OMRON

High-function General-purpose Inverters RX2 Series

Save energy and maximize performance with versatile inverter

- Triple rating: Normal Duty (ND), Low Duty (LD), and Very Low Duty (VLD)
- PM motor control helps save energy
- Safety function IEC 61800-5-2 "Safe Torque Off (STO)" Conform machinery directive with ISO13849-1 (Category 4/PLe)
- DriveProgramming allows simple sequence control without a PLC



Performance Specifications

Inverter 3G3RX2 3-phase 200-V Class

Very Low Duty (VLD)/Low Duty (LD)/Normal Duty (ND)

3G3RX2-A2			A2004	A2007	A2015	A2022	A2037	A2055	A2075	A2110	A2150	A2185	A2220	A2300	A2370	A2450	A2550	
			VLD	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75
(4-pole) capacity (kW)			0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	
ND		ND	0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	
	Rated output current (A) VLD LD ND		4.4	8.0	10.4	15.6	22.8	33.0	46.0	60.0	80.0	93.0	124	153	185	229	295	
			3.7	6.3	9.4	12.0	19.6	30.0	40.0	56.0	73.0	85.0	113	140	169	210	270	
			3.2	5.0	8.0	11.0	17.5	25.0	32.0	46.0	64.0	76.0	95.0	122	146	182	220	
	Overload LD		110% 60 sec / 120% 3 sec															
			120% 60 sec / 150% 3 sec															
			ND	150% 60 sec / 200% 3 sec														
Output	Rated out	put vol	tage	3-phase (3-wire) 200 to 240 V (depending on receiving voltage)														
			VLD	1.5	2.8	3.6	5.4	7.9	11.4	15.9	20.8	27.7	32.2	43.0	53.0	64.1	79.3	102.2
		200 V	LD	1.3	2.2	3.3	4.2	6.8	10.4	13.9	19.4	25.3	29.4	39.1	48.5	58.5	72.7	93.5
	Rated		ND	1.1	1.7	2.8	3.8	6.1	8.7	11.1	15.9	22.2	26.3	32.9	42.3	50.6	63.0	76.2
	(kVA)		VLD	1.8	3.3	4.3	6.5	9.5	13.7	19.1	24.9	33.3	38.7	51.5	63.6	76.9	95.2	122.6
		240 V	LD	1.5	2.6	3.9	5.0	8.1	12.5	16.6	23.3	30.3	35.3	47.0	58.2	70.3	87.3	112.2
			ND	1.3	2.1	3.3	4.6	7.3	10.4	13.3	19.1	26.6	31.6	39.5	50.7	60.7	75.7	91.5
	Rated input current (A) LD *1 ND		5.2	9.5	12.4	18.6	27.1	39.3	54.8	71.4	95.2	110.7	147.6	182.1	220.2	272.6	351.2	
			4.4	7.5	11.2	14.3	23.3	35.7	47.6	66.7	86.9	101.2	134.5	166.7	201.2	250.0	321.4	
			ND	3.8	6.0	9.5	13.1	20.8	29.8	38.1	54.8	76.2	90.5	113.1	145.2	173.8	216.7	261.9
Innut	Rated input AC			Control power supply: Power supply single phase 200 to 240 V/allowable variation range 170 to 264 V, 50 Hz (allowable variation range: 57 to 63 Hz)														
mput	voltage		Main circuit power supply: 3-phase (3-wire) 200 to 240 V/allowable variation range 170 to 264 V, 50 Hz (allowable variation range: 47.5 to 52.5 Hz)/60 Hz (allowable variation range: 57 to 63 Hz)															
	Power supply equipment capacity (kVA)VLD LD*2		2.0	3.6	4.7	7.1	10.3	15.0	20.9	27.2	36.3	42.2	56.3	69.4	83.9	103.9	133.8	
			1.7	2.9	4.3	5.4	8.9	13.6	18.1	25.4	33.1	38.6	51.3	63.5	76.7	95.3	122.5	
			1.5	2.3	3.6	5.0	7.9	11.3	14.5	20.9	29.0	34.5	43.1	55.3	66.2	82.6	99.8	
	I		VLD	0.5 to 10.0 kHz														
Carrier f	requency	2	LD	0.5 to 12	0.5 to 12.0 kHz													
operatin	g runge w	, ,	ND	0.5 to 16.0 kHz														
Motor start torque *4			200%/0.3 Hz															
Braking	Regenerative braking		Equipped with BRD circuit (with a discharging resistor separately installed) Regenerative braking unit separately installed															
Braking	Minimum resistance that can be connected (Ω)		50	50	35	35	35	16	10	10	7.5	7.5	5					
Dimen- sion	Height (mm)			255	255	255	255	255	260	260	260	390	390	390	540	550	550	700
	Width (mm)			150	150	150	150	150	210	210	210	245	245	245	300	390	390	480
	Depth (mm)			140	140	140	140	140	170	170	170	190	190	190	195	250	250	250
Protective construction				IP20 *5	/ UL ope	en type												
Approximate mass (kg)				3	3	3	3	3	6	6	6	10	10	10	22	33	33	47

