Terminals for Main Circuit

● 1-phase 200V type 0.2 to 2.2kW
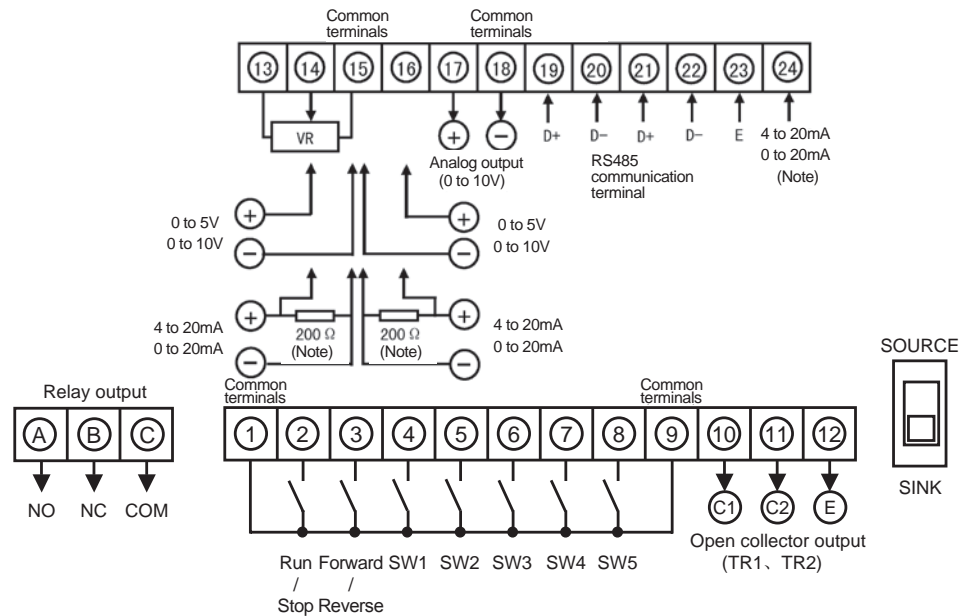
Terminal block for main circuit ⏚ : Symbol for grounding

POWER L1 L2
BRAKE UNIT ONLY P/DB+ N- DB-
MOTOR U V W

Power source
Circuit breaker for wiring (MCCB)
IM Motor
Braking resistor

● 3-phase 400V type 0.75 to 15kW

Terminal block for main circuit ⏚ : Symbol for grounding

POWER R/L1 S/L2 T/L3
BRAKE UNIT ONLY P/DB+ N- DB-
MOTOR U V W

Power source
Circuit breaker for wiring (MCCB)
IM Motor
Braking resistor
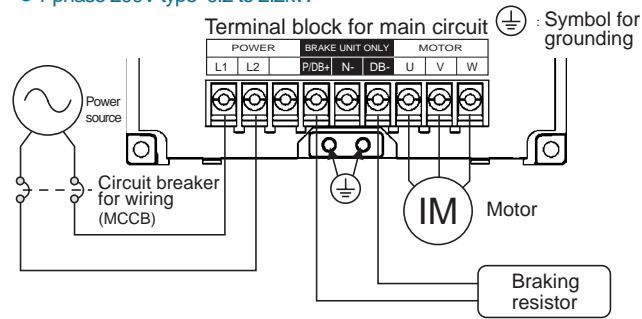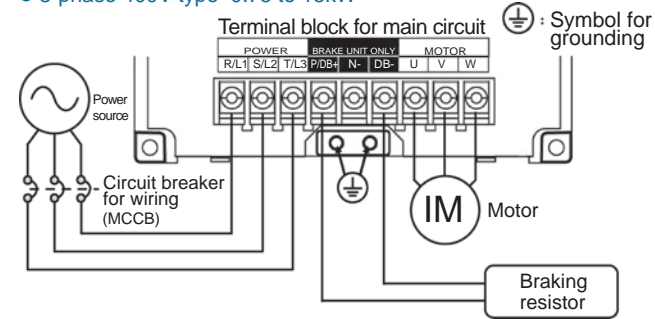
● Functions of Terminals for Main Circuit

Terminal No.	Terminal Name	Explanation of terminal function
R/L1, S/L2, T/L3	Power supply for Main circuit	For 1-phase 200 V type, connect to terminal L1 and L2.
U,V,W	Inverter output	Connect to 3-phase motor.
P/DB+, DB-	Braking resistor connection	Connect to braking resistor.
N-	Internal DC voltage (negative)	Negative terminal of internal DC voltage.
⏚ ×2	Ground	Ground terminal. 1-phase 200 V: ground resistance 100Ω or less 3-phase 400 V: ground resistance 10Ω or less Ground the neutral of power source.

