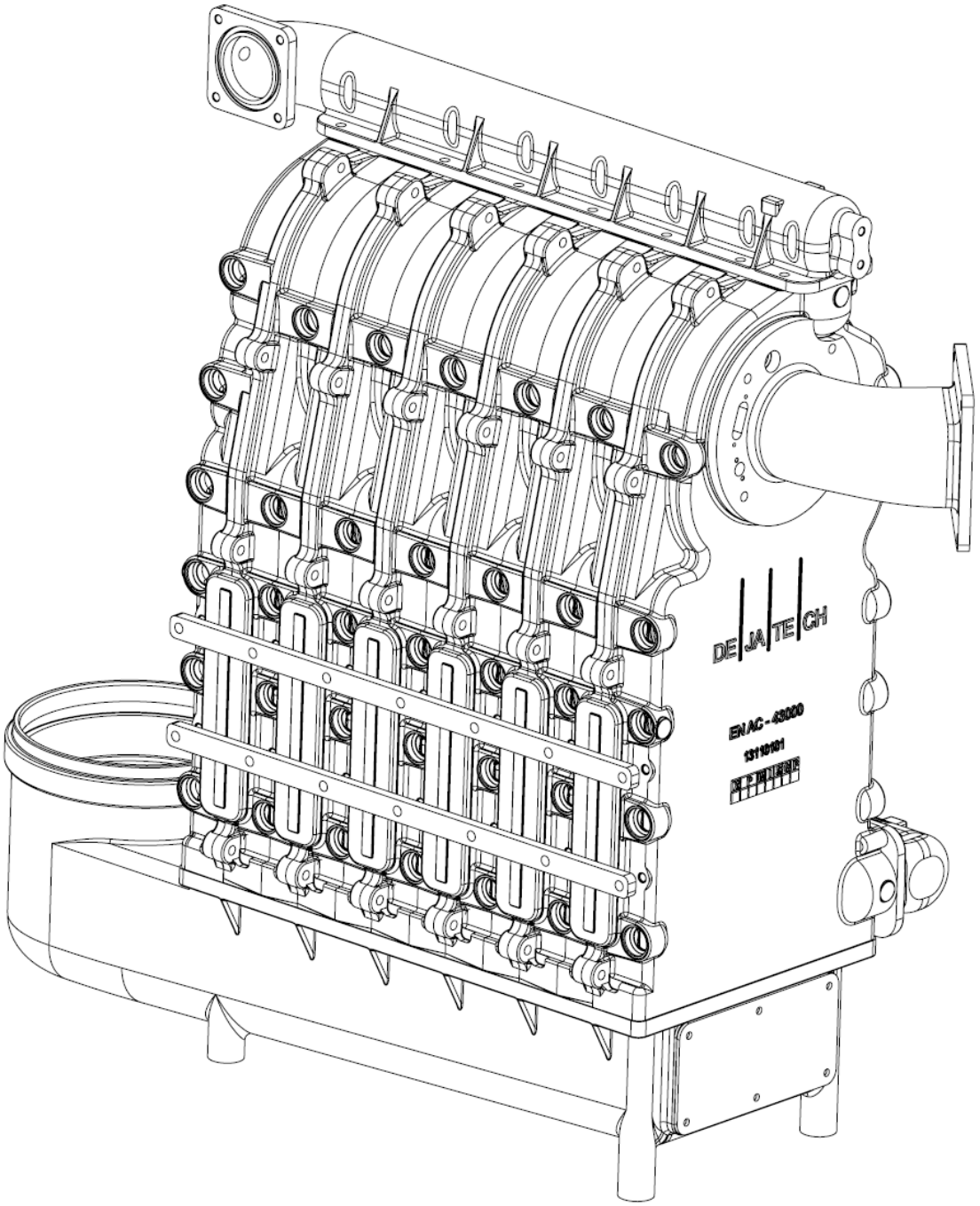
FLOORFLEX

Type 168-5
Type 210-6
Type 252-7
Type 294-8



INSTRUCTIONS FOR USER

If you have questions concerning the use of your CH installation, don't hesitate to ask your installer. It is in your own interest and that of the installer that you are aware of the functioning of your appliance.

The appliance is not to be used by children or persons with reduced physical, sensory or mental capabilities, or lack of experience and knowledge. Children, even if being supervised, must not play with the appliance

Operation
Water, coming from the radiators or from the DHW unit is heated in the aluminium heat exchanger. The CH or DHW pump quarantees circulation of water. The air needed for combustion is sucked in by a rpm controlled fan. At low boilertemperatures the fluegasses can be cooled down that far, that condens water occurs. This water is drained to the sewer via a built in syphon. This drainage may never be blocked. A burnercontroller with built in micro processor takes care of the electrical regulation of the boiler.

Topping up
The built in manometer indicates if the waterpressure is high enough. As soon as the waterpressure drops below 1 bar topping up is necessary. If topping up becomes necessary more times a year, your installation should be checked by an installer. Disconnect from the main. Connect the filling hose to the cold water tap and to the fill and drain cock of the boiler. Before tightning the coupling in the installation sowly fill the hose with water allowing present air to escape. Now open the fill and drain cock and slowly fill the installation till a pressure between 1.5 and 2.0 bar is reached. When finished connect again to the main.

De-airing
To get rid of air , present in radiators and boiler, de-airing is necessary. Disconnect from the main. Open all the radiatorcocks. De-air all the radiators starting with the ones on the lowest floor. After de-airing check the water pressure and eventually topp up (if waterpressure has dropped below 1 bar). Connect to the main again.

Putting into operation
Adjust the room thermostat to your desired setting. The boiler will start its startingprocedure.

Boiler flow temperature
The burnercontroller adjusts the flowtemperature between 20 ° and 85 °C. New setting of this temperature can be done with help of the buttons on the controlpanel. The installation manual provides the instructions for setting the flow temperature.

DHW temperature (if applicable)
Ex works the DHW temperature is set to a value of 60 °C. This set value can be changed into a value between 35 and 65 °C with help of the buttons on the control panel. If the DHW device has a thermostat the DHW temperature can be adjusted by setting this thermostat.

Switching off the boiler
During summer time the room thermostat can be set to a lower value if you don't want the boiler to operate. During winter or during a longer periode of absence this temperature never should be set to a lower value than 15 °C. **Don't** switch of the power. During a period of frost **all** the radiators should be partly or totally opened to avoid danger of freezing.

The integrated pump control wil activate the pump every 24 hours during a short period.
Only when work on the boiler is done the main may be switched off and the gas cock must be shut (let the installer show where it is located).

Errors

If an error occurs first check the following
- Is the room thermostat properly set?
- Is the boiler connected to the main? Power supply present?
- Is the gas cock opened?
- Are the radiator valves open?
- Is the waterpressure in the installation higher than 1 bar?
- Installation is de-aired thoroughly?

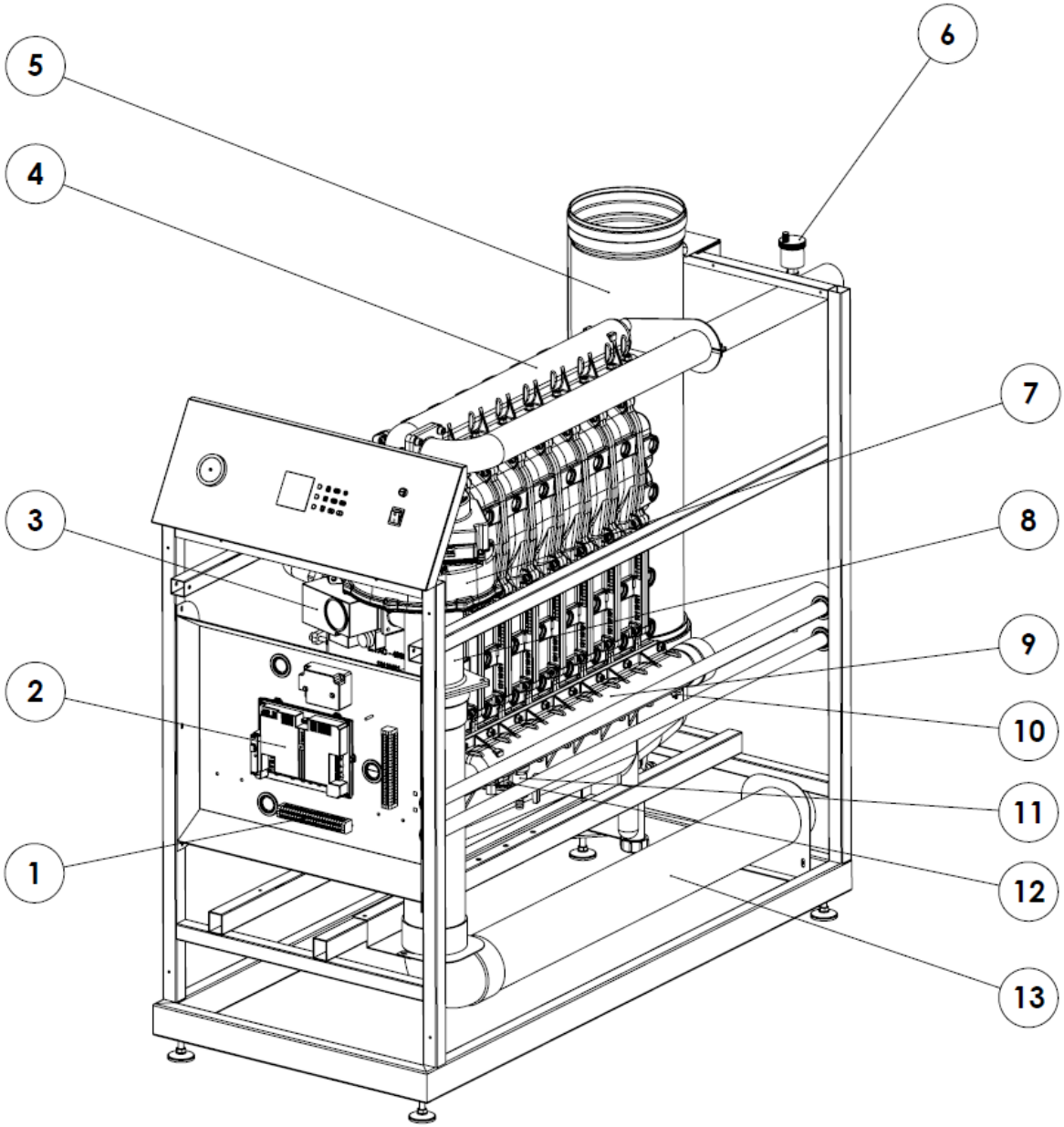
An error is indicated by a code on the display. It is very important for the sake of a correct diagnosis to mention this code when calling your installer. Reset the burnner controller by pressing the ok button on the control panel. If the error more often occurs contact your installer.

