EN TECHNOLOGIES

PRODUCT LIST

Catalog No. ENP T101.C4

Executive Summary

EN Technologies (“EN”) is leading supplier of medium voltage circuit switchgear in the electricity industry , Korea and operates two factories and one R&D center in Korea.

EN has been official supplier for KEPCO(Korea Electric Power corporation . www.kepco.co.kr) EN was awarded in 2007 by “KEPCO” as most innovative electricity venture and EN was selected as Technical Innovation Company from Small and Medium Business Administration in Korea. The Company has achieved ISO 9001 and CE-mark certification.

EN has product line of medium voltage (10~38 KV) power switchgear, gas insulated multiple circuit breaker and load breaker which are used to ensure safety in the power distribution line. The Company has developed 25.8kV GIS(“Gas Insulated Switchgear”) and 72.5kV, and 170kV classes are under development.

EN has been qualified for rigorous product certification test by international standard (IEC) at Korea Electric Research Institute(www.keri.re.kr) and China Electric Power Research Institute (www.epri.ac.cn).

EN Technologies Inc. is concentrating our best and sincere energies on electricity industry in order to make our customer happy.

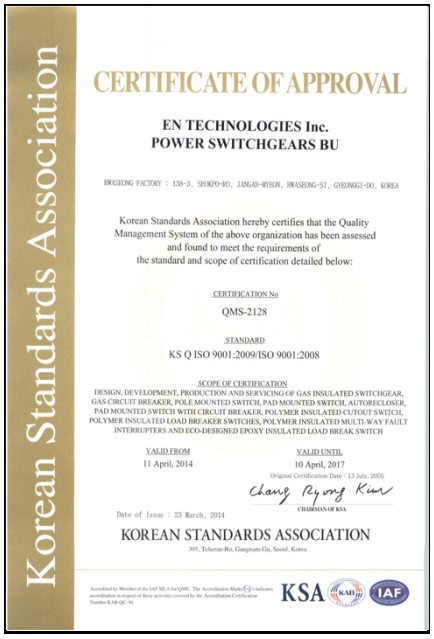
We always believe in “ Customer first”.

History

2014 – Venture business achievement(Venture Capital Association)
– Registered Smart Grid Business(Ministry of Trade, Industry & Energy)
2013 – Selected as a Good Design Selection (Korean Institute of Design Promotion)
2011 – Successful Business achievement from Korea Technology Finance Corp
2010 – CEO received Presidential Award at 2010 Entrepreneur Festival
– Achieved Green Technology Certification from [Ministry of Land, Transport and Maritime Affairs]
– 10 Milion Dollar Export Award [The Korea International Trade Association]
– Nominated as Global Leading Product from [Ministry of Knowledge Economic]
– Nominated as World Class Company[Small and Medium Business Corporation]
– Expanded factory of Power Distribution BU to $40M capacity
2009 – E P R Test performed and qualified by EPRI(Energy Power Research Institute)
– Nominated as Great Performed Vendor from KEPCO
– Single PPM Certificate Achievement (Small and Medium Business Administration. 1-07-2-1658)
– Achieve 72.5kV Gas Insulated Switchgear order from Korea Rail Network Authority (ebid.krnetwork.or.kr)
2008 – Developed 72.5kV Gas Insulated Switchgear and qualified qualified tender in Korea Rail Network Authority
2007 – Selected as an Export Promising Small and Medium Business (Gyeonggi Small and Medium Business Administration Export Support)
– Selected as a Innovative Electric Power Venture Company (Korea Electric Power Corporation No.2007-32)
– Selected as a Inno-Biz (Small and Medium Business Administration No.7061-988)
2006 – CEPRI Certificate for RMU(Ring Main Unit) by China Electronic Science Researches
– KRS(load switchgear for underground) certified and registered as authorized product at Korea Electric Power Corporation
– KRC(multi-circuit breaker) certified and registered as authorized product at Korea Electric Power Corporation
– KPS(pole-top load switchgear) certified and registered as authorized product at Korea Electric Power Corporation
– CEPRI Certificate for EPS(Pole-top load switchgear) by China Electronic Science Researches
2005 – CEPRI Certificate for RMF(Ring Main Unit with fuse) by China Electronic Science Researches
– Achieved the ISO 9001 Certificate (QMS-2128) Established the Beijing branch office
2004 – Certified as Venture Company (new technology company) by Small & Medium Business Administration, Reg. no. 41625231-1-00656.
– Certified as Superior Technology Company by the Kibo Technology Fund(www.kibo.co.kr)
– Established R&D center certified by Korea Industrial Technology Association(www.koita.or.kr), certification no. 20041678
2003 – EN Technologies Inc. was established (www.entech.biz)

EN Creative Energy to the World TECHNOLOGIES

Certifications


Korean Standards Association

CERTIFICATE OF APPROVAL

EN TECHNOLOGIES Inc.
POWER SWITCHGEARS BU

HWASEONG FACTORY : 138-3, SEOKPO-RO, JANGAN-MYEON, HWASEONG-SI, GYEONGGI-DO, KOREA

Korean Standards Association hereby certifies that the Quality Management System of the above organization has been assessed and found to meet the requirements of the standard and scope of certification detailed below:

CERTIFICATION No
QMS-2128

STANDARD
KS Q ISO 9001:2009/ISO 9001:2008

SCOPE OF CERTIFICATION
DESIGN, DEVELOPMENT, PRODUCTION AND SERVICING OF GAS INSULATED SWITCHGEAR, GAS CIRCUIT BREAKER, POLE MOUNTED SWITCH, PAD MOUNTED SWITCH, AUTORECLOSER, PAD MOUNTED SWITCH WITH CIRCUIT BREAKER, POLYMER INSULATED CUTOUT SWITCH, POLYMER INSULATED LOAD BREAKER SWITCHES, POLYMER INSULATED MULTI-WAY FAULT INTERRUPTERS AND ECO-DESIGNED EPOXY INSULATED LOAD BREAK SWITCH

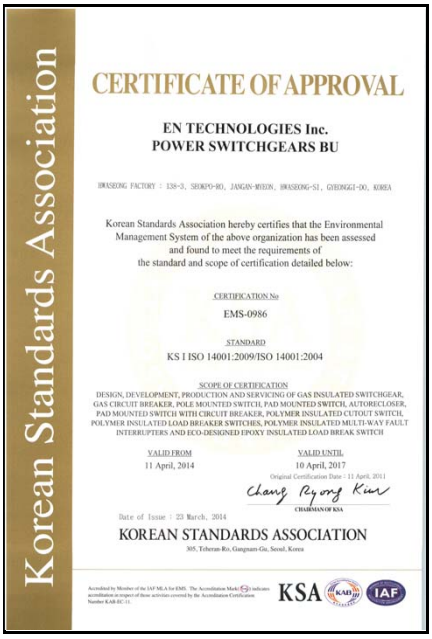
VALID FROM 11 April, 2014 VALID UNTIL 10 April, 2017
Original Certification Date : 13 July, 2005

Date of Issue : 22 March, 2014

KOREAN STANDARDS ASSOCIATION
305, Teheran-Ro, Gangnam-Gu, Seoul, Korea

KSA KAB IAF

ISO 9001 Certified


Korean Standards Association

CERTIFICATE OF APPROVAL

EN TECHNOLOGIES Inc.
POWER SWITCHGEARS BU

HWASEONG FACTORY : 138-3, SEOKPO-RO, JANGAN-MYEON, HWASEONG-SI, GYEONGGI-DO, KOREA

Korean Standards Association hereby certifies that the Environmental Management System of the above organization has been assessed and found to meet the requirements of the standard and scope of certification detailed below:

CERTIFICATION No
EMS-0986

STANDARD
KS I ISO 14001:2009/ISO 14001:2004

SCOPE OF CERTIFICATION
DESIGN, DEVELOPMENT, PRODUCTION AND SERVICING OF GAS INSULATED SWITCHGEAR, GAS CIRCUIT BREAKER, POLE MOUNTED SWITCH, PAD MOUNTED SWITCH, AUTORECLOSER, PAD MOUNTED SWITCH WITH CIRCUIT BREAKER, POLYMER INSULATED CUTOUT SWITCH, POLYMER INSULATED LOAD BREAKER SWITCHES, POLYMER INSULATED MULTI-WAY FAULT INTERRUPTERS AND ECO-DESIGNED EPOXY INSULATED LOAD BREAK SWITCH

VALID FROM 11 April, 2014 VALID UNTIL 10 April, 2017
Original Certification Date : 11 April, 2011

Date of Issue : 23 March, 2014

KOREAN STANDARDS ASSOCIATION
305, Teheran-Ro, Gangnam-Gu, Seoul, Korea

KSA KAB IAF

ISO 14001 Certified


No. 2010-035

Certificate

This is to certifies that

EN Technologies Inc. Co.,Ltd.

is the member of

"One-KEPCO Export Business Group"

organized by KEPCO

August 27, 2010

kepco

President & CEO Ssang-su Kim

One-KEPCO Exporting Business Group


TEST REPORT 2010TS00606 1/6

CLASSIFICATION	Performance Test(III)
APPARATUS	25.8 kV gas insulated multi-way fault interrupters for underground line
DESIGNATION	ENRMC-120-24/630-S
RATINGS	3 phases 25.8 kV 630 A 20 kA 1 s 60 Hz
APPLIED STANDARD	IEC 62271-100:2006.10
RECEIPT No.	TRD10S00502 (March 12, 2010)
APPLICANT	EN TECHNOLOGIES Inc. 5K VENTIUM 102-1101 Danjung-Dong, Gun-po city, Gyeonggi-do, Korea
MANUFACTURER	EN TECHNOLOGIES Inc. 5K VENTIUM 102-1101 Danjung-Dong, Gun-po city, Gyeonggi-do, Korea
DATE OF TESTS	March 26, 2010
DATE OF ISSUE	April 02, 2010

The tests have been carried out in accordance with the instructions of the applicant.

