

## User Manual for Induction Heater INCOIL model IH series

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Carefully read the manual!

Original instructions

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## *Introduction*

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This manual explains how the heater is controlled by the various buttons on the unit. The unit can be operated manually or via a PC / PLC.

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### **Supplied accessories:**

- Power cord
- Inductor/tool/coil
- User manual

### **Optional accessories:**

- External water cooler
- Trolley
- Custom inductors
- Workstation with a balancer
- Transport box
- Water pump
- IR-sensor for Temperature control
- Machine fitting
- Deck Heater
- Flex Heater
- Push button cable

## *Handling During Transport*

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- The unit contains sensitive electronic components and it is not shock resistant, never drop the unit.
- Save the original packaging for safe transport.
- When transporting, drain the water system with compressed air. This is important to avoid frost damage.

## *Draining the Cooling Water*

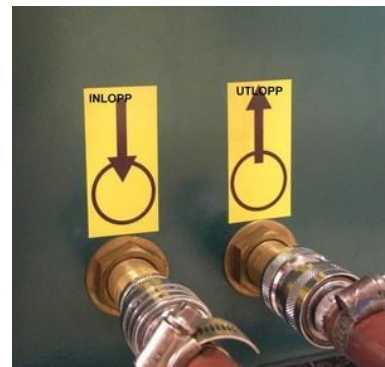
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### **Without cooler**

- Exit heating.
- Turn off the water supply
- Replace the water with compressed air in inlet.
- Blow out all the water

### **With cooler**

- Exit heating
- Shut off the cooler
- Blow compressed air in inlet.



## *Handling Care and Maintenance*

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- The unit contains sensitive electronic components and is not shock resistant, never drop the unit.
- Do not use the unit, when there is damage to the enclosure, power cord, and transformer with water-cooled cables or coil.
- There is dangerous voltage inside the unit, never open the unit.
- Do not insert objects into it.
- Make sure the power cord / hose package and coolant hoses are not squashed.
- In case of damage to the unit, contact your dealer.
- Do not place any object on the unit that contains water or other liquid and do not expose the unit to moisture.
- Do not use the unit in moist or dusty areas and don't expose it to extreme heat. For dusty areas pay extra attention to the air filter.
- Do not cover the unit with subjects or others that might prevent cooling.
- Allow space at the back, sides and under the unit.
- Do not use deformed or repaired coils which can cause a short circuit or low water flow.
- If the unit is exposed to the cold, condensation can form, let it therefore remain unconnected indoors for an hour before it is used or connected.
- Never use the unit outdoors in wet weather.
- When the unit is not used for a long time, the power plug is to be pulled out and the water turned off.
- Metallic objects close to the coil can be heated.
- Do not heat too close to electrical equipment; it can be damaged by the magnetic field from the coil.
- People with pacemakers should never reside near magnetic fields.

## *Cleaning*

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- Make the unit powerless.
- The unit should only be wiped with a damp cloth.
- The coil is cleaned of soot and dirt to prevent electrical arcing.
- Never rinse the unit since there is a risk that the water penetrates and destroys electronics.

## *Ventilation*

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- All openings in the cabinet are for ventilation, don't block or cover any of these; it also applies under the unit.
- Never insert objects into these openings.
- Replace the air filter in the front of the unit at regular intervals to ensure air flow, recommended replacement about 2-12 times a year depending on the environment.

## *Service*

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- There are no parts that can be repaired by the user, at failure contact the dealer.

## *LOTO: Lock out, tag out*

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When the machine must be powered down for maintenance, changing the coil or similar tasks, even in this powered down state the machine is never to be opened up.

1. Terminate any ongoing heating operation.
2. Turn off the main switch and lock it in its off position
3. If the unit is delivered with a separate cooler that is power from a separate power source then turn off the main switch of the cooler too.
4. Turn off the water flow to the machine.
5. Now the work around the machine is ready to proceed.

## *Weekly maintenance*

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- Check the air filter, change if needed.
- Control the hose package for wear and tear injury.
- If the system is equipped with IR-pyrometer, check that its lens is clean.
- Clean the coil from soot and dirt.
- Cooler if installed:
  - Check that the radiator is free of dirt and dust.
  - Make sure that no debris or trash has fallen into it.
- Check water filter if installed.
- Make sure that the ground cable to the transformer is not damaged and that the transformer is properly grounded.

## *Monthly maintenance*

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- Check the water level in the cooler.
- Check the water quality. A cooler might have requirements to change the water on a regular basis. The Heater has no trouble running with the same water as long as the water is clean.

## *Yearly maintenance*

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All items are handled during more frequent maintenance.

## *Explanation of Symbols*

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To get the best out of the unit, read instructions and safety before use.

These symbols are placed on the unit's chassis:



This symbol indicates that there is dangerous voltage inside the unit.



This symbol will alert you that there are important instructions for the handling, care and maintenance in the instructions that come with the product.



This symbol indicates that people with pacemakers should not be staying close to magnetic fields.



This symbol indicates that you should not stand on or charge the unit's chassis with high weight.

