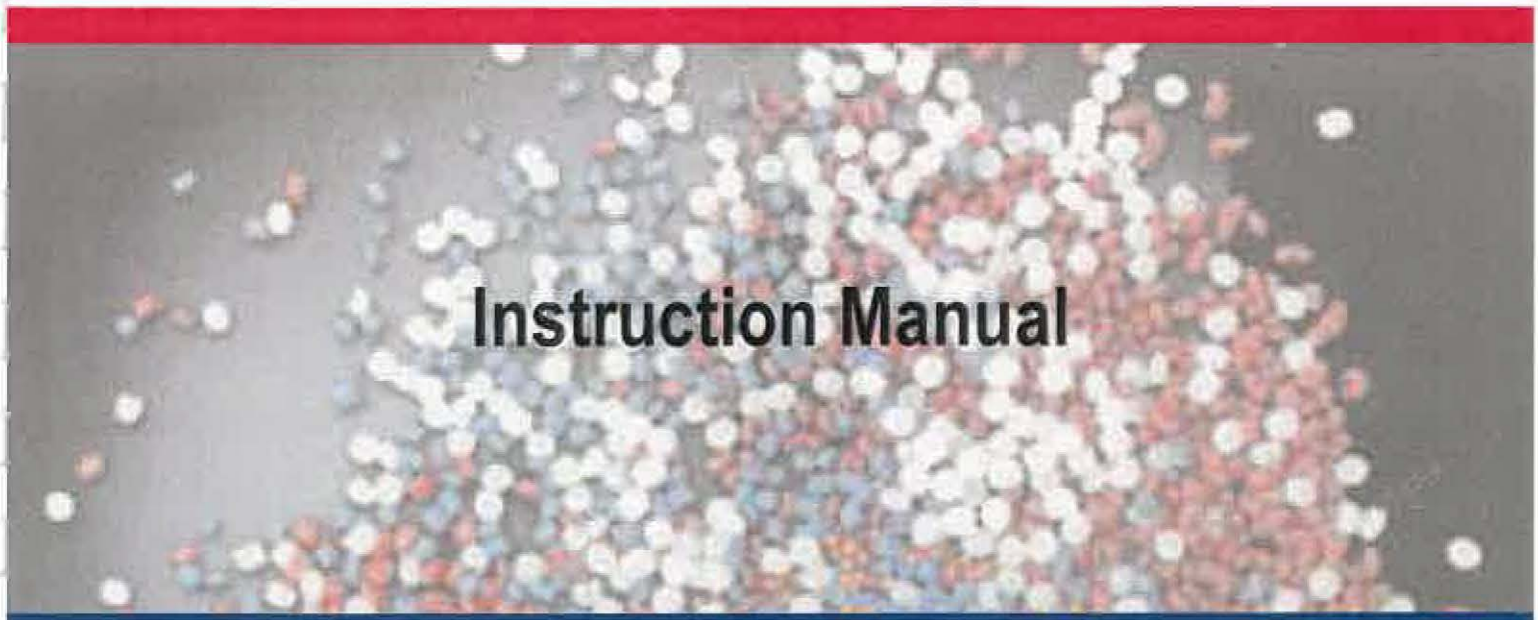
Brabender®

... where quality is measured.



Instruction Manual

MetaStation 4E

ID no. 8 156 70.xxx

3 x 400 V, 50/60 Hz

Brabender GmbH & Co. KG
Kulturstraße 49-51
47055 Duisburg
Germany

Original Instruction Manual

815670-xxx_MetaStation-4E_BAdg-00-e

Edition 0820

Use of 30-mA RCDs

If local regulations prescribe the application of 30-mA RCDs in order to protect the socket circuits, the following points are to be considered concerning selection of the RCDs.

Three-phase drive controls with variable speed:

- For operation of three-phase instruments with a three-phase frequency inverter, all-current sensitive RCDs type B must be used.

  Brabender recommends the RCD type DFS4 B SK made by Doepke (SK = special characteristic for increased tripping threshold up to 2 A in the pulse frequency range). A structurally identical RCD with the type designation RCCB2 is available from Messrs. EPA.
- Do not connect more than one instrument to each RCD. Otherwise, the respective leakage currents of combined instruments may sum up and trigger the RCD.
- **Each Brabender device is tested as an individual consumer with the recommended RCDs and the real leakage current is documented.**

Single-phase instruments with variable speed drive units:

- For the operation of single-phase instruments with frequency inverters, at least variable-current sensitive RCDs (type F) must be used, although all-current sensitive RCDs of type B should be preferred. The recommendations given above apply here as well.
- **Each Brabender device is tested as an individual consumer with the recommended RCDs and the real leakage current is documented.**
- If the recommendations concerning the type and model of the RCD and/or concerning operation of the device as an individual consumer cannot be met, please contact Brabender. The Brabender program comprises leakage current compensation devices and isolating transformers which can be installed in the power supply line.

DGUV3 tests for electrical safety in compliance with the German Workplace Ordinance

Note that electrical safety tests in compliance with VDE 0701-0702 with a leakage current threshold value of 3.5 mA is not admitted for Brabender instruments.

Brabender instruments are subject to the EG machinery directive 2006/42/EG which requires conformity to EN 60204-1 (VDE 0113) for electric layout, equipment, and tests.

Chapter 18 (Tests) of the EN 60204-1 does not prescribe leakage current tests. However, chapter 8.2.8 of the machinery directive makes additional requirements on protective equipotential bonding for electric equipment with ground leakage currents of more than 10 mA AC or DC.

Contents

1 General Information

1.1 Use of the instruction manual

Read the manual thoroughly!

Brabender instruments/software are developed/designed and built according to the state-of-the-art and comply with the demand for simple and safe handling. In order to become familiar with the applications and to use the Brabender instrument/software in an optimum way, it is imperative to read this instruction manual very carefully before putting the Brabender instrument into operation.

Strictly observe instructions and safety instructions!

The instructions, safety instructions and precautions given in the present instruction manual have to be observed strictly.

This instruction manual manual is delivered with the Brabender instrument/software and is intended for operation in practice. It is to make the operating personnel familiar with the Brabender instrument/software and to inform them about details concerning transport, storage, mounting, start-up, operation, maintenance, trouble-shooting, and disposal.

Maintenance and service instructions must be observed for reasons of effective operational safety and a long lifetime of the Brabender instrument.

Keep and hand over with the instrument!

This instruction manual is, therefore, to be considered part of the Brabender instrument/software and must be kept and handed over with the instrument/software.

Keep instruction manual accessible at any time!

The operating personnel as well as the personnel in charge of maintenance and repair must always have free access to this instruction manual.

1.2 Disclaimer of liability

Within the scope of legal regulations, Brabender GmbH & Co. KG refuses any liability - for whatever legal argument - for direct or indirect damage caused in connection with the delivery or use of the Brabender instrument/software. This is in particular true for - but not limited to - improper use and/or improper operation and handling of the Brabender instrument/software.

In this context, Brabender explicitly excludes any warranty for wear parts, in particular for those with product contact.

Under no circumstances, Brabender GmbH & Co. KG can be made liable for any damage or injuries caused by non-observance of the safety regulations included in the data sheets of the producer of substances to be tested or processed with the Brabender instrument. This is also valid if a recommendation was made concerning the application of certain substances and/or if the provision of test material is part of the scope of delivery and service.

The Brabender instrument is subject to modifications of color and design as well as to technical modification without prior notice.

1.3 Software

The Brabender software is developed with care and is tested internally - within the frame of general safety standards also for computer virus. This does, however, not involve any warranty whatsoever that the data carriers provided by Brabender and/or data transmitted electronically by Brabender are virus free.

It is within the exclusive responsibility of the user to test the Brabender software by means of state-of-the-art virus searching programs and to make sure that only Brabender software is applied which has been duly tested for computer virus by the user and has been found virus free.

Any claims arising from liability for defects concerning the functionality, faultlessness, and usability of Brabender software and/or concerning Brabender software being virus free are therefore excluded.

Our liability for any other damage arisen by the use of the Brabender software is limited to intent or gross negligence. Any further liability - for whatever legal argument, in particular for direct or indirect consequential damage - is excluded.

The software is subject to modification serving functional improvement and technical progress without prior notice.

Due to continuous progress and development of the software, the screenshots, if included in the present instruction manual, may slightly differ from the software version delivered.

1.4 Scope of delivery

The scope of delivery is given in the shipping documents.

1.5 Acquisition of components from external suppliers

Brabender cannot guarantee that any components bought by the carrier/user from external suppliers and incorporated into the system without prior consultation of Brabender will be recognized correctly by the Brabender software and will work properly within the system.

Brabender recommends contacting the Brabender Service dept. before installing such foreign components.

2 Contact

Data to be stated in case of inquiries

If there are any inquiries to Brabender - e.g. relating to handling of the Brabender instrument/software, ordering of spare parts, accessories, additional equipment or to sending back Brabender instruments or parts of the instrument/spare parts for maintenance or repair - all data given on the name plate must be stated.

For questions concerning the Brabender software, besides the ID no. of the software the version no. must be stated as well.

Contact

For any questions, further information, or in case of problems with the Brabender instrument/software, please do not hesitate to contact the Brabender Service department.

Brabender GmbH & Co. KG

Kulturstraße 49 - 51

47055 Duisburg

Germany

☎ Phone +49-203-7788-131

E-mail: service@brabender.com

North American Regions

C.W. Brabender Instruments, Inc.

50 East Wesley Street

South Hackensack, New Jersey 07606

USA

☎ Phone 201-343-8425

E-mail: service@cwbrabender.com

3 Stylistic features

3.1 General stylistic features

The following stylistic features are used in the instruction manual:

1. marks operating instructions in their serial order
   - ➢ [indented] marks individual steps of a preceding general instruction
   - ⇨ [indented] marks the consequences of a preceding action

➢ [in safety messages] marks operating instructions

- marks lists or (in instructions) alternatives
  - – [indented] marks subordinated lists

3.2 Mandatory signs

The following mandatory signs are used in the instruction manual:


General mandatory sign, additional information


Read the instructions before, cross reference

3.3 Design of safety messages

The safety messages given in the instruction manual are marked by a hazard warning sign and a signal word.

The signal word and the associated signal color indicate the relative severity of the hazard:

⚠ DANGER

Describes an **imminently hazardous situation** which will result in **death or serious injury** if not avoided.

⚠ WARNING

Describes a **potentially hazardous situation** which is likely to result in **death or serious injury** if not avoided.

⚠ CAUTION

Describes a **potentially hazardous situation** which may result in **minor or moderate injury** if not avoided.

NOTICE

Describes a situation which may result in **property damage** if not avoided.

4 Safety

4.1 Intended use

Intended use

The Brabender instrument may only be used in non-hazardous locations after having been completely assembled.

The instrument may only be used within the limits stated in chapter 8 "Technical Data" and only as a drive unit for Brabender measuring heads designed for this drive unit.

Brabender measuring instruments are high-precision instruments with a highly sensitive measuring system. Always handle the instrument with care in order to avoid damage to the instrument and to the measuring system.

Improper application

The Brabender instrument must **NEVER** be used for testing of or in connection **with explosives** - explosion hazard!

Unauthorized modifications of the Brabender instrument may cause danger to the personnel or property damage and, moreover, result in loss of guarantee and are, therefore, forbidden.

Sudden and rigid speed changes from low to high values on the drive unit can cause damage to or even destruction of the measuring head and are, therefore, forbidden.

4.2 Target group

Mounting, modification, disposal

Mounting, modification, and disposal of the Brabender instrument may only be carried out by technically skilled personnel with the corresponding qualifications.

Electric work is only allowed to be carried out by qualified and skilled electricians in compliance with the rules for electrical engineering.

Operation, cleaning, maintenance

Routine operation, cleaning during routine operation, and maintenance of the Brabender instrument may only be carried out by skilled personnel.

The personnel in charge of operation, cleaning, and maintenance of the Brabender instrument must have been instructed by a skilled person.

The persons in charge of operation, cleaning, and maintenance of the Brabender instrument must have the technical and computer skills enabling them to carry out the work described in chapter 11 "Setup and operation", chapter 12 "Cleaning", and chapter 13 "Maintenance" safely and without any risk to themselves or others.

Repair

Repair work on the Brabender instrument is only allowed to be executed by Brabender service technicians or by skilled personnel authorized for this work by Brabender.

4.3 Owner's duties

4.3.1 General owner's duties

The owner of the Brabender instrument must ensure that mounting, operation, maintenance of the instrument as well as repair and disposal, if applicable, are carried out exclusively by the personnel defined in chapter 4.2 "Target group".

The owner of the Brabender instrument has to furnish proof of training of the personnel in charge of operation, cleaning, and maintenance of the Brabender instrument.

Prior to instrument set-up, the owner of the Brabender instrument has to make sure of the proper condition, assembly, and mounting of the instrument according to the instructions given in chapter 9 "Mounting".

The owner of the Brabender instrument must ensure that the operating personnel read and understood the instruction manual of the Brabender instrument as well as the test material safety data sheets of the respective producer prior to testing and processing any test material with the Brabender instrument and that they will observe them.

The measures listed in the respective test material safety data sheets of the producer in order to avoid any possible danger when handling the corresponding material must strictly be observed.

4.4 Protective devices

4.4.1 Emergency motor stop button

4.4.1.1 Position and function of the emergency motor stop button

The instrument is equipped with an emergency motor stop button (see fig. below). Pressing the emergency motor stop button immediately stops the motor of the instrument.

Upon activation, the emergency motor stop button lights red.

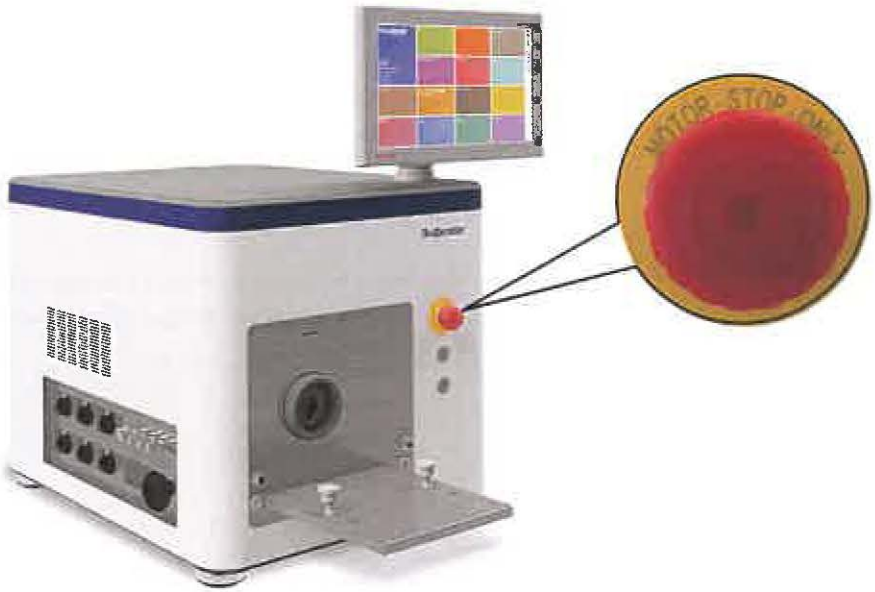


Fig. 1: Emergency motor stop button

⚠ WARNING

Risk of burns!

The emergency motor stop button does not switch off the heating/cooling system.

The measuring head still remains hot even after actuation of the emergency motor stop button.

➢ Strictly observe the safety messages concerning hot surfaces in the corresponding chapters of the separate instruction manual of the measuring head!

⚠ WARNING

Risk of severe injury!

The emergency motor stop button helps to avoid potentially hazardous situations.

➢ Never bridge the emergency motor stop button!

➢ Never lock the emergency motor stop button mechanically!

➢ Always keep the emergency motor stop button visible and easily accessible!

4.4.1.2 Procedure after emergency motor stop

⚠ WARNING

Risk of severe injury, risk of property damage!

Before restarting the system upon actuation of the emergency motor stop button

- ➢ Make sure that the cause for the actuation of the emergency motor stop button has been eliminated!
- ➢ Make sure that there is no risk to the personnel or to the machine when restarting the system!

1. Slightly turn the emergency motor stop button until it pops out.
2. Press the "Start" button on the drive unit in order to switch on the drive again.
   - ⇨ The "Start" button lights up.
   - ⇨ The drive unit immediately starts rotating with the speed set last in the operating mode currently active.

4.4.2 Emergency shut-off switch

4.4.2.1 Position and function of the emergency shut-off switch

The instrument is equipped with an emergency shut-off switch (isolator switch, see fig. below). Turning the emergency shut-off switch to position "0" immediately cuts off power supply to the instrument.

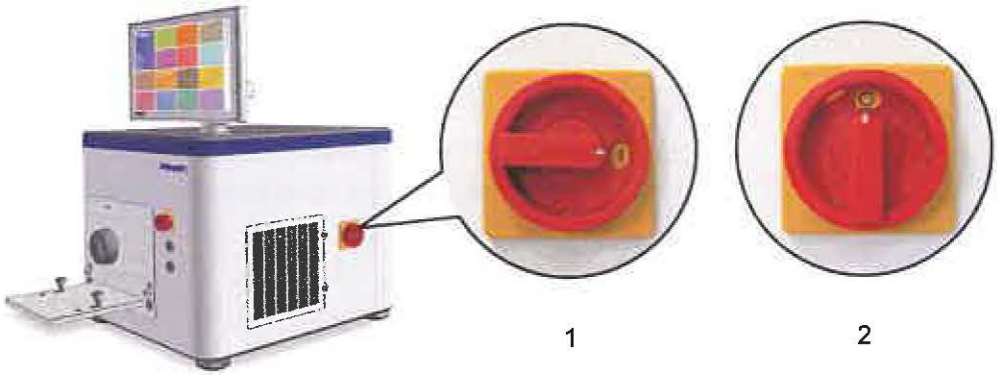


Fig. 2: Emergency shut-off switch

1 Position "1" ON *2 Position "0" OFF*

4.4.2.2 Procedure after actuation of the emergency shut-off switch

⚠ WARNING

Risk of injury, risk of property damage!

Before restarting the system upon actuation of the emergency shut-off switch

- ➢ Make sure that the cause for the actuation of the emergency shut-off switch has been eliminated!
- ➢ Make sure that the system cannot be started before having reached full operating temperature!
- ➢ Make sure that there is no risk to the personnel or to the machine when restarting the system!

1. Turn the emergency shut-off switch to position "I" again.
2. Wait until the system has reached full operating temperature again.
3. Press the "Start" button in order to restart the drive unit.
   - ⇨ The "Start" button lights up.

4.4.3 Safety device

Brabender measuring heads are equipped with a non-contact magnetic safety device which triggers the control unit of the drive unit via a safety relay and prevents unintentional operation of the system when the measuring head has been drawn off or, with measuring mixers, is open.

The drive unit can only be started in normal operation (that means through the software) if the measuring head has been mounted properly, the plug of the safety device has been connected to the connection "Safety Device" and, with measuring mixers, the mixer has been closed so that the safety switch gets a response from its counterpart.

⚠ WARNING

Risk of injury, risk of property damage!

Danger of most serious injury by rotating parts when the measuring head is open or has been drawn off or not been mounted properly.

In such cases, the safety device prevents operation of the instrument system.

➢ Never bridge the safety device or put it out of function in any other way!

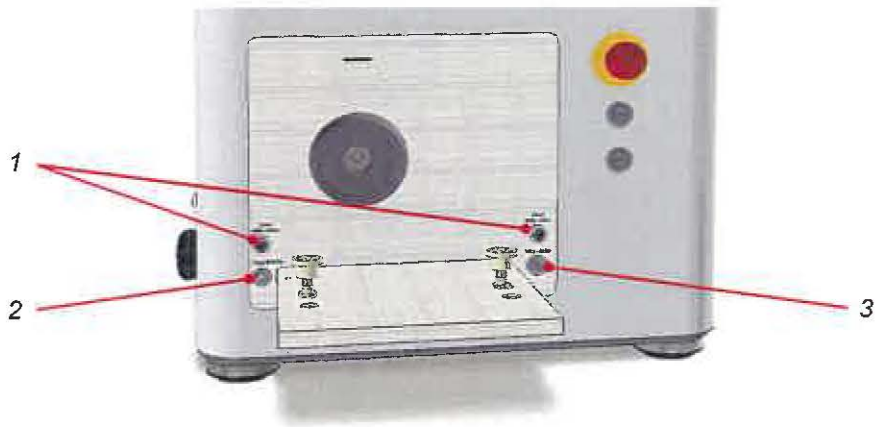


Fig. 3: Safety connections

1 Connection "2-hand control device" for measuring mixers
2 Connection "Torque limit key"
3 Connection "Safety Device" for safety device of the measuring heads

4.4.4 Automatic torque limitation

Brabender measuring heads are equipped with an automatic torque limitation. For this purpose, the 8-pole cable coming out from under the gear cover hood of the measuring head must be connected to the connection "Torque limit key" on the front side of the drive unit.

The drive unit now automatically recognizes the maximum admitted torque for the measuring head mounted. When this torque value is exceeded, the motor of the drive unit is turned off automatically (with measuring mixers) or the speed is reduced until the torque is within the admitted range again (with measuring extruders).

