



for a greener tomorrow

FACTORY AUTOMATION

FR-F800

Power-saving frequency inverters



- Ideal for pump, compressor and fan applications
- High starting torque maximum energy saving
- High savings potential to reduce TCO
- Built in Ethernet interface available at -E2 Version
- Enhanced control due to expanded PID functionality

The ideal drive solution for pumps and fans



Pump applications, e.g. for building automation operate energy-saving with frequency inverters



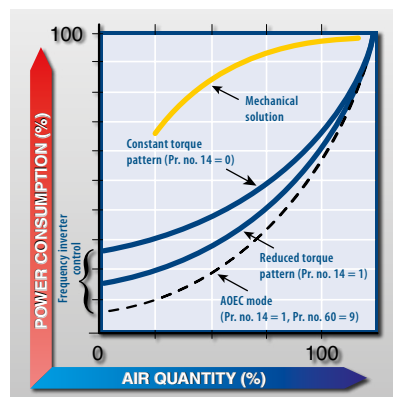
Fan applications benefit from frequency inverter use

Reduce Energy Costs

It's a fact that industrial and commercial energy users are increasingly burdened by rising energy costs. However, there is a proven way to reduce these high electricity prices by utilising frequency inverter control for pump and fan applications. Thanks to the intelligent functions, like Advanced Optimum Excitation Control or the enhanced PID

controller, these energy consumption and thus energy costs can be reduced very significantly.

The advanced optimum excitation control (AOEC) continuously adjusts the excitation current to an optimum level providing highest motor efficiency. With a small load torque, a substantial energy saving can be achieved. The newly developed AOEC, provides a large starting torque while maintaining the motor efficiency throughout the speed range.



Utilizing the motor capability to the full

This is done without the troublesome adjustment of parameters (acceleration/ deceleration time, torque boost, etc.).

Powerful features and intelligent functions

Detection of mechanical faults

With the load characteristics measurement function, 5 speed-torque values of the load can be detected and stored automatically. By comparing the present speed/load status with the stores speed/load characteristics, out-of-range warnings can be accurately measured and quickly acted upon, meaning unnecessary alarms/line stops can be avoided.

Our advanced algorithm means mechanical faults such as pump blockage/dirty impeller or broken belt can be accurately detected.

Autotuning of IM and PM motors

To ensure that the motor and drive package are perfectly matched to reach highest performance, the F800 features a variety of autotuning methods/algorithms.

Cleaning of fans and pumps

Foreign matter on the impellers of fans or pumps can be removed by repeating forward/reverse rotation and stopping of the motor. This is avoiding expensive removal of the system.

This function can be also automatically started when the result of load characteristics measurement is out of range (overload).

Smooth Restart

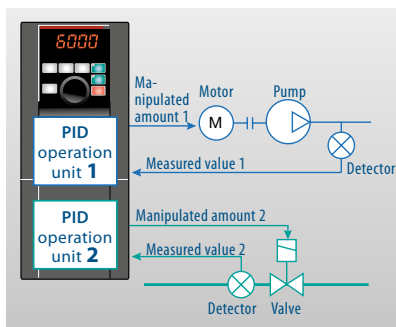
After an instantaneous power failure, the operation is restartable from the coasting motor speed automatically. With the advanced flying start function, the operation can be smoothly started from very low speed.

Advanced PID control functions

The inverter can perform PID control of the motor operation and control the external equipment at the same time.

During PID control the drive will activate "sleep mode" to avoid energy loss, when deviation is small and output speed is low. As soon deviation becomes bigger again the drive will start up immediately.

