

Welcome to **RWL Pacific**

We are Transforming the Future of Power Technology

2024

NWL Pacific

“With advanced technologies for world class power device for electrostatic precipitator and continuous R&D effort, NWL Pacific Inc. will promise to bring you reliable products.”

NWL Pacific is a manufacturer and supplier of power devices and specialized power devices for electrostatic precipitators. With well-established experience in design, production and installation of power devices and technological affiliation with NWL, US, the company strives to provide advanced technologies and optimal services to the customers to realize customer satisfaction. Continuous research to improve performance and quality will realize better technologies and customized services to earn trust from the customers. NWL Pacific will continue to strive to become a company of trust.

Thank you.

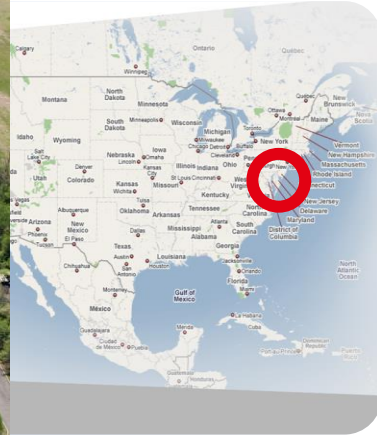
History

- 2023 Participated in 2023 ENTECH VIETNAM
- 2022 Participated in 2022 ENTECH VIETNAM
- 2021 Participated KEIA-KOTRA Superior Environmental Corporation Overseas Capacity Enhance Project
- 2018 Over 3,000 units cumulative production of T/R and PowerPlus total supply exceeded over 1,500
- 2016 Transformer Rectifier CE certificate acquired
- 2012 Constructed owned technologies data base and System Integration software
- 2009 Obtain CE Certificate for T/R Control Panel
- 2008 Install PowerPlus in POSCO & PowerPlus in Tae-An Power Plant
- 2007 Pass the Seismic Test from IMV corporation in Japan
- 2005 Participation to 11th Environmental Conference in China
- 2004 Obtain the ISO 9001 Certificate
- 2003 Obtain the 'Acknowledgement of Clean Factory' from Government 'Acknowledgement of Service Conformable Company' from KEPCO
- 2002 Open Local Service Offices at Po-Hang and Ul-San
- 2000 Participation to Environmental Festival in Japan and Registered on POSCO & KEPCO as a conformable supplier
- 1998 NWL Pacific became PowerPlus exclusive sole agent Asia market from NWL USA

NWL Pacific

"The World No. 1 Manufacturer of the Transformer Rectifier for Electrostatic Precipitator."

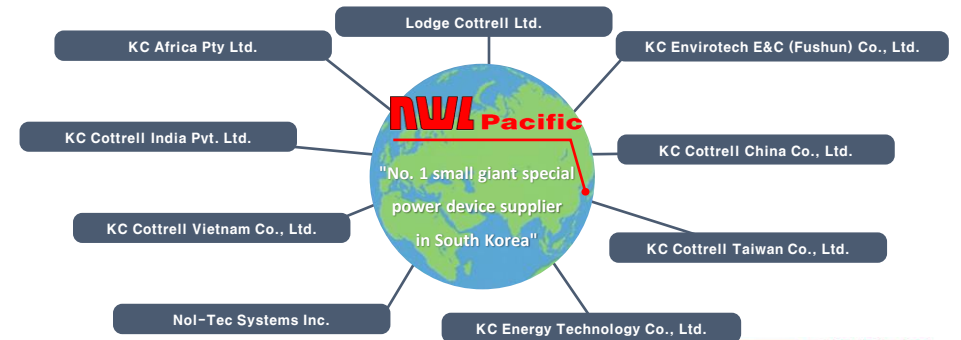
A Joint Venture Between,



"Your Global Partner for Green Business"

