LUKADENT® GmbH

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Technical Documentation

Mini Casting unit LUKACast S+

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Keep for future use!

1 General information

1.1 Scope of delivery and responsibilities

The vacuum pressure casting machine LUKACast S+ is delivered complete. Please check delivery immediately after receiving the shipment if there is something missing or possible transport damages. Please tell the faults the shipping agency and your dealer.

1.2 Liability, warranty and guarantee

The company *Lukadent GmbH* take liability, warranty and guarantee according to the legal regulations.

The vacuum pressure casting machine is built to be state-of-the-art and in compliance with the accepted safety regulations. Nevertheless, can improper installation and non-intended using lead to danger and damages.

Lukadent GmbH don't take liability for damage caused by untrained personnel operating the machine.

For damages because of demonstrably misusing of machine or because of abnormal behaviour no liability will be taken by *Lukadent GmbH!*

Lukadent GmbH don't take liability for damages caused by faulty protection of power supply and/or wrong connecting the supplies (protective gas, water, compressed air).

There is no guarantee for consumables by *Lukadent GmbH*.

Company *Lukadent GmbH* can not and will not take responsibility for all consequential damages caused by above mentioned circumstances.

This operating manual is of the technical state at printing date. All rights reserved regarding technical changings and different equipment.

Damages caused by disregard, wrong interpretation and non-compliance with specifications in this manual will lead to expiration of guarantee for this system.

1.3 Responsibility of operating company

The operator has to meet with national accident preventing regulations and technical regulations.

Operating company is allowed to let operate machine by trained and trustworthy personnel only.

Operating company has to make sure the system is supervised by personnel which is trained at this device.

Operating manual must be kept right next to the system.

Operating company has to ensure operating personnel has **read and understood** the manual before they are going to use the machine.

Operating company has to ensure unauthorized person has no access to the system.

2 Safety

2.1 Intended use

Operational safety of the mini casting machine is only guaranteed at intended use.

The mini casting machine serves exclusively for melting, pouring and vacuum casting of commercially available precious metals and of copper- or aluminium-alloys. Dental alloys and high reactive alloy like magnesium can't be melted. The specified temperature ranges must be complied with.

Every other use of the overall plant or parts is considered as not intended.

Unauthorized modifications of the plant are prohibited because of reasons for safety! The declaration of conformity will expire with modification.

Intended use includes reading, knowing and obeying the operating instructions. That also contains observing of servicing and maintenance regulations.

Set up, operation and maintenance is only allowed to be carried out by trained qualified personal that has read and understood all documents.

The plant may affiliate only to the specified media. Supply voltage and input respectively output pressure have to be observed to the given device labelling accordingly.

The machine has been developed for use in enclosed spaces and for the above-mentioned application.

Only original Lukadent consumables and spare parts are admitted for operation.

It is not allowed to change or vary the system in any way. Technical changes need explicit written approval of *Lukadent GmbH*.

The casting machine must not be placed in areas with explosive atmospheres.

Predictable abuse:

- Warming of human body parts on hot surfaces.
- Heating and casting of others then the mentioned metals.

2.2 Demands on staff, duty for utmost care

Work on and with the machine is allowed to be accomplished by reliable, trained and instructed staff only. Responsibilities for the separate sections have to be regulated clearly which include operation, preparation, service and repair.

Only authorized personnel may act at the system.

The machine may never be operated by personnel under influence of reflex diminishing medicine or people not able to work because of illness or disorder.

Running of the system has to be always supervised by trained staff.

Personnel which have to be trained und introduced to this job or within in the course of vocational training may work only under permanent observation of a person experienced with the machine.

Work on the electrical equipment is only allowed for workers skilled in the field of electricity.

The instruction manual has to be freely disposable at the location of the system. The employees have to know the storage place.

Every person working at the system has to read and apply the instruction manual especially the safety advices. The personnel have to read and understand the chapters referring to safety aspects for the particularly components of the machine. Please read before beginning the work.

Please control the personnel for paying attention to all facts of safety and danger prevention.

2.3 Protective measures

This operator’s guide contains all important advices to operate the system secure.

Basic prerequisite for safe dealing and trouble-free running of this system is the knowledge of fundamental safety advices and industrial safety rules.

In commercial facilities you have to regard the accident prevention regulations of the professional association for electrical systems and tools.

The internal regulations of industrial safety are to be observed.

2.3.1 Concept of safety

Objective is the safety:

- of the staff against injuries;
- of the system against damage or standstill and
- of the environment against endangering.

The list of actions taken:

- deployment of protective equipment like covers and mains switch; you can unplug the mains plug as an emergency stop. The wall socket for the mini-casting unit LUKACast S+ must be freely accessible.
- water-cooled inductor housing;
- duty of wearing personal protective equipment (PPE);
- affix safety markings on the installation;
- create safety advices in the manual.

2.3.2 Protective gear

Protective gear (PPE) includes:

- heat-resistant clothes,
- heat-resistant, closed shoes,
- heat-resistant protective gauntlets protecting artery and
- face guard.

Caution!

Wear always for every process step the right protective gear.

2.3.3 Safety equipment

The safety of the machine is only guaranteed if all safety equipment is proper installed and working proper. Don’t use the system without the safety equipment!

Disassembling safety equipment is only allowed in power supply free state (mains switch in off-position, mains plug disconnected and placed in sight). Install every part of the safety equipment after repair. Perfect function has to be checked.

Caution!

Safety equipment protect from unintentional access of the staff to danger spots. They prevent possible injuries. Never manipulate the safety devices!

