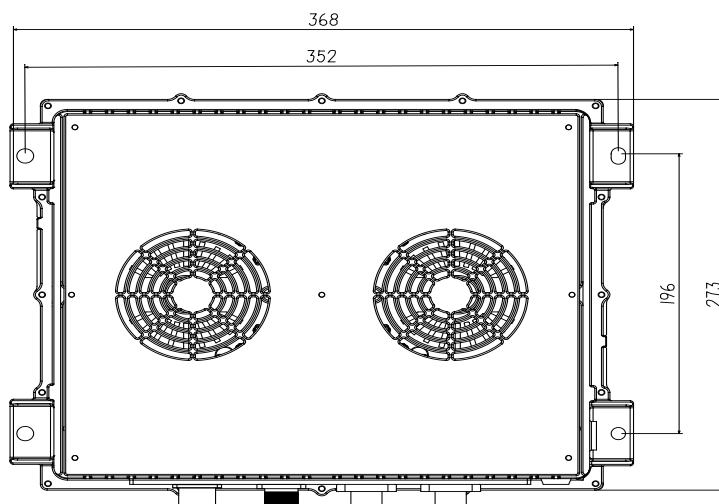




3.6KW DC-DC Converter Fan-cooling Model No. AT-RD3P6 Series



1. Product Introduction

AT-RD3P6 series DC-DC converter is a high-power, dense, high-efficiency DC-DC converter specially developed for new lithium electric vehicles, logistics vehicles, special vehicles, construction machinery and other new energy vehicles.

The module is designed with full digital control technology, with flexible and intelligent control, good protection characteristics and strong system robustness. The built-in microprocessor communicates with the monitoring unit, and the parameters in the machine can be set by the higher-level monitoring unit or adjusted by the higher-level monitoring unit through the CAN interface.

It has multiple protection functions such as input over-voltage and under-voltage protection, output over-current protection, output over-voltage protection, output short-circuit protection, and over-temperature protection

Main specification:

Input voltage range	Rated output power	Rated output voltage	Output voltage/ current range
400~750VDC	3.6KW	14VDC	0-16VDC/0-256A
200~500VDC	3.6KW	14VDC	0-16VDC/0-256A
80~200VDC	3.6KW	14VDC	0-16VDC/0-256A
80~200VDC	3.6KW	27VDC	0-32VDC/0-132A
200~500VDC	3.6KW	27VDC	0-32VDC/0-132A
200~500VDC	3.6KW	48VDC	0-64VDC/0-74A



