LS DRIVE

LS650
0.2KW~260KW

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...

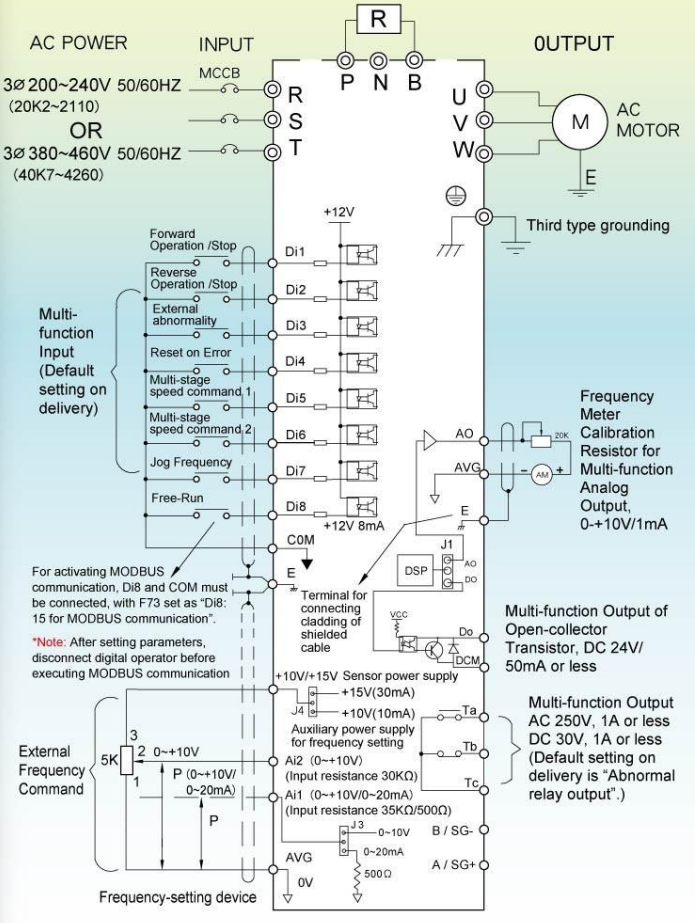
- Environmentally Friendly Technology
- Power-saving Technology
- Innovative Technology

Standard Certificates

■ Descriptions of Control Terminal Functionalities

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	LS650M is not provided with Di7 and Di8 interfaces. (The MODBUS communication mode is replaced by JP1, replacing Di8)
	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.				
	AVG	Common terminal for Frequency	The common (ground) of Inputs of Frequency Setting signals (terminals Ai1, Ai2 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	
Multi-function input terminals	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 D0 is set by the parameter F75.				
	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.	

■ Basic Wiring Diagram



LS650M-20K2-SX
LS650M-20K4-SX
LS650M-20K7-SX

LS650M-20K2-S
LS650M-20K4-S
LS650M-20K7-S
LS650M-21K5-S

LS650M-20K2-TN
LS650M-20K4-TN
LS650M-20K7-TN
LS650M-21K5-TN

LS650-20K4-TD
LS650-20K7-TD
LS650-21K5-TD
LS650-22K2-TD

LS650-40K4-TD
LS650-40K7-TD
LS650-41K5-TD
LS650-42K2-TD

LS650-22K2-TD
LS650-24K0-TD

LS650-42K2-TD
LS650-44K0-TD
LS650-45K5-TD

LS650-25K5-TD
LS650-27K5-TD
LS650-2011-TD

LS650-45K5-TD
LS650-47K5-TD
LS650-4011-TD

LS650-2015-T
LS650-2018-T
LS650-2022-T
LS650-2030-T

LS650-4015-T
LS650-4018-T
LS650-4022-T
LS650-4030-T
LS650-4037-T

The above models can be provided with a brake circuit

LS650-2037-T
LS650-2045-T
LS650-2055-T

LS650-4045-T
LS650-4055-T
LS650-4075-T

The above models can be provided with a brake circuit

LS650-2075-T
LS650-2090-T
LS650-2110-T

LS650-4090-T
LS650-4110-T
LS650-4132-T
LS650-4160-T
LS650-4185-T
LS650-4220-T
LS650-4260-T

Model Descriptions

LS650 Series

AC Motor Speed Controller

LSCT650-24K0-XX

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

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

N : Without dynamic brake
D : With built-in dynamic brake circuitry

S : 1-phase input
T : 3-phase input
X : 110V input, 220V output
Z : 110V input, 110V output

