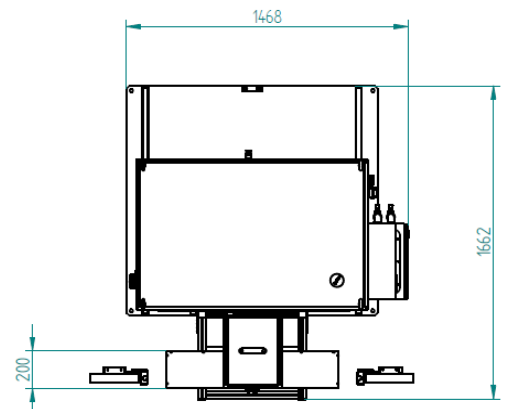
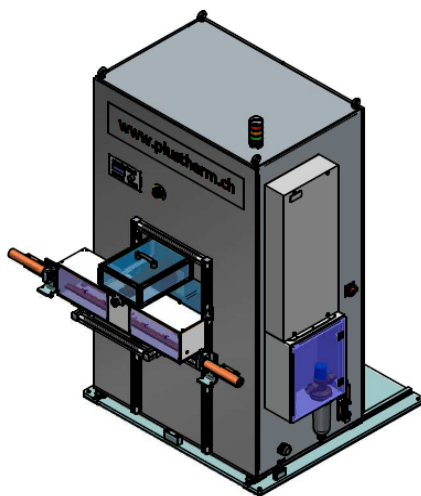
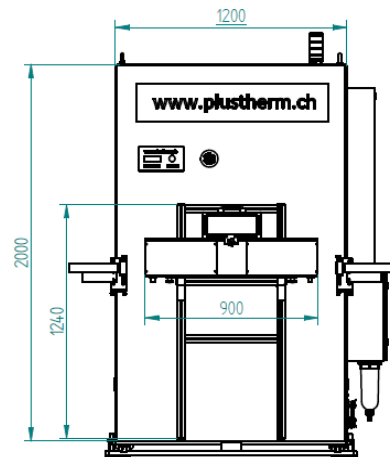
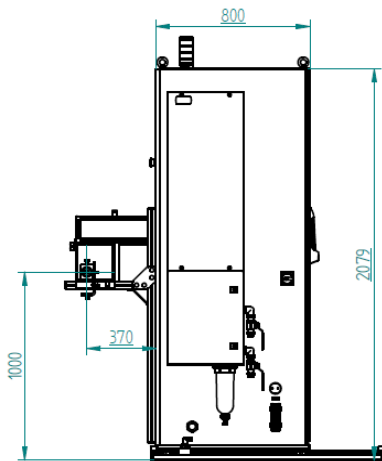


Induction heating

with

PLUSTHERM POINT LTD.

TNX50-TNX100



TNX30 induction converter with coil



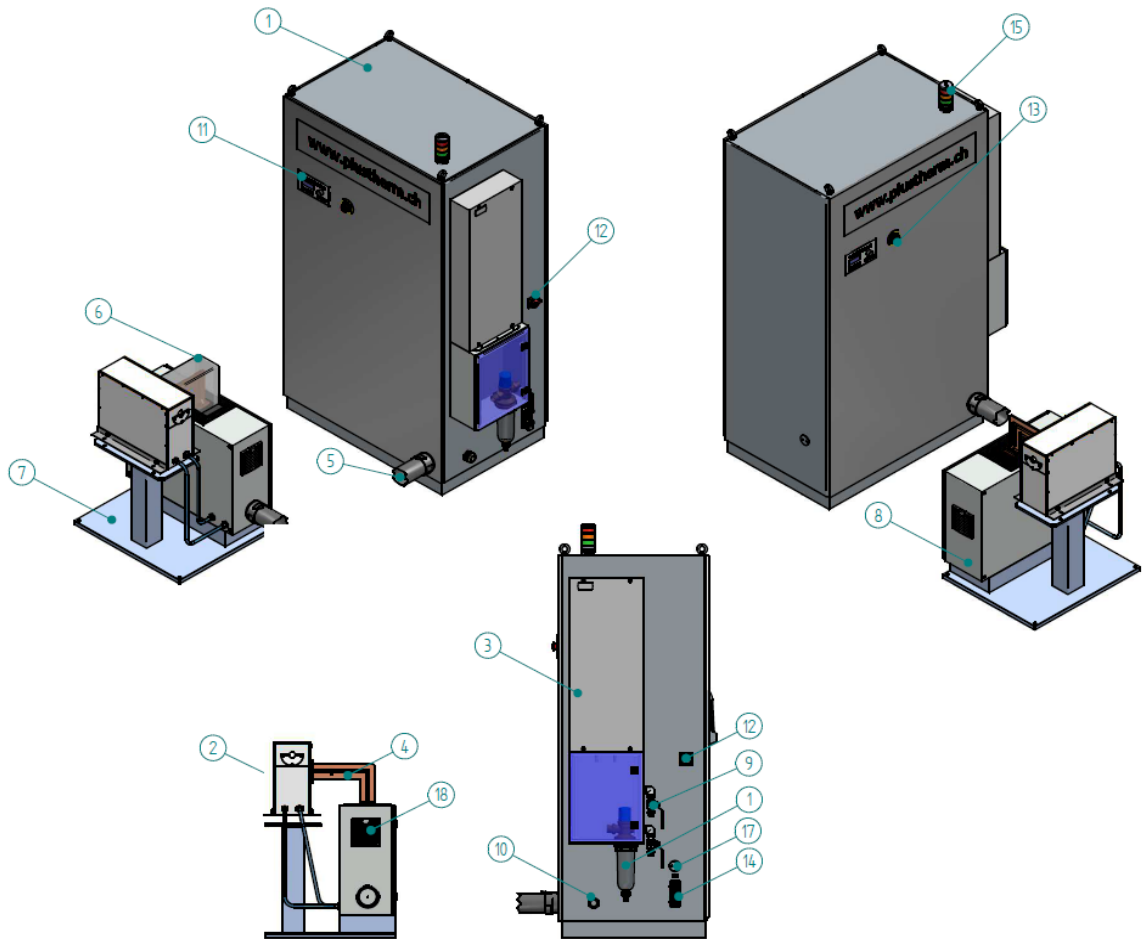
TNX compact series (5-20kW)



