Manual No.
I43-EN-01

VARISPEED V7

Compact Sensorless Vector Inverter
Model: CIMR-V7AZ
200V Class 3-phase 0.1 to 7.5kW
200V Class Single-phase 0.1 to 4.0kW
400V Class 3-phase 0.2 to 7.5kW

QUICK MANUAL

General Precautions
• Some drawings in this manual are shown with protective covers or shields removed in order to show detail with more clarity. Make sure all covers and shields are replaced before operating the product. • This manual may be modified when necessary because of improvements to the product, modifications, or changes in specifications. • To order a copy of this manual, or if your copy has been damaged or lost , contact your OMRON YASKAWA Motion Control B. V. (Hereinafter called the OYMC) representatives. • OYMC is not responsible for any modification of the product made by the user, since that will void the guarantee. • This Manual is based on software number: a) 5740 for units up to 4,0 kW b) 5750 5,5 kW and 7,5 kW units

Safety Information

The following conventions are used to indicate precautions in this document. Failure to heed precautions provided in this document can result in serious or possibly even fatal injury or damage to the products or to related equipment and systems.

⚠ **WARNING**	Indicates precautions that, if not heeded, could possibly result in loss of life or serious injury.
⚠ **CAUTION**	Indicates precautions that, if not heeded,could result in relatively serious or minor injury, damage to the product, or faulty operation. It may also be used to alert against unsafe practices. Even items classified as cautions may result in serious accidents in some situations. Always follow these important precautions.

Failure to heed a precaution classified as a caution can result inserious consequences depending on the situation.

■ Precautions for UL/cUL Marking

- Do not connect or disconnect wiring, or perform signal checks while the power supply is turned ON.
- The Inverter internal capacitor is still charged even after the power supply is turned OFF. To prevent electric shock, disconnect all power before servicing the Inverter, and then wait at least one minute after the power supply is disconnected. Confirm that all indicators are OFF before proceeding.
- Do not perform a withstand voltage test on any part of the Inverter. The Inverter is an electronic device that uses semiconductors, and is thus vulnerable to high voltage.
- Do not remove the Digital Operator or the blank cover unless the power supply is turned OFF. Never touch the printed circuit board (PCB) while the power supply is turned ON.
- This Inverter is not suitable for use on a circuit capable of delivering more than 18,000RMS symmetrical amperes, 250 volts maximum (200V class Inverters) or 480 volts maximum(400V class Inverters).

⚠ CAUTION

Use 75 C copper wires or equivalent.

Low voltage wires shall be wired with Class I Wiring.

■ Precautions for CE Markings

- Only basic insulation to meet the requirements of protection class I and over voltage category II is provided with control circuit terminals.
  Additional insulation may be necessary in the end product to conform to CE requirements.
- For 400 V class Inverters, make sure to ground the supply neutral to conform to CE requirements.
- For conformance to EMC directives, refer to section 3 in this document. For details, refer to the following document: Document No. EZZ008390 for English version

■ Receiving

⚠ CAUTION

- Do not install or operate any Inverter that is damaged or has missing parts.
  Failure to observe this caution may result in injury or equipment damage.

■ Mounting

⚠ CAUTION

- Lift the Inverter by the heatsink. When moving the Inverter, never lift it by the plastic case or the terminal covers.
  Otherwise, the main unit may fall and be damaged.
- Mount the Inverter on nonflammable material (i.e., metal).
  Failure to observe this caution may result in a fire.
- When mounting Inverters in an enclosure, install a fan or other cooling device to keep the intake air temperature below 122°F (45°C) for IP20 (open chassis type), or below 105°F(40°C) for NEMA1 (TYPE1).
  Overheating may cause a fire or damage the Inverter.
- The Inverter generates heat. For effective cooling, mount it vertically.
  Refer to the figure in Mounting Dimensions on section 3.

■ Wiring

WARNING

- Only begin wiring after verifying that the power supply is turned OFF.
  Failure to observe this warning may result in an electric shock or a fire.
- Wiring should be performed only by qualified personnel.
  Failure to observe this warning may result in an electric shock or a fire.
- When wiring the emergency stop circuit, check the wiring thoroughly before operation.
  Failure to observe this warning may result in injury.
- Always ground the ground terminal ⏚ according to the local grounding code.
  Failure to observe this warning may result in an electric shock or a fire.
- For 400V class, make sure to ground the supply neutral.
  Failure to observe this warning may result in an electric shock or a fire.
- If the power supply is turned ON during the FWD(or REV) RUN command is given, the motor will start automatically.
  Turn the power supply ON after verifying that the RUN signal is OFF.
  Failure to observe this warning may result in injury.
- When the 3-wire sequence is set, do not make the wiring unless the multi-function input terminal parameter is set.
  Failure to observe this warning may result in injury.

CAUTION

- Verify that the Inverter rated voltage coincides with the AC power supply voltage.
  Failure to observe this caution may result in personal injury or a fire.
- Do not perform a withstand voltage test on the Inverter.
  Performing withstand voltage tests may damage semiconductor elements.
- To connect a Braking Resistor, Braking Resistor Unit, or Braking Unit, follow the procedure described in this manual.
  Improper connection may cause a fire.
- Always tighten terminal screws of the main circuit and the control circuits.
  Failure to observe this caution may result in a malfunction, damage or a fire.
- Never connect the AC main circuit power supply to output terminals U/T1, V/T2, W/T3, B1, B2, -, +1 or +2.
  The Inverter will be damaged and the guarantee will be voided.
- Do not connect or disconnect wires or connectors while power is applied to the circuits.
  Failure to observe this caution may result in injury.
- Do not perform signal checks during operation.
  The machine or the Inverter may be damaged.
- To store the constant with an ENTER command by communications, be sure to take measures for an emergency Stop by using the external terminals.
  Delayed response may cause injury or damage the machine.

