

System connections, jumpers and dip switches position

Connectors:

CN16 Digital inputs Hi-Freq	
CN16.1	+B0_IN4
CN16.2	-B0_IN4
CN16.3	+B0_IN5
CN16.4	-B0_IN5
CN16.5	+B0_IN6
CN16.6	-B0_IN6
CN16.7	+B0_IN7
CN16.8	-B0_IN7
CN16.9	B0_COM_IN

CN2 Digital inputs Hi-Freq	
CN2.1	+B0_IN0
CN2.2	-B0_IN0
CN2.3	+B0_IN1
CN2.4	-B0_IN1
CN2.5	+B0_IN2
CN2.6	-B0_IN2
CN2.7	+B0_IN3
CN2.8	-B0_IN3
CN2.9	B0_COM_IN

CN3 Digital outputs Hi-Freq	
CN3.1	+24
CN3.2	VSS
CN3.3	B0_OUT0
CN3.4	B0_OUT1

CN12 Digital inputs Std	
CN12.1	B1_IN0
CN12.2	B1_IN1
CN12.3	B1_IN2
CN12.4	B1_IN3
CN12.5	B1_IN4
CN12.6	B1_IN5
CN12.7	B1_IN6
CN12.8	B1_IN7
CN12.9	B1_COM_IN
CN12.10	B1_COM_IN
CN12.11	B1_COM_IN

CN5B Digital inputs Hi-Freq		
	CANbus version	RS232/485 version
CN5B.1	CAN_H	+RX (RS485)
CN5B.2	CAN_L	-RX (RS485)
CN5B.3	CAN_GND	RXD (RS232)
CN5B.4		DTR (RS232)
CN5B.5		0V_A
CN5B.6		TXD (RS232)
CN5B.7	CAN_GND_0	+TX (RS485)
CN5B.8		-TX (RS485)

CN5A Digital inputs Hi-Freq		
	CANbus version	RS232/485 version
CN5A.1	CAN_H	+RX (RS485)
CN5A.2	CAN_L	-RX (RS485)
CN5A.3	CAN_GND	
CN5A.4		
CN5A.5		0V_A
CN5A.6		
CN5A.7	CAN_GND_0	+TX (RS485)
CN5A.8		-TX (RS485)

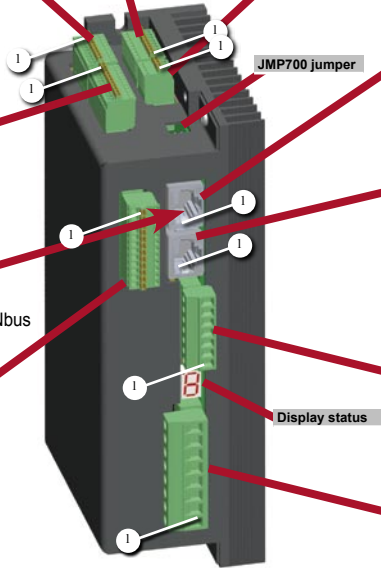
CN4 Analog Inputs	
CN4.1	V_POT
CN4.2	AGND
CN4.3	
CN4.4	+IN_AN0
CN4.5	-IN_AN0
CN4.6	+IN_AN1
CN4.7	-IN_AN1

CN1 Power supply and stepper motor	
CN1.1	PE
CN1.2	GND
CN1.3	V+
CN1.4	VLOG
CN1.5	A
CN1.6	A/
CN1.7	B
CN1.8	B/



Modbus or CANbus

CN13 Digital outputs	
CN12.1	B1_OUT0
CN12.2	B1_OUT1
CN12.3	B1_OUT2
CN12.4	B1_OUT3
CN12.5	B1_OUT4
CN12.6	B1_OUT5
CN12.7	B1_OUT6
CN12.8	B1_OUT7
CN12.9	+24V
CN12.10	+24V
CN12.11	VSS
CN12.12	VSS

