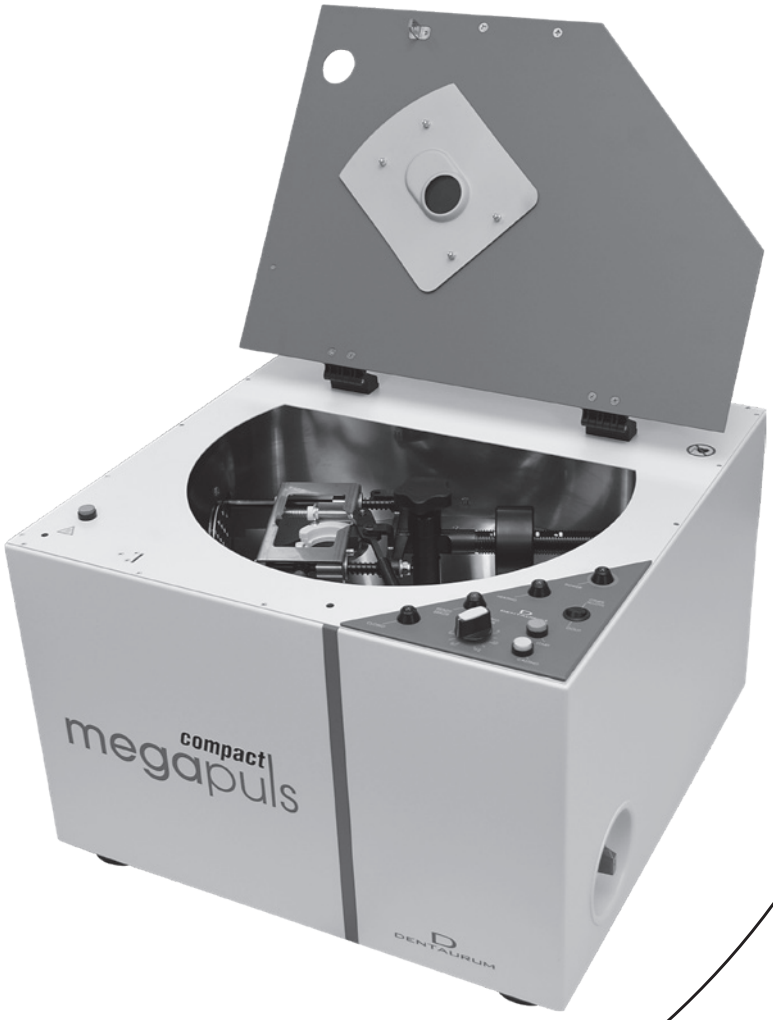
EN

compact megapuls



Instruction manual

DENTAURUM
1886

Contents

1. Declaration of Conformity

EC-Declaration of Conformity

DENTAURUM GmbH & Co. KG
Turnstr. 31
75228 Ispringen

hereby declares that the design and construction of the laboratory equipment described below, including the version marketed by us, comply with the basic regulations governing safety and health as stated in the EC Guidelines. This declaration will become invalid if the laboratory equipment is modified or altered in any way without our prior consent.

Description of unit:	**Megapuls *Compact***	
	REF 090-620-00	
Type of unit:	Induction Casting Machine	
Start with Unit No.:	140-002 051	
EC guidelines:	98/37/EC	Guideline for machine
	73/23/EWG	Low Voltage Directive
	89/336/EWG	Electromagnetic Compatibility Directive

Applied unified standards:

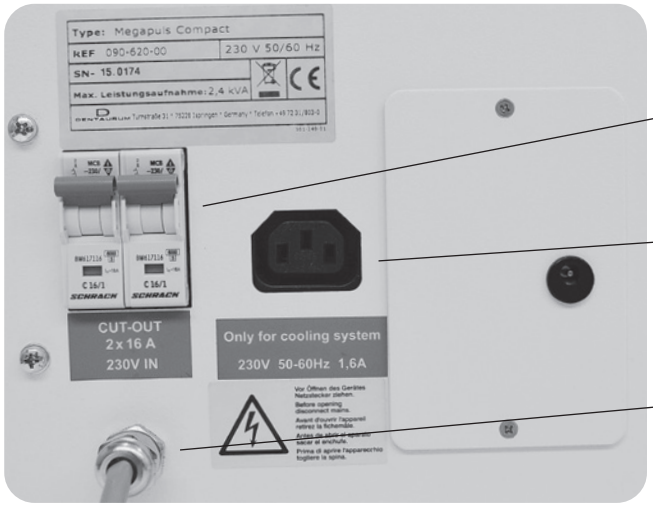
EN 61010-1:2001
EN 61010-2-010:2003
EN 61010-2-020:2006

