# Programmable Controller **MELSEC-F Series**

### Power supply specifications (Main unit)

	Itom	Specification						
itein		FX3GA-24M□-CM	FX3GA-40M□-CM	FX3GA-60M□-CM				
	Supply voltage	100 to 240 V AC	100 to 240 V AC					
	Allowable supply voltage range	ange 85 to 264 V AC						
	Rated frequency 50/60 Hz							
	Allowable instantaneous	Operation can be continued upon occurrence of						
	power failure time	instantaneous power failure for 10 ms or less.						
	Power fuse	250 V 1 A 250 V 3.15 A						
	Rush current	30 A max. 5 ms or less/100 V AC, 50 A max. 5 ms or less/200 V AC						
	Power consumption*	32 W	37 W	40 W				
	24 V DC service power supply 400 mA							

\*: This value applies when using the maximum configuration that can be connected to the main unit and consuming the maximum amount of 24 V DC service power.

Input specifications (24 V DC input type)

Itom	Specification					
nem	FX3GA-24M□-CM FX3GA-40M□-CM FX3GA-60M□-CM					
Input form	Sink/source					
Input signal voltage	24 V DC +10%, -10%					
Input impedance	dance X000 to X007: 3.3 kΩ, X010 or more: 4.3 kΩ					
Input signal current	X000 to X007: 7 mA/24 V DC, X010 or more 5 mA/24 V DC					
ON input sensitivity current X000 to X007 4.5 mA or more, X010 or more 3.5 mA or more						
OFF input sensitivity current 1.5 mA or less						
Input response time	Approx. 10 ms					
Input circuit insulation	Photocoupler insulation					
Innut an arotion diaplay	LED on nonal lights when photosopynlax is driven					

### Transistor output specifications

Itom		Specification					
item		FX3GA-24MT-CM	FX3GA-40MT-CM	FX3GA-60MT-CM			
Output form		Transistor (Sink)					
External power	supply	5 to 30 V DC					
Max. load		Resistance load: 0.5	A/point*1, Inductive le	oad: 12 W/24 V DC*2			
Open circuit leak	age current	0.1 mA or less/30 V E	C				
ON voltage		1.5 V or less					
		Y000, Y001: 5 µs or					
	OFF→ON	less/10 mA or more	Y000 to Y002: 5 µs o	r less/			
Response		(5 to 24 V DC),	10 mA or more (5 to 24 V DC),				
time	ON→OFF	Y002 or more: 0.2	Y003 or more: 0.2 ms	s or less/200 mA or			
		ms or less/200 mA	more (at 24 V DC)				
		or more (at 24 V DC)					
Circuit insulation	n	Photocoupler insulation					
Display of outpu	t operation	LED on panel lights when photocoupler is driven.					

\*1: The total load current of resistance loads per common terminal should be the following value or less. 1 output point/common terminal: 0.5 A, 4 output points/common terminal: 0.8 A
 \*2: The total of inductive loads per common terminal should be the following value or less. 1 output

point/common terminal: 12 W/24 V DC, 4 output points/common terminal: 19.2 W/24 V DC

### Belay output specifications

Item		Specification				
		FX3GA-24MR-CM	FX3GA-40MR-CM	FX3GA-60MR-CM		
Output for	rm	Relay				
External p	ower supply	30 V DC or less, 240 V AC or less*1				
Max. load		Resistance load: 2 A/point* <sup>2</sup> , Inductive load: 80 VA				
Min. load		5 V DC, 2 mA (reference value)				
Response OFF→ON		Approx 10 ms				
time	ON→OFF	Approx. To ms				
Circuit insulation		Mechanical insulation				
Display of	output operation	LED lights when power is applied to relay coil.				
*1: Between 250 V and 240 V CE, UL, and cUL are not compliant.						

