

UK



Blackstar+ v16 Manual

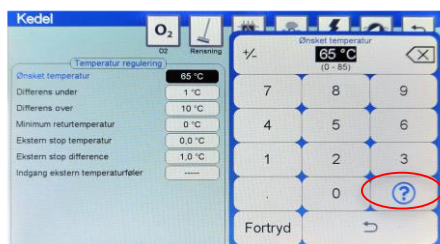
Version 2.0

CONTENTS:

Dear Customer.

Thank you for purchasing this NBE product which is designed and manufactured to the highest standards in the EU. In order for you to get the most out of your product, we strongly recommend that you carefully read this manual prior to installation and operation of the equipment. In the event that you encounter any difficulties during installation or operation, we recommend that you first refer to this manual or the information provided in the support section found on www.nbe-global.com.

Note: Help text for all menus parameters can be accessed by selecting ? in the v16 controller. The ? Can be found when selecting the values for each given parameter in the controller.



! Save this manual, so you always have it available if you ever need it.

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WARNINGS:



Never handle the auger, blower, nor crawl in the hopper when the system is powered.
There will be no warning prior to the activation of these components.
The boiler must not be operated without properly securing the ash can and lid.



The system is provided with an electrical current of 110/230V-50/60 Hz. An improper installation or improper repair can cause life-threatening electrical shock. Electrical connections must be performed by a person with the right skills and training. Performance of electrical installation must be carried out in COMPLIANCE with the relevant local rules.

Always disconnect the system from the electrical supply prior to starting maintenance or servicing work. The system must be connected to a separate electrical circuit, which is equipped with the proper circuit breaker and earth leakage breaker.



The boiler must be mounted to a functioning chimney with adequate draft. In the event that you smell smoke or see any other indication of improper draft of the chimney, all operation of your system must cease immediately and must remain so until a solution to the draft problem has been resolved. Continuing operation may result in death or injury.

Always read the manual before installing and / or repairing of the system. If in doubt, seek professional help.



As the control system is constantly being updated and new features / experiences are being added, it is the user's responsibility to keep the manuals and maintenance manuals updated.
New updated manuals can be downloaded from www.nbe-global.com



Open top covers etc. with extreme caution.
When the boiler is in operation, there is a risk of high temperature below the top covers, which can cause burns.
Avoid handling the boiler while it is in operation.
Never open the ash tray while the boiler is in operation.

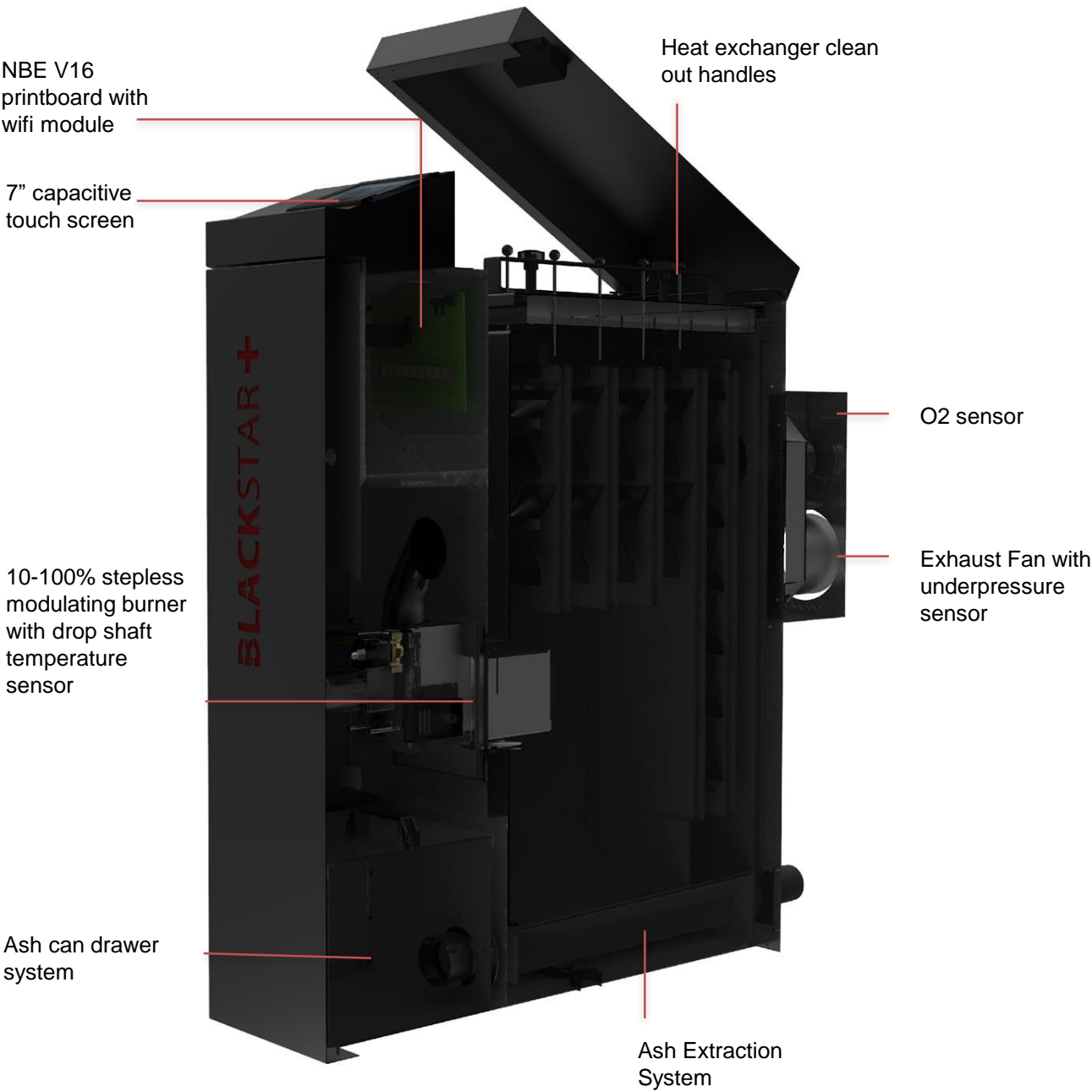
The system must be operated by skilled individuals.
Contact your dealer if you are in doubt as to the safe operational use of the boiler.



The tablet controller's menu structure supported by the help texts found in the tablet app itself. Due to continuous updates and new features, it is recommended to browse the controller thoroughly prior to use and to receive an overview of all functions, etc. by your installer.

This manual must be kept at the boiler!

TECHNICAL DATA: BS+ v16 BOILERS



TECHNICAL DATA: BS+ v16 BOILERS

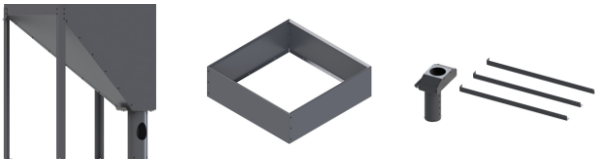


Product Name	BS+10 v16	BS+ 16 v16	BS+ 25 v16
Design Model	v16	v16	v16
Nominal Performance	12 kW	16 kW	23 kW
Minimum Performance	3 kW	5,kW	7 kW
Nominal Efficiency	95 %	95 %	95 %
Minimum Efficiency	95.1%	94.3%	92,9 %
Power Consumption (Nominal)	39.15 W	52 W	66 W
Power Consumption (Minimum)	23.6 W	25W	27 W
EN303-5:2012 Klasse	5	5	5
Controller Version:	V16	V16	V16
Width (mm) (only boiler)	500	500	500
Depth (mm)	1030	1030	1030
Height (mm)	1174	1174	1174
Chimney (mm)	130	130	130
Weight (kg)	162	163	165
Water volume (liter)	36	36	36
Ash can (liter)	25	25	25
Forward/Return/Filling	¾ "	¾ "	¾ "
Test # 300-ELAB-	2252	Administrative approval	2254

TECHNICAL DATA: BS+ HOPPERS



Product Name	280 hopper	380 hopper
SKU	226280	226380
Design Model	BS+	BS+
Estimated capacity (kgs)*	144 kgs*	216 kgs*
Capacity (liters)	240 l	360 l
Width	497 mm	742 mm
Depth	1026 mm	1026 mm
Height	1288 mm	1288 mm
Weight	55 kgs	68 kgs
Compatible w/	All BS+ and BS+v16 boilers	All BS+ and BS+v16 boilers
*kilo capacity will vary depending on the density of the pellets. 0,6 kgs/ liter is used here for the estimation.		



Product Name	80x80 hopper	80x80 Extension	Double KIT for NBE hopper 80x80
SKU	300087	300085	300069
Compatible w/	All boilers	80x80	80x80 hopper
Estimated capacity (kgs)*	130 kgs*	230 kgs*	
*kilo capacity will vary depending on the density of the pellets. 0,6 kgs/ liter is used here for the estimation.			

BULK FEEDING:

Our auger and vacuum feeds systems makes it easy to provide bulk storage and feeding of wood pellets to the boiler. Below you will find several examples on how to configure bulk feeding:

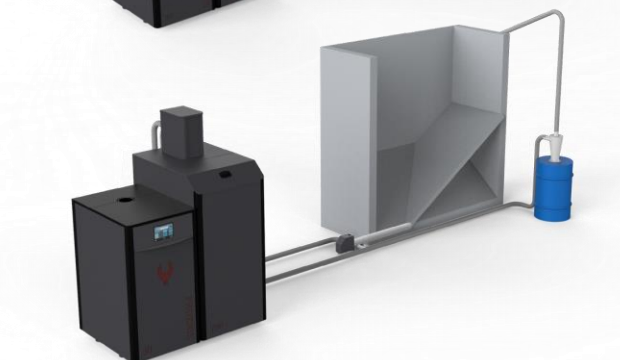
Large hopper 3,3-7,6 ton with 3 meter auger.



Large hopper, 3,3-7,6 ton with vacuum transport to RTB Phoenix hopper.



Homebuilt storage with vacuum transport to RTB hopper.



Home built storage with vacuum transport to standard hopper.



