INDUCTION HEATING

The new generation Easy therm *High quality* heaters

Easy therm 1HQ
Easy therm 2HQ
Easy therm 3.5HQ
Easy therm 15HQ
Easy therm 30HQ
Easy therm 60HQ
Easy therm 100HQ

- **General**
- **Marketing strategy**
- **Changes**
- **Advantage of the new developments**

- **General**

We have started January 2008 an investigation to find out what causes the failure of our induction heaters in the production (3%). The following points we had to improve; Space between print conductors had to be bigger, a few components had to be changed and the cooling of the thyristor was not optimal. This leaded to a complete new redesign of the printed circuit board. Simultaneously with the new development we appointed the TUV Rheinland to approve the complete range of induction heaters according CE, GS and cTUVul.

Now we have developed a new generation of induction heaters made according the highest demanding regulations for induction heaters!

The new generation induction heaters are:

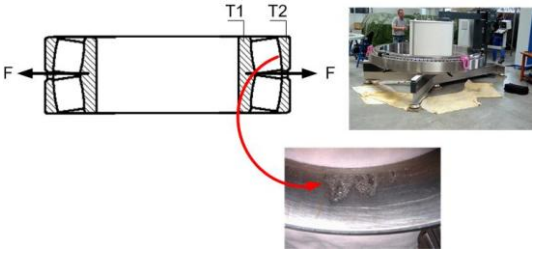
- **Save for the operator;**
- **Reliable in the production;**
- **Save to use for the parts to heat up;**
- **Save for the end products.**

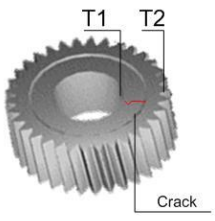
- **Marketing strategy**

All competitor are still going for a fast heating of all parts within one cup of coffee, we prefer to heat up 100% controlled and uniform. It will cost about 100.000 cups of coffee when a broken bearing or gear wheel will damage the gearbox.

What is happening when a part is heated up too fast?

A big difference between temperature inside and the temperature outside of the part will cause damage;



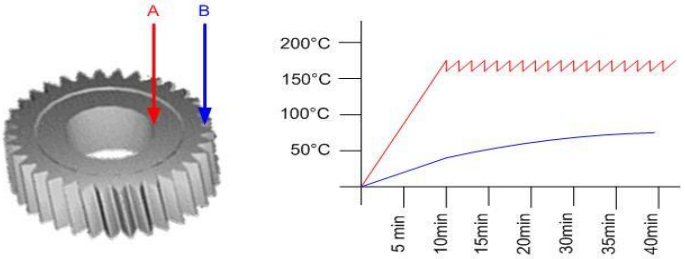


A too big difference between T1 and T2 causes:

- **Bearing: Pitting in inner- and outer ring.**
- **Gearwheel: Cracks**

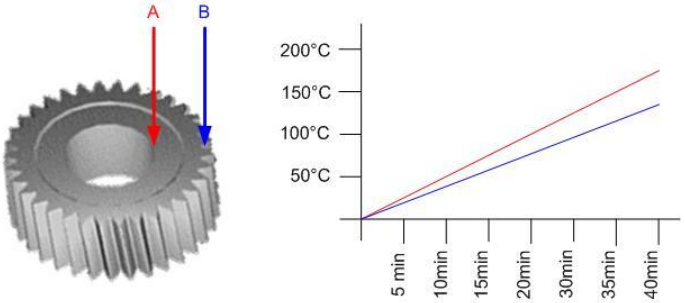
Solution: setting of a time versus temperature ramp, this is available for every heater:
This is specially developed for the heating of gears and bearings with a small clearance. The user can set the temperature and time; the heater will heat the part exactly to the preset temperature in the preset time. The major advantage this provides is the temperature differential between the internal and external component material remains low thus reducing the potential for material stress accumulation and subsequent potential distortional damage.

Conventional way of controlling the heating process:
The heater will heat the part full power till the temperature is reach where the sensor is placed (mostly the bore). By keeping the part for a while on this temperature the outside temperature will slowly rice in temperature. Because of the big difference in the begin the part is already damaged!