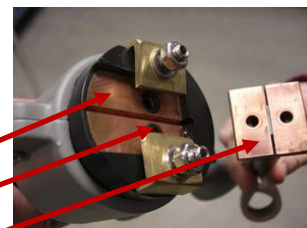
## *Preparation / Installation*

### *Installation of the coil*

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The contact surfaces of the coil and transformer must be undamaged and clean  
O-rings must be intact and of the right dimension (7x2,5 mm standard transformer / 5,28x1,78 mm lightweight transformer)

The nuts on the bayonet coupling should be easy to thread  
and be tightened with a torque (6-8 Nm for standard transformer with M8, 4 Nm for lightweight transformer with M6) to prevent leakage and provide good electrical contact.



Transformer

O-ring

Coil

### *Installation / start up.*

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1. Make sure that water of good quality (example: fresh water, process water) and electricity is available.
2. For a closed loop cooling system it is very important to check the water quality on a regular basis.
3. We recommend an external water filter to help detect pollution in the water system.
4. Arrange the workplace so that no cables, hoses or hose assembly is folded or squeezed.
5. The coil should be mounted.
6. Connect the water.
7. Turn on the water.
8. Check that there are no leaks (Paragraph 4-6 does not apply if equipment supplied with preinstalled coolers).
9. Make sure the main switch is turned off.
10. Connect External Control, external emergency circuit, IR-pyrometer and network if this is to be used.
11. Plug in the power cord and turn on the main switch.
12. Allow the machine to boot.
13. Now press the button "On / Off" to activate the heater and the cooling circuit.
14. Let the water flow through the cooling circuit and lower the handle to prevent air pockets to be formed in the transformer / coil (especially important when replacing the coil, if the machine has been drained of water, or are unused).
15. Check that no error message appears in the display window.
16. The machine is now ready for heating.



### *Changing of the coil*

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1. End heating, turn off the power to the machine, see “Lock out Tag out” above.
2. Loosen the nuts holding the coil.
3. Let the coil slide out of its mounting. Water will flow out of the coil as it is filled with water. This can be avoided by draining the cooling water, see “Draining the Cooling Water” above.  
Wipe up any water that runs out.
4. Check the coil and transformer according to “Installation of the coil” above.
5. Hold up the wings holding the coil and slide it into place. Tighten the nuts with 4 Nm of torque.
6. Wipe up any water after the assembly.
7. Turn on the water flow again.
8. Make sure that no leakage occurs in the coil connection.
9. Continue with items 11 to 16 in “Installation / start up.” above.
10. Check the water level of the cooler and fill up when needed.

### *Mains switch*

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Do turn off the machine using the mains switch under high load.  
First terminate any ongoing heating operation.  
Only then use the mains switch to turn off the machine.

**The unit can be operated both manually and externally.**

**It can also be run with programs.**

**These can easily be created directly in the machine's display.**

**It is also possible to create programs on the PC and then transfer to the machine**

**Version L (Limited) can only be run manually.**

### **Manual**

Run startup procedure as defined previously.

Heating can now be started using Button “1” on display, push button cable or handle button.

Control the power with potentiometer on the unit or on the handle.

Releasing the button stops the heating.

### **External**

Relay signals can start/stop the unit.

Also show current status: Ready to Heat, Heating and Error signal.

It is also possible to control the machine using Modbus (RS232 or TCP/IP)

### **Program**

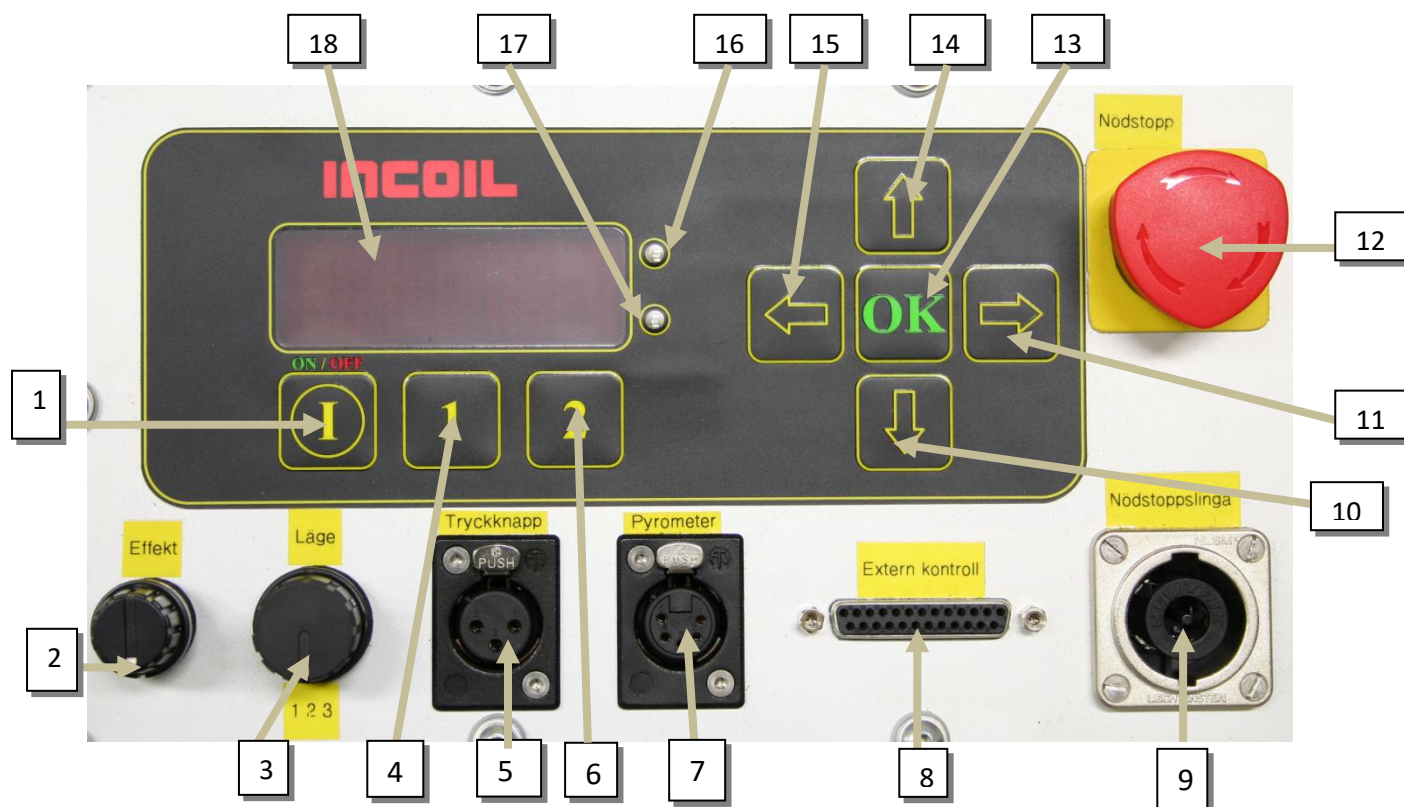
First define program to be run. See “Heating Programs” in separate document.

