TRUSTED BY CORROSION ENGINEERS WORLDWIDE

M.C. MILLER Co.

SINCE 1945

Cathodic Protection Decoupling Devices

Meeting Your AC Mitigation Needs

We not only protect pipelines, We install peace of mind

www.mcmiller.com 772-794-9448 sales@mcmiller.com

Product:

M.C.Miller Co., Inc. **Solid State Decoupler**
Model: **SSD PCR**

Category:

- Oil and Gas Transmission Pipelines.
- Tanks and Oil Depot Facilities.
- Bulk Water Pipelines.
- Refinery and Petrochemical Industries.

Background:

M.C.Miller Co., Inc. Solid State Decoupling device is a solid state DC Isolation / AC Grounding device designed for specific protection applications generally found in buried pipeline and storage tank systems. The equipment is suitable to be employed in AC Mitigation applications, Over Voltage protection of Insulating Joints, DC Isolation and AC Grounding for Cathodically Protected structures.

The need for solid state decouplers arises from mitigating induced voltages on pipelines near overhead power lines. These decouplers are installed for safety reasons as well as maintaining required DC voltages for protecting the integrity of pipelines & tanks. M. C. Miller's range of **Solid State Decouplers** are known for their quality, service life, low cost and workmanship. Using advanced electrical and electronic technologies, our SSD products enhance Cathodic Protection systems and ensure the safety of the workers operating in that environment.

Application:

Our **Solid State Decoupling** devices are purpose designed to:

- Decouple dissimilar metals that must, by regulation or galvanic corrosion, be AC grounded but isolated DC.
- Isolate electrical DC equipment in Cathodic Protection systems.
- AC coupling to earth where DC blocking/isolation is required. Over voltage, conditions emanating from Induced AC surges, lightning and switching transients and Rectifier failure.
- Protection of Insulating joints on pipelines.
- Mitigation of AC induced voltages.
- Decoupling in gradient control (earth/grounding) mats from pipelines and structures.

Protection of Insulating joints that require overvoltage protection due to the relatively small clearance between the flange faces, bolt to bolt hole and bolt head/nut to flange face. In order to protect the insulating materials used in the insulating flange kit. Overvoltage protection devices are applied to ensure the voltage does not exceed pre-determined levels.

Advantage:

- Build to meet stringent International standards
- Build to client specifications
- Standard packaging forms IP 68 and Exe.
- Ease of installation

Benefits:

- Higher blocking voltages over older technologies such as polarisation cells.
- Technically advanced.
- Can handle large steady state clamping currents for longer periods of time than Metal oxide varistor (MOV) applications.
- Light weight compact designs.

Model: **PCR** Selection Guide

Typical Order Code: **DCD** **1.2kA** **SL** **+1/-12V** **A45** **a.**

DC Decoupler – SSD PCR

Standard assembly is installed in a performance test rated moulded non metallic enclosure, suitable for indoor/outdoor application

(IP68 Certificate; Equivalent to NEMA 4, 4X, 6P) complete with access cover and cable termination fittings.

AC Fault Current Exposure – 1 cycle @ 60Hz rms:

*1.2kA *2kA *3.7kA *5kA *9kA *14kA

Surge/Lighting Protection:

Standard assembly, peak surge current rating

Primary > 100kA @ 10/350µs
100kA @ 8/20μs

DC Voltage Threshold:

Standard assembly @ +1/-12V or +1/-3V or +2/-2V
Custom – Specify DC Voltage Threshold

Mitigation of Induced AC-Steady State (@ 50 or 60 Hz rms):

Selection range 0-100 amperes, as specified by the customer.

0 amp (no AC Mitigation) - 45 amp

Options *(As Specified by Customer)*:

a. ☐ IP 68 Exe Rated Enclosure for Hazardous Areas
No. 4 Box

b. ☐ IP68 Exe Rated Explosion Proof Enclosure
for Zone 1 Hazardous Areas

Product:

M.C. Miller Co., Inc. **Solid State Decoupler**
Model: **SSD DCDth**

Category:

- Oil and Gas Transmission Pipelines.
- Bulk Water Pipelines.
- Refinery and Petrochemical Industries.
- Tanks and Oil Depot Facilities.

Background:

Maintains an off state in a desired range of voltage between a pipe and ground/earth. When the range is exceeded, it short circuits and brings the pipe down to ground potential and does not switch off until the polarity of the exceeded potential threshold reverses or the current flowing through the device falls below it characteristics holding value.

