MITSUBISHI ELECTRIC
Changes for the Better

Automating the World

INVERTER

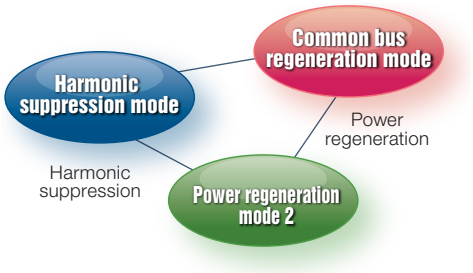
FACTORY AUTOMATION

New Product RELEASE No.25-1E-A

A New Lineup of FR-XC Series Multifunction Regeneration Converters

■ Multifunction power regeneration converter

Choose the suitable function for your needs by using the FR-XC converter with the FR-XCB, FR-XCL, or FR-XCG reactor.



Common bus regeneration mode : As the power returned from an inverter during regenerative driving can be supplied to another inverter, none of the inverters requires a brake unit, which enables total space and cost reduction.

Harmonic suppression mode : The total harmonic distortion of the input current (THDi) is 5% or less, which facilitates compliance with the overseas standards related to harmonic suppression.

Power regeneration mode 2 : The capacity of the FR-XC series converter is selectable according to the regenerative power of the system. Thus, the compact converter is applicable for the regenerative power smaller than the inverter capacity, which contributes to space saving.

