

MODERNIZING WATER OPERATIONS TO MINIMIZE COSTS

Increase water quality, availability, and sustainability.



A WORLD OF OPPORTUNITY

LET'S CHANGE THE FUTURE TOGETHER

THERE IS NO FUTURE WITHOUT WATER

Our planet is in a precarious position. It's not something that one person, one company or one country can fix. We must all do our part to enable a sustainable future.

For Mitsubishi Electric Automation, that means sharing know-how and actively collaborating to find new ways of using automation to address today's big problems. Energy consumption. Pollution reduction. Shrinking populations. Sustainable water supply.

Join us.



2.2M people in the U.S. are without running water and basic indoor plumbing.

44M people in the U.S. have inadequate water systems.

\$8.6B per year—the cost to the U.S. economy created by the water access gap.

— WORLD ECONOMIC FORUM

AN INDUSTRY IN NEED OF MODERNIZATION

DOING MORE WITH LESS

UNDERFUNDED. UNDERSTAFFED. UNDER PRESSURE.

Higher operating costs, rising consumer scrutiny regarding water quality, and a wave of retirements are cause for concern in the water sector. According to the U.S. EPA (Environmental Protection Agency), roughly one-third of the water sector workforce is eligible to retire by 2030.

Modernizing water operations can address all of these issues, as well as problems with pump clogs, water pressure, rapid leak detection, and equipment breakdowns. The opportunities for modernization are massive. Perhaps the biggest opportunity is the ability to do more with less staff.

DELOITTE RECOMMENDS:

- 1 Generating operational efficiencies to better use dwindling water, power, and labor resources
- 2 Prioritizing investments to consider whole life costs versus just CAPEX
- 3 Improving the quality and speed of decision-making throughout the organization





Drinking water and wastewater plants are typically the largest energy consumers for many municipal governments.

— U.S. ENVIRONMENTAL PROTECTION AGENCY

More than 90% of energy consumed in producing and delivering drinking water is used for pumping.

— FOCUS ON ENERGY



VFDs provide up to 30% overall reduction in energy consumption for significantly lower power bills.

— U.S. DEPARTMENT OF ENERGY

A TRUSTED PROVIDER

MODERNIZE TODAY FOR A BETTER TOMORROW

WE TAKE WATER SECURITY SERIOUSLY

Water insecurity is not just a developing world issue. “Too many Americans face water insecurity due to groundwater exhaustion, infrastructure challenges, climate change conditions, and contamination,” says the World Economic Forum.

Water insecurity can be devastating to public health and community prosperity. That’s why we’re working with water municipalities across the country. By helping them move to more automated, data-driven, and energy-efficient operations, we can help ensure that every community has safe drinking water.

“Tapping into operational data is the first step toward optimized management of water operations.”

— FOCUS ON ENERGY



VARIABLE FREQUENCY DRIVES

PROVEN APPLICATIONS FOR VFDS

TAP INTO ONGOING ENERGY SAVINGS

Mitsubishi Electric Series VFDs are used in all aspects of water operations. Energy-saving applications include:

Aeration Blowers

Up to 50% energy savings in discharge pressure by matching air flow to process requirements

Centrifugal Pumps

Up to 50% energy savings in liquid circulation by eliminating the need to throttle valves in the system

Submersible Pumps

Up to 50% energy savings in wastewater transfer by adjusting the lift station pump speed and maintaining a constant pressure

Oxidation Ditch Rotors

Up to 40% energy savings during phosphorus removal by adjusting the speed that mixes wastewater with ferric chloride

Screw Pumps

Up to 15% energy savings by matching the speed of the screw to the wastewater flow



TAKE WATER OPERATIONS TO THE NEXT LEVEL

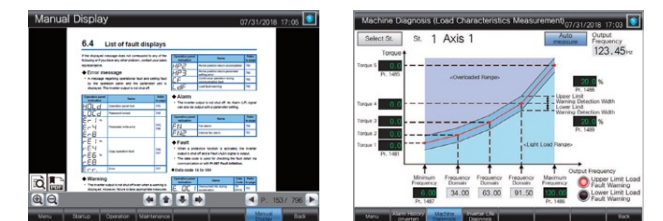
IMPROVE WORKFORCE EFFECTIVENESS

WE MAKE IT EASY

The GOT2000 Series HMI touchscreen interfaces provide easy access for plant operators and service technicians to adjust controls and monitor operating conditions.

