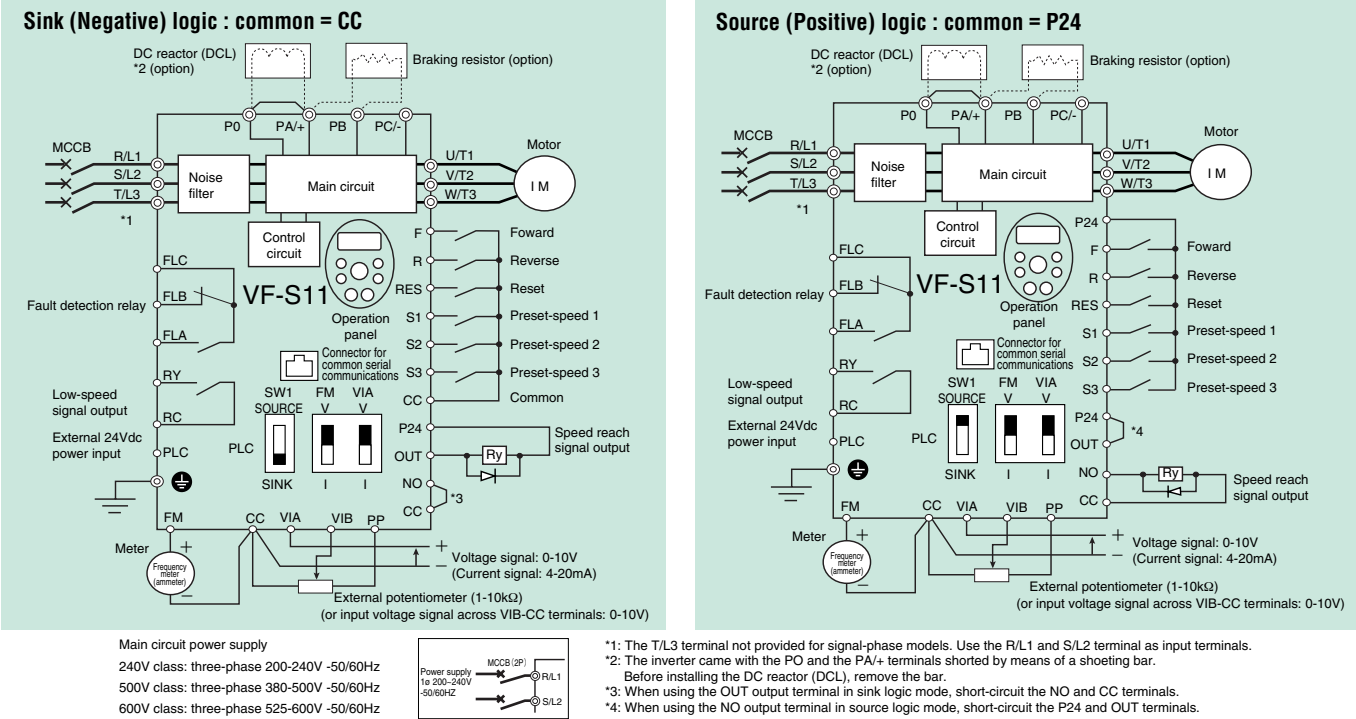


Connection diagram and selection of wiring devices

Standard connection diagram



wiring devices

Voltage class	Capacity applicable motor (kW)	Inverter model	Modified-case circuit breaker (MCCB) Earth leakage circuit breaker (ELCB)		Magnetic contactor (MC)	Overload relay (Th-Ry)	Wire size (mm ²)			
			Rated current(A) Note 8)	Rated current(A) Note 8)			Adjusted current (A) (For reference)	Main circuit (mm ²) Note 4,8)	DC reactor (optional)(mm ²)	Braking resistor (optional)(mm ²)
3-phase 240V class	0.4	VFS11-2004PM	5(5)	9(9)	2.3	2.0(2.0)	1.25	2.0	3.5	
	0.55	VFS11-2005PM	10(5)	9(9)	2.7	2.0(2.0)	2.0	2.0	3.5	
	0.75	VFS11-2007PM	10(5)	9(9)	3.6	2.0(2.0)	2.0	2.0	3.5	
	1.5	VFS11-2015PM	15(10)	9(9)	6.8	2.0(2.0)	2.0	2.0	3.5	
	2.2	VFS11-2022PM	20(15)	12(12)	9.3	2.0(2.0)	2.0	2.0	3.5	
	4.0	VFS11-2037PM	30(30)	25(18)	15	3.5(2.0)	3.5	2.0	3.5	
	5.5	VFS11-2055PM	50(40)	32(25)	22	5.5(2.0)	8.0	2.0	5.5	
	7.5	VFS11-2075PM	60(50)	38(38)	28	8.0(5.5)	14	3.5	5.5	
	11	VFS11-2110PM	100(75)	65(50)	44	14(8.0)	14	5.5	8.0	
3-phase 500V class	0.4	VFS11-4004PL	5(5)	9(9)	1.0	2.0(2.0)	2.0	2.0	3.5	
	0.75	VFS11-4007PL	5(5)	9(9)	1.6	2.0(2.0)	2.0	2.0	3.5	
	1.5	VFS11-4015PL	10(10)	9(9)	3.6	2.0(2.0)	2.0	2.0	3.5	
	2.2	VFS11-4022PL	15(10)	9(9)	5.0	2.0(2.0)	2.0	2.0	3.5	
	4.0	VFS11-4037PL	20(15)	12(9)	6.8	2.0(2.0)	2.0	2.0	3.5	
	5.5	VFS11-4055PL	30(20)	18(18)	11	2.0(2.0)	3.5	2.0	3.5	
	7.5	VFS11-4075PL	30(30)	25(18)	15	3.5(2.0)	5.5	2.0	3.5	
	11	VFS11-4110PL	50(40)	32(25)	22	5.5(2.0)	8.0	2.0	5.5	
	15	VFS11-4150PL	60(50)	38(38)	28	8.0(5.5)	14	3.5	5.5	
1-phase 240V class	0.2	VFS11S-2002PL	5(5)	9(9)	1.3	2.0(2.0)	2.0	2.0	3.5	
	0.4	VFS11S-2004PL	10(5)	9(9)	2.3	2.0(2.0)	2.0	2.0	3.5	
