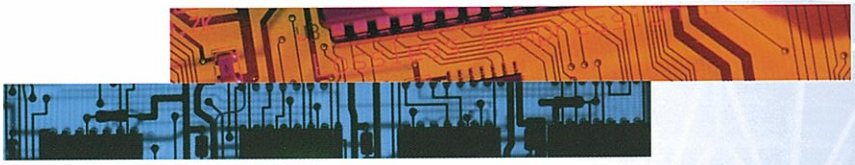
For Telecommunication and other DC



About AEC

Allis Electric Co., Ltd. (AEC) was established in 1968 and has concentrated on the research, development, and manufacturing of various electrical products. AEC's primary products are switchgear, transformers, power transmission and distribution line hardware & apparatus, and electronic equipment including switching mode rectifier, UPS and other power electronic products. Its steady growth and reputation in the community is the basis for AEC's successful public offering on the Taiwan Stock Exchange in 1994.

During thirty years of continued growth and operation, AEC's two major factories in Yangmei and Hsinchuang have earned several prestigious quality control and quality assurance awards. AEC has received ISO-9001 for quality in 1994 and ISO-14001 for environmental excellence in 2000.

In the never-ending search for sustained growth and improvement, AEC is also participating in other wide ranging investment opportunities such as: ICO satellite communications with Taiwan satellite Investment Co.; Taiwan High Speed Rail Project with Taiwan High Speed Rail Consortia; Pacific Energy Tech Ltd. to manufacture smart Lithium Ion batteries, etc.

By continuing to grow and reach for perfection, Allis Electric Co., Ltd. strives to increase its value to both its customers and shareholders well into the next millennium.

ISO 9001 BSMI REGISTERED CERT NO.3A6Y002

CE

TÜV CERT ISO 9001

TÜV CERT ISO 14001

Power application

AEC's Switching Mode Rectifier(SMR), combined with a battery provides uninterruptible DC power to any type of telecommunication systems. The reliable and low noise rectifier module is compact which make it ideal for any type of environment. Multiple rectifiers can be configured into a single unit with its multiple slots and controlled by a supervisory unit(CSU). The system can be monitored and controlled remotely through a modem using WinCSU software . The control features active current sharing, accurate battery voltage regulation, battery recharging current limit control, automatic battery equalization and battery temperature compensation.

Application

- Telephone Exchanges
- Cellular phone/ Radio base stations
- Satellite base stations
- Microwave links remote multiplexes
- Rural Telecommunications
- PABXs
- Railway switching controls
- Transmission and ISDN equipment
- Power Plants
- Airport, Hospital, Banks

Satellite base stations

Power plants

Cellular phone / Radio base stations

Microwave links remote multiplexes

Railway switching controls

Switching Mode Rectifier

Key features

* Innovative AC input with wide input range
* Power factor > 0.99, Sinusoidal input current, meet IEC 555-2; except R100C > 0.93
* High efficiency (over 90% typical)
* Microprocessor based
* Active or passive load sharing
* Hot pluggable
* More compact, mass less than 6kg for R2000 series SMR
* Exceptional power density
* Low noise < 50 dB (A Weighted)

• R100C 100A/48V or 100A/24V

• MAG2485-3 150A/48V

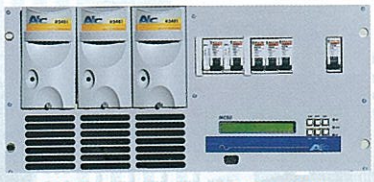
• R50C 50A/48V (forced convection)
• R75C 75A/48V or 100A/24V

• R50C 50A/48V (natural convection)

• R2481 12.5A/48V

• R2485 50A/48V

• R2482 25A/48V



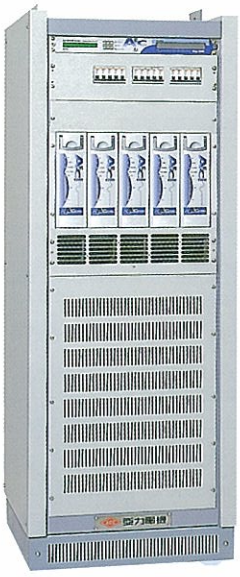
3U(132mm) high Rectifiers and Circuit Breakers

