General Purpose AC Drives Jaguar VXSM



- 5 year warranty
- High performance dynamic torque vector principle
- Display can be remote mounted
- 15 preset speeds
- FieldBus options, Profibus, Devicenet etc
- RS485 port
- PID control
- Maintenance information/alarm
- IMO loader PC software





Specification

Single-phase 200V series

Туре	VXSM***-1	40	75	150	220						
Nominal a	oplied motor kW	notor kW 0.4/0.55 0.75/1.1 1.5 2.2									
	Rated capacity *1) kVA	1.1	1.9	2.8	4.1						
	Rated voltage *2) V	3-phase 200V/	50Hz 200, 220, 2	30V/60Hz							
Output ratings	Rated current *3) A	3.0 (2.5)	5.0 (4.0)	8.0 (7.0)	11 (10)						
	Overload capability	150% of rated of	150% of rated current for 1 min. 200% of rated current for 0.5s								
	Rated frequency Hz	50, 60Hz	50, 60Hz								
	Phases, Voltage, Frequency	1-phase	200 to 240V	50/60Hz							
	Voltage/frequency variations	Voltage: +10 to	o -10% Frequency	r: +5 to -5%							
Input	Momentary voltage dip capability *5) When the input voltage is 165V or more, the inverter can be operated continuously. When the input voltage drops below 300V from rated voltage, the inverter can be operated for 15ms. The smooth recovery mode is selectable (by Auto-restart function).										
ratings	Rated current *6 (with DCR)	3.5	6.5	11.8	17.7						
	A (without DCR)	6.4	11.4	19.8	28.5						
	Required power supply capacity *7) kVA	0.7	1.3	2.4	3.6						
Control	Starting torque	200% (with Dy	namic torque-vect	or control selecte	d)						
	Braking torque (Standard) *8)	7	70			4	0				
Braking	Braking torque (Using options)				150						
	DC injection braking	Starting frequer	ncy: 0.0 to 60.0H	z Braking time: 0.	0 to 30.0s Braking	g level: 0 to 100%	% of rated current				
Enclosure	(IEC 60529)				IP 20						
Cooling m	ethod	Natural	cooling		Fan cooling						
Standards		-UL/cUL -Low -IEC 61800-2 (-IEC 61800-3 (Voltage Directive - Ratings, specifica EMC product star	EMC Directive -T tions for low volta idard including sp	UV age adjustable fre ecific test method	quency AC power ls)	r drive systems)				
Mass	kg	0.7	1.2	1.8	1.9						



Specification continued

Three-phase 400V series

Туре	VXSM***-3		40	75	150	220	400	550	750		
Nominal a	pplied motor	kW	0.4/0.55	0.75/1.1	1.5	2.2	4.0	5.5	7.5		
	Rated capacity *1)	kVA	1.1	1.9	2.8	4.1	6.8	9.9	13		
	Rated voltage *2)	V	3-phase 380, 400, 415V50Hz, 380, 400, 440, 460V/60Hz								
Output ratings	Rated current *3)	А	1.5 (1.4)	2.5 (2.1)	3.7 (3.7)	5.5 (5.3)	9.0 (8.7)	13 (12)	18 (16)		
	Overload capability		150% of rated of	current for 1min.	200% of rated	current for 0.5s					
	Rated frequency	Hz	50, 60Hz								
	Phases, Voltage, Frequend	су	3-phase 38	0 to 480V 50/	60Hz						
	Voltage/frequency variatio	ns	Voltage: +10 to	o -15% (Voltage u	nbalance *4): 2%	or less) Frequen	cy: +5 to -5%				
Input	Momentary voltage dip capa	bility *5)	When the input When the input The smooth rec	hen the input voltage is 300V or more, the inverter can be operated continuously. /hen the input voltage drops below 300V from rated voltage, the inverter can be operated for 15ms. ne smooth recovery mode is selectable (by Auto-restart function).							
ratings	Rated current *6 (with I	DCR)	0.82	1.5	2.9	4.2	7.1	10.0	13.5		
	A (without	ut DCR)	1.8	3.5	6.2	9.2	14.9	21.5	27.9		
	Required power supply capacity *7)	kVA	0.6	1.1	2.1	3.0	5.0	7.0	9.4		
Control	Starting torque		200% (with Dyr	namic torque-vect	or control selecte	d)					
	Braking torque (Standard)	*8)		70		4	0	2)		
Braking	Braking torque (Using opt	ions)	150					·			
	DC injection braking		Starting frequer	ncy: 0.0 to 60.0H	z Braking time: 0.	0 to 30.0s Brakin	g level: 0 to 100%	6 of rated current			
Enclosure	(IEC 60529)		IP 20								
Cooling m	ethod		Natural cooling		Fan cooling						
Standards			-UL/cUL -Low -IEC 61800-2 (-IEC 61800-3 (-UL/CUL -Low Voltage Directive -EMC Directive -TUV -IEC 61800-2 (Ratings, specifications for low voltage adjustable frequency AC power drive systems) -IEC 61800-3 (EMC product standard including specific test methods)							
Mass		kg	1.1	1.2	1.3	1.4	1.9	4.5	4.5		

