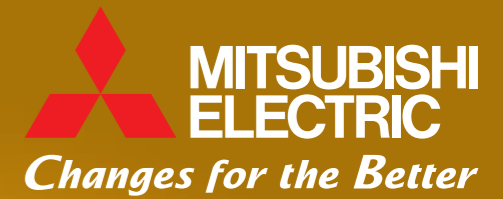


# Programmable Controller MELSEC-F Series



FACTORY AUTOMATION

## Power supply specifications (Main unit)

Item	Specification		
	FX3GA-24M□-CM	FX3GA-40M□-CM	FX3GA-60M□-CM
Supply voltage	100 to 240 V AC		
Allowable supply voltage range	85 to 264 V AC		
Rated frequency	50/60 Hz		
Allowable instantaneous power failure time	Operation can be continued upon occurrence of 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)

Item	Specification		
	FX3GA-24M□-CM	FX3GA-40M□-CM	FX3GA-60M□-CM
Input form	Sink/source		
Input signal voltage	24 V DC +10%, -10%		
Input impedance	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		
Input operation display	LED on panel lights when photocoupler is driven.		

## Transistor output specifications

Item	Specification		
	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*, Inductive load: 12 W/24 V DC**		
Open circuit leakage current	0.1 mA or less/30 V DC		
ON voltage	1.5 V or less		
Response time	OFF→ON	Y000, Y001: 5 μs or less/10 mA or more (5 to 24 V DC), Y002 or more: 0.2 ms or less/200 mA or more (at 24 V DC)	Y000 to Y002: 5 μs or less/10 mA or more (5 to 24 V DC), Y003 or more: 0.2 ms or less/200 mA or more (at 24 V DC)
	ON→OFF	Y000 to Y002: 5 μs or less/10 mA or more (5 to 24 V DC), Y003 or more: 0.2 ms or less/200 mA or more (at 24 V DC)	
Circuit insulation	Photocoupler insulation		
Display of output operation	LED on panel lights when photocoupler is driven.		

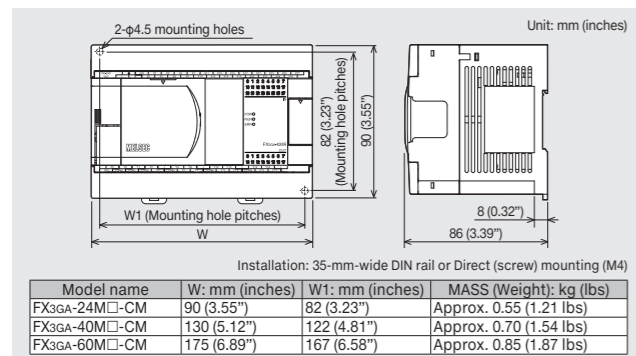
\*1: The total load current of resistance loads per common terminal should be the following value or less. 1 output point/common terminal: 0.5 A, 4 output points/common terminal: 0.8 A  
\*2: The total load current of resistance loads per common terminal should be the following value or less. 1 output point/common terminal: 12 W/24 V DC, 4 output points/common terminal: 19.2 W/24 V DC

## Relay output specifications

Item	Specification		
	FX3GA-24MR-CM	FX3GA-40MR-CM	FX3GA-60MR-CM
Output form	Relay		
External power supply	30 V DC or less, 240 V AC or less*		
Max. load	Resistance load: 2 A/point**, Inductive load: 80 VA		
Min. load	5 V DC, 2 mA (reference value)		
Response time	OFF→ON	Approx. 10 ms	
	ON→OFF	Approx. 10 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 use.

