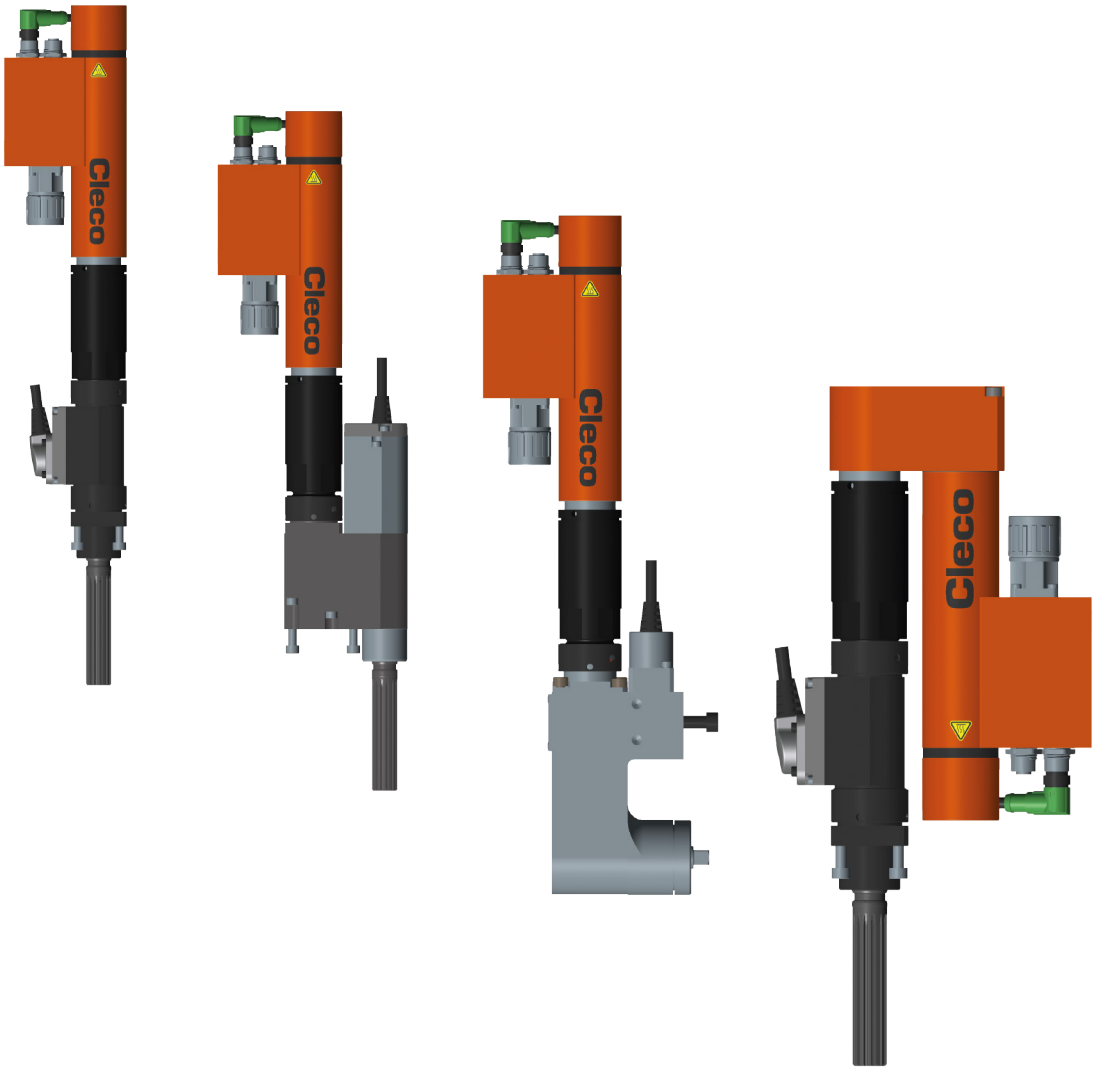
Cleco®
Production Tools

Assembly Instructions
P2579MA-EN
2021-10

Series BD

Fixtured Spindle



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Trademark

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Content

1 About this document

This document is intended for specialists in installation and maintenance (administrators, maintenance staff, service personnel, owners/operators).
It contains information on safe and proper installation.
The original language of this document is German.

Other documents

Number	Document
P2381TS	Troubleshooting – EMS Error messages
P2468TS	Troubleshooting – mPro300GCD
P2552HW	Hardware Description – mPro300GCD-STO
P2577SB	System manual – BD Series
P2578WA	Maintenance instruction – Fixtured Spindle BD Series
P2585JH	Installation Instruction – Cable Management Fixture Spindel BD Series
P3319H	Declaration of incorporation – BD Series
CE-1026	EU Declaration of Conformity – BD Series

Symbols in the text

italic Menu options (e.g., Diagnostics) input fields, check boxes, radio buttons or dropdown menus.

> Indicates selection of a menu option from a menu, e.g., *File* > *Print*.

<...> Specifies switches, pushbuttons or the keys of an external keyboard, e.g., <F5>.

`Courier` Indicates Filenames and paths, e.g., `setup.exe`.

• Indicates lists, level 1.

– Indicates lists, level 2.

a) Indicates options.
b)

➢ Indicates results.

1. (...) Indicates action steps.
2. (...)

► Indicates single action steps.

2 Safety

► Read all safety warnings and instructions. Failure to follow the directions and safety instructions could result in an electric shocks, burns and/or serious injuries.

► Read and observe all appropriate, generally applicable and local safety and accident prevention regulations. We do not claim that these safety notes are complete.

