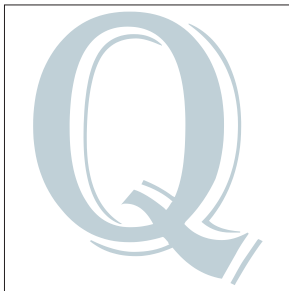


## Operating instructions



### Calibration system

- Calibration device +
- Load simulation unit



**These operating instructions must be read before commissioning!**  
**Failure to do so may be dangerous!**  
**Machines may only be operated by personnel familiar with the appropriate safety regulations!**



**The machines bear the conformity mark - and thus comply with the**  
• EC Low Voltage Guideline (73/23/EEC)  
EC EMV Guideline (89/336/EEC) (The CE Mark is only required in EC member states)



**In compliance with VDE 0544 (EN 60974-1), the machines can be used in environments with an increased electrical hazard.**

**Name des Herstellers:**

Name of manufacturer:

Nom du fabricant:

**EWM HIGHTEC WELDING GmbH**

(nachfolgend EWM genannt)

(In the following called EWM)

(nommé par la suite EWM)

**Anschrift des Herstellers:**

Address of manufacturer:

Adresse du fabricant:

**Dr.- Günter - Henle - Straße 8**

**D - 56271 Mündersbach – Germany**

**info@ewm.de**

Hiermit erklären wir, daß das nachstehend bezeichnete Gerät in seiner Konzeption und Bauart sowie in der von uns in Verkehr gebrachten Ausführung den grundlegenden Sicherheitsanforderungen der unten genannten EG- Richtlinien entspricht. Im Falle von unbefugten Veränderungen, unsachgemäßen Reparaturen und / oder unerlaubten Umbauten, die nicht ausdrücklich von EWM autorisiert sind, verliert diese Erklärung ihre Gültigkeit.

We herewith declare that the machine described below meets the standard safety regulations of the EU- guidelines mentioned below in its conception and construction, as well as in the design put into circulation by us. In case of unauthorized changes, improper repairs and / or unauthorized modifications, which have not been expressly allowed by EWM, this declaration will lose its validity.

Par la présente, nous déclarons que la conception et la construction ainsi que le modèle, mis sur le marché par nous, de l'appareil décrit ci - dessous correspondent aux directives fondamentales de sécurité de la U.E. mentionnées ci- dessous. En cas de changements non autorisés, de réparations inadéquates et / ou de modifications prohibées, qui n'ont pas été autorisés expressément par EWM, cette déclaration devient caduque.

**Gerätebezeichnung:**

Description of the machine:

Déscription de la machine:

**Gerätetyp:**

Type of machine:

Type de machine:

**Artikelnummer EWM:**

Article number:

Numéro d'article

**Seriennummer:**

Serial number:

Numéro de série:

**Optionen:**

Options:

Options:

keine

none

aucune

**Zutreffende EG - Richtlinien:**

Applicable EU - guidelines:

Directives de la U.E. applicables:

**EG - Niederspannungsrichtlinie (73/23/EWG)**

EU - low voltage guideline

Directive de la U.E. pour basses tensions

**EG- EMV- Richtlinie (89/336/EWG)**

EU- EMC guideline

U.E.- EMC directive

**Angewandte harmonisierte Normen:**

Used co-ordinated norms:

Normes harmonisées appliquées:

**EN 60974 / IEC 60974 / VDE 0544**

**EN 50199 / VDE 0544 Teil 206**

**Hersteller - Unterschrift:**

Signature of manufacturer:

Signature du fabricant:



Michael Szczesny ,

**Geschäftsführer**  
managing director  
gérant

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# Safety instructions

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## For Your Safety:



**Warning: Observe accident prevention regulations.**

**Ignoring the following safety procedures can be fatal.**

- Before undertaking welding tasks, put on prescribed dry protective clothing, e.g. gloves.
- Protect eyes and face with protective visor.



**Electric shocks can be fatal**

- The machine may only be connected to correctly earthed sockets.
- Only operate with intact connection lead including protective conductor and safety plug.
- An improperly repaired plug or damaged mains cable insulation can cause electric shocks.
- The machine may only be opened by qualified and authorised personnel.
- Before opening, pull out the mains plug. Switching off is not sufficient. Wait for 2 minutes until capacitors are discharged.
- Always put down welding torch, stick electrode holder in an insulated condition.



**Even touching low voltages can cause you to jump and lead to accidents, so:**

- Safeguard yourself against falls, e.g. from a platform or scaffolding.
- When welding, operate earth tongs, torch and workpiece properly, not in ways for which they are not intended. Do not touch live parts with bare skin.
- Only replace electrodes when wearing dry gloves.
- Never use torches or earth cables with damaged insulation.



**Smoke and gases can lead to breathing difficulties and poisoning.**

- Do not breathe in smoke and gases.
- Ensure that there is sufficient fresh air.
- Keep solvent vapours away from the arc radiation area. Chlorinated hydrocarbon fumes can be converted into poisonous phosgene by ultraviolet radiation.



**Workpiece, flying sparks and droplets are hot**

- Keep children and animals well away from the working area. Their behaviour is unpredictable.
- Move containers with inflammable or explosive liquids away from the working area. There is a danger of fire and explosion.
- Never heat explosive liquids, dusts or gases by welding or cutting. There is also a danger of explosion if apparently harmless substances in closed containers are able to build up excess pressure when they are heated.



**Take care to avoid fire hazards**

- Any kind of fire hazards must be avoided. Flames can form e.g. when sparks are flying, when parts are glowing or hot slag is present.
- A constant check must be kept on whether fire hazards have been created in the working area.
- Highly inflammable objects, such as matches and cigarette lighters for example, must not be carried in trouser pockets.
- You must ensure that fire extinguishing equipment - appropriate to the welding process - is available close to the welding work area and that easy access is possible.

# Safety instructions

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## Take care to avoid fire hazards

- Containers in which fuels or lubricants have been present must be thoroughly cleaned before welding begins. It is not sufficient simply for the receptacle to be empty.
- After a workpiece has been welded, it must only be touched or brought into contact with inflammable material when it has cooled down sufficiently.
- Loose welding connections can completely destroy protective conductor systems of interior installations and cause fires. Before beginning welding work, ensure that the earth tongs are properly fixed to the workpiece or welding bench and that there is a direct electrical connection from the workpiece to the power source.



## Noise exceeding 70 dBA can cause permanent hearing damage

- Wear suitable earmuffs or plugs.
- Ensure that other people who spend time in the working area are not inconvenienced by the noise.



## Secure gas cylinder

- Place shielding gas cylinders in the holders provided for them and secure with safety chains.
- Take care when handling cylinders; do not throw or heat, guard against them toppling over.
- When moving by crane, take off the gas cylinder from the welding machine.



## Caution: Interference by electrical and electromagnetic fields is possible e.g. from the welding machine or from the high-voltage pulses of the ignition unit.

- As laid down in Electromagnetic Compatibility Standard EN 50199, the machines are intended for use in industrial areas; if they are operated e.g. in residential environments problems can occur in ensuring electromagnetic compatibility.
- The functioning of heart pacemakers can be adversely affected when you are standing near the welding machine.
- Malfunctioning of electronic equipment (e.g. EDP, CNC equipment) in the vicinity of the welding location is possible.
- Other mains supply leads, trip leads, signal and telecommunications leads above, under and near the welding device may be subject to interference.



## Warning: Electromagnetic interference must be reduced to such a level that it no longer constitutes interference.

### Possible reduction measures:

- Welding machines should be regularly maintained (**see Sect. "Maintenance and care"**)
- Welding leads should be as short as possible and run closely together on or near to the ground.
- Selective shielding of other leads and equipment in the environment can reduce radiation.



## Caution: Repairs and modifications may only be carried out by authorised, trained, specialist personnel.

The warranty becomes null and void in the event of unauthorised interference.



Our operating instructions will provide you with an introduction into the safe use of the machine.

Therefore please read them closely and only start work when you are familiar with them.

# Safety instructions

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## Transport and set-up



- Machines may only be moved and operated in an upright position.



- Before **moving**, pull out mains plug and place on the machine.
- Secure high-pressure shielding gas cylinder with safety chain to prevent it from toppling over.

## Environmental conditions:

The welding machine can be operated in a location where there is no risk of explosion at

- an **ambient temperature** of -10°C (plasma machines 0°C) to +40°C and
- a **relative air humidity** up to 50% at 40°C.
- where the surrounding air is free of **unusual** amounts of dust, acids, corrosive gases or substances etc., insofar as they do not occur during welding.

Examples of **unusual** operating conditions:

Unusual corrosive smoke, vapour, excessive oil vapour, unusual vibrations or jolts, excessive quantities of dust such as grinding dust etc., severe weather conditions, unusual conditions near the coast or on board ship.

- When setting up the machine, ensure that air inlets and outlets are unobstructed.  
The machine is tested to **Protection Standard IP23**, i.e.:
  - Protection against penetration of solid foreign bodies  $\varnothing > 12\text{mm}$ ,
  - Protection against water spray up to an angle of 60° to the vertical.

## Notes on the use of these operating instructions

These operating instructions are arranged in Sections.

