HITACHI

Adjustable Frequency Control

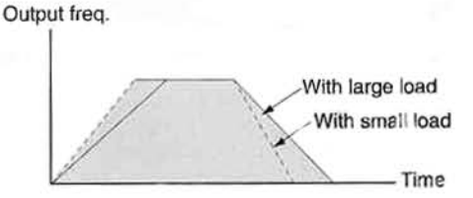
J300-P Series

Variable Torque for Fans and Pumps

The J300-P Series delivers a cost saving drive system for variable torque requirements in fan and pump applications.

"Fuzzy logic" acceleration/deceleration function (Patent pending)

The industry's first application of "fuzzy logic" to an adjustable frequency drive. With this function, optimum acceleration/deceleration time is automatically calculated based upon motor load and braking requirements. This eliminates the need for adjustment by trial and error.



Reduced energy consumption... Function for automatic maximum energy saving operation

J300-P inverters will automatically select operation parameters which enables the motor to run at the minimum current for the required torque load. This results in reduced energy consumption compared with conventional inverters. This function is particularly effective to low torque requirements in fan and pump applications.

●**Specifications and applicable inverters**

Model name	FFJ300-HB23	FFJ300-HB30	FFJ300-HB44	FFJ300-HB60	FFJ300-HB75	FFJ300-HB90	FFJ300-HB110	FFJ300-HB150	FFJ300-HB2
Input current	28A	36A	53A	80A	100A	120A	150A	195A	340A
Performance	Class B								

Inverter model name	Applicable motor and filter			
	Variable torque		Constant torque	
	Motor (kW)	Filter	Motor (kW)	Filter
J300-110HFPE	11	FFJ300-HB23	7.5	FFJ300-HB23
J300-150HFPE	15	FFJ300-HB30	11	FFJ300-HB30
J300-220HFPE	22	FFJ300-HB44	15	FFJ300-HB30 FFJ300-HB44
J300-300HFPE	30	FFJ300-HB60	22	FFJ300-HB60
J300-370HFPE	37	FFJ300-HB75	30	FFJ300-HB75
J300-450HFPE	45	FFJ300-HB90	37	FFJ300-HB75 FFJ300-HB90
J300-550HFPE	55	FFJ300-HB110	45	FFJ300-HB110
J300-750HFPE	75	FFJ300-HB150	55	FFJ300-HB110 FFJ300-HB150
J300-900HFPE	90	FFJ300-HB260	75	FFJ300-HB260
J300-1100HFPE	110	FFJ300-HB260	90	FFJ300-HB260
J300-1320HFPE	132	FFJ300-HB260	110	FFJ300-HB260

Conformity to EMC and low voltage directives

J300-P Series will acquire CE marking in conformity with the low voltage directive (73/23/EEC and the EMC directive (89/336/EEC) by mounting the prescribed EMI filters in the FFJ30(Series.

Note:That the J300-P inverter alone does not conform to the EMC directive

●**Model configuration**

Applicable motor capacity (kW)		7.5	11	15	22	30	37	45	55	75	90	110	132	160	220	260
380 - 415V (3 phase)	Variable torque		110HFPE	150HFPE	220HFPE	300HFPE	370HFPE	450HFPE	550HFPE	750HFPE	900HFPE	1100HFPE	1320HFPE	1600HFPE	2200HFPE	2600HFPE
	Constant torque	110HFPE	150HFPE	220HFPE	300HFPE	370HFPE	450HFPE	550HFPE	750HFPE	900HFPE	1100HFPE	1320HFPE	1600HFPE	2200HFPE	2600HFPE	