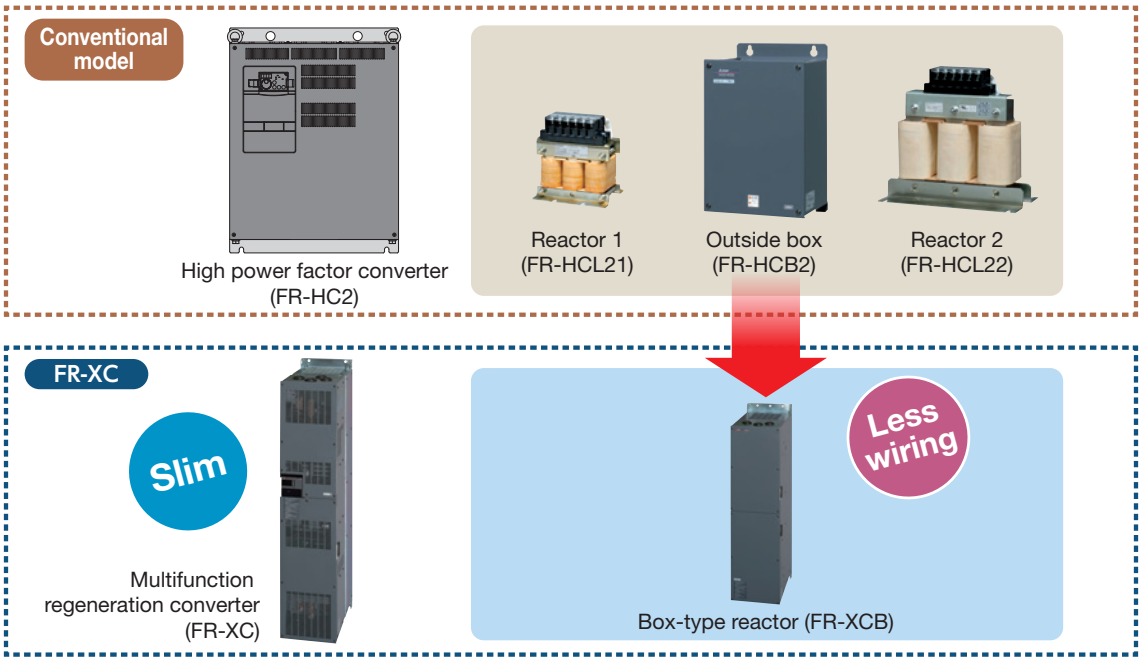
Release schedule June 2025

Merits

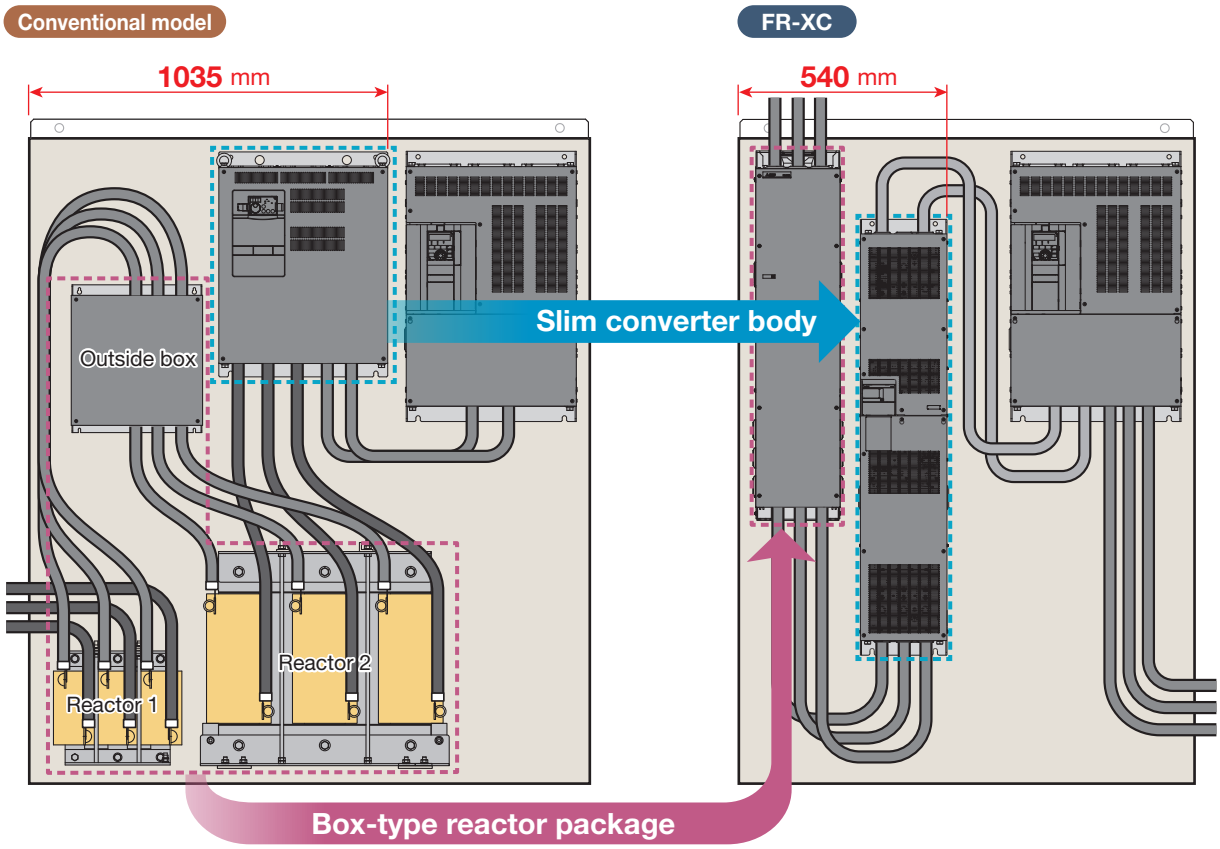
■ Wire and space saving

The slim converter requires less space, and the FR-XCB box-type reactor*1 enables wiring reduction as it contains peripheral devices such as reactors.

*1: Used for the FR-XC converter in harmonic suppression mode.



