

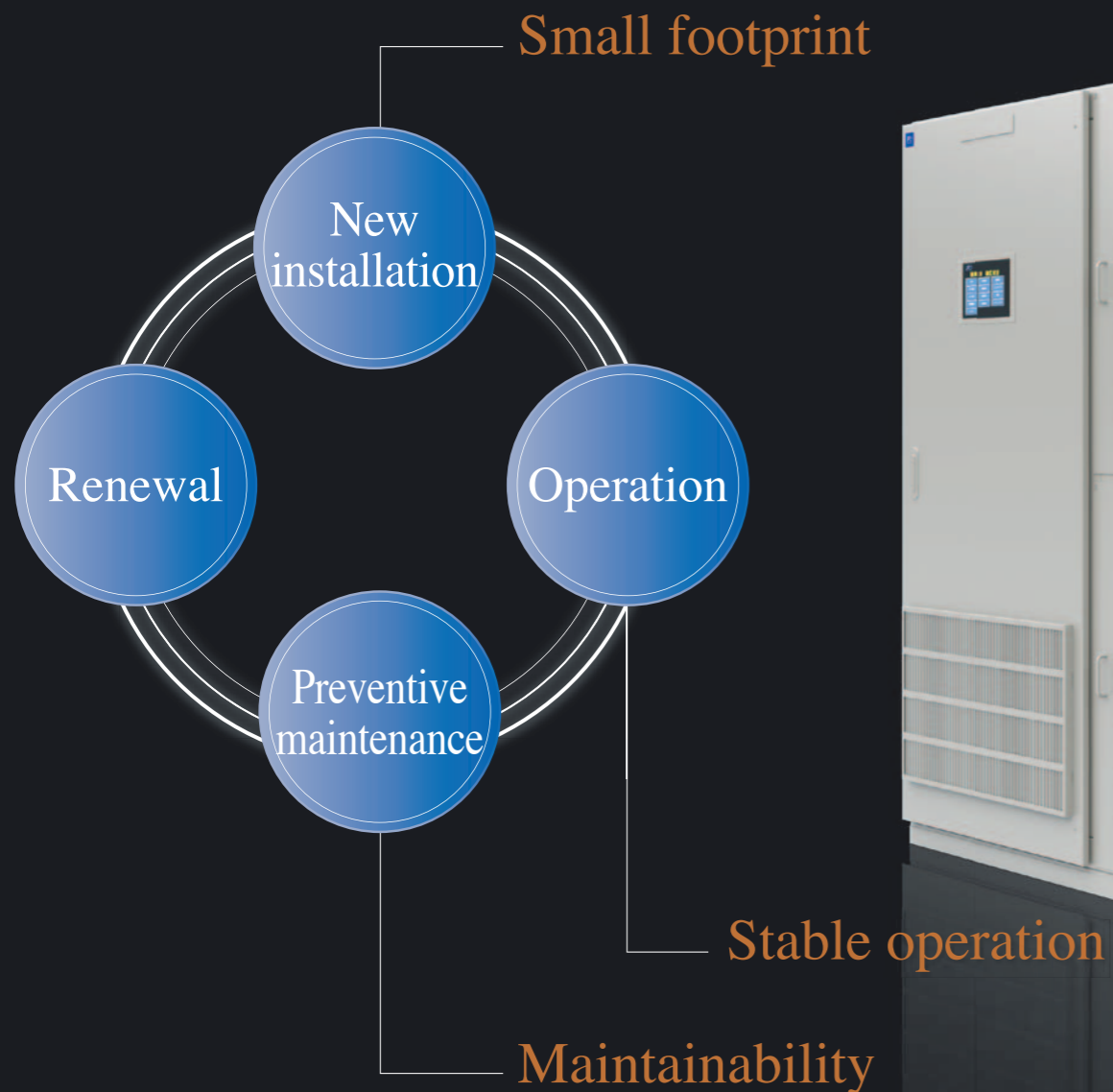
Medium-voltage Drives

FRENIC4600FM6e



Offering comprehensive benefits throughout the entire lifecycle from installation of new equipment to renewal.

