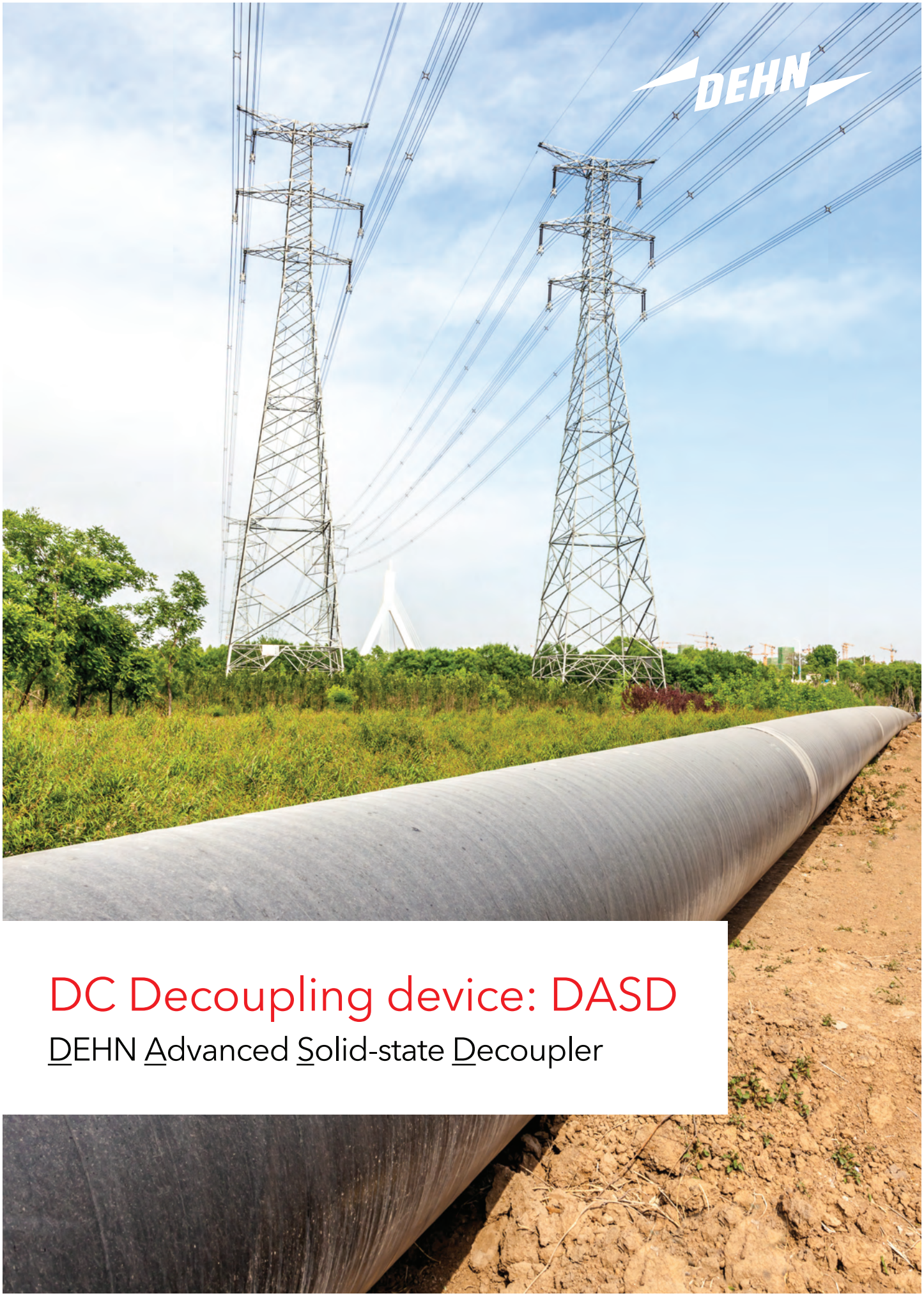


DC Decoupling device: DASD

DEHN Advanced Solid-state Decoupler

www.dehn-international.com

DEHN PROTECTS PIPELINES

from damage caused by interference voltages

PIPELINES: SECURE TRANSPORT – NON-STOP SUPPLY

Safe for people and the environment. Pipelines are the most secure means of transport for flammable liquids and gases. They represent a seamless, reliable supply of oil and gas. In Germany alone, around 40,000 kilometres of pipelines are laid in the ground.

