

SPEECON 7300PA

FAN & PUMP INVERTER

TECO

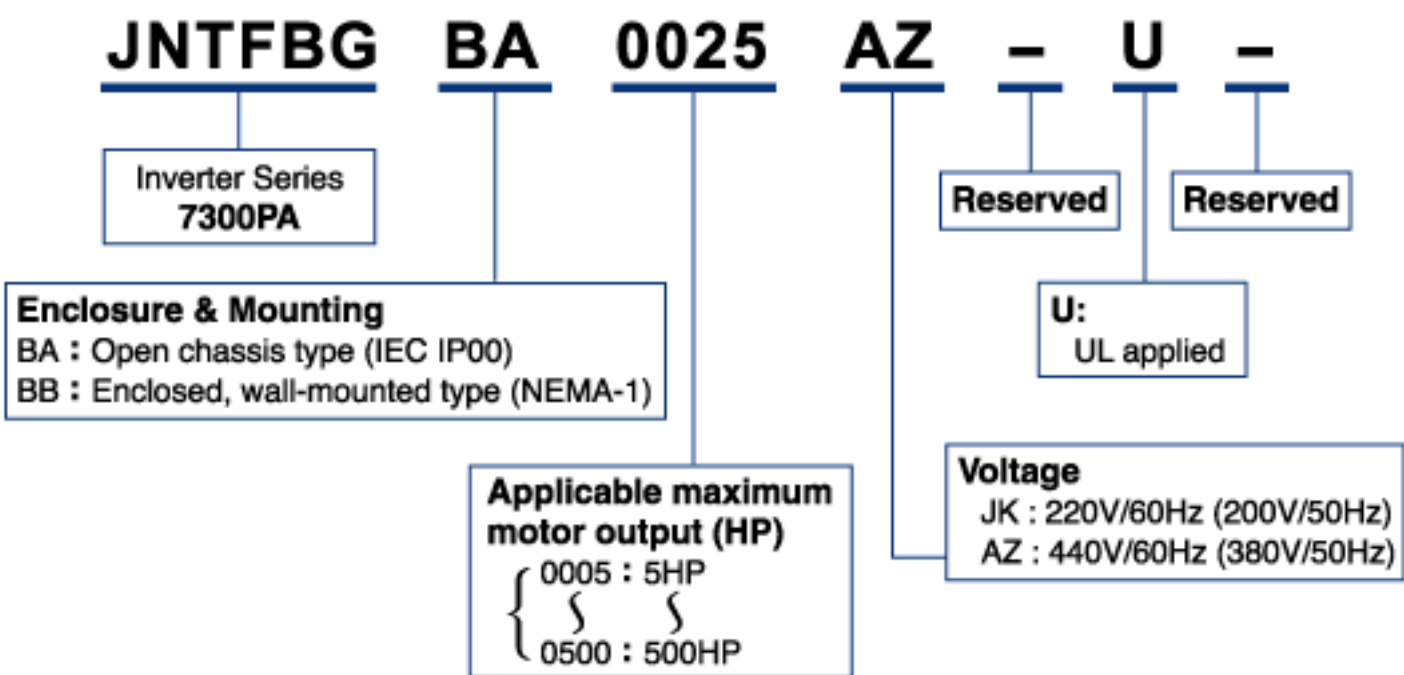


5~500HP
4~375KW

◆ **KEY FEATURES FOR HVAC APPLICATIONS**

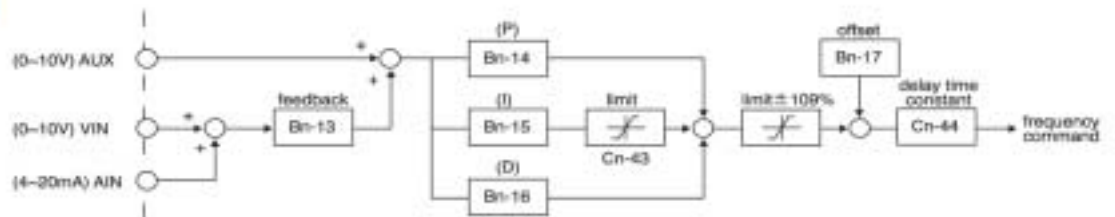
- Designed for Variable Torque Applications.
- PID & Auto Energy Saving function.
- Input Phase Loss & Output Phase Loss Protection.
- LCD keypad used as Copy Unit (Big size LED keypad Optional)
- Output common mode choke built-in.
- PF, KW, KWHr, Motor Elapsed Run Hour.
- Multi-Function Input/output interface.
- RS-485 communication — MODBUS(PA-M) METASYS N2(In plan)
 PROFIBUS(PA-P) Lonworks(PA-L)
- 1-8 PID card (PA-PID).
- PID Sleep/Wake-up Functions.
- 3 Analog Inputs (0-10V X 2, 4-20mA)
- 2 Analog Outputs (0-10V X 2, 4-20mA option)
- Motor Thermistor Input.
- Cooling Fan on/off control
- Completed Range : 220V 3Ø 5HP ~ 125 HP 440V 3Ø 5HP ~ 500 HP
- CE, UL