Control Circuit Terminal

Common terminals ⑬ ⑭ ⑮ ⑯ Common terminals ⑰ ⑱ ⑲ ⑳ ㉑ ㉒ ㉓ ㉔

VR
Analog output (0 to 10V) + −
RS485 communication terminal D+ D− D+ D−
E
4 to 20mA 0 to 20mA (Note)

0 to 5V / 0 to 10V + −
0 to 5V / 0 to 10V + −

4 to 20mA 0 to 20mA + − 200 Ω (Note) 200 Ω (Note) 4 to 20mA 0 to 20mA + −

SOURCE
SINK

Relay output
Ⓐ Ⓑ Ⓒ
NO NC COM

Common terminals
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨
Common terminals
⑩ ⑪ ⑫
C1 C2 E

Run Forward SW1 SW2 SW3 SW4 SW5 / Stop Reverse

Open collector output (TR1、TR2)

● Note) a built-in 200 Ω resistor should be set between terminal No.24 and a common terminal. If analog input signal of 4 to 20mA/0 to 20mA is used, external resistor connection can be eliminated by connecting terminal No.24 to No.14 or No.16. For external connection, it is recommended to use a resistor of 200 Ω, 1/4 W.

● Specification of potentiometer for frequency setting: select a potentiometer of "10 kΩ, 1/4 W or higher" rating.
● Relay output specification: 1c contact (contact capacity 230V AC, 0.3A; 30V DC 0.3A resistive load).
● Open-collector Output specification: max. rating 50 VDC/50 mA.
● Please refer to the User Manual for the SOURCE status terminal arrangement diagram and the functions of various terminals.

Panasonic®

Panasonic

NEW

Simple Vector Control Inverter

VF200 SERIES

High-efficiency Operation, Outstanding Performance

2012.11 | device.panasonic.cn/ac

VF200 INVERTER

Powerful

Use vector control to output higher torque at low-speed

▶ Higher torque can be generated at low-medium speed (1Hz→150%) by making use of our Company's original vector control technology. Equipments with great fluctuation in loads and requiring a sufficient starting torque, for example conveyor belts and turntables on which there are large numbers of semi-finished products, can be operate smoothly. In addition, the vector control technology also plays a significant role in the operation of the canned foods caulking machines, punching machines, injection molding machines, as well as other machines that require low-speed torque. Inverter with higher capacity is not needed in this case, which contributes greatly to the reduction of cost and installation space.

▶ It is also equipped with auto-tuning function which can conduct simple and appropriate parameter settings thus giving a full play to the motor characteristic.
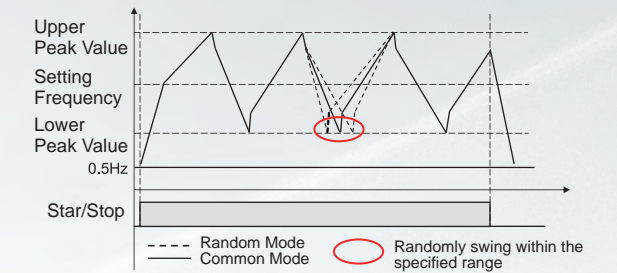
● Turntable M

● Injection molding machine M

Easy

Apply large-scale operation panel to further improve the operability

▶ Highly visible 7-segment large format display;
▶ Ease-to-use large volume knob;
▶ Easy recognizable operation key.