The test results are shown in the records of tests with the performance of the apparatus tested and the observations made during the tests. The oscillograms are attached hereto.

The test results apply only to the apparatus tested.

This document shall not be reproduced except in full, without a written approval of KERI.

This report shall not be used for any purpose such as PR brochures, propaganda, advertisement and/or legal proceedings, unless for the granted purpose.

No. OF PAGES records (6), photographs (1), circuit diagrams (2), oscillograms (1), INCORPORATED drawings & descriptions (1), attachments (0)

Test results in this report are within the scopes accredited by Korea Laboratory Accreditation Scheme, which signed the International Laboratory Accreditation Cooperation Mutual Recognition Arrangement

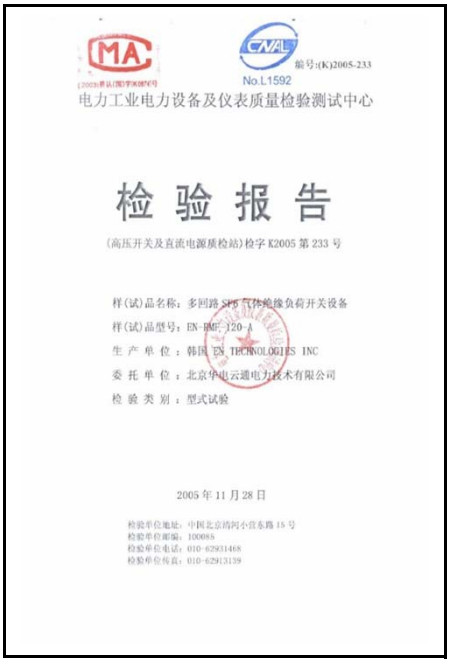
Prepared by Kim , Sun-Ho
Verified by Park, Byung-Rak
Approved by (Technical manager) Park, Sung-Kyun

Power Apparatus Testing & Evaluation Division

KERI KOREA ELECTROTECHNOLOGY RESEARCH INSTITUTE
Sa 1-dong 1271-19, Sangnok-gu, Ansan-si, Gyeonggi-do, Korea, 426-170
Tel : +82-31-8040-4114, Fax : +82-31-8040-4489, www.keri.re.kr
KERI Laboratories are accredited by KOLAS (Korea Laboratory Accreditation Scheme)

DF-CA-21/11/01

TEST REPORTS [KERI] ACHIEVEMENTS


CMA 编号:(K)2005-233

No.L1592

电力工业电力设备及仪表质量检验测试中心

检 验 报 告

(高压开关及直流电源质检站)检字 K2005 第 233 号

样(试)品名称：多回路 SF6 气体绝缘负荷开关设备
样(试)品型号：EN-RMC-120-A
生 产 单 位：韩国 EN TECHNOLOGIES INC
委 托 单 位：北京华电云通电力技术有限公司
检 验 类 别：型式试验

2005 年 11 月 28 日

检验单位地址：中国北京清河小营东路 15 号
检验单位邮编：100085
检验单位电话：010-62931468
检验单位传真：010-62913139

TEST REPORTS [CEPRI] ACHIEVEMENTS

EN RM series(Ring Main module)

Simple indoor substation, customer transfer substations and distribution substations
Industrial plants and underground stations

Highly Reliability

- Maintenance-free concept
- Pure puffer techniques, no leakage current path between open contacts.
- Switchgear vessel made of stainless steel
- SF6 gas insulation and interruption.
- At atmospheric gas pressure, it ensures the rated insulation and interruption capabilities.
- Sealed pressure system

Extensible Design

- Individual CB and LBS modules can be any combination
- All modules are same size except user's requirment and under request
- Gas work not require to extend
- 2 types of extension, top side and side extension

Safety

- Safe-to-touch and hermetically sealed enclosure
- Overpressure relief device
- Pad lock
- Easy installstion and operation

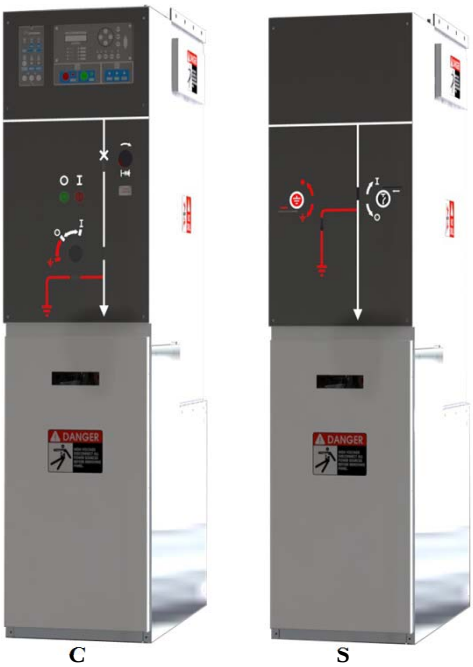
Controller

- Close/open
- Local/Remote
- Voltage/Current measuring and signals for FRTU
- Rechargeable battery with the charger

Relay

- DSP, micro-processor based relay
- Fault indicator

Multy-Way type



C **S**

Modular type

PAC-E102

Overcurrent relay

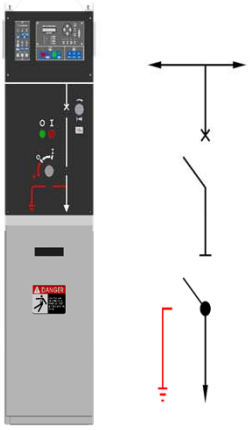
EN 155S

Self powered relay

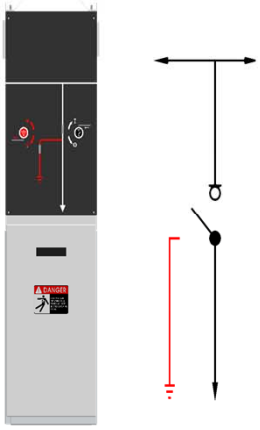
EN 255R

Dual overcurrent relay

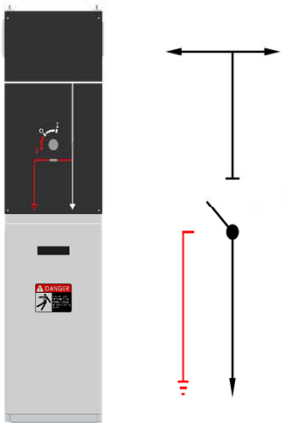
Circuit-breaker feeder - Type C



C Module



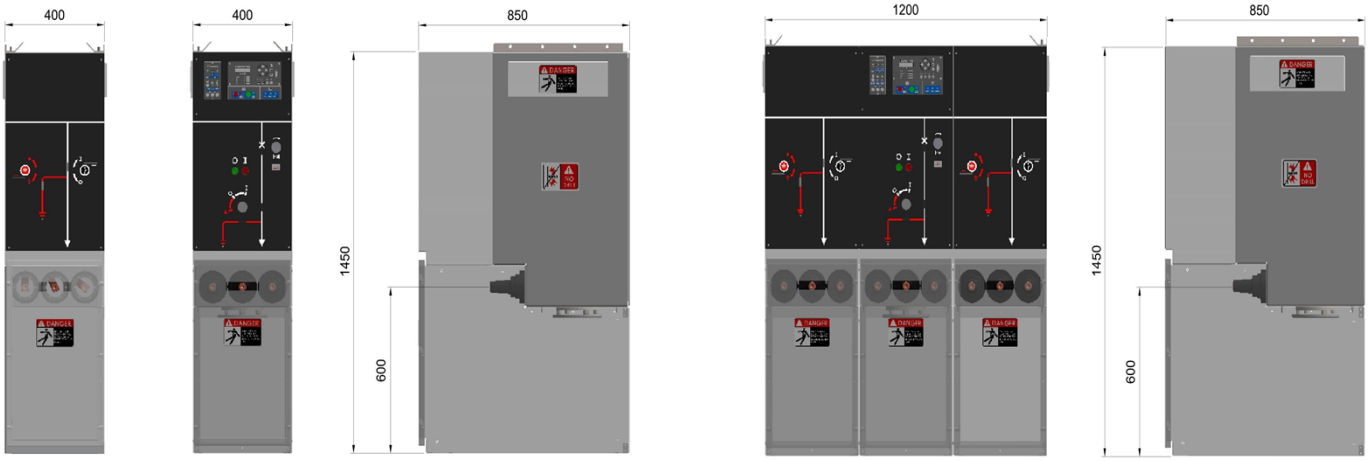
S Module



DS Module

Specification						
Item	**CB**		**LBS**		**DS**	
Ambient temperature	-25 ~ 70℃					
Relative humidity	0 ~ 95%					
Maximum altitude	2000m					
Rated voltage	15kV	27kV	15kV	27kV	15kV	27kV
Rated current (Main/T-100)	630, 1250A / 200, 630, 1250A		630, 1250A / 200, 630A		630, 1250A / 630, 1250A	
Rated frequency	50/60Hz					
Dielectric tests						
Lighting impulse	85/95kV	125kV	85/95kV	125kV	85/95kV	125kV
Power frequency 1min	42/49kV	60kV	42/49kV	60kV	42/49kV	60kV
Mechanical endurance						
Circuit Breaker	10,000CO	10,000CO	5,000CO	5,000CO	1,000CO	1,000CO
Disconnect Switch	1,000CO	1,000CO	1,000CO	1,000CO	1,000CO	1,000CO
Short-circuit tests						
Short-circuit tests	20kA 1sec		16kA 3sec		16kA 3sec	
T10	O-0.3s CO-180s-CO					
T30	O-0.3s CO-180s-CO					
T60	O-0.3s CO-180s-CO					
T100s	O-0.3s CO-180s-CO					
T100a	O, O, O					
Double Earthing fault	O					
Temperature rise test	630A, 1250A				630A, 1250A	
Gas						
Leak rate	Less than 0.1% per year					
Rated filling pressure	0.05 Mpa					