When a button is pressed the program will start.

Releasing the button will NOT stop the program!

Pressing the button for a second time will stop the program.

## Control panel full version



1	ON/OFF	
2	Power potentiometer	X
3	Switch Panel/Handle/External	X
4	Test (power on)	
5	Panel contact ON/OFF	X
6	Lock desired power	
7	Connection temperature sensor IR-pyrometer	X
8	External Control	X
9	External Emergency Stop circuit	X
10	Arrow down	
11	Arrow right	
12	Emergency stop	
13	Set/Confirm/Acknowledge	
14	Arrow up	
15	Arrow left	
16	Green = Heating   Red = Current limit Orange = On	
17	Green = OK   Red = Error	
18	Display window	

X = Option

## Menu structure of the control panel

The menu consists of seven main pages where messages and measurements are presented, settings can be reviewed and changed.

- **Operation**  
Start mode that shows the most important measurements during normal operation
- **Settings**  
View current settings and make changes.
- **Heating Programs**  
View and change programs to be run. Not part of Limited (L) variant.
- **Temperatures**  
Displays the monitored temperatures in the system
- **Diagnostic**  
Shows values not presented in operations menu
- **Alarms**  
Shows currently active alarms. Alarms are acknowledged with the “OK” button, and can be acknowledged regardless which menu is currently active.
- **Product Information**  
Versions of the installed parts of the system. Not presented in further details.

Operation	Settings	Heating Programs	Temperatures	Diagnostic
Power	Panel Locked	Program*	IGBT	Mains current
Desired Power	Max Power		Max IGBT	Mains voltage
Work Object*	Program Select*		Water in*	Mains voltage S*
Frequency	Max. Temp Work Obj.*		Rectifier*	Mains voltage T*
Resonant current	Temp.sens. WorkObj.*		Water out	Phase Order*
Program select*	Max. Resonan Curr.		Work object	Flow monitor
Mains current	Pyro. Emissivity		Temperature Scale	Flow monitor Ext.
Progress	Time Cooling Water			Heat switch
Operation time	Time			Temp sensor work object*
	Språk/Language			IrToImain
	PLC Voltage Range*			Ip address*
	Fan*			
	Temp Watch			
	No Heat temperature and Time*			
	Temp Regulate P&D*			
	Network*			

\*: Depending on the current configuration.

## *Navigating the Menu*

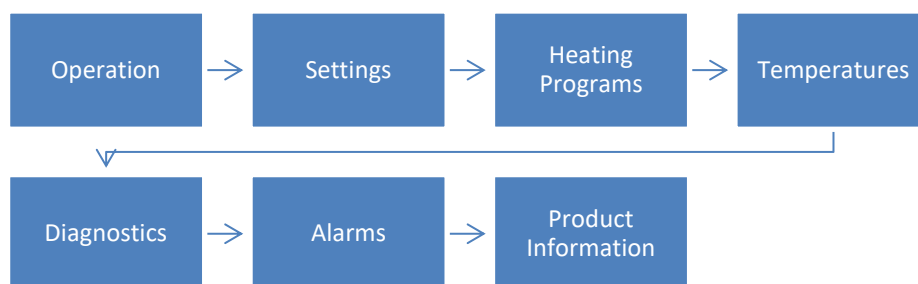
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The display has four rows.

Please note the little triangle on the left hand of the display. It is the marker and shows what option is selected.

To navigate between the main pages, use **Arrow Left & Arrow Right**.

The system always starts in Operation menu. With one press on the **Arrow Right** Settings is displayed, one more press and Heating Programs (or Temperatures in machines without programs), with more presses finally Product Information will be displayed and one more press will show the Operation menu again. It is possible to navigate in reverse order with **Arrow Left**



The system has a memory when displaying the menu. It remembers what parts of a menu was shown before. So if you are in the Settings menu displaying the “Max Power” parameter and now navigate away from the Settings menu and then later back again, it will display the “Max Power”-parameter once again. This memory is cleared when the system restarts.

