Bardac drives T2-ENCOD-IN Encoder Interface User Guide

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        Interface User Guide
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Compatibility
This Option is suitable for use on the following product ranges:
Bardac P2 Drives

Model Code
T2-ENCOD-IN (5 Volt TTL Version)
T2-ENCHT-IN (8 – 30 Volt HTL Version)

Compatible Encoder Types
TTL Version : 5V TTL – A & B Channel with Compliment
HTL Version 24V HTL – A & B Channel with Compliment Note: +24V HTL encoder requires external supply voltage

Specifications

Power Supply Output: 5V DC @ 200mA Max

Maximum Input Frequency: 500kHz
Environmental: 0∘C – +50∘C
Terminal Torque: 0.5Nm (4.5 lb-in)

Warranty

Complete Warranty Terms and Conditions are available upon request from your Bardac Authorised Distributor.

Error Code Definitions

The following error codes are related to the encoder operation:

| State	Indication	Indication
Enc-01	Communication loss	No communication between the encoder module and the drive. Please check the module is properly fitted into the slot.
SP-Err	Speed feedback error exceeds level set in P6-07	The estimated motor speed differs from the measured motor speed. Check encoder connection, wire shielding, and values set in P6-07.
Enc-03	Encoder PPR motor speed mismatch	The encoder used must have a PPR value of at least 60. Motor nameplate RPM must be entered in P1-10.
Enc-04	Encoder Channel A Fault	Error normally caused by encoder wiring error. Check encoder wiring and commissioning guidelines.
Enc-05	Encoder Channel B Fault	
Enc-06	Encoder Channels A & B Faults	

LED Status Indication
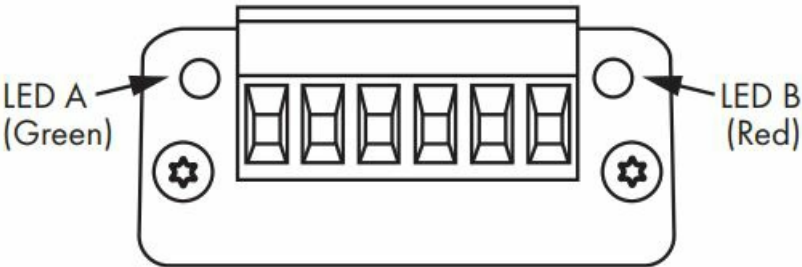
The encoder module has 2 LEDs – LED A (Green) and LED B (Red).

- LED A indicates power
- LED B indicates a wiring fault condition.

The fault code is indicated on the drive display. Please see Error Code Defi nitions. For transient faults, the LED will remain illuminated for 50ms to notify a fault on the module.

Mechanical Installation
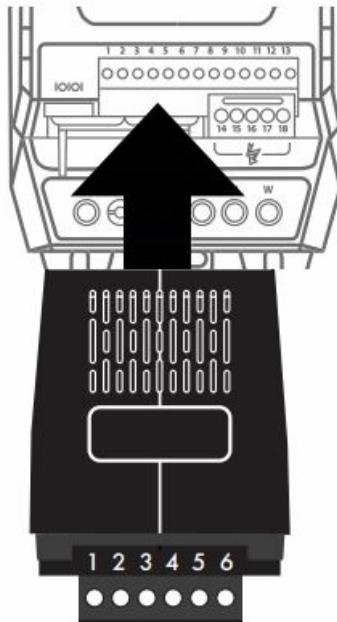
- Option Module inserted into the drive's Option Module Port (please see diagram opposite).
- DO NOT use undue force in inserting the option module into the options port.
- Ensure the option module is fitted securely before powering on the drive.
- Remove terminal block header from option module prior to tightening connections. Replace when wiring is completed. Tighten to Torque setting provided in Specifications.