To help you find your way around more quickly, in the margins you will occasionally see, in addition to sub-headings, icons referring to particularly important passages of text which are graded as follows depending on their importance:



**(Note):** Applies to special technical characteristics which the user must note.



**(Warning):** Applies to working and operating procedures which must be followed precisely to avoid damaging or destroying the machine.



**(Caution):** Applies to working and operating procedures which must be followed precisely to avoid endangering people and includes the “Warning” symbol.

**Instructions and lists detailing step-by-step actions in given situations can be recognised by bullet points, e.g.:**

- Insert plug of welding current lead into socket (**Sect. 5, G2**) and lock.

**Meaning of the diagram descriptions:**

- e.g. **(C1)** means: Item C / Figure 1 in the respective Section
- e.g. **(Sect. 3, C1)** means: in Section 3 Item C / Figure 1

# 1 About this calibration system

## 1.1 What is calibration?

In calibration, the value displayed on the welding machine is compared with the actual value on the calibration device and corrected if necessary. (Not to be confused with standardizing).

- Min/Max matching of the digital displays in the machine
- Min/Max matching of the nominal values (values displayed on digital display) with the values on the standardized external current and voltage meter.

### 1.1.1 Diagram of the measurement structure for calibrating machines

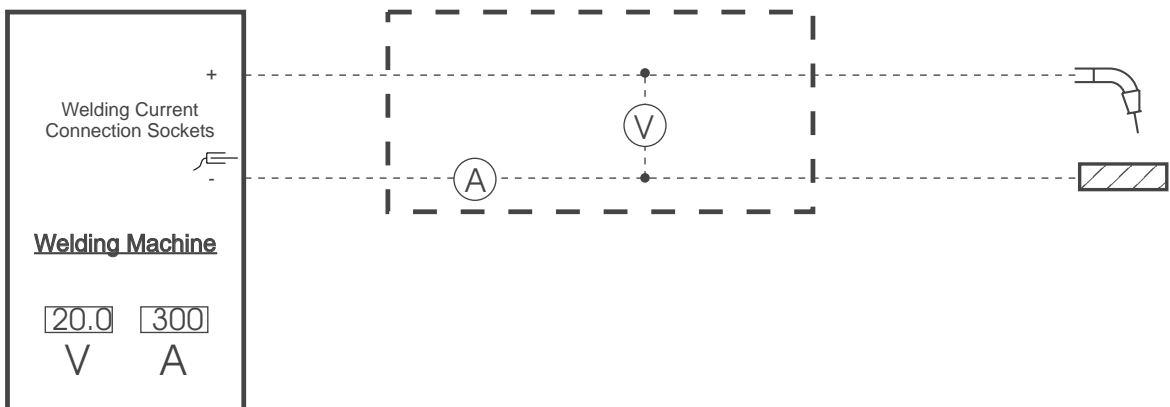


Fig. 1: Diagram of the measurement structure

### 1.1.2 Diagram of the calibration measurement structure with the calibration system

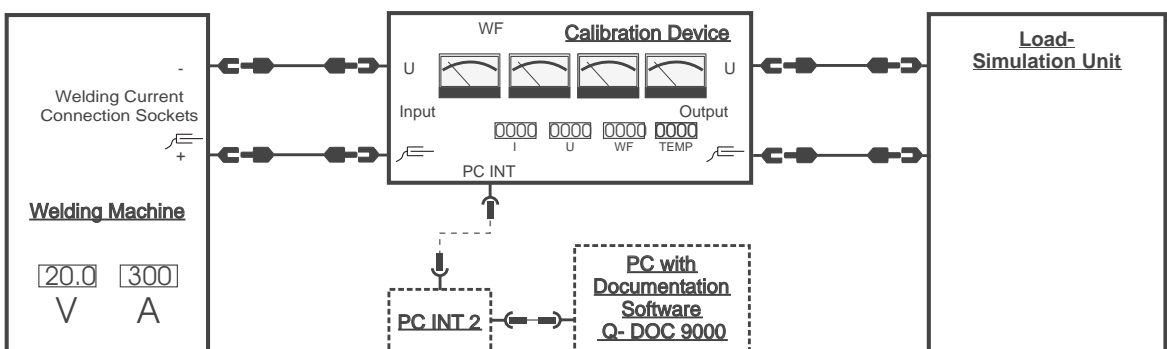


Fig. 2: Calibration



# 1 About this calibration system

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## 1.2 Why calibrate?

- Optimum reproducibility of welding processes and parameters.
- Inaccurate display instruments affect the quality of welding results.
- To maintain a certain delivery quality, generally for particular requirements such as e.g. pressure tanks, equipment, pipelines etc.

## 1.3 Calibrate how often?

- An annual check of the displays in 1-shift operation is sufficient.  
In 2-shift operation we recommend a half yearly check.  
If welding machines are involved in development work, process trials etc. a correspondingly shorter period is recommended.

## 1.4 What can be calibrated?

- **ACTUAL VALUE** of the welding current [Ampere]
- **ACTUAL VALUE** of the welding voltage [Volt]
- **ACTUAL VALUE** of the wire feed speed [m/min]

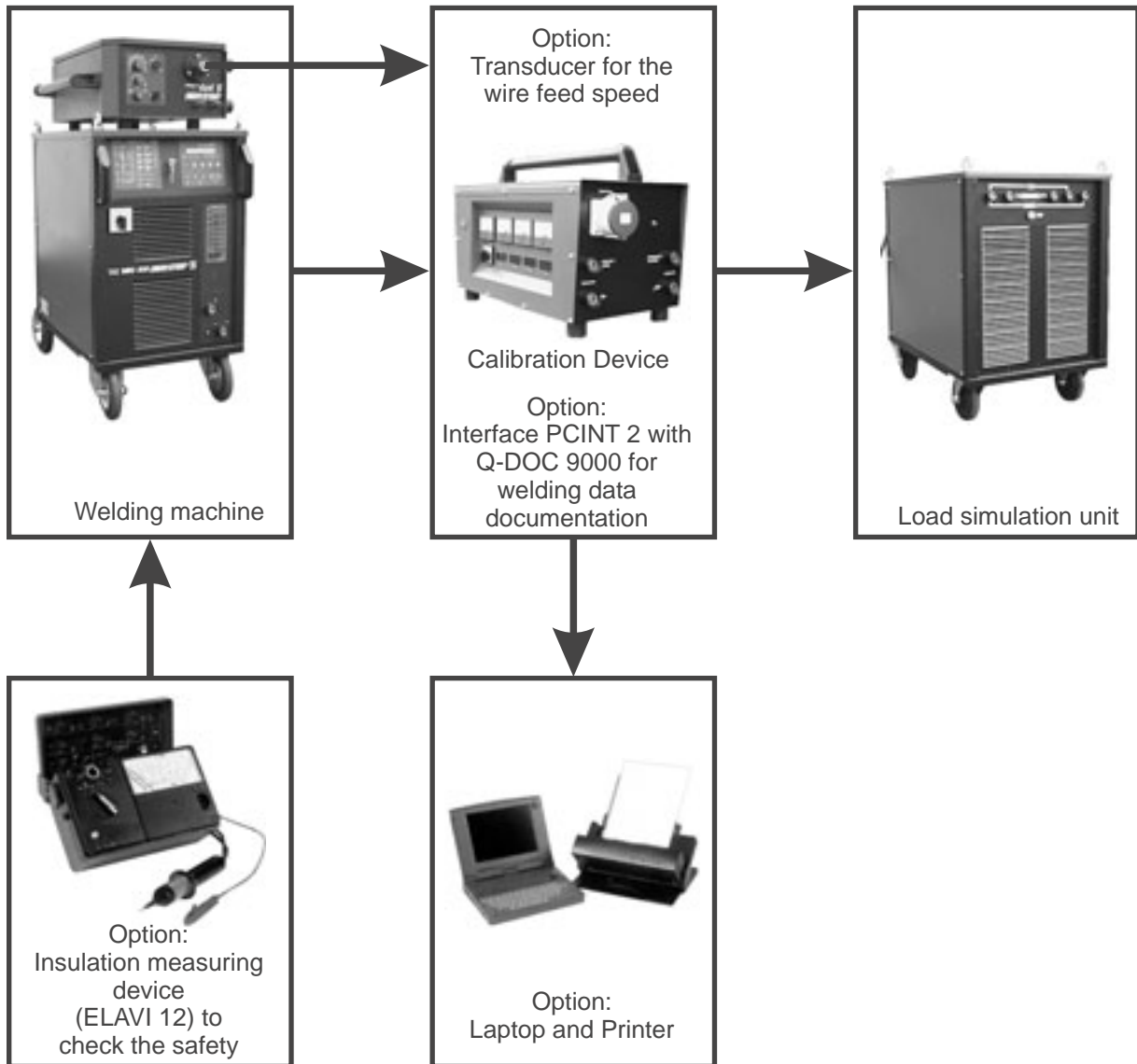
At each calibration the display instruments of the welding machines are checked and also calibrated.

## 1.5 Calibration certificate

After calibration, each machine is provided with a test plate showing next checking date.  
You are issued with a test protocol and a calibration certificate as documentation.