Standard Specifications

Item			380-415 V/400-415 V 3 phase												
Model name (type) J300-□□□HFPE			110HFPE	150HFPE	220HFPE	300HFPE	370HFPE	450HFPE	550HFPE	750HFPE	900HFPE	1100HFPE	1320HFPE	1600HFPE	2200HFPE	2600HFPE
Enclosure			IP20 excluding cooling fan			IP00										
Applicable motor rating (4P, max. kW/HP)*1	Variable torque*2		11	15	22	30	37	45	55	75	90	110	132	160	220	260
	Constant torque		7.5	11	15	22	30	37	45	35	75	90	110	132	160	220
Continuous output (kVA)	Variable torque	380V	15	21	29	39	49	58	71	96	116	143	171	197	250	316
		400V	16	22	30	41	51	61	75	101	122	150	180	208	263	333
		415V	16.5	23	32	42	53	63	78	105	127	156	187	216	273	345
	Constant torque	380V	10.5	15	21	32	38	49	59	72	98	116	143	171	214	290
		400V	11	16	22	33	40	52	62	76	103	122	150	180	225	305
		415V	11.5	16.5	23	35	42	54	65	79	107	127	156	187	234	316
Rated AC input power supply			3-phase (3-wire) 380 to 415 ± 10%, 50/60 Hz ± 5%													
Rated output voltage*3			3-phase 380 to 415 (corresponding to reception voltage)													
Rated output current (A)	Variable torque		23	32	44	59	74	88	108	146	176	217	260	300	380	480
	Constant torque		16	23	32	48	58	75	90	110	149	176	217	260	325	440
Control system			Sine-wave pulse width modulation (PWM) control													
Output frequency range*4			0.1 to 400 Hz													
Frequency accuracy			With reference to maximum frequency, ± 0.01% in digital setting and ± 0.1% in analog setting (25 ± 10℃)													
Frequency resolution			Digital setting: 0.01 Hz/60 Hz, analog setting : maximum frequency/ 1000													
Voltage/frequency characteristic			V/F optionally variable, V/F control (constant torque, reduced torque)													
Overload current rating	Variable torque		115%of variable torque current rating, for 30 sec.													
	Constant torque		150%of constant torque current rating, for 60 sec.													
Acceleration/deceleration time			0.01 to 3000 sec. (optionally settable in straight line or curve, and each acceleration and deceleration independently settable), second acceleration/deceleration rate settable													
Starting torque			Dependent on V/F characteristics													
Average braking torque	Dynamic braking Feedback to capacitor		About 20%			About 10 to 15%										
	Options for dynamic braking		Option (braking resistor for 110HFPE4, braking unit for 150HFPE4 and above)													
	DC injector braking		Operated at the DC braking frequency or by external input													
Input signal	Frequency setting	Digital operator	Setting by ▲▼													
		External signal	Variable resistor of 500Ω to 2 kΩ, 2W, 0 to 5 V, 0 to 10 V DC <nominal> (input impedance 30 kΩ), 4 to 20 mA <nominal> (input impedance 250Ω)													
	Forward/reverse run and stop	Digital operator	Run/stop (forward or reverse run selected by command)													
		External signal	Forward run/stop (a contact) [reverse run specifiable at terminal assignment (1a/1b selectable)]													
	Intelligent input terminal		RV (reverse run command), FRS (free run stop command), CF1 to 3 (multi-range speed setting), USP (unattended start protection setting), JG (jogging command), CH1 (2-stage acceleration/deceleration command), DB (external dynamic brake command), RS (reset input), STN (initial setting), CS (commercial source changeover), SFT (soft lock), AT (current input selection), SET (2nd setting selection), EXT (external trip), UP (remote control, acceleration), DOWN (remote control, deceleration)													
Output signal	Intelligent output terminal		FA1 (frequency arrival signal), RUN (running signal)													
	Frequency monitor		Analog meter (0 to 10 V DC, 1 mA full scale) digital frequency signal or analog current monitor selected by remote operator													
Alarm output contact			ON at inverter alarm (1C contact output)													
Other functions			AVR function, V/F characteristic changeover, curved acceleration/deceleration, upper and lower limiters, 8-stage speed, fine adjustment of start frequency, carrier frequency change (2 to 16 kHz), frequency jump, electronic thermal level adjustment, fuzzy acceleration/deceleration, auto tuning, gain and bias setting, retry function, trip history monitor (up to 3 trips storable in memory), etc.													
Protective functions			Overcurrent, overvoltage, undervoltage, electronic thermal level adjustment, abnormal temperature, ground fault current at start*6, overload limit, overvoltage supply, braking resistor overload, etc.													
General specifications	Ambient temperature/humidity	Variable torque	-10 to 40℃ (14 to 104°F)/20 to 90% RH (non- condensing)													
		Constant torque	-10 to 50℃ (14 to 122°F)/20 to 90% RH (non- condensing)													
	Vibration		5.9 m/s² (0.6G) 10 to 55 Hz			2 m/s² (0.2G) 10 to 55 Hz										
	Installation site		Altitude 1000m or lower, indoors (no excessive corrosive gas and dust allowable)													
	Coating color		Munsell 9.1Y7.4/0.6 semi-gloss, cooling fins in aluminum base color													
Options			A variety of application PC boards (PID control, communication, digital I/F, relay output, high resolution, etc.), remote operator, copy unit, cable of each operator, braking resistor, power factor, improvement reactor, noise filter for inverter, fixture for positioning fins outside cubicle, etc.													
Approx. mass (kg.)			7.5	13	13	21	36	36	46	46	70	80	80	130	130	130