■ Operation

WARNING

- Only turn ON the input power supply after confirming the Digital Operator or blank cover(optional) are in place. Do not remove the Digital Operator or the covers while current is flowing.
  Failure to observe this warning may result in an electric shock.
- Never operate the Digital Operator or DIP the switches with wet hands.
  Failure to observe this warning may result in an electric shock.
- Never touch the terminals while current is flowing, even if the Inverter is stopping.
  Failure to observe this warning may result in an electric shock.
- When the fault retry function is selected, stand clear of the Inverter or the load. The Inverter may restart suddenly after stopping.
  (Construct the system to ensure safety, even if the Inverter should restart.) Failure to observe this warning may result in injury.
- When continuous operation after power recovery is selected, stand clear of the Inverter or the load. The Inverter may restart suddenly after stopping.
  (Construct the system to ensure safety, even if the Inverter should restart.) Failure to observe this warning may result in injury.
- The Digital Operator stop button can be disabled by a setting in the Inverter. Install a separate emergency stop switch.
  Failure to observe this warning may result in injury and machine damage.

WARNING

- If an alarm is reset with the operation signal ON, the Inverter will restart automatically. Reset an alarm only after verifying that the operation signal is OFF.
  Failure to observe this warning may result in injury.
- When the 3-wire sequence is set, do not make the wiring unless the multi-function input terminal parameter is set.
  Failure to observe this warning may result in injury.
- If the parameter access (n001) is set to 5, a Run command can be received via control terminal, even while changing a constant. If sending a Run command while changing a constant, such as during a test run, be sure to observe all safety precautions.
  Failure to observe this warning may result in injury.
  In case of Bi-directional function is enabled (n145=1), the motor rotation direction might be wrong, because analogue frequency reference and digital input command might be oppositional.
  Failure to observe this warning may result in injury and machine damage.

⚠ CAUTION

- Never touch the heatsinks, which can be extremely hot.
  Failure to observe this caution may result in harmful burns to the body.
- It is easy to change operation speed from low to high. Verify the safe working range of the motor and machine before operation.
  Failure to observe this caution may result in injury and machine damage.
- Install a holding brake separately if necessary.
  Failure to observe this caution may result in injury.
- If using an Inverter with an elevator, take safety measures on the elevator to prevent the elevator from dropping.
  Failure to observe this caution may result in injury.
- Do not perform signal checks during operation.
  The machine or the Inverter may be damaged.
- All the constants set in the Inverter have been preset at the factory. Do not change the settings unnecessarily.
  The Inverter may be damaged.

■ Maintenance and Inspection

⚠ WARNING

- Never touch high-voltage terminals on the Inverter.
  Failure to observe this warning may result in an electrical shock.
- Disconnect all power before performing maintenance or inspection, and then wait at least one minute after the power supply is disconnected. Confirm that all indicators are OFF before proceeding.
  If the indicators are not OFF, the capacitors are still charged and can be dangerous.
- Do not perform withstand voltage test on any part of the Inverter.
  The Inverter is an electronic device that uses semiconductors, and is thus vulnerable to high voltage.
- Only authorized personnel should be permitted to perform maintenance, inspections, or parts replacement.
  (Remove all metal objects (watches, bracelets, etc.) before starting work.)
  Failure to observe these warnings may result in an electric shock.

⚠ CAUTION

- The control PCB board employs CMOS ICs.
  Do not touch the CMOS elements.
  They are easily damaged by static electricity.
- Do not connect or disconnect wires, connectors, or the cooling fan while power is applied to the circuit.
  Failure to observe this caution may result in injury.

■ Others

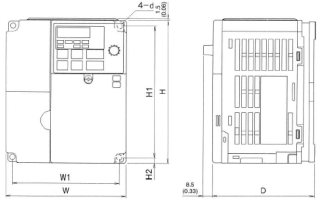
WARNING
• Never modify the product. Failure to observe this warning can result in an electric shock or injury and will invalidate the guarantee.
CAUTION
• Do not subject the Inverter to halogen gases, such as fluorine, chlorine, bromine, and iodine, at any time even during transportation or installation. Otherwise, the Inverter can be damaged or interior parts burnt.

VARISPEED V7

Quick Start Guide

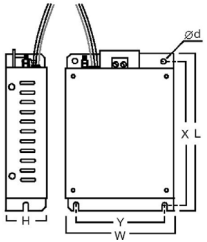
ENGLISH

1. Installation



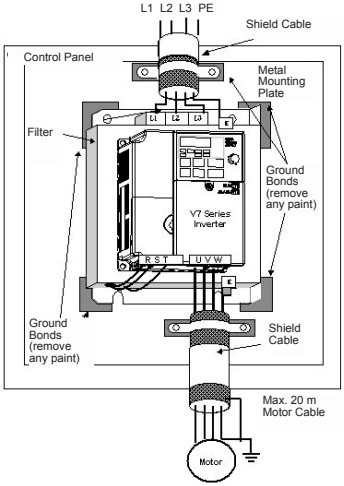
Rated Voltage	Model V7AZ	Dimensions (mm)						Supply Recommendations	
		W	H	D	W1	H1	H2	MCCB (A)	Wire (mm^2)
Three Phase 200 VAC	20P1	68	128	76	56	118	5	5	2
	20P2	68	128	76	56	118	5	5	2
	20P4	68	128	108	56	118	5	5	2
	20P7	68	128	128	56	118	5	10	2
	21P5	108	128	131	96	118	5	20	2
	22P2	108	128	140	96	118	5	20	3.5
	24P0	140	128	143	128	118	5	30	5.5
	25P5	180	260	170	164	244	8	50	8
	27P5	180	260	170	164	244	8	60	8
Single Phase 200 VAC	B0P1	68	128	76	56	118	5	5	2
	B0P2	68	128	76	56	118	5	5	2
	B0P4	68	128	131	56	118	5	10	2
	B0P7	108	128	140	96	118	5	20	3.5
	B1P5	108	128	156	96	118	5	20	5.5
	B2P2	140	128	163	128	118	5	40	5.5
	B4P0	170	128	180	158	118	5	50	8
Three Phase 400 VAC	40P2	108	128	92	96	118	5	5	2
	40P4	108	128	110	96	118	5	5	2
	40P7	108	128	140	96	118	5	5	2
	41P5	108	128	156	96	118	5	10	2
	42P2	108	128	156	96	118	5	10	2
	43P0	140	128	143	128	118	5	20	2
	44P0	140	128	143	128	118	5	20	2
	45P5	180	260	170	164	244	8	30	5.5
	47P5	180	260	170	164	244	8	30	5.5