# 1 About this calibration system

## 1.6 Overview of the calibration system



The Calibration System comprises high-quality calibrated components for

- Measurement value recording and display, → Calibration device
- Welding current simulation, → Load simulation unit
- Measurement value documentation and → PC INT 2 interface + Q-DOC 9000 software (option)
- Safety test (option) → ELAVI 12 insulation measuring device

# 1 About this calibration system

---

## 1.6.1 Advantages/User benefits

<u>Advantages:</u>	<u>User benefits</u>
Quality assurance of the production means (welding machines)	Requirement of DIN EN ISO 9000 ff
Reproducible welding parameters	Constant welding results, high quality
Less production standstill	Minimization of breakdown costs
High safety standard	e.g. Accident prevention for employees

## 1.6.2 Areas of application e.g.:

- Necessary instrument for quality assurance of the operating means (welding machines) in accordance with VDE 0702.
- Implementation of maintenance contracts for customers if requested or if not requested, in accordance with DIN EN ISO 9000ff.
- Assistance for the Service Department, e.g. in the search for faults.
- Safety inspection of machines and systems

## 1.6.3 Calibration device

The Calibration System is used to calibrate welding machines and competitors' products.

The following measurement values can be recorded and displayed with the Calibration System.

- **Primary:**  
Recording of measurement data for  
Measurement data display
  - mains input current,
  - mains input voltage.
  - one ammeter for each of the three mains currents,
  - a voltmeter with a changeover switch for three phases.
- **Secondary:**  
Recording of measurement data for  
Measurement data display
  - actual welding current,
  - actual welding voltage,
  - input for the actual wire feed speed.
  - digital ammeter for the welding current,
  - digital voltmeter for the welding current,
  - digital instrument for the wire feed speed.
- **General**  
Recording of measurement data  
Measurement data display
  - actual ambient temperature
  - digital instrument for the ambient temperature

# 1 About this calibration system

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## 1.6.4 Load simulation unit

The load simulation unit simulates the arc so that welding machines can be calibrated and tested without the arc.

Welding currents up to 600A (10% duty cycle) can be simulated with this unit.

The load voltage can be matched to the various welding processes (MIG/MAG, TIG and STICK).

## 1.6.5 Transducer for wire feed speed (option)

The wire feed speed transducer provides the facility for measuring the actual wire speed. The transducer consists of two rollers arranged side by side, between which the welding wire is clamped. This ensures an accurate wire speed measurement.

## 1.6.6 Insulation measuring device (option)

The insulation measuring device is used to check the safety of the machines.

This check can be carried out in the context of a maintenance contract or as a repetition test in accordance with VDE 0702 and VBG 15.

The repetition check should be carried out quarterly and annually.

The check should also be carried out after every repair.

## 1.6.7 Documentation interface PCINT2 and Q-DOC 9000 (option)

With the PCINT2 documentation interface, the welding data documentation software Q-DOC 9000 and a PC with a printer, the measurement data can be recorded during the calibration or checking operation, stored and if necessary printed out.

# 1 About this calibration system

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## 1.7 Theory of calibration

### 1.7.1 What is calibration (internal measuring)?

**In measuring technology, calibration means:**

Determination of measurement deviations on the finished measuring instrument. For measuring instruments with displays, the deviation in the measurement between the display and the value which is correct or regarded as correct is determined by calibration. There is no technical intervention in the measuring instrument. With transmitting measuring instruments, the deviation in the measurement between the value of the output signal and the value this signal would have under ideal transmission conditions and at a given input value is determined by calibration.

### 1.7.2 What is adjustment (matching)?

**In measuring technology, adjustment means:**

Setting up (matching) a measuring instrument so that the measurement deviations are as small as possible, or the size of the measurement deviations do not exceed the margins of error.

### 1.7.3 Standardization

Standardization of a measuring instrument (also of an incorporated gauge) comprises the tests to be carried out by the standardization authorities responsible, in accordance with standardization specifications, and the stamping.

The testing determines whether the measuring instrument submitted complies with the standardization specifications, i.e. whether it meets the requirements regarding its nature and its measuring characteristics, in particular whether or not the size of the measurement deviations exceed the margins of error. Stamping certifies that at the time of testing the measuring instrument met these requirements, and that on the basis of its nature it is to be expected that if handled according to the rules of the technology, it remains "correct" within a restandardization interval.

Which measuring instruments are subject to the obligation to standardize and which are exempt is regulated by law.

The word "standardization" should be used only in this context, and not - as is often customary - for adjustment or calibration.

## 2 Technical data

### 2.1 Calibration device

	Calibration device
Mains voltage	3 x 400 V (at 50/60Hz)
Mains fuse protection (safety fuse - slow-blow)	3 x 35 A
Max. connection load at 60% duty cycle	500 A
Load alternation	10 min
Ambient temperature	-10°C - +40°C
Machine cooling	fan
Protection classification	IP 23
Dimensions	590mm / 315mm / 405mm
Weight without accessories	31.5 kg
Tolerance of display instruments Current $I_{ACTUAL}$ Voltage $U_{ACTUAL}$ Wire feed speed $WF_{ACTUAL}$	0.4% of scale end value 500A 1.0% of scale end value 100V 0.4% of scale end value 25.0 m/min

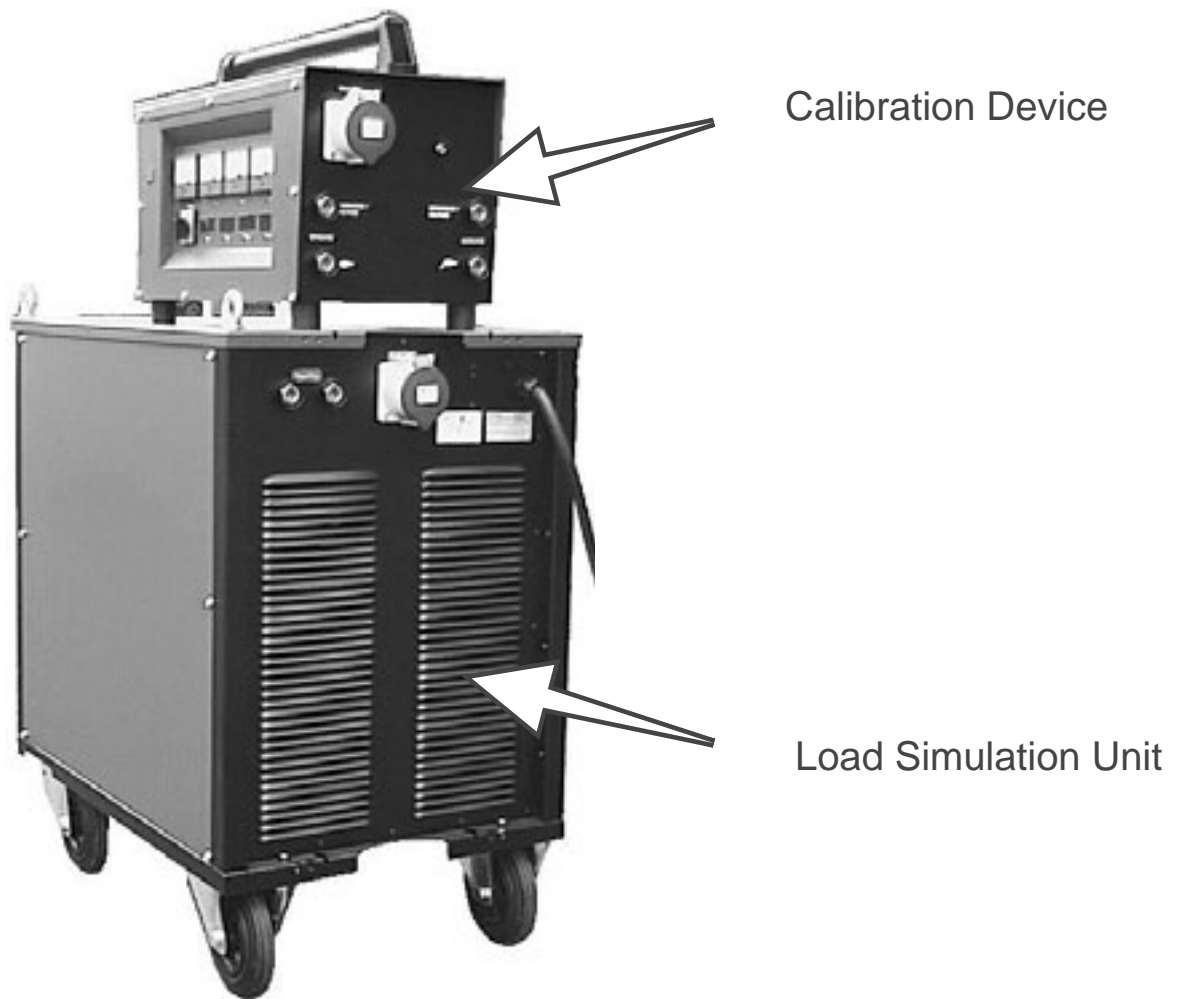
### 2.2 Load simulation unit

	Load simulation unit
Max. connection current load at 10% duty cycle	600 A
Max. connection voltage	120V DC 50V AC
Mains fuse (safety fuse - slow-blow)	3 x 35 A
Load alternation	10 min
Mains voltage	3 x 400 V (at 50/60Hz)
Ambient temperature	-10°C - +40°C
Machine cooling	fan
Protection classification	IP 23
Dimensions without gas cylinder incl. cylinder holder L/W/H	1110 mm / 550 mm / 890 mm
Weight without accessories	131.5 kg

