

INVERTER

New Product RELEASE

No.23-1E

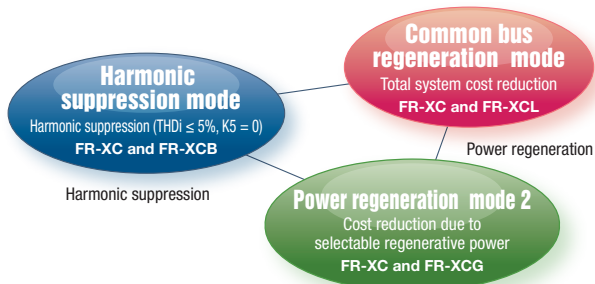
A New Lineup of FR-XC Series Multifunction Regeneration Converters

Addition of a new stand-alone option for our general-purpose inverters—400 V class 160K/220K FR-XC series converters which have a harmonic suppression function and power regeneration capability.

Features

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.



Compact design offers solution to harmonic problems

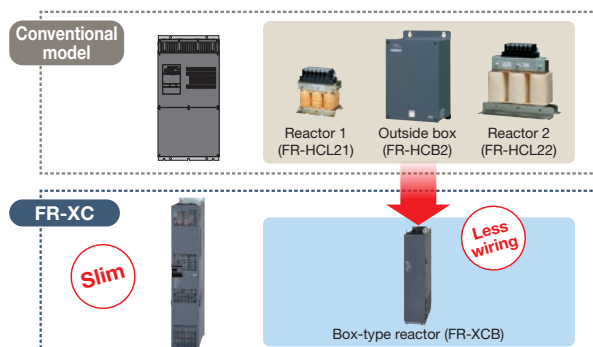
When the FR-XC series converter is used with the dedicated box-type reactor FR-XCB, the total harmonic distortion of the input current (THDi) is 5% or less, which facilitates compliance with the overseas standards related to harmonic suppression.

Merits

Wire and space saving

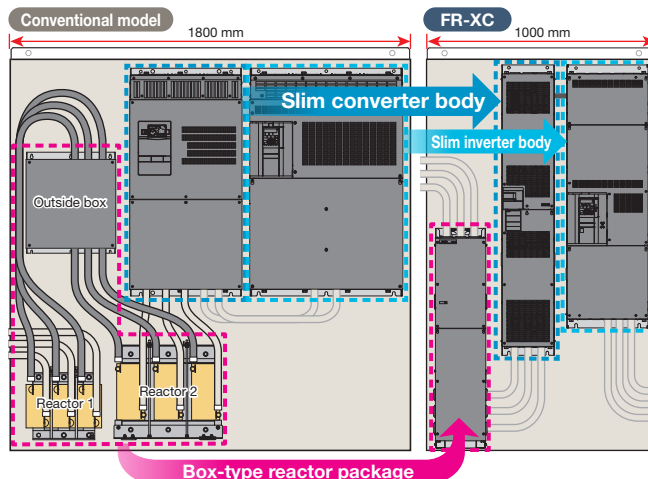
The slim converter requires less space, and the FR-XCB box-type reactor^{*1} enables wiring reduction as it contains peripheral devices such as reactors.

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



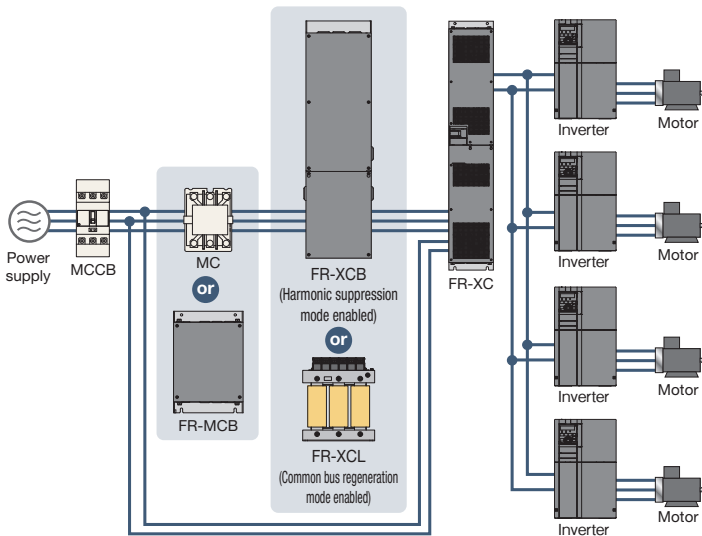
Installation space reduced by 40% or more

Width is reduced from 1800 mm to 1000 mm.