◆ **MODEL DESIGNATION**

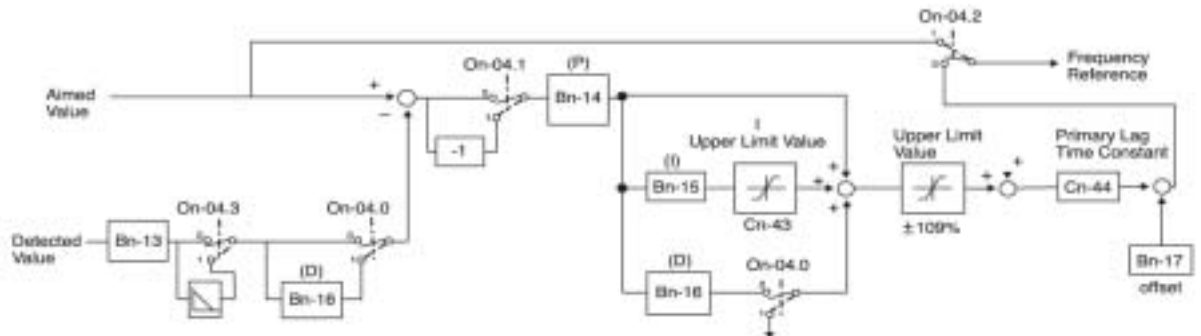


PID FUNCTION

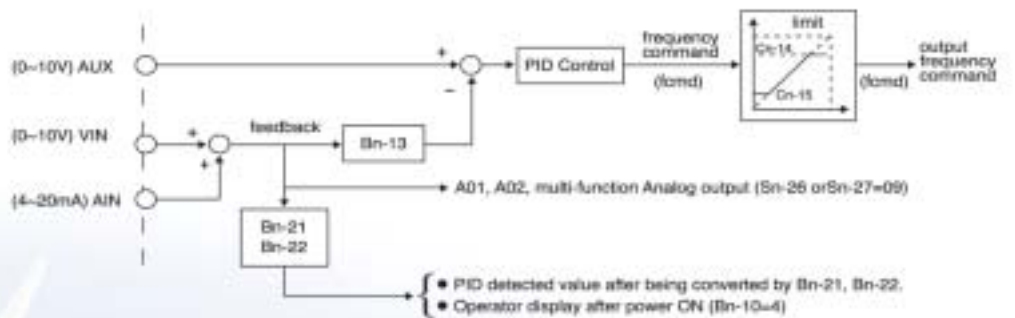
PID control



PID control
(After Ver. 04XX)