NOTES:

*1) Inverter output capacity (kVA) at 440V series, 220V in 200V series. *2) Output voltage cannot exceed the power supply voltage. *3) Current derating may be required in case of low impedance loads such as high frequency motor. Use the inverter at the current () or below where carrier frequency setting is higher than 4kHz (F26: 4 to 15) or the ambient temperature is 40°C

Conformity to Low Voltage Directive

The VXSM Series conforms to the Low Voltage Directive with EN50178

or higher. *4) Refer to the IEC 61800-3 (5.2.3). *5). Tested at standard load condition (85% load). *6) This value is under original calculation method. (Refer to the Technical information.) *7) When optional power-factor correcting DC REACTOR (DCR) is used. *8) With a nominal applied motor, this value is average torque when the motor decelerates and stops from 60 Hz. (It may change according to motor loss.)

Conformity to EMC Directive

- · Emission requirement
- Footprint filters in compliance with EN61800-3 are provided for all models (optional)
- Immunity requirement

The VXSM Series inverters meet EN61800-3 as standard.



Specification continued

		Item	Explanation								
Output		Maximum frequency	50 to 400Hz *1)								
frequency	ing	Base frequency	25 to 400Hz								
	Sett	Starting frequency	0.1 to 60.0Hz, Holding time: 0.0 to 10.0s								
		Carrier frequency *2)	0.75 to 15kHz								
	Ac	curacy (Stability)	 Analog setting: ±0.2% of Maximum frequency (at 25±10°C) Digital setting: ±0.01% of Maximum frequency (at -10 to +50°C) 								
	Set	ting resolution	 Analog setting: 1/3000 of Maximum frequency ex.) 0.02Hz at 60Hz, 0.04Hz at 120Hz at 400Hz Digital setting: 0.01Hz at Maximum frequency of up to 99.99Hz 0.1Hz at Maximum frequency of 100.0Hz and above) * LINK setting: 1/2000 of Maximum frequency ex.) 0.003Hz at 60Hz, 0.006Hz at 120Hz, 0.02Hz at 400Hz 0.01Hz (Fixed) 								
Control	Co	ntrol method	V/f control (Sinusoidal PWM control) Dynamic torque-vector control (Sinusoidal PWM control)								
	Vol	tage/freq. (V/f) tracteristic	Adjustable at base and maximum frequency, with AVR control: 160 to 480V (400V series), 80 to 240V (200V series)								
	Tor	que boost	Selectable by load characteristics: Constant torque load (Auto/manual), Variable torque load (Manual)								
	Op	eration method	• KEYPAD operation: 🝙 key, 💿 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)								
	Fre	quency setting	• KEYPAD operation: 💿 or 💿 key								
	(Fr	equency command)	• External potentiometer (*): 1 to $5k\Omega$								
			 Analog input: 0 to +10V DC (0 to +5V DC), 4 to 20mA DC (Reversible) 0 to ±10V DC (0 to ±5V DC)Reversible operation by polarised signal can be selected. (Inverse) +10 to 0V dc, 20 to 4mA DCInverse 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.								
			LINK operation: RS485 (Standard) Profibus-DP, Interbus-S, DeviceNet, Modbus Plus, CAN Open (Option)								
	Ru	nning status signal	Transistor output (2 points): RUN, FAR, FDT, OL, LU, TL, etc.								
			Relay output (1 point): Alarm output (for any fault)								
			Analog (or pulse) output (1 point): Output frequency. Output current, Output torque, etc.								
	Ac	celeration/Deceleration	0.01 to 3600s: • Independently adjustable acceleration and deceleration • 2 different times are selectable.								
	tim	e	Mode select: Linear, S-curve (weak), S-curve (strong), Non-linear								
	Fre	quency limiter	High and Low limiters can be preset.								
	Bia	s frequency	Bias frequency can be preset.								
	Ga	n for frequency setting	Gain for frequency setting can be preset. (0.0 to 200.0%) ex.) Analog input 0 to $+5V$ DC with 200% gain results in maximum frequency at 5V DC.								
	Jur	np frequency control	Jump frequency (3 points) and its common jump hysteresis width (0 to 30Hz) can be preset.								
	Ro (Fly	ating motor pick up ving start)	A rotating motor (including inverse rotating mode) can be smoothly picked up without stopping the motor (speed search method)								
	Au mo	o-restart after mentary 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. Even if the motor circuit is temporarily opened, the inverter operates without a hitch).								
	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 automatically selects a standard motor.								
			Slip compensation can be preset for the second motor.								
	Dro	op operation	The motor speed droops in proporation to output torque (-9.9 to 0.0Hz).								
	Tor	que limiter	 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 limiter 1 and 2 can be individually set, and are selectable with a digital input signal. 								
	PIC	control	This function can control flowrate, pressure, etc. (with an analog feedback signal.) • Reference • KEYPAD operation () • Voltage input (Terminal 12): • O to +10V DC								
			Current input (Terminal C1): 4 to 20mA DC Multistep frequency setting: Setting freq./Max. freq. X 100 (%) RS485: Setting freq./Max. freq. X 100 (%)								
			Feedback signal Ierminal 12 (0 to +10V DC or +10 to 0V DC) Terminal C1 (4 to 20mA DC or 20 to 4mA DC)								
	Au	omatic deceleration	 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.								
	Se	cond motor's setting	I I I I I I I I I I I I I I I I I I I								
			* The second motor's circuit parameter can be preset. Torque-vector control can be applied to both motors								
	Ene	ergy saving operation	This function minimises inverter and motor losses at light load.								
	Far	stop operation	This function is used for silent operation or extending the fan's lifetime.								