2.3.4 Safety markings on the unit

A necessary condition for safe dealing with and undisturbed running of the machine is the knowledge of safety instructions and industrial safety regulations.
At the machine casing the following safety markings are attached.

safety marking	meaning	safety marking	meaning
	Warning of dangerous electrical voltages.		Wear heat resistant safety clothing.
	Warning on hot surfaces.		Wear heat resistant protective gauntlet gloves protecting artery.
	Forbidden for persons with pacemaker.		Wear face guard.
	Read instruction manual.		Wear protective shoes.

Advice

Keep the safety markings always clean. Replace the markings if they aren't recognizable. Observe the warnings and commands. Don't expose yourself careless to dangerous situations.

3 Technical Data

	LUKACast S+
Crucible volume (1)	15 cm^3 (ceramic crucible) 10 cm^3 (with graphite inlay)
Pressure range in melting chamber in bar	-1 to 2
Crucible temperature in °C	max. 2000
Melting performance in kW	3.5
Mains supply	230 V, 50 or 60 Hz
Fuse protection in A	16
Abduct current in mA	4.45
Thermocouple	Type N (NiCr-Ni), max. 1300 °C Optional type S (PtRhPt) max. 1400 °C
Cooling water supply	Øa 6 mm, 2.5 - 5 bar / min. 1.5 liter/minute, max. 6 °dH
Cooling water recoil	Øa 6 mm, pressureless
Cooling water entry temperature	15 - 25 °C / 59 - 77 °F
Ambient temperature	10 - 35 °C / 50 - 95 °F
Relative humidity	20 - 80 %
Protective gas supply	Øa 8 mm, argon or nitrogen, 6-8 bar
Vacuum	Øa 8 mm, min. 8 m^3/h, 0.1 mbar abs.
Weight in kg	ca. 27
Dimensions in mm (Wide x Depth x Height)	400 x 450 x 400
Maximum melting temperature	Depends from used thermocouple: type N (NiCr-Ni): 1300 °C type S (PtRhPt): 1400 °C
Noise emission in dB (A)	72

(1) These are standard values which can be changed optional.

4 Description of the system

4.1 Components of the system

The system consists of several modules assembled in one housing.

Inside the housing there are:

- mains cable,
- microprocessor controlled induction generator DM-type,
- middle-frequency transformer,
- oscillating circuit capacities and
- pneumatic (magnet-) valves.

The front plate contains:

- front panel for control of the casting process.

To the melting system belongs:

- inductor housing, water cooled with inductor, crucible, insulations and thermocouple.

