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03 July 2017

Industry 4.0 compliant frequency inverters provide plants and projects with added value

Mitsubishi Electric offers new generation smart automation solutions

A recognized leader in electric, electronic and automation industries, Mitsubishi Electric provides plants and projects with smart automation solutions thanks to new generation frequency inverters. Distinguished with energy saving up to 60 per cent and service life longer than 10 years, Mitsubishi Electric frequency inverters ensure a significant drop in operational costs. The mechanical friendly frequency inverters recognized for minimum downtime and maximum system availability offer not only high level of safety but also easy and quick set-up advantages. Mitsubishi Electric's new Industrial 4.0 compliant "Panel Inverter Solution Platform", on the other hand, combine several new generation automation products in order to enable industrial plants and infrastructure projects to undertake commissioning operations in a shorter period of time.

Globally acknowledged for its high technology, eco-friendly practices and high-quality innovative solutions for several industries, Mitsubishi Electric has launched frequency inverters as a significant component of factory automation systems with a view to offering smart solutions meeting all kinds of requirements. Known to be one of the leading driver manufacturers in the world thanks to the monthly production capacity of 80 thousand units amounting to more than 20 million units sold throughout the world for over 30 years,

Mitsubishi Electric continues to launch innovations for variable speed drive technologies. New generation 64 bit RISC processors, advanced software models and state-of-the-art power electronics technology guarantee that Mitsubishi Electric offers robust and easy-to-use variable speed drive solutions. Mitsubishi Electric offers innovative, flexible and reliable drive solutions meeting the requirements of different markets and customers.

Mitsubishi Electric's frequency inverters are compatible with all standards and features provided in the Low Voltage Directive 2006/95/EC and Machinery Directive 2006/42/EG of the European. (EN50598-2 Class IE2, ≥ 98 per cent efficiency according to European Eco Design Standard, EN50598-2 Class IES2 frequency inverter and combined efficiency of IE3/IE4 engine.) With all products coming with CE certifications constituting the basis for 89/336/EEC, also UL, cUL and DNV certifications and the certifications specific to Russian market, Mitsubishi Electric provides all the important protective functions of frequency inverters as a standard feature. Also, all Mitsubishi Electric frequency inverters are compatible with ISO 9001 quality standard and ISO 14001 environmental standard.

Energy saving up to 60 per cent

Mitsubishi Electric inverters provide a real energy saving by providing minimum power consumption as well as use of maximum drive capacity. Magnetic flux optimization guarantees that the dependent engine gets the full magnetic flux solely required for optimum efficiency. Since the engines normally use a voltage/frequency control system, this becomes especially important in low speeds. In addition online automatic setting and automatic slip compensation and SLV Vector Control, v/f control with fully programmable characteristics and Mitsubishi Electric's high OEC (Optimum Excitation Control) technology facilitate energy saving performance of frequency inverters. Those features minimize the operational costs of the system by creating saving up to 60 per cent in comparison with the use of energy from conventional grids.

Service life longer than 10 years

Mitsubishi Electric frequency inverters are among the most well-known products in the industry owing to their reliability and long service life. All series come with service life over 10 years owing to high-performance, heat resistant capacitors, fans with insulated

beds and special lubricating greases. The cooled down air flow contacts only with heat coolants and not with electronic equipment. Hence, dust or dirt is not accumulated on the equipment. Electronic cards with singly or multiple varnish are protected well against extremely polluted environment. That is another feature that prolongs the service. Manufactured as single part units, fans can be dismantled and assembled in less than 10 seconds in case of cleaning procedures or any breakdown. It is possible to replace the entire inverter quickly and easily. The fact that terminal block can be dismantled eliminates any wiring operation.

Mechanical friendly inverters with preventive maintenance advantage

Mitsubishi Electric has extended the diagnostic capabilities of frequency inverters through smart condition monitoring (SCM) technology in FR-A800-E series. Users are able to carry out condition monitoring functions directly within the inverter. This additional capability comes via the integration of the SCM Kit-1 into the FR-A800-E inverters. The pre-configured, plug-and-play solution includes the FAG SmartCheck vibration sensor from e-Factory Alliance partner Schaeffler. Combined with the PLC function, also integrated within the FR-A800-E models of inverter, it provides a complete drive-based solution for preventive maintenance. It is the only solution of its kind on the market. This integrated approach to monitoring the health of individual assets combines traffic-light indication of the asset through red, amber and green status lights on the sensor, plus more detailed analysis within the FR-A800-E series. Within the inverters operating temperature and vibration feedback from the SmartCheck sensor is combined with the monitoring of a full range of other external parameters, including speed, voltage and current information. Detailed diagnoses can be monitored remotely, or displayed on the FR-A800-E inverters' integrated screen.

