



# **Electrical Equipment General Catalog**

LV Equipment
MV Equipment
Switchgear
IED & Controller
Protective Device



# 1955~1988 History of Technology, Open Up New Vistas

Kwangmyung Electric Co. was founded in 1955 and started as a neutral electricity manufacturer in January, 1968 and moved the plant to Seongsu-dong in April, 1972. The company prepared a foundation as a technology company through a technical tie-up with AICHI Company and VSS & ATS of Japan in April, 1981 and a technical cooperation with MEIDENSHA Company of Japan and a contract was concluded on Korean retail stores (V.I) in December of the same year. VCB 7.2kV-Class Type Test (localization) was completed in July, 1982 and VCB 25.8kV-Class MCSG 2 Type and 7.2kV Type Tests were completed in September of the following year. We were designated as an electric parts and materials development company (Ministry of Commerce, Industry and Energy) for Type1 other than a vacuum contact in July, 1986 and established a technical cooperation with LINDSEY Company, USA on Polymer Concrete in December of the following year. In addition, 4 types of ACB were developed in June, 1988 and successfully localized them (KEMA Authentication, Netherlands).

# 1989 ~ 1999 Opportunity, Challenge and Remarkable Leap

The company name was changed to Kwangmyung Electric Generation Co. in June, 1989 and an affiliated technology lab was founded in December of the same year. We obtained KS marks for VCB 7.2kB, 8kA and 12.5kA in 1990 (Industrial Advancement Administration) and passed the development test for ACB 2 Types (KERI) in 1991 and for outdoor VCB and Gas Insulated Load Break Switch (PGS) (CESI, Italy) in 1993. We acquired the KS mark for Gas Insulated Load Break Switch (PGS for manufacturing) in 1995 and were awarded with the first Export Award (KEMC). We began exporting ATS to GENERAC.CORP, USA in 1995 and obtained KSA-QA ISO9001 certificate. We moved the office to Seoul in August, 1996 (Neung-dong, Gwangjin-gu, Seoul) and successfully developed Manual/ Motorized ASS 25.8kV 200A in December. Also, VCB development test was completed in 1997 (POWER TECH, CANADA), developed L/A 5kA in 1998 (Polymer Rubber Type), developed VCB 25.8kV, 31.5kA, 38kA and 40kA and acquired BVQ1 ISO 9001 certificate. A joint company with China was founded in 1998 and we were awarded IR52 Jang Young Shil Award in February of the following year (Maeil Business Newspaper) and selected as one of the 50 firms with qualitative competitiveness in 1999 which displayed our technical skills and quality that we strengthened for years.

# 2000~2012 VITZRO, Stepping Forward to the World

The company name was changed to VITZRO EM Co. in 2000. We laid a foundation for a rapid growth by developing VCB 12kV 1250A 25kA/15kV 1200A 25kA and registering in KOSDAQ stock market. A new plant was constructed in July of the following year (located in Seonggok-dong, Ansan, Gyeonggi Province) and we were designated as a promising small business (Gyeonggi Province Office), an electric parts and materials development company and INNO BIZ company (Joint Korean Economic Newspaper/Small and Medium Business Administration). We sped up on development of new technology and products and developed Cable Termination kits, Insulation Cover, Feed-type ASS (auto & manual), Outdoor VCB Bushing (Polymer Type) and Processed Gas Insulated Load Break Switch in 2002, VCB for nuclear power, ACB for nuclear power (508V 30/50/65kA), Current Limit Power Fuse and so forth in 2003. We were also awarded with various certificates and awards that prove our quality and technology such as a reliability certificate on Processed Gas Insulated Load Break Switch (PGS) in 2004 (R Mark, Korean Agency for Technology and Standards), a Certificate of Quality & Environment System and Aerospace Quality System (ISO 9001 & AS9100, ISO 14001) and a grand prize at the 1st Logo & Symbol Mark Contest (Ministry of Commerce, Industry and Energy Award). We obtained GD mark in 2005 and finally got a 1,000 ten million dollar-export prize in November, 2006, confirming the remarkable growth of VITZRO EM.