► Keep this document in a safe place for future reference!

► These safety instructions must be accessible at all times to all persons who use the product.

2.1 Warnings and Notices

Warning notes are identified by a signal word and a pictogram:

- The signal word describes the severity and probability of the impending danger.
- The pictogram describes the type of danger.

Danger
A symbol combined with the word Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

Warning
A symbol combined with the word Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

Caution
A symbol combined with the word Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

Note
A symbol combined with the word Note indicates a potentially harmful situation which, if not avoided, could result in damage to property or the environment.

General instructions include application tips and useful information, but no warnings against hazards.

Structure Of Warnings

Caution
Type and source of danger.
Possible consequences of non-observance.
► Measures to avoid danger.

2.2 Symbols on the Product

Electric voltage

Hot surface

Read the operating instructions carefully

CE compliant
The product corresponds to the prescribed technical requirements in Europe.

Observe and comply with all local disposal guidelines for all components of this equipment and it's packaging.

2.3 Intended Use

The user is liable for any damage caused by improper use. Use the product only under the following conditions:

- Use only in industrial tightening processes.
- Only in conjunction with the components listed in the EU Declaration of Conformity.
- Under the prescribed ambient conditions.
- Within the power range, which is specified in the technical data.
- With equipment parameters set up properly.
- In EMC Limit Class A (electromagnetic immunity for industrial areas). For the currently observed EMC standards, see the EU Declaration of Conformity.
- The spindle is intended exclusively for stationary operation and for tightening and loosening threaded connections.
- The spindle must be fully assembled.
- Insert and lock all connecting cables.
- Always replace the spindle completely from a system.
- Repairs are only permitted personnel authorized by Apex Tool Group. If the tool is opened, the warranty is voided. In the event of repair, send the complete tool to your Sales & Service Center.

2.4 Foreseeable misuse

- ► Only use the spindle with controllers that are listed in the EU Declaration of Conformity.
- ► DO NOT use the spindle as a hammer.
- ► DO NOT use the spindle in potentially explosive areas.
- ► DO NOT use the spindle in a damp environment or outdoors.
- ► DO NOT disassemble or modify the spindle.
- ► DO NOT use the spindle as a handheld tool.
- ► Never lift the spindle or individual components by the cable.
- ► DO NOT use the spindle as a climbing aid.

2.5 Operator Training

2.6 Personal Protective Equipment

- ► Wear safety shoes.

The motor can heat up and cause burns during removal (max. motor temperature 80 °C).

- ► Wear gloves when touching the motor.
- ► When working with rotating parts, it is not permitted to wear gloves.
  - ➢ Recommendation: Freely rotating u-GUARD protected fastening tools from APEX.
- ► Wear suitable clothing. Do not wear loose clothing or jewelry.
- ► Wear protective goggles if there is a risk of dirt or parts being ejected.
- ► Wear a hair net, if necessary.

2.7 Safety instructions relevant to the system

It is imperative to observe the national, state and local regulations and standards.

- ► Do not make any changes to the controller, protective devices or accessories without the prior written consent of.Apex Tool Group.
- ► Do not open the controller or components of the controller either for troubleshooting or other work. Any intervention can cause serious injuries in case of a failure.

Operating with the controller open can also cause the following:

- Increased interference emission: Other devices can be disrupted.
- Reduced immunity to interference: The controller can deliver incorrect results.
- Loss of warranty.

Risk of injury due to electric shock

In the event of a fault, the controller can carry voltage. An electric shock can lead to cardiovascular arrest, respiratory failure, burns and serious injuries or death.

- ► Switch off the controller before connecting the power supply and tool cables, when converting, unplugging the plug connector, cleaning or decommissioning.
- ► Do not operate the fastening system if the housing, cable or spindle is damaged.
- ► In the event of any malfunctions, never repair the fastening system yourself without knowing how to do so! Inform the local repair center or the responsible *Sales & Service Center*.

During installation

- ► Use suitable lifting equipment to lift the controller to the desired installation location.
- ► Make sure that the controller is firmly installed and secured (see Quick Reference Guide).
- ► Route cables and lines such that there is no risk of damage or tripping hazard.
- ► Comply with the permissible bending radius of the cable.
- ► Use an approved power cable with suitable ratings.
- ► For 115 VAC: Use a cable with a larger cross-sectional area.
  Order No. 5416832-01.

Before commissioning

- ► Only operate on an earthed network with a neutral conductor (TN system). Operation without a neutral conductor (IT network) is not permitted.
- ► Make sure the PE connection is compliant with standards.
- ► A type "A" residual current operated device (RCD) is recommended to protect the supply line.
- ► Prior to commissioning, carry out the protective conductor measurement in accordance with the local regulations (in Germany, DGUV Regulation 3).
- ► Do not switch the controller on until all connections have been properly established.

Risk of injury due to dangerous movements

Inadequate emergency stop devices could have potentially fatal consequences.

- ► The necessity of an emergency stop and its implementation are the responsibility of the operator and subject of his risk analysis!
- ► Ensure accessible and effective emergency stop devices. Unlocking an emergency stop device must not cause an uncontrolled restart of the system!
- ► Before switching the system on, check the function of the emergency stop devices.

During operation

- ► Protect the controller against moisture.
- ► In the event of unusual noises, heating or vibrations, switch off the controller immediately.
- ► Pull out the power plug and have the tightening system checked by qualified personnel; have it repaired if necessary.
- ► Never pull the plug on the cable from the outlet.
- ► Protect the cables from heat, oil, sharp edges or moving parts.
- ► Replace damaged cables immediately.
- ► Keep the connections between the controller and spindle clean.
- ► Keep the workstation tidy to prevent injury or damage to the fastening components.
- ► Ensure that there is enough room at the workstation.

