

HIGH PERFORMANCE AC DRIVES 0.4 - 400kW

WARNING
• RISK OF INJURY OR ELECTRIC SHOCK before installation and operation
• RISK OF ELECTRIC SHOCK
• Do not remove this cover while applying power.
• This cover can be removed after at least 5min of power off and after the "CHARGE" lamp turns off.
• Do not insert fingers or tools into the inverter.
• Securely ground the inverter.




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 This publication is only to be used as a guide. Please seek the full instruction manual before installation. If in doubt please call IMO on 020 8452 6444 or visit our website on www.imopc.com (Please refer to inside back cover for further details)

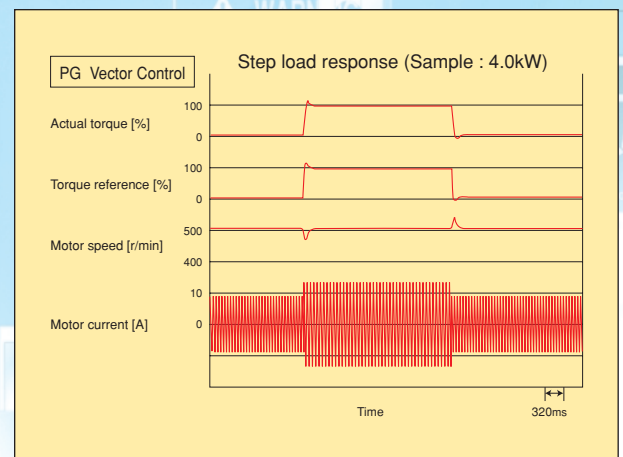
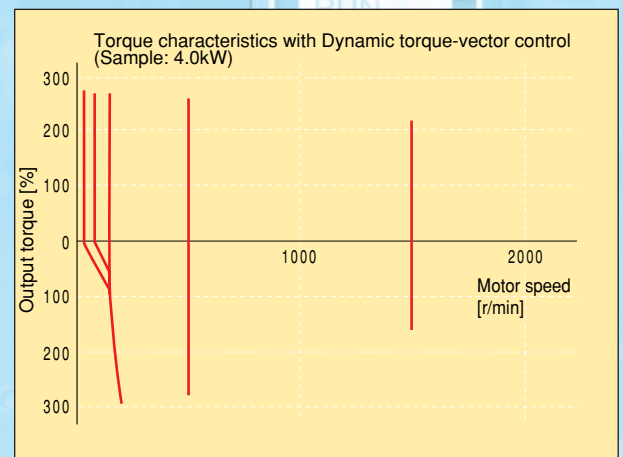


*Ideal combination of power and multiple-functionality.
Dynamic torque-vector control ensures optimum motor control under virtually any operating condition.*

Dynamic torque-vector control

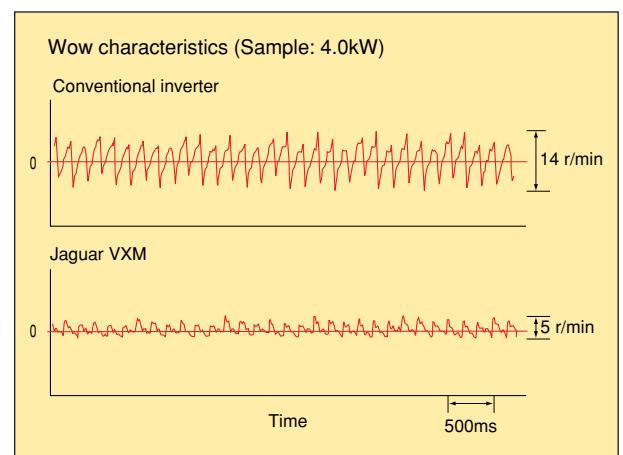
Dynamic torque-vector control system performs high-speed calculation to determine the required motor power for the load status. IMO's key technology is optimal control of voltage and current vectors for maximum output torque.

- A high starting torque of >200% at 0.5Hz.*
*180% for 30kW or larger models.
- Achieves smooth acceleration/deceleration in the shortest time for the load condition.
- Using a high-speed CPU quickly responds to an abrupt load change, detects the regenerated power to control the deceleration time. This automatic deceleration function greatly reduces the inverter tripping.
- Feedback control with encoder feedback enables the inverter to execute "vector control with encoder feedback" by adding an optional PG feedback card to obtain higher performance.
 - Speed control range : 1:1200
 - Speed control accuracy : $\pm 0.02\%$
 - Speed control response : 40Hz
(22kW or smaller)



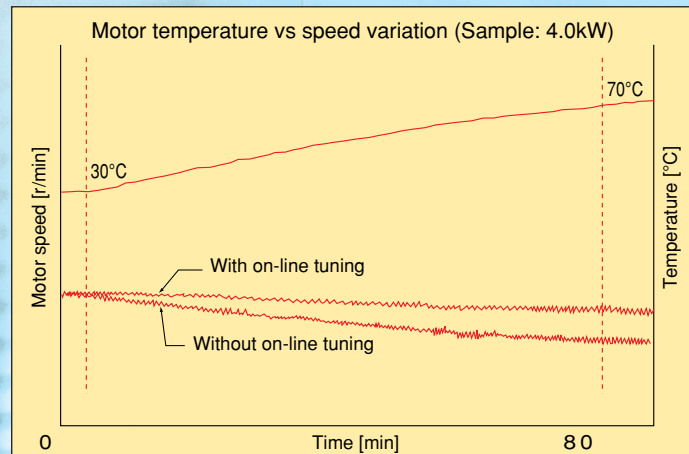
Reduced motor wow at low speed

- Motor wow at low speed (1Hz) reduced to less than $\frac{1}{2}$ of that achieved by conventional inverters, with the dynamic torque-vector control system, in combination with the VXM's unique digital AVR.



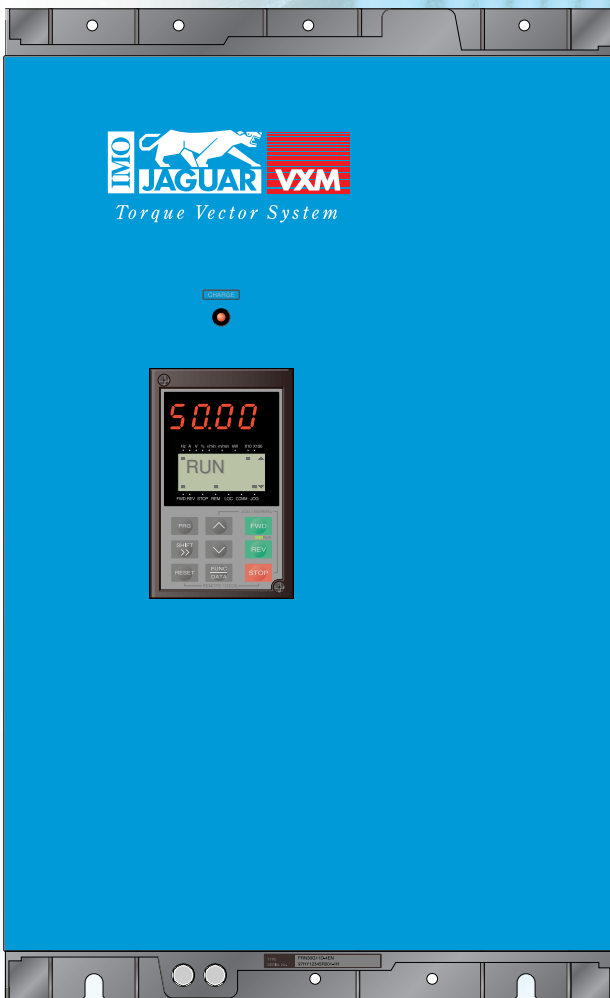
New on-line tuning system

- On-line tuning to continuously check for variation of motor characteristics during running for high-precision speed control.
- This tuning function also available for a second motor, which allows high-precision driving of the second motor by changeover operation between two motors.



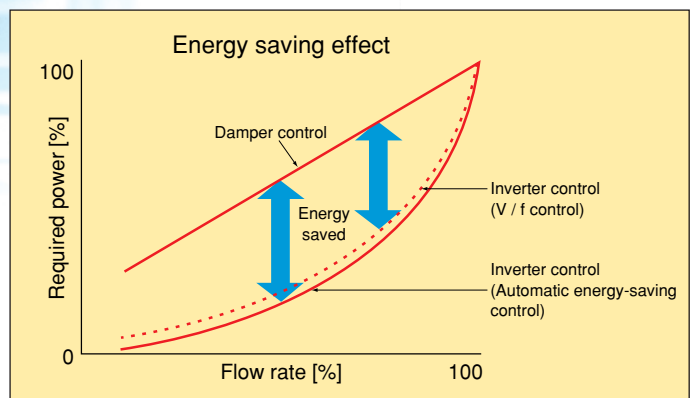
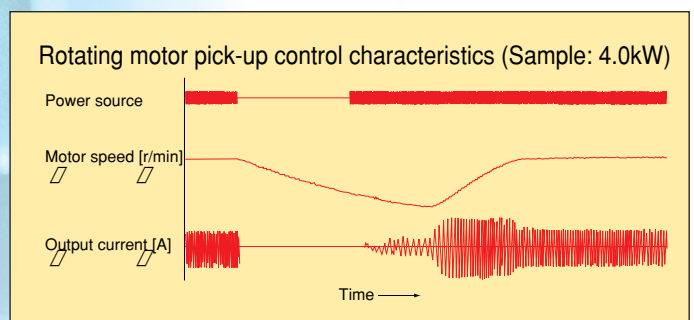
Environment-friendly features

- Provided with soft switched control power supply systems which minimise noise interference on peripheral devices such as sensors.
- Equipped with terminals for connecting DC REACTOR that will suppress harmonics.
- Complies with EMC Directive.



Advanced, convenient functions

- 16-step speed, 7 pattern operation with timer control, rotating motor pick-up control for conveyance machinery.
- PID control, cooling fan on/off control, line/inverter changeover operation for fans and pumps.
- Rotating motor pick-up control:
Restarts motor without any shocks, by detecting motor speed where motor is coasting after momentary power failure occurs.
- Automatic energy-saving operation function:
Minimises inverter and motor loss at light load.



Global products, communication

- Conforms to major world safety standards: UL, cUL, TÜV (up to 22kW), CE marked for EMC + LVD compliance.
- Equipped with RS485 interface as standard.
- Connection to field bus: Profibus-DP, Interbus-S, DeviceNet, Modbus Plus (Option).
- Universal DI/DO: Monitors digital I/O signal status and transmits to a host controller, helping to simplify factory automation.

RANGE AND APPLICATION

Model numbers and range

Easy to apply to customer systems. A consistent design concept in all models from 0.4kW to 315kW.

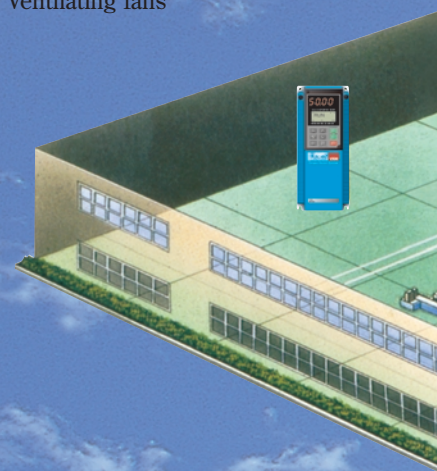
Nominal applied motors (kW)	400V series	
	Constant Torque Rating (CT)	Variable Torque Rating (VT)
0.4	VXM40	
0.75	VXM75	
1.5	VXM150	
2.2	VXM220	
4.0	VXM400	
5.5	VXM550	
7.5	VXM750	VXM550
11	VXM1100	VXM750
15	VXM1500	VXM1100
18.5	VXM1850	VXM1500
22	VXM2200G	VXM1850
30	VXM30K	VXM30KP
37	VXM37K	VXM30K
45	VXM45K	VXM37K
55	VXM55K	VXM45K
75	VXM75K	VXM55K
90	VXM90K	VXM75K
110	VXM110K	VXM90K
132	VXM132K	VXM110K
160	VXM160K	VXM132K
200	VXM200K	VXM160K
220	VXM220K	VXM200K
280	VXM280K	VXM220K
315	VXM315K	VXM280K
400		VXM315K

* : Available soon

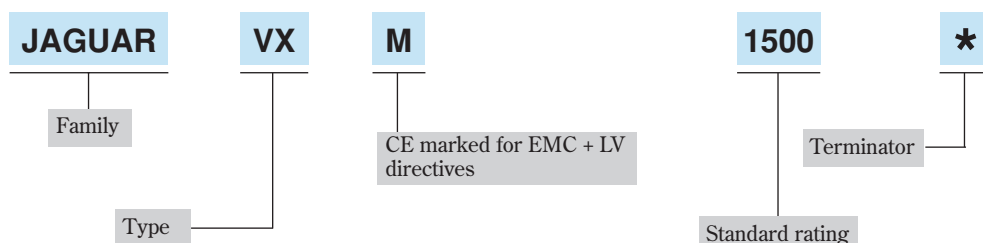
Jaguar VXM can be

Fans

- Air-conditioning systems (for factory, building, office, hospital, clean room, supermarkets and farms)
- Dryers
- Boiler fans
- Fans for controlling furnace temperature
- Roof fans controlled as a group
- Refrigeration
- Compressors
- Built-in blowers in film-manufacturing machines
- Cooling-tower fans
- Ventilating fans



How to read the model number



Standard rating examples

- 40 = 0.4kW
- 150 = 1.5kW
- 1500 = 15kW

Terminators “*”

- No letter = Standard rating applies
- K = Rating is in actual kW
- KP = As K but for fans + pumps only
- G = Cannot be used for higher power than rated

Food processing machines

- Food mixing machines
- Food slicers
- Grain milling machine (bread, cake, noodles)
- Tea making machines
- Rice cleaning machines

used for most general purpose industrial and commercial applications

Machine tools

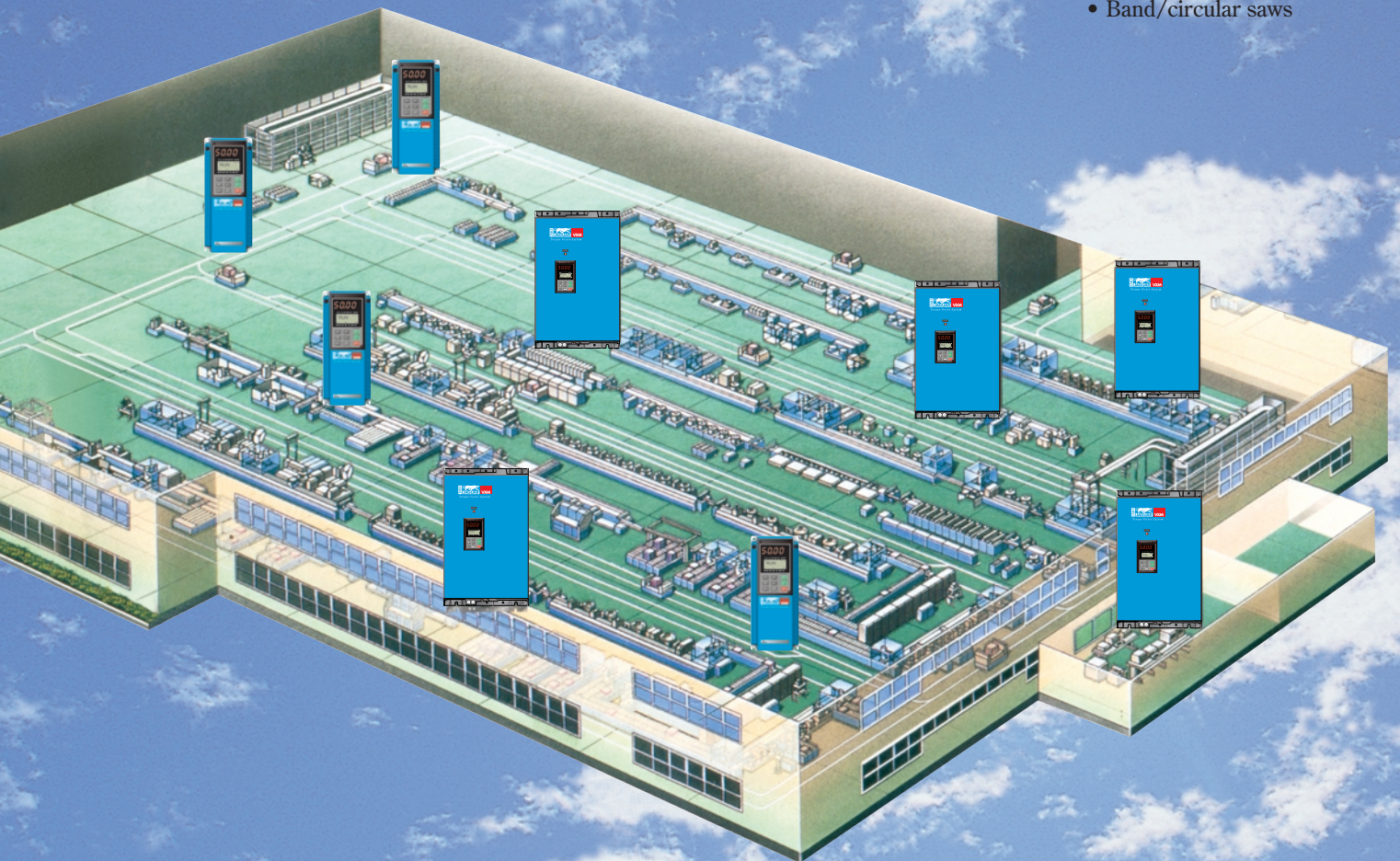
- Grinding machines
- Sanding machines
- Milling machines
- Lathes
- Drilling machines
- Turntables
- Work positioning machines
- PC board drilling machines
- Winding machines
- Presses

Conveyance machinery

- Cranes (travelling, traversing, hoisting)
- Automated warehouse
- Conveyor (belt, chain, screw, roller)
- Lifts and hoists
- Car parking facilities
- Elevator, escalator
- Automatic door
- Shutter equipment
- Speed-change gear

Chemical machinery/wood working machines

- Fluid mixing machine
- Extruders
- Vibrators
- Centrifugal separators
- Coating machines
- Take-up rollers
- Routing machines
- Sanding machines
- Planing machines
- Band/circular saws



Pumps

- Tankless water supply systems
- Submersible motor pumps
- Vacuum pumps
- Fountain pumps
- Cooling water pumps
- Circulating hot water pumps
- Well pumps
- Agricultural storage pumps
- Water treatment systems
- Constant-flow pumps
- Sludge pumps

Packaging machinery

- Palletisers

Paper making/textile machinery

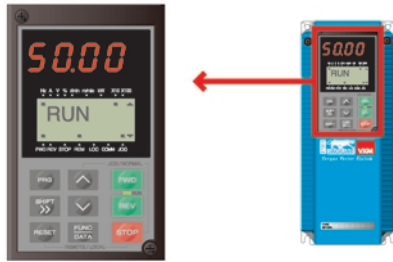
- Spinning machines
- Knitting machines
- Textile printing machines
- Synthetic fibre manufacturing plant

Other machinery

- Automated feed/medicine mixers
- Commercial-use washing machines
- Offset printing presses
- Book-binding machines
- Car-washing machines
- Shredders
- Dishwashers
- Test equipment
- Crushers

Intelligent keypad panel

- Copy function: Easily copies function codes and data to other inverters.
- Six languages (English, French, German, Italian, Spanish and Japanese) are available as standard.
- Jogging (inching) operation from the Keypad or external signal.
- Remote operation using optional extension cable (VXM podcable).



