

3rd generation Grounding Device with Total Surge protection & equi-potential function

eca3G - Perfect Ground System

(US Patent No 7,652,865 B2)

Proven performances at various national security sites :
3,855 sites for **16yrs**, Protection Success rate : **99.88%**



US Patent as "Grounding Device which not need to be buried in Ground"

eca3G - Total Lightning surge protection

for Military Tactical Operation Vehicle / Shelter System
 with grounding element, equi-potential function

Lightning protection for National Defense of Korea is ensured by eca3G.

1,003 sites at 270 regions under National defense lightning protection for 13 years

GROUND has implemented lightning protection system for entire NAVY bases from year 2001 until now (2014. 03), and has supported for 365/24 operation without interruption by lightning, and also protection for Perimeter Surveillance System of the President Office, Special agencies, command and control system, communication vehicles of army, navy, air forces are under implementation continuously with eca3G (3G digital lightning protection device) and PGS grounding system.



1. Mobile Tactical Operation Vehicle, Mobile generator
 2. CCTV, Thermal Image Camera, Surveillance system at coastal, border line

Local government and National public authorities :

1,253 sites at 345 regions

- Royal Tombs of the Joseon Dynasty-UNESCO World Heritage : 247 sites at 31 units with total integrated surveillance system (include CCTV)
- Unmanned forest fire monitoring system of Gangwon province, KyungBuk province
- Port Authority, Cultural Heritage Administration, Meteorological Agency
- Boryung Thermal power Plant, Wolsong Nuclear Power Plant
- other 60 over sites under local governments are protected under total perfect lightning protection system



1. Perimeter Surveillance System for the President Office,
 2. Royal Tombs of the Joseon Dynasty-UNESCO World Heritage with total integrated surveillance system (include CCTV)
 3. KBS Digital TV Relay Station

Broadcasting stations, Communication stations :

729 sites at 205 regions

GROUND has implemented lightning protection system for KBS HQ, its Regional stations (Korea Broadcasting System), and regional commercial broadcasting stations. Most of relay stations are located on the high mountain area, where very weak from lightning intrusion damages, are also under ensured lightning protection by GROUND, which contribute to support people's right to know, provision of various information.

Total Lightning Protection System for Water&Wastewater Treatment Plant

870 sites at 234 regions for Nationwide plants, Korea Water Resources Corporation (KWRC)

Perfect total lightning protection for distributing reservoir, intake facility, water works, pumping station nationwide, and facilities under management division of KWRC. It is important to get healthy drinking water at modern society due to environment pollution. To support clean & stable drinking water supply, GROUND has protected Water treatment facilities from lightning with eca3G(3G digital lightning protection device) and PGS grounding system.

Lightning Protection for National Security is ensured by eca3G'

We have implemented lightning protection systems for entire NAVY bases from 2001, and has supported for 365/24 operation without interruption by lightning damages. eca3G' become the lightning protection Standard of NAVY, KBS DTV Relay station, Automated Drinking water treatment plant, Korea Hydro & Nuclear power co., Ltd.



Perfect total lightning protection for

- Communication vehicles
- Satellite communication vehicles
- Tactical operation vehicles
- Mobile power generator vehicle
- Mobile Radar Control Shelter
- Next-Generation Local Air Defense Radar
- Firing Artillery Locating Radar System
- Air force Command & Control vehicle for KM-SAM missile and Shelter systems

Perfect total lightning protection for

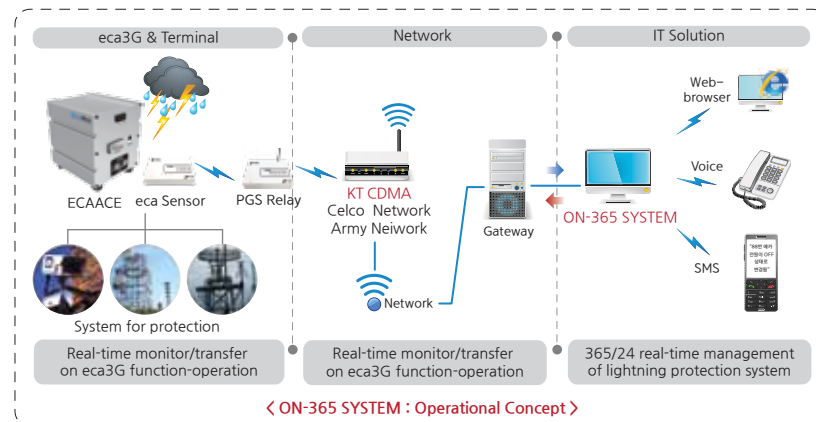
distributing reservoir, intake facility, water works, pumping station etc. on Various Control Panels, Automation, Sensors, Instrumentations, Network & communication system, CCTV surveillance system.

