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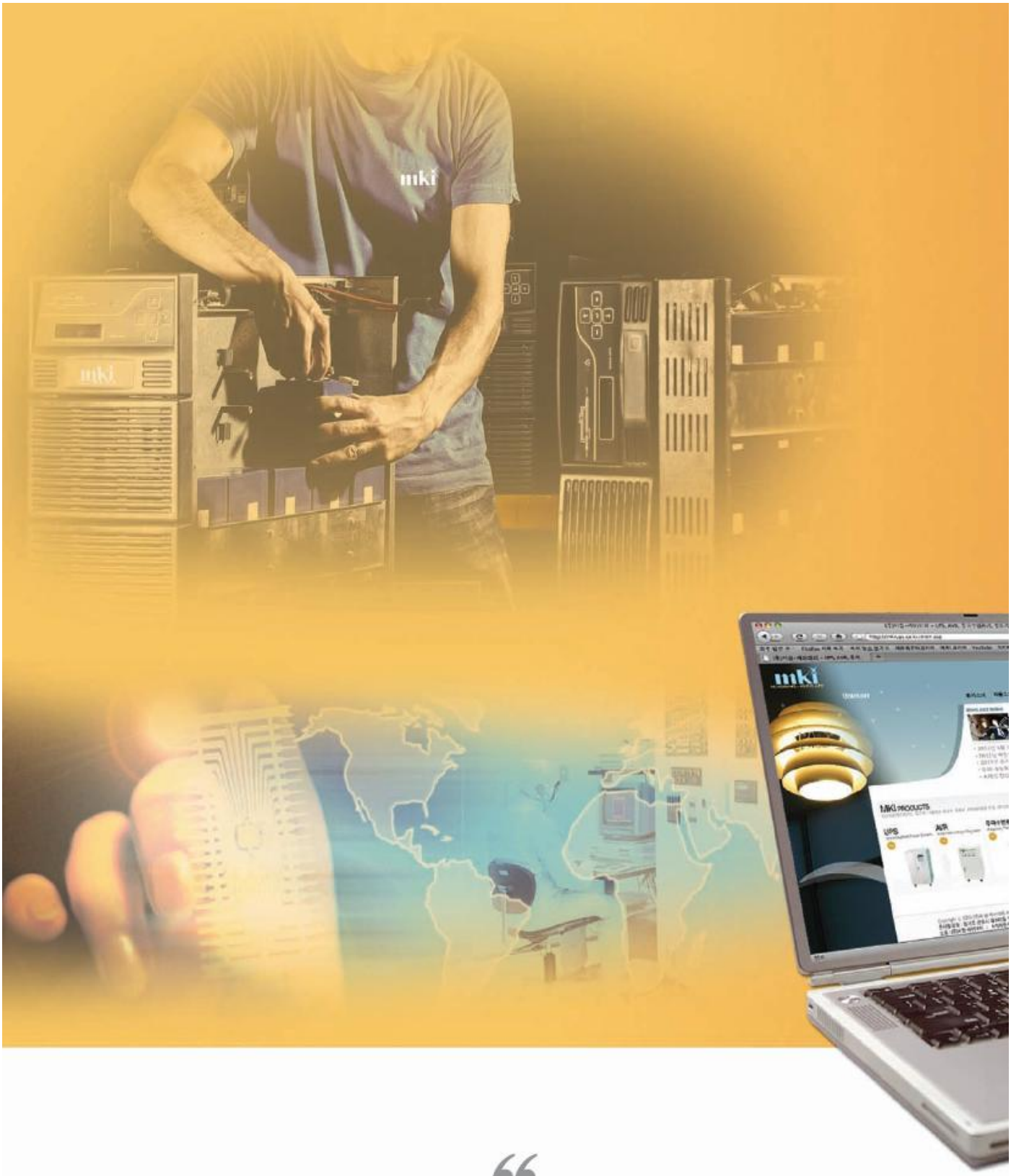
UPS/AVR

Uninterruptible Power System
Automatic Voltage Regulator

mki
MI KWANG - KI. CO., LTD.



Uninterruptible Power System
Automatic Voltage Regulator

MI KWANG – KI CO., LTD.

will do its best to manufacture products in excellent quality with continuous R & D.

Handling items

- Uninterruptible Power System (UPS)
- Automatic Voltage Regulator (AVR)
- Frequency Converter (FPC)
- Rectifier
- Battery Charge
- Transformer

▣ Overview of UPS

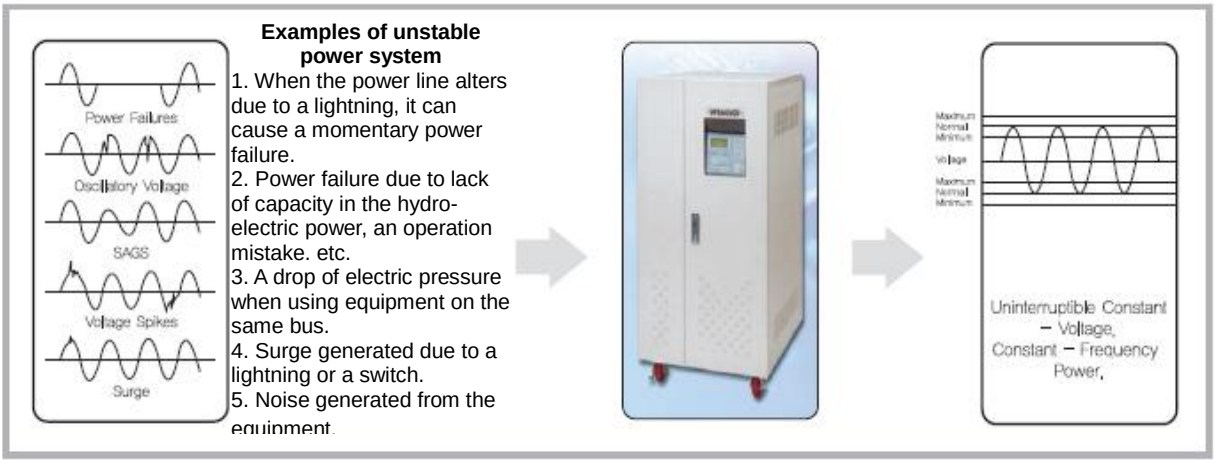
■ Definition

What is the U.P.S. (Uninterruptible Power System?)

