

# CFM90

VARIADOR ELECTRONICO  
DE FRECUENCIA PARA MOTOR DEC.A.

# PUESTA EN MARCHA RAPIDA

## 1 Electrical Installation

### 1.1 Selection of Peripheral Electrical Components

AC Drive Model	MCCB (A)	Contactora (A)	Input Side Main Circuit Wire (mm <sup>2</sup> )	Output Side Main Circuit Wire (mm <sup>2</sup> )	Control Circuit Wire (mm <sup>2</sup> )
Single-phase 220V series					
CFM90-0.7-2S	16	10	2.5	2.5	0.75
CFM90-1.5-2S	20	16	4.0	2.5	1.5
CFM90-2.2-2S	32	20	6.0	4.0	1.5
Three-phase 380V series					
CFM90-0.7-4T	10	10	2.5	2.5	0.75
CFM90-1.5-4T	16	10	2.5	2.5	0.75
CFM90-2.2-4T	16	10	2.5	2.5	0.75
CFM90-4.0-4T	25	16	4.0	4.0	1.5

### 1.2. Description of Peripheral Electrical Components

Part	Mounting Location	Function Description
MCCB	Power receiving side	✦ Interrupt the power supply when overcurrent occurs on the downstream devices.
Contactora	AC drive input side	✦ Start and stop the AC drive. Do not start and stop the AC drive frequently by switching the contactora on and off (less than twice per minute) nor use it to directly start the AC drive.
EMC input filter	Between MCCB and the AC drive input side	<ul style="list-style-type: none"> <li>✦ Reduce the external conduction and radiation interference of the AC drive.</li> <li>✦ Decrease the conduction interference flowing from the power end to the AC drive and improve the anti-interference capacity of the AC drive.</li> </ul>
AC output reactor	Between the AC drive output side and motor, close to the AC drive.	<ul style="list-style-type: none"> <li>✦ Generally, the output side of the AC drive has much higher harmonics. When the motor is far from the AC drive, there is much distributed capacitance in the circuit and certain harmonics may cause resonance in the circuit, bringing about the following two impacts:               <ul style="list-style-type: none"> <li>✦ a) Degrade the motor insulation performance and damage the motor in the long run.</li> </ul> </li> </ul>

Part	Mounting Location	Function Description
AC output reactor	Between the AC drive output side and motor, close to the AC drive.	b) Generate large leakage current and cause frequent AC drive protection trips. + If the distance between the AC drive and the motor exceeds 100m, instal an AC output reactor.

### 1.3 Three-phase Input Wiring Mode

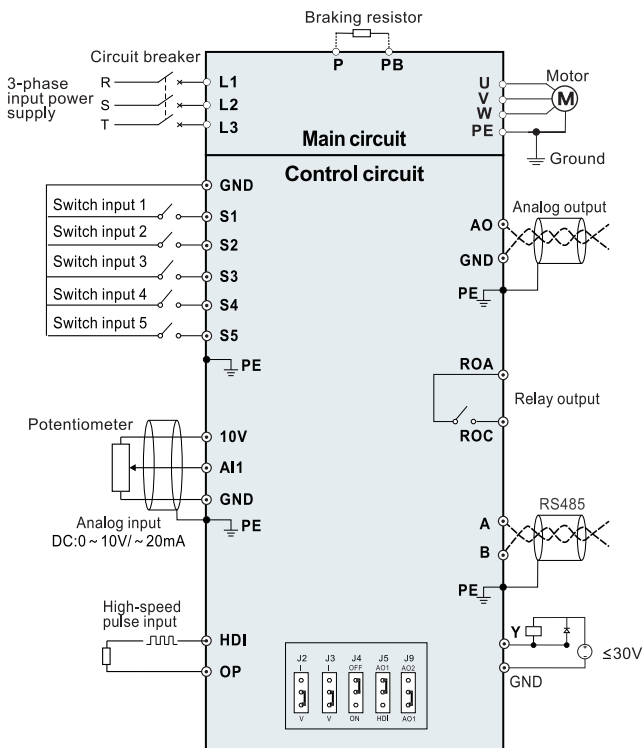


Fig. Basic Wiring Schematic Diagram (1)