Concerning the connections for the automatic torque limitation and the two-hand control device, please refer to the figure in chapter 4.4.3 "Safety device".

4.4.5 Two-hand control device

Brabender measuring mixers are equipped with a two-hand control device allowing to run the measuring mixer at low speed (approx. 10 min^{-1}) when it is open (e.g. for cleaning purposes).

For this purpose, the keys in the handles of the measuring mixer must be connected via the corresponding connection cables with the connections "2-Hand Safety Device" on the drive unit or, in case of operation of the measuring mixer on a docking station with the Plastograph or Lab-Station, on the drive unit and on the docking station.

Concerning connection of the two-hand control device, please also refer to the separate instruction manual of the measuring mixer.

4.4.6 Beeper

The instrument is equipped with two acoustic alarms (beepers) indicating the following alarm situations:

- Temperature controller alarm: intermittent sound
- Software alarm: continuous sound

Apart from that, the device is equipped with an internal beeper for announcing software alarms acoustically.

4.5 Residual dangers

4.5.1 Risk of injury when handling the measuring head

⚠ WARNING

Risk of injury, risk of property damage by a falling measuring head!

When handling the measuring head, it may possibly fall down!

Risk of serious injury, risk of property damage when the measuring head falls down!

- ➢ Ensure to always wear work shoes with protective caps when working on the instrument system!
- ➢ Grip the measuring head firmly or ensure safe handling otherwise as long as it has not been fixed firmly on the drive unit!

4.5.2 Unexpected start after switch-off triggered by the inverter

In case of continuous operation with high torque load, the motor may tend to overheat, causing automatic machine stop triggered by the inverter.

After such machine stop, cooling down, and restart of the drive unit, the measuring head may start immediately when the "Start" key is pressed.

⚠ WARNING

Risk of injury, risk of property damage!

Risk of serious injury, entanglement hazard by a sudden start of the drive unit! Risk of damage to or destruction of the measuring head by objects or tools within the measuring head when the drive unit suddenly starts!

Before pressing the "Start" key

- ➢ Make sure that there is no risk to the personnel or to the machine when restarting the device!
- ➢ Make sure that there are no objects/tools within the measuring head which might damage the measuring head!

4.5.3 Danger by electricity

⚠ WARNING

Danger to life, risk of injury due to voltage leading parts!

In case of improper use of electric components, there is the risk of serious injuries or death by direct or indirect contact with live parts or connections!

- Work on electrical equipment is only to be carried out by authorized electricians!
- Do not run the machine with faulty electric connections or connections that are not ready for operation!
- Before connecting the instrument to the power supply, make sure that the line is equipped with a fault current circuit breaker (RCD), minimum type B [30 mA], and that the line voltage and frequency match the data given on the name plate!
- Only connect the power plug to a correctly installed power outlet with protection contact (PE)!
- Avoid a tripping hazard when laying the power cable! Highlight any tripping positions!
- Keep access to the electric modules closed always. Access only by authorized personnel with the appropriate training and security briefing!
- Always pull the power plug before opening any access to the electric modules of the Brabender instrument!
- Always pull the power cable on the plug, never pull on the cable!
- Do not expose the power cable and the plug to humidity!

5 Transport and Storage

5.1 Packaging

Packaging of the instrument, accessories, and additional equipment

Brabender instruments are packed properly and professionally into wooden crates.

Small parts, accessories, and additional equipment may be packed in separate boxes or crates

Small parts and accessories are packed separately into cardboard boxes or bags contained in the crates.

Additional equipment is packed either in the same crate as the instrument or in a separate crate, depending on the scope of the order.

Shipping labels on the crate

It is essential to observe the following labels on the outside of the crate(s):

This side up!

Fragile, handle with care!

Keep dry!

5.2 Unpacking

1. Upon arrival of the Brabender instrument, the owner of the Brabender instrument must inspect the shipping crate for any outside damage.
2. If any damage is detected, notify the transport guide immediately.

   Please also refer to chapter 5.4 "Checking for and notification of damage".
3. Remove the cover of the crate(s).

NOTICE

Parts of the instrument may be damaged!

- ➢ When removing the lateral walls of the crate, take care of braces and supports within the crate as well as of bolt connections at the bottom of the crate, etc.!
- ➢ Carefully remove the lateral walls of the crate.

4. Unpack the Brabender instrument with care. Take particular care for small parts or accessories within the packing material.

   Leave cover hoods and protective films on the Brabender instrument until mounting and commissioning, respectively.
5. Inspect the packing material very carefully.

   Depending on the way of shipping and on circumstances which are beyond Brabender's influence, parts of the Brabender instrument may have loosened during transport despite proper and professional packing and may be hidden within the packing material.
6. Dispose the packing material in an ecologically friendly way in compliance with the local regulations concerning disposal only after the owner of the Brabender instrument has found the scope of delivery to be complete.

   For checking the scope of delivery, please refer to chapter 5.3 "Checking the scope of delivery".

5.3 Checking the scope of delivery

1. The owner of the Brabender instrument must compare the scope of delivery with the shipping documents in a timely manner to the arrival of the Brabender instrument at the place of destination.
2. If there is any discrepancy, notify Brabender GmbH & Co. KG or in North America, C.W. Brabender Instruments, Inc. immediately in writing.

   Any delayed claims made by the owner regarding missing equipment or spare parts will not be provided replacements free of charge.

5.4 Checking for and notification of damage

1. Upon arrival of the Brabender instrument, inspect the shipping crate(s) for outside damage.
2. Immediately upon unpacking and checking of the scope of delivery, check the Brabender instrument as such for any signs of damage.

If damage is found, notify immediately:

- the transport guide
- Brabender GmbH & Co. KG or in North America, C.W. Brabender Instruments, Inc.

3. If damage is found, notify the transport guide immediately.
4. Provide a copy of the transport damage report to Brabender GmbH & Co. KG or in North America, C.W. Brabender Instruments, Inc. immediately. Also provide the place and time of the damage.

   If the ownership of the equipment was transferred to the buyer at the same time of or prior to transportation, the buyer is liable for all damages incurred during transportation. The buyer or the receiver must observe the regulations of the insurance policy.

   If necessary, the average adjuster appointed by the claim opponent must be given the opportunity to inspect the shipment/the Brabender instrument.

⚠ WARNING

Risk of injury, risk of property damage by a defective instrument!

A defective instrument can result in unknown hazards for humans and instrument!

➢ Never mount or use a defective instrument!

5.5 Transport

⚠ DANGER

Danger of serious injury or death, risk of property damage by overhead load and/or by the use of lifting devices with insufficient carrying capacity!

- Always dismantle any mounted measuring head or parts that may come off and put them on a suitable base before transporting the Brabender instrument.
- Before lifting the Brabender instrument, ensure sufficient carrying capacity of the lifting equipment!

When moving the instrument with an overhead crane by means of ropes, chains, or belts:

- Do not stand underneath suspended loads!
- Only use ropes, chains, or belts with sufficient carrying capacity!
- Only use ropes, chains, or belts in safe operating condition!
- Fix the ropes, chains, or belts as near as possible to the gravity center of the instrument!

When moving the instrument with a fork lift truck:

- Put on or mount the lifting device as near as possible to the gravity center of the instrument!
- Do not stand underneath suspended loads!

⚠ WARNING

Risk of injury, risk of property damage by a dropping instrument or by wrong posture when persons carry or move the instrument!

- Always wear work shoes with protective caps when moving the Brabender instrument!
- When lifting and carrying the Brabender instrument, take care for a straight and upright posture!
- Lift the instrument with two persons (one on every side) onto a suitable carriage in order to carry it to the desired place of mounting!
- Do not carry the Brabender instrument over long distances!

NOTICE

Parts of the instrument may be damaged!

When mounting lifting devices, ropes, chains or belts, parts of the instrument can be damaged.

Take care of sensitive parts!

➢ Fix lifting devices, ropes, chains, or belts so that no sensitive parts of the instrument such as switches, levers, etc. are damaged!

1. Move the unpacked instrument with extreme caution to the intended installation site.

   If included in the scope of delivery, the device can be moved on the mobile frame to the intended instatllation site.

NOTICE

Risk of damage to the instrument!

Avoid slamming on surfaces!

The instrument or parts of it may be damaged by slamming it on a surface.

➢ Put down the instrument carefully!

5.6 Storage

NOTICE

Risk of property damage due to improper storage!

Storage in humid or aggressive environment may cause corrosion and, in extreme cases, pitting corrosion.

- Dismantle the measuring head before storage.
- Clean and dry all surfaces of the machine thoroughly before storage.
- Put the cover hood from the accessory kit onto the motor shaft in the clutch.
- Cover the instrument with a cover hood or protective film in order to protect it against dust and humidity.
- Store the Brabender instrument and all parts thereof in dry and safe environment only.
- Put the Brabender instrument on a support which is at least 200 mm high, in order to protect the instrument from soil moisture.
- Arrange storage areas in a way that moisture can escape and periodical inspections are possible.
- Ensure that the device stands firmly and safely and is protected against rolling or slipping away and tipping (if equipped, lock the break).

Extreme temperature fluctuations or long exposure to direct sun may cause damage to the instrument or machine!

- Do not expose the Brabender instrument or parts thereof to extreme temperature fluctuations or direct sun!

For details concerning the admissible limit values of environment temperature and humidity, please refer to chapter 8 "Technical Data".

6 Components and functional features

6.1 General description

The device is a table-top drive unit for various Brabender measuring mixers, internal mixers and measuring extruders for recipe development, material testing and quality assurance in laboratories and goods incoming inspection.

The scope of delivery of the device comprises:

- Basic software MetaBridge MixMB or ExtMB for measuring mixers and measuring extruders, respectively

The following components need to be ordered separately:

- Measuring heads
- Mobile frame (for operation with measuring heads mounted on a docking station)
- further MetaBridge program modules (e.g. data correlation, user-specific evaluation methods, etc.)

6.2 Designation of the sides of the instrument

"Front side" — The side of the device with the mounting surface for the measuring heads and with the emergency motor stop button is referred to as **"front side"** in the following.

"Terminal side" — The side of the device with the connection panel is referred to as **"terminal side"** in the following.

"Right side" — The side opposite to the terminal side with the emergency shut-off switch is referred to as **"right side"** in the following.

"Rear side" — The side with the communication ports (HDMI, USB, LAN) is referred to as **"rear side"** in the following.

6.3 Product labels

6.3.1 Name plate

The name plate of the Brabender instrument contains the following information:

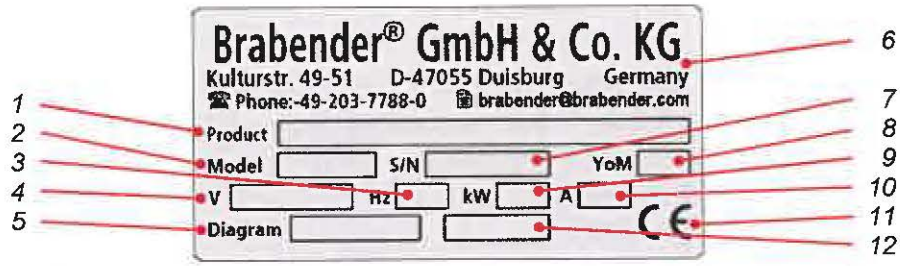


Fig. 4: Name plate (example)

1	*Instrument name*	*7*	*Serial number*
2	*ID no.*	*8*	*Year of mounting*
3	*Admissible line frequency*	*9*	*Rated power*
4	*Admissible voltage*	*10*	*Rated current*
5	*Electric drawing no.*	*11*	*CE sign*
6	*Manufacturer's name and address*	*12*	*Speed*

6.3.2 Further product labels

Signification: Instrument was checked in the Brabender workshop

Signification: Instrument was checked for electrical safety in the Brabender workshop

Signification: Read instruction manual before starting the Brabender instrument!

Signification: Pull the power cord before opening the device!

Signification: Danger electricity behind the door/under the cover hood!

Signification: Danger, machine may start automatically!

6.4 Main components

6.4.1 Front side, terminal side

The following control elements and connections are located on the front side and on the terminal side of the instrument:

Fig. 5: Control elements and connections on the front side and terminal side

1	*Connection panel*	*5*	*"Start" key*
2	*Locking wheel for mounting surface*	*6*	*"Stop" key*
		7	*Spiral tooth gear clutch*
3	*Touchscreen with integrated MetaBridge software*	*8*	*Mounting surface for measuring head*
4	*Emergency motor stop button*	*9*	*Mobile frame*

6.4.2 Right side, rear side

The following control elements and ports are located on the right and rear side of the device:

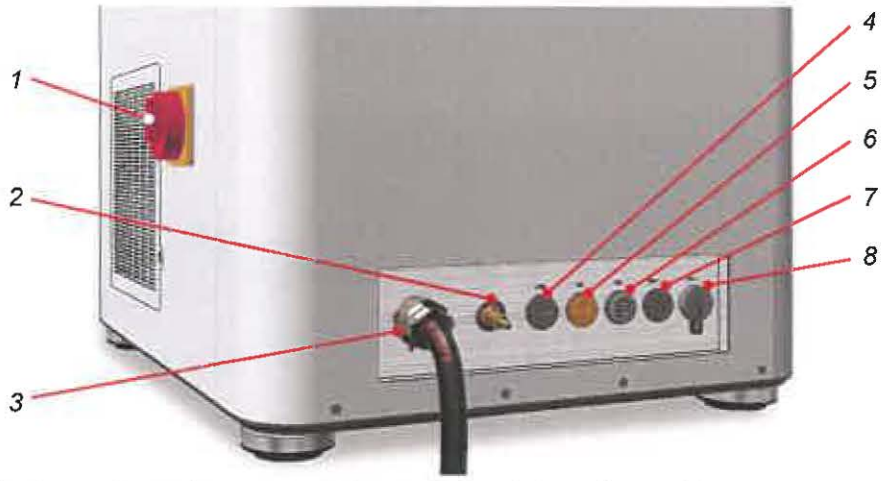


Fig. 6: Control elements and ports on the right and rear side

1	*Emergency shut-off switch (isolator switch)*	*5*	*USB 2.0 (1 x)*
2	*Equipotential bonding screw*	*6*	*USB 2.0 (2 x)*
3	*Power cord*	*7*	*LAN 1*
4	*HDMI*	*8*	*LAN 2*

6.5 Drive motor

The drive motor is a maintenance-free servomotor carried in a pendulum bearing. Due to digital control, speed variations are almost excluded.

6.6 Mounting surface

The measuring heads can be mounted either directly on the mounting surface of the drive unit or on a mobile docking station.

For measuring heads mounted on a docking station, the drive unit must be mounted on the mobile frame.

Measuring heads mounted on the mounting surface of the drive unit are connected directly to the drive unit through the spiral tooth gear clutch.

To connect measuring heads mounted on a docking station, the mounting surface of the drive unit can be unlocked with the locking wheel on the connection panel and drawn out. The docking station is then approached to the drive unit so that the mounting surface of the docking station fits into the corresponding recess and can be locked with the locking wheel.

6.7 Spiral tooth gear clutch

Brabender measuring heads built 08/2008 or later are connected to the drive unit through a spiral tooth gear clutch.

6.8 Connection panel

On the terminal side of the instrument, there is the connection panel with the following connections:

- Control temperature connections zones no. 1 - 6
- Heater cable connections zones no. 1 - 6
- Central compressed air input (max. 1.5 bars)
- Cooling air connections of the individual zones
- CAN-OUT connection with terminal resistor
- Melt temperature 1 - 4
- Locking wheel for mounting surface

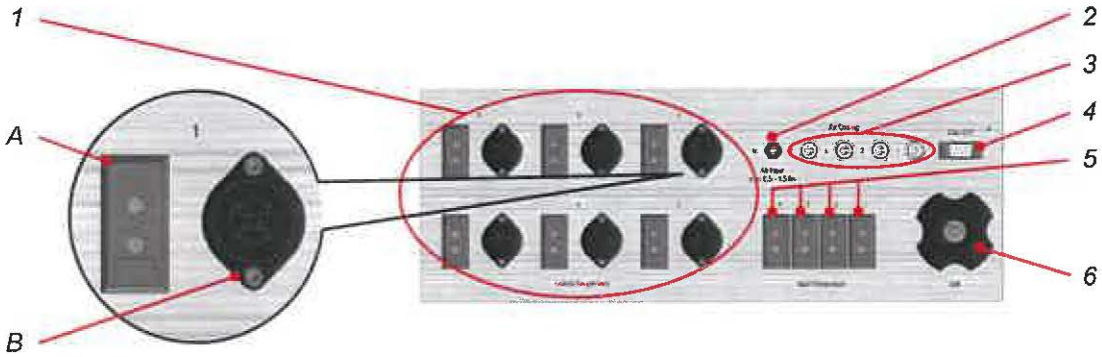


Fig. 7: Connection panel

1 Connections for control thermocouples and heater cables of zones no. 1 - 6
A Thermocouple connection
B Heater cable connection
2 Central cooling air input
3 Cooling air to zones
4 CAN-OUT connection
5 Melt temperature 1 - 4
6 Locking wheel for mounting surface

6.9 Mobile frame (option)

The Brabender device can be mounted on a mobile light metal frame which is equipped with castors for easy transport of the device to the intended installation site and for locking it there.

To level and secure the mobile frame in its final position, the adjustable feet should be screwed out.

7 MetaBridge software

The Brabender MetaBridge has been factory installed on the internal PC of the Brabender instrument. The software is web-based, that means several authorized users can log in at the same time and monitor the readings live on their PC, tablet or smartphone from anywhere around the world via internet or network. The results can be evaluated, printed, and exported using the software.

7.1 Starting/running down the internal PC

7.1.1 Starting the internal PC

1. For starting the internal PC, switch on the device on the main power switch on/off.

   ⇨ After a few seconds, the log-in window shows up (see fig. below) where you can log in or create a new user account.

   Concerning log-in and log-in window, please also refer to chapter 11.1.1 "MetaBridge log-in".

Fig. 8: Log-in window (standard log-in)

or

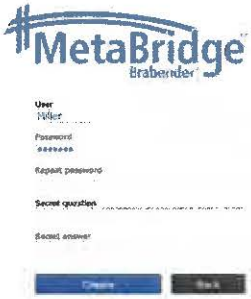


Fig. 9: Log-in window (creating a new user account)

7.1.2 Running down the internal PC

Running down the internal PC is only possible on site, that means directly on the device.

NOTICE

Risk of loss of data by running down the PC improperly!

Switching off the internal PC with the main power switch on the Brabender instrument, data may be damaged or get lost.

- ➢ Always run down the internal PC properly before switching off the Brabender instrument.
- ➢ Do not switch off the Brabender instrument as long as the internal PC is still running!

1. For running down the internal PC and the touchscreen, if any, tap the "User" tile:

⇨ The following selection window pops up:

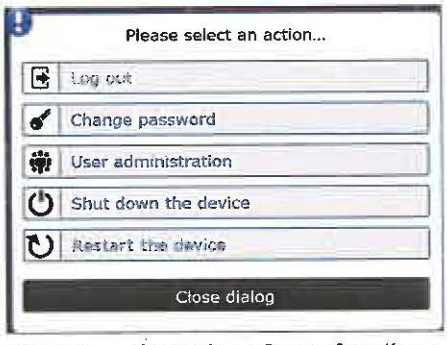


Fig. 10: Selection of user functions

The buttons "Shut down the device" and "Restart the device" are only visible in local operation. In remote mode, i.e. on external terminals, these two functions are not available

Button "Shut down the device"

2. Tap the Button "Shut down the device".

⇨ A message window "The device is shutting down" pops up.

Fig. 11: Message "The device is shutting down"

⇨ After a few seconds, the internal PC is shut down and the touchscreen turns off.

7.2 Start screen of the Brabender MetaBridge

Upon log-in, the start screen of the Brabender MetaBridge appears (see fig. below as an example).

Generally, the start screen contains some device-specific tiles in the upper part and some general tiles in the lower part.

The arrangement of the tiles may vary depending on the terminal (PC, tablet, smartphone) and monitor size.

Concerning the menus and functions of the individual tiles, please refer to the separate instruction manual of the corresponding software.

If both the extruder software ExtMB and the mixer software MixMB have been installed and released, the start screen of the last active application will appear after a restart of the device. Tapping the tile "MultiDevice" allows switching from ExtMB to MixMB and vice versa.