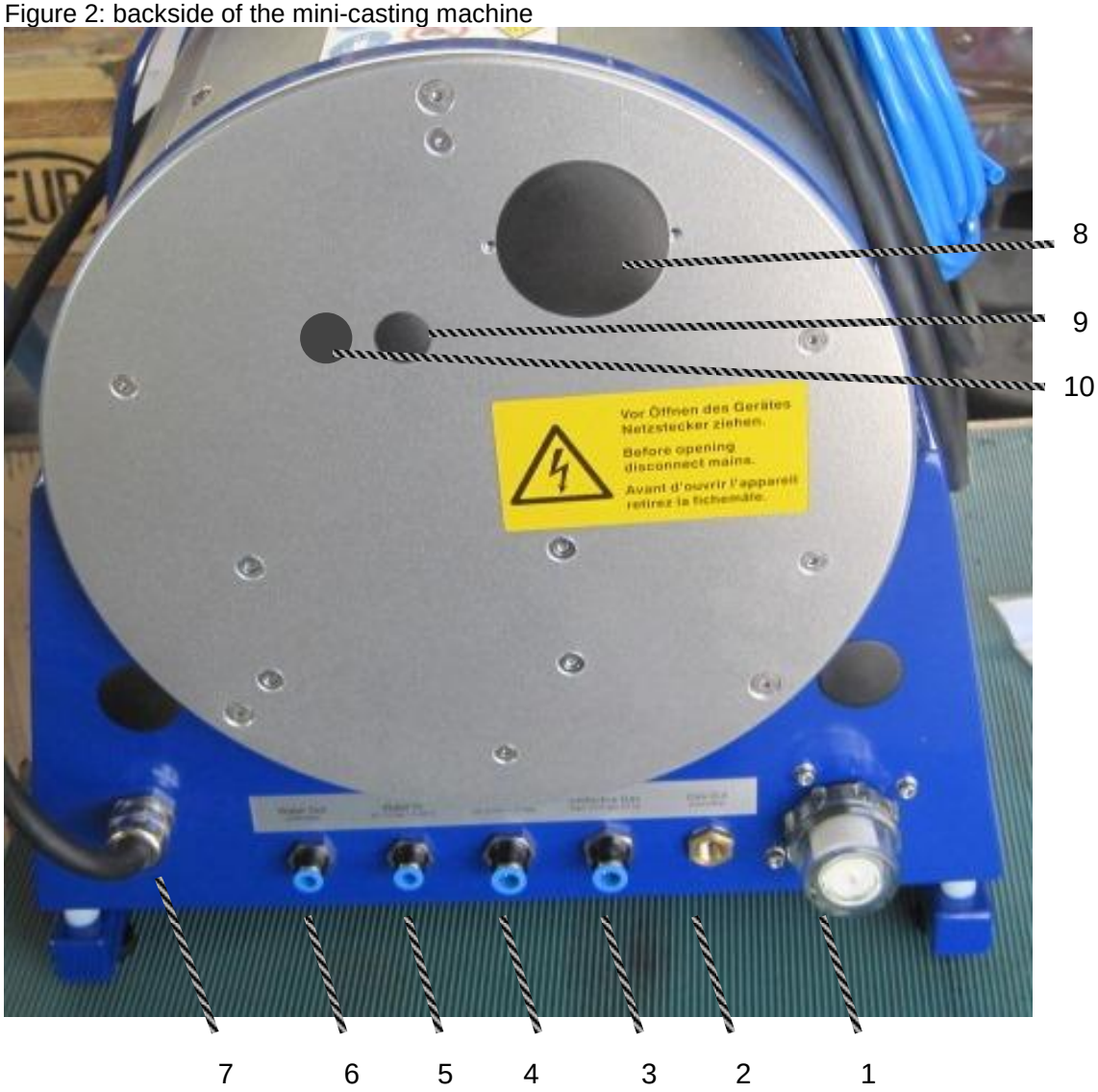
4.2 Schematic representation

Figure 1: overall view

Position	Description	Function
1	tilting handle with lock	Due to movement to the right the machine will cast.
2	inductor housing	The melting and casting process takes place here.
3	control buttons.	Control the casting process. See ch. 4.6.
4	LCD screen	See chapter 4.5
5	top plate with handle	Locks the inductor housing.
6	lock	Locks the system for safety reasons and to allow overpressure.
7	mains switch	Machine will be turned on and off here.

4.3 Connections on the backside

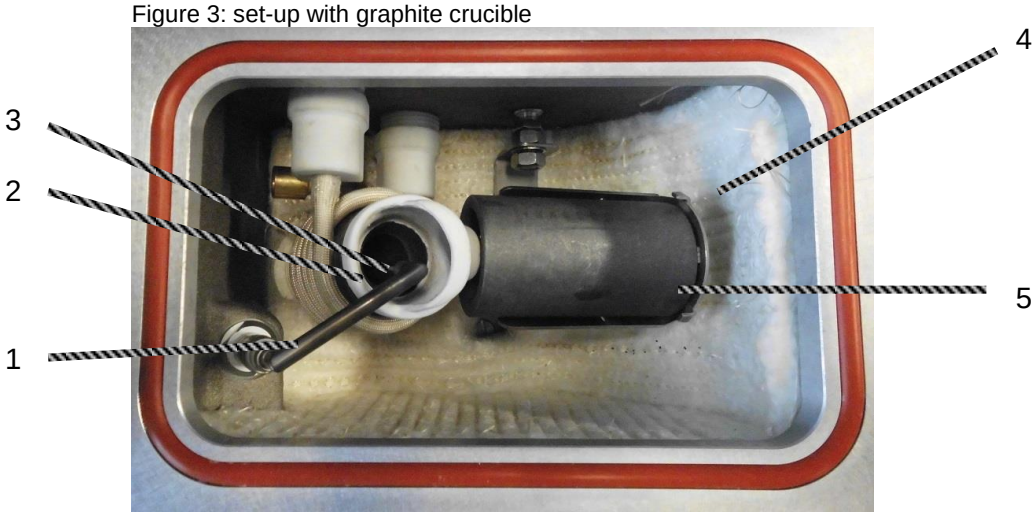
Figure 2: backside of the mini-casting machine



Position	Description	Function of the connection
1	vacuum filter	filters the vacuum
2	Gas out	gas outlet
3	Protective gas	input for protective gas or compressed air
4	Vacuum	connection for external vacuum pump
5	Water In	input for cooling water
6	Water Out	output for cooling water
7	mains cable	electrical connection for machine
8	RS232 connection	connection for PC or modem for service issues
9	Ethernet	connection for Ethernet-cable (RJ45) for service
10	USB-B-socket	connection of USB cable for service issues

4.4 Set-up in the vacuum chamber

Figure 3: set-up with graphite crucible



Position	Description	Function
1	thermocouple type S	Allows a temperature measurement up to 1400 °C.
2	ceramic crucible with graphite inlet	In this crucible the graphite contains the heat and transfers the energy to the metal.
3	ceramic cover	Protects the thermocouple against contamination with liquid metal or graphite.
4	Flask adapter	Adapter for various flasks and mould sizes.
5	Mould	Here graphite mould. You can use flasks too.

4.4.1 Different crucibles

Figure 4: types of crucibles

Ceramic crucible with graphite inlet for precious metals

#12279021.

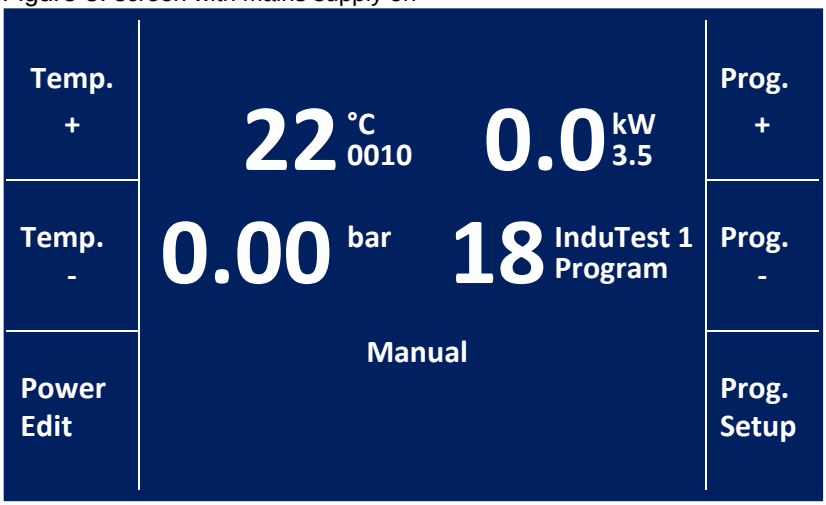
Ceramic crucible for CrNi, CrCo and other steel alloys

#12279020.