BOILER ROOM DESIGN:

The boiler room for biomass boilers must be installed in accordance with the rules set forth by your local building codes, environmental authorities, and labor inspectorate. If you are in doubt on how to set up your boiler room, we recommend that you contact your local certified RTB dealer for guidance.

1. Wall and ceiling.
2. Distance to the wall.
3. Floor.
4. Area and Lightning.
5. Chimney.
6. Air.
7. Water Faucet.
8. Fuel.
9. Prohibited Liquids and Materials in Boiler Room.
10. Permit, Notification and Inspection.



1. Wall and Ceiling.

Ceiling surfaces must be constructed with at least Class 1 surface material.

If the ceiling surface happens to be the underside of the roof, the material must be made of non-combustible materials. Wall surfaces must be constructed of at least a Class 2 surface material.

2. Distance to the wall.

Distance from the boiler or flue pipe to any combustible material should be large enough of a distance to prevent temperatures from reaching an excess of 80 C. This requirement applies even if the combustible material is covered with non-flammable material. If the distance is greater than 500 mm, the distance requirement is typically satisfied.

The RTB Phoenix includes an inbuilt compressor, compressor tank, and extraction auger motor situated in the back of the boiler. Ensure that you have at least 20 cm of clearance in the back of the boiler to allow for the maintenance and servicing of these components.

3. Floor.

Floors should consist of (or be covered with) non-combustible material under and around the boiler of a distance of at least 300 mm from the boiler sides, and 500 mm from the boiler's front (i.e. the side where the ash is removed).

4. Area and Lightning.

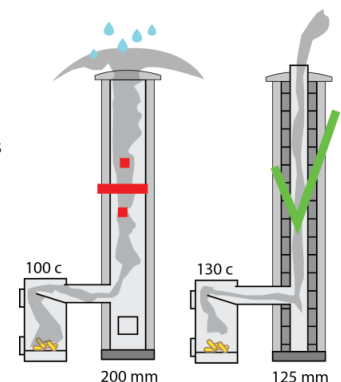
The boiler room and area around the heating system must be large enough to allow for easy operation, cleaning, and maintenance of the heating system and boiler room.

There must be adequate lighting so that operation and maintenance can be performed safely.

5. Chimney.

The chimney must be of a design, aperture area, and height that provides adequate draft conditions for the proper exiting of flue gasses. The height of the chimney must also be controlled to ensure that there is sufficient draft for chimney smoke to exit. The chimney draft is created by negative pressure resulting from hot smoke that is buoyant; thus causing the smoke to rise up through the chimney.

WARNING: If there is not enough draft in the chimney, the smoke will not properly rise and will instead seep out through small cracks; causing toxic smoke to seep into the house.



BOILER ROOM DESIGN:

The internal diameter of the chimney must be sufficient enough for the amount of flue gasses the chimney has to lead away. If the internal diameter is too small, this will prevent the smoke from exiting fast enough due to the large resistance in the chimney. This could cause the smoke to turn back; thus allowing for toxic fumes to enter into the house. Simultaneously, the pellet fuel may not be completely burned, due to the lack of oxygen for combustion. This can cause traces of tar like soot to sit in the chimney and create what is called creosote, which increases the risk of chimney fire.

The chimney opening must also not be too large since cold air can enter the chimney from the top. When the chimney becomes cooled, condensation can occur and develop soot inside the chimney. Soot is mostly a cosmetic problem, because it can penetrate through the chimney and cause ugly brown splotches to appear on the walls inside the house.

In addition, it is important that the chimney protrudes high enough above the roof so the smoke does not bother the surrounding houses. Environmental authorities have the possibility of prosecution if there are neighbors that complain about the smoke or odor.

What are the common signs that the chimney is not working?

- Smoke in the hopper.
- Warm drop shaft.
- Smoke billows out of the fan or boiler during start-up.
- Power is reduced due to lack of underpressure

If you have any problems with your chimney, it is a good idea to keep a "diary" of any draft problem; as draft problems are often associated with wind in certain directions.

Wind blowing on one side of the house can cause under pressure on the other side of the house.

Overpressure and under pressure will try to balance out – even through a chimney if possible. It is a good idea to ask your chimney sweeper about the size of the chimney and flues, the location of chimney cleaning doors, and whether it is required to have steps on the roof. He will also perform a fire prevention inspection.

6. Air

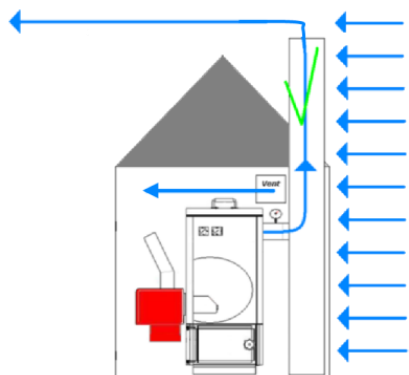
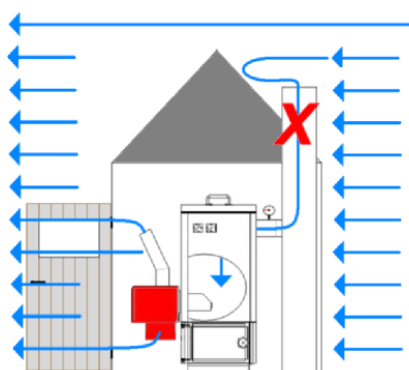
The pellet boiler should be able to get enough air for combustion. This can be achieved if the pellet boiler is installed in a room which is equipped with a sliding window with an adjustment bracket, an adjustable air vent from the outside, or by providing combustion chamber air through a duct from the outside. The area amount of the fresh air valve should generally be the same as the internal diameter of the chimney. It should also be mounted on the same side as the chimney to compensate for any pressure differences.

Note: Drum dryers, range hoods, or oil burner in the same room all use high pressure blowers that can steal the air in the room and cause under pressure in the boiler room.

7. Water tap

There must be a tap in the boiler room.

If the boiler output is less than 60 kW, a powder extinguisher is sufficient (at least 5 kg).



BOILER ROOM DESIGN:

8. Fuel.

The pellets must be pure wood, 6-8 mm, max. 8 % water.

Materials with glue, paint, wood paint or plastics shall not be burned.

If the fuel storage is greater than 0,75 m³, the boiler system and fuel storage must be located in a separate fire cell with at least one BD30 door to the other room.

If the fuel storage or hopper is placed in the open or under a shelter, there may be minimum distances to the building that should be observed. Exposed fuel may not be in the boiler room, except logs.

Do not exceed 4,75 m³ fuel in the boiler room, including fuel storage and usage storage.

9. Prohibited liquids and materials in boiler room.

The boiler room must be kept clean and contain no combustible materials nor flammable liquids (except oil for oil burners).

The floor must be kept free of spilled fuel, dust and combustible waste as well as waste from other activities in the room.

Any burning embers must be extinguished with water and transported to a secure storage location in the open.

10. Permit, notification and inspection.

Building permit:

You must obtain building permit if the burner is situated in a building that is part of the Building Regulations 1995 (commercial buildings); though not for animals and farm buildings.

Notification:

The heating system must be reported to the local council and registered with the chimney sweep.

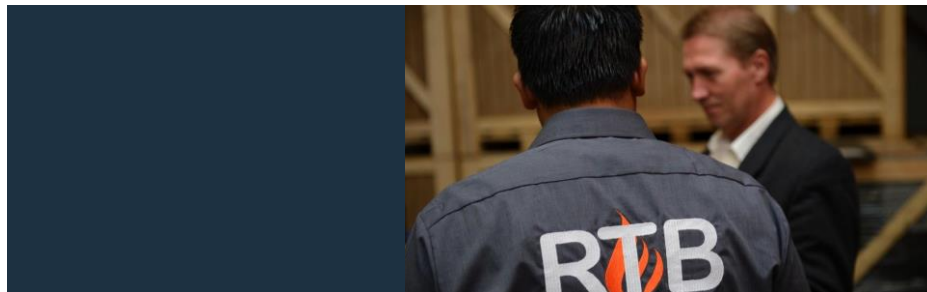
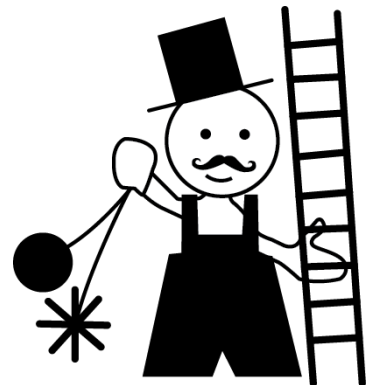
Inspection:

The chimney sweeper will regularly supervise your biofuel boiler.

If the chimney sweeper becomes aware of any illegality under the rules for fireplaces and chimneys in the building code, he may notify the local council if the owner does not change the illegal conduct.

Insurance:

You must notify your insurance company about your biomass system.



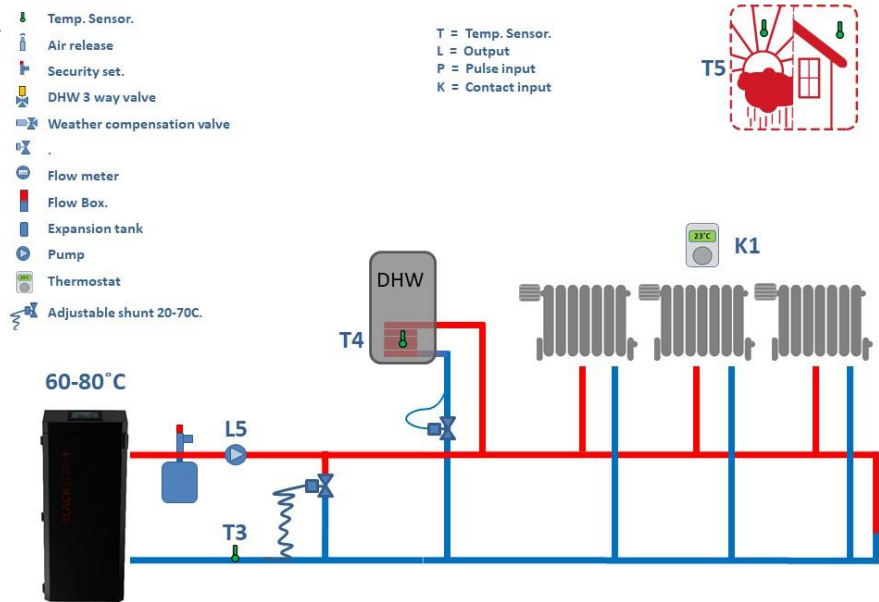
INSTALLATION DIAGRAMS:

A properly executed installation ensures that the system functions properly. Both national/local guidelines and requirements must always be observed. The boiler can be installed on a pressurized system up to max 2.5 bar.