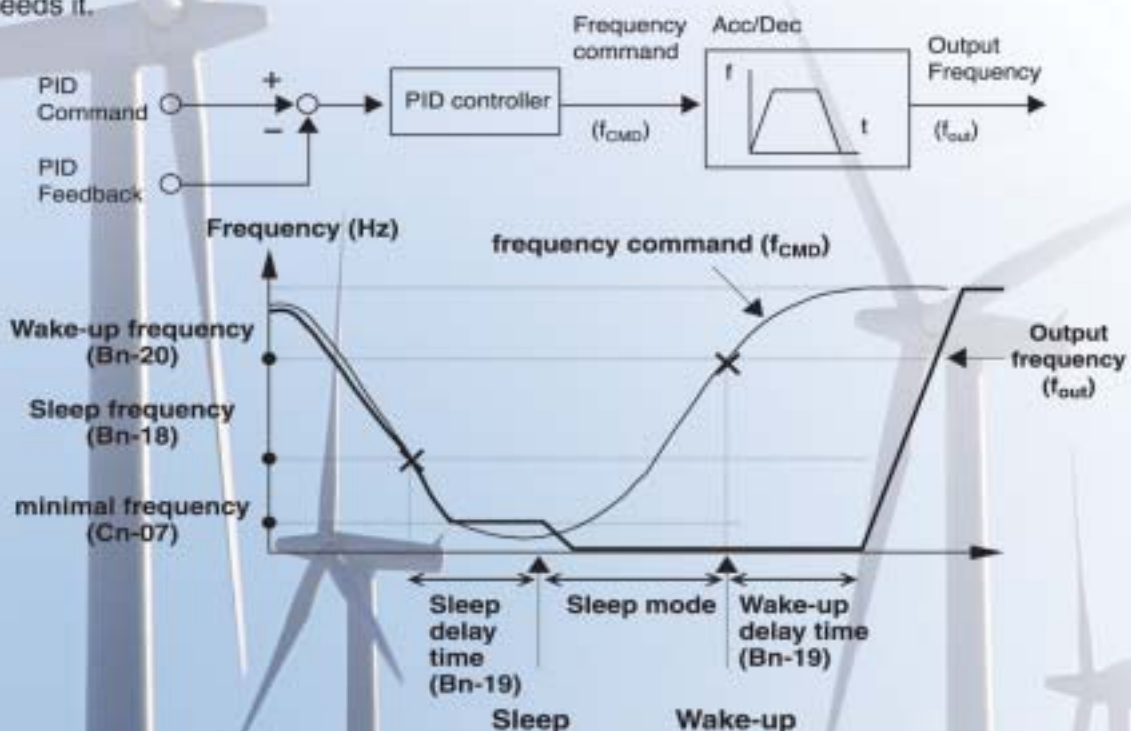


PID output value can be converted into another display unit using Bn-21, Bn-22 (ex: 4~20mA → pressure unit Mpa)



PID SLEEP/WAKE-UP FUNCTION

Sleep mode makes it possible to stop the motor when it is running at low speed and this has almost no load. If consumption in the system goes back up, the inverter will start the motor and supply the power supply. Energy saving can be saved with this function, since the motor is only in operative when the system needs it.



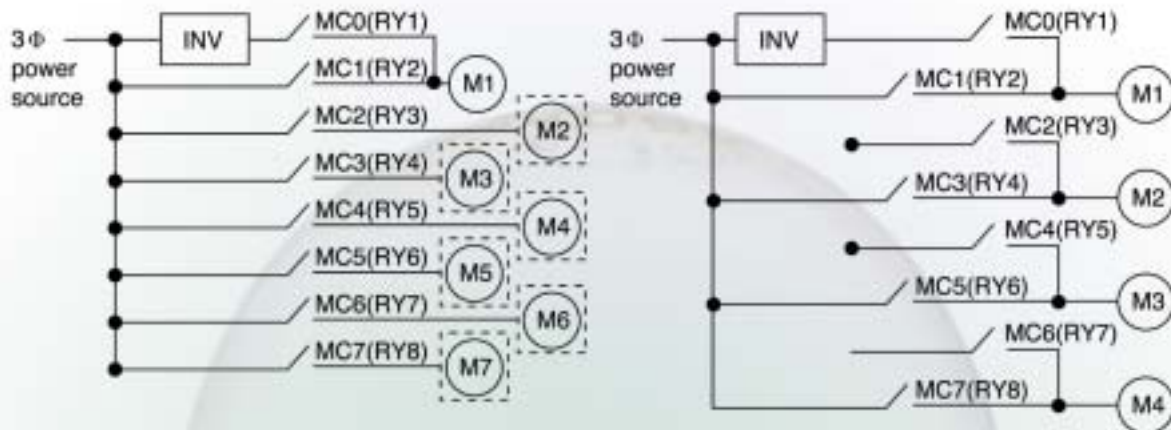
1 to 8 PID OPERATION CARD

▲ 1 to 8 PID Card (PA-PID) with 8 relay contact output, can be used to control max 7 pumps with PID function in a constant pressure water supply system.

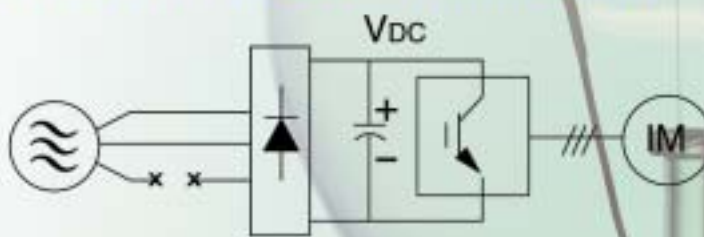
▲ The Relay constants as below:

- Bn-23 : Frequency command upper-bound delay time
- Bn-24 : Frequency command lower-bound delay time
- Bn-25 : MC ON/OFF delay time
- Bn-26 : Pump ON/OFF detection level
- Sn-30 : Pump operation mode selection
- Sn-31 : PA-PID Card Relay2 valid/invalid
- Sn-32 : PA-PID Card Relay3 valid/invalid
- Sn-33 : PA-PID Card Relay4 valid/invalid
- Sn-34 : PA-PID Card Relay5 valid/invalid
- Sn-35 : PA-PID Card Relay6 valid/invalid
- Sn-36 : PA-PID Card Relay7 valid/invalid
- Sn-37 : PA-PID Card Relay8 valid/invalid

▲ Fixed inverter driving mode and Cycled inverter driving mode connection examples:



