Installation Guide

MDX ENCODER
MDX RESOLVER

Feedback options

LEROY-SOMER™

1 - GENERAL

The **MDX** modules are add-on options dedicated to **Powerdrive MD2** and **Powerdrive FX**.

This manual develops the following options:
- **MDX-ENCODER**
- **MDX-RESOLVER**

⚠ • **Do not proceed with any action on the Powerdrive without having read the safety instructions of their installation manual.**

- **Connect the MDX module 10 min after the Powerdrive MD2 power down.**

- **Refer to the drive installation manual and user guides for drive commissioning.**

2 - MECHANICAL INSTALLATION

2.1 - MDX-Speed feedback module

Note : if a MDX-M2M is present, the feedback module have to be installed on the MDX-M2M.

• Remove the black protective plastic cover located on the drive control board (connector protection) (1).

• Align the option over the drive connector (2). The option connector is located on the underside of the housing. Press gently until it clicks into place.

• Screw the option onto the control board with the supplied screws (3). Do not exceed a maximum tightening torque of 2 N.m.
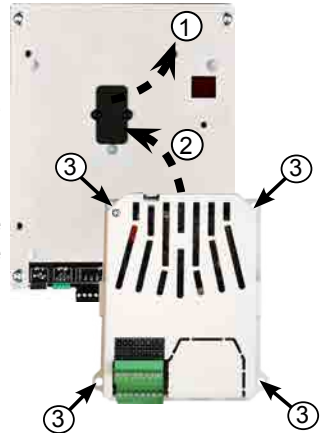
2.2 - MDX-Speed feedback option combined with a CM Fieldbus module

2 options are required:

MDX Speed feedback option

MDX-ENCODER
MDX-RESOLVER

+

CM Fieldbus module

CM-MODBUS,
CM-CAN-OPEN
CM-PROFIBUS

CM-ETHERNET
CM-ETHERNET-IP

• On the MDX-Speed feedback option: remove the plastic break-outs (4).

• Insert the back of the CM-Fieldbus housing into the space freed up (5) and screw tight (6) (2 Torx 8 screws).

⚠ **The CM module must be gently inserted to avoid damaging the connector.**

• Install the MDX-Speed feedback and the fieldbus module on the **Powerdrive MD2 or Powerdrive FX**, as shown in section 2.1.
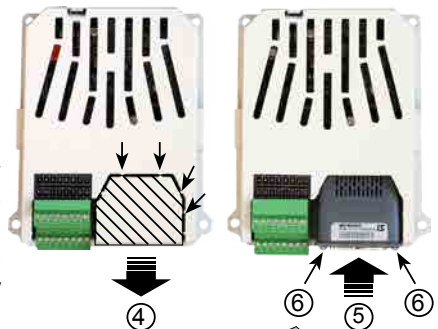
2.3 - Grounding bracket

The bracket for connecting the option shielding is supplied with each option. To fix it, screw the bracket by placing it on top of the control cable shielding clamps (the shielding clamp furthest the right should be removed).
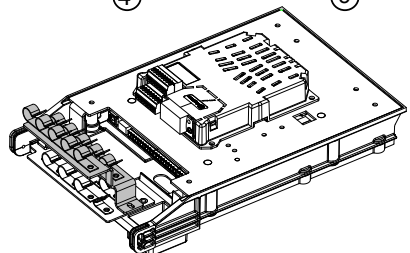
3 - ELECTRICAL INSTALLATION

3.1 - General

⚠ **Before installing or removing the MDX Speed feedback option, or when it is necessary to disconnect cables from the option, it is essential for the drive to be switched off.**

The MDX feedback modules can manage the motor PTC thermal probe via terminals T1 and T2. In this case, some parameters need to be set. Refer to parameter **Mtr.06 (05.70)** in the commissioning manual ref. 4617.

Refer the commissioning manual ref. 4617.

