

## LS650 CT/VT Series

# AC Motor Speed Controller Voltage Vector AC Drive



### Features:

- CT Series unique overload capacity: 150% / 60s
- VT Series unique overload capacity: 120% / 60s
- High reliability and low energy loss (New generation IGBT Module)
- Output Frequency: 0.01Hz~300.00Hz, Built-in AVR Function
- Multi-function PID setting, PID for pump only
- Built-in intelligent multi-function pump only parameters
- Built-in series communication interface RS-485 (Baud rate up to 34800)
- Digital monitoring software
- Setting of S-curve, linear curve and V/F curve
- 8 sets of acceleration/ deceleration selections with slip compensation
- 16-step speed presetting and 16-step programmable automation and PLC programming

### Models:

- 1 Phase 110V : 0.2~0.75kW (0.25~1HP)
- 1 Phase 220V : 0.2~1.5kW (0.25~2HP)
- 3 Phase 220V : 0.75~110kW (1~150HP)
- 3 Phase 380V : 0.75~260kW (1~350HP)

### Compliance to...

- Environmentally Friendly Technology
- Power-saving Technology
- Innovative Technology

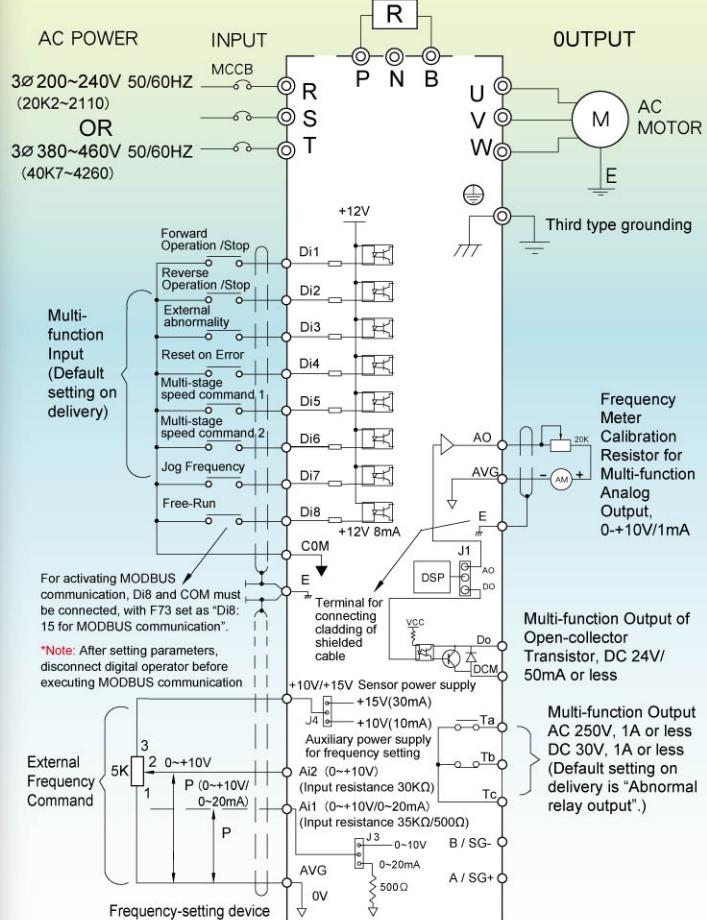


CE Standard Certificates

## ■ Descriptions of Control Terminal Functionalities

## ■ Basic Wiring Diagram

Terminal Mark		Terminal Name	Descriptions
Multi-function input terminals	Di1	Forward command	Di1-COM (ON) for Forward, (OFF) for Stop
	Di2	Reverse command	Di2-COM (ON) for Reverse, (OFF) for Stop
	Di3	Input of external error	When External Error is ON, the Inverter will trip and stop
	Di4	Reset	ON will reset from the holding status activated by the protection circuit.
	Di5	Multi-stage speed command 1	Multi-step speed command 1 and 2, configured with binary 2Bit for achieving 4-step speed control
	Di6	Multi-stage speed command 2	
	Di7	Jog Frequency	ON to activate inching frequency
	Di8	Free-Run	When a Stop command is ON, the inverter immediately cuts the output voltage, letting the motor in a free run and subsequent stop.
	COM	Common for digital input	Common terminal for multi-function inputs.
Analog frequency setup	+10V	+15V Sensor power supply	DC+15V power output for Sensor (Max. current 30mA)
		+10V Power supply for frequency setting	DC+10V power output for frequency setting device (Max. current 10mA)
	Note 1: J4 is used for selecting +10V or +15V as the output voltage. Default setting is +10V.		
Multi-function input terminals	AVG	Common terminal for Frequency	The common (ground) of Inputs of Frequency Setting signals (terminals A1, A2 and AO)