Protective functions, maintenance

Protection

- Motors with various characteristics can be used by setting thermal time constant for the electronic thermal overload relay.
- Input phase loss protective function protects the inverter from damage caused by disconnection of power supply lines.
- Motor is protected with a PTC thermistor.
- Input terminals for auxiliary control power supply (1.5kW or larger models): Alarm signal output will be held even if main circuit power supply has shut down.

Maintainability

The items below can be monitored on the Keypad panel, making it easy to analyse the cause of trip and to take preventive measures.

- Input/output terminals check
- Life expectancy of main-circuit capacitors
- Inverter on-load factor
- Accumulated operation time
- Inverter operating condition (output current, heat sink temperature, input power, etc)
- Detailed data on trip cause.

Extensive product line

- Since the product is equipped with a dual rating feature, it can be used for variable torque rating control (VT) (5.5kW or larger), as well as constant torque rating (CT).

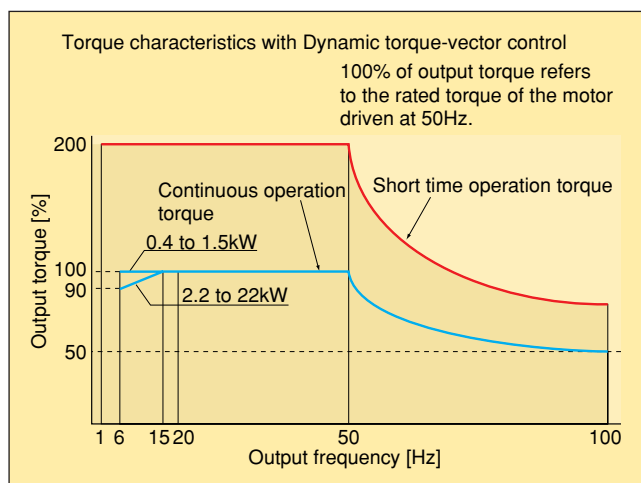
The variable torque rating can be used for one-class higher than the constant torque rating.

*For 30kW only, the model numbers for the VT rating and CT rating are different.

- Totally-enclosed casing (IP40) (up to 22kW as standard).
- Optional IP20 enclosure available for 30kW or larger models.
- Waterproof models (IP65 for 7.5kW or smaller, IP54 for 11 to 22kW) as a separate series (available soon).

Other useful functions

- Side-by-side mounting (up to 22kW) saves space when inverters are installed in a panel.
- The uniform height (260mm) of products (up to 7.5kW) makes it easy to design panels.
- User-definable control terminals: Digital input (9 points), transistor output (4 points) and relay contact output (1 point).
- Active drive feature: Performs prolonged acceleration at reduced torque, monitoring the load status to prevent tripping.
- Stall prevention function is provided as standard. Active or inactive can be also selected.



The above torque characteristics depend on the motor characteristics.

Type	VXM/VXMK	0.4	0.75	1.5	2.2	4.0	5.5	7.5	11	15	18.5	22	-	30	37	45	55	75	90	110	132	160	200	220	280	315						
	VXMKP *1)	-	-	-	-	-	-	-	-	-	-	-	30	-	-	-	-	-	-	-	-	-	-	-	-	-						
Applied motor	Nominal (CT use) kW	0.4	0.75	1.5	2.2	4.0	5.5	7.5	11	15	18.5	22	-	30	37	45	55	75	90	110	132	160	200	220	280	315						
	Maximum (VT use) kW	-	-	-	-	-	7.5	11	15	18.5	22	-	30	37	45	55	75	90	110	132	160	200	220	280	315	400						
Output ratings	Rated capacity *2) kVA	1.0	1.7	2.6	3.9	6.4	9.3	12	17	21	28	32	32	43	53	65	80	107	126	150	181	218	270	298	373							
	Rated voltage *3) V	3 phase 380, 400, 415V/50Hz											380, 400, 440, 460V/60Hz OM: 440V/50Hz																			
	Rated current *4) A	1.5	2.5	3.7	5.5	9.0	13	18	24	30	39	45	-	60	75	91	112	150	176	210	253	304	377	415	520							
	Overload capability	Cont. (VT use) A	-	-	-	-	-	16.5	23	30	37	44	-	60	75	91	112	150	176	210	253	304	377	415	520							
		Short time (CT use) *1)	150% of rated current for 1 min. 200% of rated current for 0.5s											150% of rated current for 1 min. 180% of rated current for 0.5s																		
	Output frequency Hz	0.1 - 400																														
Input ratings	Phases, Voltage, Frequency	3 phase 380 to 480V 50/60Hz											3 phase 380 to 440V/50Hz 380 to 480V/60Hz *5)																			
	Voltage/Frequency variations	Voltage: +10 to -15% (Voltage unbalance *6): 2% or less)											Frequency: +5 to -5%																			
	Momentary voltage dip capability *7)	When the input voltage is 310V or more, the inverter can be operated continuously. When the input voltage drops below 310V from rated voltage, the inverter can be operated for 15ms. The smooth recovery method is selectable.																														
	Rated current *8)	(with DCR)	0.82	1.5	2.9	4.2	7.1	10.0	13.5	19.8	26.8	33.2	39.3	54	54	67	81	100	134	160	196	232	282	352	385	491						
		A (without DCR)	1.8	3.5	6.2	9.2	14.9	21.5	27.9	39.1	50.3	59.9	69.3	86	86	104	124	150	-	-	-	-	-	-	-	-						
	Required power supply capacity (with DCR) kVA	0.6	1.1	2.1	3.0	5.0	7.0	9.4	14	19	24	28	38	38	47	57	70	93	111	136	161	196	244	267	341							
Control	Starting torque *1)	>200% (with Dynamic torque-vector control selected)											>180% (with Dynamic torque-vector control selected)																			
Braking	Standard	Braking torque	150%			100%			20% *9)			15 to 10% *9)																				
		Time s	5			5			No limit																							
		Duty cycle %	5	3	5	3	2	3	2	No limit																						
		Braking torque (Using options)	150%											100%																		
		DC injection braking	Starting frequency: 0.1 to 60.0Hz											Braking time: 0.0 to 30.0s			Braking level: 0 to 100% of rated current															
Enclosure (IEC 60529)	IP 40											IP 00(IP20: Option)																				
Cooling method	Natural cooling											Fan cooling																				
Standards	-UL/cUL											-CE Marking (Low Voltage)							-EMC Directive							-TÜV (up to 22kW)						
	-EN 61800-2 (Ratings, specifications for low voltage adjustable frequency a.c. power drive systems)																															
	-EN 61800-3 (EMC product standard including specific test methods)																															
Mass kg	2.2	2.5	3.8	3.8	3.8	6.5	6.5	10	10	10.5	10.5	31	31	36	41	42	50	73	73	104	104	145	145									

CT: Constant torque VT: Variable torque

Notes:

*1) Specifications for VT use are shown below.

Output ratings	Overload capability	Short time	110% of rated current for 1 min.
Control	Starting torque	50%	

*2) Inverter output capacity (kVA) at 415V. *3) Output voltage is proportional to the power supply voltage and cannot exceed the power supply voltage. *4) Current derating may be required in case of low impedance loads such as high frequency motor. *5) When the input voltage is 380V/50Hz or 380 to 415V/60Hz, the top of the auxiliary transformer must be changed. *6) Refer to the EN 61800-3 (5.2.3). *7) Tested at standard load condition (85% load). *8) This value is calculated. (Refer to IMO). *9) With a nominal applied motor, this value is average torque when the motor decelerates and stops from 60Hz. (It may change according to motor loss.)

Conformity to Low Voltage Directive
The Jaguar VXM Series conforms to the Low Voltage Directive with EN50178.

Conformity to EMC Directive

- Emission requirement
EMC filters in compliance with EN61800-3 are provided for all models as an optional extra

- Immunity requirement
The Jaguar VXM Series inverters meet EN61800-3 as standard.



COMMON SPECIFICATIONS

Item		Explanation
Output frequency	Maximum frequency	50 to 400Hz *1)
	Base frequency	25 to 400Hz *1)
	Starting frequency	0.2 to 60Hz, Holding time: 0.0 to 10.0s
	Carrier frequency *2)	CT use 0.75 to 15kHz (55kW or smaller) *3) 0.75 to 10kHz (75kW or larger) VT use 0.75 to 15kHz (22kW or smaller) 0.75 to 10kHz (30 to 75kW) 0.75 to 6kHz (90kW or larger)
	Accuracy (Stability)	<ul style="list-style-type: none"> Analog setting : ±0.2% of maximum frequency (at 25 ±10°C) Digital setting : ±0.01% of maximum frequency (at -10 to +50°C)
Setting resolution	<ul style="list-style-type: none"> Analog setting : 1/3000 of maximum frequency ex.) 0.02Hz at 60Hz, 0.04Hz at 120Hz, (0.15Hz at 400Hz : EN) Digital setting : 0.01Hz at maximum frequency of up to 99.99Hz (0.1Hz at Maximum frequency of 100Hz and above) LINK setting : 1/20000 of maximum frequency ex.) 0.003Hz at 60Hz, 0.006Hz at 120Hz, (0.02Hz at 400Hz : EN) • 0.01Hz (Fixed) 	
Control	Control method	• V/f control (Sinusoidal PWM control) • Dynamic torque-vector control (Sinusoidal PWM control) • Vector control with PG (*) (EN only)
	Voltage/freq. (V/f) characteristic	Adjustable at base and maximum frequency, with AVR control : 320 to 480V
	Torque boost	Selectable by load characteristics: Constant torque load (Auto/manual), variable torque (manual)
	Operation method	<ul style="list-style-type: none"> KEYPAD operation : FWD or REV key, STOP key Digital input signal operation : FWD or REV command, Coast-to-stop command, etc. LINK operation : RS485 (Standard) Profibus-DP, Interbus-S, DeviceNet, Modbus Plus, CAN open (Option)
	Frequency setting (Frequency command)	<ul style="list-style-type: none"> KEYPAD operation : ▲ or ▼ key External potentiometer (*) : 1 to 5k (1/2W) Analog input : 0 to +10VDC (0 to +5VDC), 4 to 20mA DC (Reversible 0 to ±10VDC (0 to ±5VDC) . . . Reversible operation by polarised signal can be selected. (Inverse) +10 to 0VDC, 20 to 4mA DC . . . Inverse mode operation can be selected. UP/DOWN control : Output frequency increases when UP signal is ON, and decreases when DOWN signal is ON. Multistep frequency : Up to 16 different frequencies can be selected by digital input signal. Pulse train input (*) : 0 to 100kp/s Digital signal (parallel) (*) : 16-bit binary LINK operation : RS485 (Standard) Profibus-DP, Interbus-S, DeviceNet, Modbus Plus, CAN open (Option) Programmed PATTERN operation: Maximum 7 stages
	Jogging operation	• FWD or REV key, FWD or REV digital input signal
	Running status signal	Transistor output (4 points) : RUN, FAR, FDT, OL, LU, TL, etc. Relay output (2 points) : Same as transistor output • Alarm output (for any fault) Analog output (1 point) : Output frequency, output current, output torque, etc. Pulse output (1 point) : Output frequency, output current, output torque, etc.
	Acceleration/Deceleration time	0.01 to 3600s : Independently adjustable acceleration and deceleration • 4 different times are selectable. Mode select : Linear, S-curve (weak), S-curve (strong), Non-linear
	Active drive	When the acceleration time reaches 60s, the motor output torque is automatically reduced to rated torque. After 60s the motor operation mode is changed to torque limiting operation. The acceleration time is automatically extended up to 3 times.
	Frequency limiter	High and low limiter can be preset.
	Bias frequency	Bias frequency can be preset.
	Gain for frequency setting	Gain for frequency setting can be preset (0.0 to 200.0%) ex.) Analog input 0 to +5VDC with 200% gain results in maximum frequency at 5VDC.
	Skip frequency control	Skip frequency (3 points) and its common skip hysteresis width (0 to 30Hz) can be preset.
	Rotating motor pick up (Flying start)	A rotating motor (including inverse rotating mode) can be smoothly picked up without stopping the motor (speed search method).
	Auto-restart after momentary power failure	Automatic restart is available without stopping motor after a momentary power failure (speed search method). When "Smooth recovery" mode is selected, the motor speed drop is held minimum. (The inverter searches the motor speed and smoothly returns to setting frequency.)
	Line/Inverter changeover operation	Controls the switching operation between line power and inverter. The inverter has internal sequence function.
	Slip compensation	The inverter output frequency is controlled according to the load torque to keep motor speed constant. When the value is set at "0.00" and "Torque-vector" is set at "active", the compensation value is automatically set. Slip compensation can be preset for the second motor.
	Droop operation	The motor speed droops in proportional to output torque (-9.9 to 0.0Hz).
	Torque limiting	• When the motor torque reaches a preset limiting level, this function automatically adjusts the output frequency to prevent the inverter from tripping due to an overcurrent. • Torque limiting 1 and 2 can be individually set, and are selectable with a digital input signal.
	Torque control	Output torque (or load factor) can be controlled with an analog input signal.
	PID control	This function can control flow rate pressure, etc. (with an analog feedback signal.) <ul style="list-style-type: none"> Reference signal • KEYPAD operation (▲ or ▼ key): Setting freq./Max. freq. X 100 (%) • PATTERN operation : Setting freq./Max. freq. X 100 (%) • Voltage input (Terminal 12 and V2) : 0 to +10V DC • DI option input (*) : BCD, setting freq./Max. freq. X 100 (%) • Current input (Terminal C1) : 4 to 20mA DC • Binary, full scale/100 (%) • Reversible operation with polarity (Terminal 12) : 0 to ±10V DC • Multistep frequency setting : Setting freq./Max. freq. X 100 (%) • Reversible operation with polarity (Terminal 12 + V1) : 0 to ±10V DC • RS485 : Setting freq./Max. freq. X 100 (%) • Inverse mode operation (Terminal 12 and V2) : +10 to 0V DC • Inverse mode operation (Terminal C1) : 20 to 4mA DC Feedback signal • Terminal 12 (0 to +10V DC or +10 to 0V DC) • Terminal C1 (4 to 20mA DC or 20 to 4mA DC)

NOTES: (*) Option

*1) For application at 120Hz or above, please contact IMO.



*2) Inverter may automatically reduce carrier frequency, in accordance with ambient temperature or output current for protection purposes.

*3) The minimum carrier frequency changes depending on maximum output frequency.