*1. The rated input currents shown in the table are the values when the rated current is output. The values vary depending on impedance on the power supply (wiring, breaker, input reactor option, etc.)

*2. The power supply equipment capacities shown in the table are the values when 220 V rated current is output. The values vary depending on impedance on the power supply (wiring, breaker, input reactor option, etc.)

*3. The setting of rated values for carrier frequencies [bb101]/[bb201] are internally limited in accordance with the description. Also, it is recommended to set values equivalent to or above (maximum output frequency for driving x10) Hz for the setting of carrier frequencies [bb101]/ [bb201]. Also, in the case of induction motor (IM) control, for items other than those subject to V/f control, it is recommended to set carrier frequency at 2 kHz or more. In the case of synchronous motor (SM)/permanent magnet motor (PMM) control, it is recommended to set carrier frequency at 8 kHz or more.

*4. The value of the sensor-less vector control applied to the ND rating in the Standard motor. Torque characteristics may vary depending on the control method and the motor used.

***5.** Based on self declaration.

3-pha	se 400-	V Cla	ass										Very	Low D	uty (V	LD)/Lc	w Dut	y (LD)/	/Norma	al Duty	' (ND)
3	G3RX2-□[A4007	A4015	A4022	A4037	A4055	A4075	A4110	A4150	A4185	A4220	A4300	A4370	A4450	A4550	B4750	B4900	B411K	B413K
Applicable motor (4-pole) capacity (kW)		1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160		
		1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160		
		ND	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	
	Rated output current (A) VLD LD ND		VLD	4.1	5.4	8.3	12.6	17.5	25.0	31.0	40.0	47.0	62.0	77.0	93.0	116	147	176	213	252	316
			3.1	4.8	6.7	11.1	16.0	22.0	29.0	37.0	43.0	57.0	70.0	85.0	105	135	160	195	230	290	
			2.5	4.0	5.5	9.2	14.8	19.0	25.0	32.0	39.0	48.0	61.0	75.0	91.0	112	150	180	217	260	
	VLD		110% 60 sec / 120% 3 sec																		
	Overload	atina	LD	120%	60 sec	/ 150%	3 sec														
			ND	150% 60 sec / 200% 3 sec																	
Output	Rated out	tput vo	ltage	3-phase (3-wire) 380 to 500 V (depending on receiving voltage)																	
			VLD	2.8	3.7	5.8	8.7	12.1	17.3	21.5	27.7	32.6	43.0	53.3	64.4	80.4	101.8	121.9	147.6	174.6	218.9
		400 V	LD	2.1	3.3	4.6	7.7	11.1	15.2	20.1	25.6	29.8	39.5	48.5	58.9	72.7	93.5	110.9	135.1	159.3	200.9
	Rated		ND	1.7	2.8	3.8	6.4	10.3	13.2	17.3	22.2	27.0	33.3	42.3	52.0	63.0	77.6	103.9	124.7	150.3	180.1
	(kVA)	500 V	VLD	3.6	4.7	7.2	10.9	15.2	21.7	26.8	34.6	40.7	53.7	66.7	80.5	100.5	127.3	152.4	184.5	218.2	273.7
			LD	2.7	4.2	5.8	9.6	13.9	19.1	25.1	32.0	37.2	49.4	60.6	73.6	90.9	116.9	138.6	168.9	199.2	251.1
			ND	2.2	3.5	4.8	8.0	12.8	16.5	21.7	27.7	33.8	41.6	52.8	65.0	78.8	97.0	129.9	155.9	187.9	225.2
	Rated input current (A) LD *1 ND		VLD	4.9	6.4	9.9	15.0	20.8	29.8	36.9	47.6	56.0	73.8	91.7	110.7	138.1	175.0	209.5	253.6	300.0	376.2