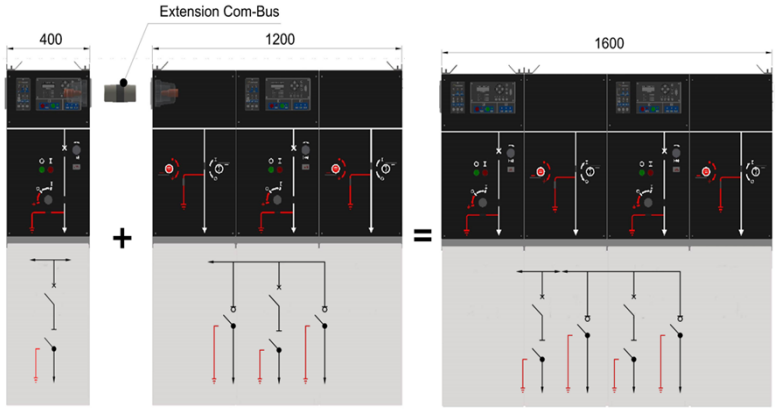
Dimension



S C SCS

Dimension Extension

Extension



Dimension of Each Module		
Height	mm	1450
Depth	mm	850
Width	mm	400
Weight	kg	200

EN RMC series(Compact Type Ring Main Unit)

Self stand type outdoor substation, customer transfer substations and distribution substations
Industrial plants and underground stations

Highly Reliability

Maintenance-free concept
Pure puffer techniques, no leakage current path between open contacts.
Switchgear vessel made of stainless steel
SF6 gas insulation and vacuum interruption.
Assurance of insulation and interruption at atmospheric gas pressure.
Sealed pressure system
Self Stand and Outdoor Usage

Safety

Safe-to-touch and hermetically sealed enclosure
Overpressure relief device
Pad lock
Easy installstion and operation

Controller

Close/open
Lock/Unlock
Local/Remote
Voltage/Current measuring and signals for FRTU
Rechargeable battery with the charger

Relay

DSP, μ-processor based relay
Fault indicator

+SVS+

EN 155S Relay

Self powered relay

PAC-E100

Overcurrent relay

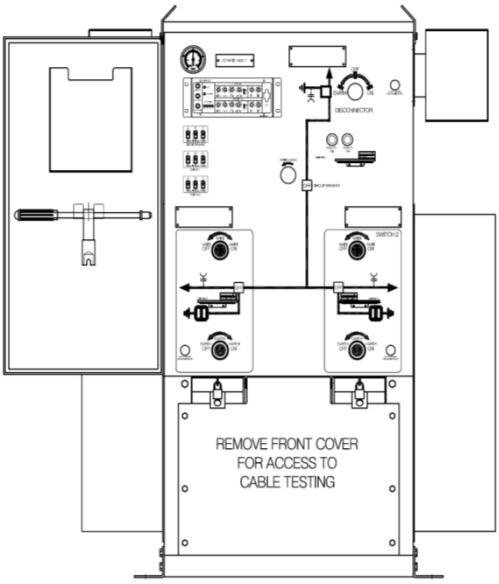
EN 255R Relay

Dual overcurrent relay

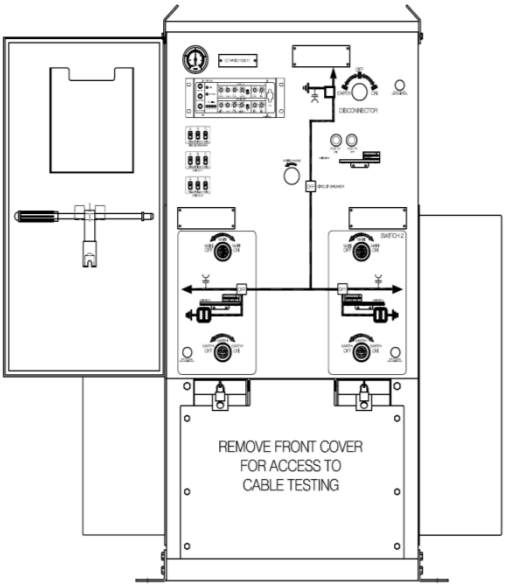
SPECIFICATIONS

Ambient temperature	-25 ~ 70℃
Relative humidity	0 ~ 95%
Maximum altitude	2000m
Rated voltage	17.5kV
Rated frequency	50/60Hz
Mechanical endurance	
Circuit Breaker	M1 (1000 CO)
Switch	M1 (1000 CO)
Earthing Switch	M1 (1000 CO)
Dielectric tests	
Lighting impulse	95kV/110kV
Power frequency 1min	38kV
Short-circuit tests	
Main circuit switch	21kA/3sec
Circuit Breaker	21kA/3sec
Internal Arc Rating	
Freestanding	21kA/1 sec
IP Class	IP54
Temperature rise test	
Main circuit switch	630A
Gas leak test	
Leak rate	Less than 0.1% per year
Rated filling pressure	0.04 Mpa

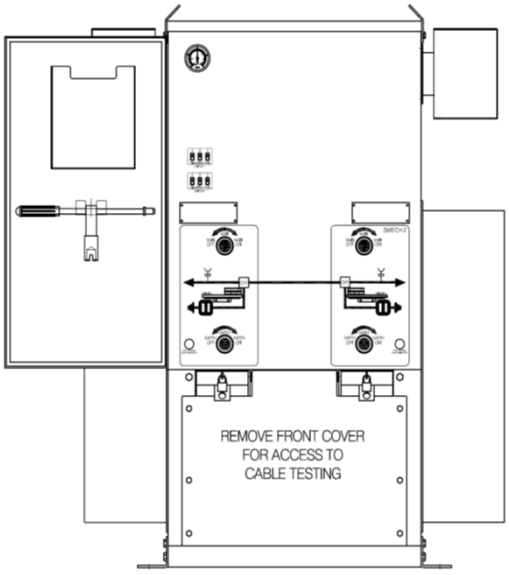
Configuration



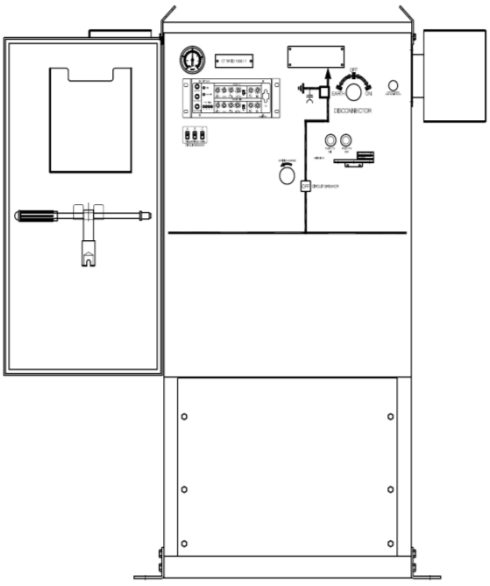
'+SVS+ both side extensible



SVS non extensible



'+SS+ both side extensible



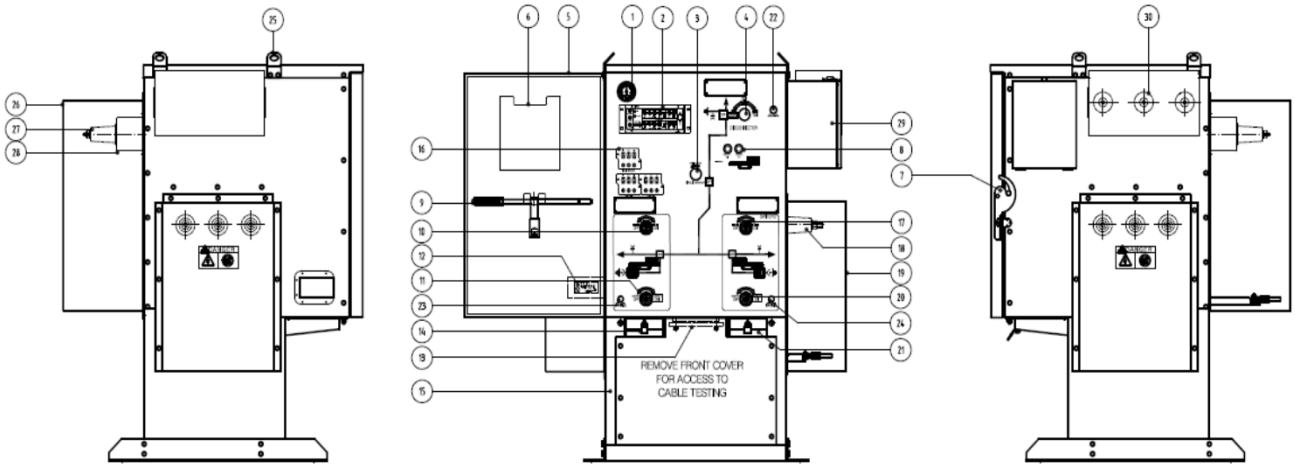
'+V+ both side extensible

'SVS' , '+SVS+' , '+V+' , '+SS+' modules be provided where,
S - Ring Switch(Load Breaker Switch)