Item		Explanation	
Control	Automatic deceleration	Torque limiter 1 (braking) is set at "F41:0" (Same as Torque limiter 2 (braking)). <ul style="list-style-type: none"> In deceleration : The deceleration time is automatically extended up to 3 times the setting time for tripless operation even if braking resistor not used. In constant speed operation : Based on regenerative energy, the frequency is increased and tripless operation is active. 	
	Second motor's setting	This function is used for two motors switching operation. <ul style="list-style-type: none"> The second motor's V/f characteristics (base and maximum frequency) can be preset. The second motor's circuit parameter can be preset. Torque-vector control can be applied to both motors. 	
	Energy saving operation	This function minimises inverter and motor losses at light load.	
	Fan stop operation	This function is used for silent operation or extending the fan's lifetime.	
	Universal DI	Transmits to main controller of LINK operation.	
	Universal DO	Outputs command signal from main controller of LINK operation.	
	Universal AO	Outputs analog signal from main controller of LINK operation.	
	Zero speed control (*)	The motor speed is controlled with the speed reference of zero – (holding torque).	
	Positioning control (*)	The SY option card can be used for positioning control by differential counter method.	
Synchronised operation (*)	The function controls the synchronised operation between 2 axes with encoders.		
Indication	Operating mode (Running)	LED monitor	LCD monitor (English, German, French, Spanish, Italian, Japanese)
		<ul style="list-style-type: none"> Output frequency 1 (before slip compensation) (Hz) Output frequency 2 (after slip compensation) (Hz) Setting frequency (Hz) Output current (A) Output voltage (V) Motor synchronous speed (r/min) Line speed (m/min) Load shaft speed (r/min) Torque calculation value (%) Input power (kW) PID reference value ("F01") PID reference value (Remote) ("C30") PID feedback value <p>• Trip history: Cause of trip by code (even when main power supply is off, trip history data of the last 4 trips are retained).</p>	<p>Operation monitor and alarm monitor</p> <p>Operation monitor</p> <ul style="list-style-type: none"> Displays operation guidance <p>• Bargraph: Output frequency (%), output current (A), output torque (%)</p> <p>Alarm monitor</p> <ul style="list-style-type: none"> The alarm data is displayed when the inverter trips. <p>Function setting and monitor</p> <p>Function setting</p> <p>Displays function codes and its data or data code, and changes the data value.</p> <p>Operation condition</p> <ul style="list-style-type: none"> Output frequency (Hz) Output current (A) Output voltage (V) Torque calculation value (%) Setting frequency (Hz) Operation condition <ul style="list-style-type: none"> Motor synchronous speed (r/min) Load shaft speed (r/min) Line speed (m/min) PID reference value PID feedback value Driving torque limiter setting value (%) (FWD/REV, IL, VL/LU, TL) Braking torque limiter setting value (%) <p>Tester function (I/O check)</p> <ul style="list-style-type: none"> Digital I/O: ■ (ON), □ (OFF) Analog I/O: (V), (mA), (H), (p/s) <p>Maintenance data</p> <ul style="list-style-type: none"> Operation time (h) DC link circuit voltage (V) Temperature of inside air (°C) (KEYPAD, RS485, Option) Temperature of heat sink (°C) Maximum current (A) Main circuit capacitor life (%) Control PC board life (h) <p>Load factor calculation</p> <ul style="list-style-type: none"> Measurement time (s) Maximum current (A) <ul style="list-style-type: none"> Average current (A) Average braking power (%) <p>Alarm data</p> <ul style="list-style-type: none"> Output frequency (Hz) Output current (A) Output voltage (V) Torque calculation value (%) (KEYPAD, RS485, Option) Setting frequency (Hz) Operation condition Operation time (h) DC link circuit voltage (V) <ul style="list-style-type: none"> Cooling fan operation time (h) Communication error times ROM version (Inverter, KEYPAD, Option) Transistor output terminal condition Multiple alarm occurrence
	Stopping	Selected setting value or output value	
	Trip mode	Displays the cause of trip by codes as follows. <ul style="list-style-type: none"> OC1 (Overcurrent during acceleration) OC2 (Overcurrent during deceleration) OC3 (Overcurrent running at constant speed) EF (Ground fault) Lin (Input phase loss) FUS (Fuse blown) OU1 (Overvoltage during acceleration) OU2 (Overvoltage during deceleration) OU3 (Overvoltage running at constant speed) LU (Undervoltage) OH1 (Overheating at heat sink) OH2 (External thermal relay tripped) OH3 (Overtemperature of inside air) dBH (Overheating of DB circuit) OL1 (Motor 1 overload) OL2 (Motor 2 overload) OLU (Inverter unit overload) OS (Overspeed) PG (PG error) Er1 (Memory error) Er2 (KEYPAD panel communication error) Er3 (CPU error) Er4 (Option error) Er5 (Option error) Er7 (Output phase loss error, impedance imbalance) Er8 (RS485 error) 	
Charge lamp	• When the DC link circuit voltage is higher than 50V, the charge lamp is ON.		

Item		Explanation
Protection	Overload	Protects the inverter by electronic thermal and detection of inverter temperature.
	Overvoltage	Detects DC link circuit overvoltage, and stops the inverter. 400V series: 800VDC.
	Undervoltage	Detects DC link circuit undervoltage, and stops the inverter. 400V series: 400VDC.
	Input phase loss	Phase loss protection for power line input.
	Overheating	Protects the inverter by detection of inverter temperature.
	Short-circuit	Short-circuit protection for inverter output circuit.
	Ground fault	<ul style="list-style-type: none"> Ground fault protection for inverter output circuit (3 phase current detection method). Zero-phase current detection method (30kW or larger).
	Motor overload	<ul style="list-style-type: none"> Electronic thermal overload relay can be selected for standard motor or inverter rated motor. Thermal time constant (0.5 to 75.0 minutes) can be preset for a special motor. The second motor's electronic thermal overload relay can be preset for 2-motor changeover operation.
	DB resistor overheating	<ul style="list-style-type: none"> Prevents DB resistor overheating by internal electronic thermal overload relay (7.5kW or smaller). Prevents DB resistor overheating by external thermal overload relay attached to DB resistor (11kW or larger). (The inverter stops discharge operation to protect the DB resistor).
	Stall prevention	<ul style="list-style-type: none"> Controls the output frequency to prevent (overcurrent) trip when the output current exceeds the limit value during acceleration. Lowers the output frequency to hold almost constant torque when the output current exceeds the limit value during operation at constant speed. Controls the output frequency to prevent (overvoltage) trip when the DC link circuit voltage exceeds the limit value during deceleration.
	Output phase loss	When the inverter executes auto-tuning, detects each phase impedance imbalance and displays an Error code.
	Motor protection by PTC thermistor	When the motor temperature exceeds allowable value, the inverter trips automatically.
Auto reset	When the inverter is tripped it can be set to automatically reset and start.	
Condition (Installation and operation)	Installation location	Free from corrosive gases, flammable gases, oil mist, dusts and direct sunlight. Indoor use only.
	Altitude	1000m or less. Applicable to 3000m with power derating (-10%/1000m).
	Ambient temperature	-10 to +50°C. For inverters of 22kW or smaller, remove the ventilation covers when operating it at a temperature of 40°C or above.
	Ambient humidity	5 to 95%RH (non-condensing).
	Vibration	3mm from 2 to less than 9Hz, 9.8m/s ² from 9 to less than 20Hz 2m/s ² from 20 to less than 55Hz, 1m/s ² from 55 to less than 200Hz
Storage condition	Temperature: -25 to +65°C, Humidity: 5 to 95%RH (non-condensing)	

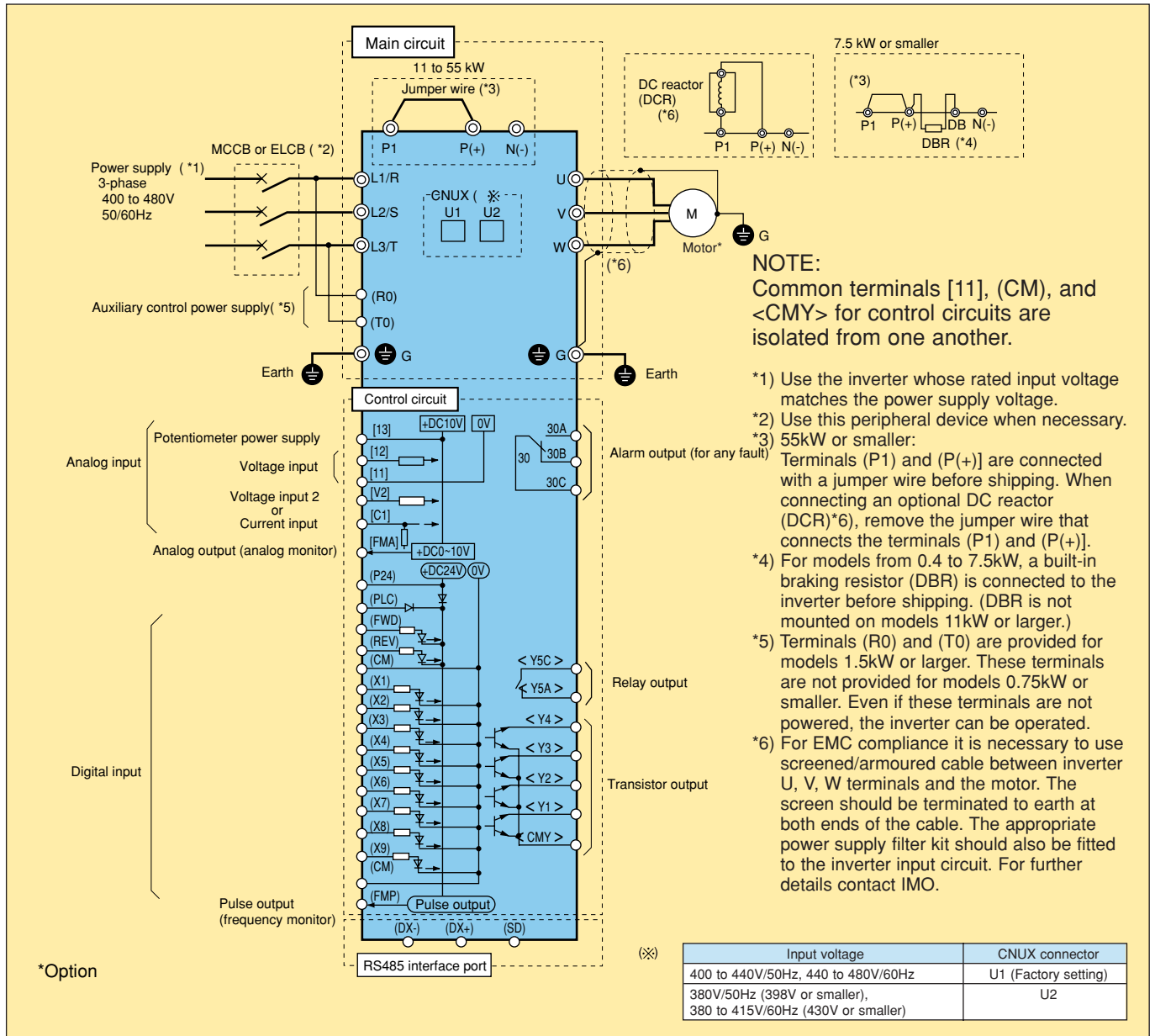


	Symbol	Terminal name	Function	Remarks	Func. code	
Main circuit	L1/R, L2/S, L3/T	Power input	Connect a 3 phase power supply			
	U, V, W	Inverter output	Connect a 3 phase induction motor			
	P1, P(+)	For DC REACTOR	Connect the DC REACTOR for power-factor correcting or harmonic current reducing	DC REACTOR: Option		
	P(+), N(-)	For BRAKING UNIT	• Connect the BRAKING UNIT (option) Used for DC bus connection system	BRAKING UNIT (Option): 11kW or larger		
	P(+), DB	For EXTERNAL BRAKING RESISTOR	Connect the EXTERNAL BRAKING RESISTOR (option)	Only for 7.5kW or smaller		
	⊕ G	Grounding	Ground terminal for inverter chassis (housing)			
	R0, T0	Auxiliary control power supply	Connect the same AC power supply as that of the main circuit to back up the control circuit power supply	0.75kW or smaller: Not applicable		
Analog input	13	Potentiometer power supply	+10VDC power supply for frequency setting POT (POT: 1 to 5kΩ)	• Allowable maximum output current: 10mA		
	12	Voltage input	• 0 to +10VDC/0 to 100% (0 to +5VDC/0 to 100%) • Reversible operation can be selected by function setting. 0 to +10VDC/0 to ±100% (0 to ±5VDC/0 to ±100%) • Inverse mode operation can be selected by function setting or digital input signal +10 to 0VDC/0 to 100%	• Input impedance: 22kΩ • Allowable maximum input voltage: ±15VDC • If input voltage is 10 to 15VDC, the inverter estimates it to 10VDC	F01, C30	
			(Torque control)	Used for torque control reference signal		H18
			(PID control)	Used for PID control reference signal or feedback signal		F01, H21
	C1	Current input	• 4 to 20mA DC/0 to 100% • Inverse mode operation can be selected by function setting or digital input signal. 20 to 4mA DC/0 to 100%	• Input impedance: 250kΩ • Allowable maximum input current: 30mA DC • If input current is 20 to 30mA DC, the inverter estimates it to 20mA DC		
			(PID control)	Used for PID control reference signal or feedback signal		F01, H21
	V2	Voltage input 2	The PTC-thermistor (for motor protection) can be connected to terminal C1-11	Change over the PIN switch on control board (SW2: PTC)	H26, H27	
			0 to +10VDC	Can't change over the terminal C1	F01	
	11	Common	Common for analog signal	Isolated from terminal CMY and CM		
	Digital input	FWD	Forward operation command	FWD: ON . . . The motor runs in the forward direction FWD: OFF . . . The motor decelerates and stops	When FWD and REV are simultaneously ON, the decelerates and stops	F02
REV		Reverse operation command	REV: ON . . . The motor runs in the reverse direction REV: OFF . . . The motor decelerates and stops			
X1		Digital input 1	These terminals can be preset as follows	• ON state maximum input voltage: 2V (maximum source current: 5mA) • OFF state maximum terminal voltage: 22 to 27V (allowable maximum leakage current: 0.5mA)	E01 to E09	
X2		Digital input 2				
X3		Digital input 3				
X4		Digital input 4				
X5		Digital input 5				
X6		Digital input 6				
X7		Digital input 7				
X8		Digital input 8				
X9		Digital input 9				
(SS1)		Multistep freq. selection	(SS1) : 2 (0,1) different frequencies are selectable	Frequency 0 is set by F01 (or C30) (All signals of SS1 to SS8 are OFF)	C05 to C19	
(SS2)			(SS1, SS2) : 4 (0 to 3) different frequencies are selectable			
(SS4)			(SS1, SS2, SS4) : 8 (0 to 7) different frequencies are selectable			
(SS8)			(SS1, SS2, SS4, SS8) : 16 (0 to 15) different frequencies are selectable			
(RT1)		ACC/DEC time selection	(RT1) : 2 (0, 1) different ACC/DEC times are selectable	Time 0 is set by F07/F08 (All signals of RT1 to RT2 are OFF)	F07, F08 E10 to E15	
(RT2)			(RT1, RT2) : 4 (0 to 3) different ACC/DEC times are selectable			
(HLD)		3 wire operation stop command	Used for 3 wire operation (HLD): ON . . . The inverter self-holds FWD or REV signal (HLD): OFF . . . The inverter releases self-holding	Assigned to terminal X7 at factory setting		
(BX)		Coast-to-stop command	(BX): ON . . . Motor will coast-to-stop. (No alarm signal will be output)	• The motor restarts from 0Hz by turning off BX with the operation command (FWD or REV) ON • Assigned to terminal X8 at factory setting	H11	
(RST)		Alarm reset	(RST): ON . . . Faults are reset. (This signal should be held for more than 0.1s)	• During normal operating, this signal is ignored • Assigned to X9 at factory setting		
(THR)		Trip command (External fault)	(THR): OFF . . . "OH2 trip" occurs and motor will coast-to-stop	This alarm signal is held internally		
(JOG)		Jogging operation	(JOG): ON . . . JOG frequency is effective	This signal is effective only while the inverter is stopped	C20	
(Hz2/Hz1)		Freq. set 2/Freq. set 1	(Hz2/Hz1): ON . . . Freq. set 2 is effective	If this signal is changed while the inverter is running the signal is effective only after the inverter stops	C30/F01	
(M2/M1)		Motor 2/Motor 1	(M2/M1): ON . . . The motor circuit parameter and V/f characteristics are changed to the second motor's ones	If this signal is changed while the inverter is running the signal is effective only after the inverter stops	A10 to A18/ P01 to P09	
(DCBRK)		DC brake command	(DCBRK): ON . . . The DC injection brake is effective. (In the inverter deceleration mode)	If the operation command (FWD/REV) is input while DC braking is effective, the operation command (FWD/REV) has priority	F20 to F22	
(TL2/TL1)		Torque limiter 2/Torque limiter 1	(TL2/TL1): ON . . . Torque limiter 2 is effective		E16, E17/ F40, F41	
(SW50)		Switching operation between line and inverter	(SW50(SW60)): ON . . . The motor is changed from inverter operation to line operation	Main circuit changeover signals are output through Y1 to Y5 terminal		
(SW60)			(SW50(SW60)): OFF . . . The motor is changed from line operation to inverter operation			
(UP)		UP command	(UP): ON . . . The output frequency increases	When UP and DOWN commands are simultaneously ON, DOWN signal is effective		
(DOWN)		DOWN command	(DOWN): ON . . . The output frequency decreases • The output frequency change rate is determined by ACC/DEC time • Restarting frequency can be selected from 0Hz or setting value at the time of stop		F01, C30	
(WE-KP)		Write enable for KEYPAD	(WE-KP): ON . . . The data is changed by KEYPAD		F00	
(Hz/PID)		PID control cancel	(Hz/PID): ON . . . The PID control is cancelled, and frequency setting by KEYPAD ( or ) is effective		H20 to H25	
(IVS)		Inverse mode changeover	(IVS): ON . . . Inverse mode is effective in analog signal input	If this signal is changed while the inverter is running the signal is effective only after the inverter stops	F01, C30	
(IL)	Interlock signal for 52-2	Connect to auxiliary contact (INC) of 52-2				
(Hz/TRQ)	TRQ control cancel	(Hz/TRQ): ON . . . The torque control is cancelled, and ordinary operation is effective		H18		
(LE)	Link enable (RS485, Bus)	(LE): ON . . . The link operation is effective. Used to switch between manual operation and serial link auto mode	RS485: Standard, Bus: option	H30		
(U-DI)	Universal DI	This signal is transmitted to main controller of LINK operation				
(STM)	Pick up start mode	(STM): ON . . . The "Pick up" start mode is effective		H09		
(PG/HZ)	SY-PG enabled	(PG/HZ): ON . . . Synchronised operation or PG-feedback operation is effective	Option			
(SYC)	Synchronised command	(SYC): ON . . . The motor is controlled for synchronised operation between 2 axes with PGs	Option			
(ZERO)	Zero speed command	(ZERO): ON . . . The motor speed is controlled with the speed reference of zero	This function can be selected at PG feedback control. Option			
(STOP 1)	Forced stop command	(STOP 1): OFF . . . The motor decelerates and stops				
(STOP 2)	Forced stop command with Deceleration time 4	(STOP 2): OFF . . . The motor decelerates and stops with Deceleration time 4		E15		
(EXITE)	Pre-exciting command	(EXITE): ON . . . Motor magnetic flux is established before starting in PG vector mode				
PLC	PLC terminal	Connect PLC power supply to avoid malfunction of the inverter that has SINK type digital input, when PLC power supply is off				
P24	DC voltage supply	DC voltage supply (+24V, maximum 100mA)				