1. Industry's top class **design** enables installation with a wide range of equipment.
2. Contributes to **stable operation** by improvement of various functions and reliability.
3. Contributes to **preventive maintenance** by improved convenience during maintenance.



Application field



Steel

Fans, induction blowers, dust collectors, cooling water pumps



Petrochemicals

Granulators, compressors, fans and pumps



Water treatment

Drainage pumps, water conveying pumps, water supply pumps



Cement

Fans, kilns, separators, bucket elevators



Other

Turbo refrigerators, Banbury mixers, ball mills

Industry's top class design enables installation with a wide range of equipment.

Industry-leading compact structure

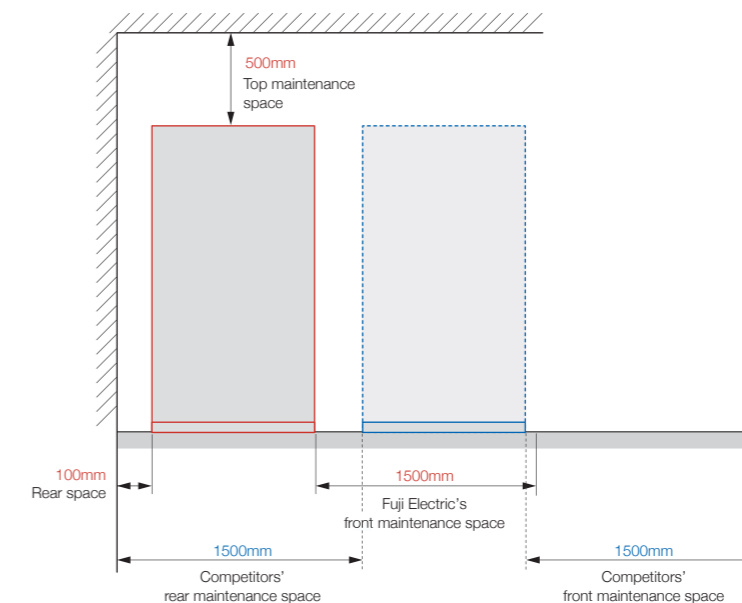
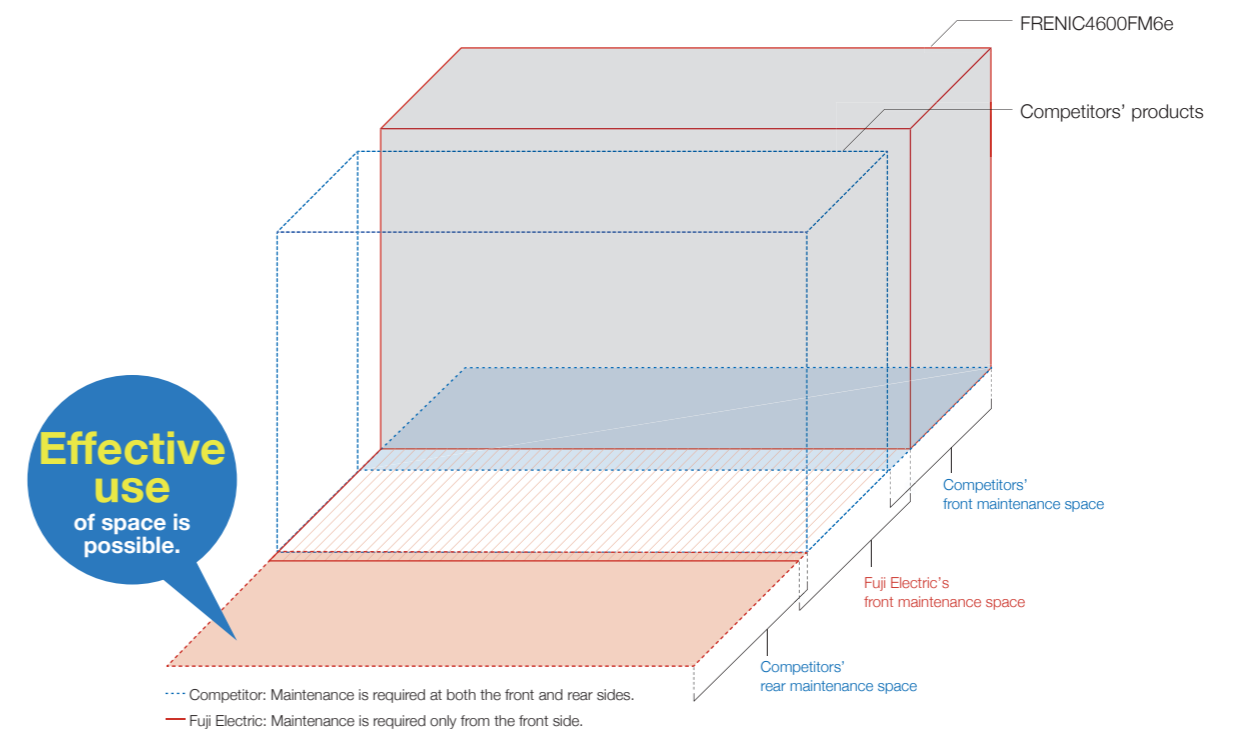
Simple main circuit configuration enables a smaller and lighter design than that of conventional models. Also contributes to a reduction in installation costs, such as building construction expenses, and enables a wider choice of installation locations.

