

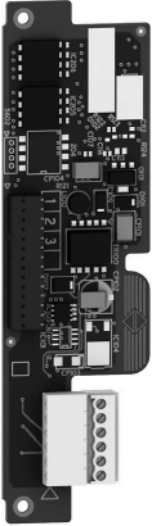
Variable speed drives for asynchronous motors

Altivar 71

Option: encoder interface cards

Presentation

5327Z



VW3 A3 401

Encoder interface cards are used for Flux Vector Control operation with sensor (FVC mode) which improves drive performance irrespective of the state of the motor load:

- Zero speed torque
- Accurate speed regulation
- Torque accuracy
- Shorter response times on a torque surge
- Improved dynamic performance in transient state

In other control modes (voltage vector control, voltage/frequency ratio), encoder interface cards improve static speed accuracy.

Encoder interface cards can also be used for machine safety irrespective of the control type:

- Overspeed detection
- Load veering detection

Encoder interface cards can also transmit an Altivar 71 drive reference provided by the encoder input. This use is specific to synchronizing the speed of several drives.

Three types of card are available depending on the encoder technology:

- RS 422 compatible differential outputs
- Open collector outputs (NPN)
- Push-pull outputs

The card is inserted into a dedicated slot.

Characteristics

Encoder interface cards with RS422 compatible differential outputs

Type of card		VW3 A3 401	VW3 A3 402 (1)		
Power (supplied by the card)	Voltage	5 V \pm (min. 5 V, max. 5.5 V)	15 V \pm (min. 15 V, max. 16 V)		
	Maximum current	200 mA	175 mA		
Short-circuit and overload protection					
Maximum operating frequency		300 kHz			
Input signals		A, \bar{A} , B, \bar{B}			
		Impedance			
		440 Ω			
Number of pulses/ encoder revolution		5000 maximum The maximum high-speed frequency should not exceed 300 kHz.			
Maximum consumption current of encoder		100 mA (2)	200 mA (2)	100 mA (3)	200 mA (3)
Minimum recommended cross-section of conductors (4)	For a maximum cable length of 25 m	0.2 mm ² (AWG 24)	0.5 mm ² (AWG 20)	0.2 mm ² (AWG 24)	
	For a maximum cable length of 50 m	0.5 mm ² (AWG 20)	0.75 mm ² (AWG 18)	0.2 mm ² (AWG 24)	
	For a maximum cable length of 100 m	0.75 mm ² (AWG 18)	1.5 mm ² (AWG 15)	0.2 mm ² (AWG 24)	
	For a maximum cable length of 1000 m	–	–	0.5 mm ² (AWG 20)	1 mm ² (AWG 17)

(1) Card VW3 A3 402 ensures compatibility between Altivar 68F and Altivar 71 drive applications.

(2) Minimum encoder power supply 4.5 V.

(3) Minimum encoder power supply 8 V.

(4) Shielded cable containing 3 twisted pairs at intervals of between 20 and 50 mm.
Connect the shielding to earth at both ends.

Minimum recommended conductor cross-section for a minimum encoder voltage in order to limit line voltage drops.

Characteristics (continued)

Encoder interface card with open collector outputs

Type of card	VW3 A3 403		VW3 A3 404	
Power (supplied by the card)	Voltage	12 V \pm (min. 12 V, max. 13 V)		15 V \pm (min. 15 V, max. 16 V)
	Maximum current	175 mA		
Short-circuit and overload protection				
Maximum operating frequency	300 kHz			
Input signals	A, \bar{A} , B, \bar{B} / AB / A			
	Impedance	1 k Ω		
Number of pulses/encoder revolution	5000 maximum The maximum high-speed frequency should not exceed 300 kHz.			
Maximum consumption current of encoder	100 mA (1)	175 mA (1)	100 mA (1)	175 mA (1)
Minimum recommended cross-section of conductors (2)	For a maximum cable length of 100 m	0.2 mm ² (AWG 24)	0.5 mm ² (AWG 20)	0.2 mm ² (AWG 24)
	For a maximum cable length of 200 m	0.5 mm ² (AWG 20)	0.75 mm ² (AWG 18)	0.2 mm ² (AWG 24)
	For a maximum cable length of 500 m	1 mm ² (AWG 17)	1.5 mm ² (AWG 15)	0.5 mm ² (AWG 20)
	For a maximum cable length of 1000 m	–	–	0.75 mm ² (AWG 18) 1.5 mm ² (AWG 15)

Encoder interface card with push-pull outputs

Type of card	VW3 A3 405		VW3 A3 406		VW3 A3 407	
Power (supplied by the card)	Voltage	12 V \pm (min. 12 V, max. 13 V)		15 V \pm (min. 15 V, max. 16 V)	+24 V \pm (min. 20 V, max. 30 V)	
	Maximum current	175 mA		100 mA	100 mA	
Short-circuit and overload protection						
Maximum operating frequency	300 kHz					
Input signals	A, \bar{A} , B, \bar{B} / AB / A					
	Impedance	1 k Ω			1.6 k Ω	
	State 0	If < 1.5 V				
	State 1	If > 7.7 V and < 13 V		If > 7.7 V and < 16 V		If > 11.5 V and < 25 V
Number of pulses/encoder revolution	5000 maximum The maximum high-speed frequency should not exceed 300 kHz.					
Maximum consumption current of encoder	100 mA (1)	175 mA (1)	100 mA (1)	175 mA (1)	100 mA (2)	
Minimum recommended cross-section of conductors (3)	For a maximum cable length of 100 m	0.2 mm ² (AWG 24)	0.5 mm ² (AWG 20)	0.2 mm ² (AWG 24)	0.2 mm ² (AWG 24)	
	For a maximum cable length of 200 m	0.5 mm ² (AWG 20)	0.75 mm ² (AWG 18)	0.2 mm ² (AWG 24)	0.2 mm ² (AWG 24)	
	For a maximum cable length of 500 m	1 mm ² (AWG 17)	1.5 mm ² (AWG 15)	0.5 mm ² (AWG 20)	0.2 mm ² (AWG 24)	
	For a maximum cable length of 1000 m	–	–	0.75 mm ² (AWG 18)	1.5 mm ² (AWG 15)	0.5 mm ² (AWG 20)

References

Encoder interface cards (4)

Description	Voltage V	Reference	Weight kg
Encoder interface cards with RS422 compatible differential outputs	5	VW3 A3 401	0.200
	15	VW3 A3 402	0.200
Encoder interface cards with open collector outputs	12	VW3 A3 403	0.200
	15	VW3 A3 404	0.200
Encoder interface cards with push-pull outputs	12	VW3 A3 405	0.200
	15	VW3 A3 406	0.200
	24	VW3 A3 407	0.200

(1) Minimum encoder power supply 10 V.

(2) Minimum encoder power supply 14 V.

(3) Shielded cable containing 3 twisted pairs at intervals of between 20 and 50 mm.

Connect the shielding to earth at both ends.

Minimum recommended conductor cross-section for a minimum encoder voltage in order to limit line voltage drops.

(4) The Altivar 71 drive cannot support more than one encoder interface card.

Consult the summary tables of possible drive, option and accessory combinations (see pages 60293/2 to 60293/9).