TNX30 induction converter with support



TNX50-TNX100 induction converter with separate coil support



TNX series

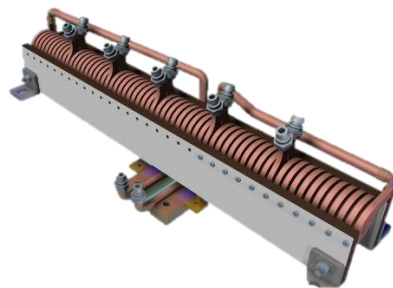
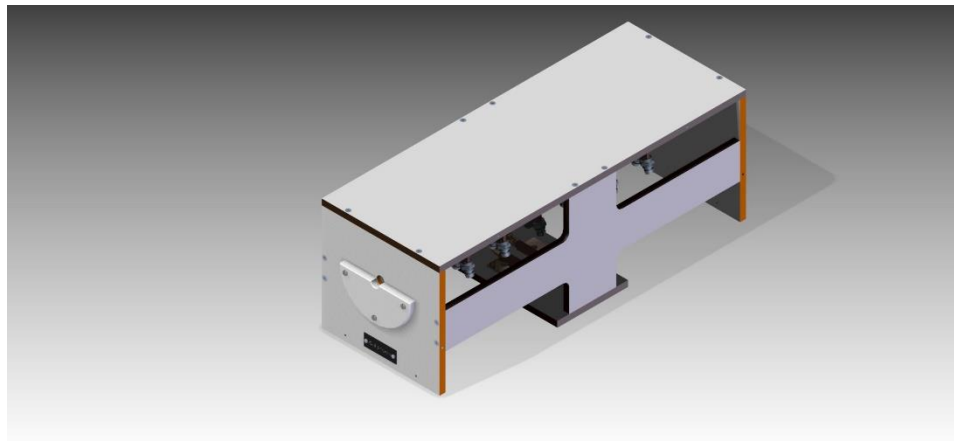
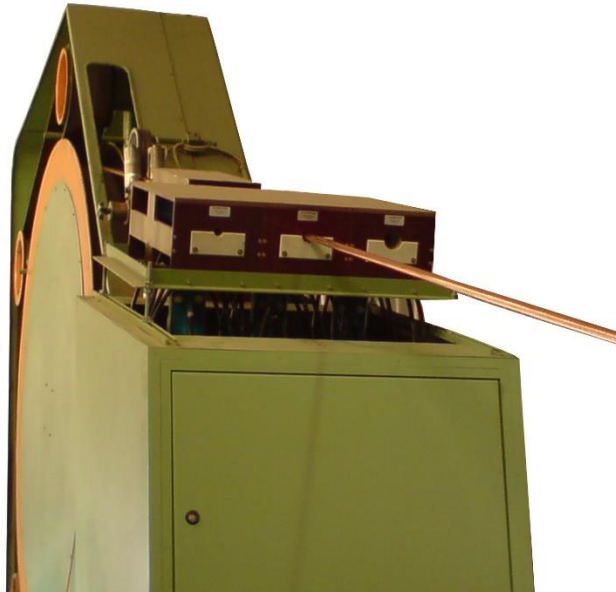
The big difference between a "classical" control concept and the TNX control is in the possibility of adapting generator and system environment optimally on the locally conditions.