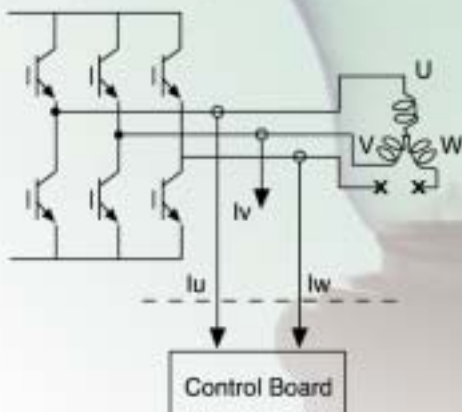
IPL-INPUT PHASE LOSS PROTECTION



IPL function is disabled in the following cases

- Stop running
- Decelerating
- Output Current $\leq 30\% \times$ INV rated current
- IPL level $\Delta V=100\%$
- IPL protection function is disable (Sn-28=1)
- When "A/D Fault CPF05"

OPL-OUTPUT PHASE LOSS

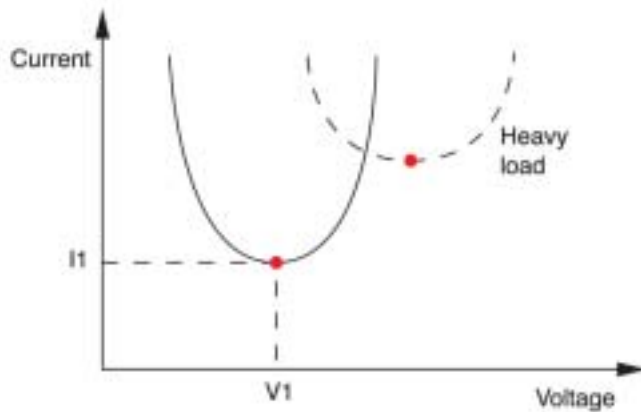


OPL function is disabled in the following cases

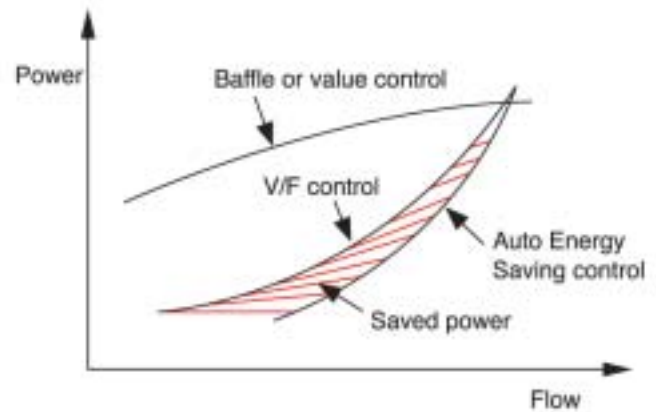
- Stop running
- DCDB
- Output current $\leq 30\% \times$ INV rated current
- OPL protection function is disable (Sn-13=xx1x)
- When "A/D Fault CPF05"

AES-AUTO ENERGY SAVING

7300PA will auto adjustable voltage to minimize output current for different load.



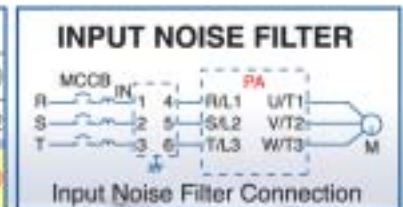
For fans, pumps and HVAC application, the auto energy saving mode will consume less power than ordinary V/F control.



NOISE FILTER

▲ When input noise filter is installed as indicated, the 7300PA will comply with the EN61800-3 (2000) noise interference suppression directive.

INVERTER	Voltage(V)	440V																				
	HP	5	7.5	10	15	20	25	30	40	50	60	75	100	125	150	175	215	250	300	350	400	500
	Rated Current(A)	8	12	16	24	32	38	44	59	75	86	111	151	189	231	267	304	340	380	516	585	732
Input Noise Filter	Rated Current(A)	25	25	25	50	50	50	50	80	80	120	120	200	200	320	320	320	400	400	600	600	800



DIGITAL OPERATOR



LCD OP

- Use Graphic LCD, Dual language (Chinese & English)
- Key function similar to as existent TECO inverter
- LCD operator, Memory built in, used us Copy unit