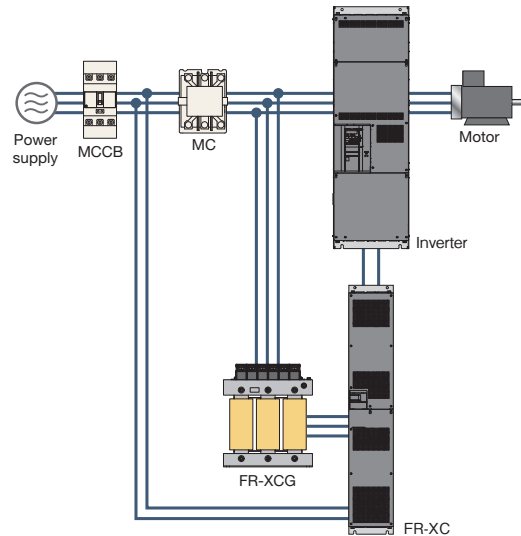
System configuration

Common bus regeneration mode/Harmonic suppression mode



- The dedicated contactor box FR-MCB is installed for coordination with the charging circuit.
- Up to 10 inverters can be connected.

Power regeneration mode 2



- The FR-XCG reactor is used only with the FR-XC in power regeneration mode 2.

Rated specifications

Model FR-XC-H[JK(-PWM)*1				160	220
Common bus regeneration mode	50°C rating	Applicable inverter capacity (kW)		160	220
		Applicable motor current (A)		325	432
		Rated input current (A)	Power driving	331	450
			Regenerative driving	288	396
		Overload current rating		100% continuous / 150% 60 s	
	40°C rating	Power supply capacity (kVA)*2		279	379
		Applicable inverter capacity (kW)		185	250
		Applicable motor current (A)		361	481
		Rated input current (A)	Power driving	382	515
			Regenerative driving	333	450
		Overload current rating		100% continuous / 150% 60 s	
		Power supply capacity (kVA)*2		322	434
Harmonic suppression mode	50°C rating	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%	
		Applicable inverter capacity (kW)		160	220
		Applicable motor current (A)		325	432
	40°C rating	Rated input current (A)	Power/regenerative driving	290	397
			Overload current rating	100% continuous / 150% 60 s	
		Power supply capacity (kVA)*2		245	334
		Applicable inverter capacity (kW)		185	250
		Applicable motor current (A)		361	481
	Power source	Rated input current (A)	Power/regenerative driving	335	450
			Overload current rating	100% continuous / 150% 60 s	
		Power supply capacity (kVA)*2		282	379
		Rated input AC voltage/frequency		Three-phase 380 to 480 V, 50/60 Hz*5	
		Permissible AC voltage fluctuation		Three-phase 323 to 506 V, 50/60 Hz	
Power regeneration mode 2	50°C rating	Permissible frequency fluctuation		±5%	
		Input power factor		0.99 or more (when load ratio is 100%)	
		Potential regenerative capacity (kW)*6		132	185
		Rated current (A)	Regenerative driving	238	333
			Overload current rating	100% continuous / 150% 60 s	
	40°C rating	Potential regenerative capacity (kW)*6		160	220
		Rated current (A)	Regenerative driving	288	396
			Overload current rating	100% continuous / 150% 60 s	
		Protection rating of structure (IEC 60529)		IP20*7(also for FR-XCB and FR-MCB)	
		Cooling system		Forced air	
		Number of connectable inverters		10*8*9	
		Approx. mass (kg)*10		96	

*1: The factory defaults of the control method differ by model (FR-XC-[JK: common bus regeneration mode, FR-XC-[JK(-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 = $\frac{\text{Max | Line voltage - Mean of three line voltages |}}{\text{Mean of three line voltages}} \times 100$)

*5: 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.

*6: Maximum capacity of regenerative power generated from the Mitsubishi Electric 4-pole standard motor in each axis.

*7: IP00 when the side wiring cover of the FR-XC is removed.

*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.