2U(88mm) high Vent & MCSU

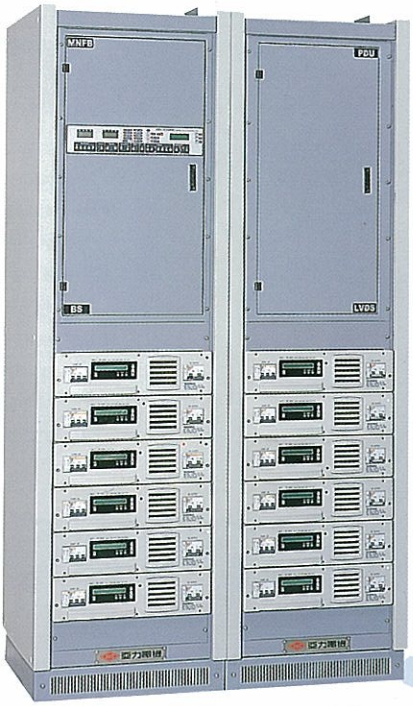
• MAG2481-3 40A/48V

Rack Power System

AEC's Rack Power System provides a complete solution for specific power requirements. The system comes with a microprocessor-based control, supervisory unit(CSU), and slots for the compact and reliable rectifier modules. Additional options are AC/ DC distribution modules, low voltage disconnect switches, and battery switches. The DC power system is easy to configure and provides state-of-art performance.



• RPS2075/RPS2150 • RPS2125/RPS2250



• RPS1200H • RPS450F

Control and Supervisory Unit

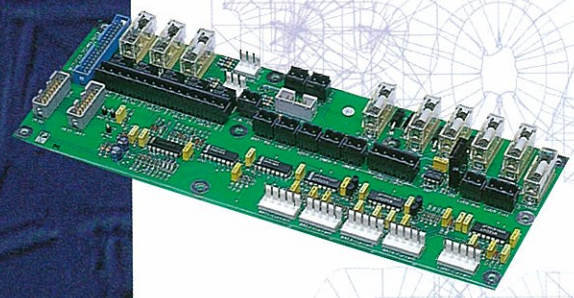
■ C1200C CSU (Used for R100C / R75C / R50C)

- Control up to 110 rectifier modules and monitor 4 banks of batteries in a 24V or 48V DC power system.
- Microprocessor-based front panel with 100 stored alarms.
- 4 digit, 12mm LCD display +/- 5% accuracy normally displays output current and output voltage.
- 16 character, a 2-line alphanumeric LCD display allows the user to pre-set operating parameters and display system status, alarms log, and battery history.
- The overall control enable active load sharing, programmable battery charging current limit, battery temperature compensation, and automatic equalization.
- Local and remote communication links (RS232 or RS485) and software.
- Size: 2U high and 200mm in depth suited for 19" rack mount; Mass: < 3.5 kg.

■ MCSU (Used for R2000 Series Rectifier)

- Control up to 15 R2000 series rectifier modules and monitor 2 banks of batteries in a 24V or 48V or 110V DC power system.
- System status is indicated by 3 LEDs - SYSTEM OK, ALARM, SMR SHUTDOWN.
- 16 character, a backlite single-line alphanumeric LCD display normally displays output current, output voltage, and system status.
- The overall control enable active load sharing, programmable battery charging current limit, battery temperature compensation, and automatic equalization.
- Local and remote monitoring and control via WinCSU2000 software and modem communications.
- Size: 1U high, 280mm in depth, and 485mm in width; Mass: < 1.5kg.
- Modem size (max.): 40 x 170 x 280mm(H x W x D)

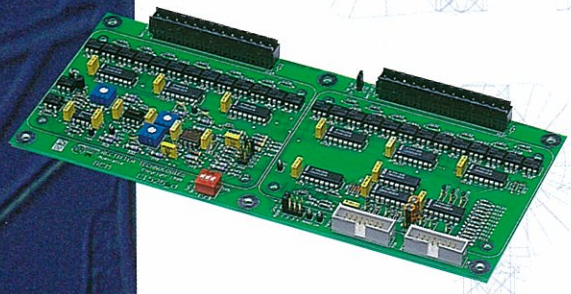
Interface Board (for R2000 Series Rectifier)



MUIB

AEC's MUIB board combined with MCSU, external tranducers and digital or analog I/O contacts to control and monitor a 24V or 48V or 110V DC power system. It provides a basic interface between the MCSU and the system environment.

