Product Information
No. EBG 164-EN

MITSUBISHI ELECTRIC
FACTORY AUTOMATION

FR-F740/F746

Frequency Inverters

The Power-Saving Inverters
for Pump and Fan Applications

SIMPLER OPERATION — One-touch Digital Dial control and multi-language display for simple configuration and user-friendly operation.

MORE FLEXIBILITY — IP00, IP20 and IP54 protection ratings, wide range of outputs from 0.75 to 630 kW

IMPROVED PERFORMANCE — Extremely high quality for exceptional reliability

IMPROVED COMMUNICATION — Comprehensive support for communications and worldwide network standards including LonWorks and Profibus

Power, Time and Cost Saving Intelligence

Complex HVAC building services automation solutions

Purpose-built for pumps and fans

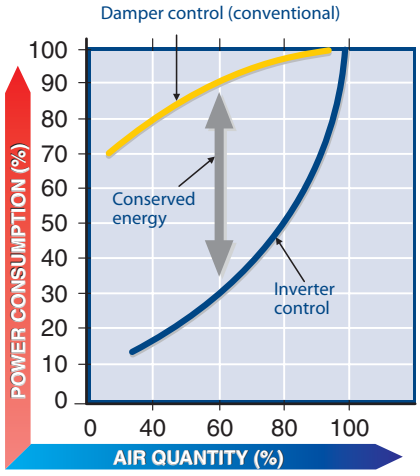
Today's innovative building services impose a wide variety of demands on drive system planners. More and more applications require open, flexible and fully-scaleable drives. In applications like heating, ventilation and air-conditioning (HVAC) there are additional demands that must be met, including user-friendliness, network support and, of course, maximum reliability. The drives must also be economical, with minimum operating costs and maximum energy savings.

The frequency inverters of the FR-F740/746 series are a modern and intelligent variable-speed drive solution that can easily be integrated into modern building services automation systems. The FR-F740/746 series is particularly well suited for driving pumps and fans and for applications with reduced overloads, including:

- Air conditioning systems in buildings and industry
- Ventilation and air extraction fans
- Drains systems, ground water pumps and heat pumps

Up to 60 % power savings

These inverters achieve massive power savings, particularly in the crucial low speed range and the braking and acceleration phases. For example, at a frequency of 35 Hz the inverter achieves a saving of 57 % over conventional solutions.



Power savings in relation to air throughput volume

Additional power savings of 10 % are achieved by Mitsubishi Electric's innovative OEC (Optimum Excitation Control) technology, which ensures that the optimum flux is applied to the motor at all times.

Savings for ventilation and extraction systems

Ventilation and air extraction systems generally require very powerful motors. The intelligent motor control functions of the FR-F740/746 series reduce starting currents and thus also the peak load power costs. Similarly, the system also cuts costs in low load operation.

A 110 kW air extraction system

Maximum flexibility for pump systems

With their multi-motor function the FR-F 740/746 inverters can autonomously integrate up to four motors in a pump system, using preset setpoint values. In this system one motor is frequency-controlled by the FR-F740/746 whilst the others are automatically switched in to or out of the network in stages. This highly-effective motor management is really useful in water supply systems requiring fast and flexible responses (e.g. for catering to sudden fluctuations in the demand for water).

Pump system

Control unit FR-DU07

Flexible control unit with Digital Dial

The integrated one-touch Digital Dial gives you much faster access to all the important parameters than would be possible using conventional control keys.

The removable FR-DU07 control unit makes operating the inverter simple and intuitive. A 4-digit LED display enables you to check and edit settings, and it is also used for monitoring operating status and displaying alarms. It is possible to monitor all the inverter and motor status parameters and any error code displays enabling rapid commissioning and troubleshooting for users. The control unit can also be used to adjust the speed of the connected motor continuously and directly

Protection ratings: IP00/IP20/IP54

In addition to the IP00 and IP20 protection ratings the inverters in the output range up to 55 kW are also available with an IP54, splash and spray rating (FR-F746 series). These rugged metal chassis units have dust, dirt and water protection making it possible to install them without an external cabinet, for example on the outside wall of the factory building or next to a ventilation or air conditioning system.

Long service life and simplified maintenance

A combination of many intelligent design features and newly developed components (including the fans and capacitors) have increased the service life of the FR-F740/746 to over 10 years. An automatic warning is displayed when the end of the service life is approaching, so that you can avoid unexpected failures.

The cooling fans are compact units that can easily be removed for cleaning or replacement. The terminal blocks are removable, so that the frequency inverters can be replaced without re-wiring in the rare event of a failure.

IMS certificate

Mitsubishi Electric's drive systems have an enviable reputation for reliability. The recent customer satisfaction survey conducted by IMS Research confirmed that the inverter drives made by Mitsubishi Electric are among the best in their class.