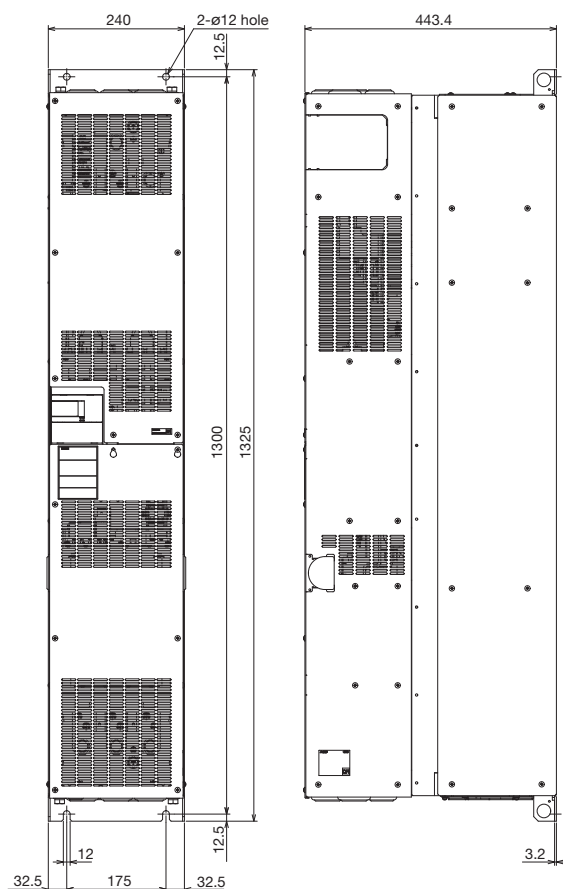
*10: Mass of the FR-XC alone.

Outline dimensions

Unit: mm

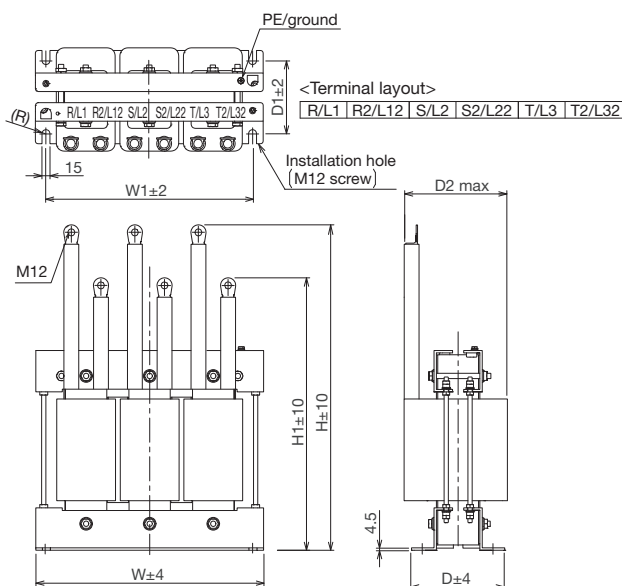
Multifunction regeneration converter FR-XC

- FR-XC-H160K, H220(-PWM)



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

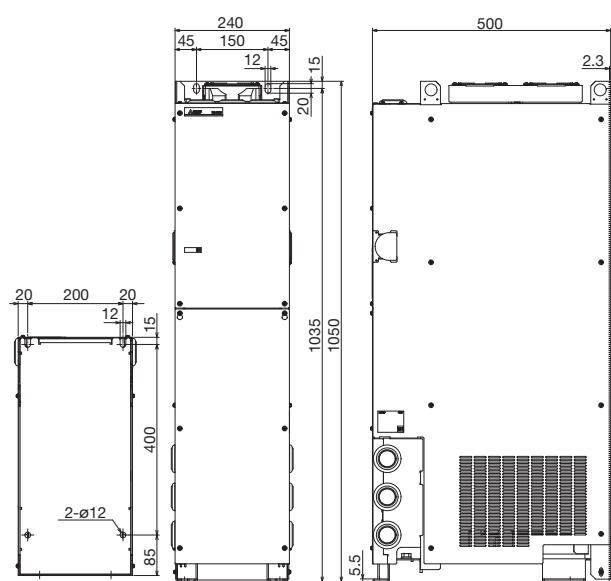
- FR-XCL-H160K, H185K, H220K, H250K
- FR-XCG-H132K, H160K, H185K, H220K