Detachable operation panel

▶ Parameter can be easily copy to another unit.
▶ Have a dimension of 72mm×72mm, it is attractive even if it is mounted on the panel surface.
▶ Standard LAN cables (max. 5m), which can be bought easily from the market, are used to realize the connection between the operation panel and the host. It has the characteristics of ease purchase and affordable price.
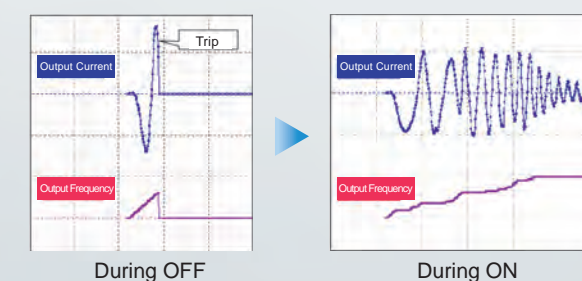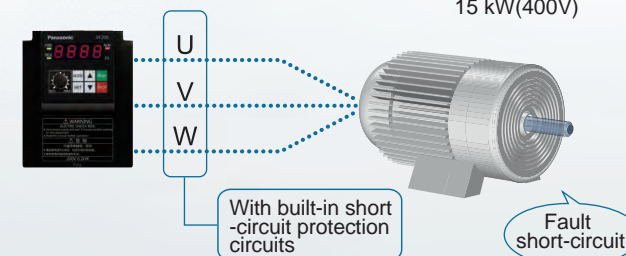
● Copy parameters

Copy   Copy

● Operation panel can be prolonged

0.2 kW(200V)
0.4 kW(200V)
0.75 kW(200V)
1.5 kW(200V)
0.75 kW(400V)
1.5 kW(400V)

2.2 kW(200V)
2.2 kW(400V)
3.7 kW(400V)

5.5 kW(400V)
7.5 kW(400V)

11 kW(400V)
15 kW(400V)

Computer

PLC

● Spinner
Apply to most textile equipments in which inverters are used.

● Control Panel
Which can be connected directly to the touch screen GT series to provide you with a convenient operating environment. For example, you may conduct various operations such as monitoring, setting and operation via the screen.

31 units

VF200 VF200 VF200 ..... VF200

RS485 (Max. 500m)

U
V
W

With built-in short -circuit protection circuits

Fault short-circuit

Trip

Output Current

Output Frequency

During OFF

Output Current

Output Frequency

During ON

Network

Equip with standard RS485 Serial Communication Interface

▶ Can control up to 31 VF200 units via the RS485 serial communication lines. VF200 is also installed with two protocols : Modbus-RTU and MEWTOCOL, that allow control, data collection/monitoring via computer or PLCs.
▶ The FP series PLCs produced by our Company support both Modbus-RTU and MEWTOCOL.

Corresponding Functions for Wire Winding Machines

● Repeated operation around the Winding Spindle
The winding mode control function operates at the frequencies of a triangle wave as shown below.

Upper Peak Value

Setting Frequency

Lower Peak Value
0.5Hz

Star/Stop

Random Mode
Common Mode

Randomly swing within the specified range

● New Operation Mode
· Random swing mode: can effectively prevent the accumulation of wires at the same point
· Winding Wire Length Stop Mode: it will automatically stop after the length of the winding wire had accumulated to the specified value.
· Pulse Input Controlled length Calculation Mode: easily indicate the accumulated length of the winding wire, and the results can be transmitted.
· Two-point Mode: the reference frequency can be ultimately changed to a secondary frequency with the smooth running of the winding wire.

Tough

Incorporate with Output Short-Circuit Protection Circuits

▶ VF200 can detect an over-current resulting from a short circuit due to a fault in the electric motor as a result of over-load, in this case, it will instantaneously disconnect the output to protect the circuit, therefore, you can rest assured that it is safe.

Equip with High-speed Current Limiting Protection function

▶ VF200 will not trip and keep operating even if instantaneous over-current is caused by a change in loads, thus improve the productivity. It is also applicable to the rapid increase in the speed of a heavy turntable and the stirring of materials with a higher viscosity such as bread and noodles.
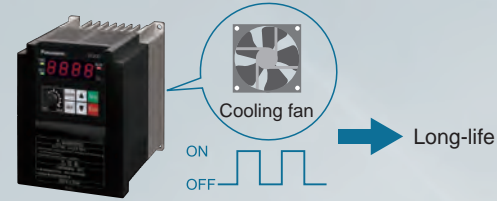
VF200
INVERTER

Highly Flexible Installation & Maintenance

● Tight Installation Is Possible

Tightly-mounted

Installation space was effectively made use.