Date and manufacturers signature: 01.10.2025

Signatory:

- i.V. Dipl. Ing. (FH) K. Merkle -
Production Manager Mechanic

2. Machine description

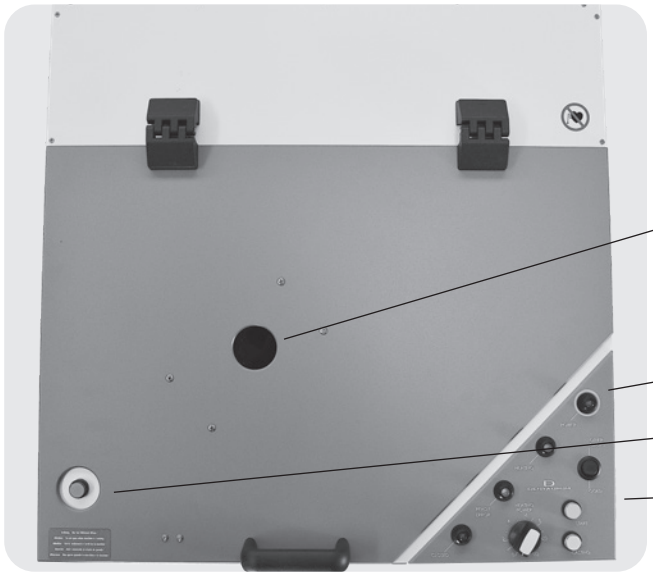


1 Circuit breakers 2x16 A

2 230V power connection socket for water table

3 Mains connection 230 V 50/60 Hz

Fig. 1: Rear view with connections



4 Protection glass

5 Control panel

6 "*STOP*" button

7 Power switch

Fig. 2: Top view

8 Power indicator

9 Melting indicator "*HEATING*"

10 Alloy selector switch

11 Readiness indicator "*READY/ERROR*"

12 "*START*" *button*

13 Rotary potentiometer for heating power

14 "*CASTING*" *button*

15 Locking indicator

Fig. 3: Control panel

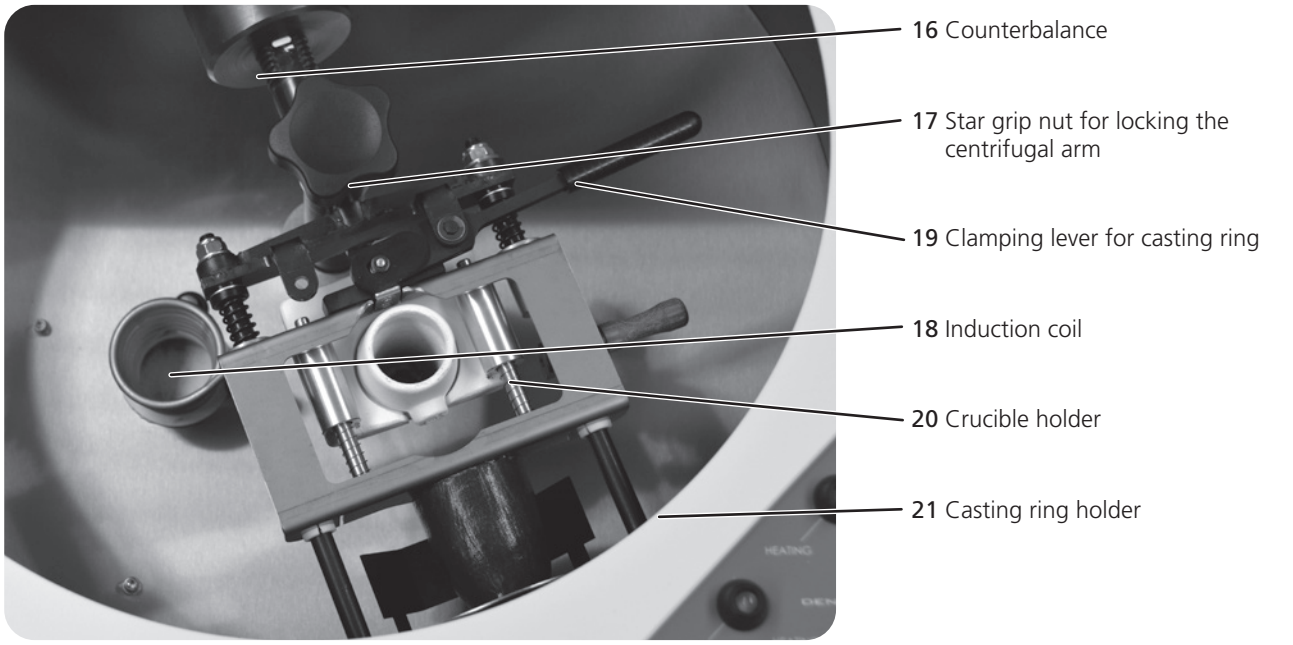


Fig. 4: Casting chamber with centrifugal arm

Fig. 5: Installation position of the water filter on the fresh water connection

3. Safety information

⚠ **Caution** **Read through the instructions for use carefully before installing and operating the unit. Only then should the unit be switched on!**

3.1. Intended use

The ***megapuls compact*** high-frequency centrifugal casting machine is designed exclusively for melting all conventional dental alloys except titanium or titanium alloys and for subsequent shaping by centrifugal casting in dental laboratories. Any other or further use is considered to be contrary to the intended purpose. The company Dentaurum, GmbH & Co. KG shall not be liable for any resulting damages. The intended use also includes observing these instructions for use and carrying out inspection and maintenance work at regular intervals.

When the machine is finally taken out of service, the relevant country-specific regulations must be observed. Dentaurum or the dental trade are available to answer questions regarding the correct disposal of the machine.

3.2. Danger symbols and markings

The following symbols indicating danger are used in the Instructions for use:

⚠ **Warning** Indicates a potentially imminent danger to the life and health of persons.

Failure to observe these instructions can lead to serious health consequences, including life-threatening injuries.

⚠ **Caution:** Indication of a potentially dangerous situation.

Failure to observe this information may result in minor injuries or damage to property.