\*2: The total load current of resistance loads per common terminal should be the following value or less. 1 output point/common terminal: 2 A, 4 output points/common terminal: 8 A

### External dimensions



### ▲ Safety Warning

To ensure proper use of the products in this document, please be sure to read the instruction manual prior to

#### Item Specification (1)Number of input points 128 points (3) Total (1) + (2) < (3) total number of or less points is 128 or less.</td> (2)Number of output points 128 points or less (The total number of remote total number of remote context) of input/ output (4)Remote I/O number of points I/O points in CC-Link and AnyWireASLINK must points be 128 points or less.) 00 120 points of ress (3) + (4) Total number of points 256 points or less For general M0 to M383, 384 points EEPROM keep M384 to M1535, 1152 points For general M1536 to M7679, 6144 points For special M8000 to M8511, 512 points Auxiliary EEPROM kee elay For initial state (EEPROM keep) S0 to S9, 10 points EEPROM keep S10 to S999, 990 points State 1000 to S4095, 3096 points D to T199, 200 points (0.1 to 3,276.7 sec) or general 00 ms 10 ms T200 to T245, 46 points (0.01 to 327.67 sec) Timer 1 ms retentive type T246 to T249, 4 points (0.001 to 32.767 sec) (EEPROM keep) delav 100 ms retentive type T250 to T255, 6 points (0.1 to 3,276.7 sec) timer) (EEPROM keep) T256 to T319, 64 points (0.001 to 32.767 sec) Available as analog timers VR1: D8030, VR2: D8031 C0 to C15, 16 points (Counting from 0 to 32,767) C16 to C199, 184 points (Counting from 0 to 32,767) C200 to C219, 20 points 1 ms analog potentiomete ariab 16 bits up (For general) 16 bits up (EEPROM keep) 32 bits up/down (Counting from -2,147,483,648 to +2,147,483,647) (For general) 32 bits up/down C220 to C234, 15 points (Counting from -2,147,483,648 to +2,147,483,647) (EEPROM keep) C235 to C255 High-speed counter 1-phase: 60 kHz/2 points, 10 kHz/4 points (EEPROM keep) 2-phase: 30 kHz/1 point, 5 kHz/2 points D0 to D127, 128 points D128 to D1099, 972 points D1100 to D7999, 6900 points D1000 to D7999, Maximum 7000 points (Can be set For general (16 bits) For EEPROM keep (16 bits) Data For general (16 bits register (32 bits when (EEPROM keep) as file registers in units of 500 points from D1000 in the program area (EEPROM) using parameters.) D8000 to D8511, 512 points V0 to V7, Z0 to Z7, 16 points R0 to R23999, 24000 points aired) For special (16 bits) For index (16 bits) For general (16 bits) R0 to ER23999, 24000 points (Stored in the Extension file register EEPBOM built-in the main unit or stored in the eaister For EEPROM keep (16 bits) EEPROM in the memory cassette) For branching of JUMP and P0 to P2047, 2048 points (For CJ instructions and CALL instructions) CALL ointe Input interruption 🗆 to I5🖃, 6 points 1600 to 1800, 3 points N0 to N7, 8 points (For MC instructions) 16 bits: -32,768 to +32,767 32 bits: -2,147,483,648 to +2,147,483,647 mer interruption esting For master control Decimal number (K) 16 bits: 0 to FFFF 32 bits: 0 to FFFFFFFF nstant Hexadecimal number (H)

Perpormance Specifications

		(=)	Decimal-point and exponential notations are possible.			
Other functions						
	Specification					
Built-in L	JSB	12 Mbps maximur	n			
Built-in F	S-422 port	115.2 kbps maximu	m (9600, 19200, 38400, 57600 or 115200 bps can be set.)			
Built-in h	igh-speed	1 phase: 60 kHz ×	2 channels and 10 kHz × 4 channels			
ounter	-	2 phases: 30 kHz × 2 channels and 5 kHz × 1 channel				
Built-in h	igh-speed	100 kHz maximum	i, independent 3 axes (2 axes in the 24-point type)			
ulse ou	tput	(Available only in t	he transistor output type)			
Built-in v	ariable	2 points are incor	porated.			
nalog p	otentiometer	8 points can be ad	ded by connecting the expansion board FX3G-8AV-BD.			
voancion board		1 board can be connected to the main unit. (When an expansion				
лраныс	mboard	board is connected, special adapters cannot be used.)				
isplay r	nodule	FX3G-5DM can be a	attached.			
lemory cassette		FX3G-EEPROM-32L can be attached.				
	l adapter	24-point type mai	n unit: 1 adapter for analog and 1 adapter for			
		communication ca	an be connected.			
pecial a		40/60-point type n	nain unit: 2 adapters for analog and 2 adapters for			
		communication ca	an be connected.			
		(When special adap	ters are connected, expansion boards cannot be used.)			
pecial e	extension	15 types are avail	able for extension.			
niversal o pr extensi	communication ion	RS-232C, RS-422	and RS-485			
pplicable network		N:N Network, parallel link, computer link, CC-Link, CC-Link/LT, inverter communication, Ethernet and MODBUS				
eripher nodel to	al equipment be selected	FX3g or FX3gc				