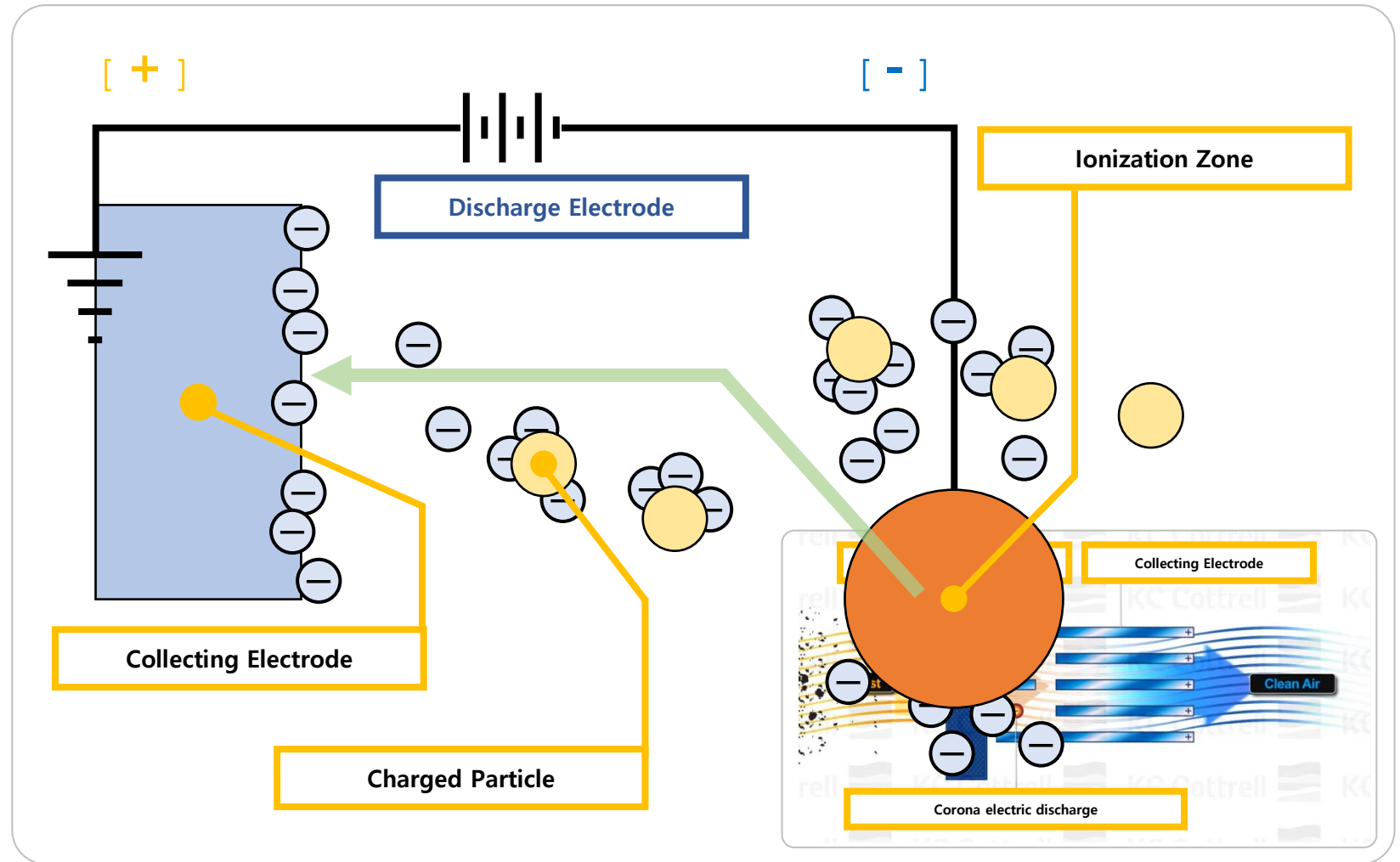
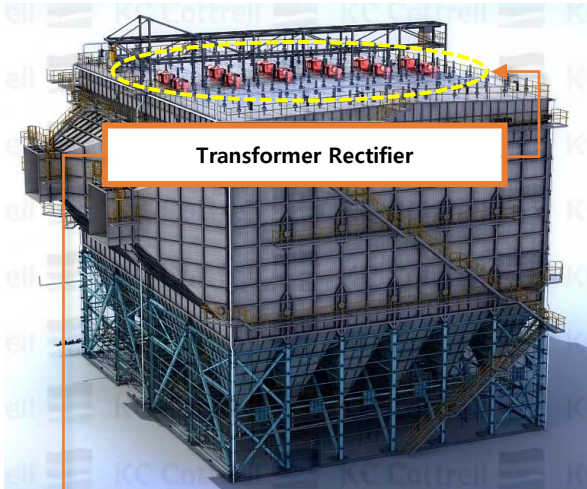
ENVIRONMENTAL EPC & O&M	ENVIRONMENTAL SERVICE	ENVIRONMENTAL MANUFACTURING	RENEWABLE ENERGY
KC Cottrell <ul style="list-style-type: none"> • KC Energy Technology • KC Air Filtertech • KC Cottrell Taiwan • KC Africa Pty Ltd. • KC Africa Power Service (Pty) Ltd. • KC Cottrell Tokyo office • Yooyang Technology NOL-TEC Systems (USA) <ul style="list-style-type: none"> • NOL-TEC KOREA • NOL-TEC Systems (Shanghai) 	KC Cottrell China Co., Ltd. KC Cottrell Vietnam Co., Ltd. KC Cottrell India Pvt. Ltd. KC Envirotech E&C Fushun Lodge Cottrell (UK)	KC Enviro Services <ul style="list-style-type: none"> • KCES Yeosu • KCES Changwon • KCES Jeonju • Changwon Enertec • Pyoungan Envitech • KC Catalyst Services • KC Eco Service KC Environmental Development KC Environmental Construction KC Eco Logistics	KC Glass & Materials Clestra Hauserman S.A <ul style="list-style-type: none"> • Mecanalu SAS (France) • Clestra International SAS • Clestra UK, Switzerland, Germany, USA, HongKong and Japan • Representatives in Asia, Latinamerica, Arab and Europe • Clestra Hauserman factory in Korea, France, Germany and China KC Thermal <ul style="list-style-type: none"> • LACC-JNK, INC. • LACC-JNK LIMITADA
		NWL Pacific	KC Solar Energy KC Green Energy

