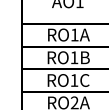


Goodrive 27 Series Smart VFD Quick Start Guide

This guide briefly describes the external wiring, terminals, keypads, quick running, common function parameter settings, common faults and solutions, product dimensions, and energy efficiency data of GD27 series variable-frequency drive (VFD).
Visit www.invt.com for more information and software download.

Scan the QR code to view the full version of GD27 series product e-manual.

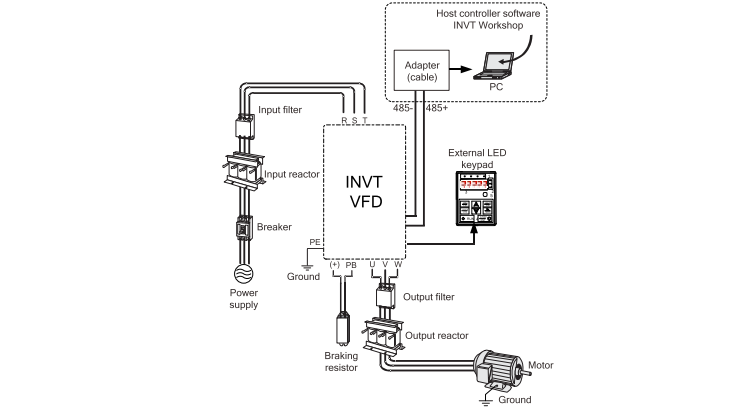


Warning
● This guide only provides the basic installation and commissioning information. Failure to comply with the safety instructions and installation and commissioning instructions in the relevant documentation may result in accidents such as equipment damage, personal injury, or even death.
● Only trained and qualified professionals are allowed to carry out related operations.

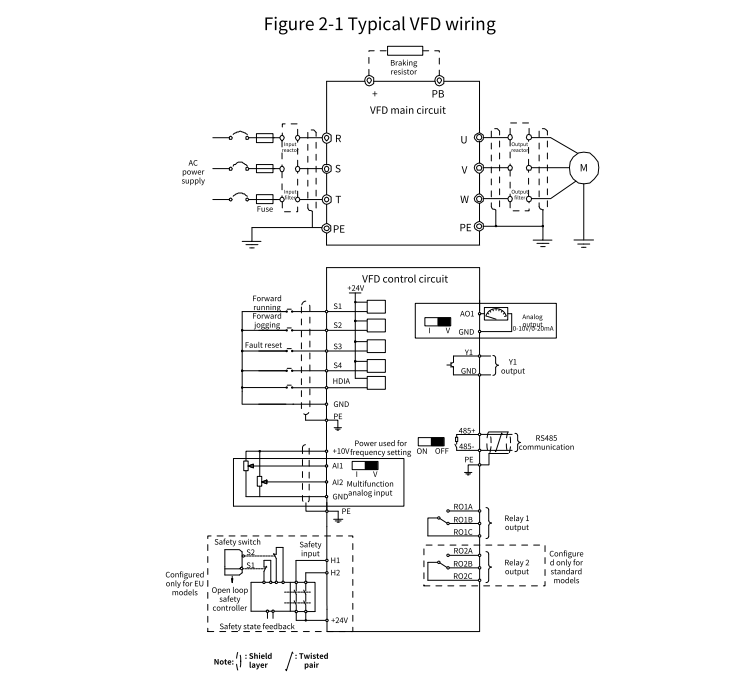
Danger
● Do not perform any operations including wiring, inspection, or component replacement when power supply is applied. Before performing these operations, ensure all the input power supplies have been disconnected, and wait for at least the time designated on the VFD.

Minimum waiting time	VFD model
5 minutes	1PH 220V 0.4~2.2kW; 3PH 220V 0.4~4kW; 3PH 380V 0.75~7.5kW

