Frequency Inverters

WJ200 Series

Compact Inverter

HITACHI

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WJ200 Series

Industry leading performance

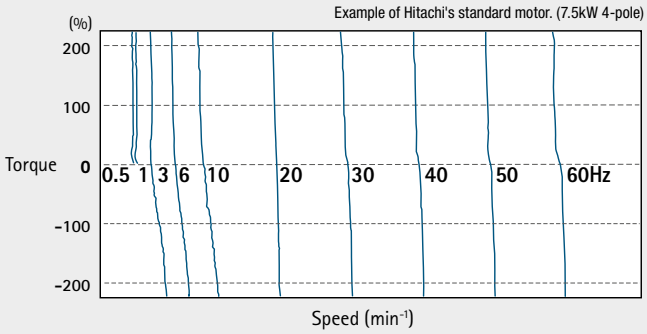
High starting torque of 200% or greater achieved using sensorless vector control

(when sized for heavy duty)

Sensorless vector control allows for the realisation of high torque required for applications such as cranes, hoist, lifts etc.

Auto-tuning function makes the implementation of sensorless vector control easy and effective.

Example of Torque Characteristics



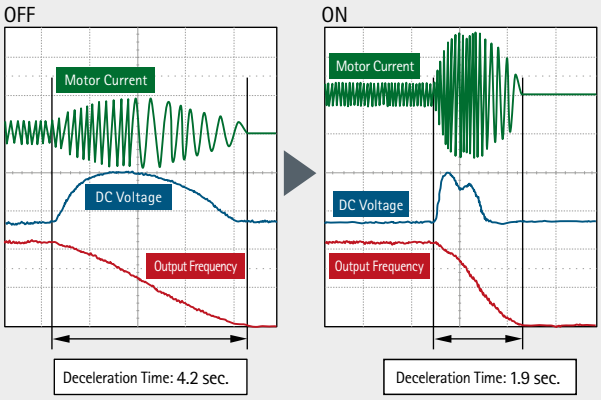
Dual rating

WJ200 can be used for both heavy and normal duty. One-frame-size smaller WJ200 can be applicable to certain applications.

Trip avoidance functions

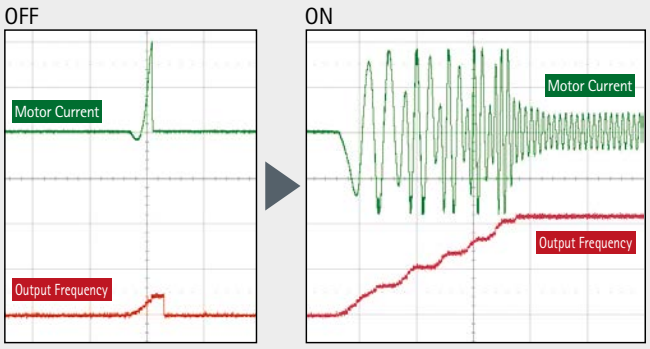
Minimum time deceleration function, over-current suppression and DC bus AVR functions are included as standard. These functions increase the robustness of the product and help to avoid unnecessary tripping. Improved torque limiting/current limiting function enables a load restriction to protect machinery and equipment. (Example of WJ200-075LF)

Minimum time deceleration Function



2.3 sec. reduction of deceleration time without a braking resistor can be achieved when the function is active.

Over-current Suppression Function*



*Turn off this function for lifting equipment.

Model Name Indication

WJ200 – 002 S F

- Series Name
- Applied Motor Capacity
  002: 0.2kW – 150: 15kW
- Power Source
  S: 1-phase 200V class
  H: 3-phase 400V class
- with Digital Operator

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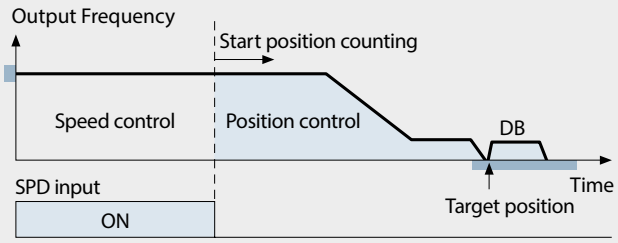
Simple positioning control

(in combination with a feedback signal)