### 3 Description of the system components

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#### 3.1 System overview



**Fig. 3/1**      **Calibration system**

### 3 Description of the system components

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#### 3.2 Description of the calibration device

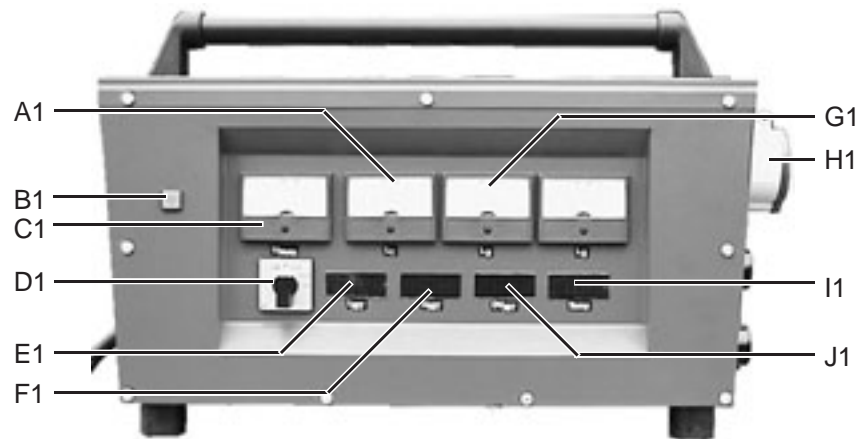


Fig. 3/2, Side view

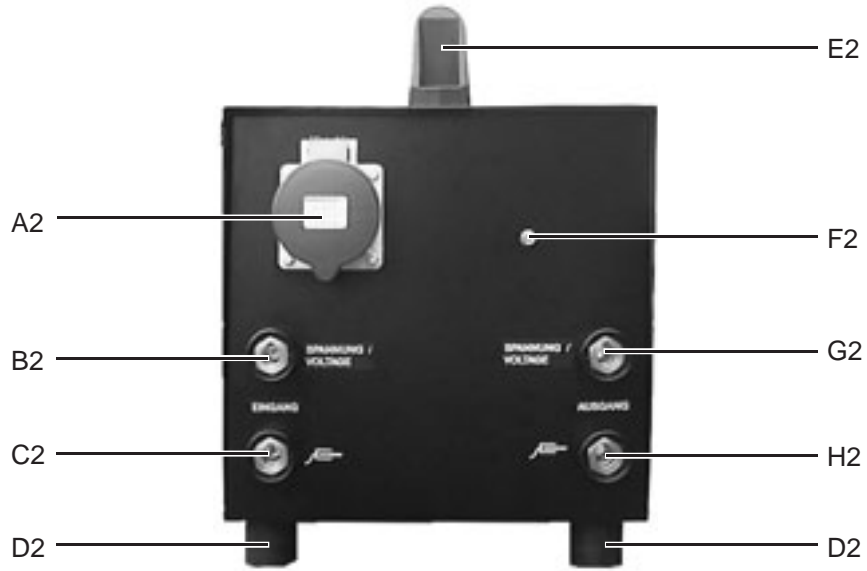






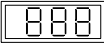



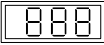

Fig. 3/3, Rear view



Fig. 3/4, Front view



### 3 Description of the system components

Symbol	Item	Designation
	A1	Analogue mains current display for phase L1
	B1	Operating control lamp "Device ON/OFF"
	C1	Analogue mains voltage display Measurement of the mains voltages according to the switch position (D1)
	D1	<p><b>Changeover switch for measuring the primary mains voltages.</b> The mains voltage selected with the changeover switch is measured by means of the analogue voltage display (C1).</p> <p>Position 0 = No measurement of the mains voltages Position L1N = Measurement between phase L1 and neutral conductor N Position L1L2 = Measurement between phase L1 and phase L2 Position L2L3 = Measurement between phase L2 and phase L3 Position L1L3 = Measurement between phase L1 and phase L3</p>
	E1	Digital welding current display
	F1	Digital welding voltage display
	G1	Analogue mains current display for phase L2
	H1	Analogue mains current display for phase L3
	I1	Digital ambient temperature display
	J1	Digital WF speed display
Symbol	Item	Designation
	A2	32A CEE mains connection socket for the welding machine to be calibrated
	B2	Welding current connection socket "Input" Connection to the <b>welding machine</b> , current socket "+"
	C2	Welding current connection socket "Input" Connection to the <b>welding machine</b> , current socket "-"
	D2	Rubber feet
	E2	Carrying handle
	F2	Welding current connection socket "Output" Connection to the <b>load simulation unit</b> , current socket (A5) or (B5)
	G2	Welding current connection socket "Output" Connection to the <b>load simulation unit</b> , current socket (B5) or (A5)
Symbol	Item	Designation
	A3	Connection socket for actual WF transducer
	B3	Mains connection lead with 32A CEE plug
	C3	Connection socket for PC- INT2 documentation interface
	D3	Fuse, fuse protection for the measuring electronics and digital displays
	E3	Main switch, device On/Off

### 3 Description of the system components

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#### 3.3 Description of the load simulation unit

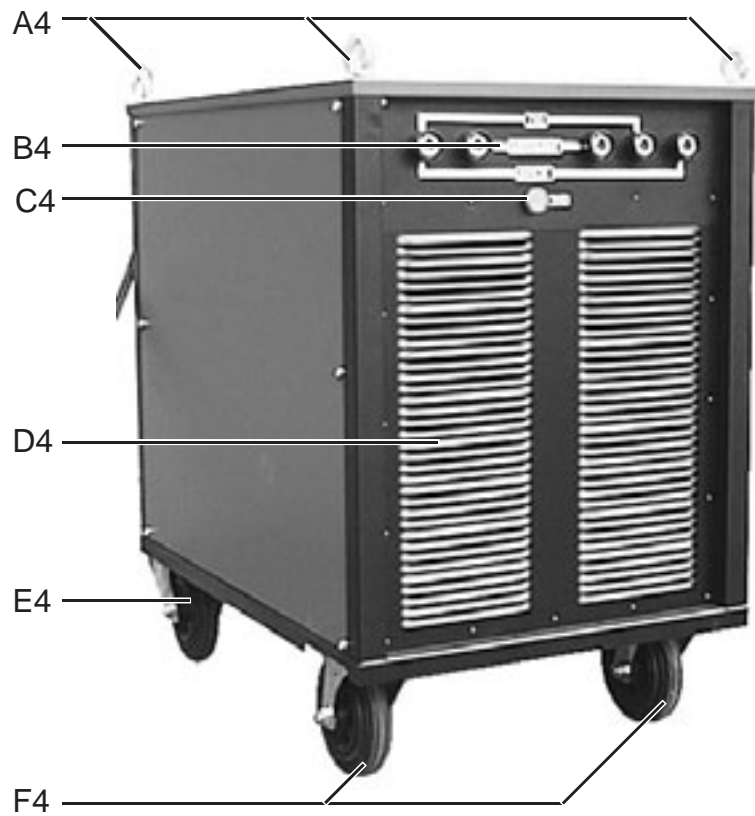



Fig. 3/5, Front view



Fig. 3/6, Rear view

### 3 Description of the system components

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Symbol	Item	Designation
	A4	Lifting lugs
	B4	<b>Sockets</b> These sockets must be bridged with a jumper according to the intended purpose (TIG, MIG/MAG or STICK).
	C4	<b>Signal light for fault display at excess temperature</b>
	D4	<b>Air outlet</b>
	E4	<b>Fixed castors</b>
	F4	<b>Guide castors</b>

Symbol	Item	Designation
	A5	<b>Welding current connection socket (polarity-independent)</b> Connection to the <b>calibration device</b> , current socket ( <b>G2 or H2</b> )
	B5	<b>Welding current connection socket (polarity-independent)</b> Connection to the <b>calibration device</b> , current socket ( <b>H2 or G2</b> )
	C5	<b>Air inlet</b>
	D5	<b>Mains cable with 32A CEE plug</b>
	E5	<b>CEE 32A socket for the calibration device</b>

### 3 Description of the system components

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#### 3.4 Transducer for wire feed speed (option)

