User manual

HIT-SYSTEM

For type

23-15
23-30

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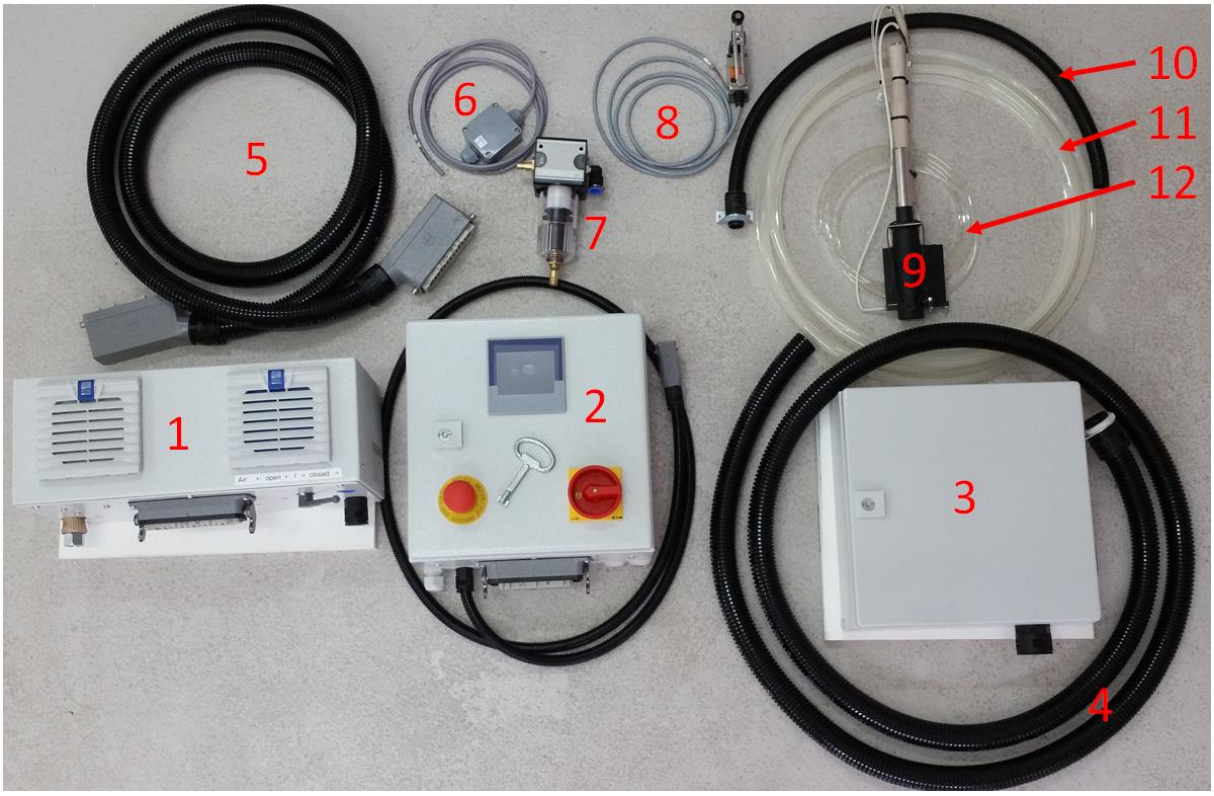
1 Before the first start

The following chapter is about the points you have to do first, before you start the HIT-System. This valid for all types of the HIT-System.

1.1 HIT-System part overview

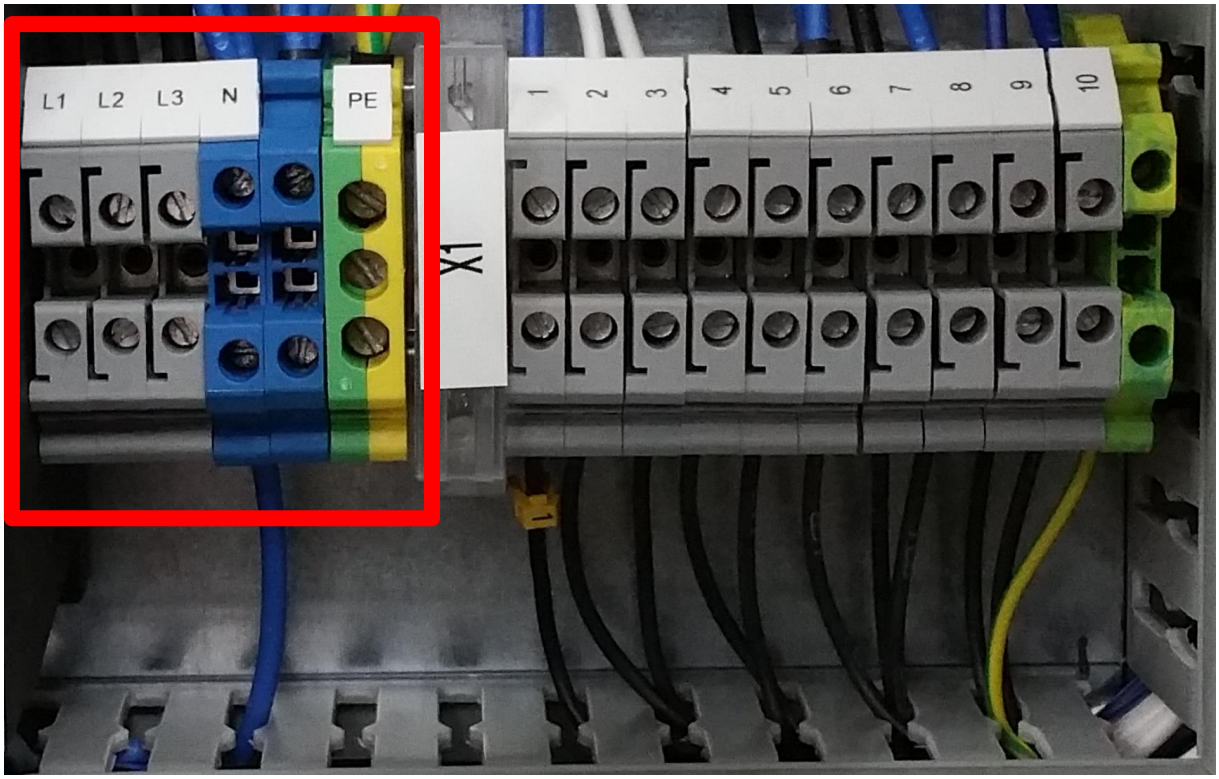


1. Heating Element box with:
   24-pole “Harting” plug, 12mm pressured air intake connector, hot air output with pinch screwing and 22mm wrench opening
2. Control unit box with:
   touch screen display, emergency-stop switch main power switch , female 12-pole “Harting” plug cable and 400V/16A current intake
3. Pneumatic control box with: male 12-pole “Harting” plug and pressured air connections (inside)
4. Protective hose for compressed-air tubes
5. 24-pole “Harting” plug to connect the heating element box with the control unit box
6. Cable extension set for the ground plate heating element
7. Pressured air water separator
8. Work piece detection switch
9. Nozzle with ground plate, temperature sensor and heating elements
10. Protective hose for work piece detection wiring and nozzle ground plate heating element wiring

11. 12mm compressed-air tube from the pressured air water separator to the pneumatic box and 12mm compressed-air tube to connect the pneumatic box with the heating element box
12. 6mm compressed-air tube from the edge bander machine pressured air supply to the pneumatic control box
13. Isolation hose (red hose) for nozzle exhaust system, (not displayed)