32 bits: -1.0 × 2<sup>128</sup> to -1.0 × 2<sup>-126</sup>, 0 , 1.0 × 2<sup>-126</sup> to 1.0 × 2<sup>128</sup>

### Registration

Dool number (E)

· Ethernet is a trademark of Xerox Corporation • MODBUS is a registered trademark of Schneider Electric SA

Anywire and ANYWIREASLINK is a trademark of Anywire Corporation

· All other company names and product names used in this document are trademarks or registered trademarks

of their respective companies.

### eco for a greener tomorrow

# **Programmable Controller MELSEC-F Series**

A MIEAR

**FX**3GA

R

MELSEC-F

Standard Model

# **High-Spec Model**

ALE REALEN

Offers more advanced controls from convenient to network. Incorporates satisfactory functions required for basic control, and handles various applications.

### For higher speed and more power Offers higher expandability and highly advanced functions. Achieves high-speed control, network connection and data logging.

# Number of control points 1411

256 points in CC-Lin and AnyWireASLINK remote I/O configuration FX3G



# MITSUBISHI **ELECTRIC** Changes for the Better

# FACTORY AUTOMATION



# 3GA launched!

### A wide range of applications from analog processing to network connection

### High Performance Model MELSEC iQ F

MELSEC-F Series has undergone many advancements, making way for the next generation MELSEC iQ-F Series, with enhanced high speed bus, expanded built-in functions, advanced SSCNET III/H support, and improved engineering environment with parameter settings in GX Works3\* engineering software.

### Number of control points

512 points in CC-Lin and AnyWireASLINK FX 3UC

remote I/O

configuration



For FX3 series, use GX Works2









	[Special adapter] [There is restriction in relationship with the e: 24-point type main unit: Up to 2 special adapt (1 special adapter for analog and 1 special adapter for communication) 40/60-point type main unit: Up to 4 special ad (Up to 2 special adapters for analog and up to 2 special adapters for analog	FX3G-CNV-ADP should be 1st level. FX3G-EEPROM-3 can be attached on the 2			
•	Analog     Analog     Analog     Analog     Communication     PXsu-4AD-ADP     FXsu-232ADP-MB     FXsu-4DA-ADP     FXsu-4AD-ADP     FXsu-4AD-ADP     FXsu-4AD-PT-ADP     FXsu-4AD-FT-ADP     FXsu-4AD-FTW-ADP     FXsu-4AD-FTW-ADP     FXsu-4AD-PNK-ADP     Expansion board, memory cassette     or display module (There is restriction     in relationship with the special adapter.)				X3G-
		BD 1st level		Extension units for FX3U/FX2N	
	BD         2nd level <ul></ul>	[Expansion bo ◆ Communica FX3G-232-BD FX3G-485-BD FX3G-485-BD FX3G-485-BD	ard] tion -RJ	<ul> <li>Input</li> <li>FX3G-4EX-BD</li> <li>Output</li> <li>FX3G-2EYT-BD</li> </ul>	[Me FX30 [Dis FX30
	Can be attached on the 2nd level when a board for communication, analog, input, output, or analog volume is attached on the 1st level.	FX3G-422-BD ◆ Analog FX3G-2AD-BD FX3G-1DA-BD		<ul> <li>Anaiog Volume FX3G-8AV-BD</li> </ul>	

# What can be achieved by the functions built in the main unit

High operability is realized in the all-in-one type main unit to offer excellent cost performance especially for small-scale control.

### Large-capacity memory which can store many comments!

- The large-capacity EEPROM memory for 32,000 steps requires no maintenance.
- A memory cassette having the loader function can be also attached

32,000 steps

# data registers.

32,000 data registers.