Best products of electric equipment field including LV and HV From designing, manufacturing, installing and diagnosing the equipment to composing the power system, it is based on the accumulated, global standard technology and continuous R&D.

# LV Equipment



#### Air Circuit Breakers

- ANSI C37.13/EED1200 Certification for Nuclear Power
- Adopted multifunction digital trip relay KS, KERI Certification
- Compact, lightweight
- Standard Specification: IEC 60947-2



- Standardized main sizes, easy manufacturing of panel
   Composed of max. 225AF, 2/3/4P
   MCCB / ELCB same frame

- Compatible installation of new and old products
- · Adjustable sensitivity current, Max. 500mA



- UL1008 Certification, KERI Type Test completed
- Maximum short circuit capacity in the country
  Optimal form that enables installation of
- 600mm-panel board for all types
- Ensure stability through separately sealed structure for each phase



- For both 100~240V AC/DC Free voltage
- Easy to replace due to adoption of drawer-type operating coil
- Manual maintenance is possible through external trip
   Compatible installation of new and old products



#### Molded Case Circuit Breakers

- UL Certification, Max. 800AF
   Max. 1200AF, fully equipped with all series 3/4P
   MCCB / ELCB same frame
- Realization of various auxiliary devices
- Compatible installation of new and old products



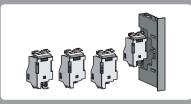
# Miniature Circuit Breakers

- Minimum size, easy to apply panel board
- Increase of breaking capacity (5kA at AC 220V)
   Equipped with leakage display button



- Improve the operation cycle of switch by upgrading the contact
- For both 100~240V AC/DC Free Voltage

  Easy to replace due to adoption of drawer-type operating coil
- AC operation DC excitation, response to optimal voltage fluctuation
- Easy to mount and connect



- Standardized auxiliaries, easier to apply AL, AX, UVT, Shunt various auxiliaries

# **MV** Equipment



#### Vacuum Circuit Breakers

- Rated breaking time of all types 3 cycle
  Nuclear power certification ANSI C37.06 / EED1100
  Developed the first domestic Embedded VCB
  Passed KERI, KEMA, CESI development test
  Standard Specification: IEC 62271-100 [M2, E2, C2 Class]



# Load Break Switch/Auto Section Switch

- Maximum fuse combined capacity in the country-Max. 100A
- LA & PF external combination structure
   Easy to design single-body panel through optimal form design
- Standard Specification: IEC 62271-105, IEC 60265-1, KEMC1126
- Compatible structure for LBS and ASS



- Rated breaking time 6.3kA(16.4kA peak)
- Minimize switch surge through optimal VI design
  Standard Specification: IEC 60470, IEC 60282-1
- Realization of mechanical interlock between VCSs or with other devices



- Maintain high-vacuum state through automation process
   Compact and lightweight, durable design
   Collect and store all manufacturing information

- Excellent mechanical strength and degasing
- High-speed breaking and short arcing time



#### Main Circuit Breaker for Rolling Stock/ Vacuum Train Breaker (MCB/VTB)

- The sole main circuit breaker for rolling stock in the country
- Excellent seismic performance
   Detection of operating pressure and auto trip function
   Stable breaking feature (AC, DC line)



# Gas Insulated Load Break Switch (GLBS)

- Division of lines and tapped line applied
- 3 position function(ON, OFF, Earth) Increase safety with hot-line display
- Certificate on reliability by KATS
- Low pressure display and lock function



- The one and only Medium Voltage Transfer Switch in Korea
  Electrical & Mechanical Interlock available.
  Economical optimization [Two sides of panels and two pieces of VCBs are not necessary.]
  Minimized outside dimension which can be possible with
- multistage loading.