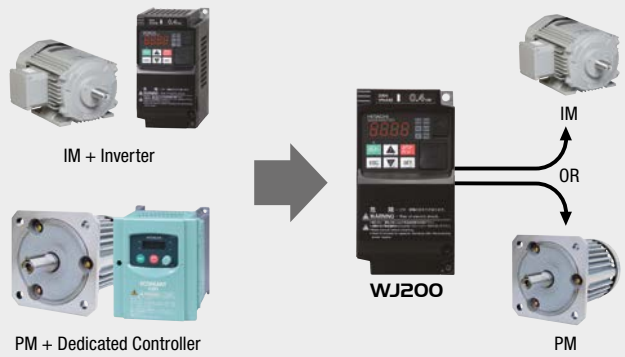
When simple positioning function is activated, speed control operation or positioning control operation is selectable via intelligent input. While the [SPD] input is ON, the current position counter is held at 0. When [SPD] is OFF, the inverter enters positioning control operation and the position counter is active.



Induction motor & Permanent magnet motor* control with one inverter series

The WJ200 inverter can be used to drive both induction motors (IM) and permanent magnetic motors (PM).

PM motors are energy efficient and make effective use of available space.



*The permanent magnet motor control function is only suitable for variable torque applications such as fan and pump.

Model Line-up

Model Name WJ200-xxx	1-phase 200V class		3-phase 400V class	
	VT	CT	VT	CT
002	0.4	0.2		
004	0.55	0.4	0.75	0.4
007	1.1	0.75	1.5	0.75
015	2.2	1.5	2.2	1.5
022	3.0	2.2	3.0	2.2
030			4.0	3.0
040			5.5	4.0
055			7.5	5.5
075			11	7.5
110			15	11
150			18.5	15

3-phase 200 V class versions are also available

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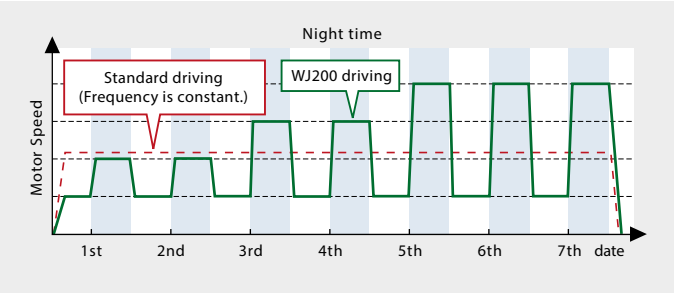
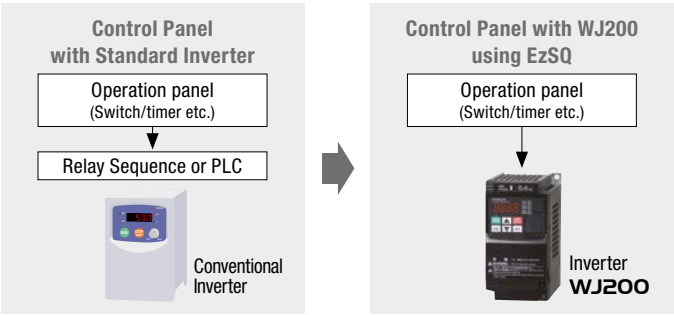
Ease of Use

Easy sequence programming function [EzSQ]

Logic operations can be realised within the inverter using Hitachi's EzSQ software without the need for external relays or a PLC. User programs are compiled using a PC program which are then downloaded to the drive.

- **EzSQ Application Example:** Energy saving through speed reduction on a spinning machine.
  - **Daytime:** Motor speed is automatically reduced to reduce demand during peak hours.
  - **Night-time:** Motor speed is increased to take an advantage of off-peak power rates. Average productivity is maintained.

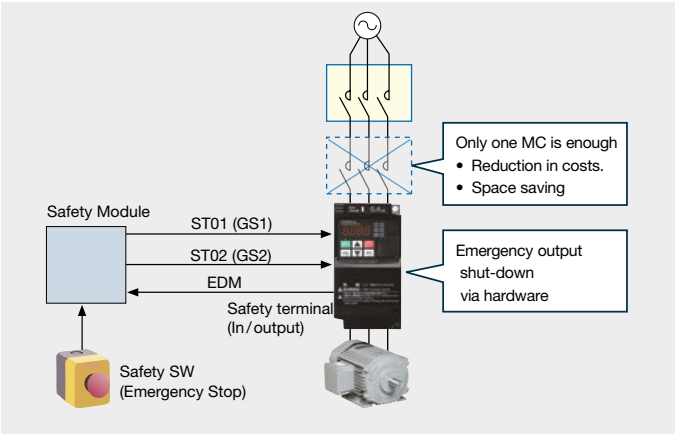




Safety stop function

WJ200 conforms to the applicable safety standards and corresponds to Machinery Directive of Europe. Inverter is shut down via hardware, bypassing the CPU, achieving a reliable safe stop function.