1. Simple

Return water control with mechanical flow via adjustable shunt.

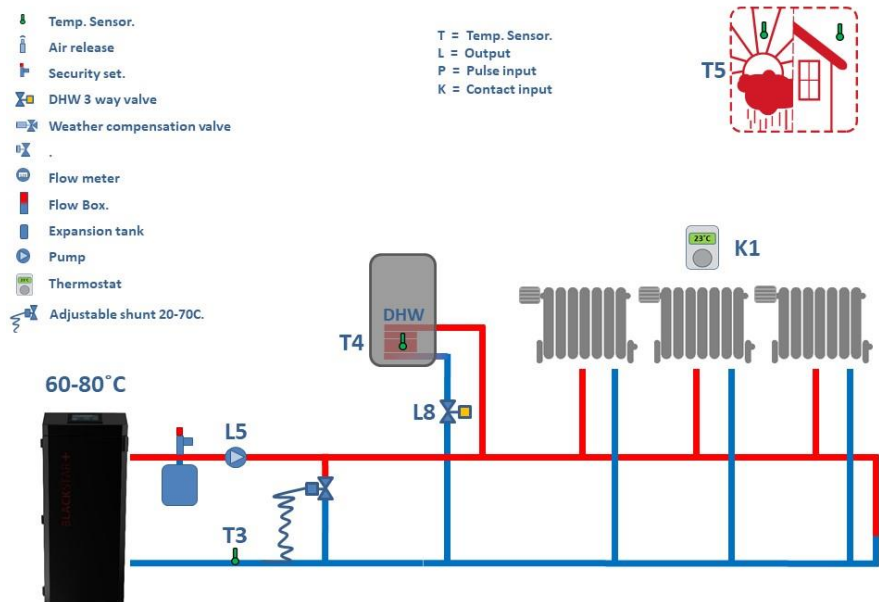
You should also have some type of control for the DHW



2. DHW w/ 2-way Hot Water Priority Valve

Typically used when DHW is small or when the surface coil is small.

Heat for the house is supplied while hot water is being produced



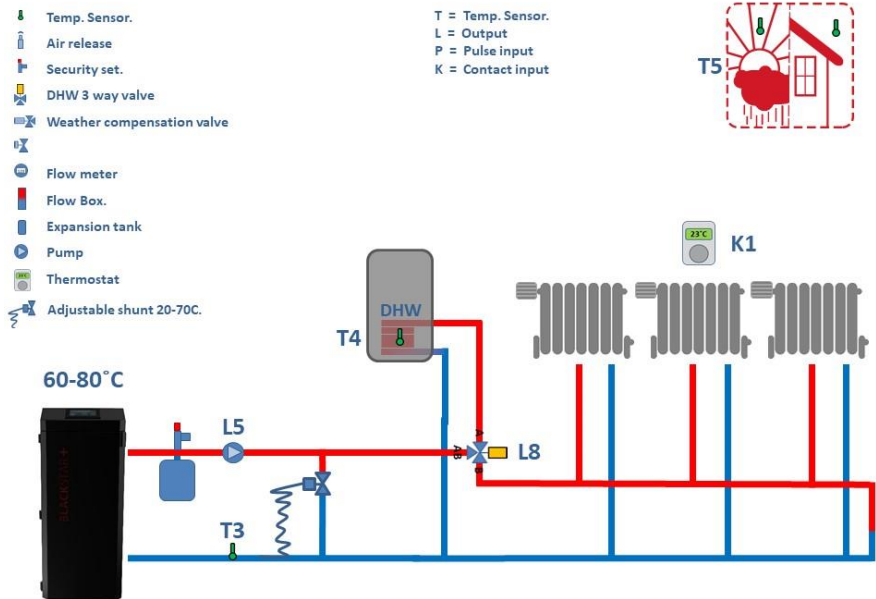
INSTALLATION DIAGRAMS:

A properly executed installation ensures that the system functions properly. Both national/local guidelines and requirements must always be observed. The boiler can be installed on a pressurized system up to max 2.5 bar.

3. DHW with 3-way valve

Typically used when the water heater is large, and when the surface coil is large.

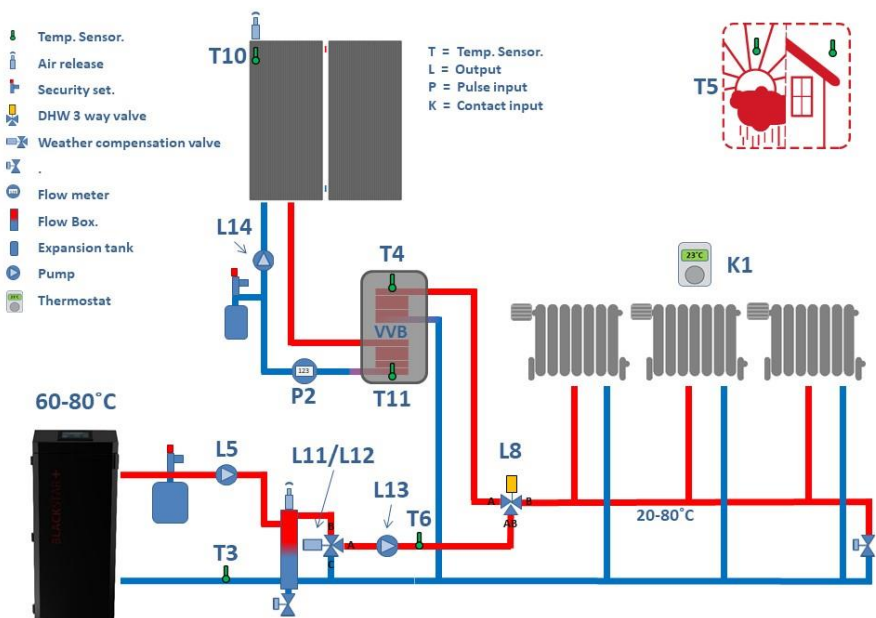
The house is not supplied with heat while producing hot water. The house must therefore be able to manage without heat for short periods during the winter



4. Weather Compensation and solar thermal heating for the DHW tank .

With an NBE flow box and 3-way weather compensation valve, the controller is able to control the minimum boiler return temperature on the system and adjust the forwarding temperature to the house based on an outdoor or indoor temperature reference.

Note ! This setup requires the use of an extension module to supply all the extra outputs required in the installation.



INSTALLATION DIAGRAMS:

A properly executed installation ensures that the system functions properly. Both national/local guidelines and requirements must always be observed. The boiler can be installed on a pressurized system up to max 2.5 bar.

5. NBE CASCADE

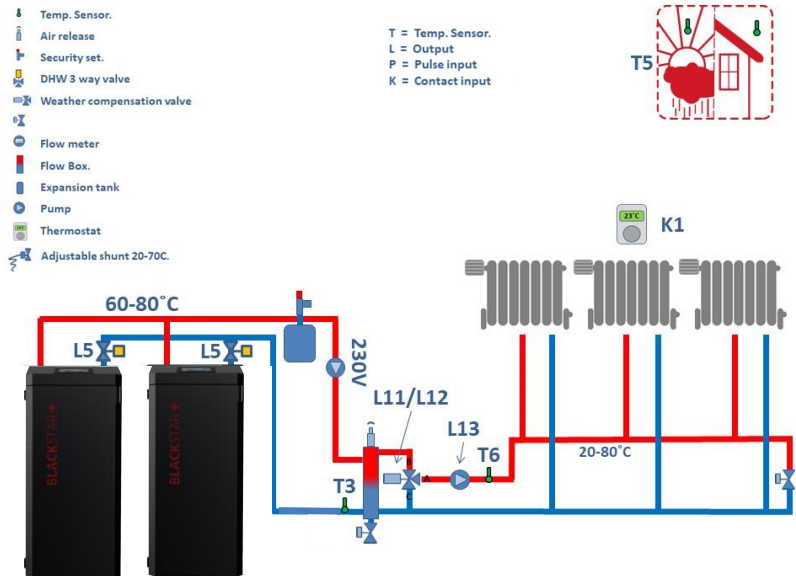
Cascade systems are ideal when achieving large kW output (up to 640kW) and when the demand for heat varies significantly throughout the year. Cascade systems maintain a high efficiency across the combined modulation range.

Up to 8 boilers can be cascaded.

The boilers must be registered on www.stokercloud.dk

And afterwards setup in a cascade system on www.cascade.stokercloud.dk

Cascade Stokercloud will start and stop the boilers in the cascade to ensure the desired combined heat and will balance the operational use of the boilers across time.



INSTALLATION OF THE BOILER:

General Guidelines

1. The boiler should only be installed by qualified installers with a "Certificate for installation and service of small biofuel plant" and must be installed according to your local and national building and construction codes.

2. The boiler must **not** be installed on any combustible surfaces.

3. Uninsulated smoke pipes should be kept to a minimum as this will reduce draft and can cause condensation that will damage the boiler. If installing a 90 degree bend in the chimney make sure to reduce chimney horizontal length and have a chimney clean out door available for easy cleaning access. For better flow we recommend installing a 45 degree bend as this will allow for less ash to accumulate in the chimney pipe.

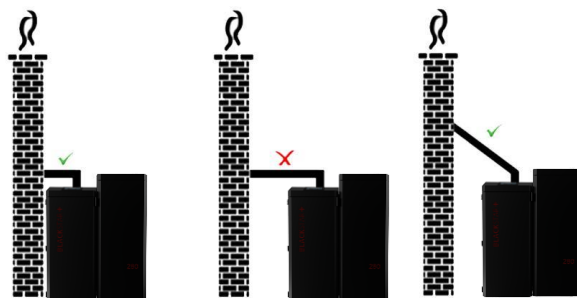
4. The chimney draft should maintain a minimum of 10 PA and be stable at both nominal and minimum power.

