Controller Manual

DB1510

Apply for Compressors:

QX1402VDL, 12V
QX1902VDL, 12V
QX1402VDH, 12V

1. Overview

DB1510 is specifically designed for variable frequency compressor DC 24V input.

The key features as follow:

※ Multiple speed control methods without position sensor

※ Operation temperature is -20℃～+45℃.

※ Operation smoothly, low noise.

※ Small installation footprint.

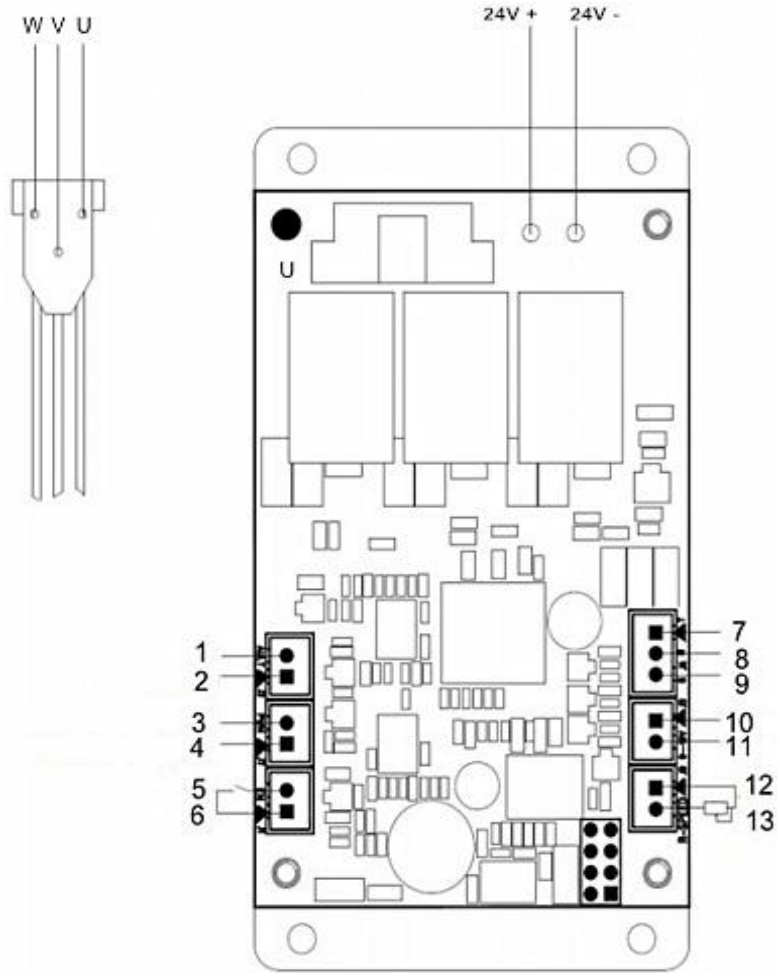
※ All components are famous brand, such as IC, capacitor, power MOSFET etc.

2. Product Type

Type	DB1510	D	DB	151	0
Definition	Driver for Variable Frequency	Direct Current	DC24V	Power:150W	IP Grade 0:IP00