It is the system to prevent abnormal condition of power due to momentary power failure of normal power source, unexpected blackout, sudden fluctuation of power voltage, or power source noise and supply stable power to the load at any time. This system is also called (Constant Voltage Constant Frequency).

■ Necessity of UPS

UPS supplies sine waves with constant and accurate voltage and frequency to protect the load from all kinds' power failures such as momentary power failure, voltage fluctuations, frequency fluctuations, noise, etc.



Examples of unstable power system

1. When the power line alters due to a lightning, it can cause a momentary power failure.
2. Power failure due to lack of capacity in the hydro-electric power, an operation mistake. etc.
3. A drop of electric pressure when using equipment on the same bus.
4. Surge generated due to a lightning or a switch.
5. Noise generated from the equipment.

■ Usage

- Computer power
- Measurement /Analysis equipment
- Photoengraving/Printing use
- Quality assurance in the production line
- Broadcasting equipment
- System control
- Testing
- NC machine! MC robot
- Communication data equipment
- CT/X-Ray/medical equipment
- Industrial measuring equipment
- Industrial equipment (Welding machine /Machining power starter/Wire cutter
- CAD system
- Medical equipment (ME)
- Optical instruments used in laboratories/laboratory power


Satellite communications ground plants


Electronic calculator Chemical Plant


The power of such big buildings, hospitals


Office Network for Computational

mki-1000 Series

■ Features and Usage

Optimal G.B.T Conversion Technology

- IGBT high-frequency switching instantaneous control PW M inverter used
- Increase in life of component by designing the optimal AIR Cycle System
- Ability to permit high-peak current to prevent nonlinear load

Doubled reliability using a high-speed micro-processor

- Complete self-diagnosis and history storage function
- Built-in self-diagnosis
- Built-in LCD display screen
- Various measuring and alerting functions
- (Input/output voltage, voltage, temperature of KVA, battery voltage, temperature of equipment, etc.)

User-friendly design concept

- Increase in the ability to decipher visually
- Doubled ability to handle tasks during holiday and at night with the HELP function
- Automatic scheduling function that does not require additional software (Optional)
- Shows bar graphs by attaching an additional Alarm Status LED besides the LCD display screen to show load capacity and battery status
- Plug-In Type design to make the replacement of expendable components easier (Hot Swap)

Quick and flexible following-up control system

- Saving various warning history up to 1024 pieces, A/S and analysis of outage becomes more objective
- Saves time in repairs using the objective data in the warning history
- Real time checks of the warning incidents at UPS with Real Time Clock

Various remote control and surveillance

- Equipped with software and numerous communication functions to cope with various systems
- Equipped with complete SNVP communication mode (Optional)
- Remote supervisory system using RS-485 communication (Optional)
- Multiple Server Auto-Shutdowns (Optional)
- Extendibility required in high reliability load

Isolated Redundant parallel operation

- Dual Inverter function(optional)

■ Display

■ Case size for the respective models

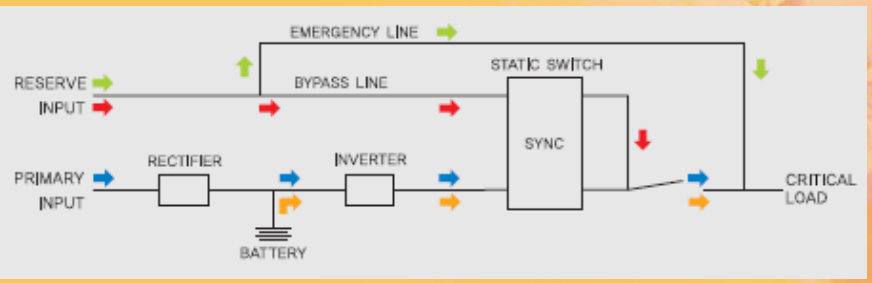
Model	Capacity (KVA)	CASE SIZE (mm)		
		WIDTH	DEPTH	HIGHT
MKI-1000	2	340	620	735
	3			
	5			
	7.5	340	660	820
	10	450	800	950
	15			
	20	500	900	1100
	30			
	40	670	800	1330
	50			
	75	750	1000	1505
	100			

- The above standard could be altered for improvement in quality purpose.