GOT2000 SERIES HMI

- Adjust and monitor VFD parameters and alarms
- Inspect historical and real-time conditions graphically
- Display work instructions and documentation
- Direct database connection



TAKE WATER OPERATIONS TO THE NEXT LEVEL

IDENTIFY REAL-TIME INSIGHTS

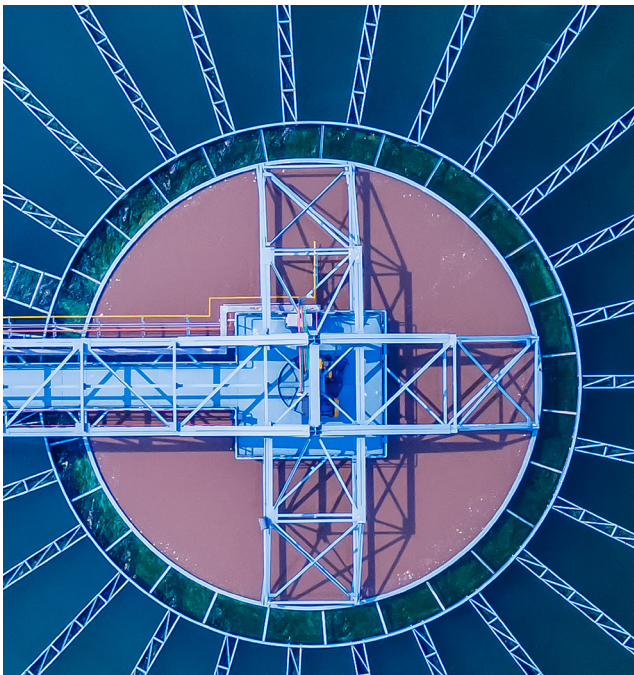
DIGITIZE PLANT EQUIPMENT

MELSEC iQ-F Series compact controllers make it possible for plant equipment and processes to communicate with each other and with IoT devices to deliver actionable insights.



iQ-F SERIES CONTROLLER

- Control multiple VFDs
- Capture and deliver sensor data to SCADA systems
- Direct connection to the cloud
- Send email alarms
- TLS encryption



TAKE WATER OPERATIONS TO THE NEXT LEVEL

TURN ON OPERATIONAL INTELLIGENCE

GET REAL VALUE FROM DATA

ICONICS software enables rapid connectivity of VFDs and other supervisory control and data acquisition (SCADA) systems. Collect, visualize, analyze, and optimize data, from a single piece of equipment up to multiple facilities. Once connected, the software unifies the data and increases the value you can derive from it.

- Real-time visibility
- Secure remote management
- Role-specific visualization
- Automated decision making

Learn more.

iconics.com/water

CYBER SECURITY

Implementing cybersecurity best practices is critical for the water and wastewater sector to minimize risk of service disruptions and to protect against threats to public health. Put remote access, access control, and data protection policies into place for the entire team without compromising operational productivity.

“We immediately realized the benefits of selecting ICONICS solutions. With GENESIS64, we achieved improved secure visualization of water and sewer levels, as well as monitoring and control of potable water and wastewater, elevation, PSI, intrusion pumps, pump monitors/controls, pump failure status, and temperature.”

— LAKE CITIES MUNICIPAL UTILITY AUTHORITY



OPTIMIZE ENERGY SAVINGS WITH VFDs

FR-F800

PRODUCT OVERVIEW



VARIABLE FREQUENCY DRIVES

PART NUMBER CONFIGURATION

MULTI OVERLOAD RATINGS

	Overload Rating		Ambient Temp
	60s	3s	
SLD	110%	120%	40°C
LD	120%	150%	50°C

STANDARD INVERTER TYPE (200 VAC, 400 VAC)

FR-F8□2-□-□-□

Symbol	Description
00023 to 06830	Inverter SLD Rated Current (A)
0.75 to 315K	Inverter LD Rated Capacity (kW)

Symbol	Voltage Class
2	200V Class
4	400V Class

Symbol	Circuit Board Coating	Plated Conductor
Without	Without	Without
60	With	Without
06	With	With

Symbol	Type	Communication Type
E1	FM	Ethernet
E2	CA	Ethernet

SEPARATED CONVERTER/INVERTER TYPE (400 VAC)

FR-F842-□-□-□

Symbol	Description
355K to 560K	Inverter LD Rated Current (kW)
07700 to 12120	Inverter SLD Rated Capacity (A)

Symbol	Voltage Class
2	Separated Converter Type

Symbol	Voltage Class
4	400V Class

Symbol	Circuit Board Coating	Plated Conductor
Without	Without	Without
60	With	Without
06	With	With

Symbol	Type	Communication Type
E1	FM	Ethernet
E2	CA	Ethernet

STANDARD INVERTER TYPE (600 VAC)

FR-F860-□-E1-N6

Symbol	Description
00027 to 00450	Inverter SLD Rated Current (A)
00680 to 04420	

Symbol	Voltage Class
6	600V Class

Symbol	Circuit Board Coating	Plated Conductor	UL Type 1 Certification
N6	With	Without	With

Symbol	Type	Communication Type
E1	FM	Ethernet

SELECTION CHARTS

200VAC – 240VAC
(SLD rating 1 to 150HP single frames)

FR-F820 Selection Chart

Model Number	AMPS For Duty		Horsepower For Duty (NEC)		Frame Size	Weight (lbs)
	SLD	LD	SLD	LD		
FR-F820-00046-E3N6	4.6	4.2	1	1	A	6
FR-F820-00077-E3N6	7.7	7	2	2	B	6
FR-F820-00105-E3N6	10.5	9.6	3	3	C	9
FR-F820-00167-E3N6	16.7	15.2	5	5	C	9
FR-F820-00250-E3N6	25	23	7.5	7.5	C	9
FR-F820-00340-E3N6	34	31	10	10	D	17
FR-F820-00490-E3N6	49	45	20	15	D	17
FR-F820-00630-E3N6	63	58	20	20	E	20
FR-F820-00770-E3N6	77	70.5	25	25	F	37
FR-F820-00930-E3N6	93	85	30	30	F	37
FR-F820-01250-E3N6	125	114	40	40	F	37
FR-F820-01540-E360	154	140	60	50	G	48
FR-F820-01870-E360	187	170	60	60	H	92
FR-F820-02330-E360	233	212	75	75	H	92
FR-F820-03160-E360	316	288	125	100	K	119
FR-F820-03800-E3U6	380	346	150	125	L	163
FR-F820-04750-E3U6	475	432	150	150	L	163

