TVF300 Series High-Performance Vector Inverter

1 Overview

TVF300 series is a new platform vector inverter developed by Tengen Electric Company. Based on the new generation low-loss IGBT module, the product uses advanced current vectoring control algorithm, high-power density structure design, high-efficient heat radiation structure design, reliable hardware circuit design, and modular design and the driving capacity of motor is maximized to satisfy the increasing diversity and specialization needs of user.

2 Type Designation

TVF300 – □□□ □ □ □ □

- L: DC reactor; Empty: None
- B: Brake unit; Empty: None
- Inverter type: G: general type; P: Fan water pump type
- Voltage grade: S2: single phase 220V; T2: three phase 220V; T3: three phase 380V
- Inverter power: For example: 007: 0.75kW; 015: 1.5kW; 110: 11kW
- Inverter series

3 Technical Parameters

Item name		Spec.	
Input	Voltage	Single-phase 220V (-15% ~ +15%)	
		Three-phase 380V (-15% ~ +20%)	
	Freq.	47~63Hz, voltage unbalance ratio: <3%	
Output	Voltage	0~Input voltage	
	Freq.	0Hz ~ 500Hz	
Basic functions	Frequency command	Digital setting: 0.01Hz; simulation setting: Max. freq. × 0.02%	
	Control mode	Open-loop vector control (SVC); Closed-loop vector control (FVC); V/F control	
	Starting torque	0.3Hz/150% (SVC); 0Hz/180% (FVC)	
	Speed regulation range	1:200 (SVC)	1:1000 (FVC)
	Speed steady accuracy	±0.5% (SVC)	±0.02% (FVC)
	Speed control accuracy	SVC: ±5% (Above 5Hz); FVC: ±3%	
	Torque boost	Auto torque boost: the manual torque is increased by 0.1% to 30.0%	
	V/F curve	Four modes: linear type; multi-point type; complete V/F separation; incomplete V/F separation	
	Acceleration-deceleration curve	Linear or S-curve acceleration and deacceleration ways; Four types of acceleration and deacceleration time; acceleration and deacceleration time range: 0.0~6500.0s	
	DC brake	DC brake starting frequency: 0.00Hz ~ Max. freq.; brake time: 0.0s~36.0s; brake action current: 0.0% ~ 100.0%	
	Inching control	Inching frequency range: 0.00Hz ~ 50.00Hz; inching acceleration and deacceleration time: 0.0s ~ 6500.0s	

TVF300 Series High-Performance Vector Inverter

Continued

Item name		Spec.
Basic functions	Single PLC, multi-speed operation	Realize the 16-speed operation through the built-in PLC or control terminal
	Built-in PID	Easily realize the process control closed-loop control system
	Auto voltage regulation (AVR)	The constant output voltage can be maintained automatically when the power voltage changes
	Overvoltage, overcurrent, and stall control	Automatic limit of current and voltage during operation to prevent the frequent trip due to overcurrent or overvoltage
	Rapid current limiting function	Minimize overcurrent fault, and ensure the normal operation of inverter
	Torque limit and control	In the vector control mode, the torque control can be realized; automatic limit of torque during operation to prevent frequent trip due to overcurrent
Personalized functions	Field bus	Modbus
	Multi-encoder support	With differential ABZ encoder supported
	Multi-motor switching	Two sets of motor parameters to realize the control of switching between two motors
	Not stop due to momentary interruption	Compensation of the voltage reduction through the load feedback energy in the event of momentary interruption to maintain the continued operation of inverter in a short time
	Timing control	Timing control function: Set time range: 0.0 minute ~ 6500.0 minutes
	Motor overheat protection	Optional IO expansion card; analogy input AI3 can receive the motor temperature sensor input (PT100, PT1000)
	Virtual IO	5 sets of virtual DI DO to realize the simple logic control
Operation	Operation command	Operation panel given, control terminal given, serial communication port given. Switched via the multiple ways
	Freq. command	10 freq. commands: digit given, analog voltage given, analog current given, pulse given, and serial port given; switched via the multiple ways
	Aux. freq. command	10 aux. freq. commands. Flexibly realize the fine regulation of aux. frequency and the frequency synthesis
	Input terminal	Standard: Five DI terminals, with one used to support the high-speed pulse input at max. 100kHz Two AI terminals used to support 0~10V voltage input or 0~20mA current input Expansion capacity: Four DI terminals One AI terminal used to support -10V ~ 10V voltage input and also support PT100/PT1000
	Output terminal	Standard: One high-speed pulse output terminal (with open-circuit collector type optional) to support 0~100kHz square wave output One relay output terminal One AO terminal to support 0~20mA current output or 0~10V voltage output Expansion capacity: One relay output terminal One AO terminal to support 0~20mA current output or 0~10V voltage output

