Solid-State Decoupler

Overview

With the wide application of cathodic protection (SACP/ICCP) for buried steel pipelines, external AC interference, lightning surges, power line fault currents, and stray currents from railways have become major threats to CP system stability. These interferences may cause CP failure, accelerated corrosion, abnormal pipe-to-soil potentials, or damage to impressed current equipment. Traditional discharge devices can only withstand low - energy disturbances and cannot effectively handle high-energy events such as direct lightning, induced lightning, or single-phase grounding fault currents.

The Solid-State Decoupler (SSD/LSD Series) uses semiconductor technology to:

• Isolate CP DC current
• Conduct harmful DC current to ground
• Fully conduct AC current to reduce induced AC voltage
• Limit transient overvoltage caused by lightning or power faults
• Prevent corrosion acceleration caused by electromagnetic interference

Widely used in oil, gas, chemical pipelines, power line crossings, and railway crossings.

Product Features

1. Effective isolation of cathodic protection DC current.
2. Full conduction path for AC current, reducing induced AC voltage.
3. Automatic conduction of harmful DC voltage to suppress interference.
4. High energy withstand capability (direct lightning, induced lightning, fault current).
5. Multiple isolation voltage options (+2/-2V, +1/-3V, +3/-1V)
6. Sealed and explosion-proof design suitable for outdoor or buried installation.
7. Maintenance-free design under normal conditions.

Technical Parameters

- Rated Isolation Voltage: -2V / +2V (customizable)
- Nominal Discharge Current (8/20 μs) 100 kA
- Lightning Impulse Current (10/350 μs) 50 kA
- AC Fault Current (AC-rms / 50Hz / 30 cycles)1.2KA
- Steady-State AC Current Rating 100A
- AC Impedance ≤ 0.01 Ω
- DC Leakage Current ≤ 1 mA (at ±1.5V)
- Response Time 1 ns
- Protection Level IP68
- Explosion-Proof Rating Exd II CT4
- Operating Temperature -40℃ ~ +70℃

Applicable Standards

- IEC 61643-1
- NACE RP0177
- GB18802.1 / IEC61643-1
- GB/T 19271.1
- GB50251 / GB50253
- GB4208 (IP Protection)
- SY/T0032-2000

Factory Inspection Items

1 DC Leakage Current ≤1 mA (1.5V), ≤10 mA (rated voltage)
2 Rated Isolation Voltage +2 / -2V or customized
3 Steady-State AC Current 100A
4 AC Impedance ≤0.01 Ω
5 Appearance & AccessoriesAccording to configuration list
All units must pass factory inspection before shipment.

Installation Instructions

Grounding System Requirements

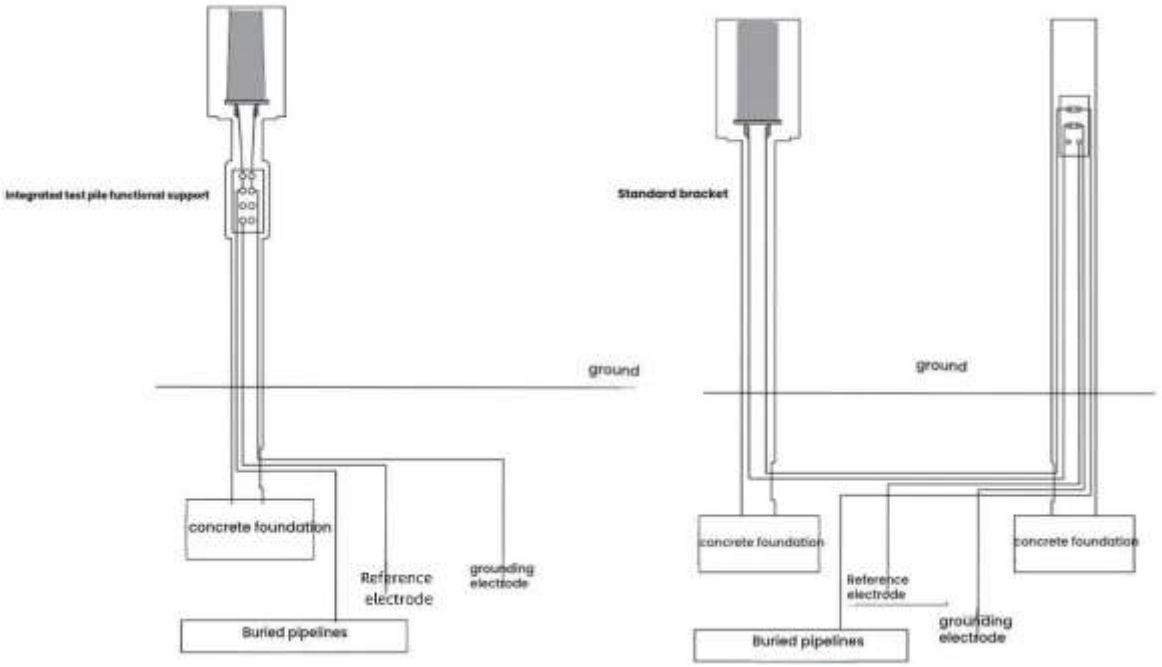
Grounding depth ≥ 0.8 m.
Recommended materials: zinc rod, zinc-clad steel, zinc ribbon, or zinc anode.
Install vertically when possible to reduce potential rise.
Multiple grounding bodies must be bonded with cable.
Ground resistance ≤ 4 Ω.

Decoupler Installation

Anti-theft bolts must face outward.
Nameplates must be attached after stamping and identification.
Support base must be firmly anchored to concrete.
Explosion-proof structure allows installation in hazardous areas.
One terminal connects to pipeline, the other to grounding network.

Cable Requirements

Cable installation must comply with CP standards.
AGG-10 kV silicone-rubber high-voltage cables recommended.
Ensure waterproofing, insulation, and secure terminals.


Integrated test pile functional support
ground
concrete foundation
Reference electrode
grounding electrode
Buried pipelines
Standard bracket
ground
concrete foundation
concrete foundation
Reference electrode
grounding electrode
Buried pipelines