

Users Manual

Version 1.7



WOOD PELLET BOILER

TW1

Controller type TH2006

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Instructions for TWIN HEAT Bio feed boiler type TW-1

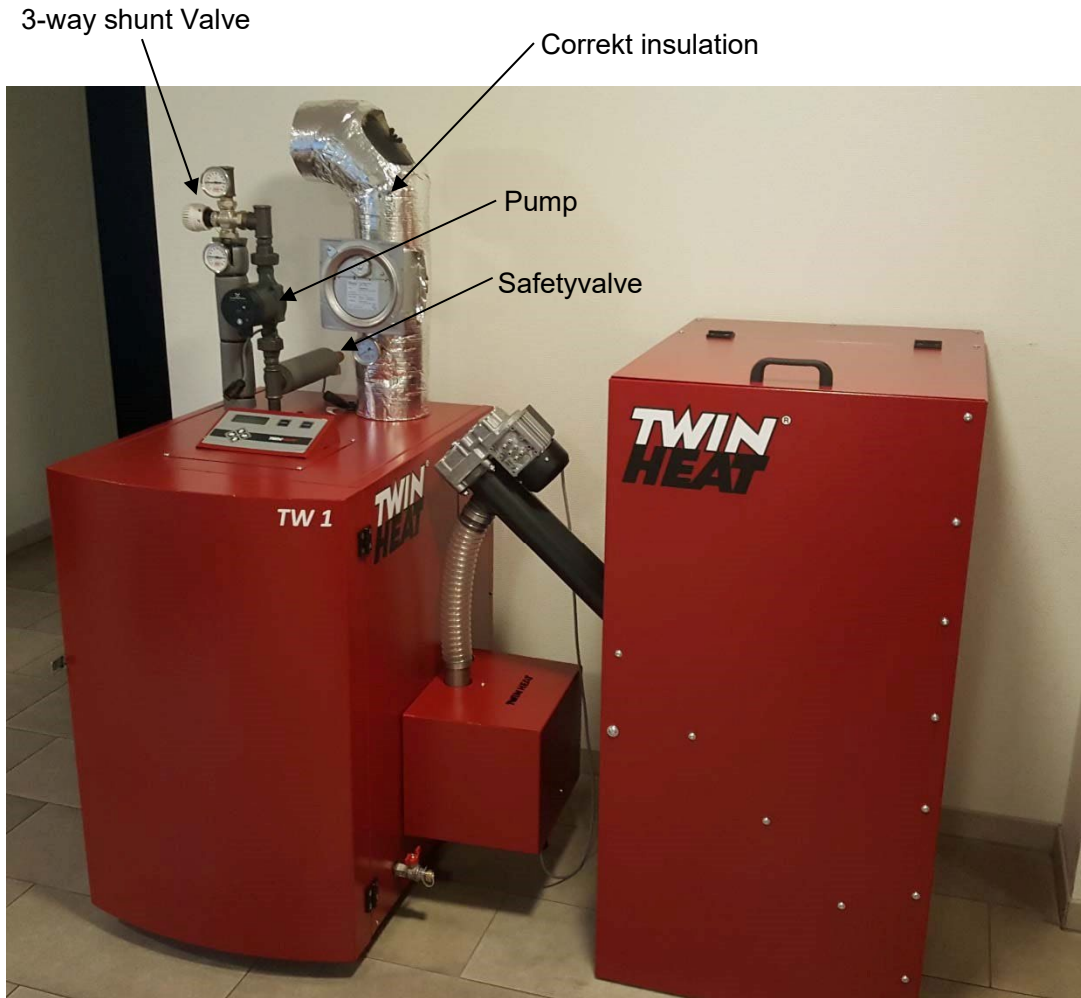
Year:

Prod. nr.:

Serial:

TWIN HEAT Bio feed boiler type TW 1 is tested and approved according to: DS/EN303-5:2012, at Dansk Teknologisk Institut.

(See declarations for DS/EN303-5:2012 type- approvals in the back of this booklet)



Guide to install your new boiler correct;

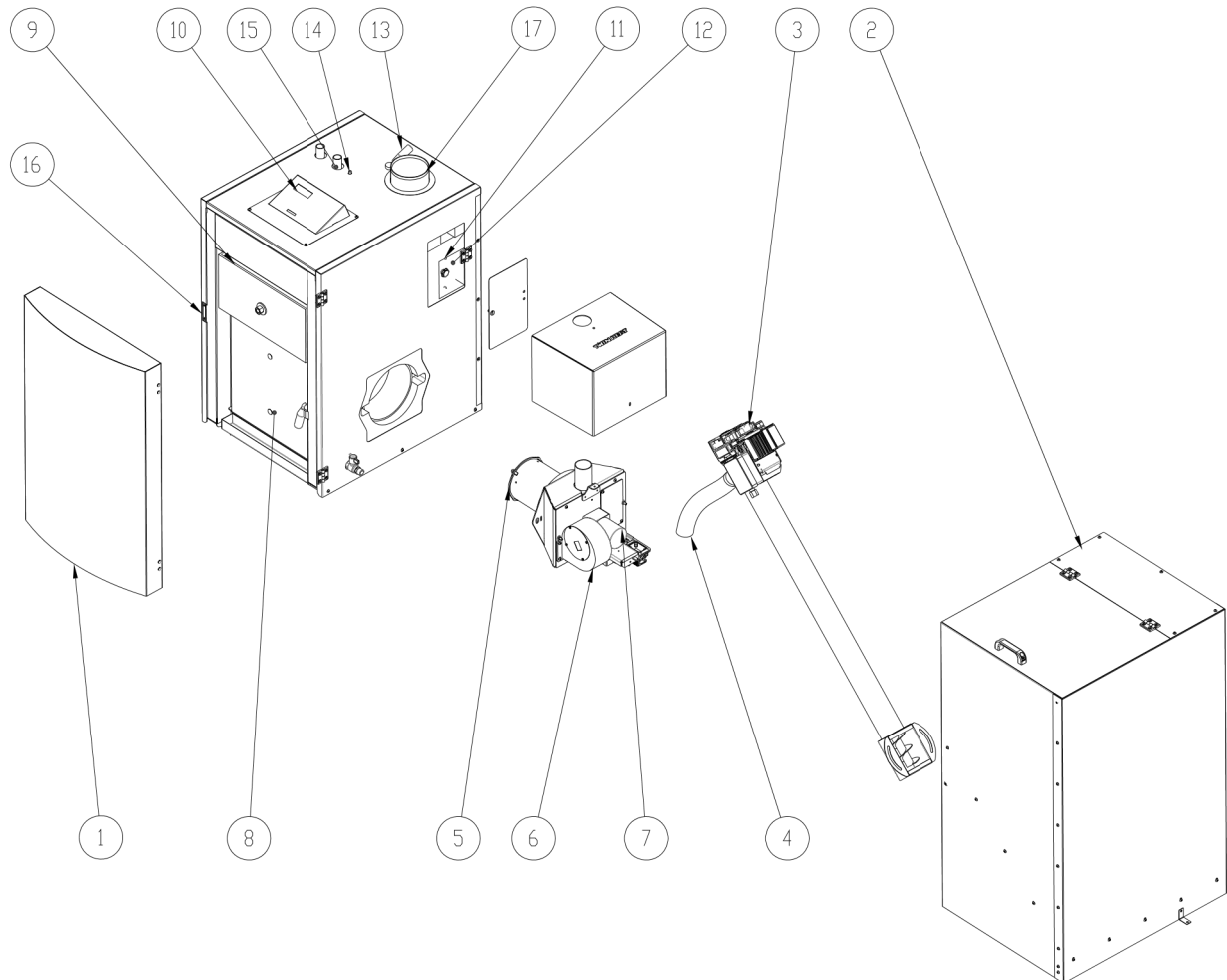
1. The chimney needs to be dimensioned for the boiler. Our recommendation is $\varnothing 130\text{mm}$, if diameter becomes larger it Will demand dependent more heat at startup, and flu gas will have tendency to generate condensates inside chimney.
2. The boiler needs to be placed as close to the chimney as possible, and flu gas tube between boiler and chimney need to be insulated (see picture above)
3. 3-way shunt valve need to be mounted (see picture above)
4. To assure that the connecting flex-tube is as vertical as possible, the pellet-silo must be placed similar as on the picture above.
5. By use of closed ekspansion - remember safety valve (see picture above). The safety valve need to be mounted prior to the pump.