1 External wiring



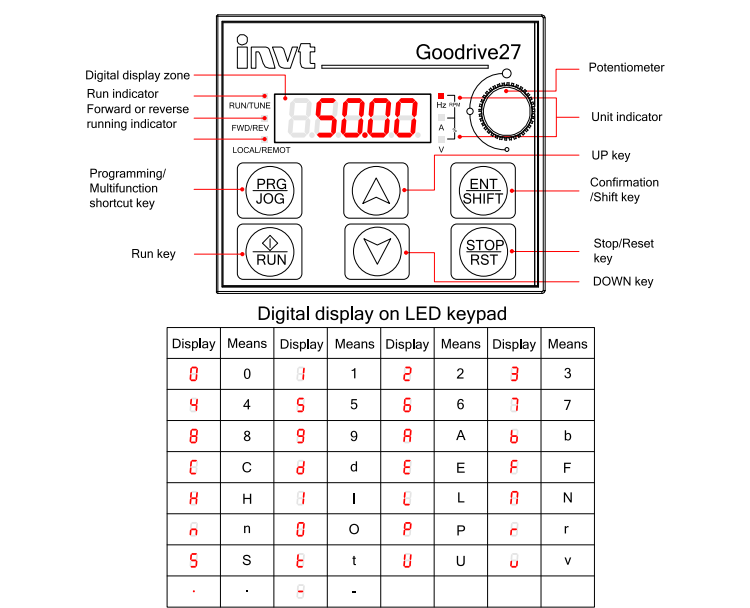
2 Terminal



Terminal	Description
R, S, T (or L, N)	3PH (or 1PH) AC input terminals, connected to the grid.
U, V, W	3PH (or 1PH) AC output terminals, connected to the motor usually.
(+)	(+) and (-) connect to the shared DC bus terminals.
(-)	(-) connect to external braking resistor terminals.
PB	PB and (+) connect to external braking resistor terminals.

Terminal	Description
PE	PE terminal. The PE terminals of each machine must be grounded reliably.
Control circuit terminals	
+10V	Locally provided +10V power supply
A11	Analog input. Range: 0~10V/0~20mA. Whether voltage or current is used for input is set through the DIP switch.
A12	Analog input. Range: 0V~10V
AO1	Analog output. Range: 0~10V/0~20mA. Whether voltage or current is used for output is set through the DIP switch.
RO1A	Relay output. RO1A: NO; RO1B: NC; RO1C: common
RO1B	Relay output. RO1A: NO; RO1B: NC; RO1C: common
RO1C	Relay output. RO1A: NO; RO1B: NC; RO1C: common
RO2A	Relay output. RO2A: NO; RO2B: NC; RO2C: common
RO2B	Relay output. RO2A: NO; RO2B: NC; RO2C: common
RO2C	Relay output. RO2A: NO; RO2B: NC; RO2C: common
GN1	Power reference ground
Y1	Switch capacity: 50mA/30V. Output frequency range: 0~1kHz
485+	RS485 differential signal communication port. The standard RS485 communication interface should be shielded twisted pair. Determine whether to connect the 120Ω terminal matching resistor of RS485 communication through the DIP switch.
485-	RS485 differential signal communication port. The standard RS485 communication interface should be shielded twisted pair. Determine whether to connect the 120Ω terminal matching resistor of RS485 communication through the DIP switch.
+24V	User power supply provided by the VFD. Max. output current: 100mA
Active low is applied. Unipolar input terminals, supporting only NPN. Internal impedance: high level input range: 10~30V. Low level input range: 0~5V. Max. input frequency: 1kHz. Programmable digital input terminals, the functions of which can be set through the related parameters.	
SI~S4	Channels for both high frequency pulse input and digital input
HDIA	Channels for both high frequency pulse input and digital input. Max. input frequency: 50kHz. Duty ratio: 30%~70%
H1	Safe torque off (STO) input. Safe torque off (STO) redundant input, connected to the external NC contact. When the contact opens, STO acts and the VFD stops output. Safety input signal wires use shielded wires whose length is within 25m. The H1 and H2 terminals are short connected to +24V by default. Remove the short connectors from the terminals before using STO function.
H2	Safe torque off (STO) input. Safe torque off (STO) redundant input, connected to the external NC contact. When the contact opens, STO acts and the VFD stops output. Safety input signal wires use shielded wires whose length is within 25m. The H1 and H2 terminals are short connected to +24V by default. Remove the short connectors from the terminals before using STO function.

3 Keypad



Indicator	Status	Meaning
RUN/TUNE	On	The VFD is running.
RUN/TUNE	Blinking	The VFD is in parameter autotuning.
RUN/TUNE	Off	The VFD is stopped.
FWD/REV	On	The VFD is running reversely.
FWD/REV	Off	The VFD is running forward.
LOCAL/REMOTE	On	The VFD adopts the communication channel of running commands.
LOCAL/REMOTE	Blinking	The VFD adopts the terminal channel of running commands.
LOCAL/REMOTE	Off	The VFD adopts the keypad channel of running commands.
RUN/TUNE	Both On	The VFD is in fault state.
FWD/REV	Both	The VFD is in pre-alarm state.
LOCAL/REMOTE	Blinking	The VFD is in pre-alarm state.