3-axis positioning realized

GX Works2 offers simple batch

setting for positioning of 3 axes.

Pulse outputs at 100 kHz maximum

by simple programming!

are available

\*: Excluding 8,000 points of data registers

Extension register

# What can be achieved by the main unit and options

24,000 points\*

Flexible and abundant extension functions are available to achieve controls and applications in various fields.

### **Expansion board**

board

attachable

- One expansion board for communication, analog input/output or various input/output can be attached.
- A memory cassette or display







Up to 4 adapters connectable!

to the 24-point type main unit.



Temperature and analog

easily possible!

analog adapters.





\*: When special adapters are connected, expansion boards cannot be used.

# Function comparison between FX3GA and FX3G

	Lineup I/O points Power type Output type		Terminal Terminal cover		Number of BD	Battery usage	High speed counter 1-phase 1-count	Non protocol communication (on built-in port)	
NEW FX3GA	24/40/60	AC	Relay/ Transistor (sink)	-	24/40 points: not supported 60 points: supported	1	-	60 kHz: 2 ch 10 kHz: 4 ch	√*
FX3G	14/24/40/60	AC/DC	Relay/ Transistor (sink)/ Transistor (source)	$\checkmark$	Supported	14/24 points: 1 40/60 points: 2	$\checkmark$	60 kHz: 4 ch 10 kHz: 2 ch	$\checkmark$

\*: Not supported on the built-in RS-422 port (ch0).

# Example of FX3GA system configuration - Filling machine -



# FX3GA can meet these requirements!

### Point 1

FX3GA can perform simultaneous positioning of 3 axes using the built-in function! EX3GA controls the AC servo amplifier for multiple axes for accurate filling. The filling nozzle can be taken in and out without generating air bubbles to improve the product guality.

### Point 2

FX3GA is compatible with various networks including MODBUS® and Ethernet to enable system upgrade at reasonable cost.



### analog input/output. RS-422 USB -

### Programming is not required for The main unit incorporates USB and RS-422 ports. Up to 4 channels in total are available Up to 8 channels are available (in by connecting communication the 40/60-point type main unit) for board/communication adapter

on 4 channels!

Simultaneous communication

Bar code reader can be connected.





### More than 30,000 data registers! High-speed signal input at 60 kHz! • The PLC main unit incorporates 2 channels at 60 kHz and 4 channels at 10 kHz can be used The EEPROM is used to back up simultaneously. Many high-speed instructions are available for fast response



onnection of ial adapters to FX3G -CNV-ADP



emory cassette] G-EEPROM-32L splay module] ag-5DM

### Convenient solutions with Mitsubishi Electric FA equipme

# Mitsubishi Electric **FA solutions**

Connecting the abundant functions incorporated in the main unit and extension units to directly connectable Mitsubish lectric FA equipment enables high efficiency and easy operation.



From stand alone use to networked system applications, MELSEC iQ-F Series brings your business to the next level of industry



### Display GOTSIMPLE

GOT SIMPLE not only offers ease of use with one-touch operation and functions specific to the display unit, but also enhances the connectivity with various FA equipment. GOT SIMPLE displays offer excellent functions required by the production site on a beautiful display, and enables higher productivity and efficiency.





MELSERI/O

FREDROL-D700

# Positioning

MELSERVO contributes to improvement of the total system at manufacturing facilities and production facilities. Rotary servo motor. linear servo motor and direct drive motor are available to considerably improve the facility performance.



# Drive

### FREQROL meets the various needs of our customers with the best choice

Inverters are variable frequency power supply devices which can easily and freely change the rotation speed of three-phase induction motors. Mitsubishi Electric has achieved high performance while caring for the environment and complying with global standards, and offers a wide lineup of inverters suitable for any of various applications.



## **Display with control**

**GOC-Graphic Operation Controller** An integrated PLC & HMI. Its aim is to meet the low end automation needs of the Indian and global markets.



Mitsubishi Electric India intends to increase the market share in entry level markets in different sectors like Packaging, HVAC, Textile and other applications in SPM. All in one unit: HMI + PLC + IO + Mimic + Annunciators + PB/Lamps.