	Ai1	Analog voltage frequency command	Input Voltage DC 0~10V, input resistance 30KΩ; or input current DC 0~20mA, input resistance 500Ω. J3 is used for selecting a voltage signal or a current signal.
	Ai2	Analog voltage frequency command	Input voltage DC 0~10V, input resistance 30KΩ
	AO	Analog output	Multi-function analog output monitor (DC 0 ~ +10V), using AVG as the reference level.
	DO	Frequency achieved	This terminal goes ON when Inverter output frequency (F76) reaches preset value.
	Note 2: Only one selection can be made between AO and DO using the software and the hardware J1 simultaneously. Software AO is set by parameters F63-F65; software DO is set by the parameter F75.		
Multi-function input terminals	DCM	Common for DO outputs	The common for multi-function output terminals.
	Ta	Output in the event of a fault	When the protection function of the inverter is activated, 1a and 1b terminals will engage to output a signal
	Tb		* During a fault, Ta-Tc becomes closed (ON).
	Tc		* During a fault, Tb-Tc becomes open (OFF).
	E	Grounding terminal	Shielded cable, exclusively used for connecting with a selected ground.



<b>LS650M-20K2-SX</b>	<b>LS650-20K4-TD</b>	<b>LS650-22K2-TD</b>	<b>LS650-25K5-TD</b>	<b>LS650-2015-T</b>	<b>LS650-2037-T</b>	<b>LS650-2075-T</b>
<b>LS650M-20K4-SX</b>	<b>LS650-20K7-TD</b>	<b>LS650-24K0-TD</b>	<b>LS650-27K5-TD</b>	<b>LS650-2018-T</b>	<b>LS650-2045-T</b>	<b>LS650-2090-T</b>
<b>LS650M-20K7-SX</b>	<b>LS650-21K5-TD</b>		<b>LS650-2011-TD</b>	<b>LS650-2022-T</b>	<b>LS650-2055-T</b>	<b>LS650-2110-T</b>
	<b>LS650-22K2-TD</b>	<b>LS650-42K2-TD</b>		<b>LS650-2030-T</b>		
<b>LS650M-20K2-S</b>		<b>LS650-44K0-TD</b>	<b>LS650-45K5-TD</b>		<b>LS650-4045-T</b>	<b>LS650-4090-T</b>
<b>LS650M-20K4-S</b>	<b>LS650-40K4-TD</b>	<b>LS650-45K5-TD</b>	<b>LS650-47K5-TD</b>	<b>LS650-4015-T</b>	<b>LS650-4055-T</b>	<b>LS650-4110-T</b>
<b>LS650M-20K7-S</b>	<b>LS650-40K7-TD</b>		<b>LS650-4011-TD</b>	<b>LS650-4018-T</b>	<b>LS650-4075-T</b>	<b>LS650-4132-T</b>
<b>LS650M-21K5-S</b>	<b>LS650-41K5-TD</b>			<b>LS650-4022-T</b>		<b>LS650-4160-T</b>
	<b>LS650-42K2-TD</b>			<b>LS650-4030-T</b>		<b>LS650-4185-T</b>
<b>LS650M-20K2-TN</b>				<b>LS650-4037-T</b>		<b>LS650-4220-T</b>
<b>LS650M-20K4-TN</b>						<b>LS650-4260-T</b>
<b>LS650M-20K7-TN</b>						
<b>LS650M-21K5-TN</b>				<b>The above models can be provided</b>		

