TATUNG

VF-TS1/VF-TSs Series

TATUNG Multi-Functional Vector Control Motor Drive

High-end vector control inverter, precise control, reliable, easy to use.
Suitable for wide variety industrial applications, energy-saving, capable of extending function.

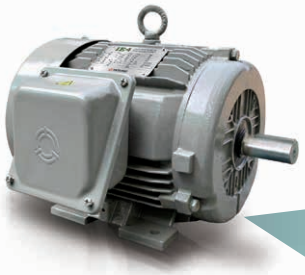
Energy efficient multi-functional VF-TS1 series vector inverter

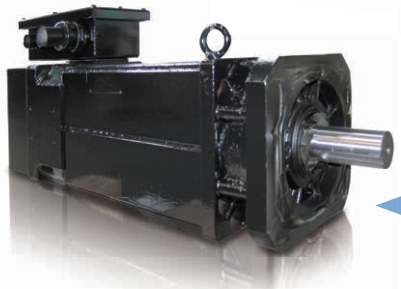
Energy-saving, low noise
Minimum parameter setting, easy to operate
High response, suitable for high torque motor, satisfying customers needs.

★ Build in RS-485 Modbus RTU communication interface.
★ Supports Line Driver, Open Collector/ Push Pull or Resolver feedback interface.

Applicable for various industries

V/F control and vector control for IMs.





Suitable for both IPM and SPM


Compressor


Crane


Machine tool


Conveyor


Extruder


Winder


Punching


Elevator


Textile

HD Heavy Duty


Fan

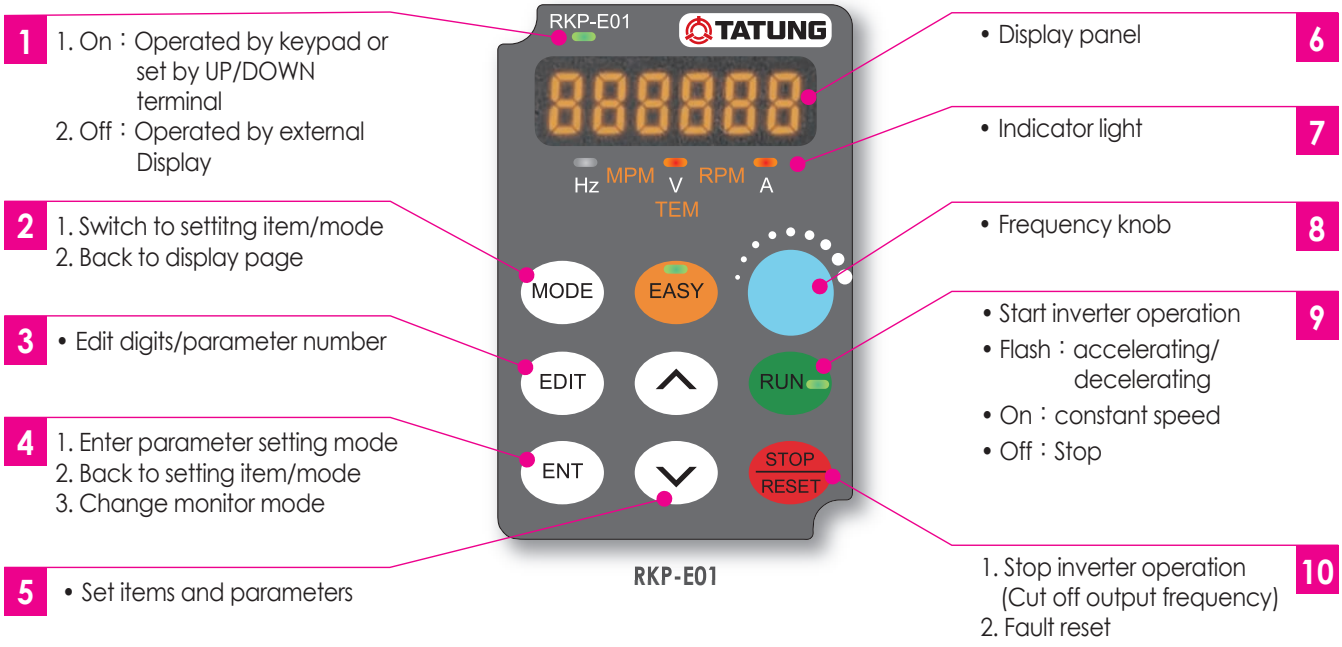

Pump


Blower

ND Normal Duty

Voltage / Type	load	Applicable motor capacity(kW)																										
	HD	0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160	200	220	250	315	375	450	
	ND	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160	200	220	250	315	375	450	500	
VF-TS1 200V series		Case2						Case3			Case4			Case5			Case6	Case7			Case8						
VF-TSs 200V series		VF-TSs																										
VF-TS1 400V series			Case2						Case3			Case4				Case5			Case6	Case7		Case8				Case9	
VF-TSs 400V series		VF-TSs																										

∗ HD：Heavy Duty; ND：Normal Duty



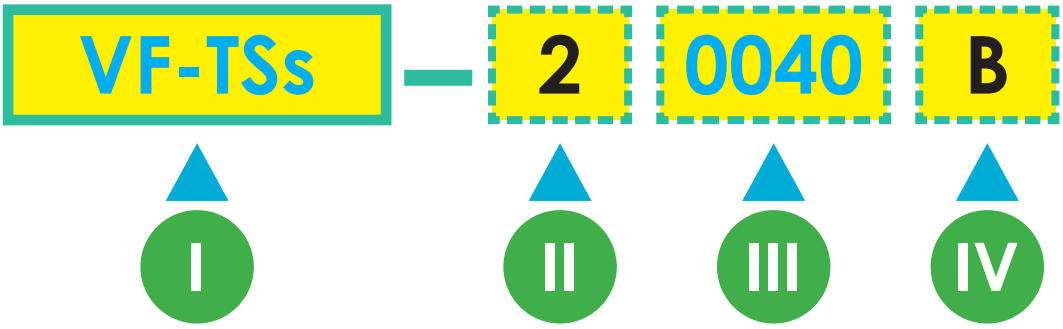
▲ Design for ease of use

- One touch operation for preset functions.
- Capable of membering two sets of motor parameter setting. Easy to switch control different motors with only one inverter, lowering equipment construction costs.
- Provide 16 different sets of preset speed, saving parameter adjusting time.