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OVERVIEW



1: Front hatch.	10: Controlpanel.
2: Wood pellet silo.	11: Oxygen sensor.
3: Complete transport auger.	12: Blindplate for flu gas box.
4: Flex-tube.	13: By-Pass, flu gas adjustment.
5: Burner tube.	14: Overboil thermostat.
6: Airsupply for combustion.	15: Temperatur sensor (flow).
7: Stoker motor.	16: Safety switch.
8: Boiler Hatch.	17: Flu gas exit.
9: Hatch for heat-surface-pipe cleaning.	

SECTION 1 – ADJUSTING CONTROLLER

1.1 Controller display

Description of the different parameters which are readable/adjustable at controller display.

Visible menu line
Hidden menu line

Hidden menu line is found by pressing 

Træp. Drift
Temperature ! 67,8 °C
O2 Auto 9,6%
O2 Wanted 9,3%

- ← Fuel type chosen – Mode – Boiler load in % -Errors
- ← Actual boiler temperature
- ← Actual oxygen-% (O2%)
- ← Oxygen-% which the control aims to meet.

Stoker puls 0,8S
Temp.Blow.Hous. 30°C
Outside temp. 10°C
Setting

- ← Latest stoker puls in seconds
- ← Temperature in blowerhouse
- ← Outside temperature
- ➡ Go to settings

Cancel Error message by pressing »START«

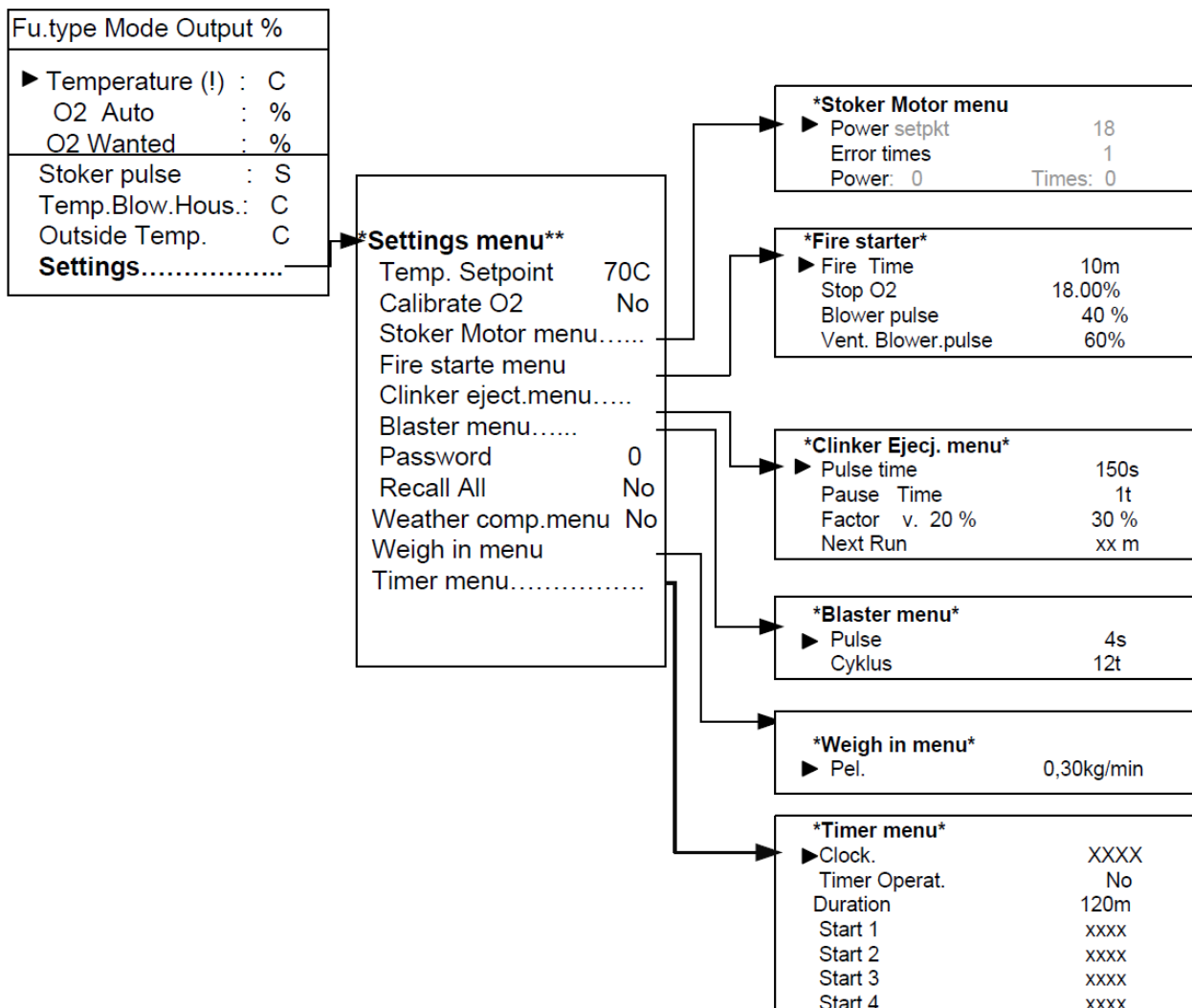
See section 3, for troubleshooting.

1.2 Menu struktur

The various adjustment possibilities are looked up in searching by means of the arrows at the front of the control panel.

If you want to leave the menu without making any changes, press **◀**

Errors are cancelled by pressing »START«





1.3 Adjustment of temperature

The temperature (boiler temperature) can be adjusted between 60 – 90°C

The temperature is by factory pre-set to 70°C.

Some situations – such as an under-dimensioned radiator system or hot water tank might make it desirable to adjust the boiler temperature higher than 70°C.

The cursor must be placed by the line: *Setting*

Press ➡ to choose *Setting*

Press ➡ The adjustment temperature is shown. (e.g. 70 °C)

Press ➡ The temperature can now be adjusted by pressing ⬆ ⬇

Confirm the new setting by pressing ➡

Exit the menu by pressing ⬅

The water returning to the boiler must always be **at least 60°C**

If the above is not respected the corrosion of the steel in the boiler will increase and the lifetime of the boiler will be expected to be reduced.

1.4 Calibrating the oxygen sensor

Oxygen sensors need calibration before the furnace is started the first time. Oxygen sensors need to be placed in absolute clean air when calibrated, meaning the sensor itself cannot be calibrated while mounted inside an active boiler!

It is important that power for the boiler plant is on, in at least 10 minutes, before it is calibrated, the reason is that the oxygen sensor needs time to heat up.

When the oxygen sensor is calibrated, the controller display must show approximately 20,9% at the line called: "O2 Auto".

If the boiler is fired up all-ready the oxygen sensor needs to be unmounted before the calibration. The procedure follows:

Open the cleaning hatch at the flu gas box. Take out the oxygen sensor by releasing the two inner hexagonal screws on the side of the oxygen sensor, be aware the gasket cannot be reused, and needs to be replaced when going through this procedure.

Use the 22mm spanner, delivered together with the plant, to dismount oxygen sensor from bracket.

Clean the sensor using a steel brush and let it rest on the side of the boiler in free air.

Place cursor on the menu line: Setting

Press ➡ to select Setting

Press ⏸ and choose Calibrate O2

Press ➡ to switch adjustment on ⬆, now yes can be chosen by pressing ⏸

Press ➡ to confirm



1.5 Fire starter menu

In the fire starter menu, it is possible to set 4 parameters:

Fire Time:

maximum number of minutes pr. fire startup:

Setting the maximum time for a fire startup.

The default setting from the factory is 10 minutes.

Stop O2%:

Make the furnace go into soft start mode:

Setting which O2% level, that makes furnace soft start.

The default setting from factory is 18%.