	0.75	VFS11S-2007PL	15(10)	9(9)	3.6	2.0(2.0)	2.0	2.0	3.5	
	1.5	VFS11S-2015PL	20(15)	18(12)	6.8	2.0(2.0)	2.0	2.0	3.5	
	2.2	VFS11S-2022PL	30(30)	25(18)	9.3	2.0(2.0)	3.5	2.0	3.5	
3-phase 600V class	0.75	VFS11-6007P	5(5)	9(9)	1.0	2.0(2.0)	2.0	2.0	3.5	
	1.5	VFS11-6015P	10(10)	9(9)	1.6	2.0(2.0)	2.0	2.0	3.5	
	2.2	VFS11-6022P	10(10)	9(9)	3.6	2.0(2.0)	2.0	2.0	3.5	
	4.0	VFS11-6037P	15(15)	12(12)	5.0	2.0(2.0)	2.0	2.0	3.5	
	5.5	VFS11-6055P	20(20)	18(18)	6.8	2.0(2.0)	2.0	2.0	3.5	
	7.5	VFS11-6075P	30(30)	25(25)	11	2.0(2.0)	2.0	2.0	3.5	
	11	VFS11-6110P	30(30)	25(25)	15	3.5(3.5)	3.5	2.0	3.5	
15	VFS11-6150P	40(40)	33(33)	22	5.5(5.5)	5.5	2.0	5.5		

- Note) 1. Be sure to attach surge killer to the exciting coil of the relay and the magnetic contactor.
 2. 500V and 600V class: For the operation and control circuit, regulate the voltage at 240V or less with a step-down transformer.
 3. When using the auxiliary contacts 2a of the magnetic contactor MC for the control circuit, connect the contacts 2a in parallel to increase reliability.
 4. Size of the wires connected to the input terminals R, S and T and the output terminals U, V and W when the length of each wire does not exceed 30m.
 5. For the control circuit, use shielded wires 0.75 mm² or more in diameter.
 6. For grounding, use a cable with a size equal to or larger than the above.
 7. The wire sizes specified in the above table apply to HV wires (copper wires shielded with an insulator with a maximum allowable temperature of 75°C) used at an ambient temperature of 50°C or less.
 8. The numeric values in parentheses refer to the sizes of wires to be used when a DC reactor is connected.