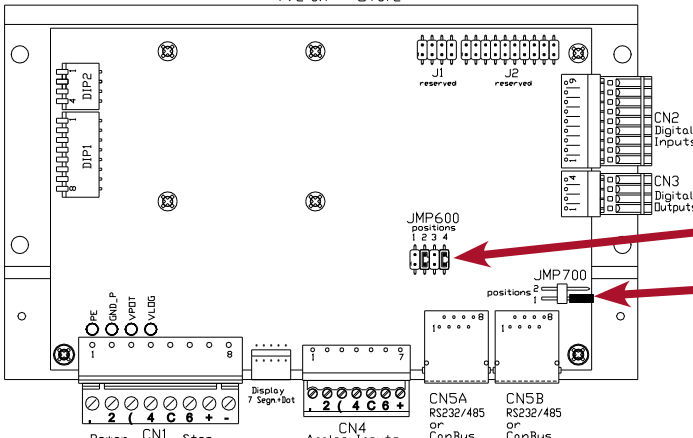


Jumpers:



Attention: the jumper JMP600 must not be closed in position 1 and 2 or in position 3 and 4 at the same time.
Attention: the jumper JMP700 with a RS485 Half-Duplex connection, insert only 1 jumper indifferently in position 1 or 2.

Rear Side



JMP600 jumpers	
Position	Function
1	IN_AN0 differential $\pm 10V$
2	IN_AN0 potentiometer
3	IN_AN1 differential $\pm 10V$
4	IN_AN1_potiometer

JMP700 jumper

Front Side

System connection and jumpers functions

CN1: Power supply and Motor

8 positions, pitch 5.08mm, PCB header connector

Pos	Name	Characteristics	
1	PE	EARTH input	Environment earthing
2	GND	PWR input	Negative power supply for Motor and Logic
3	V+	PWR input	Positive power supply for Motor
4	VLOG	PWR input	Positive power supply for Logics
5	A	PWR output	Motor Phase A
6	A/	PWR output	Motor Phase A/
7	B	PWR output	Motor Phase B
8	B/	PWR output	Motor Phase B/

CN2: Digital inputs Hi-Freq

9 positions, pitch 2.5mm, PCB header connector

Pos	Name	Characteristics	
1	+B0_IN0	Digital input	Positive terminal digital input B0_IN0
2	-B0_IN0	Digital input	Negative terminal digital input B0_IN0
3	+B0_IN1	Digital input	Positive terminal digital input B0_IN1
4	-B0_IN1	Digital input	Negative terminal digital input B0_IN1
5	+B0_IN2	Digital input	Positive terminal digital input B0_IN2
6	-B0_IN2	Digital input	Negative terminal digital input B0_IN2
7	+B0_IN3	Digital input	Positive terminal digital input B0_IN3
8	-B0_IN3	Digital input	Negative terminal digital input B0_IN3
9	B0_COM_IN	PWR input	Reference common inputs (for use of 24VDC)

CN3: Digital outputs Hi-Freq

4 positions, pitch 2.5mm, PCB header connector

Pos	Name	Characteristics	
1	+24	PWR input	Positive power supply digital outputs
2	VSS	PWR input	Negative reference power supply digital outputs
3	B0_OUT0	Digital output	Output open emitter (Surce Current) B0_OUT0
4	B0_OUT1	Digital output	Output open emitter (Source Current) B0_OUT1

CN4: Analog inputs

7 positions, pitch 3.81mm, PCB header connector

Pos	Name	Characteristics	
1	V_POT	PWR output	Output positive power supply for potentiometers
2	AGND	PWR output	Output negative references for potentiometers
3	n.c.	---	Not connected
4	+IN_AN0	Analog input	Positive terminal analog input IN_AN0
5	-IN_AN0	Analog input	Negative terminal analog input IN_AN0
6	+IN_AN1	Analog input	Positive terminal analog input IN_AN1
7	-IN_AN1	Analog input	Negative terminal analog input IN_AN1