Blower pulse x %:

Make the blower pulse the adjusted amount of time at startup.

Set the blower pulses in % of the time at fire startup.

The default setting from factory is 25%.

Vent. Blow. pulse x %:

Make the blower pulse the adjusted amount of time before startup.

Setting the blower pulses in % at venting the furnace before startup.

The default setting from factory is 60%.

Press ➡ to select Setting

Press ⬅ and choose Fire starter menu

Press ➡ to select the Fire starter menu

Press ⬅ and chose parameter

Press ➡ to switch adjustment on ⬆, new value can be chosen by pressing ⬆ or ⬅

Press ➡ to confirm

1.6 Clinker eject. menu

In the Clinker eject. menu it is possible to set 2 parameters:

Puls time:

Setting the work time for the clinker ejector.

The default setting from the factory is 150sec.

Pause:

Setting the pausing time between the clinker ejector worktimes.

Default setting from factory, at furnace 100% max work effect, once per hour (1h).

Factor at 20% of max work effect = 50%

Press ➡ to select Setting

Press ⬅ and choose Clinker eject. menu

Press ➡ to select Clinker eject. menu

Press ⬅ and chose parameter

Press ➡ to switch adjustment on ⬆, new value can be chosen by pressing ⬆ or ⬇

Press ➡ to confirm



1.7 Recall All

If you want to pull all settings back to default factory settings, select yes in the Recall All menu.

Remember to calibrate oxygen sensor according to description in chapter 1.4
Calibrating the oxygen sensor.

1.8 Weather comp. menu

In the Weather compensation menu, it is possible to set 2 parameters:

Weather comp.: Yes/No, turns on or off the function.

Min. temperature: Adjust the minimum temperature allowed, compared to outside temperature.

(lowest recommended flow temperature is 55°C).

Press ➡ to select Setting

Press ⬅ and chose Weather comp. menu

Press ➡ to select Weather comp. menu

Press ⬅ and chose parameter

Press ➡ to switch adjustment on ⬆, new value can be chosen by pressing ⬆ or ⬇

Press ➡ to confirm

1.9 Timer menu

In the Timer menu, it is possible to set 7 parameters:

Clock xx:xx Here the time is set using the format.

(notice, global time format type is used: 00:00-23:59).

Time operat. Yes/No, turns on or off the function.

Duration x min.: Set run time in minutes.

Start 1: set the time for first startup (1st daily startup)

Start 2: set the time for second startup (2nd daily startup)

Start 3: set the time for third startup (3rd daily startup)

Start 4: set the time for fourth startup (4th daily startup)

Press ➡ to select Setting

Press ⬅ and choose the Timer menu

Press ➡ to select the Timer menu

Press ⬅ and chose parameter/timer

Press ➡ to switch adjustment on ⬆, new value can be chosen by pressing ⬆ or ⬆

Press ➡ to confirm

1.10 Parameter list

The list below shows the default values set from factory.

The menu “Weigh in menu” here it is possible to put in **kg/min** dependent on fire stock specifications.

Values set from factory in the program” Pel.”	
	Wood pellets Approx water-content 7%
Start	
Start Pulse [sek]	30
Soft start [min]	10
Stoker delay [min]	1
Operation	
O2 0% [%]	18
O2 100% [%]	8
O2 pkt.	30
O2 proc.	5
Stoker pulse [sec.]	*
Stoker term [sec.]	20
Factor [%]	35
Stop	
Stop blower above [%]	20
After run B. max. [sec.]	240
Kg/min. at max.	0,04



SECTION 2 – STARTUP AND OPERATION

2.1 Adjusting the clock

See section 1.10

2.2 Calibrating the oxygensensor

See section 1.4

2.3 To fill up the silo

If the boiler is new, or the silo has been emptied, new wood pellets need to be brought to the furnace, the silo auger needs to be full. Remove the hose from the burner, place a bag under the hose. Remove the plug for the silo auger under the burner, then connect it to an external 230v until pellets come out of the hose (3-5 minutes), then re-install the hose and plug on the burner.

2.4 Start

Press "Start". The boiler starts in Pause mode before the furnace starts the fire.

The startup procedure is not active before the parameters are correct.

2.5 Fire startup

The Blower fan starts up min. 30 sec. Before continuing to the next step.

When O₂-amount exceeds 20%, the boiler will run start pulse.

Now the fire startup procedure starts – the thermal igniter turns on and the blower starts up slowly.

When O₂-level goes under 18%, the boiler continues in soft start mode.

2.6 Soft start

"Soft start" procedure runs for 10 minutes. A cold boiler has limited work effect. This is the reason it takes 10 minutes to reach 100%.

After 10 minutes the boiler changes to "operate" and it will start automatic operation.

At first start up it is recommended to check the boiler after an hour.

In case the startup is "not succeeded," **and you need to open the boiler door be very cautious**, if specific conditions are present in the room, the flu gases (white smoke), can start burning. Open bypass, this will maximize the draft in the chimney.



(Eventually investigate section 3.4 Low Temperature. And section 3.6 High O2.)

2.7 Operation (modulation)

"Modulating operations" the controller regulates boiler effect from 30-100%, dependent on the actual heat use. The controller hereby always aims the wanted temperature, the wanted temperature is by default from factory set to 70°C. The blower runs modulation operation and regulates the amount of air. The air will periodically be reduced when the need for effect is below 100%. At higher effect the blower will run more. (by 100% the blower runs constant).

High heat use = high effect %

Small heat use = low effect % (or pause)

Sample of operationscontrol:

1. The boiler runs stable and remains a wanted boiler temperature at 70°C, the effect shown by the display is 45%.
2. The boiler water is cooled, through heat exchanger, when it heats up tap water (for example when water is taken in case of a shower).
3. The controller will register a drop in the boiler temperature below 70°C.
4. Because the controller registers this dropping boiler temperature, the effect shown by display now starts to deviate. The boiler now needs to "work" harder to keep the boiler temperature steady at 70°C.

THE EFFECT SHOWN BY THE DISPLAY HEREBY EXPRESS THE BOILERS" WORK"

2.8 Pause

If the controller, because of relatively low heat consumption, has adjusted the boiler effect below 30%, the furnace will turn into "Pause" mode.

The Furnace will restart when boiler temperature reduces to a few degrees under the set temperature.

If the furnace running starts/pause often, typically in the summer season, the flue gas temperature will be relatively low. This will often result that the flue gas having tendency to condense while flowing through the chimney, and hereby black soot will appear, - in worst case chimney can be damaged by corrosion. By using "bypass" adjusted to full open, this tendency can be reduced or eliminated, because flue gas is cooled the least possible through the boiler and flue gas temperature will keep chimney hot and dry.

For further (See section 2.11- Bypass)

2.9 Stop

Manual stop. By pressing "Stop" button the furnace stops.

Automatic stop. The Furnace automatically stops in case of error events.

All clinker and glowing leftovers need to be pushed or dragged out in fire box (the main chamber of the boiler), if the boiler needs to be stopped for a longer time (days).

If the furnace is stopped for a longer period (for example during summer season) the boiler hatch and silo- lid must be slightly open to avoid condensing (humid) in boiler and chimney.

2.10 Bypass (flue gas temperature bypass)

The effective flue gas cooler/water- heater do that the flue gas, at 100% work effect, is cooled to 120-130°C, before it goes from the boiler to chimney. The flue gas work effect always follows the effect of the furnace, i.e. low work effect = low flue gas temperature.