● Cooling Fan ON/OFF Control

Cooling fan

ON
OFF

Long-life

Cooling fan can be set to always ON when power supply is applied or ON/OFF based on operation signal to prolong its operation.

Use the small-sized PLC [FP-X] and VF200 of Our Company to control the tank pump pressure

Wastewater being discharged from canteen kitchens

Flowmeter ①

Filter

Flowmeter ②

Water used for industrial use

P M

4-20mA
Analog input

4-20mA
Analog input

Decomposition tank

Setting tank

Storage tank

Control panel

Control terminals (①-③)

0-10V
Analog output

FP-X
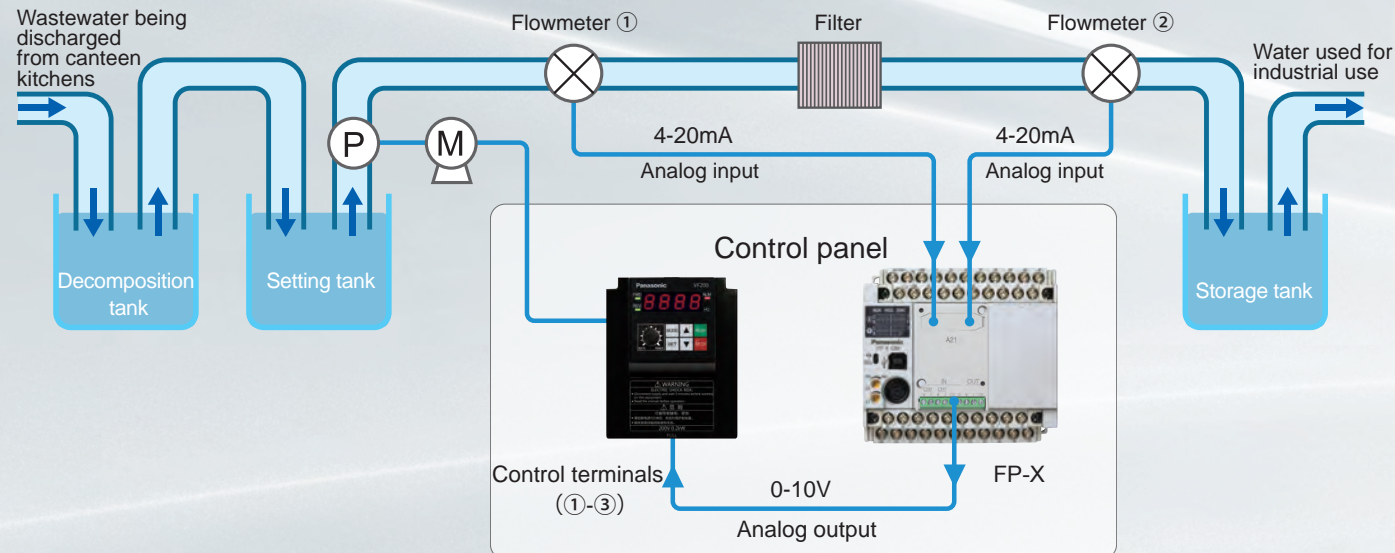
● Composition of PLC

FP-X
Control unit C30T　（AFPX-C30T）
Analog I/O card　（AFPX-A21）

AFPX-C30T

AFPX-A21

● Application Notes

- After wastewater discharged from the canteen kitchen flow through the decomposition and sedimentation process, a pump is used to draw the accumulated clean water from the setting tank. It will then go through second stage of filtration before sending to the storage tank for industrial use.
- VF200 is used to control the speed of motor, ultimately the pressure of pump.
- Use PLC [FP-X] to output speed command (0 to 10V analog signals) to VF200.
- The speed command (0 to 10V analog signals) output by FP-X is based on the value of flowmeter ②. Increase the analog output value in order to raise the pump pressure when the value of the flowmeter decreases.
- In case that the difference between the values of flowmeter ① and flowmeter ② had exceeded a certain value, the filter may be judged to be blocked, in this case, a replacement signal shall be output by FP-X.
- The analog I/O cards (AFPX-A21) installed on the FP-X are used to read in the analog inputs from the flowmeter and generate the analog output to VF200. The installation of expansion cards with small areas in combination with the use of the small-sized VF200 inverter will contribute to the miniaturization of the control panel.