Minimum downtime and maximum system availability

In the event of any deterioration in operating conditions or a likely impending failure, the system will recommend a number of preventive measures via clear text messages, or by forwarding them to higher-level systems. This means that maintenance personnel do not need any special diagnostics expertise in order to be able to identify faults. They can observe the drive messages, take the necessary actions and schedule any maintenance

work required. As a result, downtime is minimized and system availability maximized – which in turn leads to further cost reductions. The net result is that system maintenance for critical assets can be planned in advance, resulting in a longer service life.

Safety function for high performance long-lasting component life

All series come with a standard “Safe Torque Off” (STO) function compatible with EN 61800-5-2 SIL2 standards to separate the engine from feding and preventing an unexpected restart. Thus, the engine stops in unexpected and risky conditions. When compared to the conventional contactor technology, this integrated safety function reduces hardware, wiring and maintenance tasks leading to higher performance and longer economic life for components.

Easy configuration for network systems

As the new inverter supports open standard network data bus systems such as CC-Link IE Field, CC-Link, Profibus DP/DPV1, Profinet, EtherNet IP, EtherCat, DeviceNet™, CANopen and LonWorks, it makes it easier to configure network systems.

Easy and quick set-up

All frequency inverters provide control and data management capabilities optimized through ease of use and configuration. Integrated control terminals, single touch digital call, multi-language control panel with copying function and net error message screens instantly provide comprehensible information about the current drive condition.

Inherently competent F800 series frequency inverters

Designed especially for pump, fan, compressor and HVAC applications, FR‑F800 frequency inverters offer various innovative functions that combine efficiency with precision control capabilities in the best manner. They provide several advantages including 120 per cent and 150 percent overloading capacity respectively in 60 seconds and 3 seconds in ambient temperature of stable performance, start Multi PID function with 120 per cent starting torque at 0.5Hz (managing 2 different PID operations simultaneously), PID pre-charge function (soft pipe charge), input pressure control function (dry run and clogged filter detection), advanced multi-motor function (equal ageing and sequential operation), intelligent load detection function (broken belt and motor bearing damage detection), fire override function (emergency operation scenario), pump clean function (de-ragging), regeneration prevention function, mechanical resonance suppression function and BacNet communication features.

High performance, high-precision, robust and versatile A800 frequency inverters

FR-A800 frequency inverters are capable of meeting the requirements of all types of machines thanks to advanced sensorless vector control. They are distinguished with several features including 200 per cent and 250 per cent overloading capacity respectively in 60 seconds and 3 seconds in ambient temperature of 50◦C degrees, starting with the starting torque of 200 per cent at 0.3Hz, 200 per cent zero-speed torque, seamless auto-tuning performance for PM and asynchronous engines, online auto-tuning with 3 available ports for option module connection, constant break capability with 100 per cent ED, absolute positioning function, autotuning for offline operations, anti-sway function, overbraking warning, module for connection of HTL / Push-pull / Complementary type encoders for speed/torque or position controls. The modules which are compatible with TTL / HTL or SynCos type encoders of engines of different brands facilitate speed/torque or position controls. They comprise orient control, encoder feedback control, vector control, position control and encoder pulse outlet.

E700 compact frequency inverters for cost effective and versatile solutions

E700 compact frequency inverters comprise an integrated USB port, digital setting port control with integrated screens, improved power consumption in lower speeds and an expansion slot compatible with various optional cards in 700 series. All those features contribute to making FR-E700 unit an economic and versatile solution for a wide range of applications from textile machines to gate excitation and material processing systems.

D700 micro frequency inverters

As a drive setting standards in compact drives market, FR-D700 frequency inverter is reliable and easy to operate. The products are recognized for their compact design and improved performance. With spring clips, LED screen with integrated digital setting port, improved performance in lower speeds and integrated emergency stop functions, FR-D700 sets the standards in ultra-compact product class. FR-D700 provides advantages especially in standard practices with its user-friendly configuration. As the product offers ideal solutions for both simple and

complex applications, it is generally preferred for feeding and conveyor belt drives, component processing machines or revolving gate and gate drives.