Indicator	Status	Meaning
Unit indicator	Hz	Frequency unit
Unit indicator	RPM	Rotation speed unit
Unit indicator	A	Current unit
Unit indicator	%	Percentage
Unit indicator	V	Voltage unit

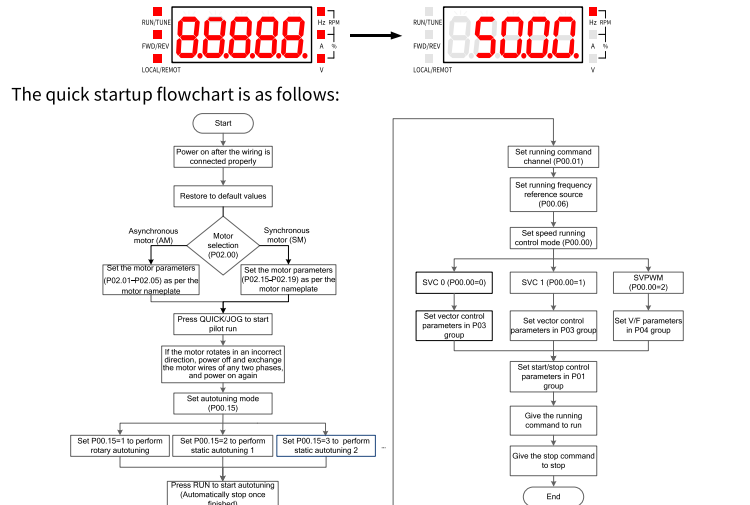
Key	Function
Prog Job	Programming / Multifunction shortcut key
ENT SHFT	Confirmation / Shift key
Up key	Press it to enter menus in cascading mode or confirm the setting of a parameter.
Down key	Press it to select display parameters in the interface for the VFD in stopped or running state.
Run key	Under keypad operation mode, the running key is used for running or autotuning.
STOP RST	Stop/Reset key

4 Quick running

- 4.1 Check before power-on**
- Ensure that all terminals have been securely connected.
 - Ensure that the motor power matches the VFD power.

4.2 Operating upon first power-on

After confirming the wiring and power are correct, close the air switch of the AC power at the VFD input side to power on the VFD.



5 Common function parameter setup

The following briefly describes only some common function parameters and typical values.
"○" indicates that the value of the parameter can be modified when the VFD is in stopped or running state.
"●" indicates that the value of the parameter cannot be modified when the VFD is in running state.
"●" indicates that the value of the parameter is detected and recorded, and cannot be modified. (The VFD automatically checks and constrains the modification of parameters, which helps prevent incorrect modifications.)

Function code	Name	Description	Default	Modify
P00.00	Speed control mode	0: Sensorless vector control (SVC), mode 0 1: Sensorless vector control (SVC), mode 1 2: Space voltage vector control mode	2	●
P00.01	Channel of running commands	0: Keypad 1: Terminal 2: Communication	0	○