			3.7	5.7	8.0	13.2	19.0	26.2	34.5	44.0	51.2	67.9	83.3	101.2	125.0	160.7	190.5	232.1	273.8	345.2	
			3.0	4.8	6.5	11.0	17.6	22.6	29.8	38.1	46.4	57.1	72.6	89.3	108.3	133.3	178.6	214.3	258.3	309.5	
Input	Rated input AC voltage			Control power supply: Power supply single phase 380 to 500 V (allowable variation range 323 to 550 V), 50 Hz (allowable variation range: 47.5 to 52.5 Hz)/60 Hz (allowable variation range: 57 to 63 Hz)																	
				Main circuit power supply: 3-phase (3-wire) 380 to 500 V (allowable variation range) 323 to 550 V, 50 Hz (allowable variation range: 47.5 to 52.5 Hz)/60 Hz (allowable variation range: 57 to 63 Hz)																	
	Power supply equipment capacity (kVA)VLD*2ND		VLD	3.7	4.9	7.5	11.4	15.9	22.7	28.1	36.3	42.6	56.3	69.9	84.4	105.2	133.4	159.7	193.2	228.6	286.7
			2.8	4.4	6.1	10.1	14.5	20.0	26.3	33.6	39.0	51.7	63.5	77.1	95.3	122.5	145.2	176.9	208.7	263.1	
			2.3	3.6	5.0	8.3	13.4	17.2	22.7	29.0	35.4	43.5	55.3	68.0	82.6	101.6	136.1	163.3	196.9	235.9	
Carrier frequency range *3		0.5 to 10.0 kHz										0.5 to 8.0 kHz									
		0.5 to	0.5 to 12.0 kHz										0.5 to 8.0 kHz								
		0.5 to	0.5 to 16.0 kHz										0.5 to 10.0 kHz								
Motor start torque *4			200%/	200%/0.3 Hz 180%/0.3 Hz																	
Braking	Regenerative braking		Equipp (with a	Equipped with braking resistance circuit (with a discharging resistor separately installed) Regenerative braking unit separately installed											ly						
	Minimum resistance that can be connected (Ω)		100	100	100	70	70	35	35	24	24	20	15	15	10	10					
Dimen- sion	Height (mm)			255	255	255	255	260	260	260	390	390	390	540	550	550	550	700	700	740	740
	Width (mm)			150	150	150	150	210	210	210	245	245	245	300	390	390	390	390	390	480	480
	Depth (mm)		140	140	140	140	170	170	170	190	190	190	195	250	250	250	270	270	270	270	
Protective construction			IP20 ¥	•5 / UL	open ty	pe											IP00 /	UL ope	en type		
Approximate mass (kg)			3	3	3	3	6	6	6	8.5	8.5	8.5	22	31	31	31	41	41	53	53	

*1. The rated input currents shown in the table are the values when the rated current is output. The values vary depending on impedance on the power supply (wiring, breaker, input reactor option, etc.)

*2. The power supply equipment capacities shown in the table are the values when 220 V rated current is output. The values vary depending on impedance on the power supply (wiring, breaker, input reactor option, etc.)

*3. The setting of rated values for carrier frequencies [bb101]/[bb201] are internally limited in accordance with the description. Also, it is recommended to set values equivalent to or above (maximum output frequency for driving x10) Hz for the setting of carrier frequencies [bb101]/ [bb201]. Also, in the case of induction motor (IM) control, for items other than those subject to V/f control, it is recommended to set carrier frequency at 2 kHz or more. In the case of synchronous motor (SM)/permanent magnet motor (PMM) control, it is recommended to set carrier frequency at 8 kHz or more.

