



for a greener tomorrow

FACTORY AUTOMATION

# FR-A800

Frequency inverters



- Higher production quality by three times faster response mode
- Long term recording of machine conditions by USB trace function
- Advanced energy saving functions reduce production costs
- Built in Ethernet interface available at - E2 Version

# Leading drive performance: the FR-A800



Perfect for crane applications due to built-in 100 % ED Break chopper up to 55 k



Fast processors due to short response times.

## Excellent control performance and response level

Designed for unparalleled drive precision, speed control, simple startup, and versatility, Mitsubishi Electric has developed a new generation of drive technology: the remarkable FR-A800.

This new drive series is the successor of the highly successful FR-A700 series. It is equipped with the new state-of-the-art high-speed processor by Mitsubishi Electric. With better than ever control performance and response level, safe and accurate operation is assured in a diverse range of applications.

Some of the outstanding features are the integrated USB port for programming and parameter copying, an easy-to-read control panel, optimum power usage and energy saving functions, improved system safety, three expansion slots for a range of option and supported network cards.

With its impressive versatility to meet equipment system needs ranging from machining and molding to winding, the FR-A800 is an extremely economical and highly-versatile solution for a wide range of applications.

The FR-A800 Series is fully backwards compatible with the FR-A700 series. Parameters can be easily copied by FR Configurator2. In order to match the former machine response time, the input/output signals of the FR-A800 can be delayed.

## Powerful features and intelligent functions

### Real Sensorless Vector Control

The Real Sensorless Vector control provides high-precision, fast-response speed control in open loop. Combined with offline auto tuning, a maximum of 200 % torque can be generated from 0.2 Hz to 400 Hz.

### Perfect autotuning of PM and IM motors

Based on the new autotuning method, even Permanent Magnet motors can be used with ease.

### Absolute positioning & built-in PLC function

By using the built-in absolute positioning function and the built-in high level PLC function, a complete machine can be managed by a stand alone drive. Sensorless positioning is possible with IPM Motors.



Positioning is one out of many scopes.

### Optimum excitation control

Optimum control of the excitation current maximizes motor efficiency for additional energy savings. As an example, an approximately 15 % increase in efficiency is obtained at a motor load torque of 10 % compared to conventional V/F control.

### High flexibility by built-in PLC

The FR-A800 is easy to program with Mitsubishi Electric standard PLC software, which is available in FR Configurator2. It is also possible to combine the PLC program with the Real time clock of the LU-08 operation panel.

### Energy saving by 24 V control power supply

By connecting an external 24 V DC control power supply, the system can be operated even when the main power supply is turned off. Furthermore parameters can be set and network communication can be maintained with this power supply which facilitates safe maintenance. More energy saving can be achieved by using the automatic "stand by" function which switches off the drive main power supply. Capacitors and other devices are offline, so heat loss is reduced.

### Improved system safety

The FR-A800 series has a two channel emergency stop for safe shutdown. This ensures safe operation in compliance with the European Machinery Directive without installation of another contactor. The FR-A800 thus conforms to the EN ISO13849-1/PLd cat. 3, EN 61508 and EN 61800-5-2 SIL2 standards.

### Easy operation

The operation panel with the one touch Digital Dial allows direct access to all



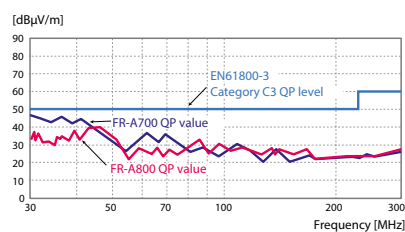
FR-LU08 as full text display with up to fifteen language and real time clock.

important parameters. Select the operation panel ideal for your needs. Choose either a LU operation panel with an LCD screen offering enhanced display functionality and a clock function, or a more economical DU operation panel with a 5-digit, 12-segment display.

The FR-A800 series also allows the connection of a Mitsubishi Electric graphical operation terminal (GOT). Communication parameters for the HMI connection are automatically set as a batch. The GOT provides operators with an easy-to-follow and intuitively high resolution display and facilitates easy operation via a touch panel.