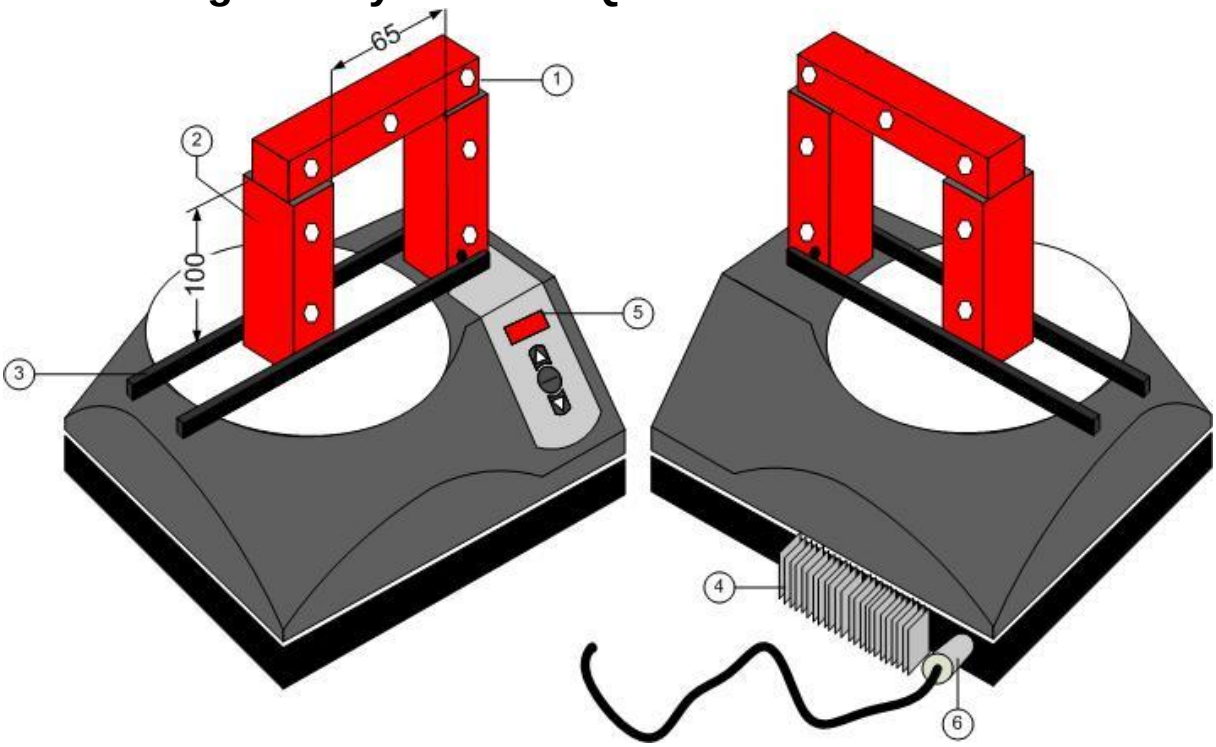
Disadvantage:
Large differences in temperature occur between areas A and B; this will cause permanent distortion in the part and can instigate crack formation.

New way of controlling the process:
By setting the time / temperature ramp the temperature difference between A and B will be never bigger than the temperature difference at the end!



Advantage;
Significant temperature differences between areas A and B are minimised thereby creating a safe and reliable heating process.

- **Changes Easy therm 1HQ**



Outside:

- U-core is not stepped anymore, standard yokes 10/20/30x120mm.
- Heater has two rails from Glass fiber15x10mm.
- On the back site a heat sink 150x30x25mm.
- Power supply cable is direct connected to the heater.
- Optional: Remote control to start or stop the heater

