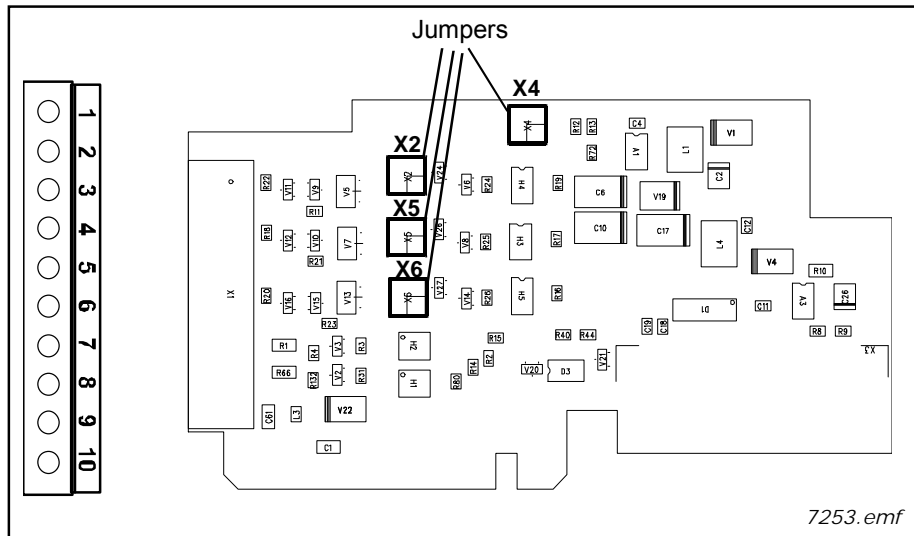


3.1.1.5 OPTA5



Description: Encoder board for VACON® NXP. Encoder input board with programmable control voltage for an encoder.

The OPTA5 board is designed for HTL (High voltage Transistor Logic) type encoders (voltage output type push-pull HTL, open collector output type HTL) which provide input signal levels dependent on the supply voltage of the encoder. The encoder inputs A, B and Z are galvanically isolated. The OPTA5 board includes, too, the qualifier input ENC1Q (meant to trace the Z-pulse in certain situations) and a fast digital input DIC4 (used to trace very short pulses). These two inputs are used in special applications.

The OPTA5 is similar to the OPTA4 in connections but the encoder inputs A, B and Z have different signal levels (voltage level). The input levels for A, B and Z of the OPTA4 are compatible with RS-422 while those of the OPTA5 are more general wide range inputs. Inputs ENC1Q and DIC4 are identical in both boards.

- Allowed slots: C
- Type ID: 16693
- Terminals: One terminal block; Screw terminals (M2.6); Coding in terminal #3.
- Jumpers: 4; X2, X4, X5, X6 (see page 31)
- Board parameters: Yes (see page 27)

I/O terminals on OPTA5 (coded terminal painted black)

Table 11. OPTA5 I/O terminals

Terminal		Parameter reference Keypad/NCDrive	Technical information
1	DIC1A+		Pulse input A (differential); Voltage range 10...24V
2	DIC1A-		
3	DIC2B+		Pulse input B; phase shift of 90 degrees compared to Pulse input A (differential); Voltage range 10...24V
4	DIC2B-		
5	DIC3Z+		Pulse input Z; one pulse per revolution (differential); Voltage range 10...24V
6	DIC3Z-		
7	ENC1Q		Reserved for future use
8	DIC4		Reserved for future use
9	GND		Ground for control and inputs ENC1Q and DIC4
10	+15V/+24V		Control voltage (auxiliary voltage) output to encoder; Output voltage selectable with jumper X4. See chapter 1.4.4.

NOTE: Encoder inputs are wide range inputs that can be used with encoders using +15V or +24V.