Fig. 12: Start screen MixMB

1 Device-specific tiles *2 General tiles*

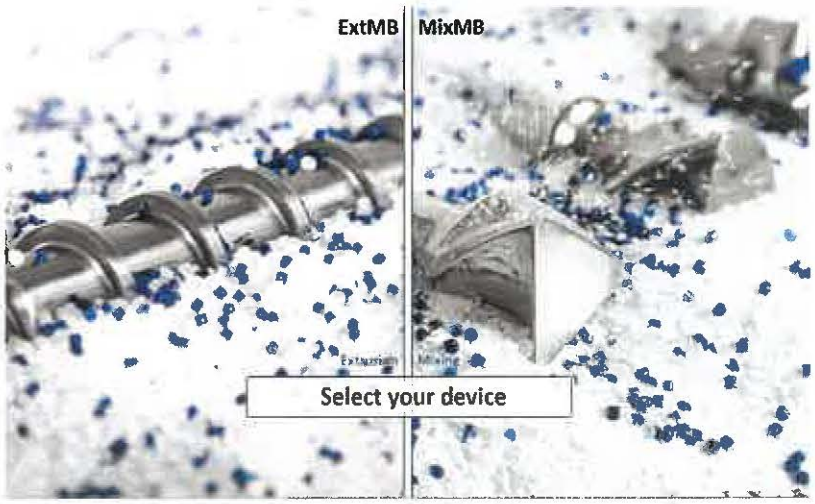


Fig. 13: Selection between ExtMB and MixMB

8 Technical Data

Drive unit	Motor:	4.2-kW servomotor
	Speed range:	0.2 - 185 min^{-1}, infinitely variable
	Speed deviation:	Max. ± 1 % of full range through digital feedback
Dynamometer unit	Torque measuring range:	0 - 200 Nm Automatic recognition of the max. torque for the connected measuring head Automatic stop or speed reduction when the max. admitted torque is exceeded
Ports	• HDMI:	For large monitor
	• USB 2.0 (3 x):	For connection of a USB stick, printer, mouse, keyboard, etc.
	• LAN 1 / LAN 2:	Internet connection and/or connection of further devices via LAN (feeder, blown film take-off unit, winder, etc.)
Temperature control	6 zones	Inputs/outputs: • 4 x Melt temperature • 6 x Control temperature • 6 x Heating • 1 x Central cooling air input • 4 x Cooling air output to the control zones • CAN-OUT
Current supply	Electricity	3 x 400 V, 50/60 Hz + N + PE, 32 A
	Power consumption: • Drive unit with measuring head without heating power: • Drive unit with measuring head with heating power:	 10 A up to 32 A, dep. on measuring head

Dimensions and weight	Dimensions (W x H x D)	
	• without mobile frame:	700 mm x 870 mm x 950 mm
	• with mobile frame:	700 mm x 1652 mm x 950 mm
	Weight:	
	• without mobile frame:	154 kg
	• with mobile frame:	174 kg
Environmental conditions	• Storage:	
	Temperature	- 20 °C - + 55 °C
	Relative humidity	5 ... 95 % without condensation The above-named maximal values for temperature and relative humidity must not occur simultaneously.
	• Operation:	
	Temperature	+ 5 °C - + 40 °C
	Relative humidity	5 ... 85 % without condensation The above-named maximal values for temperature and relative humidity must not occur simultaneously.

The dimensions stated above usually include necessary equipment such as power cord, heating/cooling hoses etc. in addition to the pure instrument dimensions.

8.1 Noise measurement

The noise measurement was run under normal operating conditions over the entire speed range of the instrument. The measurement was carried out at a distance of 1 meter and a height of 1.6 meters.

The measured equivalent continuous sound pressure level is

$$L_{eq} < 70 \text{ dB(A)}$$

9 Mounting

9.1 Safety notes concerning mounting

⚠ CAUTION

Risk of injury, risk of property damage!

Improper mounting may cause danger of injury to the personnel and risk of damage to the instrument.

➢ All mounting work on the Brabender instrument may only be carried out with care by technically skilled personnel!

9.2 Requirements to the place of mounting

- Mount the Brabender instrument in a closed room where it is protected from weather factors.
- Do not mount the Brabender instrument near heat sources (heating, presses, etc.).
- The intended base for mounting the instrument must be
  - even and plane
  - clean
  - strong enough to carry the instrument
- Make sure that the Brabender instrument is protected against vibration (make sure the instrument is stable!).
- The connection and adaptation points for power supply to the instrument must be as near as possible to the mounting place of the instrument.

  Concerning power supply data, please refer to chapter 8 "Technical Data".

9.3 Setup and assembly

9.3.1 Leveling the instrument

⚠ CAUTION

Risk of injury, risk of property damage!

The instrument is heavy! Danger of injury and risk of damage to the instrument when lifting or moving the instrument.

➢ Always lift or move the instrument with a suitable lifting device or with two or more persons!

1. Make sure to remove all covering hoods and protective films.
2. By means of a suitable lifting device or with two or more persons, place the instrument onto a sturdy, vibration-free working surface.
3. Put a bubble level onto the instrument in order to check whether it is leveled exactly horizontally.
4. If this is not the case, slightly move the device or the mobile frame, if equipped, or compensate for depressions in the mounting surface by placing e.g. thin metal shims under the feet until the device is exactly horizontal.
5. Make sure that the device stands firmly and safely.

9.3.2 Removing the shipping fixture

1. Loosen the locknuts on the shipping fixture.
2. Unscrew the threaded rod from the clutch.
3. Unscrew the two knurled nuts on the shipping fixture.
4. Remove the shipping fixture.

   Keep all parts of the shipping fixture for a possible future shipment of the device (for example for repair purposes).
5. Instead of the threaded rod, turn the screw from the accessory kit into the central bore of the clutch in order to fix the clutch half on the driving shaft.
6. Screw the knurled nuts onto the stud bolts on the mounting surface again.
7. If you do not want to mount a measuring head to the drive unit immediately, put the black cover hood from the accessory kit onto the motor shaft of the clutch.

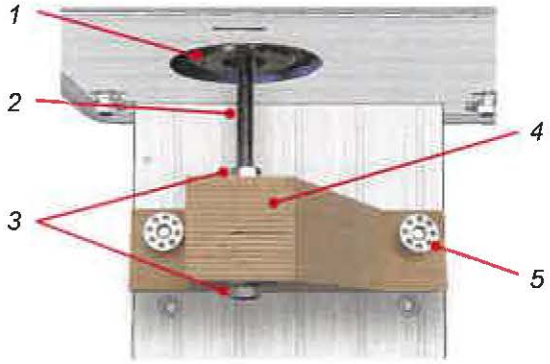


Fig. 14: Shipping fixture

1	*Clutch of the drive unit*	*4*	*Shipping fixture*
2	*Threaded rod*	*5*	*Knurled nuts*
3	*Lock nuts*		

9.4 Power supply connection

⚠ WARNING

Danger to life, danger of serious injuries due to electrocution!

Improper grid connection may lead to overvoltage and cable fire and can cause damage to the instrument! In case of a damaged cable and/or power plug, live parts may be exposed!

Danger of serious injury or death due to direct or indirect contact with live parts or connections!

- ➢ Before connecting the instrument to the power supply, make sure that the line is equipped with a fault current circuit breaker (RCD), minimum type B [30 mA], and that the line voltage and frequency match data given on the name plate!
- ➢ Switch off the instrument before connecting it to the power supply!
- ➢ Make sure that the power cable and plug are in a perfect and technically safe condition and are not damaged!
- ➢ Only connect the Brabender instrument to a socket with a protective earth contact (PE)!
- ➢ Avoid a tripping hazard when laying the power cable! Highlight any tripping positions!
- ➢ Do not expose the power cable and the plug to humidity!

1. Make sure that the instrument has been switched off.
2. Connect the power cable of the instrument to a socket with a protective earth contact (PE).

9.5 Mounting of measuring heads

⚠ WARNING

Risk of injury, risk of property damage!

Danger of serious injuries and entanglement hazard by a measuring head suddenly starting when mounting the measuring head while the drive unit is on.

Danger of burns and of damage to the heaters due to uncontrolled heating of the measuring head when mounting the measuring head to a live drive unit.

- ➢ Switch off the drive unit before mounting or dismantling the measuring head!
- ➢ Never mount or dismantle the measuring head when the drive unit is on!

⚠ CAUTION

Risk of injury, risk of property damage!

The measuring head may overturn. Danger of injury, risk of damage to the measuring head when it overturns or falls down.

- ➢ Secure the measuring head with your hands as long as it has not yet been fixed tightly to the drive unit!
- ➢ Ensure to always wear work shoes with protective caps when working on the instrument system!

Concerning mounting of the different measuring heads, please refer to the corresponding separate instruction manual of the measuring head and of the docking station, if equipped, and to the mounting instructions of the adapters, if required.

9.5.1 Mounting of measuring heads up to YoM 08/2008

For mounting Brabender measuring heads up to model 08/2008, various adapters may be required, depending on the measuring head and the year of mounting (e.g. clutch adapter, encoder box for instrument recognition and torque limitation, adapter for safety device).

Please contact the Brabender Service in such case.

9.5.2 Preparations for mounting a measuring mixer

9.5.2.1 Mounting the mixer supporting fork

The mixer supporting fork (ID no. 6 90 199) serves for safe deposition of the mixer bowl of series 30/50 measuring mixers.

1. Unscrew the two hexagon nuts M10 of the stud bolts on the underside of the mounting surface of the drive unit and remove them with their washers.
2. Mount the mixer supporting fork from below onto the stud bolts and screw them from below to the underside of the mounting surface using the two hexagon nuts M10 and the washers.

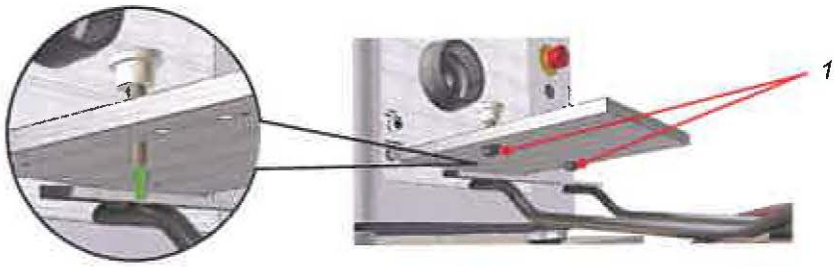


Fig. 15: Mounting the mixer supporting fork

1 Hexagon nuts M10

9.5.2.2 Mounting the mixer support (additional equipment)

The mixer support (additional equipment, ID no. 6 19 150) serves for safe deposition of both the mixer front plate and the bowl of series 30/50 measuring mixers. It is equipped with a drawer for the disposal of product from the measuring mixer.

1. If screwed in, unscrew the four M5 Allen screws on the underside of the mounting surface of the drive unit.

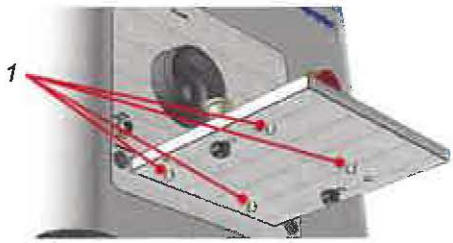


Fig. 16: Underside of the mounting surface

1 M5 Allen screws

2. Use the four Allen screws to fix the mixer support to the underside of the mounting surface of the drive unit.

The nut of the left stud bolt must fit into the corresponding recess of the mixer support (see fig. below, green arrow).

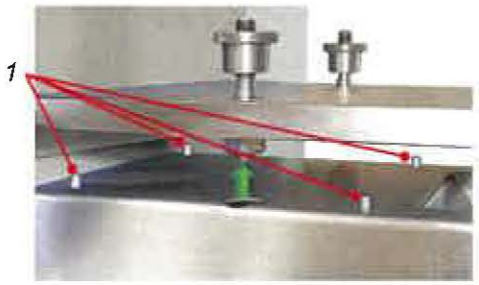


Fig. 17: Mounting the mixer support

1 Allen screws for fixing the mixer support

9.5.3 CAN connection

NOTICE

Risk of property damage!

Live connection or disconnection of CAN bus cables may cause short-circuit and, as a consequence, cause damage or destruction of CAN bus modules.

- ➢ Before connecting the CAN bus cable, make sure that the CAN bus cable and plug are in an operationally safe condition (visual check)!
- ➢ Before connecting or disconnecting the CAN bus cable, make sure that the isolator or power switches of all instruments in the system are position "0" (OFF)!

9.5.3.1 CAN connection of measuring mixers

Measuring mixers are no CAN modules and do not have any CAN connection of their own.

1. If the drive unit is the only CAN module (this is the standard case with measuring mixers without docking station):

   Plug the terminal resistor onto the connection CAN-OUT on the connection panel of the drive unit and fix it with the two lateral screws.

2. In case of downstream CAN modules (e.g. docking station or a conductivity meter):
   - ➢ Use the CAN connection cable to connect the connection CAN-OUT of the drive unit to the connection CAN-IN of the subsequent CAN module.
   - ➢ Plug the terminal resistor onto the connection CAN-OUT of the last CAN module in the system and fix it with the two lateral screws.

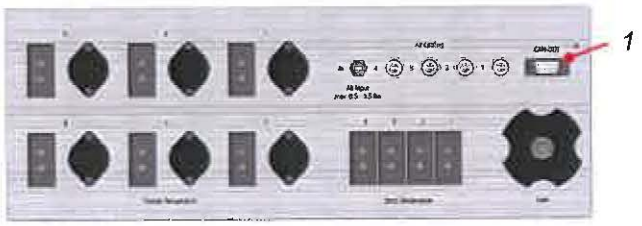


Fig. 18: Connection panel

1 Connection CAN-OUT

Examples of a CAN connection of measuring mixers:

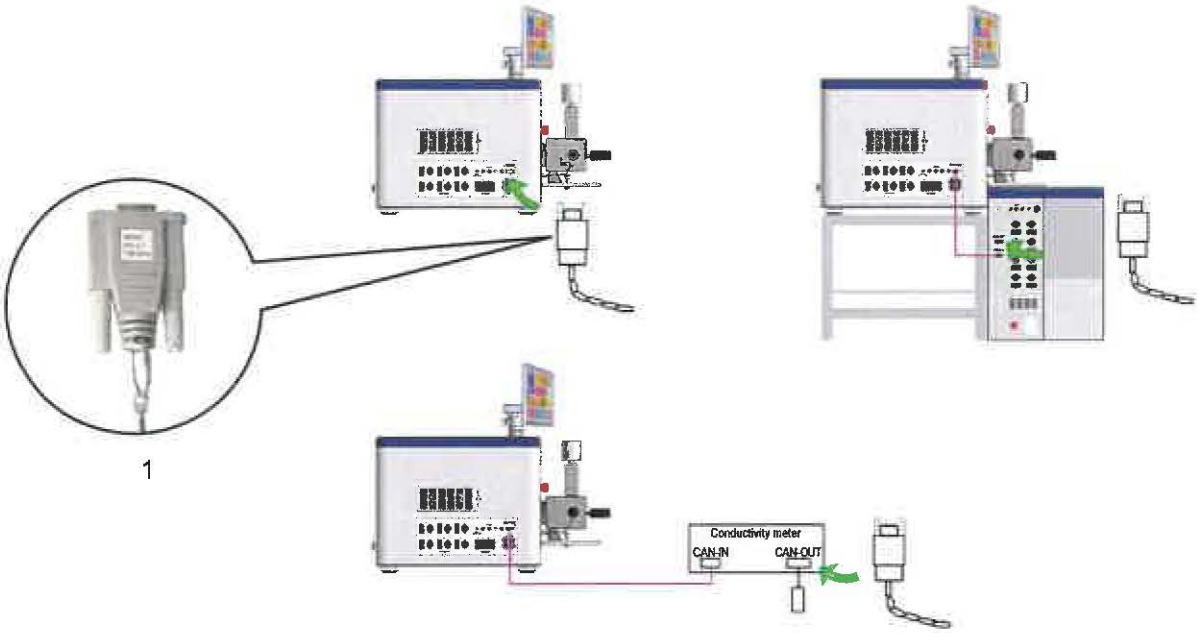


Fig. 19: Connection of CAN modules (examples)

1 Terminal resistor

9.5.3.2 CAN connection of measuring extruders

Measuring extruders are no CAN modules and do not have any CAN connection of their own. The CAN connection is effected through the pressure transducers mounted in the measuring extruder and through the controller of a feeder, if equipped.

Concerning the CAN connection of measuring extruders, please also refer to the separate instruction manual of the respective measuring extruder.

1. If the terminal resistor has been plugged onto the connection CAN-OUT on the connection panel of the drive unit, unlock and disconnect it.
2. Operation without docking station:
   - ➢ Use the CAN connection cable to connect the connection CAN-OUT of the drive unit to the connection CAN-IN of the subsequent CAN module (feeder or the first pressure transducer in the measuring extruder).

   Operation with docking station:
   - ➢ Use the CAN connection cable to connect the connection CAN-OUT of the drive unit to the connection CAN-IN of the docking station.
   - ➢ Connect the connection CAN-OUT of the docking station to the connection CAN-IN of the subsequent CAN module (feeder or the first pressure transducer in the measuring extruder).
3. Connect any further CAN modules (further pressure transducers and/or downstream modules) likewise via the CAN connection cable.
4. Plug the terminal resistor onto the connection CAN-OUT of the last CAN module in the system and fix it with the two lateral screws.

Examples of a CAN connection of measuring extruders:

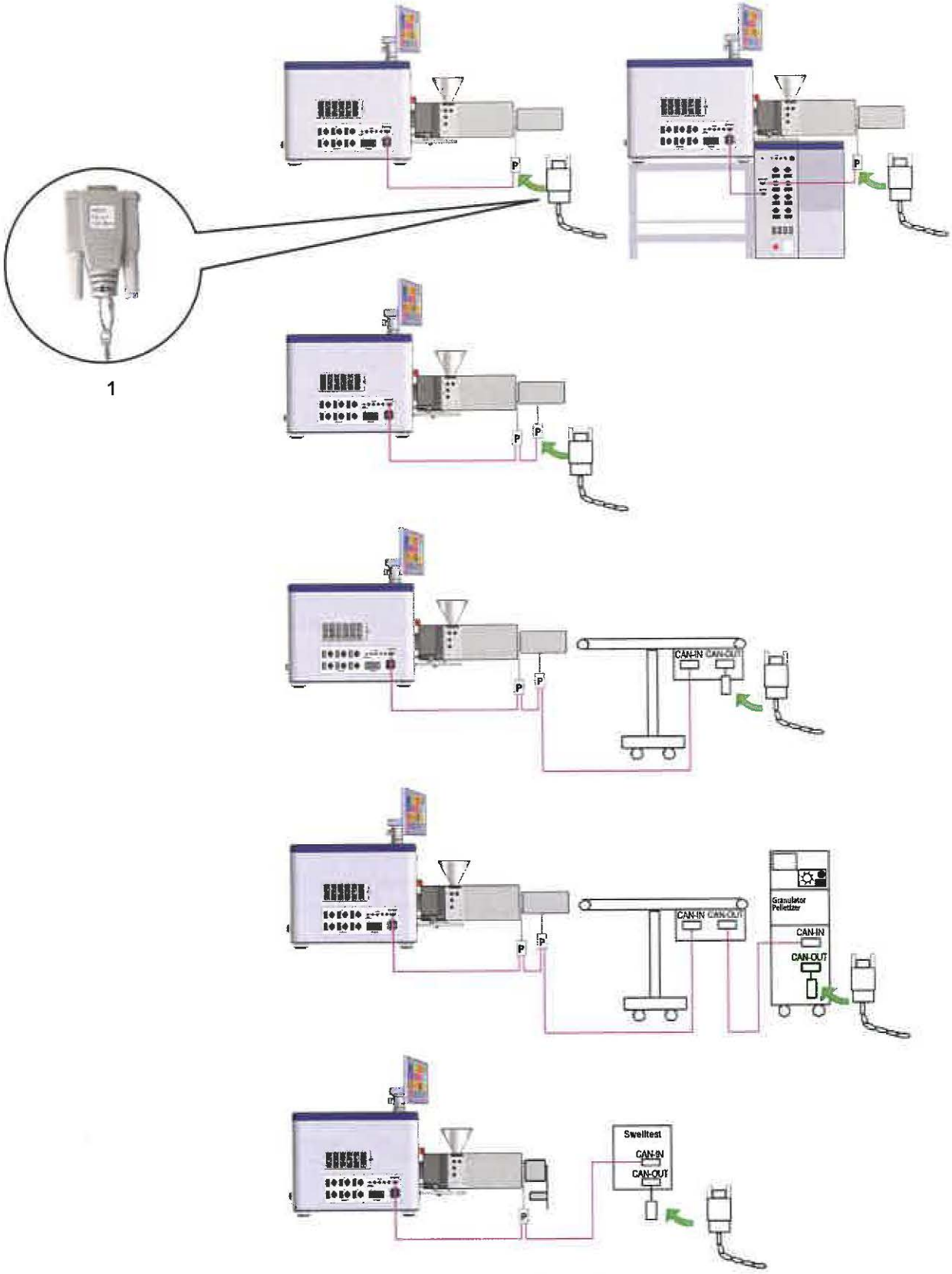


Fig. 20: Connection of CAN modules (examples)

1 Terminal resistor

10 Start-up

10.1 Safety notes concerning start-up

⚠ CAUTION

Risk of injury, risk of property damage!

Improper start-up of the instrument involves the danger of injury to the personnel and the risk of damage to the instrument.

➢ Commissioning of the Brabender instrument may only be performed by qualified operating personnel!

For starting up the measuring system, please also refer to the separate instruction manuals of all other system components and of the software!