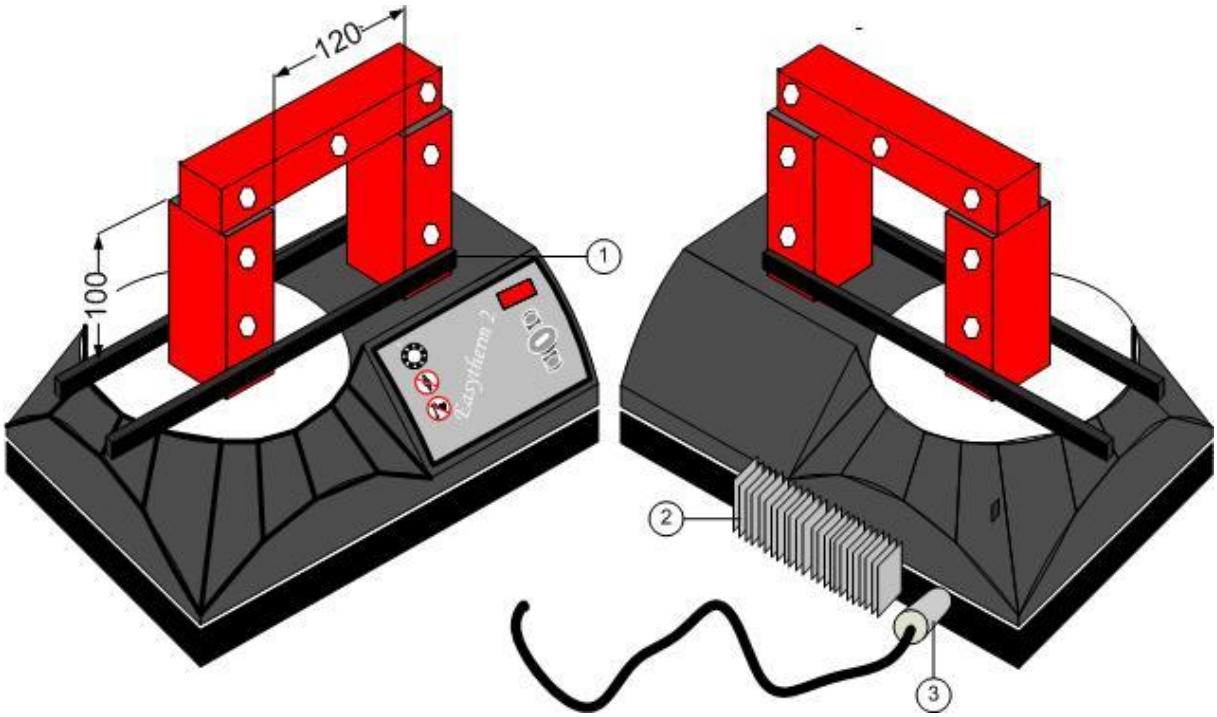
Operation:

- Standard; after pushing start the counter in display will count down for 5 seconds makes it possible for the user to operate the heater standing outside the magnetic field. New safety laws in the future will require this.
- Ramp setting possible.

New Electronic unit:

- Thyristor has double capacity and will be cooled down constantly by a heat sink; this makes it possible to use the heater constantly.
- Print tracks distances are double as the wire diameters: 100% secure!
- Temperature of the heat sink, coil and housing is constantly controlled by the microprocessor. If any limit is exceeded the heater will go in alarm: No damage to heater or part!
- The new electronic unit is not exchangeable with the older ones.

- **Changes Easy therm 2HQ**



Outside:

- Heater has two rails from Glass fiber15x10mm.
- On the back site a heat sink 150x30x25mm.
- Power supply cable is direct connected to the heater.