The handle at the boiler top (bypass) is used to adjust flue gas temperature compared to the boiler work effect needed. When the flue gas partly is passing by the cooler/water- heater in the boiler the work effect needs to be lower than specified installation, If the need of work effect is the highest according to specified installation (bypass) must be full closed and all flu gas is led through cooler/water- heater. (Se fig. 4)

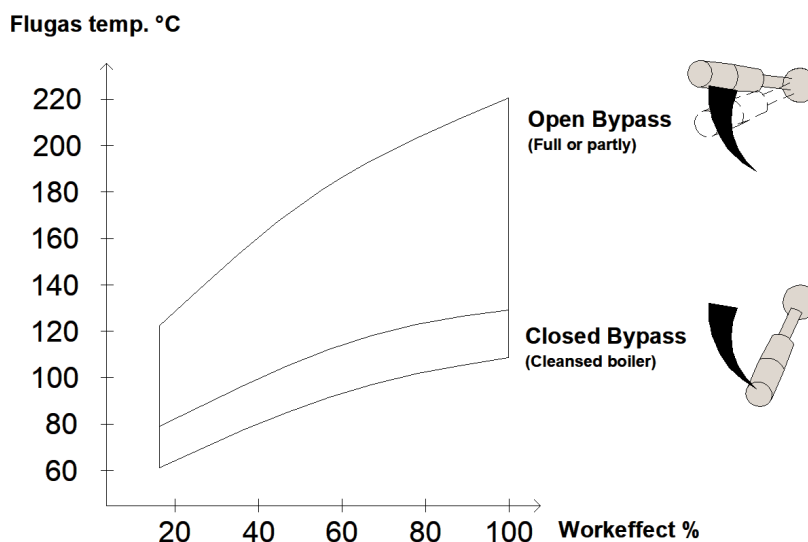


Fig. 4- Recommended flugas temperature according workeffect

If the work effect is less than 40-50%, which often will be main part of the time (season), it is recommended to open bypass and hereby raise the flu gas temperature enough. Now you will avoid the flue gas, leaving any condensates in the chimney. If doubt how to adjust a bypass, you are recommended to seek advice from a proper supervisor (i.e. chimney sweeper, or heating system technician).

(See eventually. section 2.9 Stand-by)

SECTION 3 – Troubleshooting

The controller display will show if an error occurs.

Low Temp. (start)

← **When the problem is solved, press the »START« button to remove the error message.**

► Temperature: 33,8 °C
O2 Auto: 20,9 %

Before the boiler is started up again after an error, it is needed to check if the error is corrected.

3.1 Error at startup

The wood pellets in the furnace don't burn, meaning O2 % is not reduced to below 18%.

Cause:

- Ignition hole clogged.
- The furnace has not received any wood pellets.
- The thermal igniter is defect
- False air appears in the boiler
- The Clinker- ejector is blocked
- O2 sensor covered by dirt, or defect
- Thermal igniter air supply blocked

3.2 Open boiler hatch

Cause:

- The boiler hatch is not closed correctly, or in fact fully open.

3.3 Error: Hot boiler

The boiler temperature has exceeded 95 °C and the over temperature thermostat has stopped the boiler.

The produced amount of heat could not be used in the heating system.

Cause:

- The need for heat is limited (typical for the summer season).
- There might be an air pocket in the system, no water circulation.
- The circulation pump does not function.

When the boiler temperature has been reduced to below 80 – 85 °C and the error has been removed, reset over temp. thermostat and restart the boiler.

Reset the over temp. thermostat by opening the small black plastic cover on the top of the boiler. Press gently a needle through the small reset point. Put the cover safe in place again.

If the wood pellets are still glowing in the burner tube, simply press »START« and the boiler will restart as described in section 2.4, soft start.

In case the fire has been extinguished, you must start the fire again as described in section 2.2 "Taking Wood pellets forward to the burner tube"

3.4 Low temp.

The boiler stopped because the boiler temperature has reduced more than 20°C below the adjusted value.

An error will occur if the boiler temperature has been set to 70 °C and the temperature has been under 50 °C for more than 10 minutes.

Cause:

- Empty wood pellet supply.
- A blocking has occurred in the wood pellet supply auger.
- The fire has been extinguished in the burner tube.
- The boiler has not been installed with a 3-way mixing valve, as described in the installation manual.

NOTE: "Low temp." is activated when the boiler temperature has declined to a temperature set, minus 20 °C, (i.e. when 50 °C has been reached by a setting of 70 °C).

If you still see glows in the burner tube, press »START« and the boiler will restart as described in Section 2.6, soft start. In case the fire has been extinguished, the fire must be started again as described in section 2.3 "Taking fuel forward to the burner tube."

Press »start«, and Boiler start up as described in chapter "2.6 Soft start".

3.5 Stoker stop

The controller measures how many amps the gearmotor consumes every time the stoker auger moves wood pellets forward. If the gearmotor consumption is too high, it is an indicator that the auger is stuck or has friction problem inside the auger channel.

Cause:

- Auger is blocked by an object i.e. stones.
- Burner tube is overfilled (see chapter 4.3 maintenance of burner)
- Defective capacitor

Press Start

3.6 High O₂

The furnace has stopped because oxygen -% (O₂) has been above 16% for more than 10 min. and the effect above 80%.

Cause:

- Silo is emptied and there are no wood pellets left.
- The fire has stopped burning.
- Wood pellets are not good (i.e. humid/wet) and cannot burn.
- The boiler takes false air in.

NOTICE: "High O₂." will only be detected when boiler is running in "modulated operation".

3.7 Lambda offs.

If the controller shows the error "Lambda offs." When the oxygen sensor is being calibrated it is because the measured oxygen -% (O₂) is measuring a level which is too far from 21% (clean air). The oxygen sensor can only be calibrated at levels from 17 to 25%. Eventually try to use the feature 'Recall all' before the oxygen sensor is calibrated.

Cause:

- Oxygen sensor is not in clean air
- Oxygen sensor needs to be cleaned. (Use a steel brush, carefully push out dirt from the small perforations in the sensor using a single hair from the steel brush.)
- Oxygen sensor is defect

3.8 Power loss (Brown out).

In a power loss situation related to the electric grid, the boiler starts up automatically when power is back.

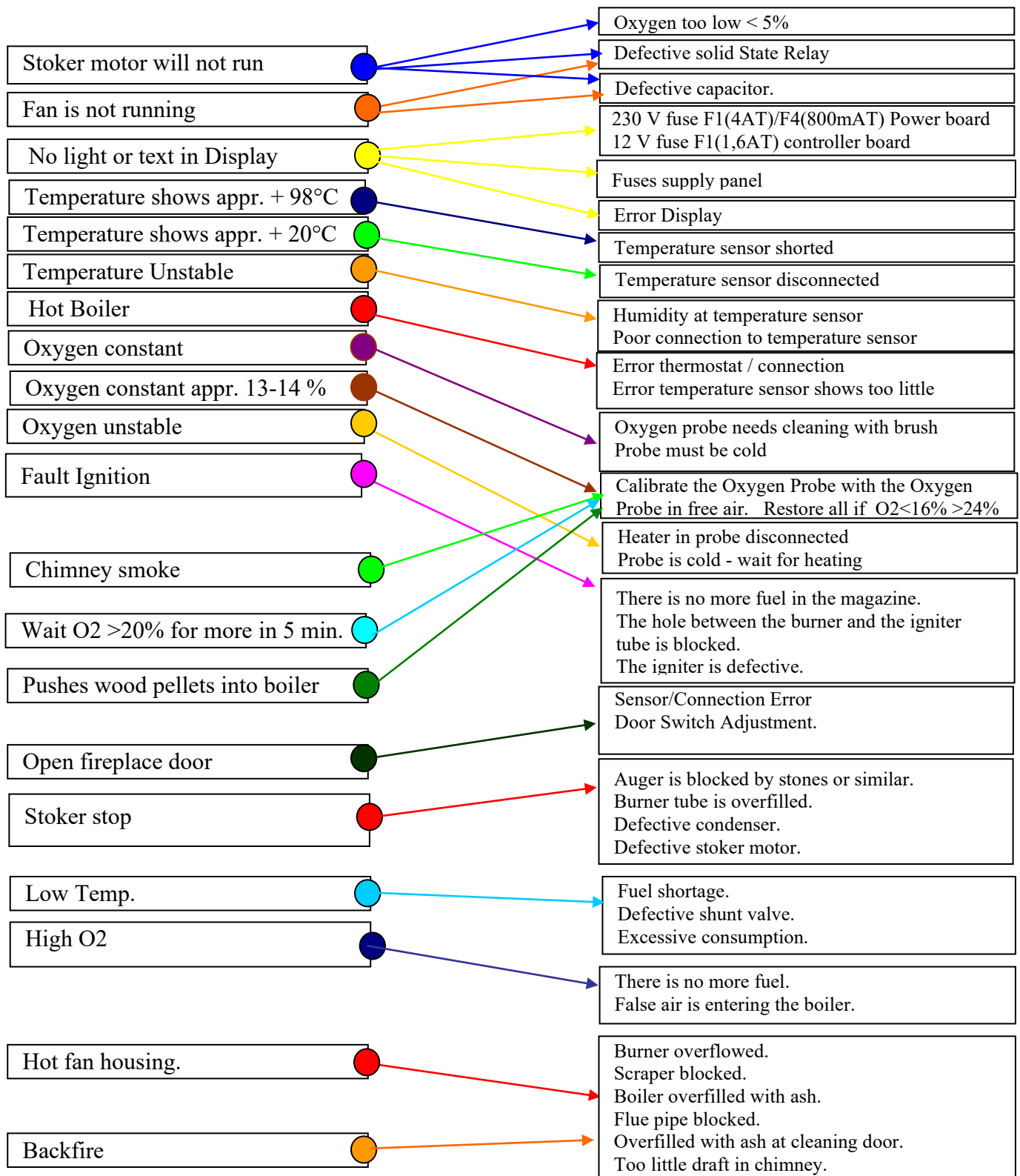
3.9 Blower house, High temp.