## Performance Specifications

Item	Specification
Number of input/output points	(1)Number of input points: 128 points (3) Total (1) + (2) < (3) total number of or less points points is 128 or less.
	(2)Number of output points: 128 points or less (The total number of remote I/O points in CC-Link and AnyWireASLINK must be 128 points or less.)
	(4)Remote I/O number of points: 256 points or less
	(3) + (4) Total number of points: 256 points or less
Auxiliary relay	For general: M0 to M383, 384 points
	EEPROM keep: M384 to M1535, 1152 points
	For special: M1536 to M7679, 6144 points
State	For initial state (EEPROM keep): S0 to S9, 10 points
	EEPROM keep: S10 to S999, 990 points
	For general: S1000 to S4095, 3096 points
Timer (on-delay timer)	100 ms: T0 to T199, 200 points (0.1 to 3,276.7 sec)
	10 ms: T200 to T245, 46 points (0.01 to 327.67 sec)
	1 ms retentive type (EEPROM keep): T246 to T249, 4 points (0.001 to 32.767 sec)
	100 ms retentive type (EEPROM keep): T250 to T255, 6 points (0.1 to 3,276.7 sec)
Variable analog potentiometers	1 ms: T256 to T319, 64 points (0.001 to 32.767 sec)
	Available as analog timers VR1: D8030, VR2: D8031
Counter	16 bits up (For general): C0 to C15, 16 points (Counting from 0 to 32,767)
	16 bits up (EEPROM keep): C16 to C199, 184 points (Counting from 0 to 32,767)
	32 bits up/down (For general): C200 to C219, 20 points (Counting from -2,147,483,648 to +2,147,483,647)
	32 bits up/down (EEPROM keep): C220 to C234, 15 points (Counting from -2,147,483,648 to +2,147,483,647)
Data register (32 bits when paired)	High-speed counter (EEPROM keep): C235 to C255, 1-phase: 60 kHz/2 points, 10 kHz/4 points 2-phase: 30 kHz/1 point, 5 kHz/2 points
	For general (16 bits): D0 to D127, 128 points
	For EEPROM keep (16 bits): D128 to D1099, 972 points
	For general (16 bits): D1100 to D7999, 6900 points
Extension register	File register (EEPROM keep): D1000 to D7999, Maximum 7000 points (Can be set as file registers in units of 500 points from D1000 in the program area (EEPROM) using parameters.)
	For special (16 bits): D8000 to D8511, 512 points
	For index (16 bits): V0 to V7, Z0 to Z7, 16 points
	For general (16 bits): R0 to R23999, 24000 points
Pointer	Extension file register For EEPROM keep (16 bits): E0 to ER23999, 24000 points (Stored in the EEPROM built-in the main unit, or stored in the EEPROM in the memory cassette)
	For branching of JUMP and CALL: P0 to P2047, 2048 points (For CJ instructions and CALL instructions)
Nesting	Input interruption: I0□□ to I5□□, 6 points
	Timer interruption: I6□□ to I8□□, 3 points
Constant	For master control: N0 to N7, 8 points (For MC instructions)
	Decimal number (K): 16 bits: -32,768 to +32,767 32 bits: -2,147,483,648 to +2,147,483,647
Other functions	Hexadecimal number (H): 16 bits: 0 to FFFF 32 bits: 0 to FFFFFFFF
	Real number (E): 32 bits: -1.0 × 2 <sup>128</sup> to -1.0 × 2 <sup>-128</sup> , 0, 1.0 × 2 <sup>-128</sup> to 1.0 × 2 <sup>128</sup> Decimal-point and exponential notations are possible.

## Other functions

Item	Specification
Built-in USB	12 Mbps maximum
Built-in RS-422 port	115.2 kbps maximum (9600, 19200, 38400, 57600 or 115200 bps can be set.)
Built-in high-speed counter	1 phase: 60 kHz × 2 channels and 10 kHz × 4 channels 2 phases: 30 kHz × 2 channels and 5 kHz × 1 channel
Built-in high-speed pulse output	100 kHz maximum, independent 3 axes (2 axes in the 24-point type) (Available only in the transistor output type)
Built-in variable analog potentiometer	2 points are incorporated. 8 points can be added by connecting the expansion board FX3G-8AV-BD.
Expansion board	1 board can be connected to the main unit. (When an expansion board is connected, special adapters cannot be used.)
Display module	FX3G-5DM can be attached.
Memory cassette	FX3G-EEPROM-32L can be attached.
Special adapter	24-point type main unit: 1 adapter for analog and 1 adapter for communication can be connected. 40/60-point type main unit: 2 adapters for analog and 2 adapters for communication can be connected. (When special adapters are connected, expansion boards cannot be used.)
Special extension for extension	15 types are available for extension.
Universal communication for extension	RS-232C, RS-422 and RS-485
Applicable network	N:N Network, parallel link, computer link, CC-Link, CC-Link/LT, inverter communication, Ethernet and MODBUS
Peripheral equipment model to be selected	FX3G or FX3GC

## Registration

- 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.