LED OP

- Big size LED operator (optional)
- Same Installation and Dimension as LCD OP



◆ SPECIFICATIONS

230V CLASS

INVERTER (HP)		5	7.5	10	15	20	25	30	40	50	60	75	100	125
MAX. APPLICABLE MOTOR OUTPUT HP (KW) * 1		5 (3.7)	7.5 (5)	10 (7.5)	15 (11)	20 (15)	25 (18.5)	30 (22)	40 (30)	50 (37)	60 (45)	75 (55)	100 (75)	125 (90)
Output Characteristics	Inverter Capacity (KVA)	6.2	9.3	12.4	18.6	24.8	27.4	33	44	55	63	81	110	125
	Rated Output Current (A)	16	24	32	48	64	72	88	117	144	167	212	288	327
	Max. Output Frequency	3-Phase, 200/208/220/230V (Proportional to input voltage)												
	Rated Output Frequency	Up to 180Hz available												
Power Supply	Rated Input Voltage And Frequency	3-Phase, 200/208/220V, 50Hz 200/208/220/230V, 60Hz												
	Allowable Voltage Fluctuation	+10% ~ -15%												
	Allowable Frequency Fluctuation	±5%												

460V CLASS

INVERTER (HP)		5	7.5	10	15	20	25	30	40	50	60	75	100	125	150	175	215	250	300	350	400	500
MAX. APPLICABLE MOTOR OUTPUT HP (KW) * 1		5 (3.7)	7.5 (5)	10 (7.5)	15 (11)	20 (15)	25 (18.5)	30 (22)	40 (30)	50 (37)	60 (45)	75 (55)	100 (75)	125 (90)	150 (100)	175 (132)	215 (160)	250 (185)	300 (225)	350 (260)	400 (300)	500 (375)
Output Characteristics	Inverter Capacity (KVA)	6.2	9.3	12.4	18.6	24.8	29	34	45	57	66	85	115	144	176	203	232	259	290	393	446	558
	Rated Output Current (A)	8	12	16	24	32	38	44	59	75	86	111	151	189	231	267	304	340	380	516	585	732
	Max. Output Frequency	3-Phase, 380/400/415/440/460V (Proportional to input voltage)																				
	Rated Output Frequency	Up to 180Hz available																				
Power Supply	Rated Input Voltage And Frequency	3-Phase, 380/400/415/440/460V, 50/60Hz																				
	Allowable Voltage Fluctuation	+10% ~ -15%																				
	Allowable Frequency Fluctuation	±5%																				

* Based on 4 pole motor

◆ CHARACTERISTICS

Control Characteristics	Control Method	Sine wave PWM
	Frequency Control Range	0.1 to 180Hz
	Frequency Accuracy	Digital command: 0.01% $\begin{matrix} +14 \text{ to } 104^{\circ}\text{F} \\ -10 \text{ to } 40^{\circ}\text{C} \end{matrix}$ Analog command: 0.1% $\begin{matrix} 77 \pm 18^{\circ}\text{F} \\ 25 \pm 10^{\circ}\text{C} \end{matrix}$
	Frequency Setting Resolution	Digital operator reference: 0.01Hz Analog reference: 0.06Hz/60Hz
	Output Frequency Resolution	0.01Hz (1/30000)
	Overload Capacity	110% rated output current for one minute.
	Frequency Setting Signal	0 to 10VDC (20K Ω), 4~20mA (250 Ω)
	Accel/Decel time	0.1 to 6000 sec (independent Accel/Decel time settings)
	Braking Torque	Approximately 20%
	No. of V/f patterns (Total of 5)	1: For adjustable pattern. 4: For fans and pumps.
Protective Functions	Motor Overload Protection	Electric thermal overload relay
	Instantaneous Overcurrent	Motor coasts to stop at approx. 200% rated current.
	Overload	Motor coasts to stop after 1 minute at 110% rated output current.
	Overvoltage (460V class)	Motor coasts to stop if inverter output voltage exceeds 820VDC.
	Overvoltage (230V class)	Motor coasts to stop if inverter output voltage exceeds 410VDC.
	Undervoltage (460V class)	Motor coasts to stop if inverter output voltage drops to 380VDC or below.
	Undervoltage (230V class)	Motor coasts to stop if inverter output voltage drops to 190VDC or below.
	Momentary Power Loss*1	Motor coasts to stop after momentary power loss lasting over 15ms. (time-setting made before shipment).
	Motor Overheat Protection	Motor PTC thermistor (Active: 1330 Ω , Return: 550 Ω)
	Input phase Loss	Single phase protection.
	Output phase Loss	Provided by electronic circuit.
	Fin Overheat	Thermostat
	Stall Prevention	Stall prevention at acceleration/deceleration and constant speed operation.
	Ground Fault	Provided by electronic circuit.
Power Charge Indication	Charge lamp stays ON until bus voltage drops below 50V.	
Environmental Conditions	Location	Indoor (Protected from corrosive gases and dust)
	Ambient Temperature	Wall-mounted type: +14 to 104°F (-10 to +40°C), (not frozen) Open chassis type: +14 to 113°F (-10 to +45°C), (not frozen)
	Storage Temperature	-4 to 140°F (-20 to +60°C)
	Humidity	95% RH (non-condensing)
	Vibration	1G at 10 to 20Hz, up to 0.2G at 20 to 50Hz.
Communication Function	RS-485 MODBUS, PROFIBUS (option)	
Noise Interference Suppression	EN61800-3 (2000) with specified noise filter	
Noise Immunity	EN61800-3 (2000)	