2. Electrical Characteristics

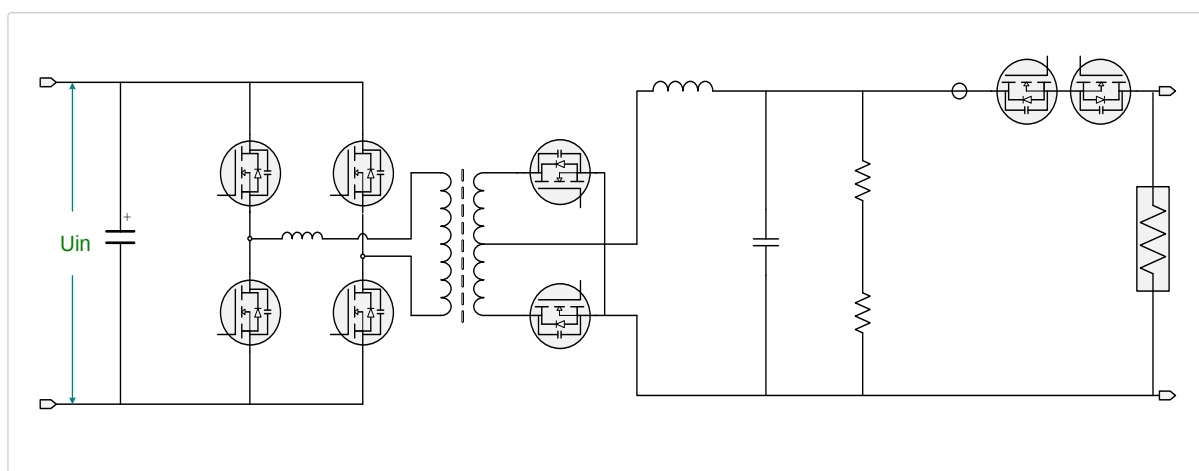
2.1. Electrical Characteristics

Modeln						
On-board power supply type	Fan-cooled automotive DC-DC converter					
Enter the properties						
Rated input voltage	540V	360V	144V	144V	360V	360V
Input voltage range	400-750V	200-500V	80-200V	80-200V	200-500V	200-500V
Enter the pre-charge path	Built					
the pre-charge resistor	120R	120R	30R	30R	120R	120R
Start the inrush current	≤7.5A	≤11A	≤24A	≤24A	≤11A	≤11A
Bus capacitors	12uF	22uF	42UF	42UF	22uF	22uF
Output characteristics						
Rated output power	3.6KW					
Rated output voltage	14V			27V		48V
Output voltage range	0~16V			0~32V		0~64V
Output current range	0~256A			0~132A		0-74A
Voltage regulation accuracy	±0.2V（引线根部测试 lead root test）			±0.4V（引线根部测试lead root test）		
Output response time	≤200mS					
Typical efficiency	≥92%			≥93%		
Operating noise	≤60dB					
Protection characteristics						
Over- and under-voltage protection	The input over- and under-voltage shutdown can be self-recovering, and the output over-voltage and under voltage shutdown can be self-recovering °					
Output reverse polarity and short-circuit protection	The output is powered off when it is short-circuited or reversed, and it can be self-recovering					
Over-temperature protection	When the heat sink temperature is higher than 75℃, the output power is reduced, when the temperature is higher than 95℃, the circuit is disconnected, and the charger resumes output when the charging temperature returns to below 85℃					
Environmental conditions						
Operating ambient temperature	-40℃~+85℃					
Storage temperature	-40~95℃					
Humidity	5%~95% no condensation, no condensation					
IP rating	IP67					
Cooling function	Self-cooling					
Communication features	CAN bus control					
Charging function	Receiving the charging command can charge normally; The no-command charger is in standby					
Safety & Reliability						
Safety & Reliability	Primary edge — secondary edge 2000VAC			Primary Side—Chassis 1000V +2U		
Insulation resistance	Primary-secondary ≥50MΩ					