- **Volume:** reduction of approx. 27% compared to conventional models
- **Footprint:** reduction of approx. 17% compared to conventional models



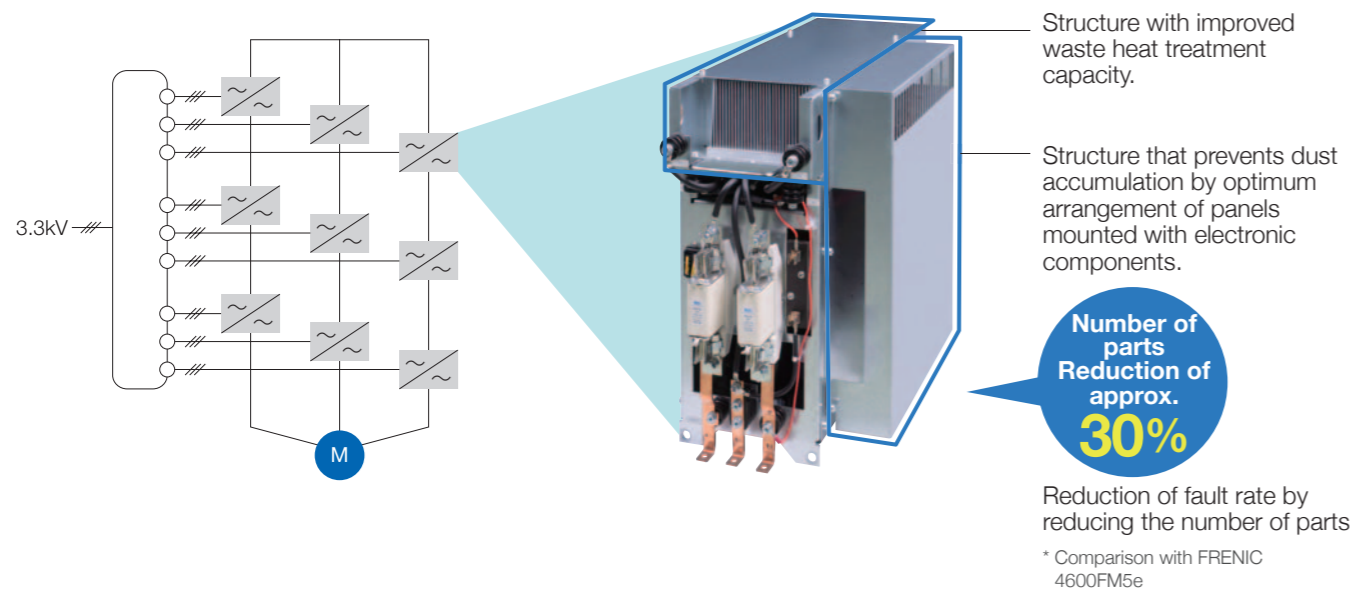
Effective utilization of electric compartment space

With complete access possible from the front of the unit, there is no need to provide maintenance space on the rear side. This enables the space in the electric compartment to be effectively utilized.