- One drive can control multi pumps
- Second PID controller



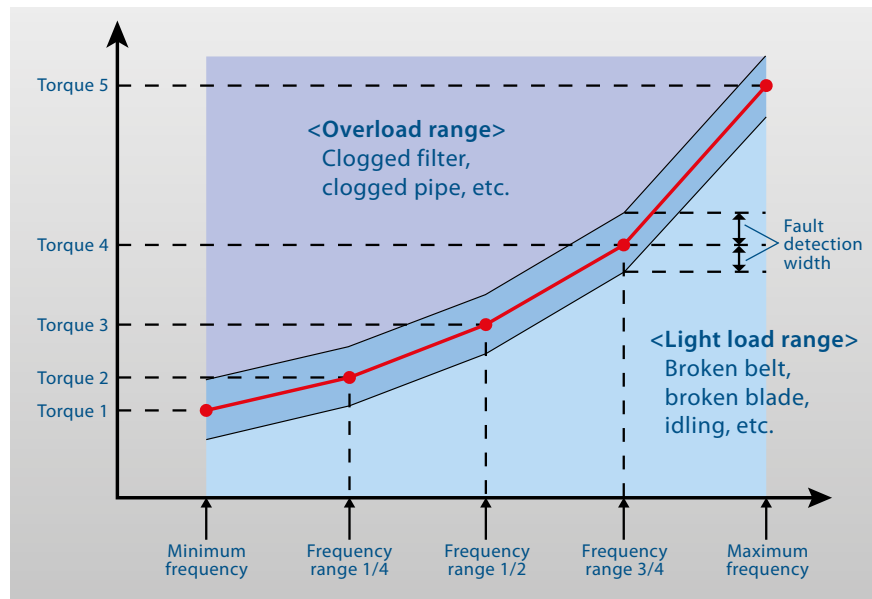
PID multiple loops (two loops)

- Direct access to PID setpoint by Display
- Pump Stir function
- PID output hold (incl. multi pump)
- PID upper/lower limit pre-warning
- Pipe burst detection/Dry run protection
- Digitally selectable PID set points
- Pipe soft fill to prevent water hammer
- PID pre-charge function
- Pre Sleep boost function
- Water Hammer avoidance at stop
- Automatic PID gain tuning

Easy handling

Easy setup

Users can comfortably setup the drives with the Setup-Software FR Configurator2, by direct connection via USB port by or by using FR-F800-E2 version with built in Ethernet connection. Modbus® TCP/IP, BACnet and CC-Link IE Field Basic are supported as standard.



Load characteristics measurement function

Easy operation

The operation panel with the one touch Digital Dial allows direct access to all important parameters. Select the operation panel ideal for your needs. Choose either a FR-LU08 operation panel with an LCD screen offering enhanced display functionality and a clock function, or a more economical FR-DU08 operation panel with a 5-digit, 12-segment display.



The operation panel allows the direct setting of the PID set point. The setting can be easily changed at hand.

Quick reaction to troubles

Clock setting is available in addition to the cumulative energization time. The time and date at a protective function activation are easily identified. The date and time are also saved with the trace data, which makes the fault analysis easier.

By using the real-time clock function with the optional FR-LU08 operation panel, the time is not reset even when the power supply is turned off.

Trace function

The F800 includes the ability to record or capture 8 of 72 device values.

This recording can be triggered automatically, meaning intermittent errors are easily investigated. These errors can be time stamped by the real time clock.

PLC Function

The integrated PLC function can be utilised to run e.g. stand alone compressor systems. This can be further enhanced by the Plug and Play connectable HMI.

Future proof technology

Fully backward compatible

The FR-F800 is fully backwards compatible with the FR-F700 series. Parameters can be easily copied by the programming package FR Configurator2.

Highest quality guaranteed

Mitsubishi is well known for high reliability, because our Ethos is to use only the highest quality components in our products. This means we are able to provide 3 year warranty.

Specifications

| TYPE | RATED CURRENT [A] | | RATED MOTOR CAPACITY [kW] | | WxHxD (mm) |
|--------------------|-------------------|-----------------|---------------------------|-----------------|-------------|
| | SLD ^① | LD ^① | SLD ^① | LD ^① | |
| 200 V CLASS | | | | | |
| FR-F820-00046 | 4.6 | 4.2 | 0.75 | 0.75 | 110x260x110 |
| FR-F820-00077 | 7.7 | 7 | 1.5 | 1.5 | 110x260x125 |
| FR-F820-00105 | 10.5 | 9.6 | 2.2 | 2.2 | 150x260x140 |
| FR-F820-00167 | 16.7 | 15.2 | 3.7 | 3.7 | |
| FR-F820-00250 | 25 | 23 | 5.5 | 5.5 | |
| FR-F820-00340 | 34 | 31 | 7.5 | 7.5 | |
| FR-F820-00490 | 49 | 45 | 11 | 11 | 220x260x170 |
| FR-F820-00630 | 63 | 58 | 15 | 15 | 220x300x190 |
| FR-F820-00770 | 77 | 70.5 | 18.5 | 18.5 | 250x400x190 |
| FR-F820-00930 | 93 | 85 | 22 | 22 | |
| FR-F820-01250 | 125 | 114 | 30 | 30 | |
| FR-F820-01540 | 154 | 140 | 37 | 37 | |
| FR-F820-01870 | 187 | 170 | 45 | 45 | 435x550x250 |
| FR-F820-02330 | 233 | 212 | 55 | 55 | 465x740x360 |
| FR-F820-03160 | 316 | 288 | 75 | 75 | |
| FR-F820-03800 | 380 | 346 | 90/110 | 90 | |
| FR-F820-04750 | 475 | 432 | 132 | 110 | |

