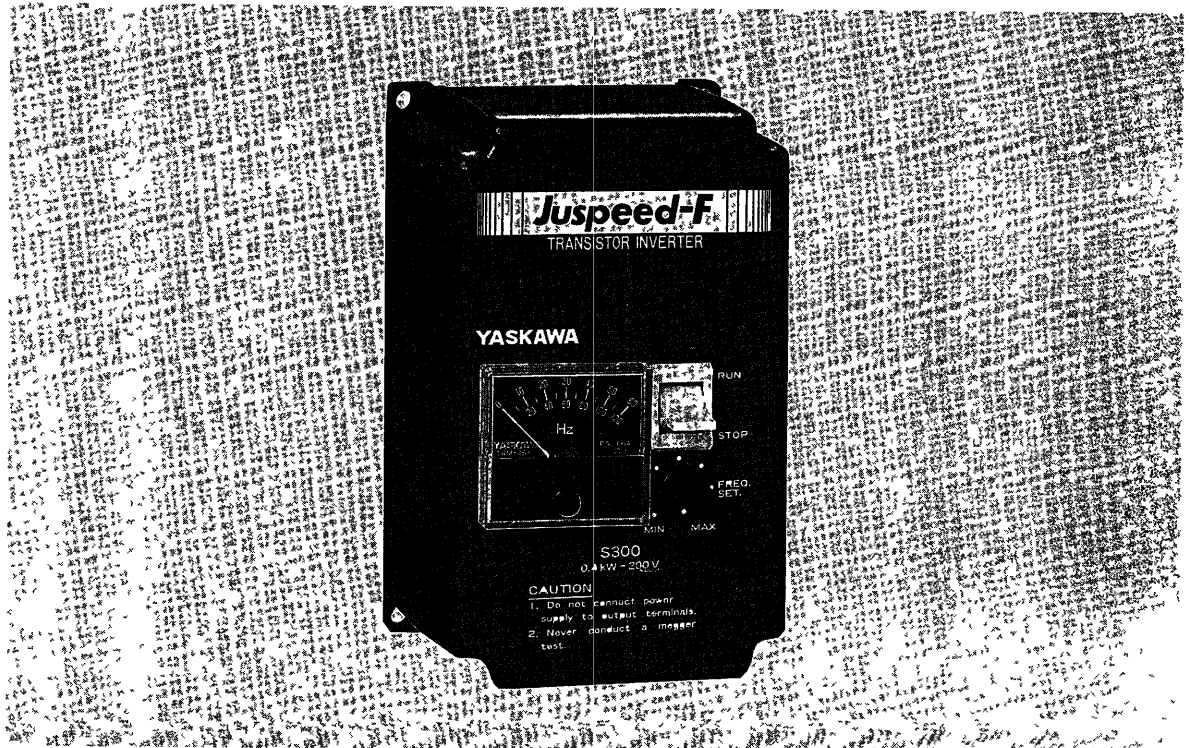


Juspeed-F

SMALL-CAPACITY ANALOG TRANSISTOR INVERTER

S₃₀₀ SERIES (STANDARD), P₃₀₀ SERIES (LOW-NOISE)
 THREE-PHASE, 400V CLASS, UP TO 10HP (7.5kW) 1 TO 12kVA
 THREE-PHASE, 200V CLASS, UP TO 10HP (7.5kW) 1 TO 12kVA
 SINGLE-PHASE, 100V/200V CLASS, UP TO 1HP (0.75kW) 1 TO 1.5kVA



TUV Certified only for three-phase, 200V class inverters



YASKAWA



Certificate No B 95 03 22945 001

RELATED INVERTERS

S300 Series

Three-phase, 400V class Model CIMR-F04AS₃ to -F75AS₃
Three-phase, 200V class Model CIMR-04AS₃ to -75AS₃
Single-phase, 100V/200V class Model CIMR-J04AS₃ to -J08AS₃

P300 Series

Three-phase, 400V class Model CIMR-F04AP₃ to -F75AP₃
Three-phase, 200V class Model CIMR-04AP₃ to -75AP₃
Single-phase, 100V/200V class Model CIMR-J04AP₃ to -J08AP₃

When properly installed, operated and maintained, this equipment will provide a lifetime of optimum operation. It is mandatory that the person who operates, inspects, and maintains this equipment thoroughly read and understand this manual.

DANGER

- When using single-phase power supply, be sure to connect terminals to L1 (R) and L2 (S). Failure to observe this caution may result in rapid failure of the unit.
- Do not touch circuit components until CHARGE lamp extinguishes after turning off AC main circuit power. The capacitors are still charged and can be quite dangerous. Wait approximately five minutes after AC main circuit power is OFF.
- Do not connect or disconnect wires and connectors while AC power is applied.
- Do not check signals during operation.
- If JUSPEED-F inverter protective circuit activates, inverter output is stopped and, motor is coasting. Take positive action to protect personnel and machines from damage caused by motor coasting. If used with brake motor, be sure that motor power supply is separate from braking power supply.

IMPORTANT

- Be sure to ground JUSPEED-F using mounting bolts.
- Do not provide capacitor between JUSPEED-F and motor.
- JUSPEED-F have been adjusted and paint-locked at the factory. Do not change their settings unnecessarily.
- Do not perform the following tests in the field:
 - Withstand voltage test on any part of the JUSPEED-F unit. It is an electronic device using semiconductors and vulnerable to high-voltage.
 - Insulation resistance test with a megger. This test has been made at the factory and need not be conducted at test run. Exception: If megger-testing is required for inspection and maintenance purposes, it should be applied only to main circuit and the ground and never to the control circuit.
 - Conduction test on control circuits.
 - When a single-phase power supply is used, connect it to terminals L1 (R) and L2 (S) and use it at 1/2 or less of rated current.

1. RECEIVING

This JUSPEED-F has been put through stringent tests at the factory before shipped. After unpacking, however, check and see the following:

- Nameplate ratings meet your requirements.
- Leads and connectors are not disengaged.
- No damage while in transit.
- Bolts and screws are not loose.
- Attachment: Pressure terminals, insulation caps.

If any part of JUSPEED-F is damaged or lost, immediately notify us giving full details and nameplate data.

2. Juspeed-F MAJOR CONTROL COMPONENT LAYOUT

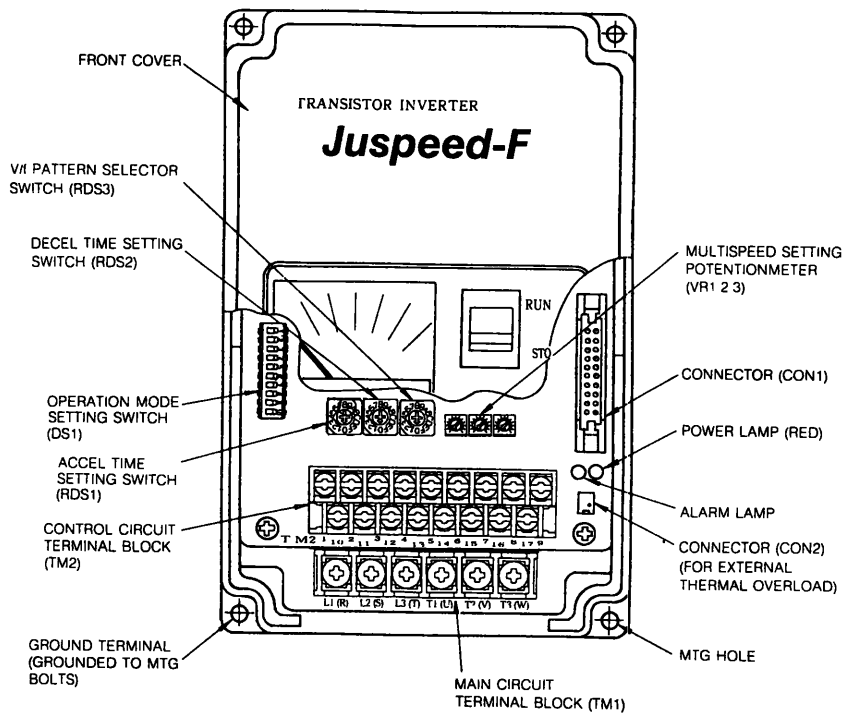
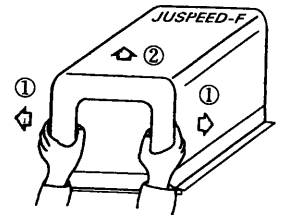


Fig 1 Major Control Component Layout of JUSPEED-F



Removal Procedure

- ① Slightly expand the bottom of Juspeed-F front cover by hands, as shown above
- ② Lift the cover with expanding

3. INSTALLATION

3.1 LOCATION

Location of the equipment is important to achieve proper performance and normal operating life. The units should be installed in areas where the following conditions exist

- Ambient temperature -10 to $+40^{\circ}\text{C}$,
 -10 to $+50^{\circ}\text{C}$ with cover removed
- Protected from rain or moisture
- Protected from direct sunlight
- Protected from corrosive gases or liquids
- Free from airborne dust or metallic particles
- Free from vibration

3.2 POSITIONING

For cooling and maintenance purposes, make sure that there is sufficient clearance around the equipment whether it is enclosed in a cabinet or not, as shown in Fig 2. Keep 5 in (12 cm) clearance between wiring duct and JUSPEED-F also.

To maintain effective cooling conditions, it must be installed vertically to the ground so that product name can be read correctly using the four mounting screws.