Specification continued

	ltem	Explanation						
Indication (LED monitor)	Operation mode (Running)	Output frequency (Hz) Setting frequency (Hz) Output current (A) Output voltage (V) Motor synchronous speed (r/min)						
	Stopping	Selected setting value or output value						
	Trip mode	Displays the cause of trip by codes as follows.• dBH (Overheating at DB circuit)• OC1 (Overcurrent during acceleration)• OL1 (Motor 1 overload)• OC3 (Overcurrent during running at constant speed)• OL2 (Motor 2 oveload)• OU1 (Overvoltage during acceleration)• OL2 (Motor 2 oveload)• OU1 (Overvoltage during acceleration)• Er1 (Memory error)• OU2 (Overvoltage during deceleration)• Er3 (CPU error)• OU3 (Overvoltage during running at constant speed)• Er4 (Option error)• OU2 (Overvoltage during running at constant speed)• Er3 (CPU error)• OH1 (Undervoltage)• Er5 (Option error)• OH1 (Overheating at heat sink)• Er7 (Output phase loss error, impedance unbalance)• OH2 (External thermal relay tripped)• Er8 (RS485 error)						
	Running or trip mode	• Trip history: Cause of trip by code. (Even when main power supply is off, trip history data of the last 4 trips are retained).						
	Charge lamp	When the DC link circuit voltage is higher than 50V, the charge lamp is ON.						
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: 800V DC, 200V series: 400V DC)						
	Incoming surge	Protects the inverter against surge voltage between the main circuit power line and the ground.						
	Undervoltage	Detects DC link circuit undervoltage, and stops the inverter. (400V series: 400V DC, 200V series: 200V DC)						
	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	Ground fault protection for inverter output circuit (Detecting at start)						
	Motor overload	 The inverter trips, and then protects the motor. Electronic thermal overload relay can be selected for standard motor or inverter motor Thermal time constant (0.5 to 10.0 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	Prevents DB resistor overheating by internal electronic thermal overload relay. (The inverter stops electricity discharge operation to protect the DB resistor).						
	Stall prevention	 Controls the output frequency to prevent <i>BC</i> (overcurrent trip when the output current exceeds 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 <i>BU</i> (overvoltage) trip when the DC link circuit voltage exceeds the limit value during deceleration. 						
	Output phase loss	When the inverter executes tuning, detects each phase impedance unbalance.						
	Motor protection by PTC thermistor	When the motor temperature exceeds allowable value, the inverter trips automatically.						
	Auto reset	When the inverter is tripped, it resets automatically and restarts.						
Condition	Installation location	Free from corrosive gases, flammable gases, oil mist, dusts and direct sunlight. Indoor use only.						
(Installation	Altitude	1000m or less. Applicable to 3000m with power derating (-10%/1000m)						
Operation)	Ambient temperature	-10 to +50°C						
. ,	Ambient humidity	5 to 95%RH (non-condensing)						
	Vibration	3mm at from 2 to less than 9Hz, 9.8m/s ² at from 9 to less than 20Hz 2m/s ² at from 20 to less than 55Hz, 1m/s ² at from 55 to less than 200Hz						
Storage con	ndition	Temperature: -25 to +65°C • Humidity: 5 to 95%RH (non-condensing)						

NOTES: (*) Option

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

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



Basic wiring diagram

External signal input operation

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

Run/Stop operation and frequency setting through external signals

When "1" is set at FO I you can set a frequency by using an input signal for 0 to 10V DV.