NWL USA which has experiences over 75 years in the Power Conversion Business. PowerPlus which is the most popular product of NWL has been delivered more than 5,000 units all around the world.



NWL Pacific

"The World No. 1 Manufacturer
of the Transformer Rectifier for Electrostatic Precipitator in various industrial facilities."



Product Line-up

Transformer Rectifier ▶▶▶ Power Plus ▶▶▶ Power Best



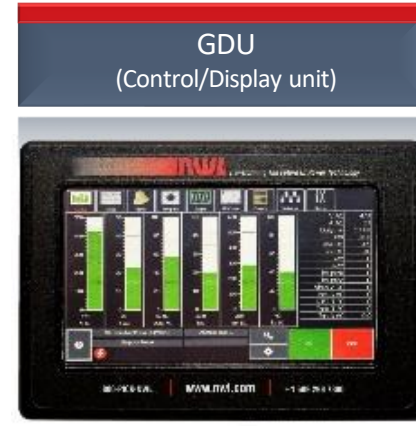
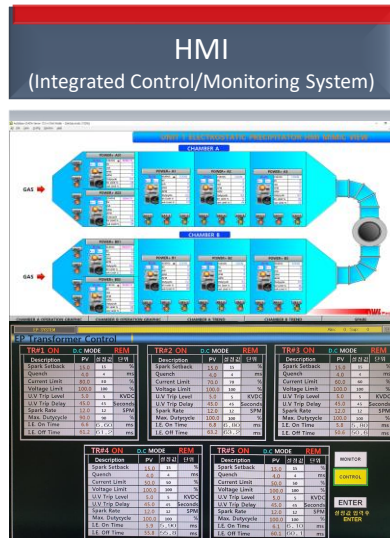
Conventional Transformer Rectifier



Switching mode power supply
(High Frequency)



New Generation Transformer Rectifier



Transformer Rectifier (Single Phase)

- ✓ 23 years know-how of manufacturing single phase transformer rectifiers.
- ✓ Durability to operate in extreme environment
- ✓ Customized Product (45~100kV, up to 3,000mA)



Technical Features

- Modulization of the core parts
- T-PACK: Diode + Divider + Choke Coil
- Easy Maintenance
- Optimized Size



T-PACK



- **Non-Reactor Type (Specialty)**
- Reduce Vibration and Noise
- Optimized Internal Arrangement for Easy Maintenance
- Maximize the Energy Efficiency

PowerPlus



- ✓ High Frequency Switch Mode Power Supply Unit
- ✓ Over 5,000 Units have been delivered all over the world. (Proven Safety)
- ✓ All-in-One System (Combined Structure of Control Part and T/R Part)