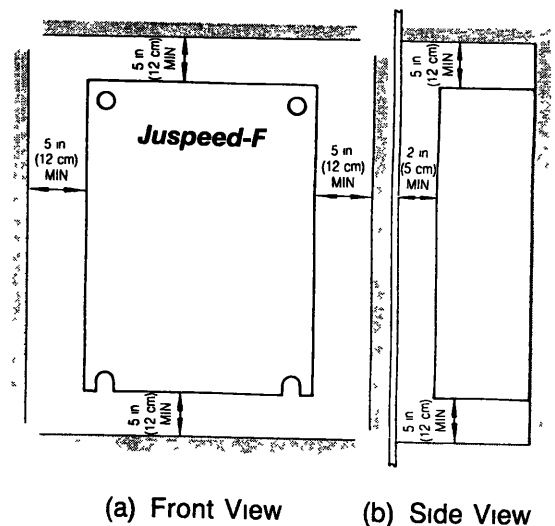
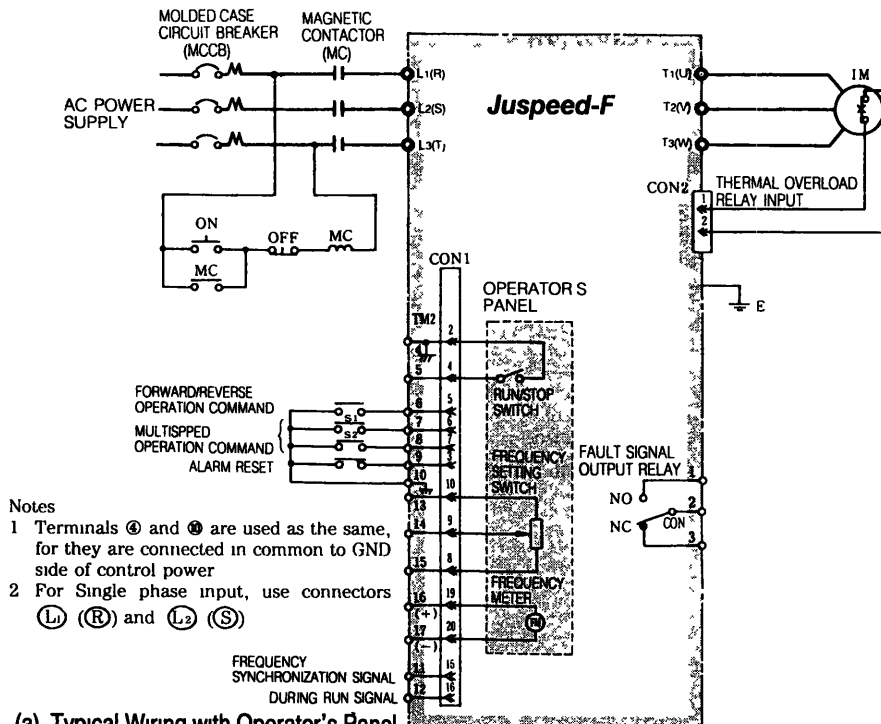


Fig 2 JUSPEED-F Clearance Requirements for Proper Cooling and Maintenance

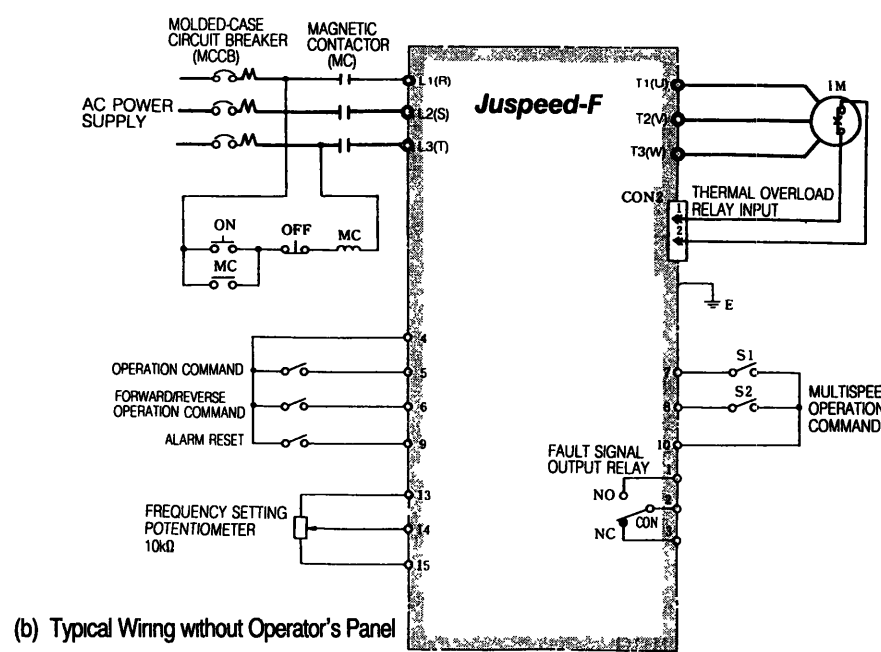
4. WIRING

INTERCONNECTIONS

Fig 3 shows the connection diagram for JUSPEED-F drive. Connections should be made correctly, referring to Fig 3. Before wiring, remove terminal block cover, run the leads through the lead entrance at the JUSPEED-F bottom and connect them at the terminal block. Since both connector CON1 and control circuit terminal TM2 have same functions and are directly connected in Juspeed-F, use either one of them.



(a) Typical Wiring with Operator's Panel



(b) Typical Wiring without Operator's Panel

Connection between Main circuit and its capacitor for single-phase 100V/200V Class

■ Connection of Main Circuit (TM1)

- For Single-phase 100V Power Supply

- For Single-phase 200V Power Supply

■ Connection of Main Circuit Capacitor

The main circuit capacitor should be separately installed from JUSPEED F. Connect the capacitor to the main circuit capacitor connection leads of JUSPEED-F.

Main circuit Capacitor Recommended Parts

- HCGF3A2D222IS (HITACHI A I C INC)
- HCGF3A2D222SS (HITACHI A I C INC)

MC Magnetic Contactor
MCCB Molded-case Circuit Breaker

Fig 3 Example of JUSPEED-F Interconnections

- (1) Be sure to connect MCCBs rated 30AF, 10A between power supply and JUSPEED-F input terminals (L1) (R), (L2) (S), (L3) (T)
- (2) It is recommended to provide a magnetic contactor (MC) with a self-holding circuit at the power supply side, for safe operation
- (3) For JUSPEED-F with a front cover, remove the cover and connect lead wire to the terminal block
- (4) For JUSPEED-F with an operator's panel, a frequency meter, frequency setting switch and run/stop switch are provided
- (5) The order of power supply phases to be connected to input terminals (L1) (R), (L2) (S) and (L3) (T) is not important
- (6) Never connect the power supply to (T1) (U), (T2) (V) or (T3) (W) Otherwise JUSPEED-F will be damaged
- (7) Connect a single-phase power supply to terminals (L1) (R) and (L2) (S) when it is used
- (8) Use the twisted lead for connections to control circuit terminals (4) to (17) The line must be separated from main circuit and high voltage circuit (200V, relay sequence circuit) See Fig 4 Lead length should be 66 feet (20 meters) or less

Frequency setting switch is plugged-in by using JAE manual pressure tool CT150-1-PSSF It employs JAE terminals 030-51304-001.

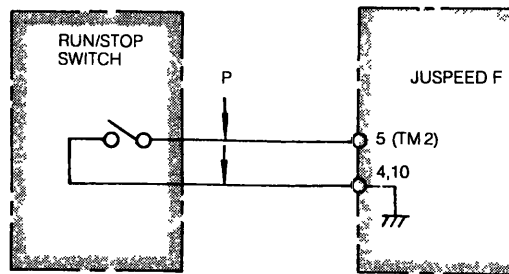


Fig 4 Connections of RUN/STOP Switch

- (9) When JUSPEED-F output terminals (T1) (U), (T2) (V) and (T3) (W) are connected to motor terminals (L1) (R), (L2) (S) and (L3) (T), respectively, upon forward run command, the motor rotates in the CCW direction viewed from the load side (When the CW direction rotation from the load side has been specified, it rotates in CW)
- (10) When a magnetic contactor is provided between JUSPEED-F output terminals (T1) (U), (T2) (V) and (T3) (W) and the motor, large starting current is applied by switching ON/OFF using the magnetic contactor during operation. Then large starting current flows and overcurrent protection functions to stop JUSPEED-F
- (11) Do not connect an advance-phase capacitor between JUSPEED-F output terminals (T1) (U), (T2) (V), (T3) (W) and the motor If it is connected and the operation is performed, JUSPEED-F will be damaged

(12) For peripheral devices and the applicable cables, refer to Tables 1 and 2

Table 1 Peripheral Devices and Applicable Cables (Three-phase, 200V Class)

JUSPEED-F Model CIMR-		04AS ₃ 04AP ₃	08AS ₃ 08AP ₃	15AS ₃ 15AP ₃	22AS ₃ 22AP ₃	37AS ₃ 37AP ₃	55AS ₃ 55AP ₃	75AS ₃ 75AP ₃
Molded-case Circuit Breaker (MCCB)	Mitsubishi Electric Corp	NF30 (5A)	NF30 (10A)	NF30 (20A)	NF30 (20A)	NF30 (30A)	NF50 (50A)	NF100 (60A)
		*NF30-CS (415VAC, 5A)	*NF30 CS (415VAC, 10A)	*NF30 CS (415VAC, 20A)	*NF30 CS (415VAC, 20A)	*NF30 CS (415VAC, 30A)	*NF50-CS (500VAC, 50A)	*NF100-CS (500VAC, 60A)
		*NF30-SS (415VAC, 5A)	*NF30-SS (415VAC, 10A)	*NF30 SS (415VAC, 20A)	*NF30 SS (415VAC, 20A)	*NF30-SS (415VAC, 30A)	*NF50-SS (500VAC, 50A)	*NF100-SS (500VAC, 60A)
	Fuji Electric Co., Ltd	*EA33 (415VAC, 5A)	*EA33 (415VAC, 10A)	*EA33 (415VAC, 20A)	*EA33 (415VAC, 20A)	*EA33 (415VAC, 30A)	*EA53 (550VAC, 50A)	*EA103B (550VAC, 60A)
		*SA33B (415VAC, 5A)	*SA33B (415VAC, 10A)	*SA33B (415VAC, 20A)	*SA33B (415VAC, 20A)	*SA33B (415VAC, 30A)	*SA53B (550VAC, 50A)	*SA103B (550VAC, 60A)
Magnetic Contactor (MC)		HI-7E		HI-10-2E		HI-20E	HI-30E	HI-50E
Main Circuit Terminals ① (R), ② (S), ③ (T), ④ (U), ⑤ (V), ⑥ (W)	Lead Size	2 mm ²		3.5 mm ²			5.5 mm ²	
	Terminal Screw	M4					M5	
Control Circuit Terminals ① to ⑦		Lead size 0.75 mm ² or larger Terminal screw diameter M3						