## 1.4 Single-phase Input Wiring Mode

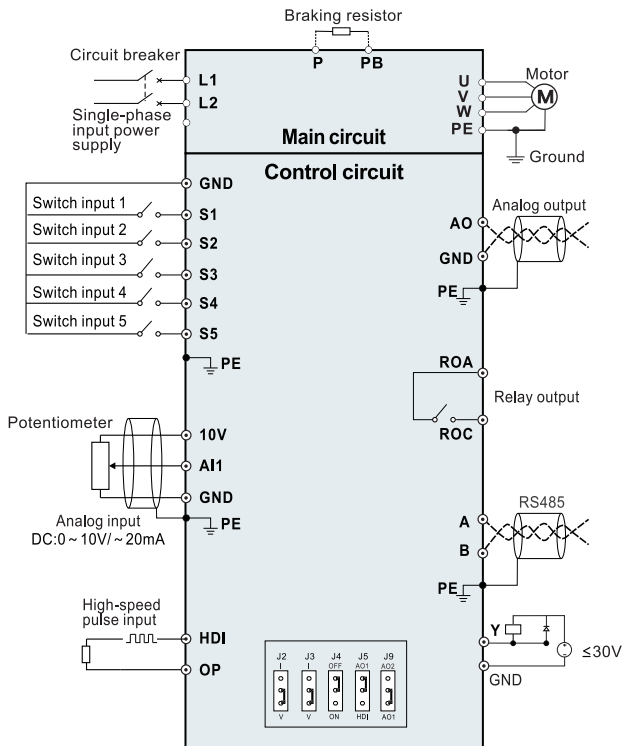


Fig.3-4 Basic Wiring Schematic Diagram (2)

### Precautions on the wiring:

- ① DC bus have residual voltage after the AC drive is switched off. Ensure voltage is less than 36V before touching the equipment. Otherwise, you may get electric shock.
- ② Braking resistor connecting terminals:
  - a. The connecting terminals of the braking resistor are effective only for the AC configured with the built-in braking unit.

b. The cable length of the braking resistor shall be less than 5m. Otherwise, it may damage the AC drive.

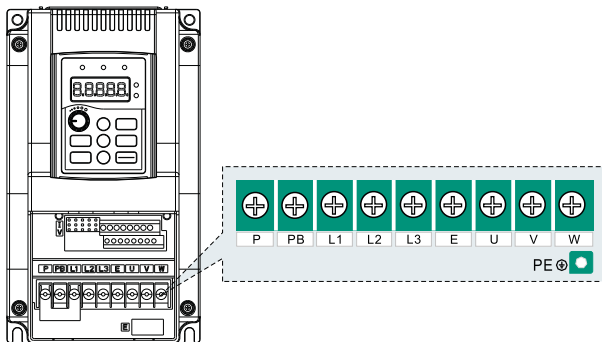
③ The AC drive output terminals: U, V, W

a. The capacitor or surge absorber cannot be connected to the output side of the AC drive. Otherwise, it may cause frequent AC drive fault or even damage the AC drive.

b. If the motor cable is too long, this will damage the motor insulation or generate higher leakage current, causing the AC drive to trip in overcurrent protection. If the motor cable is greater than 30m, need to reduce the carrier to decrease the leakage current; if it is greater than 50 m long, an AC output reactor must be installed close to the AC drive.

④ Protective grounding terminal PE: Must be reliably connected to the main grounding conductor. Grounding wire diameter should be greater than 10mm<sup>2</sup> and the resistance must be less than 5Ω. Otherwise, it may cause electric shock, mal-function or even damage to the AC drive. Do not connect the grounding terminal to the neutral conductor of power supply.