Max. applicable motor
0K7=0.75KW 1K5=1.5KW
2K2=2.2KW 4K0=4.0KW

Standard Specifications

200V Class																			
Model LS650	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

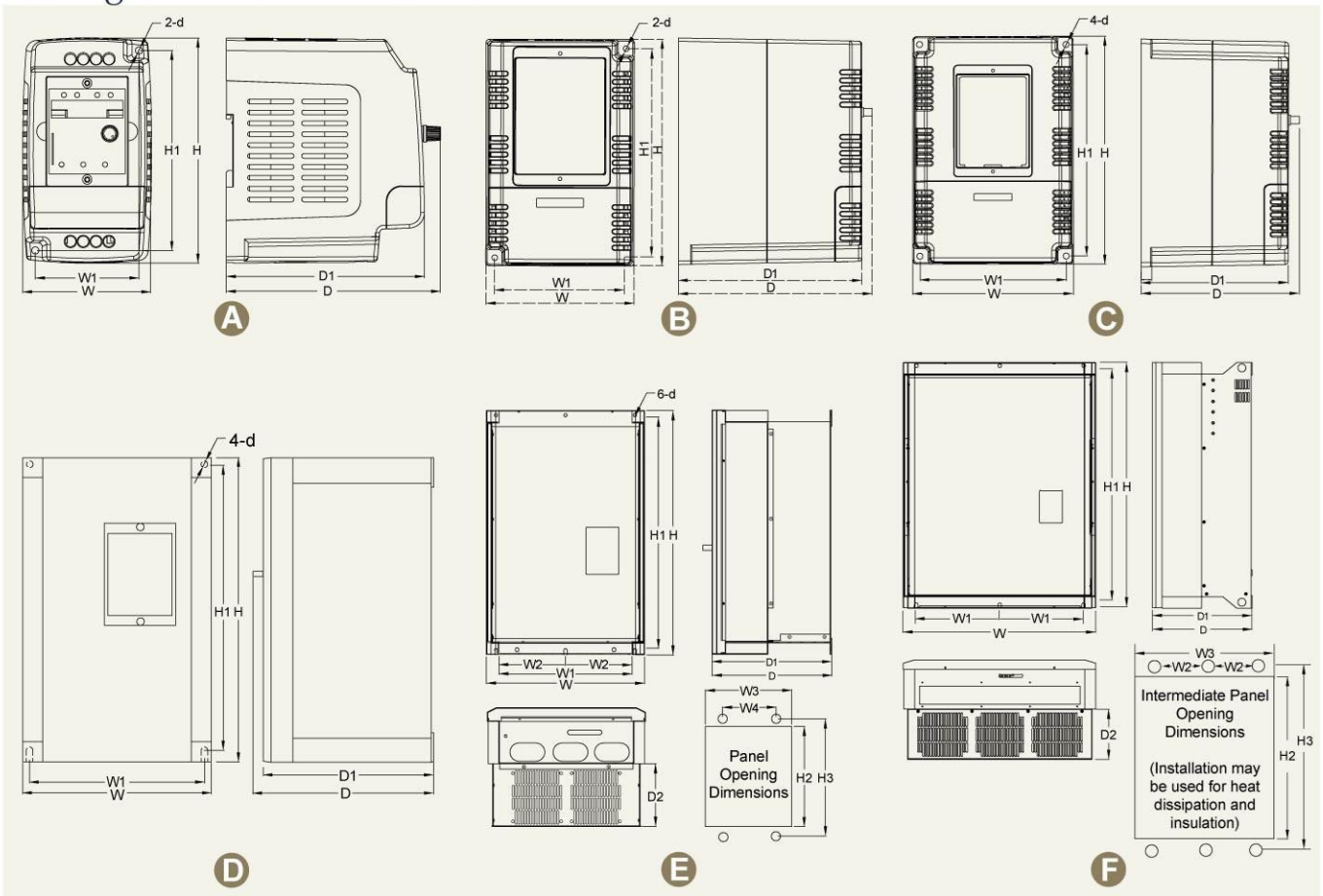
400V Class																					
Model LS650	40K7	41K5	42K2	44K0	45K5	47K5	4011	4015	4018	4022	4030	4037	4045	4055	4075	4090	4110	4132	4160	4185	4220	4260
Applicable Motor Capacity (KW)	0.75	1.5	2.2	4.0	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160	185	220	260
Output Capacity (KVA)	2.4	3.4	5.3	6.8	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	Input voltage and frequency	Single phase/Three phase 200V～240V 50/60Hz	Three phase 380V～460V 50/60Hz
	Permitted voltage fluctuation	+10%	
	Permitted frequency fluctuation	±5%	
	Max. output voltage	Corresponding 3-phase input voltage	Corresponding 3-phase input voltage
	Rated output frequency	Max. setting range: 0.01～300.00Hz	
Control Properties	Control method	Sine Wave SVPWM 3-phase modulation, switching frequency 2K～16KHZ, V/F Voltage-vector control	
	Max. output frequency	0.00～300.00Hz	
	Frequency precision (temperature variation)	Digital Signal: ±0.1% (-10℃～+40℃)，Analog Signal: ±0.1% (25℃±10℃)	
	Resolution of frequency setting	Digital Signal: 0.01Hz (0.01～300.00Hz)，Analog Signal: 0.06/60.00Hz	
	Precision of speed control	Voltage type sensorless vector: ± 1.0 % when >10Hz; V/F: ± 3.0% ～ 5.0%	
	Acceleration/ deceleration time	0.00～3000.00(s)，8 steps, each with individual setting of the acceleration/deceleration time	
	V/F Curve	CT: 3-point line setting; CT/VT: 2-point curve setting	
	Control function	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	
	Signal for frequency setting	DC 0～10V，0～20mA	
	Braking torque	Approx. 20%; up to 125% with additional brake	
	Additional control functionalities	Digital operator, RS-485, speed control, PID control, multi-step speed control, pump function, etc.	
Protection Function	Motor protection	Integral electronic thermal relay protection	
	Overcurrent 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	