* Recommended MCCB that is certified with EN standard (EN60947-3)

**Table 2 Peripheral Devices and Applicable Cables
(Three-phase, 400V, Single-phase, 100V/200V Class)**

Power Supply		Three-phase, 400V Class						Single-phase, 100V/200V Class		
JUSPEED-F Model CIMR-		F04AS ₃ F04AP ₃	F08AS ₃ F08AP ₃	F15AS ₃ F15AP ₃	F22AS ₃ F22AP ₃	F37AS ₃ F37AP ₃	F55AS ₃ F55AP ₃	F75AS ₃ F75AP ₃	J04AS ₃₋₁ J04AP ₃₋₁	J08AS ₃₋₁ J08AP ₃₋₁
Molded-case Circuit Breaker (MCCB)		NF 30, 5A		NF-30, 10A		NF-30, 20A		NF-30, 30A	NF 30, 15A	NF 30, 20A
Magnetic Contactor (MC)		HI 7E		HI 10-2E		HI 20E		HI-30E	HI 10-2E	HI 20E
Main Circuit Terminals ① (R), ② (S), ③ (T), ④ (U), ⑤ (V), ⑥ (W)	Lead Size	2 mm ²		3.5 mm ²			5.5 mm ²		2 mm ²	3.5 mm ²
	Terminal Screw	M4				M5		M4		
Control Circuit Terminals ① to ⑦		Lead size 0.75 mm ² or larger Terminal screw diameter M3								

(13) When used with brake motors, power supply of brake must be separated from that of motor. Operate JUSPEED-F after the brake has been released.

(14) Connect a surge absorber to the coils of magnetic contactor, control relay, magnetic valve or magnetic brake which is used around JUSPEED-F.

(15) Use JUSPEED-F mounting bolt for grounding (Class 3, 100Ω or less.)

Molded-case Circuit Breaker Selection and Installation

Install a molded-case circuit breaker (MCCB) at the primary side of JUSPEED-F to protect the input circuit. Circuit breakers should be selected according to the table above (power supply side power factor varied with power supply voltage, output frequency or load also affects the selection). Since the operation characteristics of full electromagnetic type circuit breakers vary with high harmonic current, it is necessary to select those with a larger capacity.

When three-phase 200V-class JUSPEED-F is used as EN standard product, the EN certified MCCB must be installed. The recommended MCCB's (EN60947-3) are shown in Table 1.

5. TEST RUN

5.1 CHECKS BEFORE TEST RUN

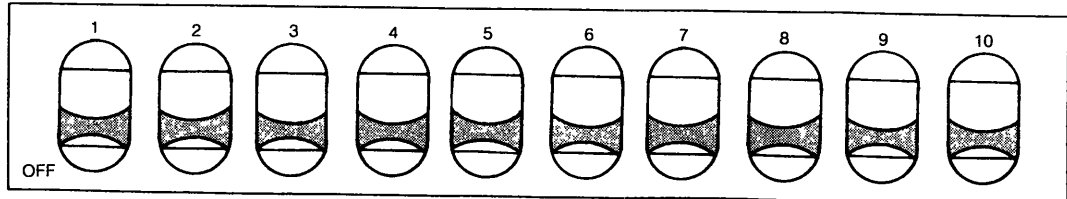
After completing mounting and connection of units, check for-

- Correct connections
- No short-circuit conditions
- No loose screws (Check especially for loose wire clippings)
- Proper load conditions
- Correct input power (No voltage drop or voltage unbalance, etc)

5.2 PRESETTING AND ADJUSTMENT

5.2.1 Operation Mode Setting Switch

Operation mode setting switch (DS1) consists of 10 ON/OFF slide switches printed on a base board. Select the operation modes from Table 3 according to the application. All the ON/OFF slide switches have been preset at factory to OFF as shown in Fig.5



Note Switches must be treated delicately

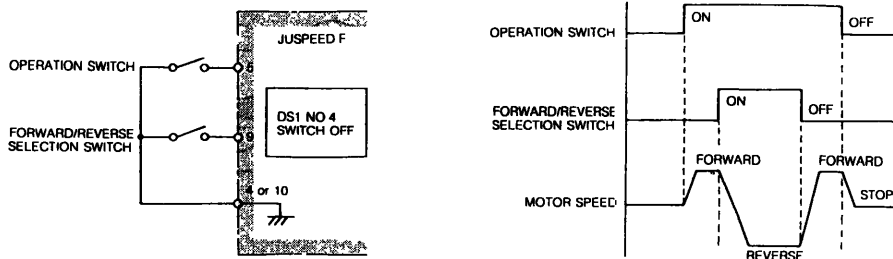
Fig 5 Operation Mode Setting Switch (DS1)
(ON/OFF Slide Switches)

Table 3 Selection of Operation Modes Slide

Switch No	Mode	ON/OFF		Operation Mode	
DS1	1	OFF		Brakes to a stop	
		ON		Coasts to a stop	
	2	OFF		Provided at braking 2Hz or less	
		ON		Not provided at braking 2Hz or less	
	3	OFF		No function provided	
		ON		No function provided (For future expansion)	
	4	OFF		Mode A (control by operation command and FWD/REV run command)	
		ON		Mode B (control by FWD run and REV run commands)	
	5	OFF		External thermal overload not used	
		ON		External thermal overload used	
	6 • 7	Max frequency	6	7	_____
			OFF	OFF	60 Hz
			ON	OFF	50 Hz
			OFF	ON	90 Hz
	8	Offset selection	OFF		Not provided
			ON		Provided (Under 1 to 5V, 4 to 20mA reference frequency up from 1V or 4mA)
	9 • 10	Frequency reference	9	10	_____
			OFF	OFF	0 to 10V, 10kΩ variable potentiometer
OFF			ON	1 to 5V	
ON			OFF	Do not use	
ON	ON	4 to 20 mA			

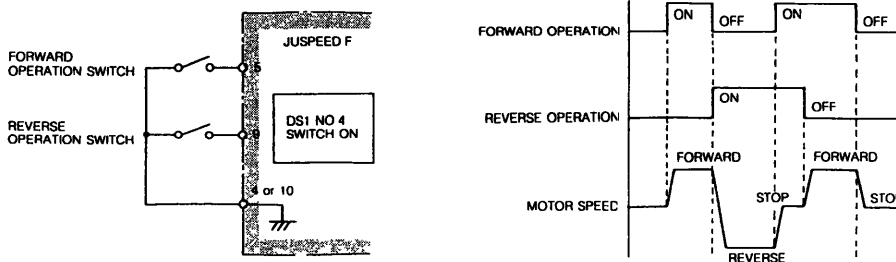
Forward/Reverse Command Selection Switch

The forward or reverse command mode can be selected by setting Mode A or B as shown below ON (closing) OFF (opening)



Mode A Selection of forward and reverse operation can be controlled by combining the operation signal and forward/reverse signal

Fig 6 Mode A



Mode B Selection of forward and reverse operation can be controlled by the forward and reverse signals

Fig 7 Mode B

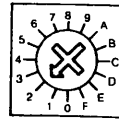
For Mode A, Forward/reverse operation is performed by closing operation switch (ON) and closing/opening the forward/reverse selection switch (ON/OFF)

For Mode B, forward/reverse operation is performed by closing forward or reverse operation switch (ON)

Inverter stops outputting if forward and reverse run signals are input simultaneously Also input can be possible by open collector signals Each switch "closed" is equivalent to open collector "L"

5.2.2 V/f Pattern Selector Switch

V/f pattern selector switch (RDS3) sets the voltage corresponding to the output frequency. For smooth motor running, select the optimum V/f pattern from 10 types listed in Table 4. The V/f pattern selector switch has been preset at the factory at notch ①. Setting V/f pattern excessively high voltage at low frequency such as notch ④ or ⑧ may cause overcurrent and result in activating overcurrent protective function to shut off the transistor power.



V/f Pattern Selector Switch (RDS3)

Table 4 Ten Types of V/f Patterns

Application	Hz	V/f Pattern	Application	Hz	V/f Pattern
General Purpose (Start at 50% torque of the rating)	50 Hz		High-start Torque (Start more than 100% torque of the rating)	50 Hz	
	60 Hz			60 Hz	
	90 Hz or 120 Hz		Fans and Pumps (At variable torque)	50/60 Hz	

Note: Circled numbers in the table above indicate the notch to be set by the V/f pattern selector switch and their respective pattern curve.

V/f Pattern Selection

Pattern Notch No	Selection
0 (at 60 Hz)	4 (at 50 Hz)
1 (at 60 Hz)	5 (at 50 Hz)
2 (at 60 Hz)	6 (at 50 Hz)
3 (at 60 Hz)	7 (at 50 Hz)
8 at 90 Hz)	9 (at 120 Hz)

For high starting at 150% of the rated torque
Apply to next upper inverter capacity, combination with motor output for inverters may activate over-voltage protective circuit. Use a special motor. Continuous operation of standard motors at low frequency cannot be made.

For starting at 100% of the rated torque
Optimum for constant torque such as conveyors. Continuous operation of standard motors at low frequency cannot be made. Use a special motor.

For starting at 50% of the rated torque
For the application requiring 50% starting torque or less, noise and vibration at low frequency will be reduced as compared with 100% rated starting torque mode of pattern ① and ⑤.

For variable torque loads specially for fans and pumps

For high-frequency motor at 90 Hz or 120 Hz

Note: 1 Operation of standard motor at 60 Hz or more may cause motor vibration or cooling fan noise.
2 With notch ① to ⑥ setting, the V/f pattern is same as that of notch ⑧.

5.2.3 Acceleration/Deceleration Time Setting Switch

Acceleration and deceleration times can be set independently

Set the acceleration and deceleration times using accel/decel time setting switches (RDS1, RDS2) according to applications and load condition. Table 5 shows the settings of RDS1 and RDS2 notches, acceleration and deceleration time and DC injection braking time. The switches have been preset at the factory to notch ⑥. High-speed frequency limit of 90 Hz or 120 Hz is selected, the time ranges in Table 5 are 0 to 120 Hz or 120 to 0 Hz.