■ Electric Specification (Input 1Φ, 3Φ →Output 1Φ)

Capacity(KVA)		1 KVA —100KVA
General features	Cooling method	Coercive wind-coding method
	Duty rating	I00% Continuous duty (When power factor is 1)
	Rectifier control method	Phase control method
	Rectifier use element	Thyrstor or Diode
	Inverter control method	Control when high frequency (20kHz) ;PWM method
	Inverter use element	IGBT
	Static Switch	Random control switch
	Converter insulating class	H Class
	Communication (Monitoring function)	Built-in SNMP CARD
Power Input	Constant	1Φ 2W or 3Φ 3W, 3Φ 4W
	Duty rating	Set voltage (V)
	Voltage regulation range	Rating: ±10%, ±15%
	Frequency	50Hz/ 60Hz ±5%
Output Voltage	Constant	1Φ2W
	Duty rating	Set voltage(V)
	Voltage stability	Within ±2% of rating
	Frequency	50Hz / 60Hz ±0.5%
	Frequency variation range	±1 Hz
	Excessive voltage fluctuation	Within ±5%
	Excessive responding speed	Within 20ms (if restored within ±2%)
	Output voltage adjustment	±5%
	Waveform distortion	THD 3% and below (if 100% linear load)
	Overload	± 120% for 10 minutes
	Overall efficiency	80% and above
	Power factor	0.8LAG
	Noise	55dB and above (front 1.5m height 1.5m when measured)
Synchronization switch	Synchronization switch period	4ms
	Momentary power cut period when synchronized	Anti-momentary power cut switch
	Switch conditions	* Inverter disorder *output overload *direct current low voltage *manual switch
Capacitor	Duty rating	2016V, 240V, 360V
	Discharge compensation time	Specify upon purchase
Others	Optional	RS-232C, 422, 485, S NMP communication

■ Configuration and operation function



Operating normally

Driving during a power outage

Operating bypass when a problem occurs with the inverter

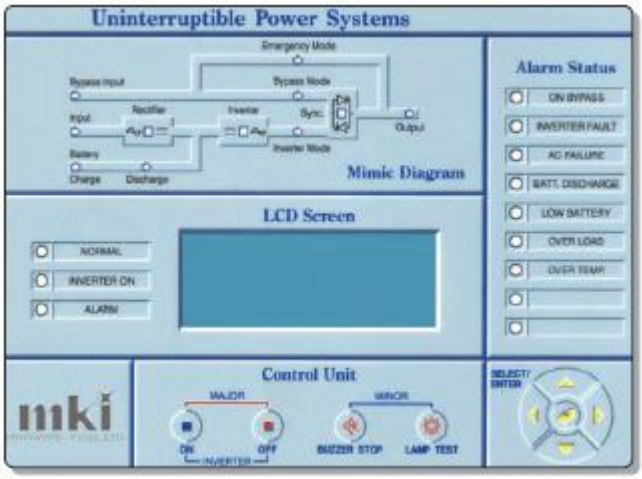
Operating Emergency (Maintenance) mode

mki - 3000 Series

■ Features and usage

- Micro-Processor Control Action
- Optimal G.B.T Conversion Technology
- Wider range of input power supply (+10%, -15%)
- LCD Display and MIMIC displays operation status for convenience
- Addition Alarm Status LED besides the LCD
- 12 measuring signs such as voltage and current
- Built-in self-diagnosis / History Log function
- Extendibility required in high reliability load
- Equipped with Help function for convenience
- Displays graphs of load capacity and battery status
- Equipped with software and numerous communication functions to cope with various OS systems

■ Display



■ Case size for the respective models

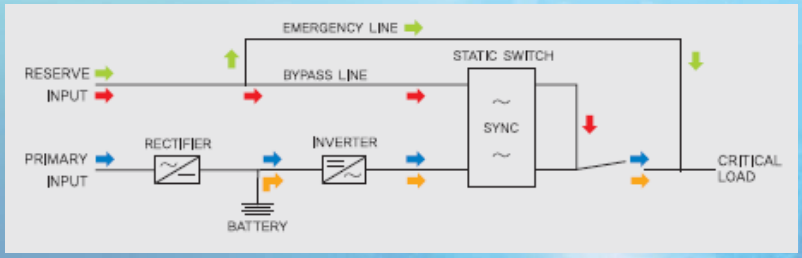
Model	Capacity (KVA)	CASE SIZE (mm)		
		WIDTH	DEPTH	HIGHT
MKI-3000	10	450	800	950
	20	500	900	1100
	30			
	40	670	800	1330
	50			
	75	750	1000	1505
	100			

- The above standard could be altered for improvement in quality purpose.

■ Electric Specification (Input 3Φ→Output 3Φ)

Capacity(KVA)		1 KVA —50KVA
General features	Cooling method	Coercive wind-coding method
	Duty rating	I00% Continuous duty (When power factor is 1)
	Rectifier control method	Phase control method
	Rectifier use element	Thyrstor or Diode
	Inverter control method	Control when high frequency (20kHz) ;PWM method
	Inverter use element	I.G.B.T
	ST / SW	Transfer x Method
	Converter insulating class	H Class
Power Input	Constant	3Φ 3W or 3Φ 4W
	Duty rating	Set voltage (V)
	Voltage regulation range	Rating: ±10%, ±15%
	Frequency	50Hz/ 60Hz ±5%
Output Voltage	Constant	3Φ 3W or 3Φ 4W
	Duty rating	Set voltage(V)
	Voltage stability	Within ±2%
	Frequency	50Hz / 60Hz ±0.5%
	Frequency variation range	±1 Hz
	Excessive voltage fluctuation	Within ±5%
	Excessive responding speed	Within 20ms (if restored within ±2%)
	Output voltage adjustment	±5%
	Waveform distortion	THD 3% and below (if 100% linear load)
	Overload	± 120% for 10 minutes
	Overall efficiency	80% and above
	Power factor	0.8LAG
	Noise	55dB and above (front 1.5m height 1.5m when measured)
Synchronization switch	Synchronization switch period	4ms
	Momentary power cut period when synchronized	Anti-momentary power cut switch
	Switch conditions	* Inverter disorder *output overload *direct current low voltage *manual switch
Capacitor	Duty rating	2016V, 240V, 360V
	Discharge compensation time	Specify upon purchase
Others	Optional	RS-232C, 422, 485, SNMP communication

■ Configuration and operation function



- Operating normally
- Driving during a power outage
- Operating bypass when a problem occurs with the inverter
- Operating Emergency (Maintenance) mode

mki - 1000T Series ALL I.G.B.T UPS!

