

FR-E700 SC

Frequency Inverters

The Compact Drive Solution

Versatile, reliable, expandable



Simple and fast installation, exceptionally user-friendly



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



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



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

The new powerhouse

With 15 million frequency inverter drives already sold, Mitsubishi Electric now introduces its latest generation of compact inverters, the new FR-E700 SC series. In addition to better features and performance than their predecessors, the models in the new series are also more compact and even easier to install.

Improvements include an integrated USB port, an integrated one-touch Digital Dial control with a display, improved 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 new models increase the maximum short-term overload capacity to 200 % for a full 3 seconds, compared to 0.5 seconds in the earlier versions. 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 new 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

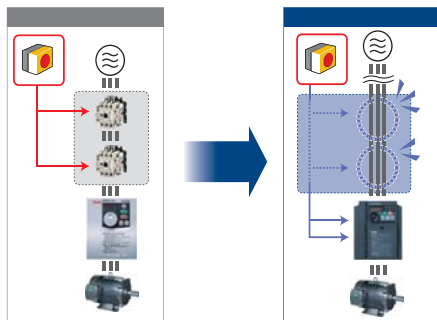
The frequency inverter can respond to power failures, using regenerative energy to perform controlled deceleration of the motor, thus preventing uncontrolled run-down and possible damage, for example to textile machines.

■ 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 would 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 in 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 now 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.

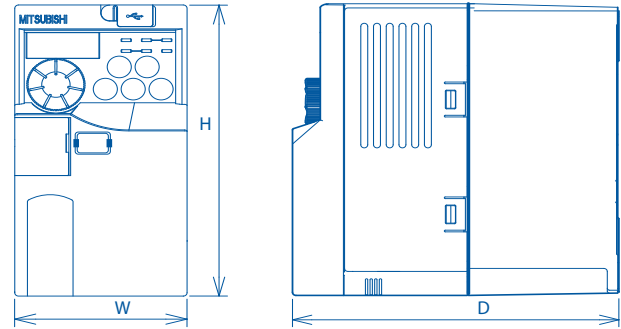
■ Self-diagnostics for reliable operation

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 |



| 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 |

* Standard operation/initial value

| 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-E-01 | 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 |

EUROPEAN BRANCHES

| | |
|---|-------------------|
| MITSUBISHI ELECTRIC EUROPE B.V. D-40880 Ratingen Phone: +49 (0)2102 / 486-0 | GERMANY |
| MITSUBISHI ELECTRIC EUROPE B.V.-org.s. Radlická 714/113a CZ-158 00 Praha 5 Phone: +420-251 551 470 | CZECH REP. |
| MITSUBISHI ELECTRIC EUROPE B.V. F-92741 Nanterre Cedex Phone: +33 (0)1 / 55 68 55 68 | FRANCE |
| MITSUBISHI ELECTRIC EUROPE B.V. Viale Colleoni 7 I-20041 Agrate Brianza (MB) Phone: +39 039 / 60 53 1 | ITALY |
| MITSUBISHI ELECTRIC EUROPE B.V. Krakowska 50 Pl-32-083 Balice Phone: +48 (0)12 / 630 47 00 | POLAND |
| MITSUBISHI ELECTRIC EUROPE B.V. 52, bld. 3 Kosmodamianskaya nab 8 floor RU-115054 Moscow Phone: +7 495 721-2070 | RUSSIA |
| MITSUBISHI ELECTRIC EUROPE B.V. Carretera de Rubí 76-80 E-08190 Sant Cugat del Vallés (Barcelona) Phone: 902 131121 // +34 935653131 | SPAIN |
| MITSUBISHI ELECTRIC EUROPE B.V. Travellers Lane UK-Hatfield, Herts. AL10 8XB Phone: +44 (0)1707 / 27 61 00 | UK |