5. SHUNT or FLOWBOX W/ WEATHER COMPENSATION KIT

The boiler must be installed with either an approved shunt or a flowbox with weather compensation valve and a boiler return temperature sensor reference. **NOTE:** You may lose your warranty if failing to install an approved anti-condensation circuit with your system. (See approved installation diagrams on pg 11-13)

6. Do not install this system with a draft stabilizer

The RTB Phoenix is equipped with an under pressure sensor and inbuilt exhaust fan that will regulate the draft to maintain 10 pascals in the chimney. If your building code requires a draft stabilizer to be installed on this system we advise to install the draft stabilizer low on the chimney to prevent flue gases from entering the boiler room. **Note:** Despite having an exhaust fan inbuilt in the boiler, the chimney must nonetheless be capable on it's own to deliver a minimum of 10 pascals of under pressure.



FIRST TIME START-UP:

I. Weighing the pellets

Once the system is assembled, filled with water, connected to power, and supplied with wood pellets, a basic calibration of the auger is required.

Detach the drop hose from the drop tube on the burner and attach a plastic bag or similar underneath the drop hose.

Go to **System>Manual>External Auger> ON**. This will force start the external auger. Allow for approximately 15 minutes of auger running time after pellets begin dispensing. This will ensure that the auger is completely filled and will allow for a more accurate weighing later. Once complete, discard the pellets from the plastic bag and refasten the empty plastic bag to the drop hose.

Go to the **Hopper menu> Force run external auger>Force auger 6 min>START** to activate the 360 second test. Wood pellets will begin dispensing.

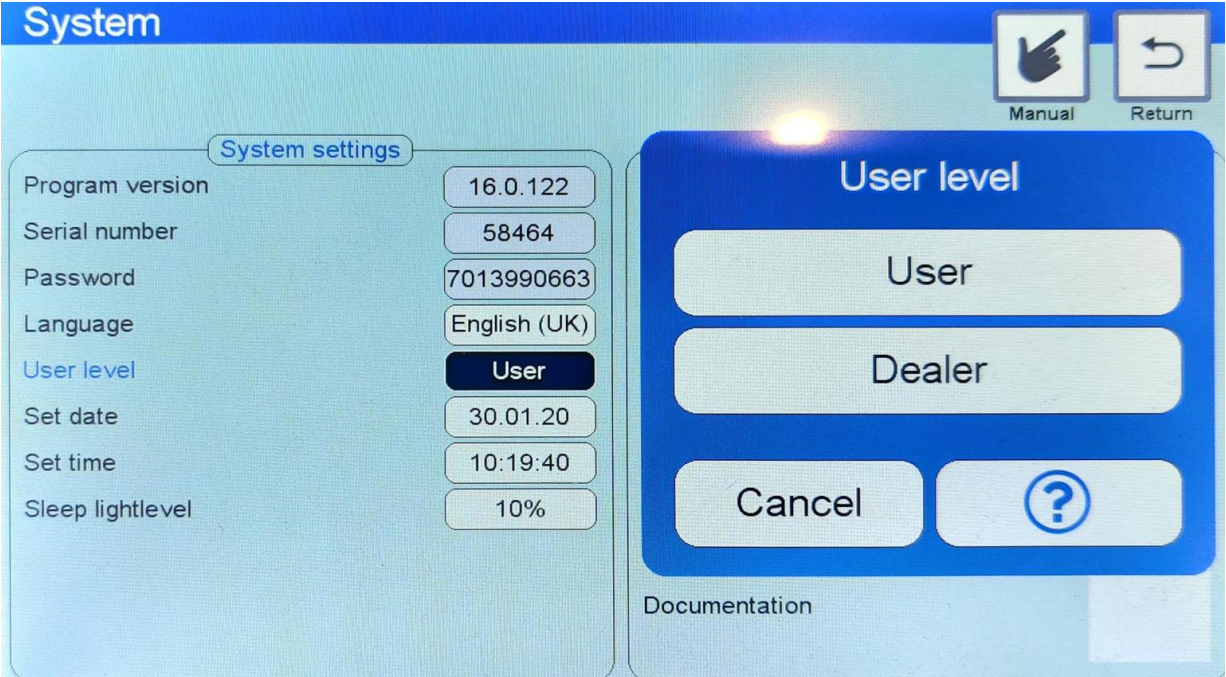
When the test is complete, remove the plastic bag, and weigh only the pellets on a kitchen scale. Enter the weight in the controller by going to the **Hopper menu >Auger capacity/6min>** enter "pellet weight"

Also, add the pellet weight to the **Pellet Correction** field

You can now reconnect the drop hose to the burner and begin normal operation.



USER LEVEL MODE



General Guidelines

The controller has several different controller modes based on the USER LEVEL selected. These include:

USER
DEALER

The USER LEVEL can be accessed by going to the SYSTEM menu and selecting USER LEVEL.

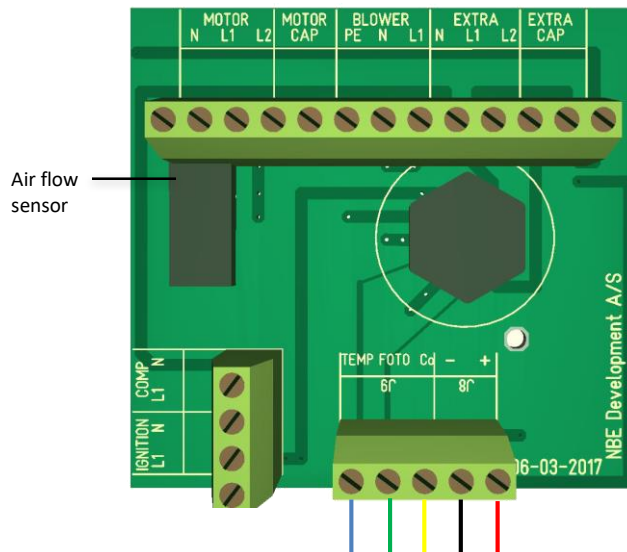
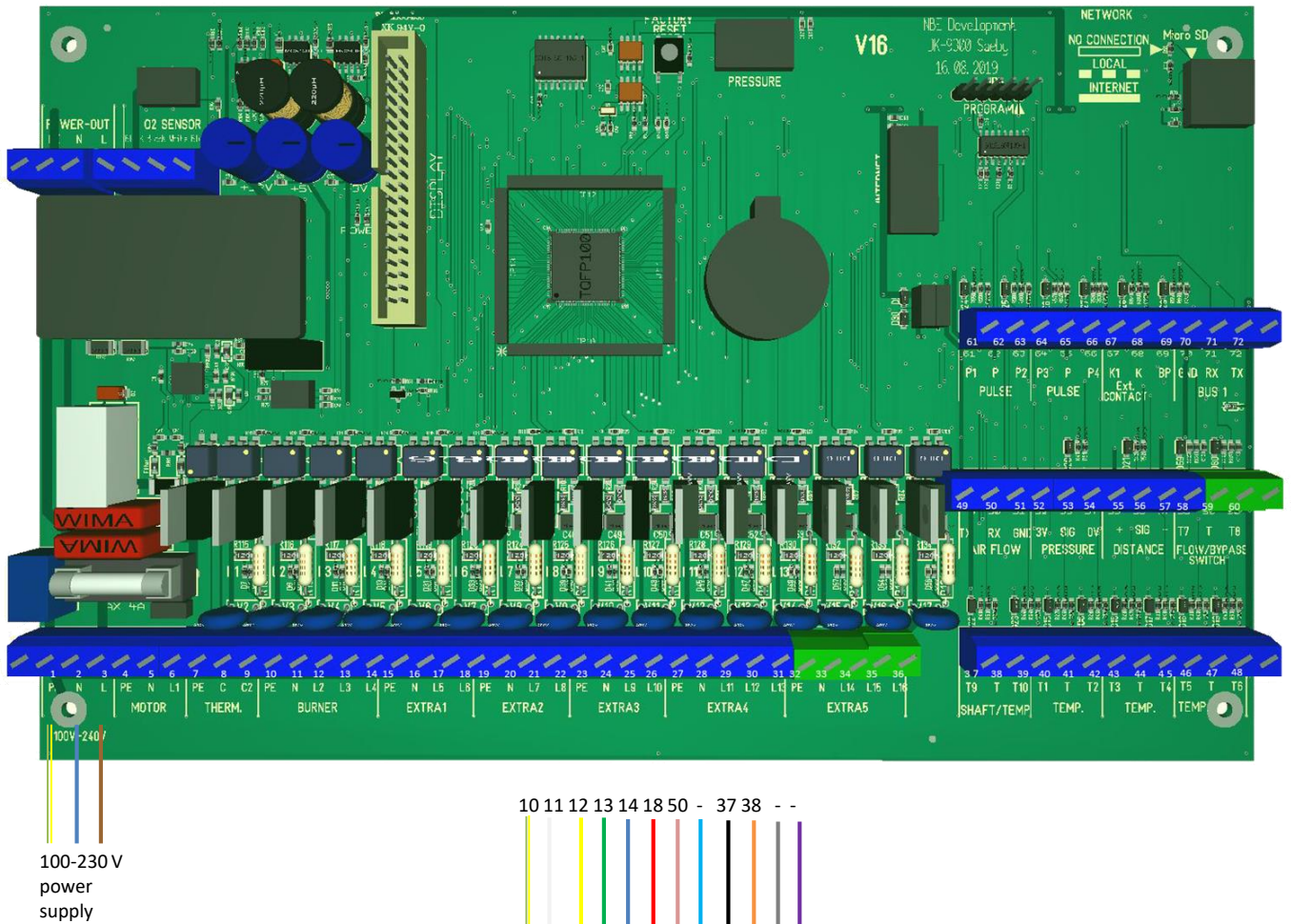
USER LEVEL:

If you are an inexperienced end user i.e. not an authorized installer you should only operate your controller in the basic USER mode. Keeping your system in USER mode will prevent you from any accidental changes to your controller that could have an influence on the performance of your boiler. Under the USER mode you will still be able to make changes to the most common basic functions such as the wanted temperature of the boiler, the weather compensation curves for each zone, as well as the timers for both heat production and DHW production.