▼ Multi-functional vector drive technology

- Support open loop V/F controc, closed loop V/F control, sensorless vector control and sensor-based vector control. Applicable to various AC motors including IPM,SPM and IM.
- Build-in speed, pressure, flow rate and temperature PID control for compressor, pump and air-conditioning usage.
- Build-in power regeneration for impact loading to reduce power consumption and saving the cost of braking unit. Particularly suitable for pressing or punching machine.
- Build-in 16 operating procedures controlled by loop, cycles and timing. Suitable for dehydration and textile machine.
- Ten sets of error record. Each set contains six status records for investigating abnormal condition.

Model Number Scheme



I ▶ **Product Series** **VF-TS1** with feedback / **VF-TSs** sensorless only

II ▶ **Input Voltage** **2**：AC 200~240V / **4**：AC 380~480V

III ▶ **Model Number** 0040~450K applicable motor capacity

IV ▶ **Brake Type** **B**：Build-in brake transistor / **N**：W/o brake transistor

VF-TSs

Model number (VF-TSs- □□□□□ B)		20040	20075	20150	20220	20370	40040	40075	40150	40220	40370
Applicable motor capacity (kW)	HD	0.4	0.75	1.5	2.2	3.7	0.4	0.75	1.5	2.2	3.7
	ND	0.75	1.5	2.2	3.7	5.5	0.75	1.5	2.2	3.7	5.5
Rated output capacity (kVA)	HD	1.1	1.9	3	4.2	6.5	1.1	1.9	3	4.6	6.9
	ND	1.6	2.6	3.8	5.8	8	1.8	2.7	3.7	6.9	8.4
Rated output current (A)	HD	3	5	8	11	17	1.5	2.5	4	6	9
	ND	4.2	6.8	10	15.2	21	2.4	3.5	4.8	9	11
Rated output voltage (V)		Three phase 200~240V (correspond to input voltage)					Three phase 380~480V (correspond to input voltage)				
Range of output frequency (Hz)		0.1~600.00Hz									
Power source (V, Hz)		Three phase 200~240V 50/60Hz					Three phase 380~480V 50/60Hz				
Power source fluctuation range		170~264V 50/60Hz / ±5%					323~528V 50/60Hz / ±5%				
Input current (A)	HD	4	6	10	14	18	2	3.5	5	8	12
	ND	5	8	12	18	25	2.8	4.2	5.8	12	13
Rated overload current (A)	HD	150% / 1 minute									
	ND	120% / 1 minute									
Cooling method		nature cooling		forced ventilation			nature cooling		forced ventilation		
Applicable safety standards		UL508C, CSA C22.2 No. 14-05, EN61800-3, EN61800-5-1									
Degree of protection		IP20									
Weight (kg)		1.8	1.8	1.9	2.0	2.1	1.8	1.8	1.9	2.0	2.0
Voltage level		Three phase 200V series					Three phase 400V series				

＊ HD: Heavy Duty; ND: Normal Duty.

VF-TS1 Three phase 200V series

Model number (VF-TS1-2 □□□□ B/N)		0040	0075	0150	0220	0370	0550	0750	1100	1500	1850	2200	3000	3700	4500	5500	7500	9000	110K	160K	200K
Applicable motor capacity (kW)	HD	0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	160	200
	ND	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	200	-
Rated output capacity (kVA)	HD	1.1	1.9	3	4.2	6.5	9.5	13	18	23	28	34	44	55	67	84	112	132	154	223	267
	ND	1.6	2.9	3.8	5.8	8.4	12	16	22	28	34	43	55	67	83	105	132	154	193	267	267
Rated output current (A)	HD	3	5	8	11	17	25	33	46	60	74	90	115	145	175	220	295	346	405	585	700
	ND	4.2	7.5	10	15.2	22	31	41	58	74	90	112	144	175	218	275	346	405	500	700	700
Rated output voltage (V)		Three phase 200~240V (correspond to input voltage)																			
Range of output frequency (Hz)		0.1~600.00Hz																			
Power source (V, Hz)		Three phase 200~240V 50/60Hz																			
Power source fluctuation range		170~264V 50/60Hz / ±5%																			
Input current (A)	HD	5	6	10	14	18	30	40	60	69	85	103	132	176	200	240	280	330	380	550	660
	ND	5	8.8	12	18	26	41	55	66	85	103	128	176	200	240	280	330	380	470	660	660
Rated overload current (A)	HD	150% / 1 minute																			
	ND	120% / 1 minute																			
Cooling method		self cooling	forced ventilation																		
Applicable safety standards		UL508C, CSA C22.2 No. 14-05, EN61800-3, EN61800-5-1																			
Degree of protection		IP20												IP00 (IP 20 optional)							
Weight (kg)		3.0	3.0	3.0	3.0	3.0	3.0	5.4	5.7	12.4	13.1	14.7	14.8	42.7	44.3	46.3	63.6	89	90	164	167
Case code		Case 2						Case 3		Case 4				Case 5			Case 6	Case 7		Case 8	

＊ Model numbers less than VF-TS1-21100 (included) are equipped with braking transistor, more than VF-TS1-21500 (included), the braking transistor is optional.