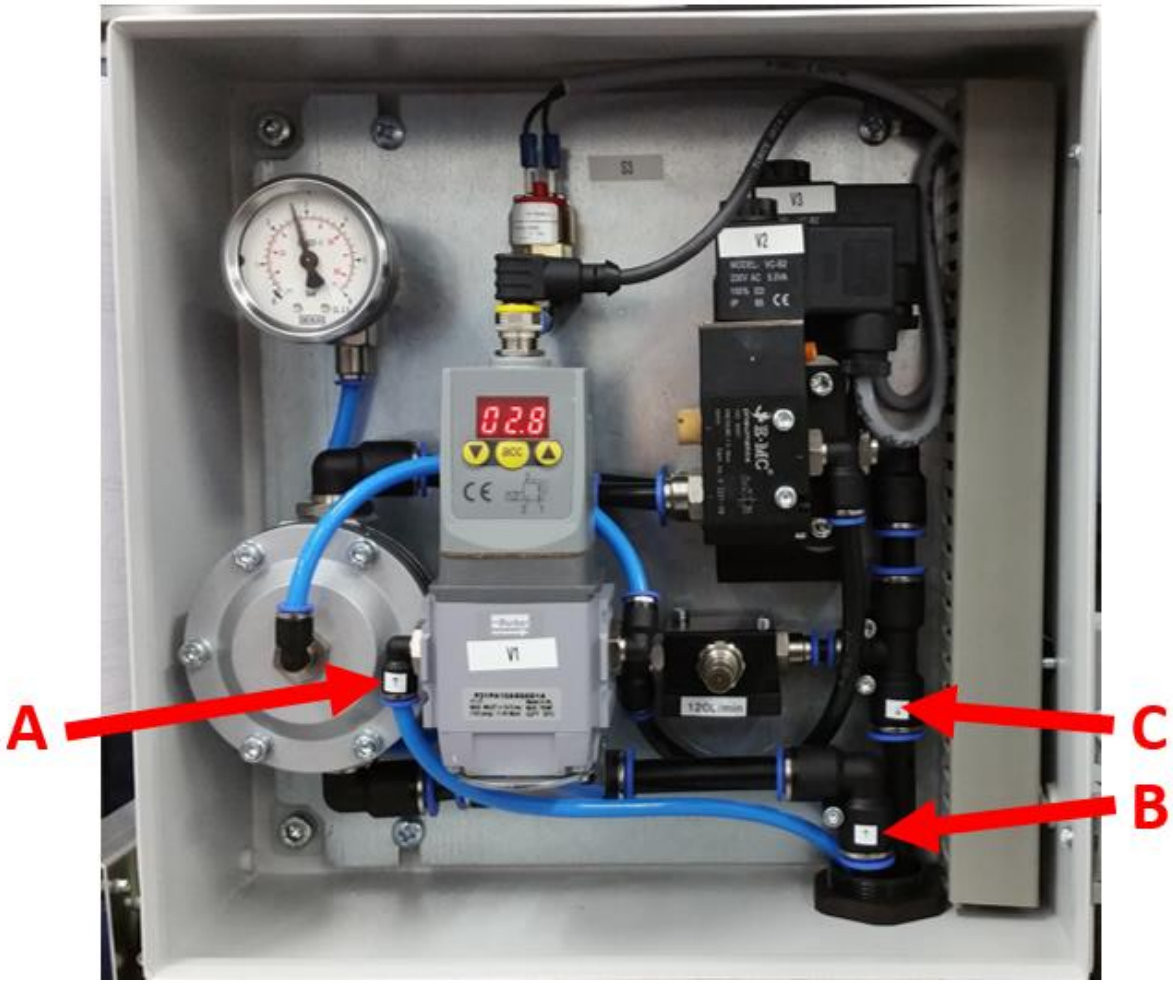
1.2 Power supply connection

Connect the HIT-System to a standard three-phase current 400V/16A power supply. The terminal strips are located in the middle of the control unit box behind the touch panel and marked with L1, L2, L3, N and PE.



1.3 Pressured air connection

The compressed air connection has to be a standard connection with a supply of minimum 8 bar constant pressure. The pneumatic module has to be connected with two pressured air supply hoses of dia. 6 and 12mm. Please plug the 6mm hose to the edge banding machine air supply and connect the other end to connector **“A”**, as shown in the picture. The 12 mm hose has to be connected to connector **“B”**. The other end of the 12 mm hose has to be connected to the enclosed pressure air water separator and that to the air supply of the plant/facility. The 12mm hose from connector **“C”** has to be connected with the connector below the heating element.



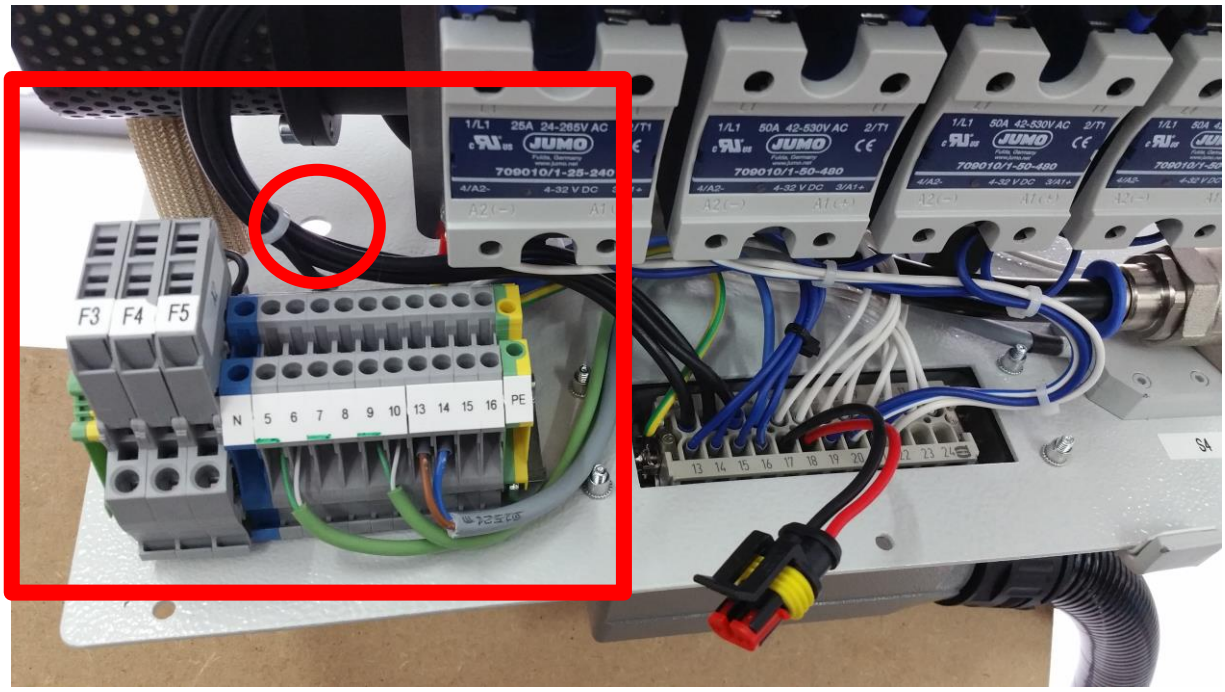
1.4 Emergency-Stop circuit

To connect the HIT-System emergency stop switch to the edge bander machine emergency stop circuit, you can use the two free clamps of the emergency stop switch (S2) on the back side of the control box door. The emergency stop switch is a break contact switch.