Input Filter Specifications



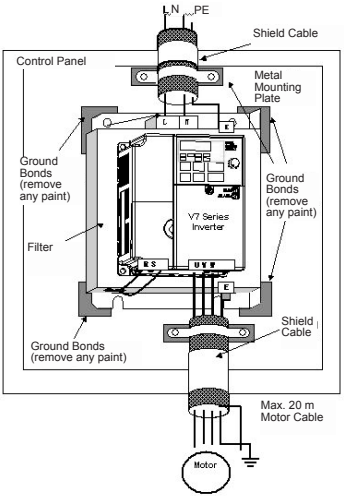
Model V7AZ	Filter 3G3MV-	Dimensions (mm)					
		W	L	H	Y	X	d
20P1	PFI2010-SE	82	194	50	62	181	5.3
20P2							
20P4							
20P7							
21P5	PFI2020-SE	111	169	50	91	156	5.3
22P2							
24P0	PFI2030-SE	144	174	50	120	161	5.3
25P5	PFI2050-SE	184	304	56	150	264	6.0
27P5							
B0P1	PFI1010-SE	71	169	45	51	156	5.3
B0P2							
B0P4							
B0P7	PFI1020-SE	111	169	50	91	156	5.3
B1P5							
B2P2	PFI1030-SE	144	174	50	120	161	5.3
B4P0	PFI1040-SE	175	174	50	150	161	5.0
40P2	PFI3005-SE	111	164	45	91	156	5.3
40P4							
40P7	PFI3010-SE	111	169	45	91	156	5.3
41P5							
42P2							
43P0	PFI3020-SE	144	174	50	120	161	5.3
44P0							
45P5	PFI3030-SE	184	304	56	150	288	6.0
47P5							

EMC Installation



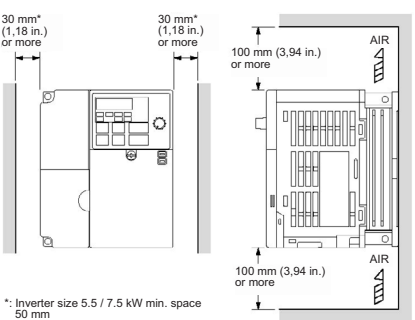
CIMR-V7AZ40P2 to 47P5

CIMR-V7AZ20P1 to 27P5

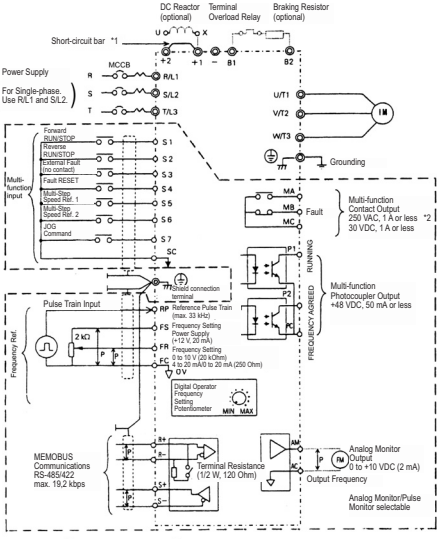


CIMR-V7AZB0P1 to B4P0

Mounting Dimensions

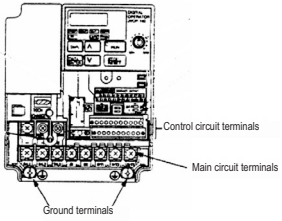


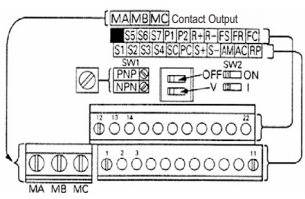
2. Wiring



Only basic insulation (protective class 1, overvoltage category II) is provided for the control circuit terminals. Additional insulation may be necessary in the end product to conform to CE requirements.

*1. Short-circuit bar should be removed when connecting a DC reactor.
*2. Minimum permissible load: 5 VDC, 10 mA (as reference value).