Maintenance
A yearly inspection of the boiler to be done by your installer is necessary. The life-time and the reliability of the installation are improved by doing so.The casing of the boiler can be cleaned with a soft cloth (no abrasives). Never use solvents like thinner!

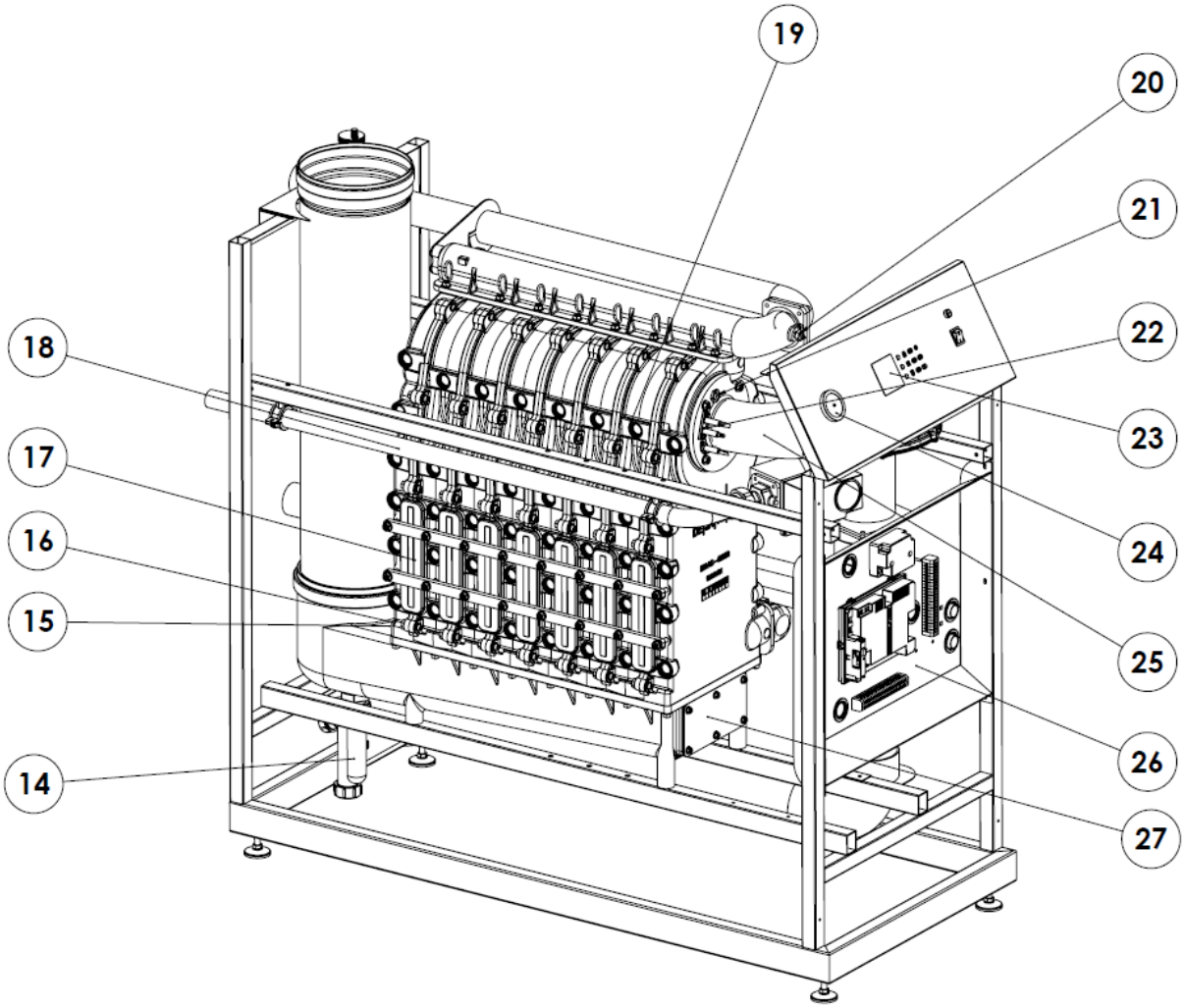
Take care
The air supply (for air needed for combustion) and the chimney parts are essential parts for well functioning of the boiler. Changes on these systems by non qualified persons are not allowed just like the settings of the gasvalve.The gas/air ratio is set to a lambda value of approximately 1.26. This corresponds with a CO_2 level of 9,3 % (full load).

For further information see installation manual.

1 DESCRIPTION BOILER



1	Terminal strip	11	Fill and drain cock
2	Boiler controller (Maxsys)	12	Water pressure sensor
3	Gasvalve	13	Air supply
4	Flow		
5	Fluegas out		
6	Auto air vent		
7	Fan		
8	Venturi		
9	Return		
10	Return NTC		



14	Syphon	21	Sight glass
15	Syphon pressure switch	22	Ignition and ionization electrode
16	Fluegas NTC	23	Display lcd
17	Inspection cover	24	Manometer
18	Gas pipe	25	Burnerhood
19	Overheat limiter Switch	26	Air pressure switch
20	Flow NTC	27	Sump inspection cover

2 TECHNICAL DATA

	Technical data FloorFlex series				
	168-5	210-6	252-7	294-8	
Central heating					
Nominal input max load (H_i)	168	210	252	290	kW
Nominal input min load (H_i)	33,6	42	50,4	58,8	kW
Nominal ouput max load 80-60 °C	163,6	204,5	245,4	282,5	kW
Nominal output min load 80-60°C	32,6	40,7	48,9	57	kW
Efficiency max load 80-60 °C (Hi)	97,4	97,4	97,4	97,4	%
Efficiency min load 80-60 °C (Hi)	97	97	97	97	%
Efficiency max load 50-30 °C (Hi)	102,8	102,8	102,8	102,8	%
Efficiency 30 % load 30 °C (return) (Hi)	107,5	107,5	107,5	107,5	%
Flue-gas					
Temperature flue-gas max load 80-60 °C	70-75	70-75	70-75	70-75	°C
Temperature flue-gas min load 80-60 °C	65-70	65-70	65-70	65-70	°C
Flow flue-gasses at max load G25	275	343	412	474	m^3/h
Flow flue-gasses at min load G25	55	69	83	96	m^3/h
Maximum flue-resistance	150	150	150	150	Pa
Emission CO (Gaskeur SV, n=1)	38	39	37	35	ppm
Emission NOx (Gaskeur SV, n=1)	29	29	29	29	ppm
Types B23,C13,C33,C53,C63	yes	yes	yes	yes	
Gas					
Also see 7.1					
Gasflow max load G25	20,2	25,2	30,3	34,9	m^3/h
Gasflow min load G25	4,04	5,05	6,05	7,06	m^3/h
Gasflow max load G20	17,4	21,8	26,2	30,2	m^3/h
Gasflow min load G20	3,49	4,36	5,23	6,1	m^3/h
CO_2 content max load G25/G20	9,3	9,3	9,3	9,3	%
CO_2 content min load G25/G20	9,1	9,1	9,1	9,1	%

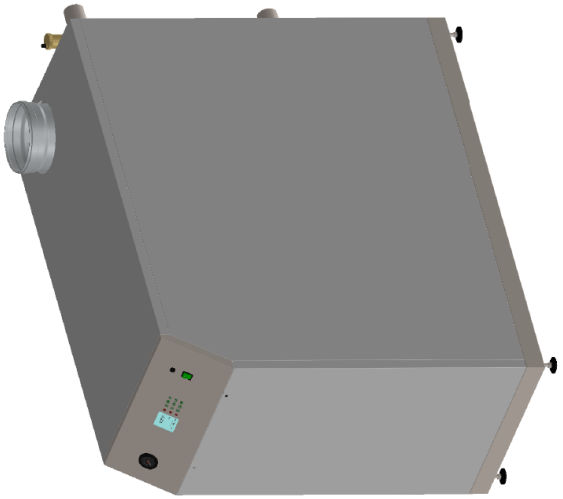
Water					
Maximum flow temperature	85	85	85	85	°C
Content heat-exchanger	16,9	21,3	24,7	30,2	ltr
Minimum/maximum operating pressure	0,8/6	0,8/6	0,8/6	0,8/6	bar
Hydraulic resistance (DT 20 nominal flow at full load 80-60 °C)	90	96	99	103	mbar
Maximum DT max load/min load	25/35	25/35	25/35	25/35	°C
Maximum waterflow	14,1	17,6	21,1	24,3	m^3/h
Weight					
Mass heat exchanger with manifolds and sump	82	99	116	133	kg
Total mass boiler	193	210	227	244	kg
Sizes of casing					
Width	602	602	602	602	mm
Depth including connections	1463	1463	1463	1463	mm
Depth without connections	1311	1311	1311	1311	mm
Height including feet and chimney connection	1307	1307	1307	1307	mm
Electrical					
Protection	00B	00B	00B	00B	IP
Supply life+neutral	230/50	230/50	230/50	230/50	V/Hz
Maximum power-consumption	1150	1150	1150	1150	W
Standby power-consumption	5	5	5	5	W
Fuse	5	5	5	5	A