Expensive auxiliary components are cancelled such as temperature evaluation, master system, monitoring units and closed loop controller. The TNX control integrated in each Plustherm generator assumes the complete controlling of the system and/or their environment. Thus their project is scalable in price and achievement, and made possible due to the flexibility of the TNX control a safe future solution.

Features Plustherm TNX Generators:

- A uniform control for all frequency and power classes.
- Complete integrated PID control system (external regulator is cancelled).
- Simple operation via operating panel or remote box.
- Full digital static frequency converter control.
- Errorlog with 200 storage spaces.
- Developed after the best available technology.
- Integrated self diagnostic system
- CAN 2.0 Controller
- RS232 Interface
- Digital and analog inputs / outputs
- PC communication
- Ease of adjustment at control system
- Cooling water input temperature up to 40°C.
- All devices correspond to the electrical safety instructions and the EMC directives.
- High efficiency and minimum operating costs.
- The working circuit is protected against over current and over voltage.
- The generator works with the resonance frequency
- Softstart system
- No mains side interference, due of use of DC-link circuit

Coils for cable heating



ABOUT US

We are a Swiss company specialized in equipment machines for inductive and capacitive heating applications. We supply static converters in the middle frequency range and high frequency converters with output power from 1kW to 600kW.

The know-how of our company is based on the experience of over 50 years, at the beginning we were known as "BBC / ABB middle-& high frequency generators". Today we are an independent company registered as "PLUSTHERM POINT LTD".

OUR STRENGTHS

Simple design

All our units are structured very simple and well-arranged. You can choose between a stand-alone unit and a unit with flexible coil circuit.

Support

With us you get support 365 days a year. In case of problems there are always graduate engineer available with a lot of experience.

Flexibility

With us the customer is always right. Our team is a small and agile unit that stands quickly and easily to your side.

And if you "just quickly" would like to clarify a question on the phone, we always have an open ear for you.

Experience

Plustherm has over 50 years' experience with cable preheating.

All our sales engineers are graduated engineers and they can give you the best assistance thanks to their technical background.

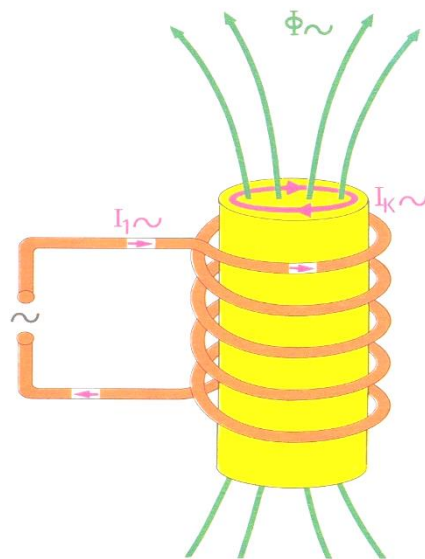
DESCRIPTION

Although induction heating will be used for commercial purposes for over 50 years, it's extensively unknown to public. A clean and fast heating transport to the work piece meets the demand of the highly increased requirements of ecology.

Thanks to advanced technology (transistors), today's units only have 1/10 of weight compared to previous units. A wide implementation of induction heating will be guaranteed by a lightweight and compact design, high flexibility of application as well as adequate pricing.

What means induction heating?

Induction heating is basically different from most other types of heating. The heat generates in the work piece itself and no heating transmission medium will be required (e.g. air or other conductive transfer). Electrical energy is transmitted by a magnetic field to the preheated work piece.



The alternating current (a.c.) which flows through the induction coil generates a varying magnetic field, which produces inside the work piece certain electricity. This electrical energy which is conducted by the induction coil will be first at all transferred in magnetical energy and afterwards within the work piece into heat.

The current density in the work piece is bound for the so-called "skin-effect". The highest current density will be achieved on the surface of the work piece. Thereafter the current density will be decreasing exponentially. Practically no electric current will be flowing inside the material.

Advantages of Induction Heating

1. Accuracy of measuring

is one of the most important advantages of inductive heating. The conducted heat can be strictly regulated, independent of current fluctuations. By using a pyrometer (temperature measuring by means of infrared radiation) and a thermostat, any temperature progress can be reproduced.