Notes:

1) Applicable motors include Hitachi standard three-phase motors. When using other motors, the rated current of the motor (at 50 Hz) must not exceed the rated output current of the inverter.

2) Applicable motor rating at variable torque is valid under the condition that the output current does not exceed the ratings at variable torque.

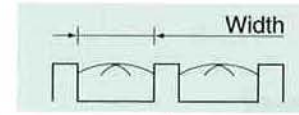
3) The maximum output voltage drops in response to a drop in line voltage.

4) For motor operation other than at 50/60 Hz, please consult with the motor manufacturer.

5) Braking torque at capacitor feedback represents average deceleration torque when a motor alone has decelerated in the shortest time period (has stopped from operation at 50/60 Hz). It does not stand for continuous deceleration torque. Also the average deceleration torque varies with motor loss. The torque value is reduced during operation other than at 50/60 Hz. Please remember that no braking resistor is incorporated in the inverter. When a large regeneration torque is needed, therefore, the optional braking resistor should be used.

6) An internal ground fault protection circuit is applied to prevent damage to the inverter and is not intended for safeguarding personnel. It is therefore recommended to install an external ground fault detection device on the input power circuit.

Terminal

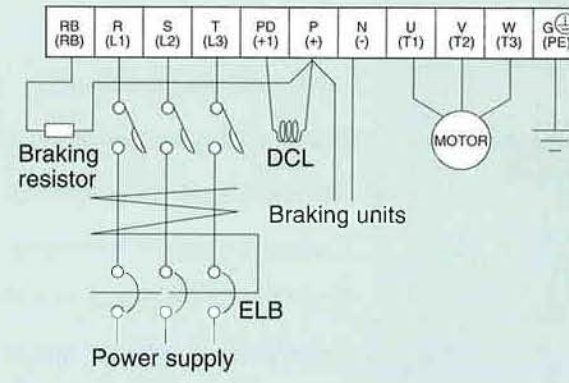


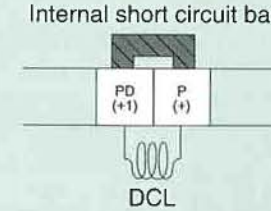
Main circuit terminal

Terminal layout	Type	Screw diameter	Width (mm)
Internal short circuit bar RB (RB) | R (L1) | S (L2) | T (L3) | PD (+1) | P (+) | N (-) | U (T1) | V (T1) | W (T1) | G (PE)	110HFPE	—	—
Internal short circuit bar R (L1) | S (L2) | T (L3) | PD (+1) | P (+) | N (-) | U (T1) | V (T1) | W (T1) | G (PE)	150,220HFPE	—	—
Internal short circuit bar G (PE) | R (L1) | S (L2) | T (L3) | PD (+1) | P (+) | N (-) | U (T1) | V (T1) | W (T1) | G (PE)	300-450HFPE	M6	17.5
	550,750HFPE	M8	23
Internal short circuit bar G (PE) | R (L1) | S (L2) | T (L3) | PD (+1) | P (+) | N (-) | U (T1) | V (T1) | W (T1) | G (PE)	900,1100HFPE	M10	35
	1320,1600HFPE	M10	40
	2200,2600HFPE	M16	51

Main circuit

Terminal symbol	Terminal description	Function
R, S, T (L1),(L2),(L3)	Main power	Connect the power supply
U, V, W (T1),(T2),(T3)	Inverter output	Connect the motor
P,RB (+), (RB)	External braking resistor	Connect a braking resistor (option)
P, N (+),(-)	External dynamic braking unit	Connect a dynamic braking unit (option)
G (PE)	Ground	Ground (connect grounding to avoid electric shock)
PD (+1)	External choke coil	Connect a choke coil (DCL) for harmonics current reduction
	Ground at case	Ground (connect grounding to avoid electric shock)





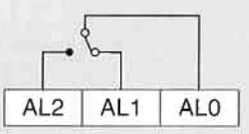
Remove the internal short circuit bar when DCL is connected.