Compliance

Model Code: T2-ENCOD-IN and T2-ENCHT is in compliance with Directive 2014/30/EU, 2014/35/EU, 2011/65/EU
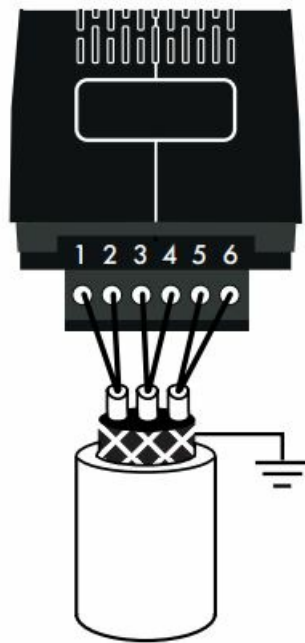The EU declaration of conformity is available on request from your Bardac Drives Sales Partner.

Bardac Drives
40 Log Canoe Circle
Stevensville, MD 21666
(410) 604-3400
bardac.com | **driveweb.com**
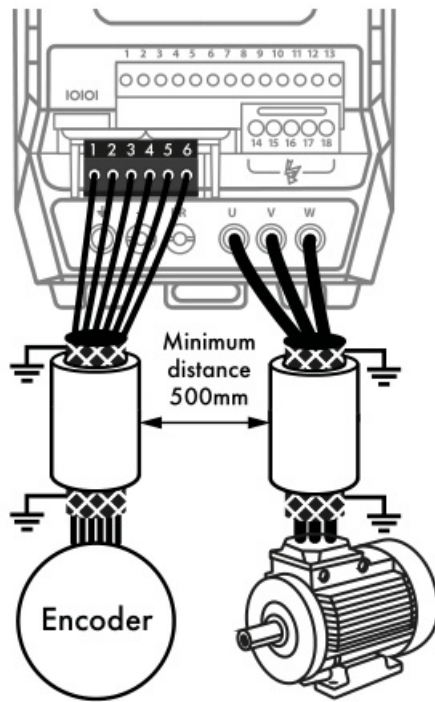

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Electrical Installation

- Overall Shielded twisted paired cable to be used
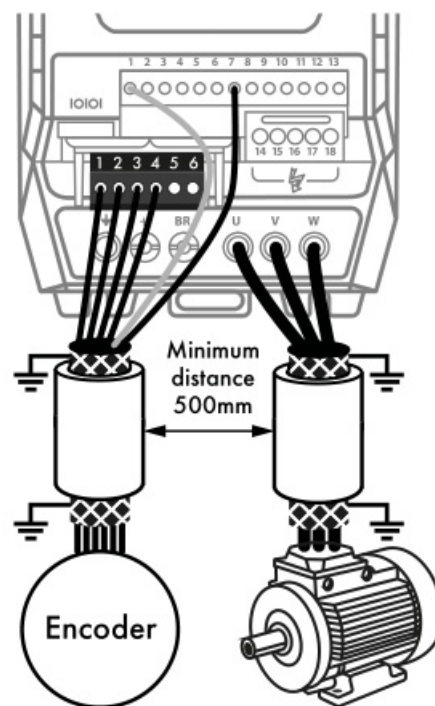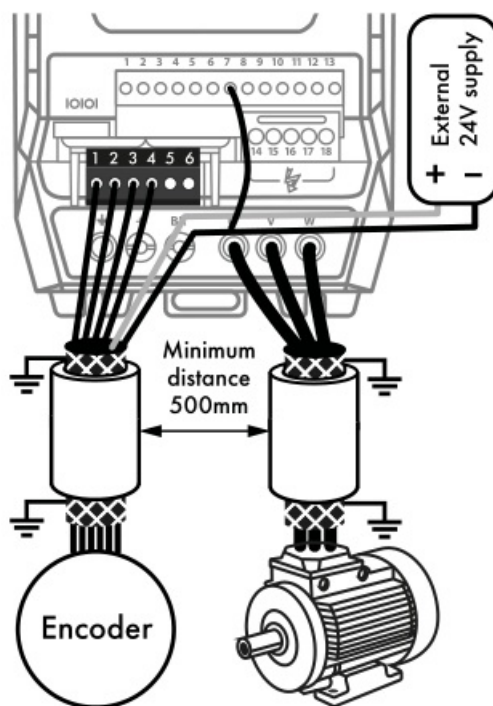- Shield should be connected to Ground (PE) both Ends

Connection Examples

5V TTL Encoder – T2-ENCOD-IN

NOTE Do not connect the encoder cable shield to 0V of the drive or encoder module.