Contributes to stable operation by improvement of various functions and reliability.

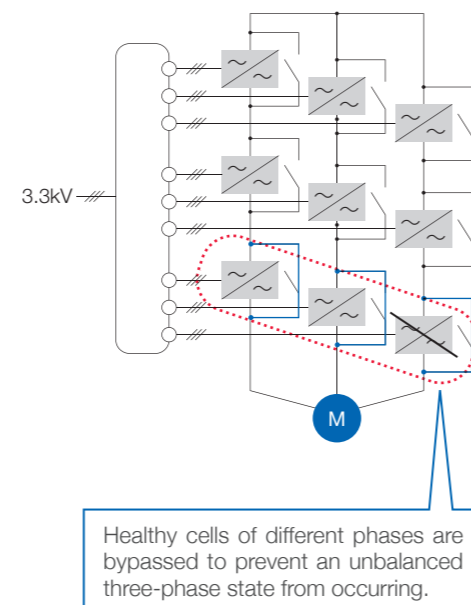
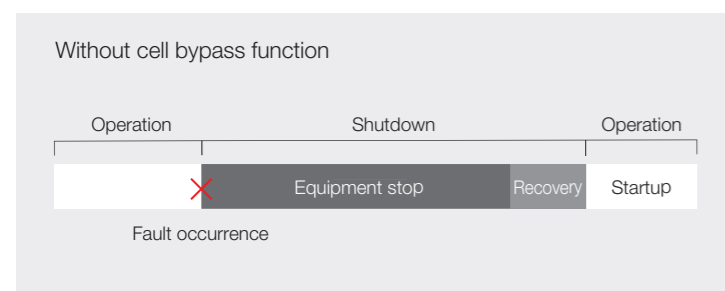
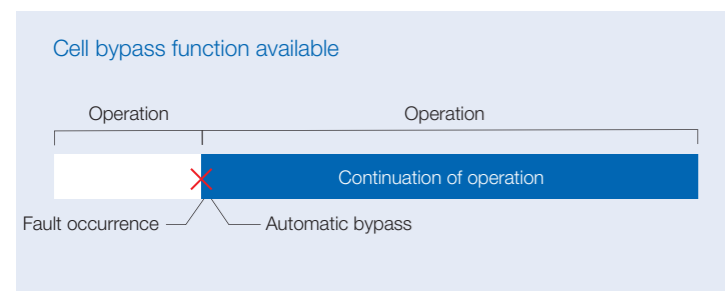
Inverter cell structure makes full use of Fuji Electric's experience and expertise.



Equipped with cell bypass function* (optional)

* Fuji Electric research

In the event of a cell fault, it is possible to bypass the failed cell and operate the unit using only healthy cells. Automatic switch-over during inverter operation does not stop the equipment.



Auto-restart function upon an instantaneous power failure can be selected to match the purpose of the equipment.

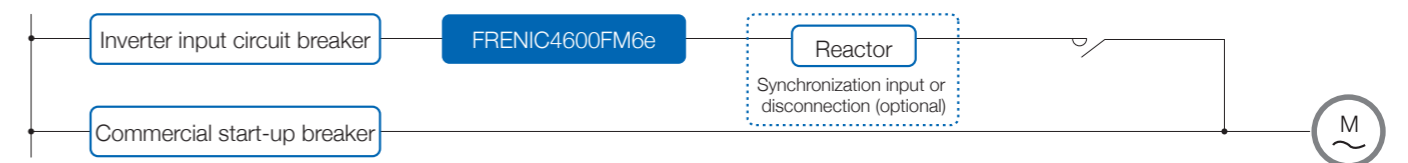
It is possible to select the operation pattern to match the application when an instantaneous voltage drop occurs.

