

FR-A700

Frequency Inverter

Upgrade from FR-A500 to a new class of drive



Industry leading performance gives faster production cycles and reduced material wastage



Design life of 10 years ensures reliable operation for longer and greater return on investment



Four load level options (SLD, LD, ND and HD) offer easier product sizing and greater flexibility

If you liked the FR-A500, then you will love the FR-A700

Are you still designing systems using the FR-A500? Then you are not alone. Many users of Mitsubishi inverters have found the FR-A500 to be a reliable and flexible solution to their high precision motor control needs. However, as time progresses the number of new FR-A500 installations is decreasing, as many users are now switching to Mitsubishi's latest high performance inverter the FR-A700.

Packed full with benefits

The FR-A700 brings a performance increase that will both surprise and delight users.

■ Long life

The thoughtful design of the new cooling fan has resulted in a design life of 10 years.



FR-A700 – Power, precision and performance

Building on success

The intelligent design of the FR-A700 has a high degree of compatibility with the FR-A500. Many of the parameters are the same, making it easy to transfer set-ups across especially when using the FR Configurator software which adopts the existing settings and adjust them automatically to the FR-A700.

The removable terminal blocks are also compatible with the FR-A500. An extensive rewiring is not necessary.

This can be extended even longer by using the inverters intelligent ON/OFF control. In addition the life of the capacitor has also been expanded based on 10 years.

■ Self monitoring

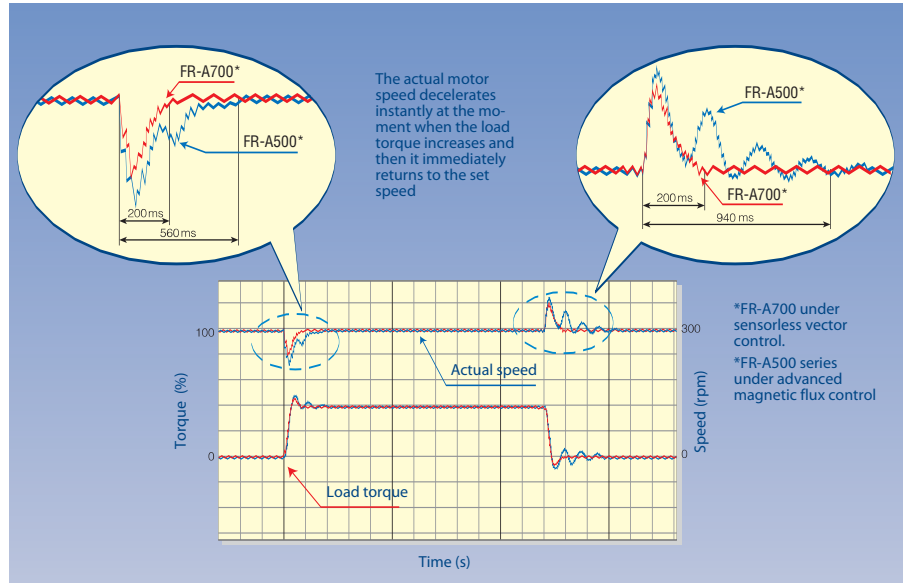
The FR-A700 can monitor the state of deterioration of the main circuit capacitor, control capacitor and in-rush limit circuits. When degradation starts to occur alarm messages are automatically output helpin users to maintain their system in optimal performance.

Wide network connectivity

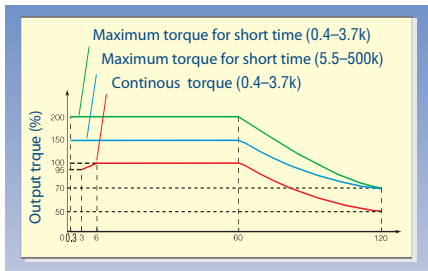
The FR-A700 can be connected to many major networks including Profibus-DP, CC-Link, LonWorks, CANopen, DeviceNET for example. In addition the units have USB connection as standard as well as RS485 which can be used for conventional multi drop applications or in a Modbus RTU configuration.

Highest level performance

The FR-A700's high accuracy and fast response speed are achieved because of Real Sensorless Vector Control. This allows high performance to be achieved even with motors without encoder feedback. The FR-A700 supports a speed control range of 1:200 over the 0.3 Hz to 60 Hz driving range and in addition the speed response has now been increased to 120 rad/s.



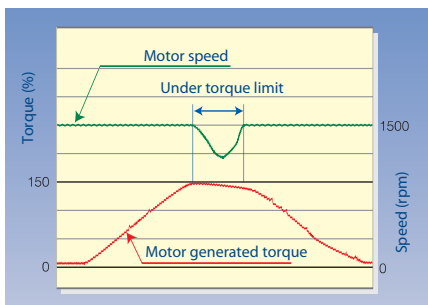
Example of actual speed variation when a load is instantaneously applied



Example of torque characteristics under real sensorless control

Torque limit function

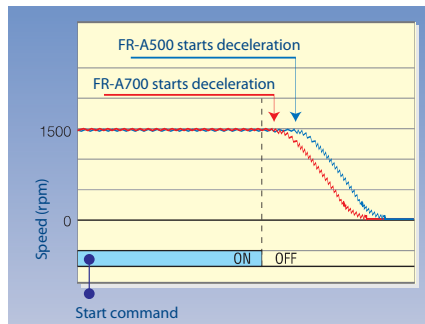
This function allows the FR-A700 to limit the maximum motor torque during speed control operation. This can be used as a method to prevent damage to controlled machinery where sudden torque disturbances occur, such as with grinding applications for example.



