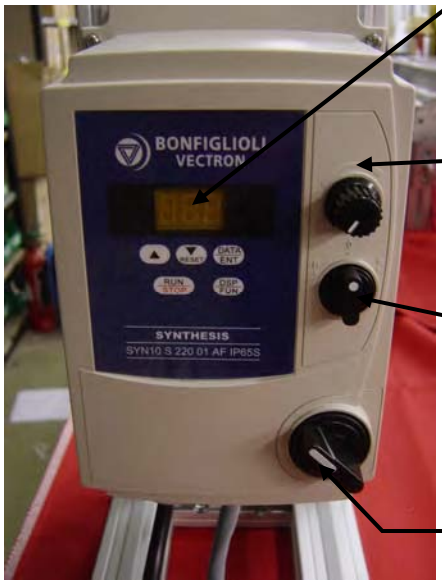
When all sections have been joined together as required, connect the motor to the speed controller.



Speed Indicator Display

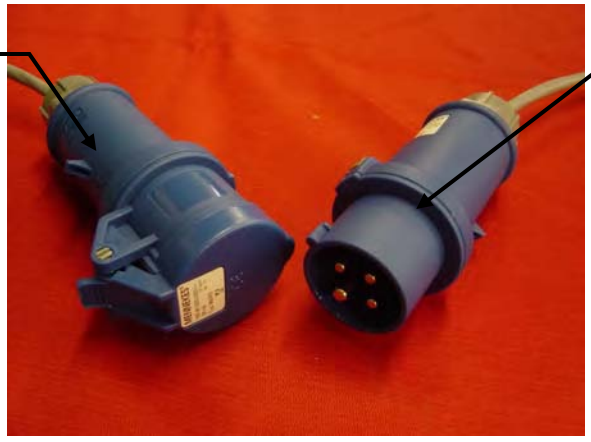
Speed Control

Direction Control (Reverse locked)

On /Off Switch

Speed Controller

Controller Cable



Motor Cable

Motor and Speed Controller connection cables

Ensure that the motor is connected to the speed controller before switching the unit on.

Malfunction Indications and Countermeasures

1. Manual reset inoperative malfunctions

INDICATION	CONTENT	POSSIBLE CAUSE	COUNTERMEASURE
CPF	Program error	Outside noise interference	Place a RC surge absorber in parallel with the noise generating magnetic contact
EPR	EEPROM error	EEPROM defective	Replace EEPROM
OV	Voltage too high while not operating	1. Power source voltage too high. 2. Detection circuitry defective	1. Examine the power supply 2. Return the inverter for repair
LV	Voltage too low while not operating	1. Power source voltage too low. 2. Detection circuitry defective.	1. Examining the power supply 2. Return the inverter for repair
OH	Inverter over heat while not operating	1. Detection circuit defective. 2. Environment over-heat or poor ventilation	1. Return the inverter for repair 2. Improve ventilation

2. Manual reset operative malfunctions (Auto-Reset inoperative)

INDICATION	CONTENT	POSSIBLE CAUSE	COUNTERMEASURE
OC	Over-current at stop condition	Detection circuit malfunction	Return the inverter for repair
OL1	Motor over-load	1. Loading too large 2. Improper V/F model setting 3. Improper F_18 setting	1. Increase capacity of motor 2. Adjust to use a proper V/F curve setting 3. Adjust F_18 according to instruction
OL2	Inverter over-load	1. Loading too large 2. Improper V/F model setting	1. Increase capacity of inverter 2. Adjust to use a proper V/F curve setting

3.Manual Reset and Auto-Reset Operative Malfunction

INDICATION	CONTENT	POSSIBLE CAUSE	COUNTERMEASURE
OCS	Transient over-current starting machine	1. Motor coil short-circuit with external casing 2. Motor connection wire short-circuit with grounding 3. Transistor module damaged	1. Examining motor 2. Examining wiring 3. Replace transistor module
OCA	Over-current at acceleration	1. Acceleration time setting too short 2. Improper V/F feature selection 3. Applied motor capacity exceeds inverter capacity	1. Adjust acceleration time to longer setting 2. Adjust to a proper V/F curve 3. Replace and install another inverter with appropriate capacity
OCC	Over-current at steady speed	1. Transient alteration of the loading 2. Transient alteration of the power supply	1. Examining the loading configuration 2. Install inductor on the power supply input side
OCd	Over-current at deceleration	Deceleration setting too short	Adjust to use a longer acceleration time
OCb	Over-current at breaking	DC Breaking frequency, breaking voltage, or breaking time setting too long	Adjust to reduce settings of F_15, F_16, or F_17
OVC	Over-voltage at operation/deceleration	1. Deceleration time setting too short or inertial loading too large 2. Power supply voltage variation too large	1. Adjust to use a longer deceleration time 2. Install a inductor on the power supply input side 3. Increase the capacity of inverter
LVC	Insufficient voltage level at operation	1. Power supply voltage too low 2. Power supply voltage variation too large	1. Improve power source quality 2. Adjust to use a longer acceleration time 3. Increase capacity of inverter 4. Install a reactor on the power supply input side
OHC	Heat-sink over heated at operation	1. Loading too heavy 2. Ambient temperature too high or poor ventilation	1. Examining the loading 2. Increase capacity of inverter 3. Improve ventilation