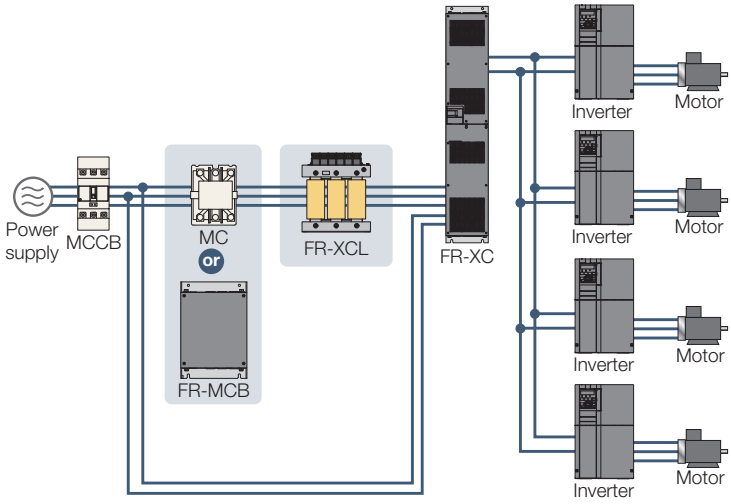
Width of the FR-XC-H110K (compared with the conventional model)



System configuration

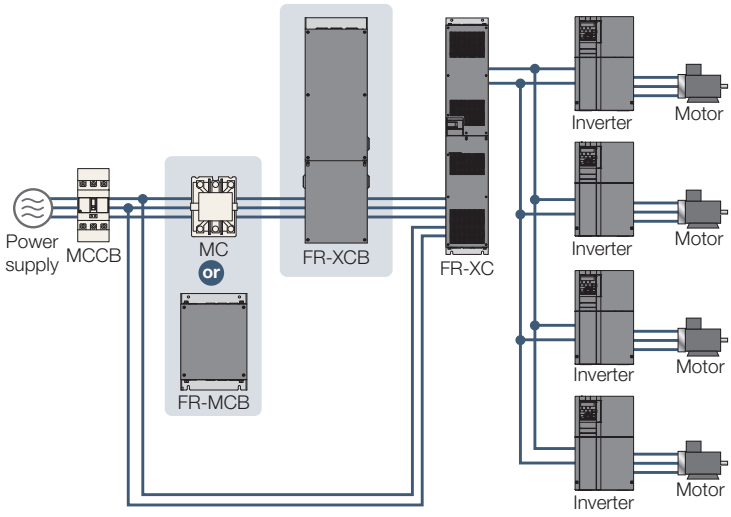
The devices required depend on the control mode.

Common bus regeneration mode



- The dedicated contactor box FR-MCB is used for coordination with the charging circuit. When it is used instead of an MC, the power supply for MC operation coil is not required, enabling easier wiring.
- Up to 10 inverters can be connected.

Harmonic suppression mode



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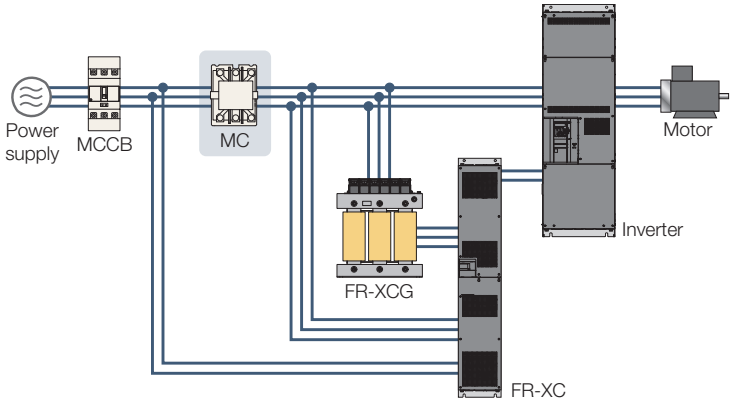
Power regeneration mode 2



- The FR-XCG reactor is used only with the FR-XC in power regeneration mode 2.
- Only one inverters can be connected.