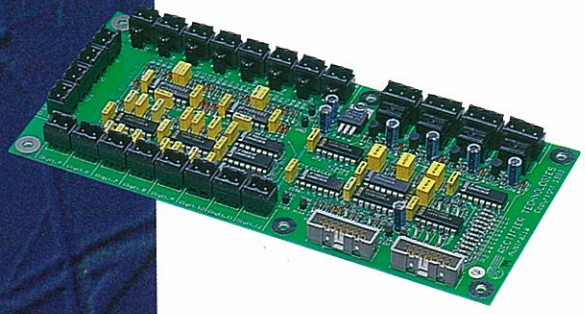
- Two batteries (MUIB&MUIB3) or four batteries (MUIB2) connection.
- The actual number of batteries used in the system can be programmed by the user via the MCSU front panel or remotely by WinCSU2000 software.
- There are 5 relay outputs, 4 digital inputs, LVDS interface, CB trip input and Battery switch input.
- Ambient and battery temperature sensors can be connected to this board.
- Two spare analog inputs are available if MMIB1 board is not used.
- This board also provides power to the MCSU, and can be connected to the DC bus and battery at the same time.



BCM (optional)

AEC's BCM board is an add-on module for the MCSU. It is used to monitor individual cells of a battery during either float, equalize operation, or discharge. Each BCM board is capable of monitoring up to 24 cells (BCM) or 96 cells (BCM2).

- Cell voltage setting can be 2V, 4V, 6V and 12V.
- Individual cell voltage of a battery can be viewed on the MCSU LCD display in real time. In addition it also displays the cell number and its percentage deviation from the average cell voltage of the battery.
- All the cell voltages can be displayed in a "Histogram" format on a local or remote PC using WinCSU2000 software. Thus providing a convenient and rapid visual indication of normal and deviant cells.

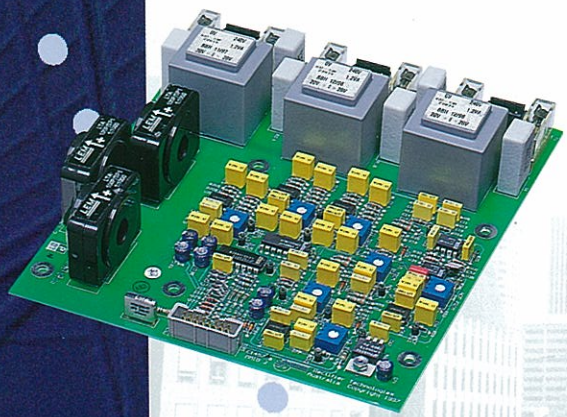


SMM (optional)

AEC's SMM board is an expansion of the MCSU. It allows the user to monitor status of equipment that is external to AEC's DC power system. It can also be used to monitor 3'rd party DC power systems. Using the same communication link and WinCSU2000 software, the SMM can supervise numerous off-site systems from a central monitoring station.

Electrical Specification:

- There are 8 analog inputs, 12 digital inputs, and 4 control outputs can be programmable.
- Power source is provided by MCSU. The MCSU is powered from the system DC bus.



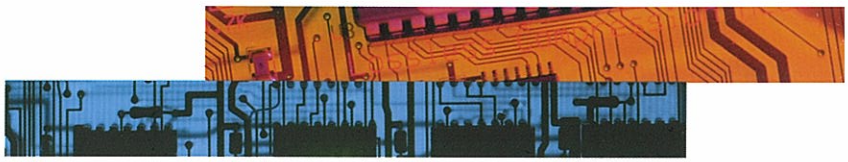
MMIB (optional)

AEC's MMIB board is an add-on module for the MCSU. It is used to monitor external AC power sources in either single phase or three phase configuration during operation.

Monitoring of:

- MMIB1 - single phase AC voltage, current, frequency.
- MMIB2 - three phase AC voltage, current, frequency.