Technical Features



Power Plus Series 7.5

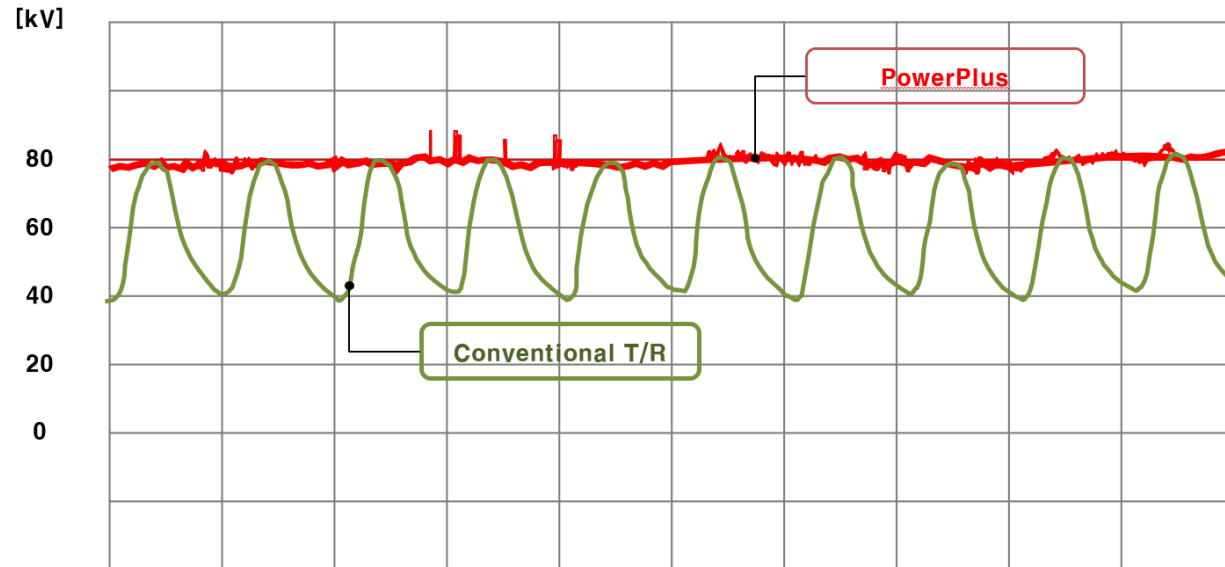
Switching mode power supply (High Frequency)

Item	PowerPlus(SMPS)		Key Differences
Figure			<ul style="list-style-type: none"> ■ Hyper Speed Power Recovery ■ Maximization Power Efficiency and Energy Saving ■ High Speed Switching (IGBT) ■ Reliability Cooling System ■ All-in-One Type : T/R + Control Module ■ Minimize the size of the monitoring system : A numbers of GDU units can be installed on a panel to control multiple PowerPlus units. ■ Easy to operate and Easy to maintain. ■ Nitrogen Charging into Tank (Remove moisture) ■ L-C Resonant Circuit (Patent) ■ Litz Wire (Dual core winding)
Product Name	PowerPlus		
Control Logic	SMPS(Switching Mode Power Supply) DSP(Digital Signal Processor)		
Frequency	IGBT current control (50kHz)		
Input	3 phases, 50/60Hz, 380-480V		
Power Factor	0.94		
Arc Shutdown Time	0.03 ms		