	Symbol	Terminal name	Function	Remarks	Func. code
Analog output	FMA	Analog monitor	Output voltage (0 to 10VDC) is proportional to selected function's value as follows. The proportional coefficient and bias value can be preset. <ul style="list-style-type: none"> Output frequency 1 (Before slip compensation) (0 to max. frequency) Output frequency 2 (After slip compensation) (0 to max. frequency) Output current (0 to 200%) Output voltage (0 to 200%) Output torque (0 to 200%) Load factor (0 to 200%) Input power (0 to 200%) PID feedback value (0 to 100%) PG feedback value (0 to max. speed) DC link circuit voltage (0 to 1000V) Universal AO (0 to 100%) 	Allowable maximum output current: 2mA	F30 to F31
	(11)	(Common)			
Pulse Output	FMP	Pulse rate monitor	<ul style="list-style-type: none"> Pulse rate mode: Pulse rate is proportional to selected function's value* (50% duty pulse) Average voltage mode: Average voltage is proportional to selected function's value* (2670p/s pulse width control) 	Allowable maximum output current: 2mA	F33 to F35
	(CM)	(Common)	• Function to be output is same as those of analog output (FMA)		
	CM	Common	Common for pulse output	Isolated from terminal CMY and 11	
Transistor output	Y1	Transistor output 1	Output the selected signals from the following items	<ul style="list-style-type: none"> ON state maximum output voltage: 3V (Allowable maximum sink current: 50mA) OFF state maximum leakage current: 0.1mA (Allowable maximum voltage: 27V) 	E20 to E23
	Y2	Transistor output 2			
	Y3	Transistor output 3			
	Y4	Transistor output 4			
	(RUN)	Inverter running	Outputs ON signal when the output frequency is higher than starting frequency		
	(FAR)	Frequency equivalence signal	Outputs ON signal when the difference between output frequency and setting frequency is smaller than FAR hysteresis width		E30
	(FDT1)	Frequency level detection	Outputs ON signal by comparison of output frequency and preset value (level and hysteresis)		E31, E32
	(LU)	Undervoltage detection signal	Outputs ON signal when the inverter stops by undervoltage while the operation command is ON.		
	(B/D)	Torque polarity	Outputs ON signal in braking or stopping mode, and OFF signal in driving mode		
	(TL)	Torque limiting	Output ON signal when the inverter is in torque-limiting mode		
	(IPF)	Auto-restarting	Outputs ON signal during auto restart operation (Instantaneous power failure) mode. (Including "restart time")		
	(OL1)	Overload early warning	<ul style="list-style-type: none"> Outputs ON signal when the electronic thermal value is higher than preset alarm level Outputs ON signal when the output current value is higher than preset alarm level 		E33 to E35
	(KP)	KEYPAD operation mode	Outputs ON signal when the inverter is in KEYPAD operation mode		F02
	(STP)	Inverter stopping	Outputs ON signal when the inverter is in stopping mode or in DC braking mode		
	(RDY)	Ready output	Outputs ON signal when the inverter is ready for operation		
	(SW88)	Line/Inv changeover (for 88)	Outputs 88's ON signal for Line/Inverter changeover operation		
	(SW52-2)	Line/Inv changeover (for 52-2)	Outputs 52-2's ON signal for Line/Inverter changeover operation		
	(SW52-1)	Line/Inv changeover (for 52-1)	Outputs 52-1's ON signal for Line/Inverter changeover operation		
	(SWM2)	Motor2/Motor1	Outputs the motor changeover switch ON signal from motor 1 to motor 2		A01 to A18
	(AX)	Auxiliary terminal (for 52-1)	Used for auxiliary circuit of 52-1 (Same function as AX1, AX2 terminal Jaguar VX series. (30kW or larger))	Refer to wiring diagram example	
	(TU)	Time-up signal	Outputs time up signal (100ms ON pulse) at every stage end of PATTERN operation		C21 to C28
	(TO)	Cycle completion signal	Outputs one cycle completion signal (100ms ON pulse) at PATTERN operation		
	(STG1)	Stage No. indication 1	Outputs Pattern operation's stage No. by signals STG1, STG2 and STG4		
	(STG2)	Stage No. indication 2			
	(STG4)	Stage No. indication 4			
	(AL1)	Alarm indication 1	Outputs trip alarm No. by signals AL1, AL2, AL4 and AL8		
	(AL2)	Alarm indication 2			
	(AL4)	Alarm indication 4			
	(AL8)	Alarm indication 8			
	(FAN)	Fan operation signal	Outputs the inverter cooling fan operation status signal		H06
	(TRY)	Auto-resetting	Outputs ON signal at auto resetting mode. (Including "Reset interval")		H04, H05
	(U-DO)	Universal DO	Outputs command signal from main controller of Link operation		
	(OH)	Overheat early warning	Outputs ON signal when the heat sink temperature is higher than (trip level - 10°C) and outputs OFF signal when the temperature is lower than (trip level - 15°C)		
(SY)	Synchronisation completion signal	Synchronisation completion signal for synchronised operation	Option		
(LIFE)	Lifetime alarm	Outputs ON signal when the calculated lifetime is longer than preset alarm level			
(FDT2)	2nd Freq. level detection	2nd outputs ON signal by comparison of output frequency and preset value (FDT2 level)			
(OL2)	2nd OL level early warning	2nd outputs ON signal when the output current value is larger than preset alarm level (OL2 level)			
(C1OFF)	Terminal C1 off signal	Outputs ON signal when the C1 current is smaller than 2mA			
(N-EX)	Speed existence signal	Outputs ON signal when motor speed is larger than stop speed* on vector control with PG	*stop speed = stop frequency (F25) x 120/pole (r/m)	F25	
	CMY	Common (transistor output)	Common for transistor output signal	Isolated from terminals CM and 11	
Relay output	30A, 30B	Alarm relay output	Outputs a contact signal when a protective function is activated	<ul style="list-style-type: none"> Contact rating: 250VAC, 0.3A, cosφ=0.3 48VDC, 0.5A, non-inductive 	F36
	30C		Changeable exciting mode active or non-exciting mode active by function "F36"		E24
	Y5A, Y5C	Relay output	Functions can be selected the same as Y1 to Y4		E25
			Changeable excitation mode active or non-excitation mode active by function "E25"		
Link	DX+, DX-, SD	RS485 I/O terminal	Connect the RS485 link signal		

Keypad panel operation

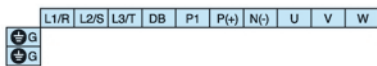
The following diagram is for reference only. For detailed wiring diagrams, refer to the relevant instruction manual.



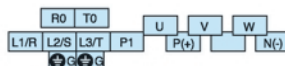
Terminal arrangement

- Main circuit terminals

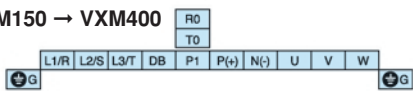
VXM40 → VXM75



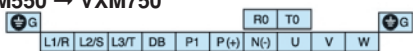
VXM30KP → VXM110K



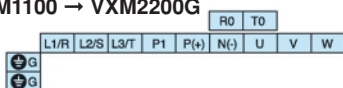
VXM150 → VXM400



VXM550 → VXM750



VXM1100 → VXM2200G

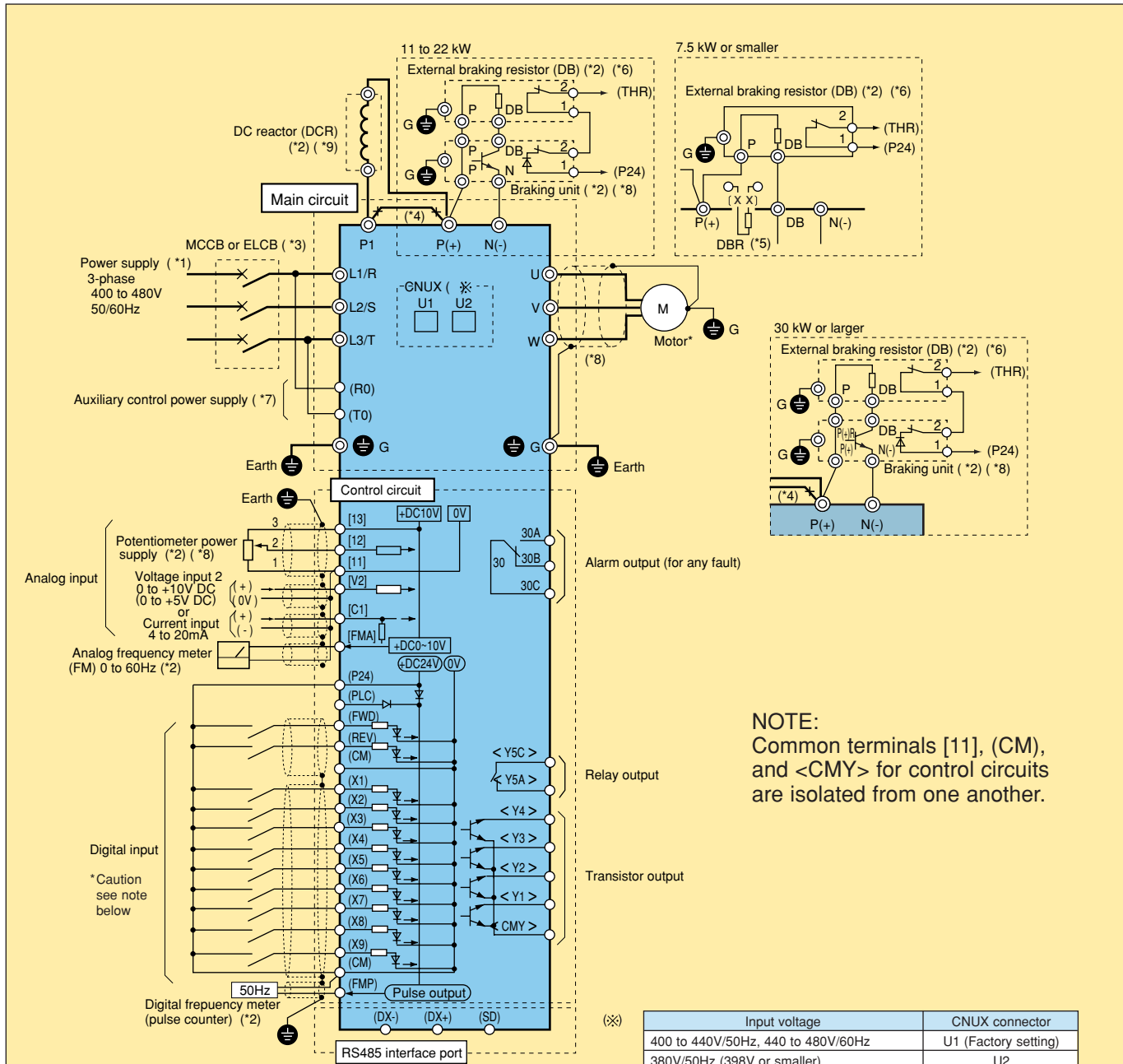


- Control circuit terminals



External signal input operation

The following diagram is for reference only. For detailed wiring diagrams, refer to the relevant instruction manual.



NOTE:

Digital inputs can be source or sink depending on position of switch SW1 on control PCB. Do not connect (P24) to (CM) as shown or damage may occur.

***Option**

- *1) Use the inverter whose rated input voltage matches the power supply voltage.
- *2) An optional device. Use it when necessary.
- *3) Use this peripheral device when necessary.
- *4) Terminals (P1) and (P+) are connected with a jumper wire before shipping. When connecting an optional DC reactor (DCR) *9), remove the jumper wire that connects the terminal (P1) and (P+).
- *5) For models from 0.2 to 7.5kW, a built-in braking resistor (DBR) is connected to the inverter before shipping. (DBR is not mounted on models 11kW or larger.) When connecting an optional external braking resistor (DB), remove the DBR connection cables from (P+) and (DB) terminals. The end of the removed cables (indicated with an X) must be insulated.

- *6) When connecting an optional external braking resistor (DB), be sure to also use an optional braking unit *8). Connect the optional braking unit to the (P+) and (N-) terminals. Auxiliary terminals (1) and (2) have polarity. Be sure to connect cables to these terminals correctly. (See the diagram).
- *7) Terminals (R0) and (T0) are provided for models 1.5kW or larger. These terminals are not provided for models 0.75kW or smaller. Even if these terminals are not powered, the inverter can be operated.
- *8) For EMC compliance it is necessary to use screened/armoured cable between inverter U, V, W terminals and the motor. The screen should be terminated to earth at both ends of the cable. The appropriate power supply filter kit should also be fitted to the inverter input circuit. For further details contact IMO.

KEYPAD PANEL FUNCTIONS AND OPERATIONS

Keypad Panel

LED monitor

In operation mode:
Displays the setting frequency, output current, voltage, motor speed, or line speed.
In trip mode:
Displays code indicating the cause of trip.

Up/Down keys

In operation mode :
Increases or decreases the frequency or speed.
In program mode :
Increases or decreases function code number and data set value.

Program key

Switches the display to a menu screen or to the initial screen for operation mode or alarm mode.

Shift key (Column shift)

In program mode :
Moves the cursor horizontally at data change. Pressing this key with the UP or DOWN key, the screen changes to the next function block.

Reset key

In program mode :
Cancels the current input data and shifts the screen.
In trip mode :
Releases the trip-stop state.

LCD monitor

In operation mode :
Displays various items of information such as operation condition and function data. Operation guidance, which can be scrolled, is displayed at the bottom.
In program mode :
Displays functions and data.

Unit indication

Displays the unit for the information shown on the LED monitor.

FWD/REV keys

In operation mode :
Starts the inverter with forward or reverse operation command.
Pressing the FWD or REV key lights the RUN lamp.
Invalid when the function code F02 (Operation method) is set at 1 (External signal operation).

Stop key

In operation mode :
Stops the inverter.
Invalid when the function code F02 (Operation method) is set at 1 (External signal operation).

Function/Data Select key

In operation mode :
Changes the displayed values of LED monitor.
In program mode :
Selects the function code or store the data.



Keypad Panel Operation


Perform the wiring shown in the Basic wiring diagram on page 14. Turn on inverter power, and use the  or  key to set an output frequency. Press the  key, then press the  or  key.

The inverter starts running using the factory setting function data.


Press the  key to stop the inverter.

Procedure for selecting function codes and data codes






The following is a sample procedure for selecting a function code and changing the function data.

- 1 Press the  key to switch the operation monitor screen to the program menu screen.





RUN	FWD
PRG → PRG	MENU
F/D → LED	SHIFT

- 2 Select "1. DATA SET", and press the  key.