- Optimal current limit feature
- Protection through full back-up with high breaking capacity
   Maximum striker motional energy in the country
- Simplified with 4 types of fuse forms
- Protect transformers, motors, condensers and wires

# Switchgear



#### Gas Insulated Switchgear (GIS)

- Gas-filled fully enclosed structure
   Minimized installation size
- Shortened installation time through composition of standard devices
- Simple maintenance
- Low noise and minimized inductive interference



# Eco-Gas Insulated Switchgear (Eco-GIS)

- Eco insulator used Dry Air
- Detailed of the control of the control
- External assembly-type PT structure applied



- Easy to expand and change due to a standardized design
   Easy for maintenance due to draw-out structure of
- Metal Clad/Compartment/Cubicle Type Optimized the application of each structure



- Easy to change the structure for each unit
- Prevent the influence of internal failures by dividing units
   Prevent the influence of internal failures on busbar
- using a metal barrier

# **IED & Controller**



#### Digital Protection Relay VIPAM5000/3000 II

- System protection required, relay element provided

- Store history of faults[trouble] and wave form
   Provide analysis function through PC interlocking
   IEC61850, DNP3.0, RS422/485 communication support
- English/Korean language support



# Digital Control Meter VIMAC3000

- Power quality analysis and breaker control
   Automatic power factor control[APFC], harmonic analysis

# **Protective Device**



- Optimal motion of Gapless type
- Scatter prevention when explodes using a polymer LA
   Can be used outdoors using a polysil SA
   Fire prevention due to nonflammable material



- IEC and KS standard certification
- Built-in fuse with disconnecting device function
   Excellent TOV failure feature
- Operation status display lamp (LED Lamp)
   Easy to install using a Plug In type

# **MV EQUIPMENT**

### Vacuum Circuit Breaker



#### ■Feature Applied Std. IEC62271-100, IEC60056, IEEE C37.09

• Installation Type : N(Fixed), E(Draw out), F(Safety shutter), G(Bushing)

Applied Std.		IEC Ratings IEE						EE[A	E[ANSI] Ratings											
Rated Voltage [kV]				7.2				12		17	'.5	2	4	4.76	8.25	15	25	.8	36/	/38
Rated breaking current[kV]		8	12.5	20	25	31.5 / 40	25	31.5	40	25	40	12.5	25	50	50	40	25	40	31.5	40
	400/630	•	•	•	•	-	•	-	-	•	-	•	•	-	-	-	•	-	-	-
Rated	1200/1250	-	-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Current[A]	2000	-	-	-	•	•	•	•	•	-	•	-	•	•	•	•	•	•	•	•
	3000/3150	-	-	-	-	•	-	•	•	-	•	-	-	•	•	-	-	•	-	•

# Load Break Switch/ **Auto Section Switch**



# ■Feature

- LBS breaking capacity E3 class
- 100A PF combination, transfer current upto 1250A
- · Various mount type for ASS: standard, horizontal, vertical

	Rated Rated		Short time withstand	Operating	PF	Withstand voltage		
	Voltage[kV]	Current[A]	current[kA/1s]	type	combination	Lightning impulse	Power frequency	
LBS	24kV	630A	20kA	Motorize/Manual	Max 100A	145/125	60/50	
ASS	25.8kV	200A	15kA	Motorize/Manual	Max 100A	145/125	60/50	

# **Vacuum Transfer Switch**



# Ratings

- 7.2kV 400/600A 12.5kA/1sec
- Transfer Sequence :  $A \leftrightarrow off \leftrightarrow B$

#### Feature

- Medium voltage load transfer with Vacuum Interrupter
- Easy maintenance with drawable structure
- · Small and light weight for 2 stage installation

# V.I Disconnecting Switch



#### ■ Ratings

- 25.8kV 600/2000A 25kA/1sec
- Motorized control DC125V
- No load operation 1000 times

#### ■ Feature

- Ensure switching performance with Vacuum Interrupter
- Selectable phase distance 300mm and 500mm
- Status check with controller (DS On/Off, Lock/Unlock, Load status)

# Vacuum Contact Switch



#### Ratings

- 3.3/6.6kV 200/400A 4kA
- Max PF rating 200A 50kA
- Continuous energize type/Instantaneous energize type

#### ■ Feature

- Minimum switching surge with optimal Vacuum interrupter
- Optimal switching capacity for motor and condenser
- Small and light weight, excellent insulation performance
- Mutual mechanical interlocking for 2 VCSs
- Multiple installation method Fixed, Draw out, PF mounted type