### Comprehensive noise countermeasures

The drive's built-in EMC filter ensures full compliance with European EMC Directive standards (EN 61800-3 2nd environment category C3), so separate certification is not required for the drive. The newly developed drive technology and power supply technology significantly reduce electromagnetic noise.



Comprehensive noise countermeasures

### Energy saving functions

Take advantage of the energy saving function, that suits your application. You can for example reduce power consumption in the standby mode by using the cooling fan ON/OFF control. During operation optimum excitation control or returning regenerative motor energy to other drives helps to save energy. The impressive energy savings can be displayed on the energy monitor.

### More energy savings with PM motors

The FR-A800 series enables factory energy savings, which can be achieved by replacing current induction motors with permanent magnet motors (PM motors). A PM motor is very efficient because

the current does not flow to the rotor, so there is no secondary copper loss. There is also magnetic flux generated by permanent magnets, so less current is required to drive a motor.

### Various network compatibility

The drive can be controlled and monitored by a controller via network. For the major network protocols such as CC-Link IE Field, CC-Link, Profibus DP/DPV1, Profinet/EtherNet IP/EtherCat and SSCNETIII/H as well as DeviceNet™ and LONWORKS communication options are available. RS485 communication (Mitsubishi Electric drive protocol, Modbus\*-RTU protocol) is supported as standard.

The FR-A800-E2 version provides a built in Ethernet port, supporting Modbus® TCP, CC-Link IE Field Basic and Web-server, to allow easy and cost effective connection to PLC or FR-Configurator Setup SW.



### Easy maintenance

To reduce the wiring check time, only a cover has to be removed for accessing the target wiring area. The administration of different drives has become much more simple, because serial numbers of drives can be retrieved via communication.

### Easy set-up

Users can comfortably setup the drives with the Setup-Software FR Configurator2. The easy plug-and-play connection to USB terminal is equipped as standard. Parameters can be simply copied to commercial USB memory devices.

### Long life components

The cooling fans and the built-in capacitors have an estimated lifespan of 10 years. By using the ON/OFF control function, the service life of the fans can be even further extended.

Specifications

TYPE	RATED CURRENT [A]				RATED MOTOR CAPACITY [kW]				WxHxD (mm)
	SLD <sup>①</sup>	LD <sup>①</sup>	ND <sup>①</sup>	HD <sup>①</sup>	SLD <sup>①</sup>	LD <sup>①</sup>	ND <sup>①</sup>	HD <sup>①</sup>	
200 V CLASS									
FR-A820-00046	4.6	4.2	3	1.5	0.75	0.75	0.4	0.2	110x260x110
FR-A820-00077	7.7	7	5	3	1.5	1.5	0.75	0.4	110x260x125
FR-A820-00105	10.5	9.6	8	5	2.2	2.2	1.5	0.75	150x260x140
FR-A820-00167	16.7	15.2	11	8	3.7	3.7	2.2	1.5	
FR-A820-00250	25	23	17.5	11	5.5	5.5	3.7	2.2	220x260x170
FR-A820-00340	34	31	24	17.5	7.5	7.5	5.5	3.7	
FR-A820-00490	49	45	33	24	11	11	7.5	5.5	220x300x190
FR-A820-00630	63	58	46	33	15	15	11	7.5	
FR-A820-00770	77	70.5	61	46	18.5	18.5	15	11	250x400x190
FR-A820-00930	93	85	76	61	22	22	18.5	15	
FR-A820-01250	125	114	90	76	30	30	22	18.5	325x550x195
FR-A820-01540	154	140	115	90	37	37	30	22	
FR-A820-01870	187	170	145	115	45	45	37	30	435x550x250
FR-A820-02330	233	212	175	145	55	55	45	37	
FR-A820-03160	316	288	215	175	75	75	55	45	465x700x250
FR-A820-03800	380	346	288	215	110	90	75	55	
FR-A820-04750	475	432	346	288	132	110	90	75	465x740x360