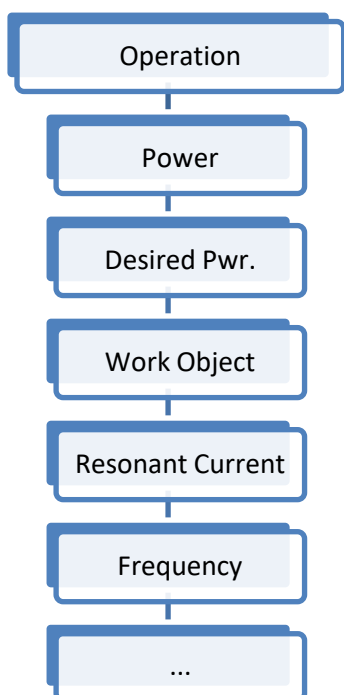
## Operation menu

Below is a chart on how the Operation menu looks like. Initially the four rows on the display show the four top squares. (Operation-Power-Desired Pwr.-Work Object)

Note: Work Object is only present on machines with activated IR-pyrometers. If this is not the case then Resonant Current will be displayed instead.

With **Arrow Down** the list is scrolled downward so the display will show the list starting with Power instead, see picture below. More values can be displayed below Frequency, see [Menu Operation](#) below.

Pressing **Arrow Left** or **Arrow Right** will leave the Operation Menu regardless what is currently displayed.



Picture showing what it looks like when the machine starts up. Note the triangle in the top left corner. Arrow on bottom left shows that more can be displayed below.



Pressing **Arrow Down** once. Power is now on the top row and Frequency is on the bottom.

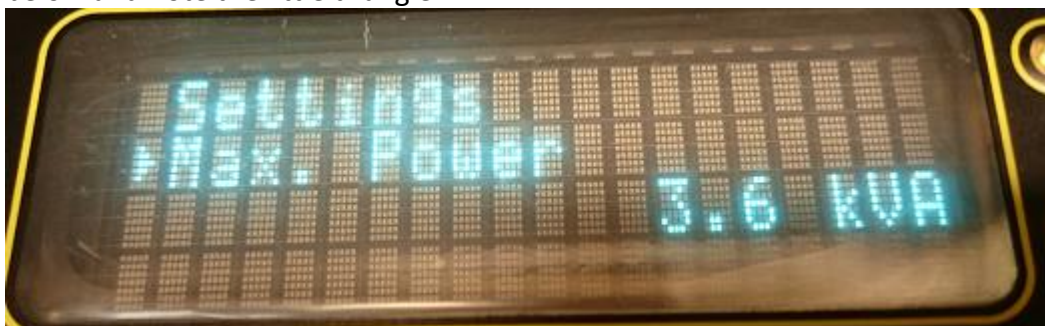




## *Settings menu*

In the Settings menu you can read and change settings in the system, hence the name. ☺  
Settings can be Max Power, Use pyrometer or not and others. All are presented below in [Menu Settings](#).

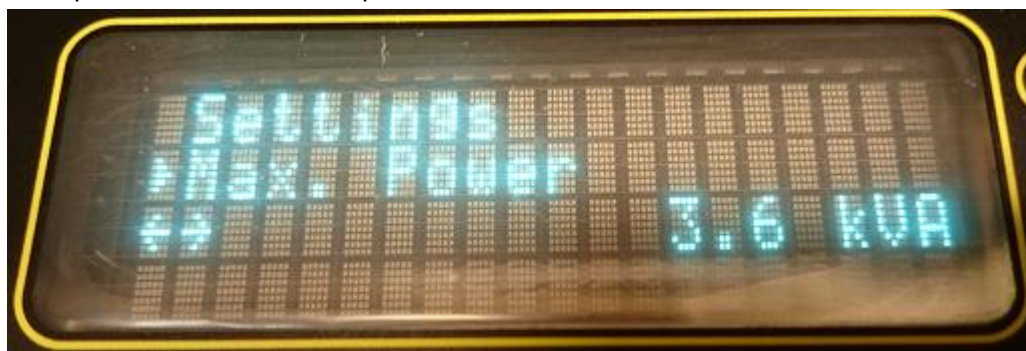
As in the Operation menu there is a list of options here but instead of displaying them on top to bottom only one parameter at a time is displayed. The current value of the parameter is displayed on the row below the name. To view the current list of settings first the settings menu have to be selected. Then press **Arrow Down** to select the Parameter level. Se picture below and note the little triangle.



Max Power is selected here and the triangle is now pointing on the Max Power name.

To change a parameter:

- First select the parameter to be changed.
- Then press **Arrow Down**. See picture below.



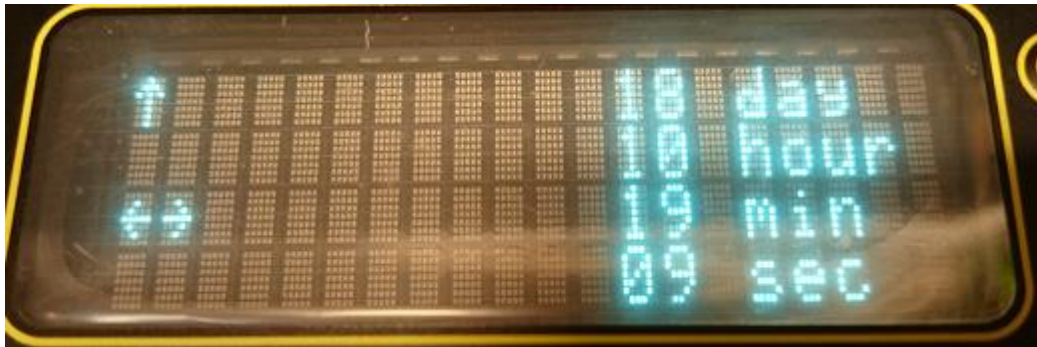
Note the ↔ twin arrows showing that we are now in change mode. The triangle remains on the name. The parameter may have more than one row to edit. See below what happens when I choose to edit the time:



It has one row for year, month, day, hour, minutes and finally one for seconds.