Control circuit terminal

The intelligent I/O terminals 1 to 8 and 11 and 12 are initialized as shown below at factory before shipment.

FM	CM1	PLC	P24	FW	REV	CF1	CF2	CHI	FRS	JG	AT	RS	H	O	OI	L	CM2	RUN	FA1	AL2	AL1	AL0
FM	CM1	PLC	P24	FW	8	7	6	5	4	3	2	1	H	O	OI	L	CM2	12	11	AL2	AL1	AL0

Control circuit

	Terminal symbol	Terminal description and function	Standard setting of intelligent terminal		Remarks
Input monitor signal	FM	Frequency monitor			Dry contact Close: ON (run) Open: OFF (stop) Min. ON time: 12 ms or more
	CM1	Common for monitor			
	PLC	Common terminal for the external power source of the sequencer (PLC)			
	P24	Internal power source for the frequency monitor and intelligent input terminal			
	FW	Forward operation			
	8	Intelligent input terminal 8	REV	Reverse operation	
	7	Intelligent input terminal 7	CF1	Multistage speed (First stage)	
	6	Intelligent input terminal 6	CF2	Multistage speed (Second stage)	
	5	Intelligent input terminal 5	CH1	2 stage acc./dec.	Note: If the power is turned on when input terminals 1 to 5 are kept on, all the data stored in the inverter is initialized. Therefore, never turn the power on in such a state.
	4	Intelligent input terminal 4	FRS	Free run input signal Note 1	
	3	Intelligent input terminal 3	JG	Jogging	
	2	Intelligent input terminal 2	AT		
	1	Intelligent input terminal 1	RS	Reset Note 2	
Frequency command input	H	Power supply for frequency command			10 VDC
	O	Voltage frequency command			0-5 VDC (nominal), 0-10 VDC (nominal)(Input impedance 30 kΩ)
	OI	Current frequency command			DC 4-20mA (nominal) Input impedance 250Ω
	L	Common for frequency command			
Output signal	CM2	Common for intelligent output terminal			
	12	Intelligent output signal 12	RUN	Run signal	27VDC 50 mA max
	11	Intelligent output signal 11	FA1	Frequency arrival signal	
Fault alarm output	AL0	 Normal: AL0-AL1 close Abnormal, Power off: AL0-AL1 open Contact rating 250 VAC 2.5 A (Resistor load) 0.2 A ($\cos\phi$=0.4) 30 VDC 3.0 A (Resistor load) 0.7 A ($\cos\phi$=0.4) (Min.100 VAC 10mA 5 VDC 100 mA)			
	AL1				
	AL2				

⚠ CAUTION

Alarm connection may contain hazardous live voltage even when inverter is disconnected. In case of removing front cover for maintenance or inspection, confirm that incoming power for alarm connection is completely disconnected.

Note 1: Initial setting is "contact b" for European version.
Note 2: Terminal RS can use only "contact a" (normally open). It cannot use "contact b" (normally closed).

Monitor, Function List

Monitor mode, function mode

Display order	Function name	Type	Screen display			Initial value	Settable for 2nd function	Set valu
			Code display	Settable during running	Monitor/set value			
1	Output frequency monitor	Monitor	d0	—	0.00-9.99/10.0-99.9/100-400	—	—	
2	Motor revolution speed monitor	Monitor	d1	—	0.00-9.99/10.0-99.9/100 Note 4	—	—	
3	Output current monitor	Monitor	d2	—	0.0-999	—	—	
4	Frequency converted value monitor	Monitor	d3	—	0.00-9.99/10.0-99.9/100.-999. *100-999/ Γ** 10- Γ 39 Note 5	—	—	
5	Trip monitor	Monitor	d10	—	—	—	—	
6	Trip history monitor	Monitor	d11	—	—	—	—	
7	Output frequency setting	Set value	F2	√	0.00-9.99/10.0-99.9/100-400	0.00	√	
8	Running direction setting	Set value	F4	Not possible	F/r (forward run/reverse run)	F	—	
9	Acceleration time setting 1	Set value	F6	√	0.01-9.99/10.0-99.9/100-999	30.0	√	
10	Deceleration time setting 1	Set value	F7	√	0.01-9.99/10.0-99.9/100-999	30.0	√	
11	Manual torque boost setting	Set value	F8	√	00-99 Note 3	80	√	
12	Run command, frequency command setting	Set value	F9	Not possible	00-15 Note 1	03	—	
13	Analog meter adjustment	Set value	F10	√	00-250	172	—	
14	Motor receiving voltage	Set value	F11	Not possible	380-460 Note 2	400	—	
15	Extension function setting	Set value	F14	Not possible	A 0-A99/C 0-C21	A0	—	

