

ELECTRIC
PRODUCTS
BY
KOREA

K-ELECTRIC

surgefree⁺

www.surgefree.co.kr



K-ELECTRIC PRODUCTS SUPPLIER SURGEFREE CORPORATION

Surgefree is well known in Korea for specializing in surge protect solutions. We are interested in electric work, especially projects related to electric components and equipment used for receiving and transferring electric power from the outside of buildings to within.

As such, we have made strategic partnerships with various Korean electric manufacturers.

Now we want to provide their excellent products and our own to meet the market needs in developing countries. We are sure that we could meet your needs in each stage of development because of our successful experiences in Korea.

ELECTRIC PRODUCTS BY
KOREA



CONTENTS

SURGEFREE

- 04** Switchgear
- 05** Panel board
- 10** Network & Telecommunication
- 11** Computer Network
Coaxial Protection
-

GDELECS

- 12** New, Economical Easy Panel Board
-

JOIN

- 16** Wide-area lightning rod
- 17** Smart Lightning Warning System
- 18** Chemical Ground Electrode
- 19** CHEM EARTH
Integrated Grounding Monitoring System
-

BUMHAN

- 20** 1Ø Noise Cut Transformers
- 22** 3Ø Noise Cut Transformers
- 23** BEMF EMI / EMC FILTERS
-

DAEYANG ELECTRIC

- 24** AC High Voltage Tester
- 25** High Current Equipment
- 26** Test equipment for protective relay
DC power supply
- 27** Impulse Voltage Generator
-

WOORYEE ELECTRIC

- 28** Band Heater
- 29** Shizu Heater
- 30** Moving-on heating heater
Heat wind Heater
- 31** Cartridge Heater



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Company

Surgefree Corporation

President

James Jeon

Main Items

Surge Protective Device (SPD),
CCTV, Core, Automatic Control Parts,
CT/VT, Transformer, Insulator, MCCB,
Panel Board, Processing Machine for
Bus-bar, etc.

Home Page

www.surgefree.co.kr
www.safetek.com.vn

Switchgear

Transformers, Main distribution board of industrial building (ACB)

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Class I / SZK12.5

- LED indicators for fault and Power
- Remote contact
- RS-485 Communication
- Surge counter (Option)



Counter

Class I + II / SURGEZERO

- LED indicators for fault and Power
- Surge counter is option
- Remote contact is option



3P4W

Technical data

Model		SZK12.5/50-380Y	SZK12.5-440D
Electrical characteristics		3P4W	3P3W
Max. continuous operating voltage	Uc	275V	440V
	Uc (N-PE)	255V	-
Lightning impulse current (10/350)	Iimp (L-N/N-PE)	12.5/50kA	12.5kA
Nominal discharge current (8/20)	In (L-N/N-PE)	12.5/50kA	12.5kA
Voltage Protection level at In	Up	<2kV	<2.5kV
	Up (N-PE)	<2.5kV	-
Response time	tA (L-N/N-PE)	<25ns/100ns	<25ns
Thermal protection	(L-N)	Yes	Yes
Short-circuit withstand current	ISCCR (L-N)	100kA	100kA
Mechanical characteristics			
Temperature range		-40°C~+80°C	
Mounting		4xM4 Bolt	
Degree of protection		IP20	
Housing material		Steel	
Indication of disconnector operation		Red LED (ON)	
Remote contacts (RC)		Yes	
Conductor size		L/N: ≥10mm², PE: ≥16mm²	

Technical data

Model		SZ120-380Y
Electrical characteristics		3P4W
Max. continuous operating voltage	Uc	320V
Lightning impulse current (10/350)	Iimp (L-N/N-PE)	12.5kA
Nominal discharge current (8/20)	In (L/N-PE)	12.5kA
Max. discharge current (8/20)	I _{max} (L/N-PE)	120kA
Voltage Protection level at In	Up	<2kV
Response time	tA (L/N-PE)	<25ns
Thermal protection	(L/N-PE)	Yes
Short-circuit withstand current	ISCCR (L/N-PE)	100kA
Mechanical characteristics		
Temperature range		-40°C~+80°C
Mounting		4xM4 Bolt
Degree of protection		IP20
Housing material		Steel
Indication of disconnector operation		Red LED (ON)
Remote contacts (RC)		Yes (Option)
Contact ratings		AC 250V/1A, 125V/2A
Conductor size		L/N: ≥10mm², PE: ≥16mm²

Panel borad

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Class II / SZK040

- LED indicators for fault and Power
- RS-485 communication
- Remote contact (Option)
- Surge counter (Option)



Counter

Class II / SZK080

- LED indicators for fault and Power
- Remote contact
- Surge counter (Option)



Counter

Technical data

Model		SZK040-380Y
Electrical characteristics		3P4W
Max. continuous operating voltage	Uc	320V
	Uc (N-PE)	255V
Nominal discharge current (8/20)	In (L-N/N-PE)	20kA
Max. discharge current (8/20)	Imax (L-N/N-PE)	40kA
Voltage Protection level at In	Up	<2kV
	Up (N-PE)	<2kV
Response time	tA (L-N/N-PE)	<25ns/100ns
Thermal protection	(L-N)	Yes
Short-circuit withstand current	ISCCR (L-N)	100kA
Mechanical characteristics		
Temperature range		-40°C~+80°C
Mounting		4xM4 Bolt
Degree of protection		IP20
Housing material		Steel
Indication of disconnector operation		Red LED (ON)
Remote contacts (RC)		Yes (Option)
Contact ratings		AC 250V/1A, 125V/2A
Conductor size		≥6mm ²

Technical data

Model		SZK080-380Y
Electrical characteristics		3P4W
Max. continuous operating voltage	Uc	320V
	Uc (N-PE)	255V
Nominal discharge current (8/20)	In (L-N/N-PE)	40kA
Max. discharge current (8/20)	Imax (L-N/N-PE)	80kA
Voltage Protection level at In	Up	<3kV
	Up (N-PE)	<3kV
Response time	tA (L-N/N-PE)	<25ns/100ns
Thermal protection	(L-N)	Yes
Short-circuit withstand current	ISCCR (L-N)	100kA
Mechanical characteristics		
Temperature range		-40°C~+80°C
Mounting		4xM4 Bolt
Degree of protection		IP20
Housing material		Steel
Indication of disconnector operation		Red LED (ON)
Remote contacts (RC)		Yes
Contact ratings		AC 250V/1A, 125V/2A
Conductor size		L/N: ≥6mm ² , PE: ≥10mm ²

Panel borad

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Class II / SURGEZERO

- LED indicators for fault and Power
- Surge counter is option
- Remote contact is option



1P2W

- LED indicators for fault and Power
- Surge counter is option
- Remote contact is option



3P4W

Technical data

Model		SZ040-220S
Electrical characteristics		1P2W
Max. continuous operating voltage	Uc	320V
Nominal discharge current (8/20)	In (L/N-PE)	20kA
Max. discharge current (8/20)	I _{max} (L/N-PE)	40kA
Voltage Protection level at In	Up	<2kV
Response time	tA (L/N-PE)	<25ns
Thermal protection	(L/N-PE)	Yes
Short-circuit withstand current	ISCCR (L/N-PE)	100kA
Mechanical characteristics		
Temperature range		-40°C~+80°C
Mounting		4xM4 Bolt
Degree of protection		IP20
Housing material		Steel
Indication of disconnecter operation		Red LED (ON)
Remote contacts (RC)		Yes (Option)
Contact ratings		AC 250V/1A, 125V/2A
Conductor size		≥6mm ²