# Vacuum Interrupter/Embedded Pole

### ■Feature

- · Maintain high-vacuum state through automation process
- Compact and lightweight, durable design
- Collect and store all manufacturing information
- Excellent mechanical strength and degasing
- High-speed breaking and short arcing time

### **Outdoor Vacuum Circuit Breaker**

#### Ratings

- 15/24/36kV 25kA 1250A
- Max Impulse 170kV(Bil)
- Frequency 50/60Hz
- · Motor drive spring mechanism

#### Feature

- Standard IEC62271-100
- Frequency 50/60Hz
- · Motor drive spring mechanism
- IP55

### Pad Mounted Switch (GLBS)

# Ratings

- 15/24kV 600A
- Max Impulse 125kV(Bil)
- · Communication is available



#### ■ Feature

- 3/4 Circuit type(automatic/manual)
- Ground Switch
- Control panel
- Based on Metal

# LV EQUIPMENT

#### Air Circuit Breaker

# **■**Feature

- Nuclear Power Plant Certificate (Class1E, KEPIC EED1000-3000)
- Compact size. User priority structure & degisn
- Multi Function Digital Trip Relay (RS485 Communication port)

#### **ACB**



Туре	VAB20	VAB40	VAB50	VAB63
Frame(AF)	2000AF	4000AF	5000AF	6300AF
Poles(P)	3,4P	3,4P	3,4P	3,4P
Rated Current In	200, 400, 630, 800, 1000 1250, 1600, 2000A	2500, 3200, 4000A	5000A	6000A
Breaking Capacity	690V 65kA	690V 65kA	660V 85kA	660V 85kA

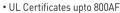
#### **Auto Transfer Switch**



	General	Synchronous Transfer	
Type	W Type	WN Type	CTTS Type
Rated Voltage	AC600V, DC125V	AC600V, DC125V	AC600V, DC125V
Rated Current[A]	100/200/400A	100~3000A	100~3000A
No.of poles	2/3/4P	2/3/4P	2/3/4P
Installation type	Front /Back	Front/Back	Front/Back
Transfer Sequence	$A \leftrightarrow B$	$A \leftrightarrow B, A \leftrightarrow N \leftrightarrow B$	$A \leftrightarrow B, A \leftrightarrow N \leftrightarrow B(Sync)$
Characteristics	Suitable for small inductive load current     UL1008 Certificate     Quick transfer to dual direction	Maximum breaking capacity (IEC60947-6)     High transfer performance for inductive load current     UL1008 Certificate	Maximum breaking capacity (IEC60947-6)     Mutual interlocking (Utility and Gen set)     Synchronous transfer performance

# Molded Case Circuit Breaker

# ■ Feature



- Max 1200AF with 3/4P
- Multi type with Breaking Capacity (Economic, Standard, High Capacity, Current limiting type)
- MCCB/ELCB same frame size for interchangeable
- Multi Auxiliaries
- Compatible installation of new and old products

# Magnetic Contactors / Switch

# **■**Feature

- · Improved breaking capacity with optimum contacts
- AC/DC combined use 100~240V
- Draw out type operating coil, easy to access
- Optimal voltage deviation response, AC operating, DC energizing
- Finger proof design
- Max. ratings 55kW 220A

# Earth Leakage Circuit Breaker

#### ■ Feature

- Max 225AF with 2/3/4P
- Multi type with Breaking Capacity [Economic, Standard, High Capacity, Current limiting type]
- Adjustable sensitive current, max 500mA
- MCCB/ELCB same frame size for interchangeable
- · Compatible installation of new and old products

# Thermal Overload Relay

# ■ Feature

- AC/DC combined use 100~240V
- Manually checkable with external tripping
- Interchangeable with old and new product
- Max. ratings 110kW 240W







# **SWITCHGEAR**

# Cubicle Type Gas Insulated Switchgear

#### **■**Feature

- Minimized installation space, reduced manufacturing period
- Easy maintenance, environmental friendly structure