i Note General information regarding the machine

3.3. Warranty and liability

Our general terms and conditions of sale and delivery apply. Warranty and liability claims in respect of injury or damage to persons and property are excluded if they are caused by one or more of the following:

- Improper putting into operation, operating, assembly and maintenance of the machine
- Improper use of the machine
- Operation with safety facilities that are defective or improperly installed or with inoperable safety and protective precautions
- Failure to observe the information in the Instructions for use regarding transport, storage, installation, operation and maintenance of the machine
- Lack of monitoring of wear parts
- Unauthorized structural modifications to the machine
- Improperly performed repairs

3.4. Operator's obligations

The operator is obliged to only allow personnel to work with this unit who

- are familiar with the regulations on occupational safety and accident prevention and are instructed in the handling of the unit
- have read and understood the safety instructions and the instructions for use
- have been instructed in accordance with the regulations on accident prevention.

3.5. Personnel's obligations

Before starting to work, all personnel who work with the unit must

- observe the basic regulations on occupational safety
- read and understand the safety instructions and Instructions for use and confirm this with their signature.

3.6. General information on the safe use of the machine

- Do not make any modifications to the machine.
- The machine may only be operated in perfect condition.
- Keep your workspace clean. Untidiness in the workplace increases the risk of accidents.
- Do not reach into the machine while it is running. Wait until the centrifugal arm has come to a complete stop before opening. The lid of the centrifuge chamber cannot be opened during the centrifugation process.
- For your own safety, only use accessories and materials specified in the instructions for use. The use of materials other than those specified in the instructions for use may pose a risk of accidents to the operator and is considered improper use.
- Turn off the machine and pull the power plug before any maintenance work.