Technical data

Model		SZ080-380Y
Electrical characteristics		3P4W
Max. continuous operating voltage	Uc	320V
Nominal discharge current (8/20)	In (L/N-PE)	40kA
Max. discharge current (8/20)	I _{max} (L/N-PE)	80kA
Voltage Protection level at In	Up	<3kV
Response time	tA (L/N-PE)	<25ns
Thermal protection	(L/N-PE)	Yes
Short-circuit withstand current	ISCCR (L/N-PE)	100kA
Mechanical characteristics		
Temperature range		-40°C~+80°C
Mounting		4xM4 Bolt
Degree of protection		IP20
Housing material		Steel
Indication of disconnecter operation		Red LED (ON)
Remote contacts (RC)		Yes (Option)
Contact ratings		AC 250V/1A, 125V/2A
Conductor size		L/N: ≥6mm ² , PE: ≥10mm ²

Panel borad

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Class II / SACO-E

- LED indicators for fault and Power
- Don't need connection cable for install



SC040-380Y



SACO-E Counter

Class II / DT40

- Indicators for Mov Status
- Potential free signal contact is option



3P3W



3P4W

Technical data

Model		SZK040-380Y	SACO-E COUNTER
Electrical characteristics		3P4W	3P4W
Max. continuous operating voltage	Uc	320V	320V
	Uc (N-PE)	255V	255V
Nominal discharge current (8/20)	In (L-N/N-PE)	20kA	20kA
Max. discharge current (8/20)	I _{max} (L-N/N-PE)	40kA	40kA
Voltage Protection level at In	Up	<2kV	<2kV
	Up (N-PE)	<2kV	<2kV
Response time	tA (L-N/N-PE)	<25ns/100ns	<25ns/100ns
Thermal protection	(L-N)	Yes	Yes
Short-circuit withstand current	ISCCR (L-N)	100kA	100kA
Mechanical characteristics			
Temperature range		-40°C~+80°C	
Mounting		4xM4 Bolt	
Degree of protection		IP20	
Housing material		Thermoplastic; extinguishing degree UL 94 V-0	
Indication of disconnector operation		Red LED (ON)	
Remote contacts [RC]		Yes (Option)	

Technical data

Model		DT40/275(V+T)-M	DT40/275(3V+T)-B
Electrical characteristics		3P4W	3P4W
Max. continuous operating voltage	Uc	275V	275V
	Uc (N-PE)	-	255V
Nominal discharge current (8/20)	In (L-N/N-PE)	20kA	20kA
Max. discharge current (8/20)	I _{max} (L-N/N-PE)	40kA	40kA
Voltage Protection level at In	Up	<1.5kV	<1.5kV
	Up (N-PE)	-	<1.5kV
Response time	tA (L-N/N-PE)	<25ns	<25ns/100ns
Thermal protection	(L-N)	Yes	
Mechanical characteristics			
Temperature range		-40°C~+80°C	
Mounting		DIN rail 35mm	
Degree of protection		IP20	
Housing material		Thermoplastic; extinguishing degree UL 94 V-0	
Indication of disconnector operation		Green (Normal) / Red (Fail)	

Panel borad

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Class II / DS40/275(V+T)

- Indicators for Mov Status
- Remote contact is option
- Potential free signal contact is option



1P2W

Class II / DT40/275(3V+T)

- Indicators for Mov Status
- Remote contact is option
- Potential free signal contact is option



3P4W

Technical data

Model		DS40/275(V+T)
Electrical characteristics		1P2W
Max. continuous operating voltage	Uc	275V
	Uc (N-PE)	255V
Lightning impulse current (10/350)	Iimp (L-N/N-PE)	20kA
Nominal discharge current (8/20)	In (L-N/N-PE)	40kA
Voltage Protection level at In	Up	<1.3kV
	Up (N-PE)	<1.3kV
Response time	tA (L-N/N-PE)	<25ns/100ns
Thermal protection	(L-N)	Yes
Mechanical characteristics		
Temperature range		-40°C ~ +80°C
Mounting		DIN rail 35mm
Degree of protection		IP20
Housing material		Thermoplastic; extinguishing degree UL 94 V-0
Indication of disconnecter operation		Green (Normal) / Red (Fail)
Remote contacts (RC)		Yes (Option)
Conductor size		AC 250V/1A

Technical data

Model		DT40/275(3V+T)
Electrical characteristics		3P4W
Max. continuous operating voltage	Uc	275V
	Uc (N-PE)	255V
Lightning impulse current (10/350)	Iimp (L-N/N-PE)	20kA
Nominal discharge current (8/20)	In (L-N/N-PE)	40kA
Voltage Protection level at In	Up	<1.3kV
	Up (N-PE)	<1.3kV
Response time	tA (L-N/N-PE)	<25ns/100ns
Thermal protection	(L-N)	Yes
Mechanical characteristics		
Temperature range		-40°C ~ +80°C
Mounting		DIN rail 35mm
Degree of protection		IP20
Housing material		Thermoplastic; extinguishing degree UL 94 V-0
Indication of disconnecter operation		Green (Normal) / Red (Fail)
Remote contacts (RC)		Yes (Option)
Contact ratings		AC 250V/1A

Protecting lighting fixtures /
Protecting electric car charger

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Class II / SIZE-L-1P2W / 3P4W



SIZE-L-1P2W(2+1)



SIZE-L-3P4W(3+1)

Class II / PVD 50/1000

- Voltage : DC 600~1000V
- Indicators for fault and Power
- Remote contact is option



Technical data

Model		SIZE-L-1P2W / 3P4W	
Electrical characteristics		SIZE-L-1P2W	SIZE-L-3P4W
Nominal operating voltage	Uc	220V	220/380V
Max. continuous operating voltage	Uc	275V	275V
	Uc (N-PE)	255V	255V
Nominal discharge current (8/20)	In (L-N/N-PE)	5kA	5kA
Max. discharge current (8/20)	Imax (L-N/N-PE)	10kA	10kA
Voltage Protection level at In	Up	<1.5kV	
Response time	tA (L-N/N-PE)	<25ns/100ns	<25ns
Temperature range		-40°C~+80°C	
Degree of protection		IP20	
Mounting		1 x M3 Bolt	

Technical data

Model		PVD 50/1000
Electrical characteristics		3 pole (+,PE,-)
Max. continuous operating voltage	Uc	1000V
Nominal discharge current (8/20)	In (L-N/N-PE)	20kA
Max. discharge current (8/20)	Imax (L-N/N-PE)	50kA
Voltage Protection level at In	Up	<3.5kV
Response time	tA (L-N/N-PE)	<25ns
Temperature range		-40°C~+80°C
Mounting		4xM4 Bolt
Degree of protection		IP20
Mounting		DIN rail 35 mm

Network & Telecommunication

SIGNAL & DATA

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surgeTRAP / SLX-24S

- The plug-in module/base design facilitates replacement of a failed module without the need to remove system wiring.
- If the module is unplugged out of the base, the connection lines remain enabled.
- 4~20mA current loop, RS-232C, RS-422, RS-485 protocol.



