

# EGGES

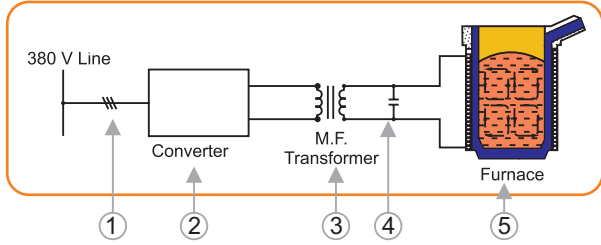
Intelligent  
*Ecomelt*®

## INDUCTION MELTING FURNACES



F a s t   E c o n o m i c a l   R e l i a b l e

# ECOMELT SERIES INDUCTION FURNACES



## BLOCK DIAGRAM

- 1-Transfer switch
- 2-Power unit (converter unit)
- 3-Medium frequency transformer
- 4-Capacitor bank
- 5-Furnace

## GENERAL

R&D Department of EGES Company has recently developed ECOMELT series induction furnace system which is the output of 48 years of experience gained on Ultramelt system.

EGES has produced this economic induction furnaces mainly for the foundries wishing to set an induction furnace at their premises.

ECOMELT series furnaces are almost contain the same features of ULTRAMELT series furnaces. All controls are done by a "microprocessor unit" that has been developed by EGES engineers detailed information about printed circuits and alarms are given above



Display and control panel



EGP1000SE



Hydraulic & Converter Control System

On ECOMELT series furnaces, all negative and weak points of aluminium body furnaces are eliminated. A new So, durable, trouble and free no after sale service required a new furnace is manufactured.

Thanks to ECOMELT series furnace system; With a small investment budget, all foundrymen can able to set an efficient furnace, at their best satisfaction.

## Power unit (converter) produced with high standards electronic components

EGES R&D engineers continuously follow up to date technology and electronic components coming up to the market. All new Innovations are examined, tried and if it contributes to EGES quality which is already represents the excellency, are used in EGES products.

### Converter Unit With Parallel Resonance System

It is obvious that high current in electrical circuits means high percentage of defaults. Current which goes through thyristors at parallel resonance converter are very low in comparison to serial resonance circuits. For the same power, serial resonance current is almost 5 times higher than parallel resonance circuit.

### Decreasing Melting Cost by Continuous Fixed Power:

Beginning from the first charge EGES ECOMELT furnaces use continuous and fixed power energy which helps to reduce melting time, causing less energy consumption. "Full power " is adjusted automatically by the unit itself without any interference by the Operator.

### High electric Efficiency:

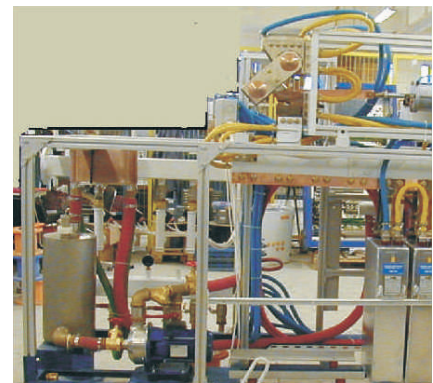
ECOMELT furnaces is designed to minimize energy losses. Power factor is better than 95 %.

### Full Power operation under Low Main Voltage

Mainly in less developed countries where electric distribution conditions are rather poor, EGES ECOMELT Induction furnaces can be operated at full power even -20%, +15% voltage fluctuations



Converter Unit



Capacitor bank & Transfer switch unit

Earth Leakage Indicator



### Electronic Earth Leakage Indicator with adjustable sensitivity

EGES ECOMELT furnaces are equipped with adjustable sensitivity Earth Leakage Indicator to control continuously the leakage level in the system. The leakage indicator at same time, gives the operator an idea about the thickness and/or the quality of furnace lining. Led bar type earth leakage display indicates to the operator the refractory lining quality as GOOD-FAIR-BAD with GREEN-YELLOW-RED colours. If metal penetrates through the furnace at RED warning colour the furnace stops automatically to in order avoid further damages.



EGP500SE

### Steel Construction ECOMELT Furnaces :

These type of furnaces give better results under heavy working conditions and their sound level are very low.