#### ■ Ratings



Par	nel	ALTS Panel	MOF Panel	PT Panel	VCB Panel	LBS Panel
Rated voltage[kV]		25.8	22.9 /√3	22.9 /√3	25.8	25.8
Short time withstand current[kA]		25	-	-	25	25
Rated current[A]		630	630 / 1250	630 / 1250	630 / 1250	630
Rated breaking current[kA]		25	-	-	25	25
Power frequency withstand	between poles	70	70	70	70	70
voltage[kV/1min]	across isolating distance	70	-	77	77	70
Lightning impulse withstand	between poles	150	150	150	150	150
voltage[BIL]	across isolating distance	150	-	165	165	150

# Eco-GIS(Dry Air Insulated Switchgear)

#### ■ Feature

- Minimized installation space(63% compared with MCSG)
- SF6 gas free, environmental friendly GIS

# ■ Ratings



Panel		LBS Panel	MOF Panel	PT Panel	VCB Panel
Rated voltag	ge[kV]	24	22.9 /√3	22.9 /√3	24
Short time withstand current[kA]		12.5	-	-	12.5
Rated current[A]		630	-	-	630
Rated breaking current[kA]		12.5	-	-	12.5
Inquistion voltage	Power frequencywithstand voltage [kV/1 min]	50	50	50	50
Insulation voltage	Lightning impulse withstand voltage[BIL]	125	125	125	125

# Metal Clad Switchgear (LV/MV/MCC)



# MV Switchgear

- Applied Standard IEC62271-200, IEC60529, ANSI C37.20, ES158-680, JEM1425
- Easy maintenance and extension with unit structure
- Short manufacturing period with one step EPC process
- · Selectable items by customer

# Ratings

Rated Voltage[kV]	3.6/7.2	12/15	24/25.8	36/38
Short time withstand current[kA]	12.5, 20, 25, 31.5, 40	25, 31.5, 40	12.5, 25, 31.5, 40	25, 31.5, 40
Rated current[A]	400, 630, 1250, 2000, 3150	630, 1250 2000, 3000	630, 1250, 2000	1250, 2000, 3000



# LV Switchgear

- Applied Standard IEC60949, IEC60439, IEC60529, ANSI C37.20, ES158, JEM1265
- Easy maintenance and extension with unit structure
- Short manufacturing period with one step EPC process
- 2, 3, 4stage installation according to circuit breaker type
- Selectable items by customer

# Ratings

Rated Voltage[kV]	600VAC
Rated breaking current [kA]	Max 85kA
Rated current of main bus[A]	Max 4000A



#### MCC Motor Control Center

#### ■Feature

- Applied Standard IEC60439, NEMA ICS2.322, JEM11195
- Minimized installation space with drawer unit type
- User safety priority door lock system

# Ratings

Rated	Voltage[kV]	600VAC		
Rated operating voltage		380, 400, 460, 480VAC		
Short time withstand current [kA]		Max 65kA		
Rated	Horizontal buses	600~2000A		
current[A]	Vertical buses	400~1000A		

# IED & CONTROLLER

# Integrated Digital Protection Relay VIPAM







#### ■VIPAM Feature

- Multifunction IED
- (OCR, OCGR, DOCR, DOCGR and 19 other protection functions)
- Power Quality (K-Factor, Harmonic, Demand)
- Color 7-TFT LCD Display Easy to set parameters Display various measurement items
- Select Korean/English
- IEC 61850 Certification Issued by KEMA
- Support IEC61850, IEC60870, DNP3.0 and Modbus RTU protocol
- Dynamic MIMIC Diagram by Vitzroem HMI Software.
- Convenience Function : Play voice alarm, Sending a SMS when an event occured.
- KEMC1120 Ceritification.

# Integrated Digital Meter & Measurement Relay VIMAC





#### ■VIMAC Feature

- Display Various measurement items about Power System. [voltage, current, power, energy, power factor, frequency, DC voltage/current and so on]
- Power Quality (K-Factor, C-Factor, Sag, Swell, Harmonic, Demand, Max)
- Alarm (OCR, OCGR, OVR, OVGR, UVR and so on)
- Support IEC60870, DNP3.0 and Modbus RTU protocol
- Support Digital Input/Output.
- Save event and fault waveform.
- Support Korean