Technical data

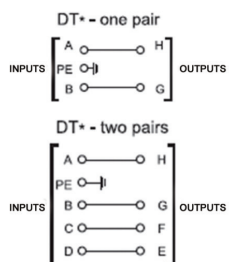
Model		SLX*
Electrical characteristics		24S
Nominal operating voltage	Un	24V
Max. continuous operating voltage	Uc	28.8V
Rated operating current at 25°C	IL	500mA
Line impedance		1~2Ω
Max. discharge current (8/20)	I _{max}	10kA
Nominal discharge current (8/20)	I _n	5kA
Voltage protection level at I _n	Up	<100V
Response time	t _A	<1ns
Transfer Speed		min.10MBit/s
Conductor connection cross-section		2~4mm ²
Temperature range		-40°C~+80°C
Degree of protection		IP20
Mounting		DIN rail 35mm

DTNVE



DTNVE 2/24/1

DTNVE 2/24/1



Technical data

Model	DTNVE 1/XX/XX		DTNVE 2/XX/XX	
	24/0.5	24/1	24/0.5	24/1
Electrical characteristics				
Number of protected pairs	1 Pair		2 Pair	
Nominal operating voltage	limp (L-N/N-PE)		24V	
Max. continuous operating voltage	I _n (L/N-PE)		28.6V	
Lightning impulse current (10/350)	I _{max} (L/N-PE)		2.5kA	
Nominal current	Up		0.5A	1A
Nominal discharge current (8/20)	t _A (L/N-PE)		1kA	
Max. discharge current (8/20)	(L/N-PE)		10kA	
Protection level at			64/34V	
Response time			<30ns	
Temperature range			-40°C~+80°C	
Degree of protection			IP 20	
Mounting			DIN rail 35mm	

COMPUTER NETWORK

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Technical data

Model	COMPUTER NETWORK	
Electrical characteristics	SHD-RJ45(L)	SHD-RJ45-8(POE)
Number of protected pairs	2 Pairs(1/2, 3/6)	4 Pairs(1/2, 3/6, 4/5, 7/8)
Nominal operating voltage U_n	24V	48V
Max. continuous operating voltage U_c	28.8V	50V
Rated operating current at 25°C I_n (L-N/N-PE)	0.5A	1A
Nominal discharge current (8/20) I_{max} (L-N/N-PE)	100A/2.5kA	150A/2.5kA
Voltage protection level at I_n U_p	$\leq 100V/\leq 1.3KV$	$\leq 300V/\leq 750V$
Transfer Speed t_A (L-N/N-PE)	155Mbps	<250MHz (Class E)
Connection terminals		RJ-45
Response time		<1ns
Temperature range		-40°C~+80°C
Degree of protection		IP 20
Mounting	Bracket	Bracket



SHD-RJ45(L)



SHD-RJ45-8(POE)

COAXIAL PROTECTION

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Technical data

Model	COAXIAL PROTECTION	
Electrical characteristics	STCC-06	
Max. continuous operating voltage U_c		7.2V
Rated operating current at 25°C I_L		1A
Max. Lightning impulse current (10/350) I_{imp}		-
Nominal discharge current (8/20) I_n		10kA
Max. discharge current (8/20) I_{max}		20kA
		$\leq 10V(L-S)$
Voltage protection level at 1kV U_p		0~20Mbps
Insertion loss		<0.2dB
Return loss		
Connection terminals		
Characteristic impedance		-
Operating temperature		-40°C~+80°C



STCC-06

New, Economical Easy Panel Board



Easy Panel Board



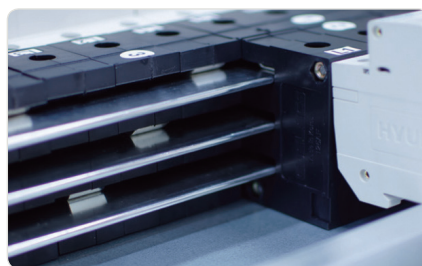
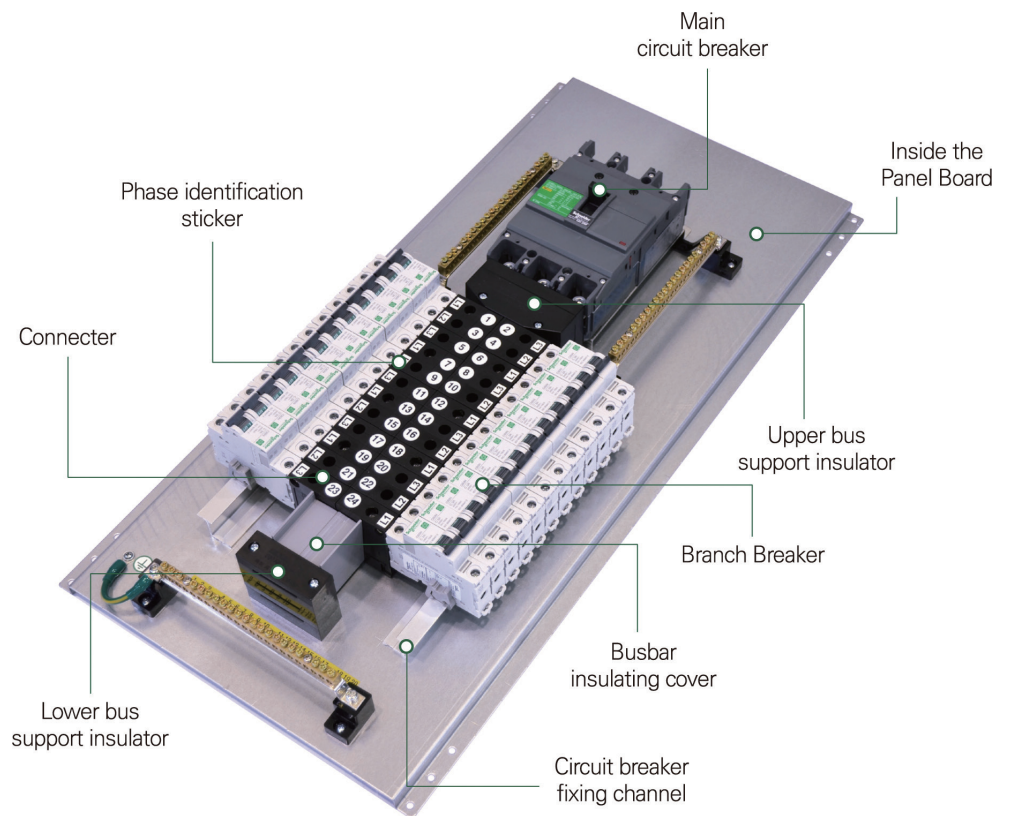
The Easy Panel Board in the panel board product worldwide, which is produced by the standard of IEC61439-1, maintaining the advantages of the distribution panel, existing size of the 50~70% level distribution panel ratio general it is a distribution board which was reduced, not the method to assemble the inner plate of the existing, that is installed in the enclosure to buy a favorite model anyone available for installation, the various models, the model that requires consumers you can buy select.

Applications

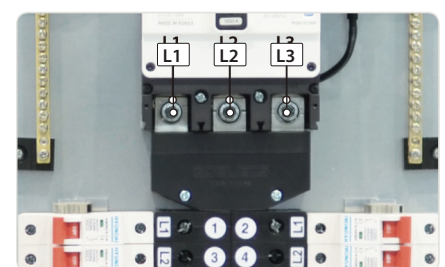
- Manufacturing / production
- Universities / Schools
- Hospitals
- Banks / Airports
- Telecommunications
- Data Center



Internal View



L1 ▶ L2 ▶ L3 Top-Down
from vertical bus



L1 ▶ L2 ▶ L3 Left to right from primary circuit breaker

Specifications

Makers of applicable circuit breakers

LS Industrial System, Hyunadi Heavy Industries, Daeryuk Electric, Devico, as well as numerous other domestic and overseas product (Chint, ABB, Schneider)