3.7. Special hazards

⚠ **Warning** The electromagnetic radiation emitted by the Megapuls Compact high-frequency casting centrifuge does not generally pose a hazard to people with cardiac pacemakers, defibrillators, diabetic sensors, or other implanted electro-medical devices. However, if in doubt, as a wearer of a medical device, especially in the case of an older implant, contact the manufacturer of the medical device. For your specific case, they can then determine whether close proximity to the high-frequency casting centrifuge may represent a hazard.

⚠ **Warning** There is a risk of burns when touching the crucible and the casting ring. Only remove the hot casting ring with tongs after casting!

⚠ **Warning** Danger of fire! Do not place any flammable objects in the melting and centrifuging chamber.

⚠ **Warning** Do not look into the melt without protective glass.

⚠ **Warning** Only metals listed in 3.1 may be melted down. Light metals such as aluminum, magnesium, and titanium in particular can lead to dangerous situations during melting and casting.

3.8. Disposal

i Note This symbol indicates that the products should not be disposed of together with household garbage. The legislator disallows commercial customers to return electronic waste via municipal collection points. Further information is available from Dentaurum or the dental trade.

3.9. Scope of delivery

1	High-frequency casting centrifuge ***megapuls compact*** - 230 V	REF 090-620-00
1.	Instructions for Use with Declaration of Conformity	
1,5 m	Fabric-reinforced fresh water pressure hose with 3/4" connectors, inner diameter 8 mm	
1,5 m	Water drainage hose, inner diameter 8 mm	
2	Crucible	
1	Power cable	

4. Description of the *megapuls compact* high-frequency centrifugal casting machine

4.1. Function

The ***megapuls compact*** is an easy-to-use high-frequency casting centrifuge with a space-saving design for melting all dental alloys (except titanium and titanium alloys) and subsequent casting into a casting ring.

It is equipped with manual operation and infinitely variable heating output control, making it universally suited for use.

The system operates according to the energy transfer principle of the transformer, the so-called induction process.

After applying a high-frequency magnetic field, a secondary current generated by induction flows in the surface of the metal to be melted, which is converted into heat and thus causes the metal to melt.

The eddy currents generated in the melt ensure that the molten metal is thoroughly mixed. Subsequent centrifugal casting into a mold also supports homogenization.

The ***megapuls compact*** is distinguished in particular by:

- High melting performance at low energy consumption
- Homogeneous melting and casting
- Low loss of material
- Reduced additional work
- Simple operation
- Low space requirements
- Easy to service

4.2. Design of the system

The high-frequency generator, which is enclosed in a steel sheet housing, is the heart of the system and complies with electromagnetic compatibility requirements. The HF generator generates an electromagnetic field, and thereby heats and mixes the melt very homogeneously. The induction coil (Fig. 4, Pos. 18) is water-cooled and protected against overheating.

- The centrifugal arm (Fig. 4) in the melting and centrifugal chamber accommodates the crucible and the casting ring. The centrifugal arm is equipped with a counterweight to ensure smooth, quiet operation.
- The induction coil (Fig. 4, Pos. 18), which serves as the heat source, is located in the lower part of the chamber and is activated by pressing the "*START*" button (Fig. 3, Pos. 12) after positioning the centrifugal arm.
- The melting process can start when the lid is closed and observed through a protective glass integrated into the lid (Fig. 2, Pos. 4).
- The melting process is completed by pressing the "*CASTING*" button (Fig. 3, Pos. 14).

5. Installation

5.1. Installation site

The installation site must have a solid foundation. The machine must be placed horizontally on a stable table. The installation site should be clean and as dust-free as possible.

⚠ **Caution** **Leave at least 20 cm distance between the casting centrifuge and other devices. This ensures that the machine is well ventilated.**

Furnaces or other equipment that emit heat must not be positioned next to the casting centrifuge.

5.2 Preparatory work for water installation by the customer

The water supply line from the water shut-off valve (Fig. 5) to the hose nozzle on the rear of the machine must be made using a fabric-reinforced fresh water pressure hose with 3/4" connection threads on both sides.