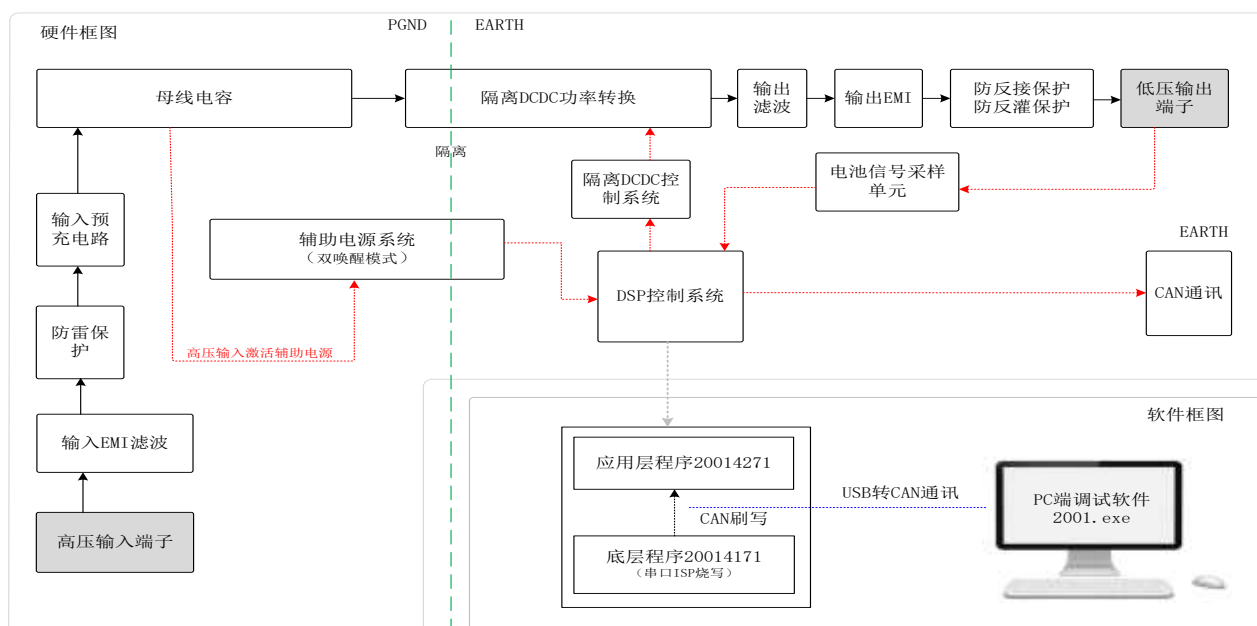


Vibration resistance	After the X, Y, Z three directions sweep vibration test, the parts are not damaged, and the fasteners are not loose
Impact resistance	See the requirements of 6.5 in GB/T15139-1994
Resistance to industrial solvents	Metal parts have a good anti-corrosion layer
Anti-salt spray Performance	See GB/T 2423.17
Durability	In accordance with the relevant provisions of not less than GB/T 24347-2009
EMC features	
Electromagnetic immunity	Meet the provisions of Chapter 4 of GB/T17619-1998
Electromagnetic harassment	See the limits set forth in Chapters 12 and 14 of GB18655-2002