To ensure permanent safety, protection against corrosion constitutes the greatest challenge. Various techniques are deployed to this end: a passive approach, with enclosures or coatings on the one hand, and an active approach on the other, with cathodic corrosion protection systems and decoupling devices.

THE PROBLEM: INTERFERENCE VOLTAGES

Pipelines are very well insulated. They can therefore pick up interference voltages. This mainly happens when they share routes with railway lines or high-voltage transmission lines. Another cause of interference voltages is lightning strikes. Surges triggered this way spread out quickly throughout the pipeline network.

The damage resulting from this is enormous:

ENVIRONMENTAL DAMAGE

Interference voltages lead to corrosion, resulting in leaks.

BREAKDOWNS

Damaged gas pressure control and measurement system, slide gate valve and compressor stations disrupt transport.

THREAT TO HUMAN LIFE

Touch voltages on freely accessible system parts during maintenance work could lead to an electric shock.

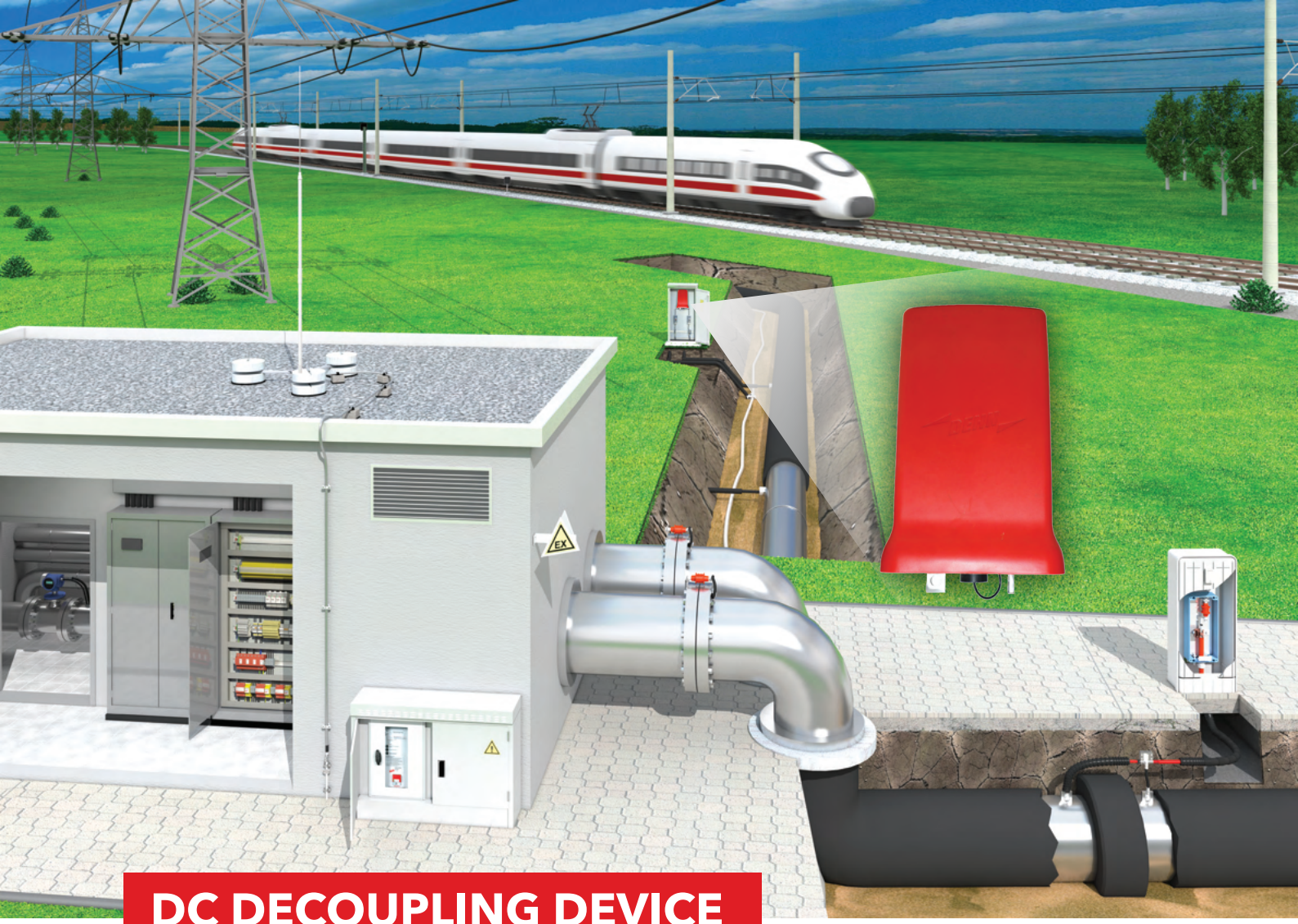
PROVIDE PERMANENT SAFETY

Safety for pipelines and people is the top protection goal of operators. To this end, interference voltages must be discharged to earth at the correct points.

Suitable measures for this are, for example, robust decoupling devices or spark gaps, as well as special surge protection solutions for cathodic protection rectifiers or field instruments.

Operators frequently use remote monitoring systems for particularly sensitive pipeline sections. Protection solutions are demanded here that are not only robust but above all smart.