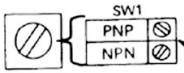


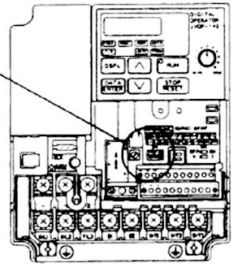


3. Control Circuit Terminals

Symbol		Name	Function	Signal Level
Input	S1	Multi-function input 1	Set by parameter n50 Default setting: Forward/Stop	Photo-coupler Insulation, 8 mA at 24 VDC Note: NPN is the default setting for these terminals. No external power supply is required. Refer to connections shown on the following page.
	S2	Multi-function input 2	Set by parameter n51 Default setting: Reverse/Stop	
	S3	Multi-function input 3	Set by parameter n52 Default setting: External fault.	
	S4	Multi-function input 4	Set by parameter n53 Default setting: Fault Reset.	
	S5	Multi-function input 5	Set by parameter n54 Default setting: Multi-stop speed reference 1	
	S6	Multi-function input 6	Set by parameter n55 Default setting: Multi-stop speed reference 2	
	S7	Multi-function input 7	Set by parameter n56 Default setting: JOG command	
	SC	Sequence input common	Common for S1 through S7	
	RP	Master speed reference train input	Pulse train input signal	Max. 33 kHz
	FS	Frequency Reference power supply	DC power supply for frequency reference setting	20mA at 12 VDC
	FR	Frequency Reference Input	Input terminal for frequency reference setting	0 to10VDC 20kΩ
	FC	Frequency Reference common	Common for frequency reference use	4 to 20 mA 0 to 20 mA
Output	MA	Multi-function output: NO	Set by parameter n57 Default setting: Fault	Relay output 1A max. at 30 VDC and 250 VAC
	MB	Multi-function output: NC		
	MC	Multi-function output common	Common for MA and MB use	
	P1	Photo-coupler output 1	Set by parameter n58 Default setting: RUNNING	Photo-coupler output , 50A max at +48VDC
	P2	Photo-coupler output 2	Set by parameter n59 Default setting: FREQUENCY AGREED	
	PC	Photo-coupler output common	Common for P1 and P2	
	AM	Analogue Monitor output	Set by parameter n65 Default setting: output frequency	2mA max. at 0 to 10VDC.
	AC	Analogue Monitor common	Common for AM use	

Selecting Input Method

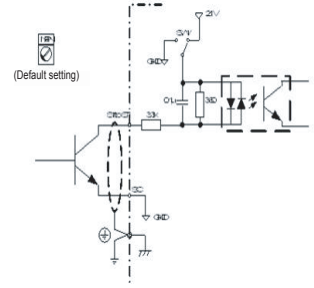


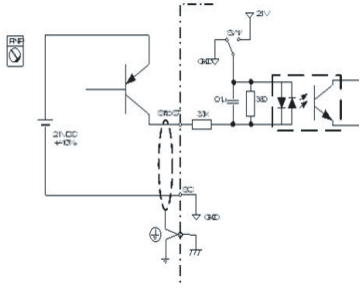


When connecting sequence inputs (S1 to S7) with transistor, turn the rotary switch SW1 depending on the polarity (0V common: NPN side, +24 V common: PNP side).
Factory setting: NPN side

Selecting Sequence Input Method

By using SW1, NPN or PNP input can be selected as shown below.





4. Operator Use

Appearance	Name	Function
	Data display	Displays relevant data, items, such as frequency reference, output frequency and parameter set values.
	FREQ adjuster	Sets the frequency reference within a range between 0Hz and the maximum frequency.
FREF	FREF Indicator	The frequency reference can be monitored or set while this indicator is lit.
FOUT	FOUT Indicator	The output frequency of the inverter can be monitored while this indicator is lit.
IOUT	IOUT indicator	The output current of the inverter can be monitored while this indicator is lit.
MNTR	MNTR indicator	The values set in U-01 through U-19 are monitored while this indicator is lit.
F/R	F/R indicator	The direction of rotation can be selected while this indicator is lit when operating the inverter with the run key.
LO/RE	LO/RE indicator	The operating of the inverter through the Digital Operator or according to the set parameters is selected while this indicator is lit. **Note:** The status of this indicator can be only monitored while the inverter is in operation. Any RUN command input is ignored while this indicator is lit.
PRGM	PRGM indicator	The parameter in n01 through to n179 can be set or monitored while this indicator is lit. **Note:** while the inverter is in operation, the parameters can be only monitored and only some parameters can be changed. Any RUN command input is ignored while this indicator is lit.
	Mode Key	Switches the setting and monitor item indicator in sequence. Parameter being set will be cancelled if this key is pressed before entering the setting.
	Increment Key	Increases multi-function monitor numbers, parameter numbers and parameters set values.
	Decrement Key	Decreases multi-function monitor numbers, parameter numbers and parameters set values.
	Enter Key	Enters multi-function monitor numbers, parameter numbers and internal data values after they are set or changed.
RUN	RUN Key	Starts the inverter running when it is in operation with the Digital Operator.
STOP RESET	STOP/RESET Key	Stops the inverter unless parameter n07 is not set to disable the STOP Key.

5. Start up Steps

The following seven steps describe the recommended minimum operations to allow the V7 to control a connected motor in typical configuration, to allow simple operation in the quickest time:

Step 1 – Initial checks

1-1) Check the power supply if it is of the correct voltage.
CIMR-V7AZ2: Three phase 200 to 230VAC
CIMR-V7AZB: Single phase 200 to 240VAC (Wire R/L1 and S/L2)
CIMR-V7AZ4: Three phase 380 to 460VAC

1-2) Make sure that the motor output terminals (U/T1, V/T2, W/T3) are connected to the motor.

1-3) Ensure that the control circuit terminals and the control device are wired correctly.

1-4) Make sure that all control terminals are turned off.

1-5) Set the motor to no-load status (i.e. not connected to the mechanical system)

Step 2 – Connecting the power supply and check the display status

2-1) After conducting the checks in step-1, connect the power supply.

2-2) After power on, the display reads as follows:

RUN indicator: flashes
ALARM indicator: off
Setting/monitor indicators: FREF, FOUT or IOUT is lit.
Data display: displays the corresponding data for the indicator that is lit.

When fault has occurred, the details of the fault will be displayed. In that case, refer to user's manual and take necessary action.

Step 3 – Initializing parameters

To initialize the drive parameters to factory defaults, set parameter n001 = 12.

This will set the V7 to accept START/STOP commands in what in termed “2-wire control”, i.e. 1 wire for a motor FORWARD/STOP command, and 1 wire for a motor REVERSE/STOP command.