2.2 Electrical topology diagrams



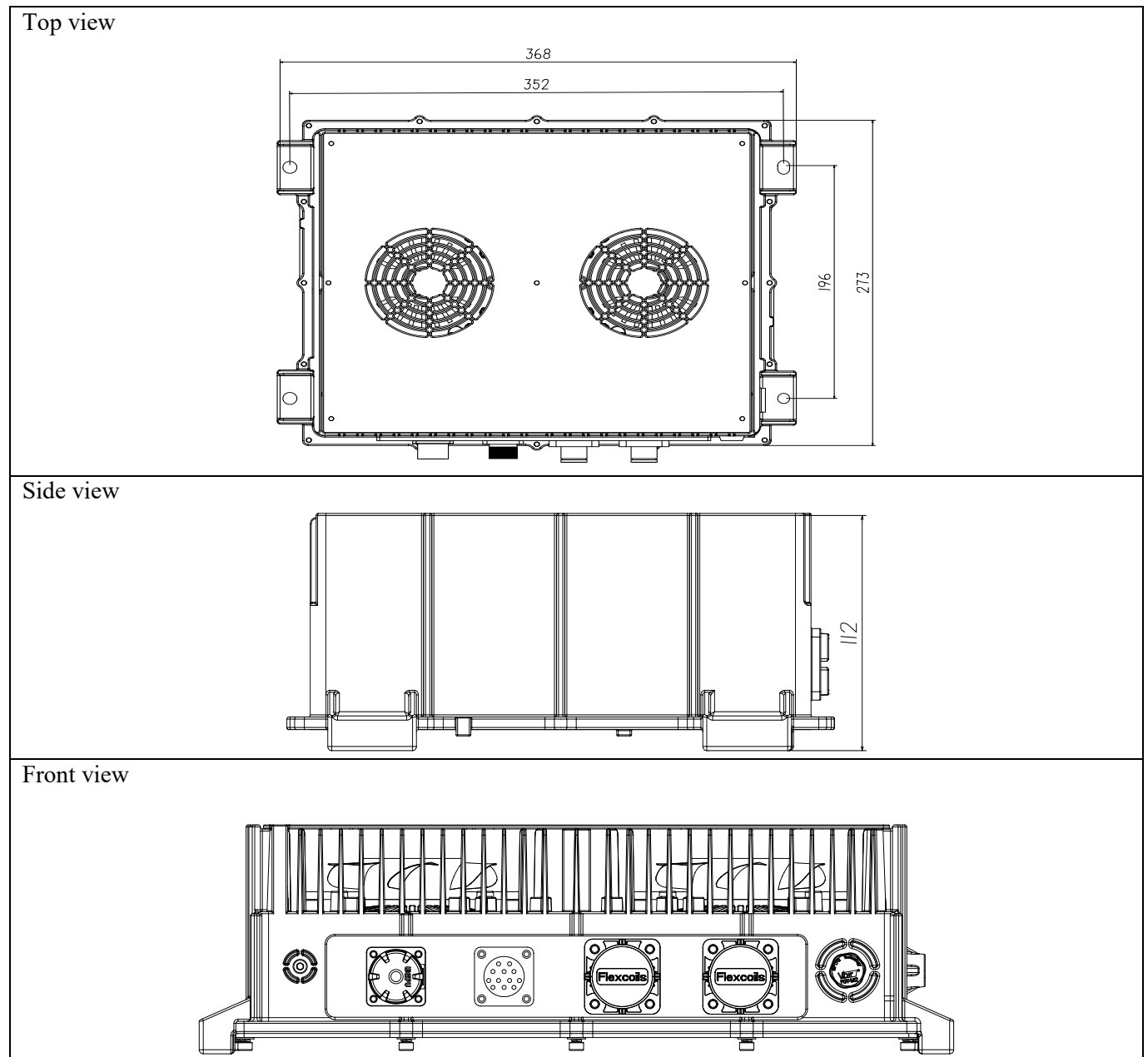
2.3 System Block Diagram





3. Dimensions and weight

3.1 Product Dimensions

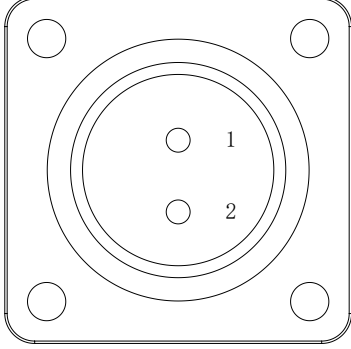
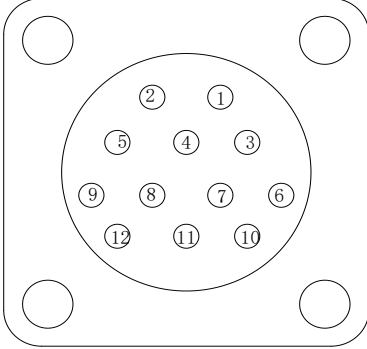
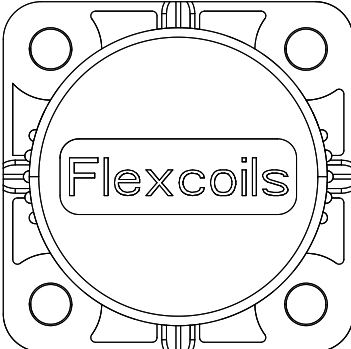