For the operator, the integration of decoupling devices into the cathodic corrosion protection and management systems means being notified of the status of the pipeline at all times – making everyday work considerably easier.



DC DECOUPLING DEVICE

safety for pipelines and people

For technical reasons, the earth electrode must not be connected directly to the Cathodically protected pipelines or structures.

Why? To prevent corrosion, pipelines are charged with a protective current – a direct link with the earth electrode would lead to the cathodic corrosion protection measure losing its effectiveness.

That is why the decoupling device is installed between the pipeline and earth electrode, where it acts like a filter. It receives the protective DC current and discharges all the harmful alternating current and impulse currents via the earth electrode.

DASD DECOUPLING DEVICE

Robust and powerful

DEHN ADVANCED SOLID-STATE DECOUPLER

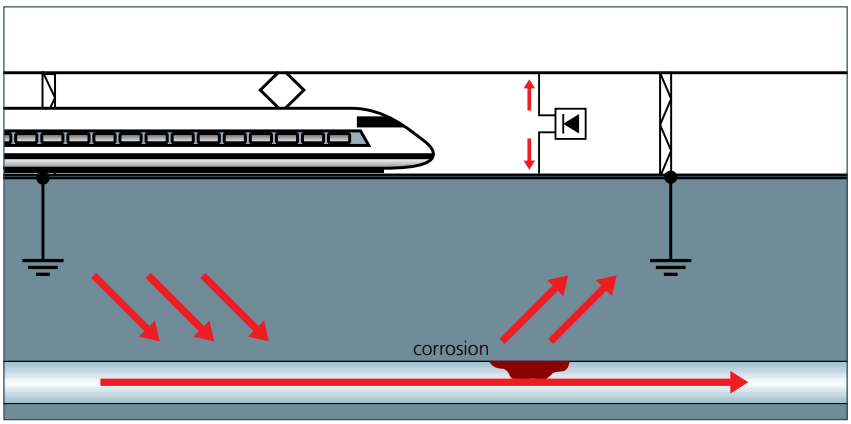
Protect employees, limit overvoltages, prevent AC corrosion

SOLID STATE DECOUPLING DEVICE FOR GROUNDING OF CATHODICALLY PROTECTED PIPELINES OR STRUCTURES OFFERING DC ISOLATION AND ALLOWS INDUCED AC CURRENT TO PASS.

- Protection against long duration, temporary and transient overvoltages
- The desired cathodic protection potential (DC potential) of the pipeline is not negatively affected
- Heavy duty design suitable for extreme climatic condition, Fail-safe failure mode
- Integrated test socket for testing the healthiness of the device during inspection cycle
- Functionally coordinated and tested device to ensure safety at the field
- Protection against impermissibly high touch voltages for people working on the pipeline