V - Vacuum Circuit Breaker (with Disconnector on the bushing side)

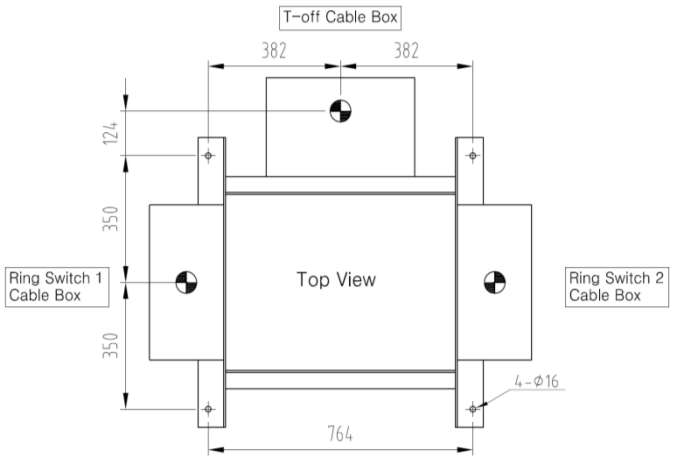
''+' symbol represents extensibility option.

Structure

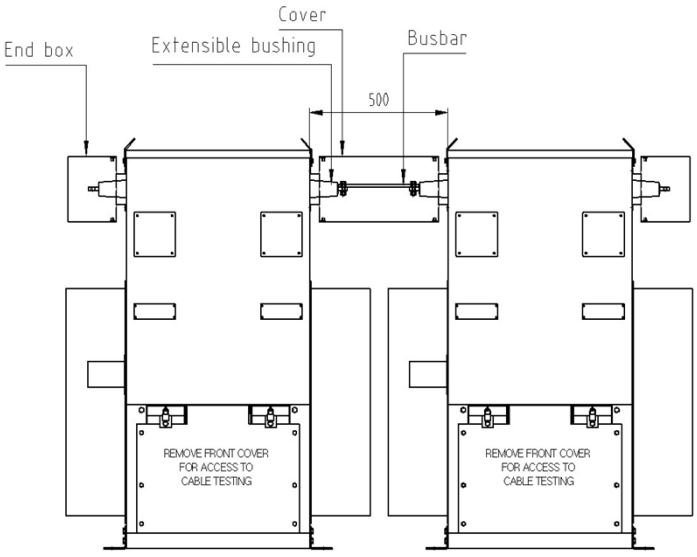


Configuration(Extensible)

1. Pressure gauge
2. Relay
3. Vacuum circuit bricker spring charge
4. VCB disconnector
5. Switchgear front door
6. Operating manual
7. Padlocking for switchgear front door
8. VCB ON/OFF push button
9. Operating handle
10. Ring main switch-1
11. Ring switch-1 earthing
12. Earth fault indicator for ring switch-1
13. Internal arc vent
14. Test point box for ring switch-1
15. Switchgear stand
16. Voltage indicator device
17. Ring main switch-2
18. Bushing for ring switch-2(M16)
19. Cable box for ring switch-2
20. Ring switch-2 earthing
21. Test point box for ring switch-2
22. T-off cable box release
23. Ring switch-1 test access cover release
24. Ring switch-2 test access cover release
25. Lifting lugs
26. T-off cable box(for VCB)
27. T-off cable bushing(for VCB) M12
28. Protection CT,s
29. Terminal Box & Control Box
30. Bushing for Extensible



Top View



Extension Units

EN RMC series(Ring Main Circuit breaker)

Simple outdoor substation, customer transfer substations and distribution substations
Industrial plants and underground stations

Highly Reliability

Maintenance-free concept
Pure puffer techniques, no leakage current path between open contacts.
Switchgear vessel made of stainless steel
SF6 gas insulation and interruption.
At atmospheric gas pressure, it ensures the rated insulation and interruption capabilities.
Sealed pressure system

With DS type

Safety

Safe-to-touch and hermetically sealed enclosure
Overpressure relief device
Pad lock
Easy installstion and operation

Without DS type

Controller

Close/open
Lock/Unlock
Local/Remote
Voltage/Current measuring and signals for FRTU
Rechargeable battery with the charger

Relay

DSP, μ-processor based relay
Fault indicator

EN 155S Relay

Self powered relay

PAC-E100

Overcurrent relay

EN 255R Relay

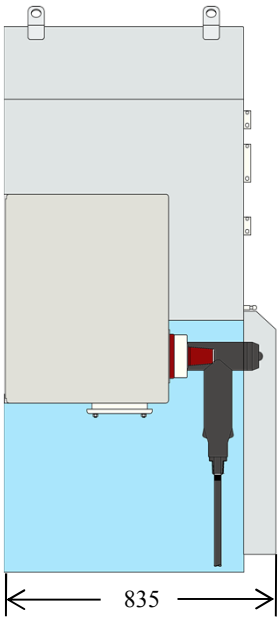
Dual overcurrent relay

SPECIFICATIONS

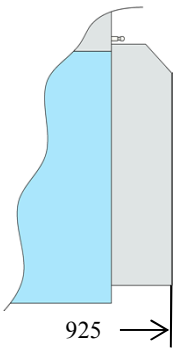
Ambient temperature	-25 ~ 70℃	
Relative humidity	0 ~ 95%	
Maximum altitude	2000m	
Rated voltage	12kV	27kV
Rated frequency	50/60Hz	
Mechanical endurance		
Circuit Breaker	10,000CO	2000CO
Switch	5,000CO	1,000CO
Earthing Switch	1,000CO	1,000CO
Dielectric tests		
Lighting impulse	85/95kV	125kV
Power frequency 1min	42/49kV	60kV
Short-circuit tests		
Main circuit switch	25kA 2sec	25kA 1sec
Circuit Breaker	20kA 4sec	20kA 1sec
T10	O-0.3s CO-180s-CO / 1time	
T30	O-0.3s CO-180s-CO / 1time	
T60	O-0.3s CO-180s-CO / 1time	
T100s	O-0.3s CO-180s-CO / 2times	
	O/10times, CO/11times	
T100a	O/3times	
Earthing fault	O-0.3s CO-180s-CO / 1time	
Temperature rise test		
Main circuit switch	630A	
Gas leak test		
Leak rate	Less than 0.1% per year	
Rated filling pressure	0.04 Mpa	

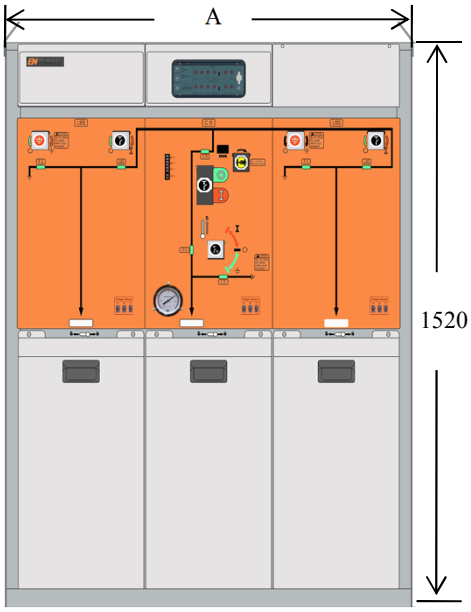
Dimension

RMC (with DS)

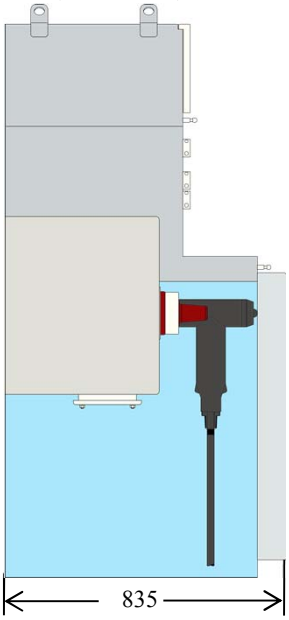


Double cable compartment cover

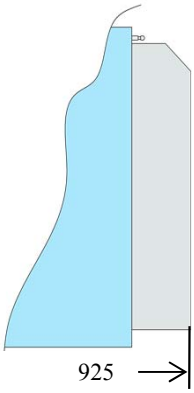


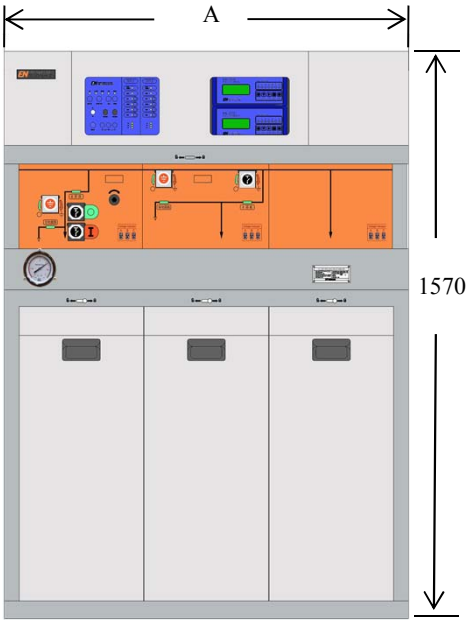


RMC (without DS)