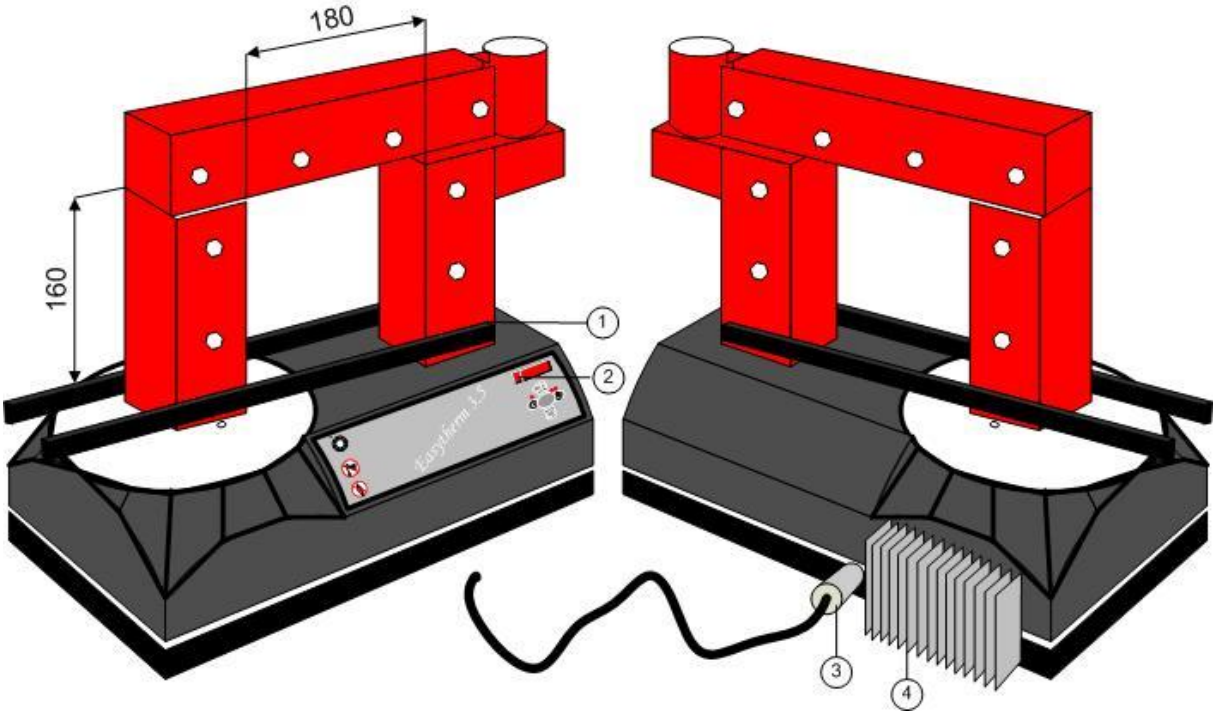
Operation:

- Standard; after pushing start the counter in display will count down for 5 seconds makes it possible for the user to operate the heater standing outside the magnetic field. New safety laws in the future will require this.
- Ramp setting possible.

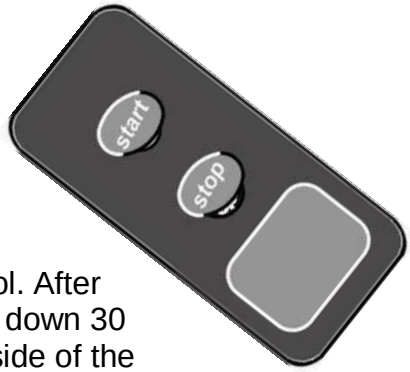
New Electronic unit:

- Thyristor has double capacity and will be cooled down constantly by a heat sink; this makes it possible to use the heater constantly.
- Print tracks distances are double as the wire diameters: 100% secure!
- Temperature of the heat sink, coil and housing is constantly controlled by the microprocessor. If any limit is exceeded the heater will go in alarm: No damage to heater or part!
- The new electronic unit is not exchangeable with the older ones.

- **Changes Easy therm 3.5HQ**



Outside:



- Heater has two rails from glass fiber 20x15mm.
- On the back site a heat sink 150x75x25mm.
- Power supply cable is direct connected to the heater.
- Remote control to start or stop the heater standard.