Special Condition Description

INDICATION	CONTENT	DESCRIPTION
SP0	Zero Speed Stopping	When F_11 = 0, F_7= 0 and frequency setting < 1 Hz When F_11 = 1, F_7<(F_6/100), and frequency setting <(F_6/100)
SP1	Fail to start directly	1. If the inverter is set to external operation (F_10 = 1) and direct start is disabled (F_28 =1), the inverter cannot be started and will flash SP1 when operation switch turned to ON before applying power (see descriptions of F_28). 2. Direct start is possible when F_28 = 0.
SP2	Keypad emergency stop	The inverter setup to external operation (F_10=1). If the STOP key in the keypad is pressed at the middle of operation, the inverter stops according the setting in F_14 and flash SP2 after stop. The RUN switch must be turned OFF than ON to restart the machine.
E.S.	External emergency stop	When the external emergency stop signal is activated through the multi-function input terminal, the inverter decelerates and stops. Inverter flashes E.S. after stops. (Refer to instruction for F_19 for detail).
b.b.	External BASE BLOCK	When the external BASE BLOCK signal is activated through the multifunction terminal, the inverter stop output immediately and flash b.b. for indication. (Refer to instruction for F_19 for detail)

Keypad Operation Error Instruction

INDICATION	CONTENT	POSSIBLE CAUSE	COUNTERMEASURE
LOC	Motor direction locked	1. Attempt to reverse direction when F_22 = 1 2. Attempt to set F_22 to 1 when F_04 = 1	1. Adjust F_22 to 0 2. Adjust F_04 to 0
Er1	Keypad operation error	1. Press ▲ or ▼ keys when F_11=1 or under sp1 operation 2. Attempt to modify F_29 3.Attempt to modify parameter that is not allowed to be modified during operation (refer to parameter list)	1. Use ▲ or ▼ keys to adjust frequency setting only after F_11=0 2. Do not modify F_29 3. Modify in stop mode
Er2	Parameter setting error	1. F_6≦F_7	1. F_6 > F_7

General Malfunction Examination Method

ABNORMALITY	CHECK POINT	COUNTERMEASURE
Motor Inoperative	Is the power source voltage delivered to L1, L2 terminal (is the charging indicator illuminated)?	• Check if the power source on. • Turn power source OFF and then ON again. • Reconfirm the power voltage level.
	Is there voltage output from output terminal T1, T2 and T3?	• Turn power source OFF and then ON again.
	Is the motor wired correctly?	• Check motor wiring.
	Is there any abnormal condition of the inverter?	• Refer to malfunction handling instructions to examine and correct wiring.
	Is the forward or reverse instruction loaded?	
Motor Inoperative	Is the analog frequency setting loaded?	• Check to see if wiring for analog frequency input signal is correct?
	If the operation mode setting correct?	• Check if the frequency input setting voltage is correct?
Motor operate in opposite direction	Is wiring on the output terminals T1, T2 and T3 correct?	• Operate by digital?
	Is the wiring for the forward and reverse signals correct?	• Wiring should be in accordance with the U, V, W terminals of motor.
Motor operation speed fixed	Is the wiring for analog frequency input correct?	• Examining the wiring and correct it.
	Is the operation mode setting correct?	• Examining the wiring and correct it.
	Is the loading too heavy?	• Check the Operation panel
Motor operation at speed too high or too low	Is the specification of motor (poles, voltage) correct?	• Reduce loading
	Is the gear ratio correct?	• Reconfirm motor specification.
	Is the highest output frequency setting correct?	• Reconfirm gear ratio
	Is the voltage on motor side reduced extremely?	• Reconfirm highest output frequency
Abnormal speed variation at operation	Is the loading too heavy?	• Reduce loading variation
	Is the loading variation too large?	• Increase inverter and motor capacity
	Is the input power source steady and stable?	• Install AC reactor on the power supply input side

Routine examination and periodical examination

Inverter requires routine and periodical examination and maintenance
Carry out the examination only after the " Power LED " indicator goes off for at least 5 minutes

Maintenance item	Maintenance description	Examination period		Examination method	Criterion	Countermeasure
		Routine	1 Year			
Installation site environment	Reconfirm environment temperature and humidity	○		Refer to installation instructions and measure with thermometer and hygrometer	Temperature: -10~40 OC Humidity: under 95% without condensing	Improve installation site environment
	Check and remove any flammable material nearby	○		Visual inspection	No foreign object	
Inverter Installation and Grounding	Is there any abnormal vibration on the installation site?	○		Visual and audio Inspection	No foreign object	Tighten loose screw
	Is the grounding resistance within acceptable range?		○	Measure resistance by multi-meter	200V class under 100 ohm	Improve grounding
Input power source voltage	Is the voltage of the primary circuitry normal?	○		Measure voltage by multi-meter	Voltage level conforming specification	Improve input power source
Inverter external terminal mounting screw	Is the tighten parts secured?		○	Visual inspection. Use screwdriver to verify screw tightness	No abnormality	Tighten loose screw or return for repair
	Is there any sign of breakage on the terminal panel?		○			
	Is there any obvious rusty condition?		○			
Internal wiring of inverter	Is it deformed or skewed?		○	Visual inspection	No abnormality	Replace or return for repair
	Is the insulation of wire broken?		○			
Heat-sink	Is it accumulating dust or dirt?	○		Visual inspection	No abnormality	Clean up dust or dirt
PCB	Is it accumulating conductive metal or oil stain?		○	Visual inspection	No abnormality	Clean up or replace PCB
	Is there any over-heated or burnt component?		○			
Cooling fan	Is there any abnormal vibration or noise?		○	Visual and audio inspection	No abnormality	Replace cooling fan
	Is it accumulating dust or dirt?	○		Visual inspection		Clean up
Power component	Is it accumulating dust or dirt?		○	Visual inspection	No abnormality	Clean up
Capacitor	Is there any sign of strange order or leakage?	○		Visual inspection	No abnormality	Replace capacitor or inverter
	Is there any sign of swelling or bulging?	○				