VF-TS1 Three phase 400V series

Model number (VF-TS1-4 □□□□ B/N)		0075	0150	0220	0370	0550	0750	1100	1500	1850	2200	3000	3700	4500	5500	7500	9000	110k	132k	160k	200k	220k	250k	315k	375k	450k
Applicable motor capacity (kW)	HD	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160	200	220	250	315	375	450
	ND	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160	200	220	250	315	375	450	600
Rated output capacity (kVA)	HD	1.9	3	4.6	6.9	11	14	18	23	30	34	46	56	66	84	114	134	160	193	232	287	316	366	446	533	655
	ND	2.7	3.7	6.1	8.4	13	17	23	28	34	43	56	66	82	105	134	160	193	232	287	316	366	396	533	655	732
Rated output current (A)	HD	2.5	4	6	9	14	18	24	30	39	45	61	73	87	110	150	176	210	253	304	377	415	480	585	700	860
	ND	3.5	4.8	8	11	17	22	30	37	45	56	73	87	108	138	176	210	253	304	377	415	480	520	700	860	960
Rated output voltage (V)		Three phase 380~480V (correspond to input voltage)																								
Range of output frequency (Hz)		0.1~600.00Hz																								
Power source (V, Hz)		Three phase 380~480V 50/60Hz																								
Power source fluctuation range		323~528V 50/60Hz / ±5%																								
Input current (A)	HD	3.5	5	8	12	16	22	28	38	45	52	70	84	100	130	155	177	196	217	282	355	385	440	540	650	800
	ND	4.2	5.8	9.6	13	20	25	43	45	52	64	84	100	130	155	177	196	217	282	355	385	440	540	650	800	900
Rated overload current (A)	HD	150% / 1 minute																								
	ND	120% / 1 minute																								
Cooling method		self cooling	31.4	31.4	31.4	62.8	62.8	59.8	59.8	59.8	150	216	216	216	212	394	394	394	394	591	591	788	788	788	1182	1182
Applicable safety standards		UL508C, CSA C22.2 No. 14-05, EN61800-3, EN61800-5-1																								
Degree of protection		IP20													IP00 (IP 20 optional)											
Weight (kg)		3.0	3.0	3.0	3.0	3.0	3.1	5.6	5.7	5.8	12.8	12.9	15	15.3	44	45.5	46.4	64	64.5	95	97	159	163	164	217	272
Case code		Case 2						Case 3			Case 4				Case 5			Case 6		Case 7		Case 8			Case 9	

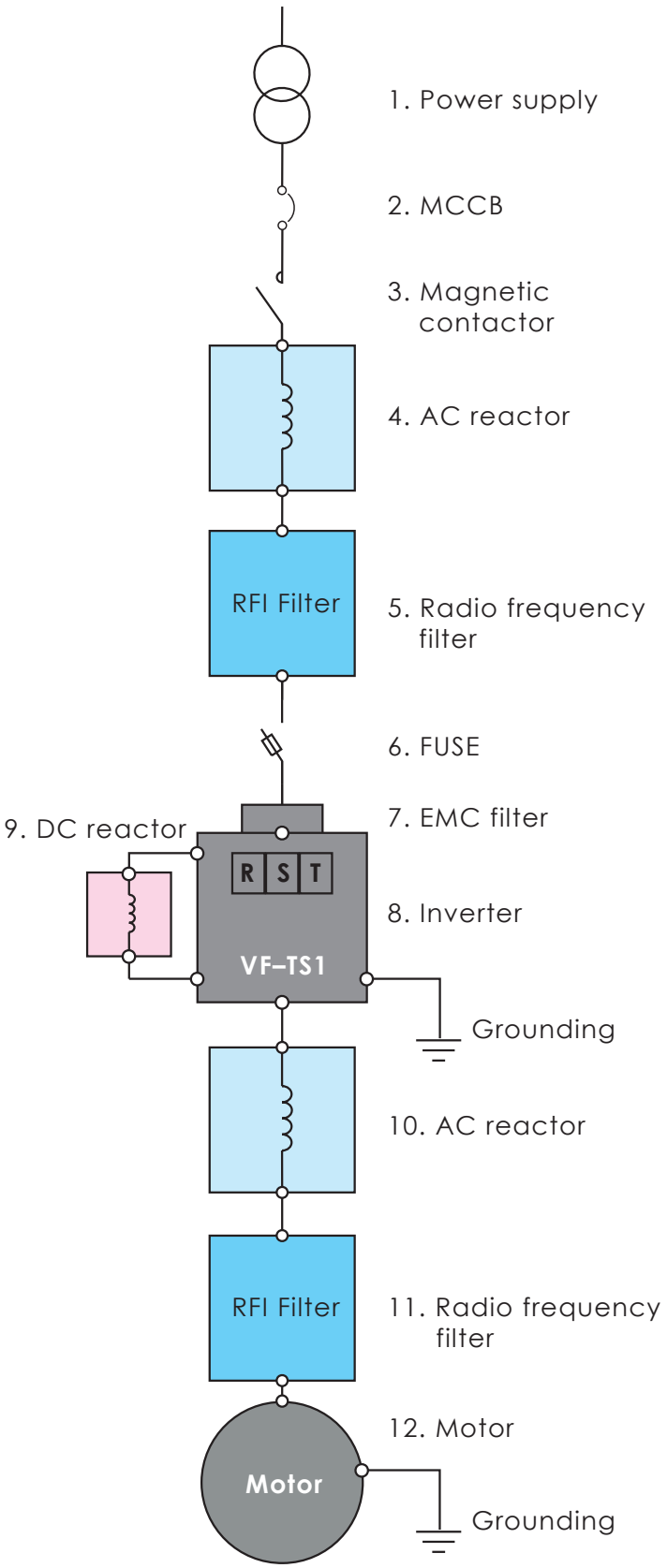
＊ Model number less than VF-TS1-41850 (included) are equipped with braking transistor, more than VF-TS1-42200 (included), the braking transistor is optional.
＊ The weight in standard specifications exclude ACL and DCL.
＊ HD: Heavy Duty; ND: Normal Duty.