## ■ Model Descriptions

### LS650 Series

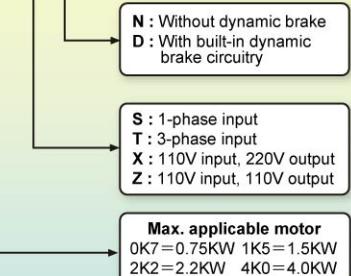
*AC Motor  
Speed Controller*



### LSCT650-24K0-XX

Code of Long Sheng Inverter Family	
LSCT650	Standard
LSVT650	Standard
LSCT650M	Miniature
LSVT650M	Miniature

Voltage class
1=100~120V
2=200~240V
4=380~460V



### ■ Standard Specifications

Model	20K2	20K4	20K7	21K5	22K2	24K0	25K5	27K5	2011	2015	2018	2022	2030	2037	2045	2055	2075	2090	2110
Applicable Motor Capacity (kW)	0.2	0.4	0.75	1.5	2.2	4.0	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110
Output Capacity (kVA)	0.6	1.2	1.7	2.7	3.8	6.4	9.5	12.5	17.5	23	29	34	45	57	68	82	114	133	162
Continuous Rated Current (A)	1.6	3.2	4.5	7.0	10	17	25	33	46	62	76	90	120	150	180	215	300	350	425

Model	40K7	41K5	42K2	44K0	45K5	47K5	4011	4015	4018	4022	4030	4037	4045	4055	4075	4090	4110	4132	4160	4185	4220	4260
Applicable Motor Capacity (kW)	0.75	1.5	2.2	4.0	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160	185	220	260
Output Capacity (kVA)	2.4	3.4	5.3	6.8	9.5	13	19	24	30	34	47	57	70	87	110	144	164	210	228	265	340	395
Continuous Rated Current (A)	3.2	4.5	7.0	9.0	12.5	17	25	32	40	46	62	75	92	115	150	180	216	275	300	350	450	530