Danger due to incorrect torque measurement

An undetected NOK tightening could have life-threatening consequences.

- ► It is imperative that the tool is recalibrated (or a capability analysis performed) after improper use (dropped, mechanical overload ...).
- ► For category A rundowns (VDI 2862) which are critical for safety, activate a redundancy measurement (e.g., current redundancy).
- ► Introduce regular measuring equipment monitoring for the machines and spindles.
- ► Only work with a tightening system that is working correctly. If in doubt, contact a *Sales & Service Center*.

Danger due to an unexpected motor start or an expected, but not functioning, stop

Despite redundant control components and monitoring functions, it can happen in very rare cases that the motor starts unexpectedly.
Possible reasons: Remote control of diagnostic functions, bit dump in the memory of the controller.
Starting from the spindle, mechanical hazards can result, such as jerks/jolts due to reaction torque and the risk of injury due to being reeled in and seized.

- ► Use sufficiently dimensioned reaction devices for the maximum possible torque.
- ► After switching the controller on, wait until the boot process is complete. This takes about 1 minute. Do not switch on/off until then.

Use of the secondary controller

Up to 15 secondary controllers can be added to a primary controller. When the secondary controller is switched off or fails, the TSNet bus communication is interrupted. The loss of communication to the primary controller affects the secondary controller:

- No results are reported back to the primary controller.
- No more fastenings are started.
- A running fastening process shows the error message SA (aborted by removal of the start signal) if the TSNet connection was interrupted during the fastening process.
- A shutdown signal is no longer received, so shutdown only takes place:
  - by activating the STO safety shutdown
  - after reaching the switch-off criterion or
  - via a safety shutdown after two seconds.

WARNING!
During remote start operation (multiple fasteners), an interruption in the TSNet bus leads to a delayed stop of the tool. This delay is 2 seconds.

During maintenance

- ► The controller is generally maintenance-free.
- ► Comply with local regulations regarding servicing and maintenance for all operating phases of the tightening system.

During cleaning

- ► Only clean the outside of the spindle with a dry or slightly damp cloth.
- ► Never immerse the controller or spindle in liquids.
- ► Do not use a high pressure cleaner.
- ► Disinfection of the surfaces is permitted with alcohol-based disinfectants.

2.7.1 Use/handling of the spindle

- ► Do not exceed the total length of the tool cable:
  - ➢ mPro300GCD-STO max. 50 m
- ► Only use bits or sockets designed for industrial use with machine-controlled tools.
- ► Make sure that the bit or socket is securely inserted.
- ► Do not attach the bit or socket to the screw head at an angle.
- ► Inspect the bit or socket for visible damage and cracks. Replace damaged screw bits immediately.

Danger from ejected parts

Components of the spindle can become loose due to rotation and cause serious injuries.

- ► Avoid accelerations in all the axes of over 100 m/s² (10 g).
- ► Note the tightening torque for the cap nut.

3 Transport / Storage

- ► Transport or store in the original packaging. The packaging is recyclable.
- ► If the packaging is damaged, check the product for visible damage. Inform the transporter, if necessary, your Sales & Service Center.

4 Assembly

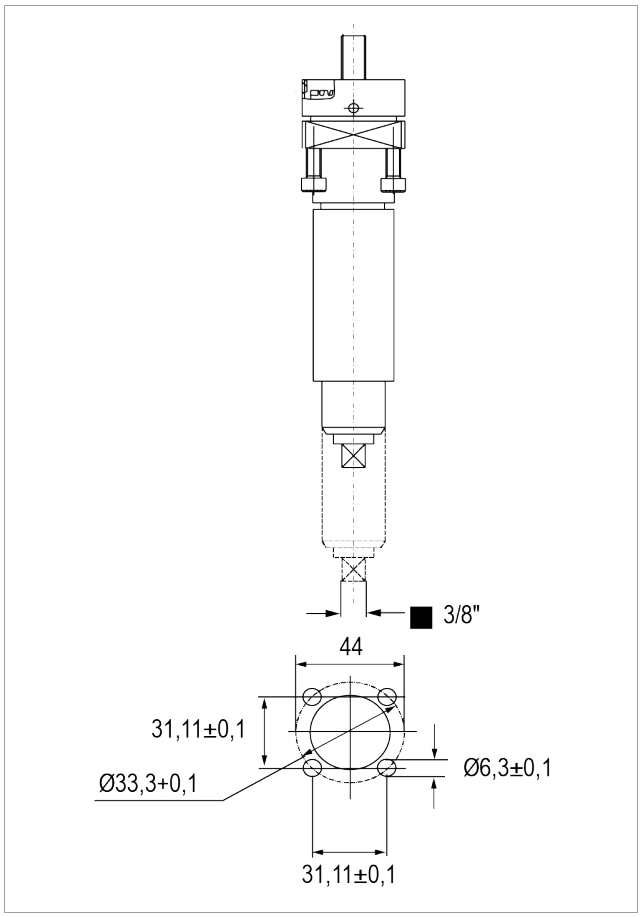
- ► Fasten the spindle onto a grounded, electrically conductive mounting plate. The spindle can be installed in any direction.

- No heated air may originate from below the spindle, including from other components.
- No component may obstruct the air flow below or above the spindle.
- The spindle must not be exposed to direct sunlight.