Function code	Name	Description	Default	Modify
P00.03	Max. output frequency	Max (P00.04)~599.00Hz	50.00Hz	○
P00.04	Upper limit of running frequency	P00.05~P00.03 (Max. output frequency)	50.00Hz	○
P00.05	Lower limit of running frequency	0.00Hz~P00.04 (Upper limit of running frequency)	0.00Hz	○
P00.06	Increase channel of A1 frequency command	1: A11 2: A12 3: A13 (Corresponding to the keypad potentiometer) 4: High-speed pulse HDIA 5: Simple PLC program 6: Multi-step speed running 7: PID control 8: Modbus communication	0	○
P00.07	Setting channel of B frequency command	1: Running 2: Running forward 3: Running reversely 4: Jogging 5: VFD in fault 6: Frequency level detection FDT1 8: Frequency reached	1	○
P00.10	Frequency set through keypad	0.00Hz~P00.03 (Max. output frequency)	50.00Hz	○
P00.11	ACC time 1	0: Disable 1: Running 2: Running forward	Model depended	○
P00.12	DEC time 1	0.0~3600.0s	Model depended	○
P00.13	Running direction	0: Run at the default direction. 1: Run at the opposite direction.	0	○
P00.15	Motor parameter autotuning	0: No operation 1: Rotary autotuning 1 (Complete) 2: Static autotuning 1 (Partial) 3: Rotary autotuning 2 (Partial)	0	●
P00.18	Function parameter restore	0: No operation 1: Restore default values (excluding motor parameters) 2: Clear fault records 3: Lock all function codes	0	●
P01.00	Start mode	0: Direct start 1: Start after DC braking	0	●
P01.08	Stop mode	0: Decelerate to stop 1: Coast to stop	0	○
P01.09	Starting frequency of DC braking for stop	0.00Hz~P00.03 (Max. output frequency)	0.00Hz	○
P01.11	DC braking current for stop	0.0~100.0%	0.0%	○
P01.12	DC braking time for stop	0.00~50.00s	0.00s	○
P01.18	Terminal-based running command protection at power-on	0: The terminal running command is invalid at power-on 1: The terminal running command is valid at power-on 2: Asynchronous motor (AM) 3: Synchronous motor (SM)	0	●
P02.00	Type of motor 1	0: Asynchronous motor (AM) 1: Synchronous motor (SM)	0	●
P02.01	Rated power of AM 1	0.1~3000.0kW	Model depended	○
P02.02	Rated frequency of AM 1	0.01Hz~P00.03 (Max. output frequency)	50.00Hz	○
P02.03	Rated speed of AM 1	1~6000rpm	Model depended	○
P02.04	Rated voltage of AM 1	0~1200V	Model depended	○
P02.05	Rated current of AM 1	0.08~600.00A	Model depended	○
P02.15	Rated power of SM 1	0.1~3000.0kW	Model depended	○
P02.16	Rated frequency of SM 1	0.01Hz~P00.03 (Max. output frequency)	50.00Hz	○
P02.17	Number of pole pairs of SM 1	1~128	2	○
P02.18	Rated voltage of SM 1	0~1200V	Model depended	○
P02.19	Rated current of SM 1	0.08~600.00A	Model depended	○
P02.23	Counter-emf of SM 1	0~10000	300	○
P03.00	Speed-loop proportional gain 1	0.0~200.0	20.0	○
P03.01	Speed-loop integral time 1	0.000~10.000s	0.200s	○
P03.03	Speed-loop proportional gain 2	0.0~200.0	20.0	○
P03.04	Speed-loop integral time 2	0.000~10.000s	0.200s	○
P03.10	Current-loop bandwidth	0~2000	400	○
P03.11	Torque setting method	0: Keypad (P03.12) 1: Keypad (P03.12) 2: A11 3: A12 4: A13 5: Pulse frequency HDIA 6: Multi-step torque 7: Modbus communication	0	○
P04.01	Torque boost of motor 1	0.0%: (Automatic torque boost), 0.1%~10.0%	0	○
P04.09	V/F slip compensation gain of motor 1	0.0~200.0%	100.0%	○
P04.10	Low-frequency oscillation control factor of motor 1	0~100	10	○

