EPC-PG31 Expansion Card User Manual

When users use a differential output encoder as the speed feedback, please choose our PG feedback card EPC-PG31. EPC-PG31 supports two sets of 5V differential inputs and three channels of O/A, O/B, O/Z frequency division outputs. The output mode is differential, and the pulse supply mode is 5V differential.

1. Appearance

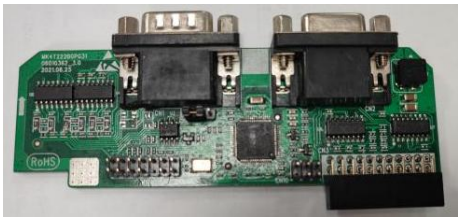

Figure 1 EPC-PG31

2. Terminal and jumper switch description

2.1 Terminal description

User terminal	Function description
CN10	Programming cable access terminal
CN8	Encoder signal access terminal
CN7	Pulse reference and differential frequency division output terminal

2.2 Jumper switch description

Switch	Function description	Factory settings
S1	Temperature sensor selection: (corresponding to TEMP channel) * PT100: PT100 temperature sensor PT1000: PT1000 temperature sensor	PT1000

3. Encoder wiring instructions

3.1 CN8 pin definition

CN8 is the encoder signal input interface, using a DB15 (male) socket. The socket pin definitions are shown in the table below, and the pin layout is shown in Figure 2.

DB15 (male) socket pin number	Signal definition
8	A+
3	A-
9	B+
4	B-
15	Z+
14	Z-
6	A1+
1	A1-
10	B1+
5	B1-
7	Z1+
2	Z1-
12	VPG (positive pole of encoder power supply)
13	GND
11	TEMP (temperature data acquisition channel)

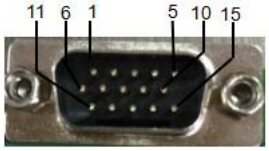

Fig. 2 CN8 Pin layout

3.2 CN7 pin definition

CN7 is the pulse supply and differential frequency division output interface, using a DB15 (female) socket. The socket pin definitions are shown in the table below, and the pin layout is shown in Figure 3.

DB15 socket pin definition	Signal definition
2	PA+
1	PA-
7	PB+
6	PB-
5	O/A+
15	O/A-
10	O/B+
14	O/B-
9	O/Z+
13	O/Z-
3	VPG (positive pole of encoder power supply)
4	GND (reference ground of VPG)
8、11、12	NC

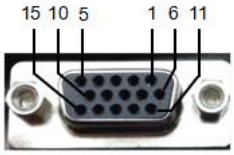

Fig. 3CN7 Pin layout

3.3 Encoder wiring instructions

3.3.1 First Set of Motor Encoder (Differential Output Type)

Figure 4 shows the wiring diagram for the first set of motor encoder (differential output type) using twisted pair single-shielded wiring. The positive pole of the encoder power connects to VPG, and the negative pole connects to GND. The encoder A+, A-, B+, B-, Z+, Z- are connected to the inverter A+, A-, B+, B-, Z+, Z- through the DB15 connector after being twisted pair. The shield layer on the motor side should be left floating.

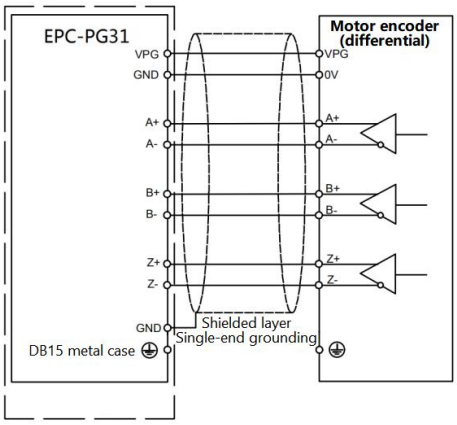

Figure 4: Wiring Diagram for the First Set of Motor Encoder (Differential Output Type) with Single Shielding (Differential signals are connected using twisted pair wires, and the shield layer should not contact PE)

In addition, in some cases, the encoder can be connected using twisted pair double-shielded cables, as shown in Figure 5. Each cable in the set is twisted pair connected, and the corresponding shield layer is connected to GND. The shield layer of the entire cable is

connected to the DB15 metal shell to ensure reliable connection. After wiring, make sure that the inner and outer shield layers are not mistakenly connected (connecting them would result in a single-layer shield). The inner shield layer is connected to "GND" on the PG31 side, and the outer shield layer is connected to the metal shell of the DB15 plug on the cable side and the encoder housing on the motor side.

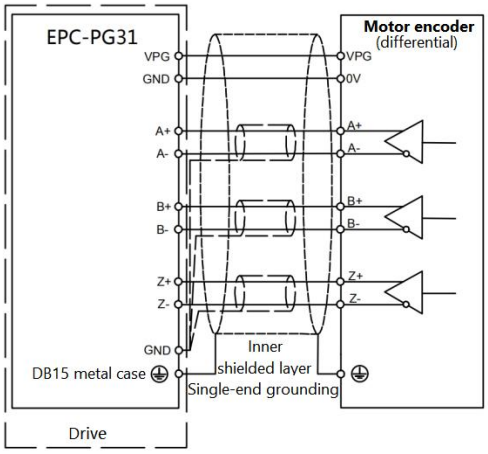

Figure 5: Wiring Diagram for the First Set of Motor Encoder (Differential Output Type) with Double Shielding (The inner and outer shield layers should not be mistakenly connected)

3.3.2 Encoder for second set of motor (spindle encoder)

Figure 6 shows the wiring diagram for the second set of motor encoder. The positive pole of the encoder power connects to VPG, and the negative pole connects to GND. The encoder A1+, A1-, B1+, B1-, Z1+, Z1- are connected to the inverter A1+, A1-, B1+, B1-, Z1+, Z1- through the DB15 connector after being twisted pair. The shield layer on the motor side should be left floating.