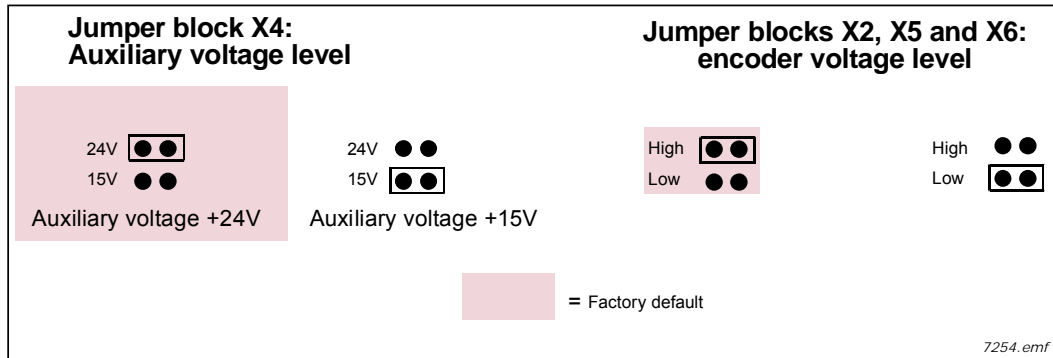
Technical data:

Encoder control voltage, +15V/+24V	Control voltage selectable with jumper X4.
Encoder input connections, inputs A+, A-, B+, B-, Z+, Z-	Max. input frequency ≤150kHz Inputs A, B and Z are differential
Qualifier input ENC1Q Fast digital input DIC4	Max. input frequency ≤10kHz Min. pulse length 50µs Digital input 24V; R _i >5kΩ Digital input is single-ended; connected to GND

NOTE: A high pulse frequency combined with a great cable capacitance places a considerable load on the encoder. Apply therefore as low a voltage as possible for the encoder supply, rather lower than 24V. The manufacturer also recommends to place jumper X4 to position +15V, if allowed in the voltage range specification of the encoder.

Jumper selections

On the OPTA5 board, there are four jumper blocks; X4 is used to program the control voltage (auxiliary voltage), X2, X5 and X6 are set according the voltage of the encoder. The factory default and other available jumper selections are presented below.



Jumper blocks X2, X5 and X6:

When these jumpers are set to High (default and typically good for 24V encoders), it means that when the voltage at the channel goes above 8V, it will acknowledge a new pulse.

When they are set to Low = 2.3 V, it means that when the voltage at the channel goes above 2.3V, it will acknowledge a new pulse.

Usage: Closed Loop Vector Control. The OPTA5 board is mainly used in conventional industrial applications where encoder cable lengths are relatively long.