10.2 Preparations, switching on

1. Check all connections and fittings for proper seat and tightness.
2. Make sure that the device stands firmly and safely.
3. Make sure for correct CAN connection. Ensure that the terminal resistor has been plugged onto the CAN-OUT connection of the last CAN module in the CAN bus.
4. Make sure that the 12-pole plug of the safety device of the measuring head has been connected properly to the connection "Safety Device" on the drive unit.
5. Make sure that the 8-pole plug of the automatic torque limitation of the measuring head has been connected properly to the connection "Torque limit key" of the drive unit.
6. For operation with a measuring mixer:

   Make sure that the two cables of the 2-hand control device of the measuring mixer have been connected properly to the connections "2-Hand Safety Device".
7. Make sure that all emergency motor stop buttons and emergency shut-off switches are free and easily accessible.
8. If not yet done, connect the power cord of the instrument to the power supply.
9. If not yet done, switch on the instrument.

10.3 Presettings in the MetaBridge software at initial start-up

When the internal PC is started for the first time, some basic presettings need to be made once before the measuring program as such can be started.

1. If not yet done, switch the Brabender device on.

   ⇨ The internal PC boots. On the touchscreen or on the external terminal, the following windows appear one after the other:

Fig. 21: Welcome screen

Fig. 22: Title screen

Fig. 23: Language selection

2. Tap the desired language.

The language can be changed at any time in the program.

⇨ The following window appears.

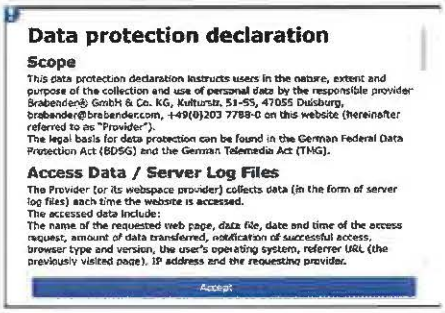


Fig. 24: Privacy statement

3. Read the privacy statement completely, then tap "Accept".

⇨ The following window appears:

Fig. 25: Setting the date

4. Set the current date, then tap "Next".

⇨ The following window appears:

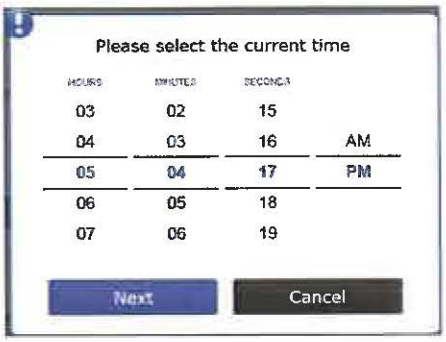


Fig. 26: Setting the time

5. Set the current time, then tap "Next".

⇨ The following window appears:

Fig. 27: Creating an administrator account

6. Fill in this window completely, then tap "Finish".

The secret question and answer are needed in case you forgot your password for logging in again in your account and setting a new password.

⇨ The presettings for initial startup are now completed. The start screen of the Brabender MetaBridge appears.

7. If a software was purchased separately, you still need to activate the license number and to install the MetaStation in the software.

⇨ Upon license activation, installation of the device and log-in, the start screen of the respective device appears.

8. If applicable, make further presettings (language, units, etc.) on the tile "Options".

10.4 Functional check of the safety devices

Check function of all safety devices every day before starting work!

Make a functional check of all safety devices every day before starting work!

10.4.1 Safety switch and two-hand control device

For checking the safety device and the two-hand control device of the measuring head (two-hand control device only with measuring mixers), please refer to the separate instruction manual of the measuring head.

10.4.2 Emergency motor stop button

1. If not yet done, turn on the device.
   ⇨ The internal PC initiates and, after a few seconds, the start screen appears.
2. Press the "Start" key.
   ⇨ The "Start" key lights up.
3. Press down the emergency motor stop button with your hand.
   ⇨ The emergency motor stop button lights up.
   ⇨ The "Start" key must go off.
4. Press the "Start" key.
   ⇨ The "Start" key must not light up again, that means that the instrument must not start.

If the "Start" key does not go off, the emergency motor stop button may be defective.

⚠ CAUTION

Risk of injury in case of a defective emergency motor stop button!

If the emergency motor stop button is defective, the drive motor cannot be stopped quickly in case of emergency - risk of injury.

If the emergency motor stop button is defective:

- ➢ Immediately switch off the instrument!
- ➢ Inform the Brabender-Service dept. (see chapter 2 "Contact")!
- ➢ Do not start-up the instrument!

5. To restart the device, slightly turn the emergency motor stop button until it pops out.
6. Wait at least 3 s in order to reactivate the safety relay.
7. Press the "Start" key in order to reactivate the drive unit.
   ⇨ The "Start" key lights up again.

10.4.3 Emergency shut-off switch

1. When the device is on, turn the emergency shut-off switch counter-clockwise from position "I" to position "0".

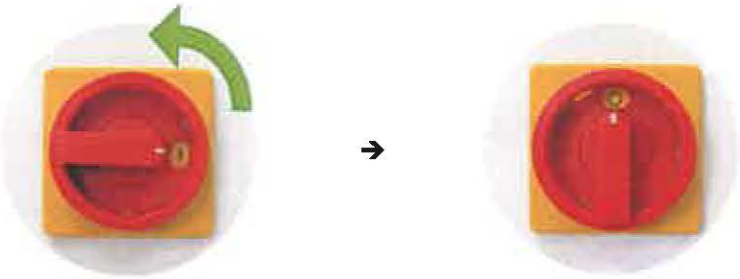


Fig. 28: Emergency shut-off switch (isolator switch)

⇨ Turning the emergency shut-off switch to position "0" must immediately cut off power supply to the machine system, that means all displays must go off and the motor, if running, must stop immediately.

If the machine system is not separated immediately and completely from power supply upon actuation of the emergency shut-off switch, the emergency shut-off switch may be defective.

⚠ CAUTION

Risk of injury in case of a defective emergency shut-off switch!

If the emergency shut-off switch is defective, the drive motor cannot be stopped quickly in case of emergency - risk of injury.

If the emergency shut-off switch is defective:

- Immediately cut off power supply to the instrument!
- Inform the Brabender Service dept. (see chapter 2 "Contact")!
- Do not start up the instrument!

2. To restart the device upon activation of the emergency shut-off switch, turn the emergency shut-off switch back to position "I".
   ⇨ The MetaBridge software restarts.
3. Press the "Start" key in order to reactivate the drive unit.
   ⇨ The "Start" key lights up again.
   ⇨ The system can now be taken into operation.

For starting, see chapter 11 "Setup and operation".

11 Setup and operation

For running and setting up the entire measuring system it is imperative to read the instruction manuals of all other system components and of the software!

11.1 Daily work before start of operation

11.1.1 MetaBridge log-in

1. Switch on the device.
   ⇨ The internal computer starts automatically.
   ⇨ After a few seconds, the log-in window appears on the touchscreen or terminal:

Fig. 29: Log-in window

2. Log in as follows:
   If you already have an account, enter your user name and password and tap "Log in".
   ⇨ The start screen appears.
   You do not have an account yet haben, tap the text "No account? Sign up now." under the field "Log in".

⇨ The log-in window appears:

Fig. 30: Log-In window

Fill in all entry fields of this window, then tap "Create".
⇨ The log-in window appears.
Enter your user name and password and tap "Log in".

⇨ The start screen appears.

11.2 Daily work before start of operation

1. If not yet done, turn on the Brabender device.
2. Check the function of the safety devices acc. to chapter 10.4 "Functional check of the safety devices".
3. Make sure that the interior of the measuring head is perfectly clean.
4. Make sure that the mixer blades and extruder screw(s), respectively, have been locked properly.
5. Make sure that all control thermocouples have been mounted properly in the respective heating zones.

   The springs of the control thermocouples must have a slight tension when locked.
6. Make sure that all control thermocouples have been connected properly to the temperature controller of the respective zone.
7. Make sure that all heater cables and heating/cooling hoses, respectively, have been connected properly and that the hoses, if equipped, are tight.
8. Prepare the loading chute/feeder of the measuring head.

   See chapter "Setup and operation" of the separate instruction manual of the measuring head.
9. **For measuring extruders (if mounted):**

   Open cooling water supply to the feed zone.
10. Start the Brabender measuring program.

11.3 Running a measurement

11.3.1 General remarks

⚠ WARNING

Risk of injury, risk of property damage!

Depending on the measuring head connected, there may be further dangerous situations to the personnel and to the machine system in addition to those mentioned in the present instruction manual!

- ➢ It is imperative to read, understand and observe the safety instructions in the separate instruction manual of the measuring head as well!

⚠ WARNING

Risk of injury, risk of property damage due to automatic start triggered by the program!

Some software programs offer the possibility of programming speed profiles. In this context, the machine system, controlled by the software, may start automatically from standstill position.

Risk of injuriy, risk of damage to or destruction of the machine system!

- ➢ Never put your hands into the open measuring head or insert any tools when the drive unit is live!
- ➢ Always pull the power plug of the drive unit before undertaking any manipulations on the open measuring head!

⚠ WARNING

Risk of injury, risk of property damage!

When the feed opening of the measuring head is open, rotating parts may be open!

When several persons work simultaneously on the device, the drive unit may be started unintentionally while another person is still working on the measuring head and rotating parts are open!

Danger of most serious injuries, entanglement hazard! Risk of damage to or destruction of the measuring head by tools!

- ➢ Never have two or more persons work simultaneously on the device!
- ➢ Never put your hands into the feed opening when the drive unit is on!
- ➢ Never work on the device with open long hair or with loose garments (tie, scarf, shawl or the like) or jewelry!

⚠ WARNING

Danger of severe burns due to hot surfaces, risk of property damage!

The surfaces of parts of the machine system can reach extremely high temperatures during operation and remain very hot even a long time after shutdown!

Danger of severe burns, danger of damage to the contact surfaces due to hot machine parts!

- ➢ Always wear suitable protective gloves when working on the machine system!
- ➢ Always ensure there is a sufficient distance for unprotected parts of your body and cables, pipelines and hose lines. Keep them away from hot surfaces!
- ➢ Do not use the machine as a storage surface!
- ➢ Deposit hot machine parts on a suitable, heat-resistant base only!
- ➢ Set up clear warning signs beside the hot machine parts in order to avoid unintentional touching by third persons!
- ➢ Guide/dispose hot product only in appropriate, heat-resistant containers!

Before starting a test with the machine system, familiarize yourself with the functions and menus of the software!

For running a measurement, please follow the instructions in the corresponding chapters of the separate instruction manuals of the measuring head, of the Brabender measuring program and of the additional equipment, if equipped.

12 Cleaning

The instrument does not need any special cleaning. In order to provide for proper operation of the entire system, it must, however, always be kept clean and dry.

For cleaning the measuring head, please refer to the separate instruction manual of the measuring head.

13 Maintenance

13.1 Safety notes concerning maintenance

NOTICE

Risk of property damage due to improper maintenance!

➢ Maintenance work on the Brabender instrument is only to be carried out by instructed personnel!

To ensure a correct maintenance of the Brabender instrument, the Brabender Service offers a maintenance contract to be purchased.

Please contact the Brabender Service department to do so (see chapter 2 "Contact").

13.2 Bearings

The instrument has got a lifetime lubrication. It is not necessary to exchange any lubricants.

Nevertheless, even bearings with lifetime lubrication are subject to aging. The service life of the motor and gear bearings under normal operating conditions is about 15,000 operating hours.

NOTICE

Risk of property damage due to leakage or wear!

Leaks on the bearings may cause damage to the bearings! Wear on the bearings causes damage to the machine!

➢ If any leakage is detected, switch off the device immediately and do not start it again!

➢ Immediately inform the Brabender Service dept. (see chapter 2 "Contact")!

➢ Have the bearings checked every 15,000 operating hours at the latest by a Brabender service technician!

13.3 Fan(s)

13.3.1 Position, function

On the terminal side of the device, two fans are mounted behind the ventilation grille for aeration of the motor and the electronics. Fresh air from outside is taken in through the ventilation grille on the right side which is blown out again by the fans through the ventilation grille on the terminal side (see fig. below).

The filter mats behind the two ventilation grilles need to be checked for contamination in regular time intervals in order to provide for sufficient aeration of the motor and the electronics.

NOTICE

Risk of property damage due to insufficient motor ventilation!

A contaminated filter mat may affect ventilation of the electrics and of the motor! Insufficient ventilation of the electrics and of the motor may cause overheating and, as a consequence, damage to the electrics and motor shut-off!

- ➢ Depending on the ambient conditions, check function of the fan(s) in regular time intervals, but not later than once per month!
- ➢ Clean the filter mat of the air supply ventilation grille at least once per month and replace it, if necessary!
- ➢ In case of a defective fan, immediately shut off the device and do not start it again!

Fig. 31: Position of filter fan and ventilation grilles

1 Ventilation grille with 2 air exhaust filter fans

2 Air supply ventilation grille

13.3.2 Checking the filter mat

1. Press onto the pressure point(s) of the ventilation grille in order to release it.
2. Dismantle the ventilation grille laterally.

Fig. 32: Dismantling the ventilation grille (example)

1 Ventilation grille
2 Pressure point
3 Filter mat

3. Remove the filter mat from the ventilation grille.
4. In case of normal contamination:
   - ➢ Carefully rinse the filter mat with clear water. If necessary, add some mild detergent.
   - ➢ Have the filter mat dry completely.

   In case of strong contamination:
   - ➢ Replace the filter mat.
5. Visually check the fan(s) behind the ventilation grille on the terminal side for contamination.
6. In case of visible contamination, clean the fan(s) with a vacuum cleaner and a paintbrush.
7. Put the cleaned or new filter mat onto the ventilation grille.
8. Remount the ventilation grille and press to lock it.
9. Check the function of the fan(s) by means of a thin sheet of paper:
   - ➢ Hold the paper close to the air supply grille - the paper must be sucked towards the grille and must not fall down.

   If there is no air current, the respective fan may be defective. In this case, please contact the Brabender Service department (see chapter 2 "Contact").

14 Trouble-shooting

This chapter lists some possible troubles which may occur during operation of the Brabender instrument and measures to be taken to eliminate these troubles.

⚠ WARNING

Danger to life from electric shock, risk of damage to the instrument!

Improper maintenance may damage or destruct the instrument. Improper handling of electric components implies danger to life or the risk of most serious injuries by direct or indirect contact to live parts or contacts!

- Work on electrical equipment is only to be carried out by authorized electricians!
- Maintenance work exceeding the work described in the present instruction manual or requiring opening of the instrument is only to be carried out by a Brabender service technician!
- Before opening the instrument or doing any other electric work, always disconnect the power plug!

⚠ WARNING

Danger of severe burns due to hot surfaces, risk of property damage!

The surfaces of parts of the machine system can reach extremely high temperatures during operation and remain very hot even a long time after shutdown!

Danger of severe burns, danger of damage to the contact surfaces due to hot machine parts!

- Always wear suitable protective gloves when working on the machine system!
- Always ensure there is a sufficient distance for unprotected parts of your body and cables, pipelines and hose lines. Keep them away from hot surfaces!
- Do not use the machine as a storage surface!
- Deposit hot machine parts on a suitable, heat-resistant base only!
- Set up clear warning signs beside the hot machine parts in order to avoid unintentional touching by third persons!
- Guide/dispose hot product only in appropriate, heat-resistant containers!

No.	Error	Cause/measure
1	**Device cannot be started**	**Cause:** ● Wrong supply voltage ● No power supply ● Emergency motor stop button activated (lights) ● Emergency shut-off switch (isolator switch) in position "0" ● CAN cable not properly connected (CAN-IN and CAN-OUT and/or no terminal resistor plugged onto CAN-OUT connection) ● Safety switch of the measuring head not connected ● Motor overheated ● Fuse released or defective ● Inverter error **Measures:** 1. Check whether the supply voltage matches the data on the name plate. 2. Check whether the power plug of the machine has been connected properly to a power supply outlet with protection contact. 3. Ensure that the isolator switch is in position "I". 4. Check whether the emergency motor stop button has been actuated (pressed down) by drawing the emergency motor stop button upwards. The emergency motor stop button lights when actuated (pressed down). 5. Check whether the CAN connection cables have been connected properly to the connections CAN-IN and CAN-OUT of all CAN modules or, if the device MetaStation-4E is the last CAN module in the system, check whether the terminal resistance has been plugged onto the connection CAN-OUT of the device (see also chapter 9.5.3 "CAN connection"). 6. Check whether the cable of the safety device of the measuring head has been connected properly to the connection "Safety Device" on the front side of the instrument. 7. Check whether the cable of the automatic torque limitation of the measuring head has been connected properly to the connection "Torque limit key". 8. **In case of operation with a measuring mixer:** Make sure that the two plugs of the two-hand control device have been connected properly to the corresponding connections "2-Hand Safety Device".

No.	Error	Cause/measure

[1] *[continued]*

⚠ WARNING

Danger to life, risk of injury due to voltage leading parts!

When access to the electric modules is open and the isolator switch is on, live parts are open!

- ➢ Work on electrical equipment is only to be carried out by authorized electricians!
- ➢ Never touch any modules inside the instrument as long as the instrument is switched on!
- ➢ As long as power supply to the instrument is on, functional checks of electric or electronic modules inside the instrument are only to be carried out visually and only by authorized electricians!

9. Dismantle the ventilation grille and the filter mat on the right side in order to check the electric components inside.

   See chapter 13.3.2 "Checking the filter mat".

10. Unscrew the fixing screws of the protective grille and remove it.

    ⇨ The HBM load cell, the safety relay, the power pack ant the overload release are now visible.

Fig. 33: Electric modules behind the ventilation grille

1	*HBM load cell*	*4*	*Power pack*
2	*LED on the HBM load cell*	*5*	*LED "DC ok" on the power pack*
3	*Safety relay*	*6*	*Overload release*

11. Check the HBM load cell: The LED in the left top must light in yellow.
12. Check the power pack: The LED "DC ok" must light in green (see fig. above).
13. Check the overload release: The switches must show to the top.
14. Check the safety relay: Depending on the instrument state, the LEDs on the safety relay must light as shown in the following schematics.

    = on = off

    If the LEDs on the safety relay do not light as shown in the following schematics, please contact the Brabender Service (see chapter 2 "Contact").

No.	Error	Cause/measure
[1]	*[continued]*	

Status with measuring mixer type 50 EHT:

- Power plug of the drive unit connected
- Isolator switch in position "I"
- Emergency motor stop button NOT pressed (button does not light)
- "Start" key pressed (the "Start" key lights)
- Connection "Safety Device" plugged in
- Connection "Torque limit key" plugged in
- Connection "2-Hand Safety Device" plugged in

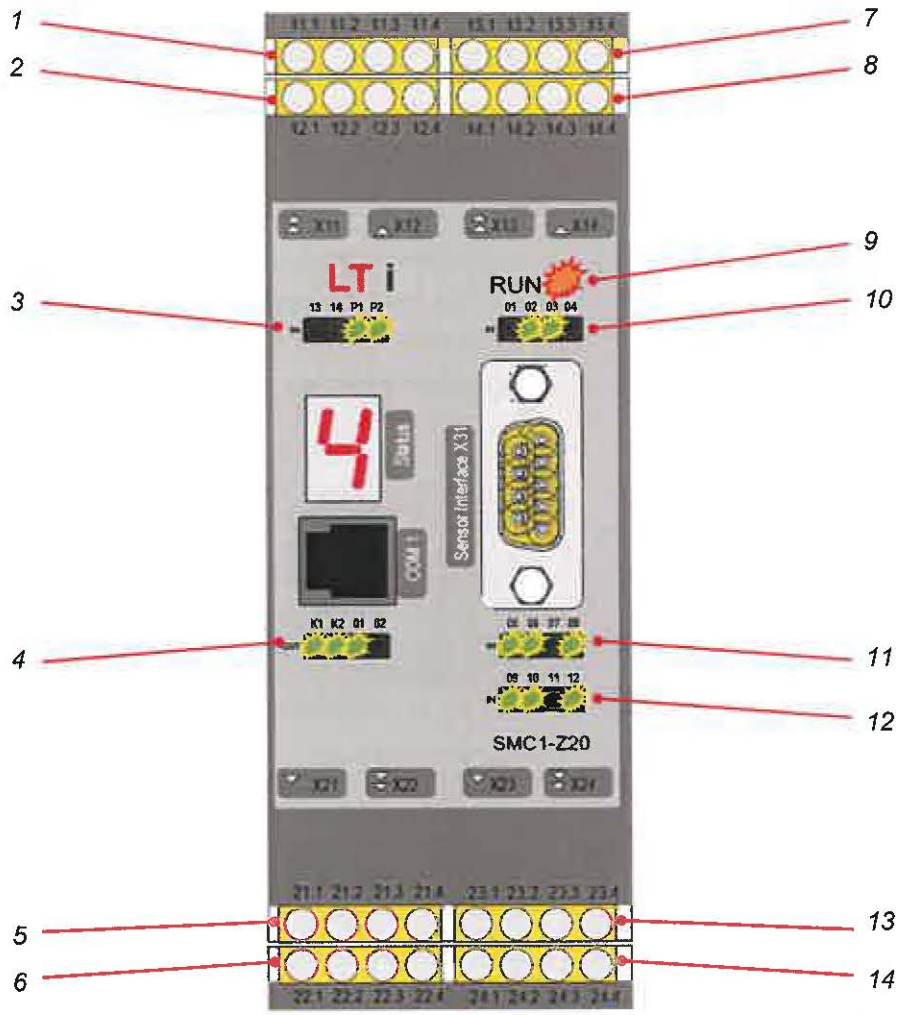


Fig. 34: Correct status display on the safety relay with meas. mixer type 50 EHT

1	*X11*
2	*X12*
3	*(X12) IN 13 14 P1 P2*
4	*OUT K1 K2 01 02 (X22) (X21)*
5	*X21*
6	*X22*
7	*X13*
8	*X14*
9	*RUN (must flash in yellow)*
10	*IN 01 02 03 04 (X14)*
11	*IN 05 06 07 08 (X23)*
12	*IN 09 10 11 12 (X24)*
13	*X23*
14	*X24*