At too high temperature in the blower house, following needs to be checked:

Cause:

- Burner overflowed.
- Scraper blocked.
- Boiler overfilled with ash.
- Flue pipe blocked.
- Overfilled with ash at cleaning door.
- Too little draft in chimney.

3.10 Troubleshooting TH2006 controller





SECTION 4 – Maintenance

Regular maintenance of the furnace has a big impact for an effective and smooth operation, it also impacts the boiler operation life.

It is highly recommended to follow the procedures noted below.

4.1 Intervals of maintenance

The intervals noted below, which is recommended, are dependent on the quality of the fire stock and operation conditions.

DAYLY (SERVICE)

- Check that the furnace is operating as it supposed.
- Check the ash-level in front of the burner, remove eventually if needed.

WEEKLY (SERVICE)

- Check and remove clinker from Burner tube if needed.
- Check the heat circuit on the boiler contains enough liquid (use gauge of pressure as a reff.)
- Check the return temperature, it needs to be at least 60°C.
- Empty the boiler (firebox) for ash (when needed).

MONTHLY MAINTENANCE

- Check if the gasket (glass- rope) in the boiler hatch is intact or needs to be renewed.
- The heat surfaces of the boiler (firebox) need to be cleaned using the supplied tool.
- Check/ cleans the fire tube from clinker (also close by the stoker auger).
- Check/ cleans the hole between the burner and the igniter.
- The boiler flue gas box needs to be totally emptied for ash.
- Cleans flue gas tubes using the tube- cleanser- steel- brush.

YEARLY MAINTENANCE

- Check flue gas tube, from boiler into the chimney, has regular flow (no starting blocking).
- Clean the intake for the air supply blower and the ventilating blower's impeller.
- Unmount the burner tube and use a drill to restore the air perforations to not have any clinker.
- Re- tighten the bolts which keep the burner tube steady on the stoker auger channel.

IMPORTANT! At any kind of work/maintenance!
always cut the power to the controller box from the
grid/wall-power.

***It is recommended to get one yearly maintenance service don by
Twin Heat reseller / service technician!***

4.2 Boiler

The cleaning of the boiler and flue gas heat tubes need to be done via the hatch on the boiler's front. The tubes are cleansed when pulling and pushing the pipe- brush back and forward through each of the tubes. The ash and sod released from the tubes need to be pushed all the way to the flue gas box at the back of the boiler, this flue gas box needs to be emptied at the end of the cleaning.



The ash in the fire box needs to be emptied when it has accumulated and comes close to the burner tube.

The boiler needs cleaning before 2 mm of ash/sod has accumulated on the heat surfaces, the reason is that the deposited material acts as a not wanted insulation, that prevents the heat from transferring into the boiler water. A good advice is to keep an eye on the flue gas thermometer, when the flue gas temperature rises 30-40°C above what a new cleaned boilers flue gas temperature is, it is time to cleans the heat surfaces.

Note: Because the work effect and the flue gas temperature are dependent as mentioned in Chapter 2.10 'Bypass (flue gas temperature bypass)', the comparison is best done at the same work effect %.

If the furnace needs to be stopped for a longer period, (i.e. summer season), the boiler needs to be emptied totally from ash and to avoid corrosion inside the boiler, caused by condense (humid and water), it is important to leave the boiler hatch in the front slightly open for all this not in use period.

4.3 Burner tube

If the clinker becomes dense, the burner tube needs to be cleaned. The issue of highest priority is to keep the air perforations clear and open.

The cleaning is done by dismantling the burner tube and drilling out the clinker using a drilling machine and 5mm drill. (see fig. 5)

The stoker- auger needs to be able to deliver the wood pellets to the burner tube. Dense clinker will block the wood pellets entering the burner tube and cause an eventual stop of operation.

The clinker can be removed using the tool depicted in appendix 1.

Take care to thoroughly remove all clinker at the hot air inlet with the thermal igniter installed, don't push any of the clinker into it.

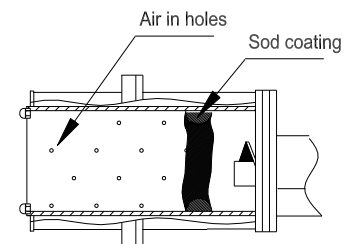
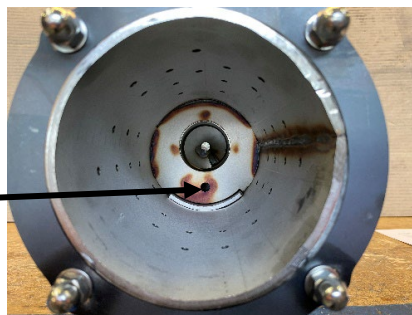


Fig. 5- Maintenance of the burner tube

Hot air in let for thermal igniter must be cleaned



(see the picture to the left).

SECTION 5 – Wood Pellet Quality

Wood pellets are made by pressing fine grinded wood through a matrice under high pressure adding steam. Pellets are produced in diameters between 3 and 25 mm. If they are over 25 mm, they are called briquettes. The pellets are cooled down and put through sieves to remove dust.

According to (*Danish*) notice no 638 regarding biomass you can only use clean wood such as sawdust, chips and grinding dust. Any added binding material may not change the character of the wood pellets from being biomass combustible. The basic material may contain maximum 1 % glue of approved types, but neither paint, plastic, metal, impregnating substance or the like. Pellets containing such material are defined as waste and should NOT be used in any furnaces.

How do I get good wood pellets?

The supplier must be able to issue a declaration, stating that the pellets are made of clean wood without any prohibited additives. Further the following should be checked.

- The pellets must smell as fresh wood.
- The smell coming through the combustion must be as from clean wood.
- The colour must be as wood without any traces of paint or the like.
- The specific weight must be OK.
- There should not be any kind of additives in the pellets.
- The amount of saw dust and the like should be very low.

How to control these preconditions?

Smell

Put a few handfuls of pellets into a plastic bag and smell the content. If the pellets smells from wood, they are OK. But remember, that some pellets are made of beech or oak which smells different than pine. The smell alone cannot define a good pellet.

Smell during combustion.

The smell from the flues must be as from wood combustion. If the flues smell differently, you should carefully check the pellets.

The colour

The pellets must be homogeneous and have a wood like colour. The colour can vary depending on the kind of wood used or if smaller amounts of finely grinded bark is mixed into the pellets (this is permissible). The exterior must be dark brown (caused by the heat during production). No particles, not looking like wood, should be visible, as this indicates pollution from paint, plastic, carpet or similar items.

The specific weight

The specific weight for wood pellets depends partly on how hard they were pressed, partly on moisture content (typically round 6 – 8 %) Due to the amount of air between pellets the specific weight is round 0,6 to 0,7 kg pr litre. But if you put a good pellet into a glass of water it should sink like a stone (due to the compression of the material).