Note 1: In the standard configuration, four values from 0 to 3 can be selected. When an optional PC board is mounted, 16 values from 0 to 15 can be selected. Refer to F9.
Note 2: For the 400 V class, one of 380, 400, 415, 440, and 460 can be selected.
Note 3: 80 is set for VT mode (VP1, VP2, VP3), 11 is for CT (VC)
Note 4: Not indicated in actual rotation but in terms of the number of rotations/100.
Note 5: *:1000-9990, **:10000-39000

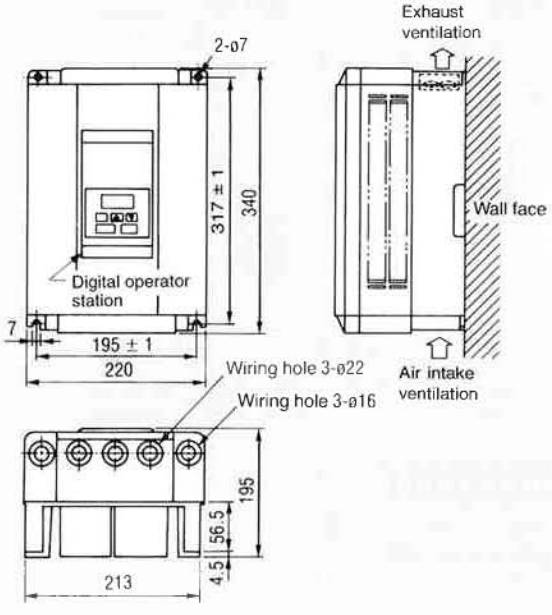
Extension function mode

Display order	Function name	Screen display				Settable or 2nd function	Remarks	Set value
		Code display	Settable during running	Setting range	Initial value			
1	Control method setting	A0	—	0-5	2	√		
2	Motor capacity setting	A1	—	4.0 to 260		√	Note 1	
3	Motor poles setting	A2	—	2/4/6/8	4	√		
4	Speed control response constant setting	A3	—	0.00-9.99/10.0-99.9/100	2.00	√	Note 4	
5	Start frequency adjustment	A4	—	0.10-9.99	0.50	—		
6	Maximum frequency limiter setting	A5	—	0-120 (400)	0	—		
7	Minimum frequency limiter setting	A6	—	0-120 (400)	0	—		
8	Jump frequency setting 1	A7	—	0-400	0	—		
9	Jump frequency setting 2	A8	—	0-400	0	—		
10	Jump frequency setting 3	A9	—	0-400	0	—		
11	Carrier frequency setting	A10	—	2.0-16.0	Note 3	—		
12	Frequency command sampling frequency	A11	—	1-8	8	—		
13	Multispeed first speed setting	A12	—	0-120 (400)	0	—		
14	Multispeed second speed setting	A13	—	0-120 (400)	0	—		
15	Multispeed third speed setting	A14	—	0-120 (400)	0	—		
16	Electronic thermal level adjustment	A23	—	20-120	100	√		
17	Electronic thermal characteristic selection	A24	—	0-2	0	√		
18	Motor pole number setting for motor speed monitor	A25	—	2 to 48	4	—		
19	External frequency setting start	A26	—	0-120 (400)	0	—		
20	External frequency setting end	A27	—	0-120 (400)	0	—		
21	Instantaneous restart selection	A34	—	0-3	0	—		
22	Dynamic braking usage ratio	A38	—	0.0-99.9/100	Note 3	—		
23	Optional arrival frequency for acceleration	A39	—	0-400	0	—		
24	Optional arrival frequency for deceleration	A40	—	0-400	0	—		
25	Monitor signal selection	A44	—	0-3	0	—		
26	Frequency converted value setting	A47	—	0.1-99.9	1.0	—		
27	Analog input selection	A48	—	0-1	1	—		