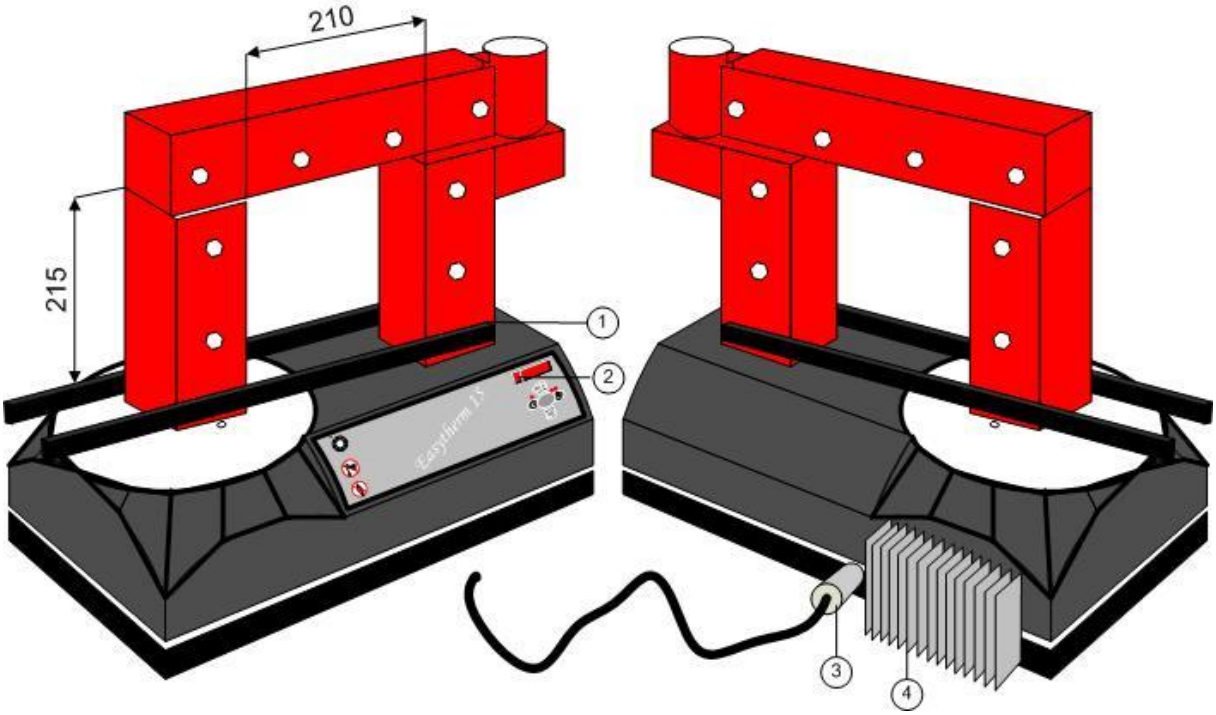
Operation:

- Standard; heater can be started with the infra red remote control. After setting the temperature on the heater push start; heater counts down 30 seconds, in those 30 seconds the operator is able to stand outside of the magnetic field and to start the heater. It is also possible to start without the remote: push start the counter in display will count down for 5 seconds makes it possible for the user to operate the heater standing outside the magnetic field. New safety laws in the future will require this.
- Ramp setting possible.

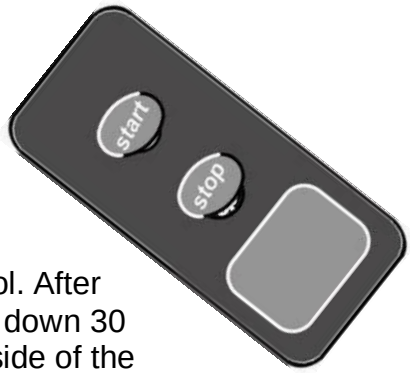
New Electronic unit:

- Thyristor has double capacity and will be cooled down constantly by a heat sink; this makes it possible to use the heater constantly.
- Print tracks distances are double as the wire diameters: 100% secure!
- Temperature of the heat sink, coil and housing is constantly controlled by the microprocessor. If any limit is exceeded the heater will go in alarm: No damage to heater or part!
- The new electronic unit is not exchangeable with the older ones.

- **Changes Easy therm 15HQ**



Outside:



- Heater has two rails from Glass fiber 20x15mm.
- On the back site a heat sink 150x75x25mm.
- Power supply cable is direct connected to the heater.
- Remote control to start or stop the heater standard.