▣ Features

- True On- Line Double UPS
- UPS in integral semiconductor system/ High-efficiency, Small size, and Light weight
- Input High Power Factor (PF) = 0.99
- Input Reverse-current Harmonic Minimization: 10% and below
- 100% Digital Control System / Stable A.C. Voltage Supply
- Setting the voltage and current values on the front panel
- Remote Control Monitoring: Support to RS- 232, RS- 485, SNMP (Optional)

▣ Usage

- Instrumentation System for Chemical Plant and Power Generation Plant
- Monitoring and Control of Medical System or Building
- Broadcasting Equipment
- On-line System for Bank or Banking Institution
- High-tech facilities, Semiconductor factory, and Production facilities

■ Display

■ Case size for the respective models

Model	Capacity (KVA)	CASE SIZE (mm)		
		WIDTH	DEPTH	HIGHT
MKI-1000T	5	210	590	430
	10	210	750	590
	15	210	750	590

- The above standard could be altered for improvement in quality purpose.

■ Electric Specification (Input 1Φ,3Φ→Output 1Φ)

Capacity(KVA)		11 10, 15, 20, 30KVA
General features	Cooling method	Coercive wind-coding method
	Duty rating	I00% Continuous duty (When power factor is 1)
	Rectifier control method	I.G.B.T control system
	Rectifier use element	I.G.B.T
	Inverter control method	Control when high frequency (20kHz) ;PWM method
	Inverter use element	I.G.B.T
	Static Switch	Random control switch
	Converter insulating class	H Class
	Telecommunications (monitoring function)	Built-in ANMP CARD
Power Input	Constant	1Φ 2W or 3Φ 4W
	Duty rating	220V, 380V
	Voltage regulation range	Rating: ±10%, ±15%
	Frequency	50Hz/ 60Hz ±5%
	Input power factor	0.99 LAG
Output Voltage	Constant	1Φ 2W
	Duty rating	220V, 380V
	Voltage stability	Within ±10%, ±15
	Frequency	50Hz / 60Hz ±0.5%
	Frequency variation range	±1 Hz
	Excessive voltage fluctuation	Within ±5%
	Excessive responding speed	Within 20ms (if restored within ±2%)
	Output voltage adjustment	±5%
	Waveform distortion	THD 3% and below (if 100% linear load)
	Overload	± 120% for 10 minutes
	Overall efficiency	80% and above
	Power factor	0.8LAG
	Noise	55dB and above (front 1.5m height 1.5m when measured)
Synchronization switch	Synchronization switch period	4ms
	Momentary power cut period when synchronized	Anti-momentary power cut switch
	Switch conditions	* Inverter disorder *output overload *direct current low voltage *manual switch
Capacitor	Duty rating	2016V, 240V
	Discharge compensation time	Specify upon purchase
Others	Optional	RS-232C, 422, 485, SNMP communication

♦ mki - 3000T Series ALL I.G.B.T UPS!

▣ Features

- ALL-I.G.B.T Integral Semiconductor Control System (rectifier/inverter)
- Small size and light weight by high-frequency control
- Easy change in battery cells
- High-frequency and High power factor Control
- S/W applicable for a range of O/S environment, and built-in various communication functions (SNMP- OPtior)

▣ Usage

- Server system in the computer center
- Instrumentation system for power generation plant
- Medical system for hospital
- Monitoring and Control System of Building
- Communication or Broadcasting equipment
- On-line System for Securities Company or Banking Institution
- Automation facilities for Semiconductor factory

■ Display

■ Case size for the respective models

Model	Capacity (KVA)	CASE SIZE (mm)		
		WIDTH	DEPTH	HIGHT
MKI-3000T	10	425	800	113
	15			
	20	425	800	124
	30	515	835	170
	40	515	835	195
	60	515	835	175
	80	515	835	185
	100	780	890	380
	120	780	890	374
	160	780	890	420
	200	780	890	436
	250	1150	890	TBA
	300	1150	890	TBA

- The above standard could be altered for improvement in quality purpose.

■ Electric Specification (Input 3Φ→Output 3Φ)

Capacity(KVA)		10KVA ~600KVA
General features	Cooling method	Coercive wind-coding method
	Duty rating	I00% Continuous duty (When power factor is 1)
	Rectifier control method	Phase control method
	Rectifier use element	I.G.B.T control system
	Inverter control method	Control when high frequency (20kHz) ;PWM method
	Inverter use element	I.G.B.T
	Static Switch	Random control switch
	Converter insulating class	H Class
	Telecommunications (monitoring function)	Built-in ANMP CARD
Power Input	Constant	3Φ 4W
	Duty rating	Set voltage (V)
	Voltage regulation range	Rating: ±10%, ±15%
	Frequency	50Hz/ 60Hz ±5%
	Input power factor	0.99 LAG
Output Voltage	Constant	3Φ 4W
	Duty rating	Set voltage(V)
	Voltage stability	Within ±10%, ±15
	Frequency	50Hz / 60Hz ±0.5%
	Frequency variation range	±1 Hz
	Excessive voltage fluctuation	Within ±5%
	Excessive responding speed	Within 20ms (if restored within ±2%)
	Output voltage adjustment	±5%
	Waveform distortion	THD 3% and below (if 100% linear load)
	Overload	± 120% for 10 minutes
	Overall efficiency	80% and above
	Power factor	0.9LAG
	Noise	55dB and above (front 1.5m height 1.5m when measured)
Synchronization switch	Synchronization switch period	4ms
	Momentary power cut period when synchronized	Anti-momentary power cut switch
	Switch conditions	* Inverter disorder *output overload *direct current low voltage *manual switch
Capacitor	Duty rating	60Cell
	Discharge compensation time	Specify upon purchase
Others	Optional	RS-232C, 422, 485, SNMP communication