Minimum distance 500mm

Encoder

24V HTL Encoder – T2-ENCHT

External 24V supply

Minimum distance 500mm
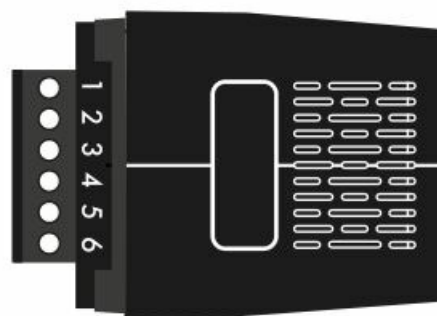
Encoder

Minimum distance 500mm

Encoder

Alternatively (to External supply) the drives on-board 24V supply can be used (T1 (24V) and T7 (0V)) – Ensure total current consumption from T1 does not exceed 100mA.

NOTE 0V of encoder must also be connected to drive 0V (T7).

NOTE Do not connect the encoder cable shield to 0V of the drive or encoder module.

Option Module Connections

Pin	Function
1	A Channel (A)
2	A Channel Inverse (/A)
3	B Channel (B)
4	B Channel Inverse (/B)
5	+5V DC Output
6	0 Volt

Operation

Parameter Settings

When operating with an encoder, the following parameter settings are required as a minimum:

- P1-09: Motor rated frequency (found on the motor nameplate).
- P1-10: Motor rated speed (found on the motor nameplate).
- P6-06: Encoder PPR value (enter value for the connected encoder).

Closed Loop Vector speed provides full torque holding capability at zero speed and enhanced operation at frequencies below 1Hz. The drive, encoder module and encoder should be connected according to the voltage rating of the encoder as shown in the wiring diagrams. The encoder cable should be an overall shielded type, with the shield bonded to earth at both ends.

Commissioning

When commissioning, the drive should firstly be commissioned in Encoder less Vector Speed Control (P6-05 = 0), and a speed / polarity check should then be made to ensure that the sign of the feedback signal matches that of the speed reference in the drive.
The steps below show the suggested commissioning sequence, assuming the encoder is correctly connected to the drive

1) Enter the following parameters from the motor nameplate:

- P1-07 – Motor Rated Voltage
- P1-08 – Motor Rated Current
- P1-09 – Motor Rated Frequency
- P1-10 – Motor Rated Speed

2) To enable access to the advanced parameters required, set P1-14 = 201
3) Select Vector Speed Control Mode by setting P4-01 = 0
4) Carry out an Auto-tune by setting P4-02 = 1
5) Once the Auto-tune is completed, the drive should be run in the forward direction with a low speed reference (e.g. 2 – 5Hz). Ensure the motor operates correctly and smoothly.
6) Check the Encoder Feedback value in P0-58. With the drive running in the forward direction, the value should

be positive, and stable with variation of + / – 5% maximum. If the value in this parameter is positive, the encoder wiring is correct. If the value is negative, the speed feedback is inverted. To correct this, reverse the A and B signal channels from the encoder.

7) Varying the drive output speed should then result in the value of P0-58 changing to reflect the change of the actual motor speed. If this is not the case, check the wiring of the whole system.

8) If the above check is passed, the feedback control function can be enabled by setting P6-05 to 1.

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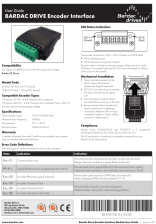
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Documents / Resources

	[Bardac drives T2-ENCOD-IN Encoder Interface](#) [pdf] User Guide T2-ENCOD-IN, T2-ENCHT, T2-ENCOD-IN Encoder Interface, T2-ENCOD-IN, Encoder Interface, Interface

References

- **[AC Drives, DC Drives, Motors & Control Technology | Bardac Drives](#)**
- **[Internet-Accessible Distributed Control Technology | drive.web](#)**

Manuals+,