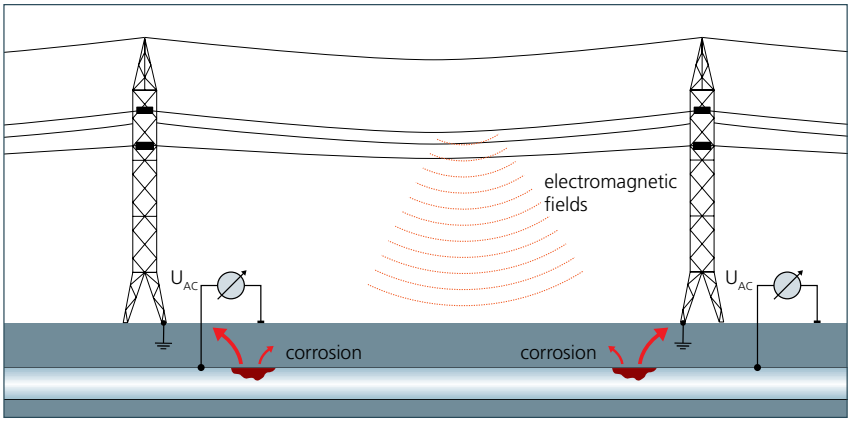
Electric railways

Electric railways produce galvanically injected stray currents which enter the pipeline via the ground through defects, thus changing the potential of the pipeline by means of interference voltages.



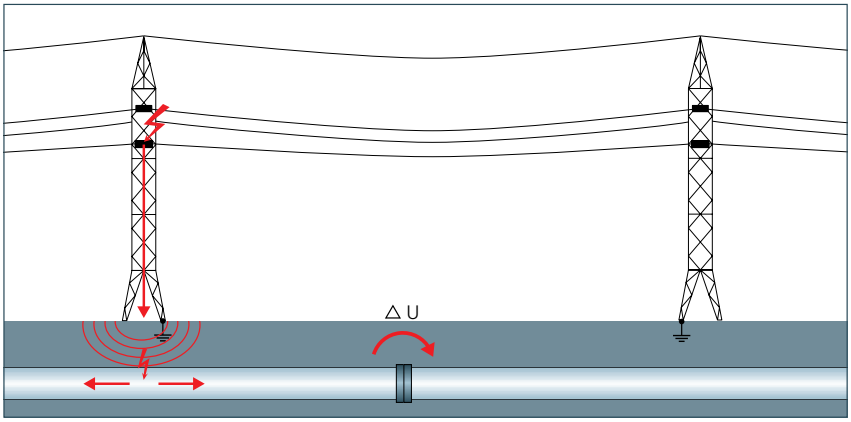
High-voltage lines

High-voltage lines generate electromagnetic fields which are injected into parallel pipelines and often occur in the form of permanent interference voltage.



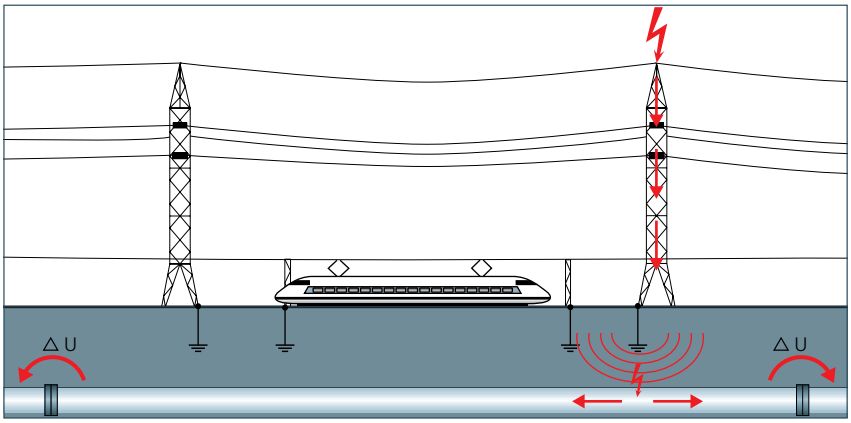
Earth faults

An earth fault causes a potential gradient area in the surrounding soil whose potential affects pipelines located in this area. This potential gradient area thus spreads over to the relevant pipeline network in the form of an interference voltage.

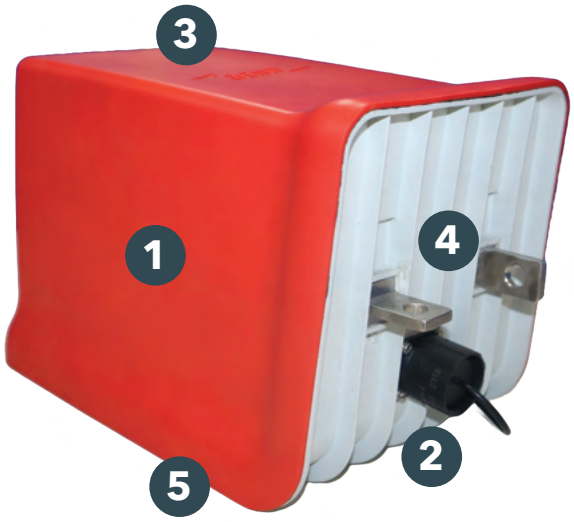


Lightning strike

Lightning overvoltage generates transient interference voltages into nearby systems. Injected via a potential gradient area, they spread over the entire pipeline network.