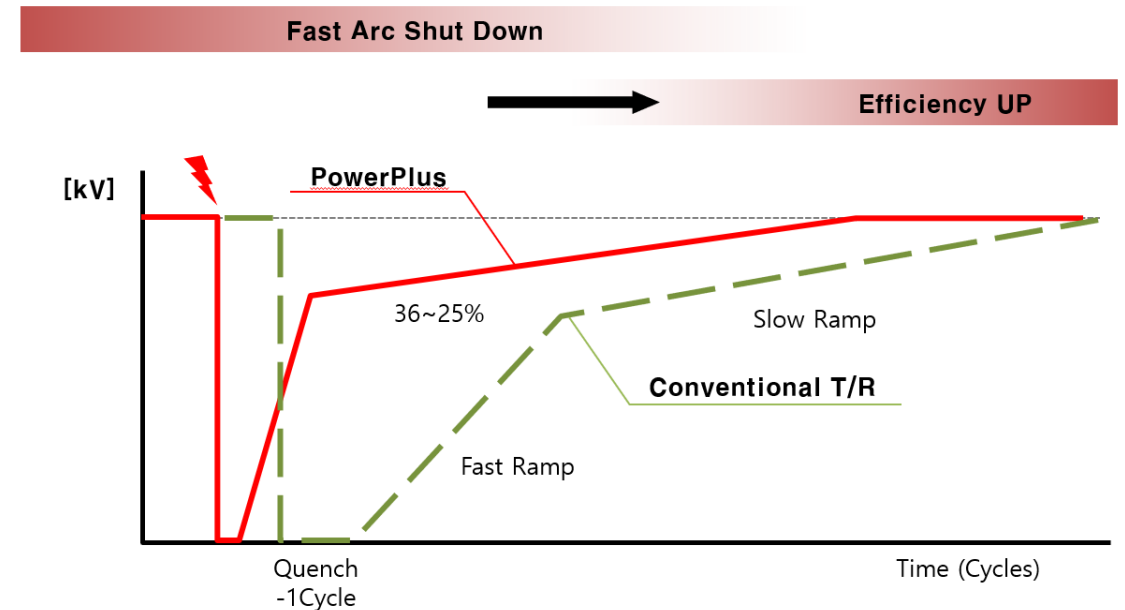


Comparison between Conventional T/R & PowerPlus

kV Waveform

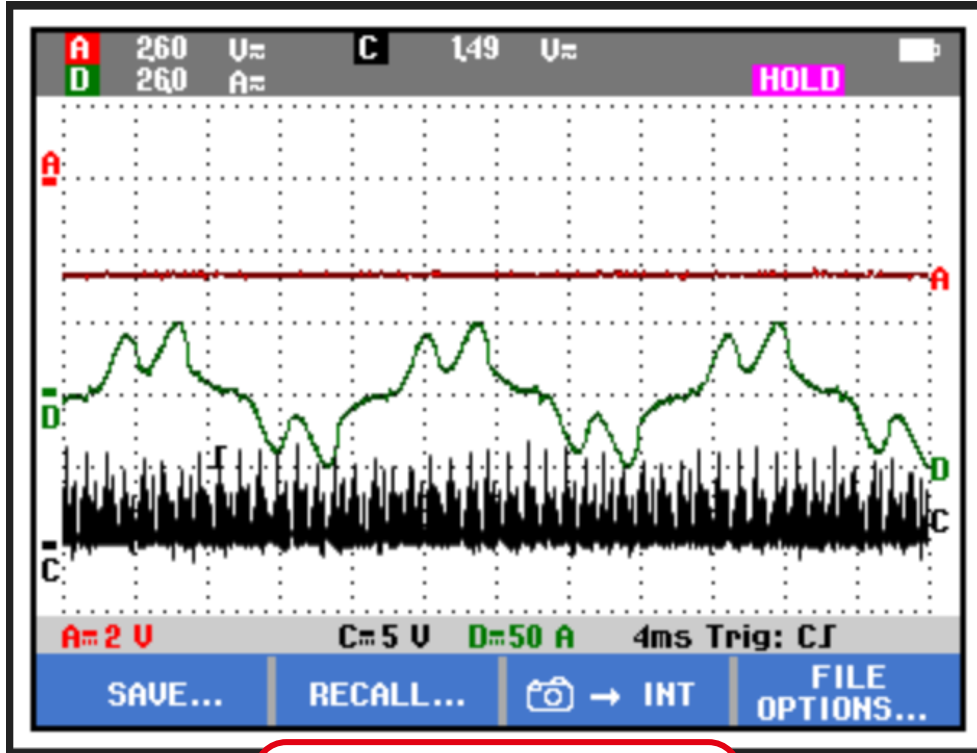


Power Recovery from Arc & Spark

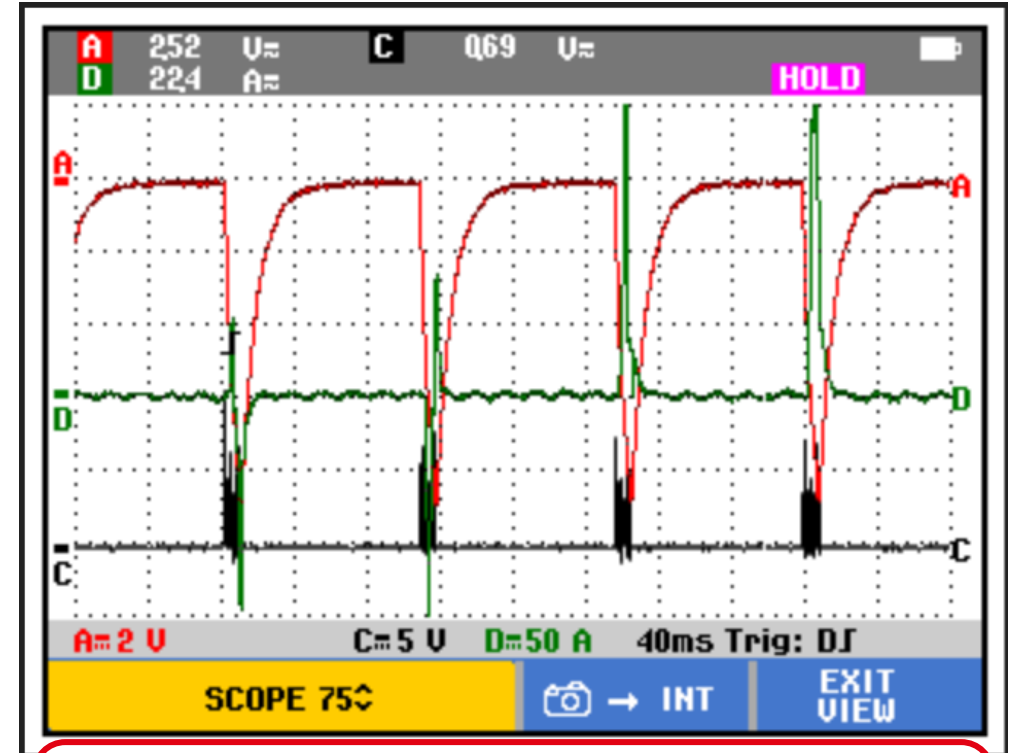


- ✓ Stable performance which can improve the dust collection efficiency.
- ✓ Faster recovery term can reduce the loss of dust collection efficiency.

Intermittent Energization Mode



DC Mode



Intermittent Energization Switch Mode

- Optimized Operation Mode for High Resistant Dust/Particle
- **Optimized energy efficiency** comparing to DC mode

Global Display Unit (GDU)

- ✓ User Friendly Digital Interface
- ✓ Multi-language Display
- ✓ Various Monitoring System



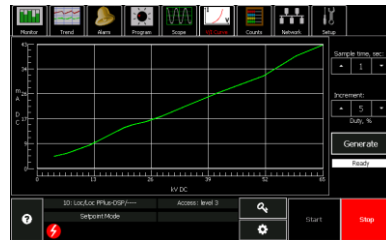
Back of Global Display Unit

Hand-held type configuration

Features



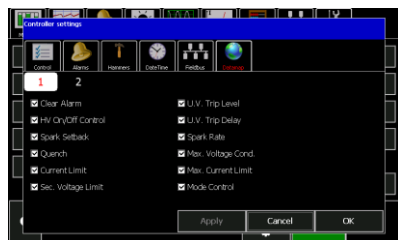
Security



V/I Curve Monitoring



Multi-Language



4 Auxiliary Alarms with the basic alarm functions



Alarm Functions
- Over Current/Voltage Protection
- Under Voltage Alarm

Part No.	G20855	Serial Ports	2 x RS-485 Isolated Serial Port (RJ45 connector)
Processor	ARM9 400MHz Processor	Inputs/Outputs	None Specified
Memory - RAM	128MB of SDRAM standard	LCD	LCD Panel Size: 7.0" Resolution: WVGA (800x480) Display Color: High Color (16-bit) Backlight: White LED
Memory - Storage	256MB NAND Flash storage		
Power Supply Input	5VDC Power Supply, 1.5A available	Speaker	Built-in Speaker
Data Connection	Ethernet 10/100T	Touch Screen	Resistive Touch Screen Input Method: Finger, Glove and Stylus
Operating System	Windows CE 6.0	Enclosure	Bent Metal Panel Mount Enclosure - NEMA 4/IP65 Rated Bezel
USB Ports	1 x USB B 2.0 Device Port: 1 x USB A 2.0 Host Port - always installed	Environmental	Temperature Rating: -30°C to 70°C

Operation Panel

- ✓ Optimized Panel Manufacturing for Order-base System
- ✓ Compatible with the other maker's Transformer Rectifier
- ✓ Able to retrofit, expand the panel configuration considering performance and safety.
- ✓ Protection system for internal circuit against the generation of spark or arc.