Acceleration time and deceleration time RDS1 and RDS2. Acceleration and deceleration times represent the range of time of output frequency from 0 Hz to 60 Hz (or 120 Hz) and 60 Hz (or 120Hz) to DC injection braking, respectively. Calculate the corresponding time from the formula.

Example

At output frequency of 50Hz or 90Hz, the following calculation will apply

$$\begin{aligned} \text{At 50 Hz, accel/decel time to be set} &= \text{Accel/decel time in Tables 4} \times \frac{50}{60} \\ \text{At 90 Hz, accel/decel time to be set} &= \text{Accel/decel time in Table 4} \times \frac{90}{120} \end{aligned}$$



RDS1 Accel Time Setting Switch



RDS2 Decel Time Setting Switch

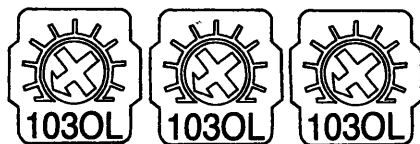
Table 5 Accel/Decel Times and DC Injection Braking Time at Switch Notches (Output Frequency Setting 0 to 60 Hz, 0 to 120 Hz)

Notch	①	②	③	④	⑤	⑥	⑦	⑧	⑨	A	B	C	D	E	F
Accel/Decel Time (s)	0.1	0.15	0.2	0.3	0.5	0.75	1.0	1.5	2.0	3.0	5.0	7.5	10.0	15.0	30.0
DC Injection Braking Time (s)	0.20	0.22	0.25	0.27	0.3	0.33	0.36	0.40	0.45	0.50	0.60	0.80	1.0	1.5	3.0

5.2.4 Multispeed Setting Potentiometer

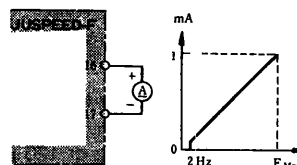
This is a variable potentiometer to set frequency by 3-step speed setting.

VR1 to VR3 can be selected by combination with input signals S1 and S2. (Refer to "Multispeed Operation Terminals" on page 13.) For JUSPEED-F with operator's panel, set frequency according to the frequency meter mounted on the front cover. For built-in type, set frequency according to DC Ammeter 1 mA full-scale or DC Voltmeter 10V/full-scale. Frequency can be set in the range of 2 to 120Hz.

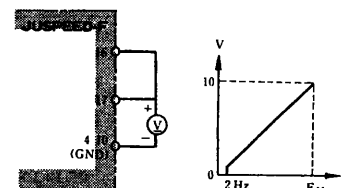


VR1 VR2 VR3

VR1 to VR3 Multispeed Setting Potentiometer



Frequency Settings according to DC Ammeter



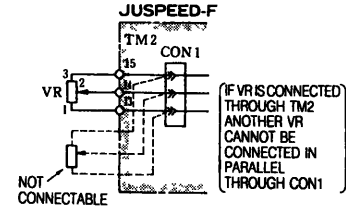
Frequency Setting according to DC Voltmeter

5.2.5 Signal Connections

Signals can be connected through terminal block (TM2) or connector receptacle (CON1). Do not use both TM2 and CON1 simultaneously. Tables 6 and 7 list the functions of terminal block (TM2) and connector receptacle (CON1), respectively.

Internal wiring of TM2 and CON1

Both terminals TM2 and CON1 with same function are directly connected internally, therefore use either one of them. For standard models with operation panel, the connection is applied to CON1, so TM2 terminal with same function is not available.



Interconnection of TM2 and CON1

Table 6 Terminal Block TM2 Function

Terminal No	Terminal Name	Terminal Function
1	Fault Signal	Contact signal output indicating that inverter protective circuit activates and operation stops
2		
3		
4, 10	I/O Common	Common terminals for I/O terminals ⑤ to ⑫ (0 V terminal of control circuit GND)
5	Operation or Forward Run	Contact signal for operation/stop or for forward run. Connected to terminal ④ or ⑩ (Closed Operation or forward operation, Open stop)
6	Forward/Reverse Changing or Reverse Run	For contact signal of forward/reverse run. Connected to terminal ④ or ⑩ (Closed Reverse, Open Forward)
7	Multispeed Operation Input	Input signal for multispeed operation. Connected to terminal ④ or ⑩
8		
9	Reset Input	Resetting input during inverter tripping and connected to terminal ④ or ⑩ (Closed Reset)
11	Frequency Synchronization Output	Open collector output terminal which indicates that output frequency reaches the set frequency ("L" - when synchronized, "H" - in other cases). V _{cc} = 35V max, I _c = 50 mA max
12	Output During Run	Open collector output terminal which indicates that the inverter is running ("L" - during running, "H" - in other cases). V _{cc} = 35V max, I _c = 50 mA max
13	Frequency Setting (Common)	0 V of control circuit. Connected to minus (-) signals of 0 to 10 V, 1 to 5V, and 4 to 20 mA
14	Frequency Setting (Input)	Inputs plus (+) signals of 0 to 10 V, 1 to 5 V, and 4 to 20 mA. For frequency setting potentiometer, connect to terminal ② (center pin)
15	Frequency Setting (Output)	Used as power supply for setting by use of frequency setting potentiometer (10 kΩ)
16	Frequency Meter Driving (Output)	Connects to frequency meter (1 mA DC at 60, 120Hz). (Plus of terminal ⑬, minus of terminal ⑰). Use moving coil type DC ammeter for frequency meter
17		

- Notes
- 1 Input contact signal or input open collector signal with terminals ④ and ⑩ as common (GND common) for each input terminal.
 - 2 To input contact signal, input no-voltage contact signal between terminals ④ and ⑩. To input open collector signal, input "L" (active) for terminals ④ and ⑩.
 - 3 Control signal leads must be separated from power cables to prevent erroneous operation caused by noise interference. Use the twisted-pair shielded leads.

Open Collector Input Terminal Interconnection

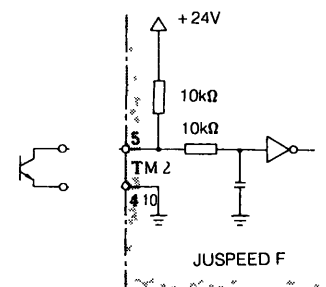


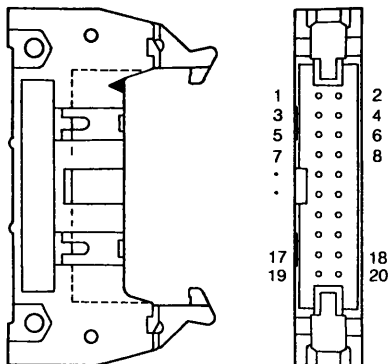
Table 7 CON1 Connector Function

Pin No	Pin Name	Connector Function
1	Control Power Supply	Do not use
2, 10, 18	I/O Common	0 V of control circuit (GND)
3	Reset Input	Resetting input at inverter tripping Connected to terminal ② or ⑩ or ⑱ (Closed Reset)
4	Operation or Forward Run Input	For input of run/stop or forward run command Connected to terminal ② or ⑩ or ⑱ (Closed Operation or Forward run, Open Stop)
5	Forward/Reverse Changing or Reverse Run Input	For input of forward/reverse or reverse run command Connected to terminal ② or ⑩ or ⑱ (Closed Reverse, Open Forward)
6	Multispeed Operation	Input for multispeed operation Activates at "L"
7		
8	Frequency setting (Power Supply Output)	Used as a power supply for setting by use of frequency setting potentiometer (10kΩ)
9	Frequency Setting (Input)	Inputs plus (+) signals of 0 to 10V, 1 to 5V, and 4 to 20mA For frequency setting potentiometer, connect to terminal ② (center pin)
11 to 14	NC	—
15	Frequency synchronizaion Signal Output	Open collector output terminal which indicates that output frequency reaches the set frequency ("L" - when synchronized, "H" - in other cases) Vcc = 35V max, Ic = 50mA max
16	Output During Run	Open collector output terminal which indicates that the inverter is running ("L" - during running, "H" - in other cases) Vcc = 35V max, Ic = 50mA max
17	Fault Signal Output	Open collector signal output indicating that inverter protective circuit activates and operation stops ("L" - at stop by fault, "H" - in other cases) Vcc = 35V max, Ic = 50mA max
19	Frequency Meter	Connect a frequency meter, 1 mA DC at 60 or 120 Hz (pin 19 at "+" and pin 20 at "-") Use a moving coil type DC ammeter as a frequency meter (e.g. Model TRM-45Y made by KUWANO Electric)
20		

- Notes
- 1 Input contact signal or open collector signal with input pins ②, ⑩ and ⑱ as common (GND common)
 - 2 To input contact signal, input no-voltage contact signal between pins ②, ⑩ and ⑱
To input open collector signal, input "L" (active) to pins ②, ⑩ and ⑱
 - 3 Control signal leads must be separated from power cables to prevent erroneous operation caused by noise interference
Use the twisted-pair shielded leads

Location of CON1 Connector Pins

Pin header (receptacle) is mounted on the PC board. Mount terminals according to connector pin numbers. Plug the connector firmly into the pin header.



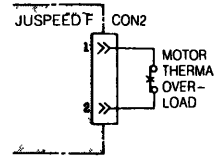
Pin Header Type PS-20PE-D4T2-M1
(Receptacle) made by JAE

	Name	Model
Leads	Connector with key	PS-D4C20
	Connector	030-51304-001
Flat Cable	Pressure welding socket connector (Type M)	PS-20SM-D4P1-1C
	Strain relief (Type M)	PS-SR20M

CON2 (for thermal overload)

Input for motor thermal overload. Connect NC contact of thermal protector between CON2 ① and ② pins. Turn ON the 5th pole of operation mode selector switch (DS1). When the motor is overheated, thermal protector in the motor operates to stop JUSPEED-F and send an alarm (Refer to page 19). Connector (CON2) wafer is mounted on the board. The table indicates the applicable connectors.

Note: When CON2 is not used, turn OFF the 5th pole of operation mode selector switch (DS1).



Name	Type (made by Molex)
Connector	5102 2
Terminals Manual	5103PBTB
Pressure Tool	JHTR5907

Fault Signal Terminals (①, ②, ③ of TM2)

Give the contact output if the inverter is tripped.