3.2 Product Weight: 13.5Kg±0.5Kg



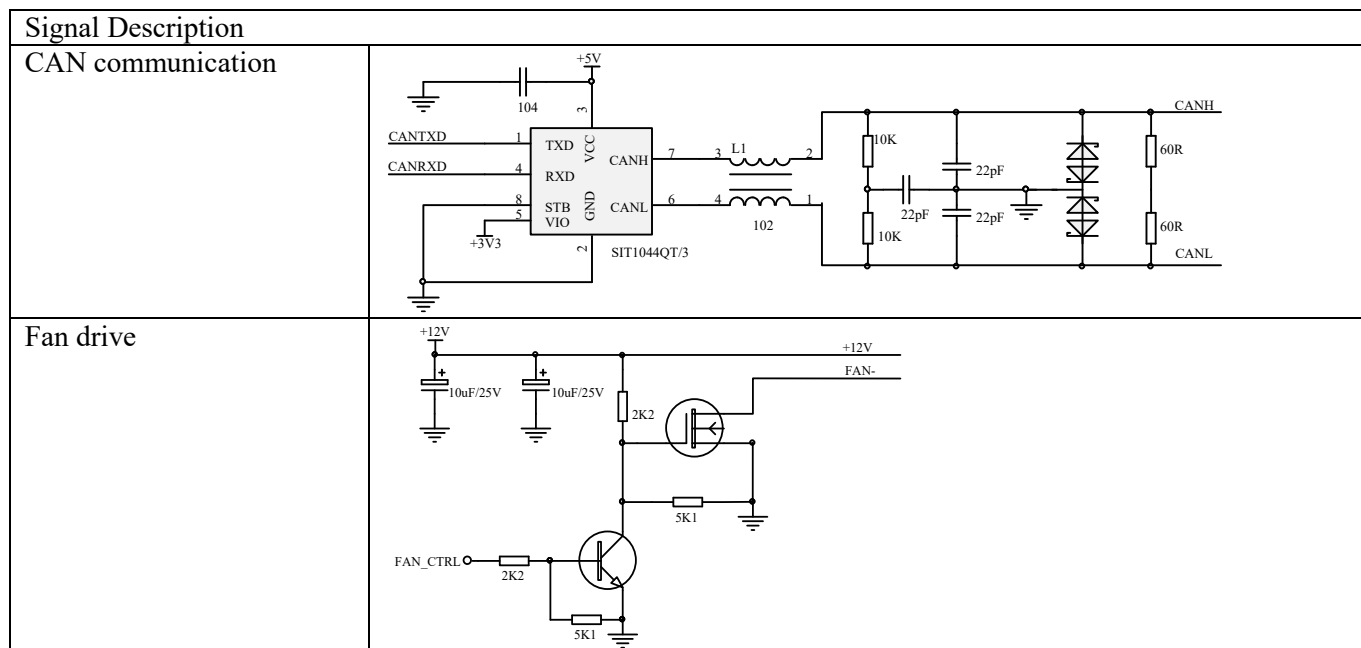
4. Definition of connectors and connecting terminals

4.1 Connector Model and Definition

Type	Connector definition		Connector drawings
In put WF20K2Z	Foot position	Definition	
	1	Input+	
	2	Input-	
	Connector manufacturer		Guangdong Weipu Electric Appliance Co., Ltd
	To the plug-in model		WF20J2TE
Signal WF20K12Z	Foot position	Definition	
	1	CANH	
	2	CANL	
	3	12V+	
	4	GND	
	5-12	/	
	Connector manufacturer		Guangdong Weipu Electric Appliance Co., Ltd
	To the plug-in model		WF20J12TE
Out put YQ-BS400A-M8M8	Foot position	Definition	
	A	Out put+	
	Connector manufacturer		Yun qi
	Connector manufacturer		M8