### 1.5 The main circuit terminals and function



**CFM90** main circuit terminals diagram

## 2.1 Introduction of the keypad

You can modify the parameters, monitor the working status and start or stop the CF90 by operating the operation panel, as shown in the following figure.



























Fig Keypad

### Note:

It is necessary to use M3 screw or install bracket to fix the external keypad.

No	Name	Instructions		
1	Status indicator	RUN	LED off means that the AC drive is in the stop state; LED on means the AC drive is in the running state.	
		LOCAL/REMOT	It indicates whether the AC drive is operated by means of operation panel, terminals or communication.	
			○ LOCAL/REMOT: OFF	Operation panel control
			● LOCAL/REMOT: ON	Terminals control
● LOCAL/REMOT: Blinking	Communication control			
	FWD/REV	ON means the AC drive is in the reverse rotation state; OFF means the AC drive is in the forward rotation state.		
2	Unit indicator	It represents the current display of the keypad		
		Hz	Frequency unit	
		A	Current unit	

No	Name	Instructions																																																																		
3	Poten-tiometer	When the frequency source A or B is set to 1, the setting of the frequency source is determined by analog potentiometer input voltage. The maximum output voltage corresponding to the maximum frequency. The minimum voltage corresponding to 0Hz																																																																		
4	Code display zone	<p>Five-figure LED display displays various monitoring date and alarm code such as set frequency and output frequency.</p> <table border="1"> <thead> <tr> <th>Display letter</th> <th>Corresponding letter</th> <th>Display letter</th> <th>Corresponding letter</th> <th>Display letter</th> <th>Corresponding letter</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>1</td> <td>1</td> <td>2</td> <td>2</td> </tr> <tr> <td>3</td> <td>3</td> <td>4</td> <td>4</td> <td>5</td> <td>5</td> </tr> <tr> <td>6</td> <td>6</td> <td>7</td> <td>7</td> <td>8</td> <td>8</td> </tr> <tr> <td>9</td> <td>9</td> <td>A</td> <td>A</td> <td>b</td> <td>B</td> </tr> <tr> <td>C</td> <td>C</td> <td>d</td> <td>d</td> <td>E</td> <td>E</td> </tr> <tr> <td>F</td> <td>F</td> <td>H</td> <td>H</td> <td>l</td> <td>l</td> </tr> <tr> <td>L</td> <td>L</td> <td>N</td> <td>N</td> <td>n</td> <td>n</td> </tr> <tr> <td>o</td> <td>o</td> <td>P</td> <td>P</td> <td>r</td> <td>r</td> </tr> <tr> <td>S</td> <td>S</td> <td>t</td> <td>t</td> <td>U</td> <td>U</td> </tr> <tr> <td>u</td> <td>v</td> <td>.</td> <td>.</td> <td>-</td> <td>-</td> </tr> </tbody> </table>	Display letter	Corresponding letter	Display letter	Corresponding letter	Display letter	Corresponding letter	0	0	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	A	A	b	B	C	C	d	d	E	E	F	F	H	H	l	l	L	L	N	N	n	n	o	o	P	P	r	r	S	S	t	t	U	U	u	v	.	.	-	-
Display letter	Corresponding letter	Display letter	Corresponding letter	Display letter	Corresponding letter																																																															
0	0	1	1	2	2																																																															
3	3	4	4	5	5																																																															
6	6	7	7	8	8																																																															
9	9	A	A	b	B																																																															
C	C	d	d	E	E																																																															
F	F	H	H	l	l																																																															
L	L	N	N	n	n																																																															
o	o	P	P	r	r																																																															
S	S	t	t	U	U																																																															
u	v	.	.	-	-																																																															
5	Keypad buttons zone	<table border="1"> <tbody> <tr> <td></td> <td>Program key</td> <td>Enter or exit Level I menu.</td> </tr> <tr> <td></td> <td>Confirm key</td> <td>Enter the menu interfaces level by level, and confirm the parameter setting</td> </tr> <tr> <td></td> <td>Increment</td> <td>Increase data or function code progressively</td> </tr> <tr> <td></td> <td>Decrement</td> <td>Decrease data or function code progressively</td> </tr> <tr> <td></td> <td>Right-Shift key</td> <td>Move right to select the displaying parameter circularly in stopping and running mode. Select the parameter modifying digit during the parameter modification.</td> </tr> <tr> <td></td> <td>Run key</td> <td>The key used to operate the AC drive in keypad operation mode.</td> </tr> <tr> <td></td> <td>Stop/Reset key</td> <td>This key is used to stop in running status and it's limited by function code F06.03. This key used to reset all control modes in the fault alarm state.</td> </tr> <tr> <td></td> <td>S key</td> <td>The function of this key is confirmed by function code F06.01</td> </tr> </tbody> </table>		Program key	Enter or exit Level I menu.		Confirm key	Enter the menu interfaces level by level, and confirm the parameter setting		Increment	Increase data or function code progressively		Decrement	Decrease data or function code progressively		Right-Shift key	Move right to select the displaying parameter circularly in stopping and running mode. Select the parameter modifying digit during the parameter modification.		Run key	The key used to operate the AC drive in keypad operation mode.		Stop/Reset key	This key is used to stop in running status and it's limited by function code F06.03. This key used to reset all control modes in the fault alarm state.		S key	The function of this key is confirmed by function code F06.01																																										
	Program key	Enter or exit Level I menu.																																																																		
	Confirm key	Enter the menu interfaces level by level, and confirm the parameter setting																																																																		
	Increment	Increase data or function code progressively																																																																		
	Decrement	Decrease data or function code progressively																																																																		
	Right-Shift key	Move right to select the displaying parameter circularly in stopping and running mode. Select the parameter modifying digit during the parameter modification.																																																																		
	Run key	The key used to operate the AC drive in keypad operation mode.																																																																		
	Stop/Reset key	This key is used to stop in running status and it's limited by function code F06.03. This key used to reset all control modes in the fault alarm state.																																																																		
	S key	The function of this key is confirmed by function code F06.01																																																																		