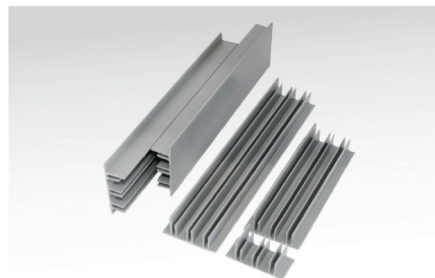


Vertical Busbar Capacity

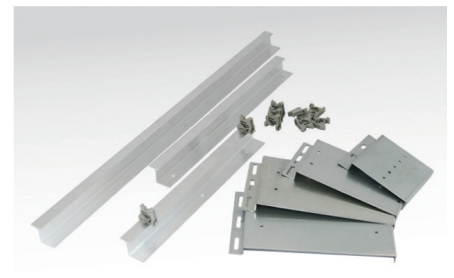
63AF : 3T X 35mm
 100AF : 3T X 35mm

125AF : 3T X 35mm
 250AF : 3T X 35mm

Easy Panel Board Part



Busbar insulating cover



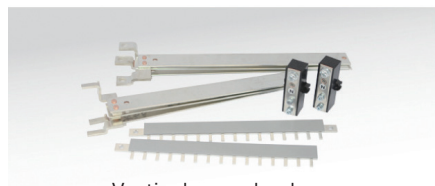
Bracket & Channel



Main bus support insulate



Connector _ BB-Kit



Vertical array busbar

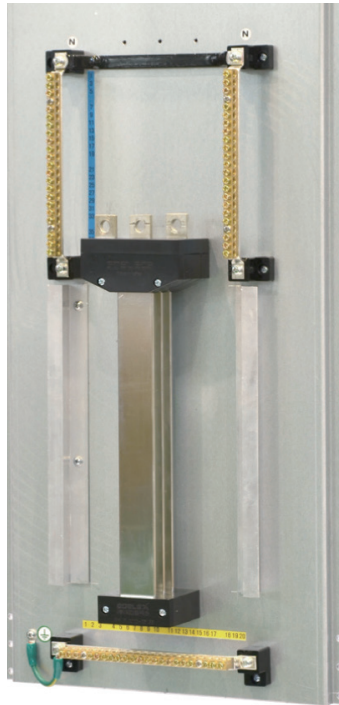


Busbar for ground and neutral terminals & Components

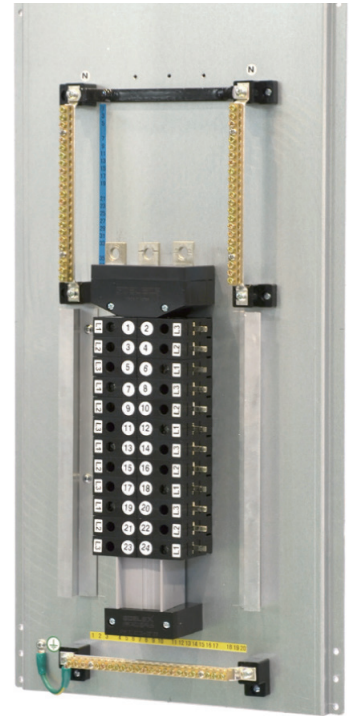


Multi Hole metal plate

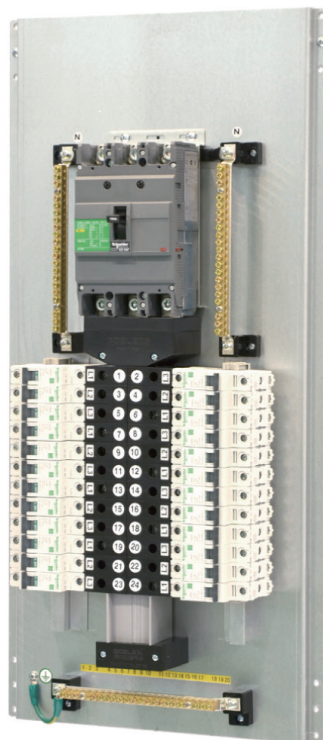
Production Process



Prepare the Multi Hole metal plate.
Install the NT & ET & Vertical array busbar



Install the BB-Kit



Insert the branch circuit breaker
and tighten a screw bolt



Install the easy panel
in the enclosure

Wide-area lightning rod JLR / ESE-1000



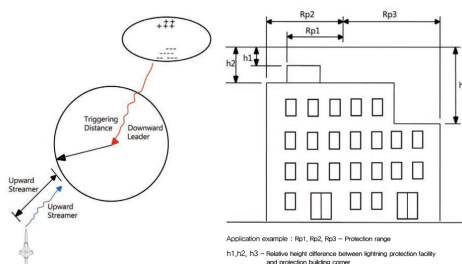
Principles and characteristics ESE-1000

Lightning protection range of JLR/ESE-1000

Protection radius according to relative height

This design method reduces the contact time between the Upward Streamer and the Downward Leader(Dart Leader) from the thundercloud. so It protects a wider range than general lightning protection system. It is used according to French Standard 17-102. Unlike the CV method, the protection range is set by the gain distance of the early streamer emission and the lightning distance by the rotating sphere without consideration of the field concentration factor of the ground due to lightning. But, because the rolling sphere method is applied, it can be applied up to a maximum height of 60m.

This design method reduces the contact time between the Upward Streamer and the Downward Leader(Dart Leader) from the thundercloud. so It protects a wider range than general lightning protection system. It is used according to French Standard 17-102. Unlike the CV method, the protection range is set by the gain distance of the early streamer emission and the lightning distance by the rotating sphere without consideration of the field concentration factor of the ground due to lightning. but, because the rolling sphere method is applied, it can be applied up to a maximum height of 60m.



JLR / ESE-1000 operates a high-voltage pulse oscillator according to the electric field strength induced by the electric charge of the thunderclouds and forms a high voltage on the electrodes in the Venturi Tube. So intermittent corona discharge causes high voltage pulses to be emitted through the central final tip to generate an up streamer.

The special effect of the ESE-1000 is that it discharges early by shortening the contact time between this Upward streamer and the Downward leader coming from thundercloud. so It protects a wider range than general lightning protection system.



It is set in accordance with the French Standard (17-102 Para. 5.2.3.2) or the formula below.

$$Rp = \sqrt{h(2D-h)} + \Delta L(2D + \Delta L) \text{ (for } h \geq 5\text{m)}$$

where

Rp : Protection Radius

h : Height of lightning protection system (standards to be protected)

D : Triggering Distance

D : $10 \times I^{(2/3)}$ (m), I = lightning return current (kA)

Level 1 (high protection) : 20 m (3 kA)

Level 2 (improved protection) : 45 m (10 kA)

Level 3 (standard protection) : 60 m (15 kA)

$$\Delta L = \nu \text{ (m/}\mu\text{s)} \times \Delta T \text{ (}\mu\text{s)}$$

where

$\nu = 1 \text{ m/}\mu\text{s}$ (Upstream streamer forward distance), ΔT = Early-onset time difference (μs)

Protection Level	Current (Maximum)	Probability of exceeding	height (m)									
			2	4	5	7	10	14	20	45	60	
Level 1	3 kA	99 %	32	64	79	79	79	80	80	-	-	
Level 2	10 kA	93 %	40	78	97	98	99	101	102	105	-	
Level 3	15 kA	85 %	44	87	107	108	109	111	113	120	120	

※ When the average ΔT value of the test result is 68.4 μs - The protection radius is 116 m

Smart Lightning Warning System / ESLW-I



Product Introduction

Lightning in natural phenomena cause a lot of damages such as power system, buildings and life on the ground. As the spread of computers, information and communication devices and electronic devices has increased, all social systems such as intelligent buildings, automation of factories, computerization of office and administration, finance and traffic communication have become advanced and networked through computer. The failure of electronic devices causes social disruption and enormous economic losses.