mki-1000H Series

▣ Features

- Small size and light weight by high-frequency control
- Easy change in battery cells
- High-frequency and High power factor Control
- S/W applicable for a range of O/S environment, and built-in various communication functions (SNMP- OPtior)

▣ Usage

- Server system in the computer center
- Instrumentation system for power generation plant
- Medical system for hospital
- Monitoring and Control System of Building
- Communication or Broadcasting equipment
- On-line System for Securities Company or Banking Institution
- Automation facilities for Semiconductor factory

mki-1000L Series

- Surge, Short-circuit
- Load protection
- Built-in EMI, RFI NOISE FILTERING functions
- Display of the Status of On-line, Bypass, Overload, or Battery
- Monitoring function, using EMS

■ Special Features

- On-line and Double Conversion System for power protection
- DSP (DIGITAL SIGNAL PROCESSING for sine wave pulse width control
- (DSP (DIGITAL SIGNAL PROCESSING)
- GBT Inverter
- Input Voltage Range in wide range (tolerance in the input voltage variation by ± 25%)
- Sine wave Output less than 3%
- Extendible Backup Time
- Input Interworking with AC Generator
- More improved Battery Control for load, battery, Input/output voltage, overload, and failure
- Automatic Charging of Battery even after UPS disconnection
- Synchronous time between AC mode and Battery mode: "0" sec.
- Convenient and more improved RS- 232, SNMP

■ Case size for the respective models

Capacity (KVA)	CASE SIZE (mm)		
	WIDTH	DEPTH	HIGHT
1(Tower)	160	405	220
1(Rack)	483	450	88 710(2U)
2/3(Tower)	212	460	300
2/3(Rack)	483	450	176 (4u)
6	264	670	710
7.5/10	400	550	1000
15	400	550	1000
20	480	580	1190

- The above standard could be altered for improvement in quality purpose.

■ Electric Specification

Capacity(KVA)		1	2	3	6	10	15~20
General features	Cooling method	Coercive wind-coding method					
	Duty rating	I00% Continuous duty (When power factor is 1)					
	Rectifier use element	Thyristor			Diode		
	Inverter control method	Control when high frequency (20kHz) ;PWM method					
	Inverter use element	FET			IGBT		
	Static Switch	Random control switch					
	Converter insulating class	H Class					
Power Input	Constant	1Φ 2W			1Φ 2W or 3Φ 4W		
	Duty rating	220V			220/380V		
	Voltage regulation range	Rating: ±25%, ±20%					
	Frequency	50Hz/ 60Hz ±0.5%					
Output Voltage	Constant	1Φ 2W					
	Duty rating	220V					
	Voltage stability	Within ±1					
	Frequency	50Hz / 60Hz ±0.5%					
	Frequency variation range	±1 Hz					
	Excessive voltage fluctuation	Within ±5%					
	Excessive responding speed	Within 20ms (if restored within ±2%)					
	Output voltage adjustment	±5%					
	Waveform distortion	THD 3% and below (if 100% linear load)					
	Overload	± 120% for 10 minutes					
	Overall efficiency	80% and above					
	Power factor	0.9LAG					
	Noise	60dB and above (front 1.5m height 1.5m when measured)					
Synchronization switch	Synchronization switch period	4ms					
	Momentary power cut period when synchronized	Anti-momentary power cut switch					
	Switch conditions	* Inverter disorder *direct current low voltage *output overload *manual switch					
Battery	Rated voltage	36V		96V			196V
	At power failure compensation time	5/15M		11/27M	5/17M		Designated time

♦ mki – 1000R / 3000R Series

■ SCR Method

Introduction

- Rectifier is the system to take direct current from alternating current by changing the waveform having positive and negative instantaneous values into positive or negative instantaneous value. We manufacture industrial rectifiers being used for electrical plating, electrical film, anodizing, electrolysis, and DC electromagnetic supply and arrangement.

Features

- Rectifier is the system to take direct current from alternating current by changing the waveform having positive and negative instantaneous values into positive or negative instantaneous value. We manufacture industrial rectifiers being used for electrical plating, electrical film, anodizing, electrolysis, and DC electromagnetic supply and arrangement.
- Noncontact and Continuous: No fault is given by contact defect or access defect as the system is noncontact and continuous.
- Higher degree of Automatic Control in constant voltage and constant current: Automatic control is made by adopting and setting constant voltage and constant current system. The degree of automatic control is within ±1.5%.
- Improved Maintenance: Better maintenance is attained by making it the unit for repairing in the front.
- Improved Safety and Reliability: All the machines are equipment with built-in automatic control of constant voltage and constant current for complete protection facilities.