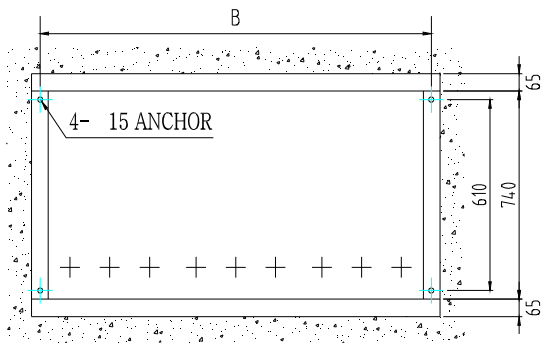


Double cable compartment cover





BASE



unit: mm

RMC	A	B
2-way	830	787
3-way	1210	1167
4-way	1590	1547
5-way	1970	1927
6-way	2350	2307

EN RMF series(Ring Main Fuse-switch combination)

Simple outdoor substation, customer transfer substations and distribution substations
Industrial plants and underground stations

RMF control(auto type only)

Highly Reliability

Pure puffer techniques, no leakage current path between open contacts.
At atmospheric gas pressure, it ensures the rated insulation and interruption capabilities.
Switchgear vessel made of stainless steel
Maintenance-free concept
SF6 gas insulation and interruption.
Sealed pressure system(above 30 years)
Climate-independent

Type: RMF 040M

Safety

Operation interlock with manual shutter
Safe-to-touch and hermetically sealed enclosure
HV parts are only accessible when outgoing feeders are earthed
Overpressure relief device
The speed of close/open is independent of the speed of lever movement.
Pad lock
Easy installstion and operation

Type: RMF 230M
(2 Fused switches and 3 Ring switches)

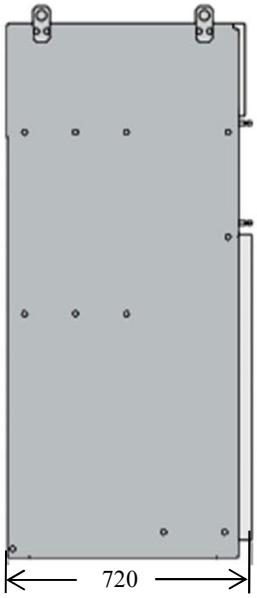
Type: RMF 201M
(2 Fused switches and 1 dummy)

SPECIFICATIONS

Ambient temperature	-25 ~ 70℃	
Relative humidity	0 ~ 95%	
Maximum altitude	2000m	
Rated voltage	15kV	27kV
Rated frequency	50/60Hz	
Mechanical endurance		
Switch	5000CO	
Earthing Switch	1000CO	
Dielectric tests		
Lighting impulse	85/95kV	125/145kV
Power frequency 1min	42/49kV	50/60kV
Short-circuit tests		
Main circuit switch	25kA 2sec	25kA 1sec
Earthing Switch	25kA 1sec	25kA 1sec
Make-break tests		
Active load	630A/100CO	
Closed loop	630A	
Cable charging	25A	
Line charging	2.5A	
Earthing fault	30A	
Transfer current	1550A	1250A
Making tests		
Switch	63kA peak, 5C	
Fuse-switch combination	31.5kA	
Temperature rise test		
Main circuit switch	630A	
Fuse-switch combination	125A	
Gas leak test		
Leak rate	Less than 0.1% per year	
Rated filling pressure	0.04 Mpa	
Protection class		
Tank	IP67	
Fuse Door, Cable box	IP3X	

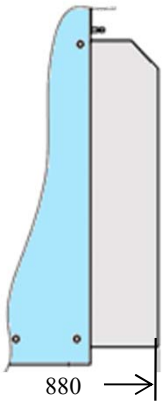
Dimension

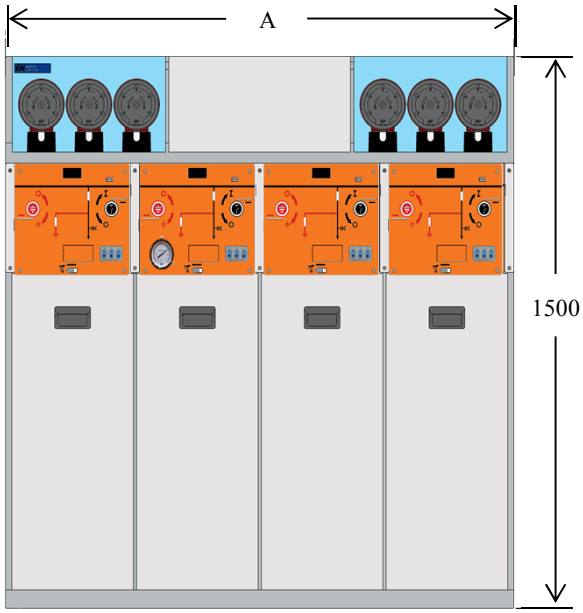
Fuse-switch combination



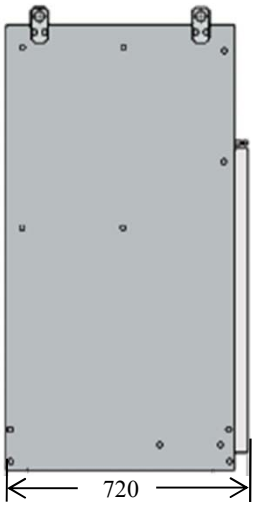
Single cable compartment cover

Double cover



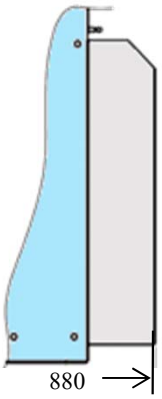


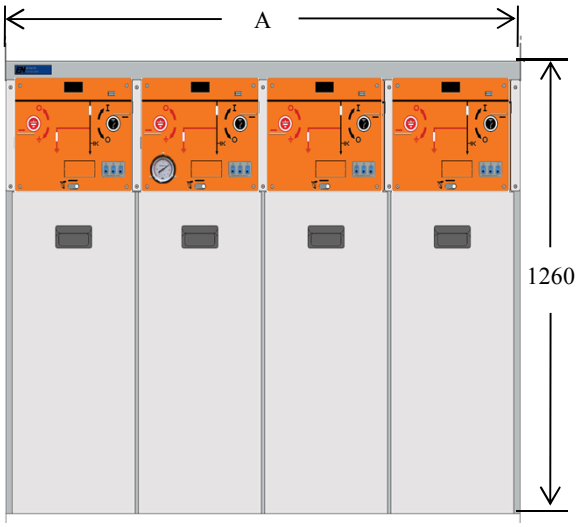
Switch only(manual type)



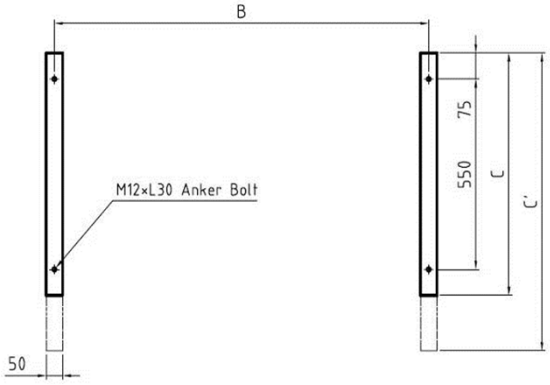
Single cable compartment cover

Double cover





BASE



unit: mm

RMF	A	B	C	C'
2-way	788	748	700	860
3-way	1168	1128		
4-way	1548	1508		
5-way	1928	1888		
6-way	2308	2268		

C: sigle cable compartment cover
C": double cable compartment cover

EN MPS series(Eco-Friendly Solid Pole mounted switch)

This Switchgear is ecofriendly product used for 24kV aerial line and compound distribution line purpose.
Improve reliability of barrier properties as using of polymer, solid insulation type , and Vacuum interrupter for blocking part.

Feature

Ecofriendly product applied solid insulation and Vacuum Interrupter without use of SF6 Gas
As use of Polymer insulation type,
There are no need of detect or suppliment for gas leakage all the time.
Continous maintenance for insulating material is not necessary.

Safety

Improve insulation function by applying compound insulation technical skill using of eco friendly insulation vehicle
Avoid danger of tank explosion stemmed from inner arc
Avoid danger of fire and explosion stemmed from gas leakage

Highly Reliability and Trouble Free

Switchgear vessel made of stainless steel
Maintenance-free concept
Without gas leakage mornitoring device and gas release device.
Climate-independent
Simple operating mechanism

SPECIFICATIONS	
Ambient temperature	-30~50℃
Insulation Vehicle	Epoxy/Silicon
Maximum altitude	1000m
Rated voltage	24kV
Rated frequency	50/60Hz
Mechanical endurance	
No-load voltage	5000 CO
Dielectric tests	
Lighting impulse	150kV
Power frequency	60kV
Short-circuit tests	
Main circuit	16kA/1sec
Make-break tests	
Active load	630A
Closed loop	630A
Cable charging	16A 25A
Line charging	1.5A
Rated Making Current	41.6kA(peak,5times)
Rated Control Voltage	DC 24V, AC 220V
Applied standard	KSC 4511,ANSI C37.71 , IEC 62271-103 KEPCO std. GS-5925-0139(2011.10.02)

EN KPS series(Pole mounted switch)

Overhead distribution line

Feature

Counter of operation times
Front and bottom On/OFF indicator
Pressure gauge

Safety

Hermetically sealed enclosure
Overpressure relief device
Manual locking device
Low gas pressure interlock device
Easy installstion and operation

Highly Reliability

Switchgear vessel made of stainless steel
Double sealing techniques with EPDM rubber
Maintenance-free concept
SF6 gas insulation and interruption.
Climate-independent
Simple operating mechanism
At atmospheric gas pressure, it ensure the rated insulation and interruption capabilities.
Pure puffer techniques, no leakage current path between open contacts.