Rated

Model	Operation Panel (Part No.)	simple panel (Part No.)	Applicable Motor Output (kW)	Rated Output Current (A)	Rated Output Capacity (kVA)	Power Capacity (kVA)	Approximate Weight (kg)	Operation Panel	simple panel
1-phase 200V Input Type	AVF200-0022	AVF200-0022P	0.2	1.5	0.6	0.9	1.0		
	AVF200-0042	AVF200-0042P	0.4	2.5	1.0	1.3	1.0		
	AVF200-0072	AVF200-0072P	0.75	4.2	1.7	2.3	1.4		
	AVF200-0152	AVF200-0152P	1.5	7.0	2.8	3.6	1.6		
	AVF200-0222	AVF200-0222P	2.2	10.0	4.0	5.0	2.1		
3-phase 400V Input Type	AVF200-0074	AVF200-0074P	0.75	2.1	1.7(Note 2)	2.6(Note 3)	1.6	(Note 5)	
	AVF200-0154	AVF200-0154P	1.5	4.0	3.2(Note 2)	4.8(Note 3)	1.7		
	AVF200-0224	AVF200-0224P	2.2	5.5	4.4(Note 2)	6.4(Note 3)	1.9		
	AVF200-0374	AVF200-0374P	3.7	8.7(Note 1)	6.9(Note 2)	10.4(Note 3)	2.0		
	AVF200-0554	AVF200-0554P	5.5	12(Note 1)	9.6(Note 2)	13.6(Note 3)	3.5		
	AVF200-0754	AVF200-0754P	7.5	17(Note 1)	13.5(Note 2)	17.6(Note 3)	3.6		
	AVF200-1104	AVF200-1104P	11	22(Note 1)	17.5(Note 2)	21.1(Note 3)	6.8		
	AVF200-1504	AVF200-1504P	15	31(Note 1)	24.5(Note 2)	27.7(Note 3)	7.0		

Note 1: Rated output current of 3.7 kW inverters varies with the set carrier frequency. So, derate the output current in accordance with the set carrier frequency.
Note 2: Rated output capacity: refers to the value at output voltage of 230 VAC for 1-phase 200 V type and the value at output voltage of 460 VAC for 3-phase 400 V type.
Note 3: The power supply capacity varies with source impedance. Please use a power supply as shown on the above table.
Note 4: If excessive amount of current flows through the circuit repeatedly or the unit is used under high temperature, overcurrent trip may occur.
Note 5: the AVF200-REM1 operation panel is applicable to both the 200V and 400V types.
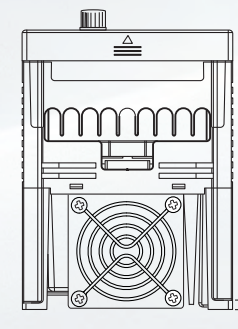
Outline Dimensions

● Main body

4-φd (Mounting holes)

Unit: mm

Panasonic VF200

Hz

MODE RUN
SET STOP
MIN. MAX.