28	Frequency arrival signal output method	A49	—	0-2	0	—		
29	Restarting after FRS signal selection	A54	—	0-1	1	—		
30	Reduced voltage soft start setting	A58	—	0-6	6	—		
31	Running mode selection	A59	—	0-2	0	—		
32	Jogging frequency setting	A61	—	0-9.99	1.00	—	Frequencies below the start frequency cannot be set.	
33	Base frequency setting	A62	—	30-120 (400)	50	√		
34	Maximum frequency setting	A63	—	30-120 (400)	50	√		
35	Maximum frequency selection	A64	—	120/400	120	—		
36	Frequency command/output frequency adjust (O-L terminal)	A80	—	0-255	—	—	Note 2	
37	Frequency command/output frequency adjust (OI-L terminal)	A81	—	0-255	—	—	Note 2	
38	Selection of reset terminal performance	A86	—	0,1	0	—		
39	P gain setting of PID function	A90	—	0.1-0.5	1.0	—		
40	I gain setting of PID function	A91	—	0.0-15.0	1.0	—		
41	D gain setting of PID function	A92	—	0.0-100	0.0	—		
42	Selection of PID function	A94	—	0-4	0	—		
43	Setting method of PID reference value	A95	—	0,1	0	—		
44	Setting of PID reference value	A96	—	0.00-200	0.00	—		
45	Auto tuning setting	A97	—	0-2	0	—		
46	Motor data selection	A98	—	0-2	0			
47	Ro-To option selection	A99	—	0-1	0	—		
48	Input terminal setting 1	C0	—	0-3, 5-9, 11-16, 18-28	18	—		
49	Input terminal setting 2	C1	—	0-3, 5-9, 11-16, 18-28	16	—		
50	Input terminal setting 3	C2	—	0-3, 5-9, 11-16, 18-28	5	—		
51	Input terminal setting 4	C3	—	0-3, 5-9, 11-16, 18-28	11	—		
52	Input terminal setting 5	C4	—	0-3, 5-9, 11-16, 18-28	9	—		
53	Input terminal setting 6	C5	—	0-3, 5-9, 11-16, 18-28	2	—		
54	Input terminal setting 7	C6	—	0-3, 5-9, 11-16, 18-28	1	—		
55	Input terminal setting 8	C7	—	0-3, 5-9, 11-16, 18-28	0	—		
56	Output terminal setting 11	C10	—	0-2	0	—		
57	Output terminal setting 12	C11	—	0-2	1	—		
58	Input terminal a and b contact setting	C20	—	00-FF	08	—		
59	Output terminal a and b contact setting	C21	—	00-07	04	—		

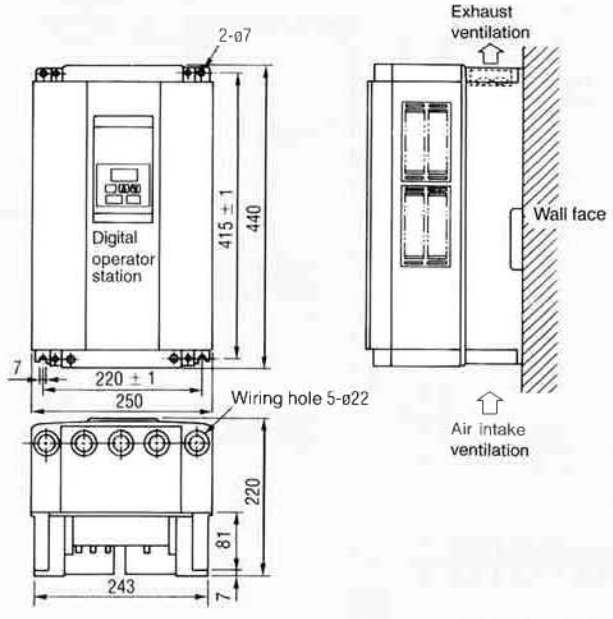
Note 1: The most applicable motor capacity of the inverter is set.
Note 2: The initial setting of each inverter is adjusted when shipped from the work.
Note 3: Initial value is dependent on the inverter model (capacity).
Note 4: No function even if the parameter is settable