4.5 Front panel display

4.5.1 LUKACast S+ screen when starting the machine

Figure 5: screen with mains supply on



Display in the middle section:	
22 °C	actual temperature
0010 °C	set temperature.
0.00 bar	actual crucible pressure (-1 to 2.0 bar)
0.0 kW	actual heating power in kW
3.5	maximum heating power in kW
18 Program	active program
InduTest 1	program name
Manual	casting mode

On the left side shown:	
Temp. +	Rise the set temperature even within a program.
Temp. -	Lower the set temperature even within a program.
Power Edit or Temp. Edit	Changes display to achieve temperature or power controlling.

On the right side shown:	
Prog. +	Go to the next program (here program 19).
Prog. -	Go to the next program one place lower (here program 17).
Prog. Setup	Level to modify the selected program (here program 18).

4.5.2 LUKACast S+ modify program screen

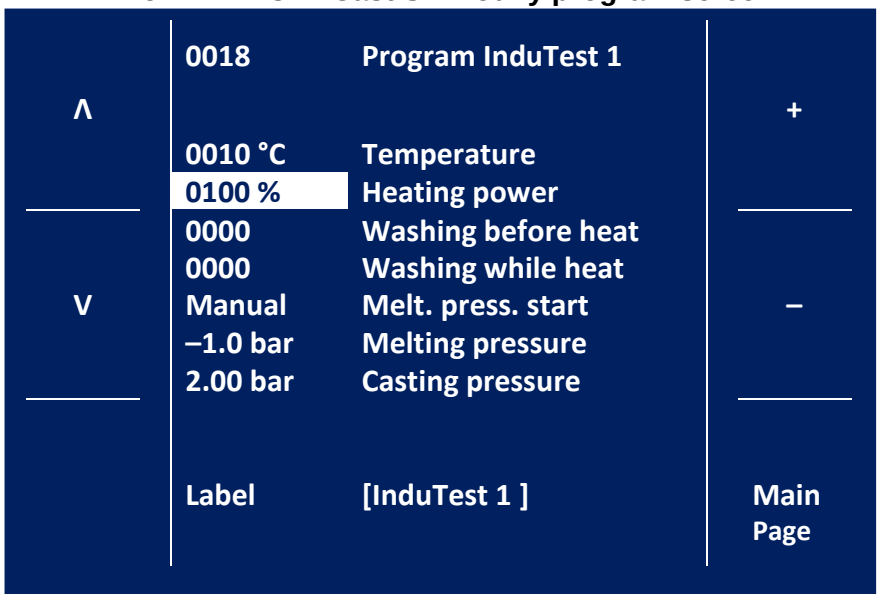


Figure 6: program parameter

middle section with program parameter

Outer area with choice

Display in the middle area:			
0018	InduTest	‚0' to ‚19'	Selected program to modify.
0010 °C	Temperature	‚10' to ‚1300'	Set temperature inside the crucible.
0100 %	Heating power	‚10' to ‚100'	You can reduce heating power here.
0000	Washing before heating	‚0' to ‚5'	Washing cycles before heating (starts with vacuum, then backfill to 0.0 bar with protective gas). Number displays the cycles that will be done. It is recommended for palladium alloys (very reactive).
0000	Washing while heating	‚0' to ‚5'	Washing cycles during the machine heats.
Manual	Melting pressure start	‚Automatic'	Start of the melting pressure. Pressure starts after the washing cycles.
		‚Manual'	To start melting pressure, you need to press the start button again.
–1.00 bar	Melting pressure	‚-1.00' to ‚0.00' bar	Melting pressure set value in chamber during heating.
2.00 bar	Casting pressure	‚-1.00' to ‚2.00' bar	Casting pressure set value.
Label	[InduTest 1]		Here you can change the name of the program.

Display on the side:	
Λ	Moves the input area (highlighted area) one level above.
V	Moves the input area one level below.
+	Increases the value within specified limits.
-	Decreases the value.
Main page	Display returns to main menu.

4.5.3 LUKACast S+ modify system parameter

If you start from the main page and you press “Program Setup” for 5 seconds you get access to the system-parameter level.