TVF300 Series High-Performance Vector Inverter

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Item name		Spec.
Display and keyboard	LED display	To display parameters
	Key lock and function selection	To lock the keys partially or fully; to define the function range of some keys to prevent misoperation
Protection function	Open-phase protection	Output open-phase protection
	Overcurrent protection	Shutdown if exceeding 2.5 times rated current of inverter for protection
	Overvoltage protection	Shutdown if the DC voltage of main circuit is too high
	Undervoltage protection	Shutdown if the DC voltage of main circuit is too low
	Overheat protection	Protection will be activated if the rectifier or inverter module is overheated
	Overload protection	Shutdown after 60s operation at the 150% rated current
	Short-circuit protection	Output interphase short-circuit protection; output-to-ground short-circuit protection
Environment	Working site	Indoors, prevent direct sunlight, free of dust, corrosive gas, combustible gas, oil mist, water steam, water drops, or salts
	Altitude	Below1000m; degraded by 1%/100m height if more than 3,000m
	Ambient temperature	-10℃~+45℃; when the ambient temperature is above 45℃, please degrading; degraded by 1.5% per 1℃ ambient temperature rise
	Humidity	Less than 95%RH, no condensation
	Vibration	Less than 5.9m/s^2 (0.6g)
	Storage temperature	-20℃ ~ +60℃

4 Model Selection

Inverter model	Power capacity kVA	Input current A	Output current A	Adapted motor kW	Structure model
Single-phase power: 220V, 50/60Hz					
TVF300-0R75S2GB	1.5	8.2	4	0.75	A
TVF300-01R5S2GB	3	14	7	1.5	
TVF300-02R2S2GB	4	23	9.6	2.2	B
TVF300-03R7S2GB	5.9	33	17	3.7	C

TVF300 Series High-Performance Vector Inverter

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Inverter model	Power capacity kVA	Input current A	Output current A	Adapted motor kW	Structure model
Three-phase power: 380V, 50/60Hz					
TVF300-0R75T3GB	2.8	2.4	2.1	0.75	A
TVF300-01R5T3GB	5	4.6	3.8	1.5	
TVF300-02R2T3GB	6.7	6.3	5.1	2.2	
TVF300-03R7T3GB	12	11.4	9	3.7	B
TVF300-05R5T3GB	17.5	16.7	13	5.5	
TVF300-07R5T3GB	22.8	21.9	17	7.5	C
TVF300-0011T3GB	33.4	32.2	25	11	
TVF300-0015T3GB	42.8	41.3	32	15	D
TVF300-18R5T3GB	45	49.5	37	18.5	
TVF300-0022T3GB	54	59	45	22	
TVF300-0030T3GB	73	78	60	30	E
TVF300-0037T3G*	63	69	75	37	F
TVF300-0045T3G*	81	89	90	45	
TVF300-0055T3GL*	97	113	110	55	
TVF300-0075T3GL*	127	157	152	75	G
TVF300-0090T3GL*	150	180	176	90	
TVF300-0110T3GL	179	214	210	110	H
TVF300-0132T3GL	220	256	253	132	
TVF300-0160T3GL	263	307	304	160	
TVF300-0200T3GL	334	385	380	200	I
TVF300-0220T3GL	375	430	426	220	
TVF300-0250T3GL	404	468	465	250	
TVF300-0280T3GL	453	525	520	280	
TVF300-0315T3GL	517	580	585	315	
TVF300-0355T3GL	565	617	650	355	J
TVF300-0400T3GL	629	687	725	400	

Note: The built-in braking unit of 37kW~90kW inverter is optional.