→	1. DATA SET
	2. DATA CHECK
	3. OPR MNT
	4. I / O CHECK

- 3 Press the  or  key to select a target function code. To quickly scroll the function select screen, press  key and the  or  key at the same time.


F00	DATA PRTC
F01	FREQ COM 1
F02	OPR METHOD
F03	MAX Hz-1

- 4 Use the , , and  keys to change the function data to the target value. (Use the  key to move the cursor when you want to enter a numerical value.)

F01	FREQ COM 1
	0
0~11	




- 5 Press the  key to store the updated function data in memory.
The screen shifts for the selection of the next function.

F02	OPR METHOD
F03	MAX Hz-1
F04	BASE Hz-1
F05	RATED V-1


- 6 Pressing the  key switches the screen to the operation monitor screen.

RUN	FWD
PRG → PRG	MENU
F/D → LED	SHIFT

1) Setting a frequency





When the operation monitor screen is displayed, a frequency can be set by using the  or  key in both the operation and stop modes. When the target frequency is displayed, press the  key to enter the frequency in memory.

2) Switching a unit indication

During both operation and stop modes, each time the  key is pressed, the value displayed on the LED monitor changes, and the unit indication on the LCD monitor shifts from Hz to A, V, r/min, m/min, kW, and % in this order in accordance with the displayed value.

The functions in the white boxes can be set while the inverter is running. Other functions must be set while the inverter is stopped.

Fundamental Functions

	Function		Setting range	Min. unit	Factory setting	
	Code	Name			LCD monitor	-22kW
Basic Functions	F00	Data protection	F00 DATA PRTC	0 : Data change enable 1 : Data protection	-	0
	F01	Frequency command 1	F01 FREQ CMD 1	0 : KEYPAD operation ( or  key) 1 : Voltage input (terminals I2 and V2) (0 to +10VDC, 0 to +5VDC) 2 : Current input (terminal C1) (4 to 20mA DC) 3 : Voltage and current input (terminals I2 and C1) 4 : Reversible operation with polarity (terminal I2) (0 to ±10VDC) 5 : Reversible operation with polarity (terminals I2 and V1) (0 to ±10VDC) 6 : Inverse mode operation (terminals I2 and V2) (+10 to 0VDC) 7 : Inverse mode operation (terminal C1) (20 to 4mA DC) 8 : UP/DOWN control 1 (initial freq. = 0Hz) 9 : UP/DOWN control 2 (initial freq. = last value) 10 : PATTERN operation 11 : DI option or Pulse train input	-	-
	F02	Operation method	F02 OPR METHOD	0 : KEYPAD operation ( or  key) 1 : FWD or REV command signal operation	-	0
	F03	Maximum frequency 1	F03 MAX Hz-1	50 to 400Hz	1Hz	50
	F04	Base frequency 1	F04 BASE Hz-1	25 to 400Hz	1Hz	50
	F05	Rated voltage 1 (at Base frequency 1)	F05 RATED V-1	0 (Free), 320 to 480V	1V	400
	F06	Maximum voltage 1 (at Maximum frequency 1)	F06 MAX V-1	320 to 480V	1V	400
	F07	Acceleration time 1	F07 ACC TIME 1	0.01 to 3600s	0.01s	6.00 20.00
	F08	Deceleration time 1	F08 DEC TIME 1	0.01 to 3600s	0.01s	6.00 20.00
	F09	Torque boost 1	F09 TRQ BOOST 1	0.0 : Automatic (for constant torque load) 0.1 to 1.9 : Manual (for variable torque load) 2.0 to 20.0 : Manual (for constant torque load)	0.1	0.0 (EV : 0.1)
	F10	Electronic thermal overload relay for motor 1 (Select)	F10 ELCTRN OLI	0 : Inactive 1 : Active (for 4-pole standard motor) 2 : Active (for 4-pole inverter motor)	-	1
	F11	(Level)	F11 OL LEVEL 1	Approx. 20 to 135% of rated current	0.01A	*1)
	F12	(Thermal time constant)	F12 TIME CNST 1	0.5 to 75.0 min	0.1 min.	5.0 10.0
	F13	Electronic thermal overload relay (for braking resistor)	F13 DBR OL	(7.5kW or smaller) 0 : Inactive 1 : Active (for built-in braking resistor) 2 : Active (for external braking resistor) (11kW or larger) 0 : Inactive	-	1
	F14	Restart mode after momentary power failure	F14 RESTART	0 : Inactive (Trip and alarm when power failure occurs.) 1 : Inactive (Trip and alarm when power recovers.) 2 : Inactive (Deceleration stop and alarm.) 3 : Active (Smooth recovery by continuous operation mode) 4 : Active (Momentarily stops and restarts at output frequency of before power failure) 5 : Active (Momentarily stops and restarts at starting frequency)	-	0
	F15	Frequency limit (High)	F15 H LIMITER	0 to 400Hz	1Hz	70
	F16	(Low)	F16 L LIMITER	0 to 400Hz	1Hz	0
	F17	Gain (for frequency setting signal)	F17 FREQ GAIN	0.0 to 200.0%	0.1%	100.0
	F18	Bias frequency	F18 FREQ BIAS	-400.0 to 400.0Hz	0.1Hz	0.0
	F20	DC brake (Starting freq.)	F20 DC BRK Hz	0.0 to 60.0Hz	0.1Hz	0.0
	F21	(Braking level)	F21 DC BRK LVL	0 to 100%	1%	0
	F22	(Braking time)	F22 DC BRK t	0.0 (DC brake inactive), 0.1 to 30.0s	0.1s	0.0
	F23	Starting Frequency (Freq.)	F23 START Hz	0.1 to 60.0Hz	0.1Hz	0.5
	F24	(Holding time)	F24 HOLDING t	0.0 to 10.0s	0.1s	0.0
	F25	Stop frequency	F25 STOP Hz	0.1 to 6.0Hz	0.1Hz	0.2
	F26	Motor sound (Carrier freq.)	F26 MTR SOUND	CT use 0.75 to 15kHz (Up to 55kW) 0.75 to 10kHz (75kW and above) VT use* 0.75 to 15kHz (Up to 22kW) 0.75 to 10kHz (30 to 75kW) 0.75 to 6kHz (90kW and above) *In case of VT use, carrier frequency should be adjusted depending on capacity.	1kHz	15 (Up to 55kW)* 10 (75kW and above)*
	F27	(Sound tone)	F27 SOUND TONE	0 : level 0 1 : level 1 2 : level 2 3 : level 3	-	0
	F30	FMA (Voltage adjust)	F30 FMA V-ADJ	0 to 200%	1%	100
	F31	(Function)	F31 FMA FUNC	0 : Output frequency 1 (Before slip compensation) 1 : Output frequency 2 (After slip compensation) 2 : Output current 3 : Output voltage 4 : Output torque 5 : Load factor 6 : Input power 7 : PID feedback value 8 : PG feedback value 9 : DC link circuit voltage 10 : Universal AO	-	0
	F33	FMP (Pulse rate)	F33 FMP PULSES	300 to 6000 p/s (at full scale)	1 p/s	1440
	F34	(Voltage adjust)	F34 FMP V-ADJ	0% : Pulse rate output: 50% duty 1 to 200% : Voltage adjust: 2670 p/s, duty adjust	1%	0
	F35	(Function)	F35 FMA FUNC	0 : Output frequency 1 (Before slip compensation) 1 : Output frequency 2 (After slip compensation) 2 : Output current 3 : Output voltage 4 : Output torque 5 : Load factor 6 : Input power 7 : PID feedback value 8 : PG feedback value 9 : DC link circuit voltage 10 : Universal AO	-	0
	F36	30RY operation mode	F36 30RY MODE	0 : The relay (30) excites on trip mode. 1 : The relay (30) excites on normal mode.	-	0
	F40	Torque limiter 1 (Driving)	F40 DRV TRQ 1	20 to 200, 999% (999: No limit) *2)	1%	180 150
	F41	(Braking)	F41 BRK TRQ 1	0 (Automatic deceleration control), 20 to 200, 999% (999: No limit) *2)	1%	150 100
	F42	Torque vector control 1	F42 TRQVECTOR 1	0 : Inactive 1 : Active	-	0

The functions in the yellow boxes can be set while the inverter is running. Other functions must be set while the inverter is stopped.

Extension Terminal Functions

Function	Code Name		LCD monitor	Setting range	Min. unit	Factory setting			
	Code	Name				-22kW	30kW-		
X1-X9 Terminal	E01	X1 terminal function	E01 X1 FUNC	Selects from the following items.	-	0			
	E02	X2 terminal function	E02 X2 FUNC		-	1			
	E03	X3 terminal function	E03 X3 FUNC		-	2			
	E04	X4 terminal function	E04 X4 FUNC		-	3			
	E05	X5 terminal function	E05 X5 FUNC		-	4			
	E06	X6 terminal function	E06 X6 FUNC		-	5			
	E07	X7 terminal function	E07 X7 FUNC		-	6			
	E08	X8 terminal function	E08 X8 FUNC		-	7			
	E09	X9 terminal function	E09 X9 FUNC		-	8			
						0 : Multistep freq. selection (1 to 4 bit) (SS1)			
				1 : (SS2)					
				2 : (SS4)					
				3 : (SS8)					
				4 : ACC/DEC time selection (1 to 2 bit) (RT1)					
				5 : (RT2)					
				6 : 3-wire operation stop command (HLD)					
				7 : Coast-to-stop command (BX)					
				8 : Alarm reset (RST)					
				9 : Trip command (External fault) (THR)					
				10 : Jogging operation (JOG)					
				11 : Freq. set. 2/Freq. set. 1 (Hz2/Hz1)					
				12 : Motor 2/Motor 1 (M2/M1)					
				13 : DC brake command (DCBRK)					
				14 : Torque limiter 2/Torque limiter 1 (TL2/TL1)					
				15 : Switching operation between line and inverter (50Hz) (SW50)					
				16 : Switching operation between line and inverter (60Hz) (SW60)					
				17 : UP command (UP)					
				18 : DOWN command (DOWN)					
				19 : Write enable for KEYPAD (WE-KP)					
				20 : PID control cancel (Hz/PID)					
				21 : Inverse mode changeover (terminals 12 and C1) (IVS)					
				22 : Interlock signal for 52-2 (IL)					
				23 : TRQ control cancel (Hz/TRQ)					
				24 : Link enable (Bus, RS485) (LE)					
				25 : Universal DI (U-DI)					
				26 : Pick up start mode (STM)					
				27 : SY-PG enable (PG/Hz)					
				28 : Synchronisation command (SYC)					
				29 : Zero speed command (ZERO)					
				30 : Forced stop command (STOP 1)					
				31 : Forced stop command with Deceleration time 4 (STOP 2)					
				32 : Pre-exciting command (EXITE)					
ACC, 2,3,4	E10	Acceleration time 2	E10 ACC TIME 2	0.01 to 3600s	0.01s	10.0	100.00		
DEC 2,3,4	E11	Deceleration time 2	E11 DEC TIME 2		0.01s	10.0	100.00		
	E12	Acceleration time 3	E12 ACC TIME 3		0.01s	15.0	100.00		
	E13	Deceleration time 3	E13 DEC TIME 3		0.01s	15.0	100.00		
	E14	Acceleration time 4	E14 ACC TIME 4		0.01s	3.0	100.00		
	E15	Deceleration time 4	E15 DEC TIME 4		0.01s	3.0	100.00		
	E16	Torque limiter 2 (Driving)	E16 DRV TRQ 2	20 to 200%, 999% (999: No limit) *2)	1%	180	150		
	E17	(Braking)	E17 BRK TRQ 2	0 (Automatic deceleration control), 20 to 200%, 999% (999: No limit) *2)	1%	150	100		
Y1-Y5C Terminal	E20	Y1 terminal function	E20 Y1 FUNC	Selects from the following items	-	0			
	E21	Y2 terminal function	E21 Y2 FUNC		-	1			
	E22	Y3 terminal function	E22 Y3 FUNC		-	2			
	E23	Y4 terminal function	E23 Y4 FUNC		-	7			
	E24	Y5A, Y5C terminal function	E24 Y5 FUNC		-	10			
						0 : Inverter running (RUN)			
						1 : Frequency equivalence signal (FAR)			
						2 : Frequency level detection (FDT1)			
						3 : Undervoltage detection signal (LU)			
						4 : Torque polarity (B/D)			
				5 : Torque limiting (TL)					
				6 : Auto-restarting (IPF)					
				7 : Overload early warning (OL1)					
				8 : KEYPAD operation mode (KP)					
				9 : Inverter stopping (STP)					
				10 : Ready output (RDY)					
				11 : Line/Inv changeover (for 88) (SW88)	} For Line/Inverter changeover operation				
				12 : Line/Inv changeover (for 52-2) (SW52-2)					
				13 : Line/Inv changeover (for 52-1) (SW52-1)					
				14 : Motor 2/Motor 1 (SWM2)					
				15 : Auxiliary terminal (for 52-1) (AX)					
				16 : Time-up signal (TU)					
				17 : Cycle competition signal (TO)	} For PATTERN operation				
				18 : Stage No. indication 1 (STG1)					
				19 : Stage No. indication 2 (STG2)					
				20 : Stage No. indication 4 (STG4)					
				21 : Alarm indication 1 (AL1)	} For Alarm signal output				
				22 : Alarm indication 2 (AL2)					
				23 : Alarm indication 4 (AL4)					
				24 : Alarm indication 8 (AL8)					
				25 : Fan operation signal (FAN)					
				26 : Auto-resetting (TRY)					
				27 : Universal DO (U-DO)					
				28 : Overheat early warning (OH)					
				29 : Synchronisation completion signal (SY)					
				30 : Lifetime alarm (LIFE)					
				31 : 2nd Freq. level detection (FDT2)					
				32 : 2nd OL level early warning (OL2)					
				33 : Terminal C1 off signal (C1OFF)					
				34 : Speed existence signal (N-EX)					
	E25	Y5RY operation mode	E25 Y5RY MODE	0 : Inactive (Y5 Ry excites at "ON signal" mode.)	-	0			
				1 : Active (Y5 Ry excites at "OFF signal" mode.)					
	E30	FAR function signal (Hysteresis)	E30 FAR HYSTR	0.0 to 10.0Hz	0.1Hz	2.5			
	E31	FDT1 function signal (Level)	E31 FDT1 LEVEL	0 to 400Hz	1Hz	50			
	E32	(Hysteresis)	E32 FDT HYSTR	0.0 to 30.0Hz	0.1Hz	1.0			
	E33	OL1 function signal (Mode select)	E33 OL1 WARNING	0 : Thermal calculation	-	0			
				1 : Output current					
	E34	(Level)	E34 OL1 LEVEL	Approx. 5 to 200% of rated current	0.01A	*1			
	E35	(Timer)	E35 OL TIMER	0.0 to 60.0s	0.1s	10.0			
	E36	FDT2 function (Level)	E36 FDT2 LEVEL	0 to 400Hz	1Hz	50			
	E37	OL2 function (Level)	E37 OL2 LEVEL	Approx. 5 to 200% of rated current	0.01A	*1			



The functions in the white boxes can be set while the inverter is running. Other functions must be set while the inverter is stopped.

Extension Terminal Functions (cont'd)

	Function		LCD monitor	Setting range	Min. unit	Factory setting	
	Code	Name				-22kW	30kW-
LED & LCD Monitor	E40	Display coefficient A	E40	COEF A	-999.00 to 999.00	0.01	0.01
	E41	Display coefficient B	E41	COEF B	-999.00 to 999.00	0.01	0.00
	E42	LED Display filter	E42	DISPLAY FL	0.0 to 5.0s	0.1s	0.5
	E43	LED Monitor (Function)	E43	LED MNTR	0 : Output frequency 1 (Before slip compensation) (Hz) 1 : Output frequency 2 (After slip compensation) (Hz) 2 : Setting frequency (Hz) 3 : Output current (A) 4 : Output voltage (V) 5 : Motor synchronous speed(r/min) 6 : Line speed (m/min) 7 : Load shaft speed (r/min) 8 : Torque calculation value (%) 9 : Input power 10 : PID reference value 11 : PID reference value (remote) 12 : PID feedback value	-	0
	E44	(Display at STOP mode)	E44	LED MNTR2	0 : Setting value 1 : Output value	-	0
	E45	LCD Monitor (Function)	E45	LCD MNTR	0 : Displays operation guidance 1 : Bar graph (Output freq. Output current and Output torque)	-	0
	E46	Language	E46	LANGUAGE	0 : Japanese 1 : English 2 : German 3 : French 4 : Spanish 5 : Italian	-	1
	E47	LCD Monitor (Contrast)	E47	CONTRAST	0 (Soft) to 10 (Hard)	-	5

The functions in the white boxes can be set while the inverter is running. Other functions must be set while the inverter is stopped.