3. Diagram and Interface

3.1 Diagram



1. GND

2. Fault Alarm

3. GND

4. 1-10KHz PWM Speed Control

5. EN Switch

6. GND

7. TXD

8. RXD

9. GND

10. 0-5V Speed Control

11. GND

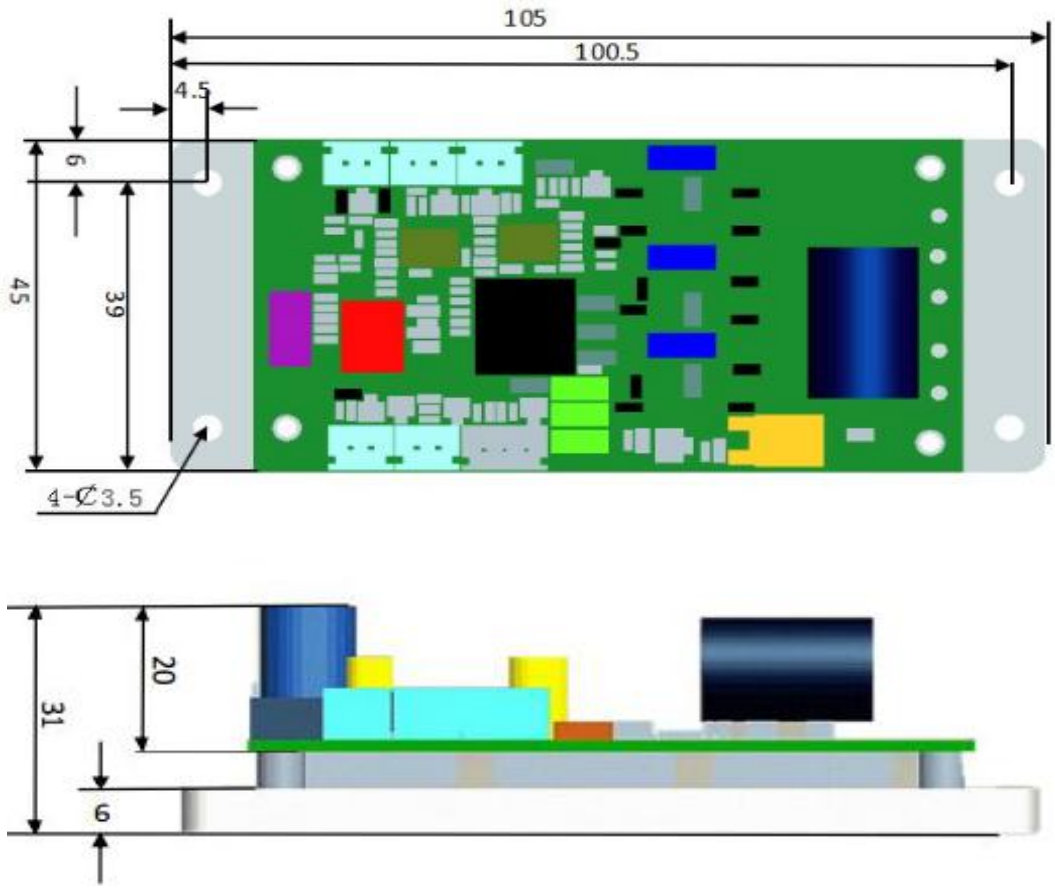
12. 50KΩ Potentionmeter

13. Speed Control

3.2 PCBA Interface (Printed Circuit Board Assembly)

Terminals	Description	SPEC
J1	EN, enable terminal, reservation for EN.	P2500J-02
J2	Compressor failure alarm, high level–normal, low leve-failure	P2500J-02
J3	0-5V to adjust the speed.	P2500J-02
J6	TTL communication port.	P2500J-03
J7	PWM speed control terminal (0-5V)	P2500J-02
J8	Terminals for potentiometers with 50KΩ to adjust speed.	P2500J-02
12V +	24V DC Positive	1015 18# Red 200mm
12V -	24V DC Negative	1015 18# Black 200mm
U	U:AC Output	
V	V:AC Output	
W	W:AC Output	

4. Dimensions



5. Specifications

Items		Specifications
Output	Rated Voltage(V)	17
	Rated Current(A)	8
	Rated Power(W)	150
	Max Power(W)	180
	Output Frequency(Hz)	541
	Speed(rpm)	6500
Input	Input(V)	DC 24V
	Input Voltage(Vac)	20V -32V
	Rated Frequency(Hz)	-
	Power Factor	-
Operation	Speedup Time(s) (0-max frequency)	30s
	Speed adjustment accuracy	1%
	Speed Scope(rpm)	2000-6500
	Start Mode	Open loop speedup
	Speed Up/Down Mode	Linear
	Stop Mode	Run to stop
Other	Cooling	Free air cooling
	Noise	＜40dB
	Operation Life	＞40000 Hours

6. Operation Instructions

6.1 Analog speed control is default speed control mode. The mode can be temporarily changed thru communication software provided by EUNICUM.But the changed mode can't be stored in product.

6.2 Under the communication control mode, the user can control the compressor speed Thru setting-up “Control Instruction”and“Speed Setup”.The communication Protocol is MODBUS RTU.

6.3 Under analog speed control mode, the higher corresponding speed will have priority among Analog voltage, potentiometer and PWM.

***6.3.1** Analog Voltage Mode-the relation between voltage and speed are linear relation: 0V-0.5V, Compressor stops≥0.7V, compressor starts to run 0.7~5V, corresponding speed is 2000~6500rpm.

***6.3.2** PWM Mode - the frequency and the speed is linear relationship:

300-500Hz, compressor stop. 1000Hz, compressor starts to run.

300-500Hz, compressor stop. 1000Hz, compressor starts to run. 1000-10000Hz, Corresponding speed is 2000rpm – 6000rpm.

***6.3.3** Potentiometer Mode 50KΩ, compressor stops; 30~0KΩ,corresponding speed 2000~6500rpm.

6.4 Red / Green LED to indicate the status of the driver.

Definition of Red/Green LED light indicator:

Driver Status	Green LED	Red LED
Stand By	Blink (On-0.25s,OFF-0.25s)	OFF
Motor Failure	OFF	Blink N times (On - 0.25s, Off - 0.25s), then off 2s, repeat as above cycle (N means Error Number, seen below definition.)
Motor Operating Normal	Blink (On-0.25s,OFF-0.25s) Green light ON while Red light OFF	Blink (OFF-0.25s,ON-0.25s) Red light ON while Green light OFF

Error Number (N):

N–Number of LED blinks	Failure	Description
1	Short or output over-current	The Controller (driver) will alarm over-current failure when peak value of output current is larger than 25A, and stop the output. The driver will restore in 3minutes. The driver will be locked if there are more than 7 times over- current protection in 1 hour. The alarm will be eliminated after re-power-on.
2	Motor Stall	The driver will stop the output and alarm when the motor is stalled. And driver will try to restore to run 3 minute later.
3	Temperature Sensor Failure	The driver will not work when disconnecting of temperature sensor is detected.
4	MOSFET Over temperature	Stop the output when the temperature of MOSFET goes up to 105℃. Restore the output when the temperature of PIM goes down to 85℃. When over-temperature protection happens, the driver stops the output and then will try to restore in 3 mins.
5	V_BUS Low Voltage	The driver will alarm and stop the output when V_BUS is lower than 19V and restore when V BUS is higher than 20V and last more than 3 minutes.
6	V_BUS Over Voltage	The driver will alarm and stop the output when V_BUS is higher than 33V and restore when V_BUS is lower than 32V.
7	Lack-phase	The Controller(driver) will alarm and stop the output if disconnecting between the driver and compressor. The driver will try to restore in 3 minutes.