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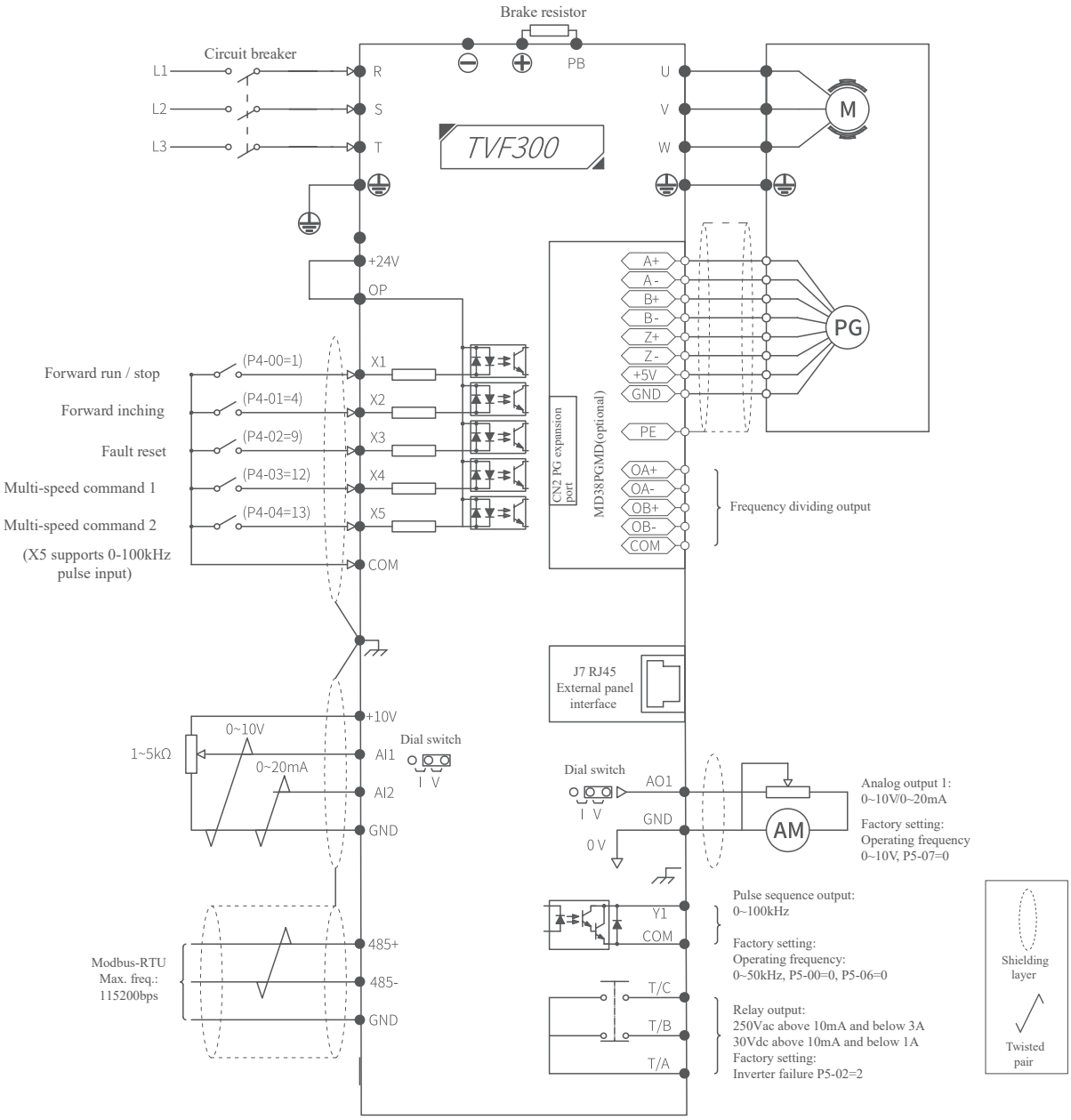
5 Basic Wiring Diagram