Control Functions of Frequency

	Function		LCD monitor	Setting range	Min. unit	Factory setting	
	Code	Name				-22kW	30kW-
Jump Hz Control	E01	Jump frequency (Jump freq. 1)	C01	JUMP Hz 1	0 to 400Hz	1Hz	0
	E02	(Jump freq. 2)	C02	JUMP Hz 2		1Hz	0
	E03	(Jump freq. 3)	C03	JUMP Hz 3		1Hz	0
	E04	(Hysteresis)	C04	JUMP HYSTR	0 to 30Hz	1Hz	3
Multi-Hz Control	E05	Multi-step frequency setting (Freq. 1)	C05	MULTI Hz-1	0.00 to 400.00Hz	0.01Hz	0.00
	E06	(Freq. 2)	C06	MULTI Hz-2		0.01Hz	0.00
	E07	(Freq. 3)	C07	MULTI Hz-3		0.01Hz	0.00
	E08	(Freq. 4)	C08	MULTI Hz-4		0.01Hz	0.00
	E09	(Freq. 5)	C09	MULTI Hz-5		0.01Hz	0.00
	E10	(Freq. 6)	C10	MULTI Hz-6		0.01Hz	0.00
	E11	(Freq. 7)	C11	MULTI Hz-7		0.01Hz	0.00
	E12	(Freq. 8)	C12	MULTI Hz-8		0.01Hz	0.00
	E13	(Freq. 9)	C13	MULTI Hz-9		0.01Hz	0.00
	E14	(Freq. 10)	C14	MULTI Hz10		0.01Hz	0.00
	E15	(Freq. 11)	C15	MULTI Hz11		0.01Hz	0.00
	E16	(Freq. 12)	C16	MULTI Hz12		0.01Hz	0.00
	E17	(Freq. 13)	C17	MULTI Hz13		0.01Hz	0.00
	E18	(Freq. 14)	C18	MULTI Hz14		0.01Hz	0.00
	E19	(Freq. 15)	C19	MULTI Hz15		0.01Hz	0.00
	E20	JOG frequency	C20	JOG Hz	0.00 to 400.00Hz	0.01Hz	5.00
PATTERN Operation	E21	PATTERN operation (Mode select)	C21	PATTERN	0 : Active (Mono-cycle operation, and then stops.) 1 : Active (Continuous cyclic operation while operation command is effective.) 2 : Active (Mono-cycle operation then continues at final frequency.)	-	0
	E22	(Stage 1)	C22	STAGE 1	• Operation time: 0.00 to 6000s	0.01s	0.00 F1
	E23	(Stage 2)	C23	STAGE 2	• F1 to F4 and R1 to R4	0.01s	0.00 F1
	E24	(Stage 3)	C24	STAGE 3	Code FWD/REV ACC/DEC	0.01s	0.00 F1
	E25	(Stage 4)	C25	STAGE 4	F1: FWD ACC1/DEC1	0.01s	0.00 F1
	E26	(Stage 5)	C26	STAGE 5	F2: FWD ACC2/DEC2	0.01s	0.00 F1
	E27	(Stage 6)	C27	STAGE 6	F3: FWD ACC3/DEC3	0.01s	0.00 F1
	E28	(Stage 7)	C28	STAGE 7	F4: FWD ACC4/DEC4	0.01s	0.00 F1
				R1: REV ACC1/DEC1			
				R2: REV ACC2/DEC2			
				R3: REV ACC3/DEC3			
				R4: REV ACC4/DEC4			
	E30	Frequency command 2	C30	FREQ CMD 2	0 : KEYPAD operation ( or  key) 1 : Voltage input (terminal 12) (0 to +10VDC, 0 to +5VDC) 2 : Inactive 3 : Inactive 4 : Reversible operation with polarity (terminal 12) (0 to ±10VDC) 5 : Reversible operation with polarity (terminal 12 and V1) (0 to ±10VDC) 6 : Inverse mode operation (terminal 12) (+10 to 0VDC) 7 : Inactive 8 : UP/DOWN control 1 (initial freq. = 0Hz) 9 : UP/DOWN control 2 (initial freq. = last value) 10 : PATTERN operation 11 : DI option or Pulse train input	-	2
	E31	Bias (Terminal 12)	C31	BIAS 12	-100 to +100.0%	0.1%	0.0
	E32	Gain (Terminal 12)	C32	GAIN 12	0.0 to +200.0%	0.1%	100.0
	E33	Analog setting signal filter	C33	REF FILTER	0.00 to 5.00s	0.01s	0.05

EXTENSION TERMINAL FUNCTIONS

Motor Parameters The functions in the white boxes can be set while the inverter is running. Other functions must be set while the inverter is stopped.

Function	Function		LCD monitor	Setting range	Min. unit	Factory setting	
	Code	Name				-22kW	30kW-
Motor 1	P01	Number of motor 1 poles	P01 M1 POLES	2 to 14	2	4	
	P02	Motor 1 (Capacity)	P02 M1-CAP	22kW or smaller : 0.01 to 45.00kW 30kW or larger : 0.01 to 500.00kW	0.01kW	*1)	
	P03	(Rated current)	P03 M1-Ir	0.00 to 2000A	0.01A	*1)	
	P04	(Tuning)	P04 M1 TUN1	0 : Inactive 1 : Active (Tuning of %R1 and %X (static test)) 2 : Active (Tuning of %R1, %X and lo (dynamic test))	-	0	
	P05	(On-line Tuning)	P05 M1 TUN2	0 : Inactive 1 : Active (Real time tuning of %R2)	-	0	
	P06	(No-load current)	P06 M1-Io	0.00 to 2000A	0.01A	*1)	
	P07	(%R1 setting)	P07 M1-%R1	0.00 to 50.00%	0.01%	*1)	
	P08	(%X setting)	P08 M1-%X	0.00 to 50.00%	0.01%	*1)	
	P09	(Slip compensation control 1)	P09 SLIP COMP1	0.00 to +15.00	0.01Hz	0.00	

High Performance Functions

Function	Function		LCD monitor	Setting range	Min. unit	Factory setting	
	Code	Name				-22kW	30kW-
High Performance Functions	H03	Data initialising (Data reset)	H03 DATA INIT	0 : Manual set value 1 : Return to factory set value	-	0	
	H04	Auto-reset (Times)	H04 AUTO-RESET	0 (Inactive), 1 to 10 times	1	0	
	H05	(Reset interval)	H05 RESET INT	2 to 20s	1s	5	
	H06	Fan stop operation	H06 FAN STOP	0 : Inactive 1 : Active (Fan stops at low temperature mode)	-	0	
	H07	ACC/DEC (Mode select) pattern	H07 ACC PTN	0 : Linear 1 : S-curve (weak) 2 : S-curve (strong) 3 : Non-linear (For variable torque load)	-	0	
	H08	Rev. phase sequence lock	H08 REV LOCK	0 : Inactive 1 : Active	-	0	
	H09	Start mode (Rotating motor pick-up)	H09 START MODE	0 : Inactive 1 : Active (Only when Auto-restart after momentary power failure mode) 2 : Active (All start modes)	-	0	
	H10	Energy-saving operation	H10 ENERGY SAV	0 : Inactive 1 : Active (Only when torque boost "F09" is set at manual setting mode.)	-	0 (EV : 1)	
	H11	DEC mode	H11 DEC MODE	0 : Normal (according to "H07" mode) 1 : Coast-to-stop	-	0	
	H12	Instantaneous overcurrent limiting	H12 INST CL	0 : Inactive 1 : Active	-	1	
H13	Auto-restart (Restart time)	H13 RESTART t	0.1 to 10.0s	0.1s	0.1	0.5	
H14	(Freq. fall rate)	H14 FALL RATE	0.00 to 100.00Hz/s	0.01Hz/s	10.00		
H15	(Holding DC voltage)	H15 HOLD V	400 to 600V	1V	470		
H16	(OPR command selfhold time)	H16 SELFHOLD t	0.0 to 30.0s, 999s (999s : The operation command is held while DC link circuit voltage is larger than 50V.)	0.1s	999		
H18	Torque control	H18 TRQ CTRL	0 : Inactive (Frequency control) 1 : Active (Torque control by terminal 12 (Driving)) (0 to +10V/0 to 200%) 2 : Active (Torque control by terminal 12 (Driving and Braking)) (0 to ±10V/0 to ±200%)	-	0		
H19	Active drive	H19 AUT RED	0 : Inactive 1 : Active	-	0		
PID Control	H20	PID control (Mode select)	H20 PID MODE	0 : Inactive 1 : Active (PID output 0 to 100%/frequency 0 to max.) 2 : Active (Inverse operation mode: PID output 0 to 100%/frequency max. to 0)	-	0	
	H21	(Feedback signal)	H21 FB SIGNAL	0 : Terminal 12 (0 to +10V) 1 : Terminal C1 (4 to 20mA) 2 : Terminal 12 (+10 to 0V) 3 : Terminal C1 (20 to 4mA)	-	1	
	H22	(P-gain)	H22 P-GAIN	0.01 to 10.00	0.01	0.10	
	H23	(I-gain)	H23 I-GAIN	0.0: Inactive 0.1 to 3600.0s	0.1s	0.0	
	H24	(D-gain)	H24 D-GAIN	0.00: Inactive 0.01 to 10.0s	0.01s	0.00	
H25	(Feedback filter)	H25 FB FILTER	0.0 to 60.0s	0.1s	0.5		
Y1-Y5C Terminal	H26	PTC thermistor (Mode select)	H26 PTC MODE	0 : Inactive 1 : Active	-	0	
	H27	(Level)	H27 PTC LEVEL	0.00 to 5.00V	0.01V	1.60	
	H28	Droop operation	H28 DROOP	-9.9 to 0.0Hz	0.1Hz	0.0	
Serial Link	H30	Serial link (Function select)	H30 LINK FUNC	(Code) (Monitor) (Frequency command) (Operation command) 0: X - - x: Valid 1: X - - -: Invalid 2: X - X 3: X X	-	0	
	H31	RS 485 (Address)	H31 485 ADDRESS	1 to 31	1	1	
	H32	(Mode select on no response error)	H32 MODE ON ER	0 : Trip and alarm (Er8) 1 : Operation for H33 timer and alarm (Er8) 2 : Operation for H33 timer and retry to communicate. *If the retry fails, then the inverter trips ("Er8") 3 : Continuous operation	-	0	
	H33	(Timer)	H33 TIMER	0 to 60.0s	0.1s	2.0	
	H34	(Baud rate)	H34 BAUD RATE	0 : 19200 bit/s 1 : 9600 2 : 4800 3 : 2400 4 : 1200	-	1	
	H35	(Data length)	H35 LENGTH	0 : 8 bit 1 : 7 bit	-	0	
	H36	(Parity check)	H36 PARITY	0 : No checking 1 : Even parity 2 : Odd parity	-	0	
	H37	(Stop bits)	H37 STOP BITS	0 : 2 bit 1 : 1 bit	-	0	
	H38	(No response error) detection time)	H38 NO RES t	0 (No detection), 1 to 60s	1s	0	
	H39	(Response interval)	H39 INTERVAL	0.00 to 1.00s	0.01s	0.01	

The functions in the white boxes can be set while the inverter is running. Other functions must be set while the inverter is stopped.

Alternative Motor Parameters

	Function		Setting range	Min. unit	Factory setting	
	Code	Name			LCD monitor	-22kW
Motor 2	R01	Maximum frequency 2	A01 MAX Hz-2	50 to 400Hz	1Hz	50
	R02	Base frequency 2	A02 BASE Hz-2	25 to 400Hz	1Hz	50
	R03	Rated voltage (at Base frequency 2)	A03 RATED V-2	0 (Free), 320 to 480V	1V	400
	R04	Maximum voltage 2 (at Maximum frequency 2)	A04 MAX V-2	320 to 480V	1V	400
	R05	Torque boost 2	A05 TRQ BOOST2	0.0 : Automatic (for constant torque load) 0.1 to 1.9 : Manual (for variable torque load) 2.0 to 20.0 : Manual (for constant torque load)	-	0.0 (EV : 01)
	R06	Electronic thermal overload relay for motor 2 (Select)	A06 ELCTRN OL2	0 : Inactive 1 : Active (for 4-pole standard motor) 2 : Active (for 4-pole inverter motor)	-	1
	R07	(Level)	A07 OL LEVEL2	Approx. 20 to 135% of rated current	0.01A	*1)
	R08	(Thermal time constant)	A08 TIME CNST2	0.5 to 75.0 min	0.1 min	5.0 10.0
	R09	Torque vector control 2	A09 TRQVECTOR2	0 : Inactive 1 : Active	-	0
	R10	Number of motor 2 poles	A10 M2 POLES	2 to 14	2	4
	R11	Motor 2 (Capacity)	A11 M2-CAP	22kW or smaller : 0.01 to 45.00kW 30kW or larger : 0.01 to 500.00kW	0.01kW	*1)
	R12	(Rated current)	A12 M2-1r	0.00 to 2000A	0.01A	*1)
	R13	(Tuning)	A13 M2 TUN1	0 : Inactive 1 : Active (Tuning of %R1 and %X (static test)) 2 : Active (Tuning of %R1, %X and I _o (dynamic test))	-	0
	R14	(On-line Tuning)	A14 M2-TUN2	0 : Inactive 1 : Active (Real time tuning of %R1 and %X)	-	0
	R15	(No-load current)	A15 M2-I _o	0.00 to 2000A	0.01A	*1)
	R16	(%R1 setting)	A16 M2-%R1	0.00 to 50.00%	0.01%	*1)
	R17	(%X setting)	A17 M2-%X	0.00 to 50.00%	0.01%	*1)
	R18	Slip compensation control 2	A18 SLIP COMP2	0.00 to +15.00Hz	0.01Hz	0.00

Notes:

*1) Typical value of standard IMO 4P motor.

*2) Percent shall be set according to FUNCTION CODE: P02 or A09, motor capacity.

Torque referenced here may not be obtainable when DATA CODE: 0 is selected for FUNCTION CODE: P02 or A09.



PROTECTIVE FUNCTIONS

Function	Description		LED monitor
Overcurrent protection (Short-circuit) (Earth fault)	<ul style="list-style-type: none"> Stops running to protect inverter from an overcurrent resulting from overload. Stops running to protect inverter from an overcurrent due to a short-circuit in the output circuit. Stops running to protect inverter from an overcurrent due to an earth fault in the output circuit. Stops running to protect inverter from an overcurrent resulting from earth fault in the output circuit by detecting zero-phase current. 	<ul style="list-style-type: none"> 30kW or larger model only 	During acceleration
			OC1
			During deceleration
			OC2
Overvoltage protection	<ul style="list-style-type: none"> The inverter stops when it detects an overvoltage in the DC link circuit. 	<ul style="list-style-type: none"> 400V series: 800VDC or more Protection is not assured if excess AC line voltage is applied inadvertently. 	While running at constant speed
			OC3
			Earth
EF			
Incoming surge protection	<ul style="list-style-type: none"> Protects the inverter against surge voltage between the main circuit power line and earth. Protects the inverter against surge voltage in the main circuit power line. 	<ul style="list-style-type: none"> The inverter may be tripped by some other protective function. 	
Undervoltage protection	<ul style="list-style-type: none"> Stops the inverter when the DC link circuit voltage drops below undervoltage level. 	<ul style="list-style-type: none"> 400V series : 400VDC or less 200V series : 200VDC or less 	LU
Input phase loss protection	<ul style="list-style-type: none"> The inverter is protected from being damaged when open-phase fault occurs. 		Lin
Overheat protection	<ul style="list-style-type: none"> Stops the inverter when it detects excess heat sink temperature in case of cooling fan failure or overload. 		OH1
	<ul style="list-style-type: none"> Stops the inverter when it detects an abnormal rise in temperature in the inverter unit caused by insufficient ventilation in cubicles or an abnormal ambient temperature. Stops the inverter when it detects an abnormal rise in temperature inside the inverter. 		OH3
	<ul style="list-style-type: none"> When the built-in braking resistor overheats, the inverter stops discharging and running. Function data appropriate for the resistor type (built-in/external) must be set. 	7.5kW or smaller model only	dbH
Electronic thermal overload relay (Motor protection)	<ul style="list-style-type: none"> This function stops the inverter by detecting an inverter overload. 		OLU
	<ul style="list-style-type: none"> This function stops the inverter by detecting an overload in a standard motor or inverter motor. 		Motor 1 overload
			OL1
Fuse blown	<ul style="list-style-type: none"> When a blown fuse is detected, the inverter stops running. 	<ul style="list-style-type: none"> 30kW or larger model only 	FUS
Stall prevention (Momentary overcurrent limitation)	<ul style="list-style-type: none"> When an output current exceeds the limit during acceleration, this function lowers output frequency to prevent an OC1 trip. 	<ul style="list-style-type: none"> The stall prevention function can be disabled. 	
Active drive	<ul style="list-style-type: none"> During running in which acceleration is 60s or longer, this function increases the acceleration time to prevent the occurrence of an OLU trip. 	<ul style="list-style-type: none"> The acceleration time can be prolonged up to three times the preset time. 	
External alarm input	<ul style="list-style-type: none"> The inverter stops on receiving external alarm signals. 	<ul style="list-style-type: none"> Use THR terminal function (digital input). 	OH2
Overspeed protection	<ul style="list-style-type: none"> Stops the inverter when the output frequency exceeds the rated maximum frequency by 20%. 		OS
PG error	Alarm output if encoder (PG) signals are disconnected.		PG
Alarm output (for any fault)	<ul style="list-style-type: none"> The inverter outputs a relay contact change over signal. 	<ul style="list-style-type: none"> Output terminals: 30A, 30B and 30C Use the RST terminal function for signal input. Even if main power input is turned off, alarm history and trip-cause data are retained. 	
Alarm reset command	<ul style="list-style-type: none"> An alarm-stop state of the inverter can be cleared with the RESET key or by a digital input signal (RST). 		
Alarm history memory	<ul style="list-style-type: none"> Stores up to four previous alarm conditions. 		
Storage of data on cause of trip	<ul style="list-style-type: none"> The inverter will store and display details of the latest alarm history data. 		
Memory error	<ul style="list-style-type: none"> The inverter checks memory data after power-on and when the data is written. If a memory error is detected, the inverter trips. 		Er1
KEYPAD panel communication error	<ul style="list-style-type: none"> If an error is detected in communication between the inverter and KEYPAD when the Keypad panel is being used, the inverter trips. 	<ul style="list-style-type: none"> When operated by external signals, the inverter continues running. The alarm output (for any fault) is not output. Only Er2 is displayed. 	Er2
CPU error	<ul style="list-style-type: none"> If the inverter detects a CPU error caused by noise or some other factor, the inverter trips. 		Er3
Option communication error	<ul style="list-style-type: none"> If a checksum error or disconnection is detected during communication, the inverter issues an alarm. 		Er4
Option error	<ul style="list-style-type: none"> If a linkage error or other option error is detected, the inverter issues an alarm. 		Er5
Output phase loss error	If an unbalance of output circuits is detected during auto-tuning, this function issues an alarm (and trips the inverter).		Er7
RS485 communication error	<ul style="list-style-type: none"> If an RS485 communication error is detected, the inverter issues an alarm. 		Er8