EUROPEAN REPRESENTATIVES

| | | | | | | | | | | | |
|---|---------------------------|--|-------------------|---|--------------------|---|-----------------|---|--------------------|--|---------------------|
| GEVA Wiener Straße 89 AT-2500 Baden Phone: +43 (0)2252 / 85 55 20 | AUSTRIA | Beijer Electronics A/S Lykkegårdsvej 17 DK-4000 Roskilde Phone: +45 (0)46 75 76 66 | DENMARK | ALFATRADE Ltd. 99, Paola Hill Malta-Paola PLA 1702 Phone: +356 (0)21 / 430 40 06 | MALTA | Sirius Trading & Services Aleea Lacul Morii Nr. 3 RO-060841 Bucuresti, Sector 6 Phone: +40 (0)21 / 430 40 06 | ROMANIA | Omni Ray AG Im Schörl 5 CH-8600 Dübendorf Phone: +41 (0)44 / 802 28 80 | SWITZERLAND | SHERF Motion Techn. Ltd. Rehov Hamerkava 19 IL-58851 Holon Phone: +972 (0)3 / 559 54 62 | ISRAEL |
| TECHNIKON Oktyabrskaya 19, Of. 705 BY-220030 Minsk Phone: +375 (0)17 / 210 46 26 | BELARUS | Beijer Electronics Eesti OÜ Pärnu mnt.160l EE-11317 Tallinn Phone: +372 (0)6 / 51 81 40 | ESTONIA | INTEHIS srl bld. Traian 23/1 MD-2060 Kishinev Phone: +373 (0)22 / 66 42 42 | MOLDOVA | INEA RBT d.o.o. Izletnicka 10 SER-113000 Smederevo Phone: +381 (0)26 / 615 401 | SERBIA | GTS Bayraktar Bulvarı Nutuk Sok. No:5 TR-34775 Yukarı İSTANBUL Phone: +90 (0)216 526 39 90 | TURKEY | CEG INTERNATIONAL Cebaco Center/Block A Autostrade DORA Lebanon-Beirut Phone: +961 (0)1 / 240 430 | LEBANON |
| ESCO D & A Culliganlaan 3 BE-1831 Diegem Phone: +32 (0)2 / 717 64 30 | BELGIUM | Beijer Electronics OY Pelttoie 37 FIN-28400 Ulvila Phone: +358 (0)207 / 463 540 | FINLAND | HIFLEX AUTOM. B.V. Wolveveerstraat 22 NL-2984 CD Ridderkerk Phone: +31 (0)180 – 46 60 04 | NETHERLANDS | SIMAP s.r.o. Jána Derku 1671 SK-911 01 Trenčín Phone: +421 (0)32 743 04 72 | SLOVAKIA | CSC Automation Ltd. 4-B, M. Raskoyevi St. UA-02660 Kiev Phone: +380 (0)44 / 494 33 55 | UKRAINE | CBI Ltd. Private Bag 2016 ZA-1600 Isando Phone: +27 (0)11 / 977 0770 | SOUTH AFRICA |
| Koning & Hartman b.v. Woluwelaan 31 BE-1800 Vilvoorde Phone: +32 (0)2 / 257 02 40 | BELGIUM | UTECO 5, Mavrogenou Str. GR-18542 Piraeus Phone: +30 21 / 1206 900 | GREECE | Koning & Hartman b. Haarlerbergweg 21-23 NL-1101 CH Amsterdam Phone: +31 (0)20 / 587 76 00 | NETHERLANDS | PROCONT, spol. s r.o. Prešov Kúpeľná 1/A SK-080 01 Prešov Phone: +421 (0)51 7580 611 | SLOVAKIA | Systemgroup 2 M. Krivonos St. UA-03680 Kiev Phone: +380 (0)44 / 490 92 29 | UKRAINE | | |
| INEA RBT d.o.o. Aleja Lipa 56 BA-71000 Sarajevo Phone: +387 (0)33 / 921 164 | BOSNIA AND HERZEG. | MELTRADE Kft. Fertő utca 14. HU-1107 Budapest Phone: +36 (0)1 / 431-9726 | HUNGARY | Beijer Electronics AS Postboks 487 NO-3002 Drammen Phone: +47 (0)32 / 24 30 00 | NORWAY | INEA RBT d.o.o. Steigne 11 SI-1000 Ljubljana Phone: +386 (0)1 / 513 8116 | SLOVENIA | Beijer Electronics AB Box 426 SE-20124 Malmö Phone: +46 (0)40 / 35 86 00 | SWEDEN | | |
| AKHNATON 4, Andrei Ljapchev Blvd., PO Box 21 BG-1756 Sofia Phone: +359 (0)2 / 817 6000 | BULGARIA | TOO Kazpromavtomatika Ul. Zhambyla 28 KAZ-100017 Karaganda Phone: +7 7212 / 50 10 00 | KAZAKHSTAN | Fonseca S.A. R. João Francisco do Casal 87/89 PT-3801-997 Aveiro, Esigueira Phone: +351 (0)234 / 303 900 | PORTUGAL | | | | | | |
| INEA RBT d.o.o. Losinjka 4 a HR-10000 Zagreb Phone: +385 (0)1/36940-01/-02/-03 | CROATIA | Beijer Electronics SIA Ritaušmas iela 23 LV-1058 Rīga Phone: +371 (0)784 / 2280 | LATVIA | | | | | | | | |
| AutoCont C.S. s.r.o. Technologická 374/6 CZ-708 00 Ostrava-Pustkovec Phone: +420 595 691 150 | CZECH REPUBLIC | Beijer Electronics UAB Savanoriu Pr. 187 LT-02300 Vilnius Phone: +370 (0)5 / 232 3101 | LITHUANIA | | | | | | | | |



Mitsubishi Electric Europe B.V. /// FA - European Business Group /// Gothaer Straße 8 /// D-40880 Ratingen /// Germany
Tel. +49(0)2102-4860 /// Fax: +49(0)2102-4861120 /// info@mitsubishi-automation.com /// www.mitsubishi-automation.com

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