(ISO13849-1 Category 3 / IEC60204-1 Stop Category 0)



Password function

The WJ200 inverter has a password function to prevent changing parameters or to hide some or all parameters.

Ease of Maintenance

Long life time for wearing parts

Design lifetime 10 Years or more* for DC bus capacitors and cooling fan.
Cooling fan ON/OFF control function for longer fan life.

*Ambient temperature: Average 40ºC (no corrosive gases, oil mist or dust)
Design lifetime is calculated, and not guaranteed.

Life time warning function

WJ200 diagnoses lifetime of DC bus capacitors and cooling fan(s).

Easy to remove cooling fan

The cooling fan can be exchanged without special tools.

Top cover can be removed with fingertips.

Remove cooling fan simply by disconnecting the power plug.

Environmental Friendliness

EU RoHS compliant

Environment-friendly inverter meets RoHS requirements

Improvement of environment

Varnish coating of internal PC board is standard.
(Logic PCB and I/F PCB are excluded.)

Micro surge voltage suppress function

Hitachi original PWM control method limits motor terminal voltage to less than twice inverter DC bus voltage.
(During regeneration, the motor terminal voltage may exceed the motor maximum insulation voltage.)

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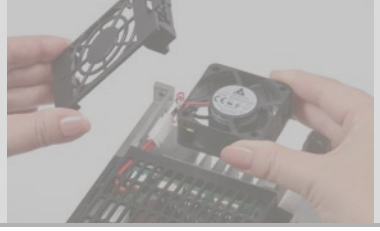
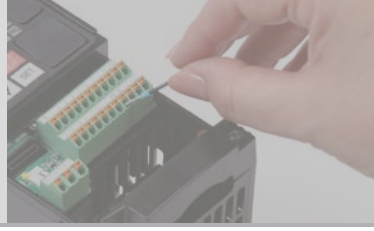
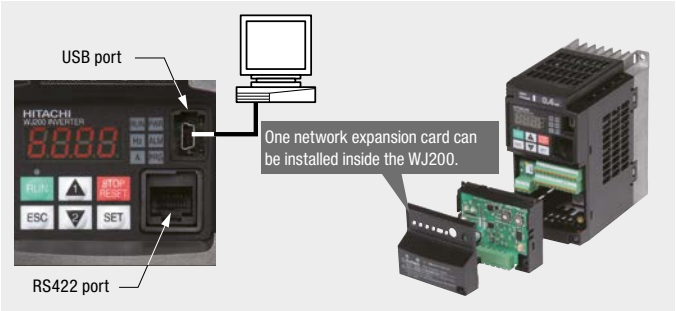




Network compatibility & External ports

USB (Mini-B connector) port and RS422 (RJ45 connector) port are available as standard.

Modbus/RTU serial communication is available as standard. The WJ200 can also be connected to various other fieldbus systems via an optional expansion card.



Easy to configure

Various display modes for easy selection of displayed parameters

- **Basic display**
  Display most frequently used parameters.
- **Data comparison function**
  Display parameters changed from default setting.
- **Quick display**
  Display 32 user-selected parameters.
- **Change history**
  Store and display the most recent parameters changed by the user (Up to 32 items).
- **Active parameter display**
  Display those parameters which are enabled.

Ease of wiring

Screw-less terminals (control circuit terminals) spring-loaded, for use with solid or stranded wire with ferrules.

Screw-less terminals
(Control circuit terminals)

Side-by-side installation

Inverters can be installed with no space between them to save space in the panel.
*Ambient temperature 40ºC max., individual mounting.

Various Versatile Functions

Output monitoring (2 terminals)

Two programmable output terminals (Analog 0 ~ 10VDC (10-bit), pulse train (0 ~ 10VDC, max 32kHz)) can be used to monitor items such as frequency, motor current etc.