Important Note: Drives in shaded area MUST be used together with FR-HEL DC Link Choke (sold separately). Weights do not include separate DC Link chokes.

380VAC – 500VAC
(SLD rating 1 to 1000HP single frames)

FR-F840 Selection Chart

Model Number	AMPS For Duty		Horsepower For Duty (NEC)		Frame Size	Weight (lbs)*
	SLD	LD	SLD	LD		
FR-F840-00023-E3N6	2.3	2.1	1	1	C	8
FR-F840-00038-E3N6	3.8	3	2	2	C	8
FR-F840-00052-E3N6	5.2	4.8	3	3	C	8
FR-F840-00083-E3N6	8.3	7.6	5	5	C	9
FR-F840-00126-E3N6	12.6	11.5	7.5	7.5	C	9
FR-F840-00170-E3N6	17	16	10	10	D	17
FR-F840-00250-E3N6	25	23	15	15	D	17
FR-F840-00310-E3N6	31	29	20	20	E	20
FR-F840-00380-E3N6	38	35	25	25	E	20
FR-F840-00470-E3N6	47	43	30	30	F	37
FR-F840-00620-E3N6	62	57	40	40	F	37
FR-F840-00770-E360	77	70	60	50	G	51
FR-F840-00930-E360	93	85	60	60	H	90
FR-F840-01160-E360	116	106	75	75	H	90
FR-F840-01800-E360	180	144	150	100	H	95
FR-F840-02160-E3U6	216	180	150	150	J	114
FR-F840-02600-E3U6	260	216	200	150	J	121
FR-F840-03250-E3U6	325	260	250	200	L	156
FR-F840-03610-E3U6	361	325	300	250	L	172
FR-F840-04320-E3U6	432	361	350	300	M	257
FR-F840-04810-E3U6	481	432	400	350	M	257
FR-F840-05470-E3U6	547	481	450	400	N	365
FR-F840-06100-E3U6	610	547	500	450	N	365
FR-F840-06830-E3U6	683	610	550	500	N	365

Important Note: Drives in shaded area MUST be used together with FR-HEL-H DC Link Choke (sold separately). Weights do not include separate DC Link chokes.

FEATURES AND ACCESSORIES

525VAC - 660VAC
(SLD rating 2 to 850HP single frames)

FR-F860 Seletion Chart

Model Number (*3)	AMPS for Duty		Horsepower for Duty (NEC)		Frame Size	Weight (lbs)
	SLD	LD	SLD	LD		
FR-F860-00027-E3N6	2.7	2.5	2	1.5	C	11.7
FR-F860-00061-E3N6	6.1	5.6	5	3	C	12.8
FR-F860-00090-E3N6	9	8.2	7.5	5	C	12.8
FR-F860-00170-E3N6	17	16	15	10	D	15.4
FR-F860-00320-E3N6	32	27	30	25	E	19.8
FR-F860-00450-E3N6	45	41	40	40	F	37.4
FR-F860-00680-E360	68	62	60	60	H	79.2
FR-F860-01080-E360 (*1)	108	99	100	100	H	90.2
FR-F860-01440-E360 (*1)	144	131	150	125	J	114
FR-F860-01670-E360 (*1)	167	152	150	150	J	114
FR-F860-02430-E360 (*1)	243	221	250	200	J	121
FR-F860-02890-E360 (*1)	289	255	300	250	M	246
FR-F860-03360-E360 (*1)	336	304	350	300	M	253
FR-F860-04420-E360 (*1)	442	402	450	400	N	337
FR-F862-05450-E360+FR-CC2-C355K-60 (*2)	545	496	550	500	P+R	810
FR-F862-06470-E360+FR-CC2-C400K-60 (*2)	647	589	650	600	Q+S	920
FR-F862-08500-E360+FR-CC2-C560K-60 (*2)	850	773	850	750	Q+S	1126

Notes:

- 1. These drives MUST be used with a DC Link Choke (sold separately).
- 2. FR-F862 Drives are inverter stage only; use together with FR-CC2-C rectifier stage. Maximum input and output current of FR-CC2 modules is the value shown. COMBINED weight shown.
- 3. The FR-F860 does not include a built-in parameter. The FR-DU08 or FR-LU08 is sold separately.