### Special Coil design with Early Warning Detection

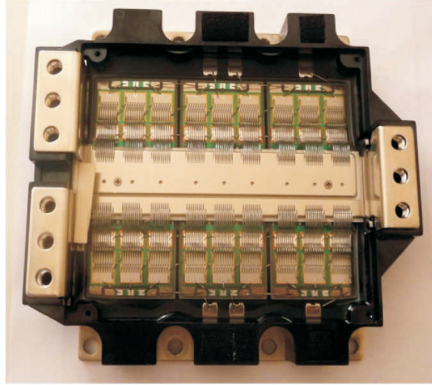
Special sensor pins are welded regularly on inner coil side to reduce the hazard of metal penetration which increase the liability of the system.

## IGBT CONTROLLED PARALLEL RESONANCE MELTING CONVERTER

FASTEST

MOST ECONOMICAL

MOST RELIABLE



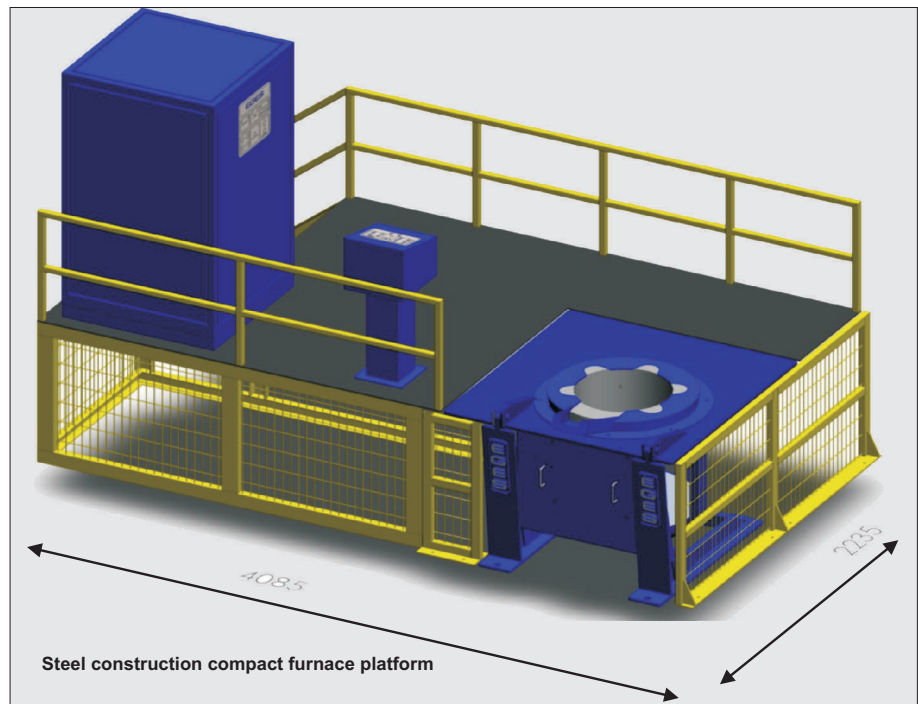
2400A IGBT

### Advantages:

- \* Input Power Factor is always 0.99 at full power and is better than 0.98 at low power. No need to additional compensation panel.
- \* Every kind of protection can be designed easily.
- \* Switching on and off is easier.
- \* Running IGBT converters above 2kHz up to 20kHz is easier.
- \* Compact design
- \* Low cost platform investment



350 kW IGBT power supply (Converter)

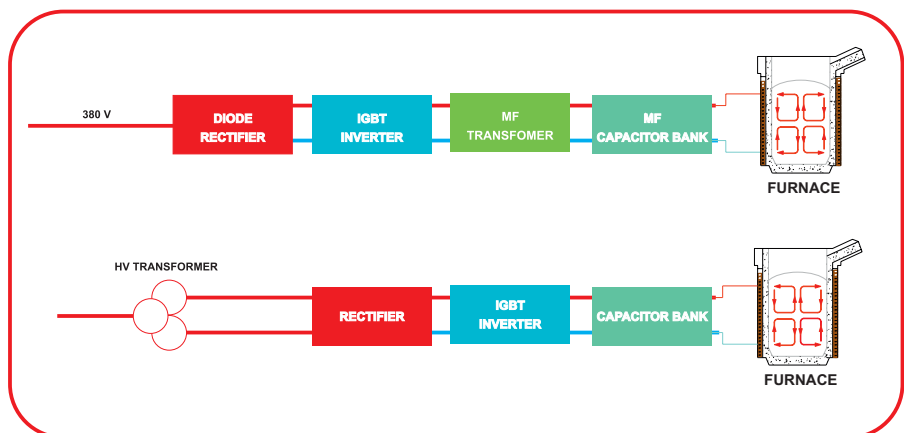


Steel construction compact furnace platform



500 kg steel frame furnace

### EGES Furnace System IGBT Schematic Diagram



# INTERCHANGEABLE DOUBLE-FREQUENCY INDUCTION SYSTEMS

Furnace frequency was chosen according to weight of the workpiece, during the induction furnace purchase process in the casting industry. Now, there is no restriction any more over the casting types caused by constant frequency in the melting systems. EGES new production interchangeable double-frequency melting systems abolish all these restrictions.