Watt-hour monitor

Energy consumption is displayed in kWh.

Built-in BRD circuit

Built-in braking resistor control circuit as standard in all models (Resistor optional).

EzCOM (Peer-to-Peer communication)

WJ200 supports Peer-to-Peer communication between multiple inverters using the built-in RS485 port. One administrator inverter is necessary in the network, and the other inverters act as master or slave.

Flexible display functions

Automatic return to the initial display:
10 min. after the last key operation, display returns to the initial parameter set.

Display limitation:
Show only the contents of display parameter.

Dual monitor:
Two arbitrary monitor items can be set. Parameters are selected via the UP/DOWN keys.

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Standard Specifications

1-phase 200V class

Models WJ200-				002SF	004SF	007SF	015SF	022SF
Applicable motor size		kW	VT	0.4	0.55	1.1	2.2	3.0
			CT	0.2	0.4	0.75	1.5	2.2
Rated capacity (kVA)		200V	VT	0.6	1.2	2.0	3.3	4.1
			CT	0.5	1.0	1.7	2.7	3.8
		240V	VT	0.7	1.4	2.4	3.9	4.9
			CT	0.6	1.2	2.0	3.3	4.5
Input Rating	Rated input voltage (V)			1-phase: 200V-15% to 240V +10%, 50/60Hz ±5%				
	Rated input current (A)		VT	3.6	7.3	13.8	20.2	24.0
			CT	3.0	6.3	11.5	16.8	22.0
Output Rating	Rated output voltage (V)			3-phase: 200 to 240V (proportional to input voltage)				
	Rated output current (A)		VT	1.9	3.5	6.0	9.6	12.0
			CT	1.6	3.0	5.0	8.0	11.0
Minimum value of resistor (Ω)				100	100	50	50	35
Weight			kg	1.0	1.1	1.6	1.8	1.8

3-phase 400V class

Models WJ200-				004HF	007HF	015HF	022HF	030HF	040HF	055HF	075HF	110HF	150HF
Applicable motor size		kW	VT	0.75	1.5	2.2	3.0	4.0	5.5	7.5	11	15	18.5
			CT	0.4	0.75	1.5	2.2	3.0	4.0	5.5	7.5	11	15
Rated capacity (kVA)		200V	VT	1.3	2.6	3.5	4.5	5.7	7.3	11.5	15.1	20.4	25.0
			CT	1.1	2.2	3.1	3.6	4.7	6.0	9.7	11.8	15.7	20.4
		240V	VT	1.7	3.4	4.4	5.7	7.3	9.2	14.5	19.1	25.7	31.5
			CT	1.4	2.8	3.9	4.5	5.9	7.6	12.3	14.9	19.9	25.7
Input Rating	Rated input voltage (V)			3-phase: 380V-15% to 480V +10%, 50/60Hz ±5%									
	Rated input current (A)		VT	2.1	4.3	5.9	8.1	9.4	13.3	20.0	24.0	38.0	44.0
			CT	1.8	3.6	5.2	6.5	7.7	11.0	16.9	18.8	29.4	35.9
Output Rating	Rated output voltage (V)			3-phase: 380 to 480V (proportional to input voltage)									
	Rated output current (A)		VT	2.1	4.1	5.4	6.9	8.8	11.1	17.5	23.0	31.0	38.0
			CT	1.8	3.4	4.8	5.5	7.2	9.2	14.8	18.0	24.0	31.0
Minimum value of resistor (Ω)				180	180	180	100	100	100	70	70	70	35
Weight			kg	1.5	1.6	1.8	1.9	1.9	2.1	3.5	3.5	4.7	5.2

VT normal duty / CT heavy duty

3-phase 200 V class versions are also available

Global standards

Conformity to global standards

CE, UL, c-UL, c-Tick approvals.

Sink / source logic is standard

Logic input and output terminals can be configured for sink or source logic.

Wide input power voltage range

Input voltage 240V for 200V class and 480V for 400V class as standard.