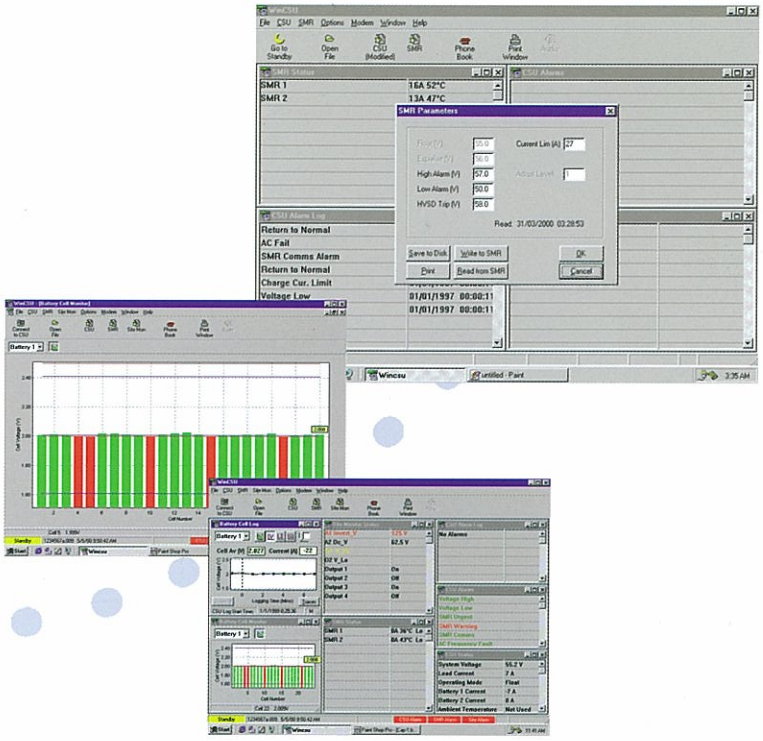
SCADA



WinCSU2000

AEC's WinCSU2000 software is an intuitive program desigend for the Windows 95,98 and NT environment.

Working through MCSU and interface boards, you could monitor and control AEC's DC power system either locally or remotely through a modem.

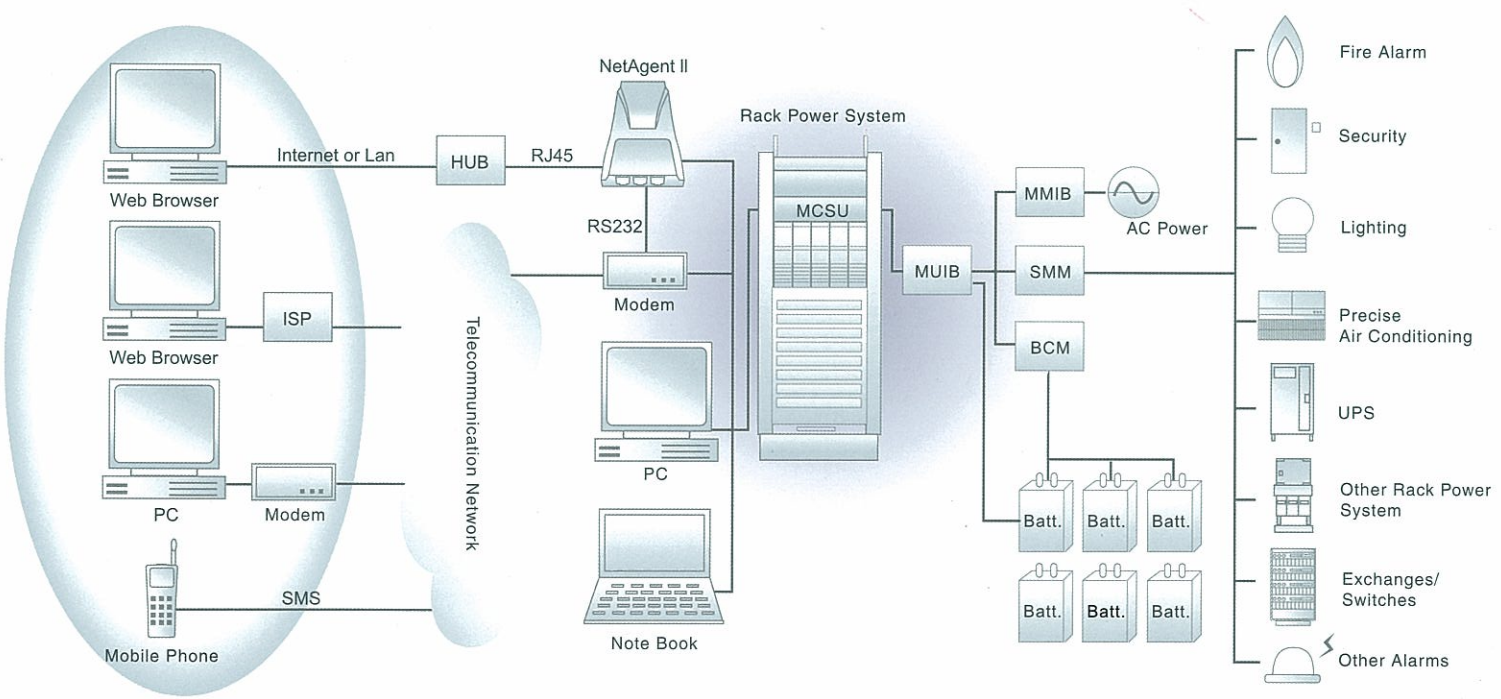


MCSU NetAgentII

AEC has integrated various communication protocols over networking enable equipment's real-time remotely monitoring and management via MCSU NetAgentII.