DEALER LEVEL:

The DEALER LEVEL is reserved for authorized installation and service providers. In this mode, the dealer will have full access to the more detailed controls of the system. **IMPORTANT:** As a dealer, you will need to access this mode when connecting any accessories to the controller as you will need to assign the outputs/inputs for the installed accessory which can only be visible within the DEALER mode.

V16 PRINT:



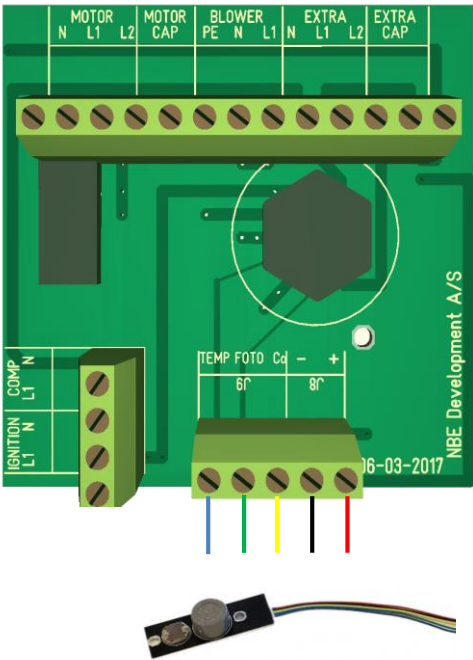
12 pin
BURNERPRINT

V16 PRINT CONNECTIONS

Main Print Board G	12 pin cable	WIRE	INPUTS	OUTPUTS	NUMBER	FUNCTION
100V-240V			PE-N-L		01-02-03	100-240 Volt 50-60Hz
THERM			C-C2		07-08-09	Safety Thermostat
MOTOR				PE-N-L1	04-05-06	External Auger
BURNER	Green/Yellow			GND	10	
BURNER	WHITE			N	11	
BURNER	YELLOW			L2	12	Blower
BURNER	GREEN			L3	13	Internal auger
BURNER	BLUE			L4	14	Igniter
EXTRA 1				PE-N-L5	15-16-17	Available Output
EXTRA 1	RED			L6	18	Compressor Cleaning Burner
EXTRA 2				PE-N-L7	19-20-21	Ash Auger
EXTRA 2				PE-N-L8	19-20-22	Compressor
EXTRA 3				PE-N-L9	23-24-25	Available Output
EXTRA 3				PE-N-L10	23-24-26	Exhaust Fan
EXTRA 4				PE-N-L11	27-28-29	Available Output
EXTRA 4				PE-N-L12	27-28-30	Available Output
EXTRA 4				PE-N-L13		Available Output.
EXTRA 5				PE-N-L14	32-33-34	Available Output
EXTRA 5				PE-N-L15	32-33-35	Available Output
EXTRA 5				PE-N-L16		Available Output.
BUS 1			GRD		77	Available for Extension Module*
BUS 1			RX		78	
BUS 1			TX		79	
PRESSURE			OV		54	
DISTANCE		BLACK	-		57	Laser Distance Sensor for Hopper
DISTANCE		YELLOW	SIG		56	
DISTANCE		RED	+		55	
O2 SENSOR 15V		WHITE	White		83A	15 V O2 Sensor
O2 SENSOR 15V		WHITE	White		84A	
O2 SENSOR 15V		GREY	Grey		85A	
O2 SENSOR 15V		BLACK	Black		86A	
O2 SENSOR 12 V		BLACK	Black		83	12 V O2 Sensor (DENSO)
O2 SENSOR 12V		BLACK	Black		84	
O2 SENSOR12 V		WHITE	White		85	
O2 SENSOR		BLUE	Blue		86	
POWER OUT				PE-N-L	80-81-82	External Power Supply
CONTACT			K-K1		74-75	External Contact ON/OFF*
PULS			P-P1			Free
PULS			P-P2			Free
PULS			P-P3			Free
PULS			P-P4			Free
DISTANCE		RED	+		55	Ash Can Level Sensor
DISTANCE		BLACK	-		57	
BP		YELLOW	BP		76	
TEMP.			T- T1		41-40	Air Intake Temperature Sensor
TEMP.			T – T2		41-42	Chimney Temperature Sensor
TEMP.			T – T3		44-43	Forwarding Air Temperature
TEMP.			T – T4		44-45	Room Reference Temperature
TEMP.			T – T5			Free
TEMP.	LIGHT BLUE		T – T8			Backpressure Sensor
SHAFT. / TEMP	BLACK		T – T9		37	Drop Shaft Sensor Burner
SHAFT. / TEMP	ORANGE		T		38	Motorprint
SHAFT/ TEMP	GREY		T-T10		39	Photosensor

*REQUIRES ACCESSORY
PE= YELLOW/GREEN N= BLUE L= BROWN

12 PIN PRINT CONNECTIONS



BS+ v16 10, 16, & 25

12 pin BURNER PRINT	WIRE	INPUTS	OUTPUTS	FUNCTION	SKU:
MOTOR	BLACK		N	Internal Auger Motor	YN60 8RPM, SKU: 400020-180
MOTOR	WHITE		L1		
MOTOR	RED		L2		
MOTOR CAP	BLACK			Capacitor	
MOTOR CAP	BLACK				
BLOWER	GREEN/YELLOW		PE (grounded on motor)	Combustion Blower	Fan FL 120mm, SKU : 400008-111
BLOWER	BLACK		N		
BLOWER	BLACK		L1		
EXTRA					
EXTRA					
EXTRA					
EXTRA CAP					
EXTRA CAP					
IGNITION	BLUE		N	Igniter	Ceramic heating element 250Watt, SKU : 400305
IGNITION	BROWN		L1		
COMP	RED		L1	Compressor Cleaning Burner	Solenoid valve. 1/2 ", SKU : 400201
COMP	RED		N		
TEMP	BLUE	Temp		Photosensor, Drop Shaft Temperature Sensor, and CO/Back Pressure Sensor	NBE photo print with shaft and back pressure sensor SKU : 400094
FOTO	GREEN	Foto			
Co	YELLOW	Co			
-	BLACK	-			
+	RED	+			

CONNECTING TO THE INTERNET:

Connecting your burner via the web:

1. On your controller go to SETTINGS/COMMUNICATION/NETWORK and find your internet Router
2. Go to PASSWORD and enter the password for your router. Your controller will now be connected to the internet.

Creating an account on Stokercloud

3. Go to www.stokercloud.dk and insert your Controller serial number under the USERNAME.
4. Enter your controller password under PASSWORD
5. Follow the registration procedures on the site to setup your stokercloud account.

Your pellet boiler will now be online on <https://www.stokercloud.dk>.


Tip: Make sure that there is a solid blue light beside the SD card slot. A flashing light is an indication that your burner is not connected to the internet and you need to check your wireless router. If the lamp does not light up, your router is not connected to the internet. Check to see if your router is on and is functioning properly.

Log In

Username

Password

Choose your language and log in

 English(GB)

LOGIN

Forgot password? (use empty password for guest)



Your account is not registered. Please register.

REGISTER

on

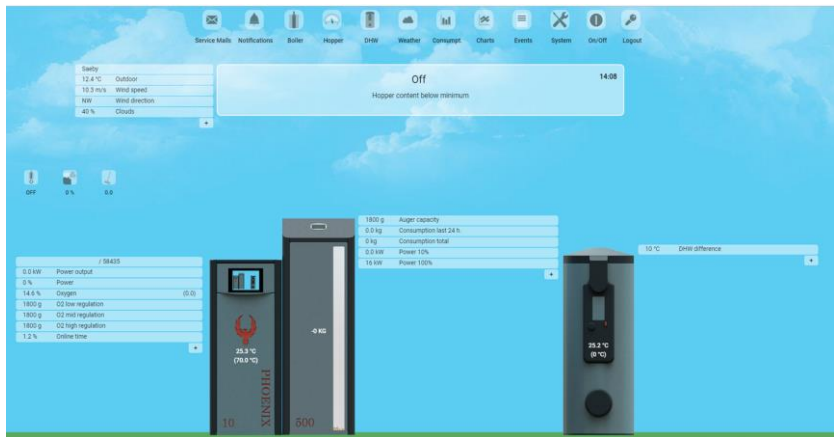
Charts

Events

System

On/Off

Logout



Registration Form

Controller serial number

5115

Controller password

✗

New StokerCloud password

New StokerCloud password (repeat)