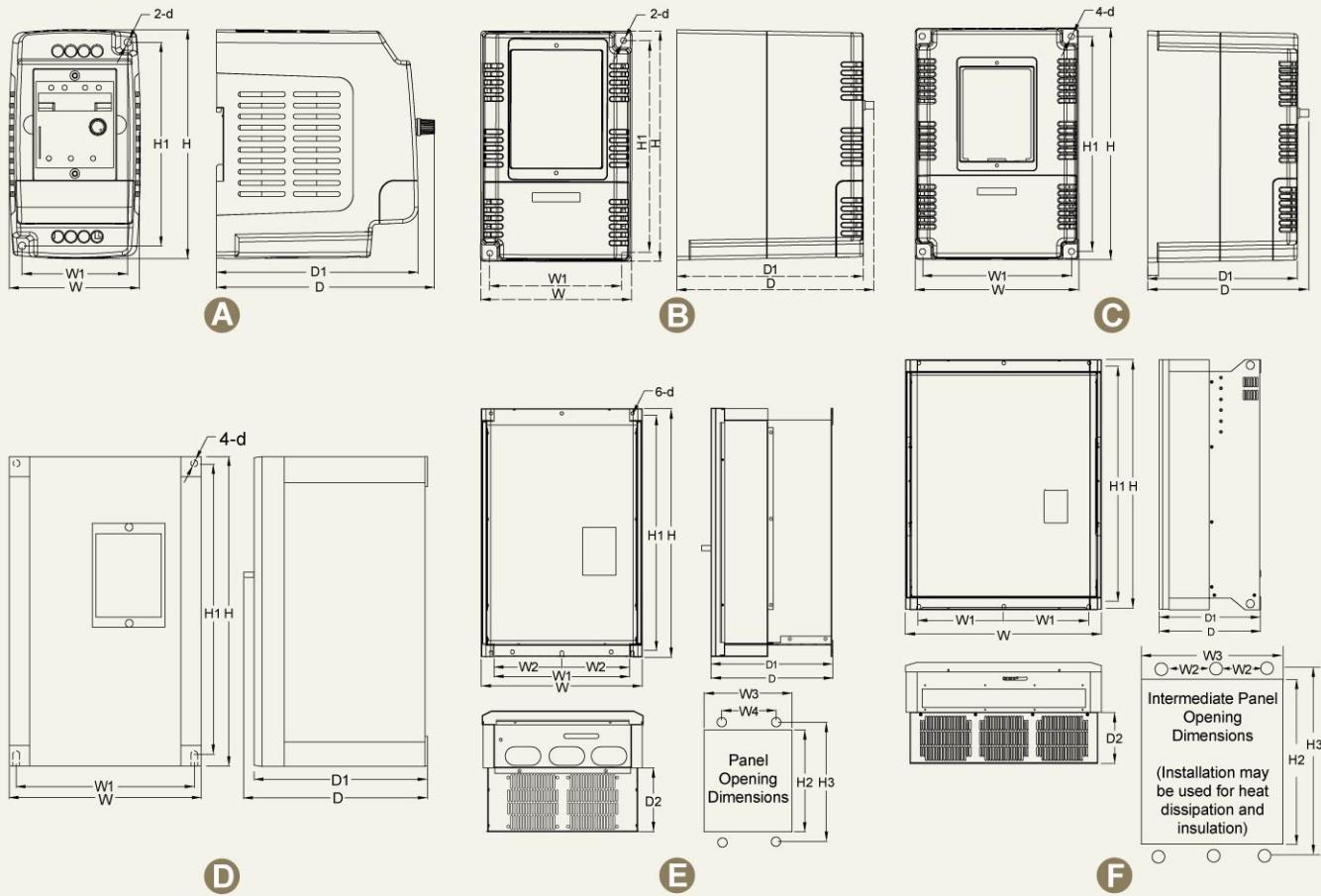
VT

Item		200V Rating	400V Rating
Power Supply		Single phase/Three phase 200V~240V 50/60Hz	Three phase 380V~460V 50/60Hz
		+10%	
		±5%	
		Corresponding 3-phase input voltage	Corresponding 3-phase input voltage
		Max. setting range: 0.01~300.00Hz	
Control Properties		Sine Wave SVPWM 3-phase modulation, switching frequency 2K~16KHZ, V/F Voltage-vector control	
		Max. output frequency 0.00~300.00Hz	
		Digital Signal: ±0.1% (-10°C~+40°C) · Analog Signal: ±0.1% (25°C±10°C)	
		Digital Signal: 0.01Hz (0.01~300.00Hz) · Analog Signal: 0.06/60.00Hz	
		Voltage type sensorless vector: ± 1.0 % when >10Hz; V/F: ± 3.0% ~ 5.0%	
		0.00~3000.00(s) · 8 steps, each with individual setting of the acceleration/deceleration time	
		CT: 3-point line setting; CT/VT: 2-point curve setting	
		15 display functions; 9 command sources of rotating speed; upper/lower frequency settings; AVR function; S-Curve; Multiplex input/output terminal control; 16-step preset speed control; frequency hopping; slip compensation; PID function; PID for Water Pump only; Intelligent Setting of Pump Function; DC-current braking at START/STOP; Simple PLC (programmable logic control) operation; MODBUS communication; Multi-step automation	
		DC 0~10V, 0~20mA	
		Approx. 20%; up to 125% with additional brake	
Protection Function		Digital operator, RS-485, speed control, PID control, multi-step speed control, pump function, etc.	
		Integral electronic thermal relay protection	
		CT: Overcurrent protection trips when exceeding 200% of the rated current for 3s, the motor stops automatically VT: Overcurrent protection trips when exceeding 170% of the rated current for 3s, the motor stops automatically	
		CT: 150%, 60s / VT: 120%, 60s	
		Over voltage level: Vdc > 414V (200V~240V Class) / Vdc>827V (380V~460V Class)	
		Under voltage level: Vdc < 200V (200V~240V Class) / Vdc<400V (380V~460V Class)	
		Phase failure protection on power source (provided for above 5.5kW), Phase failure protection on output (provided for >0.4kW)	
		Thermocouple protection: 85°C±5°C	
		Stall prevention during acceleration/ deceleration or operation	
		Electronic circuit protection	
Environment		Charge Indicator "lights up" when main circuit DC voltage exceeds 50V	
		Indoor locations without corrosives or dust	
		Temperature, surrounding -10°C~+40°C (Closed wall-mount type), -10°C~45°C (open type) without freeze	
		Storage temperature (Note 1) -20°C~+60°C	
		Humidity Below 90%RH (without condensation)	
		Vibration 1G for below 20HZ, 0.2G for 20~50HZ	