Rated specifications

Model FR-XC-H[ ]K(-PWM)*1				110
Common bus regeneration mode	50°C rating	Applicable inverter capacity (kW)		110
		Applicable motor current (A)		216
		Rated input current (A)	Power driving	231
			Regenerative driving	198
		Overload current rating		100% continuous / 150% 60 s
		Power supply capacity (kVA)*2		195
	40°C rating	Applicable inverter capacity (kW)		132
		Applicable motor current (A)		260
		Rated input current (A)	Power driving	275
			Regenerative driving	238
		Overload current rating		100% continuous / 150% 60 s
		Power supply capacity (kVA)*2		232
	Power source	Rated input AC voltage/frequency		Three-phase 380 to 500 V, 50/60 Hz*3*4
		Permissible AC voltage fluctuation		Three-phase 323 to 550 V, 50/60 Hz
		Permissible frequency fluctuation		±5%
	Protection rating of structure			Open type (IP20 for IEC 60529 only)*5 (FR-MCB included)
Harmonic suppression mode	50°C rating	Applicable inverter capacity (kW)		110
		Applicable motor current (A)		216
		Rated input current (A)	Power/regenerative driving	203
		Overload current rating		100% continuous / 150% 60 s
		Power supply capacity (kVA)*2		171
	40°C rating	Applicable inverter capacity (kW)		132
		Applicable motor current (A)		260
		Rated input current (A)	Power/regenerative driving	241
		Overload current rating		100% continuous / 150% 60 s
		Power supply capacity (kVA)*2		205
	Power source	Rated input AC voltage/frequency		Three-phase 380 to 480 V, 50/60 Hz*6
		Permissible AC voltage fluctuation		Three-phase 323 to 506 V, 50/60 Hz
		Permissible frequency fluctuation		±5%
	Input power factor			0.99 or more (when load ratio is 100%)
	Protection rating of structure			Open type (IP20 for IEC 60529 only)*5 (FR-XCB and FR-MCB included)
Power regeneration mode 2	50°C rating	Potential regenerative capacity (kW)*7		110
		Rated current (A)	Regenerative driving	198
		Overload current rating		100% continuous / 150% 60 s
	40°C rating	Potential regenerative capacity (kW)*7		132
		Rated current (A)	Regenerative driving	238
		Overload current rating		100% continuous / 150% 60 s
	Power source	Rated input AC voltage/frequency		Three-phase 380 to 500 V, 50/60 Hz*4
		Permissible AC voltage fluctuation		Three-phase 323 to 550 V, 50/60 Hz
		Permissible frequency fluctuation		±5%
	Protection rating of structure			Open type (IP20 for IEC 60529 only)*5
Cooling system				Forced air
Number of connectable inverters				10*8*9
Approx. mass (kg)*10				75

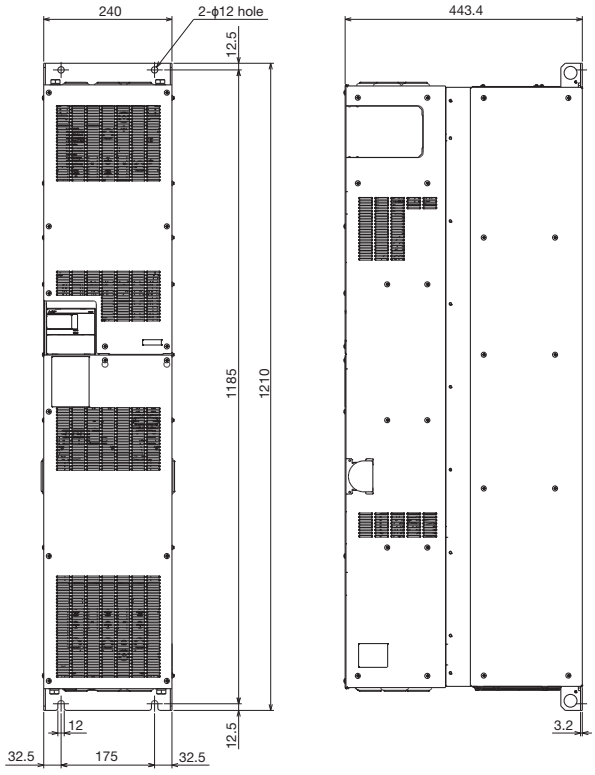
*1: The factory defaults of the control method differ by model (FR-XC-[ ]K: common bus regeneration mode, FR-XC-[ ]K-PWM: harmonic suppression mode).
*2: Selection example for 440 V power supply voltage.
*3: The rated voltage of the FR-MCB is three-phase 380 to 480 V, 50/60 Hz.
*4: The permissible voltage imbalance ratio is 3% or less. (Unbalance factor = Max | Line voltage - Mean of three line voltages | / Mean of three line voltages × 100)
*5: IP00 when the side wiring cover of the FR-XC is removed.
*6: The DC bus voltage is approx. 594 VDC at an input voltage of 400 VAC, approx. 653 VDC at 440 VAC, and approx. 713 VDC at 480 VAC.
*7: Maximum capacity of regenerative power generated from the Mitsubishi Electric 4-pole standard motor in each axis.
*8: If you want to connect 11 or more inverters, contact your sales representative.
*9: One inverter for operation in the power regeneration mode 2.
*10: Mass of the FR-XC alone.