CONTACT RATING
250VAC, 1A RESISTANCE LOAD
30VDC, 1A RESISTANCE LOAD

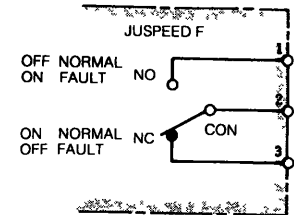
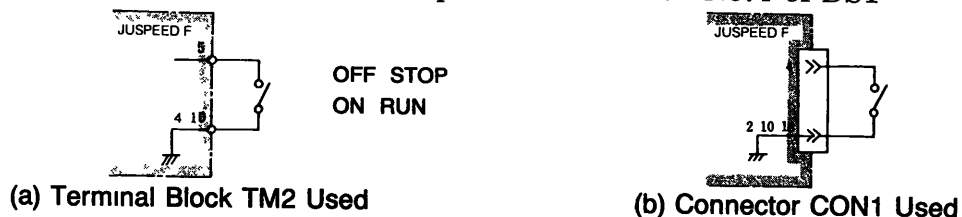


Fig. 8 Connections of Fault Signal Output Relay

RUN/STOP or Forward Operation Terminals (⑤ of TM2 or ④ of CON1)

Terminals for run/stop or forward operation switch. For JUSPEED-F with operation panel, the terminals are connected as shown in Fig. 9. For remote running or stopping of motor, use a toggle switch (30VDC, 3A, contact resistance 0.010Ω or less) and connect with twisted lead to prevent erroneous operation due to noise. Terminals ④ and ⑩ are connected within the circuit. RUN/STOP (mode A) or forward operation (mode B) can be selected by selector switch position at switch No.4 of DS1.



NOTE

TM2 and CON1 cannot be used at the same time.

Fig. 9 Connections of RUN/STOP or Forward Run Switch

Multispeed Operation Terminals (⑦, ⑧ of TM2 or ⑥, ⑦ of CON1)

Terminals for contact input for multispeed. See Fig. 10.

Set ON or OFF of contacts corresponding to three variable potentiometers (VR1 to VR3) in Table 8. For external switches S1 and S2, use the relay for small signals or containing contacts at micro level, with high reliable contact for micro current.

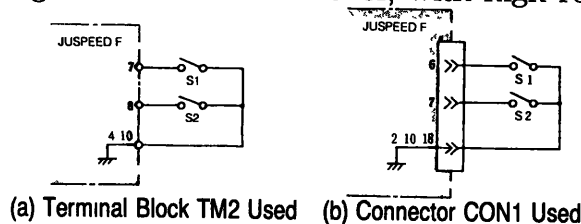


Fig. 10 Connections of External ON/OFF Switches for Multispeed Operation

Table 8 Setting of External Switches

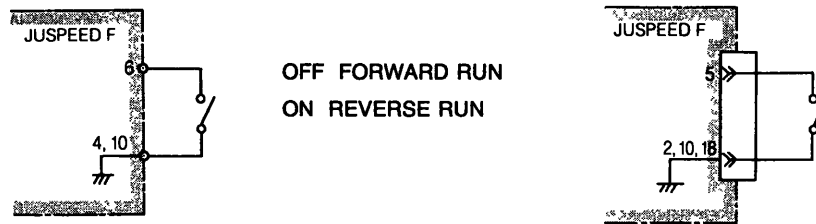
External ON/OFF Switch		Output Frequency
S1	S2	
OFF	OFF	Frequency set by frequency selector
ON	OFF	Frequency set by VR1
OFF	ON	Frequency set by VR2
ON	ON	Frequency set by VR3

Note: Setting range of VR1 to VR3: F_{MIN} to F_{MAX}

Forward/Reverse or Reverse Operation Terminals (⑥ of TM2 or ⑤ of CON1)

Terminals for forward/reverse or reverse operation switch See Fig 11 When DS1 switch No 4 is OFF, forward run is performed when open between ⑥ and ⑩, and reverse run when closed When DS1 switch No 4 is ON, reverse run command is input For selector switch, use high reliable contact for micro current

Forward/reverse running can be changed during running For forward operation only, forward/reverse switch need not be connected



(a) Terminal Block TM2 Used

(b) Connector CON1 Used

Note At the selection of forward/reverse individual operation command mode (DS1 No 4 at ON), if forward and reverse commands are simultaneously executed, inverter output becomes "0" zero

Fig 11 Connections of Forward/Reverse or Reverse Operation Switch

5.3 TEST RUN

Uncouple the motor from the driven machine to insure safety Start the operation following the procedures below

- 1 Move RUN/STOP switch to STOP Turn off the external sequence switches, if used
2. Set the frequency setting switch to scale 0 (Min).
- 3 Turn on JUSPEED-F molded case circuit breaker (MCCB) and then the magnetic contactor (MC) At this time, motor still does not start unless the operation circuit malfunctions Check the motor for any noise or vibration (by hand) to make sure no malfunction has occurred
- 4 When any fault has not been found, set the operation switch to the RUN side In this status, rotate the frequency setting device in CW and check the motor rotating direction
- 5 JUSPEED-F output frequency increases or decreases according to the preset accel/ decel time Motor accelerates or decelerates according to the frequency as well If the motor does not run smoothly during acceleration or deceleration, or JUSPEED-F stops due to malfunction, the accel/decel time is assumed to have been set too short for the load level Extend the accel/decel time
- 6 Accel/decel time and V/f pattern can not be changed during motor operation The change must be carried out at operation command off

- 7 If any of the protective functions activates, JUSPEED-F is stopped. Turn off the AC main circuit power by turning off the molded case circuit breaker (MCCB) or magnetic contactor (MC) and turn on the power again.

Faults can be located by the blinking fault lamp (milk-white) in JUSPEED-F (under the front cover). If JUSPEED-F stops, remove the front cover and identify the trouble with the blinking lamp, referring to Table 9.

- 8 If load inertia (WK^2) is excessively large and rapid acceleration or deceleration frequently occurs, braking discharge resistor may be needed.

6. OPERATION

After the test run is over, start the operation keeping the following in mind.

- (1) For general purpose motors combined with JUSPEED-F controller, motor temperature rises and noise and vibration increase as compared with commercial power.
- (2) At low speed operation, operate the motor at the temperature below the allowable temperature rise level, for motor cooling effects decrease.
- (3) Motor ratings
 - When two or more motors are controlled by a single JUSPEED-F, check to be sure that the total motor current is not larger than the inverter rating.
 - When multipole motors of more than 8 poles or special purpose motors are used, make sure that motor current is within the inverter rating.
 - Even with small load, never use a motor whose current exceeds the inverter rating.
- (4) Never connect a capacitor at the inverter output, for it may damage JUSPEED-F.
- (5) To start and stop the motor, use RUN/STOP switch on the front of JUSPEED-F, not the magnetic contactor (MC) or molded case circuit breaker (MCCB) which are used only for emergency stop.
- (6) If supply voltage changes at momentary power failure, protective functions may operate and stop JUSPEED-F, resulting in motor coasting to a stop. Turning on the AC power supply within one second after the activation of protective functions will not restart the motor. Power input after approximately 10 seconds will restart the motor. For the application requiring positive motor stop in an emergency, provide magnetic contactor (MC) including self-holding circuit at power input as shown in Fig 3.
- (7) Restart the motor after making sure that the motor has come to a full stop. If the operation is started during motor coasting, overcurrent protective function may be activated.

7. MAINTENANCE

JUSPEED-F requires almost no routine checks. It will function efficiently and longer if it is kept clean, cool and dry, observing precautions listed under "Location". Especially check for tightness of electrical connections, discoloration or other signs of overheating. When servicing inspection, turn off AC main circuit power and wait ten minutes before removing the front cover. The capacitors are still charged and can be quite dangerous.

Insulation Resistance Test

- For megger test of the external circuit, remove all the JUSPEED-F terminals and do not apply the test voltage to the inverter.
- For megger testing the inverter, measure the insulation resistance of the main circuit only with a 500 VDC megger.

Connect the AC main circuit terminals (L1) (R), (L2) (S), (L3) (T), (T1) (U), (T2) (V), and (T3) (W) by a common wire as shown in Fig 12. After that, measure the insulation resistance between the common wire and ground with a megger. If reading is above $1M\Omega$, it is considered satisfactory. Never measure the insulation resistance of the control circuit.

- Never make a conduction test of the control circuit.

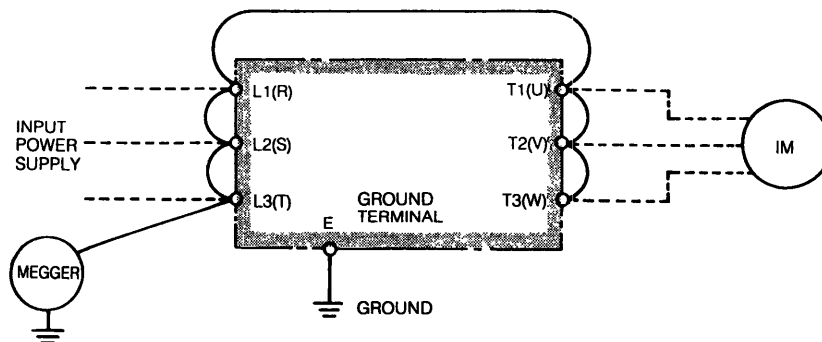
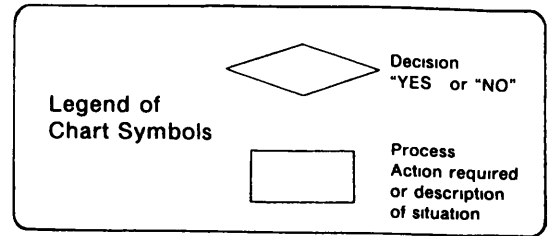