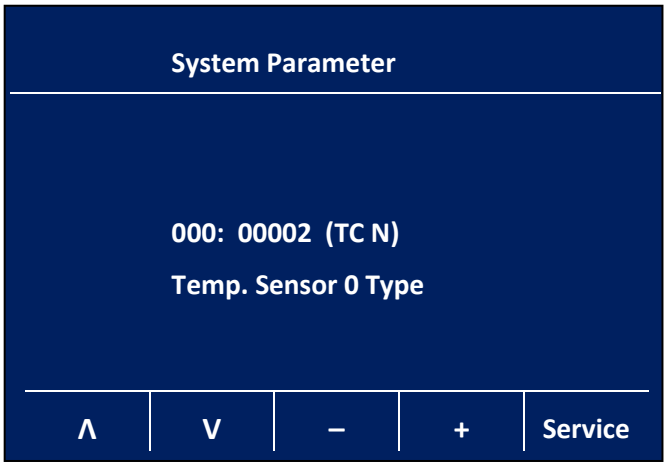


Figure 7: System parameter

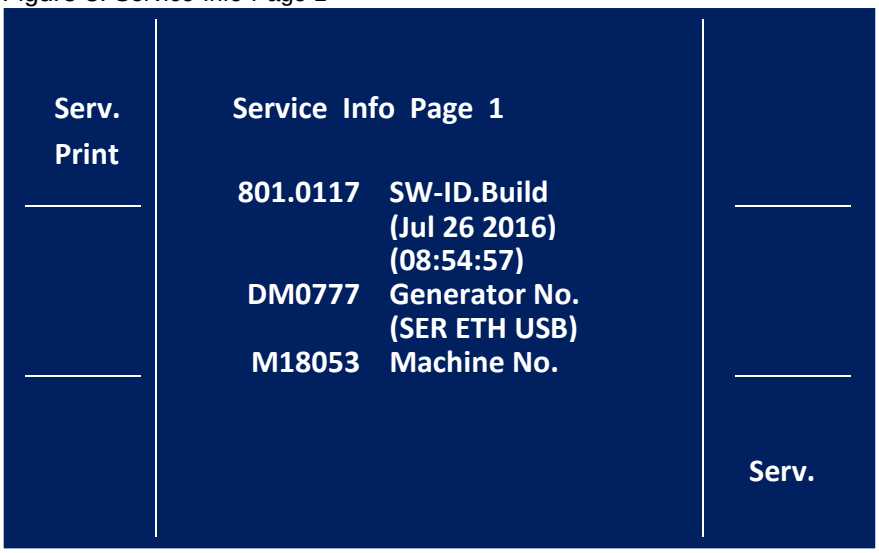
Note:
Please refer to the explanations for the parameters in the attachment software documentation. The adjusted values should be changed with care and usually after consultation with the Indutherm service staff.

Display-functions:		
000:	00002	Selected parameter: 000. Value of parameter is 2, which means here thermocouple type N (TC N) is activated.
V		With pressing ‘arrow down’ you get to previous parameter (here not possible).
Λ		With pressing ‘arrow up’ you get to next parameter 001.
-		With pressing ‘-’ you decrease the value to 1.
+		With pressing ‘+’ you increase the value to 3.
Service		With pressing the button near to this word, you see information of ‘Service Info Page 1’ with several serial numbers.

4.5.4 LUKACast S+ State-Level (Service Info Page 1 + 2)

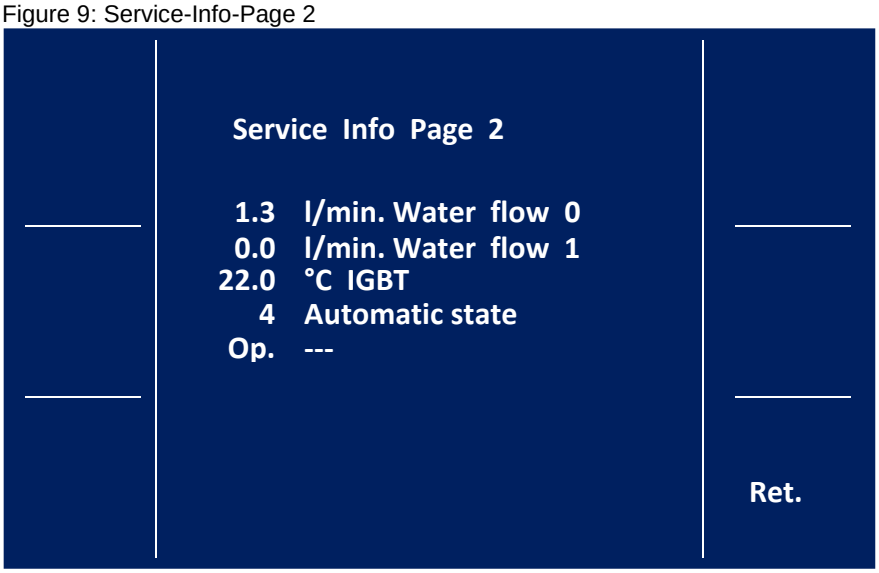
If you press “Serv.” in system parameter menu, you’ll see software ID, generator no. and machine no.

Figure 8: Service-Info-Page 1



If you press „Serv.“-button again, you’ll see cooling water flow (sensor 0), generator temperature (IGBT) and actual machine state. The rows ‘Water flow 1’ and ‘Op.’ are not used in LUKACast S+. The button ‘Serv. (Service) Print’ is without function.