When "2" is set at FOP you can set frequency by using an input signal for 4 to 20mA DC.

In both cases set "1" at FD2



NOTES:

- *1) When connecting an optional DC REACTOR, remove the jumper short bar that connects the terminals [P1] and [P+].
- *2) If there is a magnetic contactor or a solenoid close to the inverter, connect a surge suppresser to the coil in parallel connection. Keep the wiring length to a minimum.
- *3) For the wiring of the control circuit, use shielded or twisted wires with the shortest possible length. When using shielded wires, connect the shields to the inverter ground terminal.
- *4) Ensure motor cable is shielded, and <u>both</u> ends are securely earthed using short wire links with minimum c.s.a the same as the motor / supply cable, or use appropriate brass terminating gland.



Specification continued

	Symbol	Terminal name	Function	Remarks	Func. code
Main circuit	L1/R, L2/S, L3/T	Power input	Connect a 3-phase power supply		
	L1/L, L2/N	Power input	Connect a 1-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 DC link circuit	Used for DC bus connection system		
	P(+), DB	For EXTERNAL BRAKING RESISTOR	Connect the EXTERNAL BRAKING RESISTOR (Option)		
	O G	Grounding	Ground terminal for inverter chassis (housing)		
Analog Input	13	Potentiometer power supply	+10V DC power supply for frequency setting POT (POT: 1 to $5 k \Omega$	Allowable maximum output current: 10mA	
	12	Voltage input	 0 to +10V DC/0 to 100% (0 to +5V DC/0 to 100%) Reversible operation can be selected by function setting. 0 to ±10V DC/0 to ±100% (0 to ±5 DC/0 to ±100%) 	 Input impedance: 22k Allowable maximum input voltage: ±15V DC If input voltage is 10 to 15V DC, the inverter estimates it to 10V DC. 	F01, C30
		(PID control)	Used for PID control reference signal or feedback signal.		F01, H21
	C1	Current input	• 4 to 20mA DC/0 to 100%	 Input impedance: 250Ω 	F01
		(PID control)	Used for PID control reference signal or feedback signal.		F01, H21
		(PTC-thermistor input)	The PTC-thermistor (for motor protection) can be connected to terminal C1-11.		H26, H27
	11	Common	Common for analog signal	Isolated from terminal CME 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 motor decelerates and stops	F02
	REV	Reverse operation command	REV: ON The motor runs in the reverse direction. REV: OFF The motor decelerates and stops.	The digital inputs can directly connect to source type output (PNP transistor output) circuit.	
	X1	Digital input 1	These terminals can be preset as follows.	ON state maximum input voltage: 2V (maximum sink surrant, 6mA)	E01 to E05
		X2	Digital input 2	OFF state maximum terminal voltage: 22 to 27V	
		X3	Digital input 3	(allowable maximum leakage current: 0.5mA)	
		X4	Digital input 4	The digital inputs can directly connect to source type output (PNP transistor output) circuit	
		X5	Digital input 5		
	(SS1) (SS2) (SS4) (SS8)	Multistep freq. selection	(SS1) : 2 (0, 1) different frequencies are selectable. (SS1, SS2) : 4 (0 to 3) different frequencies are selectable. (SS1, SS2, SS4) : 8 (0 to 7) different frequencies are selectable. (SS1, SS2, SS4) : 8 (0 to 7) different frequencies are selectable. (SS1, SS2, SS4) : 16 (0 to 15) different frequencies are selectable.	Frequency 0 is set by F01 (or C30). (All signals of SS1 to SS8 are OFF)	C05 to C19
	(RT1)	ACC/DEC time selection	(RT1) : 2 (0, 1) different ACC/DEC times are selectable.	Time 0 is set by F07/F08.	F07, F08 E10, E11
		(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.	
	(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 operated command (FWD or REV) 0N. Assigned to terminal X4 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 X5 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.	
	(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.	F01/C30
	(M2/M1)	Motor 2/Motor 1	(M2/M1): ON The motor circuit parameter and V/f characteristics are changed	If this signal is changed while the inverter is running, the signal is effective only after the inverter stops.	P01 to P10/ A10 to A19
	(DCBRK)	DC brake command	(UCBHK): UN The DC injection brake is effective. (In the inverter deceleration mode	If this 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	(1L2/TL1): ON Torque limiter 2 is effective.		F40, F41/ E16, E17
	(UP)	UP command	(UP): ON The output frequency increases.	When UP and DOWN commands are simultaneously ON. DOWN signal is effective.	F01, C30
	(DOWN)	DOWN command	 (DUWN): ON The output frequency decreases. The output frequency change rate is determined by ACC/DEC time. Restarting frequency can be selected from OHz or setting value at the time of stop. 		
	(WE-KP)	Write enable for KEYPAD	(WE-KP): ON The data is changed by KEYPAD		
	(Hz/PID)	PID control cancel	(Hz/PID): ON The PID control is canceled and frequency setting by KEYPAD () 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
	(LE)	Link enable (RS485, Bus)	(LE): ON The link operation is effective. Used to switch operation between ordinary operation and link operation to communication.	IRS485: Standard, Bus: Option	H30
	CM	Common	Common for digital signal	Isolated from CME and 11.	