# PROTECTIVE DEVICE

#### **Surge Protective Devices**



#### ■Feature

- KS C IEC61643-1 Certificate
- $\bullet$  Power SPDs and Communication SPDs
- Type 1 SPD : Direct lightning strike,10/350 wave (Class I test)

Type 2 SPD : Indirect lightning strike, 8/20 wave (Class II test)

- Excellent TOV(Temporary Over Voltage) fault characteristics
- High surge energy cut with single MOV type
- Surge noise cut and fast follow current breaking
- DIN rail type mount

### Ratings

Class	Class I Direct strike protection	Class II Indirect strike protection			
Туре	LD-22EFSK	VD-40K2	VD-40K3	LT-L2FK	
Max. cont. operating voltage Uc	274V	275V	275V	275V	
Nominal discharge current In (8/20µs)	25kA	20kA	20kA	20kA	
Max. discharge current Imax(8/20s)	25kA (limp)	40kA	40kA	40kA	
TOV withstand (5s)	375V	375V	375V	375V	
TOV withstand (200ms)	1442V	1442V	1442V	1442V	

# Lightning Arrester/ Surge Absorber

### ■Feature

### ■ Lightning Arrester

- Polymer type 18kV 5kA, Porcelain type 18kV 2.5kA
- Excellent humidity tightness characteristics
- Prevention of explosion scattering with polymer type insulator
- Ideal steep response characteristics by gapless type
- No follow current type

#### ■Surge Absorber

- Polymer type 3.3/6.6/18kV 5kA
- Completely molded polysil for outdoor use
- Stability ensured due to non-combustible material in case of accidents

#### Insulator



# ■ Polymer Insulator

- Excellent dielectric strength with optimal combination of organic and inorganic compound
- · High impact resistance
- Light weight to reduce costs and lineman handling requirements

#### ■ Epoxy Insulator

- Excellent dielectric strength, withstand characteristics of arc and humidity
- High impact resistance
- Useful for GIS connecting socket and embedded pole VCB







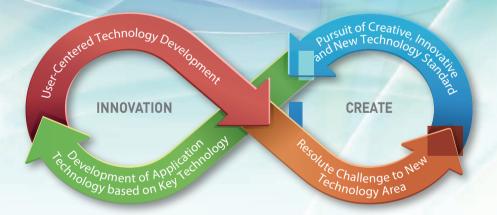
# World Wide Player

Customer-Centered Technology Partner, Leading Value Creation and Customer Innovation Through Constant Technology Investment and R&D

# Technology is a life of VITZRO EM

Technology is a life of VITZRO EM. It is because a customer's growth can be promoted only through the technology and a company can be constantly developed only through the customer's growth. A total solution partner that leads the customer innovation beyond the customer value creation via continuous technology investment and R&D, it is the true image of VITZRO EM.

VITZOR EM is putting emphasis on building a global standard technology capacity by focusing on R&D of electric equipments and systems and automatic equipments fields. Furthermore, we are performing R&D activities in 3 different directions-ensuring a key technology, close-adhesion type R&D and creating infra for new business-in order to develop the optimal products in the heavy electric equipments and automation fields. The products of VITZRO EM are user-friendly products applied with ergonomic, compact designs and voluminous shapes. They gained public favor as premium products with high-reliability in international standards as well as with strong and convenient functions, confirmed safety and adoption of safe structure.











MCCB/ELCB ACB ATS VCB





To the Light of Technology, To the Light of Value and To the Light of Reliability VITZRO EM, in company with the customers

# **Create Better Life**

Electric Equipment General Catalog

 $MV\ Equipment\ /\ LV\ Equipment\ /\ Switchgear\ /\ IED\ \&\ Controller\ /\ Protective\ Device$ 



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#### Minmun specification on system

Window 98/ME/NT/2000/XP
IBM compatible PC: Pentium 3 Class or above
RAM 64MB or above recommended
Explorer 6.0 or above/Adobe Acrobat 5.0 or above
Install Acrobat Reader to view PDF documents









LBS/ASS VIPAM/VIMAC GIS/LV/MV/MCC SPD/LA/SA/Insulator

# **Electrical Equipment General Catalog**

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Specifications in this catalog are subject to change without notice due to continuous product development and improvement.

VITZROEM Agency

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