| TYPE | RATED CURRENT [A] | | RATED MOTOR CAPACITY [kW] | | WxHxD (mm) |
|--------------------------------|-------------------|-----------------|---------------------------|-----------------|--------------|
| | SLD ^① | LD ^① | SLD ^① | LD ^① | |
| 400 V CLASS^③ | | | | | |
| FR-F840-00023 | 2.3 | 2.1 | 0.75 | 0.75 | 150x260x140 |
| FR-F840-00038 | 3.8 | 3.5 | 1.5 | 1.5 | |
| FR-F840-00052 | 5.2 | 4.8 | 2.2 | 2.2 | |
| FR-F840-00083 | 8.3 | 7.6 | 3.7 | 3.7 | |
| FR-F840-00126 | 12.6 | 11.5 | 5.5 | 5.5 | 220x260x170 |
| FR-F840-00170 | 17 | 16 | 7.5 | 7.5 | |
| FR-F840-00250 | 25 | 23 | 11 | 11 | |
| FR-F840-00310 | 31 | 29 | 15 | 15 | |
| FR-F840-00380 | 38 | 35 | 18.5 | 18.5 | 220x300x190 |
| FR-F840-00470 | 47 | 43 | 22 | 22 | 250x400x190 |
| FR-F840-00620 | 62 | 57 | 30 | 30 | |
| FR-F840-00770 | 77 | 70 | 37 | 37 | |
| FR-F840-00930 | 93 | 85 | 45 | 45 | |
| FR-F840-01160 | 116 | 106 | 55 | 55 | 435x550x250 |
| FR-F840-01800 | 180 | 144 | 90 | 75 | |
| FR-F840-02160 | 216 | 180 | 110 | 90 | |
| FR-F840-02600 | 260 | 216 | 132 | 110 | |
| FR-F840-03250 | 325 | 260 | 160 | 132 | 465x620x300 |
| FR-F840-03610 | 361 | 325 | 185 | 160 | |
| FR-F840-04320 | 432 | 361 | 220 | 185 | |
| FR-F840-04810 | 481 | 432 | 250 | 220 | |
| FR-F840-05470 | 547 | 481 | 280 | 250 | 680x1010x380 |
| FR-F840-06100 | 610 | 547 | 315 | 280 | |
| FR-F840-06830 | 683 | 610 | 355 | 315 | |
| FR-F842-07700 ^② | 770 | 683 | 400 | 355 | |
| FR-F842-08660 ^② | 866 | 770 | 450 | 400 | 790x1330x440 |
| FR-F842-09620 ^② | 962 | 866 | 500 | 450 | |
| FR-F842-10940 | 1094 | 962 | 560 | 500 | |
| FR-F842-12120 | 1212 | 1094 | 630 | 560 | |

| OPERATING CONDITIONS | | SPECIFICATIONS | |
|----------------------|--|--|--|
| Power supply | | FR-F820: 3-phase, 200–240 V AC (-15 %, +10 %) at 50/60 Hz; FR-F840: 3-phase, 380–500 V AC (-15 %, +10 %) at 50/60 Hz FR-F842: 3-phase, 380–500 V AC (-15 %, +10 %) at 50/60 Hz | |
| Ambient temperature | | -10 °C to +50 °C (non-freezing) (LD ratings); -10 °C to +40 °C (non-freezing) (SLD ratings) | |
| 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 | |
| Compliant standards | | EN50598-2 Class IE2, the new European Eco Design standard, EN50598-2 Class IE2S, the combined efficiency of VFD and IE3/IE4 motor, IEC60721-3-3 Class 3C2, Environmental Protection class as standard, EN ISO 13849-1 PLd / Cat.3 / EN 61508, EN61800-5-2 SIL2 for safety standards | |

- ① SLD= Super light duty (110 % at 60 s, 120 % at 3 s); LD= Light duty (120 % at 60 s, 150 % at 3 s)
- ② The FR-F842 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-F840-E2 version provides a built in Ethernet port, supporting Modbus[®] TCP, CC-Link IE Field Basic and BACnet TCP.

European Offices

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