Wanted username

✗

Name

Address

Zip Code

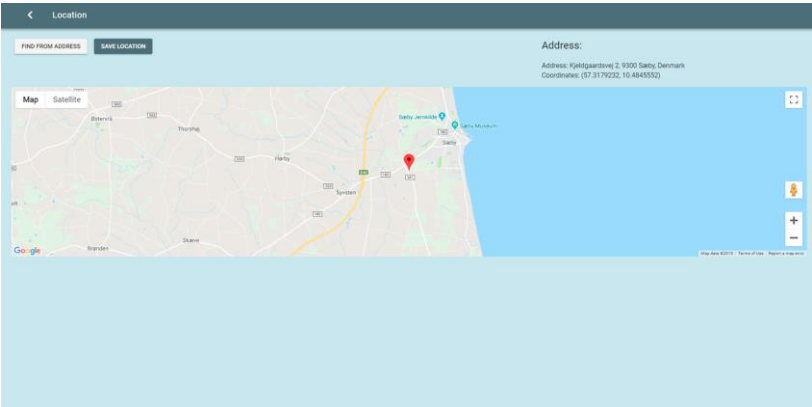
City

Country

Denmark

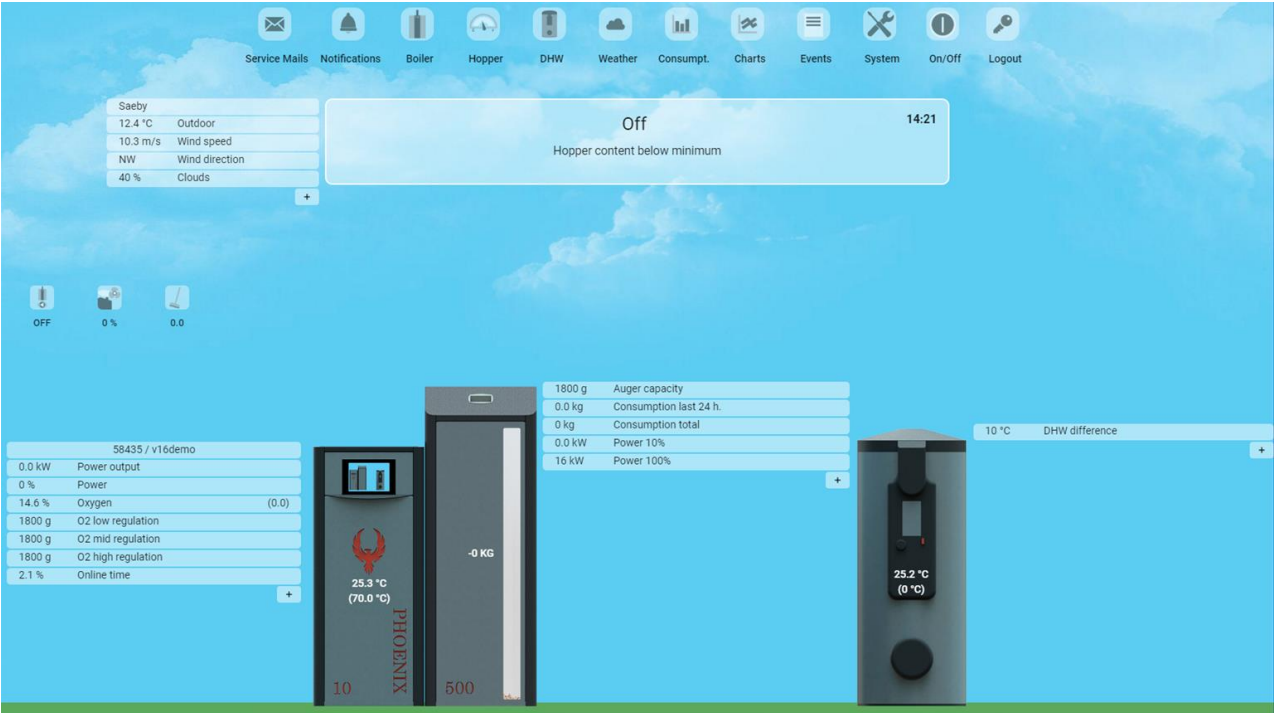
CONNECTING TO THE INTERNET:

6. Enter where you live and save location.



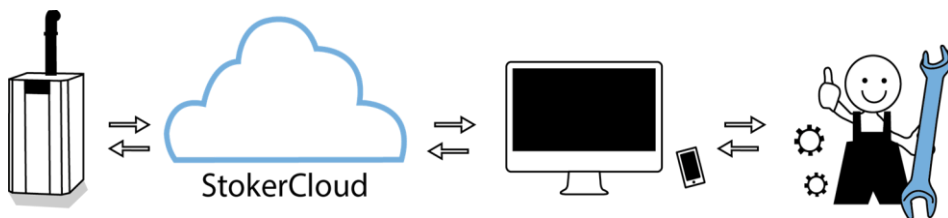
Once your configuration are saved, you will now have your own webpage and system dashboard on Stokercloud.

After a short period of time you will see data streaming from the burner.



CLOUD SERVICE:

If your burner is registered online via our website www.stokercloud.dk, we can help keep an eye on your system. If something unexpected happens, such as too many ignitions, unstable operation, improper PI regulation etc., then we have the opportunity to help you ONLINE.

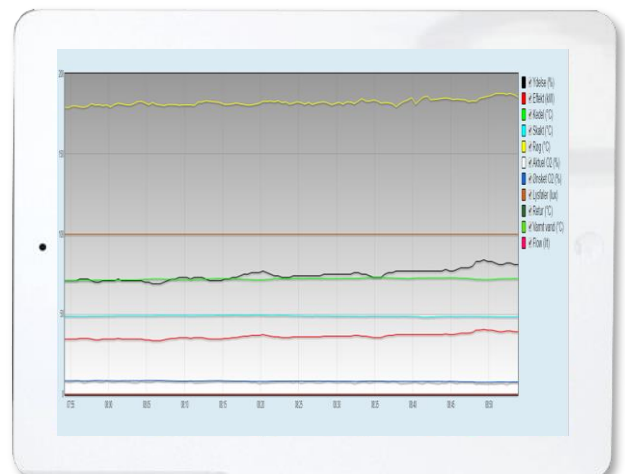
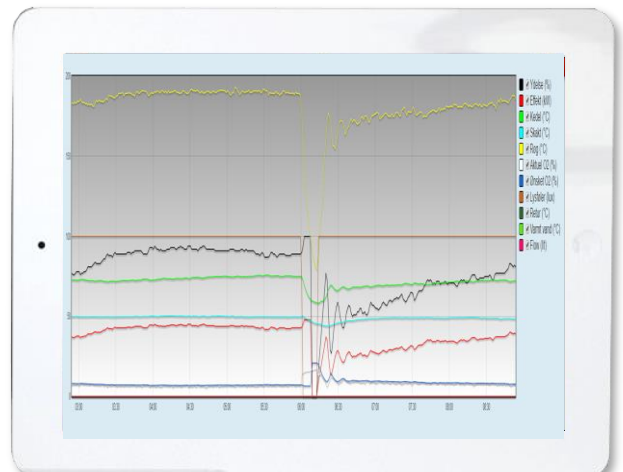


How it works:

- NBE observes abnormality on your graphs.
- If necessary, NBE will contact you by e-mail and ask your permission to make operational change.
- NBE evaluates your graphs and the patterns of your burner, and makes adjustments based on the observations.
- Changes to your settings can always be viewed via your system LOG.
- After adjusting, it should look like this

NBE's Cloud Service ensures:

- Fewest possible number of electric ignitions.
- Best possible PI regulation.
- An optimized system for your house.
- Lower wood pellet consumption.
- Security in your everyday life.
- The latest updates to the controller.



SERVICE MAINTENANCE

Cleaning should be carried out as needed. There is a big difference depending on the construction setup, adjustments and wood pellet quality on how often maintenance should be performed. The maintenance table below is only an indication of the type of maintenance required and applies only for RTB Phoenix systems!

When needed	7 days	14 days	30 days	½ annually	Annually	BS+ v16
X			X	X	X	Clean cinders out of the burner head
				X	X	Clean under the combustion grate for dust and cinders
				X	X	Clean O2 sensor of dust
					X	Clean burner fan of dust
X			X			Clean heat exchanger and smoke pipes
X				X		Empty ash drawer, typically every 1000- 2000 kgs consumed.
					X	Check gasket/replace worn gaskets
					X	Check under pressure sensors/replace where necessary
					X	Adjusting the burner (weighing the pellets)
X						Filling the hopper
					X	Chimney sweeper

Turn off the burner during maintenance cleaning.

Turn off the controller and allow to cool for approx. 15 min. Once the burner is completely turned off, it is ready for cleaning. Unplug the burner, remove the shield, drop shaft and remove the burner from the boiler so work can be easily performed.

The ash can

- ! Never throw warm ashes in the trash bin, but let it cool off in a metal bucket. Warm ashes can burn if it gets air (O2)
- ! Remember to mount the ash bin correctly after emptying it, otherwise smoke can leak out the back!

Burner head.

Remove any ash or cinders from the grate. Remove any pellet remnants under the burner grate. Ensure that there is nothing lodged in the fan and that it can rotate freely.

O2 Sensor recalibration

Remove O2 sensor head from exhaust mount found on top of the boiler adjacent to the exhaust fan. Make sure that the O2 sensor is warm and has had power for at least 15 minutes. Go to BOILER/OXYGEN/START OXYGEN CALIBRATION/START. The sensor will then begin calibrating.

Hopper.

Since pellets naturally contain dust, you should once in a while empty the hopper completely. The more dust that is present in the hopper, the less pellets the auger will dispense, and the more unstable the dosing. The boiler will go out of adjustment with greater risk of downtime. How often one should empty the hopper depends greatly on the design and quality of the pellets you use.

Start-Up after cleaning.

Reassemble the system and turn on the controller, the burner will start up automatically.

TROUBLESHOOTING:

We have collected the most typical solutions to small problems.

Problem.	Possible cause.	Possible solution.
Alarm hot drop shaft.	Cinders in the burner head.	More air for combustion.
Cause must be identified.	Back pressure in the boiler.	Clean the boiler etc.
Contact your dealer	No draft in the chimney.	Increase the chimney height.
		Clean the burner head regularly.
		Switch to a better quality of pellets.
Smoke in the hopper.	Ash in the hopper.	Clean the boiler etc.
Cause must be identified.		
Contact your dealer		
Smoke setbacks	No draft in the chimney.	Insulate the smoke pipe.
Cause must be identified.		Increase the chimney height.
Contact your dealer		Submerge a liner in the chimney.
		Increase temperature of the smoke, remove the semi cleaning grates from the boiler.
	Drop shaft sensor defective.	Change temperature sensor on the burner print.
	Unfortunate wind conditions.	Increase the chimney height.
		Close doors etc.
		Make intake on the same side as the chimney.
Alarm ignition	Defective igniter	Replace the electrical igniter with a new one.
	Igniter is mounted incorrectly	Mount it correctly
	Burner grate is fitted wrong.	Mount it correctly.
	Too high chimney draft.	Install a draft stabilizer in the chimney.
		Set electric ignition power up.
		Reduce the fan speed during ignition.
	Stopped fan	Check if the fan can run, replace if necessary
Alarm temp. boiler	Defective temperature sensor	Change temperature sensor.
	Temperature sensor fallen off the boiler.	Mount it correctly, attach the sensor with a cable tie.
	Power too low compared to the house.	Make a new adjustment of the burner.
		Adjust the alarm limit down.
		Add more power to the burner if possible.
Alarm motor output	Fault current on the electric grid	Supply the burner from another protection group.
	Relay defective	Send the controller in for repair.
Alarm no fuel	Hopper is empty	Fill hopper with wood pellets and restart.
	Flame has gone in operation	Make a new adjustment of burner.
	Photo sensor is defective	Change photo sensor with a new one.
	Unstable fuel supply	Empty auger / hopper for sawdust.
Plug is disconnected	Burner plug is not fitted	Insert the plug of the burner
	Dirt inside the plug to burner	Clean the plug for pellet dust.
	No connection to the burner	Change temperature sensor on the burner print.