■ Inside of the Rectifier

Usage

- For Communication, Industries, Plating, and Dealing with other rectifiers

Specifications

- input Voltage: 110V, 220V, 380V, 440V
- Frequency: 50Hz or 60Hz
- Input Voltage Variation: ±10% or ±15%
- Of Phase: 1.3
- Rated Output Voltage: DC. V (12, 24, 48, 110, 220, 0~400V)
- Rated Output Current: DC.V (10A~1000A)
- Regulation: ±1.0%
- Rat1ng, Continuous
- Cooling Method: Sell Cooling or Fan Cooling
- Control Method: SCR Gate Control

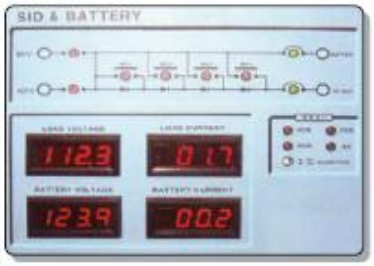
mki – 1000RI / 3000RI Series

■ I.G.B.T System

Features

- High-frequency system with IGBT
- High-tech function with Full Digital System
- High-efficiency above 90%; high power factor above 90%
- Every setting is available at adjustment part (MIMIC).
- Rack type with 19”, and other type can be made.

DISPLAY



■ Electric Specification: IGBT High-Frequency System

Power Input	Phase	1phase, 3phase
	Rated frequency	47Hz~63Hz
	Rated voltage	220, 380, 400, 440, ±15%
Power output	Rated voltage	DC 100V (24V, 48V, 60V, 72V, 125V, 220V, 250V, Other)
	Current Rating	30A~4000A
	Voltage regulation range	Rating: -30% ~ +10%
	Voltage fluctuation	Within 0.1%, ±15% if the input voltage variation
	Voltage fluctuation	Within 0.2%, 10%~100% if load changes
	Current limiting characteristics	More than 110% of the rated current
Efficiency and power factor		Efficiency: Over 90%, Power factor: Over 90%
Ripple		1% P-P or less
Response characteristics		25ms or less
Noise		55db or less (FAN noise standards)
Characteristics of the DC spark		Within 1V
insulation resistance		5MΩ or more
Impulse Withstand Voltage		6KV (1.2 x 50㎲), 3KA (8 X 20㎲)
Withstand voltage characteristics		1 min 2,000V
Cooling Method		Fan Forcibly Cooled (Thermostatic method)
Coating		40㎲ or more
Control method		I.G.B.T (Insulated Gate Bipolar Trasistor)
Panel protection rating		IP 21
Standard Weight		20kg, 25kg, 35kg, 45kg, 65kg, 76kg

***** The above standard could be altered for improvement in quality purpose.

mki - 1000F / 3000F Series

Features

- Multi-P. W. M (Pulse Width Modulation) Type
- Digital Control System
- I.G.B.T High Frequency Switching
- High Efficiency a Low Audible Noise
- Constant Voltage : ±1%
- Constant Frequency: ±0. 5%
- Voltage variable with semiconductor system: there is no trouble in voltage fluctuation when applying load with existing Slidac system.
- Output Frequency: 50, 60, 45 ~ 500Hz (Variable)
- Output Voltage: 0 ~ 700V (Variable)

Usage

- Export/import, development, production, inspection of electric/electronic products
- For frequency conversion by enterprises and laboratories
- For reliability testing
- For transformer testing
- For motor test and inspection
- For Standard AC Power Source
- For every testing equipment requiring constant voltage and constant frequency

I DISPLAY I

■ Specification

MODEL	MKI F/C Series										
Output Capacity	1KVA	3KVA	5KVA	7.5KVA	10KVA	15KVA	20KVA	30KVA	50KVA	75KVA	100KVA
Circuit Type	M.P.W.M (Multi-Pluse Width Amplifier Modulation										
Input Voltage	100V / 110V / 115V / 120V / 200V / 220V / 230V / 240V / 380V / 440V 1PHASE or 3PHASE (±10%)										
Input Frequency	50Hz / 60Hz										
Output Voltage	0~700V 1PHASE or 3PHASE										
Voltage Stability	≦ ±1%										
Output Frequency	50, 60, 45-500Hz (Variable)										
Frequency Stability	±0,5%										
T.H.D	±3%										
Protector	Electronic Circuit / Over Load / Short Circuit										
Frequency Meter	LED Digital Display										
V.A-Meter	True RMS Digital Display										
Temperature	0~40℃										
Humidity	0~90%										
Transfer time	Zero Break										
Option	Remote Control(RS-232C : Variable Voltage, Variable Frequency) / Remote Multi Control(RS-485)										

■ Features and Usage

■ Quality for Higher Stability and Reliability

- Power and Electronics – UPS, AVR, F/C
- Control Panel – CP, Elevator
- AC, DC, REACTOR
- NCT (Nose Cut Trans)

mki – AVR Series

AVR – *Series* can supply power to the load continuously and stably.

AVR – *Series* can give the maximum effect with the minimum cost to prevent power disturbing elements such as Noise, Sag, or Impulse flowed into unstable voltage and input part.