Function code	Name	Description	Default	Modify
P04.11	High-frequency oscillation control factor of motor 1	0~100	10	○
P05.01	Function of S1	0: No function 1: Run forward (FWD)	1	○
P05.02	Function of S2	1: Run reversely (REV)	4	○
P05.03	Function of S3	2: Three-way running control (SIN) 3: Jog forward 4: Jog reversely 5: Coast to stop 6: Reset faults 7: External fault input	7	○
P05.04	Function of S4	8: Increase frequency setting (UP) 9: Increase frequency setting (DOWN) 10: Increase frequency setting (UP) 11: Decrease frequency setting (DOWN)	0	○
P05.32	A11 lower limit	0.00V~P05.34	0.00V	○
P05.34	A11 upper limit	P05.32~10.00V	10.00V	○
P06.01	Y1 output	0: Disable 1: Running 2: Running forward	0	○
P06.03	RO1 output	1: Running 2: Running forward 3: Running reversely 4: Jogging 5: VFD in fault 6: Frequency level detection FDT1 8: Frequency reached	1	○
P06.04	RO2 output	1: Running 2: Running forward 3: Running reversely 4: Jogging 5: VFD in fault 6: Frequency level detection FDT1 8: Frequency reached	5	○
P06.14	A01 analog output	ACC is too fast. The motor in rotating is restarted. Grid voltage is too low. Load is too large. VFD power is too small. The motor rated current is set incorrectly. The motor stall occurs or the load transient is too large. The VFD is not connected to the VFD rated current. Output current (relative to twice the VFD rated current) 4: Output current (relative to twice the VFD rated current) 5: Output current (relative to twice the motor rated current) 6: Output voltage (relative to 1.5 times the VFD rated voltage) 7: Output power (relative to twice the motor rated power)	0	○
P06.17	A01 output lower limit	Setting range: -300.0%~P06.19	0.0%	○
P06.18	A01 output corresponding to lower limit	Setting range: 0.00V~10.00V	0.00V	○
P06.19	A01 output upper limit	Setting range: P06.17~300.00Hz	100.0%	○
P06.20	A01 output corresponding to upper limit	Setting range: 0.00V~10.00V	10.00V	○
P06.21	A01 output filter time	Setting range: 0.000s~10.000s	0.000s	○
P07.00	User password	0~65535	0	○
P07.27	Present fault type	0~65535	0	●
P07.28	Last fault type	0~65535	0	●
P07.29	2nd-last fault type	0~65535	0	●
P07.30	3rd-last fault type	0~65535	0	●
P07.31	4th-last fault type	0~65535	0	●
P07.32	5th-last fault type	0~65535	0	●
P08.28	Auto fault reset count	0~10	0	○
P08.29	Auto fault reset interval	0.1~3600.0s	1.0s	○
P11.00	Phase loss protection	Setting range: 0x000~0x011 Ones: 0: Disable software protection against input phase loss 1: Enable software protection against input phase loss Fens: 0: Disable protection against output phase loss 1: Enable protection against output phase loss Hundreds: Reserved	1PH model: 0x010 3PH model: 0x011	○
P14.00	Local communication address	0: 1200BPS 1: 2400BPS 2: 4800BPS 3: 9600BPS 4: 19200BPS 5: 38400BPS	1	○
P14.01	Communication baud rate	0: No check (N, 8, 1) for RTU 1: Even check (E, 8, 1) for RTU 2: Odd check (O, 8, 1) for RTU 3: No check (N, 8, 2) for RTU 4: Even check (E, 8, 2) for RTU 5: Odd check (O, 8, 2) for RTU	4	○
P14.02	Data bit check	0: No check (N, 8, 1) for RTU 1: Even check (E, 8, 1) for RTU 2: Odd check (O, 8, 1) for RTU 3: No check (N, 8, 2) for RTU 4: Even check (E, 8, 2) for RTU 5: Odd check (O, 8, 2) for RTU	1	○

6 Common faults and solutions

Fault code	Fault type	Possible cause	Solution
E4	Overcurrent during ACC	ACC/DEC is too fast; The voltage of the grid is too low;	Increase ACC/DEC time. Increase grid input voltage.
E5	Overcurrent during DEC	VFD power is too small; Load transient or exception occurred.	Select a VFD with larger power. Check for motor stalling, short connection, and load device exceptions.
E6	Overcurrent during	Load transient or exception occurred.	Check for and remove the external interference source.