4.1 Drilling templates in the mounting plate

Size 1

(…)1ZB



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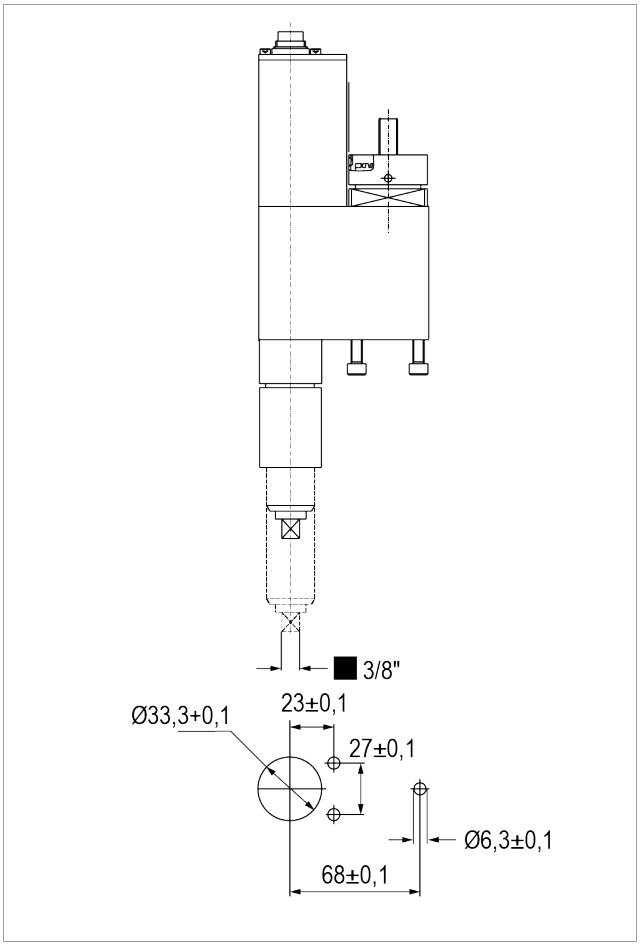

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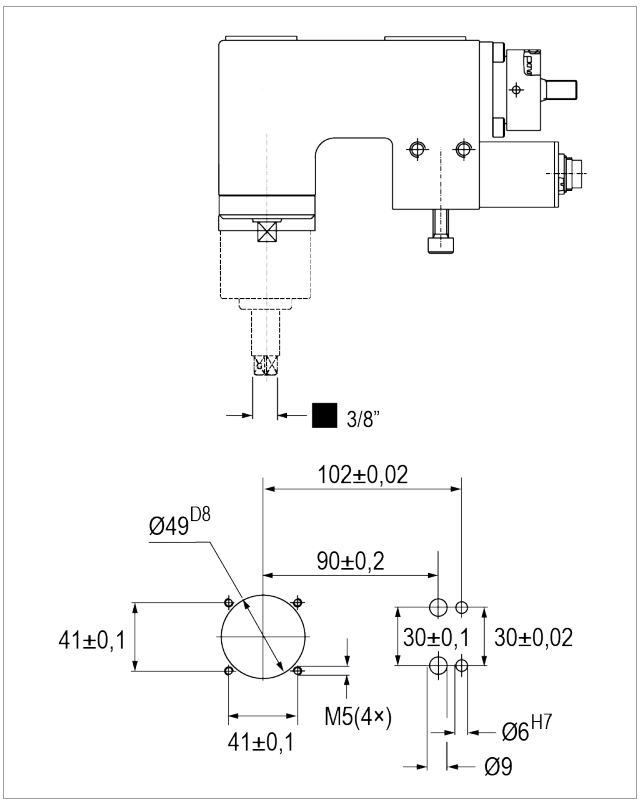

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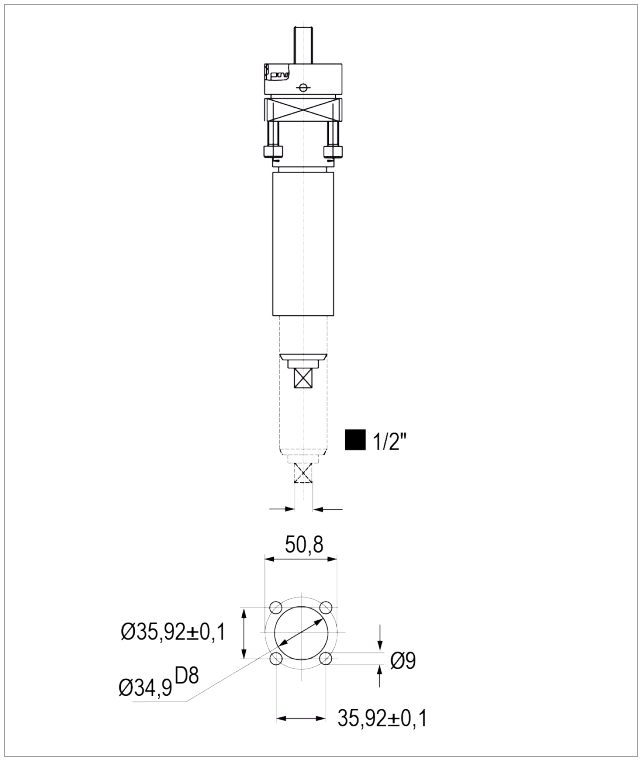