It equipped UTP RJ45 plug for 10Base-T or 100M Fast Ethernet connecting through TCP/IP, UDP, HTTP, Telnet, SNTP, PPP, or SMTP protocol to LAN and WAN.

Besides, it also provides RS232 port connect with external modem to dial in via PPP protocol access Internet connection.



Specifications

Model No.	R100C	R75C	R50C	R2485	R2482	R2481	R2111
INPUT							
Voltage	380Vac or 220Vac +25/-15%, Three Phase	220Vac +25/ -32 % (150 to 275 Vac) Single phase: Active, Neutral and Earth					
Current	16A@220Vac; 9A@380Vac.	21A @220Vac , sinusoidal waveform.	14A @220Vac , sinusoidal waveform.	21A @150 Vac; 14A @ 220 Vac; sinusoidal waveform.	11A @150 Vac; 7A @ 220 Vac; sinusoidal waveform.	5.5A @150 Vac; 3.5A @ 220 Vac; sinusoidal waveform.	11A @150 Vac; 7A @ 220 Vac; sinusoidal waveform.
Frequency	45~65Hz						
Power Factor	>0.93 @full load	> 0.99, THD < 8% @ full load, meet IEC555-2					
Efficiency	91% @full load	91% @full load; >90% @load >20A		>90% typical from 50% to 100% output at nominal input voltage			
Surge Protection	Complies with ANSI C62.41 (IEEE C587); Combination wave 6kV/3kA and Ring wave 6kV/500A tests applied						
EMI Compliance	Complies with VDE 0871 Class A and FCC part 15 Class A			Complies with CISPR 22 Class B and VDE 0871 Class A			
Inrush current	<5A @380Vac; <10A @220Vac	< 16A peak at nominal main voltage		<8 A peak at nominal main voltage		<4 A peak at nominal main voltage	<8 A peak at nominal main voltage
Soft Start	Minimum O/P current ramp-up time 3 seconds						
Isolation	1500 Vac input to chassis, 1 minute.						
OUTPUT							
Voltage	Float - 48~56V; Equalize - 50~60V adjustable			Float - 48~58V; Equalize - 50~61V adjustable			Float - 110~140V. Equalize -125~155V
Current Limit	10~110A adjustable	5~84A adjustable	5~55A adjustable	10~52A adjustable	5~27A adjustable	1-14A adjustable	2~12A adjustable
Power Limit	5820W max.	4230W max.	2960W max.	2960W max.	1650W max.	700W max.	1400W max.
Static Regulation	Line - +/- o.1% Load - +/-1.0%	Line - +/- o.1% Load - +/-0.5%	Line - +/- o.1% Load - +/-0.5%	Line: +/-0.02% Load: +/- 0.05%	Line - +/- o.1% Load - +/-0.5%	Line - +/- 0.02% Load - +/-0.05%	Line - +/- o.1% Load - +/-0.5%
Dynamic Regulation	+/-5% for 10%-90% step load change +/-1% within 4 ms of step change	+/-5% for 10%-90% step load change +/-1% within 1 ms of step change	+/-5% for 10%-90% step load change +/-1% within 1 ms of step change	+/- 5% for 10%-90%-10% step load change +/- 1% within 1 ms of step change +/- 1% for +/- 25% step change in AC input voltage		+/- 2% for 10%-90%-10% step load change +/- 1% within 200 μs of step change +/- 0.1% for +/- 25% step change in AC input voltage	+/- 5% for 10%-90%-10% step load change +/- 1% within 20 ms of step change +/- 1% for +-25% step change in AC input voltage
Output noise	<24dBrnc@ Battery side <2mVrms Psophometric weighting <10mVrms 10KHz-100MHz			<1mVrms Psophometric weighting <10mVrms 10KHz-100MHz <100mV peak to peak 100MHz bandwidth			<10mVrms Psophometric weighting <50mVrms 100Hz-10kHz <50mVrms 10kHz-100MHz <0.5V peak to peak 100MHz bandwidth
Acoustic Noise	<56dB (A Weighted)	<50dB (A Weighted)	<50dB (A Weighted)	<50dB (A Weighted)	<50dB (A Weighted)	<45dB (A Weighted)	<50dB (A Weighted)
Load Sharing	Better than +/-3%, active current sharing	Better than +/-5%, active current sharing		Better than +/-5% of full scale with active current sharing from MCSU			