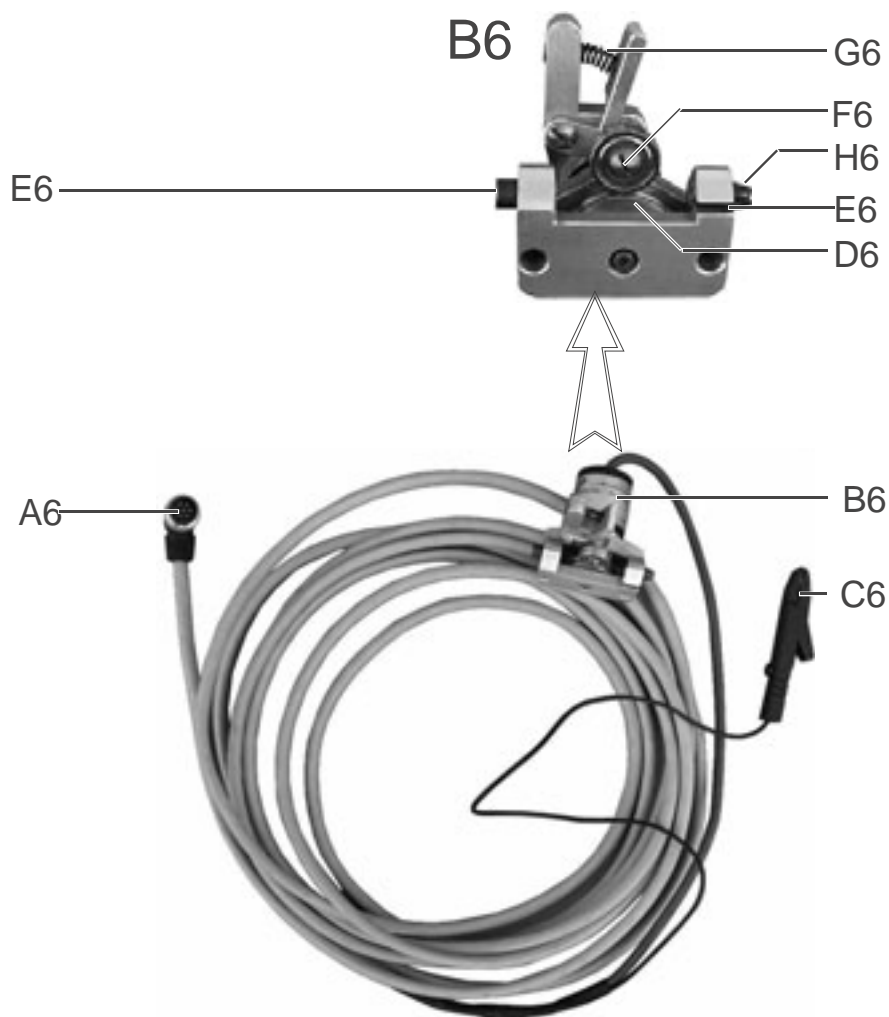


Fig. 3/7 Transducer

A6	Plug
B6	Transducer
C6	Crocodile clip
D6	Wire guide roller
E6	Aperture for mounting the transducer on the wire electrode
F6	Counterpressure roller
G6	Lever for easing the counterpressure roller away from the wire feed roller
H6	Cone

#### 3.5 Documentation interface PC INT 2 and Q-DOC 9000 (option)

With the documentation interface PCINT2, the welding data documentation software Q-DOC 9000 and a PC with a printer, the measurement data can be recorded during the measuring operation, stored and if necessary printed out.

## 4 Commissioning

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In commissioning, a distinction is made between the following measurement structures:

- Measurement structure for STICK and TIG welding machines
- Measurement structure for compact MIG/MAG welding machines
- Measurement structure for decompact MIG/MAG welding machines **with** transducer for wire feed speed
- Measurement structure for decompact MIG/MAG welding machines **without** transducer for wire feed speed



The following examples of measurement structures for the various welding processes relate exclusively to products from our range. Our products are provided with Dinse connection sockets.



Measurements of TIG welding processes should as far as possible be performed in the Liftarc operating mode (ignition devices, HF off)

### 4.1 Mains connection



**Warning:** Follow safety instructions on the opening pages entitled “For Your Safety”.

- Set up the machines so that there is enough room to adjust the operating elements.
- Ensure that the machines are set up in a stable position and appropriately secured.



**The operating voltage shown on the rating plate must be consistent with the mains voltage! For mains fuse protection, please refer to the technical data (chapter 2)!**

- Insert mains plug of the switched-off welding machine into the calibration device socket.
- Insert mains plug of the calibration device into the load simulation unit socket.
- Insert mains plug of the load simulation unit into the appropriate socket.



**The fans of the load simulation unit rotate after the mains plug has been inserted.**

# 4 Commissioning

## 4.2 Measurement structure for STICK and TIG welding machines

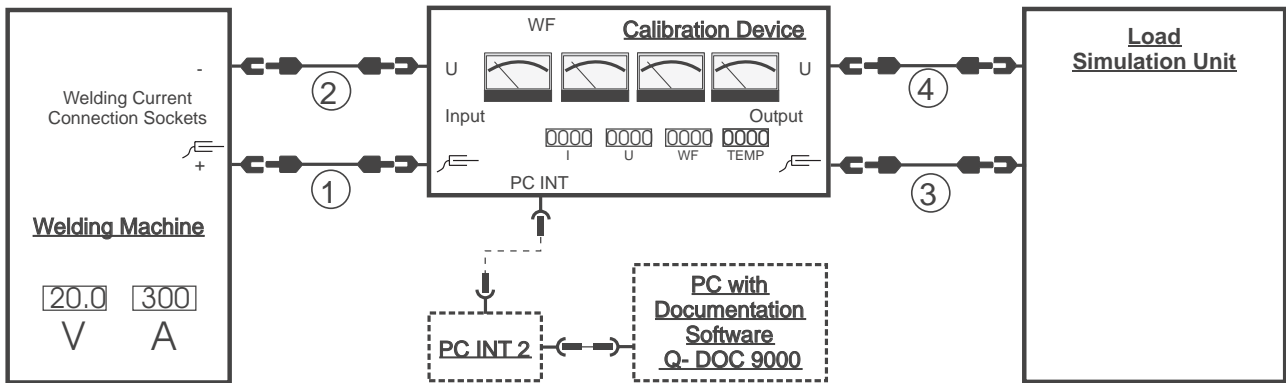


Fig. 4/1; Measurement structure for STICK and TIG welding machines

**Accessories:**

4 welding current cables



**Procedure:**

- **Pos. ①** : Connect the welding current cable to socket (+) of the welding machine and calibration device input (**Chap. 3.2, C2**).
- **Pos. ②** : Connect the welding current cable to socket (-) of the welding machine and calibration device input (**Chap. 3.2, B2**).
- **Pos. ③** : Connect the welding current cable to the calibration device output (**Chap. 3.2, H2**) and the load simulation unit (independent welding current polarity).
- **Pos. ④** : Connect the welding current cable to the calibration device output (**Chap. 3.2, G2**) and the load simulation unit (independent welding current polarity).



For alternating current perform the AC welding current calibration at a welding current frequency of 50Hz!

Prepare the load simulation device for the calibration operation:



For process-true calibration of the welding machine (TIG or STICK), the following cable connection must be established on the front of the load simulation device.

- Insert the cable bridge included between the welding current sockets (**Chap. 3.3, B4**) and lock by turning to the right.

**Cable bridge connection for STICK machines:**



**Cable bridge connection for TIG machines:**



## 4 Commissioning

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### 4.3 Measurement structure for MIG/MAG welding machines

The wire feed speed transducer provides the facility for measuring the actual wire speed. The transducer consists of two rollers arranged one above the other, between which the welding wire is clamped. This ensures an accurate wire feed speed measurement.

#### 4.3.1 Structure of the transducer for the wire feed speed (option)

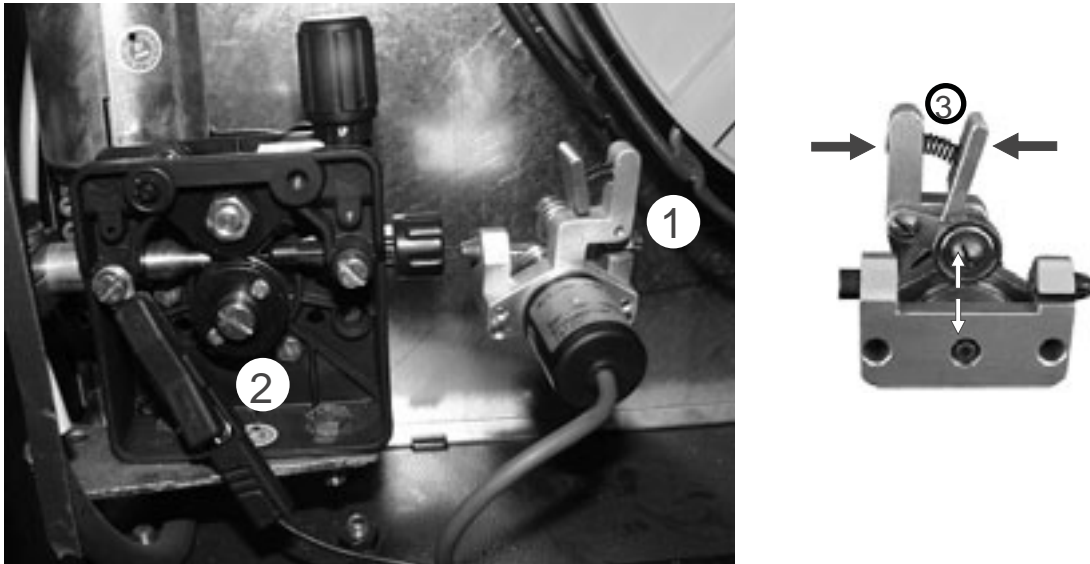


Fig. 4/2: Structure of the transducer for the wire feed speed

#### Procedure:

- **Pos. ①** : Mount the transducer on the wire electrode. By pressing together the levers (**Pos. ③**) the distance between the wire guide rollers is that necessary for installation. The transducer must be installed such that the wire electrode lies centrally between the wire guide rollers and can move freely. The cone (**Chap. 3.4, H6**) of the transducer must point towards the wire feed casing. The transducer must move on the wire electrode without resistance.
- **Pos. ②** : Clip on the crocodile clip (**Chap. 3.4, C6**) on the welding voltage (wire feed unit).
- Insert the plug (**Chap. 3.4; A6**) in the connection socket (**Chap. 3.2, A3**) of the measuring box provided for this.
- The wire feed speed is measured via the transducer.
- + potential is fed into the measuring box via the crocodile clip.