1. Water Plant control 2. Meteorological station 3. Navy Communication system
 4. RADAR Station 5. Thailand Army Ammunition Depot 6. Base Surveillance System

What is ON-365 SYSTEM

ON-365 SYSTEM - Total real-time lightning protection monitoring system to ensure viability of 21 century advanced electronic-information systems from lightning, real-time monitor the operation status of eca3G, maintain normal condition to provide perfect protection.

- ▶ Real-time monitor the status&function of eca3G, maintain the completion status of installed stage.
- ▶ Real-time monitor, report, transfer of lightning/surge intrusion to system, check eca3G performance and life.
- ▶ Real-time monitor, report, transfer of degradation status of modules of lightning surge protection device to predict degradation, enable to repair before failure.
- ▶ In case power is off from distribution board to eca3G, ON-365 SYSTEM informs to manager and center as real-time, ensure to maintain lightning protection monitoring.



eca3G

1,602 x 10⁻¹⁹

Perfect Ground System

(US Patent No 7,652,865 B2)

Advanced DC Decoupling Device

(Co-developed with KOGAS, patented)

Advanced DC Decoupling Device

- enabled Instant Off potential measurement
- class I lightning surge protection
- no internal corrosion



Perfect Lightning Surge Protection

- 3,855 proven sites for 16 ys with 99.88% success protection
- Widely adopted for national security facilities protection

Advanced DC Decoupling Device

(Co-developed with KOGAS, Patented)

Under the partnership of Government-Large Corp-SME, completely solved the problems of imported products, successfully develop the first, patented product in Korea

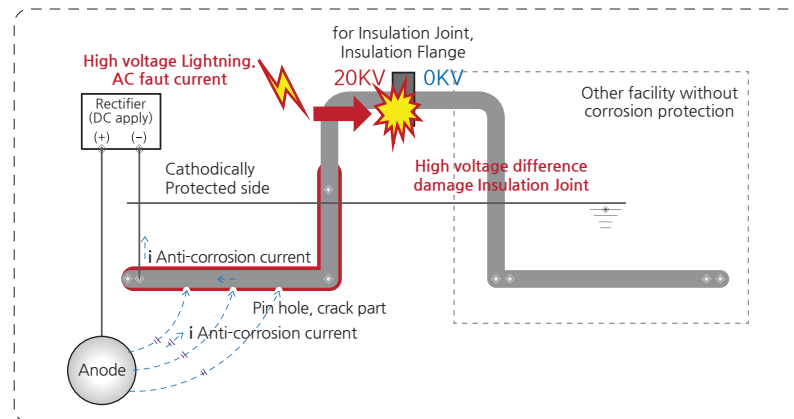
Brief of Co-development Technologies

- Advanced DC Decoupling Device has the improved functions as below ;
- enable to measure Instant off potential without dismantle the device
 - remove noise peak which is generated upon rectifier On/Off
 - solve internal galvanic corrosion (adopt all aluminum parts) (these problems are shown at the field by imported products)

For stronger protection against high voltage lightning surge, AC fault current, and induced AC current at field, we apply lightning protection technology and Knowhow which have been accumulated since 1999.

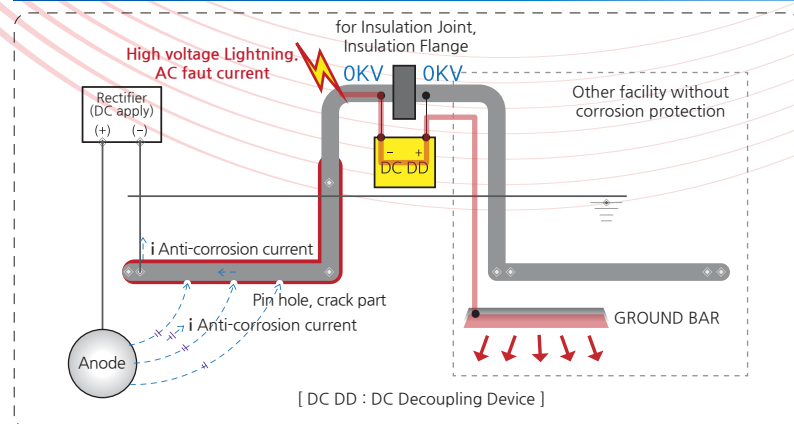
- apply Class I (10/350 μ s, 20kA)
- IEC 61643 protection to protect insulation joint, motor operated valve.
- other products adopt Class II (8/25 μ s, 100kA) component.