- Selection of major fault
- Selection of free-run restart (optional)
- Selection of continued operation (optional)
 - Operation continues for 300 msec from the instantaneous power failure detection level (detected at system voltage = 85% or less)

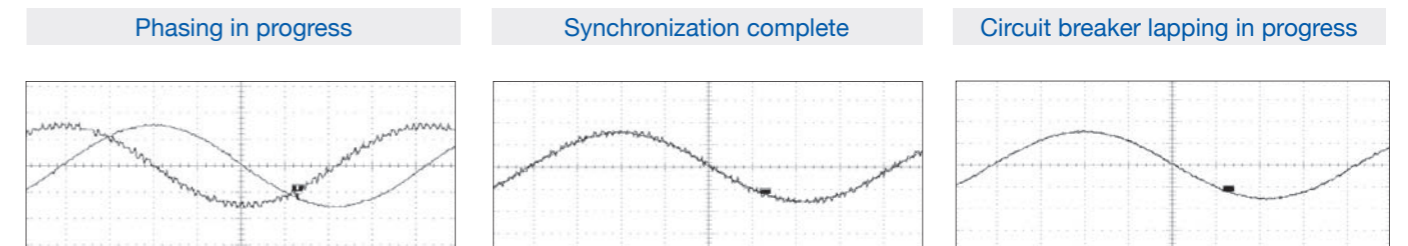
Synchronized input or disconnection function that enables the power supply to be switched over without stopping the equipment.

Inverter output is switched over according to the phase of the system voltage. This function enables the power supply to be switched over without instantaneous disruption and shock, so the equipment does not need to be shut down.

Power system diagram



Synchronization input or disconnection waveform



* A reactor (optional) is required on the inverter output side for this function.

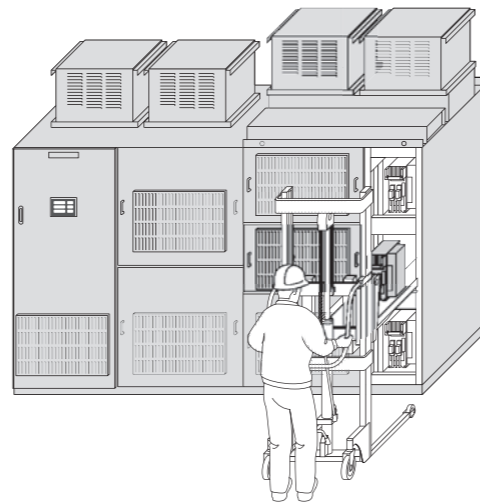
Backup by a commercial bypass system

A commercial bypass system can be constructed by using a commercial start-up circuit in combination. Enables equipment operation to continue when the inverter is stopped.

Contributes to preventive maintenance by improved convenience during maintenance.

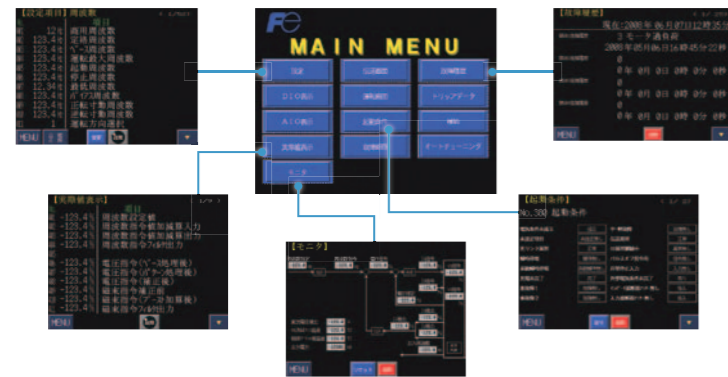
Quick exchange of cells is possible.

Easy-to-carry structure enables cells to be easily exchanged also in the event of a fault.



Standard equipped LCD touch panel features good visibility.

7-inch liquid crystal display mounted on the front enables easy monitoring and operation.



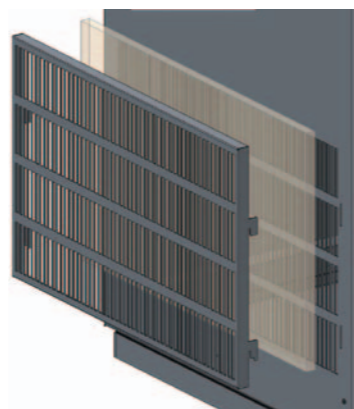
Main functions of LCD touch panel

- Start and stop of the inverter
- Set, change and display of control parameters
- Display of actual value data as bar graphs
- Display of fault causes (first fault, detailed display)
- Display of trends

* Japanese, English and Chinese are available for the LCD touch panel display language.