*4. The value of the sensor-less vector control applied to the ND rating in the Standard motor. Torque characteristics may vary depending on the control method and the motor used.

***5.** Based on self declaration.

Function Specifications

Inverter 3G3RX2

	ltem		Specifications								
Control mod (output to th	de ne motor)		Sine wave PWM control voltage output (line sine wave modulation)								
Output frequency range *1			0.00 to 590.00 Hz								
Frequency a	accuracy		Digital command ±0.01% and analog command ±0.2% (25°C±10°C) against the maximum frequency								
Frequency r	resolution		Digital setting: 0.01 Hz Analog setting: maximum frequency/4000 (Ai1 terminal/Ai2 terminal: 12 bit/0 to +10 V or 0 to +20 mA, Ai3 terminal 12 bit/-10 to +10 V)								
Control mod (frequency/	de voltage calcu	lation) *2	IM V/f control (fixed torque/reduced torque/free), automatic boost control cascade model sensorless vector control, 0 Hz range sensorless ve control, vector control with sensor.								
			SM/PMM Synchronous starting sensoriess vector control, IVMS starting smart sensoriess vector control								
Speed fluct	uation *3		±0.5% (during sensorless vector control)								
Acceleration	n or decelera	tion time	0.00 to 3600.00 sec (linear, S-shaped,	U-shaped, reverse U-shaped, EL-S sh	aped)						
Display mor	nitor		Output frequency, output current, outp	ut torque, trip history, I/O terminal statu	is, I/O power ≭ 4, P-N voltage.						
Starting fun	ctions		Start after DC braking, frequency colle	ction start, frequency entrainment start	, reduced voltage start, retry start						
Stopping fu	nctions		adjustment)								
Stall preven	tion function	l	Overload restraining function, overcurr	ent suppression function, overvoltage s	suppression function						
Protective f	unction *5		Overcurrent error, Motor overload error, Braking resister Overload error, Overvoltage error, Memory error, Undervoltage error, Current detector error, CPU error, External trip error, USP error, Ground fault error, Incoming over voltage error, Instantaneous power failure error, Temperature detector error, Cooling fan rotation speed reduction temperature error, Temperature error, Input open-phase error, IGBT error, Output open-phase error, Thermistor error, Brake error, Low-speed range overload error, Controller overload error, RS485 communication error, Operator keypad disconnection error.								
Other functions			V/f free settings (7 points), Upper/lower limit frequency limiter, Frequency jump, Curve acceleration/deceleration, Manual torque boost, Energy-saving operation, Analog output adjustment function, Minimum frequency, Carrier frequency adjustment, Motor electronic thermal function (free setting is also possible), Inverter electronic thermal function, External start/end (volume/ratio), Frequency input selection, Trip retry, Restart after instantaneous stop, Output of signals, Initialization settings, PID control, Automatic deceleration at power shut-off, Brake control function, and Auto-tuning for commercial switching function (online/offline).								
		Standard operator keypad	Parameter setting using arrow keys								
	Frequency setting		Ai1/Ai2 terminal (when changing voltag	ge)	Setting through input of 0 to 10 VDC voltage (input impedance: 10 k Ω)						
			Ai1/Ai2 terminal (when changing curre	nt)	Setting through input of 0 to 20 mA current (input impedance: 100Ω)						
		External signals *6	Ai3 terminal	Setting through input of -10 to +10 V voltage (input impedance: 10 k Ω)							
			Multistage speed terminal (use of input terminal function)	15 speed							
			Pulse string input (A/B terminal, use of input terminal fun	32 kHz × 2 at maximum							
		External port	Setting via RS485 serial communication (protocol: Modbus-RTU)								
	Normal rotation/ reverse rotation	Standard operator keypad	Execution with the RUN /STOP key (normal rotation/reverse rotation can be switched by setting parameters)								
		External signals	Normal rotation operation (FW)/reverse rotation (RV) (when an input terminal function is assigned) 3-wire input available (when an input terminal function is assigned)								
	Run/stop	External port	Setting via RS485 serial communication	i: 115.2 kbps)							
	Input termir Backup pov	nal function	11 terminals (input of pulse string is available on terminal A and B) FW (Normal rotation)/RV (Reverse rotation), CF1-4 (Multistage speed 1-4), SF1-7 (Multistage speed bit 1-7), ADD (Addition of frequency), SCHG (Switching of frequency command), STA (3-wire start)/STP (3-wire stop)/F_R (3-wire normal/reverse), AHD (Retention of analog command), FUP (Increase of speed via remote operation/FDN (Deceleration via remote operation), UDC (Deletion of data via remote operation), F-OP (Forced command switching), SET (Second control), RS (Reset), JG (Jogging), DB (External current braking), 2CH (2-stage acceleration/deceleration), FRS (Free-run stop), EXT (External abnormality), USP (Prevention of restart after restoration of power), CS (Commercial switching), SFT (Soft-lock), BOK (Brake check), OLR (Overload restriction switching), KHC (Clearance of integrated input power), OKHC (Clearance of integrated output power), PID (PID1 disabled), PIDC (PID1 integration reset), PID2 (PID2 disabled), PIDC2 (PID2 integration reset), SVC1-4 (PID1 multistage target values 1-4), PRO (PID gain switching), PIO (PID output switching), SLEP (SLEEP condition satisfied)/WAKE (WAKE condition satisfied), TL (Torque restriction enabled), TRQ1, 2 (Switching of torque limit 1, 2), PPI (Switching of P/PI control), CAS (Switching of control gain), FOC (Preparatory excitation), M1-11 (General-purpose input 1-11), PCC (Clearance of pulse counter), ECOM (Start of EzCOM), PRG (Program run), HLD (Acceleration/ deceleration stop), REN (Operation permission signal), PLA (Pulse string input A), and PLB (Pulse string input B) P+/P-: DC24V input (allowable input voltage: 24 V±10%)								
	STO input to	erminal	2 terminals (simultaneous input)								
	Thermistor	input terminal	1 terminal (possible to switch between positive temperature coefficient/negative temperature coefficient resistance element)								