In recent years, the number of lightning strikes has become more frequent due to abnormal weather phenomena, and its intensity has also become stronger, causing more losses in civilized modern industrial societies. Currently, most of the industrial facilities are mainly driven by power sources, and accordingly, reliable power supply is required. Over the past several decades, damage from lightning to ground, as well as from aircraft and ships has been damaging, and a reliable lightning alarm system must be introduced as a countermeasure against such lightning accidents.

Smart lightning warning system ESLW-I consists of a sensor for measurement of Ground-Level Electric Field and electric radiation and a main control panel equipped with a 7-inch touch screen equipped with the latest program, that displays status and alarms in real time.

Based on the information of thundercloud collected through the above system, it predicts the risk of expected lightning strike. Based on this, it is possible to prevent the damage cause by lightning in advance and secure the reliability of the power system and establish a stable industrial structure.

With the antenna configuration, The field-mill sensor detects the change of the electric field caused by the thunderstorm in real time and the lightning sensor(lightning position sensor) detects the lightning position to 30 [km] And informs the lightning information by sound and visual alarm.

The data collected through the antenna are connected to the main control panel. The touch screen can be used to check the status of the lightning strikes and the operation of the equipment in real time. The alarm phase is Normal, Warning, Alert, Clear. And the sensitivity of the antenna is composed of 3 levels of Low, Normal and High, so it can be adjusted according to the surrounding environment of each site.

Performance comparison with existing products



- It is linear by applying field-mill type measurement sensor, and can measure high sensitivity from low electric field.
- Graphical representation of location information and progress direction in case of lightning strike.

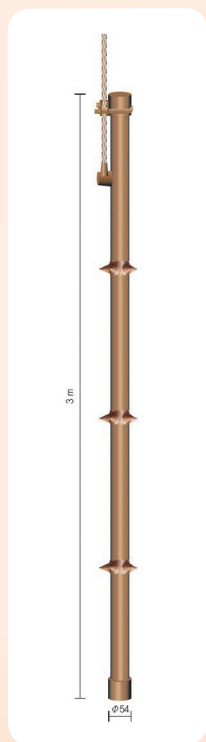
Specifications	Existing Products	ESLW-I
Type	Point electrode corona	Field-mill
Alarm phase	3 or 4 step	4 step
Display	LED light	LED light / Graphic Display
Alarm method	Flash light / External siren alarm	Internal buzzer / Flash light / External siren alarm
Data Management	Download real-time and historical data	
	Connect with PC and download	Download as USB connector
Lightning information	Lightning potential alarm	Lightning potential alarm
Lightning location information	Lightning progress information	
Remote monitoring	X	Real-time monitoring possible at distances up to 1 km
Temperature and humidity function	X	Temperature and humidity display on touch screen

Chemical Ground Electrode(Chem-Rod)



Overview of Chem-Rod Grounding System

Chemical Ground Electrode System Configuration



Chem-Rod Grounding System is the most efficient system that maintains low grounding resistance for more than 30 years regardless of ground soil type, geological structure, soil composition, moisture content and seasonal temperature change.

Chem-Rod Grounding System uses the grounding method using the "Highly conductive ground rod of strong alkaline electrolytes", and it is a new grounding method developed to satisfy the modernization of highly integrated computational and communication service and high reliability operation quality.

It is particularly well suited for systems that require extremely stable grounding performance, such as computational or telecom grounding, as well as grounding systems that provide the best solution for that are difficult to obtain low ground resistance for rock or soil layers.

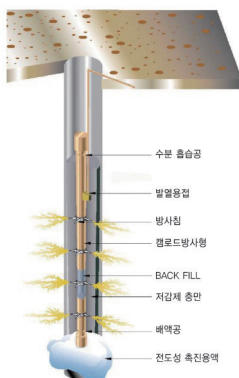
Electrolytic Conductive Grounding Rod

[Rechargeable electrolyte of Bentonite main component]

Chem Earth [Grounding Rod outer layer reducing agent]

Access Well [Maintenance area]

Pigtail Connector (to ground grid or down conductor)



- Method according to geological condition
 - Vertical Type / - Horizontal Type
- Applicable length
 - 1.2m, 3m, 6m length is supplied. If more than 6m is required, you can extend and construct in the field by using 3m extension rod.
- How to order
 - Type : (V) Vertical Type / (H) Horizontal Type("L" Type)
 - Length : 1.2m, 3m, 6m, More than 6m use 3m extension type
 - Ground connection : 1.2 m Standard, nominal name see chart
 - Ground direction : (D) Down, (U) Up
- Ground wire standard
 - 70 SQ (mm²), 95 SQ (mm²)

Comparing grounding resistance change characteristics according to season, climate and aging (Durability)

Method Characteristic	Chem-Rod	Driven Rod	Cause of change
Weather change	- Almost none. (Stable at a value lower than the initial value)	- Usually shows a difference of more than 50Ω from 20Ω.	- Moisture content changes during the rainy season and dry season
Seasonal change		- Usually shows a difference of more than 30Ω from 10Ω.	- Four Seasons Climate Change
Temperature change			- Summer and winter temperature changes
Aging	- Almost no aging. - Guaranteed 30 years of stable grounding resistance.	- Aging is very large. Due to reduced grounding resistance, it must be fully repaired and rebuilt within 3 to 5 years.	- Corrosion caused by soil contact (Risk of trouble due to grounding)
Performance Comparison	- Chem-Rod Grounding System always maintain stable grounding resistance regardless of external changes after construction.	- As the season, climate, and temperature change, the grounding resistance changes significantly, and over time, the ground performance degrades significantly and increases significantly above the initial grounding resistance.	

CHEM EARTH (25Kg)



Overview



Chem-Earth is a natural mineral component such as silicate. It is excellent in adhesion and compressibility to the grounding rod. It prevents corrosion of the grounding rod and absorbs moisture up to 15 times its self volume, and maintains the condition like Gel. The photoionic electrolyte is a reducing agent that helps to have a low resistance value by properly reacting with the moisture in the surrounding soil and has a gentle effect on maintaining the stable resistance value. There is no aging change, it has a reduction effect of construction cost by more than 50% compared with the existing construction method in terms of long-term maintenance. Various types of grounding electrodes can be made according to site conditions, and it can be used in combination with various methods such as underground cable, boring, mesh and ground rod. The constructed ground electrode forms a hardened body with high strength, so it does not cause environmental pollution because There is no leakage due to rainwater or underground water.

Advantages of Chem Earth

- Permanently maintain low grounding resistance
- High electrical conductivity: effective on any soil
- Non-corrosive / - Pollution-free: No effect on groundwater
- Dough or powder can be applied as it is
- Hygroscopicity: can be applied even in places where water
- Reduced cost compared to chemical ground rod is difficult to obtain

How to use

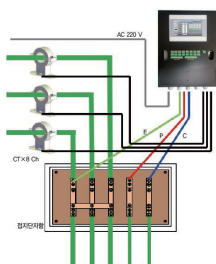
Mix Chem Earth (25 kg) with 50L of water, and apply to the earth pole according to each method. In places where it is difficult to use water, such as mountainous areas, it absorbs moisture even when it is used without mixing with water, and exhibits its original performance.

Application field

- Power plant / - Communication facilities / - Industrial facilities
- Oil painting industry facilities / - Public facilities / - Defense facilities / - Other facilities

Integrated Grounding Monitoring System

Overview and Key Features



- Overview The integrated ground monitoring system measures and displays the ground resistance in real time. so, Users can easily grasp the change in ground resistance, It can detect the problem in the power system by measuring the leakage current flowing into each grounding. In addition, It has a purpose of stably operating and protecting the power supply and communication equipment by discriminating the abnormality of the grounding system.