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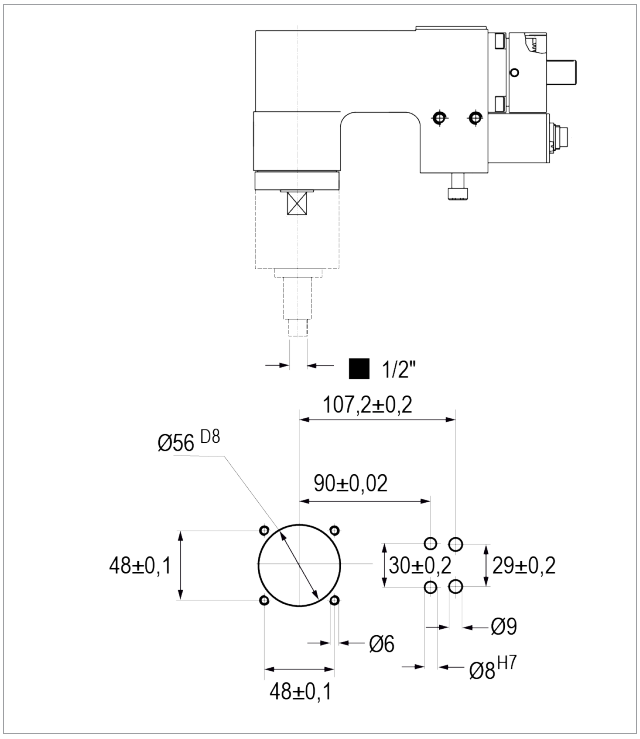

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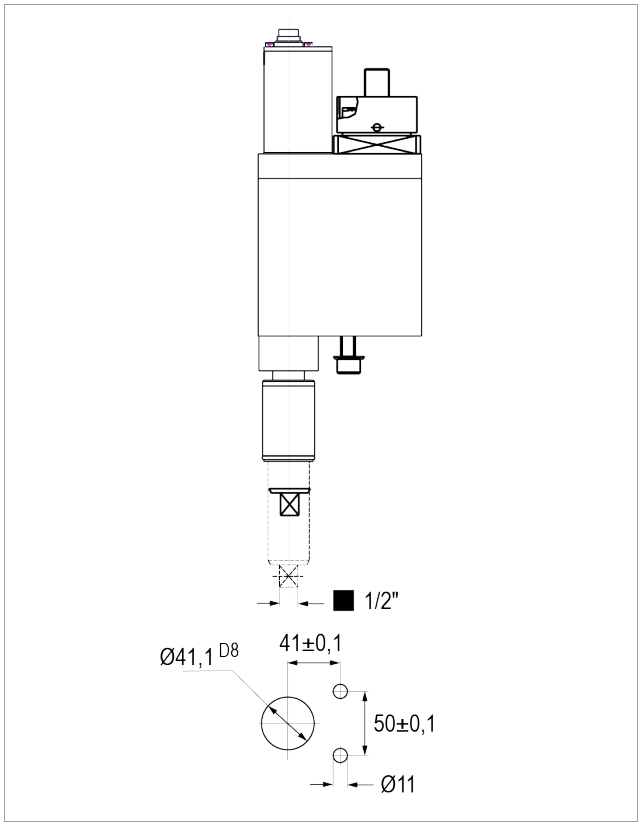

Size 3

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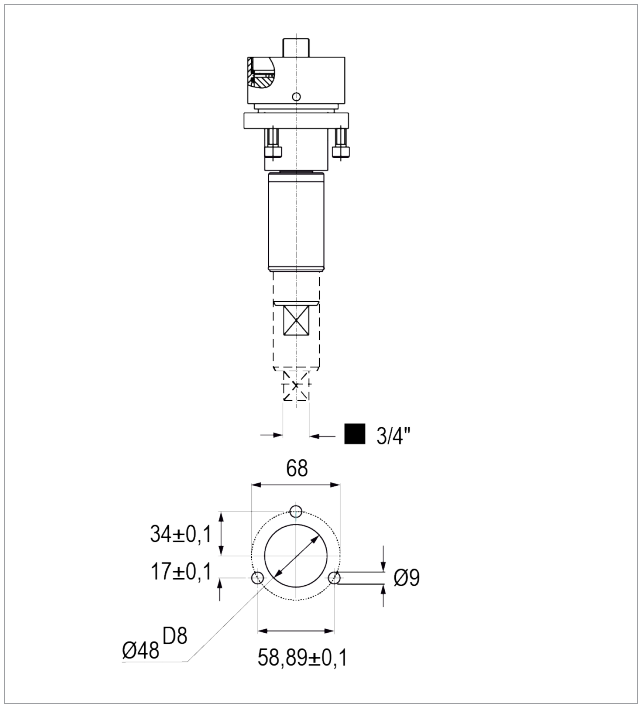

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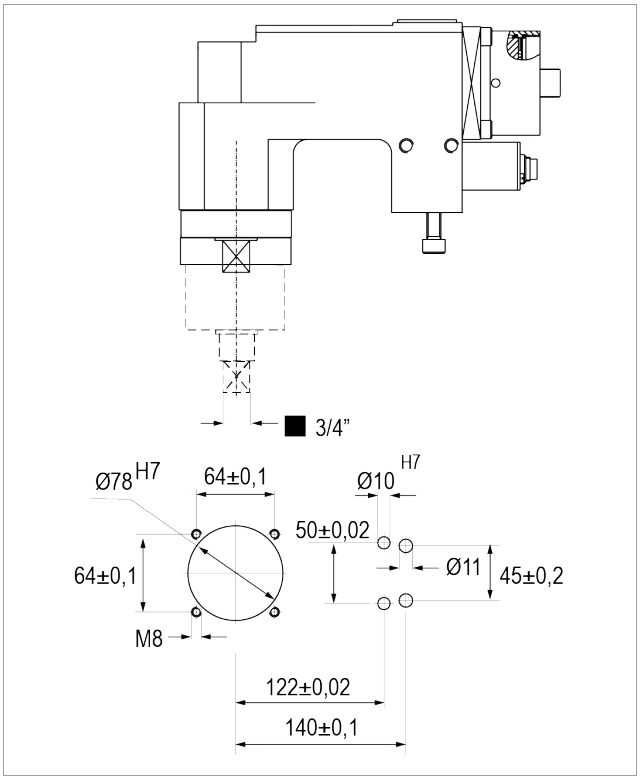