1.5 HIT-System Assembly

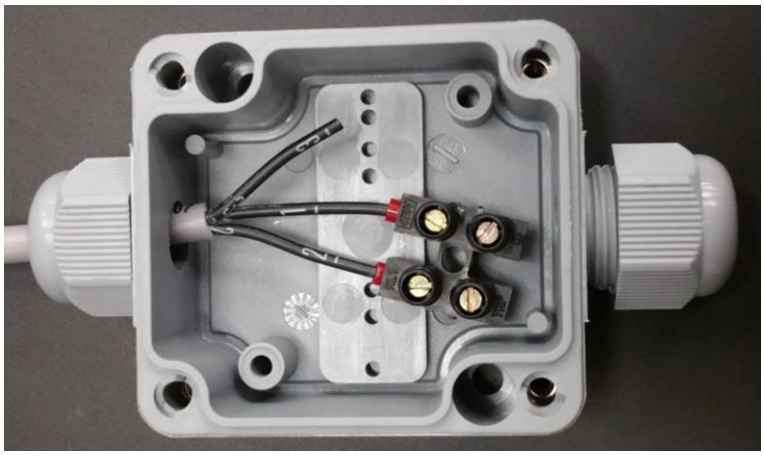
After you have mounted the heating element box, the nozzle system, control unit box and the pneumatic control box on your edge bander machine, connect the heating element box to the control unit box with the 24-pole “Harting” plug. Also, connect the pneumatic control box with the control box with the 12-pole “Harting” plug. Then you have to mount the work piece detection into the machine and measure the distance between the work piece detection and the tip of the nozzle. This value is needed, to set up the correct activation time in the display afterwards (see chapter 2.8 before processing edges). To connect the nozzle temperature sensor, work piece detection switch and nozzle heating elements you have to remove the cover of the heating element box first. Please be careful when you are lifting the cover upwards, cause the cooling fan and the ground cable is mounted to the cover and need to be disconnected for the following tasks.

The wiring of the nozzle temperature sensor has to be connected to cable clamp 7 (**+**, green) and 8 (**-**, white) in the heating element box. After that you have to connect the nozzle heating system. One wire of each nozzle heating element has to be connected to Fuse F3, F4, F5. The other wire of each heating element has to be connected to cable clamp N. The work piece detection switch has to be connected to cable clamps 15 and 16.



If the cable length of the ground plate heating element is too short to reach the heating element box, you can use the shown extension set (below) which is enclosed to the HIT-System. The attached protective hose is for the work piece detection wiring and also the

ground plate heating element wiring. The wiring of the nozzle heating element and the nozzle temperature sensor has to be routed through the shown hole next to the hot air output.



When you are mounting the heating element box above the nozzle please ensure that you tightening the pinch screwing with a 22mm wrench and hold opposite screw with a 19mm wrench that you don’t put any forces on the hot air tube of the heating element.

2 General control

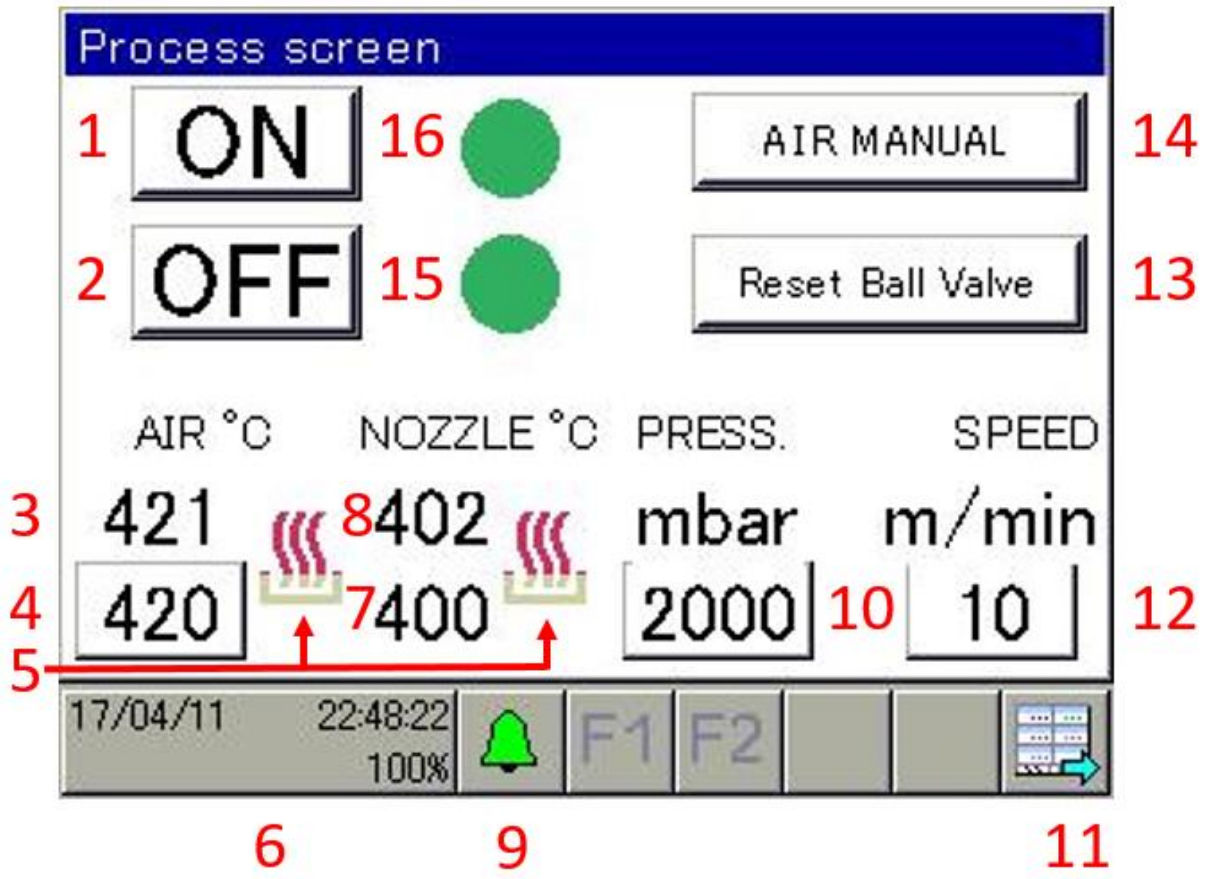
2.1 Control panel overview

1. Emergency-Stop switch
2. Main power switch
3. Touch screen display for control

2.2 Touch-Display overview

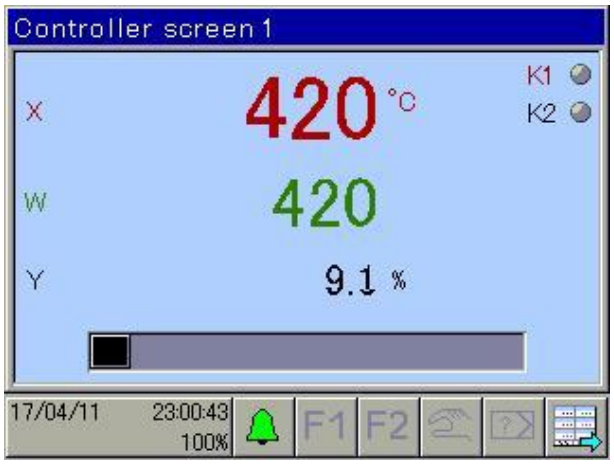
The touch screen display has three process screens, between you can switch. On the first one, you can surveil and adjust temperature, machine speed and pressure of the HIT-System. The second and third process screen showing you the actual status of the air and nozzle temperatures. Those are not needed during the usual processing of “laser” edges. To switch between the different process screens you have to touch the box on the right bottom corner in the display (Box 11).