3.2 - Wiring

⚠ **Use a single twisted pair cable, shielded pairs with an outer shield for the connection.**
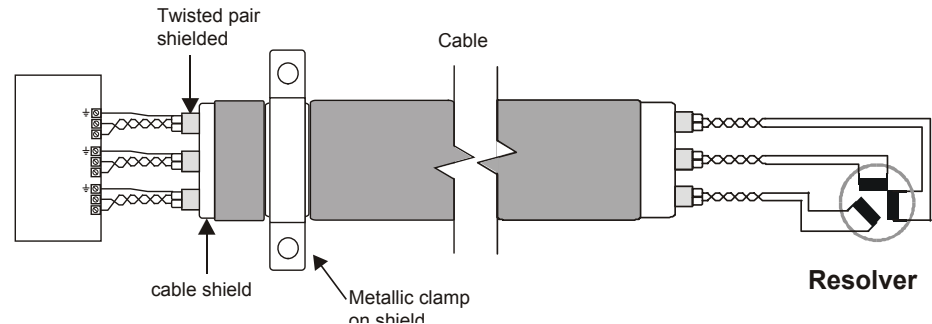
• **Connect the shield over 360 ° at both ends (use grounding bracket supplied with the option).**

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Note: Optional connection cables are also proposed. For more information, please get in touch with your usual contact.
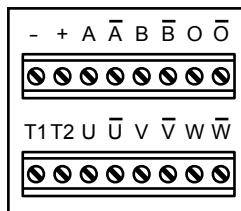
3.2.1 - Wiring an encoder
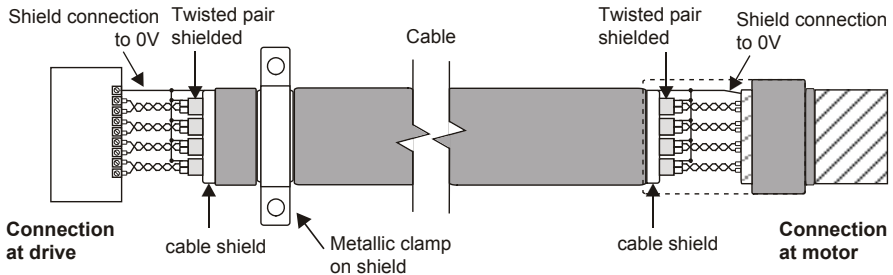
3.2.2 - Wiring a resolver

3.3 - MDX-ENCODER

The MDX-ENCODER option is used to manage the motor speed feedback. It manages incremental encoders with or without commutation channels (up to 500kHz).

3.3.1 - Wiring

+	Power supply
-	

Rated voltage	5V ± 10% - Output current 300mA
(see Mtr.12)	15V ± 10% - Output current 200mA

T1	**CTP motor thermal probe**
T2	Set **Mtr.06 (05.70)**

A	
A\	Encoder channel connection
B	
B\	Maximum frequency : 500 kHz

0	
0\	Not used

U	
U\	
V	Connection of commutation
V\	channels
W	
W\	

3.3.2 - Settings

Mtr.10 (03.38) : Encoder type
Possible values: Incremental(0), Réserved (1), U,V,W only (2), Incremental U,V,W (3), Hall effect sensor(4) ...
Select an encoder (values 0 to 4)
Refer the commissioning manual ref. 4617.

Mtr.11 (03.34):   Encoder lines per revolution
Values: 0 to 32000 ppr
Factory setting: 1024 ppr
Format : 16 bits
Used to configure the number of lines per incremental encoder revolution. Converts the encoder input into a speed.

Mtr.12 (03.36): Encoder supply voltage
Values: 5V (0) or 15V (1)
Factory setting: 5V (0)
Format : 8 bits
This parameter is used to set the encoder supply voltage.
CAUTION: Before selecting «15V», check that the encoder used can withstand this voltage.

Mtr.13 (03.25): Position feedback phase angle
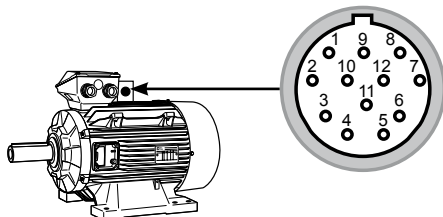Values: 0.0 to 359.9°
Factory setting: 0.0°
Format : 32 bits
Indicates the result of the phasing test performed during autotuning (see **Ctr.14**). It is stored when the drive is powered down and will only be modified automatically after another autotune.

⚠ The phase angle, when it is known, can be entered manually. Any incorrect value can cause the motor to rotate in the wrong direction or trip the drive.