No.	Error	Cause/measure

[1] *[continued]*

Status with measuring extruder 19/25 D:

- Power plug of the drive unit connected
- Isolator switch in position "I"
- Emergency motor stop button NOT pressed (button does not light)
- "Start" key pressed (the "Start" key lights)
- Connection "Safety Device" plugged in
- Connection "Torque limit key" plugged in

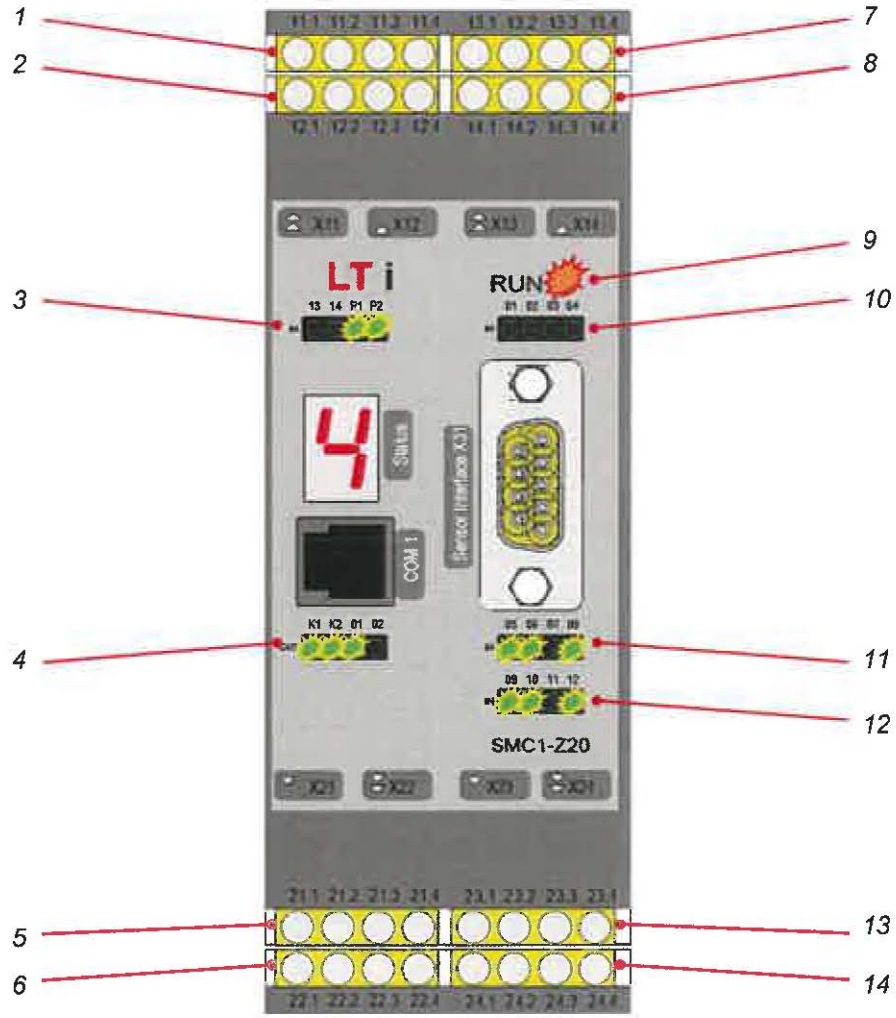


Fig. 35: Correct status display on the safety relay with meas. extruder 19/25 D

1 X11
2 X12
3 (X12) IN 13 14 P1 P2
4 OUT K1 K2 01 02
(X22) (X21)
5 X21
6 X22
7 X13
8 X14
9 RUN (must flash in yellow)
10 IN 01 02 03 04 (X14)
11 IN 05 06 07 08 (X23)
12 IN 09 10 11 12 (X24)
13 X23
14 X24

No.	Error	Cause/measure

[1] *[continued]*

15. Check the over-/undervoltage relay: The green one of the three status LEDs must light.

    Glowing of the left one of the two red LEDs ("<U") indicates low voltage, glowing of the right one of the two red LEDs (">U") indicates high voltage.

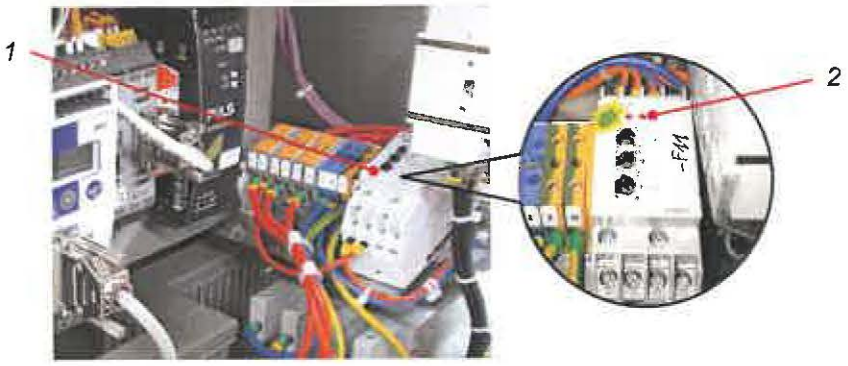


Fig. 36: Over-/undervoltage relay

1 Over-/undervoltage relay 2 Status LEDs

16. If all of these checks were positive, remount the protective grille and fix it with the four screws.
17. Remount the ventilation grille with the filter mat and press to lock it.
18. Unscrew and remove the four screws fixing the cover of the device on the rear side in order to get access to further electric and electronic modules.

⚠ CAUTION

Danger of injury by falling cover!

The cover is just clamped on the front side and cannot be secured when open.

Danger of injury, risk of property damage by a falling cover!

- ➢ Use both of your hands to open the cover!
- ➢ Do not open the cover too far in order to prevent it from tipping over and falling down!
- ➢ Grip the cover with both of your hands when opening it and holding it open in order to prevent it from slipping off and falling down!

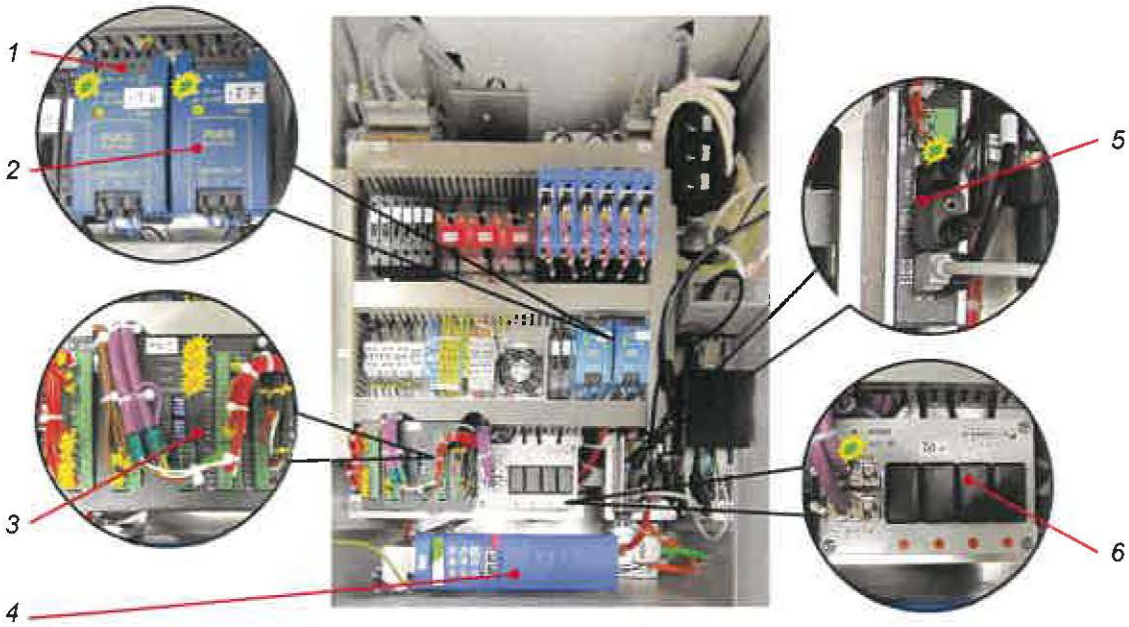
No.	Error	Cause/measure

[1] *[continued]*

19. Grip the cover with both of your hands and tilt it open with care.

    There is a recess on the rear side of the cover to facilitate opening.

    ⇨ The inverter and other electric and electronic modules are now visible (see fig. below).



Fug. 37: Electronic modules under the cover

1	*CAN-Bus power pack (24 V)*	*4*	*Inverter*
2	*Power pack internal PC (5 V)*	*5*	*USB hub*
3	*Temperature controller*	*6*	*Melt temperature module*

20. Check the inverter: In case of an error, the inverter display shows a clear text error message and an error code.

    In case of an error, please contact the Brabender Service department and state this error code.

    Please also refer to the separate instruction manual of the inverter.

21. Check the two power packs of the CAN bus (left, 24 V) and of the internal PC (right, 5 V): The LEDs "DC ok" must light in green on both power packs.

22. Check the temperature controller module: The LED "Power" must light in yellow, the LEDs "Run" and "Bus" must flash in yellow.

23. Check the melt temperature module: The LED "ON CAN" must light in green.

24. Check the USB hub prüfen: The LED "PWR" must light in green.

15 Repair

⚠ WARNING

Risk of injury, risk of property damage!

Improper repair work may lead to the danger of injury to the personnel and the risk of damage to the instrument!

➢ Repair work on the Brabender instrument is only to be carried out by Brabender service technicians or by skilled personnel authorized for this work by Brabender!

If the Brabender instrument needs to be repaired, please contact the Brabender Service department.

Brabender GmbH & Co. KG
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Germany
☎ Phone +49-203-7788-131
✉ E-mail: service@brabender.com

North American Regions
C.W. Brabender Instruments, Inc.
50 East Wesley Street
South Hackensack, New Jersey 07606
USA
☎ Phone 201-343-8425
✉ E-mail: service@cwbrabender.com

16 Disposal

The owner of the instrument is responsible for ecologically sound disposal of the Brabender instrument or of parts thereof.

In case of a necessary disposal of the Brabender instrument or of parts thereof, we recommend entrusting an authorized disposal company with the disposal of the machine/machine parts to make sure that the local regulations concerning collection, recycling, and disposal as well as those concerning documentation are observed.

17 Annex

17.1 Accessories, spare parts, additional equipment

For accessories, spare parts and additional equipment, please contact the Brabender Service in case of need.

Brabender GmbH & Co. KG
Kulturstraße 49 - 51
47055 Duisburg
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☎ Phone +49-203-7788-131
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North American Regions
C.W. Brabender Instruments, Inc.
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🖃 E-mail: service@cwbrabender.com

17.2 Electrical documents, wiring diagrams

The electrical documents and wiring diagrams of the Brabender instrument are included separately in the scope of delivery.

17.3 Electric interferences

The close arrangement of electric instruments in an electrically disturbed environment may cause electric interferences on the power supply connection which require potential equalization.

Example no. 1: Potential equalization with separate ground cables (for separate wall outlets or separate distribution boxes)

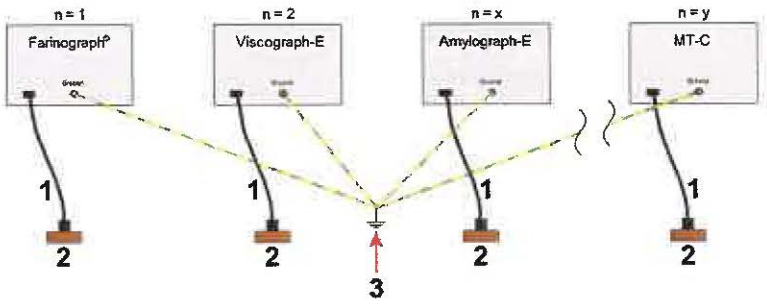

Fig. 38: Potential equalization with separate ground cables

1 Power cord
2 Wall outlet
3 Connect ground cable for potential equalization

Example no. 2: Potential equalization without separate ground cable (with a single, common power outlet extension)

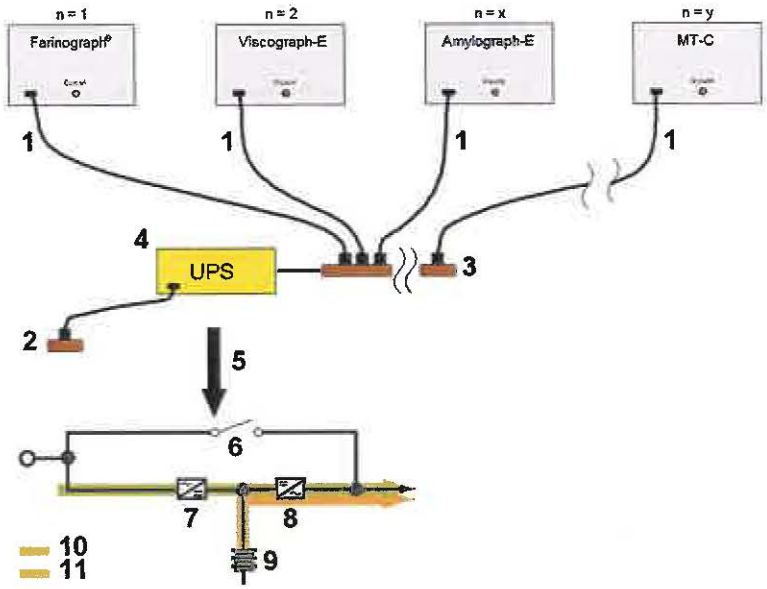

Fig. 39: Potential equalization with common power outlet extension

1 Power cord
2 Wall outlet
3 Potential equalization with power outlet extension
4 UPS: if required, for weak power supply grid
5 IMPORTANT: Use double-conversion UPS!
6 Internal static bypass
7 AC to DC rectifier
8 DC to AC inverter
9 Battery
10 Normal operation
11 Battery power

Example no. 3: Potential equalization with separate ground cables (for different voltages and separate wall outlets)

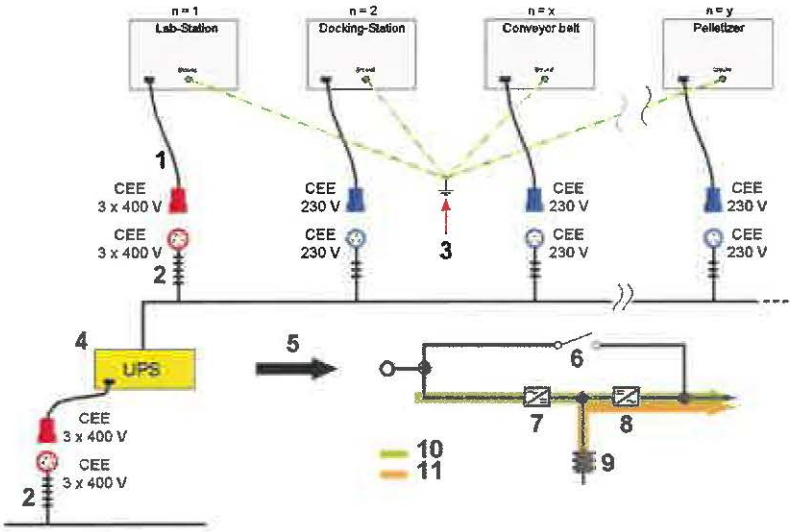

Fig. 40: Potential equalization with separate ground cables

1	*Power cord*	*6*	*Internal static bypass*
2	*Wall outlet*	*7*	*AC to DC rectifier*
3	*Connect ground cable for potential equalization*	*8*	*DC to AC inverter*
		9	*Battery*
4	*UPS: if required, for weak power supply grid*	*10*	*Normal operation*
		11	*Battery power*
5	*IMPORTANT: Use double-conversion UPS!*		

18 Index

Device 815670 MetaStation 4E

Brabender®

Order:

Brabender® GmbH & Co. KG

Kulturstr. 49-51 47055 Duisburg Germany

Phone:+49 -203 -7788 -0 brabender@.brabender.com

Product	MetaStation 4E							
Model	815670	SN		YoM				
V	3 x 400V +N+PE	Hz	50/60	KW	6,5	A	10	
Diagram	815670E000-04	185 1/min						

CE

				Datum	22.06.2020	Brabender®	Deckblatt Cover sheet	Baugruppe	815670
				Bearb.	P.Hommes				
				Gepr.				Zeichnungs-Nr.	815670E000-04
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4	Power supply	Wiring Diagram				3.0_Stromlaufplan
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Brabender®

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Zeichnungs-Nr. 815670E000-04

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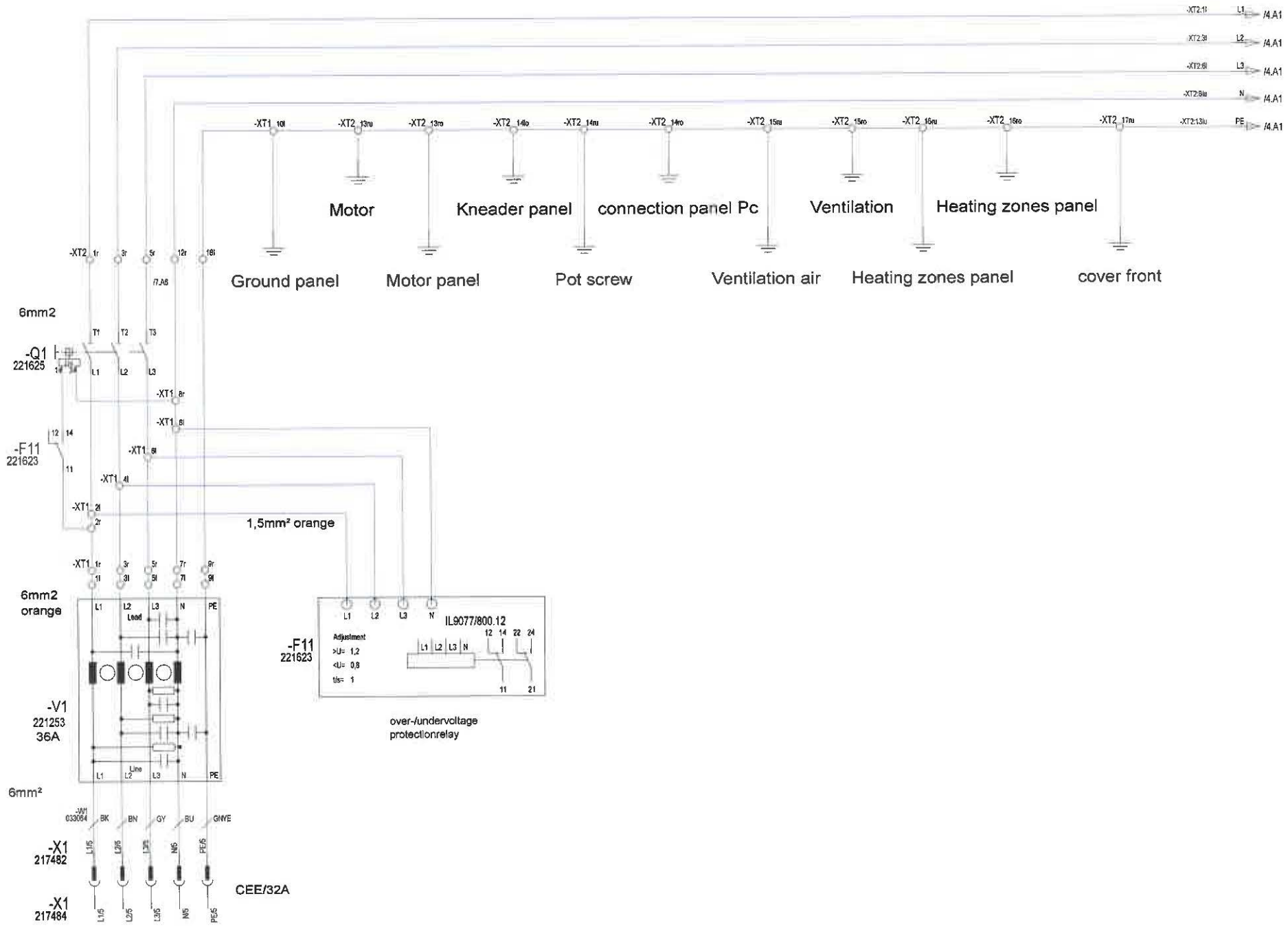