Frequency inverter FR-F746

Comprehensive communications options

The FR-F740/746 inverters are fitted with two serial ports as standard for integration in automation networks. A network cable can be connected to the PU interface with a standard RJ45 plug and there are RS485 terminals inside the inverter for connection to a multidrop network, enabling inexpensive network connection of up to 32 nodes.

In addition to the Mitsubishi network protocol you can also set Modbus-RTU (binary) as the standard protocol.

The inverters can be connected to all the following networks:

- LonWorks*
- Profibus/DP*
- DeviceNet*
- Modbus RTU*
- RS-485*
- CC-Link*

*optional

The FR-F740/F746 in a LonWorks network system

Specifications ///

Frequency inverter FR-F740	120 % overload capacity*		150 % overload capacity**	
	Rated current (A)	Rated motor capacity (kW)	Rated current (A)	Rated motor capacity (kW)
FR-F740-00023-EC	2.3	0.75	2.1	0.75
FR-F740-00038-EC	3.8	1.5	3.5	1.5
FR-F740-00052-EC	5.2	2.2	4.8	2.2
FR-F740-00083-EC	8.3	3.7	7.6	3.7
FR-F740-00126-EC	12.6	5.5	11.5	5.5
FR-F740-00170-EC	17	7.5	16	7.5
FR-F740-00250-EC	25	11	23	11
FR-F740-00310-EC	31	15	29	15
FR-F740-00380-EC	38	18.5	35	18.5
FR-F740-00470-EC	47	22	43	22
FR-F740-00620-EC	62	30	57	30
FR-F740-00770-EC	77	37	70	37
FR-F740-00930-EC	93	45	85	45
FR-F740-01160-EC	116	55	106	55
FR-F740-01800-EC	180	90	144	75
FR-F740-02160-EC	216	110	180	90
FR-F740-02600-EC	260	132	216	110
FR-F740-03250-EC	325	160	260	132
FR-F740-03610-EC	361	185	325	160
FR-F740-04320-EC	432	220	361	185
FR-F740-04810-EC	481	250	432	220
FR-F740-05470-EC	547	280	481	250
FR-F740-06100-EC	610	315	547	280
FR-F740-06830-EC	683	355	610	315
FR-F740-07700-EC	770	400	683	355
FR-F740-08660-EC	866	450	770	400
FR-F740-09620-EC	962	500	866	450
FR-F740-10940-EC	1094	560	962	500
FR-F740-12120-EC	1212	630	1094	560

* 120 % for 3 s, 110 % for 60 s, up to 40 °C ** 150 % for 3 s, 120 % for 60 s, up to 50 °C

Frequency inverter FR-F746	120 % overload capacity*		150 % overload capacity**	
	Rated current (A)	Rated motor capacity (kW)	Rated current (A)	Rated motor capacity (kW)
FR-F746-00023-EC	2.3	0.75	2.1	0.75
FR-F746-00038-EC	3.8	1.5	3.5	1.5
FR-F746-00052-EC	5.2	2.2	4.8	2.2
FR-F746-00083-EC	8.3	3.7	7.6	3.7
FR-F746-00126-EC	12.6	5.5	11.5	5.5
FR-F746-00170-EC	17	7.5	16	7.5
FR-F746-00250-EC	25	11	23	11
FR-F746-00310-EC	31	15	29	15
FR-F746-00380-EC	38	18.5	35	18.5
FR-F746-00470-EC	47	22	43	22
FR-F746-00620-EC	62	30	57	30
FR-F746-00770-EC	77	37	70	37
FR-F746-00930-EC	93	45	85	45
FR-F746-01160-EC	116	55	106	55

* 120 % for 3 s, 110 % for 60 s, up to 30 °C ** 150 % for 3 s, 120 % for 60 s, up to 40 °C

Operating conditions	Specifications
Voltage	Three-phase, 380 – 500 V (-15 %/+10 %) (below 75 kW to 480 V)
Ambient temperature in operation	FR-F 740: -10 °C to +50 °C; FR-F 746: -10 °C to +40 °C
Storage temperature	-20 °C to +65 °C
Ambient humidity	Max. 90 % relative humidity (non-condensing)
Altitude	Max. 1,000 m above sea level
Protection rating	F740: IP00 from 30 kW, IP20 up to 22 kW; F746: IP54
Shock resistance	10 G (for 00023 to 03610); 0.3 G (for ≤ 04320)
Vibration resistance	Max. 0.6 G
Certifications	FR-F740: CE/UL/cUL/GOST FR-F746: CE/GOST

MITSUBISHI ELECTRIC
FACTORY AUTOMATION