	Item	Specifications								
	Output terminal function	Transistor output 5 terminal, 1a contact relay 1 point, 1c contact relay 1 point								
Output	Relay and alarm relay (16, AL)	RUN (During operation), FA1-5 (Reached signal), IRDY (Operation ready completion), FWR (During normal rotation operation), RVR (During reverse rotation operation), FREF (Frequency command operator keypad), REF (Operation command operator keypad), SETM (Second control under selection), AL (Alarm signal), MJA (Severe failure signal), OTQ (Over torque) * 7, IP (During instantaneous power failure), UV (Under insufficient voltage), TRQ (During torque limitation), IPS (During power failure deceleration), RNT (RUN time over), ONT (Power on time over), THM (Electronic thermal warning), THC (Electronic thermal warning), WAC (Capacitor life advance notice), WAF (Fan life advance notice), FR (Operation command signal), OHF (Cooling fin heating advance notice), LOC/LOC2 (Low-current signal), OL/OL2 (Overload advance notice), BRK (Brake release), BER (Brake abnormality), ZS (Zero-speed detection signal), OJ/OD2 (PID deviation excessive), FBV/FBV2 (PID feedback comparison), NDc (Communication disconnection), Ai1Dc/Ai2Dc/Ai3Dc (Analog disconnection Ai1/Ai2/Ai3), WCAi1/WCAi2/WCAi3 (Window comparator Ai1/Ai2/Ai3), LOG1-7 (Logical operation result 1-7), MO1-7 (General output 1-7), and OVS (Receiving overvoltage).								
	EDM output terminal	Output for STO diagnosis								
	Monitor output terminal *8	Possible to output through selection from monitor data of parameters								
EMC filter s	witching *9	Possible to enable the EMC noise filter (switching method is different depending on the model)								
External acc	cess to PC	USB Micro-B								
		ND (normal duty)	-10 to 50°C							
	Ambient temperature *10	LD (low duty)	-10 to 45°C							
		VLD (very low duty)	-10 to 40°C							
Use	Storage temperature *11	-20 to 65°C								
environment	Humidity	20-90%RH (location free of condensation)								
	Vibration *12	5.9 m/s² (0.6 G) 10 to 55 Hz: 3G3RX2-A2004 to A2220 / 3G3RX2-A4007 to A4220 2.94 m/s² (0.3 G) 10 to 55 Hz: 3G3RX2-A2300 to A2550 / 3G3RX2-A4300 to A413K								
	Use location *13	1000 m altitude or lower (location free from corrosive gas, oil mist, and dust)								
Expected Life time		Smoothing capacitor 10 years								
		Designed life of cooling fan 10 years (models equipped with a cooling fan) free from dust								
		Memory element on the control circuit board								
Applicable s	standards *14	Compliance with UL/cUL/CE standards, RCM, Functional Safety SIL3/PLe								
Painting col	lor	Black								
Operating, o	display	LCD Operator *15								
Number of c	option slots	3 ports								
Other option	ns	Braking resistor, AC reactor, DC reactor, noise filter								