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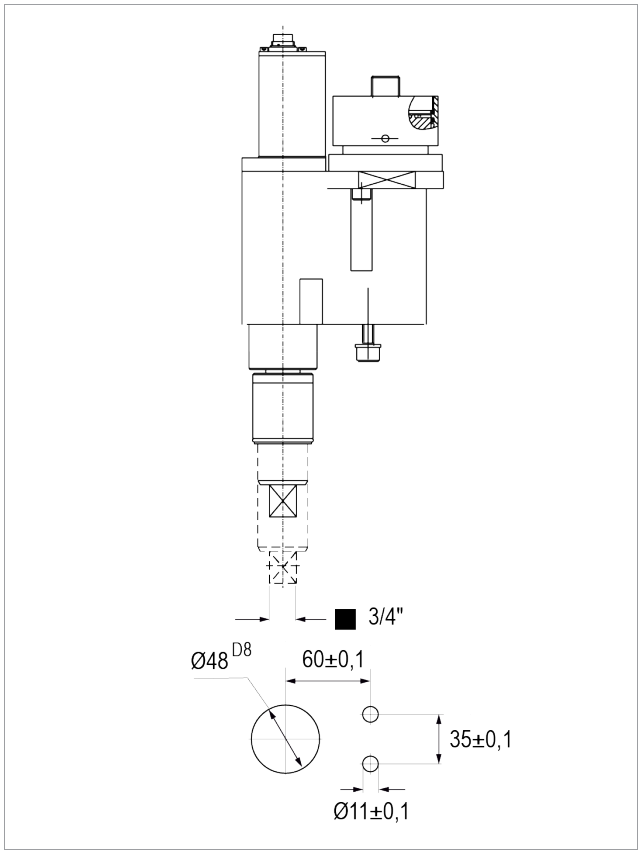

Size 4

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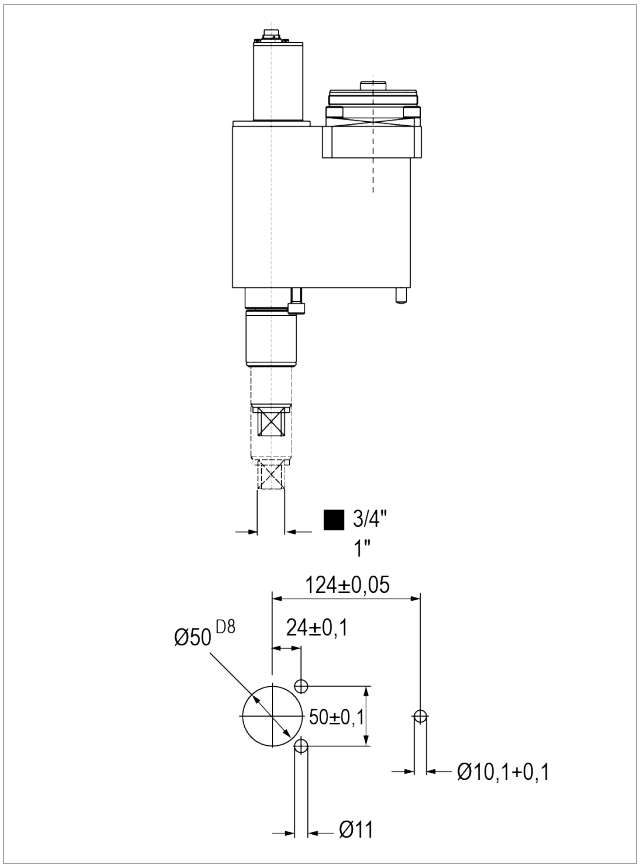

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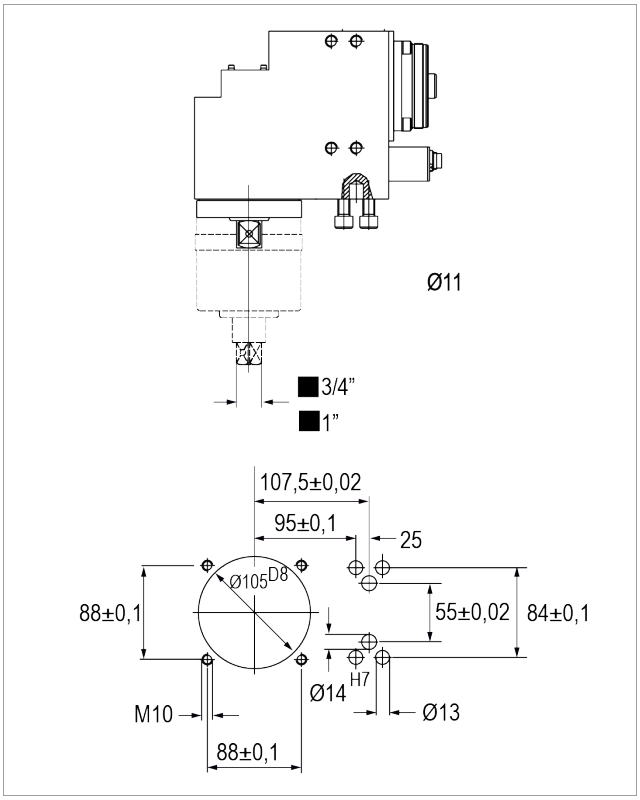