NOTES:

1) Retaining alarm signal when auxiliary control power supply is not used:

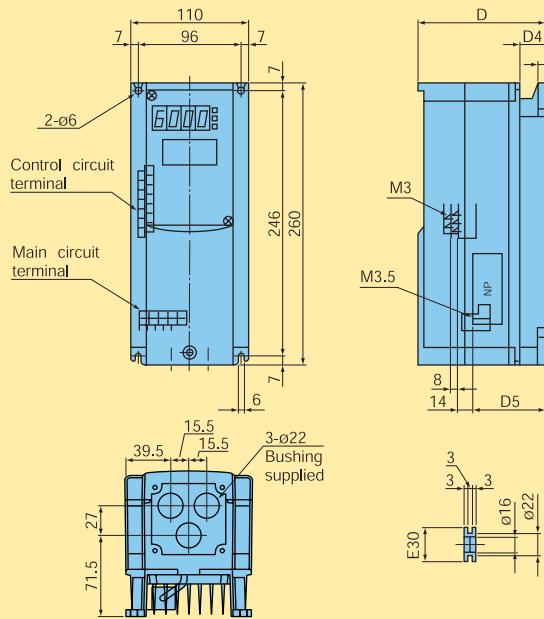
If the inverter power supply is cut off while an internal alarm signal is being output, the alarm signal cannot be retained.

2) To issue the RESET command, press the **RESET** key on the KEYPAD panel or connect terminals RST and P24 and disconnect them afterwards.

3) Fault history data is stored for the past four trips.

Fig. 1

VXM40 → VXM75



Type	D	D4	D5
VXM40	130	36.5	80
VXM75	145	51.5	95

Fig. 2

VXM150 → VXM400

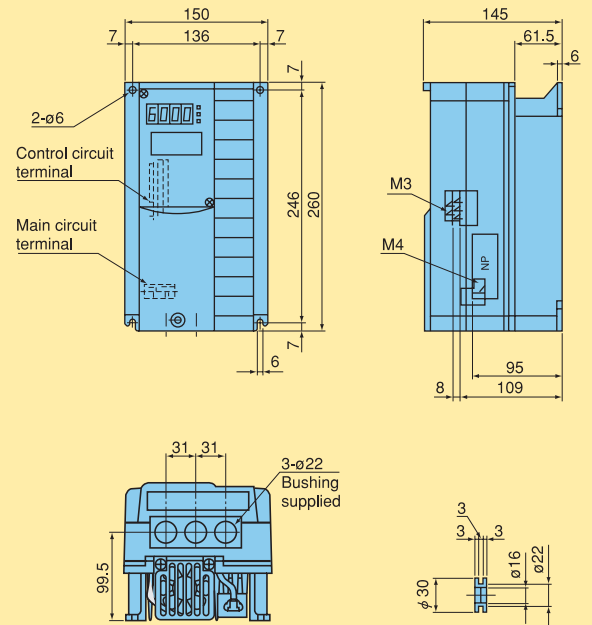


Fig. 3

VXM550 → VXM750

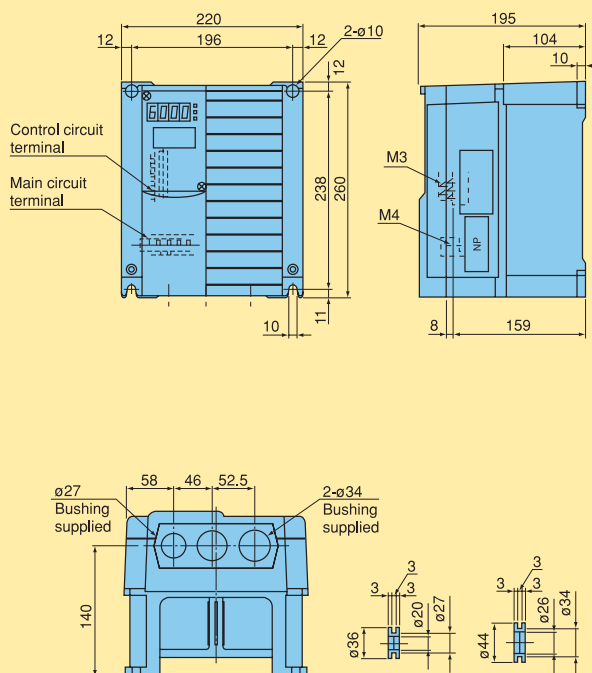


Fig. 4

VXM1100 → VXM2200G

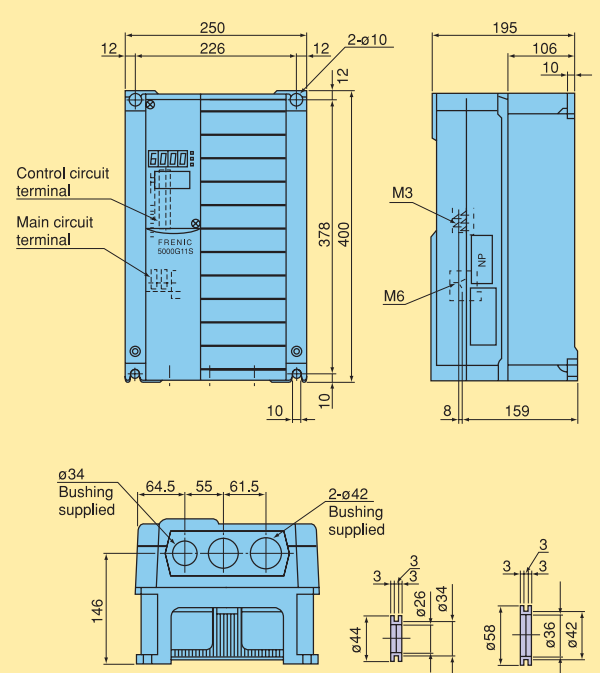


Fig. 5

Internal mounting type
(30kW or larger)

External cooling type
(30kW or larger)

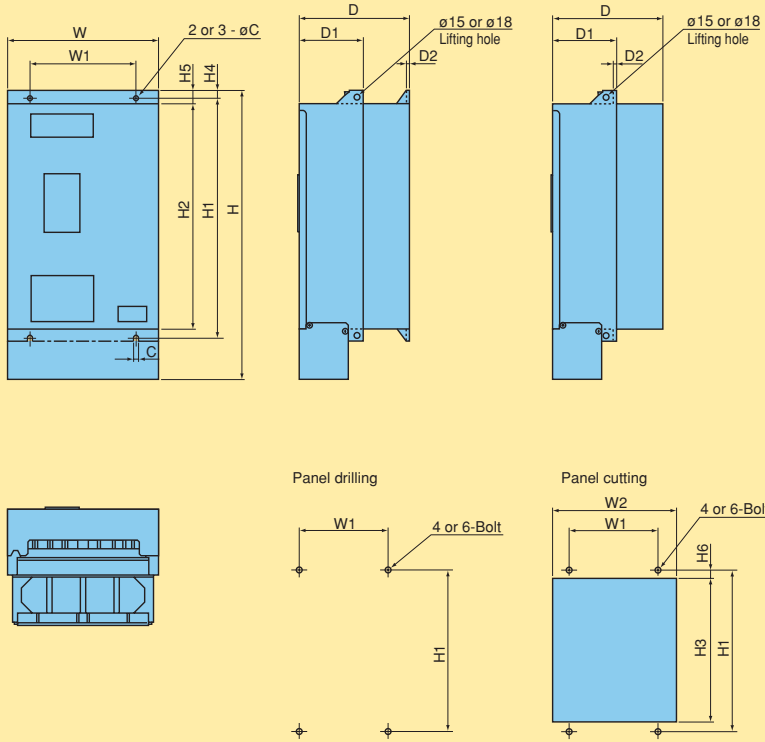
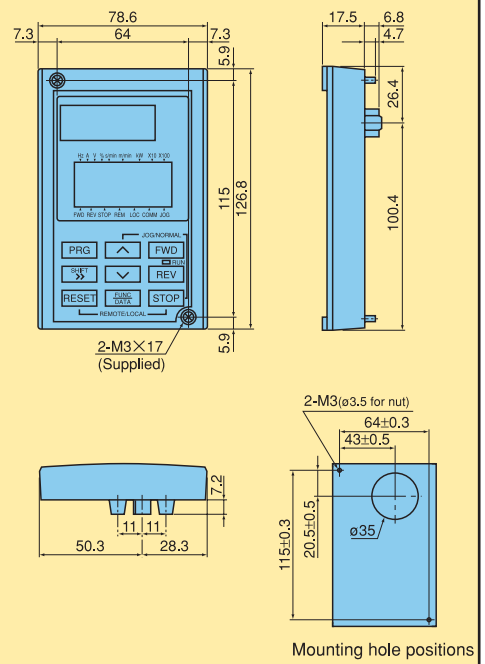


Fig. 6

KEYPAD panel (Common for all models)



Power supply voltage	Nominal applied motor (kW)	Type	Dimensions (mm)													Mtg. Bolt
			W	W1	W2	H	H1	H2	H3	H4	H5	H6	D	D1	D2	
400V	30	VXM30K/VXM30KP	340	240	326	645	530	500	512	12	25	9	255	145	10	M8
	37	VXM37K	375	275	361	770	655	625	637				270			
	45	VXM45K				770	655	625	637				270			
	55	VXM55K	530	430	510	835	720	690	702	15.5	32.5	12.5	315	175	15	M12
	75	VXM75K				835	720	690	702				315			
	90	VXM90K				827.5	710	675	685				315			
	110	VXM110K	680	580	660	1087.5	970	935	945	15.5	32.5	12.5	360	220	15	M12
	132	VXM132K											360			
	160	VXM160K											360			
	200	VXM200K	Available soon	580	660	1087.5	970	935	945	15.5	32.5	12.5	360	220	15	M12
	220	VXM220K											360			
	280	VXM280K											360			
315	VXM315K	Available soon	580	660	1087.5	970	935	945	15.5	32.5	12.5	360	220	15	M12	

Reactor, Filter and Other Accessories

Name	Function	Mounting position
Surge arrester (Contact IMO)	Suppresses induced transient surges from power source, thus protecting all equipment connected to the power supply.	
Ferrite ring for reducing radio noise (OC1-OC5)	Reduces radio frequency noise. If the wiring between motor and inverter is shorter than 20m, use the ferrite ring in the power supply side. If longer than 20m, use it in the output side, if required.	
Dynamic brake resistor (DBR□□□R□□□W)	Converts excess regenerated energy into heat. A light duty resistor is supplied as standard for drives less than 11kW. For higher powers/duty, extra resistors or additional equipment is necessary.	
RFI Filter (RFM□□FP/K)	This is a special filter which complies with the European EMC (Emission) Directive. This filter should be used with a screened motor cable. <i>Note: Other prerequisites must be fulfilled to ensure compliance with EMC Directives. Refer to IMO for details.</i>	
Optional Sin O/P filter (Contact IMO)	Connected to the output circuit of inverters under low-noise operation with carrier frequency from 8 to 15kHz, (6kHz higher for 30kW or larger inverters), this filter has the following functions: 1. Suppresses fluctuation of motor terminal voltage. Protects the motor insulation from being damaged by PWM voltage overshoot. (400V series) 2. Suppresses leakage current from output side wiring. Reduces leakage current caused when several motors are operated in parallel or connected with long wiring. *Total wiring length should be less than 400m. 3. Suppresses radial noise or inductive coupling from output side wiring. Effective noise suppression device for long wiring applications such as plant. <i>Note: When connecting this filter, set the carrier frequency F26 at 8kHz or more.</i>	
DC Reactor (DCR) (VXMLC) (optional for smaller power ratings)	(Use the DCR to normalise the power supply in the following cases.) 1. The power transformer capacity is 500kVA or over and exceeds the inverter rated capacity by 10 times. 2. The inverter and a thyristor converter are connected with the same transformer. * Check if the thyristor converter uses a commutation reactor. If not, AC reactor must be connected to the power supply side. 3. Overvoltage trip occurs due to open/close of the phase-advancing capacitor for the power supply lines. 4. The voltage unbalance exceeds 2%. $\text{Voltage unbalance (\%)} = \frac{\text{Max. voltage [V]} - \text{Min. Voltage [V]}}{\text{Three-phase average voltage [V]}} \times 67 (\%)$ <p>(For improving input power-factor, reducing harmonics)</p> <ul style="list-style-type: none"> • Used to reduce input harmonic current (correcting power-factor) • For the resultant effects, contact IMO. 	
AC Reactor (ACR) (LO□□□-3)	Optional. May be fitted to compensate for long motor cables, or shock loads	
Frequency meter (X72M10V)	Analog frequency meter 72mm square, 0-10VDC, M/C, 1000Ω/V	
Frequency setting device (JAGPOT1K)	Frequency setting potentiometer (mounted externally)	
Output relay and DIN rail base (VXEJ1)	Low power DC coil, 8A capacity, for extending VXM digital outputs Y1-Y4.	

* Screened motor cable not shown for simplicity

EMC Filter, DC Reactor

EMC filters (typical)

Fig. A

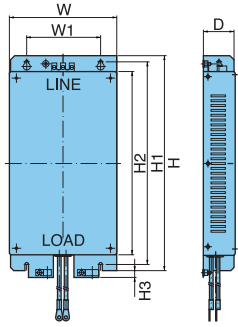


Fig. B

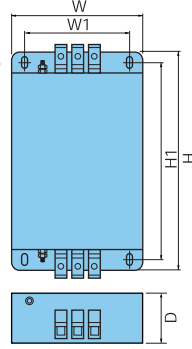
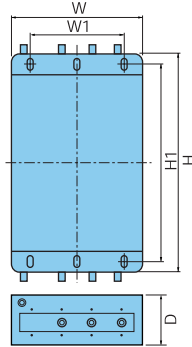


Fig. C



Inverter type (and use)	Filter required	Rated current (A)	Fig.	Dimensions (mm)						
				W	W1	H	H1	H2	H3	D
VXM40-75	RFM75FP	5	A	116	90	310	293	265	10	42
VXM150-400	RFM400FP	12		155	105	310	293	265	10	45
VXM550-750	RFM750FP	35		225	167	331	311	260	10	47.5
VXM1100-1500	RFM1500FP	50		250	185	480	449	400	20	70
VXM1850-2200G	RFM2200FP	72		250	185	480	449	400	20	70
VXM30K (CT) -30KP	RFM30K	100	B	200	166	435	408	-	-	130
VXM30K (VT) -90K (CT)	RFM90K	180		200	166	495	468	-	-	160
VXM90K (VT) -132K (CT)	RFM132K	280	C	250	170	587	560	-	-	205
VXM132K (VT) -220K (CT)	RFM220K	400		250	170	587	560	-	-	205
VXM220K (VT) -315K	RFM315K	880		*	364	300	688	648	-	-

* See Jaguar VXM instruction manual or contact IMO for details

DC reactors (typical)

Fig. A

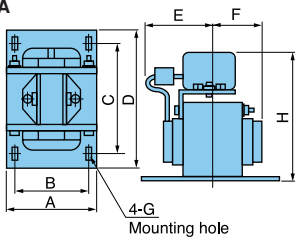


Fig. B

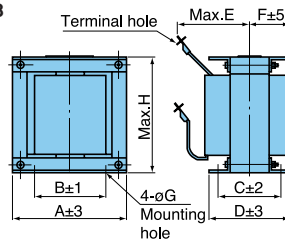
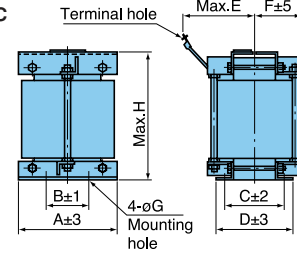