Front view [KPS-260A]

Front view [KPS-260M]

SPECIFICATIONS

Ambient temperature	-25 ~ 70℃	
Relative humidity	0 ~ 100%	
Maximum altitude	2000m	
Rated voltage	12kV	27kV
Rated frequency	50/60Hz	
Mechanical endurance		
Switch	5000CO	
Dielectric tests		
Lighting impulse	85/95kV	150kV
Power frequency	42/49kV	60kV
Short-circuit tests		
Main circuit	25kA/2sec	20kA/1sec
Make-break tests		
Active load	630A	
Closed loop	630A	
Cable charging	25A	
Line charging	2.5A	
Earthing fault	30A	
Making tests		
Switch	63kA peak, 3C	52kA peak, 3C
Temperature rise test		
Main circuit	630A	
Gas leak test		
Gas leak test	Less than 0.1% per year	
Rated filling pressure	0.1 Mpa	
Protection class		
Tank	IP67	

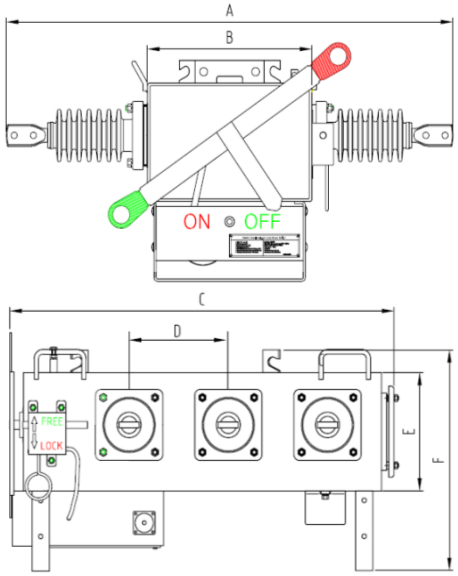
* Total weight of Main Unit only : Less than 130 kg

Bushing & Terminal

Porcelain bushing + Moldcone lead	
Porcelain bushing + NEMA terminal	
Epoxy bushing + NEMA terminal	

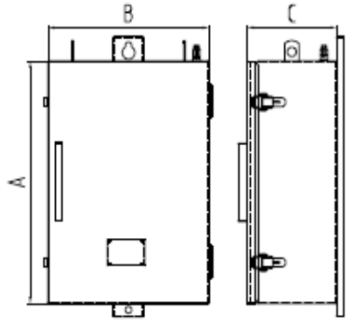
LBS control cubicle

Dimension



unit: mm

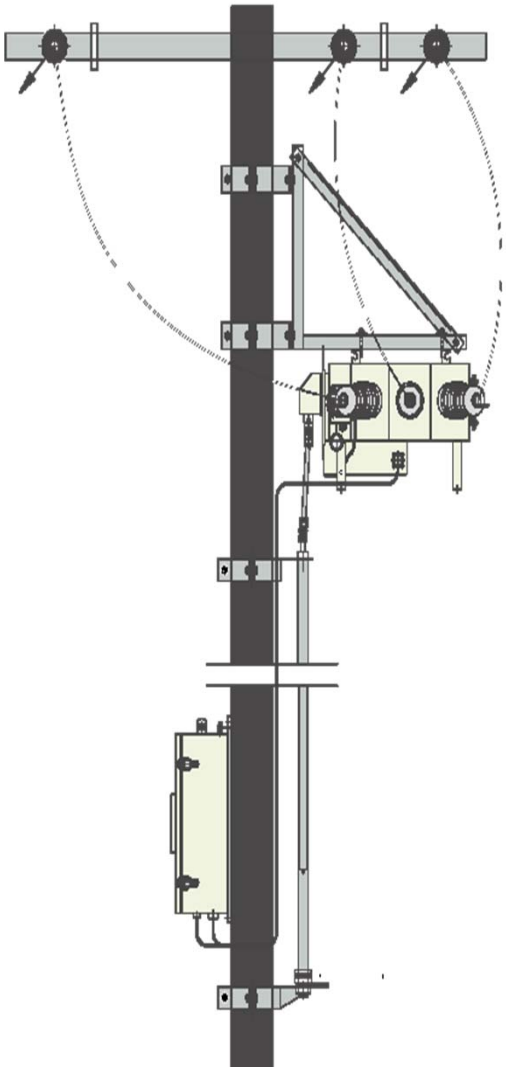
Measured points	A	B	C	D	E	F	G
Specified values	1012	2000	380	260	485	890	230



unit: mm

Measured points	A	B	C
Specified values	650	450	250

Mounting



EN ERC(Sf6)/ESR(Solid) Automatic Recloser

Reclosers are used on overhead distribution systems to detect and interrupt momentary faults within short period of time and re-close back to avoid black out and also to avoid major failure of power line to be spread.

Feature

PMA
Bottom On/OFF indicator
Pressure gauge(Gas type only)

Safety

Hermetically sealed enclosure
Overpressure relief device(Gas type only)
Manual tripping/locking device
Low gas pressure interlock device(Gas Only)
Easy installation and operation

Highly Reliability

Switchgear vessel made of stainless stee
Maintenance-free concept
SF6 gas insulation and Solid Dielectric insulation
Climate-independent
Simple operating PMA
At atmospheric gas pressure, it ensure the rated insulation and interruption capabilities.

SPECIFICATIONS

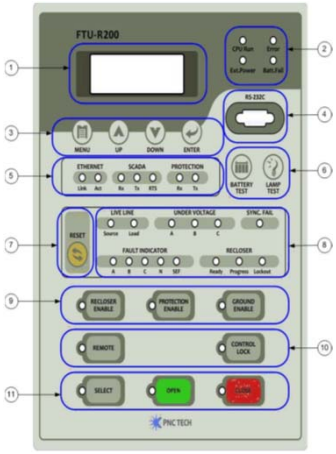
Maximum system Voltage	**15kV**	**27kV**	**24kV(Soid)**	**38kV**
Norminal frequency	50 / 60 Hz			
Rated continuous current	630 / 800A	630 / 800A	630A	630 / 800A
Short time withstand current	12.5 / 16kA	12.5 / 16kA	16kA	12.5 / 16kA
Fault make capacity (RMS)	12.5 / 16kA	12.5 / 16kA	16kA	12.5 / 16kA
Fault make capacity (Peak)	32.5 / 41.6kA	32.5 / 41.6kA	41.6kA	32.5 / 41.6kA
Operating time (Close/Open)	0.1 / 0.05s			
Mechanical endurance	10000	10000		10000
Breaking capacity				
Load switching	630 / 800A	630 / 800A	630A	630 / 800A
Line charging switching	2A	5A	5A	5A
Cable charging switching	10A	25A	25A	40A
Fault break capacity	12.5 / 16kA	12.5 / 16kA	16kA	12.5 / 16kA
Lightning impulse withstand level				
Phase to earth	110kV	150kV	125kV	170kV
Phase to Phase	110kV	150kV	125kV	170kV
Across interrupter	110kV	150kV	125kV	170kV
Power frequency withstand voltage				
Phase to earth	50kV	60kV	50kV	70kV
Phase to Phase	50kV	60kV	50kV	70kV
Across interrupter	50kV	60kV	50kV	70kV
Fault pick up				
Phase	10 ~ 900A (step:1)			
Earth	5 ~ 900A (step:1)			
Reclosing				
Reclose interval 1st	0.3 ~ 180s (step:0.1)			
Reclose interval 2nd	1 ~ 180s (step:1)			
Reclose interval 3rd	1 ~ 180s (step:1)			
Reclose interval 4th	1 ~ 180s (step:1)			
Reset time	3 ~ 180s (step:1)			

Protection

Fault passage indicator

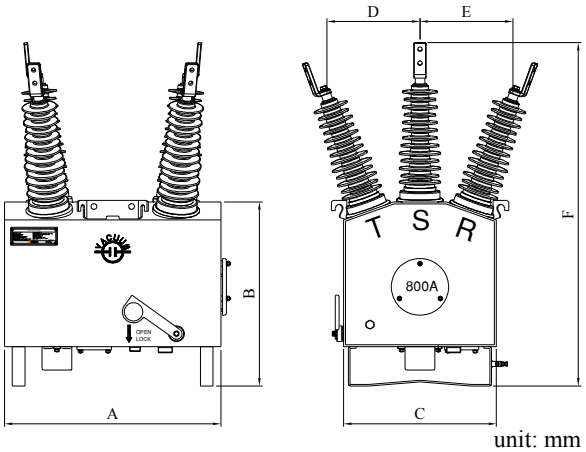
- 3-stage over current protection (directional or non-directional)
  - Fast and delayed TC trip elements for phase and earth fault
  - Definite time over-current element
  - Definite time HCT (High current trip)
- SEF(Sensitive earth fault) detection
- Cold load protection(pickup adjustment)
- Magnetizing inrush restraints
- Sequence coordination
- Open line detection
- Phase sync. fail detection
- Over voltage, under voltage, under /over frequency
- Auto reclosing (up to 4 shots)