All these interference voltages may cause personal or material damage and a.c. corrosion.



APPLICABLE ANYWHERE

DASD is independent of an external power supply. The decoupler can therefore be used anywhere - even in places where, depending on the situation, there is a particularly high risk of interference voltages, potential changes or stray currents.

1. **IP65 housing**
   Water and dustproof, for installation
2. **Integrated test socket**
   For easy functional testing of the decoupler
3. **High discharge capacity**
   Long duration 45A, Temporary 5 kA, Transient 100 kA
4. **Clearly marked**
   No danger of confusing the pipeline and earth connection
5. **Fail-safe failure mode**
   Safe state in case of overload

CERTIFICATION

- CE-compliant protection solution
- Manufacturer-functionally tested solution

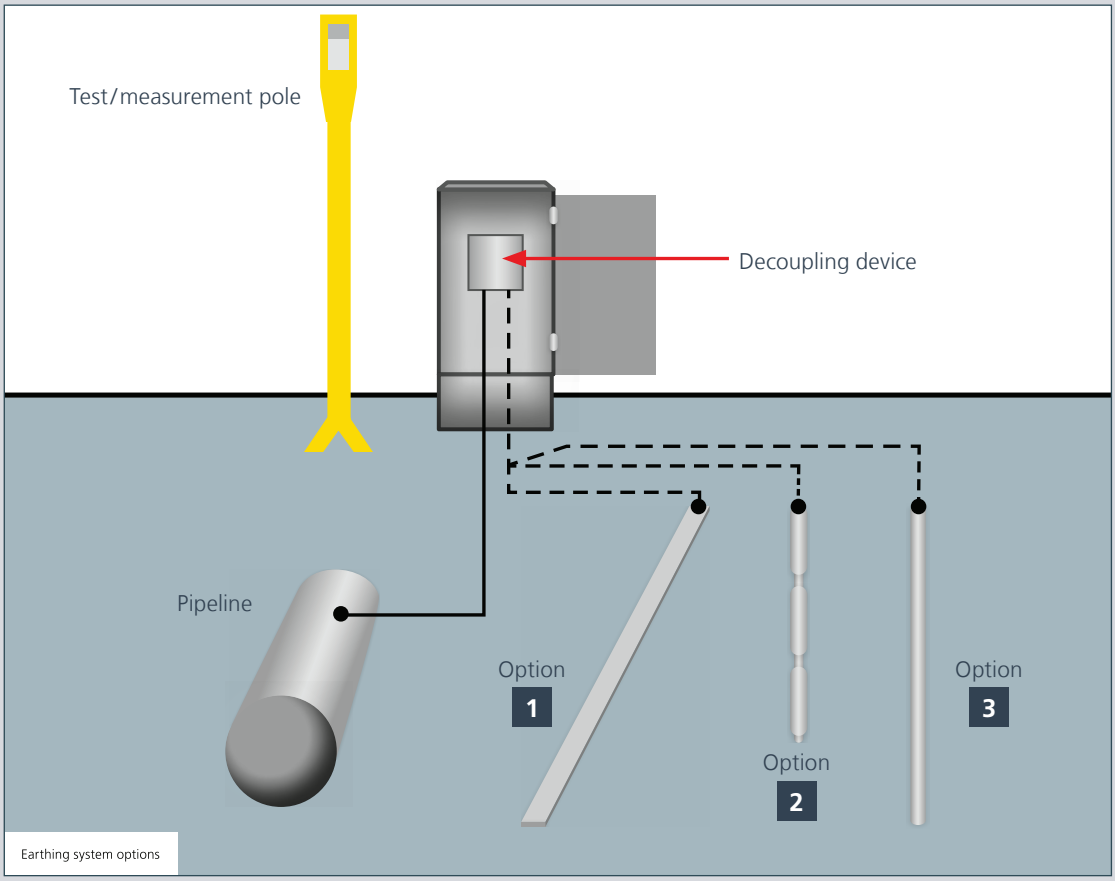
Optional: IECEx and UL approvals under progress