Terminal functions

	Symbol	Terminal name	Function	Remarks	Func. code
Analog circuit	L1/R, L2/S, L3/T	Power input	Connect a 3-phase power supply		
	L1/L, L2/N	Power input	Connect a 1-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 DC link circuit	Used for DC bus connection system		
	P(+), DB	For External Braking Resistor	Connect the EXTERNAL BRAKING RESISTOR (Option)		
	O G	Grounding	Ground terminal for inverter chassis (housing)		
Analog Input	13	Potentiometer power supply	\pm 10V DC power supply for frequency setting POT (POT: 1 to 5k $\!\Omega$	Allowable maximum output current: 10mA	
	12	Voltage input	O to +10V DC/0 to 100% (0 to +5V DC/0 to 100%) Reversible operation can be selected by function setting. O to ±10V DC/0 to ±100% (0 to ±5 DC/0 to ±100%)	 Input impedance: 22k Allowable maximum input voltage: ±15V DC If input voltage is 10 to 15V DC, the inverter estimates it to 10V DC. 	F01, C30
		(PID control)	Used for PID control reference signal or feedback signal.		F01, H21
	C1	Current input	• 4 to 20mA DC/0 to 100%	 Input impedance: 250Ω 	F01
		(PID control)	Used for PID control reference signal or feedback signal.		F01, H21
		(PTC-thermistor input)	The PTC-thermistor (for motor protection) can be connected to terminal C1-11.		H26, H27
	11	Common	Common for analog signal	Isolated from terminal CME 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 motor decelerates and stops	F02
	REV	Reverse operation command	REV: ON The motor runs in the reverse direction. REV: OFF The motor decelerates and stops.	The digital inputs can directly connect to source type output (PNP transistor output) circuit.	
	X1	Digital input 1	These terminals can be preset as follows.	ON state maximum input voltage: 2V (maximum sink summath SmrA)	E01 to E05
		X2	Digital input 2	OFF state maximum terminal voltage: 22 to 27V	
		X3	Digital input 3	(allowable maximum leakage current: 0.5mA)	
		X4	Digital input 4	The digital inputs can directly connect to source type output (PNP transistor output) circuit	
		X5	Digital input 5		
	(SS1) (SS2) (SS4) (SS8)	Multistep freq. selection	(SS1) : 2 (0, 1) different frequencies are selectable. (SS1, SS2) : 4 (0 to 3) different frequencies are selectable. (SS1, SS2, SS4) : 8 (0 to 7) different frequencies are selectable. (SS1, SS2, SS4) : 8 (0 to 7) different frequencies are selectable. : 16 (0 to 15) different frequencies are selectable.	Frequency 0 is set by F01 (or C30). (All signals of SS1 to SS8 are OFF)	C05 to C19
	(RT1)	ACC/DEC time selection	(RT1) : 2 (0, 1) different ACC/DEC times are selectable.	Time 0 is set by F07/F08.	F07, F08 E10, E11
		(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.	
	(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 operated command (FWD or REV) 0N. Assigned to terminal X4 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 X5 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.	
	(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.	F01/C30
	(M2/M1)	Motor 2/Motor 1	(M2/M1): ON The motor circuit parameter and V/f characteristics are changed	If this signal is changed while the inverter is running, the signal is effective only after the inverter stops.	P01 to P10/ A10 to A19
	(DCBRK)	DC brake command	(DCBRK): ON The DC injection brake is effective. (In the inverter deceleration mode	If this 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.		F40, F41/ E16, E17
	(UP)	UP command	(UP): ON The output frequency increases.	When UP and DOWN commands are simultaneously	F01, C30
	(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 OHz or setting value at the time of stop. 	Un, DUVIN Signal is eliceuve.	
	(WE-KP)	Write enable for KEYPAD	(WE-KP): ON The data is changed by KEYPAD		
	(Hz/PID)	PID control cancel	(Hz/PID): ON The PID control is canceled 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
	(LE)	Link enable (RS485, Bus)	(LE): ON The link operation is effective. Used to switch operation between ordinary operation and link operation to communication.	IRS485: Standard, Bus: Option	H30
	СМ	Common	Common for digital signal	Isolated from CME and 11.	