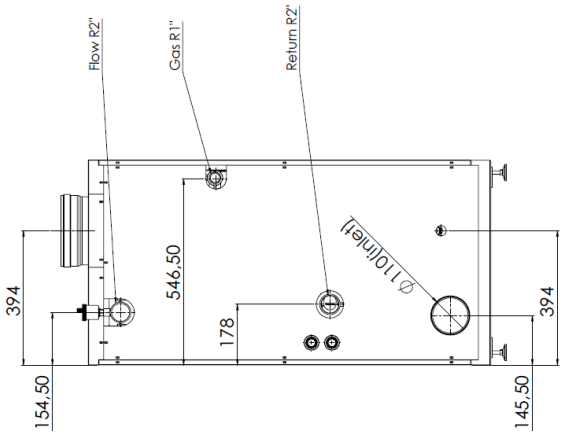
2.1 COMPONENT MATRIX

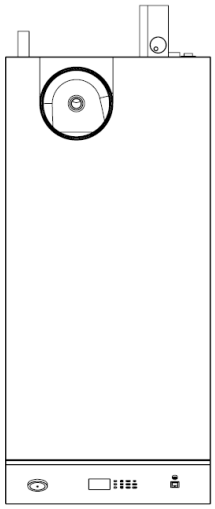
Overview of main components used in Floorflex-series ;

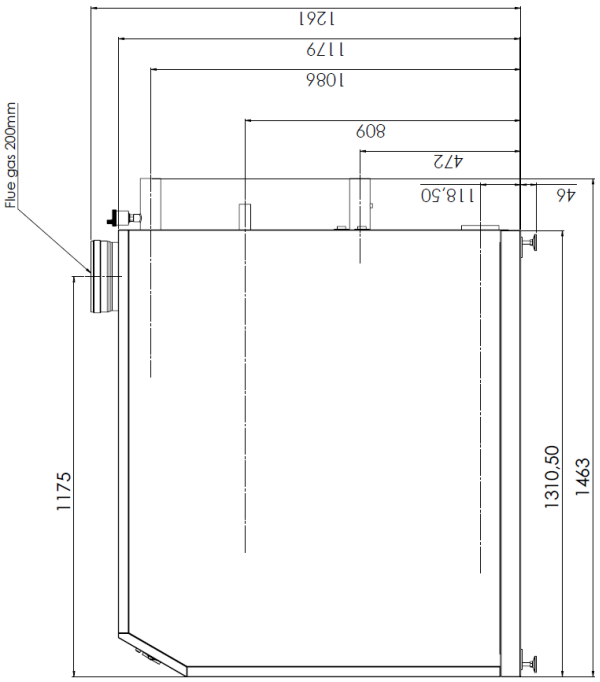
Part	168-5	210-6	252-7	294-8
Boiler control Honeywell Maxsys	S4966V2052	S4966V2052	S4966V2052	S4966V2052
Display (user interface)	DSP 49G2193	DSP 49G2193	DSP 49G2193	DSP 49G2193
Fan MVL 230 VAC	G1G170-AB31-42	G1G170-AB31-42	G1G170-AB31-42	G1G170-AB31-42
Gas-valve Honeywell 230 VAC	VR420VE5001-0000	VR425VE5022-0000	VR425VE5022-0000	VR425VE5022-0000
Venturi Honeywell	VMU185 A1009	VMU300A1004	VMU335A1000	VMU335A1000
Texi Burner round 128 mm Worgas	L=341	L=425	L=509	L=593
Silencer air-inlet	yes	yes	yes	no
Silencer flue-gas round 200 mm	yes	yes	yes	yes
NTC 12 k L=50	3	3	3	3
NTC 10 k OTC	optional	optional	optional	optional
Water low pressure device 1,6/0,8 bar	yes	yes	yes	yes
Pressure difference switch 40 Pa in and 25 Pa out	yes	yes	yes	yes
Syphon pressure difference switch 8,3 mbar out	yes	yes	yes	yes

3 DIMENSIONS

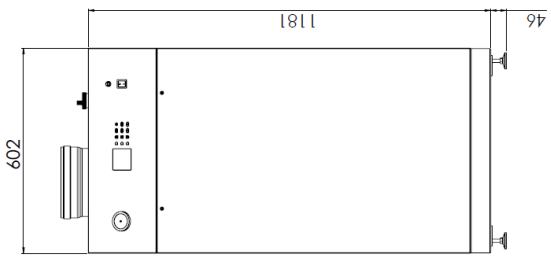








168-210-252-294



The appliance is not to be used by children or persons with reduced physical, sensory or mental capabilities, or lack of experience and knowledge. Children, even if being supervised, must not play with the appliance.

4 OPERATION

4.1 General

The Floorflex is a room sealed boiler, equipped with a cast aluminium heat-exchanger. During heat demand the pump is activated by the controller. After zero-check of the air pressure switch the fan speeds up to airflow-check fanspeed. Once the air pressure switch is closed the fan goes to ignition fanspeed (5 seconds pre-purge). The water pressure sensor, gas pressure switch and siphon pressure switch are checked. When all pressure switches are closed and the water pressure is ok, the ignition is released. The air needed for combustion is taken in from the outside by the fan. The air is transported through a gas/air mixing device creating an underpressure. This underpressure is an indication for the amount of air being transported. The underpressure is supplied to the gas-valve by an internal tube. The gasvalve automatically adjusts the right amount of gas that will be injected into the venturi and that will be mixed with the air-flow. This mixture is supplied to the burner.
The ignition and flame-control of the mixture is done by two separate electrodes each of them mounted on the burnerhood.
The temperature control and safeguarding is done with the use of NTC's. Data coming from these NTC's is processed by the controller (Maxsys) that takes care of control and safe-guarding of the boiler.

4.2 Central Heating (CH)

4.2.1 On-off room thermostat

As standard the boiler is programmed for using an on-off room thermostat. The room thermostat has to be connected to the pin nrs. 1 + 2 on the terminal strip. Open Therm will be recognized if connected on 1 + 2. The desired flow temperature is adjustable, but as standard is set to 85 °C.
At CH heat request from the roomthermostat (and no DHW heat request present) the CH-pump is activated after 10 seconds. The controller will adjust the burner-input in such a way that a flow-temperature of 85 °C towards the CH-circuit is achieved.

4.2.2 Optional 0-10V

Optionally the boiler can be programmed for using a 0-10Vdc signal. The DC signal has to be connected to pin nrs. 3 (negative 0 Vdc) and 4 (positive +) on terminal strip C2.
A short cut (wire) must be placed between the pin nrs. 1 and 2 of terminal strip C2.
In the technician menu , advanced CH settings , CH request either 0-10Vdc % or 0-10Vdc SP can be selected.

4.2.2.1 0-10Vdc % power control

A value between 2 and 10Vdc generates a CH power demand proportional to this value between 0 and 100% (0% = minimum load, 100% = nominal load). The heat demand is removed below 1 volt.
The setpoint of maximum flow temperature is set to 90°C.

In the user/technician menu , diagnostics, boiler information the actual voltage input and target power are being displayed.

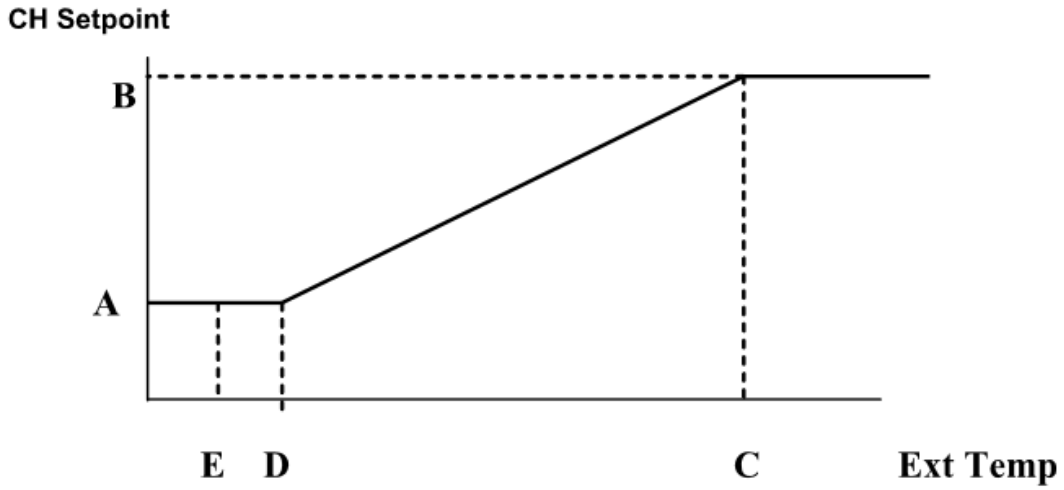
4.2.2.2 0-10Vdc Setpoint

A value between 2 and 10Vdc generates a CH setpoint demand proportional to this value between CH minimum flow temperature and maximum CH flow temperature.
The heat demand is removed below 1 volt.
The minimum and maximum CH flow temperature can be set in the technician menu, advanced CH settings, CH temperatures.
In the user/technician menu , diagnostics, boiler information the actual voltage input and boiler setpoint are being displayed.

Notice : Take care that the 0-10 V DC signal is disturbance free!

4.2.3 Outside Temperature Control OTC (optional)

The boiler is prepared to work with an outdoor sensor.
To get the controller working with an outdoor sensor, it is only necessary to connect the outdoor sensor to numbers 5 and 6 on the terminal strip C2. Pin numbers 1 and 2 have to be bridged by a wire. Alternatively those pin numbers (1 and 2) can be used for connecting room thermostat on/off. In the technician menu, advanced CH settings, CH request, OTC only must be selected. The outdoor sensor is then automatically detected by the controller. The parameters corresponding with A-E in the figure below can be set in the technician menu (advanced CH settings).