2. Maximum production speed

The heating-energy can be conducted, as fast as the material will permit. Compared to radiation-heating there will be an increase of production speed up to factor 1000.

3. Heating of objects which are otherwise unachievable

Metal particles in plastics/vacuum/water/wood etc.

4. Less storage

Compared to radiation-heating-installation

5. Improvement of working conditions

- Abolition of dirt and smoke
- Less radiation of heat as the heat generates inside the material

6. Higher coefficient

- No loss of heat
- No environmental heat

Mode of heating-treatment	Power transmission in W/cm*
Convection (Thermal conduction through molecular motion)	0.5
Radiation (Electric furnace, muffle furnace)	8
Contact, thermal conduction (Cooking plate, Salt bath)	20
Flame (Torch)	1'000
Induction heating	30'000

7. Equal quality

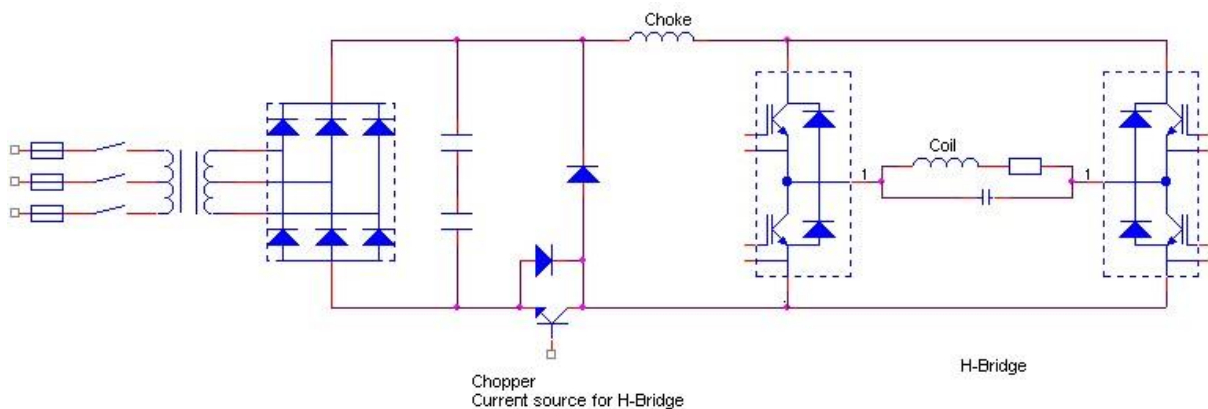
The products manufactured by inductive heat are characterized by equality and quality for the following reasons: restricted boundary of heating, accurate measuring, maximum working speed and no deformation of the work piece.

Plustherm TNX Converter

The static frequency converter is designed for different induction heating and melting processes. The compact, almost completely covered design allows using the converter in industrial ambient conditions, also in case of difficult locations. All components are contained in one case, ready to connect for power and cooling water supplies.

The handling and indicating devices are located on the front side of the generators. The clearly arranged buttons, status lamps and status indications allow easy handling.

The reliability of the converter is ensured with a 2-step supervising system for all relevant electrical and thermal working-states. The technique of the frequency conversion is based on a parallel-oscillating circuit on the working side with power capacitors and an induction coil. The values of inductance and capacitance of this device determines the working frequency of the generator. The load-oscillating circuit is connected to a power source. The power source comprises a 6-pulse rectifier, chopper, ferrite-transformer and smoothing-device.



With the use of a mains transformer there is a potential-separation between the mains and the working circuit. Due to this design there is no short-circuiting in case of an earth link at the induction-coil. The switching of the H-bridge is achieved with the switching of the chopper. Due to this solution it doesn't matter how often and under which power states the high frequency is switched on or off. There are no mechanical switches installed.

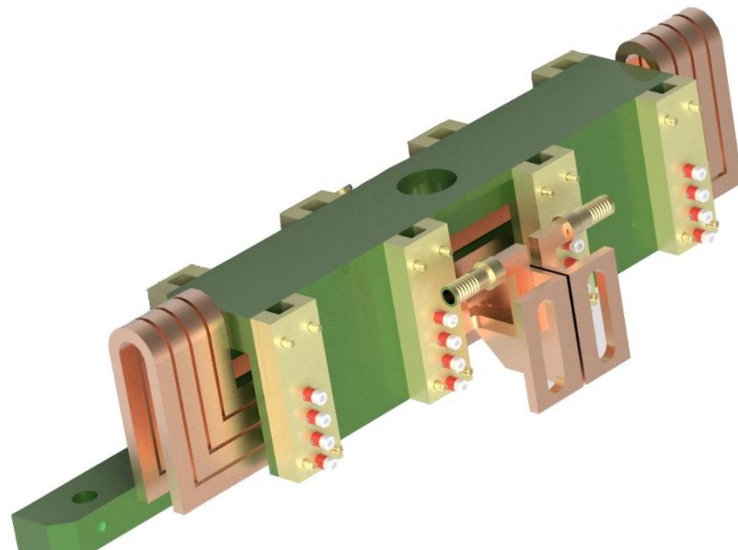
High-frequency-generators of the series TNX serve as heating-treatment for magnetical as well as unmagnetical work-pieces, in particular for hardening, brazing, welding etc.