Water drainage from the hose nipple (Fig. 5) at the rear of the machine to the drain into a siphon or directly into the domestic sewage system is via a hose with an inner diameter of 8 mm. The water must be able to drain without any back pressure.

⚠ **Caution** **If necessary, please check the water pressure in your water supply system before connecting the machine. It must be ensured that the pressure is at least 3 bar but no more than 8 bar, even in the summer. If the water pressure is too low, a cooling water circulation unit must be used. However, if the water pressure exceeds 8 bar, then a pressure reducing valve must be installed in the water pipe leading to the machine.**

⚠ **Caution** **In water supply networks which, based on experience, lead to deposits or contamination, the installation of a flow-through filter is necessary to prevent malfunctioning of the water monitor.**

5.3. Preparatory work for electrical installation by the customer

The machine must be connected to a 230 V power outlet, which must be protected by a 16 A K circuit breaker or a 16 A slow-blow fuse.

⚠ **Caution** **All electrical work on the power outlet or supply lines may only be carried out by a qualified electrician.**

6. Commissioning and operation

6.1. Insertion of the casting ring and adjusting the balance of the centrifugal arm

Once the machine has been properly installed, one can start operations. Prior to each casting, the centrifugal arm, together with the crucible and the casting ring, must first be brought into a balanced position.

Note To prevent the casting ring from cooling down, it is advisable to adjust the equilibrium position before waxing the casting ring.

- First, open the tap for the cooling water supply.
- Switch on the machine via the power switch (Fig. 2, Pos. 7).
- When the water cycle is circulating properly, the green "*READY / ERROR*" indicator light (Fig. 3, Pos. 8) lights up.
- Insert the crucible with the casting metal into the crucible holder (Fig. 4, Pos. 20) of the centrifugal arm. Always preheat the crucible without the metal!

- Then clamp the preheated casting ring in the casting ring holder (Fig. 4, Pos. 21) using a clamping lever (Fig. 4, Pos. 19).
- The centrifugal arm must then be brought into a balanced position. To do this, loosen the star grip nut (Fig. 4, Pos. 17) and bring the centrifugal arm into the balanced position by turning the counterweight (Fig. 4, Pos. 16) on the spindle. Then retighten the star grip nut and remove the casting ring. As a rule, this adjustment is carried out before the actual melting process.

⚠ **Caution** **The star grip nut must be tightened securely! Otherwise, this could lead to damage to the centrifugal arm or the machine during the centrifuging process.**

6.2. Starting the melting process

Once the centrifugal arm has been balanced with the casting ring and the casting ring has been removed for waxing, the actual melting process can commence.

Note The hot casting ring can either be inserted into the centrifugal chamber immediately prior to the melting process or only after the casting metal has been pre-melted in the crucible (preheating function). This prevents the casting ring from cooling down too much. Pre-melting is recommended for larger quantities of metal.

Note A graphite insert must be used when melting gold-colored precious metal alloys. Only use the ceramic crucible when melting silver-colored precious metal alloys! This also applies to palladium base alloys. But first, vitrify the crucible with melting powder.

Note The rotary potentiometer for the heating power (Fig. 3, Pos. 13) and the duration of the pre-melting process should be adjusted for the respective alloy or the required amount of metal so that the metal does not melt 100% during pre-melting.

- Preselect the melting performance using the rotary potentiometer for the heating power (Fig. 3, Pos. 13). Control the power such that the melting process takes less than one minute but more than 30 seconds, depending on the alloy and the amount of material being melted. Only for very large quantities of metal can the melting process take longer than 60 seconds.