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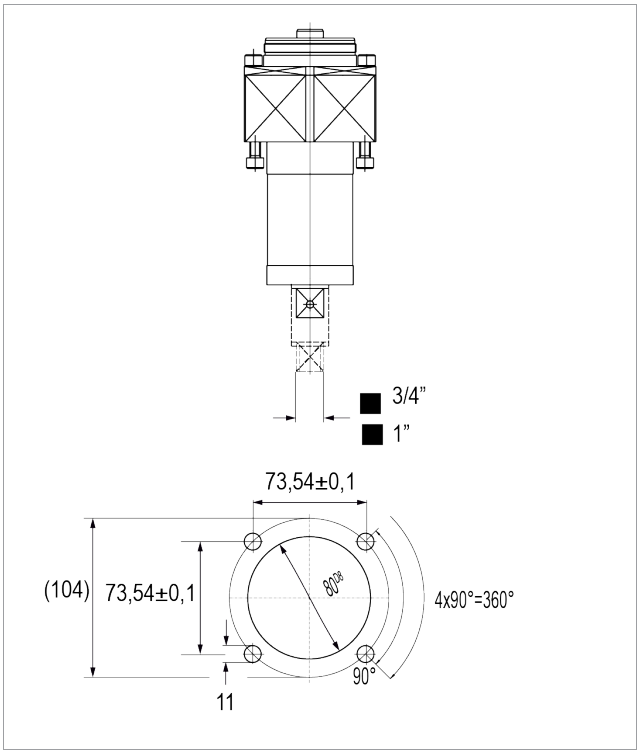
(…)4Z660A



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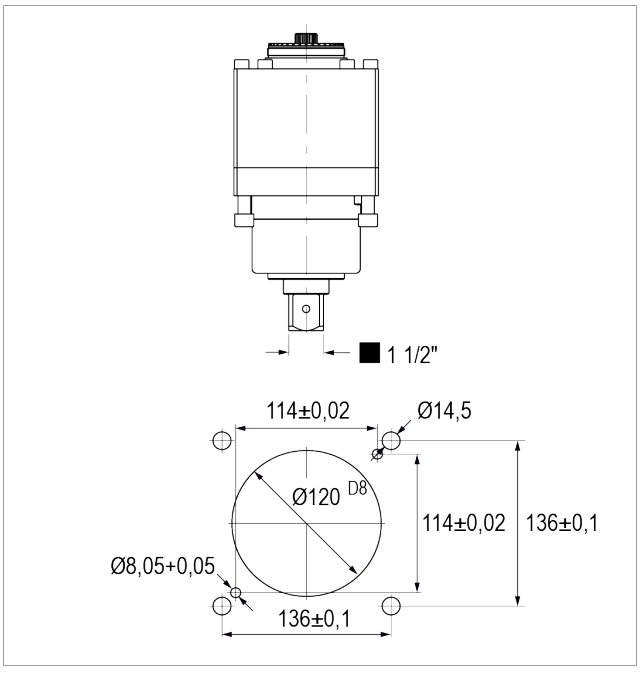

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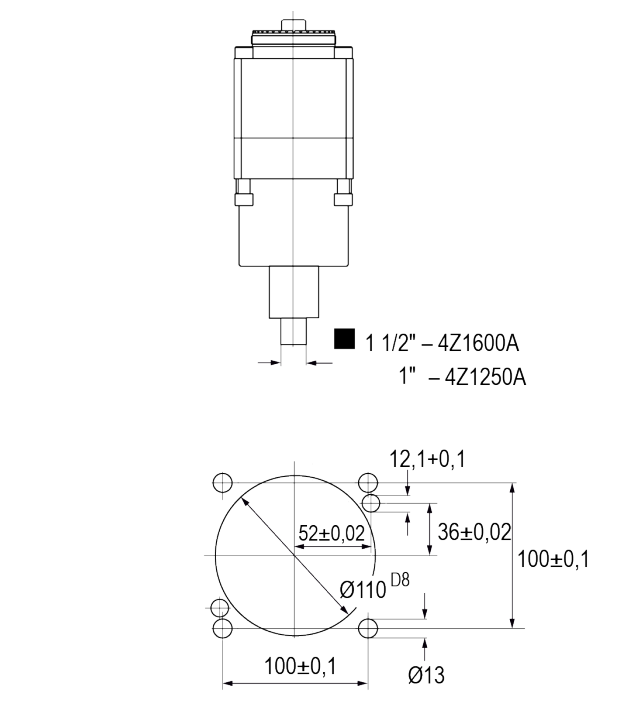
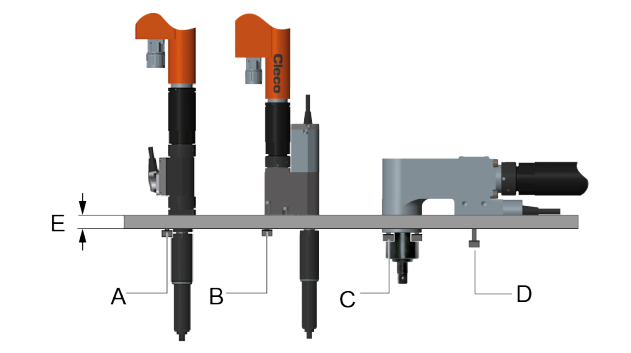
(…)4Z1600A



