Instruction Manual
P2054MA/EN
2011-04

Factory standard for control cabinet construction

m-Pro400SE Fastening System

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About these assembly instructions

Setup and assembly instructions for the m-Pro-400SE fastening system consisting of

- Switch cabinet
- Station controllerm-Pro-400SE
- Built-in nutrunner series 1BB… to 4BB…
- Hand tools series 18E…E… and 48E…E…
- Tightening modules STM12, STM12
- Tightening modules STMH.1 for hand tools
- Transformers for tightening modules
- Cables
- Switching elements (relays, etc.)

A fastening system set up according to this factory standard fulfills all applicable safety and EMC standards and laws for industrial use.

Detailed information on individual components

P1713E	System overview modular fastening system
P2055MA	Assembly instruction Built-in nutrunner BB
P1544E	Tightening torques for installation of the Built-in nutrunner
P2037BA	Instruction manual for station controller m-Pro-400SE
P1671E	STMH.1 tightening module instruction manual
P1672E	Instruction manual for tightening modules STM12, STM34
P2102JH	Factory standard for cable installation

Symbols in text

➔	Identifies instructions to be followed.
•	Identifies lists.

Abbreviations

m-Pro-400S(E)	Nutsetter control

Symbols in graphics:

⟵	Identifies movement in a direction.
⇩	Identifies function and force.

Disclaimer:

Contents

Install and wire all components according to the following chapters.

1 Establishment of earth and potential equalization

WARNING!

The system must not be operated without an attached protective earth (PE)!

Potential differences may occur between the electrical components during operation, caused by high-frequency interference currents. The resulting equalizing currents flow through the cable shields and interfere with signal lines.
Corrective measures:

- ➔ Connect all components to an earth neutral point with potential equalization conductors (control cabinet mounting plate).
- ➔ Install the m-Pro-400SE station controller in the control cabinet door and ground it using a 1.5 qm protective earth on the rear connection.
- ➔ Using an earthing strap, connect the control cabinet door to the galvanized control cabinet mounting plate at the specified threaded bolt.
- ➔ Since the STM tightening modules are mounted on the control cabinet mounting plate, no further measures are necessary here.
- ➔ Connect the nutrunner mounting plate with the control cabinet mounting plate, order no. 960408-××× using a >10 mm^2 earth line (yellow/green protective earth).
- ➔ Connect built-in nutrunners electroconductively with the nutrunner mounting plate.
- ➔ If there are multiple nutrunner mounting plates in a system, they must be connected to the control cabinet mounting plate in a star-shaped configuration.

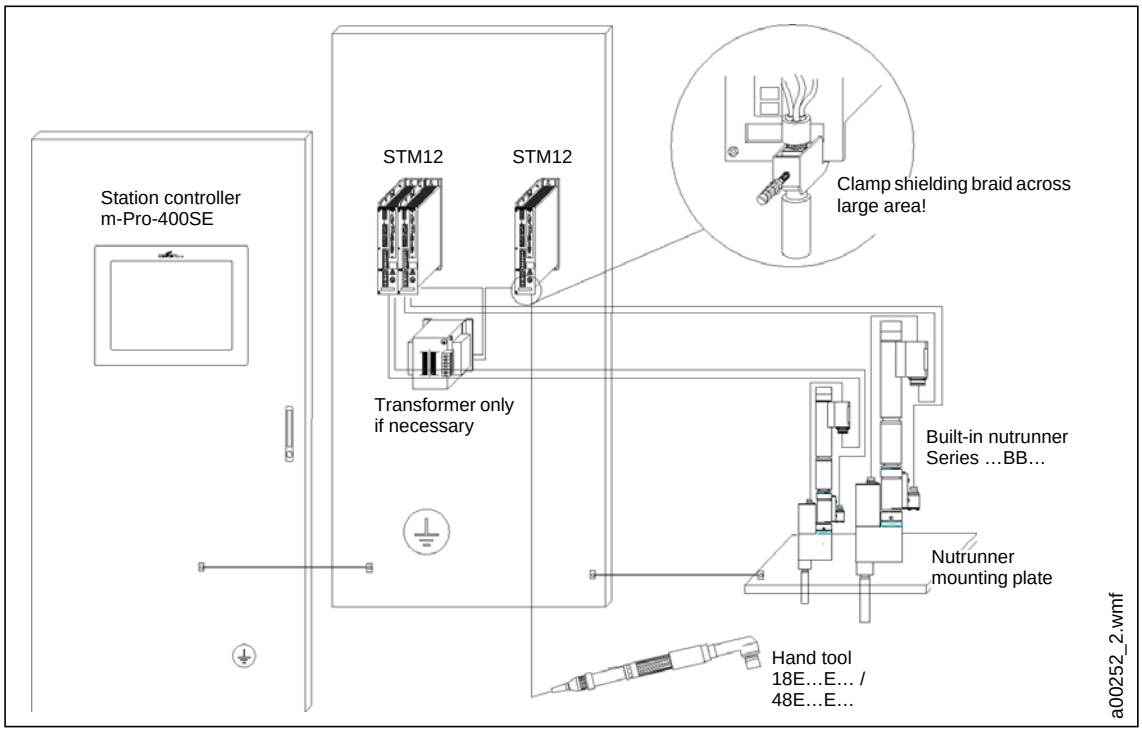

Fig. 1-1

2 Conducting EMC Measures

NOTE

This is a class A device. This device may cause radio interference in residential areas; should this occur, you may request that the operator pay for and implement relevant EMC measures.

➔ The system may only be operated with the control cabinet closed. The properties of the shielding would be altered and the noise emission increase.