# 4 Commissioning

## 4.3.2 Measurement structure for compact MIG/MAG welding machines

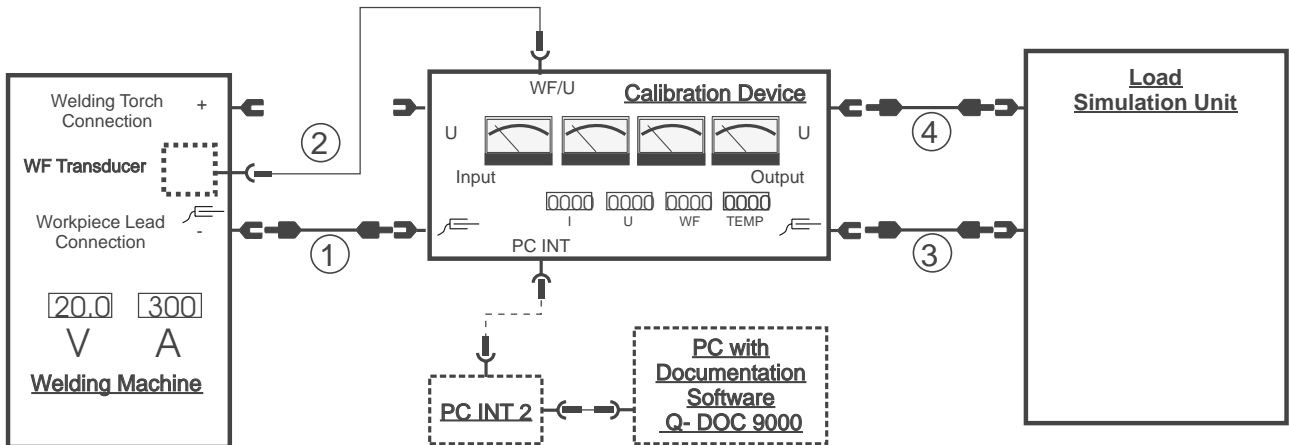


Fig. 4/3: Measurement structure for compact MIG/MAG welding machines

### Accessories:

3 x welding current cables



### Procedure:

- Install the transducer for the wire feed speed (option) (Chap. 4.3.1).
- **Pos. ①** : Connect the welding current cable to socket (-) of the welding machine and calibration device input (Chap. 2, C2).
- **Pos. ②** : Connect the transducer cable to the connection socket (Chap. 3.2, A3).
- **Pos. ③** : Connect the welding current cable to the calibration device output (Chap. 3.2, H2) and the load simulation unit (independent welding current polarity).
- **Pos. ④** : Connect the welding current cable to the calibration device output (Chap. 3.2, G2) and the load simulation unit (independent welding current polarity).



In compact MIG/MAG welding machines, the welding voltage and wire feed speed can be measured only via the transducer.

Prepare the load simulation device for the calibration operation:



For process-true calibration of the welding machine (MIG/MAG), the following cable connection must be established on the front of the load simulation device.

- Insert the cable bridge included between the welding current sockets (Chap. 3.3, B4) and lock by turning to the right.

Cable bridge connection for MIG/MAG machines:





## 4 Commissioning

### 4.3.3 Measurement structure for decompact MIG/MAG welding machines with transducer for wire feed speed

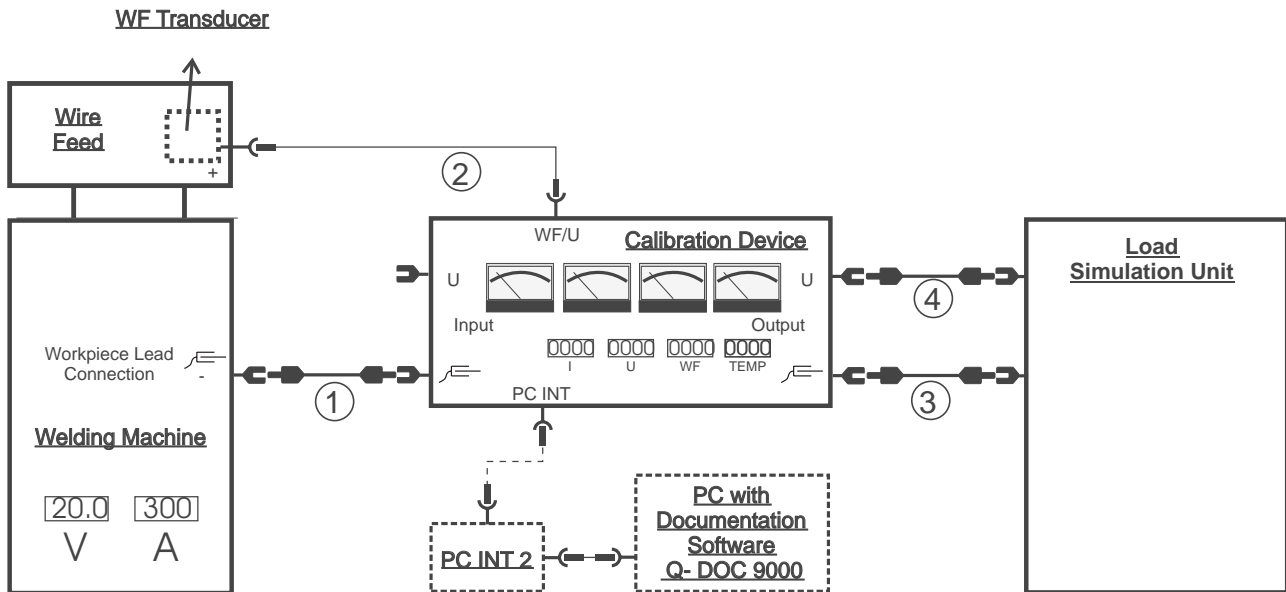


Fig. 4/4: Measurement structure for decompact MIG/MAG welding machines with transducer

#### Accessories:

3 x welding current cables



#### Procedure:

- Install the transducer for the wire feed speed (option) (Chap. 4.3.1).
- **Pos. ①** : Connect the welding current cable to socket (-) of the welding machine and calibration device input (Chap. 3.2, C2).
- **Pos. ②** : Connect the transducer cable to the connection socket (Chap. 3.2, A3).
- **Pos. ③** : Connect the welding current cable to the calibration device output (Chap. 3.2, H2) and the load simulation unit (independent welding current polarity).
- **Pos. ④** : Connect the welding current cable to the calibration device output (Chap. 3.2, G2) and the load simulation unit (independent welding current polarity).

#### Prepare the load simulation device for the calibration operation:



For process-true calibration of the welding machine (MIG/MAG), the following cable connection must be established on the front of the load simulation device.

- Insert the cable bridge included between the welding current sockets (Chap. 3.3, B4) and lock by turning to the right.