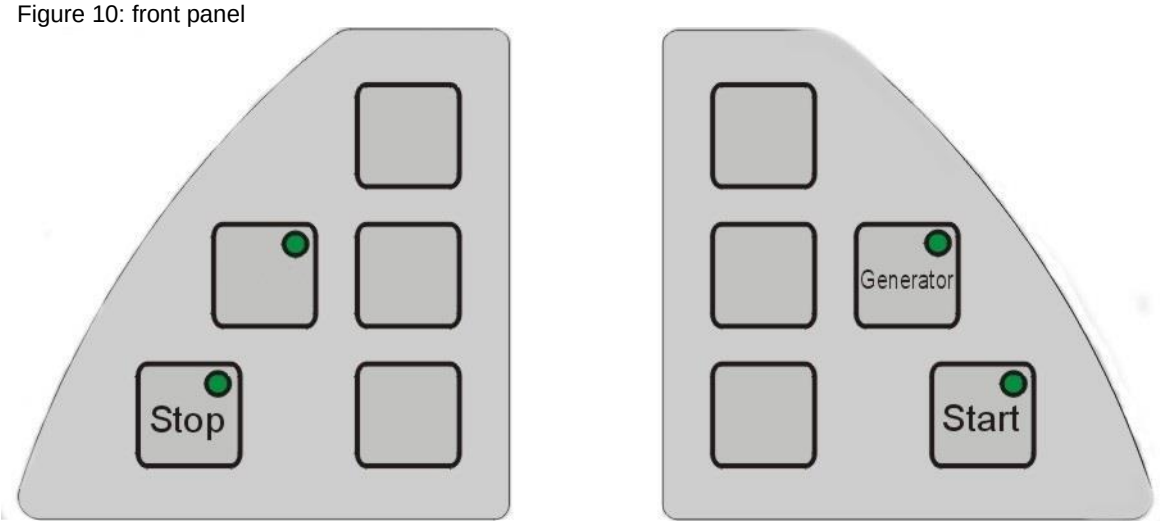
Figure 9: Service-Info-Page 2



With pressing of button ‘Ret.‘ you can return to main menu.

4.6 Front panel buttons

Figure 10: front panel



From left to the right

Button	Function
Stop	Stops active program.
6 push buttons left and right from display	Function of these buttons you can see in display. See chapter 4.5.2 too.
Generator	Starts and stops heating with induction generator outside the automatic mode.
Start	Starts selected program. Second push starts melting pressure in manual mode.

Special function of "Start" button:

If you are operating within a program cycle and melting pressure is active, you can release and reactivate the melting pressure by pressing the start button.

4.7 Casting programs for LUKACast S+ (05.12.2016)

Figure 11: predefined casting programs

LUKACast S+							
Material		**Aurium Bio 413**	**Aurium Bio 405**	**Luka Chrom FH**	**Luka Chrom C**	**Luka Chrom N**	**PD Alloys**
Crucible		Graphite	Graphite	Ceramic	Ceramic	Ceramic	Ceramic
Temperature read-ing		Thermo-couple	Thermo-couple	without	without	without	without
Program No.		**10**	**11**	**12**	**13**	**14**	**15**
Temperature*	°C	1000	1230	1480	1500	1450	1450
Heating power	%	0050	0050	0100	0100	0100	0100
Washing before heating		0000	0000	0000	0000	0000	0000
Washing while heating		0000	0000	0000	0000	0000	0001
Melting pressure start		Manual	Manual	Manual	Manual	Manual	Manual
Melting pressure**	bar	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
Casting pressure	bar	3	3	3	3	3	3
Label		Bio 413	Bio405	FH	C	N	PD

*	Temperature: Please see the alloys data sheet for recommended casting tempera-ture.
**	Melting pressure: When the display shows “Melting”, the melting pressure can be applied at any time by pressing the “Start” button again.
***	Casting should be done as fast as possible. The temperature setting doesn’t matter here. The casting needs to be done by vision. Once the material is liquid wait 5-10 seconds and then cast!

4.8 Temperature control

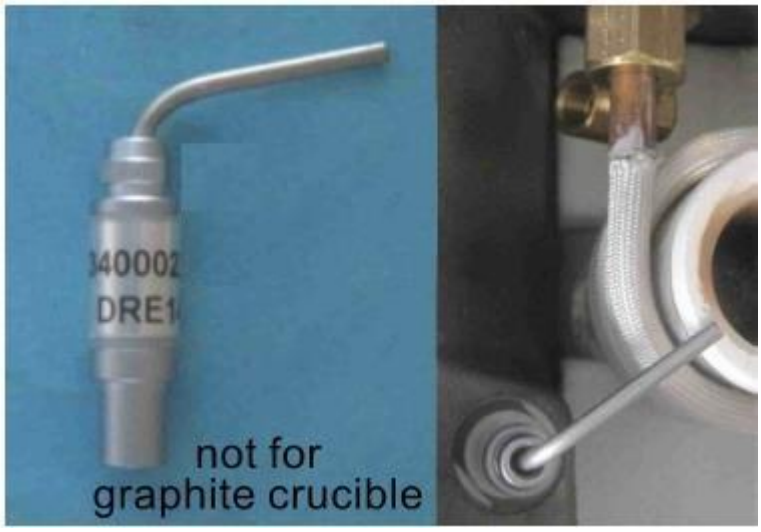
To use the temperature controller a thermocouple

type S article no 13000030 up to 1400 °C (parameter P.000 - must be set to 0001) has to be connected to the socket inside the casting chamber.

Figure 12: thermocouple with protective cover

Important: Use thermocouple for melting only in crucibles **with graphite inlet**. Otherwise induction energy will stimulate thermocouple directly (without protection by graphite). Result, read in display, is pure nonsense!

Figure 13: connector with crucible holder



Item no. 13400022 – connector with crucible holder for using power control instead of temperature control. Another name is dummy plug.

The nominal temperature can be set with the buttons "Temp. +" and "Temp. -". The heating power is now controlled by the temperature controller. If the temperature control is not in use (e.g. for temperatures above 1400 °C, platinum alloys) the dummy plug must be connected to the thermocouple socket. The machine automatically switches to the manual heating power mode. The heating power can now be adjusted with the buttons "Power +" and "Power -" (display shows 0.0 kW (0 %) or 3.5 kW (100 %).

Information!

Without thermocouple, without dummy plug or with defective thermocouple the display shows "E041". The machine detects automatically change from thermocouple to crucible holder within 20 seconds after pressing Start/Generator-button. From crucible holder to thermocouple machine needs 5 seconds for detection after START. At this moment the heating power will be set to 50 % (1.7 kW) according to program and parameters.