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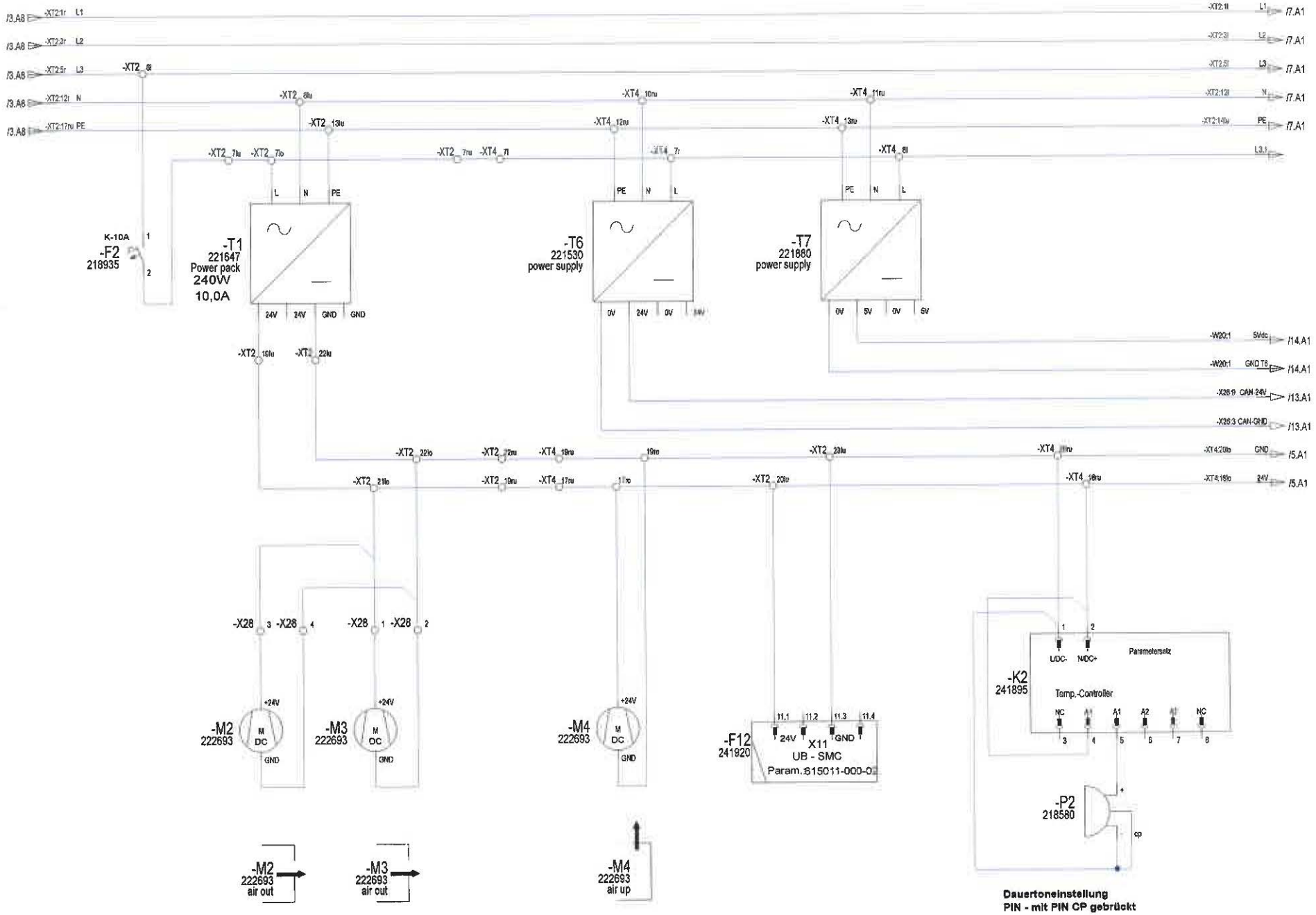

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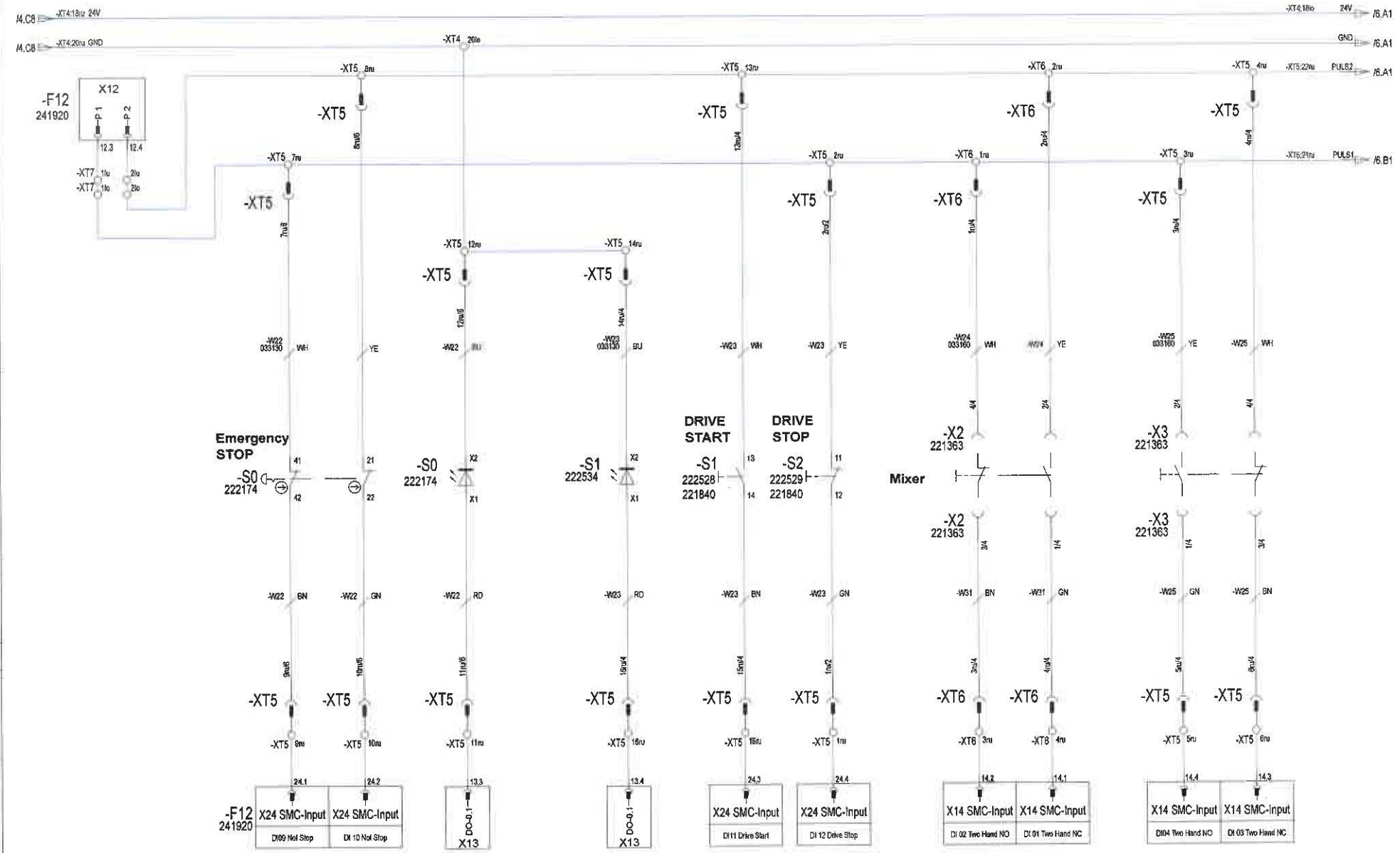

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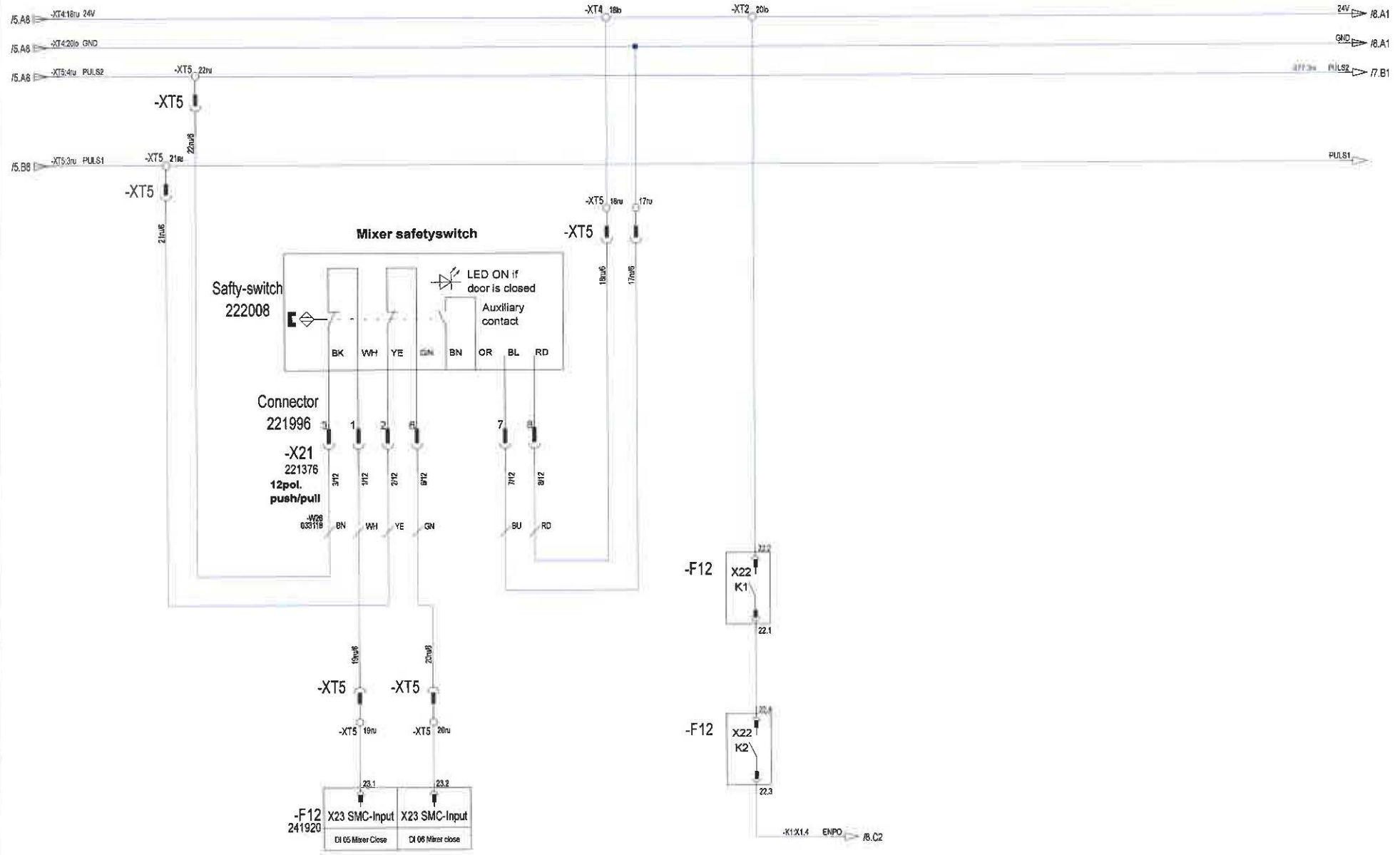

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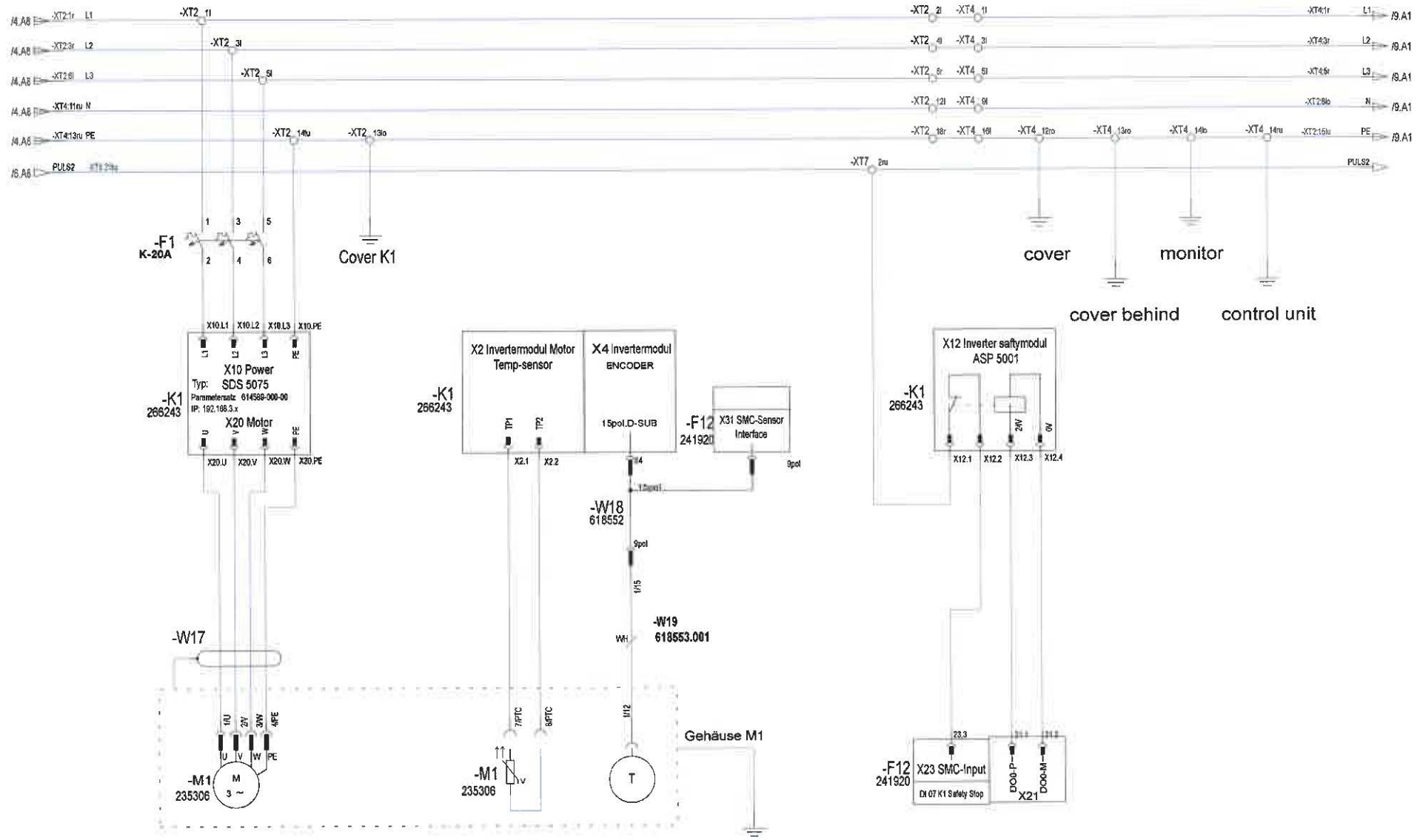

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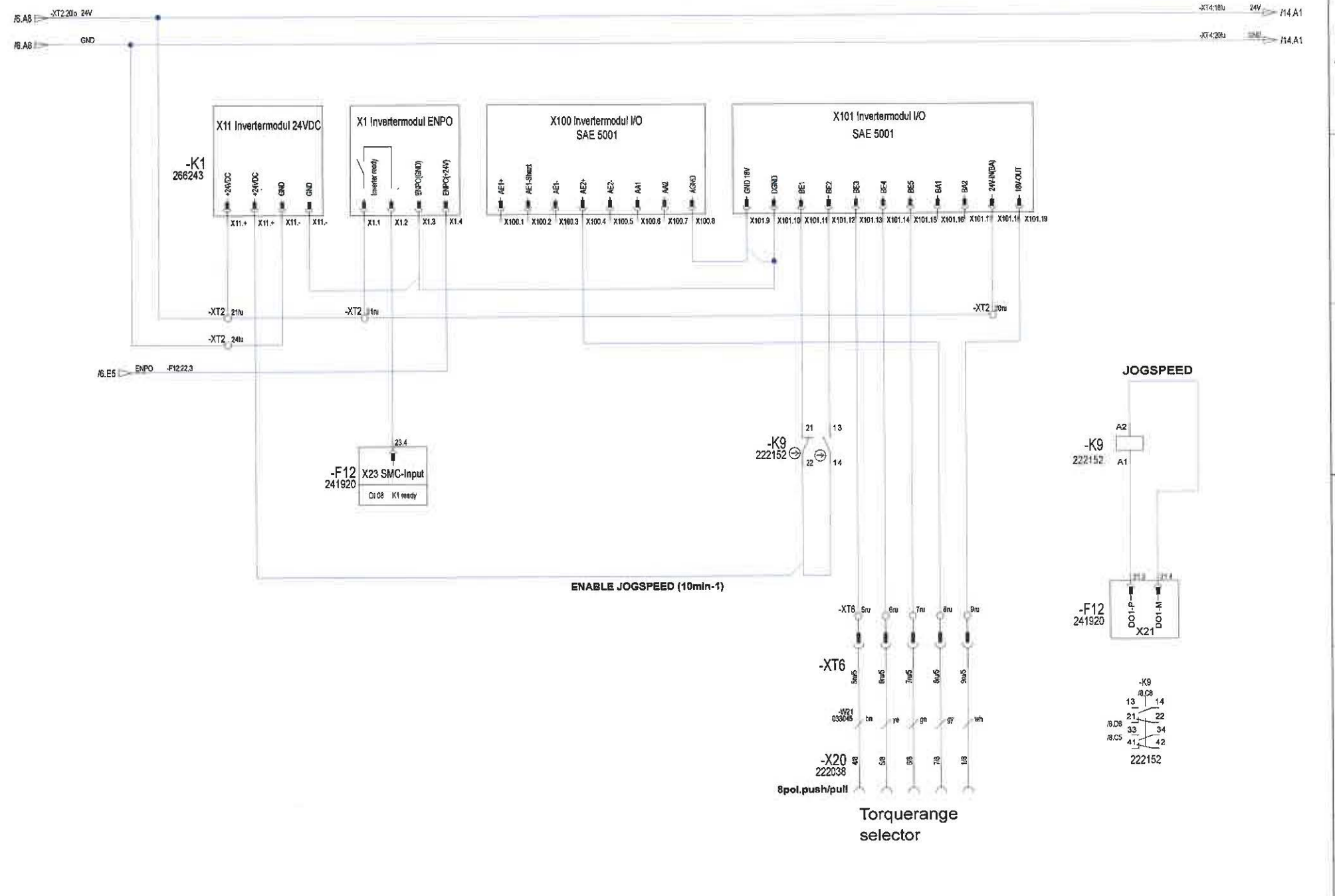
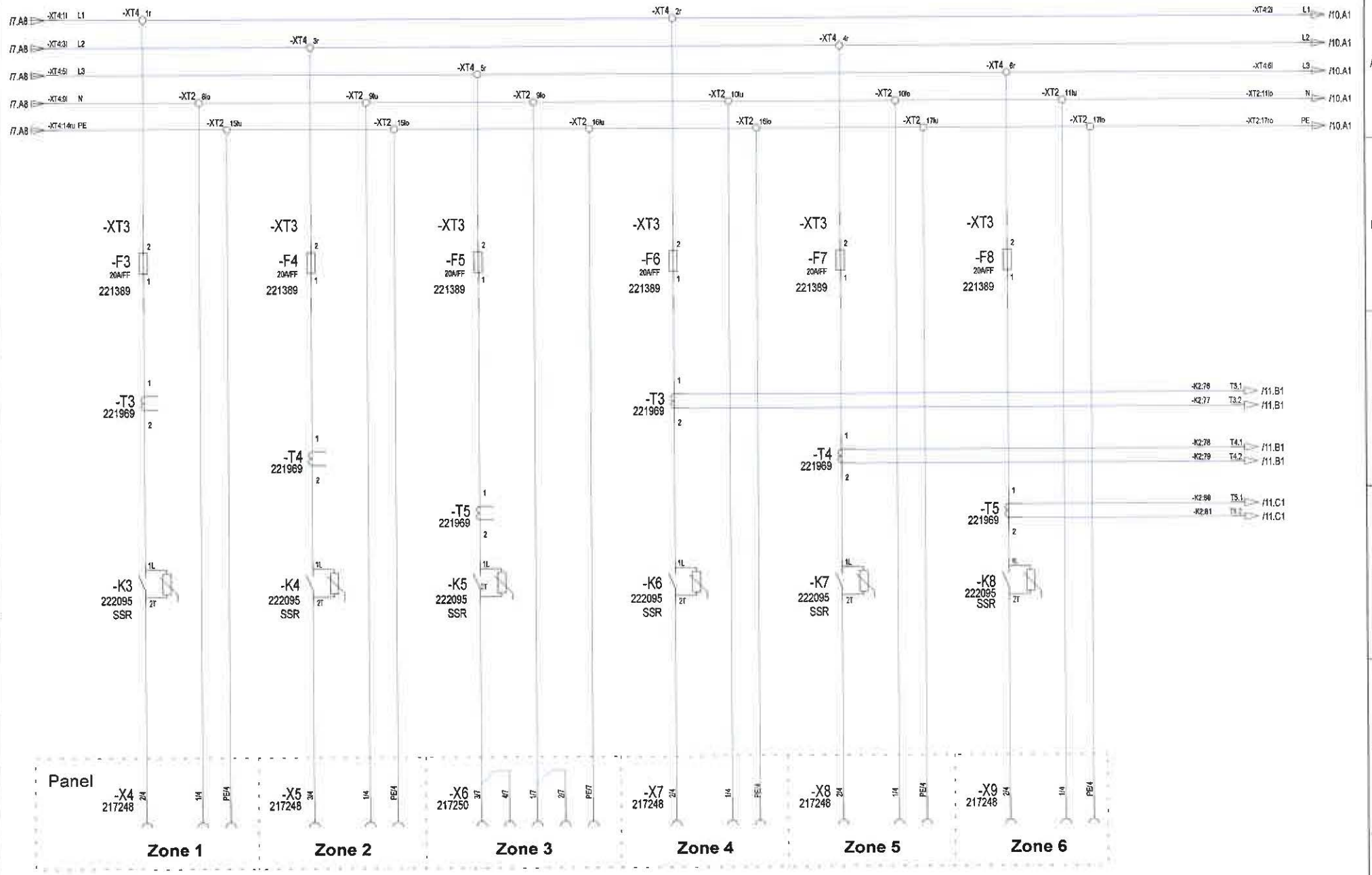
				Gepr.				Zeichnungs-Nr:	815670E000-04	Blatt	7
Zustand	Änderung	Datum	Name	Norm		Urspr.	Ers. f.	Ers. d.		Bl.-Anzahl	20