Application:

Our **Solid State De-Coupling** devices are purpose designed to:

- De-couple dissimilar metals that must, by regulation or galvanic corrosion, be AC grounded but isolated DC.
- Isolate electrical DC equipment in Cathodic Protection systems.
- AC decoupling to earth where DC blocking/isolation is required. Over voltage, conditions emanating from Induced AC surges, lightning and switching transients and Rectifier failure.
- Protection of Insulating joints on pipelines.
- Mitigation of AC induced voltages.
- De-Coupling in gradient control (earth/grounding) mats from pipelines and structures.

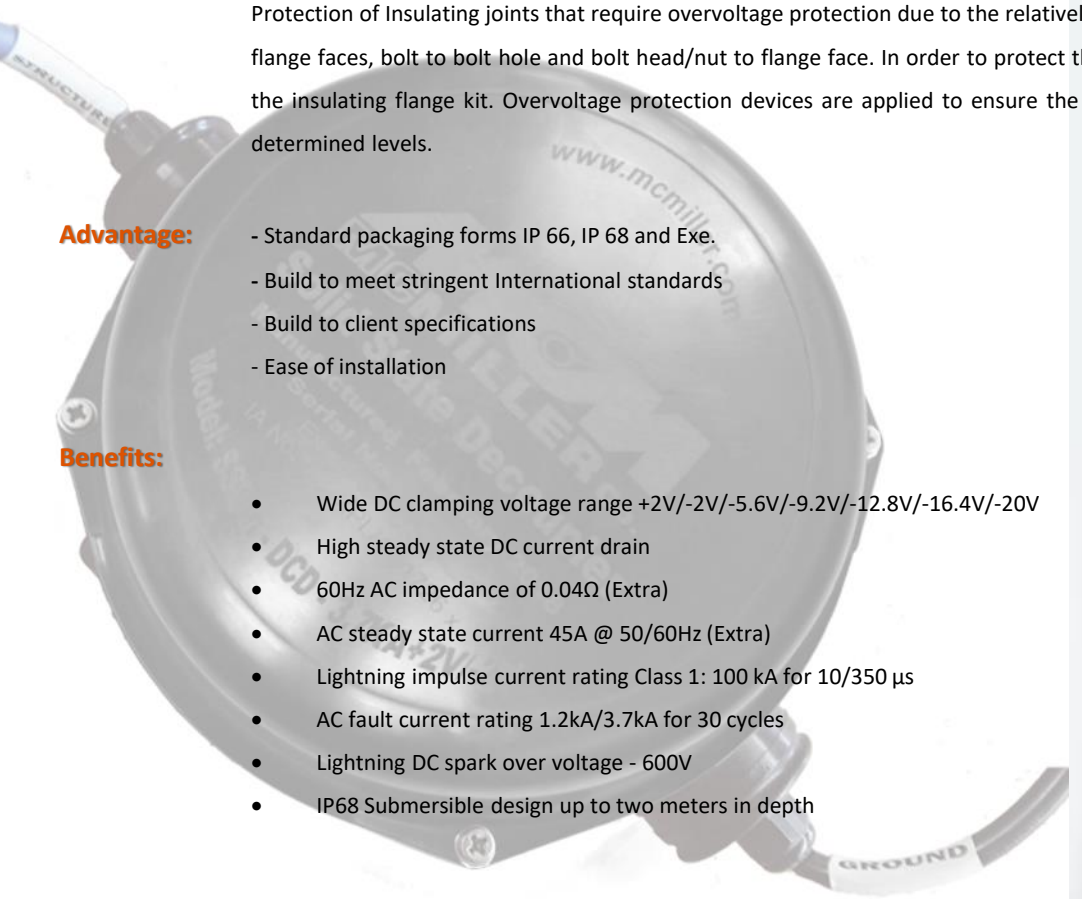
Protection of Insulating joints that require overvoltage protection due to the relatively small clearance between the flange faces, bolt to bolt hole and bolt head/nut to flange face. In order to protect the insulating materials used in the insulating flange kit. Overvoltage protection devices are applied to ensure the voltage does not exceed pre-determined levels.

Advantage:

- Standard packaging forms IP 66, IP 68 and Exe.
- Build to meet stringent International standards
- Build to client specifications
- Ease of installation

Benefits:

- Wide DC clamping voltage range +2V/-2V/-5.6V/-9.2V/-12.8V/-16.4V/-20V
- High steady state DC current drain
- 60Hz AC impedance of 0.04Ω (Extra)
- AC steady state current 45A @ 50/60Hz (Extra)
- Lightning impulse current rating Class 1: 100 kA for 10/350 µs
- AC fault current rating 1.2kA/3.7kA for 30 cycles
- Lightning DC spark over voltage - 600V
- IP68 Submersible design up to two meters in depth



Model: **SSD DCDth** Selection Guide

Typical Order Code:	**DCDth**	**1.2kA**	**SL**	**-2V to +2V**	**A45**	**No.1**

DC Decoupler – SSD DCDth

Standard assembly is installed in a performance test rated moulded non metallic enclosure, suitable for indoor/outdoor application

(IP68 Certificate; Equivalent to NEMA 4, 4X, 6P) complete with access cover and cable termination fittings.