Common Standard

Control characteristics	Control method		V/F control, PM vector control, IM vector control
			V/F contorl + feedback card*, PM vcetor control + feedback card*, IM vcetor control + feedback card*
	Frequency setting range		0.01~600Hz
	Resolution of frequency setting		Digital keypad (RKP-E01/RKP-C01): 0.01Hz Analog signal: 0.03Hz/60Hz (11bit)
	Resolution of output frequency		0.001Hz
	Frequency setting signal		-10~10V, 0~10V, 4~20mA, Pulse input
Operating characteristics and protections	Overload protection	Haevy duty	150% of inverter rated output current for 1min
		Normal duty	120% of inverter rated output current for 1min
	DC braking		Time of DC braking after stop/before start: 0 ~ 60.0sec DC braking frequency at stop: 0.1 ~ 60Hz DC braking lever: 0 ~ 150% of inverter rated output current
	Braking torque		About 20% (Build-in braking transistor type: About 100%)
	Acceleration / Deceleration time		0.1~3200.0 sec or 0.01~320.00 sec Acceleration/ Deceleration time can adjust from 0.01~600.00Hz
	Stall protection		Acceleration/ Constant speed stall protection (Current level 30~200%) Stall protection when decelerate
	Other functions		Silp compensation, auto-torque compensation, auto-adjustment of output torque stability, auto-operation for energy saving, auto-adjustment of switching frequency, restart after instantaneous power failure, speed tracing, overload detection, acceleration/deceleration switch, parameters copy, dynamic brake unit duty control, 16 sections of operating procedures control, kWh accumulation, counter, timer, Modbus communication, jump frequency, holding frequency, upper and lower limits output frequency, 16 sections speed, S curve acceleration and deceleration, motor temperature display and protection, inverter temperature display, fan temperature control start and stop, pulse input/output, password lock, predictive maintenance information, error record, PID control (two-stage PID), upper and lower limits detection feedback, traverse textile, 2 independent motors parameter switch, automatic adjustment, torque limit, KEB function, overvoltage suppress function.
	Expansion card*		Feedback card (Line Driver, Open Collector, Resolver)
Input / Output signals	Input signal	Multi-function inputs	8 sets programmable input terminals: X1~X8 X8 also has function of pulse input
		Analog inputs	Vin1/ Vin2-GND: DC 0~10V or DC -10~10V Iin-GND: DC 4~20mA/ 2~10V or DC 0~20mA/ 0~10V
		Simulate analog inputs	Vin3, Vin4* (function = Vin1, Vin2): set by parameter/communication
	Output signal	Multi-function outputs	5 sets programmable output detection: Ta2-Tc2, Ta1-Tb1-Tc1, Y1-CME, Y2-CME, FM_P-COM* 2 sets programmable output detection: Y3, Y4 (detection function = Y1, Y2)
		Analog outputs	" FM+ " - " M- ": DC 0~10V " AM+ " - " M- ": DC 0~10V or DC 0~20mA/DC 4~20mA
Display	LED keypad(RKP-E01)		Monitor inverter frqeuency, voltage, current, temperature,terminal situation, motor temperature ..... information
Protection	Fault protection	Error trip messages of drive	EEPEOM error (EEr), A/D converter error (AdEr), Fuse open (SC), Under voltage during operation (LE1), Inverter over current (OC), Grounding fault (GF), Over voltage (OE), Inverter overheat (OH), Motor overload (OL), Inverter overload (OL1), System overload (OLO), External fault (EF), Keypad interrupt (PAdF), Input/Output phase loss fault (IPLF/OPLF)
		Waring messages of drive	Power source under voltage (LE), Inverter output interruption (bb), Coast to stop (Fr), Dynamic brake transistor over voltage (db), Keypad cable trip before connecting (Err_00), Keypad cable trip during operation (Err_01), Direction command error (dFt), Version copy error (Fault)
Enviroment	Operation field		Non-corrosive or non-conductive, or non-explosive gas or liquid, and non-dusty
	Ambient temperature		Heavy duty: -10˚C (14˚F) ~ +50˚C (122˚F)(Non-freezing and non-condensing) Normal duty: -10˚C (14˚F) ~ +40˚C (104˚F)(Non-freezing and non-condensing)
	Storage temperature		-25˚C (-13˚F) ~ +70˚C (158˚F)
	Relative humidity		95% RH or less (No-condensing atmosphere)
	Vibration		Less than 5.9m/sec^2 (0.6G)
	Altitude		Less than 1000m (3280ft)

* Not equipped in VF-TSs series.

Inverter peripheral devices



No.	Name	Function/Purpose, etc
1	Power supply	Please use permissible power 200V series：170 ~ 264V 400V series：323 ~ 528V
2	Molded-case circuit breaker (MCCB)	Protect power system when overload or short circuit happened. Prevent secondary damage occurs.
3	Magnetic contactor (MC)	When inverter or dynamic brake is in abnormal contion, cut off inverter power to prevent work accidents.
4	AC reactor (ACL)	Suppress surge voltage to potect inverter. It is recommeneded to install ACL when power supply capacity larger than 500kVA. Increase power factor and reduce harmonic currents.
5	Radio frequency filter (RFI Filter)	Reduce radiation interfences of inverter.
6	FUSE	Prevent work accidents when internal short circuit happens.
7	EMC Filter	Reduce inverter interferences to power supply(conduction).
9	DC reactor (DCL)	Suppress high-order harmonic. Improve power factor and lower ripple current.
10	AC reactor (ACL)	Reduce leakage current. ACL is needed when cable longer than 30m.
11	Radio frequency filter (RFI Filter)	Reduce radiation interfences of inverters.