				Datum	22.06.2020	Brabender®	Speed controller Wiring Diagramm	Baugruppe	815670
				Bearb.	P.Hommes				
				Gepr.				Zeichnungs-Nr.	815670E000-04
Zustand	Änderung	Datum	Name	Norm		Urspr.	Ers. f.	Ers. d.	Blatt 6 / Bl.-Anzahl 20



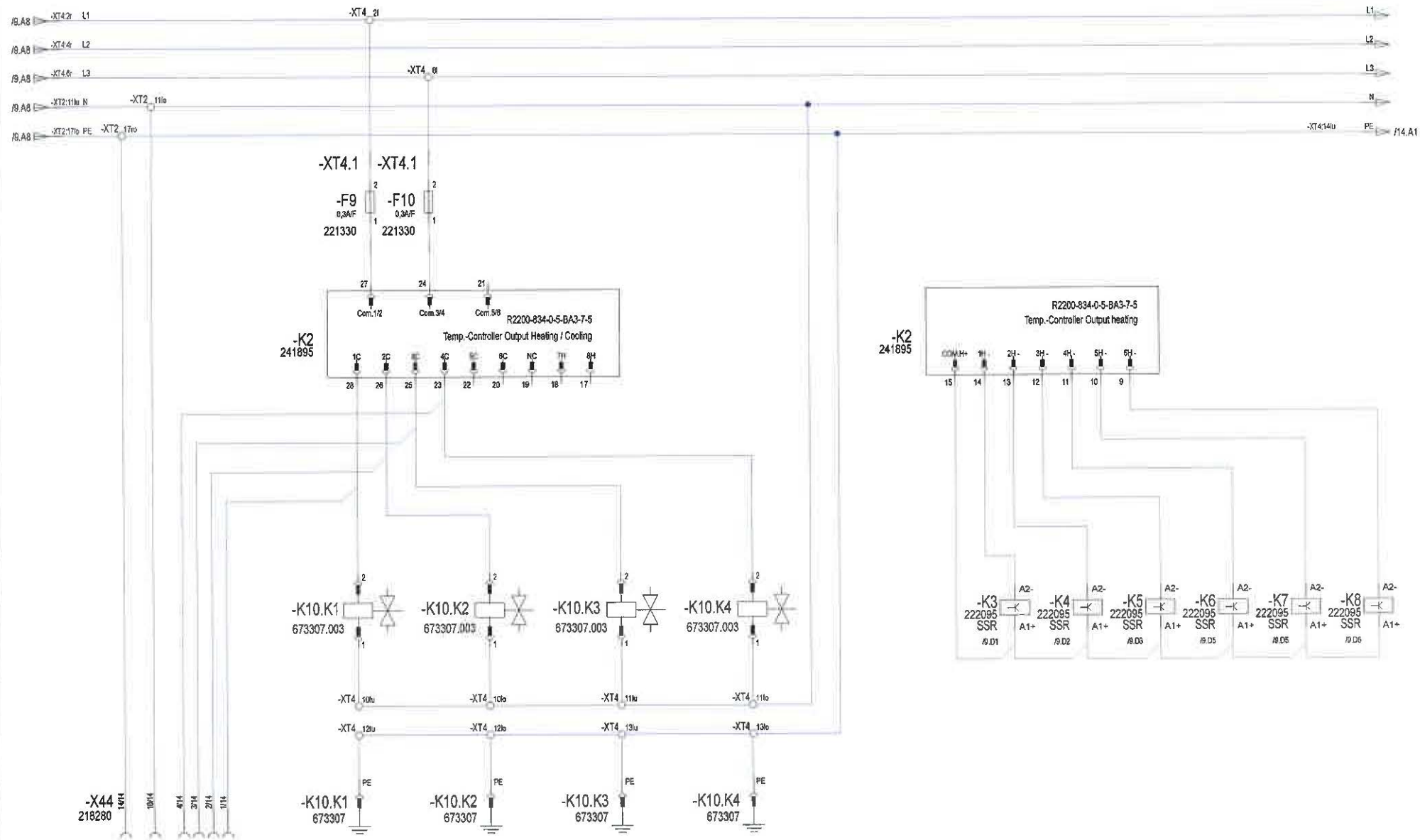
Zustand	Änderung	Datum	Name	Norm
		Datum	22.06.2020	
		Bearb.	P.Hommes	
		Gepr.		

Ursp. Ers. f. Ers. d.

Brabender®

Temperature controller
Wiring Diagramm

Baugruppe	815670
Zeichnungs-Nr.	815670E000-04
Blatt	9
Bl.-Anzahl	20



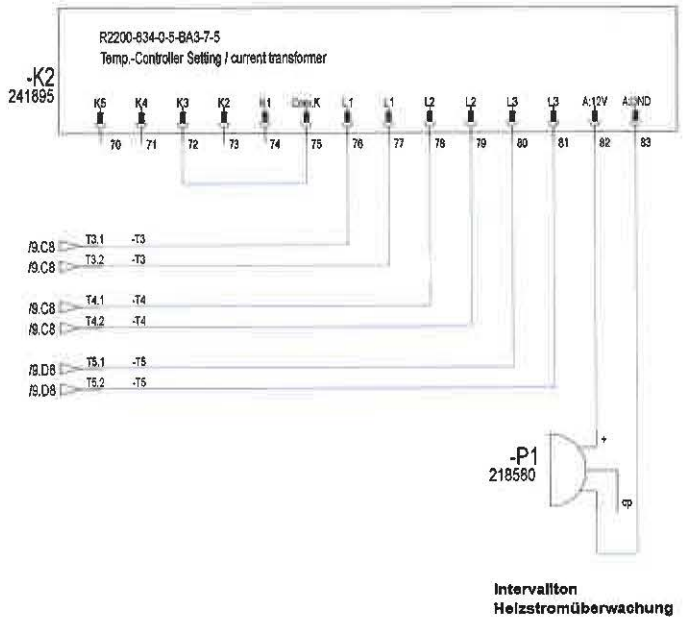
Zustand	Änderung	Datum	Name	Norm	Datum	22.06.2020
					Bearb.	P.Hommes
					Gepr.	

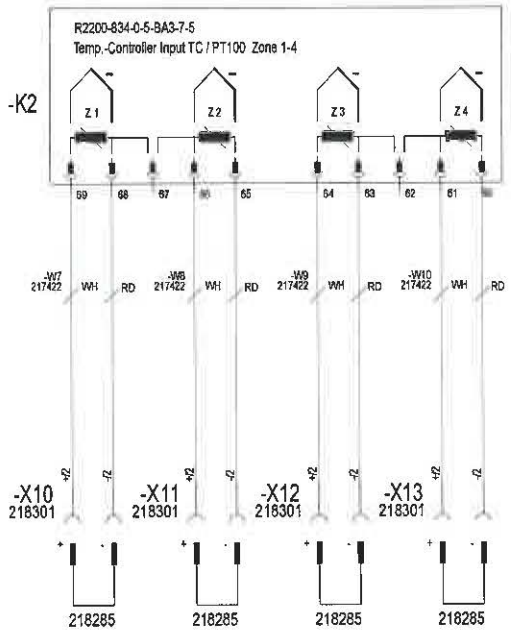
Ursprung | Ers. f. | Ers. d.

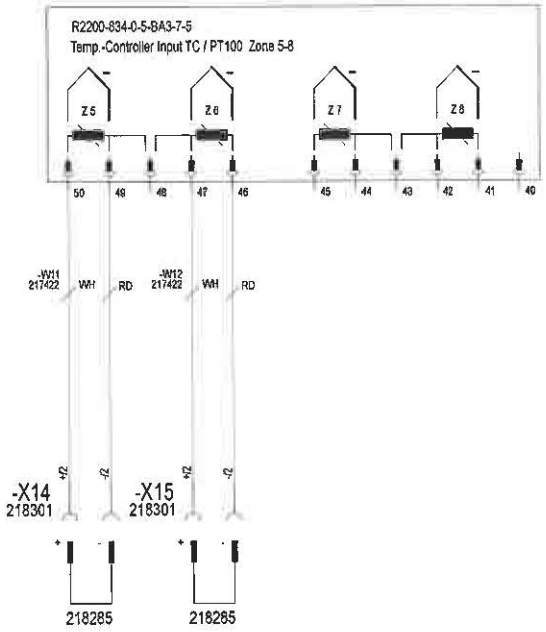
Brabender®

Temperature controller
Wiring Diagramm

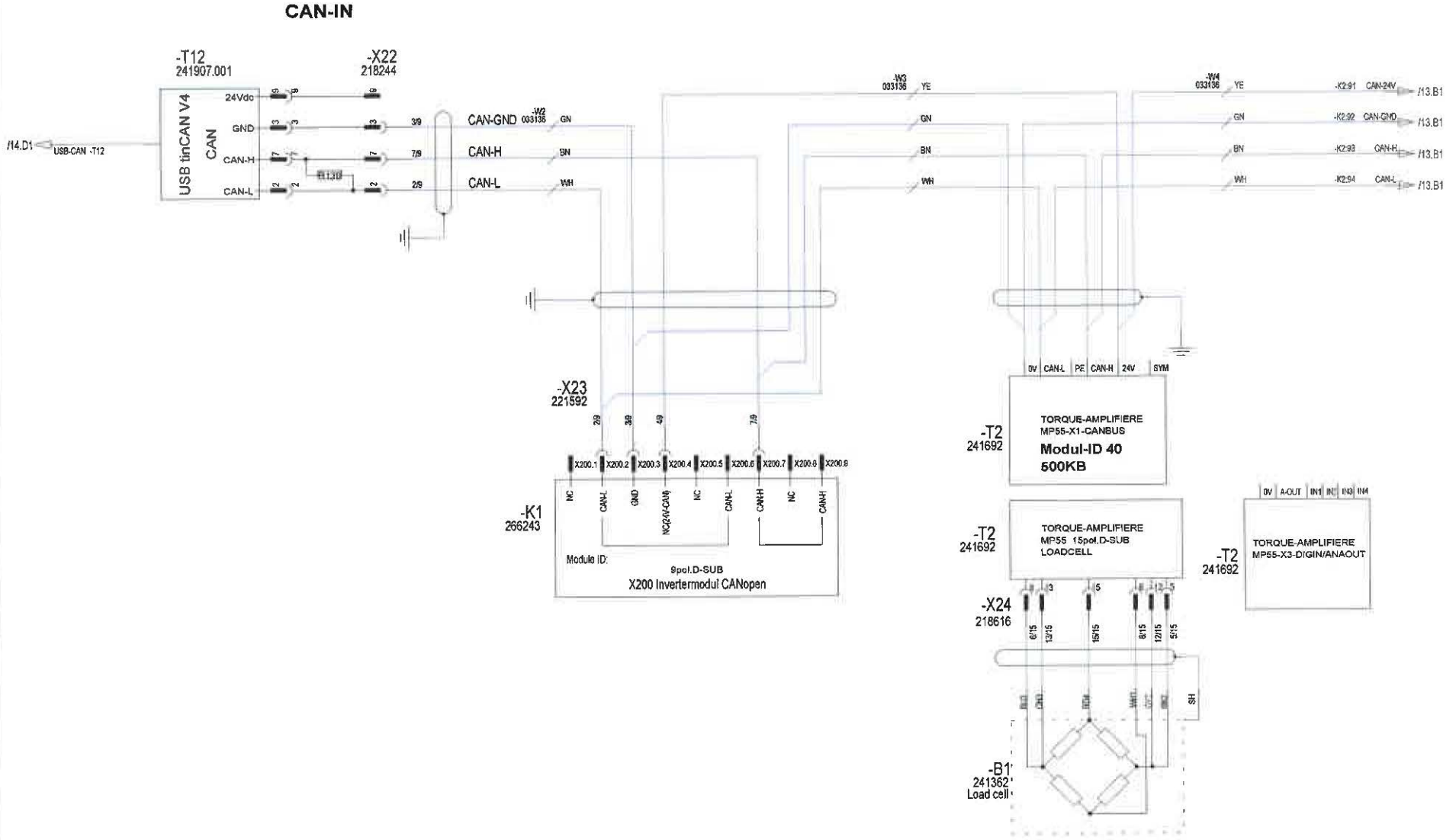
Baugruppe	815670
Zeichnungs-Nr.	815670E000-04
Blatt	10
Bl.-Anzahl	20







				Datum	22.06.2020	Brabender®	Stocktemperature measurement Wiring Diagramm	Baugruppe	815670
				Bearb.	P.Hommes				
				Gepr.				Zeichnungs-Nr.	815670E000-04
Zustand	Änderung	Datum	Name	Norm		Urspr.	Ers. f.	Ers. d.	Blatt 11 / Bl.-Anzahl 20

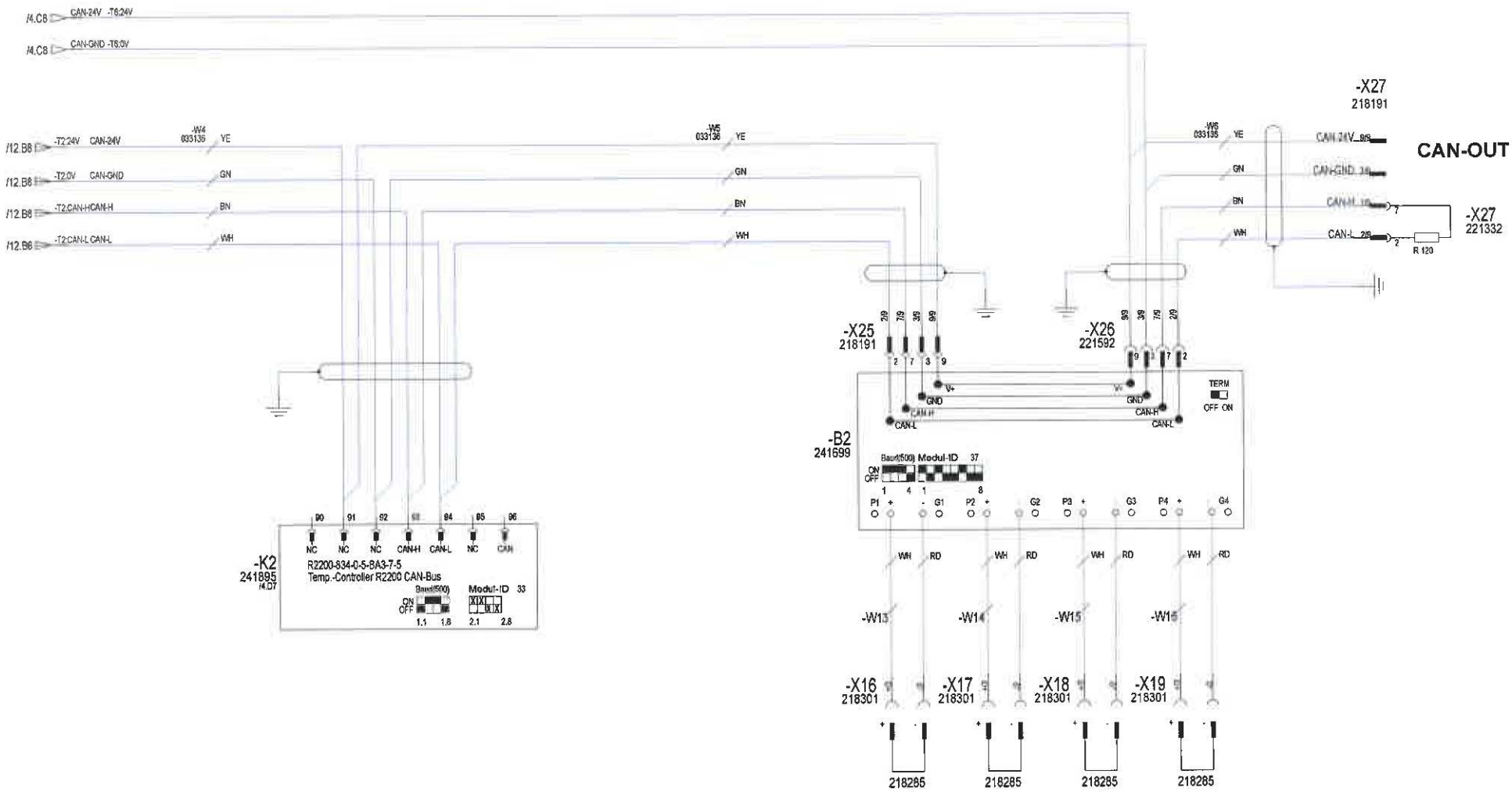


Zustand	Änderung	Datum	Name	Norm	Datum 22.06.2020	Bearb. P.Hommes	Ursprung	Ers. f.	Ers. d.