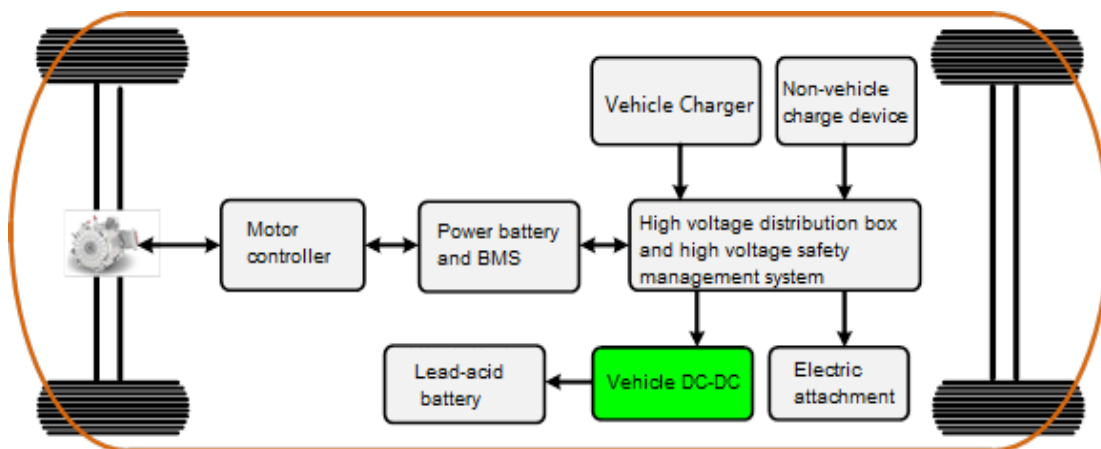


4.2 Signal Interface Schematic



5. User Guide

5.1 Block diagram of electrical connections



5.2 Product Installation

Part number	TBD	
Product type	DCDC	
Mounting screws	Mounting hole aperture	Φ10
	Number	4
	Screw model recommended	M10*20 Hexagon socket screws

Install and secure this product

Align the mounting holes, lock the fastening screws, and secure the power supply.

Tightening force distance requirements



When installing, according to the size of the screw, the connection method, etc., use the appropriate torque for installation, refer to the following table for details:

Specifications and models		Tightening torque (torque range: $\pm 10\%$)/(unit: Kgf.cm)						
Categories	Sub-categories	Plastics - Plastics	Steel-plastic Copper - Copper	General connections		High-density connectivity		
				Steel - Steel	Copper-cast aluminum Steel-aluminium profiles Steel-copper	Steel - Steel	Steel - cast aluminum Steel-copper	Steel-aluminium profiles
Allen socket screws	M2		0.8	1.5	1.5	2.5	2.5	1.5
	M2.5		1.6	3	3	5.5	4.5	3
	M3	1.5	3	5.5	5	10	8	6
	M4		6	12	10	16	14	12
	M5		10	20	13	30	28	20
	M6		15	30	28	50	48	30
	M8					80	80	-

5.3 CCAN communication protocol

Projects	Technical indicators	Remarks
Crystal oscillator tolerance	$\pm 0.15\%$	within the operating temperature range
Communication rate	It can be configured through the background software, and it will not be lost after power failure	The tolerance is ± 0.375 Kbit/s
Sampling points	The sampling point should be set close to but no later than 7/8 of the bit time	
Transceiver	The maximum transceiver "ring delay" (from send to receive) is 300 ns	CAN transceivers should comply with the ISO 11898-2 standard
Termination resistor	The DC-DC CAN communication circuit has no 120 ohm termination resistor by default	
Default CAN communication protocol		

5.4 Background Debugging Software Description

Product type	DCDC	
Background software coding	2001 Setup V2.0.exe	
Background software communication mode	CAN communication	Baud rate 125K/250K/500K adjustable
Installation and usage assistance		
Support CAN box Brand 1	1. Beijing Aitai USBCAN-2I 2. Beijing Aitai USBCAN-I	Prepared by customer
Support CAN box Brand 2	TBD	



5.5 Troubleshooting and Confirmation

Fault phenomenon	Common causes of failures	Troubleshooting
The power supply has no output	High Voltage Input Exception (None or Reverse)	Check if the high-voltage input is normal
	12V voltage input port is abnormal (none, over/undervoltage, reverse connection)	Check whether the 12V voltage input port is normal
	The output is disconnected	Check whether the output connection is normal
No packets are sent from DC-DC	The signal connector is not properly connected	Reseat the signal connector
	The CAN cable is reversed	Adjust the CAN line sequence
	The communication protocol does not match	Compare whether the protocols match
	Baud rates don't match	Compare whether the protocols match
The distribution box high voltage input fuse is damaged The product reports a fault signal	Input short circuit	Check if the high-voltage input is normal
	Input over/under voltage, output over/under voltage, over temperature, output short-circuit/overcurrent	Check the input voltage, output for overcurrent/short circuit, turn off the power, let stand for 10 minutes, if it still fails, contact the manufacturer.
Over temperature failure	Air-cooled machines: The fan is stalled or the air duct is blocked	Check the fan and air duct
	Water-cooled machines: No coolant or too high coolant temperature	Check that the coolant is normal