Attention:

Do not use a thermocouple in direct heating process! Energy will melt thermocouple! If you use graphite crucible and thermocouple the output power must not exceed 50 % (1.7 kW). Otherwise the temperature overshoot is too high and will burn the thermocouple.

4.9 Apply supply connections

4.9.1 Power supply

The electrical connection may only be performed by a specialist. Note the information specified on the nameplate rated voltage or frequency. The single-phase power supply may differ for max. +/- 10% from the rated voltage.
The mains supply must be equipped with a 16 A fuse (slow). The system is supplied with A power plug with earthing contacts is supplied with this machine. All three lines (L, N and PE) must be connected correctly.

The wall socket of the mini-casting unit LUKACast S+ must be freely accessible.

On the installation site must be provided by a loop impedance measurement of the detection of the switch-off of the overcurrent protective device.

High leakage current:

This machine has a leakage current of 4.45 mA.

Please take notice: The machine must have own mains line. It is not allowed to use the machine at the same fuse as the burnout furnace!

4.9.2 Cooling water

Cooling water supply is connected to machine by 2 hoses with outside diameter of 6 mm.

Water pressure must be 2.5 bar at minimum and don't exceed 5 bar. Water outlet must be pressureless.

Input water temperature should be between 15 °C (59 °F) and 25 °C (77 °F).

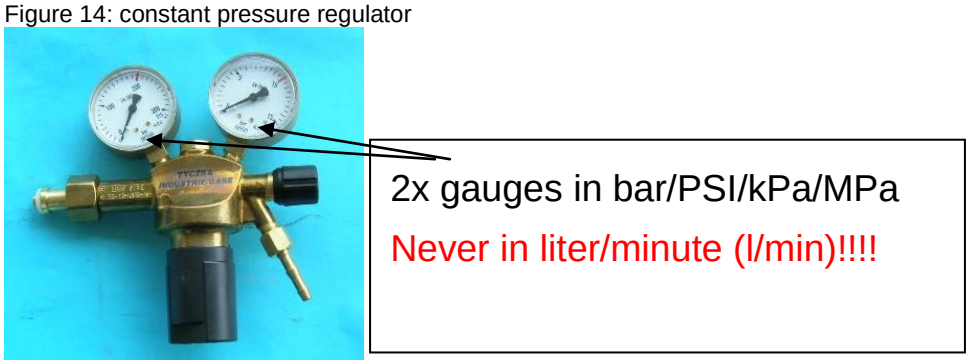
Lime concentration may not exceed of maximum 6 German hardness degrees. The water should be free of pollutions.

Attention:
The cooling water flows continuously even when the mains switch is switched off!

4.9.3 Protective gas

The protective gas only nitrogen or argon may be used with a purity status of at least 99.9 %. The supply is effected via a compressed air hose having an inner diameter of 6 mm. The inlet pressure must not exceed 8 bar. Gas consumption is about 1 - 3 l/min. Please use only a constant pressure regulator.

Figure 14: constant pressure regulator



4.9.4 Vacuum

Here, a vacuum pump with a suction capacity of at least 8 m³/h and a final pressure of 2 mbar should be connected via a tube of 8 mm in outside diameter. Keep the tube short to avoid vacuum loss. The pump should run 5 minutes **before and after** the casting to bring the pump at working temperature and evaporate moisture in the end.

For detailed information, please also refer to the operating manual in maintenance of the vacuum pump.

4.9.5 Gas out

Exit to the pressure reduction. This output must be kept clear at all times. You can connect a hose to lead fumes to the outside.

Figure 15: Check of the backside connections

4.9.6 RS232 for service

At this plug behind a black cover our modem can be connected for service issues.

4.9.7 Operation

4.10 Safety advices for operation

Caution!

Examine all consumables, insulations and hoses before switching on. Check for damages and cleanliness, especially crucible and glass shield. Operate the system only when it's free of damages.

Warning!

Risk of burning on hot surfaces and hot metal (until ~ 2000 °C). Wear always personal protective equipment when you work with the machine.

Utmost caution during using graphite crucibles and graphite moulds. The heat of these parts is only visible when the temperatures are over 500 °C.

Danger!

Risk of burns. If metal is melted without the supply of protective gas, can cause a flash fire or explosion when opening the bell.
Melt at temperatures above 500 °C always with protective gas. Use as a protective gas exclusively argon or nitrogen.

Attention!

At crucible temperatures over 100 °C the cooling water supply must be switched on. If it is not turned on, the inductor will be destroyed. If cooling water supply fails, the heating system immediately is turned off. Inspect the system for damage before putting back into operation again.

4.11 Changing casting parts

Attention!
Switch off the machine at mains switch, when you change consumables, like e.g. crucible.

4.11.1 Removal

> Open the top plate of the casting chamber.

> Remove “old crucible”. Check glass inductor shield.

4.11.2 Mounting

> Check crucible surface for damages and cleanliness before you start casting.

> Put a small piece of quartz fleece in glass inductor shield.

Figure 16: quartz fleece in inductor shield

The crucible should be sitting easily on the quartz fleece. The crucible collar should be close to the glass inductor shield.

Figure 17: crucible and glass inductor shield

Place crucible with glass inductor shield in the induction coil.

4.12 Recommendation for a casting process

Figure 18: further suggestions of casting programs

Suggestions		
Material		**Aurium Bio 405**
Crucible		Graphite
Temperature reading		Thermo-couple
Program No.		
Temperature	°C	1230
Heating power	%	0050
Washing before heating		0000
Washing while heating		0000
Melting pressure start		Manual
Melting pressure	bar	1.00
Casting pressure	bar	3.00
Label		Bio 405

> Switch on water-, protective gas and vacuum supply.