Outline dimensions

(Unit: mm)

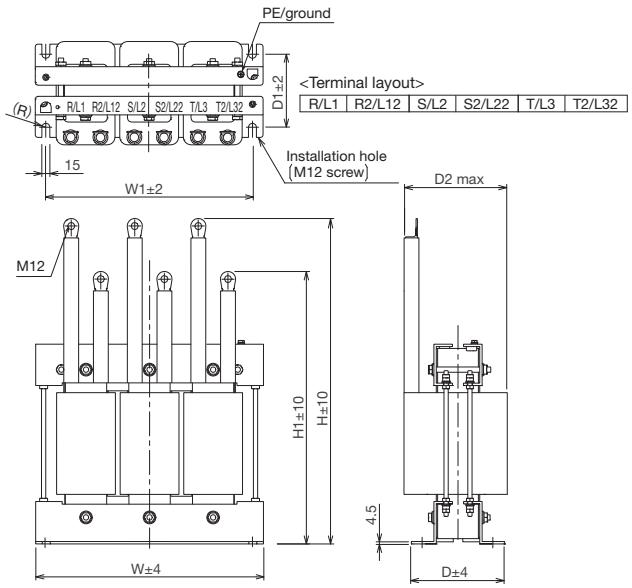
Multifunction regeneration converter FR-XC

• FR-XC-H110K(-PWM)