Certified product safety

Mitsubishi Electric is also acclaimed for its safety in that its drives have been listed among the best in their own classes in terms of product reliability according to the results of the latest customer satisfaction survey conducted by IMS Research.

Mitsubishi Electric offers a new product compatible with Industry 4.0

Mitsubishi Electric, a giant of technology which is preferred globally by manufacturers for its high-tech automation systems, offers a brand new product, “Panel Inverter Solution Platform” which is compatible with Industry 4.0. Recognized for its efforts to provide Turkish industrialists with high-tech automation solutions with high added value, Mitsubishi Electric combines the innovative automation system solutions under “Panel Inverter Solution Platform” which is compatible with Industry 4.0. Distinguished with its outer cabin which will be manufactured in Turkey, the platform will enable industrial plants and infrastructure projects to be commissioned in a relatively short while.

As the automation of various processes such as fans, pumps, compressors, air-conditioning plants, mills, conveyors, cranes, breakers, mixers, and opening-spinning applications becomes more practical and efficient than before, “Panel Inverter Solution Platform” also eliminates the need for supplementary hardware thanks to the embedded ready-made solution parameters and programs. The platform comes with a far-fledged infrastructure offering PLC control system solution, low harmonic converter solution, break unit and break resistance solution and panel cooling system solution in addition to panel inverter solution. Besides, the platform may be procured individually or in groups based on the requirements of individual plants and projects thanks to its wide range of options and modular structure.

Modular panel system with EN 61439-1/2 type test standards

Mitsubishi Electric’s new platform boasts of a modular design equipped with bar systems and accessories meeting EN 61439-1/2 type test standards and manufactured in line with assembly instructions in addition to undergoing short circuit and temperature rise tests. Developed in line with Mitsubishi Electric’s high quality principle, the platform offers a wide range of panel IP options from IP21 to IP54 which are capable of operating effectively under humidity as high as 95 per cent and ambient temperature ranging from -10ºC to 50ºC. Also, it enables smooth grounding continuity with its peak ventilation

system comprised of fan and fan module with high emission performance and non-welded skeleton structure.

About Mitsubishi Electric Corporation

With over 90 years of experience in providing reliable, high-quality products, Mitsubishi Electric Corporation is a recognized world leader in the manufacture, marketing and sales of electrical and electronic equipment used in information processing and communications, space development and satellite communications, consumer electronics, industrial technology, energy, transportation and building equipment. Embracing the spirit of its corporate statement, Changes for the Better, and its environmental statement, Eco Changes, Mitsubishi Electric endeavours to be a global, leading green company, enriching society with technology. The company recorded consolidated group sales of 4,394.3 billion yen (US$ 38.8 billion) in the fiscal year ended March 31, 2016. For more information visit: www.MitsubishiElectric.com*

** At an exchange rate of 113 yen to the US dollar, the rate given by the Tokyo Foreign Exchange Market on March 31, 2016.*

About Mitsubishi Electric Turkey Operations

Mitsubishi Electric concentrates on sales and after-sales services for HVAC systems, factory automation systems, CNC-Mechatronics systems and advanced robot technologies in Turkey. In addition, the company provides support for satellite, elevator, visual data systems, power sources and transportation-based infrastructure projects. Mitsubishi Electric, the acknowledged manufacturer of Turksat 4A and 4B satellites contributing to communication and broadcasting infrastructure of Turkey and neighbouring countries, is also recognized for the automation technology used for Marmaray project. Having incorporated a company for development and manufacturing of room air-conditioners in Turkey in April 2016, Mitsubishi Electric intends to start manufacturing operations in Manisa plant by January 2018. For more information visit: tr.mitsubishielectric.com

About Mitsubishi Electric Turkey Factory Automation Systems

Mitsubishi Electric Turkey Factory Automation Systems division provides added value to leading industrial corporations in Turkey in a range of fields including automotive, foodstuff, packaging, metal and PVC processing machinery in terms of fast integration, efficiency, flexibility and productivity. It has adapted to "Industry 4.0", the new industrial phase, with its digital factory platform known as e-F@ctory. For more information visit: tr3a.mitsubishielectric.com