Air filters can be replaced without touching the high voltage charging section

Air filters that need to be replaced on a regular basis are mounted on the outside of the panel. There is no danger of coming in contact with the high-voltage charging unit when replacing the filter.



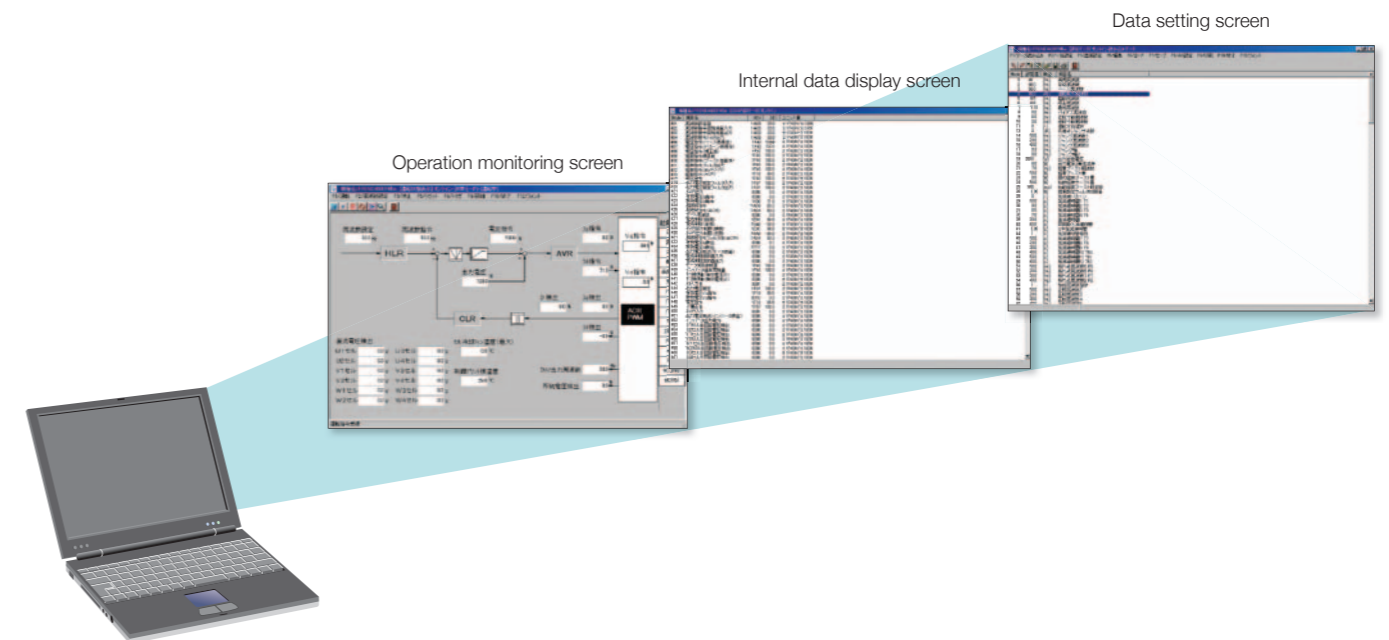
After installation, change to a film capacitor is possible (optional)*.

Electrolytic capacitors are equipped in the standard specification. Change to a film capacitor is possible during component maintenance. Selection is possible to meet the customer's requirements with regard to installation cost and running cost.

Interactive and easily accessible DDC loader maintenance tool

Maintenance and adjustment are normally performed using the touch panel, but a DDC loader is also available for use as a maintenance adjustment tool. The DDC loader can be used easily and interactively on the screen of a personal computer.

* Loader software is included free of charge. PC hardware is optional.