Terminal functions continued

	Symbol	Terminal name	Function	Remarks	Func. code
Analog output	FM (11)	Analog monitor (Common)	Output voltage (0 to 10V DC) is proportional to selected function's value as follows. The proportional coefficient and bias value can be preset. • Output frequency 1 (Before slip compensation) (0 to max. frequency) • Output frequency 2 (After slip compensation) (0 to max. frequency) • Output voltage (0 to 200%) • Output voltage (0 to 200%) • Output voltage (0 to 200%) • Load factor (0 to 200%) • Input power (0 to 200%) • PID feedback value (0 to 100V) • DC link circuit voltage (0 to 100V)	Allowable maximum output current: 2mA	F29 F30, F31
Pulse	FM (11)	Pulse rate monitor (Common)	 Pulse rate mode: Pulse rate is proportional to selected function's value* (50% duty) pulse output Average voltage mode: Average voltage is proportional to selected function's value* (2670p/s pulse width control) Kinds of function to be output is same as those of analog output (FM) 	Allwable maximum output current: 2mA	F29 F33 to F35
Transistor output	P24	DC voltage supply	Power supply for transistor output load. (+24V DC, 50mA max.)	Link P24 to CMC and connect loads such as relays between Y1E, Y2E and CM.	
	Y1E Y2E	Transistor output 1 Transistor output 2	Output the selected signals from the following items.	 ON state maximum output voltage: 2V (Allowable maximum source current: 50mA) OFF state maximum terminal voltage: 0.1mA (allowable maximum voltage: 27V) 	E20, E21
	(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
	(FDT)	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 \ensuremath{ON}		
	(B/D)	Torque polarity	Outputs ON signal in braking or stopping mode, and OFF signal in driving mode		
	(TL)	Torque limiting	Outputs 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")		
	(0L)	Overload early warning	 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
	CMC	Common (transistor output)	Common for transistor output signal	Isolated from terminals CM and 11.	
Relay output	30A, 30B 30C	Alarm relay output	Outputs a contact signal when a protective function is activated. Changeable exciting mode active or non-exciting mode active by function "F36".	Contact rating: 250V AC, 0.3A, cosø=0.3 48V DC, 0.5A, non-inductive (for LVD) 42V DC, 0.5A, non-inductive (for UL/cUL)	F36
LINK	RS485 I/O terminal	Connect the RS485 link signal.			

Terminal Arrangement

Main circuit terminals





÷

0



Function settings

Protective functions

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

Function	Description			LED monitor
Overcurrent protection (Short-circuit)	Stops running to protect inverter from an overcurrent resulting from overload. Stops running to protect inverter from an overcurrent due to a short-circuit		During acceleration	0C I
(Ground fault)	 Stops running to protect inverter from an overcurrent due to a ground fault in the output significant inverter from an overcurrent due to a ground fault 		During deceleration	530
			While running at constant speed	0C 3
Overvoltage protection	The inverter stops when it detects an overvoltage in the DC link circuit.	 400V series: 800V DC or more 200V series: 400V DC or more 	During acceleration	001
		 Protection is not assured if excess AC line voltage is applied 	During deceleration	500
		inadvertently.	While running at constant speed	003
Incoming surge protection	 Protects the inverter against surge voltage between the main circuit power line and ground. Protects the inverter against surge voltage in the main circuit power line. 	The inverter may be tripped by some function.	other protective	
Undervoltage protection	Stops the inverter when the DC link circuit voltage drops below undervoltage level.	 400V series: 400V DC or less 200V series: 200V DC or less 		LU
Input phase loss protection	The inverter is protected from being damaged when open-phase fault occurs.			Lin
Overheat protection	Stops the inverter when it detects excess heat sink temperature in case of cooling fan failure or overload.			0H I
	When the external braking resistor overheats, the inverter stops discharging and running			дЪН
Electronic thermal	This function stops the inverter by detecting an inverter overload.			OLU
overload relay (Motor protection)	This function stops the inverter by detecting an overload in a standard motor or inverter motor.		Motor 1 overload Motor 2 overload	0L 1 0L2
Stall prevention	This function stops the inverter by detecting an inverter overload.			
(Momentary overcurrent limitation)	When an output current exceeds the limit during acceleration, this function lowers output frequency to prevent the occurrence of an OC1 trip.	The stall prevention function can be	disabled.	
External alarm input	The inverter stops on receiving external alarm signals.	Use THR terminal function (digital in	put).	0H2
Alarm output (for any fault)	The inverter outputs a relay contact signal when the inverter issued an alarm and stopped	 Output terminals: 30A, 30B and 30C Use the RST terminal function for signal function for signal function. 	inal input.	
Alarm reset command	• An alarm-stop state of the inverter can be cleared with the RESET key or by a digital input signal (RST).	 Even if main power input is turned of and trip-cause data are retained. 	n, alarm history	
Alarm history memory	Stores up to four instances of previous alarm data.			
Storage of data on cause of trip	The inverter can store and display details of the latest alarm history data.			
Memory error	• The inverter checks memory data after power-on and when the data is written. If a memory error is detected, the inverter stops.			Er i
KEYPAD panel communication error	 If an error is detected in communication between the inverter and KEYPAD when the Keypad panel is being used, the inverter stops. 	 When operated by external signals, t running. The alarm output (for any fa Only Er2 is displayed. 	he inverter continues ault) is not output.	Er2
CPU error	• If the inverter detects a CPU error caused by noise or some other factor, the inverter stops.			Erð
Option communication error	If a checksum error or disconnection is detected during communication, the inverter issues an alarm.			ЕгЧ
Option error	• If a linkage error or other option error is detected, the inverter issues an alarm.			Ers
Output phase loss error	If an unbalance of output circuits is detected during tuning, this function issues an alarm (and stops the inverter).			Er7
RS485 communication error	• If an RS485 communication error is detected, the inverter issues an alarm.			8-3