  When using the graphite crucible, which is inserted into the ceramic crucible, reduce the melting power significantly so that the slowly heating graphite crucible gently melts the contained precious metal alloy.
- Set the centrifuging time using the alloy selector switch "*GOLD/OTHER ALLOYS*" (Fig. 3, Pos. 10). In the "*GOLD*" setting, the centrifuging time is slightly increased. In the "*OTHER ALLOYS*" setting, the centrifuge exhibits its maximum force and the centrifugation time is shortened.
- Position the centrifugal arm over the induction coil until a signal sounds.
- Press the "*START*" button (Fig. 3, Pos. 12) to start up the induction coil.
- Close the lid of the centrifugal chamber. The melting process will start and the "*HEATING*" indicator (Fig. 3, Pos. 9) lights up.
- Monitor the melt through the protective glass. Once the casting metal has almost melted, the casting ring can be inserted.
- Clamp the hot casting ring into the casting ring holder (Fig. 4, Pos. 21) using suitable tongs.
- Closing the lid again immediately resumes the melting process. The rotary potentiometer for heating power (Fig. 3, Pos. 13) can also be used to increase or decrease power during the melting process.

Note The melting process can be interrupted by pressing the red "*STOP*" button (Fig. 2, Pos. 6) (see also Section 6.6).

⚠ **Caution** **Danger of burns! High temperatures can be reached in the centrifuging chamber due to the melting process.**

6.3. Starting the centrifuging process

Once the casting metal has melted completely, press the "*CASTING*" button (Fig. 3, Pos. 14). The centrifugal arm is now accelerated via an electric motor. The molten casting metal flows into the hot casting ring due to centrifugal force.

6.4. Opening the centrifuge chamber lid and removing the casting ring

Only after the centrifugal arm has come to a complete stop can the centrifuge chamber lid be opened and the casting ring removed.

⚠ **Caution** **Danger of burns when removing the hot casting ring! The casting ring and crucible may only be removed using suitable casting ring tongs and additional protective gloves.**

⚠ **Caution** **Do not open the lid with force! During the centrifuging process and also while the centrifugal arm is slowing down, a locking mechanism prevents the centrifuge chamber lid from being opened.**

6.5. Switching off the machine

To switch off the machine, close the centrifuge chamber lid and switch off the machine at the power switch (Fig. 2, Pos. 7).

i Note The machine must not be switched off between different casting processes for better cooling. Only switch off the machine at the power switch after the last cast.

i Note The machine automatically stops the water supply after being switched off. Therefore, there is no need to turn off the water after each casting process. However, during longer periods of downtime, e.g. over the weekend, the water supply must be turned off.

6.6. Using the "*STOP*" button

When the casting system is used correctly, the "*STOP*" button (Fig. 2, Pos. 6) is not required. Its use is only necessary if the current work cycle has to be interrupted due to an error or malfunction.

When the "*STOP*" button (Fig. 2, Pos. 6) is pressed, the current work step, e.g. melting the casting metal, is immediately interrupted and the induction coil is moved downwards.

7. Cleaning and maintenance

⚠ **Warning** **Always switch off the machine and disconnect it from the power supply before performing any service or maintenance work. During servicing and repairs, there must always be a second person in the immediate vicinity who is knowledgeable about the effects of electrical voltages.**

All work on electrical components of the machine may only be carried out by authorized, qualified personnel or by the Dentaurum service technicians.

7.1. Cleaning the water inlet

The water filter on the fresh water connection (Fig. 5) must be cleaned every six months:

- To do this, first close the water shut-off valve in the laboratory while the device is switched on. This way, the water cycle in the machine is no longer subjected to water pressure.
- Then switch off the machine and disconnect it from the electricity supply.
- After closing the water connection and disconnecting the machine from the power supply, unscrew the fresh water pressure hose from the machine (Fig. 5).

- A fine filter is located in the fresh water connection on the machine, which can be removed with pliers (Fig. 5). Clean the fine filter with a brush under running water or in an ultrasonic bath.
- Then reinsert the cleaned fine filter into the opening on the fresh water connection and screw the fresh water pressure hose back on. Ensure that the washer between the fresh water connection and the connector on the fresh water pressure hose is in place.
- Before switching on the device and before reopening the water shut-off valve, check the hose connection for leaks.

7.2. Cleaning the machine

Wipe the machine with a slightly damp cloth from time to time. Do not use aggressive cleaning agents or sharp objects for care.

After each use of the machine, clean any residue from the centrifugal arm and check that it moves freely.