Model	W	W1	D	D1	D2	H	H1	Terminal screw size	Mass
FR-XCL-H160K	430	390	176	140	190	600	500	M12	95 kg
FR-XCL-H185K						640	540		115 kg
FR-XCL-H220K	500	460	196	160	210	660	560		150 kg
FR-XCL-H250K									160 kg
FR-XCG-H132K			176	140	195	560	460	M12	80 kg
FR-XCG-H160K	430	390			190	600	500		95 kg
FR-XCG-H185K			196	160	210				115 kg
FR-XCG-H220K	500	460				650	550		150 kg

Dedicated box-type reactor FR-XCB

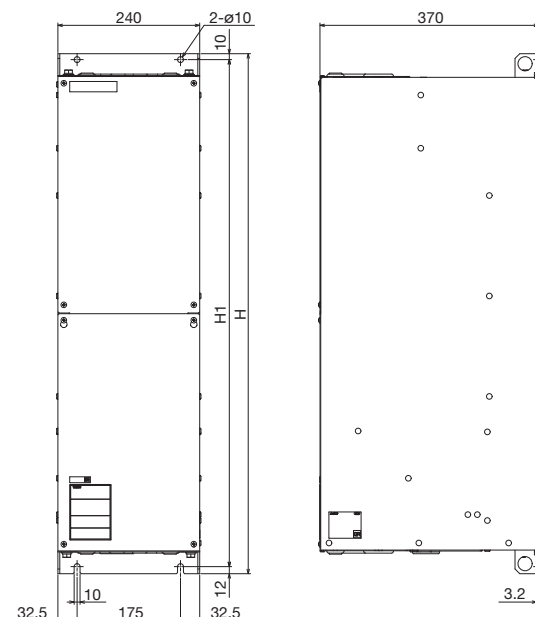
- FR-XCB-H160K, H220K



Model	Mass
FR-XCB-H160K	230 kg
FR-XCB-H220K	260 kg

Dedicated contactor box FR-MCB

- FR-MCB-H400, H800



Model	H	H1	Mass
FR-MCB-H400	540	518	29 kg
FR-MCB-H800	880	858	51 kg

Lineup

Multifunction regeneration converter model

Multifunction regeneration converter with harmonic suppression and power regeneration functions.

FR-XC-H 160 K -

Symbol	Voltage	Converter capacity	Symbol	Circuit board coating	Plated conductor	Symbol	Functional specification ^{*1}
None	200 V class	Capacity (kW)	None	Without	Without	None	Common bus regeneration mode
H	400 V class		60	With	Without	PWM	Harmonic suppression mode
			06	With	With		

^{*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 stand-alone reactor for use with the FR-XC converter in common bus regeneration mode.

FR-XCL-H 160 K

Symbol	Voltage	Reactor capacity
None	200 V class	Capacity (kW)
H	400 V class	

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

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

FR-XCG-H 132 K

Symbol	Voltage	Reactor capacity
None	200 V class	Capacity (kW)
H	400 V class	

Dedicated box-type reactor (option) model

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

FR-XCB-H 160 K -

Symbol	Voltage	Reactor capacity	Symbol	Circuit board coating
None	200 V class	Capacity (kW)	None	Without
H	400 V class		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-H 400

Symbol	Voltage	Capacity	Built-in magnetic contactor
H	400 V class	150	S-N[] AC200 V
		400	
		800	

Combination with FR-XC-H[]K

Operation mode	Model	Rated surrounding temperature	Capacity
Common bus regeneration mode	FR-XC-H75K	50°C rating	FR-MCB-H150
	FR-XC-H75K-PWM	40°C rating	
	FR-XC-H160K	50°C rating	FR-MCB-H400
	FR-XC-H160K-PWM	40°C rating	
Harmonic suppression mode	FR-XC-H220K	50°C rating	FR-MCB-H400
	FR-XC-H220K-PWM	40°C rating	
	FR-XC-H75K	50°C rating	FR-MCB-H150
	FR-XC-H75K-PWM	40°C rating	
	FR-XC-H160K	50°C rating	FR-MCB-H400
	FR-XC-H160K-PWM	40°C rating	
	FR-XC-H220K	50°C rating	FR-MCB-H400
	FR-XC-H220K-PWM	40°C rating	

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