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 is being output, the alarm signal cannot be retained.
2) To issue the RESET command, press the avector where the KEYPAD panel or connect terminals RST and CM once and disconnect them afterwards.

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



Function settings

External dimensions

Fig. 1 VXSM40-1



Fig. 3 VXSM400-3 VXSM150 and 220-1



Fig. 5 VXSM keypad



Mounting hole positions

Fig. 2 VXSM40 to 220-3 VXSM75-1







Fig. 4 VXSM550 and 750-3







Power	Normal	Tuno		D	imen	sions	; (mn	1)		Ei.a
voltage	motor (kW)	iyhe	w	Н	D	D1	D2	D3	D4	rıy.
3-phase	0.4/0.55	VXSM40-3	106	130	126	86	40	50.5	103	2
400V	0.75/1.1	VXSM75-3	106	130	150	86	64	62.5	115	2
	1.5	VXSM150-3	106	130	170	106	64	86.5	159	2
	2.2	VXSM220-3	106	130	170	106	64	86.5	159	2
	4.0	VXSM400-3	170	130	158	86	72	94.5	147	3
	5.5	VXSM550-3	180	220	158	-	-	117	146	4
	7.5	VXSM750-3	180	220	158	-	-	117	146	4
1-phase	0.4	VXSM40-1	70	130	118	86	32	60.2	107	1
200V	0.75	VXSM75-1	106	130	126	86	40	62.5	115	2
	1.5	VXSM150-1	170	130	158	86	72	94.5	147	3
	2.2	VXSM220-1	170	130	158	86	72	94.5	147	3



Options

EMC compliance footprint filter

Dimensions



Power	Nominal	1401145	EMC Filter										
voltage	motor	Inverter type	TYPE	Rated	Rated	Leakage		Dimensions mm					
	(KW)		ITPE	Voltage (V)	(A)	(mA)nom.	W	W1	W1 H H1 D 80 191 165 40 145 191 165 40 145 278 252 50				
Three-	0.4 to 2.2	VXSM40-3 to VXSM220-3	RFM220-3		10	1	110	80	191	165	40		
phase	4.0	VXSM400-3	RFM400-3	480	15	1	174	145	191	165	40		
400V	5.5 and 7.5	VXSM550-3, VXSM750-3	RFM750-3	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	182	145	278	252	50				
Single	0.4	VXSM40-1	RFM40-1		7	7	71	55	189	178	38		
phase	0.75	VXSM75-1	RFM75-1	250	18	7	110	80	191	165	38		
2307	1.5 and 2.2	VXSM150-1, VXSM220-1	RFM220-1	1	29	14	174	145	191	165	40		

DC reactor



Applicable inverter	Reactor	Dimensions (mm)								
3 phase 400V series	type	A	В	C	D	E	F	G	H	(kg)
VXSM40-3	VXSMLC4	66	56	72	90	60	35	5.2 x 8	94	1.0
VXSM75-3	VXSMLC7	66	56	72	90	65	40	5.2 x 8	94	1.4
VXSM150-3	VXSMLC15	66	56	72	90	65	45	5.2 x 8	94	1.6
VXSM220-3	VXSMLC22	86	71	80	100	65	45	6 x 9	110	2.0
VXSM400-3	VXSMLC40	86	71	80	100	70	50	6 x 9	110	2.6
VXSM550-3	VXSMLC55	86	71	80	100	70	50	6 x 9	110	2.6
VXSM750-3	VXSMLC75	111	95	80	100	75	60	7 x 11	130	4.2
1 phase 230V series										
VXSM40-1										
VXSM75-1	Please Contact IM	0 Precision	Controls L	td						
VXSM150-1	1									
VXSM220-1	1									

NOTES:

The above data is typical only. IMO reserve the right to change product specifications as necessary. Please contact IMO for confirmation or otherwise of specification before ordering.