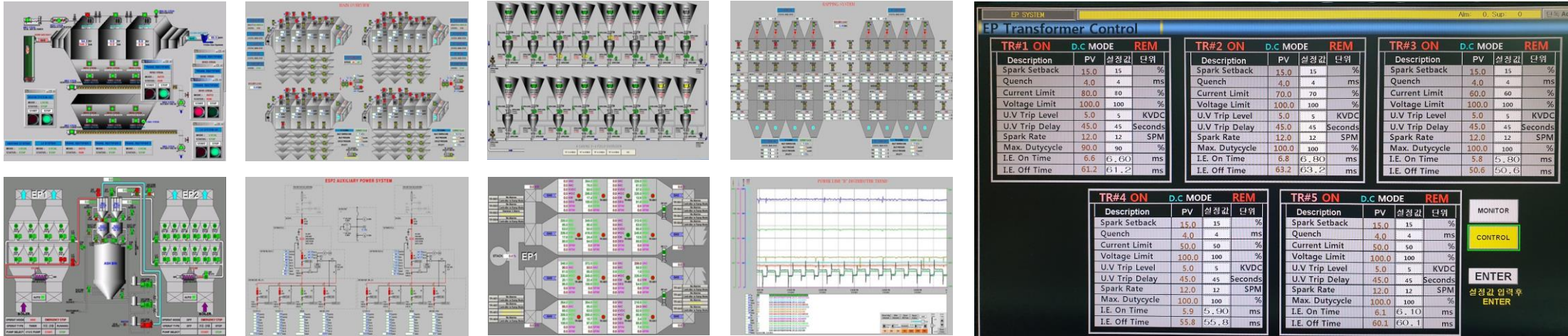
Various Industrial Sites

✓ Over 5,000 units in all around the world, various industrial sites.

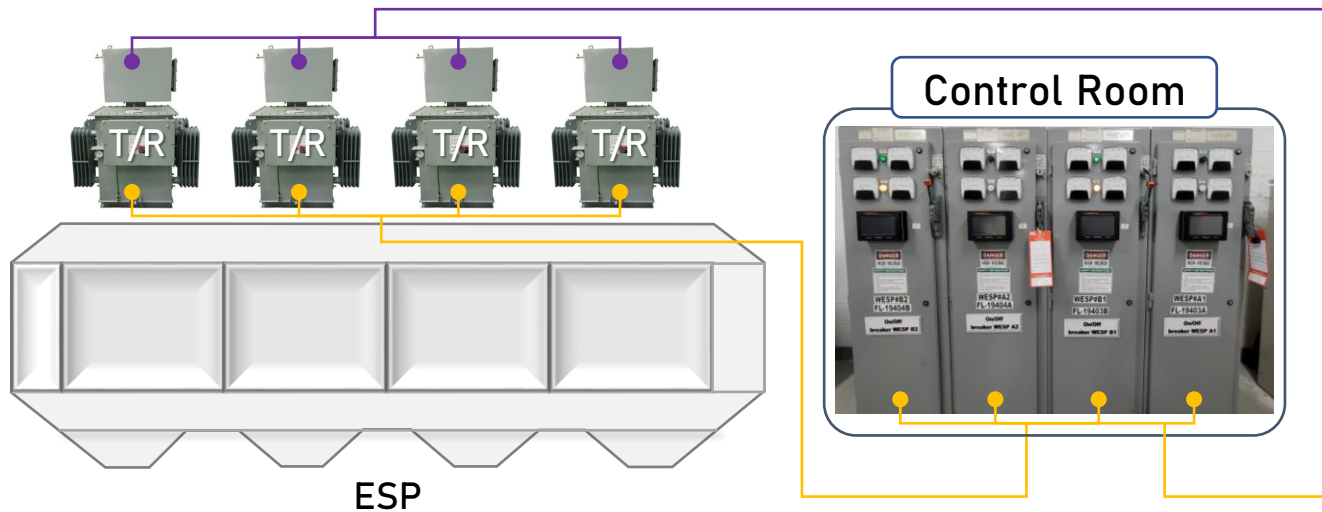


HMI

✓ NWL Pacific's Human Machine Interface which can be customized to various industrial sites.



Configuration Sample



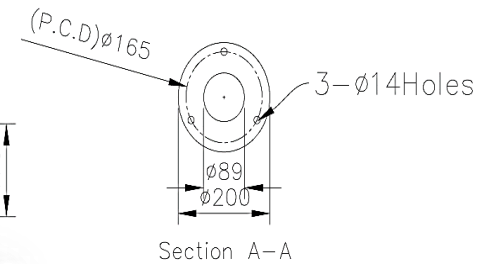
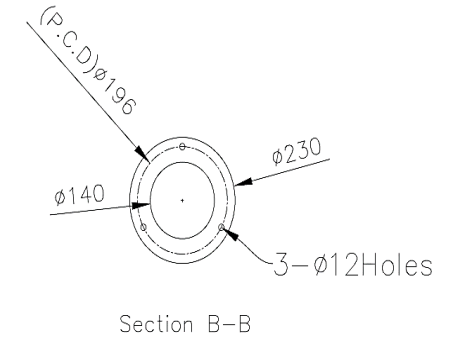
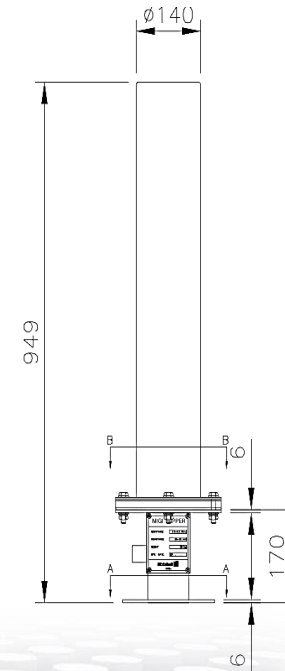
Main Control Room