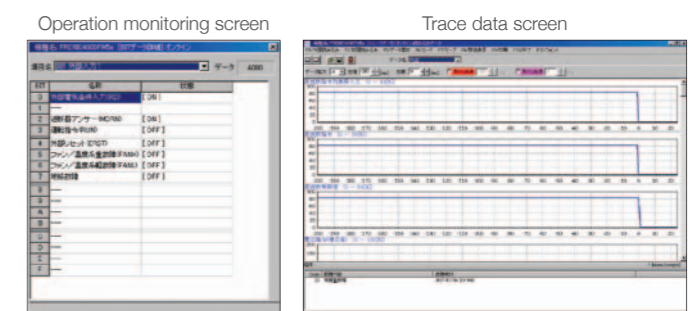


Main functions of maintenance tool

- Set, change, display, and save control parameters
- Operating status display: Display of block diagrams, actual values, and internal data
- Display of fault causes: first fault, detailed display, trace back data

* Japanese and English are available for the display language.

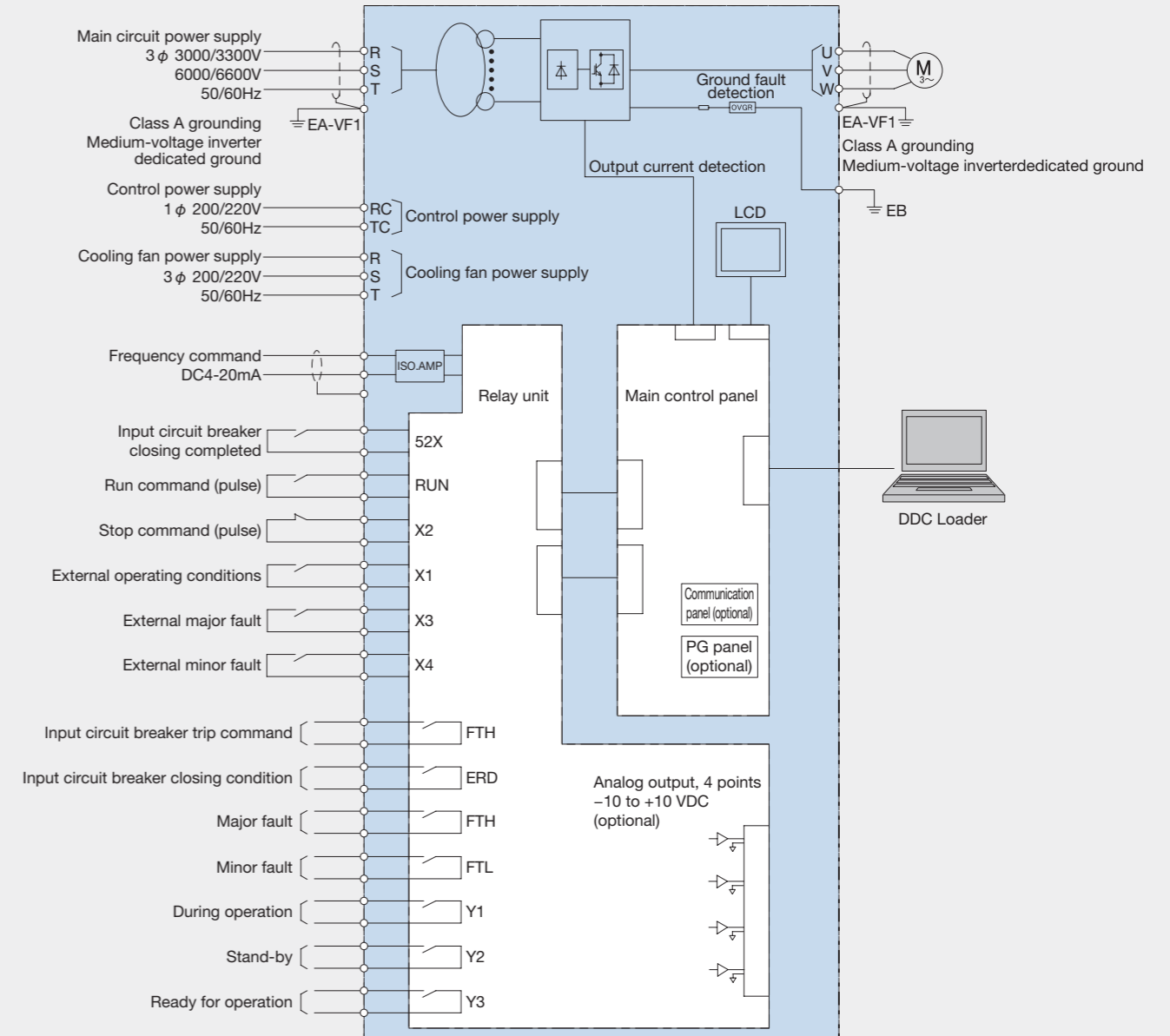
* Windows 7 is the currently supported OS. (Support for Windows 10 is planned.)