1. ACL appropriate using time：

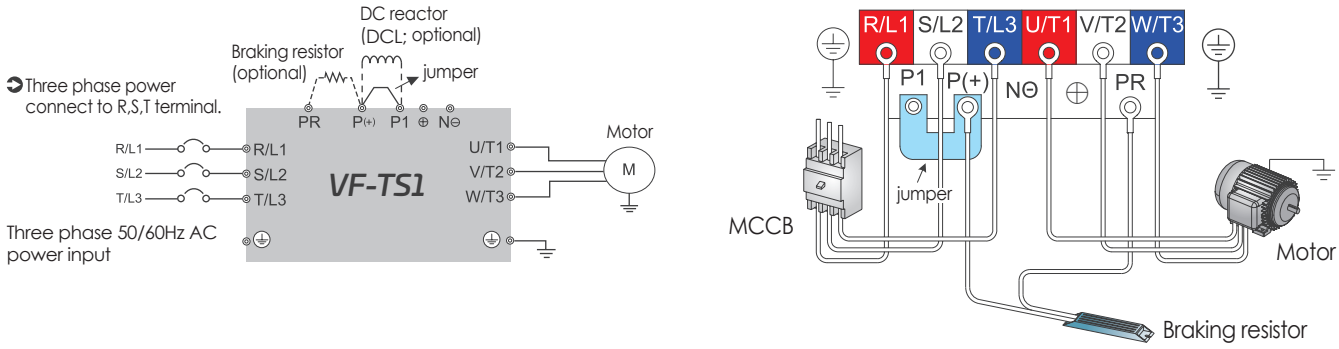
   RST input side：

   - When power supply capacity is over 500KVA or 10 times larger than inverter rated capacity.
   - When high frequency devices which may cause harmonic current installed in same power system.

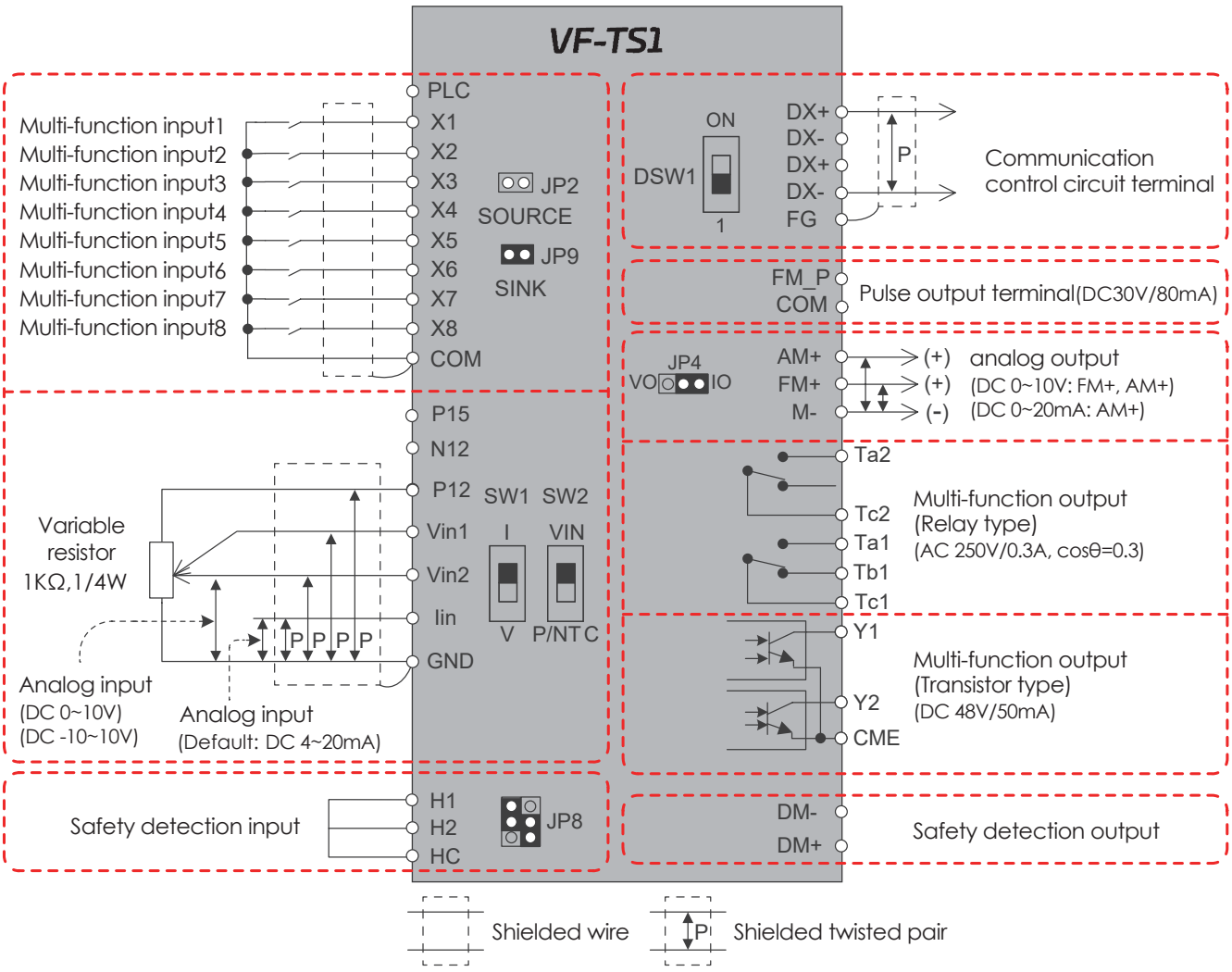
   UVW output side：

   - Cable length between inverter and motor is longer than 30 meters or multiple motors used in parallel.