◆ MAIN CIRCUIT TERMINALS

TERMINALS	TERMINAL FUNCTION
R / L1	Main Circuit Input Power Supply
S / L2	
T / L3	
U / T1	Inverter Output
V / T2	
W / T3	
⊕	DC Power Supply Input or Braking Unit
⊖	
B2	B2- ⊕ :External Braking Resistor (Only for 220V 25HP, 440V 25HP, 30HP)
E (PE, \perp)	Grounding (3rd Type Grounding)

◆ CONTROL CIRCUIT TERMINALS

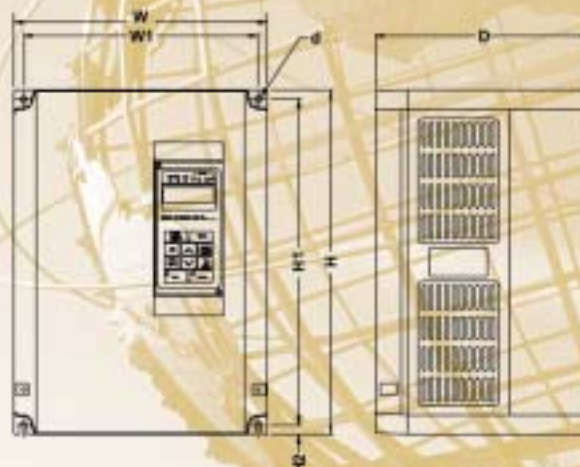
I/O	Terminal	Function	
Digital Input Terminals	1	Forward operation-stop signal.	
	2	Reverse operation-stop signal.	
	3	External fault input.	
	4	Fault reset.	
	5	Multi-function contact input: the following signals available to select. Forward/reverse select, run mode select, multi-speed select, jog frequency select, accel/decel time select, external fault, external coast to stop, hold command, inverter overheat prediction, DB command, aux. Input effective, speed search, energy-saving operation.	
	6		
	7		
	8		
		24VG	SINK Common (0V), ref to appendix D.
		24V	SOURCE Common (24V), ref to appendix D.
	SC	Sequence input Common (24V), ref to appendix D.	
Analog Input Terminals	+15V	+15V power supply for external frequency command.	
	VIN	Master speed voltage reference (0 to 10V).	
	AIN	Master speed current reference (4 to 20mA).	
	AUX	Auxiliary analog command: one of the following signals available to select. Frequency command, frequency gain, frequency bias, overtorque detection level, voltage bias, accel/decel rate, DB current.	
	MT	Motor temperature PTC thermistor. (active: 1330Ω, Return: 550Ω)	
	GND	Analog signal common.	
	E	Connection to shield signal lead. (frame ground)	
Digital Output Terminals	R3A	Fault contact output A (Closed at fault).	
	R3B	Fault contact output B (Open at fault).	
	R3C	Fault contact output common.	
	R2A-R2C	Multi-function contact output: one of the following signals available to output. Output during running, zero speed, synchronized speed, arbitrary speed agreed, frequency detection, overtorque, undervoltage, run mode, coast to stop, braking resistor overheat, alarm, fault.	
	R1A-R1C		
	D01	Multi-function PHC (photo-coupler) output 1 (open collector, 48VDC, 50mA)	The same functions as terminals R1A-R1C and R2A-R2C
DCOM	Multi-function PHC output common.		
Analog Output Terminals	A01	Analog multifunction output port: Frequency command, Output frequency, Output current, Output voltage, DC voltage, Output power.	0~11V max. 2mA or less
	A02		
	GND	Common lead for analog port.	