Example of torque limit characteristics

Input response time reduced to 50 %

With high precision-high speed applications even the slightest delay's can be serious. The FR-A700 has reduced its response time by half compared to FR-A500.



Example of input command signal response characteristic

Up to 4.7 times faster response to fluctuating loads

Impacting loads and sudden load changes, as seen in sawmill applications or large quarry conveyors, are handled quicker and easier by the FR-A700 helping to keep production running smoothly under even the most demanding conditions. The FR-A700 responded up to 2.8 times faster to applied loads and almost 4.7 times faster for removed loads.

Higher accuracy operation

When using the FR-A700 in Vector control mode with a motor with encoder feedback, users can benefit from greater speed and torque control. The speed control range of

the FR-A700 is now comparable to a simple servo system (1:1500) with an accuracy of $\pm 0.01\%$.

PLC inside as standard

The FR-A700 also has an integrated PLC function that gives the customer the ability to adapt the FR-A700's performance to his individual needs. Because of this, many small applications can now be completely handled by the FR-A700 inverter without any other control device. The PLC function allows access to the inverters internal data registers as well as digital and analog I/O. Any results obtained from mathematical calculations can be stored in the inverters EPROM memory. This keeps the results safe, even when main power is removed from the system. Programming the PLC function is simple and easy when using Mitsubishi's GX Developer programming software.

Four approved load ratings

The FR-A740 range has four approved load ratings.

Rating	Duty	Overload capacity
SLD	Super light	120 %
LD	Light	150 %
ND	Normal	200 %
HD	Heavy	250 %

This allows users to select the most appropriate inverter with confidence and ease. It also means that in many applications users can actually use a smaller inverter frame size, saving space and cost.

Specifications ///

Item	FR-A500(L-G)	FR-A 700
Control method	V/F control Advanced magnetic flux vector control	V/F control Advanced magnetic flux vector control Real sensorless vector control Vector control (used with a plug-in option FR-A7AP)
Changed/cleared functions	User group 1 (16), user group 2 (16) (Parameter 160 and 173 to 175)	User group (16) only Setting methods were partially changed (Parameter 160 and 172 to 173)
	User initial value setting (Parameter 199)	User initial value setting (Parameter 199) was cleared Substitutable with the copy function of the operation panel (FR-DU07)
	Intelligent mode selection (Parameter 60)	Parameter number change (Parameter 60: Energy saving control selection) (Parameter 292: Automatic acceleration/deceleration)
	Program operation (Parameter 200 to 231)	Function not supported, it can be achieved with PLC option
Terminal block	Removable terminal block	Removable terminal block Downward compatibility (A500 terminal block mountable)
Analog outputs	2 outputs (1 x pulse, 1 x voltage)	2 outputs (1 x current, 1 x voltage)
Parameter unit (PU)	FR-PU04, DU04	FR-PU07 FR-DU07 FR-PU04 (some functions, such as parameter copy, are unavailable.) FR-DU04 unavailable
Plug-in options	Dedicated plug-in option (incompatible)	
	Computer link, relay output option FR-A5NR	Built into the inverter (RS-485 terminals, relay output 2 points)
Installation size dimensions	FR-A740-00023 to 00250, 00470, 00620, 04320 and 05470 are compatible in mounting. For the FR-A740-00310, 00380, an optional intercompatibility attachment (FR-AAT) is necessary (see table below for unit "size" exceptions).	
	Heatsink protrusion attachment is not compatible. Also, the panel cut dimension of 00023 to 00126, 00310, 00380, 02160 or more is not compatible.	

With the exception of 12 units, all FR-A740 inverters have the same footprint as the equivalent FR-A540 product. The 12 exceptions are smaller than their FR-A540 equivalent – see the table for details.

Capacity (kW)	FR-A540				FR-A740				Drilling compatible
	Model	W	H	D	Model	W	H	D	
11	FR-A540-11k	250	400	190	FR-A740-00310	220	300	190	—
15	FR-A540-15k	250	400	190	FR-A740-00380	220	300	190	—
30	FR-A540-30k	340	550	195	FR-A740-00770	325	550	195	✓
37	FR-A540-37k	450	550	250	FR-A740-00930	435	550	250	✓
45	FR-A540-45k	450	550	250	FR-A740-01160	435	550	250	✓
55	FR-A540-55k	450	550	250	FR-A740-01800	435	550	250	✓
75	FR-A540-75k	480	740	360	FR-A740-02160	465	620	300	—
90	FR-A540-90k	480	740	360	FR-A740-02600	465	620	300	—
110	FR-A540-110k	480	740	360	FR-A740-03250	465	740	360	✓
132	FR-A540-132k	498	1010	380	FR-A740-03610	465	740	360	—
280	FR-A540-280k	790	1330	440	FR-A740-06830	680	1010	380	—
450	FR-A540-450k	1100	1900	500	FR-A740-10940	995	1580	440	—

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