2. ACL and DCL：
   - ACL is standard equipment when model number more than 7500(included)
   - DCL is standard equipment when model number more than 132k(included)
3. Please refer to user manual for detail instructions.



Main circuit connection diagram



Control circuit connection diagram

Main circuit terminal

Symbol	Function	Description
R, S, T (L1, L2, L3)	AC power source input	Three-phase sinusoidal power source input terminal
⊕、N⊖	DC power source input	External DC power source input terminal ※ only 20040~23000,40075~44500 modules have ⊕ terminal
U, V, W (T1, T2, T3)	Inverter output to motor	Output three-phase variable frequency and voltage to motor
P(+), N⊖	Dynamic brake terminal	This terminal can be connected to dynamic brake unit (optional)
P(+), PR	External brake terminal	This terminal can be connected to external brake resistor (optional)
P(+), P1	External reactor terminal	This terminal can be connected to DCL for improving power factor; Default: Jumper
PE 與 ⏚	Ground terminal	Inverter ground should comply with NEC or local standard

Control circuit terminal

		Symbol	Function	Description	
control circuit terminal	Control Power	PLC/P24	Power terminal for control device	output DC +24V；Maximum supply current: 100mA	
		P12		output DC +12V；Maximum supply current: 20mA	
		N12*		output DC -12V；Maximum supply current: 20mA	
		P15*		output DC +15V	
		GND	Analog ground	Common ground for control power (P12、N12、P15) and analog input (Vin1/Vin2/Iin)	
	Input terminal	X1	Multi-function input 1	Selective function with setting term H1-00 ；Default：Forward command	
		X2	Multi-function input 2	Selective function with setting term H1-01 ；Default：Reverse command	
		X3	Multi-function input 3	Selective function with setting term H1-02 ；Default：Jog command	
		X4	Multi-function input 4	Selective function with setting term H1-03 ；Default：External fault command	
		X5	Multi-function input 5	Selective function with setting term H1-04 ；Default：Reset command	
		X6	Multi-function input 6	Selective function with setting term H1-05 ；Default：Disable	
		X7	Multi-function input 7	Selective function with setting term H1-06 ；Default：Disable	
		X8	Multi-function input 8	Selective function with setting term H1-07 ；Default：Disable	
		COM	Digital ground	Common ground for multi-function input (X1~X8),control power (PLC) and pulse output terminal (FM_P)	
		Vin1	Analog input 1	Input range DC 0~10V or DC -10~10V, input impedence: 20kΩ	
		Vin2*	Analog input 2	Selective function with DIP switch - SW2: Thermistor or external voltage signal	
		Iin	Analog input 3	Selective function with DIP switch - SW1: Current signal or voltage signal	
	output terminal	FM_P*	Pulse output terminal	NPN open collector isolated output； Maximum: 30VDC/80mA；Default：Output frequency	
		AM +	Analog output 1	Selective function with JP4: Voltage singal or current signal	
		FM +	Analog output 2	Selective function with setting term H4-00 ；Default：Output frequency	
		M -	Analog output ground	Common ground for analog output	
		Ta1	Multi-function output (Relay type)	Capacity：AC 250V、0.3A Max、cos θ =0.3	Selective function with setting term H2-04 ；Default：Error detection
		Tb1			Selective function with setting term H2-04 ；Default：Error detection
		Tc1			Common of Ta1 and Tb1 terminals
		Ta2		Capacity：AC 250V、0.5A Max、cos θ =0.3	Selective function with setting term H2-05 ；Default：Detection during operation
		Tc2			Ta2 common terminal
		Y1	Multi-function output (Transistor type)	Capacity：DC 48V、50mAMax	Selective function with setting term H2-00 ；Default：Zero speed detection
		Y2			Selective function with setting term H2-01 ；Default：Zero speed detection
		CME			Common of Y1 and Y2 terminals

＊ Not equipped in VF-TSs series

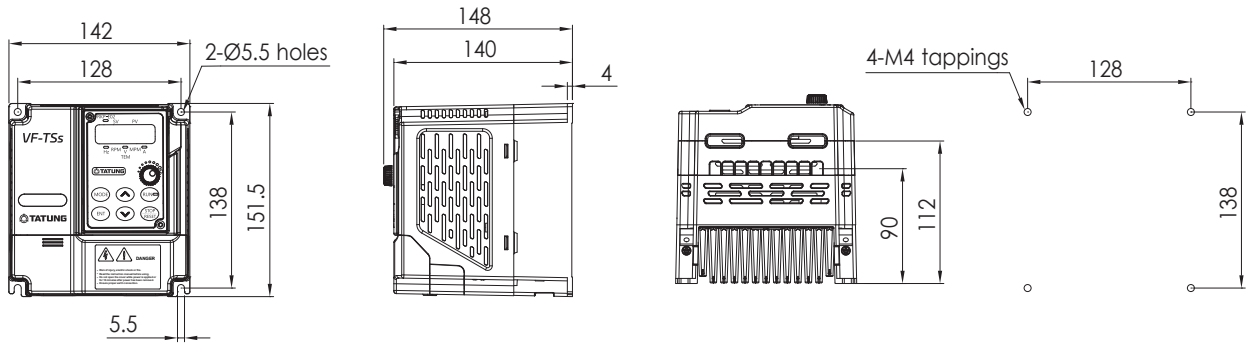
Communication control circuit terminal

Type	Symbol	Function	Description
Communication circuit terminal	DX+	Modbus communication circuit terminal	Use HMI, NB or other devices to control inverter. Interface：RS-485；Protocal：Modbus Terminal resistance switch： DSW1； Terminal resistance：120Ω.
	DX-		
	FG	Modbus ground terminal	Grounding terminal for shielding wire