Protection	"Trip Free" Current Breaker. Over Voltage - only faulty unit shuts down. Over current - can sustain short circuit. Over Temperature - gradual reduction of current limit if heat-sink temp exceeds pre-set limit.			Fuse at output of SMR Over Voltage - only faulty unit shuts down. Over current - can sustain short circuit. Over Temperature - gradual reduction of current limit if heat-sink temp exceeds pre-set limit.			
Isolation	500Vac output to chassis, 1 minute.			1000Vac output to chassis, 1 minute.			1500Vac output to chassis, 1 minute.
MONITORING							
Current	Alpha-numeric LCD display; +/- 0.5% @ full scale			Monitored on MCSU Alpha-numeric LCD display with 1A resolution; Analog measurement accuracy +/- 1% at full load; Optional bar-graph display on rectifier			
Voltage	Alpha-numeric LCD display; +/- 0.5% @ full scale			System Voltage normally displayed on MCSU Alpha-numeric LCD display; Accuracy +/- 0.5% @ full scale			
LED Indications	AC (AC Power on) - Green OFF (Rectifier Fault) - Red ALARM - Amber			ON (Rectifier normal) - Green SHUTDOWN (Rectifier Fault) - Red ALARM - Amber		One green LED indicates: On (Rectifier normal) - continuous Shutdown (Rectifier Fault) - off Alarm - flashing	ON (Rectifier normal) -Green SHUTDOWN(Rectifier Fault) - Red ALARM - Amber
Alarms	Coded Alarm and Status Indication on Alpha-numeric LCD display			The MCSU monitors and displays any alarm and status conditions for each rectifier module			
CONTROLS							
Front panel	MENU INC, DEC and ENTER Push -Buttons for : Entering through Menu; Scrolling through Menu. Changing values and exiting Menu.			All parameter settings are programmable through the SMR menu and Battery menu push-button on the MCSU. Test function - activated on the MCSU the rectifier LEDs are cycled. Rectifier address - automatically set by a resistor on the Magazine.			
REMOTE CONTROLS							
Rectifier Inhibit	Rectifier can be inhibited by the C1200C CSU.			Rectifier can be inhibited by a signal from a remote computer, transmitted via the MCSU.			
Equalize Mode	Equalize Mode can be initiated by the C1200C CSU.			Equalise Mode can be initiated by a signal from the MCSU.			
External Voltage Control	Optically coupled PWM signal used to control rectifier output voltage.			Optically coupled PWM signal used to control rectifier output voltage.			
ENVIRONMENTAL							
Operating Temperature	0~50°C						
Humidity	90%, non-condensing						
Cooling	forced convection	forced convection	natural convection or forced convection	forced convection	natural convection	natural convection	natural convection
MECHANICAL							
Dimensions	Height - 132.5mm (3U) Width - 434mm (19 "Rack) Depth - 400mm	Height - 356mm (8U) Width - 145mm (3 fit in a Magazine) Depth - 340mm	Height - 267mm (6 U) / 356mm (8 U) Width - 145mm (3 fit in a magazine) Depth - 340mm	Height - 267mm (6 U) Width - 89mm (5 fit in a magazine) Depth - 300mm (external 80mm fan with variable speed temp control)	Height - 267mm (6 U) Width - 89mm (5 fit in a magazine) Depth - 300mm	Height - 132.4mm (3U) Width - 71mm (6 fit in a magazine) Depth - 293mm	Height - 267mm (6U) Width - 89mm (5 fit in a magazine) Depth - 300mm
Mass	< 26kg	< 17kg	< 16kg	< 5.5kg	< 5.5kg	< 1.8kg	< 6kg

Allis Electric has a policy of continuous product improvement and specifications may be subject to change without notice.

ISO9001 Certificate

Allis Electric Co., Ltd.

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