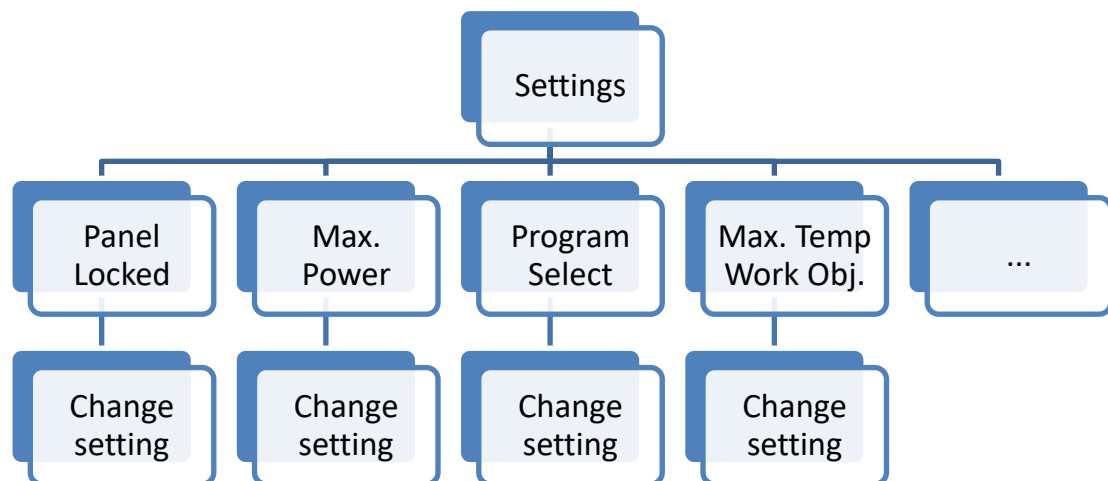
The  $\leftarrow \rightarrow$  will indicate which row is currently being edited and the Arrows Up/Down on the left hand screen indicate that there is more to be displayed above and below.

NOTE: Pressing **Arrow Up** when editing the top value (Year in time or when editing a single row value like Max Power) will end the editing and no change to the parameter is done.



Reached the bottom for editing the Time parameter.

- Now changing the selected parameter (or part of a parameter) is done using **Arrow Left** to decrease the value and **Arrow Right** to increase the value. If the arrow is pressed and held the change is accelerated. Releasing the arrow will allow the change rate to start to decrease.
- To complete the change of the parameter **Button OK** has to be pressed. Only then will the parameter change its value. If you navigate above the top value for a multi row parameter (like time) or press **Arrow Up** for a single line parameter (like Max Power) then the edit is cancelled.



Note: Network parameters that is last in the list of parameters has its own submenu and to access the parameters for this an additional **Arrow Down** has to be pressed before changing those parameters.



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*Other menus*

Temperatures and Diagnostics menus work in the same way as the Settings menu. A list of parameters but only one displayed at a time. Here no changes can be made except one. In Temperatures menu it is possible to change from Celsius to Fahrenheit if that is preferred.

Alarms looks more like the Operation menu with a list of active alarms. It is however rare that the list will be so long that all cannot be displayed.

Product Information is also like Operation menu with versions of SW and dates.

The Heating Programs menu is described in a separate document.

## Menu Operation

No settings can be made in the Operation Menu

Menu selection Operation	Comments
<b>Power</b>	Displays IS-value VA (VoltAmpere)
<b>Desired Power</b>	Displays desired power in kVA An 'L' is displayed next to the value when the power is locked. It is locked when program mode is selected. It can also be locked in manual mode using the button '2' on the panel. Set the desired power and then press button '2'. The 'L' will now be displayed. To set another power, press the button '2' again to remove the lock.
<b>Work Object</b>	Temperature from connected Pyrometer. Displays "-“ if not connected. Not part of Limited version
<b>Frequency</b>	Shows the operating frequency in use. Direct after the start of heating shows resonant frequency.
<b>Resonant current</b>	Shows the primary current. May be limited at high power output to avoid high resonant current peaks
<b>Program Select</b>	Display heating program to use Manual= no program. >=1= heating program Chang in Settings->"Program Select"
<b>Mains current</b>	Shows line current in A (Ampere)
<b>Progress</b>	Shows time for current heating in manual operation, shows current program step time in program mode
<b>Operation time</b>	Displays the time the machine has been in operation (heating time) hhhh:mm:ss