In Level III menu, if the parameter has no blinking digit, it means that the parameter cannot be modified. This may be because:

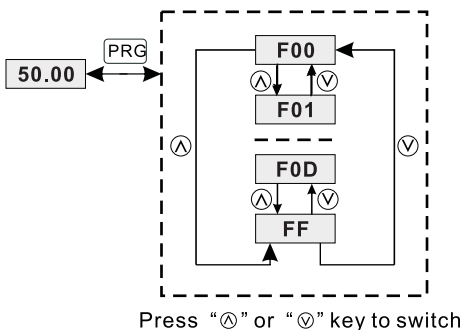
- ① Such a function code is only readable, such as, AC drive model, actually detected parameter and running record parameter.
- ② Such a function code cannot be modified in the running state and can only be changed at stop.

## 2.2 Structure of Function Codes

Function Code Group of **CFM90** AC drives

Function Code Group	Function	Instructions
F00~F0C	Setting function codes	Users can set function parameters
F0D	Status function group	Users can view the state parameters
F0F	Factory parameter group	Only factory use

In the function code display state, select the required function group by pressing the key “ $\Delta$ ” and “ $\nabla$ ”, as shown in the following figure.



## 2.3 Viewing Status Parameters

Status parameters including stop status parameters and running status parameters which display different contents. In the stop or running state, you can press shift key to display multiple status parameters. Whether parameters are displayed is determined by the binary bits of values converted from the values of F06.04, F06.05 and F06.06 in the hexadecimal format. In stop state, a total of 16 status parameters can be displayed, as listed in the following table.