Insulation Joint protection from high voltage lightning, AC fault current with Advanced DC Decoupling Device (DDD)



Not installed DDD. By intrusion of high voltage lightning surge, AC fault current, There is large potential difference at each end of Insulation Joint which damage the joint.

Protect Insulation Joint from high voltage lightning, fault current, Block DC cathodic anti-corrosion current discharge



DDD installed. DDD discharge high voltage current to make equi-potential at each end of Insulation Joint, protect from damage, also block DC cathodic anti-corrosion current.

Advanced technical targets & Secured performances

Technical items for co-development	Secured Performance
DC blocking voltage performance	Potential difference of each end - 1V
AC steady-state characteristics	Potential difference of each end - 1V
Current leakage under DC blocking voltage	Below 0.25mA/V
Lightning current rating	Class I, 10x350 μ sec, max20kA (Class II, 200kA 8/20 μ sec 200kA <)
AC fault current rating(AC 60Hz rms)	30 cycle. 3.7 kA above
AC steady-state current	60Hz, Max 45A
Explosion proof	OEM Test Certificate
Others	Patent Registration : No.10-1279856, Economic Cost

Solving Field problems of existing products at KOGAS sites

(completely overcome these problems under Advanced DDD)

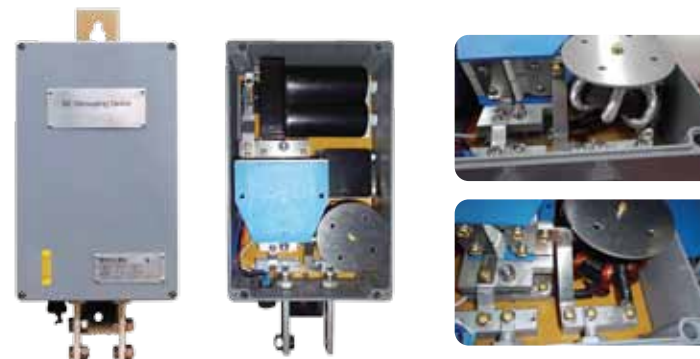
1. enable to measure Instant Off potential without dismantle DDD.
2. remove noise peak which is generated upon rectifier ON/OFF.
3. improve lightning protection level for high voltage current (lightning surge, AC fault current, induced AC current)
4. prohibit internal metal corrosion of DDD - galvanic corrosion
5. Others : economical cost, customized service , test terminal etc
6. uthorized third party performance test

Advanced DC Decoupling Device Specification

(Patented, Success determination by SME Agency, Co-developed product)

items	Advanced DC Decoupling Device specification
(1) Lightning current rating	max20kA, Class I, 10x350 μ sec waveform (primary lightning surge)
(2) AC fault current rating(AC 60Hz rms)	Max 3.7kA or above, 30Cycle,
(3) DC Blocking Voltage	DC -6V/+1V (each ends voltage difference under DC supply : below 1V)
(4) AC steady-state current	max 45A, 60Hz (each ends voltage difference under AC supply : below 1V)
(5) DC current leakage	below 0.25 mA/V under DC blocking voltage
(6) power supply	Not required
(7) instant off potential	enable to measure instant off potential without dismantle
(8) Inner corrosion	Adopt one type of metal parts
(9) Explosion proof	Provide certificate
(10) Others	Patent registered, measuring terminal attached, silicon

Product Image



Authorized Third party Test



Lightning Current Rating test by KERI. Apply Class I (10x350 μ s), 20kA surge current



AC Fault Current Rating Test by KERI. Apply 60Hz, 30cycle, 3.7kA current

Patent certificate, Test Report



Patent certificate : No 10-1279836 Advanced DC Decoupling Device



KERI Test Report Advanced DC Decoupling Device



Explosion proof certificate for enclosed Box



Lightning Surge Protection Specialist
Leaping toward to the 100 years dream

Homepage

Please visit home page for further information
www.ground.co.kr / www.eca3g.com

Contact us

H.Q : #209, Suntechcity2, Sagimakgol-ro, Jungwon-gu, Seongnam-si, Gyeonggi-do, (462-736) Korea
Tel : +82-2-572-0008 / Fax : +82-2-572-3224
Factory-R&D Institute : 950, Deokum-ro, Kumwang-up, Eumsung-gun, Chungbuk, Korea
Tel : +82-43-878-4577 / Fax : +82-43-883-2374
E-mail : overseas@ground.co.kr