Additives

If the pellets are produced without any binding materials, they will easily dissolve in water, when immersed. Try to put a few pellets into a glass of water. If they dissolve within a few minutes, the risk of unwanted binding material and the like is very low.

Dust

The content of dust between the pellets should be very low, as dust can be a real problem. It prevents the pellets from moving freely and adds to the risk of building bridges in the fuel store or in the auger. Good, clean pellets easily run down into the auger, whereas dust often remains in the lower part of a silo or the fuel store.

The dust originates from the production process, from the transport or from being blown into a silo. The pellets are considered OK, if the amount of dust is below 8 % at delivery. As dust is not homogeneous distributed between the pellets, it may be hard to check this figure, but you should use your best judgement to distinguish between "good pellets" and "not good pellets".

SECTION 6- TECHNICAL INFORMATION

6.1 Datasheet

Filled in according to test by the: "Danish Technological Institute"

Data Sheet
Automatic biofuelboiler
The energy labelling regulation (EU nr 2015/1187) and eco-design regulations (EU nr 2015/1189) do comprehend automatic biofuelboilers. The boiler types covered by data sheet demands, mentioned in Artikel 1 according to regulation 1187, appendix IV paragraph 1, <u>one</u> data sheet needs to be produced pr boiler. Information noted in the data sheet can be given either as an informative table, or as an energy label reproduction. If this solution is chosen, the information that represents pkt 1.1, and not present on the energy label, needs to be presented together with the energy label on the Data sheet.

Data sheet for Automatic biofuelboiler		
The type- indicator and model type of the boiler, including its derived variants.		Twin Heat TW-1
fuel		Wood pellets
Boiler class according to. EN303-5, 2012	-	Class 5
Nominal work effect	kW	13
Work effect range	kW	0 – 13
Fuel capacity of silo	liter	300
Nominal work effect during test	Hour	7,7
Flue gas temperature Nominal work effect	°C	124
Flue gas temperature at low work effect	°C	79
Flue gas flow at nominal work effect	kg/hour	24
Flue gas flow at low work effect	kg/hour	9
Electricity consumption at nominal work effect	W	103
Electricity consumption at low work effect	W	63
Electricity consumption at standby (pause)	W	19
Noise emission	dB	-

Necessary draft (chimney):	10 Pa
Size of flue gas exit:	Ø 129 mm
Boiler water- capacity:	74 litre
Water flow dynamic gain at temp. diff. 10°C, flow 0,5m³/h	3 mbar
Water flow dynamic gain at temp. diff. 20°C, flow 1,0m³/h	12 mbar
Adjustment range for boiler thermostat:	70 – 85°C
Minimum temperature of water- return:	60°C
Electric installation:	1 x 230 VAC + N + PE 50Hz 10A



Fuel specifications:

- Wood pellets (C1) size 6-8mm at water content $\leq 10\%$

The boiler is running a non-condensing operation. It uses combustion air supply blower and draft at flue gas exit.