Fig 12 Connections for Megger-Testing

8. TROUBLESHOOTING

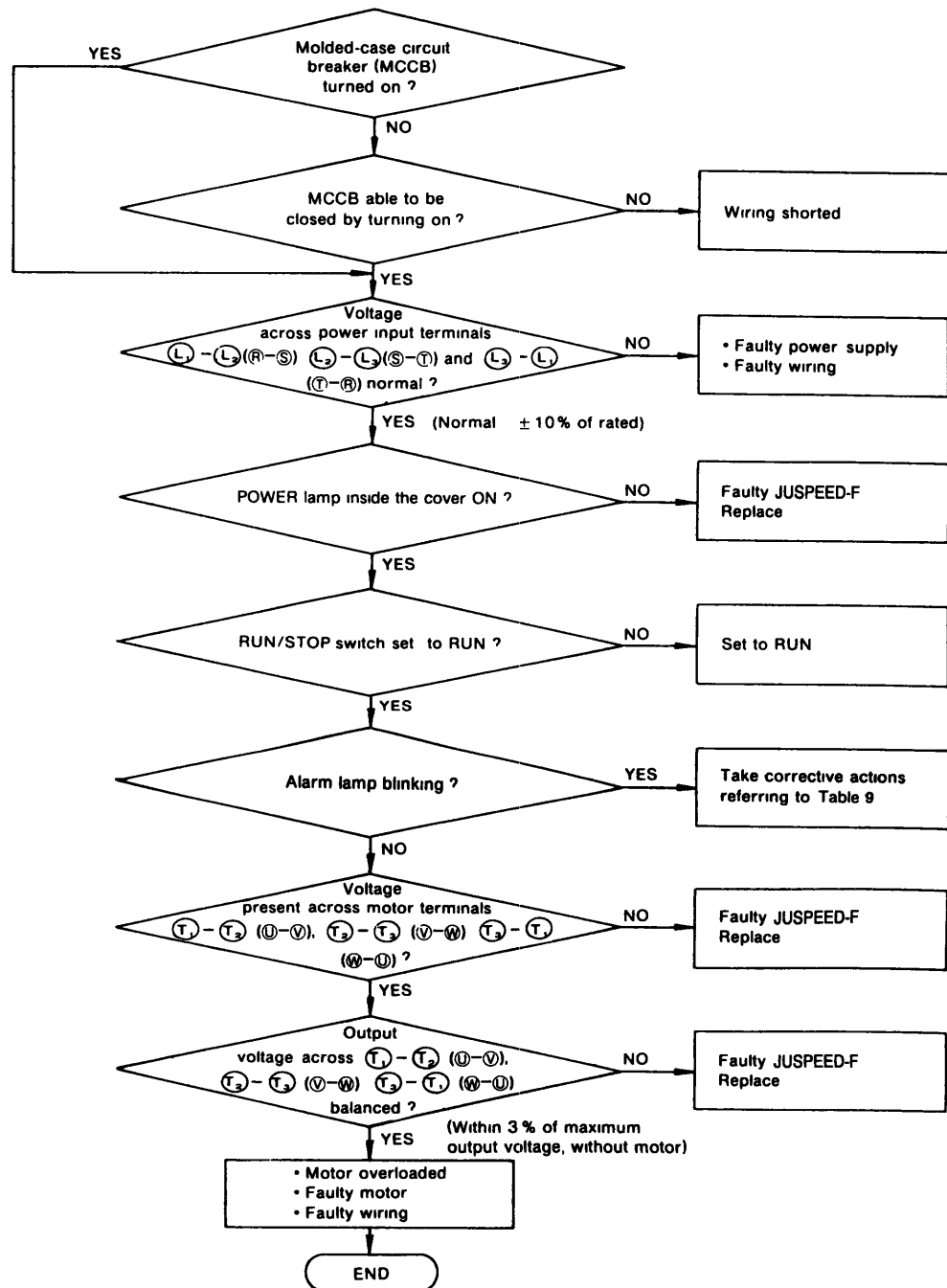
If JUSPEED-F malfunctions, find the cause and take the corrective actions by following the flowcharts

If the causes cannot still be located by the flowcharts, the inverter or some parts are damaged, or any other problem occurs, contact Yaskawa representative

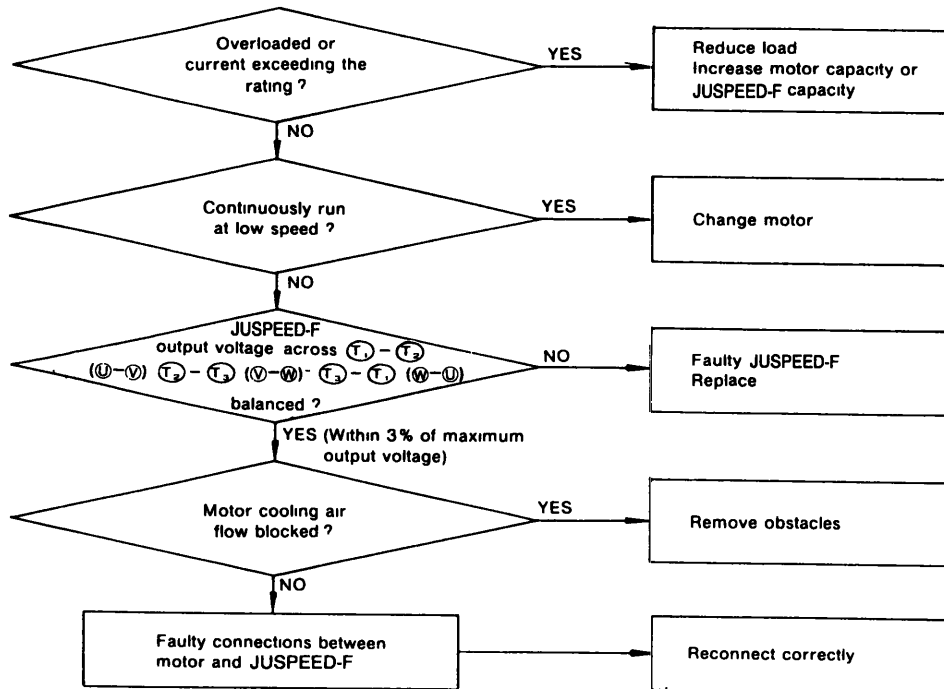


8.1 TROUBLESHOOTING CHART

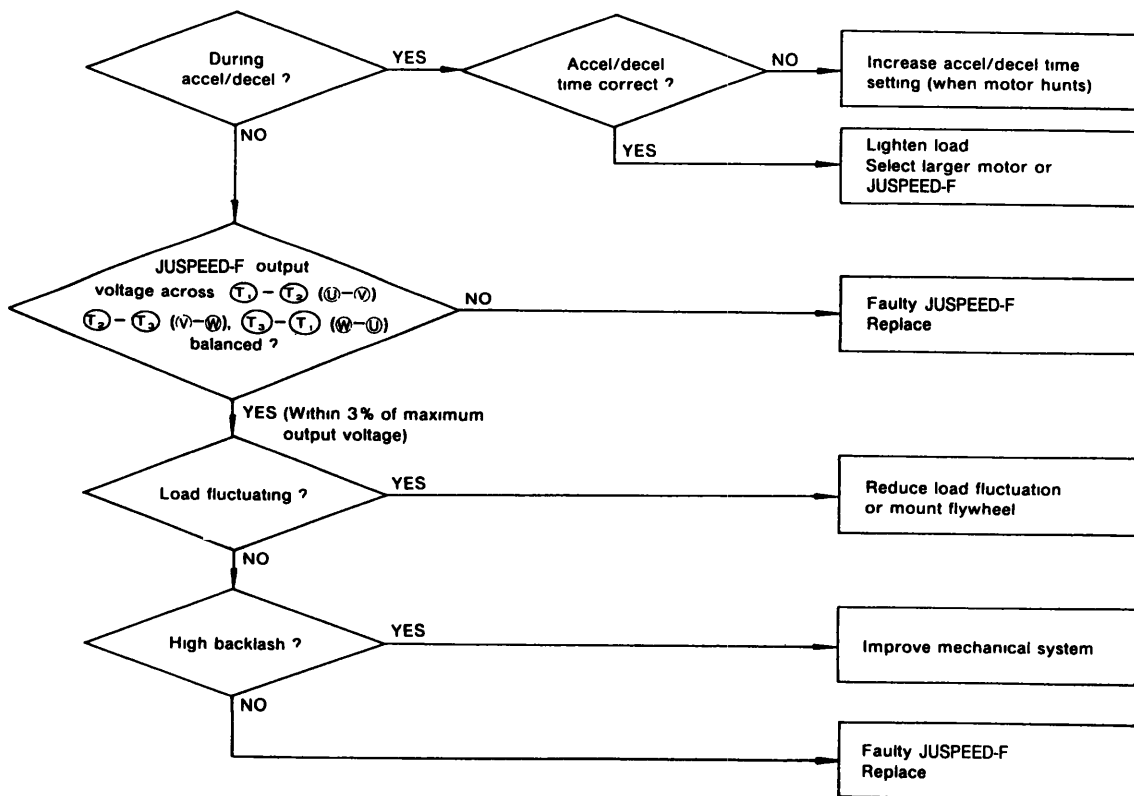
(1) Motor will not run



(2) Motor overheat









(3) Motor hunting



8.2 CAUSES FOR FAULT LAMP (MILK-WHITE) ACTIVATION AND REMEDIAL ACTIONS

If JUSPEED-F malfunctions, fault lamp (milk-white) lights. Depending on the type of malfunction, the lamp will blink. When the lamp blinks, check for continuous or intermittent blink and whether the operation switch is ON or OFF.