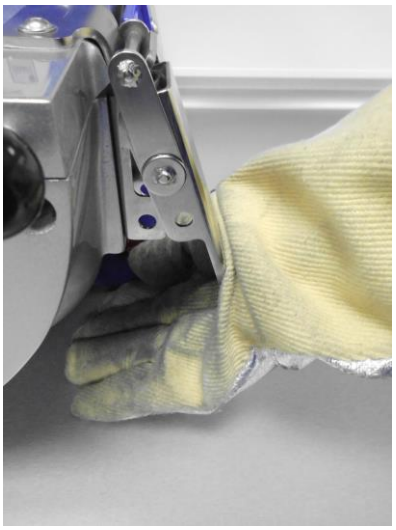
> Prepare crucible with thermocouple. Switch on mains switch (booting takes about 10 seconds).

> Fill in casting material.

> Put in preheated flask (620...650 °C).

> Close and lock casting chamber secure.

Figure 19: safe handling of lock



Close the lock with the ball of hand. Hold the hand open and use a glove.

> Start your casting program with “Start” button.

> If casting temperature is reached press “Start”-button again for building up vacuum (melting pressure).

> After 10 seconds please press the button on the handle and tilt the chamber uninterrupted clockwise till the catch. Release the button on the handle to lock the unit in the tilted position. During the tilting the unit automatically switches from vacuum (melting pressure) to overpressure (casting pressure) inside the chamber.

The generator stops heating. On the display “Time” a timer counts the seconds after casting.

> After a sufficient waiting time, unlock the handle and tilt the unit back to horizontal position. The casting pressure inside the crucible chamber is released through “Gas Out” to ambient pressure.

> Open the casting chamber and remove flask and flask holder.

Attention!

You have to activate the melting pressure by pressing “Start”-button after the washing cycles.

4.13 Error diagnosis

There two types of trouble.

- Error and
- Warnings.

If an error occur the heating will be switched off and you’ll see error code in display.
With a light fault a warning appear in display. You’ll see the warning code in display.

4.14 Troubleshooting

Only an expert may open the system.

Trouble	Cause
Machine can’t be switched on.	• Missing mains supply.
Heating don’t work	• Missing water supply ‘E010’. • Missing protective gas supply ‘E083’. • Thermocouple not connected or defect ‘E041’. • Generator overheated (too hot), ‘E021’. • Other error, error display ‘Exxx’. • Exhibition mode activated (P.155 = 0?!).
Temperature indication not right	• Wrong thermocouple programmed, see software documentation. • Thermocouple faulty. Because of that the generator can stop heating!
Low genera-toroutput	• Set-value of temperature too low.

Additional error messages see software-documentation.

4.15 Service

If you need technical support from company Lukadent GmbH, we’d like to have following information with first contact:

- Service No. on the left front side of machine or
- Service No. from nameplate at backside of machine.

Manufacturer:	Lukadent GmbH Felsenbergweg 2, 71701 Schwieberdingen, Germany

Product type:	Mini-casting machine
Machine type:	S+
Serial number:	16265 or higher
Authorized to sign:	Dirk Lukaschewski

We herewith declare that the machine named above corresponds to the essential safety and health requirements of the following EC directives because of its design and construction in the version which we have placed on the market.

Legal normative basis

Machinery Directive 2006/42/EG (MRL) in extracts Reference - Directive 2006/42 / EC, EU-Ab. No L 157/24 of 9 June 2006
EN 60204-1:2006+A1:2009 Security of machines Electrical equipment of machines Part 1 General requirements
EN 61010-1:2010 (in extracts) Safety requirements for electrical equipment for measurement, control and laboratory use Part 1: General requirements
EN ISO 12100:2010 Safety of machinery General principles for design Risk assessment and risk reduction
EN 349:1993+A1:2008 Safety of machinery Minimum gaps to avoid crushing of parts of the human body
EN ISO 13849-1:2015 Safety of machinery Safety-related parts of control systems Part 1: General principles of design
EN ISO 13849-2:2012 Safety of machinery Safety-related parts of control systems Part 2: Validation

EN ISO 13850:2008 Safety of machinery Emergency stop function – Principles of design
EN ISO 13857:2008 Safety of machinery Safety distances to prevent hazard zones being reached by upper and lower limbs
EN ISO 14120:2015 Safety of machinery Guards – General requirements for the design and construction of fixed and moveable guards
EN 1037:1995+A1:2008 Safety of machinery Prevention of unexpected start-up
EN ISO 11201:2010 Acoustics Noise emitted by machinery and equipment – Determination of emission sound pressure levels at a work station and at other specified positions in an essentially free field over a reflecting plane with negligible environmental corrections.

EC Directive on Electromagnetic Compatibility Reference - Directive 2014/30 / EU, EU-Ab. No L 96/79, 29 March 2014
EN 61000-6-2:2005 Electromagnetic compatibility (EMC) Part 6-2: Generic standards - Immunity for industrial environments
EN 61000-6-4:2007+A1:2011 Electromagnetic compatibility (EMC) Part 6-4: Generic standards - Emission standard for industrial environments

The declaration of conformity relates only to the machine in the state in which it was placed on the market; Parts and / or retrospective interventions carried out subsequently by the end user remain unaffected.

The test protocols are stored at Lukadent for 10 years.

city/date/signatory: Schwieberdingen/2020-07-22/Dirk Lukaschewski, CEO