## Menu Settings

Menu Settings	Comment
Panel Locked	Lock the panel from unintended changes. See below.
Max power	Limit the power used
Power Control	Select where to control the desired power in manual mode. Panel, Handle or the external control Not available on all models.
Program selected	Set the currently selected program. 0 for manual operation
Max. Temp.Work Object	Temperature at which point the machine will disable heating for manual operation
Temp. Sens. Workobj	Use external Pyrometer to monitor the temperature of the work object.
Thermocouple	Choose thermocouple type when this is used instead of pyrometer
10V corresponding Temp	If an analogue input corresponding to a temperature is used, then you set the temperature corresponding to the maximum signal.
Allowed Temp Change	Set a maximum temperature change between two measurements (~15 to 50ms) that the system should accept when running If the change in temperature is larger then the set value, the system will not accept the new value. If the temperature does not return to "normal" then an error is presented Set to 0 to disable this test.
Pyrometer Filter	Use an average of four measurements from the pyrometer. Slower regulation but perhaps more stable control of temperature.
Max Resonant current	Limit the resonant current, to remove this limit set 0. The machine still has factory limitations that cannot be disabled.
Pyro.emissivity	Set the emissivity for the pyrometer. Dependent on the material used.
Time cooling water	

	After heating cooling water will still be active for this time. Set 0 for continuous cooling applied
<b>Time</b>	Set the current time and date
<b>Språk/Language</b>	Select language
<b>PLC Voltage Range</b>	Set the voltage range of the power control in the external control port. 0-10V or 0-20V
<b>Fan</b>	Set Fan mode operation. Only IH5 model Off = Always off Normal = Controlled by water temperature Low = Always on low speed. High = Always on high speed.
<b>No heat temperature &amp; No heat time</b>	When using a predefined program with temperature, it is possible to set a temperature that the object that is heated should reach within a specified amount of time. To disable set the time to 0 sec.
<b>Temp Regulate P &amp; D</b>	PID regulator settings used when running temperature control programs. This is the systems parameter used when program step data is not used.
<b>Temp Reached Hyst &amp; Time</b>	The unit can signal when the desired temperature is reached on an external signal or on some pyrometer models on the display. Here a delay of that signal can be set. And a hysteresis allowing the temperature to drop without clearing the signal. This can also be used to set an alarm if the system cannot keep the temperature within the hysteresis limit (above and below for alarm) after the set delay.
<b>Pyrometer type</b>	Set the type of pyrometer connected to the machine. Only change

<b>Min Frequency</b>	<p>Set a low frequency that the system should work with. Used very rarely, this can limit the available output power of the system.</p> <p>This is the system setting if no others are set in program</p>
<b>Start Current</b>	<p>Set a starting desired current that the system should try and reach. Can make the system reach desired power faster.</p> <p>Contact Incoil for more information if needed.</p> <p>This is the system setting if no others are set in program</p>
<b>Temp Watch</b>	<p>Settings for Temp watch output. (Replaces High Temp alarm output)</p> <p>At a certain Pyrometer Temperature a relay can switch.</p> <p>NO:</p> <p>Above temp: Closed relay</p> <p>Below temp: Opened relay</p> <p>And vice versa for NC.</p> <p>Set temperature to 0 to disable</p>
<b>Network</b>	<p>Select Static or DHCP network configuration</p> <p>Network settings, not available on all models, Contact distributor if unclear.</p>

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*Panel Locked*

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The data changeable in the Settings and Heating Programs panels can be locked to avoid changes by accident.

A four digit pin code is used to unlock the panel. Setting the pin code to 0000 will allow the machine to start in unlocked mode, basically a disabled lock. However the panel can still be locked from this state and 0000 will have to be entered to unlock the machine, or rebooting the machine.

To Lock the system from unlocked state:

- Navigate to the Panel Locked setting and press the Down key.

- Five rows of settings are now available Lock/Unlock and the four digits in the pin code.

- Change the first line to Lock and press Ok.

- The panel is now locked. If you change the pin code in the settings now the pin is NOT changed.

- To change the pin see below.

To Unlock the system from locked state:

- Navigate to the Panel Locked setting and press the Down key.

- Five rows of settings are now available Lock/Unlock and the four digits in the pin code.

- The first line can be ignored. The pin code will show only X's.

- Using the Down/Up arrow to select each digit and Left/Right arrow to change the values, set the correct pin code values and then press the OK key.

- The system should now be unlocked and Unlock should be displayed as the value.

To Change the pin code:

- This needs to be done from an unlocked system. (Hmm, how odd?)

- Navigate to the Panel Locked setting and press the Down key.

- Five rows of settings are now available Lock/Unlock and the four digits in the pin code.

- The first line must be left as Unlocked value.

- Change the pin code digits as desired.

- Press the OK key to store the new pin.

- The system is still unlocked and Unlock should be displayed as the value.

*Menu Temperatures*

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Menu Temperatures	Comment
IGBT	Current temperature of IGBT
Max IGBT	Maximum temperature of IGBT ever reached.
Water in	Temperature on Water into heater, dependent on configuration
Rectifier	Temperature on rectifier, dependent on configuration
Water out	Temperature on Water out of heater
Work object	Temperature on work object if pyrometer present. Not part of Limited
Celsius/Fahrenheit	Set temperature to be displayed in Celsius (default) or Fahrenheit.