2.3 First process screen



1. “ON” box to turn on the HIT-System
2. “OFF” box to switch off the HIT-System and start the cooling phase
3. Actual air temperature
4. Box to adjust the set air temperature
5. Heating pictograms, showing when heating element or nozzle will be heated
6. Box to switch into the settings
7. Nozzle set temperature, not adjustable
8. Nozzle actual temperature
9. Alarm box, switches to a red bell, if a malfunction is detected
10. Box to adjust the working pressure
11. Switch to the next process screens (3 process screens available)
12. Box to set the machine speed
13. Ball valve reset, more information see chapter 2.13
14. Air manual, more information see chapter 2.14
15. Pictogram 1 more information see chapter 2.15
16. Pictogram 2 more information see chapter 2.16

2.4 Second process screen (Air Heating Element)



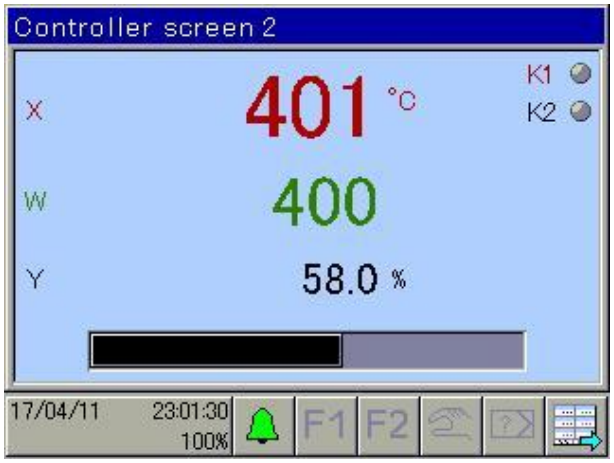
This process screen gives you information about the process parameters of the heating element:

X: Actual air temperature

W: Set air temperature

Y: Percentage of available power used for air heating

2.5 Third process screen (Nozzle heating element)



This process screen gives you information about the process parameters of the nozzle heating elements:

X: Actual nozzle temperature

W: Set nozzle temperature

Y: Percentage of available power used for nozzle heating

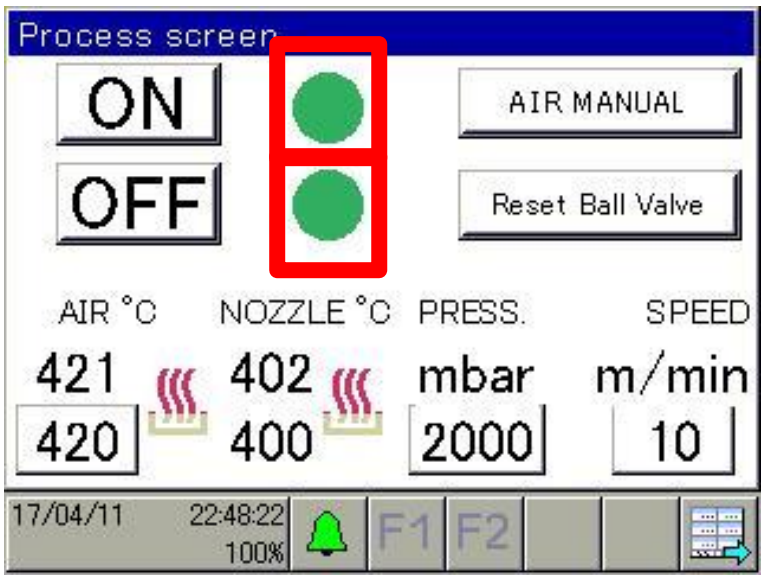
2.6 Main power switch (System start)

To start the HIT-System, you have to switch the main power switch in position “ON”. After that, the system will start to boot. This takes around 15 seconds and the display will flash during the booting phase. The touch screen display is ready for use, if you can see the process screen. Is the main power switch in position “off”, the complete HIT-System is disconnected from the power supply.

Don’t turn off the main power switch whilst the HIT-System is heated up and working. You have to shut-off it as it is described in the next chapter. Otherwise the heating element life time will be reduced significant.

2.7 Process mode start and shut-off

After you have switched the main power switch to “ON” and the system has booted successfully, you can touch box “ON” in the process screen and the system starts to heat up. The heating time is pending from your set temperature but shouldn’t exceed more than 2 minutes. The system is ready for processing “laser”-edges, when the both pictograms are appearing green. So long the system is not heated up, the system does not process, if the work piece detection switch was activated. If you want to shut down the system, touch the box “OFF” in the display and wait until the air temperature is cooled down to 70°C (approx. 5 minutes). If the temperature is below 70°C you can hear the stand-by air flow has stopped as well. Now you can switch the main power switch to position “OFF”



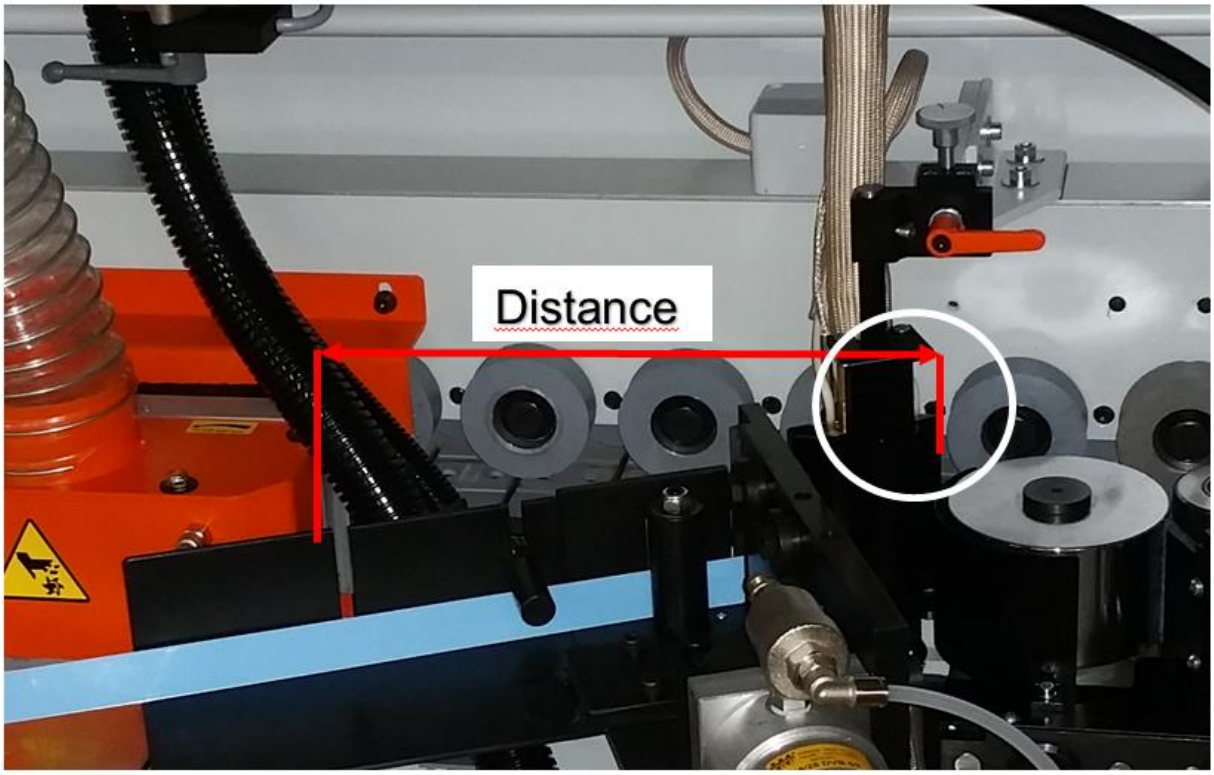
If the process mode is set “ON” and no work piece is running through the edge-banding machine, the HIT-System is blowing a small amount of air through the system, that the

temperature sensors still can measure the right temperatures. When a work piece is now activating the work piece detection switch, the system will open all air valves to increase the airflow through the nozzle. The delay between activation of the work piece detection switch and open all air valve for “laser” edge processing, is calculated by the control unit and pending on the machine speed.