Features of the AVR

- Outstanding effect of Noise shielding
- Very low waveform distortion (0.3% and below)
- Very fast response speed (within 0.008~0.048 sec.)
- Very high efficiency (95% and above)
- No noise
- Very low harmonic occurrence
- Less no-load loss
- No interference with load
- Availability for any load, including inductive load, as well as computer
- Semi-permanent life time
- Simple operating and easy maintenance
- Built-in interrupting device against overvoltage, low voltage, and overcurrent to protect peripheral equipment in abnormal condition

Usage of the AVR

- Power for computing machines, including computer
- Test and inspection
- Measurement and analysis devices
- Electronic medical instruments (X-ray, CT)
- System control
- Industrial measuring machines
- Quality control for production line
- Power for research room and laboratory
- Optical devices
- Plate making for photograph, and printing
- NC machine and robot
- Industrial machines

■ Electric Specification

Classification		Specificity
Power Input	Phase	1Ø 2W, 3Ø 3W, 3Ø 4W
	Rated voltage	110VAC, 220VAC, 380VAC, 440VAC, 480VAC
	Voltage range	±15%
	Rated frequency	60Hz, 50Hz
Power output	Phase	1Ø 2W, 3Ø 3W, 3Ø 4W
	Rated voltage	110VAC, 220VAC, 380VAC, 440VAC, 480VAC
	Rated frequency	60Hz, 50Hz
	Response speed	Within 0.008~0.048 Sec
	Voltage Stability	Within ±2%
	Distortion Less	±3% Linear , At 100% load
	Power factor	0.7Lag more
Efficiency		95% or more
Ambient temperature		-10°C ~ 40°C
Protection devices		Overvoltage, under voltage, overcurrent

■ Features of the AVR

Classification	AVR-Series
Adjustment Method	Electronic tab convertible
Control element	TRIAC, PT, IC
Input voltage range	±15%
Output voltage stability	V2%
Response speed	0.008~0.048 Sec
efficiency	95%
Distortion Less	0.3% or less
Self-harmonic generation	None
Radio interference	Suitable for FCC or VDE regulations
Use the load function	Suitable for all computers and equipment
noise	Not at all
Frequency	Combination possible
No-load losses	Very few
Interference effect of the load	Not at all

■ Quality for Higher Stability and Reliability

Capacitie (KVA)	CASE SIZE(mm)		
	WIDTH	DEPTH	HIGHT
1	275	415	295
2			
3	280	500	475
5			
7,5			
10	400	480	710
15			
20	450	550	815
30	530	630	1005
40	530	690	1130
50			

Capacitie (KVA)	CASE SIZE(mm)		
	WIDTH	DEPTH	HIGHT
10	450	550	815
15			
20	530	630	1005
25			
30	590	690	1130
40	650	750	1275
50	700	800	1510
75			
100	800	900	1660

mki – Module UPS Series

■ What is Module Type?

As UPS module, having the unit capacity of 10~200KVA, operates with complete UPS, it is operated with parallel configuration. Even if one module becomes failure, odd modules can perform the UPS function, thus, other failure of module is allowed. When increasing module or in case of maintenance, the module can be Hot-swappable easily without switching the UPS off. Such high reliability makes the use not worry about the loss of important date caused by power problem in the load device.

■ Features

- Protection against uninterruptible system failure by adopting Parallel Redundancy
- Completely free from failure
- Outstanding power density (volume/capacity)
- Minimized cost when increasing the capacity
- Minimized maintenance cost and failure management time
- Easy transfer and installation
- S/W for remote monitoring network, automatic shut-down, and automatic restart
- Minimized installation space
- Minimized power consumption

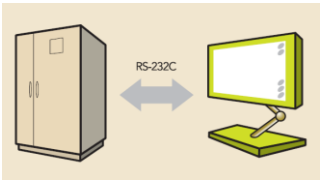
■ Advantages of the Module UPS

- System stability
- Cost reduction (lower cost by the Redundancy configuration with N+1 or N+2 than stand-by system configuration)
- Simple maintenance
- Cost reduction by increasing the equipment as much as required capacity
- Horizontal or vertical installation of modules available in accordance with the installation environment
- Light and compact system
- 3/3, 3/1, 1/3, or 1/1 conversion available by the switch operation
- System control and management
- Remote control by sending/receiving to/from mobile phone or personal computer, using portable wireless communication device (W- NG)

UPS Operating System

■ **Operating System of UPS Monitoring and Control Program**

RS232c, RS422, RS485 System

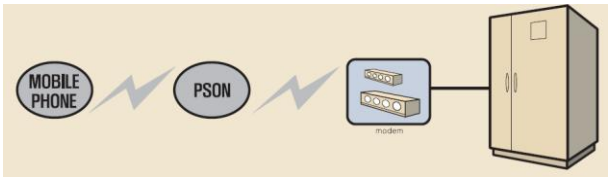


➢ They are the most basic systems of the UPS monitoring system, based on 1:1 communication between UPS and computer. The communication distance is limited to 15 meters due to the feature of the system. The system can be operated in case that the distance between the UPS and the computer to monitor the system is near. If the distance between the UPS and the monitoring system is above 15 meters, the communication distance may be extended up to 1. 2Km by RS422 or RS485 system, using the converter for RS232c.

Feature: The system is accessed to RS- 232c port of the computer, without requiring separate communication device.

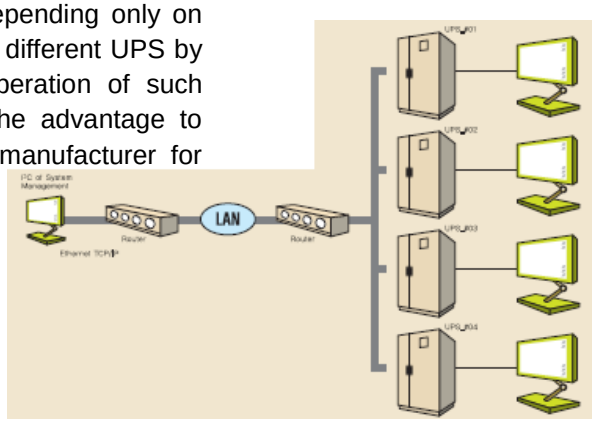
The System with Modem

➢ The system can be used for monitoring and control of the UPS in the remote area. It does not need sending/receiving connection wires as it uses telephone wire. It is possible for the computer of the monitoring system to sense and grasp the status of the UPS by remote control via model. In addition, the delivery of the situation can be made through phone or pager as it uses modem.