CN5A - CN5B: RS232/RS485 versions

RJ45, 8 positions, PCB shielded header connector

Pos	CN5A (IN) RS485	CN5B (OUT) RS485 RS242	Characteristics	
1	+RX	+RX	Digital input	Non-inverting input RS485 receiver
2	-RX	-RX	Digital input	Inverting input RS485 receiver
3	n.c.	RXD	Digital input	Input RS232 receiver
4	n.c.	DTR	Digital output	Output data transmit ready RS232
5	0V_A	0V_A	PWR output	Reference (mass) communication interface
6	n.c.	TXD	Digital output	Output RS232 transmitter
7	+TX	+TX	Digital output	Non-inverting output RS485 transmitter
8	-TX	-TX	Digital output	Inverting output RS485 transmitter

CN5A - CN5B: CANbus version

RJ45, 8 positions, PCB shielded header connector

Pos	Name	Characteristics	
1	CAN_H	Digital I/O	Bus line dominant HIGH
2	CAN_L	Digital I/O	Bus line dominant LOW
3	CAN_GND	PWR output	Signal ground
4	n.c.		Not connected
5	n.c.		Not connected
6	n.c.		Not connected
7	CAN_GND_O	PWR output	Optional signal ground
8	n.c.		Not connected

JMP600: Analog inputs settings

4 positions, pitch 2.54 mm, PCB header

Pos	Analog input	Characteristics		Default
1	IN_AN0	Differential ±10V	Jumper inserted	
2		Potentiometer	Jumper inserted	■
3	IN_AN1	Differential ±10V	Jumper inserted	
4		Potentiometer	Jumper inserted	■

JMP700: Insertion of termination resistors on communication interfaces

2 positions, pitch 2.54 mm, PCB header

Pos	Factory setting	RS232/485	CANbus versions
1	Jumper <u>not</u> inserted	120 ohm resistance on transmission line RS485 not inserted	Not connected
	■ Jumper inserted	120 ohm resistance on transmission line RS485 inserted	Not connected
2	Jumper <u>not</u> inserted	120 ohm resistance on transmission line RS485 not inserted	120 ohm resistance on CANbus not inserted
	■ Jumper inserted	120 ohm resistance on transmission line RS485 inserted	120 ohm resistance on CANbus inserted

System connection and jumpers functions

CN12: Standard digital inputs

11 positions, pitch 2.5mm, PCB header connector

Pos	Name	Characteristics	
1	B1_IN0	Digital input	Terminal digital input B1_IN0
2	B1_IN1	Digital input	Terminal digital input B1_IN1
3	B1_IN2	Digital input	Terminal digital input B1_IN2
4	B1_IN3	Digital input	Terminal digital input B1_IN3
5	B1_IN4	Digital input	Terminal digital input B1_IN4
6	B1_IN5	Digital input	Terminal digital input B1_IN5
7	B1_IN6	Digital input	Terminal digital input B1_IN6
8	B1_IN7	Digital input	Terminal digital input B1_IN7
9	B1_COM_IN	PWR input	Reference common inputs B1_INn
10	B1_COM_IN	PWR input	Reference common inputs B1_INn
11	B1_COM_IN	PWR input	Reference common inputs B1_INn

CN13: Standard digital outputs

12 positions, pitch 2.5mm, PCB header connector

Pos	Name	Characteristics	
1	B1_OUT0	Digital output	Terminal digital output B1_OUT0
2	B1_OUT1	Digital output	Terminal digital output B1_OUT1
3	B1_OUT2	Digital output	Terminal digital output B1_OUT2
4	B1_OUT3	Digital output	Terminal digital output B1_OUT3
5	B1_OUT4	Digital output	Terminal digital output B1_OUT4
6	B1_OUT5	Digital output	Terminal digital output B1_OUT5
7	B1_OUT6	Digital output	Terminal digital output B1_OUT6
8	B1_OUT7	Digital output	Terminal digital output B1_OUT7
9	+24V	PWR input	Positive power supply digital outputs
10	+24V	PWR input	Positive power supply digital outputs
11	VSS	PWR input	Negative reference power supply
12	VSS	PWR input	Negative reference power supply