A OTC offset: minimum CH setpoint value
B OTC setpoint maximum: maximum CH setpoint value
C OTC weather cold: external temperature value at which the maximum CH value will be used.
D OTC weather warm: external temperature value at which the minimum CH value will be used
E OTC warm weather shutdown: external temperature value at which the CH demand will end

In the user menu an eco setpoint reduction (night reduction) can be set.
A day, week and weekend will also be available (on , eco off)

The outdoor sensor can be ordered at your supplier.

The sensor should be installed on the north-side of the building at a hight of approximately 2 meters.

Notice : The resistance of the outdoor NTC should be 12 kOhm at 25 °C.
Also see table of resistance for NTC's at 6.6.2

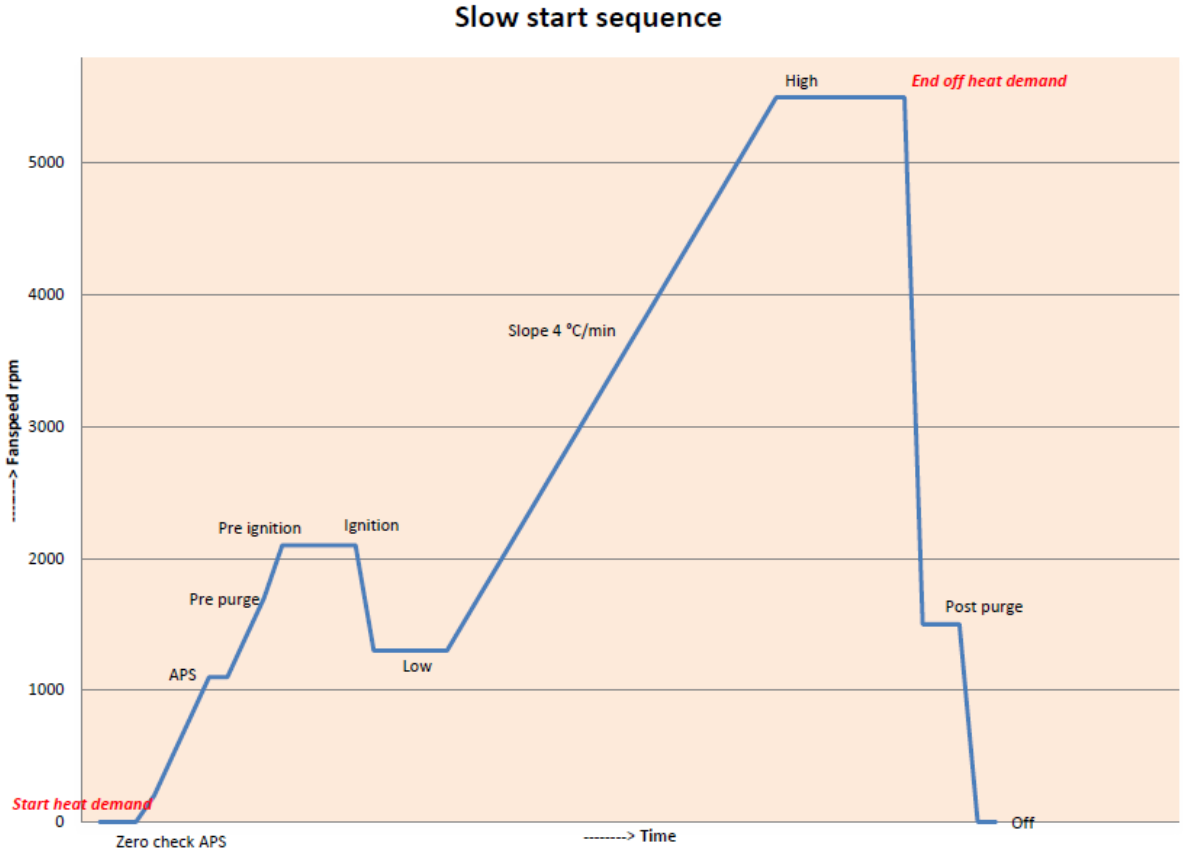
4.2.4 Optional digital communication

The boiler is also prepared for digital communication with room thermostats with Open-Therm communication protocols (automatically recognised if connected to pins 1 + 2 on terminal strip C2, also see 4.2.1.

.

4.2.5 Slow start

Standard setting of the boiler involves the “slow start” principle in order to avoid the boiler and installation to heat up too quickly.
After “zero check” APS and closure APS with pre purge ignition starts. After a stabilizations time the boilers modulates down to low capacity and stays there for 1 minute. Subsequently the boiler speeds up at a rate of 4 °C/min till set capacity or set temperature has been reached. Once heat demand has finished the boiler will stop after its set postpurge period.
Also see figure below ;



4.2.6 Protection against insufficient flow through boiler

The boiler should be protected against insufficient flow (also see 6.3.2). This is done by checking the difference in temperature between flow and return (so called ΔT).
If flow decreases the ΔT will rise. The ΔT safe-guarding principle is as follows ;
At ΔT > 22 the boiler starts modulating
At ΔT between 22 and 27 modulating
At ΔT > 27 boiler the rpm speed will be reduced until ΔT < 25

4.3 Domestic Hot Water preparation (DHW)

4.3.1 External storage tank

4.3.1.1 External storage tank with thermostat (hydraulic 3-way valve)*

As standard the DHW configuration is set to use storage tank + tank thermostat .

For hydraulic connection of an external storage tank to the boiler one should either use :

- the default configuration 2 pumps: 230 VAC DHW pump (terminal strip C1:6,7,8) and CH pump (terminal strip C1: 9,10,11)
- a hydraulic 3-way valve (terminal strip C1: 6,7,8)

The 2 wires of the tank thermostat need to be connected to numbers 7 and 8 on terminal strip C2.

In case of using a hydraulic 3-way valve adjust setting in technician menu, system settings, boiler parameters, number of pumps to: pump and 3-way valve.

4.3.1.2 External storage tank with thermostat (electric 3-way valve)*

As standard the DHW configuration is set to use storage tank + tank thermostat.

For hydraulic connection of an external storage tank to the boiler one should either use :

- the default configuration 2 pumps: 230 VAC DHW pump (terminal strip C1: 6,7,8) and CH pump (terminal strip C1: 9,10,11)
- an electric 3-way valve with a maximum travel time of 255 sec. (terminal strip C1: 6,7,8,9). At the end of the travel time in either direction DHW or CH the 230 VAC on the 3-way valve will be switched off.

The 2 wires of the tank thermostat need to be connected to numbers 7 and 8 on terminal strip C2.

In case of using an electric 3-way valve adjust the setting in the technician menu, system settings, boiler parameters, number of pumps to: pump and 3-way valve.

The 3-way valve travel time can be changed in the technician menu, system setting, boiler parameters, 3-way valve travel time.

4.3.2 External storage tank with NTC sensor

In case the storage tank is equipped with an NTC sensor, adjust setting in technician menu, advanced DHW settings, DHW request to sensor.
Notice : The resistance of the NTC sensor must have a value of 12 kOhm at 25 °C.
The 2 wires of the tank NTC sensor need to be connected to numbers 7 and 8 on terminal strip C2.
Heat request and keeping on temperature of the storage tank is done at an adjustable temperature (default set at 60°C,the flow temperature is DHW setpoint + 20K).
Notice : in case of a CH heat request, immediately after finishing the heat request for DHW, there is a chance of hot water flowing into the CH system (hot shot).

4.3.3 General behaviour with external storage tank (DHW priority)

Disabling warm water operation : press Summer-Winter button R2-C4(not active in main screen).

Enabling warm water operation : press Summer-Winter button R2-C4(active in main screen).

In the default boiler configuration, meaning 2 pumps (DHW and CH pump), a DHW request has priority over CH request

In the technician, advanced DHW settings, DHW priority, the DHW priority over CH can either be disabled or can be defined after how much time the DHW priority is ended. For the same amount of time CH can be served.

In case the DHW priority is disabled and both demands are active at the same, both pumps (CH and DHW) will be activated. During this time the flow temperature is set to either 80 °C (thermostat) or DHW setpoint + 20K (NTC sensor).

***The 3-way valve can either be a hydraulic valve or an electric valve. This is a OEM factory setting and CAN NOT be changed from the (technician) menu. The default setting is a hydraulic 3-way valve**

In case an electric 3-way valve should be the default one, please ask your OEM supplier for the correcty settings

Notice : At outputs ≥ 40 kW double separation between exchanging media is required.

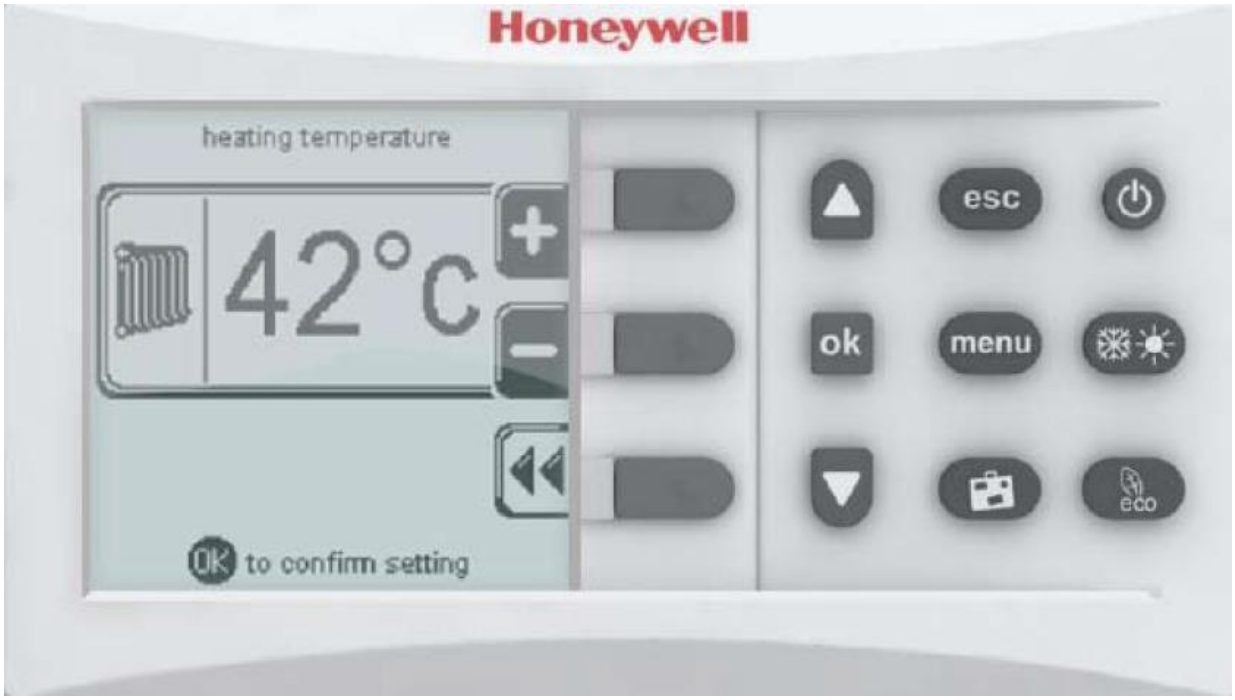
4.4 Cascade

For cascade application see appendix “cascade”