Model Number	AMPS For Duty		Horsepower For Duty (NEC)		Frame Size	Weight (lbs)*
	SLD	LD	SLD	LD		
FR-F842-07700-E3U6 + FR-CC2-H355K-60	-	683	-	550	P+R	827
FR-F842-07700-E3U6 + FR-CC2-H400K-60	770	-	650	-	P+S	979
FR-F842-08660-E3U6 + FR-CC2-H400K-60	-	770	-	650	P+S	979
FR-F842-08660-E3U6 + FR-CC2-H450K-60	866	-	700	-	P+S	986
FR-F842-09620-E3U6 + FR-CC2-H450K-60	-	866	-	700	Q+S	1162
FR-F842-09620-E3U6 + FR-CC2-H500K-60	962	-	800	-	Q+S	1168
FR-F842-10940-E3U6 + FR-CC2-H500K-60	-	962	-	800	Q+S	1168
FR-F842-10940-E3U6 + FR-CC2-H560K-60	1094	-	900	-	Q+S	1168
FR-F842-12120-E3U6 + FR-CC2-H560K-60	-	1094	-	900	Q+S	1168
FR-F842-12120-E3U6 + FR-CC2-H630K-60	1212	-	1000	-	Q+S	1168

*Weights of the drive and the CC2 modules are COMBINED
Important Note: Drives in shaded area MUST be used together with FR-HEL-H DC Link Choke (sold separately). Weights do not include separate DC Link chokes.

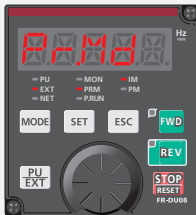


VARIABLE FREQUENCY DRIVES

PARAMETER UNITS

FR-DU08 12-SEGMENT TYPE PARAMETER UNITS (Standard with FR-F800)

- **User-friendly**
- One-touch operation
- Copy/paste parameters
- Removable panel for enclosure door mounting
- Direct panel and external control
- Monitor display
- Alarm indication
- LED one-line display
- 11 indicating lights
- UL Type 1 environment



FR-PU07/BB LCD TYPE PARAMETER UNITS (Optional)

- **4 lines of text**
- Numeric buttons for parameter selection
- Battery backup
- Copy/paste parameters
- Removable panel for enclosure door mounting
- Direct panel and external control
- Monitor display
- Alarm indications
- 2 indicating lights
- UL Type 1 environment



FR-LU08 LCD TYPE PARAMETER UNITS (Optional)

- **5 lines of text**
- Graph trends
- Start-up wizard
- Real-time clock
- Battery backup
- Copy/paste parameters
- Removable panel for enclosure door mounting
- Direct panel and external control
- Monitor display
- Alarm indication
- 2 indicating lights
- UL Type 1 environment



VARIABLE FREQUENCY DRIVES

ACCESSORIES

GENERAL OPTIONS

- AC reactor
- DC reactor
- DC link choke
- Balance reactor
- Line noise filter
- Surge suppressor
- Parameter units (FR-PU07, FR-LU08)
- Parameter unit battery pack
- Brake and resistor units
- Screw terminal block

OPTION CARD OPTIONS

Model Number	Description
FR-A8AX	16 Bit Digital Input Card
FR-A8AY	Digital Output / Extended Analog Output Card
FR-A8AR	Relay Output Card
FR-A8ERS-60	A/F800 Series RS-485 Option Card
FR-A8AC	A/F800 120V Control Option
FR-A8AN	F/A800 4-20mA I/O Card
FR-A8NL	A/F800 Series LONWorks Communication Card
FR-A8NC	CC-Link® Communications Card
FR-A8NCE	CC-Link IE Communications Card
A8NC-CON	CC-Link Communications Card and Connectors
FR-A8ND	DeviceNet Communications Card
FR-A8NP	Profibus DPV0 Communications Card
A8NDPV1	Profibus DPV1 Communications Card
FR-A8NF	FL-Net Communications Card
A8N-XLT	Multi-protocol RS-485 Communications Card
A8NEIP-2P	EtherNET IP Communications Card
A8NPRT-2P	Profinet Communications Card
A8NECT-2P	EtherCAT® Communications Card
A8NETH-2P	Multi-protocol EtherNET Communications Card



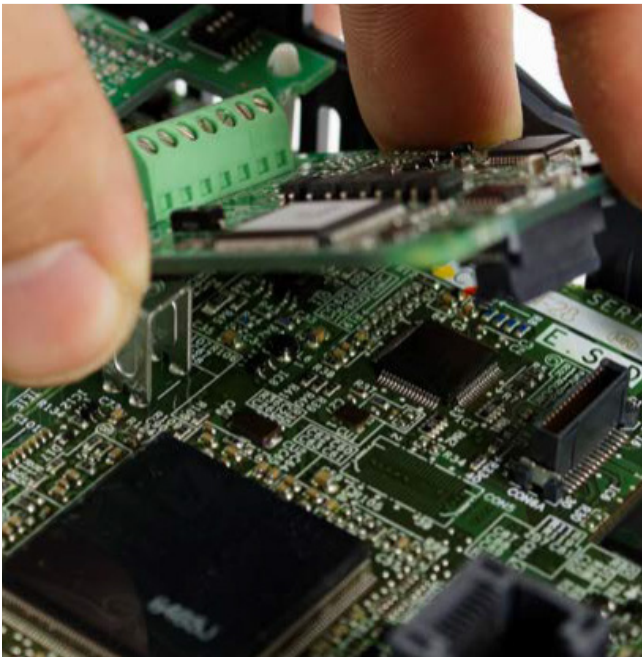
DC REACTOR (for power supply coordination) FR-HEL-(H)_K