Table 9 Failure Indication of JUSPEED-F

Protection Function	Operation of Fault Lamp	Cause	How to Check	What to Do
Motor Burnout Protection	n = number of blinking times n = 1 time 	<ul style="list-style-type: none"> DS1 switch No 5 ON when external thermal overload relay does not function Motor overheated 	Check the motor load status	<ul style="list-style-type: none"> Set Switch No 5 to OFF position Improve motor cooling capability Reduce motor load Change V/f pattern
Instantaneous Overcurrent Protection	n = 2 times 	<ul style="list-style-type: none"> JUSPEED-F output circuit shorted or ground fault 	<ul style="list-style-type: none"> Remove JUSPEED-F output terminals and measure the resistance across motor leads or motor leads and ground 	Correct the short-circuit conditions
		<ul style="list-style-type: none"> Accel/decel time set too short 	<ul style="list-style-type: none"> Extend the accel/decel time and operate the motor 	<ul style="list-style-type: none"> Extend the accel/decel time
		<ul style="list-style-type: none"> Load too heavy 	<ul style="list-style-type: none"> Run motor without load Check load conditions 	<ul style="list-style-type: none"> Change V/f pattern Reduce load
		<ul style="list-style-type: none"> Power factor correction capacitor connected to JUSPEED-F output 	—	Remove
Regenerative Overvoltage Protection	n = 3 times 	<ul style="list-style-type: none"> Incorrect V/f pattern selection 	<ul style="list-style-type: none"> Run motor with frequency set at 5Hz, and V/f pattern selector switch at notch ③ or ⑦ 	<ul style="list-style-type: none"> Select the optimum V/f pattern
		<ul style="list-style-type: none"> Decel time set too short 	<ul style="list-style-type: none"> Extend the decel time and operate the motor 	<ul style="list-style-type: none"> Extend the decel time
Undervoltage Protection	n = 4 times 	<ul style="list-style-type: none"> Supply voltage too low Momentary power loss (15 ms. or more) 	Measure supply voltage with voltmeter, and restart the motor	<ul style="list-style-type: none"> Eliminate the cause of voltage drop
Inverter	n = 5 times 	<ul style="list-style-type: none"> Ground fault Transistor module damaged 	Remove all JUSPEED-F terminals and check continuity across any one of motor leads and ground	Eliminate the cause of ground fault
Ground Fault Alarm				
Noise Alarm	n = 6 times 	<ul style="list-style-type: none"> Microcomputer malfunction due to noise 	Check to see if noise source exists at inverter Input/Output	<ul style="list-style-type: none"> Separate the control signal leads from power cables to prevent erroneous operation caused by noise interference. Use the twisted-pair shielded leads.

Notes

- If fault lamp blinks, set RUN/STOP switch to STOP, find the cause, and turn off MCCB and MC
- If the cause cannot be found, disconnect leads from JUSPEED F and motor

- For any problem which cannot be corrected locally, contact your Yaskawa representative

Juspeed-F S300 Ratings and Specifications

THREE-PHASE, 400V CLASS (STANDARD)

Model CIMR-	Analog	F04AS ₃	F08AS ₃	F15AS ₃	F22AS ₃	F37AS ₃	F55AS ₃	F75AS ₃
Max Motor Output		3/4HP (0.4kW)	1HP (0.75kW)	2HP (1.5kW)	3HP (2.2kW)	5HP (3.7kW)	7.5HP (5.5kW)	10HP (7.5kW)
Rated Capacity		1kVA	1.5kVA	2.5kVA	3.5kVA	6kVA	9kVA	12kVA
Rated Current		1.5A	2.3A	4.0A	5.5A	9.0A	11.0A	17.5A
Input Power Supply	3-phase 342 to 484V 50Hz (±5%) 342 to 506V 60Hz (±5%)							
Max Output Voltage	3-phase 342 to 506V							
Output Control Element	IGBT (Insulated Gate Bi-polar Transistor)							
Carrier Frequency	1 to 4kHz							
Control Method	Sinusoidal sine wave PWM							
Output Frequency Range	2 to 120Hz (0.1 to 360Hz available)							
Frequency Resolution	0.01Hz (2 to 60Hz), 0.02Hz (2 to 120Hz)							
Frequency Accuracy	±0.5% (-10 to +40°C, +14 to +104°F)							
Allowable Overload Capacity	200% for 30 seconds, 150% for 2 minutes							
Accel/Decel Time	0.1 to 30 sec (16 selections available independently of accel/decel)							
Braking	Braking by charging capacitor and discharging resistor, or D C injection braking for less than 2Hz (100% braking torque)							
Approx Mass		2.2kg	2.2kg	2.6kg	2.6kg	5.6kg	7.6kg	7.8kg
Munsell Notation	7.5R 3/12, dull finish							
Enclosure	Enclosed type with operator panel, enclosed-type without operator panel, built-in type							
Input Signal	Run and Stop	Command by NO contact or open collector signal, Mode A or B selectable						
	Forward/Reverse Run	(Mode A RUN/STOP, FOW/REV, Mode B FOW/RUN, REV/RUN)						
	Frequency Setting	Analog Frequency setting pot or any of 0 to 10V, 1 to 5V, 4 to 20mA selectable						
	Multi-speed	3-step speed selected by external input signal Frequency selectable in the range of 2 to 120Hz by variable potentiometers VR1 to VR3 on the printed board						
	Reset	Reset command of protective function by NO contact, or open collector signal (alarm reset)						
Output Signal	Frequency Synchronization Signal, During Run Signal	Signal output or open collector output V _{cc} = 35V max, I _c = 50mA max						
Protective Functions	Instantaneous Power Loss	Protective circuit functions if power loss is detected						
	Undervoltage	Stopped at 330V or less						
	Overcurrent	Stopped by overcurrent caused by short circuit and/or ground fault						
	Overvoltage	Stopped by overvoltage when regeneration						
Environmental Conditions	Location	Indoor (free from corrosive gases and dust)						
	Ambient Temperature	-10 to +40°C (+14 to +104°F) for enclosed type -10 to +50°C (+14 to +122°F) for built-in type						
	Humidity	95% max relative (non-condensing)						
	Elevation	3300 feet max (1000 meters)						
	Vibration	4.9m/s ² (0.5G) max at 10 to 55Hz						

Note: 0.1 sec or less accel/decel time available as an option. For details, contact your YASKAWA representative.

Juspeed-F P300 Ratings and Specifications

THREE-PHASE, 400V CLASS (LOW-NOISE)

Model CIMR-	Analog	F04AP ₃	F08AP ₃	F15AP ₃	F22AP ₃	F37AP ₃	F55AP ₃	F75AP ₃
Max Motor Output		3/4HP (0.4kW)	1HP (0.75kW)	2HP (1.5kW)	3HP (2.2kW)	5HP (3.7kW)	7.5HP (5.5kW)	10HP (7.5kW)
Rated Capacity		0.8kVA	1.3kVA	2.2kVA	3.3kVA	5kVA	9kVA	12kVA
Rated Current		1.5A	2.3A	4.0A	5.5A	9.0A	11.0A	17.5A
Input Power Supply		3-phase 342 to 484V 50Hz (±5%) 342 to 506V 60Hz (±5%)						
Max Output Voltage		3-phase 342 to 506V						
Output Control Element		IGBT (Insulated Gate Bi-polar Transistor)						
Carrier Frequency		14 to 15kHz						
Control Method		Sinusoidal sine wave PWM						
Output Frequency Range		2 to 120Hz (0.1 to 360Hz available)						
Frequency Resolution		0.01Hz (2 to 60Hz), 0.02Hz (2 to 120Hz)						
Frequency Accuracy		±0.5% (-10 to +40°C, +14 to +104°F)						
Allowable Overload Capacity		200% for 30 seconds, 150% for 2 minutes						
Accel/Decel Time		0.1 to 30 sec (16 selections available independently of accel/decel)						
Braking		Braking by charging capacitor and discharging resistor, or D C injection braking for less than 2Hz (100% braking torque)						
Approx Mass		2.2kg	2.2kg	2.6kg	2.6kg	5.6kg	7.6kg	7.8kg
Munsell Notation		7.5R 3/12, dull finish						
Enclosure		Enclosed type with operator panel, enclosed-type without operator panel, built-in type						
Input Signal	Run and Stop	Command by NO contact or open collector signal, Mode A or B selectable (Mode A RUN/STOP, FOW/REV, Mode B FOW/RUN, REV/RUN)						
	Forward/Reverse Run							
	Frequency Setting	Analog Frequency setting pot or any of 0 to 10V, 1 to 5V, 4 to 20mA selectable						
	Multi-speed	3-step speed selected by external input signal Frequency selectable in the range of 2 to 120Hz by variable potentiometers VR1 to VR3 on the printed board						
	Reset	Reset command of protective function by NO contact, or open collector signal (alarm reset)						
Output Signal	Frequency Synchronization Signal, During Run Signal	Signal output or open collector output V _{cc} =35V max, I _c =50mA max						
Protective Functions	Instantaneous Power Loss	Protective circuit functions if power loss is detected						
	Undervoltage	Stopped at 330V or less						
	Overcurrent	Stopped by overcurrent caused by short circuit and/or ground fault						
	Overvoltage	Stopped by overvoltage when regeneration						
Environmental Conditions	Location	Indoor (free from corrosive gases and dust)						
	Ambient Temperature	-10 to +40°C (+14 to +104°F) for enclosed type -10 to +50 °C (+14 to +122°F) for built-in type						
	Humidity	95% max relative (non-condensing)						
	Elevation	3300 feet max (1000 meters)						
	Vibration	4.9m/s ² (0.5G) max at 10 to 55Hz						

Note 0.1 sec or less accel/decel time available as an option For details, contact your YASKAWA representative

Juspeed-F S300 Ratings and Specifications

THREE-PHASE, 200V CLASS (STANDARD)