## Menu Diagnostic

Menu Diagnostic	Comment
Mains Current	Measured Mains Current
Mains Voltage/ Mains Voltage R	Measured Mains Voltage
Mains Voltage S	Additional two phases when present
Mains Voltage T	
Phase Order	<p>Shows the Phase order of Input Mains RST or RTS.</p> <p>If a cooler is supplied by Incoil and its power supply is connected thru the IH machine the phase order should be RST. The cooler needs a correct phase order for the fan and pump to operate in the correct direction.</p> <p>If a phase change connector is present on the cooler it should have a mark which will indicate the correct setting when the machine detects RST order. If the machine detects RTS then the phase changer should be in the other setting.</p> <p>Not all machines.</p>
Flow Monitor	Shows if monitor detects water flow or not.
Flow Monitor Ext.	Shows if second monitor detects water flow or not.
Heating Switch	Is Switch open or closed.
Temp.sens. WorkObj.	OK, Not connected or Communication error
IrTolmain	<p>Not all machines.</p> <p>During operation shows the relationship between resonance current and mains current. Can in some systems be used to detect that the coil is running without object to heat.</p>
IpAddress	Shows the machines Ip-address, not on all machines.



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*Menu Alarms*

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In this menu active alarms are presented. If more alarms are active than can be displayed then Arrow Up/Down can be used to navigate the list of active alarms.

In order to be able to acknowledge an alarm the conditions that raised the alarms need to go away.

Example: Phase error: then all three phases need to be restored to be able to acknowledge the alarm.

More than one alarm may be active at any time but only one will be flashing and is also displayed in the bottom row in all other menus.

Pressing OK button will acknowledge the current alarm. But if the conditions for the alarms still apply then the alarm will still be active. Acknowledged alarms will disappear from the list and if more than one active alarm then the next one will become flashing and can be acknowledged.

## Message in the display

Display text	Comments	Solution
<b>Reboot!</b>	Internal error requiring reboot	Restart the machine
<b>EEPROM format err.</b>	Cannot read parameter memory	Contact dealer.
<b>EEPROM incomplete</b>	Cannot read parameter memory	Contact dealer.
<b>EEPROM write error</b>	Error when storing parameters	Contact dealer.
<b>Regulator config.</b>	Internal error	Contact dealer.
<b>3V3 low voltage</b>	Internal monitoring of externally supplied voltages. Check connected equipment	Check connected equipment for short circuit. If error persist contact dealer.
<b>24V low voltage</b>		
<b>5V low voltage</b>		
<b>Regulator error 1</b>	Internal error	Contact dealer.
<b>Regulator error 2</b>	Internal error	Contact dealer.
<b>Regulator error 3</b>	Internal error	Contact dealer.
<b>Regulator error 14</b>	Internal error	Contact dealer.
<b>Regulator error 16</b>	Internal error	Contact dealer.
<b>Regulator error 17</b>	Heating stopped as phase error discovered	Check phases and fuses.
<b>Regulator error 18</b>	Internal error	Contact dealer.
<b>Regulator error 29</b>	Internal error	Contact dealer.
<b>Phase error</b>	Error on one or more phases.	Check phases and fuses.
<b>Load error</b>	Heater cannot detect working coil	Check coil and its connections
<b>Mains current rush</b>	Heating stopped because of large mains current detected	Can occur if the unit comes too close to the resonance frequency. Contact dealer.
<b>High mains current</b>	Normally the heater can regulate the current to within limits but for some reason has now failed and finally cancelled heating	Should not occur under normal operating. Contact dealer.

<b>Contactor released</b>	Contactor released during heating. Occurs together with other errors. Need to set the unit in standby to be able to acknowledge.	Check other errors.
<b>Resonanscurrent high</b>	Heating stopped as possible short circuit was detected.	Contact dealer.
<b>Resonanscurrent low</b>		Contact dealer.
<b>Resonanscurrent rush</b>		Contact dealer.
<b>Low mains voltage</b>	One or more phases missing or voltage too low	Check phases and fuses. Contact dealer.
<b>No Current flow</b>	No current flows in the resonance circuit.	Check coil and its connections. Contact dealer.
<b>Temp. sensor IGBT</b>	Unable to measure the temperature of internal temperature sensors.	Contact dealer.
<b>Temp.sensor w.in</b>		Contact dealer.
<b>Temp.sensor w.out</b>		Contact dealer.
<b>Temp.sens.WorkObj.</b>	Heater set to operate with external pyrometer but the heater cannot establish connection	Check pyrometer and cables.
<b>Emergency stop</b>	Emergency stop was pressed	Release when <b>safe</b> and acknowledge.
<b>Contactor</b>	Contactor is in the wrong position.	Contact dealer. Internal cable error?
<b>Heating switch</b>	If button to start heating is pressed when unit is in standby	Release switch and acknowledge. Check cables if error persist
<b>No Water flow</b>	No Water flow detected when in On.	Check waterflow.
<b>No Water flow ext</b>		
<b>Unexp. Water flow</b>	Water flow detected in standby on machines with internal water valve.	Water valve may be damaged or water flow sensor damaged. Contact dealer.
<b>Unexp. W. flow ext</b>		
<b>Temperature IGBT</b>	Temperature too high on IGBT	Internal electronics have become very hot should not occur unless some error. Contact dealer
<b>Water temp in</b>	Temperature too high on water into the machine. Difficult to cool with hot water	Check incoming water supply.
<b>Water temp out</b>	Temperature too high on water going out of the machine. Something may generate too much heat.	Check incoming water temperature if this may be the cause. Contact dealer