**Refer the commissioning manual ref. 4617.**

3.3.3 - Connection of an incremental encoder

Wiring an encoder to a LEROY-SOMER asynchronous motor

12-pin connector encoder side (male plug)		MDX-Encoder terminals
Ref.	Description	Description
1	0V	-
2	+5V or +15V	+
3	A	A
4	B	B
5	0	x
6	A\	A\
7	B\	B\
8	0\	x
9	x	x
10	x	x
11	Shielding	Bracket
12	x	x

3.3.4 - Connection of an incremental encoder with commutation channels

Wiring an encoder to a LEROY-SOMER Dyneo® synchronous motor
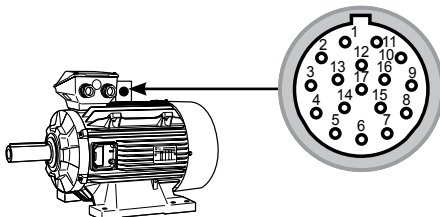
Use one twisted cable per pair (U,U\; V,V\, etc). The thermal sensor is connected in the terminal box.

17-pin connector encoder side (male plug)		MDX-Encoder terminals
Ref.	Description	Description
1	x	x
2	x	x
3	x	x
4	U	U
5	U\	U\
6	V	V
7	V\	V\
8	W	W
9	W\	W\
10	A	A
11	0	x
12	0\	x
13	A\	A\
14	B	B
15	B\	B\
16	+5V or +15V	+
17	0V	-
*	Shielding (*)	Bracket

(*) to be connected to connector housing.

3.4 - MDX-RESOLVER

The MDX-RESOLVER option is used to manage the motor speed feedback. It manages 2 to 8 poles resolvers.

3.4.1 - Wiring
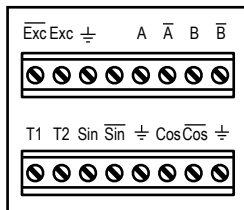
Exc \	**Resolver excitation**
Exc	
⏚	10 kHz sine wave signal Max. current 80 mA (Exc)

A	**Encoder simulation output**
A \	
B	RS 485 differential voltage
B \	(A and /A, B and /B)

| T1 | **CTP motor thermal probe** |
| T2 | Set **Mtr.06 (05.70)** |

Sin	
Sin \	**Resolver inputs**
⏚	
Cos	2 Vrms sine wave signal (max)
Cos \	Frequency : 10 kHz
⏚	Impedance : 4.7 kΩ

3.4.2 - Settings

03.58: Resolver transformation ratio

• Factory setting : 1:1 (0)
• Format: 16 bits

This value should be entered from the resolver manufacturer data.

Rapport de transformation **03.58**	Tension (Vrms)
1 : 1 (0)	1,3
2 : 1 (1)	2,6
3 : 1 (2)	3,8
4 : 1 (3)	5,2

03.59: Resolver resolution

The resolver resolution depends on the maximum resolver speed (see table below).

On the MDX-RESOLVER option an incremental encoder type output is emulated. The resolution of this output is set via parameter **03.34** «Encoder lines per revolution» (See commissioning manual ref 4617)

Se référer au Guide de mise en service, ref. 4617

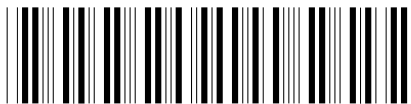| **Resolution 03.59**	**Maximum resolver speed (rpm)**	**Maximum value of 03.34**
10 bits (0)	150000 / Pp	256
12 bits (1)	60000 / Pp	1024
14 bits (2)	30000 / Pp	4096
16 bits (3)	7500 / Pp	16384

Pp : number of resolver pole pairs
• Factory setting : 14bits (2)
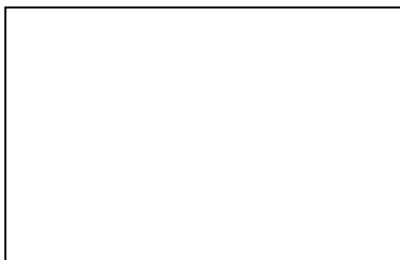
Refer to the commissioning manual ref. 4617.

Nidec

All for dreams

4 0 0 2 6 5 0 4

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