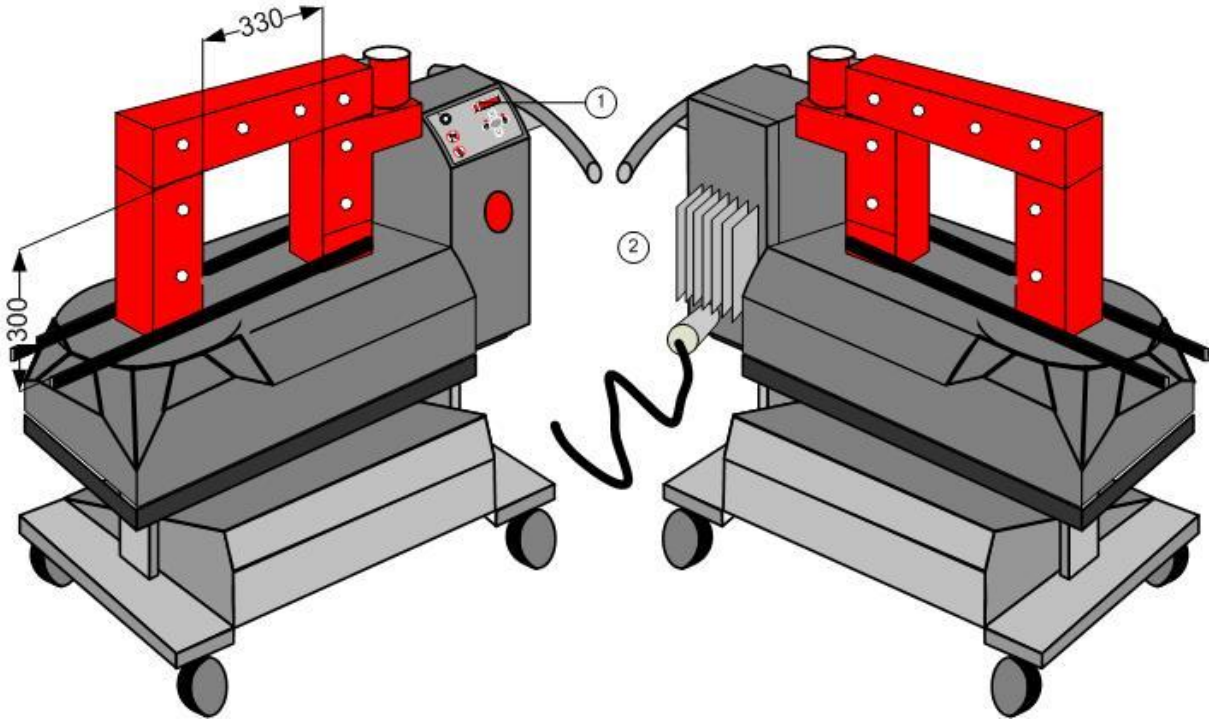
Operation:

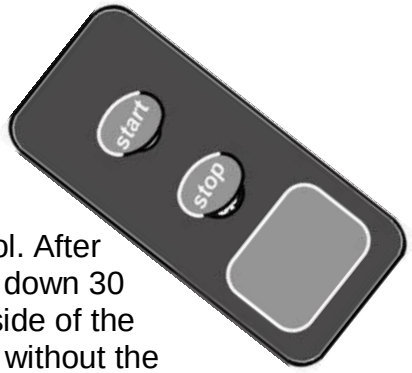
- Standard; heater can be started with the infra red remote control. After setting the temperature on the heater push start; heater counts down 30 seconds, in those 30 seconds the operator is able to stand outside of the magnetic field and to start the heater. It is also possible to start without the remote: push start the counter in display will count down for 5 seconds makes it possible for the user to operate the heater standing outside the magnetic field. New safety laws in the future will require this.
- Ramp setting possible.

New Electronic unit:

- Thyristor has double capacity and will be cooled down constantly by a heat sink; this makes it possible to use the heater constantly.
- Print tracks distances are double as the wire diameters: 100% secure!
- Temperature of the heat sink, coil and housing is constantly controlled by the microprocessor. If any limit is exceeded the heater will go in alarm: No damage to heater or part!
- The new electronic unit is not exchangeable with the older ones.

- **Changes Easy therm 30HQ**





Outside:

- On the back site a heat sink 150x150x25mm.
- Remote control to start or stop the heater standard.

Operation:

- Standard; heater can be started with the infra red remote control. After setting the temperature on the heater push start; heater counts down 30 seconds, in those 30 seconds the operator is able to stand outside of the magnetic field and to start the heater. It is also possible to start without the remote: push start the counter in display will count down for 5 seconds makes it possible for the user to operate the heater standing outside the magnetic field. New safety laws in the future will require this.
- Ramp setting possible.