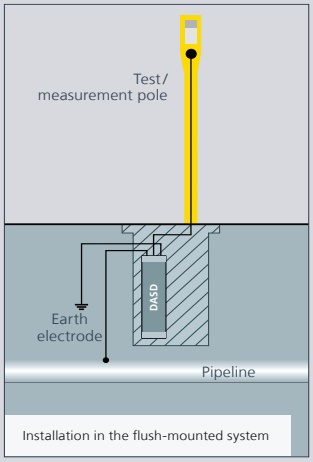
DAkkS Deutsche Akkreditierungsstelle D-PL-20356-01-00

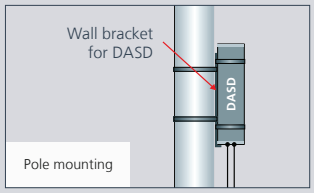
TECHNICAL PARAMETERS

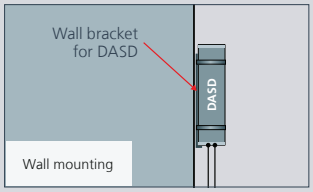
MODEL DASD 45 X LP X T
PART NO. 923XXX

AC Steady state current (50/60Hz)	**45A$_{rms}$ (77A$_{peak}$)**
DC Blocking voltage (3 options, customizable)	**-2V/+1V** **-2V/+2V** **-3V/+1V**
AC Fault current (0.6 sec/30 cycles) (5 options, customizable)	**3.7kA** **5kA** **10kA** **15kA** **20kA**
Nominal Surge (8/20µs) current I$_n$	**100kA**
Lightning impulse (10/350µs) current I$_{imp}$	**100kA**
Degree of Protection	**IP 65**
DC leakage current	**<5mA @ 20° C**
Operating Temperature	**-30° C to +85° C**









TYPICAL FIELDS OF APPLICATION

Mastering interference voltages

Prevention of AC corrosion

Protection of pipelines

Protection of the insulation

Protection of the people - Touch voltage

SAFETY FOR YOUR EMPLOYEES

In case of failure of the DASD, the device enters a fail-safe state - People working on the pipeline are still protected against touch voltages.

Designed and developed in compliance with requirement of ISO 18086, SP0177, EN 50443 to meet various application needs.

The device has integrated test socket, designed to ease out the testing mechanism for the device for its healthiness check as per inspection schedule in accordance with EN 12954

No derating factor for steady state current with rise in operating temperature due to high environmental temperature during the summer.

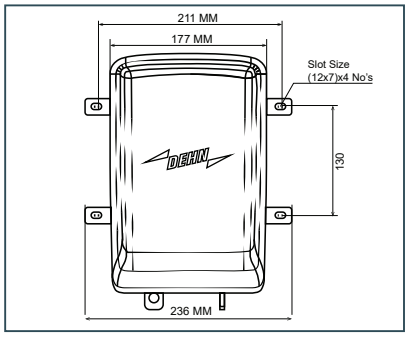
The device also provides flexibility in selection by offering good range of customization for DC blocking voltage and fault current to meet the mitigation needs as per Interference study. The device has modular inhouse design which makes it possible for factory repairs, means the user can get longevity of the device service life and optimized maintenance budget.

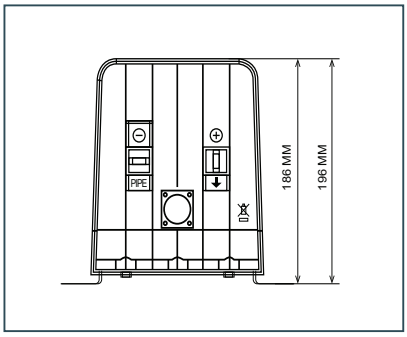
Functional Test is done in a DAkkS accredited manufacturer test center ensuring proper performance and safety at the field. The reliability of the product is determined through rigorous coordination testing of all the components against all possible interferences. The device is tested for IP 65 (with option of IP68 enclosure) to meet harsh field conditions and designed for extreme practical operating temperatures ranging between -30° C to 85° C.