◆ DIMENSIONS

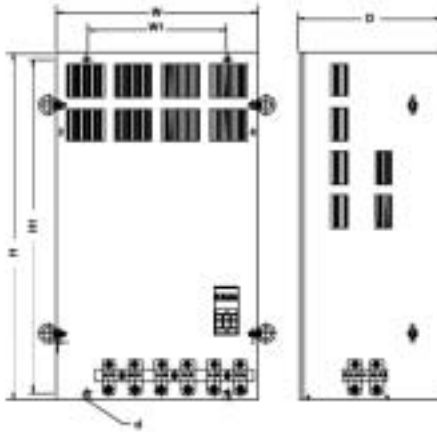
Voltage (V)	Inverter Capacity (HP)	Open Chassis Type (IP00) mm						Weight (Kg)	Enclosed Type (NEMA1) mm						Weight (Kg)	ACL/DCL	Reference Figure
		W	H	D	W1	H1	d		W	H	D	W1	H1	d			
220V	5	211.2	300	215	192	286	M6	5.6	211.2	300	215	192	286	M6	5.6	External ACL (option)	(a)
	7.5																
	10																
	15	265	360	225	245	340	M6	12	265	360	225	245	340	M6	12	External ACL (option)	(a)
	20																
	25																
	30	283.5	525	307	220	505	M8	36	291.5	745	307	220	505	M8	38	DCL Built-in (Standard)	(b)
	40																
	50																
	60	344	630	324.5	250	610	M8	47	352	945	324.5	250	610	M8	50		
75	49							52									
100	459	790	324.6	320	760	M10	82	462	1105	324.6	320	760	M10	87	DCL Built-in (Standard)		
125																	

440V	5	211.2	300	215	192	286	M6	5.6	211.2	300	215	192	286	M6	5.6	External ACL (option)	(a)
	7.5																
	10																
	15	265	360	225	245	340	M6	12	265	360	225	245	340	M6	12	External ACL (option)	(a)
	20																
	25																
	30	283.5	525	307	220	505	M8	36	291.5	745	307	220	505	M8	38	DCL Built-in (Standard)	(b)
	40																
	50																
	60	344	630	324.5	250	610	M8	47	352	945	324.5	250	610	M8	50		
	75							81							86		
	100	459	790	324.6	320	760	M10	80	462	1105	324.6	320	760	M10	85		
	125							81							86		
	150	599	1000	381.6	460	960	M12	128	602	1305	381.6	460	960	M12	135		
	175							132							139		
	215							160							166		
	250	730	1230	382	690	930	M12	170	730	1330	382	690	930	M12	176	External ACL (option)	(c)
300	190							196									
350	190							196									
400	190	196															
500	190	196															

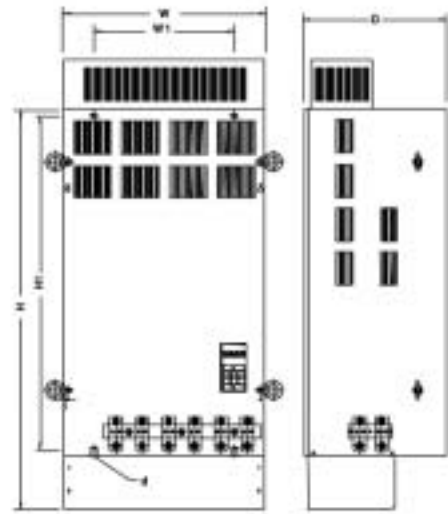
(a) 220V: 5HP~25HP
440V: 5HP~30HP



(b) 220V: 30HP~125HP
440V: 40HP~300HP

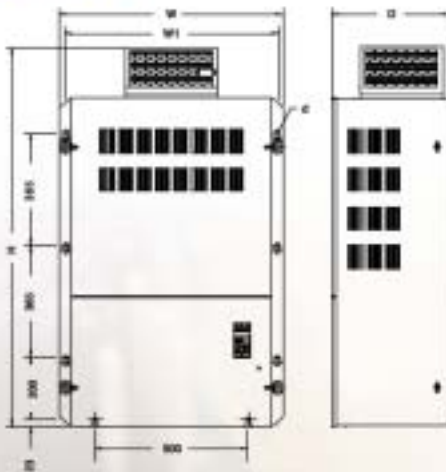


(Open Chassis Type – IP00)

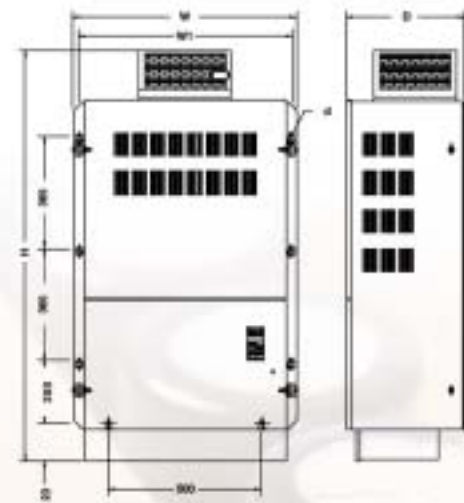


(Wall-mounted Type – NEMA1)

(c) 440V: 350HP



(Open Chassis Type – IP00)