AC Fault Current Exposure – 1 cycle @ 60Hz rms:

*1.2kA *2.0kA * 3.7kA *5kA

Surge/Lighting Protection:

Standard assembly, peak surge current rating

Primary > 100kA @ 10/350µs
100kA @ 8/20μs

DC Voltage Threshold:

Standard assembly @ -2 V to +2 V -5.6 V to +2 V -9.2 V to +2 V

-12.8 V to +2 V -16.4 V to +2 V -20 V to +2 V

Mitigation of Induced AC-Steady State (@ 50 or 60 Hz rms):

Selection range 0-100 amperes, as specified by the customer.

0 amp (no AC Mitigation) - **45 amp**

Options *(As Specified by Customer)*:

IP 68 & Exe for hazardous areas.

IP68 Exe Rated Explosion Proof Enclosure for Zone 1 Hazardous Areas

Product:

M.C. Miller Co., Inc. **Voltage Limiting Device**
Model: **CE-VLD-70-EX**

Category:

DC transient protection and voltage limiting device for:

- Test points
- Ground Mats
- Earth Spikes
- Rebar Connections

Background:

CEVLD70Ex has low voltage threshold ensuring secure equipotential across the insulating flanges where "touch" hazards can occur across insulating flanges. The **CEVLD70Ex** devices out-perform general purpose equipotential devices in it's application

Application:

CEVLD70 and its hazardous areas counterpart the CEVLD70Ex are especially applicable where low equipotential thresholds are required across the insulating flange as well as above ground, accessible to public, sections of pipeline, Pipe racking and non-grounded pipe supports ensuring ground decoupling whilst maintaining a low equipotential.

Advantage:

- DC Voltage Blocking @ 75 V
- Lightning impulse clamping voltage @360 V
- Very fast clamping response time @25 ns
- Lightning current rating Class II @50 kA for (8/20 µs)+

Benefits:

- Submersible enclosure up to 2 metres in depth – IP68

Product:

M.C. Miller Co., Inc. **Gas Discharge Device**
Model: **Spark Gap Device**

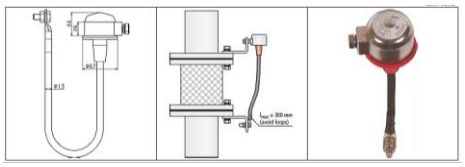
Category: Protecting Insulated Joints from lighting and AC Fault Damage

Application: Typical discharge currents are 50 kA & 100 kA. Please be advised that Gas Discharge devices cannot accommodate an indefinite number of discharges. Most discharge devices can only cope with 1 (one) 100 kA discharge before the characteristics of the device are irreversibly altered through repetitive discharge.

Advantage: Flexible connecting cable.

Benefits: A long service life

Easy connection of the spark gap at pipeline flanges



EXFS L300

• Lightning impulse current (10/350µs)	- 50 kA
• Classification of lightning current carrying capability acc. To prEN	- N
• Nominal discharge current (8/20 µs)	- 100 kA
• 100% lightning impulse spark over voltage	- ≤ 2.5kV
• Power frequency spark over voltage (50 Hz)	- ≤ 1.2kV
• Type of protection according to EN 50014, EN 50021	- II 3 G Eex nC II T4
• Operating temperature range [TU]	- -20 °C...+80 °C
• Degree of protection	- IP 54
• Approvals certifications	- ZELM 03 ATEX 3192X
• Length of enclosure	- 90 mm
• Diameter of enclosure	- 63 mm
• Enclosure material	- zinc die casting , plastic
• Connecting cable	- H01N2-D 25 mm² with cable lug and M 10 screw / nut
• Cable Length	- 300 mm
• Suitable for flange size	- 220-320 mm

CEH-E800 100kA

• Dimensions	- 48 mm long x 30 mm diameter
• Protection class	- 1 EN61643-11
• Nom DC spark over voltage	- 800 VDC
• DC spark over voltage	- >600 VDC
• Impulse spark over voltage @ 1.2/50 µs	- 1500V
• Max continuous operating voltage	- 255 VAC 50/60 Hz
• Nominal discharge current 8/20 µs	- 100 kA
• Impulse current 10/350 µs	- 100 kA
• Follow current @ 50/60 Hz	- 100 A
• Mounting	- M8 x 7 mm stud

OPTION:
If provided with the flange size and spec we are able to supply mounting lugs to suit as indicated