6 Outline and Installation Dimensions

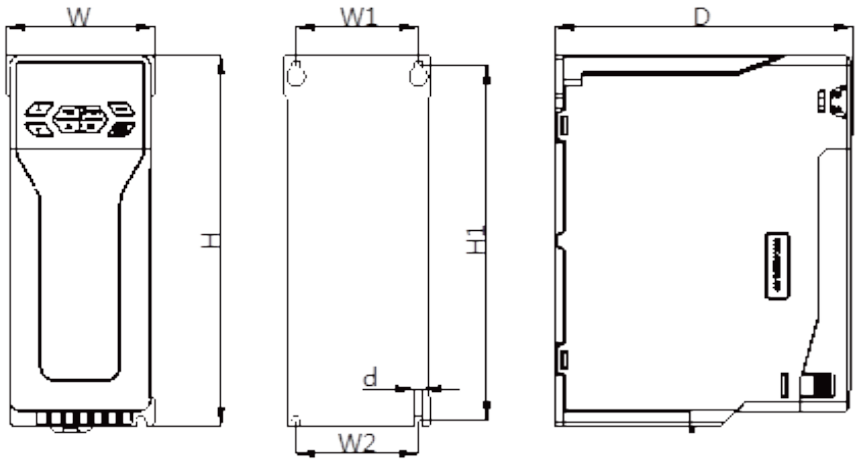


Fig. 1 Dimensional diagram for A, B, C, D, and E types

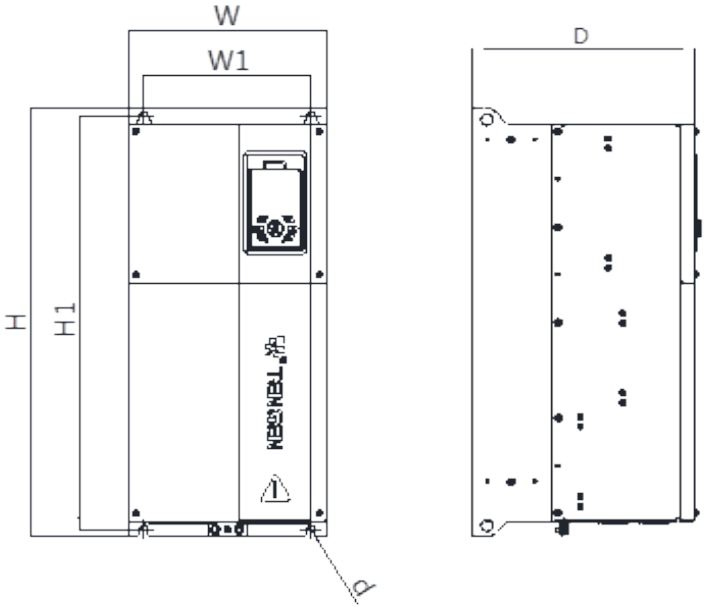


Fig. 2 Dimensional diagram for F, G, H, I, and J types

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Structure model	Dimensions/mm			Mounting hole/mm			Mounting hole diameter/mm
	H	W	D	H1	W1	W2	
A*	200	80	160	192	66	—	φ5
B*	240	100	160	230	85	—	φ5
C*	320	120	180	310	105	—	φ5
D	380	140	200	370	125	125	φ7
E	380	140	230	370	125	125	φ7
F	540	250	280	520	210	210	φ10
G	600	320	310	580	270	270	φ10
H	760	390	350	740	300	300	φ12
I*	1150 (1490)	550	420	1120	380	380	φ13
J*	1200 (1633)	800	472	1165	500	500	φ15

Note 1: A type, B type, and C type structure has only one mounting hole at the bottom;

Note 2: The structure is iron shell for F type and above;

Note 3: I type structure can have an optional base, with its height H of 1490 including base; the fixed holes are shown in Fig. 3;

Note 4: J type structure has a base as standard configuration, with its height H of 1633 including base; the fixed holes are shown in Fig. 4.

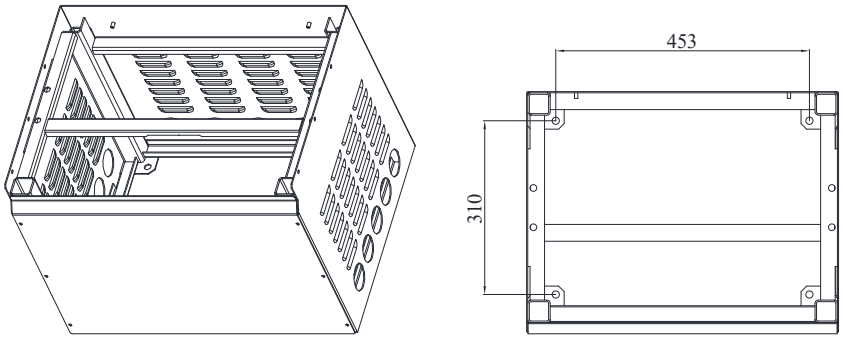

Fig. 3 Dimensional diagram for I type with an optional base

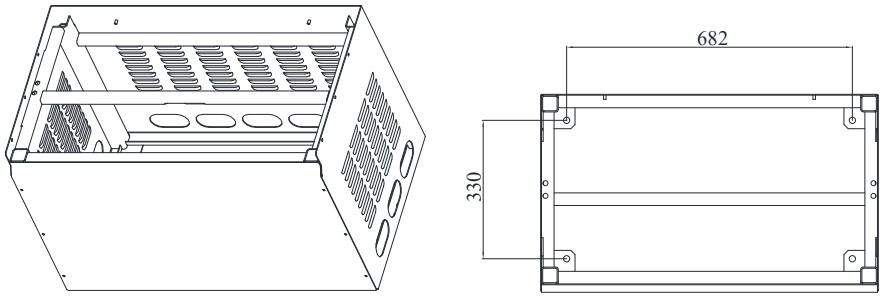

Fig. 4 Dimensional diagram for J type with an optional base