Encoder connection – Differential

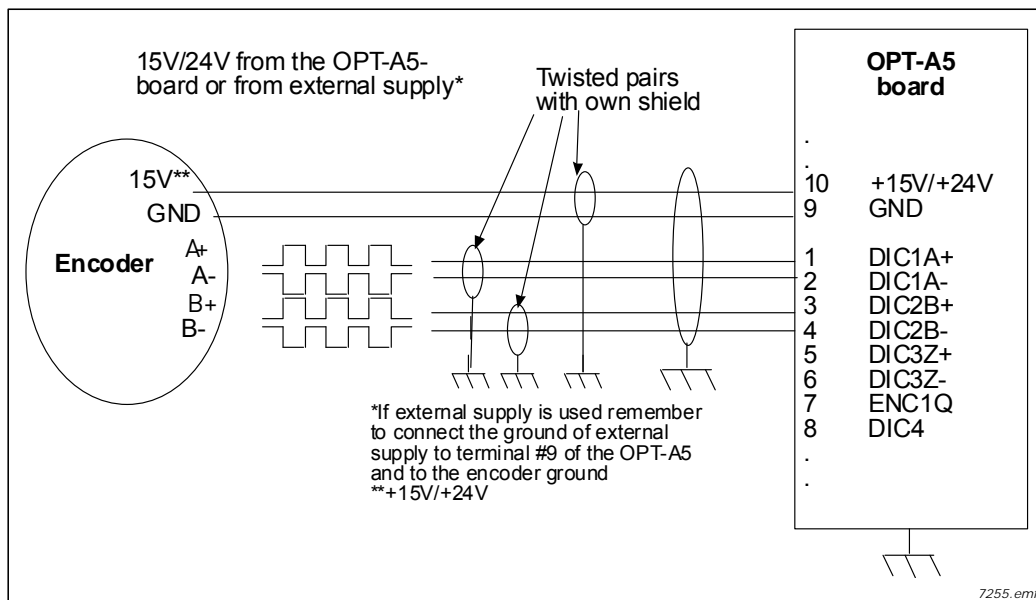


Figure 14. HTL type encoder connection using differential inputs

Encoder connection – Single-ended

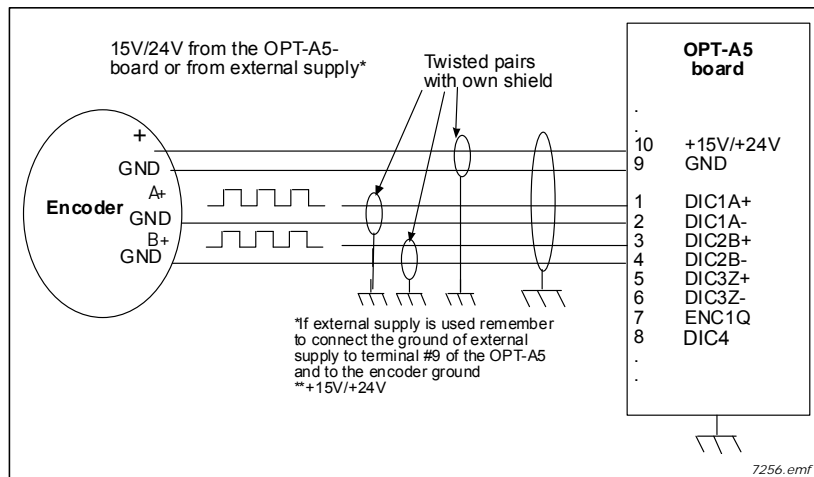


Figure 15. HTL type encoder connection (open source) using single-ended inputs

NOTE! Grounding is to be connected only at the AC drive to avoid circulating current in the shield. Isolate shield at the encoder.

It is recommended to use double shielded cable for encoder connection.

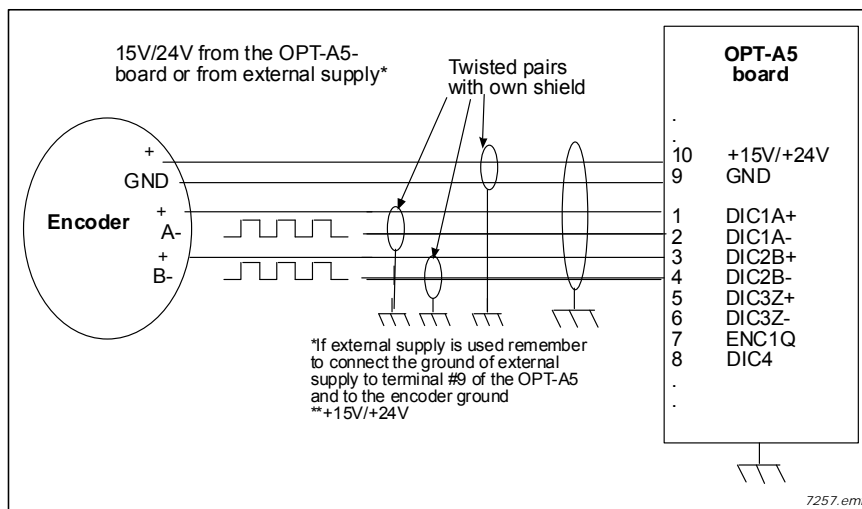


Figure 16. HTL type encoder connection (open collector) using single-ended inputs

NOTE! Grounding is to be connected only at the AC drive to avoid circulating current in the shield. Isolate shield at the encoder.

It is recommended to use double shielded cable for encoder connection.

OPTA5 parameters

See page 27 and 27.