Fault code	Fault type	Possible cause	Solution
E7	Overvoltage during ACC	ACC/DEC time is too short; Exception occurred to input voltage; The motor starts during input voltage;	Check for abnormal VFD 3PH output voltage and motor 3PH resistance imbalance. Check whether the control board software version of keypad backup parameters is consistent with that of the VFD. Increase ACC/DEC time. Check the input voltage. Wait for motor to stop steadily, and start the VFD. Install dynamic brake components or regenerative unit.
E8	Overvoltage during deceleration	Current detection circuit is faulty. Actual motor power setup deviates sharply from the VFD power.	Check whether the motor is short circuited to the ground and wiring is normal. Remove the motor cable for verification.
E9	Overvoltage during constant speed running	The grid voltage is too low.	Check for overload, increase speed deviation detection time, or prolong ACC/DEC time. Check motor parameter settings and re-perform motor parameter autotuning.
E10	Bus undervoltage fault	The load is too heavy or stalled.	Check whether speed loop control parameters are set properly.
E11	Motor overload	The motor rated current is set incorrectly. The motor stall occurs or the load transient is too large.	Check for overload or stalling. Check motor parameter and counter EMF settings. Re-perform motor parameter autotuning.
E12	VFD overload	ACC is too fast. The motor in rotating is restarted. Grid voltage is too low. Load is too large. VFD power is too small.	Check for overload or stalling. Check motor parameter and counter EMF settings. Re-perform motor parameter autotuning. Increase maladjustment according to the set value. Adjust flux weakening coefficient and current loop parameters.
E13	Phase loss on input side	Phase loss or violent fluctuation occurred on inputs R, S, and T. Screws on the input side are loose.	Check the load and the underload pre-alarm points. Check whether the input power is normal and input cables are connected to the set value. Set P11.00 to screen out the fault.
E14	Phase loss on output side	Output cables broken or short connected to the ground. U/V/W output phase loss or seriously asymmetrical 3PH loads.	Check whether terminal wiring of STO is proper and firm enough; Check whether the external switch of STO can work properly; Replace the control board.
E16	Inverter module overheating	Air duct is blocked or fan is damaged. Ambient temperature is too high. Long-time overload running.	Ventilate the air duct or replace the fan. Keep good ventilation to lower ambient temperature. Select a VFD with larger power.
E17	External fault	External fault input signal of S terminal acts.	Check whether external device input is normal.
E18	RS485 communication fault	Baud rate is set improperly. Communication line fault. Communication address error. Communication suffers from strong interference.	Set proper baud rate. Check the wiring of communication interfaces. Set the communication address correctly. Replace or change the wiring to enhance the anti-interference capacity.
E19	Current detection fault	Motor cable or motor insulator exception occurred.	Remove the motor cable for verification. Contact the manufacturer.
E20	Motor autotuning fault	The motor capacity does not match the VFD capacity. Motor parameter is set improperly. The parameters gained from autotuning deviate sharply from the standard parameters.	Change the VFD model. Set proper motor type and nameplate parameters. Empty the motor load and carry out autotuning again. Check the motor wiring and parameter setup; Check whether the upper limit frequency is larger than 2/3 of the rated frequency.
E21	EEPROM operation error	Error in reading or writing control parameters. EEPROM is damaged.	Press STOP/RST to reset. Replace the main control board.
E22	PID feedback offline fault	PID feedback offline. PID feedback source disappears.	Check PID feedback signal wires. Check PID feedback source.
E23	Braking unit fault	Fault occurred to the braking circuit or the braking pipe is damaged. Resistance of the external braking resistor is small.	Check the braking unit, and replace with new braking pipe; Increase the brake resistance.
E24	Running time reached	The actual running time of the VFD is longer than the internal set running time.	Contact the manufacturer.
E27	Parameter upload error	Keypad cable connected improperly or disconnected. Keypad cable too long, causing strong external interference source.	Check the keypad cable and re-plug to determine whether a fault occurs. Check for and remove the external interference source.
E28	Parameter download	Keypad cable connected improperly or disconnected.	Check for and remove the external interference source.

Fault code	Fault type	Possible cause	Solution
E32	To-ground short-circuit fault 1	The output of the VFD is short circuited to the ground.	Check whether the motor is short circuited to the ground and wiring is normal. Remove the motor cable for verification.
E33	To-ground short-circuit fault 2	Current detection circuit is faulty. Actual motor power setup deviates sharply from the VFD power.	Check whether the motor is short circuited to the ground and wiring is normal. Remove the motor cable for verification.
E34	Speed deviation fault	The load is too heavy or stalled.	Check for overload, increase speed deviation detection time, or prolong ACC/DEC time. Check motor parameter settings and re-perform motor parameter autotuning.
E35	Maladjustment fault	The load is too heavy or stalled.	Check whether speed loop control parameters are set properly.
E36	Electronic underload fault	The VFD reports underload pre-alarm according to the set value. Underload pre-alarm function is enabled by external forces.	Check the load and the underload pre-alarm points.
E40	Safe torque off	Exception occurred to safe circuit of channel 1.	Check whether terminal wiring of STO is proper and firm enough; Check whether the external switch of STO can work properly; Replace the control board.
E41	Exception occurred to safe circuit of channel 1	The wiring of STO is improper; Fault occurred to external switch of STO; Hardware fault occurred to safety circuit of channel.	Check whether terminal wiring of STO is proper and firm enough; Check whether the external switch of STO can work properly; Replace the control board.
E42	Exception occurred to safe circuit of channel 2	Exception occurred to channel 1 and channel 2.	Replace the control board.
E43	Exception occurred to channel 1 and channel 2	Hardware fault occurred to STO circuit.	Replace the control board.
E92	A11 disconnection	Input voltage of A11 is too low. A11 wiring is disconnected.	Connect a 5V or 10mA power source to check whether the input is normal. Check the wiring or replace the cables.
E93	A12 disconnection	Input voltage of A12 is too low. A12 wiring is disconnected.	Connect a 5V or 10mA power source to check whether the input is normal. Check the wiring or replace the cables.
E94	A13 disconnection	Input voltage of A13 is too low. A13 wiring is disconnected.	Check the wiring or replace the cables.