Cable bridge connection for MIG/MAG machines:



## 4 Commissioning

### 4.3.4 Measurement structure for decompact MIG/MAG welding machines without transducer for wire feed speed

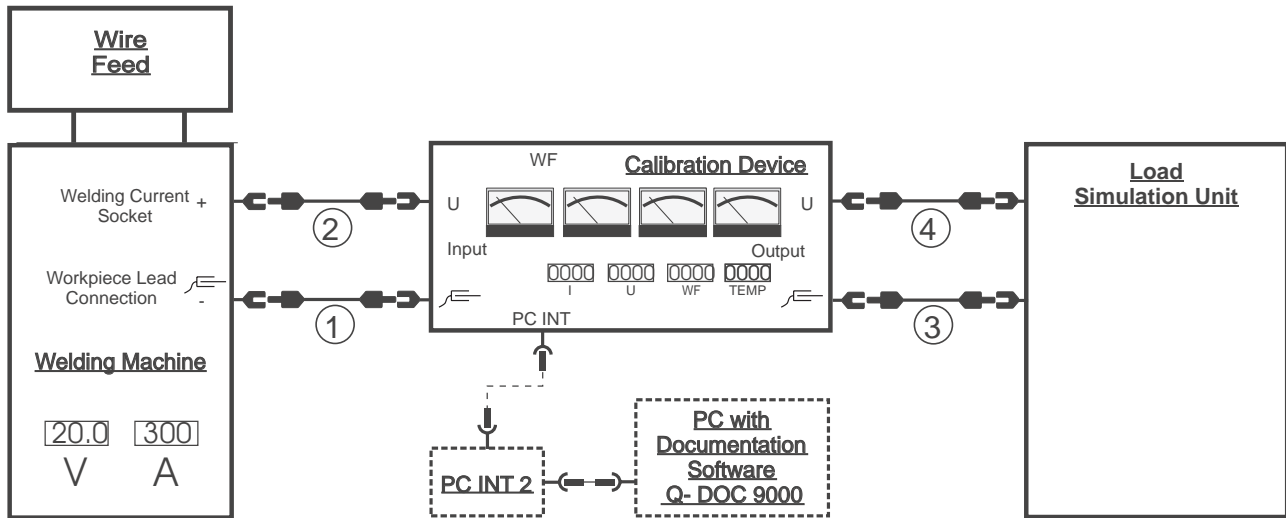


Fig. 4/5: Measurement structure for decompact MIG/MAG welding machines without transducer

#### Accessories:

4 x welding current cables



#### Procedure:

- **Pos. ①** : Connect the welding current cable to socket (-) of the welding machine and calibration device input (**Chap. 3.2, C2**).
- **Pos. ②** : Connect the welding current cable to socket (+) of the welding machine and calibration device input (**Chap. 3.2, B2**).
- **Pos. ③** : Connect the welding current cable to the calibration device output (**Chap. 3.2, H2**) and the load simulation unit (independent welding current polarity).
- **Pos. ④** : Connect the welding current cable to the calibration device output (**Chap. 3.2, G2**) and the load simulation unit (independent welding current polarity).

Prepare the load simulation device for the calibration operation:



For process-true calibration of the welding machine (MIG/MAG), the following cable connection must be established on the front of the load simulation device.

- Insert the cable bridge included between the welding current sockets (**Chap. 3.3, B4**) and lock by turning to the right.

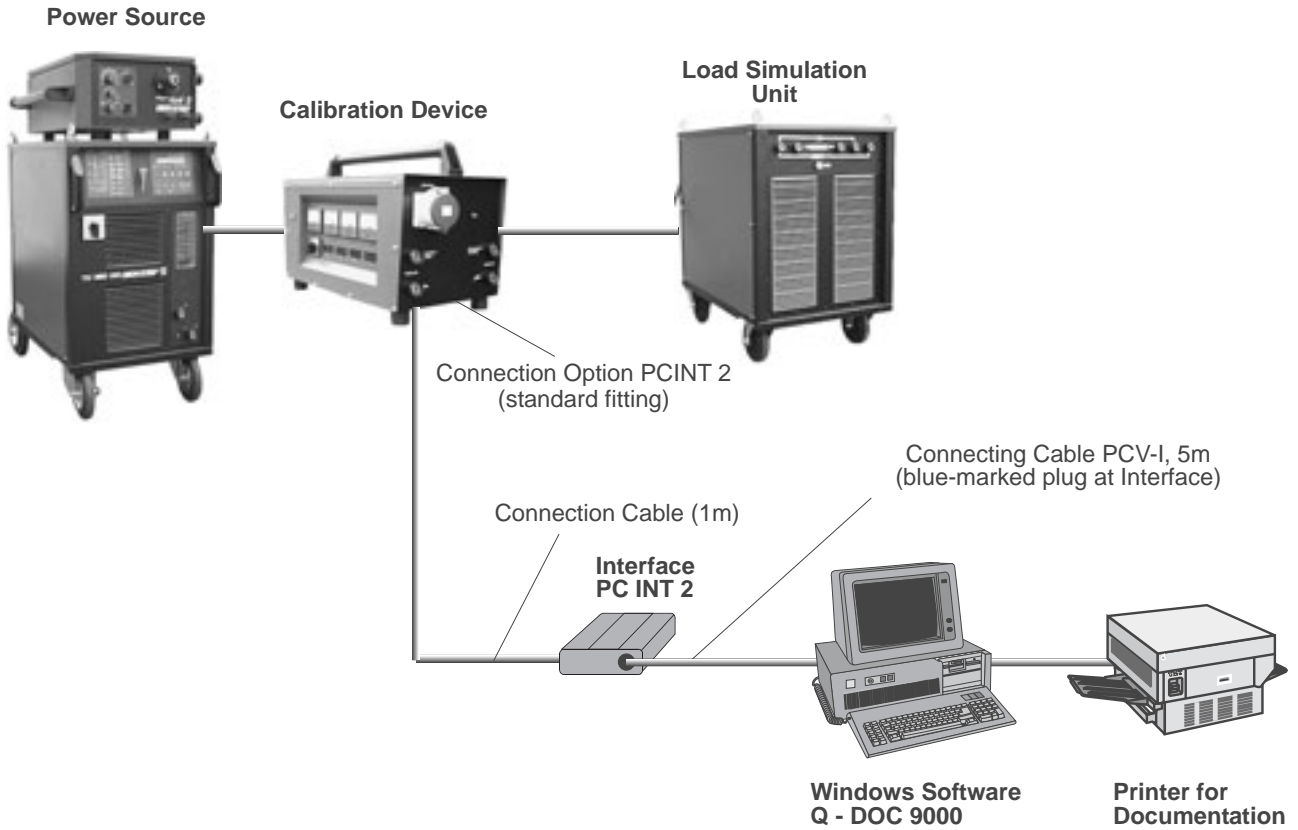
Cable bridge connection for MIG/MAG machines:



## 4 Commissioning

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### 4.4 Connecting the documentation interface PC-INT 2 (option) with Q-DOC 9000 (option)

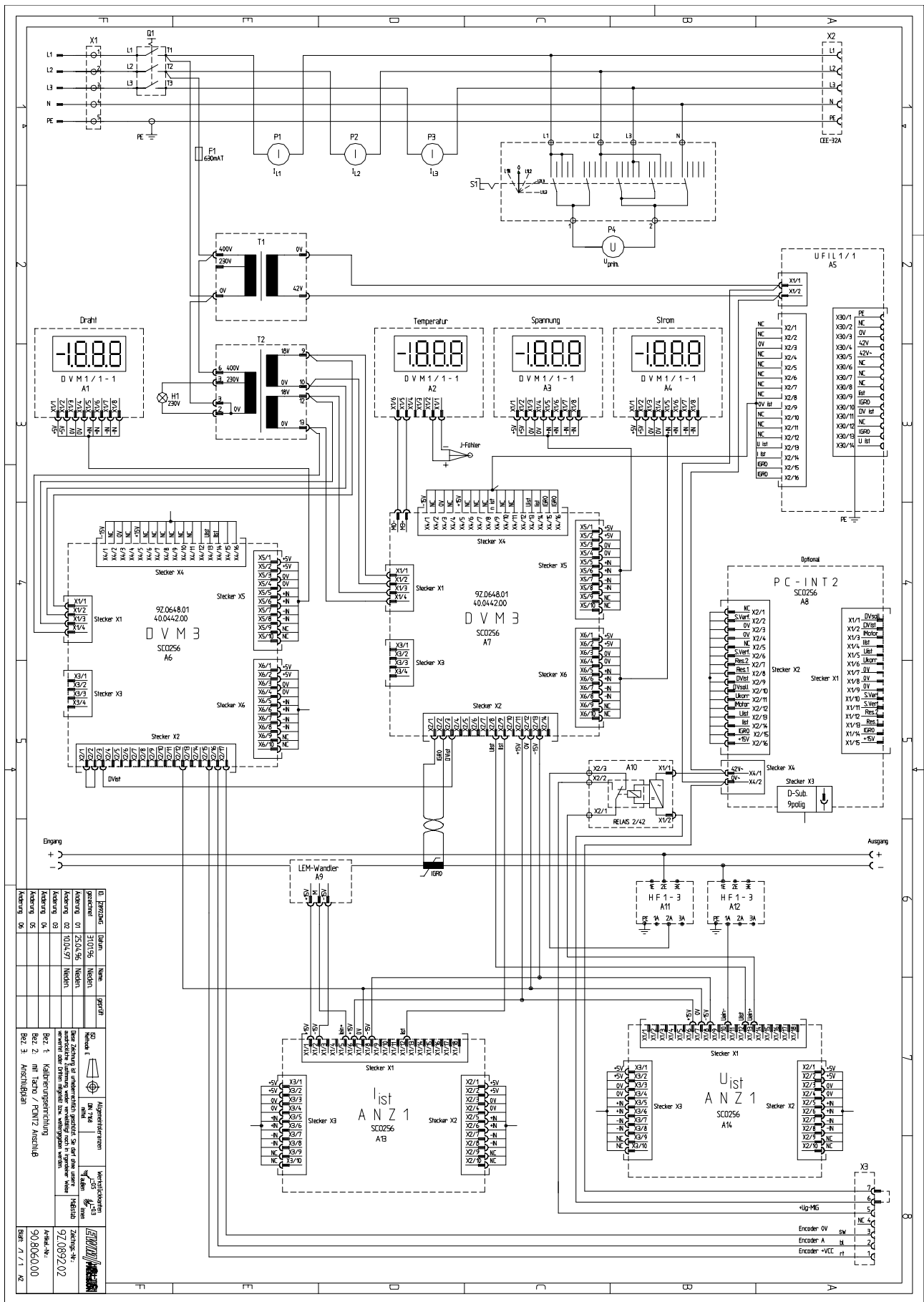


#### Procedure:

- Insert the plug (D-Sub, 9-pole) with the blue label on the PC-INT interface (**Chap. 3.2, C3**) and the 2nd plug on a free serial interface (COM1, COM2, COM3 or COM4) on the PC and screw tight.
- For the subsequent procedure for installation of the documentation software, please see the operating instructions "**Documentation interface PC INT 1 / 2 / 3 and software Q-DOC 9000**"