Residues must be removed regularly from the centrifugal chamber. Great care must be taken here to ensure that no metal particles enter the guides of the working coil.

7.3. Handling the crucibles

To achieve optimal casting results, the following must be observed:

- The crucibles (REF 090-611-00) should be stored in a dry, dust-free place and protected against impact.
- After each melting process, the crucible must be checked for possible damage or wear. Crucibles with cracks must no longer be used.
- Residues must be removed from the crucible with care. Remove coarse residues with tweezers and then clean the crucible with compressed air.
- Mark the crucibles on the outside with a graphite pencil to record which alloy was melted in them.

i Note Use a separate crucible for melting different alloys in each case.

- Due to the nature of the crucible materials used, the ceramic industry has to work with large tolerances. It is therefore possible that a crucible may become jammed in the holder. The crucible can be made to fit by reworking with a file.

According to the supply conditions of the ceramics industry, neither a specific service life nor a warranty against damage during transport can be provided for the crucibles.

The following crucibles are offered as standard for the ***megapuls compact*** high-frequency centrifuge:

Crucible	10 pieces	REF 090-611-00
Graphite crucible insert	10 pieces	REF 090-615-00

8. Troubleshooting

The casting system is equipped with a fault monitoring system. The following sources of error can lead to a malfunction:

Fault	Cause	Action
Display "*READY / ERROR*" (Fig. 3, Pos. 11) lights up red	Water cycle interrupted	Check the water cycle
	Flow monitor defective	Replace the flow monitor
	Water pressure too low	Check the water pressure
	Overheating of the system due to insufficient air circulation	Leave at least 20 cm distance right and left of the machine to other devices or a wall
	Overheating of the system due to an excessive number of castings	Built-in thermal protection automatically interrupts the melting function for 5 minutes. Perform a maximum of 15 consecutive casts. With connected water circulation device, max. 7 casts, then a 10-minute break!
No LED lights up after switching on.	Circuit breakers on the rear panel of the machine are switched off	Switch on circuit breakers
	Power voltage missing	Check mains connection
	Power switch defective	Replace power switch
No LED lights up after switching on.	Power supply fuses defective	Check or replace fuses
	Power supply defective	Power supply unit must be replaced (call customer service)
Induction coil cannot be started.	Centrifugal arm not positioned	Move the centrifugal arm into position (confirmed by a continuous beep)
	Position of the arm is not detected by the integrated light barrier	Light barrier defective, must be replaced (call customer service)
	Fuse or motor for lifting mechanism defective	Check or replace fuse, lift mechanism motor defective (call customer service)
	START button defective	START button needs to be replaced (call customer service)
	Switch at the lower end position defective	Lower end position switch must be replaced (call customer service)
After the melting process and pressing the "*CASTING*" button, the device does not centrifuge.	Control defective	Control unit must be replaced (call customer service)
	Induction coil does not move down	Check or replace fuses, lift mechanism motor defective (call customer service)
	Induction coil is blocked mechanically	Clean guide sleeves of the induction coil
	Centrifugal motor defective	Motor must be replaced (call customer service)
	Switch at the upper end position defective	Upper end position switch must be replaced (call customer service)