Key sequence	Indicator	Display example	Explanation
	FREF	6.00	Power On
MODE	PRGM	n001	Press the Mode Key repeatedly until the PRGM indicator is lit.
ENTER	PRGM	0	Press the Enter Key. The data of n001 will be displayed.
▲ ▼	PRGM	12	Use the Increment or Decrement Key to set n001 to 12. The display will be lit.
ENTER	PRGM	12	Press the Enter Key so that the set value will be entered and the data display will be lit.
In approx. 1 s.	PRGM	n001	The parameter number will be displayed.

Step 4 – Set the motor rated current

This parameter is used for the electronic thermal function for motor overload detection (OL1). By correctly setting this, the V7 will protect an overloaded motor from burning out.

Read the rated current (in amps) on the motor nameplate, and enter this into parameter n036. The example to the below shows entering a value of 1.8Amps.

Key sequence	Indicator	Display example	Explanation
	PRGM	n001	Displays the parameter number.
▲ ▼	PRGM	n036	Use the Increment or Decrement Key until n036 is displayed.
ENTER	PRGM	1.9	Press the Enter Key. The data of n036 will be displayed.
▲ ▼	PRGM	1.8	Use the Increment or Decrement Key to set the rated motor current. The display will flash.
ENTER	PRGM	1.8	Press the Enter Key so that the set value will be entered and the data display will be lit.
In approx. 1 s.	PRGM	n036	The parameter number will be displayed.

Step 5 – Set the motor rated frequency

This is the maximum frequency the motor can run and allows the V7 to properly control the motor.

Read the rated frequency (in Hz) on the motor nameplate, and enter this into parameters n011.

Step 6 – Set the operation command

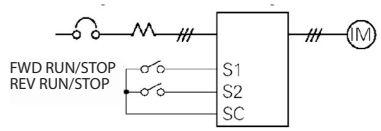
This is the method for motor run and stop commands (i.e. how the inverter will start and stop the motor). The two basic operations are for the RUN and STOP/RESET keys on the Digital Operator, or for one of multi-function inputs through the control circuit terminals.

To set the operation command, enter the appropriate value into parameter n003:

0 = RUN and STOP/RESET keys on the Digital Operator are enabled.

1 = Multi-function inputs through the control circuit terminals.

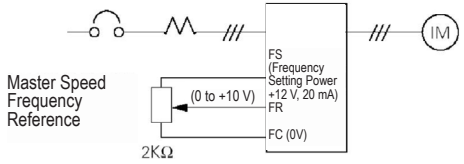
The diagram below shows how to connect a switch to start/stop the motor in the forward direction in "2-wire control". Set parameter n003=1. To enable a separate switch for reverse rotation on control terminal S2, set parameter n051=2, parameter n050=1 (This is actually the factory default setting for n051 and n050).



Step 7 – Set the frequency reference

This is the method for selecting the source for the motor speed command. The factory default is for the digital Operator. Frequency reference can also come from the potentiometer on the digital operator, an external potentiometer, an analog output from a PLC, or up to 8 pre-programmed speeds held in the inverter and selected via the multi-function inputs.

For example, to accept frequency reference from an external potentiometer, or a 0-10V analog out from a PLC, set parameter n004=2.



Quick Parameter List

Parameter No.	Description	Range	Default
n001	Parameter access: 1: Limited parameter access 4: Full parameter access 12: Factory parameter initialise	0 to 13	1
n002	Control mode selection: 0: V/F control mode 1: Vector control mode	0.1	0
n003	Run Command 0: Digital operator RUN, STOP/RESET 1: Control circuit terminal run/stop 2: Communications (MEMOBUS) 3: Communications (option)	0 to 3	0
n004	Frequency reference selection: 0: Digital operator (potentiometer) 1: Frequency reference 1 (n024) 2: Control circuit terminal (0 to 10V) 3: Control circuit terminal (4 to 20mA) 4: Control circuit terminal (0 to 20mA) 5: Control circuit terminal (Pulstrain reference) 6: Communications (MEMOBUS) 7: Digital operator circuit (0 to 10V) 8: Digital operator circuit (4 to 20 mA) 9: Communication (option)	0 to 9	1
n011	Maximum output frequency	50 to 400Hz	50Hz
n012	Maximum output voltage	0.1 to 255V (200V class) 0.1 to 510V (400V class)	200 (200V class) 400 (400V class)
n019	Acceleration time 1	0.0 to 6000sec	10 sec
n020	Deceleration time	0.0 to 6000sec	10sec
n024	Frequency reference 1	0.0 to 400Hz	6Hz
n025-n031	Frequency reference 2-8	0.0 to 400Hz	0Hz
n036	Motor rated current	Depending on model	0 to 150% of inverter rated output current
n050-n056	Multi-function input (S1-S7)	0 to 35	-
n057	Multi-function output (MA-MB-MC)	0 to 21	1
n066	Multi-function analog output (AM-AC): 0: Output frequency (10V/Max, freq.) 1: Output current (10V/Inverter rated current)	0 to 6	0
n080	Carrier frequency	1 to 4 (2.5 - 10kHz) 7 to 9 (Proportional to output freq.)	Depending on model

n089	DC injection braking current	0 to 100%	50%
n090	DC injection braking at stop	0.0 to 25.5sec	0.5sec
n091	DC injection braking at start	0.0 to 25.5sec	0.0sec
n092	Stall prevention during deceleration: 0: Enabled 1: Disabled	0.1	0

Note: Refer to user´s manual for complete list.