<b>Temp.sensor rectific</b>	Temperature too high on internal rectifier	Internal electronics have become very hot should not occur unless some error. Contact dealer
<b>Empty coil</b>	IrTolmain setting has detected that the coil is running empty.	Check that the coil is not empty. Contact dealer for assistance if problem persist.
<b>No heat detected</b>	The temperature detected has not reached the correct temperature within the defined amount of time	Make sure that the IR-Pyrometer is correctly positioned. Check if the object is inserted correctly into the coil. Adjust the setting in Settings menu to reflect the correct temperature and or time.
<b>Prog Interrupt</b>	When configured that programs should not be interrupted but allowed to run thru.	Something stopped a running program when not allowed
<b>PC Connection</b>	Trying to start heating program without connection to PC when configured to demand connection	Check PC-connection, program running...
<b>Cannot reach Temp</b>	Heating program Run To Temp or Temp Change programs was unable to reach the desired temperature within the specified time limit	
<b>Prog Needs Temp</b>	Trying to start a program that requires that an pyrometer is present and is ok	Check Pyrometer connector and setting (Temp. Sens. Workobj)
<b>Resonance Limit cnt</b>	If the system detects resonance (rushing resonance current) too many times the system will stop.	In handheld operation try to keep the coil steady when heating. Not to raise the coil from the workpieces and down again.
<b>Temp control fail</b>	Configurable alarm.	See programming manual
<b>Rec. Write Fail</b>	Internal error	Contact dealer.
<b>Program Format</b>	Internal error	Contact dealer.
<b>Prog. Save error</b>	Internal error	Contact dealer.
<b>Save Prog Too Big</b>	Internal error	Contact dealer.

<b>High Temperature</b>	Pyrometer or similar measures a temperature above the set value for the current program running	Increase the allowed limit Reduce the power or adjust the regulation parameter to avoid reaching the limit
<b>Pyro High Temp</b>	Pyrometer or similar measures a temperature above the range that it is made or setup for	Check settings in pyrometer or replace pyrometer with one that can handle the higher temperature
<b>Pyro Low Temp</b>	Pyrometer or similar measures a temperature below the allowed min level.	Check pyrometer or measurement system.
<b>Power Control warning</b>	The manual control of power can have three sources, the handle (if present), panel potentiometer or the external control connector. If External is selected this interface should also start the heating. If the other two is selected the external connector should not start the heating	Set the switch (physical or in menu setting under Power Control) to the correct position and then start heating.

## Technical specifications

		IH10	IH18	
Continuous Output power / kVA		10	22	
Frequency Range kHz		4-50	4-50	
Supply voltage/current range		400/16	400/32	
Power Frequency Hz		50/60	50/60	
Cooling		Extern	Extern	
Water consumption L/min		>4,5	>4,5	
Water pressure bar min/max		3-8	3-8	
Max temperature electronic		50°C	50°C	
Max temperature water		40°C	40°C	
Chassis height		630mm	271mm	
Chassis width		310mm	300mm	
Chassis depth		600mm	596mm	
Total weight approx.		43kg	43kg	
Transformer length - standard 5 m		5/7/10	5/7/10	

		IH25	IH50	IH80
Continuous Output power / kVa		22	44	80
Frequency Range kHz		4-50	1-50	1-50
Supply voltage/current range		400/32	400/63	400/125
Power Frequency Hz		50/60	50/60	50/60
Cooling		Extern	Extern	Extern
Water consumption L/min		>4,5	9,5	9,5
Water pressure bar min/max		3-8	3-8	3-8
Max temperature electronic		50°C	50°C	50°C
Max temperature water		40°C	40°C	40°C
Chassis height		630mm	630mm	890mm
Chassis width		310mm	310mm	400mm
Chassis depth		600mm	600mm	900mm
Total weight approx.		43kg	45kg	70kg
Transformer length - standard 5 m		5/7/10	5/7/10	5/7/10

Security Class: Standard

EN 61000-6-4

EN 61000-6-2

EN 60335-1

*Warranty*

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1 year guarantee from date of sale.

- Damage caused by carelessness during handling and transport, is not covered by the guarantee
- The use of induction coils which are not made for the unit and therefore causing damage is not covered by guarantee. Always contact the dealer / manufacturer for the design of induction coils.
- Damage caused by faulty electrical connection or cooling problems / dirty cooling water is not covered under guarantee.
- Squeeze injuries of the hose assembly and transformer are not covered by warranty.
- Induction coils are excluded from the guarantee.

**Incoil Induktion AB**

Brandthovdagatan 29

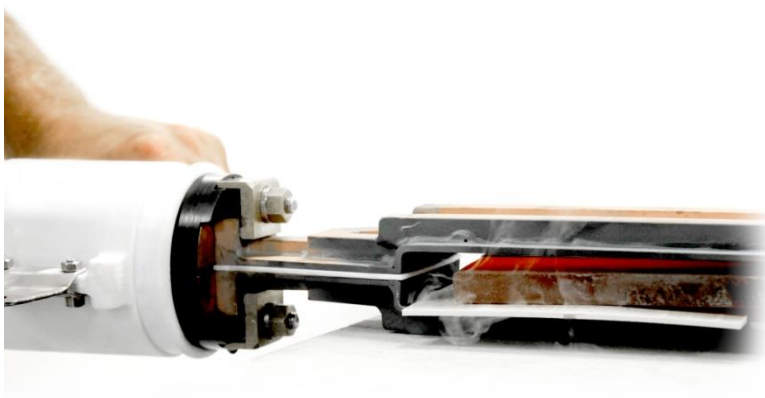
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