ME-VLD-B COMBINATION OF THYRISTORS AND CONTACTOR



**MEPSEL0047**  
THYRISTORS  
DRIVE BOARD

**ME-MPS31**  
MULTIFUNCTION  
PROTECTION DEVICE  
AND CONTROL UNIT

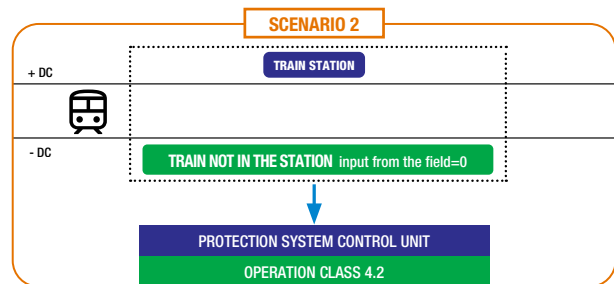
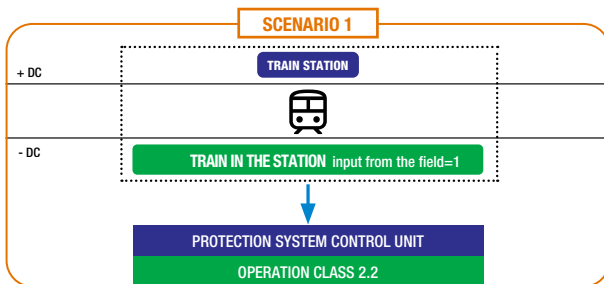
**VAC-2**  
CURRENT MEASURING  
AMPLIFIER FOR HALL  
EFFECT TRANSDUCER

N°	OBJECT
1	ME-MPS31: Mont-Ele multifunction protection and control unit
2	MEPSEL0047: Mont-Ele THYRISTORS drive board unit
3	Anti-parallel THYRISTORS unit (SCR)
4	Limiting resistance
5	Voltage transducer – METRO-TV-V: Mont-Ele Voltage transducer
6	Hall effect current transducer (TA)
7	VAC-2: Mont-Ele current measuring amplifier for Hall effect transducer
8	Power contactor (K)
N	Negative
E	Earth

ME-VLD-B makes negative to earth connection using anti-parallel connected thyristors together with a power contactor; control and coordination between the two devices is realized by a dedicated ME-MPS31 protection relay, which also manages current and voltage measurements coming from TA and METRO-TV-V.

## ME-VLD-C CUSTOM APPLICATION EXAMPLE

ME-VLD-C layout is the same as ME-VLD-B (refer to Figure 2). The difference between the two versions lies in the possibility of realizing an overvoltage protection oriented to possible customer requests and typical applications that can be encountered in railway systems. ME-VLD-C owns an additional programmability allowing a change in the kind of operation (from class 2.2 to 4.2). A typical application is:



### BENEFITS:

- Change of VLD operation class during the transition of the train passing through a station.
- Closing only SCR as the train is in station means more protection safeguarding at the same time contactor's wear (and therefore reducing maintenance need). Contactor can anyway be closed in case of anomalous conditions (as SCR maximum specific energy overcome).

## VLD-PS - PROTECTION FUNCTIONS

Overvoltage protections	Overcurrent protections	Other functions
<b>MAX DC Overvoltage (45 OVV)</b> <ul style="list-style-type: none"> <li>• n.4 DC (45 OVV) custom settable levels</li> <li>• EN-50122-1 DC curve limit protection</li> </ul>	<b>I2t</b> Thermal current limit protection	<b>Anti-pumping / locket state</b> Contactor permanently closed in case of fault or in case of continuous repetition of OV, fault or anomalous conditions
<b>MAX AC Overvoltage (59 OVV)</b> <ul style="list-style-type: none"> <li>• n.4 AC (59 OVV) custom settable levels</li> <li>• EN-50122-1 AC curve limit protection</li> </ul>	<b>HSCB triggering command</b> in case of anomalous overcurrent or fault	<b>Test SCR</b> Verification of functionality of SCRs with real overvoltage injection
<b>MAX_V_SCR</b> Instantaneous SCR intervention according to settable threshold	<b>I++</b> overcurrent protection	<b>Counters</b> <ul style="list-style-type: none"> <li>• n. SCR operation</li> <li>• n. 45 OVV trip</li> <li>• n. SCR trip</li> <li>• n. I2t trip</li> <li>• n. Contactor operation</li> <li>• n. 59 OVV trip</li> <li>• n. I++ trip</li> </ul>
	<b>I_OP_K</b> Max current allowable for commanding contactor (K) reopening	<b>Autodiagnostic function</b> <b>Stray Current System:</b> measure available for Stray Current System <b>Storage</b> of events, alarms, trips with measurement values measure

ELECTRICAL FEATURES	ME-VLD-A	ME-VLD-B	ME-VLD-C
VLD class EN 50526–2 Tab. 1	Class 2.2	Class 4.2	Class 4.3 / Settable class
Switching method	Triggering of Thyristors	Combination of thyristors and contactor	
Polarity	Unidirectional / Bidirectional		
Nominal Voltage (Un)	600 ÷ 3600 Vdc		
Power frequency withstand voltage (Ua)	4,2 kV (EN 50526–2 standard)		
Auxiliary circuits insulation	2kV		
Short time withstand current (I <sub>w</sub> )	35 kA – 50 kA – 71 kA – 100 kA		
Rated current (Ir)	Up to 500 A	1500 A	client request
Nominal triggering voltage (UTn)	Manual threshold within following values: 60 V – 120V – 200 V – 300 V 500 V – 600 V	According to EN 50122–1	According to EN 50122–1 or client request (with range 10 V ÷ 600 V)
Response time TR	instantaneous	According to EN 50122–1	Instantaneous or according to EN 50122–1 or client request (with range: 20ms ÷ 5000ms)
PROTECTION FUNCTIONS	– AC / DC overvoltage – continuous analysis of correct functioning	VLD–PS PROTECTION FUNCTIONS	VLD–PS PROTECTION FUNCTIONS and client request
Mechanical operations of the contactor	NA	Up to 1.500.000	
Operations of the thyristors	Up to 15.000.000		
Auxiliary power supply voltage	48 – 110 – 132 VDC Other Vaux levels available on request		
Trigger board choice	Self–supplied version (from 0V between track and earth) or AUX voltage supplied version		



MECHANICAL FEATURES	AVAILABLE FOR ALL VERSIONS OF ME-VLD		
Type of installation	INDOOR	OUTDOOR	OUTDOOR
IP DEGREE VERSION	IP 31	IP 43	IP 65
Withdrawable version available (all the equipment installed on the trolley)	YES	YES	NO
Cubicle overall dimensions (W–D–H) Width – Depth – Height1	800 mm – 600 mm – 1500 mm Other dimensions available on client requests.		
Maximum altitude	< 1400 a.s.l.		
Operating temperature range	– 5°C +40°C	– 40°C +50°C	

This document contains general description of the technical options which may not be present in individual cases. Therefore, the required performance characteristics must be defined in individual cases during conclusion of the contract. In view of the constant evolution in standards and design, and due to continuous developments, the characteristics of the elements contained in this catalogue are subject to changes without prior notification. These characteristics, as well as the availability of components, are subject to confirmation by the MONT-ELE Technical Sales Department. No contractual value. All right reserved. No part of this publication may be reproduced without the permission of MONT-ELE S.r.l. Mont-Ele is a registered trademark. **Cod. VLD-SSE-001**

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