## MITSUBISHI ELECTRIC CORPORATION

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<http://Global.MitsubishiElectric.com>

# Programmable Controller MELSEC-F Series FX3GA



# MELSEC-F FX3GA launched!

A wide range of applications from analog processing to network connection

### Standard Model

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

Number of control points

128 points

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



### High-Spec Model

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

256 points

384 points in CC-Link and AnyWireASLINK remote I/O configuration



### 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

256 points

512 points in CC-Link and AnyWireASLINK remote I/O configuration



\*: For FX3 series, use GX Works2.

# FX3GA



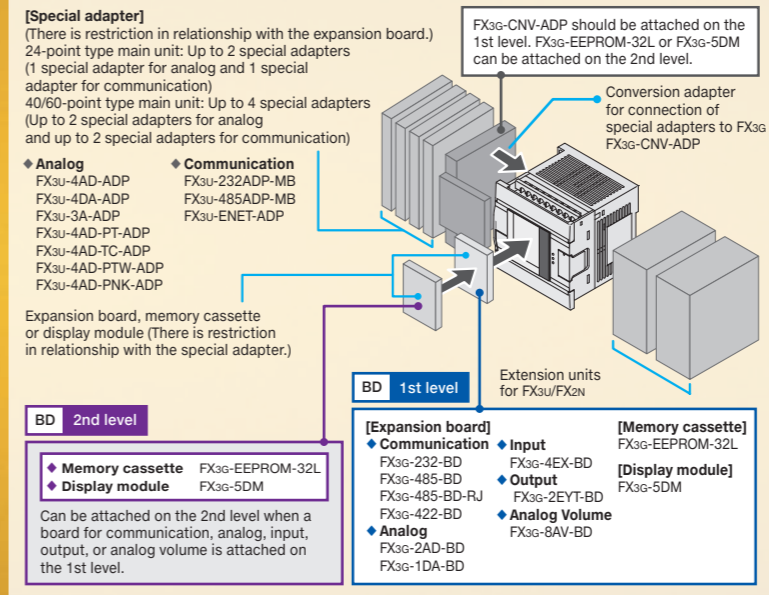
FX3GA-24MR-CM FX3GA-24MT-CM  
14 input points/10 output points



FX3GA-40MR-CM FX3GA-40MT-CM  
24 input points/16 output points



FX3GA-60MR-CM FX3GA-60MT-CM  
36 input points/24 output points



## Convenient solutions with Mitsubishi Electric FA equipment Mitsubishi Electric FA solutions

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

### Control MELSEC iQ-F Series

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



### Display GOT SIMPLE

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.



### Positioning MELSERVO

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-D700

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.