5 BOILER CONTROL

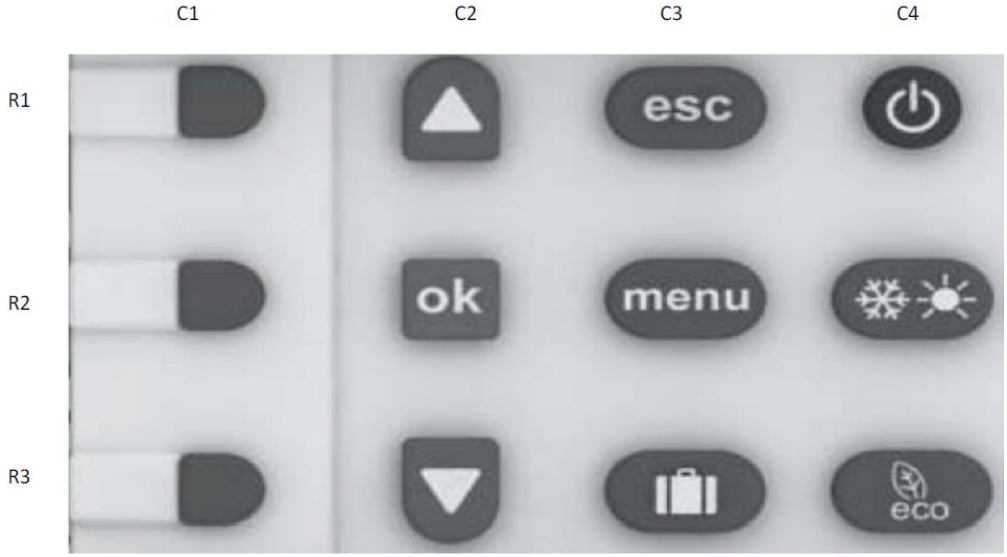
5.1 Control Panel

The control panel has 12 buttons and a display as shown in the figure below.



5.2 Push buttons on control panel

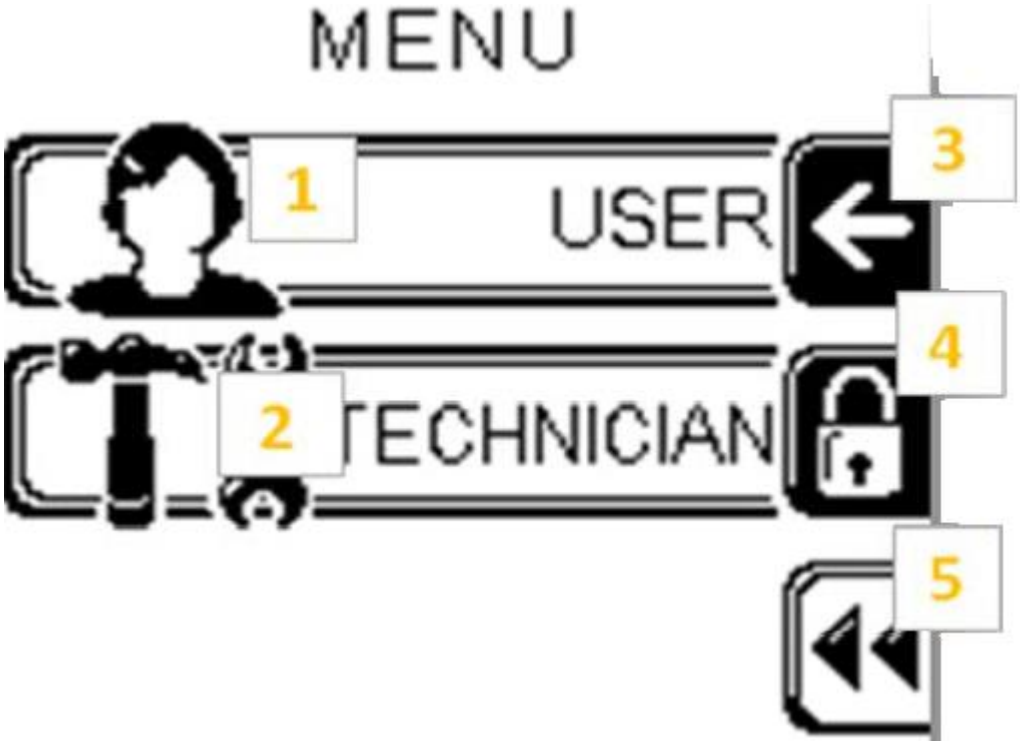
Description of push button use



R1-C1, R2-C1 and R3-C1(back) buttons follow, if pressed, the associated icon in the display (left)
R1-C2 and R3-C2 (up-down) buttons, scroll, if pressed, through the different menus
R2-C2 button confirms, if pressed, the highlighted selection, or confirms what is required by LCD
R1-C3 button (escape) returns, if pressed, to main screen
R1-C4 (on-off) button puts boiler in off mode, main logo and date/time stay displayed
R2-C3 (menu) button enables, if pressed, access to both user and installer menu
R2-C4 (summer-winter) button enables-disables, if pressed, CH and DHW in main screens
R3-C3 (holiday) button enables, if pressed, holiday function in main screens
R3-C4 (eco) enables, if pressed, eco function in main screens

5.3 User menu

By pressing the “menu-button” the display will show the text as given in the figure below.



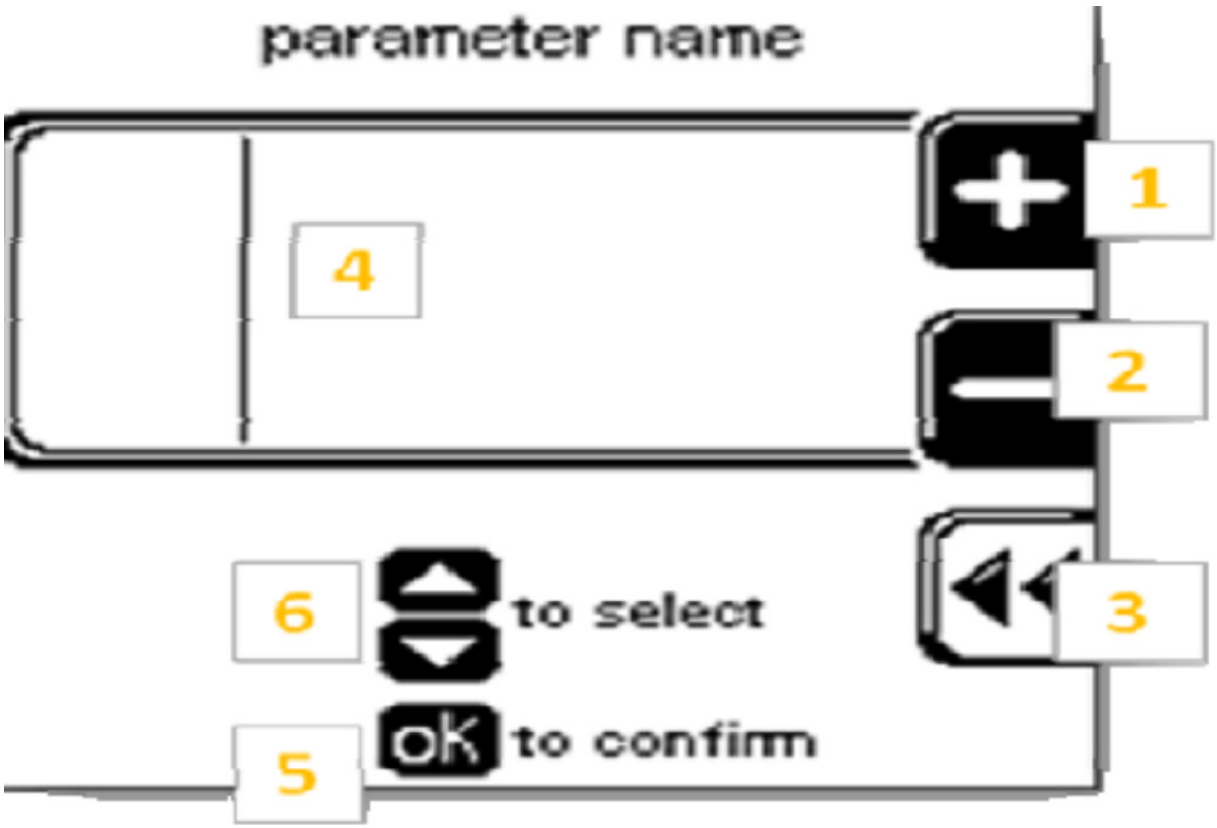
By pressing the button right to “3” (R1-C1 see 5.2) the user menu is accessed.
Pressing the button right to “5” (R3-C1 see 5.2) returns back to general indication.
By pressing the button right to “4” (R1-C2 see 5.2) the installer menu is accessed.
In the user menu the following possibilities will be shown :

1. HEATING
2. DOMESTIC HOT WATER
3. HOLIDAY
4. MAINTENANCE
5. SETTINGS
6. CHIMNEY-SWEEPER
7. DIAGNOSTICS

By pressing up and down (R1-C2 and R3-C2) 1 of the 6 options as shown above will be highlighted. By pressing the ok button (R2-C2) the chosen option will be confirmed. Once an option has been chosen it is possible to change the parameters corresponding with the chosen option

5.3.1 Parameter/value setting

By pressing up and down (R1-C2 and R3-C2) buttons the desired parameter will be highlighted. By pressing the ok button (R2-C2) the chosen parameter will be ready for changing
The figure as shown beneath will appear



The actual value can be changed by pressing the R1-C1 and R2-C1 buttons.
The changed value can be confirmed by pressing the ok (R2-C2) button
Pressing the back (R3-C1) button leaves the actual displayed parameter.
If there are more parameters shown in the parameter value area (4) the desired parameter can be selected by pressing the up and down ((R1-C2 and R3-C2) buttons.