4.2 Installing on the mounting plate



Size	Tightening torque +10% <Nm>				E <mm>
	A	B	C	D	
1	10	10	6	25	12–15
2	25	50	10	25	Material: steel or aluminum
3	25	50	25	50	
4	50	50	85	85	

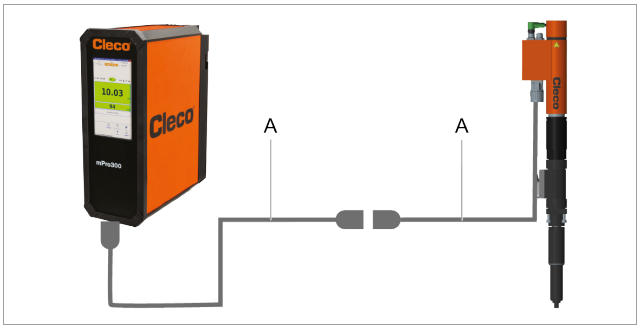
5 Cable

Note

Malfunction

The total length of the tool cable must not exceed 50 m.

► Match the length of the tool cable with the extension cable.



Size	A Tool/extension cable	
	Order No.	Length [m]
1	961561-010 … 961561-250	1 … 25
2 3 4	961923-010 ... 961923-340	1 … 34

For more information, see P2102JH cable management spindle.

6 Initial operation

1. If necessary, position the components of the spindle with respect to one another via face gear interfaces.
   - Turn size 1 in 15° increments.
   - Turn sizes 2–4 in 10 ° steps.
2. Establish protective grounding of moving machine parts according to EN 60204-1.

Caution

Risk of falling

Loose cables can lead to tripping and falling.

► Route the connected cables securely.

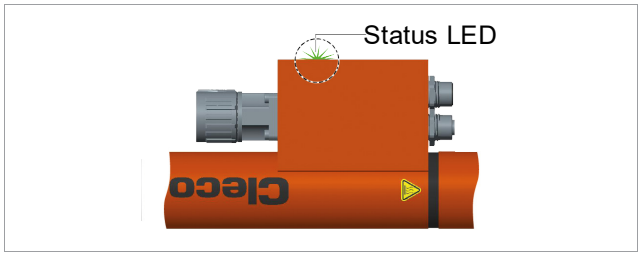
3. Close and lock the plug connection on the spindle.
4. Connect the power cable to the controller.
5. Close the protective devices (i.e., safety grilles).
6. Switch on the machine control unit (PLC/SPS).
7. Switch on the controller. If there is a fault after switching on, see the chapter entitled "Troubleshooting" in the system manual.
8. The process programming for the controller must be carried out by qualified personnel during initial startup, see programming instructions.

7 Troubleshooting

For troubleshooting, see the document
P2468TS Troubleshooting

7.1 LED Display

The status LED indicates the status of the fixtured spindle software and the connected transducers.



Status LED Color	Explanation
○ Continuous white light	Software update is running. Do not interrupt the power supply.
● Continuous yellow light	Initialisation of fixtured spindle.
● – ● Flashing yellow light	A connected transducer does not yet provide valid data.
● Continuous red light	A connected transducer does not provide valid data.
● – ● Flashing red light, slowly	Internal error: transducer.??
● Continuous blue light	The transducer is in read/write mode.
● Continuous green light	Fixtured spindle is ready for use.

Error analysis

Status LED shows error (flashing red) when two transducer are connected. Procedure for identifying a defective transducer:

► Disconnect transducer 2.
  ➢ Status LED continues to flash: Transducer 1 is defective.
► Disconnect sensor 1 and connect sensor 2.
  ➢ Status LED continues to flash: Transducer 2 is defective.

8 Maintenance

Maintenance is only permitted byApex Tool Group authorized personnel. Regular maintenance reduces operational interruptions, repair costs and downtimes. Therefore, implement a safety-related maintenance program that takes into account the local regulations for repair and maintenance for all the operating phases of the tool.

See document *Maintenance instruction*

9 Ambient conditions

Features	Data
Operation site	Indoors
Working temperature	0 °C – 45 °C
Storage temperature	-25 °C – 70 °C
Type of cooling	Convection (self-cooling)
Relative humidity	10 % – 90 % no condensation
Working height	Up to 3000 m (9,843 ft) above sea level
Degree of protection as per DIN EN60529 (IEC60 529)	IP40

10 Disposal

Components and auxiliary materials of the product pose risks to the health and the environment. The tool contains components that can be recycled as well as components that must be specially disposed of.

► Separate the components of the packing and segregate the different materials before disposing of them.
► Catch auxiliary materials (oils, greases) when drained and dispose of them properly.
► Separate the components and dispose of them by segregating them clearly.
► Follow the locally applicable regulations.

Observe generally valid disposal guidelines such as, in Germany, the Electrical and Electronic Equipment Act (ElektroG) and the Battery Act (BattG). Wasted electronic equipment must be disposed of.

► Return the defective product to your company collection facility or to *Sales & Service Center*.

POWER TOOLS SALES & SERVICE CENTERS

Please note that all locations may not service all products.
Contact the nearest Cleco® Sales & Service Center for the appropriate facility to handle your service requirements.

Sales Center

Service Center

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