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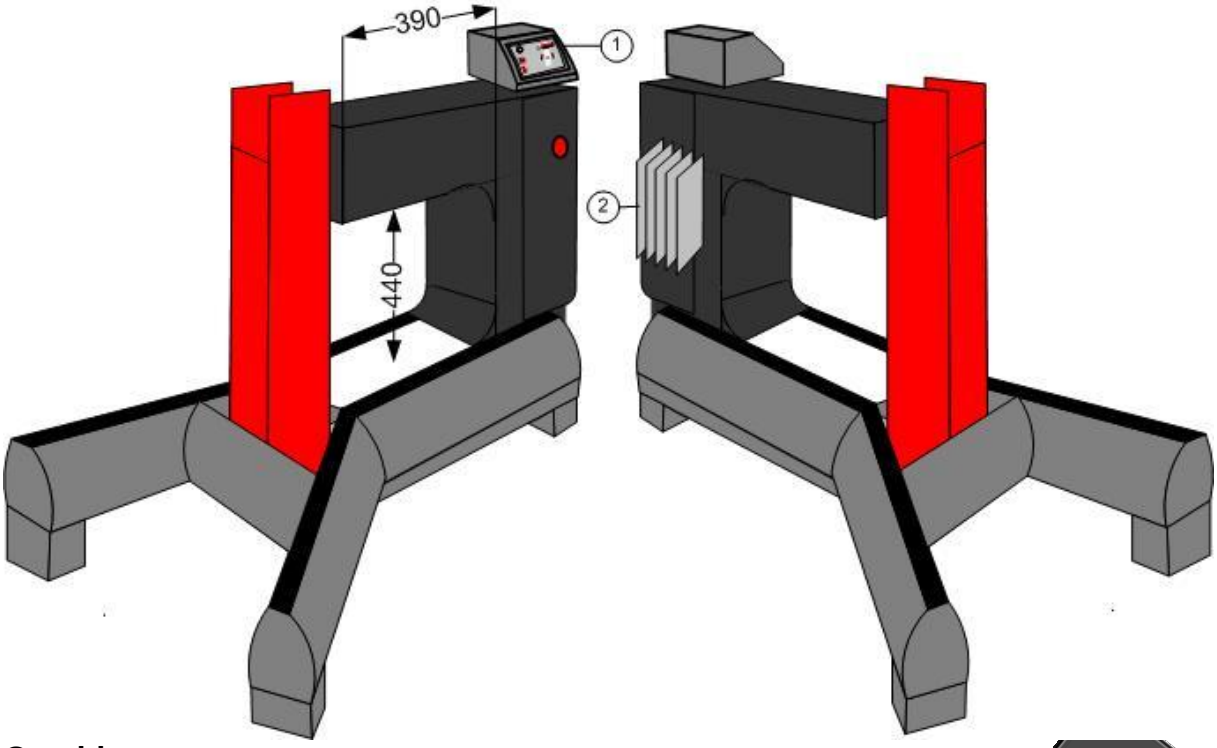
New Electronic unit:

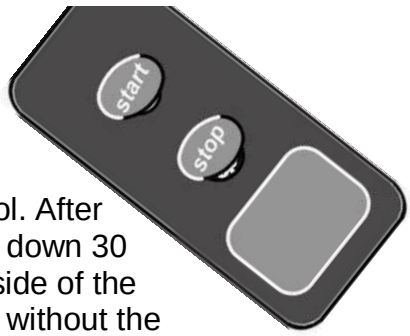
- Thyristor has double capacity and will be cooled down constantly by a heat sink; this makes it possible to use the heater constantly.
- Print tracks distances are double as the wire diameters: 100% secure!
- Temperature of the heat sink, coil and housing is constantly controlled by the microprocessor. If any limit is exceeded the heater will go in alarm: No damage to heater or part!
- The new electronic unit is not exchangeable with the older ones.

- **Changes Easy therm 60**



Outside:

- On the back site a heat sink 150x150x25mm .
- Remote control to start or stop the heater standard



Operation:

- Standard; heater can be started with the infra red remote control. After setting the temperature on the heater push start; heater counts down 30 seconds, in those 30 seconds the operator is able to stand outside of the magnetic field and to start the heater. It is also possible to start without the remote: push start the counter in display will count down for 5 seconds makes it possible for the user to operate the heater standing outside the magnetic field. New safety laws in the future will require this.
- Yoke detection, without yoke the heater won't run.
- Ramp setting possible.