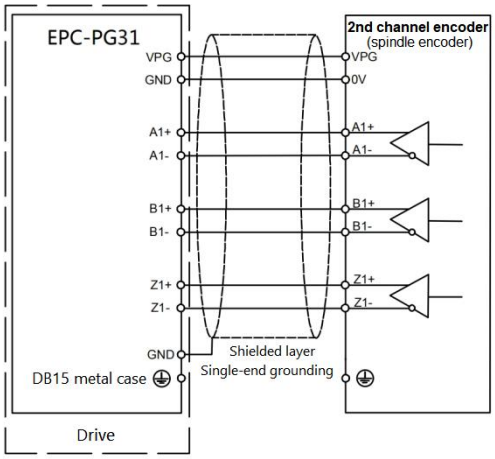

Figure 6: Wiring Diagram for the Second Set of Motor Encoder (Spindle Encoder) with Single Shielding (Differential signals are connected using twisted pair wires, and the shield layer should not contact PE)

In addition, in some cases, the encoder can be connected using double-shielded cables, as shown in Figure 7. Each cable in the set has its shield layer connected to GND. The shield layer of the entire cable is connected to the DB15 metal shell to ensure reliable connection. After wiring, make sure that the inner and outer shield layers are not mistakenly connected (connecting them would result in a single-layer shield). The inner shield layer is connected to "GND" on the PG31 side, and the outer shield layer is connected to the metal shell of the DB15 plug on the cable side and the encoder housing on the motor side.

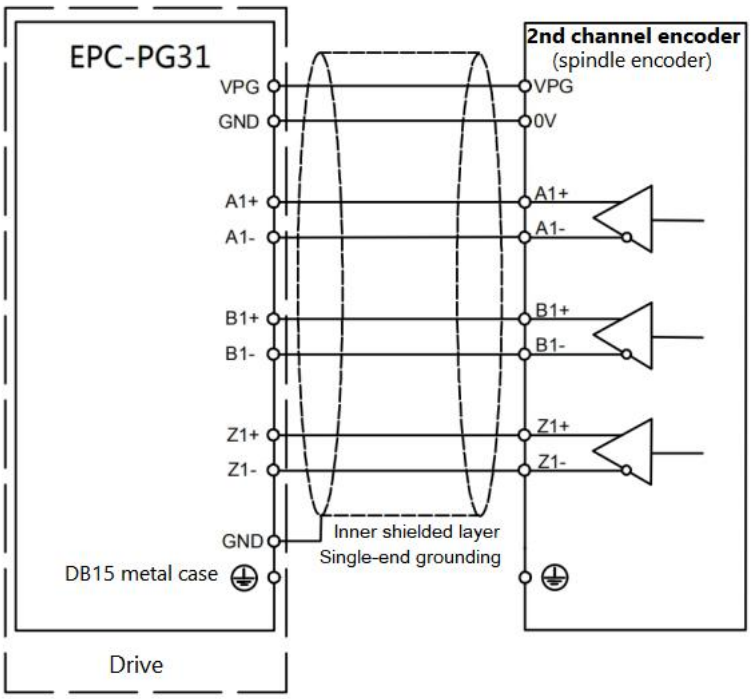

Figure 7: Wiring Diagram for the Second Set of Motor Encoder (Spindle Encoder) with Double Shielding (The inner and outer shield layers should not be mistakenly connected)

4. Frequency division output description

4.1 Description of Frequency division output terminal

Terminal	Function	Response speed	Output method	Output current	Frequency division range
O/A+ O/A-	Frequency division signal output	0~2MHz	differential	20mA	Even division frequency from 1 to 128
O/B+ O/B-	Frequency division signal output	0~2MHz	differential	20mA	Even division frequency from 1 to 128
O/Z+ O/Z-	Frequency division signal output	0~2MHz	differential	20mA	Even division frequency from 1 to 128

4.2 Wiring Instructions of O/A+, O/A-, O/B+, O/B-, O/Z+, O/Z- Frequency Division Output

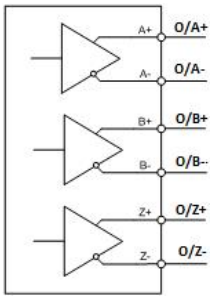

Figure 7: Wiring Diagram for O/A+, O/A-, O/B+, O/B-, O/Z+, O/Z- Frequency Division Output

4.3 Explanation of frequency division output multipliers

Set the parameter F4-12=n (where n=0, 1, 2, 3, 4, ..., 64) via the keyboard to determine the frequency division output multiplier for O/A, O/B, and O/Z. The default factory setting is F4-12=0, indicating no frequency division. Starting from n=1, the frequency division output multiplier for O/A, O/B, and O/Z is determined as 2^n. Therefore, F4-12=1 corresponds to a 2-fold frequency division, F4-12=2 corresponds to a 4-fold frequency division, F4-12=3 corresponds to a 6-fold frequency division, F4-12=4 corresponds to an 8-fold frequency division, and so on. F4-12=64 corresponds to a 128-fold frequency division.

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