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TW1 Burner

Temperature Fan
Housing

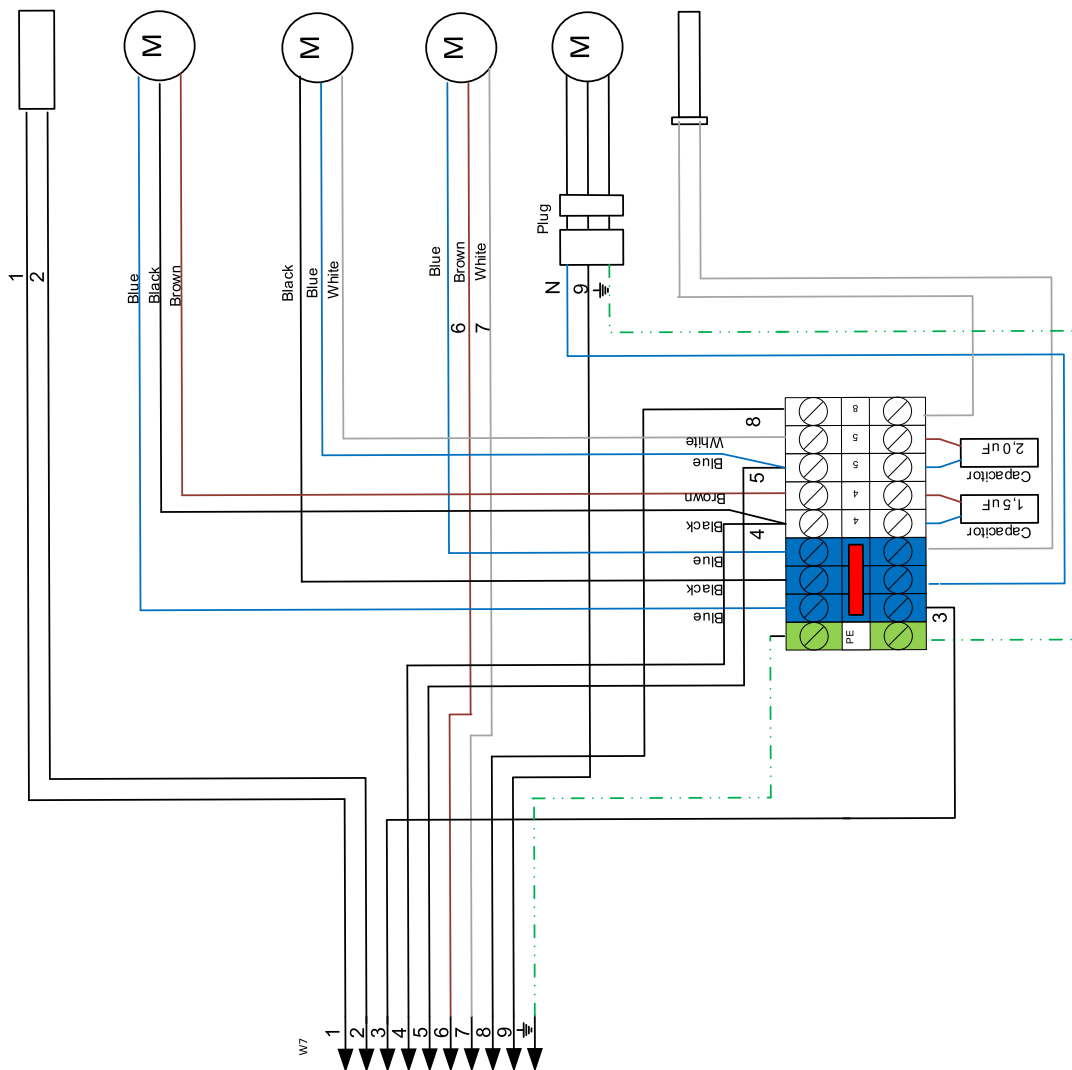
Fan Motor

Stoker auger

Clinker motor

Silo auger

Ceramic igniter

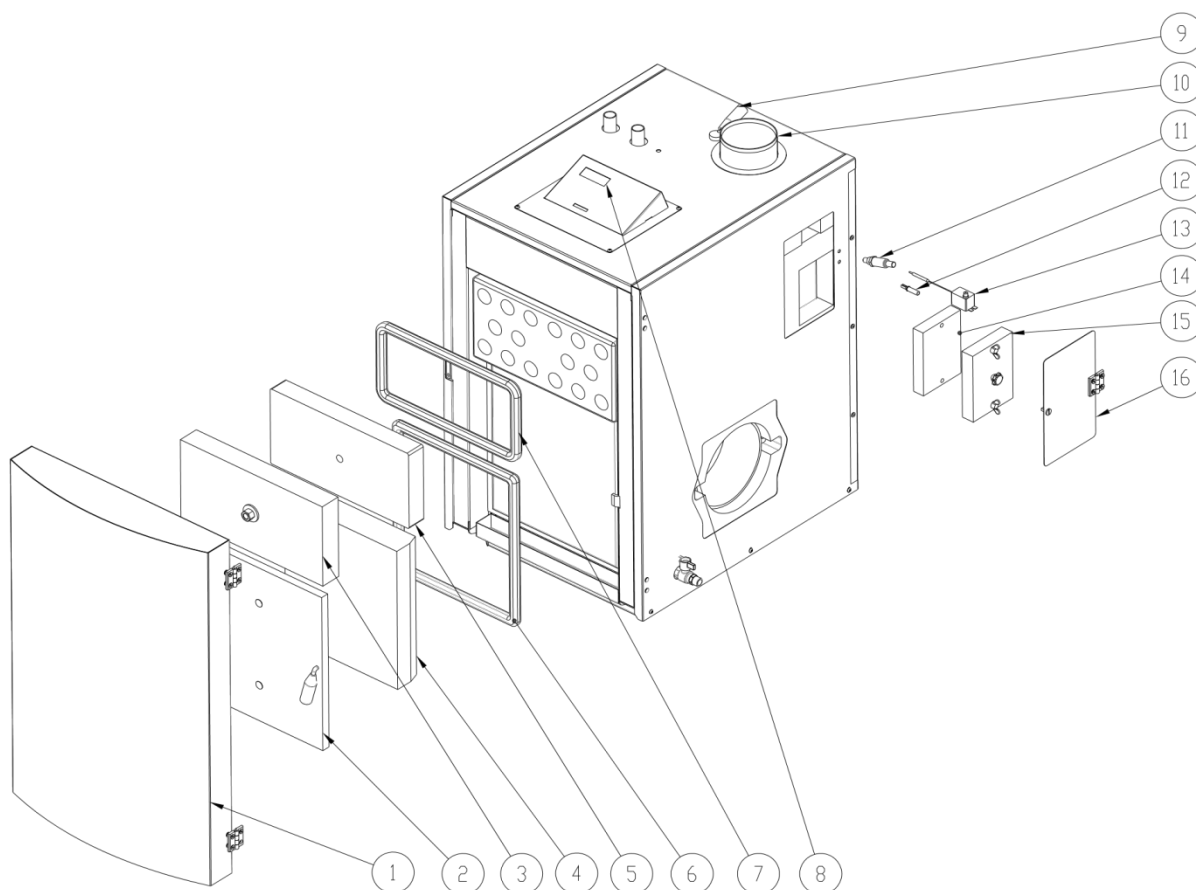


TW1	
Electrical Diagram	
TWIN HEAT	04.02.25 MM

SECTION 8- Spareparts

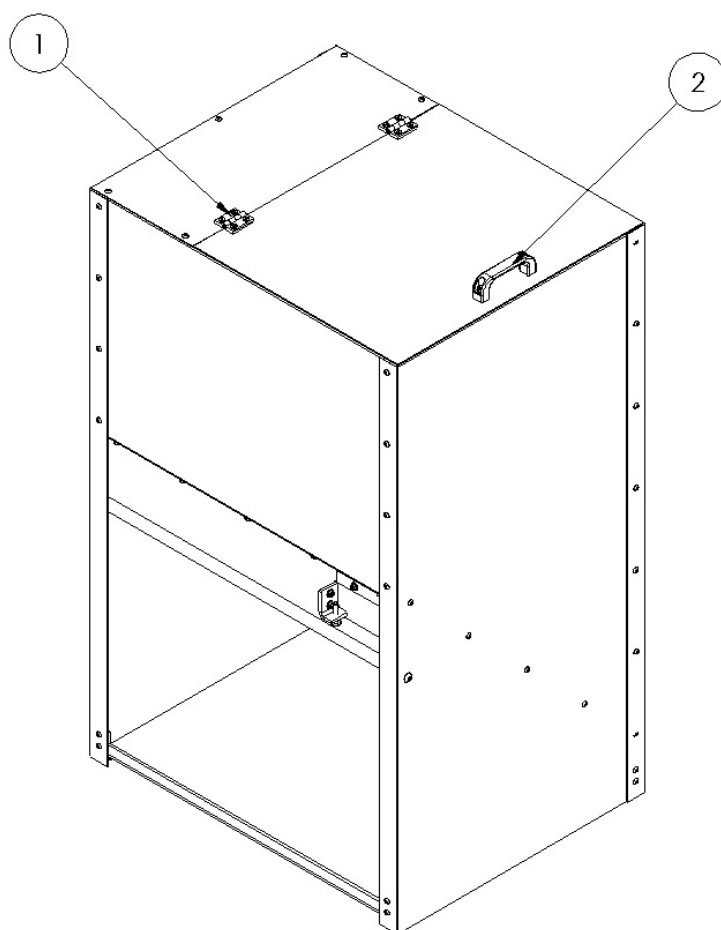
8.1 Boiler

Pos.	Res.nr.	Stk.	Benævnelse
1	1002792-00	1	(Frontlåge komplet) hatch, front complete
2	3103000-00	1	(Kedellåge komplet) hatch, boiler complete
3	3104000-00	1	(Renselåge komplet) hatch, cleansing complete
4	3103040-00	1	(Isolering for kedellåge) insulation, boiler hatch
5	3104020-00	1	(Isolering for renselåge) insulation, cleansing hatch
6	3100011-00	1	(Glassnor kedellåge) glass gasket, boiler hatch
7	3100021-00	1	(Glassnor renselåge) glass gasket, cleansing hatch
8	4000811-00	1	(Styring) controller
*	4000820-00	1	(Frontfolie Styring TH2006) foil front controller TH2006
*	4000825-00	1	(Display Styring TH2006) controller display TH2006
*	4000830-00	1	(Fladkabel Styring TH2006) flat cable controller TH2006
9	3101000-00	1	(By-pass spjæld (højre)) right bypass
*	3100999-00	1	(By-pass spjæld (venstre)) left bypass
10	1002812-00	1	(Røgafgang) flue gas exit
11	4001094-00	1	(Lampda sonde (O2-måler)) oxygen sensor
12	4001125-00	1	(Fremløbsføler) flow Thermo- sensor
13	4001160-00	1	(Overkogstermostat) thermo- valve (overheat)
14	3105020-00	1	(Isolering for rensedæksel) insulation, cleansing coverplate
15	3105000-00	1	(Rensedæksel komplet) cleansing coverplate complete
16	1002806-00	1	(Låge for rensedæksel) hatch for coverplate