Dimensions

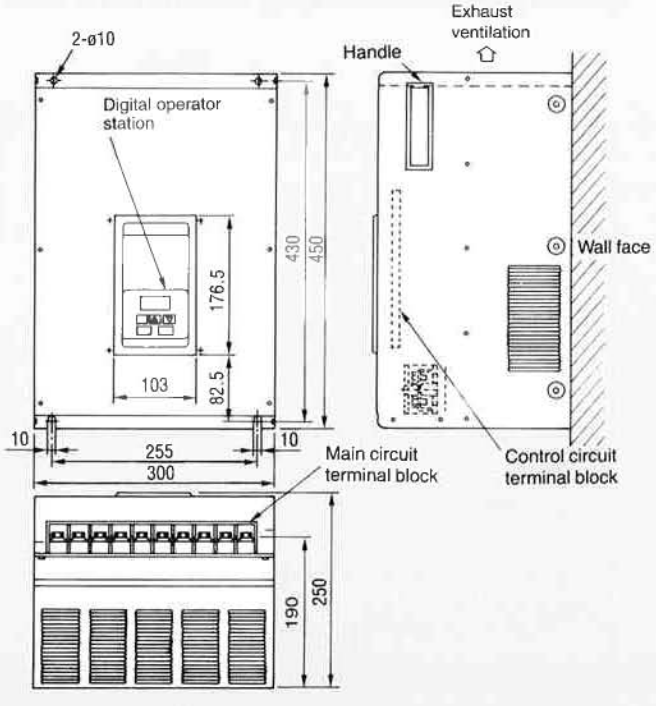
J300-110HFPE4



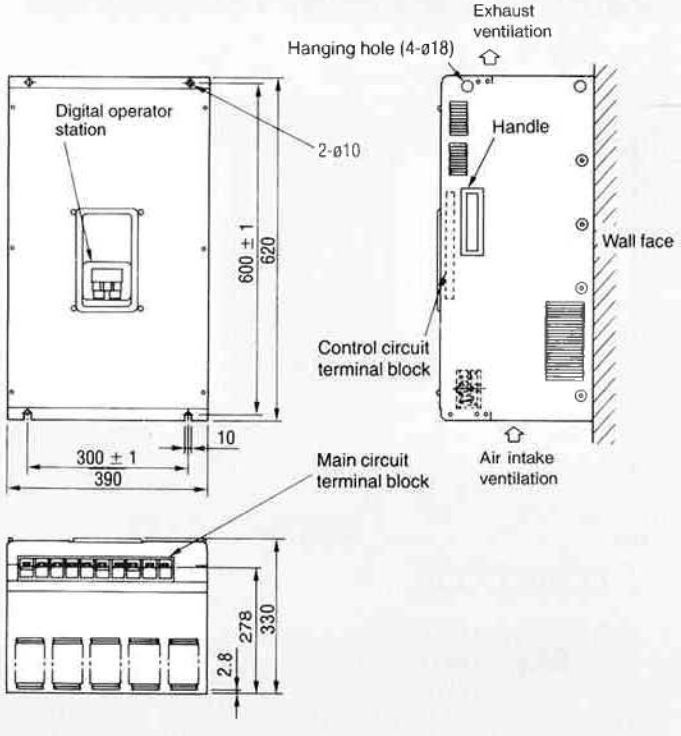
J300-150HFPE4, 220HFPE4



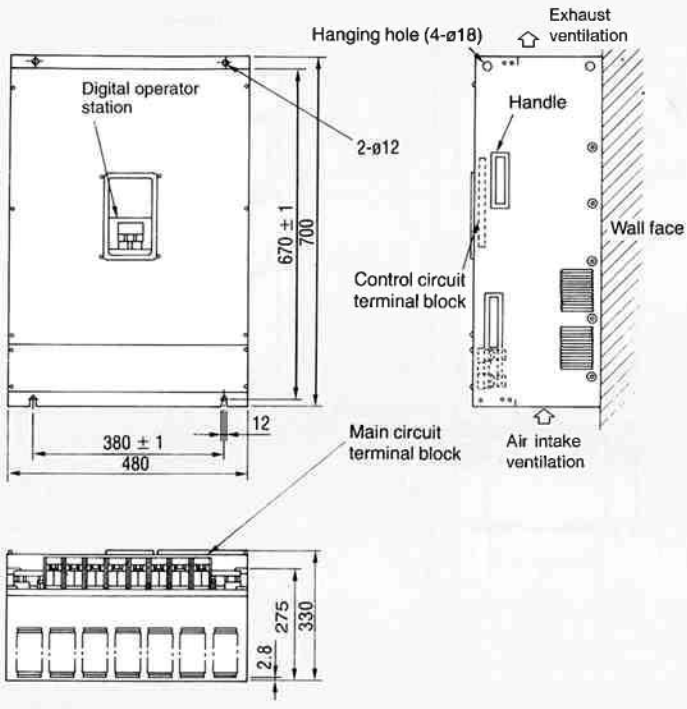
J300-300HFPE4



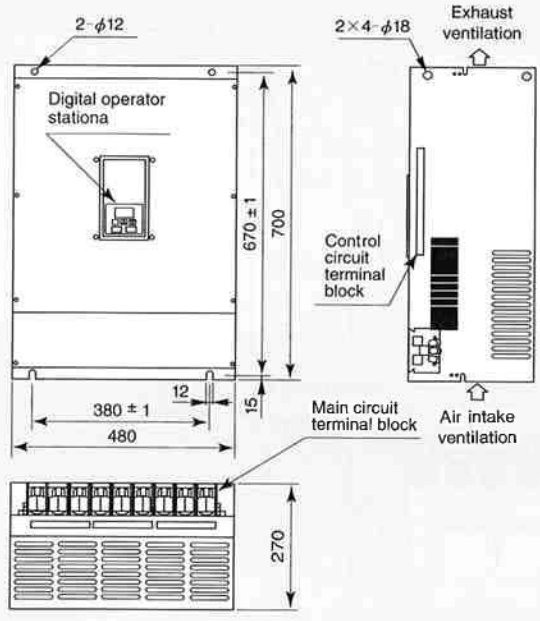
J300-370HFPE4, 450HFPE4