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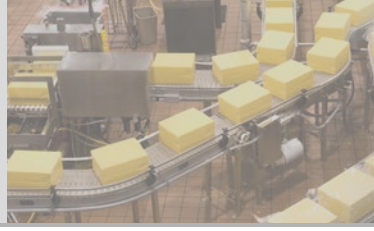

General Specifications

Item			General Specifications
Protective housing			IP20
Control method			Sinusoidal Pulse Width Modulation (PWM) control
Carrier frequency			2kHz to 15kHz (derating required depending on the model)
Output frequency range			0.1 to 400Hz
Frequency accuracy			Digital command: ±0.01% of the maximum frequency Analog command: ±0.2% of the maximum frequency (25°C ±10°C)
Frequency setting resolution			Digital: 0.01Hz; Analog: max. frequency / 1000
Volt. / Freq. characteristic			V/f control (constant torque, reduced torque, free-V / F): base freq. 30Hz – 400Hz adjustable, Sensorless vector control, Closed loop control with motor encoder feedback (only V/f control).
Overload capacity			Dual rating: CT (Heavy duty): 60 sec. @150% VT (Normal duty): 60 sec. @120%
Acceleration / deceleration time			0.01 to 3600 seconds, linear and S-curve accel / decel, second accel / decel setting available
Starting torque			200% @0.5Hz (sensorless vector control)
DC braking			Variable operating frequency, time, and braking force
Freq. setting		Operator panel	⚠▽ keys / Value settings
		External signal	0 to 10 VDC (input impedance 10kΩ), 4 to 20mA (input impedance 100Ω), Potentiometer (1k to 2kΩ, 2W)
		Via network	RS485 ModBus RTU, other network option
FWD / REV run		Operator panel	Run / Stop (Forward / Reverse run change by command)
		External signal	Forward run / stop, Reverse run / stop
		Via network	RS485 ModBus RTU, other network option
Input signal	Intelligent input terminal	Terminals	7 terminals, sink / source changeable by a short bar
		Functions	68 functions assignable to each terminal (for the details, refer to the instruction manual)
	Pulse train input		2 terminal, 2/32kHz max. (one terminal is common with intelligent terminal [7])
	Thermistor input		1 terminal (PTC characteristic, common with intelligent terminal [3])
Output signal	Intelligent output terminal	Terminals	2 open-collector terminal, NO/NC swichable, sink logic
		Functions	48 functions assignable to each terminal
	Monitor output (analog)	Terminal	1 terminal, 0 to 10VDC
		Functions	Output freq., output current, output torque, output voltage, input power, thermal load ratio, LAD freq., heat sink temperature, general output (EzSQ)
	Pulse train output	Terminals	1 terminal, 0–10VDC, 32kHz max.
		Functions	[PWM output] Output freq., output current, output torque, output voltage, input power, thermal load ratio, LAD freq., heat sink temperature, general output (EzSQ) [Pulse train output] Output frequency, output current, pulse train input monitor
	Alarm output contact (relay)		ON for inverter alarm (1c contacts, both normally open or closed available.)
Other functions			Free-V/f, manual / automatic torque boost, output voltage gain adjustment, AVR function, reduced voltage start, motor data selection, auto-tuning, motor stabilization control, reverse running protection, simple position control, simple torque control, torque limiting, automatic carrier frequency reduction, energy saving operation, PID function, non-stop operation at instantaneous power failure, brake control, DC injection braking, dynamic braking (BRD), frequency upper and lower limiters, jump frequencies, curve accel and decel (S, U, inversed U,EL-S), 16-stage speed profile, fine adjustment of start frequency, accel and decel stop, process jogging, frequency calculation, frequency addition, 2-stage accel / decel, stop mode selection, start / end freq., analog input filter, window comparators, input terminal response time, output signal delay / hold function, rotation direction restriction, stop key selection, software lock, safe stop function, scaling function, display restriction, password function, user parameter, initialization, initial display selection, cooling fan control, warning, trip retry, frequency pull-in restart, frequency matching, overload restriction, over current restriction, DC bus voltage AVR
Protective function			Over-current, over-voltage, under-voltage, overload, brake resistor overload, CPU error, memory error, external trip, USP error, ground fault detection at power on, temperature error, internal communication error, driver error, thermistor error, brake error, safe stop, overload at low speed, modbus communication error, option error, encoder disconnection, speed excessive, EzSQ command error, EzSQ nesting error, EzSQ execution error, EzSQ user trip
Operating environment		Temperature	Operating (ambient): -10 to 50°C / Storage: -20 to 65°C
		Humidity	20 to 90% humidity (non-condensing)
		Vibration	5.9m/s² (0.6G), 10 to 55 Hz
		Location	Altitude 1,000m or less, indoors (no corrosive gasses or dust)
Coating color			Black
Options			Remote operator unit, cables for the units, braking unit, braking resistor, AC reactor, DC reactor, EMC filter