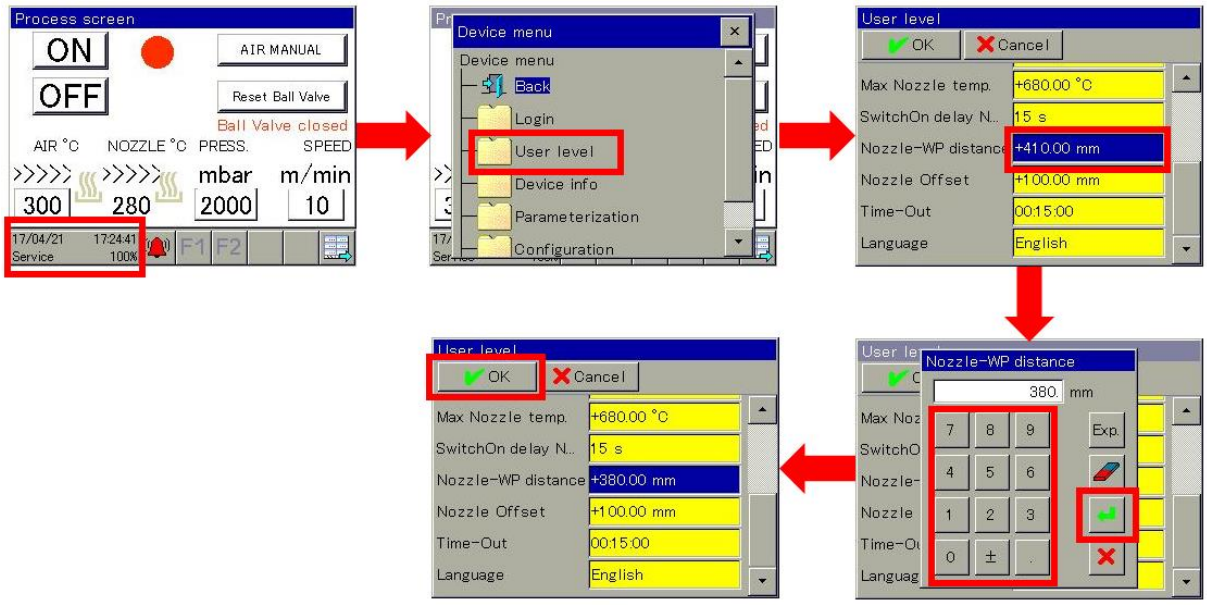
2.8 Important activation delay time adjustment

This setting has to be done just one time at the first system start and should be performed by the manufacturer and not the customer of the edge bander.

To set up the activation time, you have to measure the distance between the work piece detection and the tip of the nozzle.



To put the distance value into the system, you have to be logged in as “Service”-Operator (login to “Service” level is described in chapter 3). Then you have follow the next pictures. After you have touched the “OK” box in the last step, the system will save the new settings. This takes a few seconds.



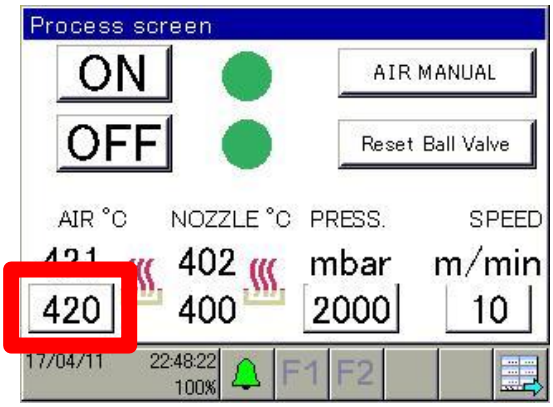
2.9 Time outs

The HIT-System has implemented some time-out operations to safe energy and also to extend the life time of the system.

- **Stand-by time out**: This control unit will shut off the process mode, if the last work piece was processed 15min ago. After that time, the system shuts off the process mode and switchs to the cooling-phase. During the cooling phase, the heating elements are not heating anymore and the standby airflow will flow until the air temperature is below 70°C. The display is still showing the process screen, cause the main power switch is still on “ON”. To restart the system you have to touch the box “ON” again.
- **Activation time limit**: If the work piece detection, is activated more than 45 sec., the system will stop heating and will close the working pressure valve. This will avoid overheating in the nozzle area, if a work piece would stick in that area and the “laser” edge could not move in front of the nozzle any more. To restart the system, remove the work piece at the work piece detection switch and touch box “ON” again, to start the process mode again.

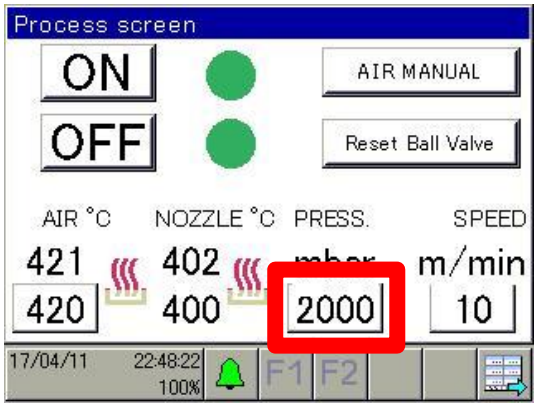
2.10 Set the SET-Temperature

To set up the temperature, just touch the shown box in the display and put in your wished temperature in the next display. The range for the temperature is limited up to 700°C. You can set the temperature either before system start or during the system is running, to be able to adjust the temperature for any reason.



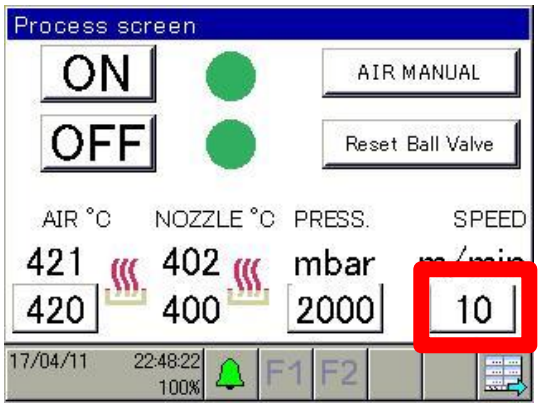
2.11 Set the working pressure

To set the working pressure, just touch the marked box on the touch screen. In the following display you can set the pressure against your needs. The unit is “mbar”. The pressure range is limited from 500 until 3800 mbar. You can set the pressure either before system start or during the system is running, to be able to adjust the pressure for any reason.