LINE NOISE FILTER FR-BSF01
(for small capacities) FR-BLF



BRAKE UNIT FR-BU2-(H)_K
discharging resistor GZG type
GRZG type resistor unit
FR-BR-(H)_K
MT-BR5-(H)_K



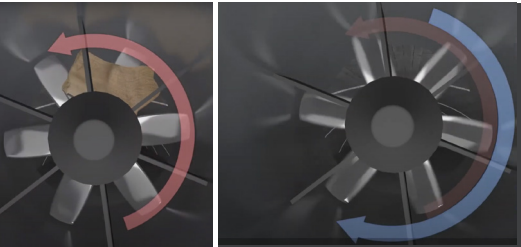
FEATURES

ENHANCED CONTROL METHODS

- Volts per hertz (speed control)
- Advanced magnetic flux vector control (fast speed response)
- Real sensorless vector control (fast torque and speed response)

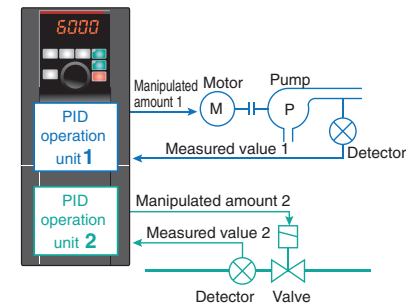
PUMP CLEANING/ DE-RAGGING FUNCTION

The FR-F800 has a function that will remove any foreign object from the impellers of fans or pumps by performing a forward/reverse rotation sequence.



ADVANCED PID CONTROLLER

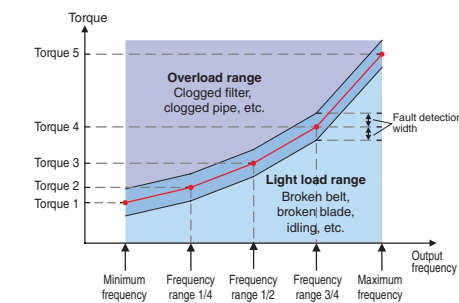
- Pump stir function
- Two PID controllers
- PID output shutoff (sleep) function
- PID automatic switchover function
- Pipe burst detection/ dry run protection
- Pipe soft fill to prevent water hammer
- Water hammer avoidance at stop
- Automatic PID gain tuning
- Direct access to PID setpoint by display



MECHANICAL FAILURE PREVENTION

The FR-F800-E can store the motor speed/torque characteristics to monitor the actual motor speed/torque conditions for fast recognition of light or overloaded mechanical issues including:

- Broken fan drive belt
- Motor bearing damage
- Clogged pipes
- Blocked filter

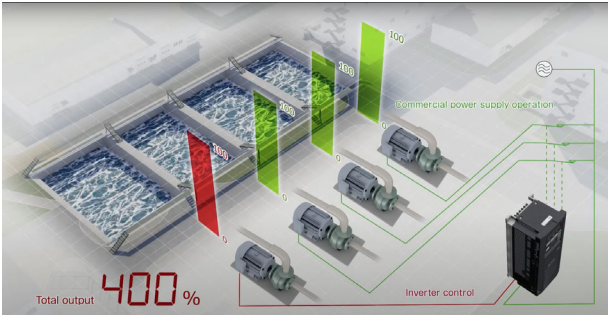


PRE-CHARGE FUNCTION

The FR-F800 performs a function that controls the speed of the pump before enabling the PID controller to avoid water hammering inside the piping.

MULTI-PUMP CONTROL

The FR-F800 controls the flow or pressure of one pump and can add up to 3 additional pumps across the line to maintain the increased flow or pressure demand.



ENERGY SAVINGS AND OPTIMUM EXCITATION CONTROLS

- The energy savings function controls the output voltage automatically during constant speed operation to minimize the output power consumption
- The optimum excitation control function controls the output voltage by controlling the excitation current to maximize the motor efficiency

LONGER OUTPUT CABLE LENGTH

- No need for expensive filters or reactors
- Easier to run multiple motors from one drive
- Easier to mount drives in remote areas that is environment friendly
- Achieve peace of mind and optimum performance by applying with an inverter duty rated monitor

Pr.72 Setting (Carrier Frequency)	FR-A820-00046 (0.4K) FR-A840-00023 (0.4K)X	FR-A820-00077 (0.75K) FR-A840-00038 (0.75K)	FR-A820-00105 (1.5K) or higher FR-A840-00052 (1.5K) or higher
2 (2 kHz) or lower	300 m	500 m	500 m
3 (3 kHz) or higher	200 m	300 m	500 m

CONFORMAL COATED – H2S ENVIRONMENT

- The FR-F800 Series VFDs conform to IEC60721-3-3 class 3C2 levels
- Mitsubishi Electric offers the option of conformal coated bus bars, which are not offered by most of our competitors
- When Mitsubishi Electric is compared to a competitor, ensure the competitor is offering the IEC60721-3-3 class 3C2 because NOT all conformal coating meets this spec

PCB AND BUS BAR COATING

In the FR-A800/F800 Series, the products which have the PCB coating treatment have either a “-60” or “-06” dedicated suffix added to the model name. In the “-06” product, conductor plating is performed in addition to the PCB coating treatment.