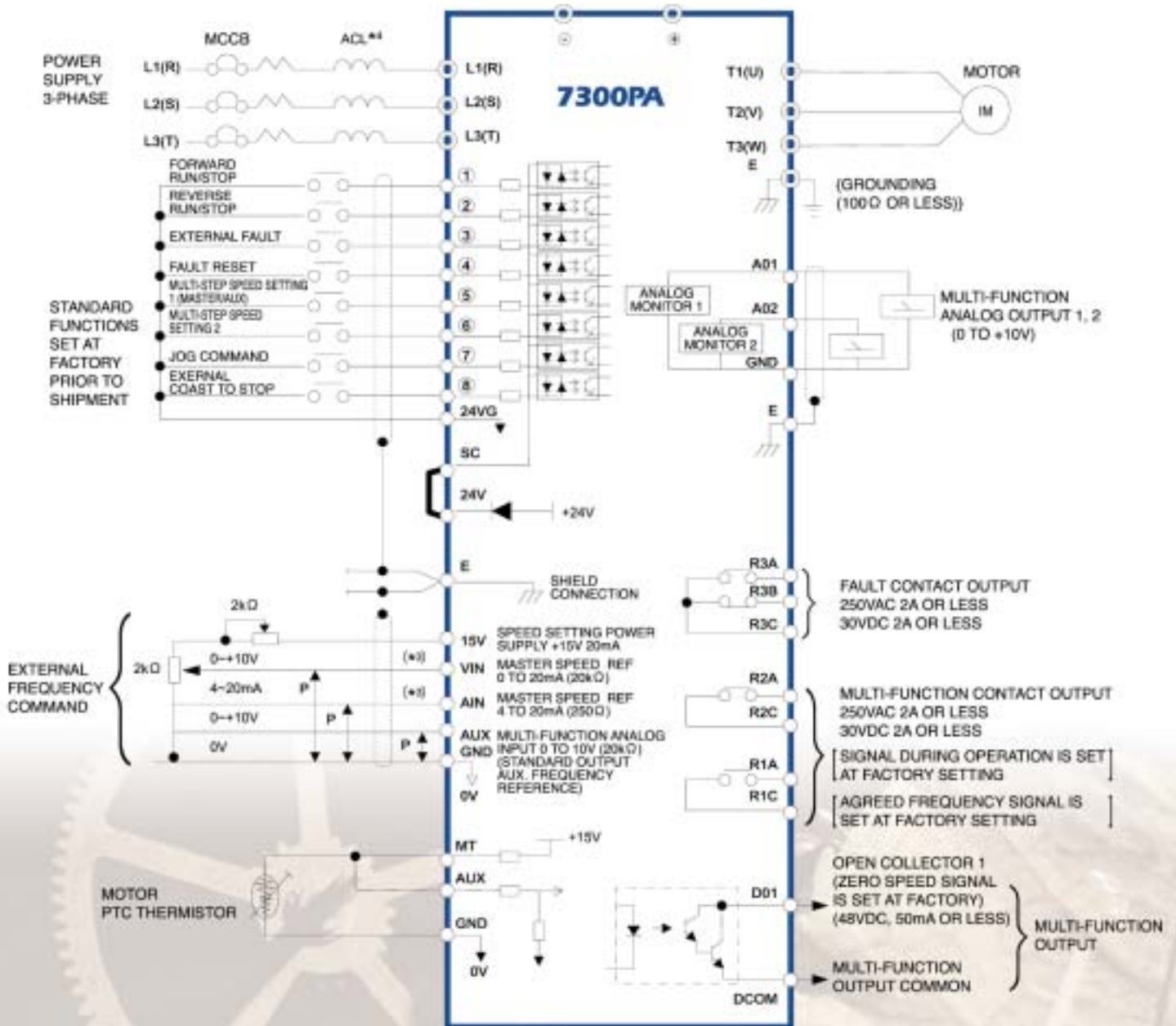


(Wall-mounted Type – NEMA1)

(d) 440V: 400HP~500HP



◆ CONNECTION DIAGRAM



*1 shield wire shield twisted wire

*2 The terminal ① ~ ⑧ can be connected as SINK or SOURCE type input interface. (Ref. to Appendix D)

*3 The terminal arrangement.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	1	2	3	4	5	6	7
24VG	24VG	1	2	3	4	5	7	8	8C	24V	E	15V	VIN	AIN	AUX	MT	GND	A01	A02	GND	D01	DCOM	R1A	R1C	R2A	R2C	R3A	R3B	R3C	

Shorted at factory

*4 External ACL is a must for 350HP ~ 500HP (DCL built-in for 40HP ~ 300HP).

TECO  **TECO ELECTRIC & MACHINERY CO., LTD.**

49, WU KUNG 6 RD., WU KU INDUSTRIAL DISTRICT, TAIPEI HSIANG, TAIWAN
TEL:886-2-89901111 FAX:886-2-22900465 <http://www.teco.com.tw>

GJ-22-01 2004-05-20