OPERATING CONDITIONS	SPECIFICATIONS
Power supply	FR-A820: 3-phase, 200–240 V AC (-15 %, +10 %) at 50/60 Hz; FR-A840: 3-phase, 380–500 V AC (-15 %, +10 %) at 50/60 Hz
Ambient temperature	-10 °C to +50 °C (non-freezing) (LD, ND, HD ratings); -10 °C to +40 °C (non-freezing) (SLD rating)
Ambient humidity	Compliance to IEC 60721-3-3 class 3C2, maximum 95 % RH (non-condensing)
Altitude	Maximum 1000 m above sea level
Protection rating	IP20 up to 22 kW, IP00 from 30 kW
Vibration resistance	Max. 0.6 G
Break chopper	Built-in up to 55 k (400 V) and up to 22 k (200 V)

① SLD= Super light duty (110 % at 60 s, 120 % at 3 s); LD= Light duty (120 % at 60 s, 150 % at 3 s); ND= Normal duty (150 % at 60 s, 200 % at 3 s); HD= Heavy duty (200 % at 60 s, 250 % at 3 s)  
 ② The FR-A842 models must be operated in combination with a converter unit FR-CC2, which has to be ordered separately. For more details please refer to the inverter family catalogue.  
 ③ The FR-A840-E2 version provides a built-in Ethernet port, supporting Modbus® TCP, CC-Link IE Field Basic and Webserver.

TYPE	RATED CURRENT [A]				RATED MOTOR CAPACITY [kW]				WxHxD (mm)
	SLD <sup>①</sup>	LD <sup>①</sup>	ND <sup>①</sup>	HD <sup>①</sup>	SLD <sup>①</sup>	LD <sup>①</sup>	ND <sup>①</sup>	HD <sup>①</sup>	
400 V CLASS <sup>③</sup>									
FR-A840-00023	2.3	2.1	1.5	0.8	0.75	0.75	0.4	0.2	150x260x140
FR-A840-00038	3.8	3.5	2.5	1.5	1.5	1.5	0.75	0.4	
FR-A840-00052	5.2	4.8	4	2.5	2.2	2.2	1.5	0.75	220x260x170
FR-A840-00083	8.3	7.6	6	4	3.7	3.7	2.2	1.5	
FR-A840-00126	12.6	11.5	9	6	5.5	5.5	3.7	2.2	220x300x190
FR-A840-00170	17	16	12	9	7.5	7.5	5.5	3.7	
FR-A840-00250	25	23	17	12	11	11	7.5	5.5	250x400x190
FR-A840-00310	31	29	23	17	15	15	11	7.5	
FR-A840-00380	38	35	31	23	18.5	18.5	15	11	325x550x195
FR-A840-00470	47	43	38	31	22	22	18.5	15	
FR-A840-00620	62	57	44	38	30	30	22	18.5	435x550x250
FR-A840-00770	77	70	57	44	37	37	30	22	
FR-A840-00930	93	85	71	57	45	45	37	30	465x620x300
FR-A840-01160	116	106	86	71	55	55	45	37	
FR-A840-01800	180	144	110	86	90	75	55	45	465x740x360
FR-A840-02160	216	180	144	110	110	90	75	55	
FR-A840-02600	260	216	180	144	132	110	90	75	498x1010x380
FR-A840-03250	325	260	216	180	160	132	110	90	
FR-A840-03610	361	325	260	216	185	160	132	110	680x1010x380
FR-A840-04320	432	361	325	260	220	185	160	132	
FR-A840-04810	481	432	361	325	250	220	185	160	680x1580x440
FR-A840-05470	547	481	432	361	280	250	220	185	
FR-A840-06100	610	547	481	432	315	280	250	220	540x1330x440
FR-A840-06830	683	610	547	481	355	315	280	250	
FR-A840-07700 <sup>②</sup>	770	683	610	547	400	355	315	280	680x1580x440
FR-A842-08660 <sup>②</sup>	866	770	683	610	450	400	355	315	
FR-A842-09620 <sup>②</sup>	962	866	770	683	500	450	400	355	680x1580x440
FR-A842-10940 <sup>②</sup>	1094	962	866	770	560	500	450	400	
FR-A842-12120 <sup>②</sup>	1212	1094	962	866	630	560	500	450	

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