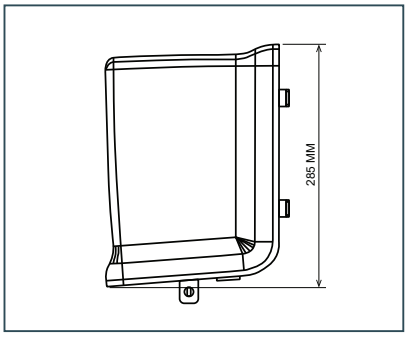
ORDERING INFORMATION

DASD	45	X	LP	X	T
Decoupler	Steady state current 45A@50Hz, 45A@60Hz	AC Fault current 3 - 3.7kA 5 - 5kA 10 - 10kA 15 - 15kA 20 - 20kA	Integrated Lightning protection	DC Blocking voltage 1: -2V/+1V 2: -2V/+2V 3: -3V/+1V	Integrated test socket

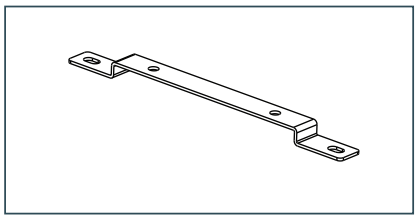
DIMENSIONAL DRAWING

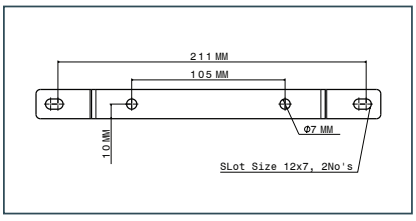


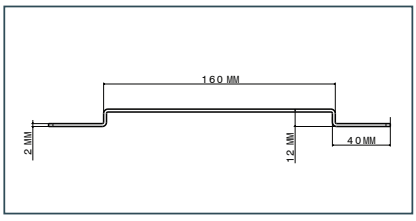




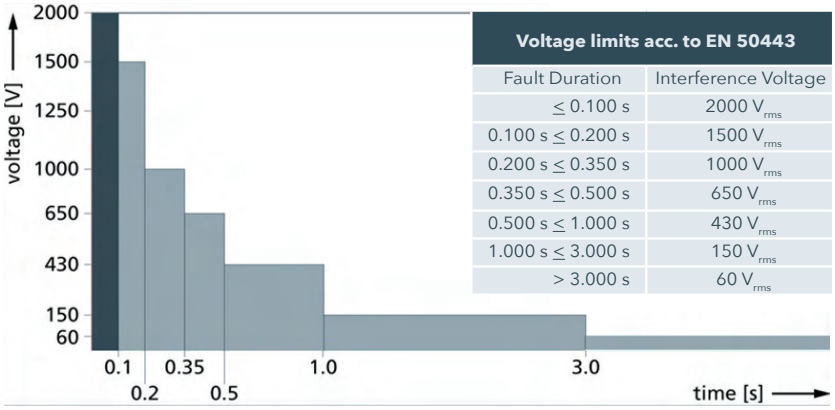
MOUNTING ACCESSORIES







SAFETY INFORMATION



Voltage limits acc. to EN 50443		Limiting Performance of the device	
Fault Duration	Interference Voltage	Operating Time	Limiting Voltage (Typical values)
≤ 0.100 s	2000 V_{rms}	≤ 0.100 s	1350 V_{peak}
0.100 s ≤ 0.200 s	1500 V_{rms}	0.100 s ≤ 0.600 s	≤ 20 V_{rms}
0.200 s ≤ 0.350 s	1000 V_{rms}		
0.350 s ≤ 0.500 s	650 V_{rms}		
0.500 s ≤ 1.000 s	430 V_{rms}	≤ 0.600 s	3 V_{rms}
1.000 s ≤ 3.000 s	150 V_{rms}		
> 3.000 s	60 V_{rms}		

ATTENTION:

When installing and replacing the decoupler DASD 45 X LP X T (E.g. DASD 45 5 LP 2 T), it must be ensured that no currents are present which may cause an electric arc. Work on the DASD 45 X LP X T may only be performed in a de-energised state!

The voltage on the pipeline may exceed 15 V. For this reason, we recommended connecting the pipeline connection directly to earth when installing and servicing the DASD 45 X LP X T or safely insulating it against accidental contact!

www.dehn-international.com/partners

Surge Protection
Lightning Protection/Earthing
Safety Equipment
DEHN protects.

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