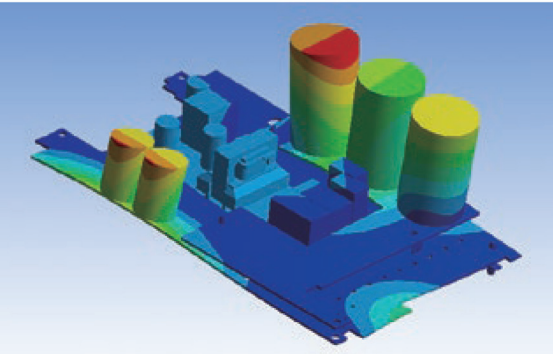
FR-F840-00023-2-06
Dedicated Suffix

Dedicated Suffix	PCB Coating	Plated Conductor
None	Without	Without
-60	With	Without
-06	With	With

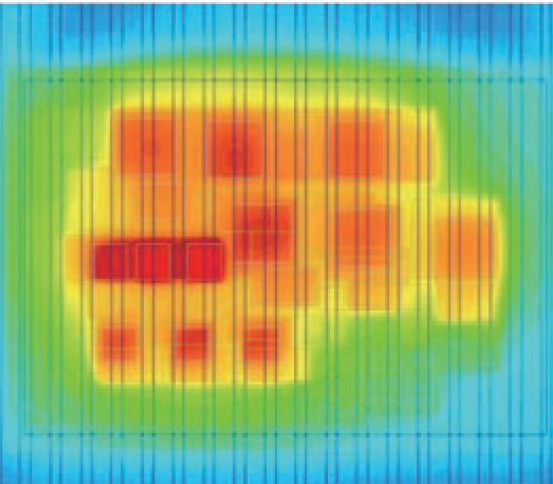
FEATURES

DESIGNED FOR HAZARDOUS AND HOT ENVIRONMENTS

3D-vibration analysis is performed to confirm the vibration resistance. The analysis is also useful to find the best layout position and to further improve the product's rigidity. Assuming a hazardous service condition, the product reliability is thoroughly assessed in the design stage. Every effort is made to ensure the best quality of the Mitsubishi Electric VFD.



Resistance against heat is what makes a VFD reliable. A well-designed heat resistant power module is essential in a reliable VFD. From the power module's design stage, its heat resistance is carefully considered.



BUILT-IN COMMUNICATIONS

Built-in Ethernet and Modbus TCP communications

“DRIVE TO DRIVE” COMMUNICATIONS

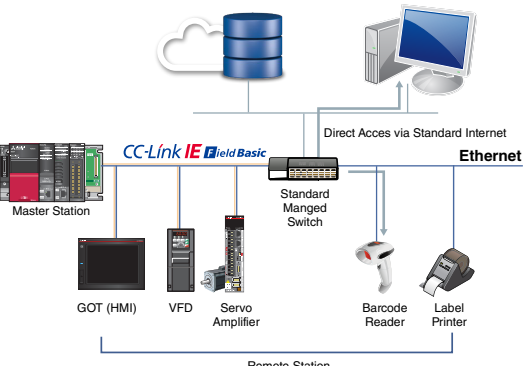
Drives can communicate without a separate master controller

APPLICATIONS

- Load sharing
- Multi-pump
- “Cascade starting” multiple motors

CC-LINK IE FIELD NETWORK BASIC

- CC-Link IE Field Basic is Mitsubishi Electric's network for products using the standard built-in 100 Mb/s Ethernet ports
- Does not require dedicated master module
- Easy start-up, easy troubleshoot
- Can be used together with TCP/IP communication
- Connectivity expansion

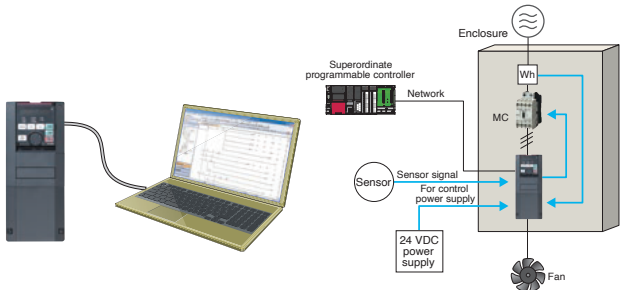


SAFETY DRIVES

All Mitsubishi Electric drives have 'Safety Capability' – STO / SIL2 / SIL3 / PLe

PLC FUNCTION IN THE VFD

- The FR-F800 built-in 6K step PLC allows user customization
- Avoids the need for separate master
- I/O card can be added to expand the PLC function
- The PLC function can manage external functions
- Ease of programming your custom application