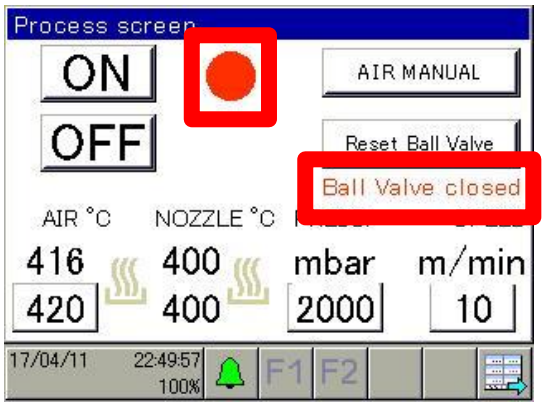
2.12 Set the machine speed

To set the machine speed, just touch the marked box on the touch screen. In the following display you can set the speed against your needs. The unit is “m/min”. The machine speed range is limited from 0 until 15 m/min. You can set the speed either before system start or during the system is running, to be able to adjust the speed for any reason.



2.13 Ball valve reset

If you have to clean the nozzle area or have to remove some residues at the nozzle without shutting down the system, you can just close the ball valve below the heating element. This has the advantage, that the air flow is stopped whilst you are working in the area of the nozzle. If the ball valve is closed, the HIT-System stops heating the heating element, but still heats the nozzle, that you can better clean it. In that case the display will show a sign that the ball valve is closed and that you can't process any "laser edges" at the moment.



If you want to proceed with processing "laser" edges, you have to open the ball valve again and also press the "Reset Ball Valve" box. After that the system will start heating again and the sign "Ball Valve closed" will disappear. If you don't press the "Reset Ball Valve" box after you have opened the ball valve again, the system will not heat again.

2.14 Air manual

The "Air manual" box is a switch to open the valve for the working pressure by hand. You can use this feature to blow away some particles around the nozzle. Also you support the heating-up phase of the nozzle.

2.15 Pictogram 1

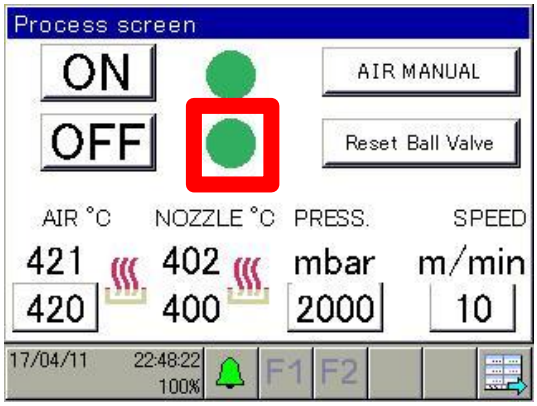
The first pictogram is showing you is which condition the HIT-System in the moment. There are three conditions possible which will be indicated by three different colors.

- Red pictogram: The system is either turned off or a malfunction is detected. In the latter case, the bell would also change from green to red
- Purple pictogram: The work piece detection switch is activated, whilst the work piece is running through the edge bander machine.
- Green pictogram: The system is turned on and on stand-by mode cause no work piece will be processed at the moment.

2.16 Pictogram 2

The second pictogram will either shown with green color or is not visible:

- Pictogram is not visible: the system is still heating up. During that time is not possible to process a “laser” edge.
- Green pictogram: If the system is heated up, the green pictogram will appear and it’s possible to process “laser” edges. The green pictogram will only appear, if the first pictogram is either green or purple. If the first pictogram is red the second pictogram will disappear immediately.

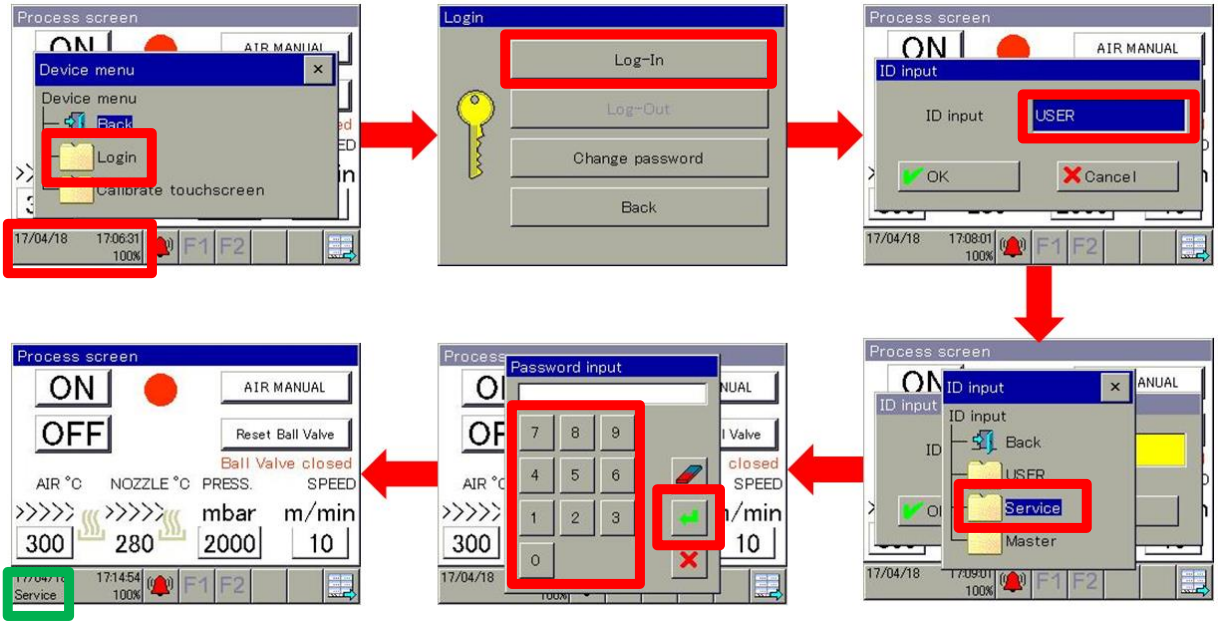


3 Setting and Log-in

Two user levels are available for HIT-System users: User and Service.

- **User-Level**: User can set up values like temperature, pressure and machine speed, which are important for “laser” edge processing. If you are not logged on, the “User-Level is activated.
- **Service-Level**: The service level user can, additional to the user level, change some further settings. These are language settings, distance work piece detection switch/nozzle (Chapter 2.8) and open the alarm-tracking list. The service level is mainly intended for shop floor supervisors and manufacturers of edge banding machines etc. They should keep the password for their level save.
  The password for the “Service-Level” is : **4481**