CN16: Hi-Frequency digital inputs

9 positions, pitch 2.5mm, PCB header connector

Pos	Name	Characteristics	
1	+B0_IN4	Digital input	Positive terminal digital input B0_IN4
2	-B0_IN4	Digital input	Negative terminal digital input B0_IN4
3	+B0_IN5	Digital input	Positive terminal digital input B0_IN5
4	-B0_IN5	Digital input	Negative terminal digital input B0_IN5
5	+B0_IN6	Digital input	Positive terminal digital input B0_IN6
6	-B0_IN6	Digital input	Negative terminal digital input B0_IN6
7	+B0_IN7	Digital input	Positive terminal digital input B0_IN7
8	-B0_IN7	Digital input	Negative terminal digital input B0_IN7
9	B0_COM_IN	PWR input	Reference common inputs (for use at 24Vdc)

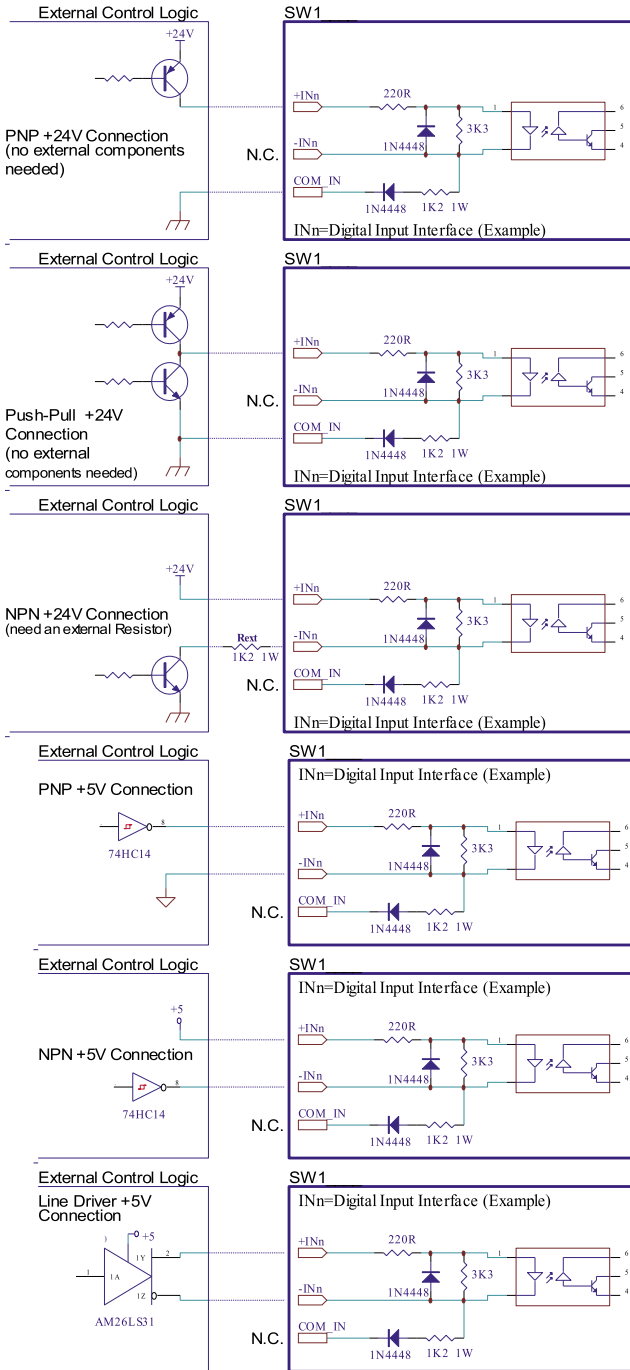
Dip-Switches settings

Dip-switch allocation											
DIP2				DIP1							
U1	U0	ID6	ID5	ID4	ID3	ID2	ID1	ID0	BD2	BD1	BD0
1			4	1							9

Drive's baud rate selection					
BD2	BD1	BD0	Modbus rate	CANopen rate	
OFF	OFF	OFF	115200	1 M	
OFF	OFF	ON	57600	500 K	
OFF	ON	OFF	38400	250 K	
OFF	ON	ON	19200	125 K	
ON	OFF	OFF	9600	100 K	
ON	OFF	ON	4800	50 K	
ON	ON	OFF	2400	50 K	
ON	ON	ON	1200	50 K	