MIGI Rapper Assembly

✓ An efficient tool for remove the dusts in electrodes of ESP

Model	NP-MG-01
Materials	Rapper Coil Tank & Terminal Box: Mild Steel Rapper Coil Pipe: Polyester Glass
Resistance	2.2 ~ 3.5 Ohm
Inductance	30 ~ 35 mH
Protection	Weather-Proof
Weight	20 kg
Maker	NWL Pacific Inc.



Certificates


C.E. Certificate

EC Declaration of Conformity According to
EC Machinery Directive 2006/42/EC, Annex II A

We herewith declare,
NWL Pacific Inc.
253-9, Singi-Ri, Seoun-Myeon, Anseong-Si, Gyeonggi-Do, Korea

that the following machine complies with the appropriate basic safety and health requirements of the EC Directive based on its design and type, as brought into circulation by us. In case of alteration of the machine, not agree upon by us this declaration will lose its validity.

Machine Description : T/R Control Panel
Machine Type : NP-ST-V01
Serial No. :
Applicable EC Directives : Machinery Directive (2006/42/EC)
Low Voltage Directive (2006/95/EC)

This is to  that the following machine comply to the essential requirements (Annex 1) of the above mentioned European Directives and the following standards :

EN ISO 12100-1 : Safety of Machinery - Basic Concepts and General Principles for Design - Part1 Basic Terminology and Methodology : 2003
EN ISO 12100-2 : Safety of Machinery - Basic Concepts and General Principles for Design - Part2 Technical Principles : 2003
EN 14121-1 : Safety of Machinery - Principles for risk assessment : 2007
EN 60204-1 : Safety of machinery - Electrical equipment of machines: 2006

Authorized Signature / Date : *J.H. Kim* / Feb 03, 2010 / President
Authorized Complier in the Community :
Name: *John Ward*
Address: *21 George St, Birmingham, B3 1&8, England*

DECLARATION OF CONFORMITY
according to EC Machinery Directive 2006/42/EC Annex II
Part 1 Section A

We ;
NWL Pacific
89-20, Singiyangchon-gil, Seoun-myeon, Anseong-si,
Gyeonggi-do, 17606, Republic of Korea

declare under our sole responsibility that the following product:

Product : **Transformer Rectifier**
Model : **N16036**

to which this declaration relates is in conformity with the following standard(s) or other normative document(s)

Directive	Standard	Description
Low Voltage Directive	EN 60204-1:2006/A1:2009	Safety of machinery General principles for design Risk assessment and risk reduction

Importer
Company; **ENERJI SA**
Address; **ENERJISA ENERJI URETIM A.S. KENTSA TESISLERI 41220 ALIKAHYA / IZMIT / TURKEY**
TEL: **+90-212-385-85-84**

05th August, 2016
(Date of issue)

KIM YOUNG JOO
(Name and signature of authorized person)

ISO 9001



This is to certify that:
NWL Pacific Inc.
#89-20, Singiyangchon-gil, Seoun-myeon, Anseong-si, Gyeonggi-do, KOREA

operates a
QUALITY MANAGEMENT SYSTEM
which complies with the requirements of
ISO 9001:2008
for the following scope
The design, development, manufacture and service of rectifier transformers and control panels for electrostatic precipitator and other related products.

Initially certified on 07/23/2004.
Certificate No: QMS41606
Issued: 15 July 2016
Expires: 14 September 2018
Originally Certified: 10 July 2015
Current Certification: 15 July 2016

Heather Mahon

Heather Mahon
Acting Head of Policy, Risk and Certification



Registered by:
SAI Global Certification Services Pty Ltd (ACN 108 116 855) 865 George Street Sydney NSW 2000 Australia with SAI Global Limited
860 George Street Sydney NSW 2000 Australia (SAI Global) and subject to the SAI Global Terms and Conditions for Certification.
Where all our use and risk was assessed in carrying out this assessment. SAI Global accepts responsibility only for errors
regardless. This certificate remains the property of SAI Global and must be returned to SAI Global upon its request. To verify that this
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Thank you.

<http://www.nwlpacific.co.kr>