- The filters, mains filters, motor output filters and filters on the input and output plug connections necessary for compliance with the EMC regulations are integrated into the devices.
- The closed control cabinet and shielded cable provide very good protection against irradiated and radiated interference.
- Disturbances by other electrical components must be inspected by the control cabinet assembler. EMC-compliant setup of the control cabinet is required.

Examples

➔ Keep earth connection points large in size and free of paint.
➔ Use an earthing strap with a large cross section.
➔ Fasten transformers on a conductive, galvanized control cabinet mounting plate across the largest possible area.
➔ Attach protective circuits as closely to the disturbance source (relay, valve ...) as possible.
➔ Mount filters directly to galvanized and grounded mounting plate.
➔ Don't lay input and output lines in parallel to each other.
➔ Place line crossings as perpendicularly as possible and with sufficient space between lines that emit interference and lines that are sensitive to interference.

3 Control cabinet measures

➔ Use a closed steel-sheet control cabinet (IP54).
➔ Connect all movable control cabinet parts with the control cabinet mounting plate using earthing straps.

3.1 Control cabinet mounting plate

➔ Use a galvanized, unpainted, steel mounting plate. The mounting plate serves as a neutral earth point.

3.2 Installation of m-Pro-400SE station controller

- ➔ Refer to m-Pro-400SE station controller instruction manual.
- ➔ Install the m-Pro-400SE station controller in the control cabinet door and ground it using a 1.5 qm protective earth on the rear connection.
- ➔ Using an earthing strap, connect the control cabinet door to the galvanized control cabinet mounting plate at the specified threaded bolt.
- ➔ When operating the m-Pro-400SE station controller, the control cabinet must be closed.

3.3 Installation of tightening modules STM12 and STM12 for built-in nutrunners 1BB... to 4BB...

- ➔ Refer to the STM12, STM12 tightening module instruction manual.
- ➔ No extreme filter measures are necessary due to integrated mains filters.
- ➔ Screw tight tightening modules on galvanized and grounded nutrunner mounting plate using two M6 screws.
- ➔ Connect protective earth (PE) at connection XS1 pin 3.
- ➔ If transformers are used, ground them at the neutral point on the secondary side.
- ➔ Only use tightening modules with CLECO series BB built-in nutrunners.

3.4 Installation of tightening modules STMH.1 for hand tools 18E…E… and 48E…E…

- ➔ Refer to the STMH.1 tightening module instruction manual.
- ➔ No extreme filter measures are necessary due to integrated mains filters.
- ➔ Screw tight tightening modules on galvanized and grounded nutrunner mounting plate using two M6 screws.
- ➔ Connect protective earth (PE) at connection XS1 pin 3.
- ➔ Power can be supplied via an isolated transformer (see 3.5 Transformers for tightening modules, page 6). The transformer can be ungrounded on the secondary side, protection class 1.
- ➔ Install an FI circuit breaker as an additional protective measure.
- ➔ Use STMH.1 tightening module only with CLECO hand tools.

3.5 Transformers for tightening modules

- ➔ Only use isolation transformers according to IEC 742 or EN 60742.
- ➔ Only transformers authorized by CLECO must be used.
  Only these transformers fulfill the parameters important for the tightening technology, such as rigidity and overload capacity.
- ➔ If the STM12 and STM12 tightening modules are powered using a 3-phase transformer, the secondary neutral point of the transformer must be grounded. Only with this measure can the tightening module detect and shut off any potentially occurring short circuit between the motor phase and earth (e.g. in the cable or motor).
- ➔ With a cable length exceeding 20 m, the power supply of the STMH.1 tightening module (for hand tools) is wired with an isolation transformer. The secondary neutral point is not grounded due to safety reasons. This applies to 1-phase and 3-phase transformers.
- ➔ If STMH.1 is used beside STM12 or STM12 in a control cabinet, the power supplies must be realized as described above.
- ➔ Screw the transformers tight to the control cabinet mounting plate. If this is not possible, the mounting plate of the transformer must be connected with the control cabinet mounting plate using an earthing strap.

3.6 Switching elements (relays, etc.)

➔ Always use spark suppressors with relays, switching elements and valve coils. They reduce the number of internally-caused disturbances.

4 Cables

➔ Refer to the "Cable laying factory standard" installation information.
➔ Only cables or cable types authorized by CLECO may be used.
➔ Adhere to maximum cable length
- Built-in nutrunner and hand tools = 50 m.
- Hand tools without transformer = 20 m.
- ARCNET cables = 100 m.

4.1 Cable laying

➔ Don't use extra-long cables and wires (reserve). Avoid mutual interference.
➔ Lay so-called "hot" and "cold" signal lines separately.
For this, use cable ducts in the control cabinet that are physically separated from each other.

"Hot" signal lines	Motor cable, spindle cable, mains, controller power supply, cooling unit
"Cold" signal lines	24 VDC, PE, ARCNet cable, bus cable, resolver lines, separate cables from transducers

NOTE

➔ Don't lay "hot" and "cold" signal lines in parallel to each other.

5 Mounting of built-in nutrunner and hand tools

➔ Refer to System overview modular fastening system.
➔ Only CLECO built-in nutrunners and hand tools must be used.
➔ Connect the nutrunner mounting plate with the control cabinet mounting plate using a >10 mm^2 earth line (yellow/green protective earth).
➔ Connect built-in nutrunners electroconductively with the nutrunner mounting plate.
➔ The hand tools are classified according to "Protection class I". Connect all conductive housing parts with the protective earth.

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