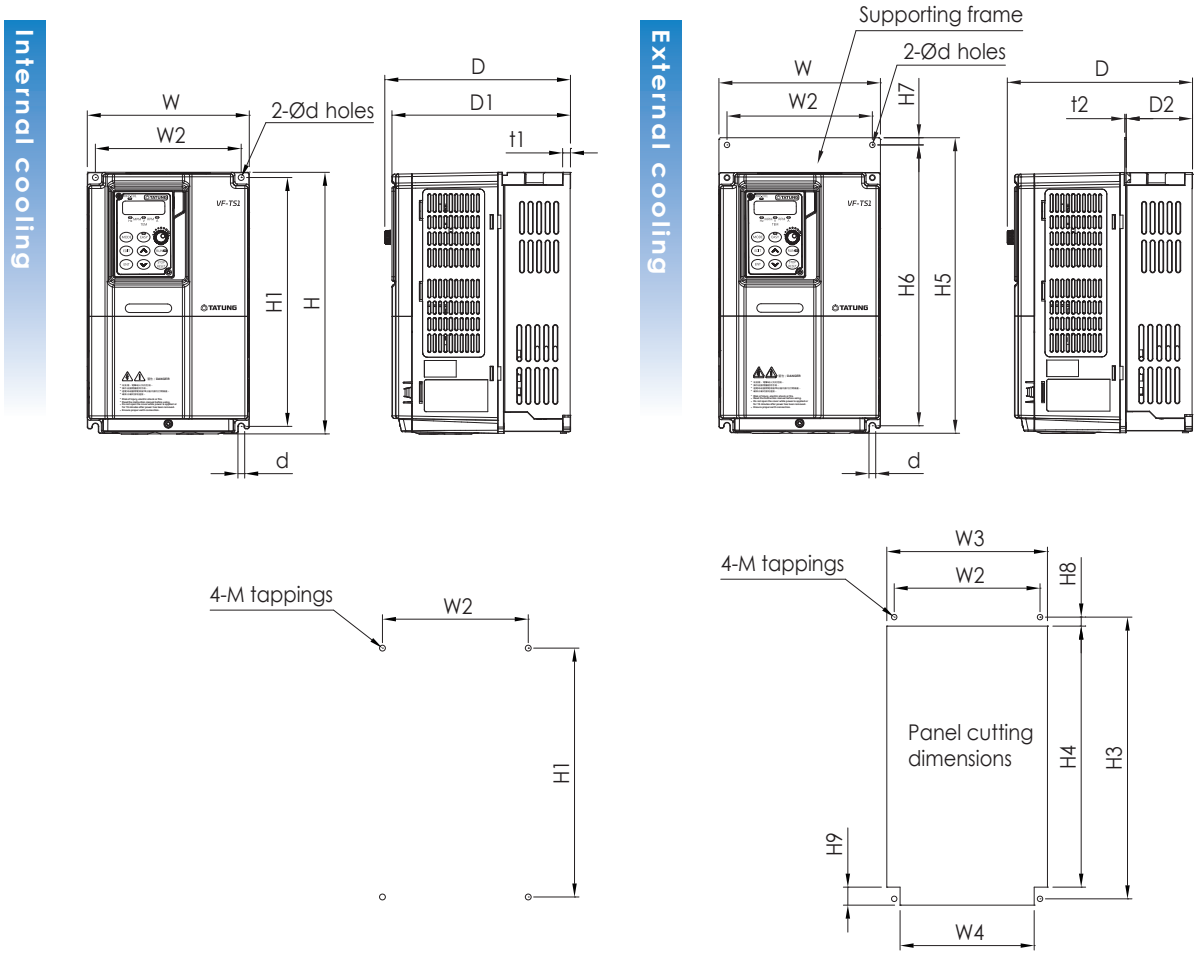
Note：Total length of connceting calbe should not exceed 500 meters.