TROUBLESHOOTING:

Problem.	Possible cause.	Possible solution.
No power to the controller	Defective fuse in the controller.	Replace the fuse to a new one.
	Safety thermostat not active.	Reconnect by firmly pressing the red button.
	The controller has been overvoltage.	Send controller to NBE for repair.
The burner deactivate residual current protection	Electric ignition is faulty.	Change the electric ignition to a new.
	Current leak in a component.	Note when RCD deactivate, replace the component.
	Cables exposed.	Check cables, insulate them if possible.
Too high pellet consumption	Lean burning.	Make a new adjustment of the burner.
	Too high chimney draft.	Install draft stabilizer in the chimney.
	Uninsulated pipes in the installation.	Insulate with pipe insulation.
Too many electric ignitions	Flow in the system is fluctuating.	Set the pressure controlled circulation pump to fixed pressure.
	External thermostat unstable.	Set "External wait" up in the controller.
Unburnt pellets in the ash	Lean burning.	Make a new adjustment of the burner.
	The grate is placed incorrectly.	Mount it correctly.
	Too many pellets on the grate.	Make a new adjustment of the burner.
	The fan is adjusted too high.	Make a new adjustment of the burner.
	Too high chimney draft.	Install a draft stabilizer in the chimney.
Cinders on the grate	Blower cleaning is not sufficient.	Adjust the fan % up to clean, and the time between the down.
		Clean the grate mechanical more frequently.
	Poor quality pellets.	Change supplier.
		Mount compressor cleaning.
		Change the grate to a model that is more open.
	Fat combustion.	Adjust the fan up at 10, 50 and 100 % power.
		Adjust the burner power down in "auto calculation".
The boiler is condensing	Too low chimney temperature.	See page 27 about flue gas condensation.

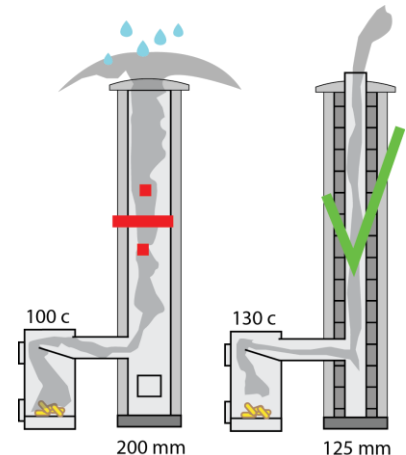
PREVENTING FLUE GAS CONDENSATION:

When a boiler has an extremely high efficiency >93 %, the temperature of the flue gas is naturally low. Typical flue loss is only 2-3 %. This creates greater demands on your chimney and on how to adapt the boiler to its existing installation. It is important, if you have condensation to prevent it; otherwise you risk developing soot into the chimney and corrosion in the boiler.

Note: Even if there is water in the boiler, it may be due to condensation from the chimney.

Things that can prevent condensation in the boiler and chimney.

1. **High chimney > 5m.**
Provides a good draft in all conditions.
2. **Small cleaning in the chimney 125mm – 150mm.**
Provides better flow, and can "carry" out more moisture.
3. **Short un-insulated smoke pipe < 0,5m.**
Do not cool down the smoke unnecessarily before it reaches the chimney.
4. **High boiler temperature >70C degrees .**
10 degrees up in the boiler temperature gives 10 degrees more smoke temperature.
5. **Suitable return temperature > 55C degrees.**
The boiler may condense when the heat exchanger surfaces are below 47 degrees.
6. **Heated boiler room.**
Lowers cooling of the boiler and smoke pipe and provides draft stabilizer more hot air to work with.
7. **More oxygen in combustion.**
Increases air flow in the boiler, and carries more moisture, 1 % more oxygen costs approx. 0,5 % in efficiency.
8. **Remove the turbulators.**
Decreases resistance of the boiler, and get a bad chimney to work better. The gas temperature typically increases to approx. 100 degrees. The burner should be readjusted after the turbulators are removed.
9. **Keep the boiler heated at all times.**
If you are using DHW priority in the controller, and the boiler starts being cold by every start, the boiler will not manage to dry out at every start.
10. **Avoid limiting Max Power% under Weather Compensation**
Limiting Max Power% under weather compensation should be performed only by a certified RTB professional that is familiar with the specific operations of the system. Limiting the power% could have the effect of preventing your boiler from reaching the wanted boiler temperature and thus could cause condensation in the boiler. **Warning:** damages resulting from condensation are not covered in the manufacturer warranty.



WARRANTY

All products purchased from NBE is covered by the current Danish Purchasing Law.
This includes 6 months warranty on the products valid from the date of receipt.
A 2 year warranty is granted with the completion of the Warranty Registration.

If you purchase your system from an authorized dealer, and have your boiler online as well as have annual service visits, the guarantee can be increased to 24 months.

The customer installs it himself	6 months
A plumber installs the boiler (not authorized dealer).	6 months
An authorized dealer installs the boiler + online on StokerCloud.	12 months
An authorized dealer installs the boiler + online on StokerCloud + annual service visits	24 months

The warranty covers only manufacturing and material defects.

The warranty of product failure of the system when under warranty, NBE will repair the spare part at no charge to the buyer. Buyer will be responsible for the installation or replacement of the part. If NBE offers repair of the defective part, the purchaser shall send the part to NBE for repair. NBE will return the part once repaired.

Guarantee shall be invalid if product failure is due to circumstances caused by the buyer; either by accident and/or abuse of the product, inadequate cleaning, chimney conditions, as well as circumstances where NBE has no influence. In addition, the warranty is invalid due to misuse of the burner – e.g. using fuel that is not approved by NBE.

The warranty does not cover parts such as the electrical igniter.

The buyer is obligated to check the goods immediately upon receipt.

If the buyer declares that the delivery was inadequate or defective, the customer must immediately and without delay make a written claim with NBE.

Returns are only made by agreement with NBE.

To the extent that NBE is liable to the purchaser, NBE's liability is limited only to direct loss and not to damages incurred by connected equipment and / or indirect damage, loss of earnings, operating losses, connection costs, etc.

Responsibilities:

NBE assumes no responsibility as a result of the purchaser's legal relations with third parties. All orders are accepted subject to force majeure, including war, civil unrest, natural disasters, strikes and lockouts, failing supplies of raw materials, fire, damage of NBE or its supplier network, lack of transport opportunities, import/export prohibitions or any other event which prevents or restricts NBE's ability to deliver.

NBE has in cases of force majeure, the right to cancel the transaction or any part thereof, or to deliver the agreed product as soon as the obstacle to normal delivery has lapsed. In cases of force majeure, NBE will not be held responsible for any losses incurred by the purchaser due to changes, sold out items or changes to specifications in the product manual.

It is the buyer's responsibility to register the equipment to the appropriate authorities. If any disputes arise between the authorities and the purchaser, NBE will be held harmless from any claims or disputes.

The following can be delivered upon request:

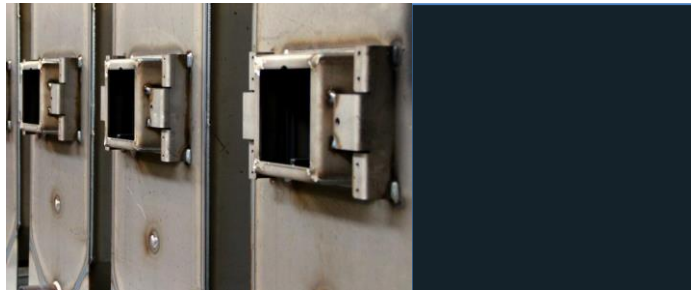
Exception of the expansion by Labor Inspectorate.

Chimneys endorsements.

Approval of Technology Institute (DTI).

Print charts.

The material is also available on www.nbe-global.com.



**EC DECLARATION OF
CONFORMITY**

No. : 2605-2020

The undersigned, representing the following manufacturer

Manufacturer : NBE production A/S

Address : Kjeldgaardvej 2, DK9300 Saeby, Denmark

**or representing the manufacturer's authorized representative established within the
Community (or the EEA) indicated hereafter**

Authorized representative :

address :

herewith declares that the product

Product identification :

BS+ 10, BS+ 16, BS+ 25

RTB 10, RTB10 VAC, RTB 10 Phoenix

RTB 16, RTB16 VAC, RTB 16 Phoenix

RTB 30, RTB 30 VAC, RTB 30 Phoenix

RTB 50, RTB 50 VAC, RTB 50 Phoenix

RTB 80, RTB 80 VAC, RTB 80 Phoenix

RTB 100, RTB100 VAC, RTB 100 Phoenix

is in conformity with the provisions of the following EC directive(s)
(including all applicable amendments)

Reference n °	Title
<i>EN 303-5:2012</i>	<i>Europe Norm</i>
<i>2006/95-EC</i>	<i>Low Voltage Directive</i>
<i>2004/08-EC</i>	<i>EMC directive (EMCD)</i>
<i>97/23/EEC</i>	<i>Pressure Equipment Directive</i>
<i>2006/42-EC</i>	<i>Machinery directive</i>
<i>Arbejdstilsynets bekendtgørelse</i>	<i>Nr. 612</i>
<i>Energimærkningsforordningen</i>	<i>(EU) 2015/1187</i>
<i>Ecodesign forordningen</i>	<i>(EU) 2015/1189</i>

and that the standards and/or technical specifications referenced overleaf have been applied.