• Ground resistance measurement function

Measuring method	Ground resistance measurement method by voltage drop method
Number of Channels	1 CH
Measurement range	0 ~ 100 [Ω]
Resolving power	0.01 [Ω]
Display	Check 'FAULT' measurement connection / 'OVER' Ground resistance exceeds 100 [Ω]

• Leakage current measurement function

Measuring method	Noncontact current measurement method using CT
Number of Channels	8 CH
Measurement range	0 ~ 10 [A]
Resolving power	0.01 [A]
Display	'OVER' Leakage current value exceeds 10 [A]

• Surge Counter Function

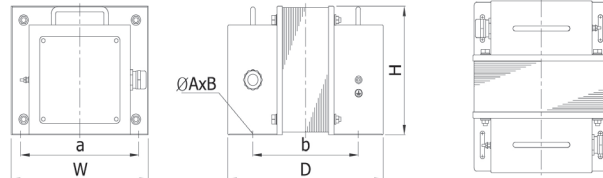
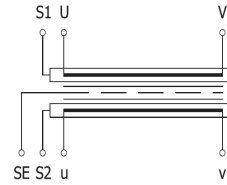
Number of Channels	1 CH
Scope of Operation	500 [A] ~ 40 [kA] [8/20 [μ s]]
Display	0 ~ 9999 / When '9999' is exceeded, Data is updated from 1

Product installation diagram

1Ø Noise Cut Transformers (Single phase NCT)



BHNCT-HC Series



Technical data

Primary Voltage	208V / 220V
Secondary Voltage	208V / 220V
Operating Frequency	50/60Hz
Insulation Class	H Class
Standard	EN61558-2-4

※ 1MHz → Over -80dB

Typical Applications

Semi-conductor manufacture, Display power equipment
Broadcasting audio-visual devices, Medical devices
Controller systems (PLC, Robot, DCS etc.)
Rail network, Subway to surge influence
Transportation network signal control etc.

Selection Table

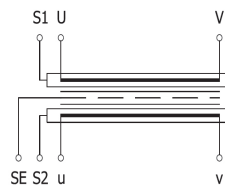
Type	Specification			Dimension (mm)						Weight (kg)	Re-mark
	Pri.(V)	Sec.(V)	Cap. (VA)	W	D	H	a	b	ØAxB		
BHNCT-HC500	208V 0 / 220V 0	208V 0 / 220V 0	500	157	160	144	130	115	7x28	13	Cable type [2.0m]
-HC1K			1k	186	190	166	160	135	7x34	19.5	Terminal block type
-HC1.5K			1.5k	186	201	166	160	145		22	
-HC2K			2k	224	230	192	192	160		32	
-HC3K			3k	248	280	210	213	190	8x45	44	
-HC5K			5k	275	340	233	238	230	8x50	63	
-HC7.5K			7.5k	314	370	268	270	250	8x60	91	

1Ø Noise Cut Transformers (Case Type)

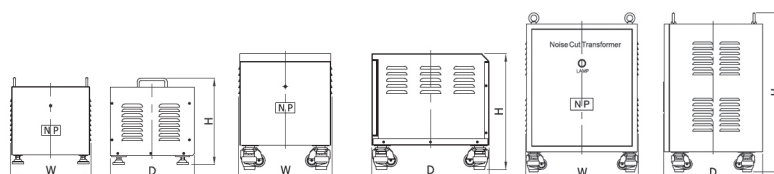
(Single phase NCT Enclosure type)



BHNCT-HB Series



Munsell No RAL 7035



Technical data

Primary Voltage	208V / 220V
Secondary Voltage	208V / 220V
Operating Frequency	50/60Hz
Insulation Class	H Class

※ 1MHz → Over -80dB

Typical Applications

Semi-conductor manufacture, Display power equipment
Broadcasting audio-visual devices, Medical devices
Controller systems (PLC, Robot, DCS etc.)
Rail network, Subway to surge influence
Transportation network signal control etc.

Selection Table

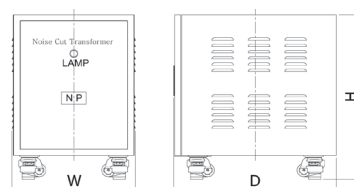
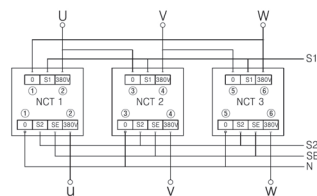
Type	Specification			Dimension (mm)			Weight (kg)	Remark	Shape
	Pri.(V)	Sec.(V)	Cap.(VA)	W	D	H			
BHNCT-HB1K	208V 0 / 220V 0	208V 0 / 220V 0	1k	275	289	285	25		Fig.1
-HB2K			2k	275	289	285	36		
-HB3K			3k	315	349	305	51		
-HB3K			3k	318	400	381	63		Fig.2
-HB5K			5k	318	400	381	75		
-HB7.5K			7.5k	458	403	623	108		Fig.3
-HB10K			10k	558	503	721	143		
-HB15K			15k	558	503	721	185		
-HB20K			20k	628	503	821	240		
-HB30K			30k	628	503	821	290		

3Ø Noise Cut Transformers (Case Type)

(Three phases NCT Enclosure type)



BHNCT-3HB Series



Technical data

Primary Voltage	208V / 220V
Secondary Voltage	208V / 220V
Operating Frequency	50/60Hz
Insulation Class	H Class

Typical Applications

Semi-conductor manufacture, Display power equipment
Broadcasting audio-visual devices, Medical devices
Controller systems (PLC, Robot, DCS etc.)
Rail network, Subway to surge influence
Transportation network signal control etc.

Selection Table

Type	Specification			Dimension (mm)			Weight (kg)	Remark	Shape
	Pri.[V]	Sec.[V]	Cap.[VA]	W	D	H			
BHNCT-3HB3K	380V	380V	3k	358	464	470	92		
-3HB5K			5k	408	554	595	112		
-3HB7.5K			7.5k	458	604	632	180		
-3HB10K			10k	458	604	632	187		
-3HB15K			15k	558	752	703	245		
-3HB20K			20k	558	804	750	290		
-3HB30K			30k	558	934	810	387		
-3HB50K			50k	608	904	900	518		
-3HB75K			75k	658	1104	1020	684		
-3HB100K			100k	658	1104	1020	832		
-3HB150K			150k	758	1304	1242	1080		
-3HB200K			200k	758	1404	1242	1420		

BEMF EMI / EMC FILTERS



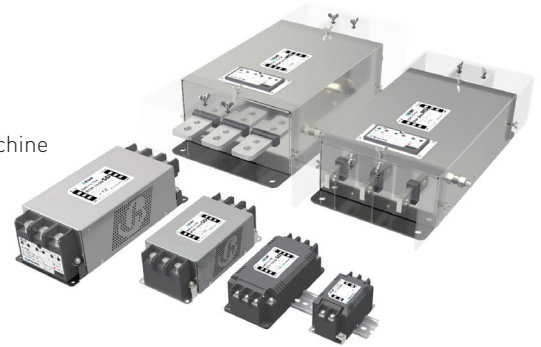
BEMF

Bumhan
Electromagnetic Filters



BEMF products are designed and manufactured for installation in commercial and industrial equipment. They are used in the following equipments and facilities:

- Measuring equipment
- Computers and peripherals
- Converter
- Inverter
- Servo motor driver
- Industrial power supply
- Telecommunication equipment
- Commercial automatic washing machine
- FA equipment
- CNC machine
- Industrial UPS
- Elevator
- Etc.