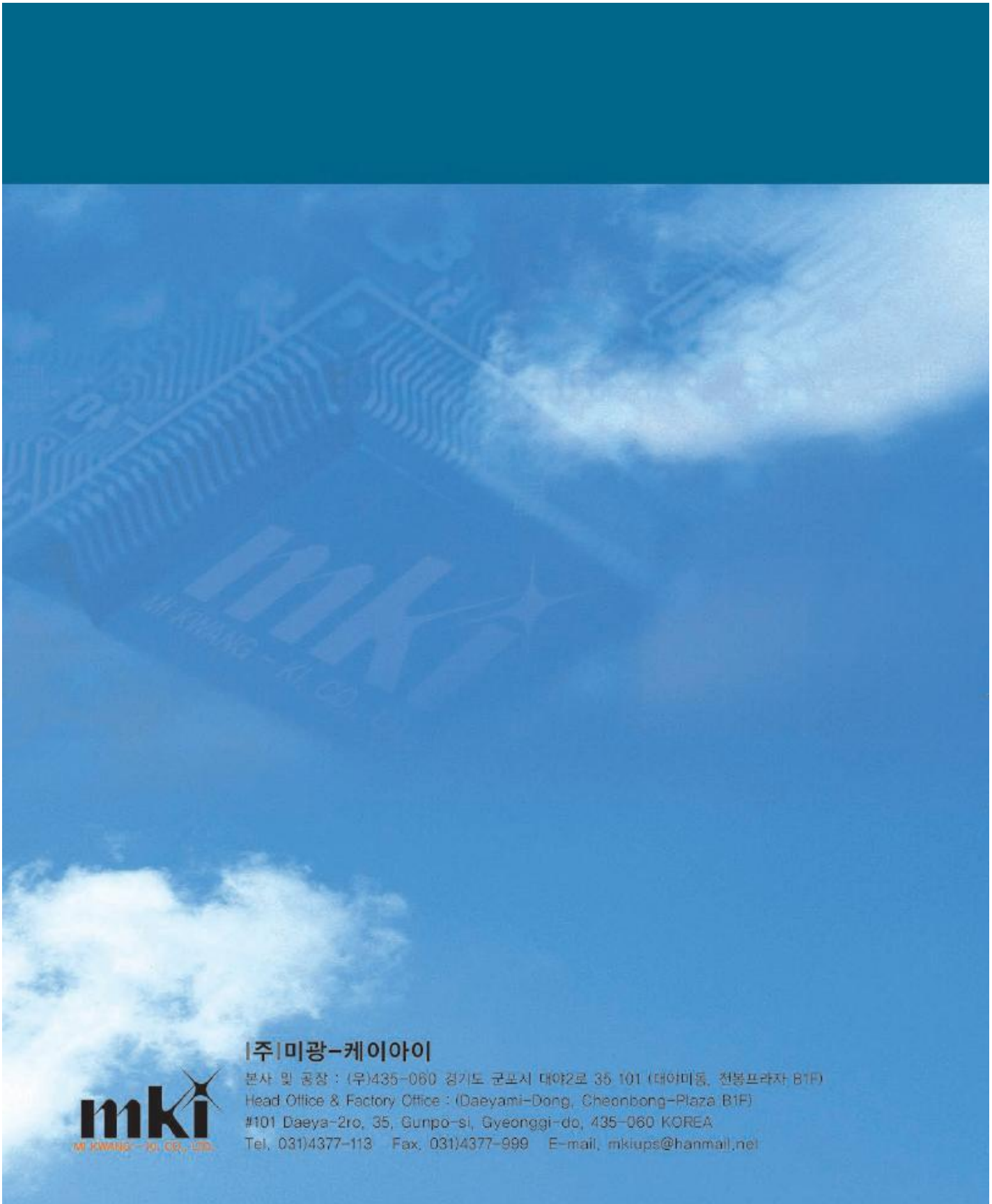
➢ **Feature:**
- **available for remote monitoring for many UPSs**
- **The monitoring person can check the situation by mobile phone or pager.**
- **Separate communication line is not required.**

Power Wise Master-UPS Integrated Management System



➢ Power Wise Master is the program that is created to resolve the inconvenience arising from the management of UPS by depending only on individual manufacturer's monitoring program, in case of the different UPS by different manufacturer. This program makes integrated operation of such different UPS by different manufacturer possible. It has the advantage to accept and choose communication protocol by individual manufacturer for various UPSs.

Features and Advantage in use:
- **Integrated management of the UPSs by different manufacturers**
- **Easy upgrading of the system**
- **Integrated management for single phase and 3-phase UPS both**
- **Lower cost performance than cost**



|주|미광-케이아이

본사 및 공장 : (우)435-060 경기도 군포시 대야2로 35 101 (대야미동, 천봉프라자 B1F)
Head Office & Factory Office : (Daeyami-Dong, Cheonbong-Plaza B1F)
#101 Daeya-2ro, 35, Gunpo-si, Gyeonggi-do, 435-060 KOREA
Tel. 031)4377-113 Fax. 031)4377-999 E-mail. mkiups@hanmail.net