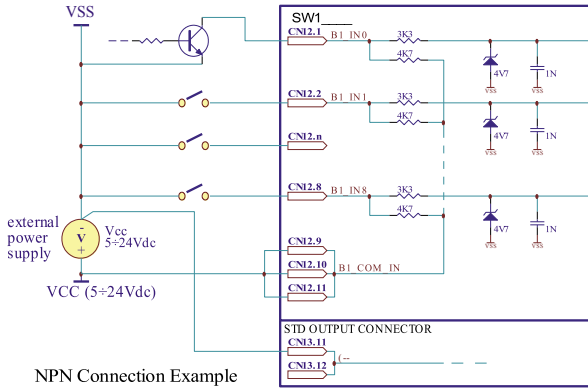
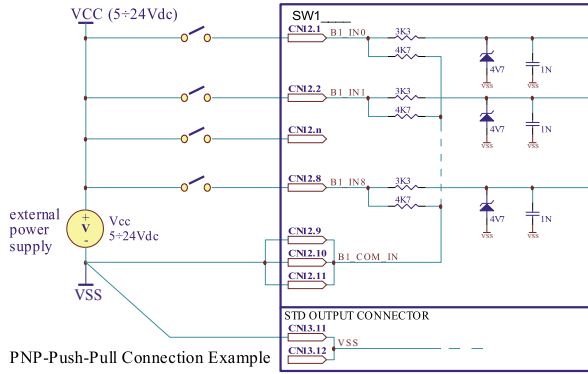
Drive's ID number selection								
ID6	ID5	ID4	ID3	ID2	ID1	ID0	Node ID #	
OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Not allowed
OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	1
OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	2
OFF	OFF	OFF	OFF	OFF	ON	ON	ON	3
OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	4
OFF	OFF	OFF	OFF	ON	ON	OFF	ON	5
OFF	OFF	OFF	OFF	ON	ON	ON	OFF	6
OFF	OFF	OFF	ON	OFF	ON	ON	ON	7
OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	8
OFF	OFF	OFF	ON	OFF	OFF	ON	OFF	9
OFF	OFF	OFF	ON	OFF	ON	OFF	OFF	10
OFF	OFF	OFF	ON	OFF	ON	ON	ON	11
OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	12
OFF	OFF	OFF	ON	ON	ON	OFF	ON	13
OFF	OFF	OFF	ON	ON	ON	ON	OFF	14
OFF	OFF	OFF	ON	ON	ON	ON	ON	15
OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	16
OFF	OFF	ON	OFF	OFF	OFF	ON	OFF	17
OFF	OFF	ON	OFF	OFF	ON	OFF	OFF	18
OFF	OFF	ON	OFF	OFF	ON	ON	ON	19
OFF	OFF	ON	OFF	ON	OFF	OFF	OFF	20
OFF	OFF	ON	OFF	ON	OFF	ON	ON	21
OFF	OFF	ON	OFF	ON	ON	OFF	OFF	22
OFF	OFF	ON	OFF	ON	ON	ON	ON	23
OFF	OFF	ON	ON	OFF	OFF	OFF	OFF	24
XX	XX	XX	XX	XX	XX	XX	XX
ON	ON	ON	ON	ON	ON	ON	ON	127