Now, both cast iron and all kind of steel group can be cast flawlessly with EGES interchangeable double-frequency technology.

In order to get high quality product in the cast iron melting process, furnace frequency selection is recommended as low as possible. Low frequency during the casting process means that the molten metal mixture level is high, and the carbon resolution is uniform. Also, desirable mixture quality during the chip melting process is provided with frequency as low as possible.

In order to get high quality product in the steel casting melting process, furnace frequency selection is recommended as high as possible.

High frequency during the casting process means that the molten metal mixture level is low, and it will provide minimum penetration range into the bath for the undesirable fumes which will be absorbed from the surface.

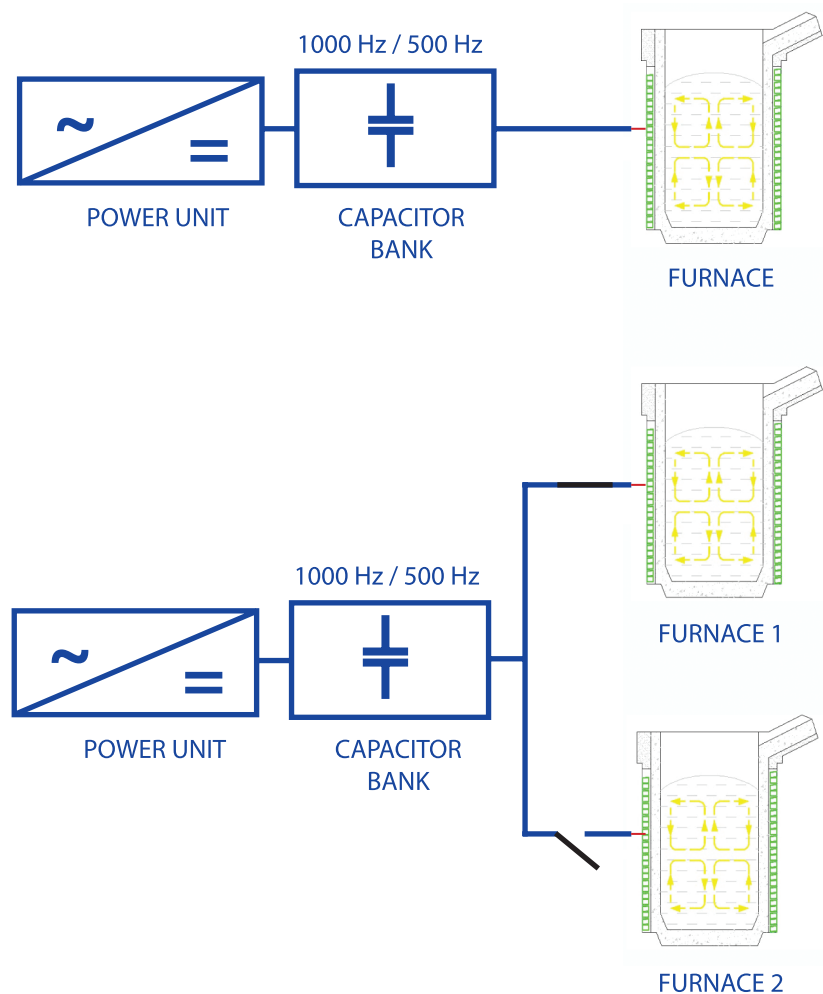
Using the appropriate lining in the same units, the best quality cast iron or steel melting process can be made by interchangeable double-frequency melting systems of the EGES.

Frequency selection process can be done easily by the operator. Interchangeable double-frequency can be carried out in the existing system whether single or double furnaces.

All features of the EGES interchangeable double-frequency system are acceptable for non-ferrous metals as well, and demanded capacities can be applied.

The world's **FASTEST**, **MOST ECONOMICAL** and **SAFEST** induction furnace emerges when IGBT controlled melting system's superior features combined with the advantages of the interchangeable double-frequency system.