6. Full parameter list

Parameter No.	Description	Factory Setting
n001	Parameter Access	1
n002	Control Mode Selection	0 (Note1, 4)
n003	RUN Command	0
n004	Frequency Reference Selection	1
n005	Stopping Method Selection	0
n006	Reverse Run Prohibit	0
n007	Stop Key Selection	0
n008	Frequency Reference Selection in Local Mode	1
n009	Frequency Reference Setting Method From Digital Operator	0
n010	Detecting Fault Contact of Digital Operator	0
n011	Max. Output Frequency	50.0Hz
n012	Max. Voltage	200V (Note 2)
n013	Max. Voltage Output Frequency	50.0Hz
n014	Mid. Output Frequency	1.3Hz (Note 4)
n015	Mid. Output Frequency Voltage	12.0V (Note 2,4)
n016	Min. Output Frequency	1.3Hz (Note 4)
n017	Min. Output Frequency Voltage	12.0V (Note 2,4)
n018	Selecting Setting Unit for Acceleration/deceleration Time	0
n019	Acceleration Time 1	10.0s
n020	Deceleration Time 1	10.0s
n021	Acceleration Time 2	10.0s

Parameter No.	Description	Factory Setting
n022	Deceleration Time 2	10.0s
n023	S-curve Selection	0
n024	Frequency Reference 1 (Master Frequency Reference)	6.00Hz
n025	Frequency Reference 2	0.00Hz
n026	Frequency Reference 3	0.00Hz
n027	Frequency Reference 4	0.00Hz
n028	Frequency Reference 5	0.00Hz
n029	Frequency Reference 6	0.00Hz
n030	Frequency Reference 7	0.00Hz
n031	Frequency Reference 8	0.00Hz
n032	Jog Frequency	6.00Hz
n033	Frequency Reference Upper Limit	100%
n034	Frequency Reference Lower Limit	0%
n035	Setting/displaying Unit Selection for Frequency Reference	0
n036	Motor Rated Current	(Note 3)
n037	Electronic Thermal Motor Protection Selection	0
n038	Electronic Thermal Motor Protection Time Constant Setting	8min
n039	Selecting Cooling Fan Operation	0
n040	Motor Rotation Direction	0
n041	Acceleration Time 3	10.0s
n042	Deceleration Time 3	10.0s
n043	Acceleration Time 4	10.0s

Parameter No.	Description	Factory Setting
n044	Deceleration Time 4	10.0s
n045	Frequency reference bias step amount (UP/DOWN command 2)	0.00Hz
n046	Frequency reference bias accel/decel rate (UP/DOWN command 2)	0
n047	Frequency reference bias operation mode selection (UP/DOWN command 2)	0
n048	Frequency reference bias value (UP/DOWN command 2)	0.0%
n049	Analog frequency reference fluctuation limit level (UP/DOWN command 2)	1.0%
n050	Multi-function Input Selection 1 (Terminal S1)	1
n051	Multi-function Input Selection 2 (Terminal S2)	2
n052	Multi-function Input Selection 3 (Terminal S3)	3
n053	Multi-function Input Selection 4 (Terminal S4)	5
n054	Multi-function Input Selection 5 (Terminal S5)	6
n055	Multi-function Input Selection 6 (Terminal S6)	7
n056	Multi-function Input Selection 7 (Terminal S7)	10
n057	Multi-function Output Selection 1	0
n058	Multi-function Output Selection 2	1
n059	Multi-function Output Selection 3	2
n060	Analog Frequency Reference Gain	100%
n061	Analog Frequency Reference Bias	0%
n062	Filter Time Constant for Analog Frequency Reference	0.10s
n063	SI-T/V7 W-DT Detection	0

Parameter No.	Description	Factory Setting
n064	Frequency Reference Loss Detection Selection	0
n065	Monitor Output Type	0
n066	Monitor Item Selection	0
n067	Monitor Gain	1.00
n068	Analog Frequency Reference Gain (Voltage input from Operator)	100%
n069	Analog Frequency Reference Bias (Voltage input from Operator)	0%
n070	Analog Frequency Reference Filter Time Constant (Voltage input from Operator)	0.10s
n071	Analog Frequency Reference Gain (Current input from Operator)	100%
n072	Analog Frequency Reference Bias (Current input from Operator)	0%
n073	Analog Frequency Reference Filter Time Constant (Current input from Operator)	0.10s
n074	Pulse Train Frequency Reference Gain	100%
n075	Pulse Train Frequency Reference Bias	0%
n076	Pulse Train Frequency Filter Time Constant	0.10s
n077	Multi-function Analog Input Function	0
n078	Multi-function Analog Input Signal Selection	0
n079	Frequency Reference Bias (FBIAS) Value	10%
n080	Carrier Frequency Selection	(Note3)
n081	Momentary Power Loss Ridethrough Method	0
n082	Automatic Retry Attempts	0
n083	Jump Frequency 1	0.00Hz

Parameter No.	Description	Factory Setting
n084	Jump Frequency 2	0.00Hz
n085	Jump Frequency 3	0.00Hz
n086	Jump Frequency Range	0.00Hz
n087	Cumulative operation time function selection	0
n088	Cumulative operation time	0H
n089	DC Injection Braking Current	50%
n090	DC Injection Braking Time at Stop	0.5s
n091	DC Injection Braking Time at Startup	0.0s
n092	Stall Prevention During Deceleration	0
n093	Stall Prevention Level During Acceleration	170%
n094	Stall Prevention Level During Running	160%
n095	Frequency Detection Level	0.00Hz
n096	Overtorque Detection Function Selection 1	0
n097	Overtorque/Undertorque Detection Function Selection 2	0
n098	Overtorque Detection Level	160%
n099	Overtorque Detection Time	0.1s
n100	Hold Output Frequency Saving Selection	0
n101	Speed Search Deceleration Time	2.0s
n102	Speed Search Operation Level	150%
n103	Torque Compensation Gain	1.0
n104	Torque Compensation Time Constant	0.3s (Note4)
n105	Torque Compensation Iron Loss	(Note3)