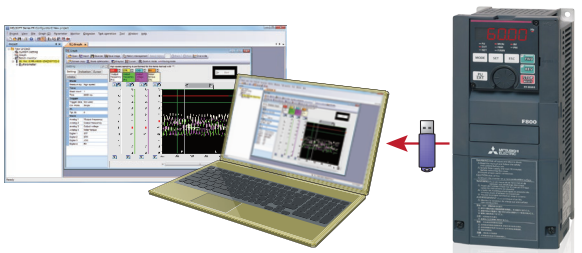


TRACE FUNCTION

Diagnose trip information quickly and easily share critical data for analysis using FR-Configurator2 software

ADVANTAGES

- Fast diagnosis
- Shorter setup times
- Active 24/7
- Permanent record

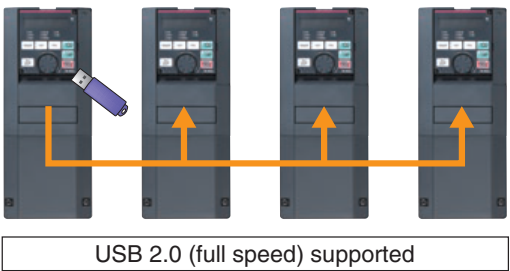


FAST SET UP

Use a standard USB stick to upload/download parameters into multiple drives

ADVANTAGES

- Fast and simple setup
- Easy to store on-site
- Simple to restore parameter sets
- Give to customers



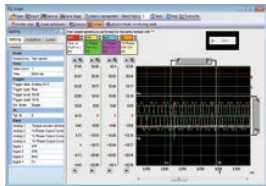
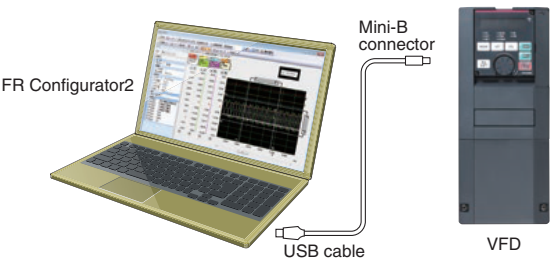
LONG LIFE AND EASY MAINTENANCE

A long-life cooling fan and a long-life capacitor are incorporated to give the drive a 10-year design life. Degradation degrees of the main circuit capacitor, control circuit capacitor, and inrush current limit resistor can be monitored for product failure prevention.

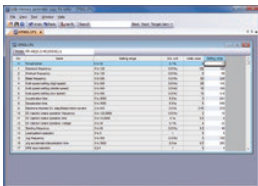
PROGRAMMING AND REMOTE CONNECTIVITY

FR-CONFIGURATOR2 DRIVE INTERFACE SOFTWARE

- Parameter read and write
- Ease of parameter programming
- Save parameter list
- Batch monitoring
- Trending
- Test operation
- PLC programming
- Startup wizard
- Fast and easy connectivity



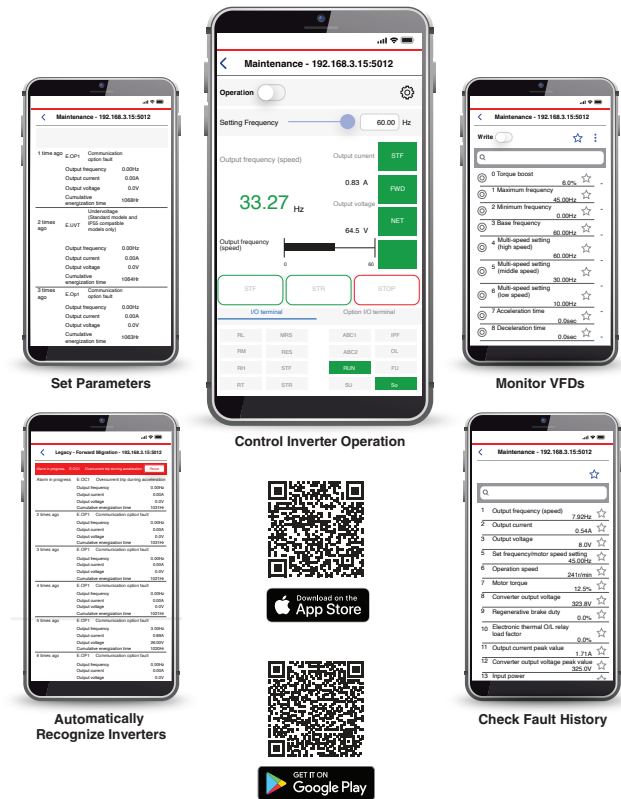
Graph function



Editing the USB memory parameter copy file

FR-CONFIGURATOR2 MOBILE APP

Wireless access with VFDs from a remote location enables setting or changing of parameters, starting and stopping, and monitoring on the screen of mobile devices. Users can easily monitor the VFD operation by checking data such as the running frequency and status of input and output terminals at a glance in one screen. Wireless communication equipment must be prepared in the system that includes the VFD.