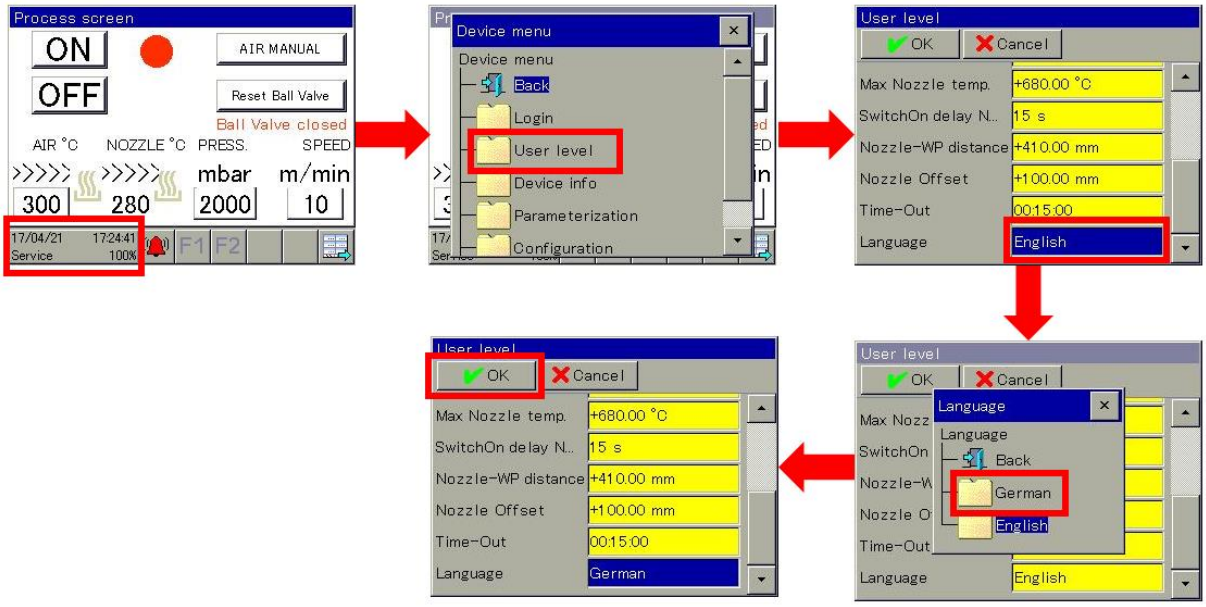
Login procedure:



If you have put in the password for the service level and have pressed enter, the system will jump back to the process screen. To know in which level you are logged in, the system tells you in bottom left (green box) corner the current login level. To log out, you have to press “Log-Out” in the second picture shown above.

3.1 Language settings

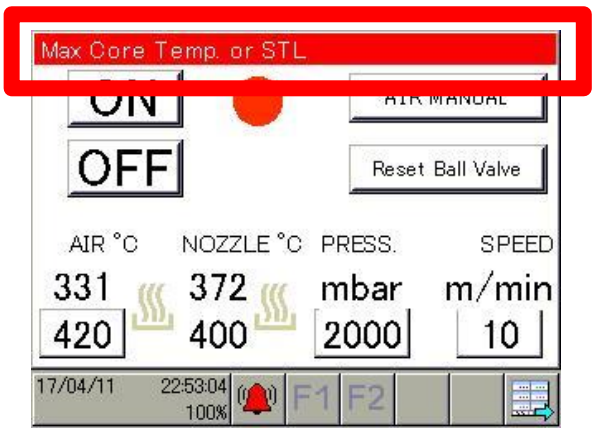
To change the language, have to log in as the service operator. Then you have to follow the instructions below. After you have touched the “OK” box in the last step, the system will save the new settings. This takes a few seconds.



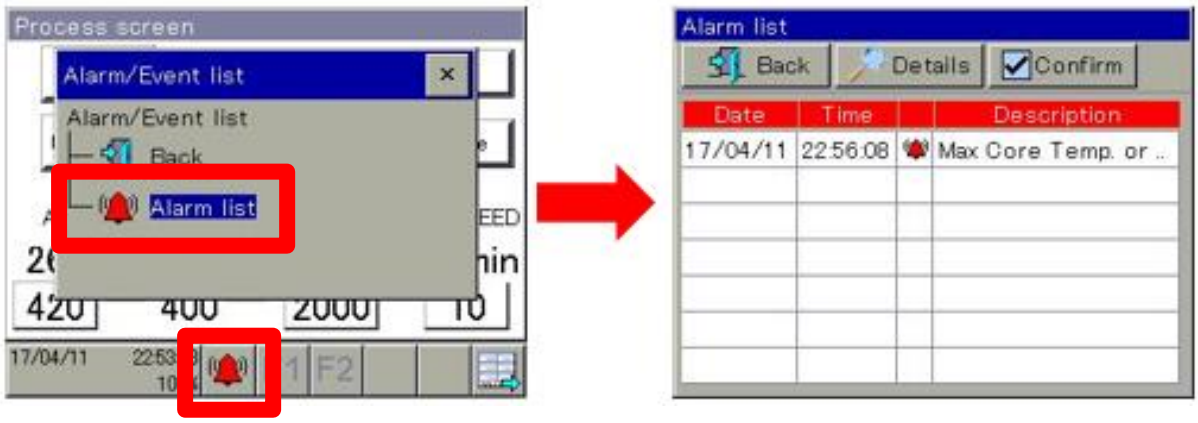
4 Malfunction management

In the case of a malfunction in the HIT-System, a warning message will be showed in the display. Below you can find a table with potential malfunction and their causes. If a malfunction happens please follow the instructions below:

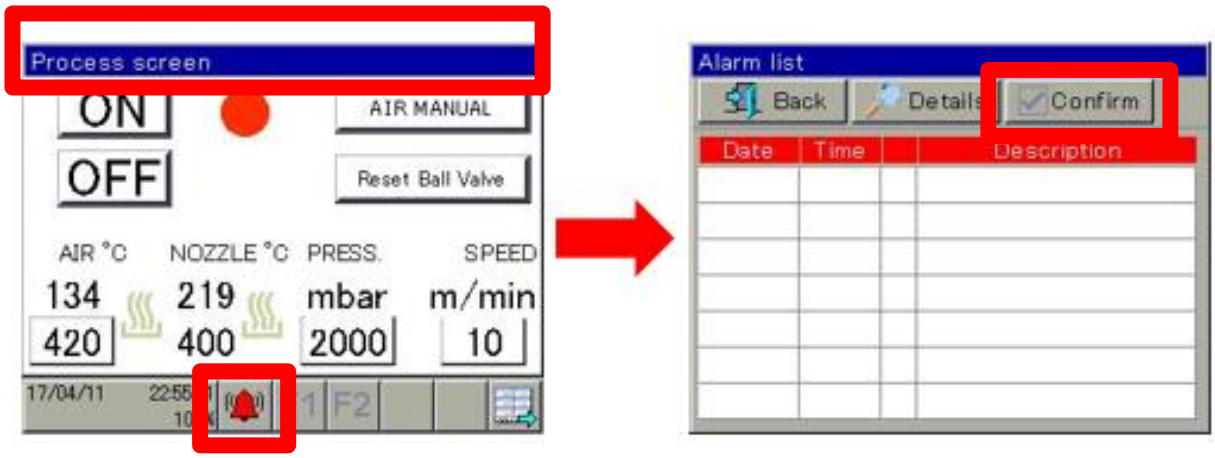
1. The HIT-System shows you, which malfunction has happened. At that point of time the HIT-System is turned off automatically to avoid any further damage of the equipment. No “laser” edges can be processed. Also the color of the bell turns from green to red.



2. Touch on the red bell to get to the alarm list, to see the full malfunction description.



3. After you have repaired the malfunction the signal on the top of the process screen has disappeared. The bell remains red. Cause of that, you still have to go back to the alarm list to confirm that you have solved the issue. If the problem is solved the list should be empty, but still needs to be confirmed by touching the “Confirm” box top right. If you have confirmed the alarm list, the “Confirm” box will be greyed out and you can go back to the process screen to proceed with processing “laser” edges.



