

# Indutherm VC 490 V – Fully Automatic Vacuum Gold Casting Machine



This guide is only applicable to Indutherm VC 490 V – Fully Automatic Vacuum Gold Casting Machine

Note: Please read this User Guide carefully before operating the product. Please keep this Guide properly for future reference.

## VC490V – Vacuum Overpressure Casting Machine

FOR VARIOUS METALS like Au, Ag but also Cu, Zn, Sn, Al, ...



The VC490V is an induction heated vacuum overpressure casting machine developed for working in graphite crucibles. The VC490V is equipped with novel technology to cast filigree and precise pieces. Low frequency generator ensures excellent mixing of liquid metal.

The VC490V is engineered for continuous and efficient operation by its robust design and fully automatic operation mode. Modular systems guarantee low running costs, easy maintenance and service. Within several options the machine can be even more customized to customer needs. Besides of casting into filigree moulds, the machine could be also used for granulation, bar casting and diffusion bonding.

### Areas of application:

- All casting applications in workshops, designer studios, smaller and medium size factories.
- Casting machine for filigree items
- Casting using different molds e.g. wax lost casting, sand molds, copper molds
- For all metals/alloys till 1.400°C to be molten in graphite crucible
- Alloy preparation within the machine due to string stirring effect
- Cleaning of used metal by granulation process via optional granulation tank



## Particular Advantages of the VC490V

- **8kW medium frequency induction system** ensures a fast melting
- Melting temperature with S-type thermocouple 1.500°C
- **Alloying possible with good stirring/mixing effect** due to strong medium frequency induction generator
- Equipped with an **indirect induction heating system** using a graphite crucible
- With a **crucible capacity** of 170ccm batches up to 2,5kg\* 18kAu or 1,5kg\* Cu
- Optional **crucible capacity** of 245ccm batches up to 3,6 kg 18ct Au
- **Controllable atmosphere and melting under vacuum**
- **Prevention of material loss and inaccuracy of alloy chemistry** due to precise temperature measurement & control of melting temperature via thermocouple
- **Mold/Flask sizes** of max. up to  $\varnothing$  130 x 240 mm h, standard diameters  $\varnothing$  125, 100, 90, 80, 70 mm. Option for Moulds/Flask up to  $\varnothing$  160 x 400 mm h available.
- For **flasks** with or without flange
- **Excellent form filling** thanks to novel high-speed pressure (up to 1,5bar)
- **Vibration Technology** for an improved form-filling, less porosity, smaller grain size and higher density
- **Turbulence reduction** feature
- **Adjustable vacuum** in flask chamber are excellent for massive pieces
- **Turbo-pressure** kit for rapid reaching the over pressure
- **Oxidation reduced casting** facility, e.g. very important for silver and red gold casting.
- The **fully automatic control** allows the operator to define various parameters, like temperature, pressure, vacuum and further parameters. By manual mode the machine can be also operated step by step which is sometimes preferred for R&D applications.
- **Flexible usage** to produce filigree items by e.g. wax lost casting but also producing semi-finished material like sheet / rod / bars. Options like granulation tank or sintering unit allows to produce grains or do diffusion bonding of e.g. rings
- **Low running costs** of efficient induction system working, precise temperature control and inert gas atmosphere
- **Very simple use**, short training period, very good result even by operators with less of experience in casting technique.
- **Optimum accessibility for inspection and maintenance** guarantees fast and easy servicing, minimizes the risk of lengthy production interruptions and ensures long term reliability.
- The systems are equipped with a **software and interface management** that allows remote service and support and the communication with external systems.
- **Best value-performance ratio.**

\* Liquid metal up to top level of the crucible



## Overview Properties VC490V

VC490V

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<b>Performance</b>	<ul style="list-style-type: none"> <li>• Crucible-based inductive heating under protective gas and vacuum atmosphere</li> <li>• Microprocessor-controlled induction generator by a one box system which is easy to service.</li> <li>• Excellent liquid metal mixing (adjustable with micro PWM), allowing possible prior to atomization / granulating process.</li> <li>• 3x400V Output for controlling the vacuum pump integrated</li> <li>• Indirect induction heating system: The graphite crucible (susceptor) will be primarily heated by the induction system while energy will still be transferred to the material directly to provide a stirring effect to the melt.</li> <li>• Direct Induction heating system: The ceramic crucible is placed into the inductor / backed-up tightly by a "sand-like" ceramic powder mix. The induction system couples directly into the charged metal and therewith heats it up directly and fast.</li> </ul>
power max. / electrical connection Generator kW (3 x 400V, 50 or 60 Hz)	8kW / mains external fuse 3 x 16 A
temperature max. in °C	■ 1400 °C measured by thermocouple