Function Code	Name	Setting Range	Default	Property
Group F00 Basic Function				
F00.00	Speed control mode	0: V/F control 1: Vector mode 0 control	1	⊙
F00.01	Run command channel	0: Keypad running command channel (LED OFF) 1: Terminal running command channel (LED ON) 2: MODBUS communication running command channel (LED FLASH)	0	○
F00.02	Reserve	0	0	●
F00.03	Maximum output frequency	F00.04~600.00 Hz	50 Hz	⊙
F00.04	Upper limit of the running frequency	F00.05~F00.03 (Max. frequency)	50 Hz	⊙
F00.05	Lower limit of the running frequency	0.00Hz~F00.04 (Upper limit)	0.0 Hz	⊙
F00.06	A frequency command selection	0: Keypad digital setting 1: Panel potentiometer setting 2: Analog AI1 setting 3: Reserve 4: High-pulse setting(HDI) 5: Simple PLC program setting 6: Multi-stage speed running setting 7: PID control setting 8: MODBUS communication setting	1	○
F00.07	B frequency command selection	0: Keypad digital setting 1: Panel potentiometer setting 2: Analog AI1 setting 3: Reserve 4: High-pulse setting(HDI) 5: Simple PLC program setting 6: Multi-stage running setting 7: PID control setting 8: MODBUS communication setting	5	○
F00.08	B frequency command reference	0: Max output frequency 1: A frequency command	0	⊙
F00.09	B frequency source gain coefficient	0.0~100.0%	100.0%	○

Function Code	Name	Setting Range	Default	Property
F00.10	Combination mode of the setting	0: A 1: B 2: (A+B) 3: (A-B) 4: Max. (A, B) 5: Min. (A, B)	0	○
F00.11	Keypad set frequency	0.00 Hz~F00.03 (max. frequency )	50.00Hz	○
F00.12	Acceleration time 1	0.0~3600.0s	Model dependent	○
F00.13	Deceleration time 1	0.0~3600.0s	Model dependent	○
F00.14	Running direction	0: Default direction 1: Reverse direction 2: Prohibit reverse running	0	○
F00.15	High frequency carrier setting	2.0kHz~10.0kHz	Model dependent	○
F00.16	Low frequency carrier setting	2.0kHz~F00.15	Model dependent	○
F00.17	Motor parameter auto-tuning	0: None 1: Stator resistance + No-load current auto-tuning 2: No-load current auto-tuning	0	⊙
F00.18	Function restore parameter	0: No operation 1: Restore default value 2: Cancel the fault record	0	⊙
<b>Group F01 Start-up and Stop Control</b>				
F01.00	Start running mode	0: Start-up directly 1: Start-up after DC braking	0	⊙
F01.01	Starting frequency of direct start	0.00~50.00Hz	0.50Hz	⊙
F01.02	Retention time of the starting frequency	0.0~100.0s	0.0s	⊙
F01.03	Braking current before starting	0.0~150.0%	0.0%	⊙
F01.04	Braking time before starting	0.0~100.0s	0.0s	⊙

Function Code	Name	Setting Range	Default	Property
F01.05	ACC and DEC mode selection	0: Line 1: Reserve	0	⊙
F01.06	Stop mode selection	0: Decelerate to stop 1: Coast to stop	0	○
F01.07	Starting frequency of stop braking	0.00~F00.03 (Max. frequency )	0.00Hz	○
F01.08	Waiting time of stop braking	0.0~50.0s	0.0s	○
F01.09	Stop DC braking current	0.0~150.0%	0.0%	○
F01.10	Stop DC braking time	0.0~50.0s	0.0s	○
F01.11	Dead time of FWD/REV rotation	0.0~3600.0s	0.0s	○
F01.12	Shift mode of FWD/REV rotation	0: Shift after zero frequency 1: Shift after starting frequency 2: Shift after stopping speed and delay time (delay time is set by F01.22)	0	⊙
F01.13	Stopping frequency	0.00~50.00Hz	1.00Hz	⊙
F01.14	Detection time of stop frequency	0.0~100.0s	0.5s	⊙
F01.15	Reserve	0	0	●
F01.16	Terminal running protection selection when powering on	0: The terminal running command is invalid when powering on 1: The terminal running command is valid when powering on	0	○
F01.17	Action if running frequency < frequency lower limit (Valid: > 0)	0: Run at lower limit frequency 1: Stop 2: Zero speed operation	0	⊙
F01.18	Hibernation restore delay Time	0.0~3600.0s (F01.17 = 2 is valid)	0.0s	○
F01.19	Restart after power off	0: Disable 1: Enable	0	○
F01.20	Waiting time of restart after power off	0.0~3600.0s (F01.19=1 is valid)	1.0s	○