4.1 Malfunction table

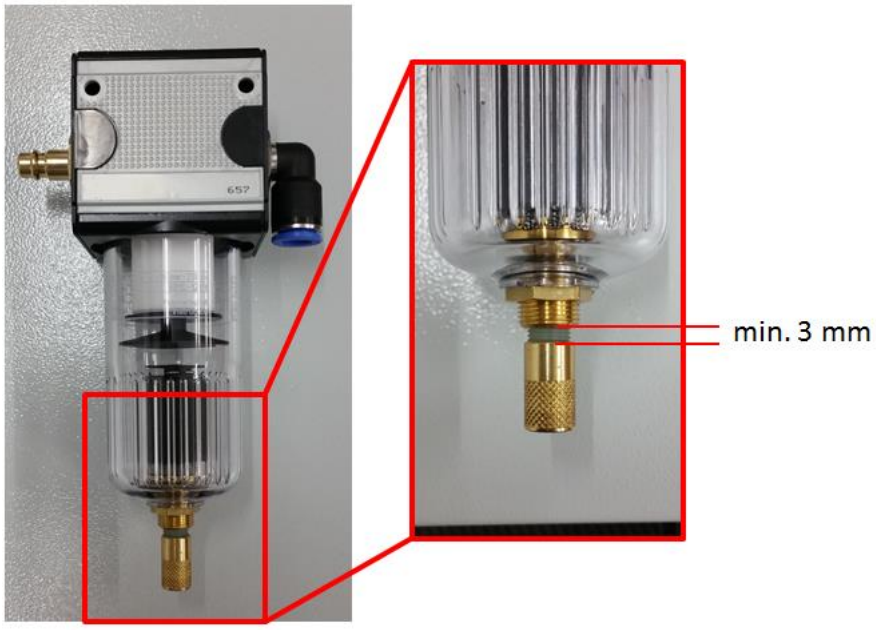
Malfunction text shown in the display	Cause	Solution
Air temp. Sensor broken	Temp. Sensor defect	Replace temperature sensor
Nozzle sensor broken	Temp. Sensor defect	Replace temperature sensor
Max Core Temp. or STL	Heating element core temperature limit exceeded	Stop processing “laser” edges and cool down the system
	Safety temperature limiter has activated	See chapter 5.3
No air pressure	Pressure sensor defect (pneumatic box)	Replace pressure sensor
	Pressure sensor detects to less (<1bar) or no air pressure from the air supply	Check if plant air supply is working correct

5 Maintenance

5.1 Dust filter of the heating element

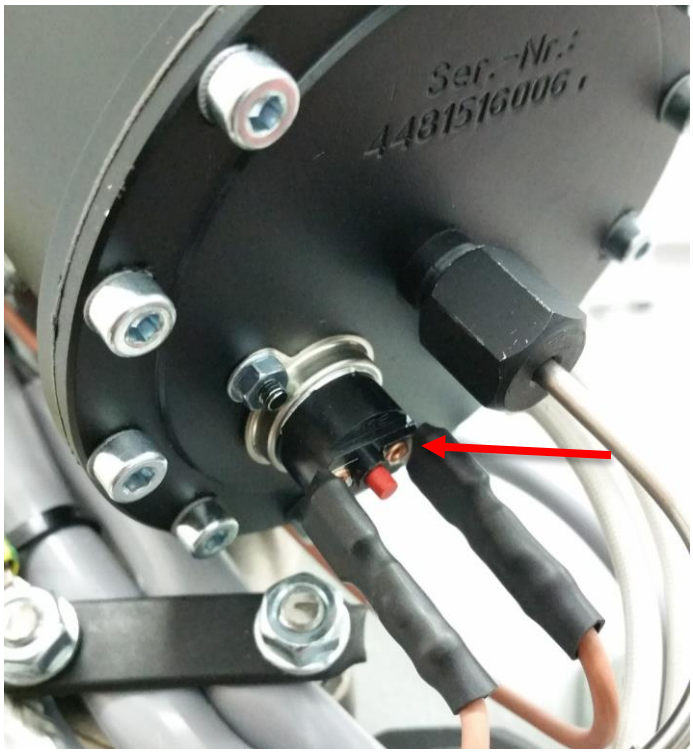
Please clean the dust filter as shown of the heating element box every week to avoid restricted cooling airflow through the box. Otherwise, the system can overheat with insufficient cooling airflow.

5.2 Pressured air oil and water separator



The pressured air oil and water separator has to be checked according to the pressured air supply quality. Please ensure the gap between the control nut and the separator housing approx. 3 mm.

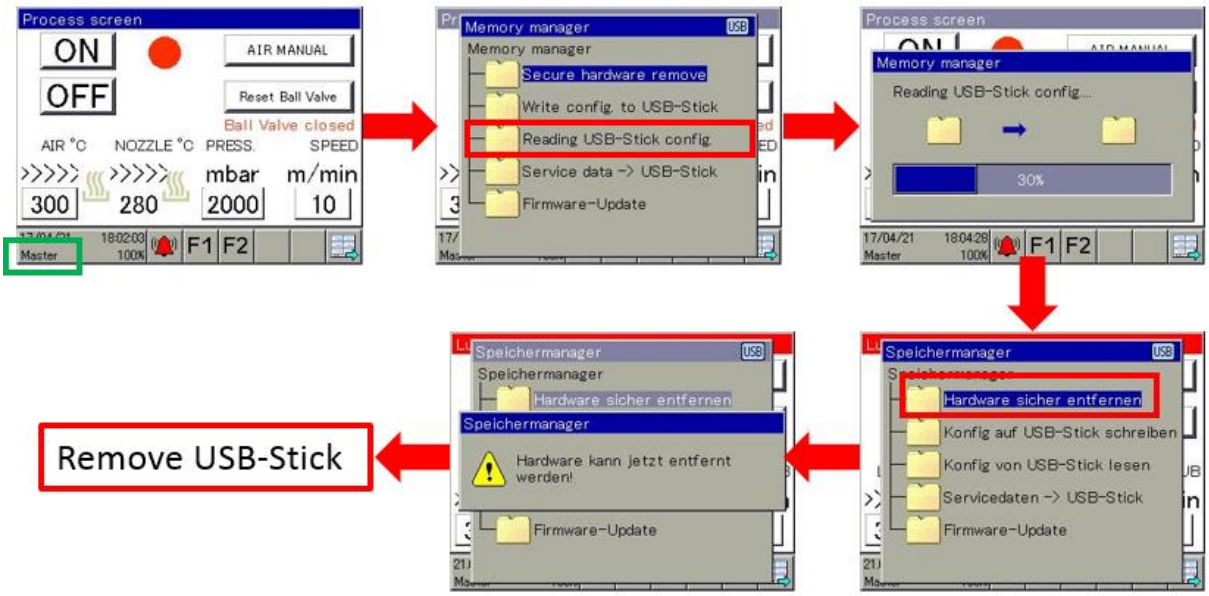
5.3 Safety temperature limiter (STL) switch



The safety temperature limiter (STL) switch is located in the heating element box. If the STL was activated (heating device surface temperature over 110°C), the cover of the heating element box has to be dismounted first, before you can set it back into the default position.

5.4 Software update

In the case, your HIT-System requires a software update, you have to follow the instructions below to upload the new software into the touch screen panel. The updated software file will be supplied by us. Before you start to upload any file, you have to switch to the “Master level” as described in chapter 3. The password, to login as the master, will be given by us. After you have been logged in successfully, you have to save the software file on an USB-Stick and plug it into the touch screen display (Please do not change the file name). The USB-Port is on the top of the touch screen display behind the control unit door. If you have plugged the USB into the display, you have to follow the instructions below:



After you have removed the USB-Stick, change the language back (chapter 3.1) again and log out (chapter 3). Now you have the latest software version on your HIT-System.