Recloser control



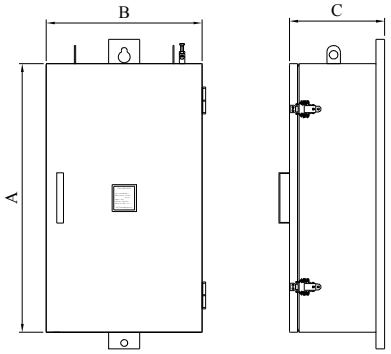
1. LCD DISPLAY
2. FTU STATUS
3. BUTTONS
4. SERIAL PORT
5. COMMUNICATION LED
6. BATTERY/LAMP TEST
7. RESET BUTTON
8. FUNCTION LED
9. RECLOSE/PROTECTION/GROUND ENABLE BUTTONS AND LEDS
10. REMOTE/CONTROL LOCK BUTTONS AND LEDS
11. SELECT/OPEN/CLOSE BUTTONS AND LEDS

Dimension



unit: mm

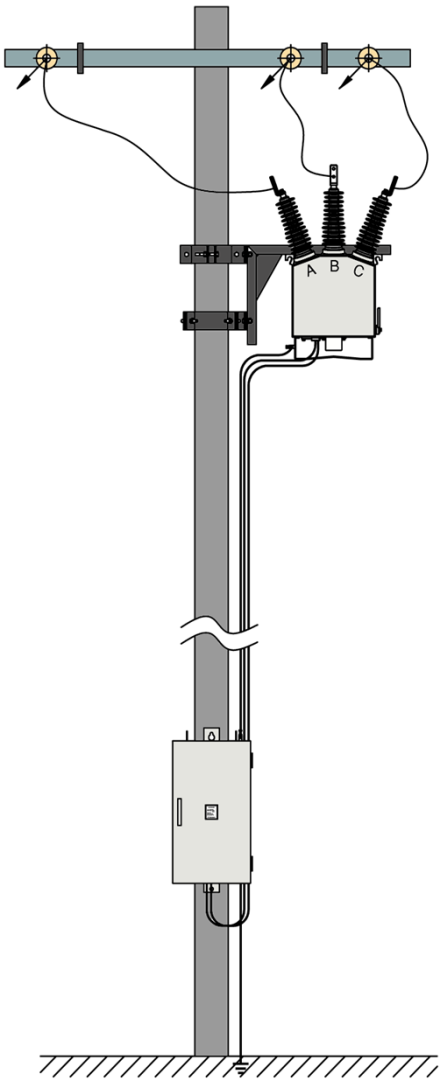
Rated voltage	A	B	C	D	E	F
15kV	680	585	480	270	270	990
27kV	680	585	480	270	270	1090
38kV	750	665	560	350	350	1295



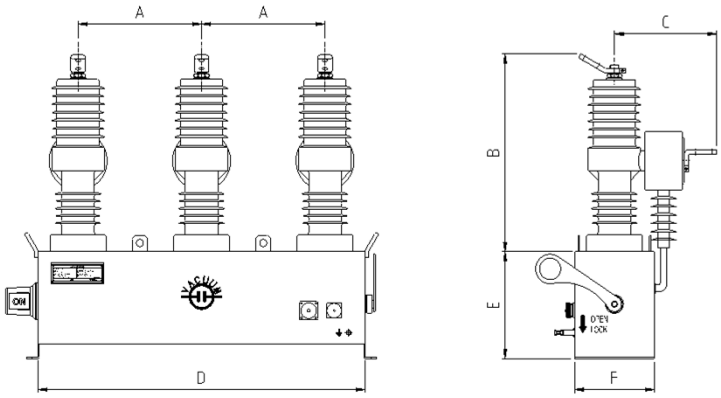
unit: mm

Rated voltage	A	B	C
15/27/38kV	800	450	275

Mounting

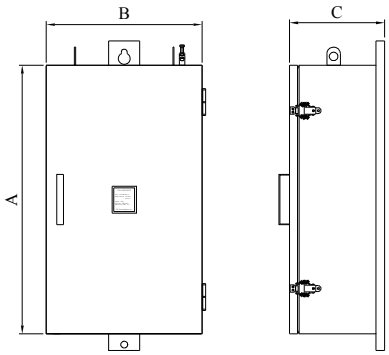


Dimension



unit: mm

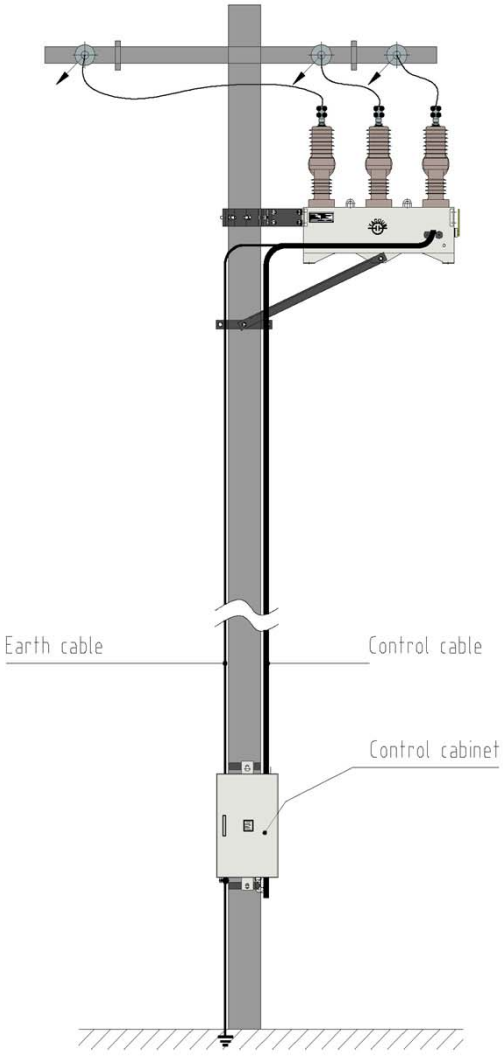
Rated voltage	A	B	C	D	E	F
15kV	340	535	280	900	290	220
27kV	340	535	280	900	290	220
38kV	390	757	340	1010	290	260



unit: mm

Rated voltage	A	B	C
15/27/38kV	800	450	275

Mounting



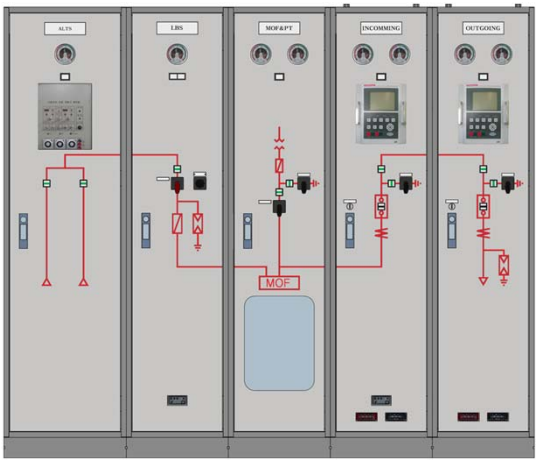
EN GIS series(25.8kV Gas Insulated Switchgear)

All-in-one Compact Gas Insulated Switchgear combining Circuit Breaker, Disconnecting Switch, and Earthing Switch by using SF6 gas for unification of Metal Enclosed Distribution Panel and making higher

Features

Acheive safety through hermetically sealed SF6 gas
Prevention operator from mal-operation (mechanical, electrical interlock)
Indicator for applying electric current, operation status (voltage detector)
Equipped the pressure relief device for inner breakdown
Prevention from trouble expansion into individual gas section
Extend service life and safety applying patented circuit breaker

Standard Construction of EN-TGIS Series



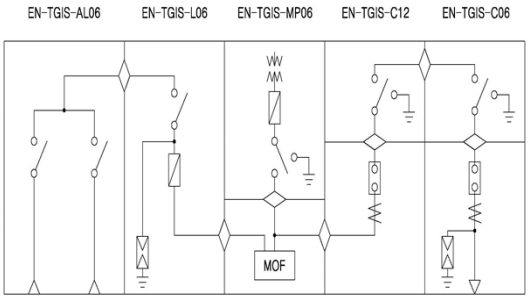
Highly Reliability

Achieve equipment reliability using Vacuum nterrupter
Outstanding accuracy based on digital relay and meta
Apply three dimensions structural analysis and electric field analysis technique

Safety

Securment of stability for complete sealed type of live part
Protection from operator mal-operation (technical, electrical interlock)
Satisfy securing device against internal breakdown
Protection from fault expansion by each gas division

Single Line Diagram



Econmic&Practicality

Minimization of installation area (lower30%)
Convenience of Maintenance by modulation of indivisual Panel
Easy transport and installation by laying out light weight and compact design