# 8 Circuit diagrams

(Circuit diagrams are also in the machine)

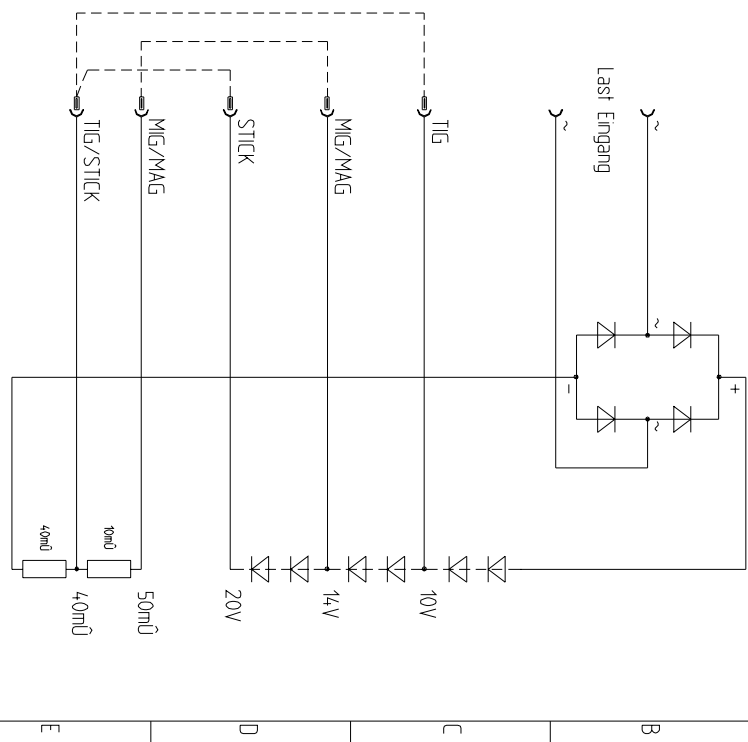
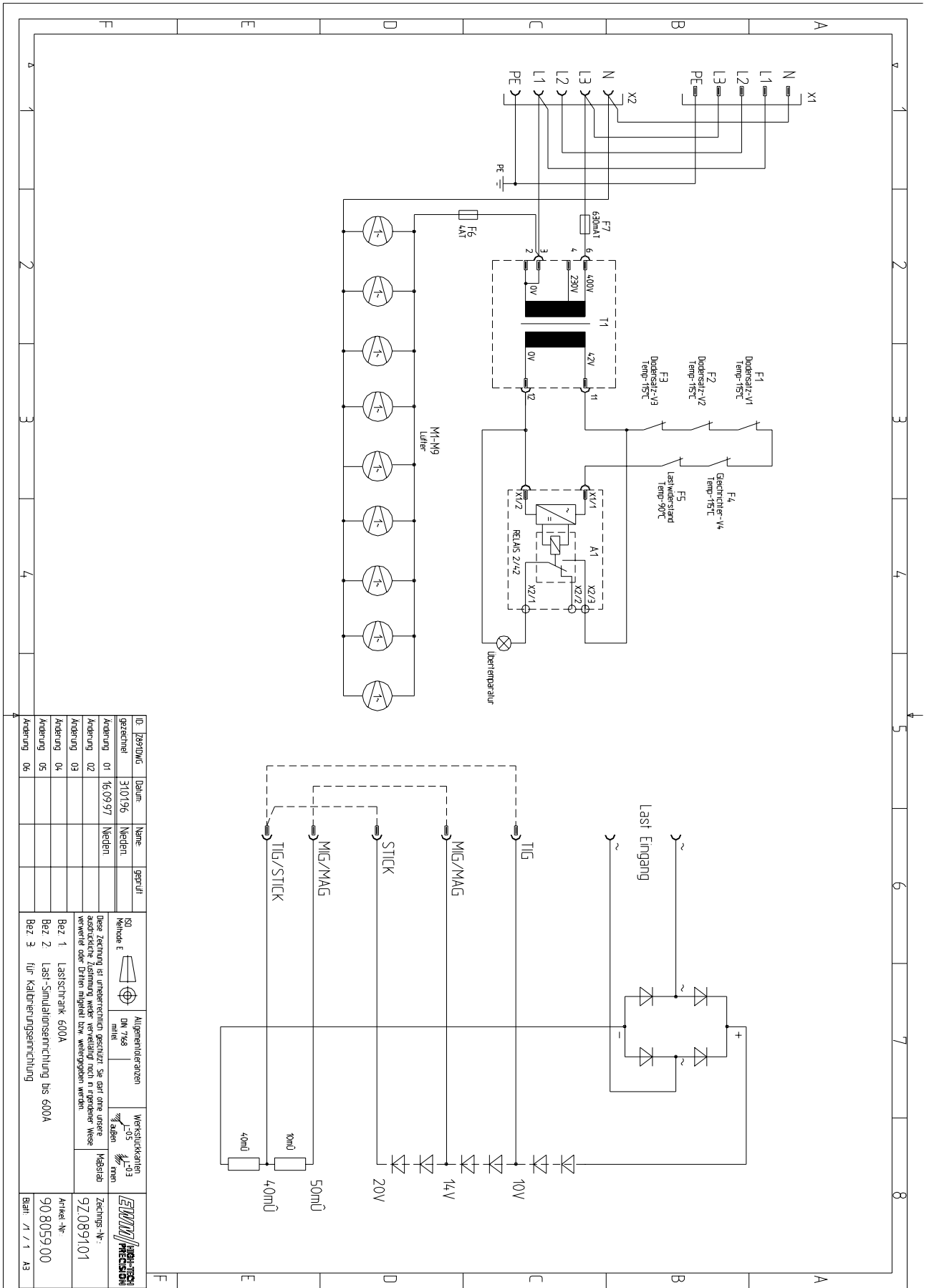


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40.0442.00	3101.56	W0801	1:1		
92.0648.01	3101.56	W0801	1:1		
40.0442.00	3101.56	W0801	1:1		
92.0648.01	3101.56	W0801	1:1		
40.0442.00	3101.56	W0801	1:1		

Bezeichnung	Material	Maßstab	gezeichnet
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Stecker 2	SC0256	1:1	
Stecker 3	SC0256	1:1	
Stecker 4	SC0256	1:1	
Stecker 5	SC0256	1:1	
Stecker 6	SC0256	1:1	
Stecker 7	SC0256	1:1	
Stecker 8	SC0256	1:1	
Stecker 9	SC0256	1:1	
Stecker 10	SC0256	1:1	
Stecker 11	SC0256	1:1	
Stecker 12	SC0256	1:1	
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Stecker 97	SC0256	1:1	
Stecker 98	SC0256	1:1	
Stecker 99	SC0256	1:1	
Stecker 100	SC0256	1:1	

# 8 Circuit diagrams



ID	Zers/DWG	Datum	Name	geprüft	SO Methode E	Allgemeinreferenzen	Verstückelungen	ETWIL/RECHEN/
	gezeichnet	31.01.96	Nieden		DN 748	05 Käben	03 Kästch	92.089101
	Änderung 01	16.09.97	Nieden		Diese Zeichnung ist unvollständig gezeichnet. Sie darf ohne unsere ausdrückliche Zustimmung weder vervielfältigt noch in irgendeiner Weise verwendet oder Dritten mitgeteilt bzw. weitergegeben werden.			
	Änderung 02				Bez 1 Laserschrank 600A			
	Änderung 03				Bez 2 Last-Simulationsrechnung bis 600A			
	Änderung 04				Bez 3 für Kalibrierungseinrichtung			
	Änderung 05				Artikel-Nr. 90.8059.00			
	Änderung 06				Blatt 1 / 1 / 1 A3			

# Calibration Certificate

Examiner:

Date of Calibration:

Customer:

Customer number:

Machine type:

Item no.:

Serial number:

Manufacturer: Messer-EWM GmbH / 56271 Mündersbach

**Messer-EWM GmbH herewith certifies that the above machine has been examined in accordance with national and international standards, using calibrated measuring devices, and operates within the limits of tolerance laid down by the manufacturer and recorded in the test protocol.**

**Recommended interval for calibration of the above machine: 12 months**

## Measuring device used

Measuring device	Serial number	Calibrated with:	Date:	Next due date:
Calibration device		Keithly Model 2000 Serial no.: 0601122		

\_\_\_\_\_  
Stamp / Signature

\_\_\_\_\_  
Date