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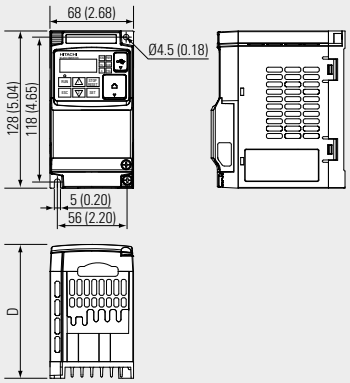
Dimensions

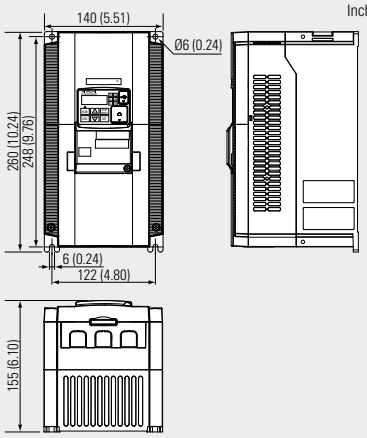
• WJ200-002SF – 004SF



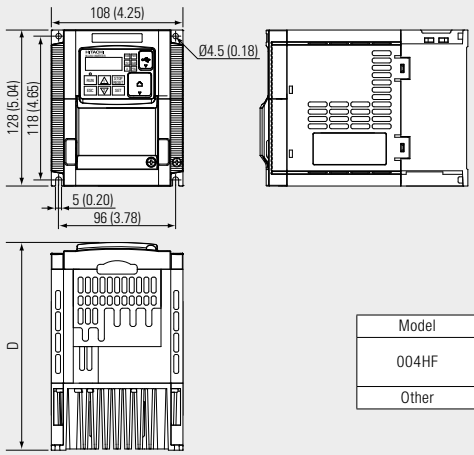
Model	D
002SF	109 (4.29)
004SF	122.5 (4.82)

• WJ200-055HF
• WJ200-075HF

[Unit: mm(inch)]
Inches for reference only

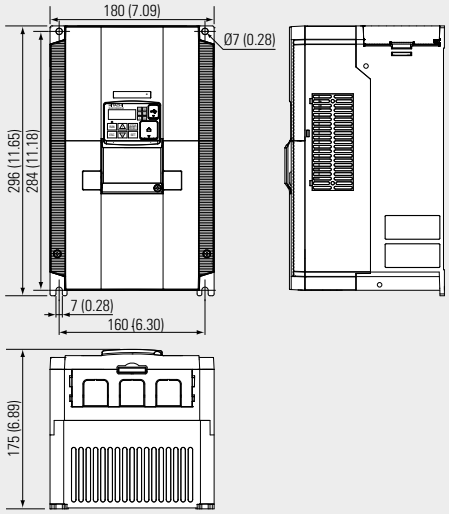


• WJ200-007SF – 022SF
• WJ200-004HF – 030HF

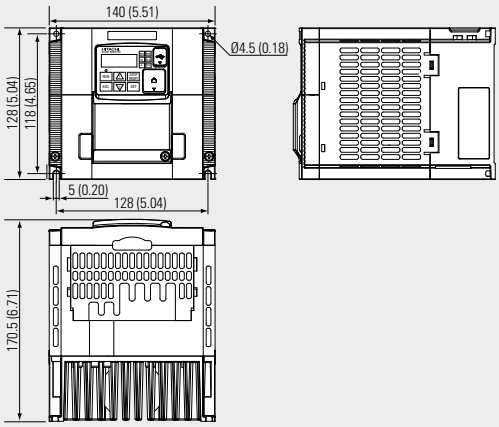


Model	D
004HF	143.5 (5.65)
Other	170.5 (6.71)

• WJ200-110HF
• WJ200-150HF



• WJ200-040HF



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For more information about WJ200 Frequency Inverters, please scan this QR-Code with your smartphone.

Please call us!

BR-WJ200-03/13-EN 333-BW