### further data

dimension (l x w x h)	770 x 500 x 1450mm
weight (without packaging)	125kg

### Capacity

crucible volume (graphite)	<ul style="list-style-type: none"> <li>■ 170ccm / ■ up to* 2,5kg 18kAu / 1,5kg Cu</li> <li>● 245 ccm / ● 3,6 kg 18ct Au</li> </ul>
crucible type: U crucible / S crucible	has to be decided by machine configuration / later upgrade is possible
for use of molds	<ul style="list-style-type: none"> <li>■ up to ø130mm x 240mm h</li> <li>● up to ø160mm x 400mm h</li> </ul>

\* Liquid metal up to top level of the crucible  
■ = standard equipment    ● = optional





**VC490V**

**information**






**Handling + control**

programs / process control via LCD display and control panel		■ 100
automatic mode which follows the program parameters		■
manual mode which allows the operator to control the process step by step		■
temperature reading and control via PID	following thermocouples could be used:	■
	Typ N up to 1300°C	● <i>on request</i>
Typ S up to 1400°C		● <i>on request</i>
overlapping casting for process times <3min		■
the novel high-speed pressure system is ensuring a laminar but intense metal filling into the mold avoiding turbulences		■
max. overpressure	+3bar	■
max. vacuum		■ -1bar
washing cycles by evacuating the atmosphere and purging with protective gas		■
casting under vacuum only		■
variable vacuum in flask chamber		■
oxidation- reduced casting system		■
turbulence reduction software		■
vibration technology		■
automatic bell lock/automatic closing system		■
automatic flask and chamber lift		■
power control via PWM and micro PWM		■
integrated 3x400V output for controlling the vacuum pump by the VC490V		■

**Quality management**

RS 232 interface, USB, Ethernet interface for Data Transfer	■
Self-diagnostic system with Error and Warning messages	■
GSM-modem for remote service (10-year contract).	● <i>on request / see below</i>

■ = standard equipment    ● = optional

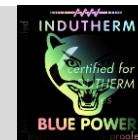
Article		Indicated price in € or comment
VC490V		
<b>Maschine options</b>		
special window to reduce fogged observation window		
feeding system	openable view glass (limited to 0,5 bar overpressure)	
	manual ball valve	
	for feeding under vacuum	
	double ball valve system	
turbo pressure/turbo pressure PLUS system		
additional gas tank for turbo pressure PLUS		
crucible with increased volume	Ø 78 * 120mm (245ccm) Ø / 3,6 kg 18ct Au	
for use moulds up to	up to Ø130mm x 240mm h	
	up to Ø160mm x 400mm h	
granulating tank (depending on mould/flask chamber size)	for mould chamber up to Ø130mm x 240mm h	
	for mould chamber up to Ø160mm x 400mm h	
Sintering kit (for diffusion bonding)	for mould chamber up to Ø130mm x 240mm h	
	for mould chamber up to Ø160mm x 400mm h	

■ = standard equipment    ● = optional

## Consumables & spare parts

Ask for our consumable sets & spare parts sets

INDUTHERM proposes packages of consumables / spare and wear parts sufficient for one a certain number / period of time of normal use. Sufficiency of this package for a certain number / period of time doesn't mean that all these parts will be needed during this period. However, this means that with high probability not one part beyond this package will be needed then.





## Further information

**Delivery Time:** According to prior agreement.

**Prices** are quoted: ex works Walzbachtal (Germany), packing not included

**Warranty:** 1 year. For extended warranty please ask your contact person at INDUTHERM

The machines are designed and produced according to European directives (Machinery directive / Low voltage directive / EMC directive). At delivery we add the corresponding declaration of conformity (CE).

Article		Indicated price in € or comment	
<b>Peripheral equipment</b>			
<b>Vacuum pump</b> *** 400V/3phase 50Hz, rotary pump, single stage	21 m <sup>3</sup> /h		
	25 m <sup>3</sup> /h		
	40 m <sup>3</sup> /h		
<b>Water re-cooling system</b> *** 4,0 kW cooling power, 230V 50Hz pump included. Maximal ambient temperature is 35° Celsius. For higher temperatures specify your room temperature. Dim. lxwxh: 744 x 550 x 860 mm weight 95 kg			

■ = standard equipment    ● = optional; \*\*\*60 Hz on request