Product Information

EBG 225-EN

MITSUBISHI ELECTRIC
Changes for the Better

FR-E700 SC

Frequency Inverters

The Compact Drive Solution

Versatile, reliable, expandable

SIMPLER OPERATION — Simple and fast installation, exceptionally user-friendly

INTELLIGENT DESIGN — High-grade components for at least 10 years of maintenance-free operation

INTEGRATED SAFETY — Integrated safety stop function (restart prevention in accordance with ISO 13849-1)

IMPROVED COMMUNICATION — Very expandable, extensive communications options

The Powerful Compact Inverter

Material transport systems like this example in a printing works are just one of the many applications for the FR-E700 SC

Mitsubishi Electric frequency inverter drives are now standard equipment in the textile industry.

The outstanding powerhouse

With 17 million frequency inverter drives already sold, Mitsubishi Electric introduces the compact inverters of the FR-E700 SC series. In addition to better features and performance than their predecessors, the models in the FR-E700 SC series are also more compact and even easier to install.

Some of the outstanding featues are the integrated USB port, an integrated one-touch Digital Dial control with a display, optimum power usage at low speeds and an expansion slot compatible with the many option cards from the 700 series. All this makes the FR-E700 SC an economical and highly-versatile solution for a wide range of applications from textiles machines to door and gate drive systems to material handling systems.

Intelligent functions for every application

Sensorless Vector Control

The outstanding speed and torque performance and the fast response of the FR-E700 SC are due to a large extent to the Sensorless Vector Control system. This technology makes it possible to achieve exceptional speed and torque performance, even with motors that do not have encoder feedback loops, thus saving additional hardware costs.

Advanced Autotuning

Good motor control is only possible with accurate motor data. This current generation of inverter drives has an Autotuning function that can read out all the necessary parameters directly from the motor in less than a minute, even when it is not running.

Overload capacity increased to 200 %

The maximum short-term overload capacity is 200 % for a full 3 seconds. This makes it much easier to select the right frequency inverter drive for your application and also reduces wasteful downtime caused by overload alarms.

Torque limiting

Improved torque/current limiting during startup and deceleration ensures better protection for your machines, reliably preventing machine damage.

External brake

Applications like gate drives, hoists, cranes and so on often need an additional brake to cope with their suspended loads. The frequency inverter drives of the FR-E700 SC series support connection of an external mechanical brake controlled by the inverter.

Responsive technology

To protect both staff and valuable machinery the FR-E700 SC series is packed with innovative functions that enable the inverters to respond with great sensitivity to a variety of external events.

Controlled deceleration for brief power failures

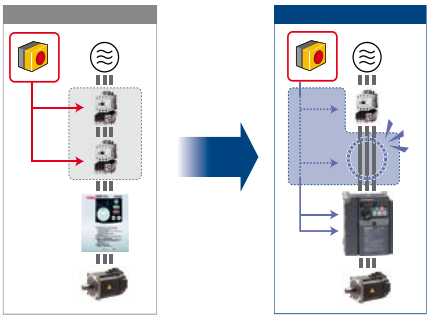
The frequency inverter can respond to power failures, using regenerative energy to perform controlled deceleration of the motor, thus preventing uncontrolled rundown and possible damage, for example to textile machines.

Automatic restart after power failures

In pump and fan applications you can configure the inverter to resume operation after brief power failures – the system then "catches" the coasting motor and automatically accelerates it back up to the preset speed.

Integrated emergency stop function

The FR-E700 SC 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-E700 SC thus conforms to the ISO13849-1, PLd and IEC60204-1 cat. 0 standards.



Simple operation

Integrated control unit

The integrated control unit with the one-touch Digital Dial gives the user direct access to all important parameters – much more quickly than it be possible with normal keys.

The installed Multi User Panel with the Digital Dial

In addition to entering and displaying parameter values, the integrated LED display is also used to monitor and check operating values and alarm codes.

Powerful software

The FR-Configurator software package comes with a number of powerful and user-friendly functions including graphical machine analysis for optimisation of your drive system and an automatic conversion tool that makes it easy to switch from a previous model to an inverter of the latest generation

Integrated USB port

An integrated USB port enables direct connection of a PC or notebook computer for quick and easy parameter configuration, monitoring and maintenance.

An investment in the future

Long lifetime

Frequency inverter drives from Mitsubishi Electric are famous for their reliability and longevity. The FR-E700 SC is designed for a service life of over 10 years. Among other things, this is made possible by high-performance heat-resistant capacitors, cooling fans with sealed bearings and special lubricating greases. The flows of cooling air only come into contact with the heat sinks, not with the electronic components, ensuring that no dust or dirt can collect on the components.

The circuit boards are very well protected against aggressive environments with single or double coatings of varnish – another feature that ensures a longer service life.