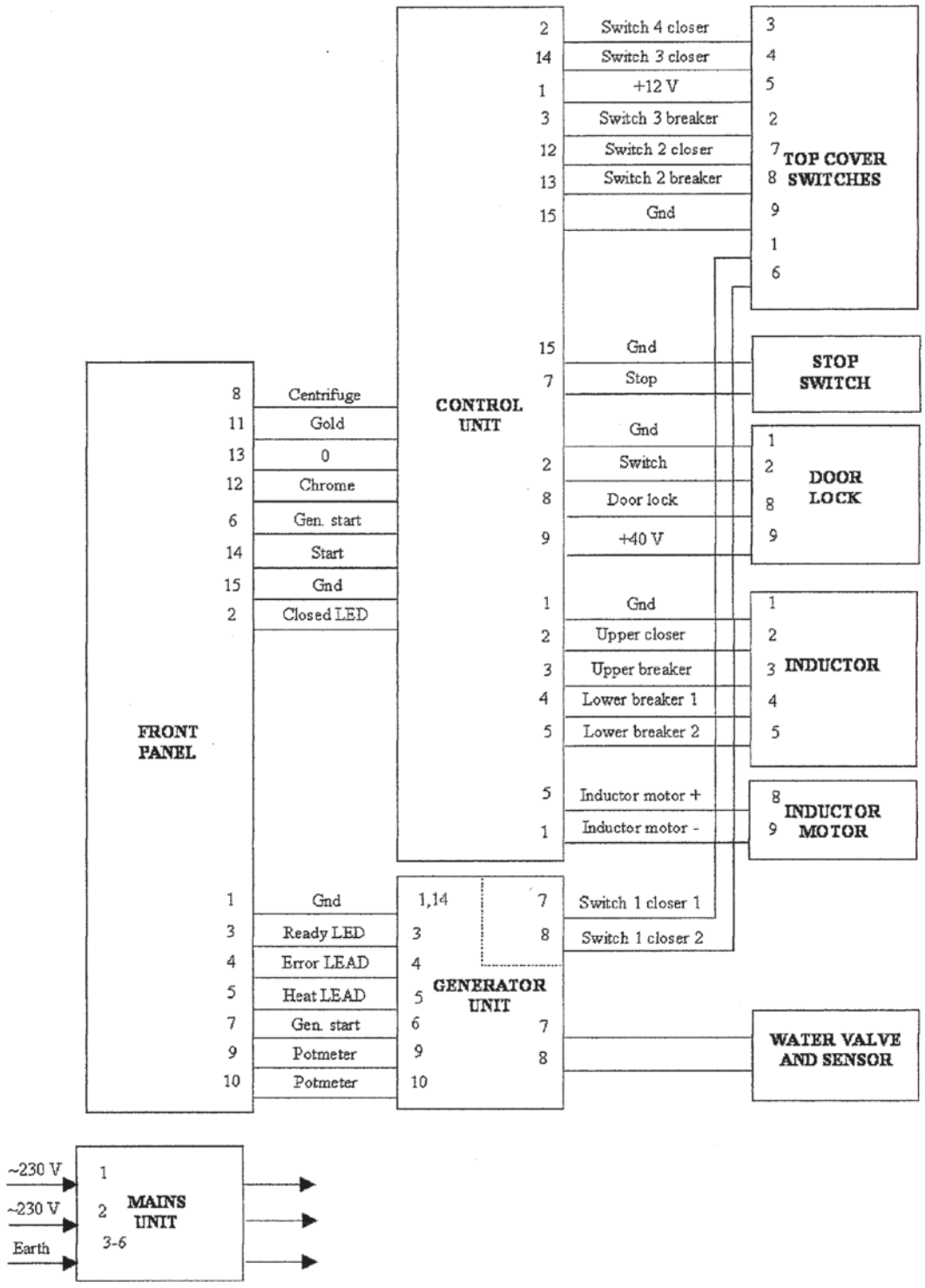
If you encounter problems that cannot be resolved using this troubleshooting table, please call your local service technician or contact the Dentaurum Technical Customer Service – Devices directly.

Tel: **+49 72 31 / 803 - 211** · info@dentaurum.com

9. Spare parts

Crucible	10 pieces	**REF** 090-611-00
Graphite crucible insert	10 pieces	**REF** 090-615-00
Light protection glass	1 piece	**REF** 908-271-00

10. Schematic



11. Technical data

Power voltage	230 V
Power frequency	50/60 HZ
Max. power consumption	2.4 kW
Average power consumption	1.5 kW
Contact protection class	I
Starting torque	0...21 Nm
Min. melting charge	15 g precious metal, 15 g CoCr, NiCr, Pd
Max. melting charge	100 g precious metal, 70 g CoCr, NiCr, Pd
Max. electr. output	2.2 kW
Water requirement	min. 2 l/min
Ambient temperature for operation	15 °C...40 °C
Storage temperature	5 °C...40 °C
Relative humidity of the environment	max. 70 %
Dimensions [width x height x depth]	560 mm x 425 mm x 630 mm
Weight	55 kg

Date: 2025-10

Subject to modifications

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