Model CIMR-	Analog	04AS ₃	08AS ₃	15AS ₃	22AS ₃	37AS ₃	55AS ₃	75AS ₃
Max Motor Output		3/4HP (0.4kW)	1HP (0.75kW)	2HP (1.5kW)	3HP (2.2kW)	5HP (3.7kW)	7.5HP (5.5kW)	10HP (7.5kW)
Rated Capacity		1kVA	1.5kVA	2.5kVA	3.5kVA	6kVA	9kVA	12kVA
Rated Current		3.0A (2.0A)*	4.5A (3.0A)*	7.5A (4.5A)*	10.5A (7.5A)*	17.5A (10.5A)*	24.0A	33.0A
Input	Power Supply	Three-phase 180 to 242V 50Hz (±5%) 180 to 253V 60Hz (±5%)						
	Current	4.6A	6.6A	10.2A	13.8A	21.1A	26.4A	36.6A
Max Output Voltage		3-phase 180 to 253V						
Output Control Element		BT (Bi-polar Transistor)						
Carrier Frequency		1 to 4kHz						
Control Method		Sinusoidal sine wave PWM						
Output Frequency Range		2 to 120Hz (0.1 to 360Hz available)						
Frequency Resolution		0.01Hz (2 to 60Hz), 0.02Hz (2 to 120Hz)						
Frequency Accuracy		±0.5% (-10 to +40°C, +14 to +104°F)						
Allowable Overload Capacity		200% for 30 seconds, 150% for 2 minutes						
Accel/Decel Time		0.1 to 30 sec (16 selections available independently of accel/decel)						
Braking		Braking by charging capacitor and discharging resistor, or D C injection braking for less than 2Hz (100% braking torque)						
Approx Mass		0.8kg	1.1kg	1.3kg	2.8kg	3.8kg	7.6kg	7.8kg
Munsell Notation		7.5R 3/12, dull finish						
Enclosure		Enclosed type with operator panel, enclosed-type without operator panel, built-in type						
Input Signal	Run and Stop	Command by NO contact or open collector signal, Mode A or B selectable (Mode A RUN/STOP, FOW/REV, Mode B FOW/RUN, REV/RUN)						
	Forward/Reverse Run							
	Frequency Setting	Analog Frequency setting pot or any of 0 to 10V, 1 to 5V, 4 to 20mA selectable						
	Multi-speed	3-step speed selected by external input signal Frequency selectable in the range of 2 to 120Hz by variable potentiometers VR1 to VR3 on the printed board						
	Reset	Reset command of protective function by NO contact, or open collector signal (alarm reset)						
Output Signal	Frequency Synchronization Signal, During Run Signal	Signal output or open collector output V _{cc} =35V max, I _c =50mA max						
Protective Functions	Instantaneous Power Loss	Protective circuit functions if power loss is detected						
	Undervoltage	Stopped at 170V or less						
	Overcurrent	Stopped by overcurrent caused by short circuit and/or ground fault						
	Overvoltage	Stopped by overvoltage when regeneration						
Environmental Conditions	Location	Indoor (free from corrosive gases and dust)						
	Ambient Temperature	-10 to +40°C (+14 to +104°F) for enclosed type -10 to +50 °C (+14 to +122°F) for built-in type						
	Humidity	95% max relative (non-condensing)						
	Elevation	3300 feet max (1000 meters)						
	Vibration	4.9m/s ² (0.5G) max at 10 to 55Hz						

* Parenthesized values are for single-phase power input

Notes 1 When a single-phase power supply is used, connect to terminal L1(R) and L2(S)

2 0.1 sec. or less accel/decel time available as an option. For details, contact your YASKAWA representative

3 Where the inverter is used as the EN standard product, the enclosure is IP00

Juspeed-F P300 Ratings and Specifications

THREE-PHASE, 200V CLASS (LOW-NOISE)

Model CIMR-	Analog	04AP ₃	08AP ₃	15AP ₃	22AP ₃	37AP ₃	55AP ₃	75AP ₃
Max Motor Output		3/4HP (0.4kW)	1HP (0.75kW)	2HP (1.5kW)	3HP (2.2kW)	5HP (3.7kW)	7.5HP (5.5kW)	10HP (7.5kW)
Rated Capacity		0.8kVA	1.3kVA	2.2kVA	3.3kVA	5kVA	9kVA	12kVA
Rated Current		2.4A (2.0A)*	4.0A (3.0A)*	6.5A (4.5A)*	9.5A (7.5A)*	14.5A (10.5A)*	24.0A	33.0A
Input	Power Supply	Three-phase 180 to 242V 50Hz (±5%) 180 to 253V 60Hz (±5%)						
	Current	4.6A	6.6A	10.2A	13.8A	21.1A	26.4A	36.6A
Max Output Voltage		3-phase 180 to 253V						
Output Control Element		IGBT (Insulated Gate Bi-polar Transistor)						
Carrier Frequency		14 to 15kHz						
Control Method		Sinusoidal sine wave PWM						
Output Frequency Range		2 to 120Hz (0.1 to 360Hz available)						
Frequency Resolution		0.01Hz (2 to 60Hz), 0.02Hz (2 to 120Hz)						
Frequency Accuracy		±0.5% (-10 to +40°C, +14 to +104°F)						
Allowable Overload Capacity		200% for 30 seconds, 150% for 2 minutes						
Accel/Decel Time		0.1 to 30 sec (16 selections available independently of accel/decel)						
Braking		Braking by charging capacitor and discharging resistor, or D C injection braking for less than 2Hz (100% braking torque)						
Approx Mass		0.8kg	1.1kg	1.3kg	2.8kg	3.8kg	7.6kg	7.8kg
Munsell Notation		7.5R 3/12, dull finish						
Enclosure		Enclosed type with operator panel, enclosed-type without operator panel, built-in type						
Input Signal	Run and Stop	Command by NO contact or open collector signal, Mode A or B selectable						
	Forward/Reverse Run	(Mode A RUN/STOP, FOW/REV, Mode B FOW/RUN, REV/RUN)						
	Frequency Setting	Analog Frequency setting pot or any of 0 to 10V, 1 to 5V, 4 to 20mA selectable						
	Multi-speed	3-step speed selected by external input signal Frequency selectable in the range of 2 to 120Hz by variable potentiometers VR1 to VR3 on the printed board						
	Reset	Reset command of protective function by NO contact, or open collector signal (alarm reset)						
Output Signal	Frequency Synchronization Signal, During Run Signal	Signal output or open collector output V _{cc} = 35V max, I _c = 50mA max						
Protective Functions	Instantaneous Power Loss	Protective circuit functions if power loss is detected						
	Undervoltage	Stopped at 170V or less						
	Overcurrent	Stopped by overcurrent caused by short circuit and/or ground fault						
	Overvoltage	Stopped by overvoltage when regeneration						
Environmental Conditions	Location	Indoor (free from corrosive gases and dust)						
	Ambient Temperature	-10 to +40°C (+14 to +104°F) for enclosed type -10 to +50 °C (+14 to +122°F) for built-in type						
	Humidity	95% max relative (non-condensing)						
	Elevation	3300 feet max (1000 meters)						
	Vibration	4.9m/s ² (0.5G) max at 10 to 55Hz						

* Parenthesized values are for single-phase power input

Notes 1 When a single-phase power supply is used, connect to terminal L1(R) and L2(S)

2 0.1 sec or less accel/decel time available as an option For details, contact your YASKAWA representative

3 Where the inverter is used as the EN standard product, the enclosure is IP00

Juspeed-F S300, P300 Ratings and Specifications

SINGLE-PHASE, 100V CLASS AND 200V CLASS

Type		Standard		Low-Noise	
Model CIMR-	Analog	J04AS ₃ -1	J08AS ₃ -1	J04AP ₃ -1	J08AP ₃ -1
Max Motor Output		3/4HP (0.4kW)	1HP (0.75kW)	3/4HP (0.4kW)	1HP (0.75kW)
Rated Capacity		1.0kVA	1.5kVA	0.8kVA	1.3kVA
Rated Current		3.0A	4.5A	2.4A	4.0A
Input Power Supply		Single-phase 90 to 121V 50Hz/60Hz (±5%) 180 to 242V 50Hz/60Hz (±5%)			
Max Output Voltage		3-phase 180 to 242V			
Output Control Element		BT (Bi-polar Transistor)		IGBT (Insulated Gate Bi-polar transistor)	
Carrier Frequency		1 to 4kHz		14 to 15kHz	
Control Method		Sinusoidal sine wave PWM			
Output Frequency Range		2 to 120Hz (0.1 to 360Hz available)			
Frequency Resolution		0.01Hz (2 to 60Hz), 0.02Hz (2 to 120Hz)			
Frequency Accuracy		±0.5% (-10 to +40°C, +14 to +104°F)			
Allowable Overload Capacity		200% for 30 seconds, 150% for 2 minutes			
Accel/Decel Time		0.1 to 30 sec (16 selections available independently of accel/decel)			
Braking		Braking by charging capacitor and discharging resistor, or D C injection braking for less than 2Hz (100% braking torque)			
Approx Mass		0.5kg	0.8kg	0.5kg	0.8kg
Enclosure		Built-in type			
Input Signal	Run and Stop	Command by NO contact or open collector signal, Mode A or B selectable			
	Forward/Reverse Run	(Mode A RUN/STOP, FOW/REV, Mode B FOW/RUN, REV/RUN)			
	Frequency Setting	Analog Frequency setting pot or any of 0 to 10V, 1 to 5V, 4 to 20mA selectable			
	Multi-speed	3-step speed selected by external input signal Frequency selectable in the range of 2 to 120Hz by variable potentiometers VR1 to VR3 on the printed board			
	Reset	Reset command of protective function by NO contact, or open collector signal (alarm reset)			
Output Signal	Frequency Synchronization Signal, During Run Signal	Signal output or open collector output V _{cc} = 35V max, I _c = 50mA max			
Protective Functions	Instantaneous Power Loss	Protective circuit functions if power loss is detected			
	Undervoltage	Stopped at 80V or less			
	Overcurrent	Stopped by overcurrent caused by short circuit and/or ground fault			
	Overvoltage	Stopped by overvoltage when regeneration			
Environmental Conditions	Location	Indoor (free from corrosive gases and dust)			
	Ambient Temperature	-10 to +40°C (+14 to +104°F) for enclosed type -10 to +50 °C (+14 to +122°F) for built-in type			
	Humidity	95% max relative (non-condensing)			
	Elevation	3300 feet max (1000 meters)			
	Vibration	4.9m/s ² (0.5G) max at 10 to 55Hz			

Notes 1 0.1 sec or less accel/decel time available as an option For details, contact your YASKAWA representative

2 Model CIMR-J04AP₃-1 and CIMR-J08AP₃-1 are available on order

3 Two main circuit capacitors separately installed are required See page 4

Types HCGF3A2D222IS (Vertically mounted type)

HCGF3A2D222SS (Horizontally mounted type)

NOTES

Juspeed-F

SMALL-CAPACITY ANALOG TRANSISTOR INVERTER

S₃₀₀ SERIES (STANDARD), P₃₀₀ SERIES (LOW-NOISE)
THREE-PHASE, 400V CLASS, UP TO 10HP (7.5kW) 1 TO 12kVA
THREE-PHASE, 200V CLASS, UP TO 10HP (7.5kW) 1 TO 12kVA
SINGLE-PHASE, 100V/200V CLASS, UP TO 1HP (0.75kW) 1 TO 1.5kVA

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