5.3.2 Parameters accessible by user

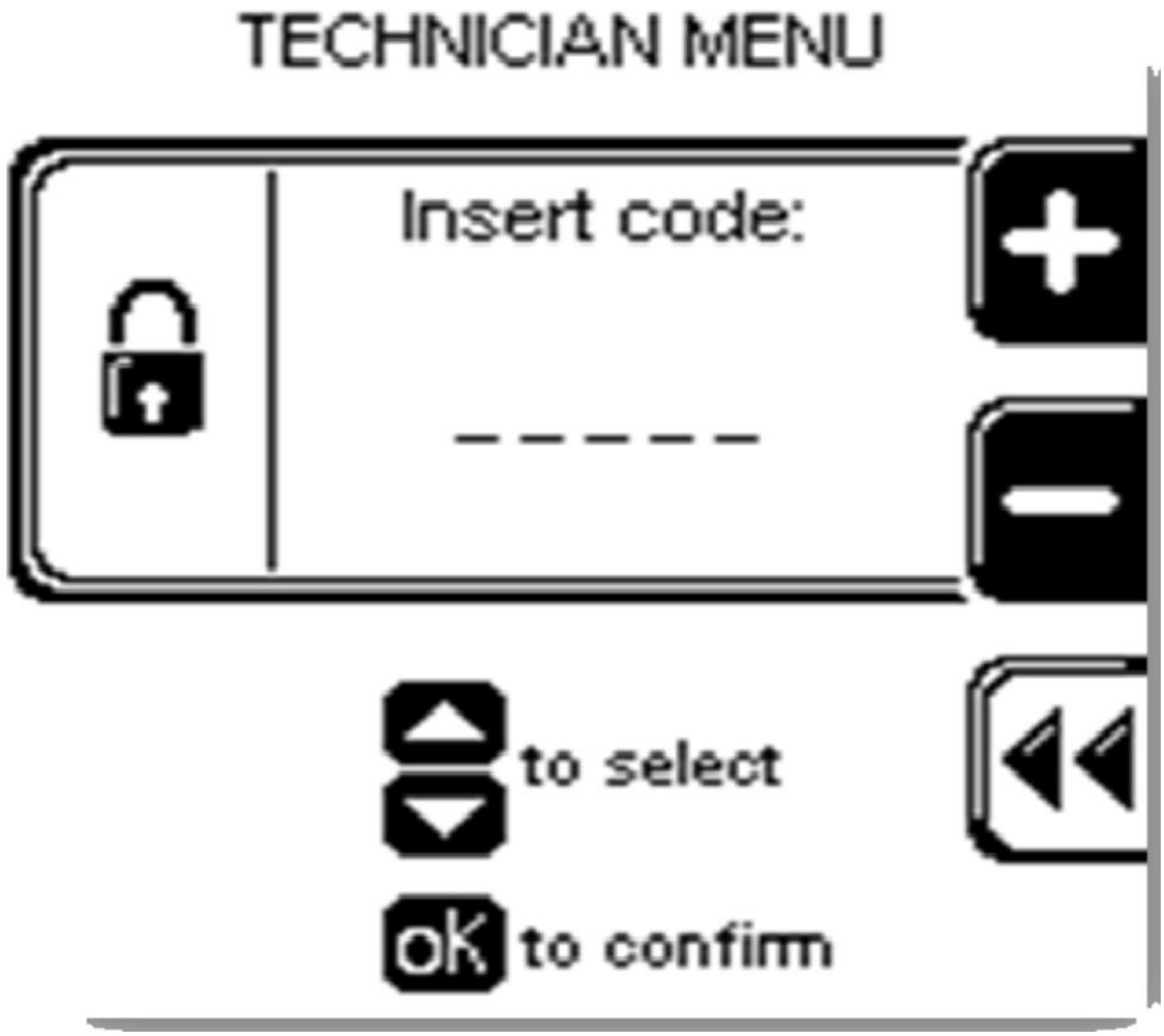
An overview of the parameters accessible by the user is given on the next pages

USER MNEU	SUBMENU 1	SUBMNEU 2	SUBMENU 3	SUBMENU 4	NOTES
1 Heating					Heating user settings
	1 CH temperature /OTC set				Set the CH temperature and OTC curve parameters
		1 CH setpoint			Adjust setpoint of CH circuit
		2 Outside temperature for CH off			Set the external temperature at which heat demand is removed . If set OFF, heat demand will never be removed.by controller (Only by removing RT or bridge between terminal strip C2:1,2)
	2 ECO setpoint reduction				Set the temperature that will be subtracted from the actual setpoint when ECO mode is activated
	3 Scheduler set				Invoke scheduler menu
		1 Enable/disable on board scheduler			Based on selection is possible to enable/disable on board scheduler
			Enable		Enable on board scheduler
			Disable		Disable on board scheduler
		2 Scheduler set			Select to set scheduler
			1 Monday 2 Tuesday 3 Wednesday 4 Thursday 5 Friday 6 Saturday 7 Sunday 8 Monday – Friday 9 Monday – Sunday 10 Saturday - Sunday		Used to program on board scheduler (On, Off , Eco)
2 Domestic hot water					Domestic hot water user settings
	1 DHW set point				Set the DHW temperature (in case of a DHW with sensor this is the actual DHW temperature, in case of DHW with thermostat this is the base boiler flow temperature)
	2 ECO set point reduction				Set the temperature that that will be subtracted from the actual setpoint when ECO mode is activated
	3 Scheduler set				Invoke scheduler menu
		1 Enable/disable on board scheduler			Based on selection possible to enable/disable DHW on board scheduler
			Enable		Enable on board scheduler
			Disable		Disable on board scheduler
		2 Scheduler set			Select to set scheduler
			1 Monday 2 Tuesday 3 Wednesday 4 Thursday 5 Friday 6 Saturday 7 Sunday 8 Monday – Friday 9 Monday – Sunday 10 Saturday - Sunday		Used to program on board scheduler (On, Off, Eco)
3 Holiday					Holiday temperatures settings

USER MNEU	SUBMENU 1	SUBMENU 2	SUBMENU 3	SUBMENU 4	NOTES
	1 CH holiday setpoint				Set CH temperature used when Holiday mode active
	2 DHW holiday setpoint				Set DHW temperature used during holiday mode
4 Maintenance					Set maintenance related info
	1 Service information				Used to display service company phone number or entered info
	2 Service due date				Show next service due date . When date expire a MSG is shown on lower part of main screen asking for service
5 Settings					Boiler option settings
	1 Select Language				Allow selection of a different language
		English			Select for English
		Italian			Select for Italian
		German			Select for German
		Russian			Select for Russian
	2 Select units				Allow selection of different unit
		Fahrenheit			Select for Fahrenheit
		Celsius			Select for Celsius
	3 Set date				Allow RTC date setting
	4 Set time				Allow RTC time set. When selected a screen asking for time format 24/12 Hours is opened. When selected appropriate format screens jump to time entering screen
		24 hours			Select for 24 hours clock
		12 hours			Select for 12 hours clock
6 Chimney sweeper					Manual mode. Hitting OK will force boiler to operate at % of power. Timeout 15 minutes. While test in progress navigating through other menus is allowed.
7 Diagnostics					Will display boiler usage information and errors
	1 Boiler information				Boiler information
		1 CH request 2 DHW demand 3 Firing rate 4 Flame ionization current 5 Boiler set point 6 Boiler supply temp 7 Return temperature 8 Flue temperature 9 Outdoor temp 10 DHW storage temp 11 Boiler fan speed 12 CH ignitions 13 CH runtime 14 DHW ignitions 15 DHW runtime 16 System pressure 17 Heat Exchanger Temp. 18 0-10V input 19 Target power			Will display the information shown in SUBMENU 2 When the line has a * at the end of the line means that hitting OK when the line is highlighted will open a graph that shows the latest 120 variable values stored every 12 minutes (24 hour history)
	Lockout history				Show a list of recent errors. Hitting OK on the highlighted error will open screens that contain details on boiler status when error occurred

5.4 Installer (technician) menu

If the button (R2-C1) right to “4” (see figure above is) is pressed the screen as given in the figure below will appear.



The installer (technician) access code is 231
+ - (R1-C1 and (R2-c1) buttons ared used to increment/decrement value
Up and down (R1-C2 and R3-C2) buttons are used to select character to be modified
ok (R2-C2) button confirms value

Once the menu is accessed by entering the code the following possibilities will be shown

1. ADVANCED CH SETTINGS
2. ADVANCED DHW SETTINGS
3. SYSTEM SETTINGS
4. DIAGNOSTICS
5. USER SETTINGS
6. CASCADE
7. RESTORE FACTORY SETTINGS

By pressing up and down (R1-C2 and R3-C2) 1 of the 7 options as shown above will be highlighted. By pressing the ok button (R2-C2) the chosen option will be confirmed.