EGES Interchangeable Double-Frequency Melting Systems Schematic Diagram



## CHIPS MELTING

Machining the casting parts generates a lot of metal chips. Therefore, melting metal chips efficiently and with minimum metal losses are very important. Aluminium chips or foils, copper, brass or bronze chips are mostly melted chips. Now, these kinds of chips can be melted with minimum metal losses with EGES low frequency technology.

In order to get high quality product in the melting process, furnace frequency selection is recommended as low as possible. Low frequency during the casting process means that the molten metal mixture level is high, and the metal composition is homogen. Also, desirable mixture quality during the chip melting process is provided with frequency as low as possible.

### MELTING ALUMINIUM AND BRASS CHIPS

They can be melted at 1-2 kHz too because they are fairly conductive, however metal losses are somewhat high at these frequencies. The Working Frequency is chosen to provide enough stirring in the bath in order to mix the chips inside the molten metal bath, which prevents metal burning and metal oxidation. Sufficient stirring is ensured by EGES 50Hz Low Frequency Melt Technology.

This difference in Working Frequency is due to lower density of Aluminium, which in turn means less magnetic force is required for stirring.

There are two methods of charging Aluminium and Brass chips;

- First Method is add chips gradually to molten bath left from the previous batch. As the added chips cool the molten metal bath, through the charging process induction energy is carefully managed to keep a constant bath temperature.
- Second Method, an empty furnace is fully charged with chips. As the chips melt and form a molten stirring bath, the charge collapses down. Then further chips are added to achieve full charge.

### EGES 50Hz Low-Frequency Melting Technology Aluminium and Brass Chips Stirring



Some features and messages that exist on ECOMELT Induction Furnaces are given below

- \* Energy counter (input voltage, input current, rectifier current, power factor, active/reactive energy etc )
- \* Automatic sintering mode which do not require thermocouple unit.
- \* Over 30 messages for warning-failure and information data.
- \* Automatic pumps turn-off mode
- \* Audio visual warning units



## HYDRAULIC UNIT

### Manual Tilting on Emergency Cases:

During energy cut-off situation, molten metal can be safely taken out from the furnace by hand operated lever which takes place on the hydraulic unit.

## COOLING SYSTEM

### Closed circuit converter cooling:

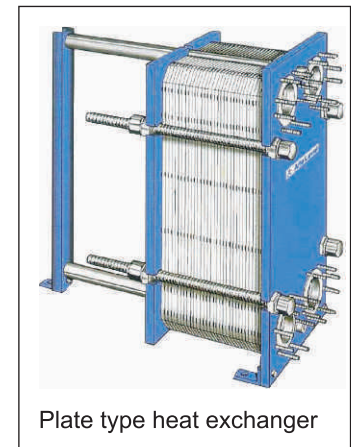
The converter unit is cooled with closed circuit de-ionizer the conductivity of water is kept at desired level, so that, corrosion of that causing

The converter unit is also cooled with plate type water/water heat exchanger.

### Closed or open circuit Cooling Systems for Furnaces:

As per customer's request the furnaces are cooled by one of the followings;

- \* " Open Circuit " with Evaporative type Cooling Unit
- \* " Closed Circuit" with water/water heat exchanger



CONVERTER	FURNACE	MELTING RATE	MELTING TIME	MELTING RATE	MELTING TIME
POWER	CAPACITY	1450°C-Cast Iron		1650°C-Steel	
(kW)	(kg)	(kg/h)	(min)	(kg/h)	(min)
100	100	138	43	127	47
150	200	232	52	213	56
200	300	326	55	299	60
250	350	445	47	408	51
350	500	639	47	586	51
450	750	831	54	763	59
600	1000	1137	53	1043	58
800	1500	1580	57	1449	62



**EGES** since 1975

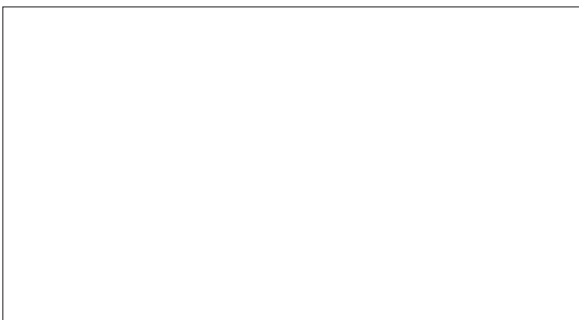


## PREFERRED PARTNER FOR THE 21<sup>st</sup> CENTURY

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