SPECIFICATIONS

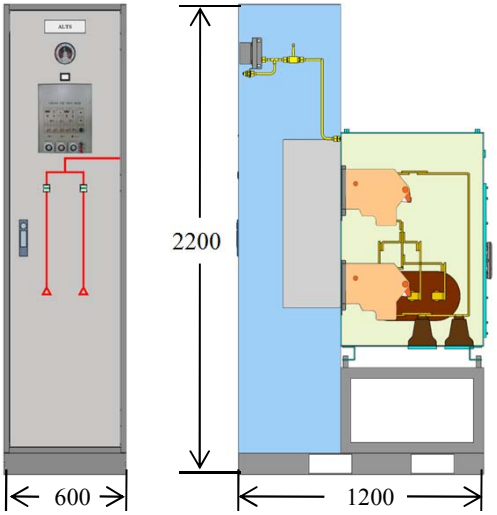
PANEL	EN-TGIS-AL06	EN-TGIS-L06	EN-TGIS-MP06	EN-TGIS-C12	EN-TGIS-C06
Rated voltage (kV)	25.8	25.8	25.8	25.8	25.8
Rated current (A)	630(1250)	630(1250)	630(1250)	1250(2000)	630
Circuit configuration	3PH	3PH	3PH	3PH	3PH
Rated frequency (Hz)	50/60	50/60	50/60	50/60	50/60
Rated power frequency withstand voltage (kV)	50	70	70(77)	70(77)	70(77)
Impulse withstand voltage (kV)	150	150	150(165)	150(165)	150(165)
Partial discharge extinction voltage					
Phase to ground (pC)	≤10	≤10	≤10	≤10	≤10
Rated short time withstand current					
RMS (kA/sec)	16/1	25/1	25/1	25/1	25/1
Peak (kAp)	41.6	65	65	65	65
Rated gas pressure -at 20℃ (MPa·G)	0.05	0.05	0.05	0.05	0.05
Rated minimum gas pressure -at 20℃ (MPa·G)	0.03	0.03	0.03	0.03	0.03
Operation voltage of control circuit (Vd.c.)	Note.1	110	110	110	110
International Protection	IP4X	IP4X	IP4X	IP4X	IP4X

Note.1 : EN-TGIS-AL06 power circuit supply voltage is AC220V, and operation circuit supply voltage is DC24V.
Note.2 : withstand voltage dimension in bracket is same with DS(Disconnecting Switch) figure between poles.
Note 3 : ( ) is an optional under cutomers request and requirement

Structure and Feature of EN-TGIS Series

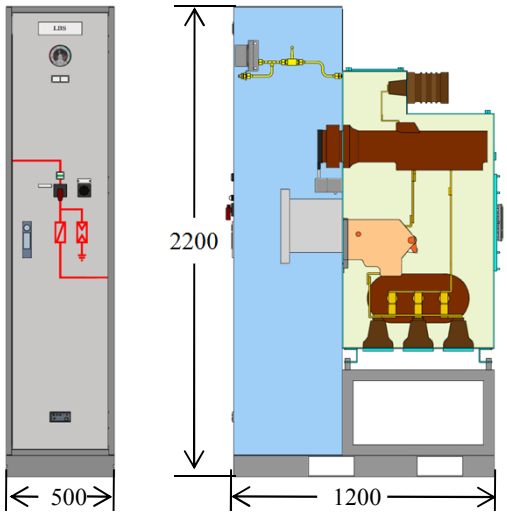
EN-TGIS-AL06

About ALTS (Automatic Load Transfer Switches)



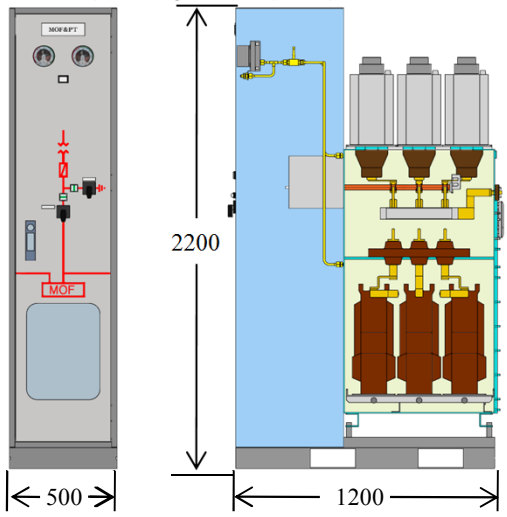
EN-TGIS-L06

About LBS (Load Break Switch)



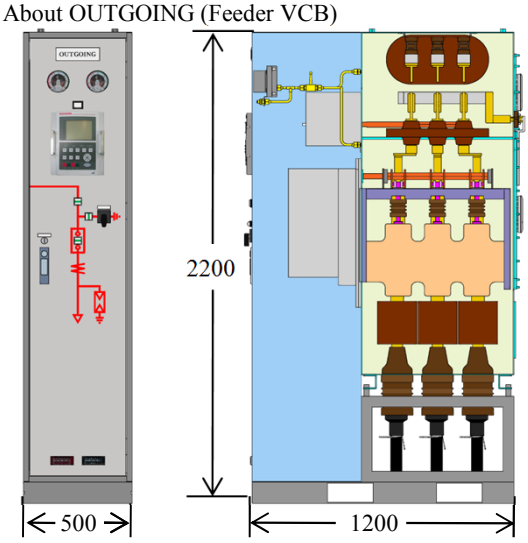
EN-TGIS-MP06

About MOF(Metering Out Feet)+PT(Potential Transformer)



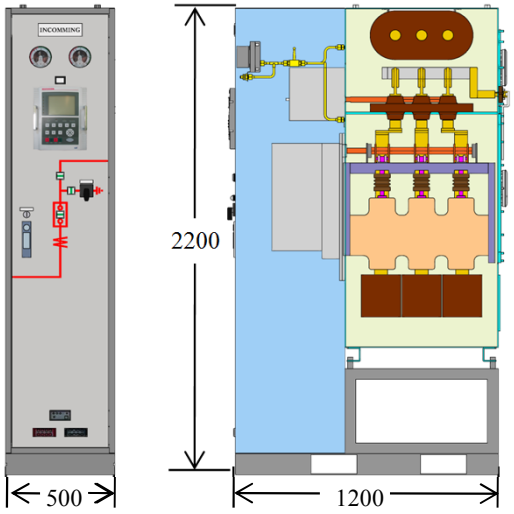
EN-TGIS-C06

About OUTGOING (Feeder VCB)



EN-TGIS-C12

About INCOMMING (Main VCB)



INCOMMING (Main VCB)

Option

1. Cable Connecting Method
   T-Connector (630A)
   Plug Termination (1250A/630A)

2. Docking type
   Spacer (necessity of gas site operation)
   Plug-in (needless of gas site operation)

3. Form of bus bar
   is capable of change to user's request

EN GIS series(72.5kv Gas Insulated Switchgear)

Features

Multi switching device using SF6 Gas filled sealed metalize enclosure which contain CB, DS and ES.
Minimized installing area
Main protection system for power line of Railroad application
High reliability by using SF6 Gas completely sealed enclosure
High safety with No Power Out or fault by contact
Bus bar contained by metal seal
Local Control Panel and Open/Close indicator provided

SPECIFICATIONS			
Ambient temperature	-25 ~ 40℃	Operation system	Motorized Spring type
Relative humidity	0 ~ 95%		
Maximum altitude	2000m	Breaking type	SF6 gas
Rated voltage	72.5kV		
Rated frequency	50 / 60Hz	Short time current	
		R.M.S	20kA
Dielectric tests		Peak	52kAp
Lighting impulse	325 / 375 kV	Duration	1s
Power frequency 1min - Switch	140 / 160kV		
Power frequency 1min - Control	2kV / 1 min		
		Rated current	2000A
Partial Discharge		Breaking current	20 kA , rms
Earth	50.2kV, below 5pc	Making current	52 kA , Peak
Phase	87kV, below 5pc	Breaking time	3 Cycle

Summary of the EN technologies products

Underground Line RMU series

RMC Series
Up to 6 feeders with common tank
Sf6 Gas Insulation and VI interruptio
Circuit Breaker and Switch combinati
12 ~ 27kV 630A 20/25kA 125 BIL

RMF Series
Up to 6 feeders with common tank
Sf6 Gas Insulattion and interruption
Fuse-switch and switch combination
12 ~ 27kV 630A 25kA 125 BIL

RM Series
Extensible Moduler type
Sf6 Gas Insulation and VI interruption
Individual Circuit Breaker or Switch combination
12 ~ 27kV 630/1250A 20/25kA 125 BIL

Overhead Line Pole mounted series

KPS(EPS) series
SF_6 gas Load Break Switch
12kV~38kV 630A 25kA 70kV 170 BIL
DSP, µ-processor control FRTU function

MPS MPS Series
Solid Load Break Switch
12~24kV 630A 12.5kA 150 BIL
DSP, µ-processor control
FRTU function

ERC Series
SF6 Gas Automatic Circuit Recloser
12~38kV 800A 16kA 60kV 150 BIL
DSP, µ-processor control
FRTU function

ESR Series
Solid Automatic Circuit Recloser
24kV 630A 16kA 50kV 125 BIL
DSP, µ-processor control
FRTU function

EN GIS series

25.8kV Gas Insulated Switchgear
All-in-one Compact Gas Insulated Switchgear
combining Circuit Breaker, Disconnecting Switch, and Earthing Switch
25.8kV 1250(2000)A 25kA 70kV 150 kV BIL

EN GIS series

72.5kV Gas Insulated Switchgear
Multi switching device using SF6 Gas filled sealed metalize enclosure
which contain CB, DS and ES
72.5kV 2000A 20kA 140kV 325kV BIL

Global Leader in Switchgear & Power Distribution System

POWER SWITCHGEAR :
682-1 Sukpo-ri, Jangan- myeon, Hwasung-si, Gyeonggi, 445-941, Korea
Tel. +82. 31. 686. 8815 / Fax. +82. 31. 686. 8816

H.Q./R&D Center/Power Electronics :
SK Ventium102-11F, Dangjeong-dong 522, Gunpo, Gyeonggi, 435-776, Korea
Tel. +82. 31. 429. 7794 / Fax. +82. 31. 429. 7795

Seoul Office :
Geumbok Bldg. 9F, Bang-yi-dong 45-2, Songpa-gu, Seoul, 138-828, Korea
Tel. +82. 2. 420. 3810 / Fax. +82. 2. 420. 3820

Web site: www.entek.kr

EN Creative Energy to the World TECHNOLOGIES

KSA
ISO9001