Generator Type	Output Power	Frequency range	Powerline	Cooling Water	Weight	Dimensions
[Typ]	[kW]	[kHz]	[kVA]	[L/min]	[kg]	W x D x H (cm)
						[cm]
TNX5	5	10 -150	6	4	50	37 x 50 x 58
TNX10	10	10 -150	11	8	50	37 x 50 x 58
TNX15	15	10 -150	16	11	50	37 x 50 x 58
TNX20	20	10 -150	23	15	54	37 x 50 x 58
TNX30	30	10-150	34	22	60	37 x 50 x 78
TNX50	50	5-50	57	36	500	150 x 60 x 200
TNX50 HF	50	5-120	57	36	500	150 x 60 x 200
TNX60	60	5-50	69	43	500	150 x 60 x 200
TNX60 HF	60	5-120	69	43	500	150 x 60 x 200
TNX100	100	5-40	120	72	780	150 x 60 x 200
TNX100 HF	100	5-100	120	72	780	150 x 80 x 210
TNX150	150	5-20	175	107	850	150 x 80 x 210
TNX200	200	5-20	235	142	900	150 x 80 x 210
TNX300	300	5-20	350	214	1000	200 x 80 x 210

(Subject to modifications)

Main features of Plustherm frequency-converter

1. **Precise power regulation**
 - Power regulation can be set to a few watts precisely and reproducibly
2. **Reactive current does not circulate through the semiconductors (IGBT's)**
 - Less switching-loss
3. **The work-frequency is equivalent to resonance-frequency of the LC circuit**
 - No switching-loss for H-bridges IGBT's
 - The same capacitors can be used for various inductors
4. **The load-circuit is over current and over voltage protected**
 - No problems at overload or no-load operation
5. **Direct regulation of HF-rating (Return of rating)**
 - The heating of the work-piece stays proportional to the specified value of reference
6. **The generator starts with resonance-frequency**
 - No problems whilst turning on (over-current)
7. **Smooth-start appliance**
 - Reduced stress for electrolyte-capacitors and semiconductors
8. **Minimal system perturbations**
9. **Integrated PID-regulation for temperature control**
 - Temperature measurement systems like a pyrometer or thermocouple with a measurement transducer can directly connected to our generator.



Optional equipment

Foot pedal
Heavy or light version



Machine stand
Perfect for the independent handling



Pyrometer
For an exact temperature regulation in the range of +/- 1°C



Remote Box
External control box up to 5m cable



Profibus

Integrate the Plustherm
Generator in your
system



Chiller

(water recooling unit)
For 5-600kW
generators



Signal lamp

A lamp increase the
security of your system



C-Box

External circuit up to
10m cable



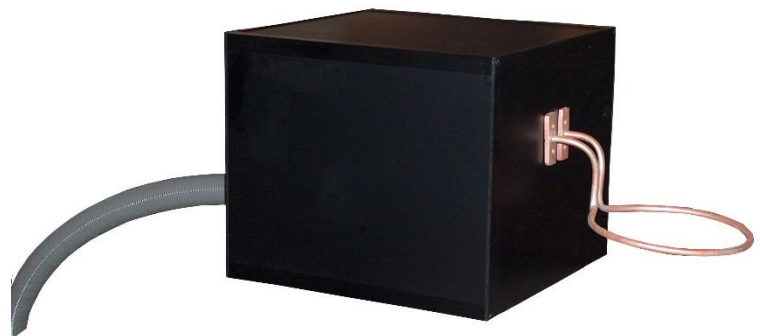
Industrial plug

As place as the
standard plug DIP-25
there's a version with a
heavy industrial plug



**Matching
transformer**

Up to 5m cable





PLUS^{POINT}THERM
INDUCTION HEATING - INDUKTIONSERWÄRMUNG

Would you like to inquire about our products? We are pleased to help you. Send your request to info@plustherm.ch or call us directly at +41 (0)56 426 80 81 and talk to our technician.

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