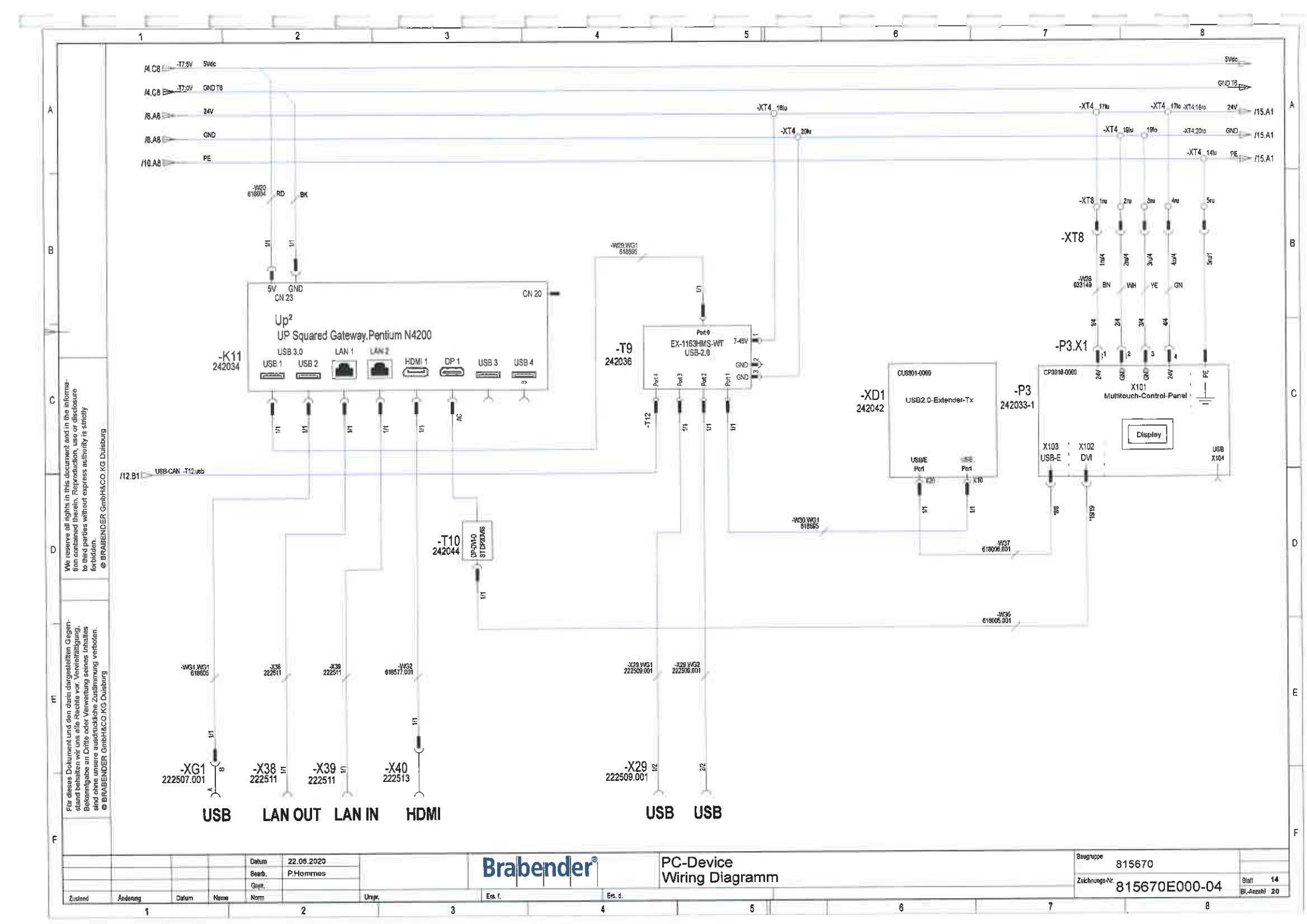
Brabender®

CAN-Bus and Torque measurement
Wiring Diagramm

Baugruppe 815670
Zeichnungs-Nr. 815670E000-04
Blatt 12
Bl.-Anzahl 20



				Datum	22.06.2020	Brabender®	CAN-Bus and Torque measurement Wiring Diagramm	Baugruppe 815670
				Bearb.	P.Hommes			
				Gepr.				Zeichnungs-Nr. 815670E000-04
Zustand	Änderung	Datum	Name	Norm		Urspr.	Ers. f.	Ers. d.	Blatt 13 Bl.-Anzahl 20

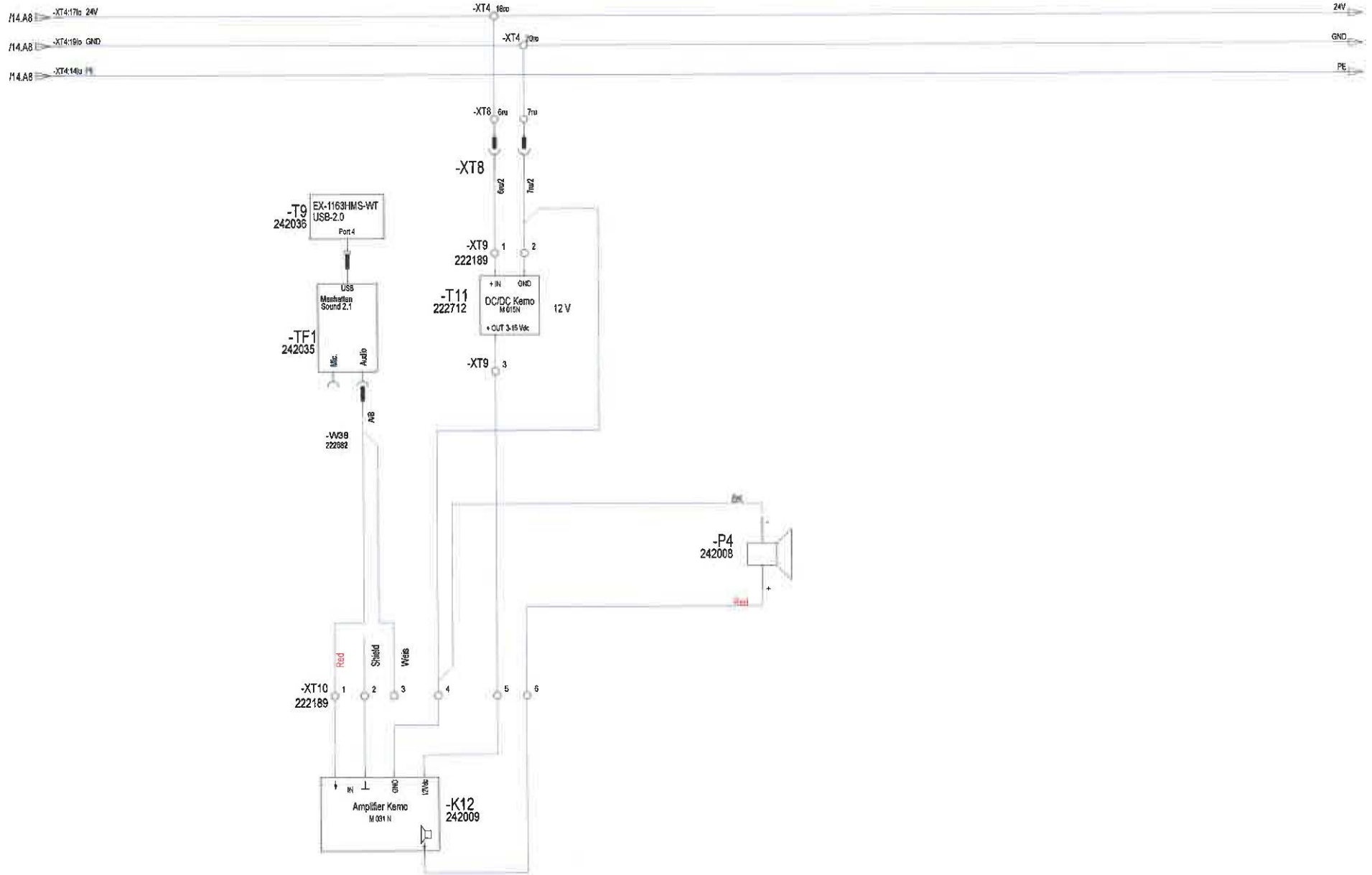


Zustand	Änderung	Datum	Name		
		Datum	22.06.2020		
		Bearb.	P.Hommes		
		Gepr.			
		Norm			

Brabender®

PC-Device
Wiring Diagramm

Baugruppe	815670
Zeichnungs-Nr.	815670E000-04
Blatt	14
Bl.-Anzahl	20



				Datum	22.06.2020	Brabender®	PC-Device Wiring Diagram	Baugruppe 815670
				Bearb.	P.Hommes			
				Gepr.				Zeichnungs-Nr. 815670E000-04
Zustand	Änderung	Datum	Name	Norm		Urspr.	Ers. f. / Ers. d.	Blatt 15 / Bl.-Anzahl 20

Components

POS.	assembly	location	device designations	component	description	supplier	page / path
1			-B1	241362	Load cell Z6 200KG	Hottinger Baldwin	/12.E6
2			-B2	241699	Stock temperatur Modul µCAN 4.ti; 4 channel	Micro Control	
3			-F1	222023	automatic circuit breaker 3 pol 20A Type S203P-K 20	ABB Stotz	/7.B2
4			-F2	218935	automatic circuit breaker 1 pol 10A Type S281-K10	ABB Stotz	/4.B2
5			-F3	221389	Fuse 6,3x32 20A ultra fast	Schurter	/9.B2
6			-F4	221389	Fuse 6,3x32 20A ultra fast	Schurter	/9.B3
7			-F5	221389	Fuse 6,3x32 20A ultra fast	Schurter	/9.B3
8			-F6	221389	Fuse 6,3x32 20A ultra fast	Schurter	/9.B5
9			-F7	221389	Fuse 6,3x32 20A ultra fast	Schurter	/9.B6
10			-F8	221389	Fuse 6,3x32 20A ultra fast	Schurter	/9.B7
11			-F9	221330	Fuse 6,3x32 0,3A fast acting	Schurter	/10.B3
12			-F10	221330	Fuse 6,3x32 0,3A fast acting	Schurter	/10.B3
13			-F11	221623	Over- and undervoltage relay IL 9077.12/800	Dold	/3.D3
14			-F12	241920	SMC-Z20 Safety controller w. sensor interface	LT-i Motion GmbH	/4.E5
15			-K1	266243	servo-controller Stöber SDS5075/L 7,5KVA/10A/3x400V	Stöber	
16			-K2	241895	Elotech R2200 8 Zonen Temperatur controller 6x H/C; 2X H; 24	Elotech	/4.D7
17			-K3	222095	Solid state Relay SUL967460-K 230-600V/25A	Celduc	/10.D6
18			-K4	222095	Solid state Relay SUL967460-K 230-600V/25A	Celduc	/10.D7
19			-K5	222095	Solid state Relay SUL967460-K 230-600V/25A	Celduc	/10.D7
20			-K6	222095	Solid state Relay SUL967460-K 230-600V/25A	Celduc	/10.D7
21			-K7	222095	Solid state Relay SUL967460-K 230-600V/25A	Celduc	/10.D8
22			-K8	222095	Solid state Relay SUL967460-K 230-600V/25A	Celduc	/10.D8
23			-K9	222152	Safety-Relaymodul RM-24V-2Ö/2S	APPOLDT GmbH	/8.C7
24			-K10	673307.003			
25			-K11	242034	UP Squared Gateway.Pentium N4200	AAEON Technology	/14.B2
26			-K12	242009	Kemo Amplifier M031N	Kemo Elektronik GmbH	/15.E3
27			-M1	235306	Stöber-Servo 4,24KW i=17,517	Stöber	/7.E4
28			-M2	222693	Fan 24VDC,60 x 60 x 15mm	RS Pro	/4.E2
29			-M3	222693	Fan 24VDC,60 x 60 x 15mm	RS Pro	/4.E3
30			-M4	222693	Fan 24VDC,60 x 60 x 15mm	RS Pro	/4.E4
31			-P1	218580	piezoelectric hooter SCI 535 B5 24Vdc	Sonitron	/11.C3
32			-P2	218580	piezoelectric hooter SCI 535 B5 24Vdc	Sonitron	/4.E7

				Datum	22.06.2020	Brabender®	Betriebsmittelliste Components list	Baugruppe	815670
				Bearb.	P.Hommes				
				Gepr.				Zeichnungs-Nr.	815670E000-04
Zustand	Änderung	Datum	Name	Norm		Urspr.	Ers. f.	Ers. d.	Blatt 16 / Bl.-Anzahl 20

Components

POS.	assembly	location	device designations	component	description	supplier	page / path
33			-P3	242033	Multi-touch Control Panel CP3916-0000	Beckhoff	
34			-P4	242008	Structure-borne driver Visatron BS 76- 8Ohm	Visatron GmbH&Co.KG	/15.D5
35			-Q1	221625	Power Switch 32A with undervoltage trip	Elektra Talfinger	/3.C1
36			-S0	222174	Emergency stop button	IDEC	/5.C2
37			-S1	222534	LED T5,5K24UB;White;24V AC/DCV;7-14mA	Schlegel	/5.C4
38			-S1	222528	Pushbutton illuminated START	Schlegel	/5.C5
39			-S1	221840	Contactor 2S+2Ö 5-250V 4A	Schlegel	/5.C5
40			-S2	221840	Contactor 2S+2Ö 5-250V 4A	Schlegel	
41			-S2	222529	Pushbutton illuminated STOP	Schlegel	/5.C5
42			-T1	221647	Puls Power pack 84-276 VAC / 24-28 VDC Iout 10A	Puls	/4.B2
43			-T2	241692	Torque amplifier MP55 f. CAN-bus	HBM	/12.C6
44			-T3	221969	current transformer M2000; 50A/50mA i= 1:1000	Elotech	/9.C5
45			-T4	221969	current transformer M2000; 50A/50mA i= 1:1000	Elotech	/9.C6
46			-T5	221969	current transformer M2000; 50A/50mA i= 1:1000	Elotech	/9.D7
47			-T6	221530	puls power pack 84-264 VAC / 24-28 VDC / 2,1A / 50W	Puls	/4.B4
48			-T7	221880	puls power pack 84-264 VAC / 5-5,5 VDC / 5A / 25W	Puls	/4.B6
49			-T9	242036	Industry USB-2.0 Hub fold	Exsys	/14.B5
50			-T10	242044	Active Adapter Displayport- DVI-D; ST DP2DVIS	Startech	/14.D3
51			-T11	222712	adjustable DC voltage converters 3 - 15V	Kemo	/15.B4
52			-T12	241907.001	USB-to-CAN V2 compact	HMS Ind.Net. GmbH	
53			-TF1	242035	2.1 Sound, Manhattan Hi-Speed USB 3-D Audio	Manhattan-Products	/15.B3
54			-V1	221253	Powerline filter FN356-36/33, 3x400V+N+PE 36A	Schaffner	/3.E1
55			-W17	221842	Cable for Stöber-Servomotor ED704	Stöber	/7.D2
56			-W18	618552	Apapterkabel Resolver MDS-SMC1 Z21	Stoeber	/7.C4
57			-W19	618553.001	Stöber cable Motordekoder Endat	Stöber	
58			-W20	618004	Low power cable, plug 5.5 / 2.1 mm, 2 m	Conrad	
59			-W29	618595	Connectioncable USB A/B 1,0 m	InLine	
60			-W30	618595	Connectioncable USB A/B 1,0 m	InLine	
61			-W36	618005.001	Connection Wire DVI 1,5 m f. Multitouch CP39xx-0000	EVG-Martens	
62			-W37	618006.001	Connection Wire USB-E 1,5m f. Multitouch CP39xx-0000	EVG-Martens	
63			-W38	222682	Connectioncable Klinkenstecker-3,5-Stereo	VOLTCRAFT	/15.C3
64			-WG1	618605	Connection cable USB 3.0 A/A 1m	Delock	

Zustand	Änderung	Datum	Name	Norm	Datum	22.06.2020
					Bearb.	P.Hommes
					Gepr.	
				Urspr.	Ers. f.	Ers. d.

Brabender®

Betriebsmittelliste
Components list

Baugruppe 815670

Zeichnungs-Nr. 815670E000-04

Blatt 17

Bl.-Anzahl 20

Components

POS.	assembly	location	device designations	component	description	supplier	page / path
65			-WG2	618577.001	Cable HDMI(A) male /HDMI(A) male 90° angles 0,5m	Bechtle direct GmbH	
66			-X1	217484	CEE-Connector socket 32A 380-415V 9h, 3P+N+PE		/3.F1
67			-X1	217482	CEE-Connector Pin 32A 380-415V 9h, 3P+N+PE	Diverse	/3.F1
68			-X2	221363	cable connector femal M12 4pol	Woodhead/Nies	/5.D6
69			-X3	221363	cable connector femal M12 4pol	Woodhead/Nies	/5.C7
70			-X4	217248	Female receptacle 4 polig BU	Tuchel-Amphenol	/9.E2
71			-X5	217248	Female receptacle 4 polig BU	Tuchel-Amphenol	/9.E3
72			-X6	217250	Female receptacle 7pol BU	Tuchel-Amphenol	/9.E3
73			-X7	217248	Female receptacle 4 polig BU	Tuchel-Amphenol	/9.E5
74			-X8	217248	Female receptacle 4 polig BU	Tuchel-Amphenol	/9.E6
75			-X9	217248	Female receptacle 4 polig BU	Tuchel-Amphenol	/9.E7
76			-X10	218301	Thermocouple Connector type FSTC-J-FF	Merz	/11.C4
77			-X10	218285	thermo short-circuit termination	Spoerle	/11.C4
78			-X11	218301	Thermocouple Connector type FSTC-J-FF	Merz	/11.C5
79			-X11	218285	thermo short-circuit termination	Spoerle	/11.C5
80			-X12	218301	Thermocouple Connector type FSTC-J-FF	Merz	/11.C5
81			-X12	218285	thermo short-circuit termination	Spoerle	/11.C5
82			-X13	218301	Thermocouple Connector type FSTC-J-FF	Merz	/11.C6
83			-X13	218285	thermo short-circuit termination	Spoerle	/11.C6
84			-X14	218301	Thermocouple Connector type FSTC-J-FF	Merz	/11.C7
85			-X14	218285	thermo short-circuit termination	Spoerle	/11.C7
86			-X15	218301	Thermocouple Connector type FSTC-J-FF	Merz	/11.C7
87			-X15	218285	thermo short-circuit termination	Spoerle	/11.C7
88			-X16	218301	Thermocouple Connector type FSTC-J-FF	Merz	/13.D5
89			-X16	218285	thermo short-circuit termination	Spoerle	/13.D5
90			-X17	218301	Thermocouple Connector type FSTC-J-FF	Merz	/13.D6
91			-X17	218285	thermo short-circuit termination	Spoerle	/13.D6
92			-X18	218301	Thermocouple Connector type FSTC-J-FF	Merz	/13.D6
93			-X18	218285	thermo short-circuit termination	Spoerle	/13.D6
94			-X19	218301	Thermocouple Connector type FSTC-J-FF	Merz	/13.D7
95			-X19	218285	thermo short-circuit termination	Spoerle	/13.D7
96			-X20	222038	push pull connector female 8 pol D 104 A066	Fischer Connectors	/8.E6

				Datum	22.06.2020	Brabender®	Betriebsmittelliste Components list	Baugruppe 815670	
				Bearb.	P.Hommes				
				Gepr.				Zeichnungs-Nr. 815670E000-04	Blatt 18
Zustand	Änderung	Datum	Name	Norm		Urspr.	Ers. f.	Ers. d.	Bl.-Anzahl 20

Components

POS.	assembly	location	device designations	component	description	supplier	page / path
97			-X21	221376	12pol.push pull connector female	Fischer	/6.C3
98			-X22	218244	D-SUB female connector 9pol	Ernie	/12.B3
99			-X23	221592	D-SUB female connector 9pol Subcon M2	Ernie	/12.C4
100			-X24	218616	D-SUB male connector 15pol	Ernie	/12.D6
101			-X25	218191	D-SUB male connector 9pol	Ernie	/13.B5
102			-X26	221592	D-SUB female connector 9pol Subcon M2	Ernie	/13.B7
103			-X27	218191	D-SUB male connector 9pol	Ernie	/13.B8
104			-X27	221332	D- Sub connector with terminal resitor 120 Ohm for CAN-bus	KKC Handelsge.	/13.B8
105			-X28	217057	Terminal connector 12 pol.	Klering GmbH	/4.D3
106			-X29	222509.001	flange socket 2xUSB 2.0-A type RRJ_USB	Schlegel GmbH&Co.KG	
107			-X38	222511	flange socket RJ45 typ RRJ_RJ45	Schlegel GmbH&Co.KG	
108			-X39	222511	flange socket RJ45 typ RRJ_RJ45	Schlegel GmbH&Co.KG	
109			-X40	222513	flange socket PS2 typ RRJ_HDMI_STB	Schlegel GmbH&Co.KG	
110			-X44	218280	CPC-square Flange receptacle AMP 182641-1	AMP/Tyco	/10.E2
111			-XD1	242042	C9900-K630/CU8801, USB2.0-Extender-Tx	Beckhoff	
112			-XG1	222507.001	Flange socket USB 2.0-A RRJ_USB_AA	Schlegel	/14.F1
113			-XT1	222763	Connection block MetaStation 4E XT1	Phoenix Contact	
114			-XT2	222760	Connection block MetaStation 4E XT2	Phoenix Contact	
115			-XT3	222690	Connection block XT3 Drive Unit	TE Connectivity	
116			-XT4	222761	Connection block MetaStation 4E XT4	Phoenix Contact	
117			-XT5	222764	Plug - PP-H 1,5/S/6 for Terminal	Phoenix Contact	/6.D3
118			-XT5	222736	Plug - PP-H 1,5/S/4 for Terminal	Phoenix Contact	/5.A5
119			-XT5	222764	Plug - PP-H 1,5/S/6 for Terminal	Phoenix Contact	/5.B2
120			-XT5	222736	Plug - PP-H 1,5/S/4 for Terminal	Phoenix Contact	/5.B7
121			-XT5	222734	Plug - PP-H 1,5/S/2 for Terminal	Phoenix Contact	/5.D5
122			-XT5	222694	Connection block XT5 Drive Unit	Phoenix Contact	
123			-XT6	222737	Plug - PP-H 1,5/S/5 for Terminal	Phoenix Contact	/8.E6
124			-XT6	222736	Plug - PP-H 1,5/S/4 for Terminal	Phoenix Contact	/5.B6
125			-XT6	222695	Connection block XT6 Drive Unit	Phoenix Contact	
126			-XT7	222715	Terminal connector PTV 2,5-Quattro	Phoenix Contact	/5.B1
127			-XT8	222773	Plug - PP-H 1,5/S/1 GNYE	Phoenix Contact	/14.B8
128			-XT8	222734	Plug - PP-H 1,5/S/2 for Terminal	Phoenix Contact	/15.B4

				Datum	22.06.2020	Brabender®	Betriebsmittelliste Components list	Baugruppe 815670	
				Bearb.	P.Hommes				
				Gepr.				Zeichnungs-Nr. 815670E000-04	Blatt 19
Zustand	Änderung	Datum	Name	Norm		Ursp.	Ers. f.	Ers. d.	Bl.-Anzahl 20

Components

POS.	assembly	location	device designations	component	description	supplier	page / path
129			-XT8	222736	Plug - PP-H 1,5/S/4 for Terminal	Phoenix Contact	/14.B7
130			-XT8	222762	Connection block MetaStation 4E XT8	Phoenix Contact	
131			-XT9	222189	Terminal connector 10pol	Weidmüller	/15.B4
132			-XT10	222189	Terminal connector 10pol	Weidmüller	/15.D3
133			-XT4.1	221576	Terminal connector	ABB Entrelec-Schiele	/10.B3

Zustand	Änderung	Datum	Name
		Datum	22.06.2020
		Bearb.	P.Hommes
		Gepr.	
		Norm	

Ursprung | Ers. f. | Ers. d.

Brabender®

Betriebsmittelliste
Components list

Baugruppe 815670

Zeichnungs-Nr. 815670E000-04

Blatt 20

Bl.-Anzahl 20

Brabender®

... where quality is measured.

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