Safety

Design corresponding to UL 1283, IEC/EN 60939

Type & Ratings

Power Type	Type & Code		Rated Voltage [Vn]	Rated Current [A] at 50/60Hz																		Re- marks	
				6	10	16	20	30	40	50	60	80	100	120	150	200	250	300	400	500	600		800
Single-phase (1Ø)	BST	SD/EC/ MS	250VAC	●	●	●	●	●															DIN Rail
Three-phase (3Ø)	BTL	SD/EC/ VR	250 / 500VAC	●	●	●	●	●															DIN Rail
	BTM	SD/EC/ VR/MS	250 / 500VAC					●	●	●	●												
	BTH	SD/EC/ VR/MS/ SP	250 / 500VAC							●	●	●	●	●	●								Opt.01
	BBA	SD/EC/ MSV/ MSH	250 / 500VAC											●	●	●	●	●	●	●	●	●	Opt.01
	Three-phase (3Ø)	SPU-01	SP (Option 01)	220 / 450VAC Imax= 10kA	Surge protection device that can easily be mounted on EMI filter(for BTH/BBA Series)																		

BEMF Product Coding System

BTL - 2 006 -SD

Rated Voltage :

2 - 250Vac

4 - 450Vac

5 - 500Vac

Rated Current :

006 - 6A

050 - 50A

I

999 - 999A

102 - 1,000A

Product Class :

SD : Standard

EC : Economic

VR : for Inverter

MS : Multi Stages

MSV : Multi Stages Vertical Busbar

MSH : Multi Stages Horizontal Busbar

SP : with SPU-01 (Opt.01)

Coupling Method :

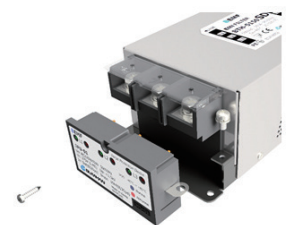
BST - 1Ø, 6-30A, Terminal Block Type

BTL - 3Ø, 6-30A, Terminal Block Type

BTM - 3Ø, 30-60A, Terminal Block Type

BTH - 3Ø, 60-200A, Terminal Block Type

BBA - 3Ø, 150-1,000A, Busbar Type



AC High Voltage Tester

 DAE YANG ELECTRIC CO., LTD.



Single-phase AC Dielectric test sets are designed mainly for applied voltage testing of samples such as motors, cables, transformers, switchgear, bushings, fuse, arresters, and so on, according to all applicable national and international standards, The test sets consist of three major components:

The high voltage transformer, voltage regulator and control module.



DY-101



DY-101-1



DY-101-2



DY-101-3



DY-102

	Input Voltage	Output Voltage	Capacity
DY-101	AC 220V	1ØAV 0 ~ 75kV	5KVA
DY-101-1	AC 220V	1ØAV 0 ~ 100kV	20KVA
DY-101-2	AC 220V	1ØAV 0 ~ 100kV	20KVA
DY-101-3	AC 220V	1ØAV 0 ~ 100kV	20KVA
DY-102	AC 220V	1ØAV 0 ~ 60kV	3KVA
DY-102-1	AC 220V	1ØAV 0 ~ 50kV	1.5KVA
DY-102-2	AC 220V	1ØAV 0 ~ 30kV	1.5KVA

High Current Equipment

 DAE YANG ELECTRIC CO., LTD.



The Dae yang tester High Current Test Set is ruggedly constructed for field use.

Designed using the latest technology, this unit combines a variable high current output with appropriate controls and instrumentation. The Dae yang tester is ideal for testing thermal, magnetic, and solid-state motor overload relays as well as molded-case circuit breakers and ground fault trip devices. It can also be used in many other applications requiring a high current source.



DY-302



DY-302-1



DY-303



DY-305



DY-306



DY-306-1

	Input Voltage	Output Voltage	Capacity
DY-302	1 Ø AC 220/380V	1 Ø AV 0 ~ 250A / 3000A	1 Ø AV 40kVA
DY-302-1	1 Ø AC 220/380V/440V	1 Ø AV 0 ~ 6000A	1 Ø AV 150kVA
DY-302-2	1 Ø AC 220/380V	1 Ø AV 0 ~ 800A	1 Ø AV 5/10kVA
DY-303	1 Ø AC 220/380V	1 Ø AV 0 ~ 3000A / 0~200A	1 Ø AV 40/50/1kVA
DY-306	3 Ø AC 220/380V	3 Ø AV 0 ~ 4000A / 0~10000A	3 Ø AV 150/300/1kVA
DY-306-1	3 Ø AC 220/380V	3 Ø AV 0 ~ 5000A / 0~200A	3 Ø AV 180/300/1kVA
DY-307	1 Ø AC 220/380V	1 Ø AV 0 ~ 4000A / 0~5000A	1 Ø AV 60kVA

Test equipment for protective relay DAE YANG ELECTRIC CO., LTD.



This test equipment can test and adjust the protective relay because it takes Selection of voltage and current to adjust output rapidly and preciously also the digital watch to measure the operating time.

And it is portable and handy for field test.



DY-501

DY-502

DY-503

DY-504

	Input Voltage	Output Voltage Current	Milisecond mete	Phase angle
DY-501	1Ø 220V	Current range 0~50A 200VA with taps of 5, 50A or voltage range 0~300V 100VA	0~999.999(sec.)	
DY-502	3Ø 380V	Current range 0~50A 200VA with taps of 5, 50A or voltage range 0~300V 100VA	0~999.999(sec.)	0° 30° 60°~360° 12 TAP change able
DY-503 DY-504	3Ø 380V	3Ø current range 0~50A 200VA with taps of 5, 50A or voltage range 0~300V 100VA	0~999.999(sec.)	0° 30° 60°~360° 12 TAP change able

DC power supply

 DAE YANG ELECTRIC CO., LTD.



This DC power supply, the stable power equipment in electric elect-ron industry, is suited to experiment space or production line as the stable power in the constant voltage and constant current, or a little ripple.



DY-901

DY-903

DY-902

DY-904

	Input Voltage	Output Voltage Current
DY-901	AC 220V	0~300V / 0~100A
DY-902	AC 220V	0~160V / 0~10A / 20A
DY-903	AC 220V	DC 0~300V / 50A
DY-904	AC 220V	DC 160V / 10A

Impulse Voltage Generator

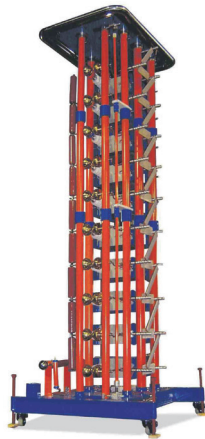
 DAE YANG ELECTRIC CO., LTD.



Electric devices for power transmission and distribution lines, such as transformers and switchgears, and insulators are subjected to excessively high voltage caused by thunder-bolt and switching surge voltage, and specified in KS and ESB to be subject to an impulse voltage test. We have supplied so far a number of impulse voltage generators to electrical manufacturers, technical colleges, universities, and research laboratories. Recent regulations in KOREA enact the impulse voltage test on distribution panels of classes 3KV and 6KV, and related CT and PT. Our equipment is designed to meet the regulations. We are also ready to provide equipment that generates wave-forms other than the standard wave.

Specified to have $1.2\mu s$ duration of wave front and $50\mu s$ duration of wave tail. Our "Surge Scope" is the equipment developed to observe the waveforms.