	Overload capacity of Inverter	CT: 150%, 60s / VT: 120%, 60s	
	Overvoltage protection	Over voltage level: Vdc > 414V (200V~240V Class) / Vdc>827V (380V~460V Class)	
	Under-voltage protection	Under voltage level: Vdc < 200V (200V~240V Class) / Vdc<400V (380V~460V Class)	
	Power supply protection	Phase failure protection on power source (provided for above 5.5KW), Phase failure protection on output (provided for >0.4KW)	
	Fin Over-heat	Thermocouple protection: 85℃±5℃	
	Stall prevention	Stall prevention during acceleration/ deceleration or operation	
	Ground protection	Electronic circuit protection	
	Charge indication	Charge Indicator "lights up" when main circuit DC voltage exceeds 50V	
	Site surrounding	Indoor locations without corrosives or dust	
Environment	Temperature, surrounding	-10℃~ +40℃ (Closed wall-mount type), -10℃~45℃ (open type) without freeze	
	Storage temperature (Note 1)	-20℃~ +60℃	
	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)				⌀	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 LS650M-20K7、LS650M-21K5	82.5 Traditional carriage bolt or Din Rail installment	145	138	66.5	–	128.5	127.5	4.6	–	–	–	–	–	1	1.1	0.18'	A
LS650-20K4 LS650-40K4 LS650-20K7 LS650-40K7 LS650-21K5 LS650-41K5 LS650-22K2 LS650-42K2	114	172	146	101	–	159	136	5.3	–	–	–	–	–	1.33	2.0	0.33'	B
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 LS650-2011 LS650-4011	188	300	180	170	–	283	170	7	–	–	–	–	–	8.0	9.4	1'	D
LS650-2015 LS650-4015 LS650-2018 LS650-4018 LS650-2022 LS650-4022 LS650-2030 LS650-4030 LS650-4037	250	458	227	218	–	401	217	7	242	170	445	460	112	14.6	21.8	1.8'	E
LS650-2037 LS650-4045 LS650-2045 LS650-4055 LS650-2055 LS650-4075	345	563	272	305	152.5	515	262	7	330	212	546	568	140	33.0	39.0	4.9'	E
LS650-4090 LS650-4110 LS650-2075 LS650-4132 LS650-2090 LS650-4160 LS650-2110 LS650-4185 LS650-4220 LS650-4260	604	770	322	262.4	220	749.5	312	7	582	–	745	770	158	75.0	81.0	11.6'	F
Digital Controller (KP-AD20)	70.9	102	25.8	–	–	–	15.8	3.5	65.3	–	84.5	93	–	–	–	–	

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