H1 H

W1
W
10.5 D
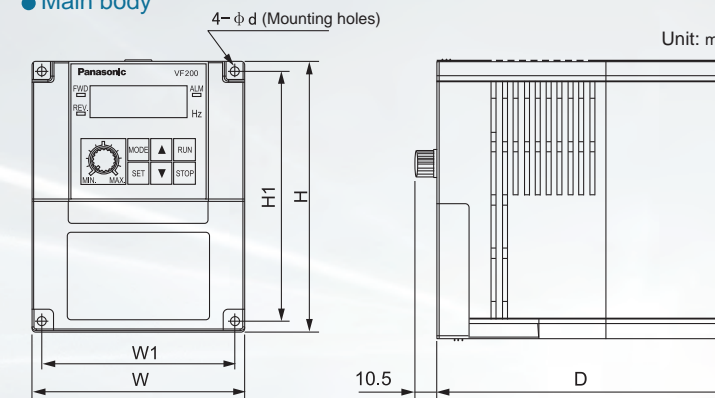
1-phase 200 V input type
Unit: mm

Inverter capacity	W1	W	H1	H	D	Φd
0.2, 0.4kW	100	112	130	143	120	5
0.75, 1.5kW	100	112	130	143	150	5
2.2kW	130	143	130	143	160	5

Note) Cooling fan is not mounted on 0.2 kW～0.75 kW model.

3-phase 400 V input type
Unit: mm

Inverter capacity	W1	W	H1	H	D	Φd
0.75, 1.5kW	100	112	130	143	150	5
2.2, 3.7kW	130	143	130	143	150	5
5.5, 7.5kW	150	163	190	203	179	5
11, 15kW	204	223	265	283	179	7

Note) The cooling fan is not mounted on 0.75 kW model.

● Operation Panel

Unit: mm
7.3

Panasonic VF200
FWD ALM
REV. Hz

MODE RUN
SET STOP
MIN. MAX.

72

72
10.5 16 2

61
61
45

2－φ3.5 (Mounting holes)
61
61

Panel Cut-out

24 (18.5) 3.5

Dimensions of Panel Cut-out (A View)
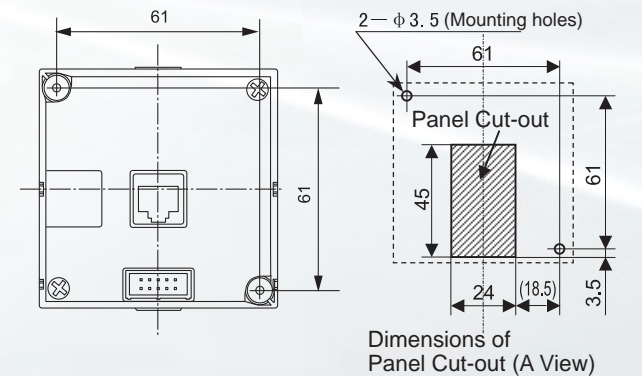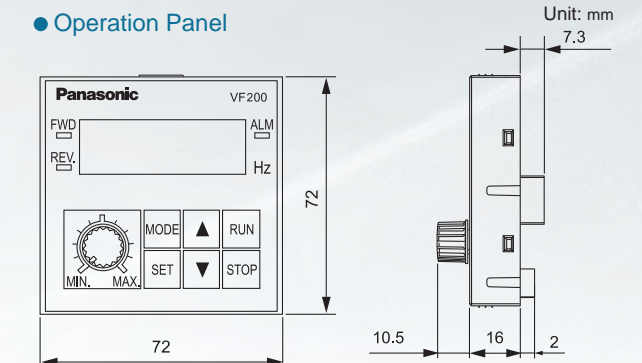
※Please process the mounting plate based on the dimensions of the panel cut-out.
The appropriate thickness of the plate shall be 1.0mm to 3.5mm.

Specifications

● 1-phase 200 V input type

Standard output of applicable motor (kW)		0.2 to 2.2kW
Rated Output	Rated Voltage	1-phase, 200 to 230V AC (proportional to power supply voltage)
	Over-load Current Rating	150% of rated output current for 1 minute
Input power supply	Number of phases, voltage and frequency	1-phase, 200 to 230V AC, 50/60 Hz
	Allowable voltage fluctuation	+10% and −15% of rated input AC voltage
	Allowable frequency fluctuation	±5% of rated input frequency
	Instantaneous voltage drop ride-through capability	Operation continues when voltage is above 165V AC. Operation continues for 15 ms when voltage drops below 165V AC.