Last two digits of the year in which the CE marking was affixed: ...19

Jannich Hansen

Sæby

02/12/2019

Jannich Hansen

(signature)

ACCESSORIES:

The controller supports the following accessories.



Extension module for V13 and V16 controller (SKU:300211)
Get additional 7 outputs and inputs for additional equipment.



Wifi Temperature Sensor: (SKU: 300042)
Battery powered wireless temperature sensor that can be used as a reference sensor for weather compensation, domestic hot water, or as an external stop temperature reference.



Hot Water Priority kit ¾" (SKU:300040, 300041)
Produces hot water only when it is needed. Closes hot water tank, when the house is heated. Kits available with either 2 or 3 way motorized valve.



Kit: Weather/Indoor reset compensation (SKU:510027,510028)
Maintains a high boiler temperature and adjusts the house inlet temperature in relation to the outdoor temperature.

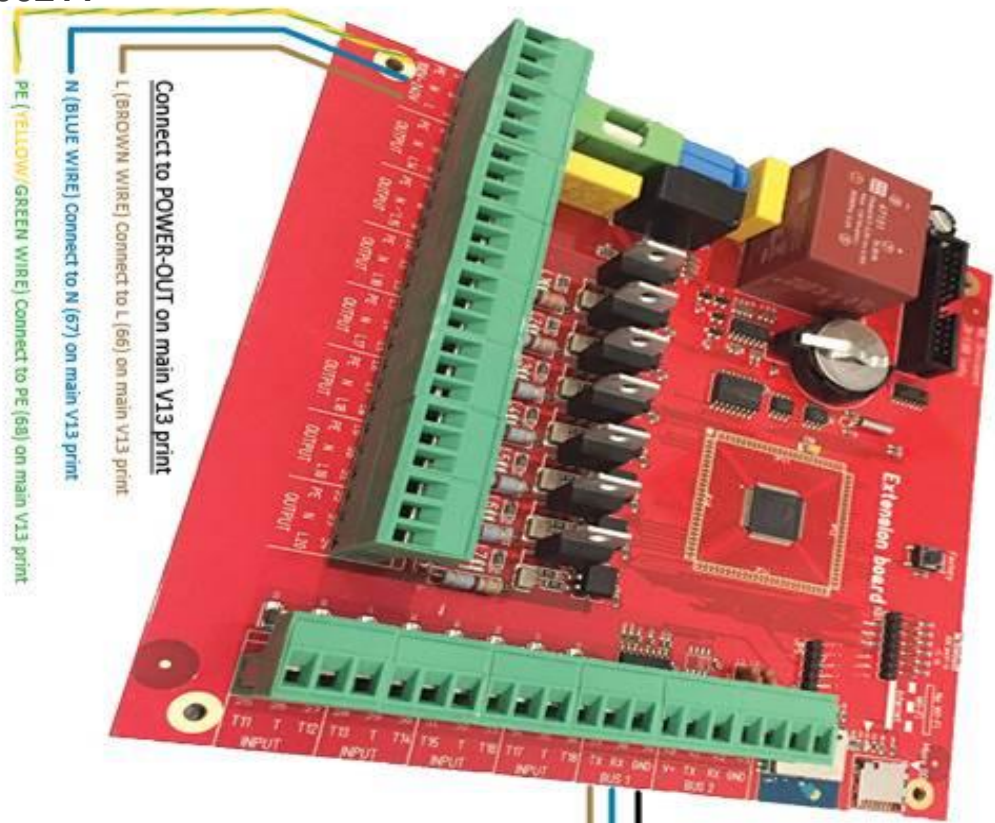


Pelvac Vacuum System (SKU: 707100, 708100)
Allows you to pneumatically deliver pellets from your bulk storage to your day hopper. Includes pelvac extraction auger, transport piping, fittings, and vacuum head unit with rotary valve. Available in 600 & 1000 W units.

WIRING DIAGRAM:

EXTENSION MODULE for V13/V16

sku:300211



Connect to POWER-OUT on main V13 print

L (BROWN WIRE) Connect to L (66) on main V13 print

N (BLUE WIRE) Connect to N (67) on main V13 print

PE (YELLOW/GREEN WIRE) Connect to PE (68) on main V13 print

GND (BLACK WIRE) Connect to GND (63) on main V13 print

RX (BLUE WIRE) Connect to TX (65) on main V13 print

TX (BROWN WIRE) Connect to RX (64) on main V13 print

Installation Instructions:

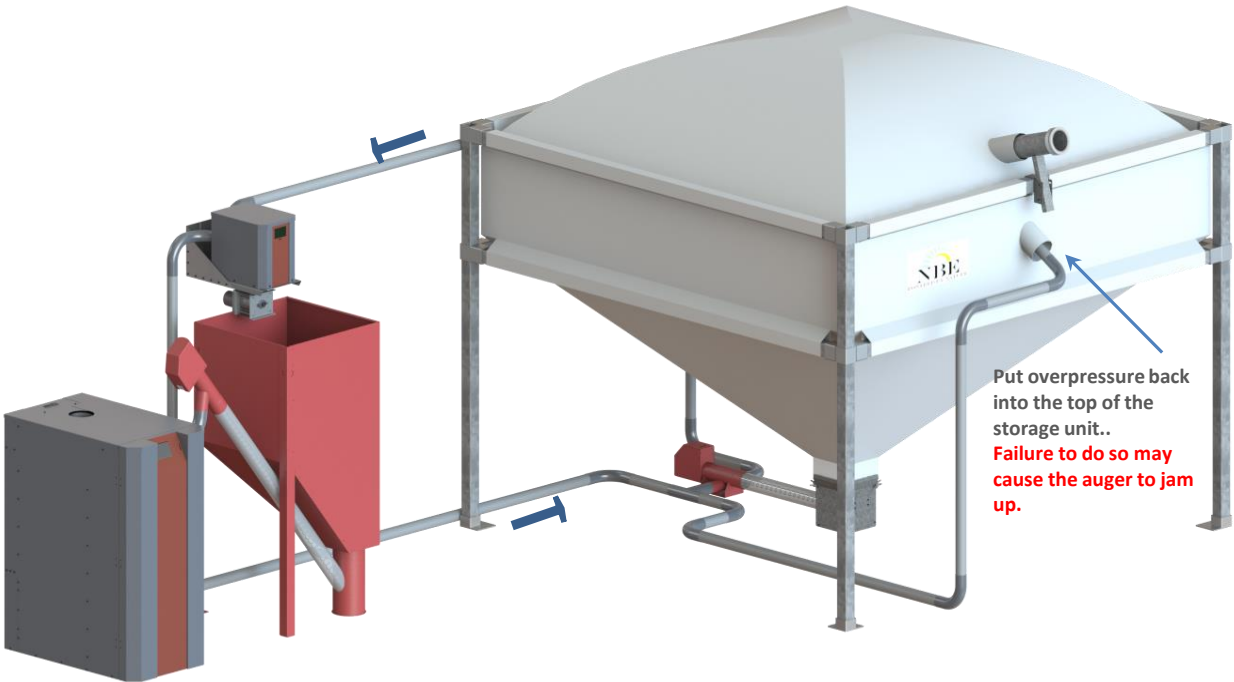
1. Disconnect Power
2. Mount the extension module along side the main V13 print board.
3. Connect power supply from main print board to 100V-240V connection found at 1, 2, & 3 on the extension module.
4. Connect TX (on main V13 print BUS 1) to RX (on Ext mod. BUS 1)
5. Connect RX (on main V13 print BUS 1) to TX (on Ext mod. BUS 1)
6. Connect GND (on main V13 print BUS) to GND (on Ext mod. BUS 1)
7. On the tablet go to setup and set the "extension module connected" setting to "on"

Important: Do not connect the exhaust fan nor solar pump on the extension module. The extension module cannot handle equipment that pulses.

Quick Installation Guide

Pelvac Vacuum Transport System with rotary valves

SKU: 708100, 707100



Wire	Wire Color	Connection to print
Vacuum/Rotary Valve	Green/Yellow	PE
Vacuum/Rotary Valve	Blue	N
Vacuum/Rotary Valve	Black or Grey	On an available output L12-L16 or on Ext. mod U14-U20 . <i>Make sure to attach the provided heatsink to the triac on the chosen output and change the fuse in the controller with the provided 8 amp fuse.</i>
Distance Sensor	Red	Distance +
Distance Sensor	Yellow	Distance Sig
Distance Sensor	Black	Distance -
External/Extraction Auger	Green/Yellow	PE
External/Extraction Auger	Blue	N
External/Extraction Auger	Black	On an available output L12-L16 or on Ext mod U14-U20

Installation Guide

Pelvac Vacuum Transport System with rotary valves
SKU: 708100, 707100



Under Vacuum Transport Menu:

Specify Outputs for Vacuum/Rotary valve and External(Extraction)Auger in the controller

Specify Maximum Distance (i.e. distance from the sensor when the vacuum will start) and Minimum Distance (i.e distance from the sensor when the vacuum should stop) .

Vacuum Transport	
External Feed Auger Output	Output L12
Vacuum Output	Output L13
Duty Cycle %	100
Minutes per cm min	30
Distance sensor alarm time min	30
Minimum Distance cm	20
Maximum Distance cm	30
Schedule	<button>SCHEDULE</button>
Running time Hours	52

Vacuum Transport Menu :

External Feed Auger Output: Select the output the auger is connected to

Vacuum Output: Select the output the vacuum is connected to

Duty Cycle %: Running time in percent for external feed auger. 100% = Always on.

Minutes per cm min: Maximum minutes allowed for at least one centimeter increase of pellets in hopper.

Distance sensor alarm time min: Amount of time the distance sensor is out of range before triggering an alarm

Minimum Distance cm: Distance used to stop the external feed system

Maximum Distance: Distance used to start the external feed system

Schedule: Select time periods when the vacuum transport system is allowed to run

Running Time Hours: The total amount of hours that the vacuum transport system has been running

NOTES:

Date	
Weighing	g
kW low	kW
kW high	kW
Blower low	%
Blower middle	%
Blower high	%
Comments:	

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Comments:	

NBE

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