By pressing up and down (R1-C2 and R3-C2) 1 of the 6 options as shown above will be highlighted. By pressing the ok button (R2-C2) the chosen option will be confirmed. Once an option has been chosen it is possible to change the parameters corresponding with the chosen option
See 5.3.1 for procedure of parameter change/setting.

5.4.1 Parameters accessible by installer (technician)

An overview of the parameters accessible by the installer (technician) is given on the next pages

TECHNICIAN MENU	SUBMENU 1	SUBMENU 2	SUBMENU 3	SUBMENU 4	NOTES
1 Advanced CH settings					Heating installer advanced settings
	1 CH power set				Set power of boiler in CH mode
		1 Maximum power			Set % of boiler maximum power in CH mode
		2 Minimum power			Set % of boiler minimum power in CH mode
	2 CH temperatures				Set (selecting OK) and show CH temperatures
		1 Absolute max temp			Set CH absolute max temperature (CH setpoint is limited by this parameter)
		2 CH maximum setpoint			Determine higher boundary of CH setpoint
		3 CH minimum setpoint			Determine lower boundary of CH setpoint
		4 CH setpoint hysteresis			Set CH setpoint hysteresis (temperature above setpoint at which boiler will be switched off)
	3 OTC parameters				Set the OTC parameters
		1 Outside temp for max CH			Define external temperature at which OTC will set maximum CH setpoint
		2 Outside temp for min CH			Define external temperature at which OTC will set the minimum CH setpoint
		3 Outside temp for CH off			Set the external temperature at which heat demand is removed . If set OFF heat demand will never be removed.by controller (Only by removing RT or bridge between terminal strip C2:1,2)
		4 OTC setpoint table			Show in a table the link between external temperature and actual setpoint determined by the OTC parameter selection
		5 OTC curve			Show in a curve the link between external temperature and actual setpoint determined by the OTC parameter selection
	4 CH pump settings				Set pump usage related parameters
		1 post pump time			Set the CH pump overrun time
	5 CH anti cycling timer				Set the ant cycling timer (minimum time between boiler goes off till next ignition)
	6 CH request type				Allow selection of different CH requests:
		Only OTC			Select OTC: outdoor Temperature controller
		Room Tstat			Select RT/OT: Room Thermostat or OpenTherm
		0-10V Signal [%]			Select 0-10Vdc input for Power mode
		0-10V Signal[SP]			Select 0-10Vdc input for setpoint mode
2 Advanced DHW settings					Domestic hot water advanced settings
	1 DHW power				Set power of boiler in DHW mode
		1 Maximum power			Set % of boiler maximum power in DHW mode
		2 Minimum power			Set % of boiler minimum power in DHW mode
	2 DHW temperatures				Set (selecting OK) and show DHW temperatures
		1 Storage temperature setpoint			Set Flow temperature during DHW mode when DHW done via a thermostat (Switch)
		2 Boiler temperature set point			Set DHW temperature setpoint when DHW done with temperature sensor

TECHNICIAN MENU	SUBMENU 1	SUBMENU 2	SUBMENU 3	SUBMENU 4	NOTES
		3 DHW set point hysteresis			Set DHW setpoint hysteresis. (temperature below setpoint at which the boiler will be switched on)
	3 DHW pump settings				Define pump usage in DHW mode
		DHW post pump time			Set the DHW pump overrun time added to the prefixed time of 3 minute.
	4 DHW priority				Define DHW priority over CH
		1 DHW priority status			Enable /disable DHW priority over CH
			Enabled		Enable
			Disabled		Disable
		2 DHW priority timeout			Define after how much time DHW priority is ended. (CH can be served if present for the same amount of time).
			Off		Select for no timeout (While DHW priority status is enabled)
			minutes		Set timeout in minutes. (While DHW priority status is enabled)
	5 DHW request type				Define DHW request switch or sensor
		Switch			DHW start when DHW thermostat closes
		Sensor			DHW start based on required vs actual DHW temperature
3 System setting					Boiler and system parameters
	1 Boiler parameters				Boiler related parameters
		1 Ignition power			Set power % used when igniting burner
		2 Delay siphon check			Delay time to validate a syphon error
		3 Number of boiler pump			Define Pump and 3-way valve or 2 pumps
			Pump and 3WayValve		System with pump and 3-way valve
			Two pumps		System with 2 pumps (DHW and CH)
		4 Pump speed max			Maximum % of PWM pump speed
		5 Pump speed min			Minimum % of PWM pump speed
		6 Antilegionella			Based on selection possible to enable/disable Antilegionella protection
			Enabled		Enable Antilegionella protection
			Disabled		Disable Antilegionella protection
		7 Modbus parameters			Set Modbus parameters
			Address		Set address default: 1
			Baudrate		Set baudrate default: 38400 bps
			Frame		Set frame 8N!
		8 3 Way valve travel time			Select for setting travel time 3WV in seconds. Only for electric valve not hydraulic valve. Type of valve is an OEM setting cannot be changed

TECHNICIAN MENU	SUBMENU 1	SUBMENU 2	SUBMENU 3	SUBMENU 4	NOTES
			seconds		Set travel time 3Wv (DHW ←→ CH)
	2 User interface settings				
		1 Select language			Allow selection of a different language
			English		Select for English
			Italian		Select for Italian
			German		Select for German
			Russian		Select for Russian
		2 Select unites			Allow selection of different unit
			Fahrenheit		Select for Fahrenheit
			Celsius		Select for English
		3 Set date			Set system date
		4 Set time			Set system time
	3 Service settings				Service information
		1 Service information			Used to insert service company phone number (selection done as per technician password enter)
		2 service due date			Next service due date (input done as per date entering)
4 Diagnostics					Boiler information and lockout history
	1 Boiler information				Boiler information
		1 CH request 2 DHW demand 3 Firing rate 4 Flame ionization current 5 Boiler setpoint 6 Boiler supply temperature 7 Return temperature 8 Flue temperature 9 Outdoor temperature 10 DHW storage temperature 11 Boiler fan speed 12 CH ignitions 13 CH runtime 14 DHW ignitions 15 DHW runtime 16 System pressure 17 Heat Exchanger Temp. 18 0-10V input 19 Target power			Will display the information shown in SUBMENU 2 When the line has a * at the end of the line means that hitting OK when the line is highlighted will open a graph that shows the latest 120 variable values stored every 12 minutes (24 hour history)
	2 Lockout history				Shows the list of recent errors. Hitting OK on the highlighted error will open new screen that contains details of the boiler status when the error occurred.
	3 Manuel test				See chimney sweeper.
5 User settings					Access the user settings from the advanced menu.
	1 Heating				Heating user settings
		1 CH temperature/ OTC set			Set the CH temperature and OTC curve parameters
			1 CH set point		Adjust setpoint of CH circuit

TECHNICIAN MENU	SUBMENU 1	SUBMENU 2	SUBMENU 3	SUBMENU 4	NOTES
			2 Outside temperature for CH off		Set the external temperature at which Heat demand is removed .
		2 ECO set point reduction			Set the temperature that will be subtracted from the actual setpoint when ECO mode is activated
		3 Scheduler set			Invoke scheduler menu
			1 Enable/disable on board scheduler		Based on selection is possible to enable/disable on board scheduler
				Enable	Enable on board scheduler
				Disable	Disable on board scheduler
			2 Scheduler set		Select to set scheduler
				1 Monday 2 Tuesday 3 Wednesday 4 Thursday 5 Friday 6 Saturday 7 Sunday 8 Monday – Friday 9 Monday – Sunday 10 Saturday - Sunday	Used to program on board scheduler
	2 Domestic hot water				Domestic hot water user settings
		1 DHW set point			Set the DHW temperature (in case of a DHW with sensor this is the actual DHW temperature, in case of DHW with thermostat this is the base boiler flow temperature)
		2 ECO set point reduction			Invoke scheduler menu
		3 Scheduler set			Invoke scheduler menu
			1 Enable/disable on board scheduler		Based on selection is possible to enable/disable on board scheduler
				Enable	Enable on board scheduler
				Disable	Disable on board scheduler
			2 Scheduler set		Select to set scheduler

TECHNICIAN MENU	SUBMENU 1	SUBMENU 2	SUBMENU 3	SUBMENU 4	NOTES
				1 Monday 2 Tuesday 3 Wednesday 4 Thursday 5 Friday 6 Saturday 7 Sunday 8 Monday – Friday 9 Monday – Sunday 10 Saturday - Sunday	Used to program on board scheduler
	3 Holiday				Holiday temperatures settings
		1 CH holiday setpoint			Set CH temperature used when Holiday active
		2 DHW holiday setpoint			Set DHW temperature used during holiday mode
6 Cascade					Access to cascade information and settings
	1 Cascade set				Cascade related parameters
		1 cascade switch delay			Delay between switching on and of different boilers
		2 cascade min power			Minimum power of boilers in cascade
		3 Single Burner power			Max power of SINGLE boiler in cascade
		4 Boiler for DHW			Number of boilers assigned to DHW
		5 PI loop period			Base time for PI loop calculation
		6 Burner water flow delay			Water propagation time delay.
		7 Different boiler size			Heterogeneous mode with 2 power groups DHW+ CH /CH only
			Disabled		Disable Heterogeneous mode
			Enabled		Enable Heterogeneous mode
		8 Cascade pump speed max			Cascade pump full speed
		9 Cascade pump min speed			Cascade pump min speed
	2 Cascade info				Cascade related info
		1 Cascade role			Role of boiler in cascade mode= MASTER, SLAVE, TERMINAL SLAVE. If not in cascade mode : STANDALONE
		2 System temperature *			Cascade temperature value. Hitting OK when highlighted will open graph that shows the latest 120 variable values stored every 12 minutes (over the past 24 hours). Samples will not be averaged over the 12 minutes period.
		3 Numbers of burners on			Number of burners that are switched on
		4 Number of burners			Number of burner in cascade
		5 Modulation level			Actual percentage of cascade modulation level
	3 Cascade autodetect				Pressing OK will start the auto detection of the cascade configuration. Can only be started from the master boiler.
7 Restore factory settings					Pressing OK all the advanced settings will be restored to the original factory defaults .