Parameter No.	Description	Factory Setting
n106	Motor Rated Slip	(Note3)
n107	Motor Line-to-neutral Resistance	(Note3)
n108	Motor Leakage Inductance	(Note3)
n109	Torque Compensation Voltage Limiter	150%
n110	Motor No-load Current	(Note3)
n111	Slip Compensation Gain	0.0s (Note4)
n112	Slip Compensation Time Constant	2.0s (Note4)
n113	Slip Compensation During Regenerative Operation	0
n114	SI-T/V7 BUS Detection Counter	2
n115	Stall Prevention Above Base Speed During Run	0
n116	Acceleration/deceleration Time during Stall Prevention	0
n117	Undertorque Detection Function Selection 1	0
n118	Undertorque Detection Level	10%
n119	Undertorque Detection Time	0.1s
n120	Frequency Reference 9	0.00Hz
n121	Frequency Reference 10	0.00Hz
n122	Frequency Reference 11	0.00Hz
n123	Frequency Reference 12	0.00Hz
n124	Frequency Reference 13	0.00Hz
n125	Frequency Reference 14	0.00Hz
n126	Frequency Reference 15	0.00Hz
n127	Frequency Reference 16	0.00Hz
n128	PID Control Selection	0

Parameter No.	Description	Factory Setting
n129	PID Feedback Gain	1.00
n130	Proportional Gain (P)	1.0
n131	Integral Time (I)	1.0s
n132	Derivative Time (D)	0.00
n133	PID Offset Adjustment	0%
n134	Upper Limit of Integral Values	100%
n135	Primary Delay Time Constant for PID Output	0.0s
n136	Selection of PID Feedback Loss Detection	0
n137	PID Feedback Loss Detection Level	0%
n138	PID Feedback Loss Detection Time	1.0s
n139	Auto-tuning Selection	0
n140	Max. Output Frequency (2nd Motor)	50.0Hz
n141	PTC Thermistor Selection	0
n142	Motor Temperature Filter Timer	0.2 s
n143	Read sequence input twice	0
n144	Stop Distance Enlarge Gain	1.00
n145	Bi-direction Selection	0
n146	Frequency Offset Selection	0
n147	Max. Voltage Output Frequency (2nd Motor)	50.0Hz
n148	Parameter memorization at UV detection	0
n149	Pulse Train Input Scaling	2500 (25kHz)
n150	Pulse Monitor Output Frequency Selection	0
n151	MEMOBUS Timeover Detection	0

Parameter No.	Description	Factory Setting
n152	MEMOBUS Frequency Reference and Frequency Monitor unit	0
n153	MEMOBUS Slave Address	0
n154	MEMOBUS BPS Selection	2
n155	MEMOBUS Parity Selection	0
n156	Transmission Waiting Time	10ms
n157	RTS Control	0
n158	Max. Voltage (2nd Motor)	200 V (Note 2)
n159	Mid. Output Frequency (2nd Motor)	12.0V (Note 2,3)
n160	Min. Output Frequency (2nd Motor)	12.0V (Note 2,3)
n161	Motor Rated Current (2nd Motor)	(Note 2,3)
n162	Motor Rated Slip (2nd Motor)	(Note 2,3)
n163	PID Output Gain	1.0
n164	PID Feedback Value Selection	0
n165	Externally-mounting type braking resistor overheat protection selection *8	0
n166	Input Open-phase Detection Level	0%
n167	Input Open-phase Detection Time	0s
n168	Output Open-phase Detection Level	0%
n169	Output Open-phase Detection Time	0.0s
n170	ENTER Command Operation Selection (MEMOBUS Communication)	0
n171	Frequency reference bias upper limit (UP/DOWN command 2)	0.0%

Parameter No.	Description	Factory Setting
n172	Frequency reference bias lower limit (UP/DOWN command 2)	0.0%
n173	DC Injection Braking Proportional Gain	83 (0.083)
n174	DC Injection Braking Integral Time Constant	25 (100ms)
n175	Reducing Carrier Frequency Selection at Low Speed	0 (Note5)
n176	Constant Copy Function Selection	rdy
n177	Constant Read Selection Prohibit	0
n178	Fault History	-
n179	Software Version No.	-

Note: Refer to user's manual for complete list

1. Not initialized by constant initialization.
2. Upper limit of setting range and factory setting are doubled for 400V Class.
3. Depends on inverter capacity. Refer to user's manual.
4. When control mode selection (n002) is changed, factory setting corresponds to the control mode. Refer to user's manual.
5. Enabled (1) for 5.5kW and 7.5kW inverters

Multi-Function Inputs

Value	Function
2	Reverse/Stop
3	External fault (NO)
4	External fault (NC)
5	Fault reset
6	Multi-step reference 1
7	Multi-step reference 2
8	Multi-step reference 3
10	JOG command
12	External base block (NO)
13	External base block (NC)
17	Local/Remote selection

Multi-Function Outputs

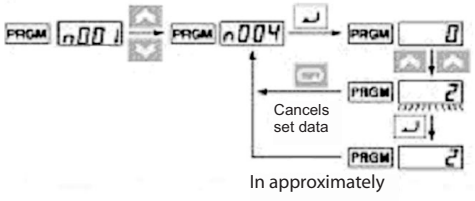
Value	Function
0	Fault output
1	Running output
2	Frequency agree
6	Overtorque being Monitored (NO)
12	Run mode
13	Inverter ready
15	Undervoltage in progress

Analogue Output Functions

Value	Function
0	Output frequency
1	Output current

Note: Refer to user's manual for full set value listings

Example of Parameter Settings



Key sequence	Indicator	Display example	Explanation
	FREF	6.00	Power ON
MODE	PRGM	n001	Press the Mode Key repeatedly until the PRGM indicator is lit.
▲ ▼	PRGM	n003	Use the Increment or Decrement Key to set the parameter number.
ENTER	PRGM	0	Press the Enter Key. The data of the selected parameter number will displayed.
▲ ▼	PRGM	2	Use the Increment or Decrement Key to set the data. At that time the display will flash.
ENTER	PRGM	2	Press the Enter Key so that the set value will be entered and the data display will be lit. (see note 1)
In approx. 1s	PRGM	n003	The parameter number will be displayed.