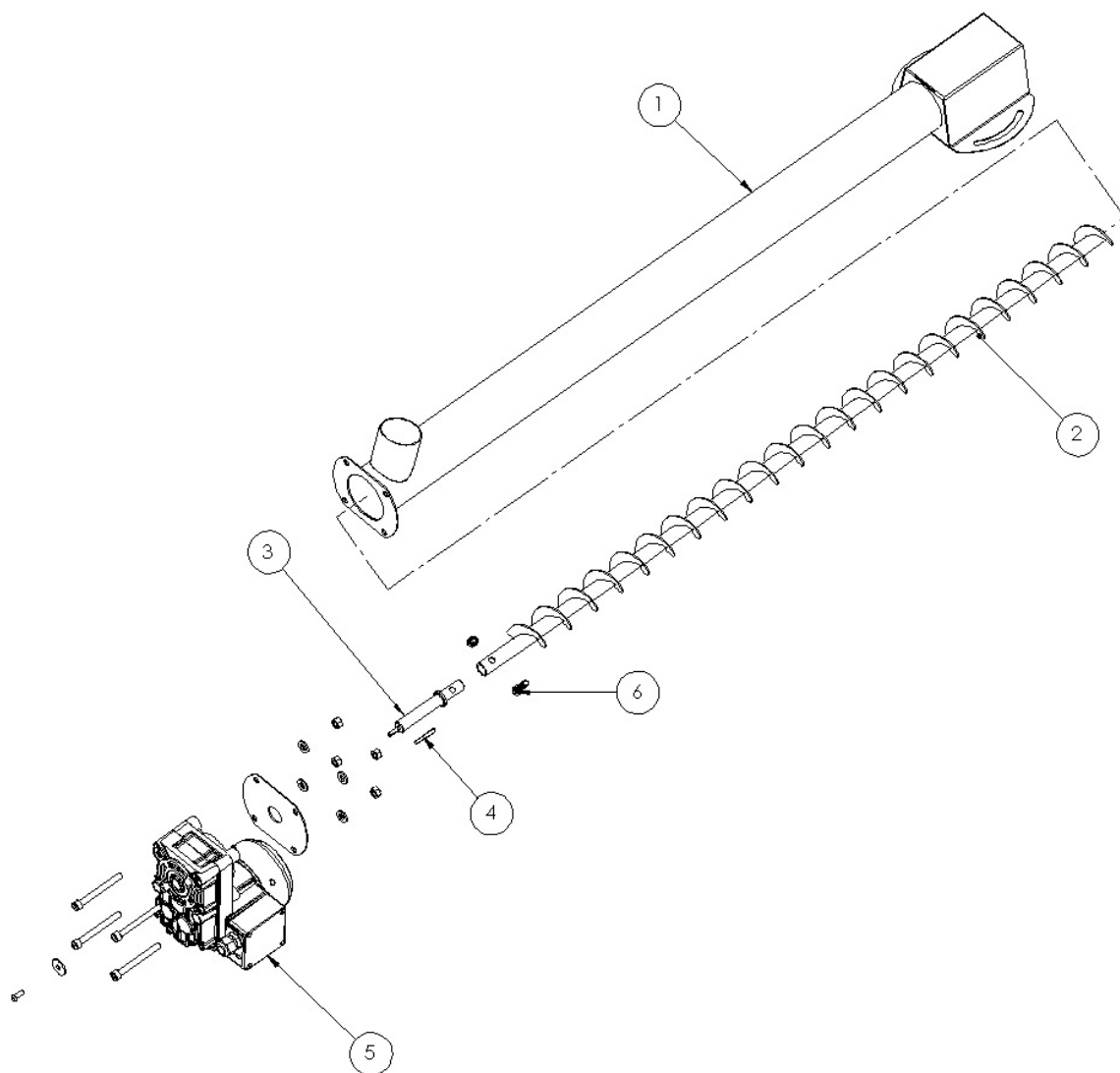
8.2 Silo

Pos.	Res.nr.	Stk.	Benævnelse
1	5400110-00	2	(HÆNGSEL SORT 50X50MM) black hinge 50x50mm
2	00404-00	1	(Håndtag) handle



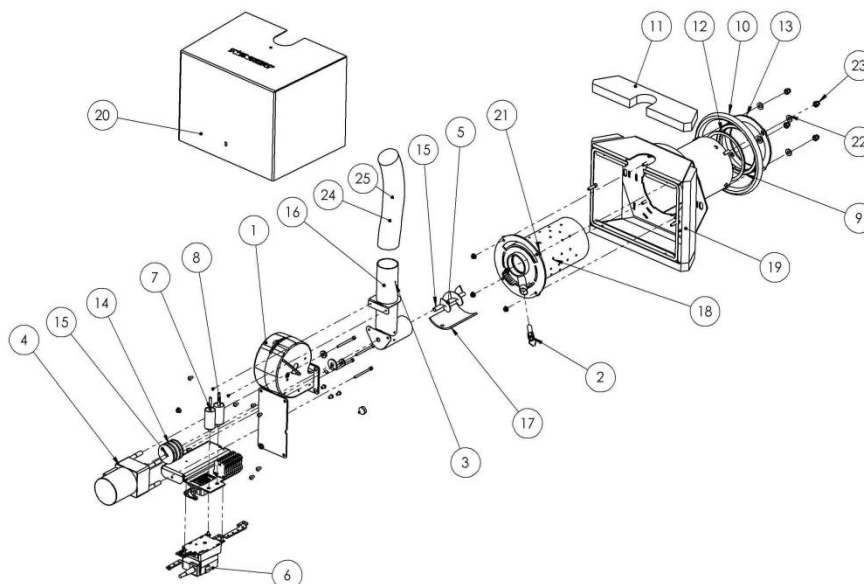
8.3 Auger

Pos.	Res.nr.	Stk.	Benævnelse
1	1002052-00	1	(Sneglør for stokersilo TW) TW auger tube, silo
2	1002056-00	1	(Snegl for TW stokersilo 300/400L) TW auger, silo 300/400L
3	1002060-00	1	(Aksel for snegl TW1 stokersilo) TW1 auger axel, silo
4	7000180-00	1	(Not 5x5x36) Feeder 5x5x36mm
5	4000310-00	1	(Gearmotor, fladgear f. TW 1 magasin snegl) spur gear motor, TW1 silo auger
6	6208832-00	1	(Bolt CH M8x30 8.8) 8.8 cylindric head bolt M8x30
*		1	(Komplet snegl med motor) complete augerunit including gear motor



8.4 Burner

Pos.	Res.nr.	Stk.	Benævnelse
1	4001108-00	1	(Blæser G2E 108 TW1) Blower G2E 108 TW1
2	4000920-00	1	(Gløderør keramisk) Thermal igniter
3	1002602-00	1	(Stokerkanals tempføler TW1) Thermo sensor, stoker channel TW1
4	4000312-00	1	(Gearmotor f. stokersnegl TW1) Stoker auger gearmotor TW1
5	1002586-00	1	(Stokersnegl TW1) Stoker auger TW1
6	4000587-00	1	(Actuator 60mm slaglængde Belimo) Belimo actuator 60mm stroke
7	4000121-00	1	(Kondensator 2uF, f. gearmotor) 2uF capasitor for gearmotor
8	4001109-00	1	(Kondensator 1,5uF, f blæsemotor) 1,5uF capasitor for blowermotor
9	1002590-00	1	(Brænderringspakning TW1) TW1 Burnertube gasket
10	2100051-00	1	(Koblingspakning Cpi12/ TW1) Attachment gasket Cpi12/TW1
11	1002598-00	1	(Isolering top, brænder TW1) Top insulation, burner TW1
12	1002556-00	1	(Anlægsring brænderrør TW1) Attachment ring burnertube TW1
13	1002558-00	1	(Frontflange brænderrør TW1) Front Flange burnertube TW1
14	1002580-00	1	(Alukobling f. stokersnegl TW1) Transm. element, stoker auger TW1
15	1002588-00	2	(Feeder 4x4x16 f. stokersnegl TW1) Feeder 4x4x16, stoker auger TW1
16	1002554-00	1	(Stokerkanal TW1) Stoker channel
17	1002568-00	1	(Skraberplade TW1) Scraperplate TW1
18	1002564-00	1	(Brænderrørs Ring TW1) Burnertube ring TW1
19	1002524-00	1	(Brændekappe TW1) Burner encapsulation TW1
20	1002544-00	1	(Afskærmning TW1) Shielding TW1
21	6200407-00	8	(Skive) Washer
22	6200409-00	4	(Skive) Washer
23	6200308-00	4	(Topmøtrik) Top nut
24	1001114-00	1	(Flexslange) Flex tube
25	1001115-00	1	(Flexslange) Flex tube



APPENDIX

Appendix 1 – Equipment supplied.



Brush for cleansing Ø38mm. With/ extension.



Angled Log Poker



Wrench/spanner



EF DECLARATION OF CONFORMITY
OVERENSSTEMMELSESERKLÆRING

Signing part, whom represents manufacturer:

Twinheat A/S
Nørrevangen 7, DK-9631 Gedsted

Declare hereby that the product:

TWIN HEAT Wood pellet boiler Type TW-1 for residential heating systems.

Is in accordance with legislation contained in the following EF directive/directives:

2006/42/EC	Machinery Safety Directive
2006/95/EC	Low Voltage Directive
97/23/EC	Pressure Equipment Directive
2004/108/EC	Electromagnetic Compatibility Directive

References to standards and/or technical specifications contained in this declaration of conformity, or dragged-out subparts:

Nr.	Udgave	Titel	Dele
60204-1	3.	Safety of machinery – Electrical equipment of machines - Part 1 – General requirements	Part 1
12100	2.	Safety of machinery - General principles for design	Part 2
14121-2	1.	Safety of machinery – Risk assessment Part 2	

- other standards and/or technical specifications:

Nr.	Udgave	Titel	Dele
BR10	24-08-2011	Bygningsreglementet – Installationer – BR10	Part 8

Gedsted 28-09-2021


CEO. Søren Vasegaard