Standard specification

Item		FRENIC4600FM6e
Ambient conditions	Ambient temperature	Ambient temperature: 0 to 40°C Storage temperature: -10 to 60°C Transport temperature: -20 to 70°C (-20 to -10°C, 60 to 70°C: within 24 hours)
	Humidity	Up to 90% RH (non-condensing)
	Altitude	1000 m above sea level
	Vibration	4.9 m/s ² or less (10 to 50 Hz)
	Location of installation	Indoor (General environment without corrosive gas, dust, flammable or volatile gases)
Applicable standard		JIS, JEC, JEM
Structure	Panel structure	Steel sheet, self-standing enclosed structure, with maintenance access at front
	Protective structure	IP20
	Cooling method	Forced air cooling using ceiling fan
	Paint color	Munsell 5Y7/1, semi-gloss
Input	Main circuit	Three-phase 3000/3300/6000/6600 V, 50/60 Hz
	Control power supply	Single-phase 200 V, 50/60 Hz 220 V, 50/60 Hz
	Fan power supply	Three-phase 200 V, 50/60 Hz 220 V, 50/60 Hz
	Allowable power supply fluctuation	Voltage: -10% to +10%, frequency: ±5%
Control method	Control method	Simplified sensorless vector control with V/f constant control Vector control with speed sensor (induction motors) Speed sensorless vector control (induction motors) Vector control with speed sensor (synchronous motors) * With optional resolver Speed sensorless vector control (synchronous motors)
	Output frequency	0 to 72 Hz (72 Hz to 120 Hz, optional)
	Frequency accuracy	±0.5Hz
	Frequency resolution	0.005%
	Acceleration, deceleration time	0.1 to 5500 S
	Overload tolerance	110% 60s
	Main control functions	Current limit, deceleration overvoltage avoidance, instantaneous power failure restart, cell bypass function (optional)
	Main protective functions	Overcurrent, main circuit fuse blown, overvoltage, undervoltage, CPU abnormality, cooling fan stop, etc.
	Transmission function (optional)	Modbus, Profibus-DP, T-LINK

Standard connection diagram



Standard interface		
Input side		
Main circuit voltage	Three-phase 3000/3300/6000/6600V, 50/60Hz	
Control power supply	Single-phase 200/220V - 50/60Hz	
Fan power supply	Three-phase 200V - 50Hz, 220V - 50/60Hz	
Frequency setting	0 to 10 V, 0 to 100% or 4 to 20 mA, 0 to 100%	Input impedance: 1 MΩ Input impedance: 250 Ω
Run command	"Closed" during operating (contact a)	Dry contact
Stop command	"Opened" when stopped (contact b)	
Run preparation	"Closed" when preparation is completed (contact a)	
Input breaker status signal	"Closed" when closed by input (contact a)	
Output side		
Electrical conditions established	"Closed" when electrical conditions are established (contact a)	Dry contact (contact capacity: 250 VAC, 2A; 30 VDC, 3A)
During operation	"Closed" during operation (contact a)	
Major fault	"Closed" by major fault (contact a)	
Minor fault	"Closed" by minor fault (contact a)	
Input circuit breaker closing condition	"Closed" when electrical conditions are established (contact a)	
Input circuit breaker trip signal	"Closed" by major fault (contact a)	
Analog signal (optional) *	0 to 10 V 4 to 20 mA	Load resistance 10 kΩ or more Load resistance 750 Ω or less

* The analog output signal can be selected (output current, output voltage, output frequency, etc.).

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Information in this catalog is subject to change without notice.

2017-9(I2017/I2017)3FOLS Printed in Japan