\* Note 1: Excessive storage temperature may cause damage to main capacitors of the circuit.

## ■ Diagram of Dimensions

UNIT : mm



## ■ LS650 Table of dimensional specifications (CT/VT Series)

Applicable Motor Capacity	Dimensions (mm)			Fixing dimensions (mm)				$\varnothing$	Semi-recessed Opening • Fixing dimensions (mm)						Unit Net Wt. (kgs)	Unit Gross Wt. (kgs)	Square-foot per unit	Drawing No.
Model	W	H	D	W1	W2	H1	D1	d	W3	W4	H2	H3	D2					
LS650M-20K2・LS650M-20K4	82.5	145	138	66.5	—	128.5	127.5	4.6	—	—	—	—	—	1	1.1	0.18'	A	
LS650M-20K7・LS650M-21K5	Traditional carriage bolt or Din Rail installation																	
LS650-20K4	LS650-40K4																	
LS650-20K7	LS650-40K7	114	172	146	101	—	159	136	5.3	—	—	—	—	1.33	2.0	0.33'	B	
LS650-21K5	LS650-41K5																	
LS650-22K2	LS650-42K2																	
LS650-24K0	LS650-44K0	152	214	146	137.5	—	200	136	5.3	—	—	—	—	2.2	3.0	0.45'	C	
LS650-25K5	LS650-45K5																	
LS650-27K5	LS650-47K5	188	300	180	170	—	283	170	7	—	—	—	—	8.0	9.4	1'	D	
LS650-2011	LS650-4011																	
LS650-2015	LS650-4015																	
LS650-2018	LS650-4018																	
LS650-2022	LS650-4022	250	458	227	218	—	401	217	7	242	170	445	460	112	14.6	21.8	1.8'	E
LS650-2030	LS650-4030																	
LS650-2037	LS650-4037																	
LS650-2045	LS650-4045																	
LS650-2045	LS650-4055	345	563	272	305	152.5	515	262	7	330	212	546	568	140	33.0	39.0	4.9'	E
LS650-2055	LS650-4075																	
LS650-2075	LS650-4090																	
LS650-2075	LS650-4110																	
LS650-2090	LS650-4132																	
LS650-2110	LS650-4160	604	770	322	262.4	220	749.5	312	7	582	—	745	770	158	75.0	81.0	11.6'	F
LS650-2110	LS650-4185																	
LS650-2220	LS650-4220																	
LS650-2460	LS650-4260																	
Digital Controller (KP-AD20)	70.9	102	25.8	—	—	—	15.8	3.5	65.3	—	84.5	93	—	—	—	—		

\* We are reserves the right to make changes of the models as well as the specifications. All rights reserved. Do not copy. Please visit our website <http://www.acinverter.com.tw/> for an update of the latest revised specifications.



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