Function Code	Name	Setting Range	Default	Property
F01.21	Start delay time	0.0~60.0s	0.0s	○
F01.22	Delay time of the stop speed	0.0~100.0s	0.0s	○
<b>Group F02 Motor Parameters</b>				
F02.00	Reserve	0	0	●
F02.01	Motor type	0: General asynchronous motor (With low frequency compensation) 1: AC drive asynchronous motor (without low frequency compensation)	0	⊙
F02.02	Motor rated power	0.1~100.0kW	Model dependent	⊙
F02.03	Motor rated voltage	0~1200V	Model dependent	⊙
F02.04	Motor rated current	0.8~1000.0A	Model dependent	⊙
F02.05	Motor rated frequency	0.01Hz~F00.03 (max frequency)	50.00Hz	⊙
F02.06	Motor rated rotational speed	1~36000rpm	Model dependent	⊙
F02.07	Motor stator resistance	0.001~65.535Ω	Model dependent	○
F02.08	Motor no-load current	0.2~30.0A	Model dependent	○
F02.09	Overload protection selection	0: No protection 1: General Motor protection 2: Variable frequency motor protection	1	⊙
F02.10	Overload protection coefficient	20.0%~120.0%	100.0%	○
<b>Group F03 V/F Control</b>				
F03.00	V/F curve setting	0: Linear V/F curve 1: Multiple-point V/F curve 2: 1.3 <sup>th</sup> power low torque V/F curve 3: 1.7 <sup>th</sup> power low torque V/F curve 4: 2.0 <sup>th</sup> power low torque V/F curve	0	⊙
F03.01	Torque boost	0.0% (Automatic); 0.1%~20.0%	0.0%	○
F03.02	Torque boost close	0.0~50.0% (Relative to motor rated frequency)	20.0%	○
F03.03	V/F frequency point 1	0.00Hz~F03.05	00.00Hz	○

Function Code	Name	Setting Range	Default	Property
F03.04	V/F voltage point 1	0.0~100.0% (Motor rated voltage)	00.0%	○
F03.05	V/F frequency point 2	F03.03~F03.07	00.00Hz	○
F03.06	V/F voltage point 2	0.0~100.0% (Motor rated voltage)	00.0%	○
F03.07	V/F frequency point 3	F03.05~F02.05 (Motor rated frequency)	00.00Hz	○
F03.08	V/F voltage point 3	0.0~100.0% (Motor rated voltage)	00.0%	○
F03.09	V / F slip compensation gain	0.0~200.0%	100.0%	○
F03.10	V / F slip compensation close frequency	0.00HZ~F00.03 (max frequency)	50.00Hz	○
F03.11	Low frequency suppression oscillation factor	0~30	2	○
F03.12	High frequency suppression oscillation factor	0~30	2	○
F03.13	Motor suppression oscillation demarcation point	0.00Hz~F00.03 (Max frequency)	30.00Hz	○
F03.14	Reserved	-----	-	-
F03.15	Reserved	-----	-	-
F03.16	Reserved	-----	-	-
F03.17	Reserved	-----	-	-
F03.18	Reserved	-----	-	-
F03.19	Reserved	-----	-	-
F03.20	AVR function selection	0: Invalid 1: Valid	1	○

## - SERVICIO TÉCNICO

Dirección: Carlos M. Ramírez 2555 - Capital Federal - Argentina

Teléfono: (011) 4918 - 2299

E-mail: [info@mocbos.com](mailto:info@mocbos.com)

Web: [www.mocbos.com](http://www.mocbos.com)

**MOTORTECH S.A.**



¡Descargar PDF!