Dedicated stand-alone reactor FR-XCL/FR-XCG

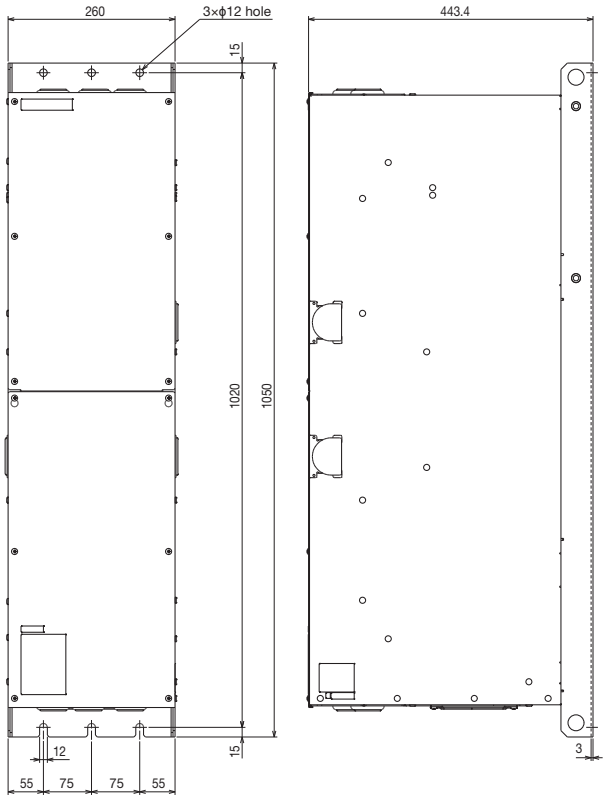
• FR-XCL-H110K, H132K
• FR-XCG-H110K



Model	W	W1	D	D1	D2	H	H1	Terminal screw size	Mass
FR-XCL-H110K	430	390	176	138	195	510	425	M12	74 kg
FR-XCL-H132K						520	435		79 kg
FR-XCG-H110K						510	425		72 kg

Dedicated box-type reactor FR-XCB

• FR-XCB-H110K



Model	Mass
FR-XCB-H110K	164 kg

Lineup

● : Newly released model
● : Released
— : Not applicable

• Multifunction regeneration converter model

Multifunction regeneration converter with harmonic suppression and power regeneration functions.

FR-XC-H110K

Symbol	Voltage
None	200 V class
H	400 V class

Converter capacity
Capacity (kW)

Symbol	Circuit board coating	Plated conductor
None	Without	Without
-60	With	Without
-06	With	With

Symbol	Functional specification*1
None	Common bus regeneration mode
-PWM	Harmonic suppression mode

*1: Pr.416 ="9999"

Voltage	Model	7.5	11	15	18.5	22	30	37	55	75	110	160	220
200 V	FR-XC-[ ]K	●	●	●	—	●	●	●	●	—	—	—	—
	FR-XC-[ ]K-PWM	—	—	—	●	●	—	●	●	—	—	—	—
400 V	FR-XC-H[ ]K	●	●	●	—	●	●	●	●	●	●	●	●
	FR-XC-H[ ]K-PWM	—	—	—	●	●	—	●	●	●	●	●	●

• Dedicated stand-alone reactor (option) model

A dedicated stand-alone reactor for use with the FR-XC converter in common bus regeneration mode.

FR-XCL-H110K

Symbol	Voltage
None	200 V class
H	400 V class

Reactor capacity
Capacity (kW)

A dedicated stand-alone reactor for use with the FR-XC converter in power regeneration mode 2.

FR-XCG-H110K

Symbol	Voltage
None	200 V class
H	400 V class

Reactor capacity
Capacity (kW)

Voltage	Model	7.5	11	15	22	30	37	55	75	90	110	132	160	185	220	250
200 V	FR-XCL-[ ]K	●	●	●	●	●	●	●	—	—	—	—	—	—	—	—
	FR-XCG-[ ]K	●	●	●	●	●	●	●	—	—	—	—	—	—	—	—
400 V	FR-XCL-H[ ]K	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	FR-XCG-H[ ]K	●	●	●	●	●	●	●	●	●	●	●	●	●	●	—

• Dedicated box-type reactor (option) model

A dedicated stand-alone box-type reactor for use with the FR-XC converter in harmonic suppression mode.

FR-XCB-H110K

Symbol	Voltage
None	200 V class
H	400 V class

Reactor capacity
Capacity (kW)

Symbol	Circuit board coating
None	Without
-60	With

Voltage	Model	18.5	22	37	55	75	110	160	220
200 V	FR-XCB-[ ]K	●	●	●	●	—	—	—	—
400 V	FR-XCB-H[ ]K	●	●	●	●	●	●	●	●

• Dedicated contactor box (option) model

A dedicated contactor box used for coordination with the charging circuit.

FR-MCB-H400

Symbol	Voltage
H	400 V class

Capacity	Built-in magnetic contactor
150	S-N150 AC200V
400	S-N400 AC200V
800	S-N400 AC200V (2pcs)

Combination with FR-XC-H110K

Operation mode	Model	Rated surrounding temperature	Capacity
Common bus regeneration mode	FR-XC- H 110K FR-XC- H 110K-PWM	40°C / 50°C rating	FR-MCB-H400
Harmonic suppression mode			

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