Fast servicing

The fans are designed as compact units that can be replaced in less than 10 seconds for cleaning or in the event of failure. Even replacing the entire inverter is a quick and simple operation – there is no wiring work at all because the terminal block is removable.

Versatile design

Compact installation

The installation footprint is the same as that of the predecessor models but the FR-E700 SC units can now be installed directly next to one another. Heat dissipation has been optimised by designing the heat sinks so that they can also be installed outside the switchgear cabinet.

Flexible connection and expansion

FR-E700 SC inverters can be connected to RTU Modbus and network systems like Profibus DP, CC-Link, DeviceNet and LonWorks.

Functions can be added with option cards and additional I/O modules to configure the system for individual applications and requirements.

Option cards for additional functions

Conformity with international standards including CE, UL, cUL and GOST ensure trouble-free deployment worldwide.

Self-diagnostics for reliable operation

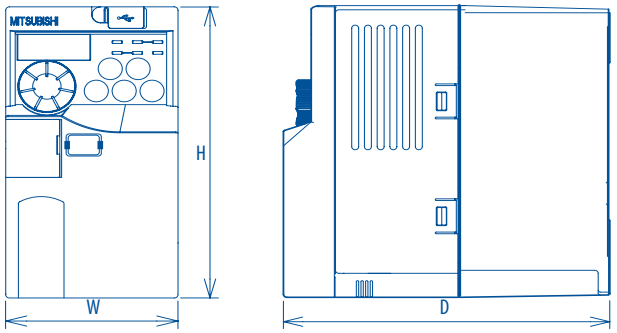
These inverter drives actively monitor themselves to make sure they are working properly. For example, if the fan performance drops to 40 % or lower a pre-alarm is triggered automatically. An internal measurement program monitors the ageing of the main circuit capacitors and an operating hours counter enables the operator to plan the best time for servicing well in advance. Protection and overload functions like the phase failure monitoring system for both the input and output circuits ensure trouble-free operation.

Specifications

Overload capacity	ND (normal duty)
60 seconds overload	150 %
3 seconds overload	200 %
Ambient temperature	50 °C

Type	Rated current [A] *	Rated motor capacity [kW] *	WxHxD (mm)
FR-E720S-008SC-EC	0.8	0.1	68x128x86.5
FR-E720S-015SC-EC	1.5	0.2	68x128x86.5
FR-E720S-030SC-EC	3.0	0.4	68x128x148.5
FR-E720S-050SC-EC	5.0	0.75	108x128x141.5
FR-E720S-080SC-EC	8.0	1.5	108x128x167
FR-E720S-110SC-EC	11	2.2	140x150x161.5
FR-E740-016SC-EC	1.6	0.4	140x150x120
FR-E740-026SC-EC	2.6	0.75	140x150x120
FR-E740-040SC-EC	4.0	1.5	140x150x141
FR-E740-060SC-EC	6.0	2.2	140x150x141
FR-E740-095SC-EC	9.5	3.7	140x150x141
FR-E740-120SC-EC	12	5.5	220x150x153
FR-E740-170SC-EC	17	7.5	220x150x153
FR-E740-230SC-EC	23	11	220x260x196
FR-E740-300SC-EC	30	15	220x260x196

* Standard operation/initial value



Operating conditions	Specifications
Power supply	FR-E720S-☐SC: 1-phase, 200–240 V AC (–15 %, +10 %) FR-E740-☐SC: 3-phase, 380–480 V AC (–15 %, +10 %)
Ambient temperature	–10 °C to +50 °C (non-condensing)
Storage temperature	–20 °C to +65 °C
Relative humidity	Max. 90 % (non-condensing)
Installation altitude	Max. 1000 m above sea level
Protection	IP20
Shock resistance	10 G
Vibration resistance	Max. 0.6 G
Certifications	CE/UL/cUL/GOST

Internal options	Description
FR-A7AX Ekit-SC-E	Additional free configurable digital inputs
FR-A7AY Ekit-SC-E	Selectable standard digital output signals of the inverter can be output at the open collector. Selectable additional signals like analog output voltage or output current can be output and indicated at the analog output.
FR-A7AR Ekit-SC-E	Selectable output signals of the inverter can be output through relay terminals.
FR-A7NP Ekit-SC-E	Integration of the frequency inverter in a Profibus DP network
FR-A7NP Ekit-SC-01-E	Integration of the frequency inverter in a Profibus DP network with D-Sub connection
FR-A7ND Ekit-SC-E	Integration of the frequency inverter in a DeviceNet network
FR-A7NC Ekit-SC-E	Integration of the frequency inverter in a CC-Link network
FR-A7NL Ekit-SC-E	Integration of the frequency inverter in a LonWorks network

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