● 3-phase 400 V input type

Standard output of applicable motor (kW)		0.75 to 15kW
Rated Output	Rated Voltage	3-phase, 380 to 460V AC (proportional to power supply voltage)
	Over-load Current Rating	150% of rated output current for 1 minute
Input power supply	Number of phases, voltage and frequency	3-phase, 380 to 460V AC, 50/60 Hz
	Allowable voltage fluctuation	+10% and −15% of rated input AC voltage
	Allowable frequency fluctuation	±5% of rated input frequency
	Instantaneous voltage drop ride-through capability	Operation continues when voltage is above 323V AC. Operation continues for 15 ms when voltage drops below 323V AC.

VF200 INVERTER

Specifications

Output Frequency	Frequency range	0.5 to 400Hz
	Frequency display	Digital display
	Frequency accuracy	Analog setting: within ±0.5% of maximum setting frequency (25°C±10°C) Digital setting: within ±0.01% of maximum setting frequency (-10°C to +50°C)
	Frequency resolution	Digital setting: 0.1 Hz Analog setting: 0.1 Hz (in 50/60 Hz mode)
Inverter control mode		High carrier frequency sinusoidal PWM control (V/F control or simple vector control is available.)
Carrier frequency		• V/F control setting: 7 options can be selected (adjustable from 0.8 to 10 kHz). • Simple vector control setting: 4 options can be selected (adjustable from 2.5 to 10 kHz). (0.8, 1.1, 1.6, 2.5, 5.0, 7.5, 10.0kHz)
Operation	Start/Stop	• Operation panel buttons • 1a contact signal and 3-wire input (1a and 1b contact signals) can be selected. • RS485 communication • Wait time (0.1 to 100 s) can be set.
	Forward/Reverse run	• Operation panel buttons • 1a contact signal (reverse run can be disabled.) • RS485 communication
	JOG operation	Operation frequency: adjustable from 0.5 to 400 Hz; acceleration/deceleration time: adjustable from 0.04 to 3600s
	Stop mode	Ramp-to-stop / coast-to-stop (switchable)
	Reset function	Stop signal reset/external reset/panel reset (optional) / power supply reset
	Start frequency	Adjustable from 0.5 to 60 Hz
	Stop frequency	Adjustable from 0.5 to 60 Hz
	Ride-through restart select	0 Hz restart/operation frequency restart/speed search restart (switchable)
	Speed search	Speed search Operation during startup (optional)
	Retry function	Retry select: validity of function, details of retry faults Retry times: adjustable from 1 to 10 times
Control	Frequency setting signal	Panel setting (operation panel): volume and digital setting Analog setting signal input from external control: • Volume (10 kΩ, 1/4 W or higher) • 0 to 5 V DC、0 to 10 V DC • 4 to 20 mA, 0 to 20 mA (An external resistor of 200 Ω/1/4 W or higher is connected.) Digital setting signal input from external control: • PWM signal (cycle: 0.9 to 1100 ms) • Frequency rise SW/reduction SW/storage SW signal Communication setting: RS485 communication
	Frequency/voltage characteristics	Base frequency: fixed at 50/60 Hz, adjustable from 45 to 400 Hz In 3-point V/F mode: adjustable voltage and frequency V/F curve: constant/square torque mode (switchable)
	Torque boost	Adjustable from 0 to 40%/auto torque boost (switchable)
	Acceleration/deceleration time	0.04 to 3600 s (independent acceleration/deceleration setting)
	Acceleration/deceleration characteristics	Linear and S-shaped acceleration/deceleration (switchable)
	The 2nd function select	The 2nd function select (acceleration/deceleration time, torque boost, V/F characteristics (base frequency/3-point V/F mode), electronic thermal and analog frequency setting)
	Multi-speed frequency setting	• Multi-speed operation: up to 16 speed settings (No limitation to frequency setting) • Timer operation: up to 8 speed settings (No limitation to frequency setting) • Pulse input operation: up to 8 speed settings (No limitation to frequency setting) It can be linked with acceleration/ deceleration time.
	Skip frequency setting	Up to 3 settings (skip frequency band adjustable from 1 to 10 Hz)
	Upper frequency limit setting	Adjustable from 0.5 to 400 Hz
	Lower frequency limit setting	Adjustable from 0.5 to 400 Hz