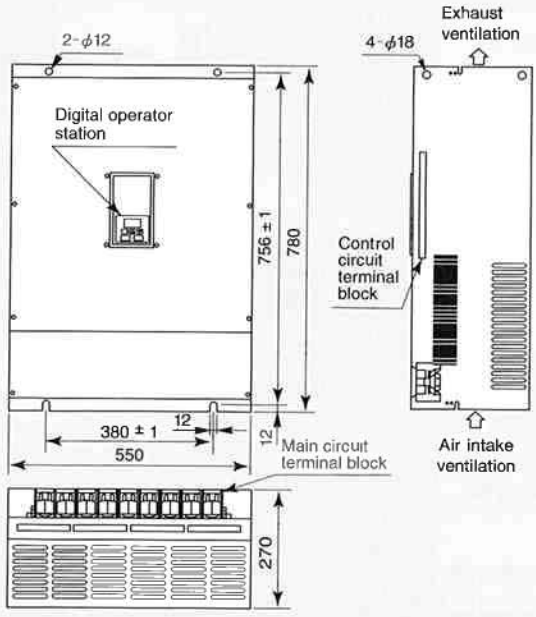
J300-550HFPE4, 750HFPE4



J300-900HFPE4, 1100HFPE4



J300-1320HFPE4, 1600HFPE4



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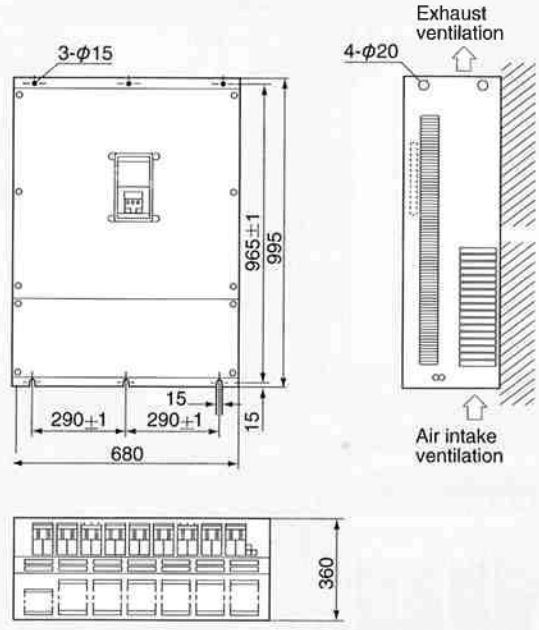

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