	DY-A901	DY-A902	DY-A903	DY-A904	DY-A905	DY-A906	DY-A907
Input Voltage	AC 220V 50/60Hz	AC 220V 50/60Hz	AC 220V 50/60Hz	AC 220V 50/60Hz	AC 220V 50/60Hz	AC 220V 50/60Hz	AC 220V 50/60Hz
Voltage Nominal	200KV	300KV	400KV	500KV	600KV	800KV	20KV
Maximum energy	10KJ	15KJ	20KJ	25KJ	30KJ	40KJ	100J
Maximum Voltage	180KV	270KV	360KV	450KV	540KV	720KV	18KV
Waveform generated	1.2x50	1.2x50	1.2x50	1.2x50	1.2x50	1.2x50	1.2x50



DY-A906



DY-A902-5



DY-A901



Control Pannel
PC TYPE



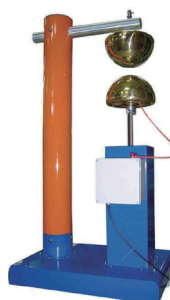
DC Power



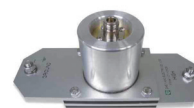
Divider



Horizontal Standard
Ball - Foundation



Chopping



Impulse Shunt
(DY-ICS05)



Attenuator (Option)

	Peak current	Nomial resis- tance	Sensitivity	Accuracy
DY-ICS05	5KA	0.1	0.1 V/A[option] 0.01 V/A @ Commented 20dB Attenua- tor limpance]	$\leq \pm 1\%$

Band Heater

WOORYEE ELECTRIC HEATING CO.LTD

General type

Disinfect the heating in the motor plate, wrap it in a dry plate, and insulate it.
After external processing with cast iron or STS steel, it is made of a cylindrical shape.

Ceramic

Heata made a cylindrical heating system by putting heat between the ceramics.

Temperature used

General 250, ceramic 400°

Product specification

General type - minimum 30 m/s or more, Ceramic - at least 80 m/s.

Application

To heat pipes such as extrusion, exfiltrator, and plastic molding machines.

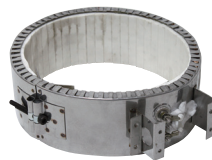
※ Production in Plate Form



Band heater



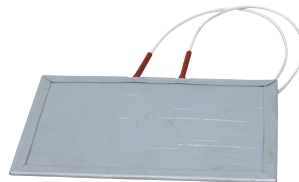
Drum for pre-heating purposes
band heater



Ceramic band heater



Disciform band heater



Band type heater



Rosel type band heater



Pavior heater



Banding machine heater



Banding machine heater

Shizu Heater

WOORYEE ELECTRIC HEATING CO.LTD

As a base of the heating system, the metal protection tube has a coil of wires and It is a tubular heater that insulates the heat line and the protective pipe by Magnesium oxide, an insulating powder, was charged and charged together.

Characteristics

It is robust against external physical impacts, while improving the efficiency of electric thermal energy. It has the merit that it can be processed appropriately according to user's use and form. Compressed to block air and not oxidize. Pipe can be manufactured according to usage

Purpose of use

Liquid heating, air heating, object heating, Dryer, hot air fan, electric stove, water heater, etc. can be manufactured according to the application if it uses heat to generate heat.

Pipe type

Iron, SUS (304, 310, 316, 316), Copper, Aluminum, Incool, Inconel, etc.

Precautions

- It can be manufactured for underwater use and dry use, and should be used according to each production purpose. (Excessive heat may cause overheating and breakdown)
- When it is used for special liquid heating, pipe should be selected according to its purpose.
- Putting the capacity too much in comparison with the length shortens the life of the heater.
- In the case of dry production using SUS pipe, when the temperature rises, it will be distorted, so it should be fixed in the middle.



1 inch Furenjl heater



Hot season heater



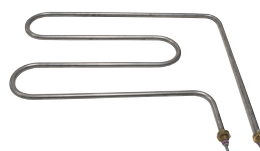
U Pinhita



S heater



Dehydrator heater



Sauna heater



M heater

Moving-on heating heater

WOORYEE ELECTRIC HEATING CO.LTD



SL-A 300L



SL-A 500L



SL-C 500L

Characteristics

- Electricity can heat water anywhere.
- Move installation is convenient, and temperature setting is simple to use.

Precautions

- Be sure to install and use a circuit breaker.
- Do not immerse your hands or body in water during use.
- At least 15CM of water and a maximum of 30CM of water must be present at the bottom of the product.
- Be careful not to flood the temperature control box.
- Before unplugging the unit, unplug the power cord first and remove it after the heating unit has cooled down.
- Using it in other than pure water may cause malfunction.
- Do not use it for chemicals or salt water.
- Do not use in old outlets.
- Be careful not to cover the heating area with a cloth or other foreign material.

Kinds

L type, I type, C type

Length

300L, 500L,
700L, 1000L

Volume

1500W, 2000, 2500W

Operating temperature

0 to 99 degrees.

Note

Hita shape of the length capacity can be made to order.

Heat wind Heater

WOORYEE ELECTRIC HEATING CO.LTD

Electric hot air heater
(High-grade type)

Electric hot air heater (Entry level)

Standard Type

Put the Shizuh heater into the Fade and blow the windy to raise the heat.
(Use the regulator separately)

High-grade type

Hita heated in hot ceramic and heated up with windy. [3~5KW is equipped with SSR regulator]

Standard

- Standard Type : 2KW (discharge temperature about 90 degrees)
3kw (discharge temperature about 100 degrees)
5kw (discharge temperature about 120 degrees)
- High-grade type : 3kw Maximum temperature 350 degrees
5kw Maximum temperature 400 degrees

Precautions

- Standard type will damage the product when using for more than 8 hours.
- The high-grade type is a cooling type fan and can be used for a long time.
- Not available in places with high humidity.
- Narrowing or clogging the entrance can cause malfunctions.

Cartridge Heater

WOORYEE ELECTRIC HEATING CO.LTD

Various molds and automatic packing machine High-performance heater that can insert a hole in a metal body of semiconductor such as semiconductor to get reduces the heat loss and get high thermal efficiency

Special feature

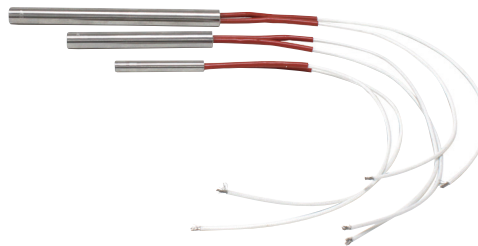
Heater can be replaced easily, saving maintenance cost.

Purpose of use

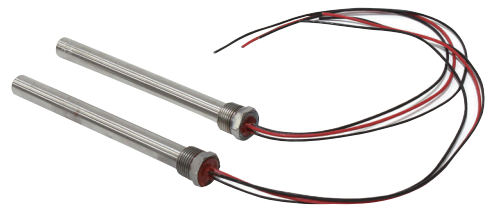
Use of machines (packing machines, injection molds) for molds and high-temperature plastic processes / Liquid heating, mold heating, space heating.

Precautions

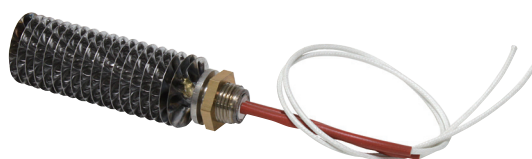
- The gap between the heater and the heater must be inserted exactly so that the thermal conductivity is high and the larger the gap, the shorter the life of the heater.
- When the capacity is too much compared with the size of the heater, the time to reach the desired temperature is short, but the heater life is short.
- Use of thermostat is recommended.
- The position of the temperature sensor differs depending on the thermal conductivity of the object to be heated, but it is recommended to install it 2CM above the normal heater.



Mold Insert type



Liquid Heating type



Air heating type

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