FR-F800 SPECIFICATIONS



VARIABLE FREQUENCY DRIVES

FRAME DIMENSIONS,
WARRANTY, AND CERTIFICATIONS

FRAME DIMENSIONS
200V, 400V, 600V DRIVES

FR-F800-E Model Number	Frame Size	Height	Width	Depth
		Dimensions Inches (mm)	Inches (mm)	(mm)
FR-F820-00046 (N6)	A	12.2 (310) 10.24 (260) w/o conduit box	4.33 (110)	4.41 (112)
FR-F820-00077 (N6)	B	12.2 (310) 10.24 (260) w/o conduit box	4.33 (110)	5.00 (127)
FR-F820-00105, 00167, 00250 (N6) FR-F840-00023, 00038, 00052, 00083, 00126 (N6) FR-F860-00027, 00061, 00090 (N6)	C	12.52 (318) 10.24 (260) w/o conduit box	5.91 (150)	5.51 (140)
FR-F820-00340, 00490 (N6) FR-F840-00170, 00250 (N6) FR-F860-00170 (N6)	D	12.76 (324) 10.24 (260) w/o conduit box	8.66 (220)	6.69 (170)
FR-F820-00630 (N6) FR-F840-00310, 00380 (N6) FR-F860-00320 (N6)	E	14.29 (363) 11.81 (300) w/o conduit box	8.66 (220)	7.48 (190)
FR-F820-00770, 00930, 01250 (N6) FR-F840-00470, 00620 (N6) FR-F860-00450 (N6)	F	20.37 (517) 15.75 (400) w/o conduit box	9.84 (250)	7.48 (190)
FR-F820-01540 FR-F840-00770	G	21.65 (550)	12.80 (325)	7.68 (195)
FR-F820-01870, 02330 FR-F840-00930, 01160, 01800 FR-F860-00680, 01080	H	21.65 (550)	17.13 (435)	9.84 (250)
FR-F840-02160, 02600 FR-F860-01440, 01670, 02430	J	24.41 (620)	18.31 (465)	11.81 (300)
FR-F820-03160	K	27.56 (700)	18.31 (465)	9.84 (250)
FR-F820-03800, 04750 FR-F840-03250, 03610	L	29.13 (740)	18.31 (465)	14.17 (360)
FR-F840-04320, 04810 FR-F860-02890, 03360	M	39.76 (1010)	19.61 (498)	14.96 (380)
FR-F840-05470, 06100, 06830 FR-F860-04420	N	39.76 (1010)	26.77 (680)	14.96 (380)
FR-F842-07700, 08660 FR-F862-05450	P	52.36 (1330)	21.26 (540)	17.32 (440)
FR-F842-09620, 10940, 12120 FR-F862-06470, 08500	Q	62.20 (1580)	26.77 (680)	17.32 (440)

FR-CC2 Model Number	Frame Size	Height	Width	Depth
		Dimensions Inches (mm)	Inches (mm)	(mm)
FR-CC2-H315K, H355K, C355K	R	52.36 (1330)	23.62 (600)	17.32 (440)
FR-CC2-H400K, H450H, H500K H560K, H630K, C400K, C560K	S	62.20 (1580)	23.62 (600)	17.32 (440)

WARRANTY

- FR-F800 extended to 5 years with startup performed through a certified Drives Startup Partner
- FR-F800 has an industry unmatched 0.000045% failure rate

GLOBAL CERTIFICATIONS

- Conform to the international standards CE, UL, cUL, EAC, CCC, ISO 9001, ISO 14001, and C-Tick.



ENGINEERED SOLUTIONS

SOLUTIONS THAT MEET
THE MOST EXACTING
SPECIFICATIONS

READY FOR ANY CHALLENGE

Mitsubishi Electric engineered solutions can provide build-to-spec services to an existing design or engineer a completely new design.

Configured Drives

General-Duty Applications — flexible for a wide range of applications without limiting performance

Heavy-Duty Applications — designed for challenging applications where overloads are the norm

- Low cost
- Pre-engineered
- Quick delivery

Custom Panels

Fully customized, ranging from a single enclosure to a complete shipping container full of pre-commissioned control equipment

- Made to U.S. or global requirements
- Every package fully documented
- Backed by a comprehensive 2-year warranty
- NEMA12, NEMA 3R, NEMA 4/4X Environmental Ratings, and more
- Solutions including active-front end, multi-pulse, common DC-bus, Regen, liquid cool, and more



A FULL RANGE OF SMART WATER SOLUTIONS

MAKING AUTOMATION WORK FOR MODERN UTILITIES

LET’S TALK

If you’re ready to modernize water operations, we’re ready to help. We’re committed to achieving sustainable water supplies, reducing energy consumption, and enabling more efficient and profitable water management operations.

Let’s change the future together.

Schedule a meeting.

Visit our website
to learn more about
**modernizing your
water operations.**



Americas Offices

US Mitsubishi Electric Automation, Inc. 500 Corporate Woods Parkway Vernon Hills, Illinois 60061 847-478-2100	Canada Mitsubishi Electric Automation, Inc. 4299 14th Avenue Markham, Ontario L3R 0J2 905-754-3805	Mexico Bvd. Miguel de Cervantes Saavedra 301 Col. Ampliación Granada, Miguel Hidalgo CDMX, 11520, México
---	--	---



Mitsubishi Electric’s e-F@ctory concept utilizes both FA and IT technologies, through collaboration with e-F@ctory Alliance Partners, to reduce the total cost of development, production, and maintenance, with the aim of achieving manufacturing that is a “step ahead of the times”.