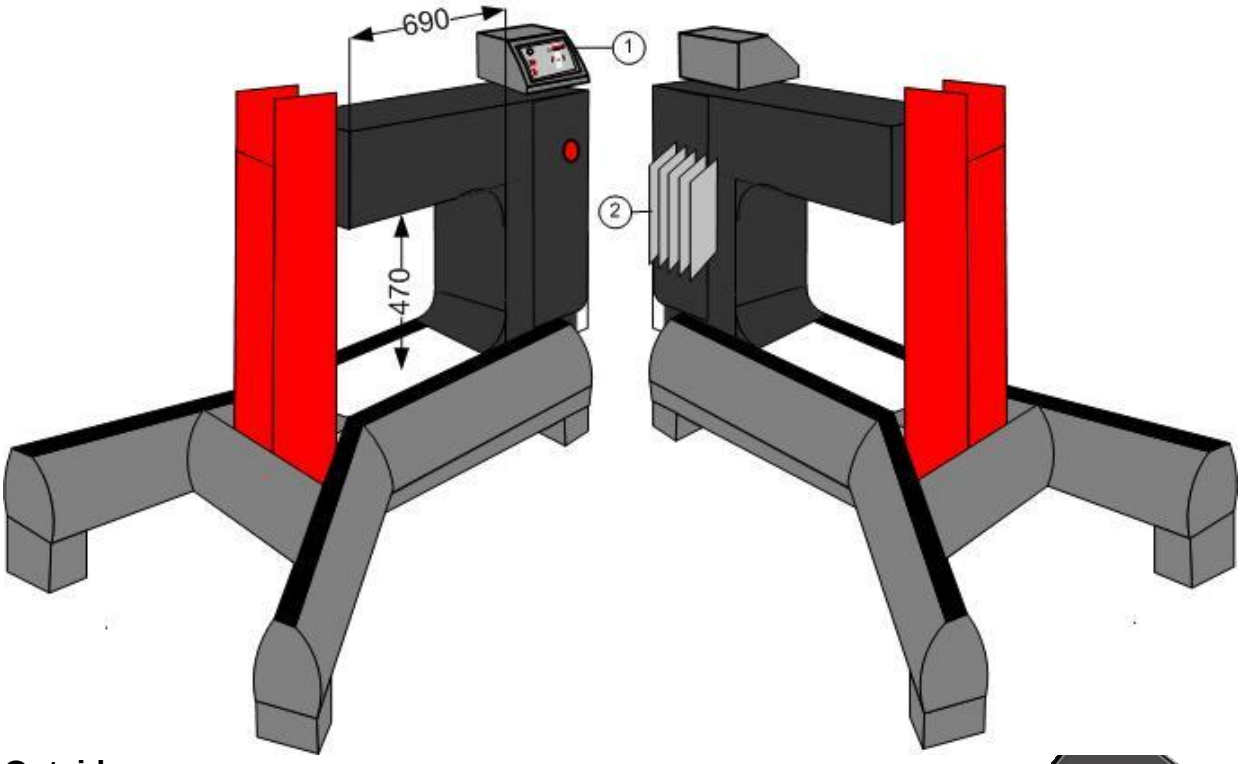
New Electronic unit:

- Thyristor has double capacity and will be cooled down constantly by a heat sink; this makes it possible to use the heater constantly.
- Print tracks distances are double as the wire diameters: 100% secure!
- Temperature of the heat sink, coil and housing is constantly controlled by the microprocessor. If any limit is exceeded the heater will go in alarm: No damage to heater or part!
- The new electronic unit is not exchangeable with the older ones.

Optional:

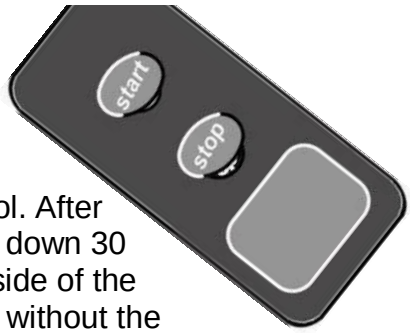
- With a PLC it is possible to control the inside and outside temperature of the part, the heater will control the complete process automatically.

- **Changes Easy therm 100**



Outside:

- On the back site a heat sink 150x300x25mm.
- Remote control to start or stop the heater standard



Operation:

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