Wiring equipment

_					IMO I	Magnetic Cont	actor	R	ecommended	wire size (mm	1²)	-
Power supply voltage	Nominal applied motor	al JAGUAR d Inverter type	MCCB or ELCB Rated current (A)		Input	Input circuit		Input circuit [L1/R, L2/S, L3/T]		Output	DCR	DB
	(kW)		With DCR	No DCR	With DCR	No DCR	circuit	With DCR	No DCR	(U, V, W)	[P1, P(+)]	[P(+), DB, N(-)]
Three	0.4	VXSM40-3	6	6								
phase	0.75	VXSM75-3	6	6								
415V	1.5	VXSM150-3	6	10		MC14-S-10			2.5		2.5	2.5
	2.2	VXSM220-3	6	16	MC14-S-10		MC14-S-10	2.5		2.5		
	4	VXSM400-3	10	20								
	5.5	VXSM550-3	16	32		MC24-S-00						
	7.5	VXSM750-3	20	35		MC40-S-00			4			
Single	0.4	VXSM40-1	6	10								
phase	0.75	VXSM75-1	10	16	MC14-S-10	MC14-S-10	MC14-S-10	2.5	2.5	2.5	2.5	2.5
230V	1.5	VXSM150-1	16	20								
	2.2	VXSM220-1	20	32		MC24-S-00		4	6	4	4	4

NOTES:

*1) The applicable frame and series of the moulded case circuit breaker (MCCB) and earth leakage circuit breaker (ELCB) vary according to the capacity of the transformer of the equipment. For details of selection, refer to the concerning technical documents.

*2) The recommended wire size for the main circuit is the case for the low voltage directive at ambient temperature 40°C.

*3) The power supply impedance without a reactor is considered to be the equivalent of 0.1% of the inverter capacity, with 10% current imbalance accompanied by the voltage imbalance.

*4) Crimp terminals up to 7.4mm in width (including tolerance) can be used.

*5) Crimp terminals up to 9.5mm in width (including tolerance) can be used.

*6) Use the grounding cable of a size equal to or larger than that of the input power supply cable.



Options

Dynamic braking resistors

Dimensions

	Resistor	Dimensions (mm)							
	IMO Part No.	L	н	w	Slots	Holes	R (ohms)	P (Watts)	Tolerance ±%R
 See Fig. 1 —		142	62	28	12 x 5	6	105	90	5
	DBR210R150W	217	62	28	12 x 5	6	210	150	5
	DBR50R220W	310	62	28	12 x 5	6	50	220	5
-	DBR150R220W	310	62	28	12 x 5	6	150	220	5
	DBR160R380W	358	90	42	14 x 6	6	160	380	5
	DBR57R450W	356	94	42	14 x 6	5	57	450	10
See Fig. 2 —	DBR133R750W	409	125	51	17 x 6	5	133	750	10

Power supply voltage	Applicable Inverter	VXSM40-3	VXSM75-3	VXSM150-3	VXSM220-3	VXSM400-3	VXSM550-3	VXSM750-3
	Applied Motor kW	0.4/0.55	0.75/1.1	1.5	2.2	4	5.5	7.5
	Braking Module	Not necessary						
	Avg. braking torque (%)	150	150	150	150	150	150	150
415V	Total resistor capacity (kW)		0	.2	0.4			
	Total ohmic value	20	00	16	50	130	0.4	60
	Max duty cycle (%)	22	18	10	7	5	5	5
	Continuous max braking time	145 s	45 s	45 s	30 s	20 s	20 s	10 s

-

Fig. 2 Resistor Type 2 DBR57R450W DBR133R750W

Resistor Type 1 DBR105R90W DBR210R150W DBR50R220W DBR150R220W DBR160R380W



	1	oleg		
ШШ.			Pi-	
	L_		<u>_*</u> *	
	-		W	

Power supply voltage	Applicable Inverter	VXSM40-1	VXSM75-1	VXSM150-1	VXSM220-1
	Applied Motor kW	0.4	0.75	1.5	2.2
	Braking Module				
	Avg. braking torque (%)	150	150	150	150
230V	Total resistor capacity (kW)	0.2		0.4	
	Total ohmic value	100		40	
	Max duty cycle (%)	15	12	7	7
	Continuous max braking time	60 s	60 s	30 s	30 s

Extension cable with adapter or keypad panel (VXSM podcable)