Specifications

Control	Bias/gain frequency setting	Bias frequency: adjustable from -99 to 250% Gain frequency: adjustable from 0 to 500%
	External stop function	External fault stop/coast-to-stop (switchable)
	PID function	PID control mode (optional)
	Automatic tuning	Automatic tuning of motor constant
	Slip compensation control	Available
	Cooling fan ON/OFF control	Available
	Communication function	• Interface : RS485 serial communication • Communication speeds : 4800/9600/19200/38400 bps (switchable) • Protocols : MEWTOCOL-COM/Modbus (RTU) (switchable) • Communication pattern: Half duplex • Maximum number of connected units: 31 • Maximum transmission distance: 500 m (in total)
Braking	Regenerative braking torque	• 200 V 0.2 kW: 100% or higher; 0.4 kW: 80% or higher; 0.75 to 2.2 kW: 20% or higher • 400 V 0.75 to 15 kW: 20% or higher
	DC braking	Operate at the frequency below stop frequency • Braking torque level: 0 to 100 (20 steps adjustable) • Braking time: adjustable from 0.1 to 120 s
Output signal	Analog output	Output specification: 0 to 10V DC (max. 1 mA) Output function: output frequency and output current proportion (switchable)
	Open-collector output	Output specification: max. rating 50V DC/50 mA Output functions: operation signal, arrival signal, overload alarm, frequency detection, abnormal reverse run signal alarm, current detection, timer OFF signal and output frequency/current proportion PWM signal (cycle: 1 ms) (switchable)
	Relay output	Output specification: 1c contact (contact capacity 230 VAC, 0.3 A resistive load) Output functions: operation signal, arrival signal, overload alarm, frequency detection, abnormal reverse run signal alarm, current detection and timer OFF signal (switchable)
Display	Operation/control status	Output frequency, linear speed display (switchable) and rotation direction Output voltage, internal DC voltage, setting frequency, communication station No., operation times of timer, alarm type, control circuit terminal status (I/O signal), operation status, PID (setting value, measured value and output value), progress of automatic tuning, accumulative operation time and accumulative operation time of fan
	Details of abnormality	Specific symbol is indicated when the protection function is activated (the latest four abnormalities are stored.)
Protection	Current limit	Current limit can be set within 1 to 200% of rated output current.
	Trip (stop)	Instantaneous overcurrent (SC1-6) and abnormal temperature (OH) Overcurrent (OC1-3), overload and electronic thermal relay (OL), undervoltage (LU), overvoltage (OU1-3), cooling fan fault (FAN), external fault (AU), operation fault (OP) and CPU fault (CPU)
	Stall prevention function	Overcurrent and overvoltage stall prevention
Environment	Ambient temperature and humidity	-10 to +50°C (Note 1) (without freezing) and below 90%RH (without condensation)
	Storage temperature and humidity	-25 to +65°C and below 95%RH
	Vibration	5.9m/s^2 (0.6G) or lower
	Altitude	1000m or lower
	Location	Indoor areas free of corrosive gases, flammable gases, oil mist or dust
Enclosure		IP20 cabinet-mounted
Cooling method		• 200 V 0.2 to 0.75 kW: self-cooling; 1.5 to 2.2 kW: air-cooling • 400 V 0.75 kW: self-cooling; 1.5 to 15 kW: air-cooling

Note 1: it is -10 to +40°C when multiple inverters are installed side-by-side.

● Product Ordering System

1-phase 200V type: 0.2 to 2.2kW; 3-phase 400V type: 0.75 to 15 kW

A VF200 – 007 2 ☐
① ② ③ ④

①	Series name:	VF200	
②	Applicable motor capacity:	002 : 0.2 kW 004 : 0.4 kW 007 : 0.75 kW 015 : 1.5 kW 022 : 2.2 kW 037 : 3.7 kW	055 : 5.5 kW 075 : 7.5 kW 110 : 11 kW 150 : 15 kW
③	Voltage class:	2 for 1-phase 200 V type; 4 for 3-phase 400V type	
④	Panel type:	without marks: operation panel P: simple panel	