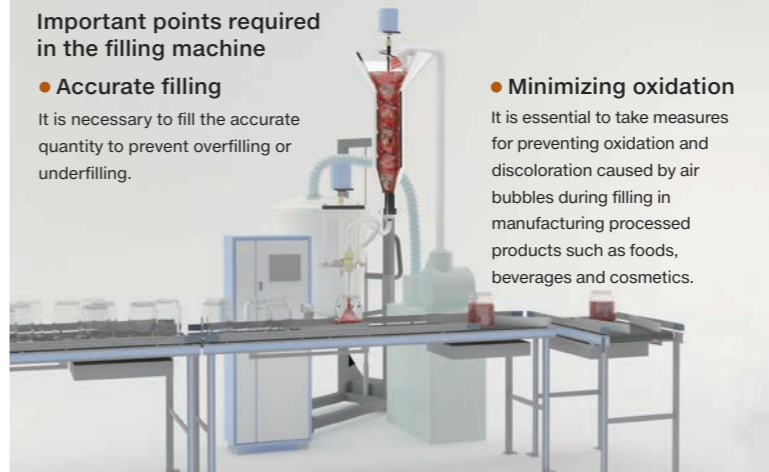


### Display with control

**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.



## Example of FX3GA system configuration - Filling machine -

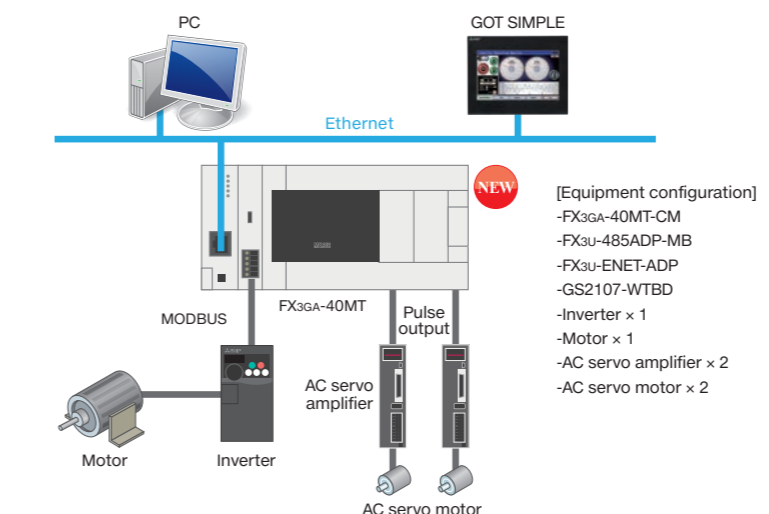


### Important points required in the filling machine

- Accurate filling**  
It is necessary to fill the accurate quantity to prevent overflowing or underfilling.
- Minimizing oxidation**  
It is essential to take measures for preventing oxidation and discoloration caused by air bubbles during filling in manufacturing processed products such as foods, beverages and cosmetics.

## FX3GA can meet these requirements!

- Point 1**  
FX3GA can perform simultaneous positioning of 3 axes using the built-in function! FX3GA 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 quality.
- Point 2**  
FX3GA is compatible with various networks including MODBUS® and Ethernet to enable system upgrade at reasonable cost.



## 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

### More than 30,000 data registers!

- The PLC main unit incorporates 32,000 data registers.
- The EEPROM is used to back up data registers.

Extension register  
24,000 points\*

\*: Excluding 8,000 points of data registers

### High-speed signal input at 60 kHz!

- 2 channels at 60 kHz and 4 channels at 10 kHz can be used simultaneously.
- Many high-speed instructions are available for fast response.

60 kHz

### 3-axis positioning realized by simple programming!

- Pulse outputs at 100 kHz maximum are available.
- GX Works2 offers simple batch setting for positioning of 3 axes.

3 axes  
40/60-point type

## What can be achieved by the main unit and options

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

### Expansion board

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

1 expansion board attachable

### Up to 4 adapters connectable!

- Up to 4 adapters can be connected to the 40/60-point type main unit.
- Up to 2 adapters can be connected to the 24-point type main unit.

2 or more adapters connectable

### Temperature and analog easily possible!

- Programming is not required for analog adapters.
- Up to 8 channels are available (in the 40/60-point type main unit) for analog input/output.

Temperature and analog

### Simultaneous communication on 4 channels!

- The main unit incorporates USB and RS-422 ports. Up to 4 channels in total are available by connecting communication board/communication adapter.
- Bar code reader can be connected.

RS-422 USB +Board +Adapter\*  
4 ch

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

## Function comparison between FX3GA and FX3G

	Lineup			Terminal		Number of BD	Battery usage	High speed counter 1-phase 1-count	Non protocol communication (on built-in port)
	I/O points	Power type	Output type	Terminal cover	Removable				
<b>NEW</b> 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)	✓	Supported	14/24 points: 1 40/60 points: 2	✓	60 kHz: 4 ch 10 kHz: 2 ch	✓

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