*1. The output frequency range depend on the control and motor used. When running the inverter exceeding 60 Hz, check the maximum allowable frequency with the manufacturer of the motor.

*2. When the control mode is changed, unless the motor constant is appropriately configured, you cannot obtain the desired starting torque or the inverter may trip.

***3.** The variable range of motor speed may vary depending on your system or the environment where the motor is used. Please contact us for details.

*4. Both the input power and output power are reference values, which are not appropriate for use in calculation of efficiency values, etc. To obtain an accurate value, use an external device.

*5. The IGBT error [E030] is generated by the protective function not only for short circuit protection but also when IGBT is damaged. Depending on the operating conditions of the inverter, the overcurrent error [E001] may occur, instead of the IGBT error.

***6.** At the factory default setting, when voltage and current on Ai1/Ai2 terminal is changed using a switch, with input of voltage at 9.8 V and current at 19.8 mA, the maximum frequency is commanded. To change characteristics, make adjustments using the analog start/end function.

*7. The threshold for signal output varies depending on the motor to be combined with the inverter, parameter adjustment, etc.
*8. The output data of analog voltage monitor and analog current monitor are reference values for connecting an analog meter. Due to the meter to be connected and variation in analog output circuit, the maximum output value may slightly vary from 10 V or 20 mA. To change characteristics, make adjustments using the Ao1 adjustment and Ao2 adjustment functions. Some monitor data cannot be output.

***9.** To enable the EMC filter, connect with a power supply grounded at a neutral point. Otherwise, the leakage current may increase.

*10. Use the 400 V class inverter at an input voltage of 500 VAC or below. If input voltage exceeds 500 VAC due to fluctuation of power, use the inverter at 40°C or lower ambient temperature.

***11.** The storage temperature is the temperature during transport.

*12. To be in accordance with the testing method specified in JIS C 60068-2-6: 2010 (IEC 60068-2-6:2007)

***13.** When the inverter is used in a location at 1000 m or higher altitude, air pressure reduces approximately 1% every 100 m elevation. Perform 1% current der- ating and conduct evaluation for every 100 m elevation.

*14. For insulation distance, comply with UL and CE standards

***15.** When a clock function is used, the optional battery (CR2032, 3 V) is required. When you purchase, this LCD operator does not come with the battery.

Components and Functions

Note: Example of the 3G3RX2-A2055/A2075/A2110/A4055/A4075/A4110

Inverter 3G3RX2



Open the terminal block cover to wire the main circuit terminal block and the control circuit terminal block. Moreover, you can open the Option Unit Connection Cover to mount option boards.



High-function General-purpose Inverters RX2 Series Connection Diagram



(unit: mm)

Dimensions

Inverter 3G3RX2

3G3RX2-A2004
3G3RX2-A2007
3G3RX2-A2015
3G3RX2-A2022
3G3RX2-A2037
3G3RX2-A4007
3G3RX2-A4015
3G3RX2-A4022
3G3RX2-A4037





203

3G3RX2-A2150 3G3RX2-A2185 3G3RX2-A2220 3G3RX2-A4150 3G3RX2-A4185 3G3RX2-A4220



Inverter User's Manual (Cat.No.I620) for details.





12

3G3RX2-B4750 3G3RX2-B4900



3G3RX2-B411K 3G3RX2-B413K