Note 1: To cancel the set value, press the Mode Key instead. The parameter will be displayed.
Note 2: There are parameters that cannot be changed while the Inverter is in operation. Refer to the list of parameters. When attempting to change such parameters, the data display will not change by pressing the Increment or Decrement Key.

7. Monitors

The V7 allows you to monitor various conditions, such as output current and status of multi-function inputs. These monitors are indicated by "U-".

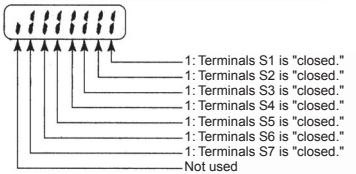
Key sequence	Indicator	Display example	Explanation
	FREF	6.00	Power ON
	MNTR	U-01	Press the Mode Key repeatedly until the PRGM indicator is lit.
	MNTR	U-05	Use the Increment or Decrement Key to set the monitor number.
	MNTR	283	Press the Enter Key. The data of the selected monitor number will be displayed.
	MNTR	U-05	Press the Enter or Mode Key. The monitor number will be displayed.

Constant No.	Name	Unit	Description
U-01	Frequency reference (FREF)*1	Hz	Frequency reference can be monitored. (same as FREF)
U-02	Output frequency (FOUT)*1	Hz	Output frequency can be monitored. (Same as FOUT)
U-03	Output current (IOUT)*1	A	Output current can be monitored. (Same as IOUT)
U-04	Output voltage	V	Output voltage can be monitored.
U-05	DC voltage	V	Main circuit DC voltage can be monitored
U-06	Input terminal status	-	Input terminal status of control circuit terminals can be monitored.
U-07	Output terminal status	-	Output terminal status of control circuit terminals can be monitored.
U-08	Torque monitor	%	The amount of output torque can be monitored. When V/f control mode is selected, "----" is displayed.
U-09	Fault history (last 4 faults)	-	Last four fault history is displayed.
U-10	Software No.	-	Software No. can be checked.
U-11	Output power*2	KW	Output power can be checked.
U-12	Frequency offset monitor	Hz	Frequency offset can be monitored.
U-14	ASCII code from the PLC	-	ASCII code from the PLC is displayed.
U-15	Data reception error	-	Contents of MEMOBUS communication data reception error can be checked. (contents of transmission register No. 003DH are the same)
U-16	PID Feedback	%	Input 100(%) Max. output frequency or equivalen.
U-17	PID input	%	±100(%). Where Max. output frequency=100%
U-18	PID output	%	±100(%). Where Max. output frequency=100%
U-19	Frequency reference bias monitor	%	±100(%). Where Max. output frequency=100%

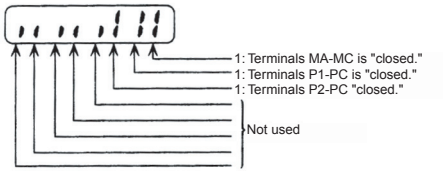
*1 The status indicator LED is not turned ON.
*2 When in the vector control mode,"---" will be displayed.

Input / Output terminal status

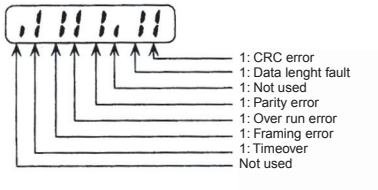
Input terminal status



Output terminal status



Data reception error display



8. Faults and alarms

Fault Display	Fault name and meaning	Possible cause and remedy
OC	**Overcurrent** Output current is higher than 250% of inverter rated current.	Check output for shortcircuit or ground fault. The load is too large, reduce it or use larger inverter. Check motor FLA rating compared to inverter and V/f setting.
OV	**Overvoltage** DC bus voltage has exceeded detection level.	Load inertia is too large and the motor is regenerating. Increase deceleration time (n020 or n022). Connect an external braking resistor and set n092 to 1. Check braking resistor and wiring.
UV1	**Main circuit undervoltage** DC bus voltage is below detection level.	Check mains power supply voltage and connections. Check correct supply for inverter being used. Monitor for mains dips or interruptions.
OH	**Unit overheat** Temperature inside the inverter has exceeded 110°C	Refer to manual for installation guidelines and recommendations. Check cooling fan (if fitted). Check V/f characteristic or reduce carrier frequency.
OL1	**Motor overload** The inverter is protecting the motor from overload, based on an internal I^2t calculation using n036 setting.	Check and reduce the load. Check V/f characteristic (Vmax and Fmax). Increase the running speed of motor. Increase acceleration/deceleration times.
EF	**External fault** An external fault has been input.	Check your control terminal wiring. A multi-function digital input has been set to 3 or 4. Run signal has to be removed before this can be reset.
SER (flashing)	**Sequence error** Inverter received LOCAL / REMOTE selection command, or communication / control circuit selection command signal during operation.	Check sequence and make sure that LOCAL / REMOTE selection or communication / control circuit selection command is not set during operation.
bb (flashing)	**External Baseblock** An external baseblock command has been input.	Check your control terminal wiring. A multi-function digital input has been set to 12 or 13.
EF (flashing)	**Sequence error** Sequence Error has occurred.	Forward and reverse run signal have been applied simultaniously. Check sequence and make sure that FORWARD and REVERSE Run is not set at the same time.

Note: Refer to user's manual for full fault code listings

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Specifications are subject to change without notice
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