Terminal functions

Main circuit terminal functions

Terminals symbol	Terminal function
	Grounding terminal for connecting inverter. There are 3 terminals in total. 2 terminals in the terminal board, 1 terminal in the cooling fin.
R/L1, S/L2, T/L3	240V class: single-phase 200~240V-50/60Hz three-phase 200~240V-50/60Hz 500V class: three-phase 380~500V-50/60Hz 600V class: three-phase 525~600V-50/60Hz * Single-phase input: R/L1 and S/L2 terminals
U/T1, V/T2, W/T3	Connect to a (three-phase induction) motor.
PA/+, PB	Connect to braking resistors. Change parameters <i>F304, F305, F308, F309</i> if necessary.
PC/-	This is a negative potential terminal in the internal DC main circuit. DC common power can be input across the PA/+ terminals (positive potential).
PO, PA/+	Terminals for connecting a DC reactor (DCL: optional external device). Shorted by a short bar when shipped from the factory. Before installing DCL, remove the short bar.

Control circuit terminal functions

Terminal symbol	Function	Electrical specifications	Wire size
F	Multifunction programmable contact input	Dry contact input 24Vdc - 5mA or less	Solid wire : 0.3 to 1.5 (mm ²) Stranded wire : 0.3 to 1.5 (mm ²) (AWG22 to 16) Sheath strip length : 6 (mm)
R			
RES			
S1			
S2			
S3			
PLC	External 24Vdc power input	(Insulation resistance: 50Vdc)	
CC	Control circuit's equipotential terminal (sink logic). 3 common terminals for input/output.		
PP	Power output for analog input setting.	10Vdc (permissible load current: 10mAdc)	
VIA	Multifunction programmable analog input. Standard default setting: 0-10Vdc input and 0-60Hz frequency. The function can be changed to 4-20 mAdc (0-20 mA) current input by flipping the VIA slide switch to the I position.	10Vdc (internal impedance: 30kΩ) 4~20mA (Internal impedance: 250Ω)	
VIB	Multifunction programmable analog input. Standard default setting: 0-10Vdc input and 0-50Hz (50Hz setting) or 0-60Hz (60Hz setting) frequency.	10Vdc (internal impedance: 30kΩ)	
FM	Multifunction programmable analog output. Standard default setting: output frequency. Connect a 1mAdc full-scale ammeter or 7.5Vdc (10Vdc)-1mA full-scale voltmeter. The function can be changed to 0-20mAdc (4-20mA) current output by flipping the FM slide switch to the I position.	1mA full-scale DC ammeter or 7.5Vdc 1mA full-scale DC voltmeter 0-20mA (4-20mA) full-scale DC ammeter	Screwdriver: Small-sized flat-blade screwdriver Blade thickness: 0.4 mm or less Blade width: 2.5 mm or less
P24	When the source logic is used, a common terminal 24Vdc is connected.	24Vdc - 100mA	
OUT NO	Multifunction programmable open collector output. Standard default settings detect and output speed reach signal output frequencies. The NO terminal is an isoelectric output terminal. It is insulated from the CC terminal. These terminals can also be used as multifunction programmable pulse train output terminals.	Open collector output: 24Vdc - 50mA Pulse train output 10mA or more	
RC RY	Multifunction programmable relay contact output. Contact ratings: 250Vac - 2A (cosφ = 1), 30Vdc - 1A, 250Vac - 1A (cosφ = 0.4). Standard default settings detect and output low-speed signal output frequencies.	250Vac - 1A: at resistance load 30Vdc - 0.5A, 250Vac - 0.5A (cosφ = 0.4)	
FLA FLB FLC	Multifunction programmable relay contact output. Contact ratings: 250Vac-1A (cosφ = 1), 30Vdc-0.5A, 250Vac-0.5A (cosφ = 0.4). Detects the operation of the inverter's protection function. Contact across FLA-FLC is closed and FLB-FLC is opened during protection function operation.	250Vac - 1A: at resistance load 30Vdc - 0.5A, 250Vac - 0.5A (cosφ = 0.4)	

- Note 1: By changing parameter setting, this terminal can also be used as a multifunction programmable contact input terminal. When the inverter is used in a sink logic configuration, a resistor (4.7kΩ at 0.5W) should be inserted between the P24 and VIA/VIB terminals. Also, the slide switch for the VIA terminal needs to be turned to the V position.
 Note 2: Multifunction output terminals to which two different functions can be assigned.

Terminal functions