Fig. C



Power supply voltage	Nominal applied motor (kW)	Inverter type	Reactor type	Fig.	Typical dimensions, mm								Terminal screw	Typical mass (kg)
					A	B	C	D	E	F	G	H		
Three phase 400V	0.4	VXM40	*	A	66	56	72	90	60	35	5.2 x 8	94	M4	1.0
	0.75	VXM75	*	A	66	56	72	90	60	40	5.2 x 8	94	M4	1.4
	1.5	VXM150	*	A	66	56	72	90	60	45	5.2 x 8	94	M4	1.6
	2.2	VXM220	*	A	86	71	80	100	65	45	6 x 9	110	M4	2.0
	4.0	VXM400	*	A	86	71	80	100	70	50	6 x 9	110	M4	2.6
	5.5	VXM550	*	A	86	71	80	100	70	50	6 x 9	110	M4	2.6
	7.5	VXM750	*	A	111	95	80	100	75	60	7 x 11	130	M5	4.2
	11	VXM1100	VXLC11	A	111	95	80	100	75	60	7 x 11	130	M5	4.3
	15	VXM1500	VXLC15	A	146	124	96	120	75	60	7 x 11	171	M5	5.9
	18.5	VXM1850	VXLC18	A	146	124	96	120	85	65	7 x 11	171	M6	7.2
	22	VXM2200G	VXLC22	A	146	124	96	120	85	65	7 x 11	171	M6	7.2
	30	VXM30K	VXLC30	B	152	90	115	157	100	78	8	130	M8	13
	37	VXM37K	VXLC37	B	171	110	110	150	100	75	8	150	M8	15
	45	VXM45K	VXLC45	B	171	110	125	165	110	82	8	150	M8	18
	55	VXM55K	VXLC55	B	171	110	130	170	110	85	8	150	M8	20
	75	VXM75K	VXLC75	C	190	160	115	151	100	75	10	240	M10	20
	90	VXM90K	VXLC90	C	190	160	125	161	120	80	10	250	ø12	23
	110	VXM110K	VXLC110	C	190	160	125	161	120	80	10	250	ø12	25
	132	VXM132K	VXLC132	C	200	170	135	171	120	85	10	260	ø12	28
	160	VXM160K	VXLC160	C	210	180	135	171	120	85	12	290	ø12	32
200	VXM200K	VXLC200	C	210	180	135	171	140	90	12	295	ø12	35	
220	VXM220K	VXLC220	C	220	190	135	171	140	90	12	300	ø15	40	
280	VXM280K	VXLC280	C	220	190	145	181	150	95	12	320	ø15	45	
315	VXM315K	VXLC315												

Available soon

NOTE:

(1) A DC reactor *must* be used for 75kW and above.

(2) The above drawings, masses and dimensions are intended as a guide only.

Product details may be subject to change without prior notice. If in doubt contact IMO Ltd.

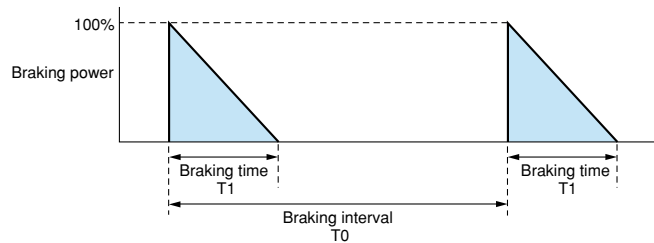
*Please contact IMO for details.

Braking Unit, Braking Resistor

Power supply voltage	Inverter				Option				CT	Continuous braking (100% torque conversion value)		Repetitive braking (100s or less cycle)		VT	Continuous braking (MAX. braking torque)		Repetitive braking (100s or less cycle)								
	Constant Torque Rating (CT)		Variable Torque Rating (VT)		Braking Unit		Braking resistor			Max. braking torque (%)	Braking time (s)	Discharging capability (kW)	Duty cycle (%)		Average loss (kW)	Max. braking torque (%)	Braking time (s)	Discharging capability (kW)	Duty cycle (%)	Average loss (kW)					
	Motor (kW)	Inverter type	Motor (kW)	Inverter type	Type	Qty	Ω(min)	kW																	
Three-phase 400V	0.4	VXM40	-	-	-	1	200	0.2	150%	45	9	22	0.044	-	-	-	-	-							
	0.75	VXM75			-	1	200	0.2		45	17	18	0.068												
	1.5	VXM150			-	1	160	0.4		45	34	10	0.075												
	2.2	VXM220			-	1	160	0.4		30	33	7	0.077												
	4.0	VXM400			-	1	130	0.4		20	37	5	0.093												
	5.5	VXM550			7.5	VXM550	-	1		80	0.8	20	55						5	0.138	100%	15	37	3.5	0.093
	7.5	VXM750			11	VXM750	-	1		60	0.9	10	38						5	0.188		15	55	3.5	0.138
	11	VXM1100			15	VXM1100	VXDBU	1		40	1.4	10	55						5	0.275		7	38	3.5	0.188
	15	VXM1500			18.5	VXM1500		1		35	1.4	10	75						5	0.375		7	55	3.5	0.275
	18.5	VXM1850			22	VXM1850	11-22	1		27	1.8	10	93						5	0.463		8	75	4	0.375
	22	VXM2200G	-	-	1	22		1.8	10	93	5	0.463	8	93	4	0.463									
	-	-	30	VXM30KP	VXDBU	1	15	3.6	-	-	-	-	-	6	88	3	0.55								
	30	VXM30K	37	VXM30K	30-37	1	15	3.6	100%	10	150	10	1.5	75%	10	150	10	1.5							
	37	VXM37K	45	VXM37K	VXDBU	1	12	4.8		10	185	10	1.85		10	185	10	1.85							
	45	VXM45K	55	VXM45K		45-55	1	10		6	10	225	10		2.25	10	225	10	2.25						
	55	VXM55K	75	VXM55K	1		7.5	7.2		10	275	10	2.75		10	275	10	2.75							
	75	VXM75K	90	VXM75K	VXDBU	1	6	9.6		10	375	10	3.75		10	375	10	3.75							
	90	VXM90K	110	VXM90K	75-90	1	5	12		10	450	10	4.5		10	450	10	4.5							
	110	VXM110K	132	VXM110K	VXDBU	1	3.75	14.4		10	550	10	5.5		10	550	10	5.5							
	132	VXM132K	160	VXM132K	110-132	1	3.33	18		10	660	10	6.6		10	660	10	6.6							
	160	VXM160K	200	VXM160K	VXDBU	1	3.0	19.2		10	800	10	8.0		10	800	10	8.0							
	200	VXM200K	220	VXM200K		1	2.5	24		10	1000	10	10.0		10	1000	10	10.0							
	220	VXM220K	280	VXM220K	160-220	1	1.88	28.8	10	1100	10	11.0	10	1100	10	11.0									
	280	VXM280K	315	VXM280K	Available soon																				
	315	VXM315K	400	VXM315K	Available soon																				

NOTE:

The braking time and duty cycle (%) are calculated as the constant-torque braking used for deceleration.



• Duty cycle (%) = $\frac{T_1}{T_0} \times 100\%$

(Procedure for selecting options)

All three conditions listed below must be satisfied.

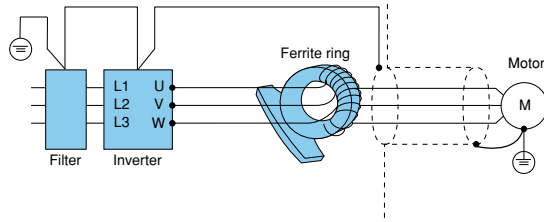
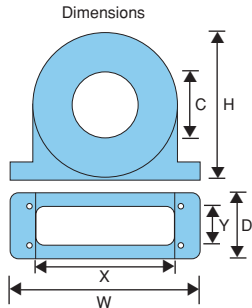
1. The maximum braking torque does not exceed the value shown in the table.
2. The energy discharged in the resistor for each braking (the area of the triangle shown in the above figure) does not exceed the discharging capability (kW) in the table.
3. The average loss (energy discharged in the resistor divided by a braking interval) does not exceed the average loss (kW) shown in the table.

Name (type)	Dimensions											
Braking unit	Fig.A			Fig.B			Fig.C					
	Voltage	Type	Fig.	Dimensions (mm)						Mass (kg)		
				W	W1	H	H1	H2	D	D1		
400V Series		VXDBU 11-22	A	See Fig. A						-	1.1	
		VXDBU 30-37	B	150	100						-	4
		VXDBU 45-55	C	230	130	280	265	250	160		1.2	5.5
		VXDBU 75-90				370	355	340			2.4	9
		VXDBU 110-132				450	435	420			13	
	VXDBU 160-220											

Braking resistors (typical combinations for heavier duty applications)	Example 1 – PE380H 160Ω 380W		
	Covers: VXM150 → VXM400	160Ω 380W	
	Covers: VXM550 → VXM750	80Ω 760W	
	Covers: VXM1100 → VXM2200G	40Ω 1520W	
	Example 2 – PE150H 210Ω 150W		
	Covers: VXM40 → VXM75	210Ω 150W	

Part No.	Centre Hole C	Width W	Height H	Depth D	Mounting Dim X	Mounting Dim Y	Mounting Holes Dia
Ferrite28.5 (OC2)	28.5	105	62	25	90	-	5
Ferrite50 (OC3)	50	150	110	50	125	30	5
Ferrite58 (OC4)	58	200	170	65	180	45	6

Ferrite ring



Optional ferrite ring wiring position for further HF noise reduction (if required)

Part No.	Centre Hole C	Width W	Height H	Depth D	Mounting Dim X	Mounting Dim Y	Mounting Holes Dia
Ferrite21 (OC1)	21	85	46	22	70	-	5
Ferrite28.5 (OC2)	28.5	105	62	25	90	-	5
Ferrite50 (OC3)	50	150	110	50	125	30	5
Ferrite58 (OC4)	58	200	170	65	180	45	6

Option Cards and Other Options

Name (type)	Function	Specifications		
Relay output card (VXMROC)	<ul style="list-style-type: none"> Includes four relay output circuits. Converts transistor output signals from inverter control output terminals Y1 to Y4 to relay (1SPDT) output signals. 			
Digital I/O interface card (VXMDIO)	<ul style="list-style-type: none"> For setting frequency using a binary code. For monitoring frequency, output current and output voltage using a binary code. For input and output of other individual signals. 			
Analog I/O interface card (VXMAIO)	<ul style="list-style-type: none"> For setting a torque limit value using an input analog signal. For input of auxiliary signal to set frequency. For analog monitoring of inverter output frequency, output current and torque. 			
T-link interface card (OPC-G11S-TL)	<ul style="list-style-type: none"> For setting a frequency. For setting and reading function data for function codes. For setting operation commands (FWD, REV, RST, etc.). For monitoring the operation status. For reading trip information. 	<ul style="list-style-type: none"> Used together with MICREX-F series PLC. 		
PG feedback card (VXMEFC)	<ul style="list-style-type: none"> For performing PG vector control using feedback signals obtained from an encoder. 	<ul style="list-style-type: none"> Applicable Pulse Encoder specification: <ul style="list-style-type: none"> 100 to 3000P/R • A, B, Z phase • 12V or 15V 		
Synchronised operation card (VXMSYN)	<ul style="list-style-type: none"> Wait and synchronise mode, simultaneous start and synchronising mode. Proportional speed operation. Speed control by pulse train input can be made. 			
Extension cable for keypad (VXPODCABLE)	Connects the keypad panel to an inverter unit. Three cable types are available: straight 2m, curled 1m and curled 2m. The curled 1m cable can be extended up to 5m, and the curled 2m cable up to 10m. Note: Cables once extended to the maximum length do not return to their original length.	Type	Nominal length	Maximum length
		VXPODCABLE	2m	2m
		CONTACT IMO	1m	5m
		CONTACT IMO	2m	10m
Copy unit (VXMCOPY)	<ul style="list-style-type: none"> For batch data transfer (read, store, write) between an inverter unit and the copy unit. For comparison of data stored in an inverter and data stored in the copy unit. For comparison of two sets of data stored in the copy unit. For editing a part of the data stored in an inverter. Write protection is available in copy mode and edit mode. The copy unit can write data to inverter memory even though the inverter is not connected to power source. 	Application <ul style="list-style-type: none"> Copying Verification Editing Write protect 		
IP20 enclosure adaptor	<ul style="list-style-type: none"> Used to put 30kW or larger models to increase enclosure rating from IP00 to IP20. 	Type	Applicable inverter type	
		P20G11-30	VXM30K VXM30KP	
		P20G11-55	VXM37K to VXM55K	
		P20G11-75-4	VXM75K	
		P20G11-75-2	Not Available	
		P20G11-110	VXM90K to VXM110K	
		P20G11-160	VXM132K to VXM160K	
		P20G11-220	VXM200K to VXM220K	
Mounting adaptor for external cooling	<ul style="list-style-type: none"> Used to put the cooling fan section of the inverter outside the panel. Only applicable to 22kW and below inverters. (30kW and above inverters can be modified to external cooling type by replacing the mounting bracket, as standard.) 	Type	Applicable inverter type	
		PBG11-0.75	VXM40 to VXM75	
		PBG11-3.7	VXM150 to VXM400	
		PBG11-7.5	VXM550 to VXM750	
		PBG11-22	VXM1100to VXM2200G	
Panel-mount adaptor (MAG9-□□)	Used to mount a Jaguar VXM inverter in panel holes that were used to mount a Fuji G7S inverter.	Type	Applicable inverter type	
		MAG9-3.7	VXM40 to VXM400	
		MAG9-7.5	VXM550 to VXM750	
		MAG9-22	VXM1100 to VXM2200G	

Wiring Equipment

Power supply voltage	Nominal applied motor (kW)	Inverter type		MCCB or ELCB Rated current (A)		Magnetic contactor (MC)			Recommended wire size (mm ²)																	
		Constant Torque Rating (CT)	Variable Torque Rating (VT)	With DCR	Without reactor	MC1 for input circuit		MC2 for output circuit	Input circuit (L1/R, L2/S, L3/T)		Output circuit (U.V.W.)		DCR circuit (P1,P(+))	DB circuit (P(+),DB,N(-))												
						With DCR	Without reactor		With DCR	Without reactor	CT	VT														
Three phase 400V	0.4	VXM40	-	6	6				1.5	1.5	1.5	-	1.5	1.5												
	0.75	VXM75	-																							
	1.5	VXM150	-	10	16				1.5	1.5	1.5	-	1.5													
	2.2	VXM220	-																							
	4.0	VXM400	-	16	20				2.5	4	2.5	2.5														
	5.5	VXM550	-																							
	7.5	VXM750	VXM550	20	32	K223A10	K223A10	K223A10	2.5	6	2.5	2.5														
	11	VXM1100	VXM750	32	40	K230A10	K230A10	K230A10	4	10	4	6	4													
	15	VXM1500	VXM1100	40	50	K237A10	K237A10	K237A10																		
	18.5	VXM1850	VXM1500	50	75				6	16	6	10	6		6											
	22	VXM2200G	VXM1850																							
	30	VXM30K	VXM30KP	75	100	K245A00	K245A00	K245A00	16	25	10	16	16		16											
	37	VXM37K	VXM30K	100	125																					
	45	VXM45K	VXM37K						150	175	K85A22	K85A22	K85A22		35	50	25	35	25							
	55	VXM55K	VXM45K	125	175	K110A22	K110A22	K110A22	25	70	35	50	35		35											
	75	VXM75K	VXM55K	175	-					50	70	50	70		50	6										
	90	VXM90K	VXM75K	200													225	K3150A11	K3150A11	K3150A11	70	95	70	95	70	
	110	VXM110K	VXM90K	225													300	K3175A11	K3175A11	K3175A11	95	120	95	120	95	10
	132	VXM132K	VXM110K	300													350	K3315A11	K3315A11	K3315A11	120	185	120	150	120	16
	160	VXM160K	VXM132K	350													400	K3450A22	K3450A22	K3450A22	185	300	150	240	185	16
	200	VXM200K	VXM160K	400													500	K3700A22	K3700A22	K3700A22	300	500	240	300	300	25
	220	VXM220K	VXM200K	500													600				300	500	300	400	300	25
	280	VXM280K	VXM220K	600																	500	500	400	400	500	25
315	VXM315K	VXM280K																			400	-	500	25		
400	VXM315K	VXM315K																							Available soon	

NOTES:

- For molded-case circuit breakers (MCCB) and earth-leakage circuit breakers (ELCB), the required frame type and series depend on the transformer capacity and other factors. When selecting breakers, refer to IMO, if uncertain.
- Select the current sensitivity of ELCB, with reference to motor cable length and type, and carrier frequency.
- The recommended cable sizes are based on the condition that the temperature inside the panel does not exceeds 50°C.
- The above are 600V PVC insulated (75°C).
- Data in the above table may differ for different conditions (ambient temperature, power supply voltage and other factors).

CAUTION:

- If in doubt, consult local/national wiring regulations such as the relevant IEE Wiring Regulations - latest edition.