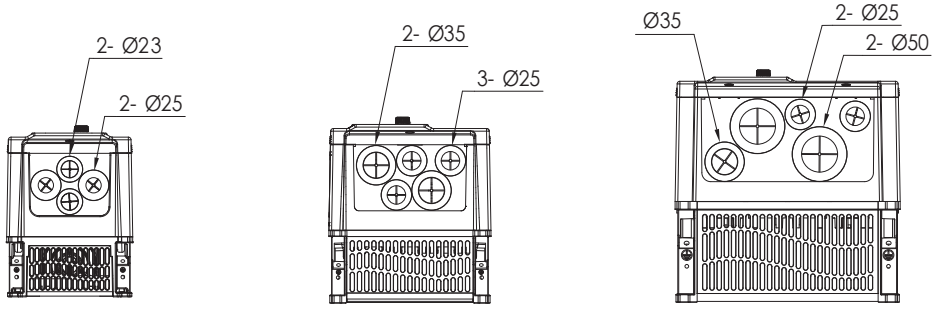
Dimension drawing

VF-TSs outline dimension drawing 20040B~20370B / 40040B~ 40370B



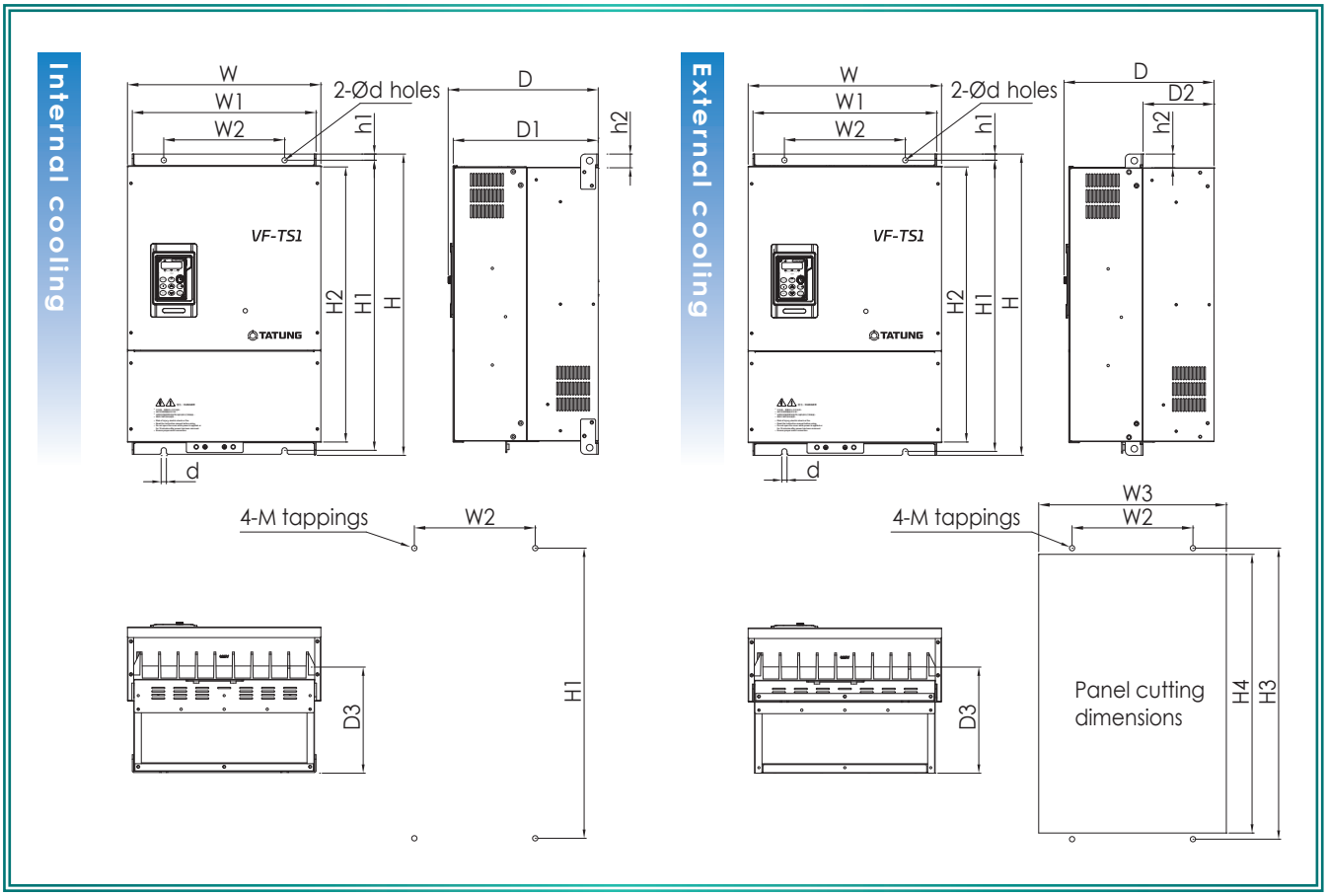
VF-TS1 outline dimension drawing Case 2~ 4





Case 2 Case 3 Case 4

Case 5~9



VF-TS1

Case	Model number		Dimensions(mm)												Screw
	200V	400V	W	W1	W2	W3	W4	H	H1	H2	H3	H4	H5	H6	M
CASE2	0040~0550	0075~0750	140	-	122	138.5	105	260	246	-	284	267	300	284	M5
CASE3	0750~1100	1100~1850	180	-	162	178.5	149	290	277	-	313	290	329	313	M5
CASE4	1500~3000	2200~4500	250	-	230	248.5	212	400	380	-	427	396	448	427	M8
CASE5	3700~5500	5500~9000	386	361	275	365	-	584	562	539	564	545	-	-	M8
CASE6	7500	110K~132K	446	418	275	427	-	685	660	630	662	634	-	-	M10
CASE7	9000~110K	160K~200K	508	479	275	487	-	818	785	751	788	758	-	-	M12
CASE8	160K~200K	220K~315K	696	654	580	657	-	1000	974	929	978	936	-	-	M12
CASE9	-	375K~450K	992	954	710	958	-	1030	1003	963	1007	968	-	-	M12

Case	Model number		Dimensions(mm)											Screw
	200V	400V	H7	H8	H9	h1	h2	t1	t2	D	D1	D2	D3	d	M
CASE2	0040~0550	0075~0750	8	10	14.5	-	-	4.7	1.2	190	182	60	-	6	M5
CASE3	0750~1100	1100~1850	8	10	20	-	-	9	1.6	207	199	74	-	6.5	M5
CASE4	1500~3000	2200~4500	10	11.5	29	-	-	9.5	2	258	250	103	-	9	M8
CASE5	3700~5500	5500~9000	-	-	-	11	25	-	-	331	323	155	242	10	M8
CASE6	7500	110K~132K	-	-	-	14	30	-	-	334	326	163	246	12	M10
CASE7	9000~110K	160K~200K	-	-	-	19	35	-	-	374	366	183	257	15	M12
CASE8	160K~200K	220K~315K	-	-	-	15	39	-	-	413	405	182	294	15	M12
CASE9	-	375K~450K	-	-	-	15	39	-	-	427	419	185	308	15	M12

■ Specifications stated in this catalogue are for reference only. Subject to change without notice.

TATUNG

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TATUNG Sanshia Motor Factory Facts

TATUNG Company Founded in 1918
Sanshia Factory Land Area --- 1,800,000 ft^2
Total MV Motors Produced --- over 30,000 Units
Continuous Production since 1949
Voltage Range --- through 13,800 Volts
Test Facility through 50,000 HP --- IEEE 112 Method F1
Location --- 352 Shi-tong Rd., Sanshia, New Taipei City 23743, Taiwan