High-Freq digital input connection



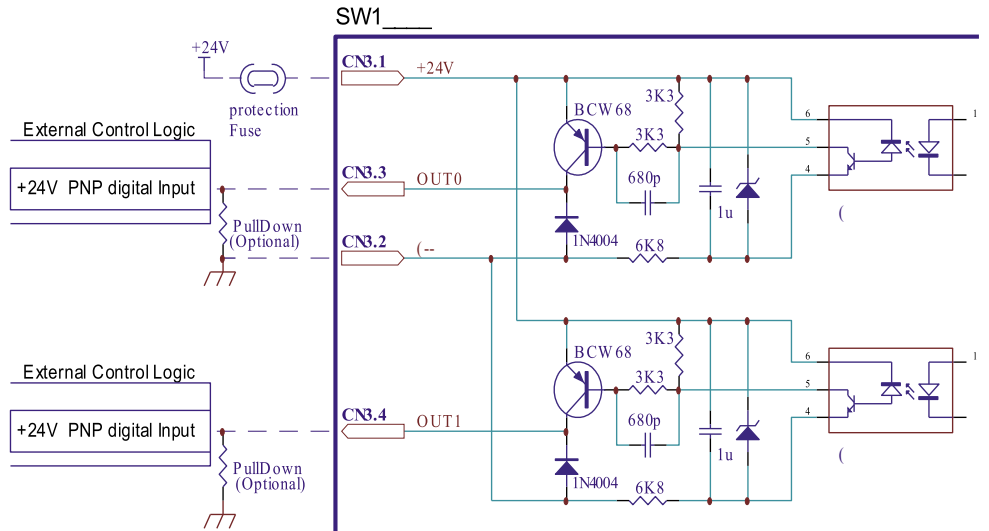
Standard digital inputs connection

Standard digital inputs 24Vdc



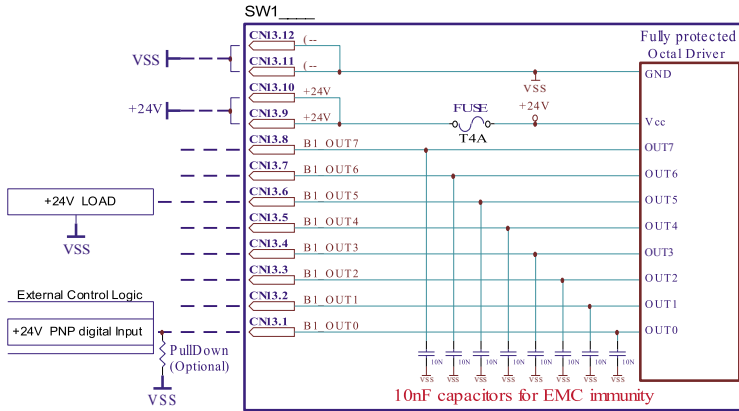
High-Freq digital output connection

Digital outputs $V_{outmax} = 24Vdc$, $I_{outmax} = 100mA$



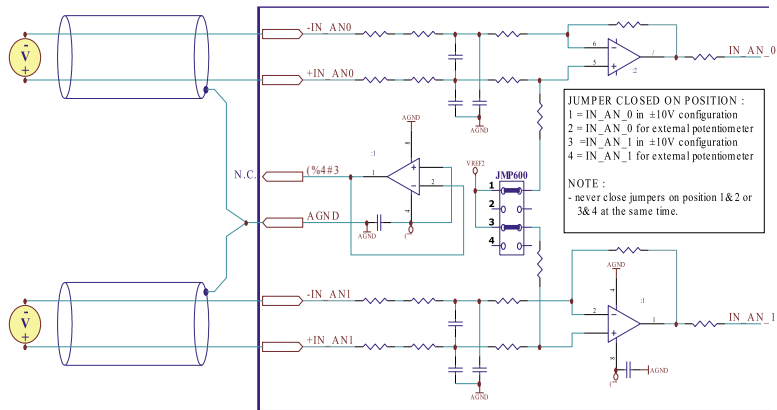
Analog input connection

Digital outputs $V_{OUTmax}=24Vdc$, $I_{OUTmax}=100mA$



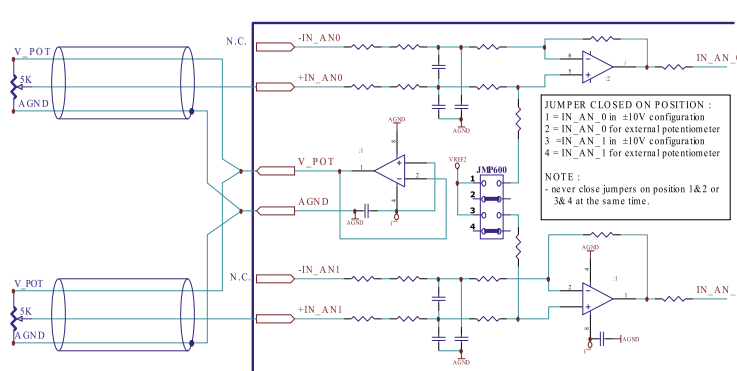
Analog input connection

Analog input +/-10Vdc CEI EN 61131-2 type, not isolated



Analog input connection

Analog input for potentiometer connection



Operational statuses and their signals

The following statuses can be displayed:

Display simbol	Description	Display simbol	Description
-L-	Missing Operating System: no software application stored on drive;	-F ** 0-	Security intervention of watchdog;
-U-	Firmware update: updating of new software in progress;	-F ** 1-	Internal software error;
-I-	Initialization: the drive executes the start-up procedure (a few seconds after the start-up procedure begun);	-F ** 2-	Missing calibration values;
-S-	Correct functioning;	-F ** 4-	Management EEPROM;
-S ** 1-	Voltage of the DC bus near the nominal value;	-F ** U-	Error: feature unavailable;
-S ** 3-	Drive temperature is near to the maximum value;	-P ** 0-	Open motor phases;
-S flashing	Enable OFF, current zero;	-P ** 1-	Over/under voltage (1);
		-P ** 2-	Over current on the motor output;
		-P ** 3-	Over temperature of the drive;

Mating cable kit

Connector	Description	Order code
CN1	8 position, pitch 5.08mm., plug connector PHOENIX CONTACT p# MSTB 2,5/8-ST-5,08	1757077
CN2 / CN16	9 position, pitch 2.5mm., plug connector PHOENIX CONTACT p# FK MC0,5/9-ST-2,5	1881396
CN3	4 position, pitch 2.5mm., plug connector PHOENIX CONTACT p# FK MC0,5/4-ST-2,5	1881341
CN4	7 position, pitch 3.81mm., plug connector PHOENIX CONTACT p# MC1,5/7-ST-3,81	1803620
CN5A / B	8 position, RJ45, plug connector, MOLEX p# FCC 68 compliants and equivalents	44915-0011
CN12	11 position, pitch 2.5mm, plug connector PHOENIX CONTACT p# FK MC0,5/11-ST-2,5	1881419
CN13	12 position, pitch 2.5mm, plug connector PHOENIX CONTACT p# FK MC0,5/12-ST-2,5	1881422

Section of the cables

Function	Cable	
	Minimum	Maximum
Power supply	0.5 mm ² (AWG20)	2.5 mm ² (AWG12)
Motor output	0.5 mm ² (AWG20)	2.5 mm ² (AWG12)
Analog inputs	0.14 mm ² (AWG25)	--
Digital inputs	0.14 mm ² (AWG25)	0.5 mm ² (AWG20)
Digital outputs	0.14 mm ² (AWG25)	0.5 mm ² (AWG20)

Verify the installation

- Check all connection : power supply and inputs/outputs.
- Make sure all settings right for the application.
- Make sure the power supply is suitable for the drive.
- If possible, remove the load from the motor shaft to avoid that wrong movements cause damage.
- Enable the current to the motor and verify the applied torque.
- Enable a movement of some steps and verify if the rotation direction is the desired one.
- Disconnect the power supply, connect the load on the motor and check the full functionality.

Analysis of malfunctions



When one of the following situations occur, the drive doesn't function correctly and it is reported an error.

DEFECT	CAUSE	ACTION
The external fuse to the drive burns.	May be due to a wrong connection of the power supply.	Adjust the connection and recover the fuse. Use a fuse suitable for the application.
Over temperature protection.	May be due to a duty cycle.	Increase the air flux and if it is possible chose a motor with higher torque at same current value.
Over current protection.	May be due to a short circuit on the motor power stage.	Shut down the power supply and check if the motor is damaged.
Noisy motor movement with vibrations.	May be caused due to a state of resonance.	Increase the resolution of the step angle and/or change the motor velocity to avoid resonance area.
The motor produce torque but doesn't rotate.	May be caused due to a wrong connection of the I/O's.	Check the connection of the I/O's.

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