5.5 Service-(manual) mode Chimney sweeper

For periodical maintenance and/or service intervention a CH request can be generated to force the burner (not in error condition) to a specific load from minimum to nominal (0-100%). The chimney sweeper function can be started from the user menu and will be active for 15 minutes.While active it is possible to navigate through other menus to check the boiler status and functionality.

5.6 Disabling CH request

The CH function can be disabled. See 5.3.2 parameters accessible by user at 1 HEATING nr 3 scheduler set.

5.7 Service code

To acces the service-level of the controller it is necessary to enter the service-code. How this done is explained in 5.4 installer (technician) menu.

5.8 Tacho fan speed

For service purposes it is possible to read the fanspeed.
See 5.4.1 parameters accessible by installer (technician) at 4 DIAGNOSTICS nr 1 boiler information.

5.9 Errors

For service purposes it is possible to see a list of recent errors. See 5.3.2 parameters accessible by user at 6 DIAGNOSTICS nr error history.

5.10 ECO working mode

When the ECO button (R3-C4) is pressed a programmable value (see user menu 1.HEATING under 2) is substracted from the flow temperature setpoint. Also in case of OTC and on/off usage or a modulating setpoint received from external the flow temperature setpoint is reduced with this programmable value. The same principal is applicable for DHW (see user menu 2.DOMESTIC HOT WATER under 2)

5.11 Holiday mode

When the Holiday button (R3-C3) is pressed a request is indicated to enter the start and end date of the holiday period.
The wished flow temperature and the DHW temperature for this period can be set (see user menu 3. HOLIDAY under 1 and 2)

5.12 Schedulers CH and DHW

For CH and DHW separate schedulers can be filled out.
Default both schedulers are enabled and always on.

Scheduler set (ON, ECO, OFF) can be done for each day, for a group of weekdays, for weekend days or for an entire week. The status of the scheduler is set on the main screen (ON, ECO, OFF).

The scheduler can be set in the user menu, heating or domestic hot water or in the technician menu, user settings, heating or domestic hot water.

Eco mode can also be forced by pushing the ECO button on the control panel (R3-C4).

5.13 Cascade and Modbus

Cascade and Modbus options are shown in two separate attachments “Modbus” and “Cascae”.

5.14 Parameter settings

The parameter settings are listed on the following pages

Notice

The OEM parameters are listed in the attachment “OEM” parameters.

USER MENU

						Recommended	Min	Max
1	HEATING	1	CH temperature/OTC set	1	Ch setpoint	85	20	90/Technician
				2	Outside temperature for CH off	OFF	7	30
		2	ECO setpoint reduction			50	0	50
		3	Scheduler set	1	Enable/disable on board scheduler	Enabled	Disabled	Enabled
				2	Scheduler set	ON	ON| OFF	ECO
2	DOMESTIC HOT WATER	1	DHW setpoint (Switch)			80	35	85
		1	DHW setpoint (NTC sensor)			60	10	65
		2	ECO setpoint reduction			20	0	50
		3	Scheduler set	1	Enable/disable on board scheduler	Enabled	Disabled	Enabled
				2	Scheduler set	ON	ON| OFF	ECO
3	HOLIDAY	1	CH holiday setpoint			20	20	90/Technician
		2	DHW holiday setpoint (Thermostated)			80	35	85
		2	DHW holiday setpoint (NTC sensor)			60	10	65
4	MAINTENANCE	1	Service information			Service tel. set by Technician		
		2	Service due date			Date set by Technician		
5	SETTINGS	1	Select language			English	English|Italian	German | Russian
		2	Select units			Celsius	Fahrenheit	Celsius
		3	Set date			set date		
		4	Set time			24 hours	24 hours	12 hours
6	CHIMNEY SWEEPER					OFF	0	100
7	DIAGNOSTICS	1	Boiler information			Real time boiler status		
		2	Lockout history	Overview lockout history		Status boiler at time of lock/block		

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TECHNICIAN MENU

								Reccomended	Min	Max	After factory reset
1	ADVANCED CH SETTINGS	1	CH power set	1	Maximum power			100	0	100	100
				2	Minimum power			0	0	100	0
		2	CH temperatures	1	Absolute max. temperature			90	20	90	80
								Higher than 90 not allowed			
				2	CH maximum setpoint			85	20	Abs. max CH temp	75
				3	CH minimum setpoint			20	20	70	40
				4	CH setpoint hysteresis			5	2	10	3
		3	OTC parameters	1	Outside temp for max CH			-10	-34	10	-10
				2	Outside temp for min CH			18	15	25	18
				3	Outside temp for CH off			OFF	7	30	OFF
				4	OTC setpoint table			OTC table			
				5	OTC curve			OTC curve			
		4	CH pump settings	1	Post pump time			10	1	30	5
		5	CH anticycling timer					3	0	15	
		6	CH request type					RT+SP/OT	onlyOTC|RT	01-Vdc % | SP	RT+SP/OT
2	ADVANCED DHW SETTINGS	1	DHW power	1	Maximum power			100	0	100	100
				2	Minimum power			0	0	100	0
		2	DHW temperatures	1	Storage temperature setpoint			80	35	85	80
				2	Boiler temperature setpoint			60	35	65	60
				3	DHW setpoint hysteresis			6	2	10	3
		3	DHW pump settings	1	DHW post time			1	OFF	180	30
		4	DHW priority	1	DHW priority Status			Enabled	Enabled	Disabled	Enabled
				2	DHW priority TimeOut			Off	1	60	Off
		5	DHW request type					Swicth	Switch	Sensor	Switch
3	SYSTEM SETTINGS	1	Boiler parameters	1	Ignition power			20	0	100	
								Higher than 30% not allowed			
				2	Delay siphon check			3	0	20	
								Check syphon is not emptied by new value			
				3	Number of boiler pumps			2 pump	Pump 3-w-valve	2 pump	2 pump
				4	PWM pump speed Max			100	1	100	100
				5	PWM pump speed min			40	1	100	30
				6	Antilegionella			Enabled	Disabled	Enabled	Disabled
				7	Modbus parameters			Adress	Baudrate	Frame	
				8	3 Way valve travel time			180	1	255	10
		2	User interface settings	1	Select language			English	English | Italian	German | Russian	
				2	Select units			Celsius	Fahrenheit	Celsius	
				3	Set date			Set date			
				4	Set time			24 Hours	24 hours	12 hours	
		3	Service settings	1	Service information			Set telelphone number			
				2	Service due date			Set service date			
4	DIAGNOSTICS	1	Boiler information					Real time boiler status			
		2	Lockout history	Overview lockout history				Status boiler at time of lock/block			
		3	Manual test					See chimney sweeper			
5	USER SETTINGS	0	Heating	1	CH temperature/OTC set	1	CH set point	85	20	90/abs max CH temp	75
						2	Outside temperature for CH off	off	7	25	off
				2	ECO setpoint reduction			50	0	50	
				3	Scheduler set	1	Enable/disable on board scheduler	Enabled	Disabled	Enabled	
						2	Scheduler set	Set time scheduler (Time/On/ECO/OFF)			
		2	Domestic hot water	1	DHW setpoint (NTC sensor)			60	35	65	
				1	DHW setpoint (Thermostated)			80	35	85	
				2	ECO setpoint reduction			20	0	50	
				3	Scheduler set	1	Enable/disable on board scheduler	Enabled	Disabled	Enabled	
						2	Scheduler set	Set time scheduler (Time/On/ECO/OFF)			
		3	Holiday	1	CH holiday setpoint			20	20	90/Abs max CH temp	
				1	DHW holiday setpoint (Thermostated)			80	35	85	
				2	DHW holiday setpoint (Sensor)			60	10	65	
6	Cascade	1	Cascade set	1	Cascade switch delay			30	0	255	
				2	Cascade min power			20	0	100	
				3	Burner power (default value x= 17,21,25,29 boiler specifiic)			x	0	2550	
				4	Boiler for DHW			0	1	6	0
				5	PI loop period			5	0	15	5
				6	Burner water flow delay			30	0	255	30
				7	Different boiler size			Disabled	Disabled	Enabled	Disabled
				8	Cascade pump speed mx.			100	15	100	100
				9	Cascade pump speed min			40	15	100	30
		2	Cascade info	1	Cascade Role : see Cascade auto detecftion			Standalone	Standalone	Master | Slave	
				2	System temperature			Actual temperature Cascade system sensor			
				3	Number of boilers on			Actual number of burners /boilers on in cascade			
				4	Modulation level			Actual cascade modulation level			
		3	Cascade auto detect : press OK to start detecting role boiler in cascade chain					Standalone	Standalone	Master | Slave	
7	RESTORE FACTORY SETTINGS							Reset to factory/check settings			

6 INSTALLATION

6.1 Installing the boiler

Take into account the local regulations and those that are prescribed by national law or authorities.

1. The boiler has to be installed in an area were it is allowed to install it.
   Make sure that this area is protected against the danger of freezing.
2. The area should be vented sufficiently in order to get rid of excess heat.
3. When delivered the boiler is on a pallet.
   You can put 2 straps from one side beneath the boiler to the other side.
   With these straps and a few persons you can lift the boiler from the pallet.
4. Install the boiler on a flat non-combustible floor and level it by using its positioning bolts.
5. A minimum free space of 50 cm should be left on each side of the boiler for servicing purposes.
6. Remove the sealing/protection caps from the connection tubes.
   Notice: dirty water can come out of the boiler.
7. Fill the condensate trap with clean water.
   This can be done by flushing some water into the cast aluminium exhaust connection on the back. This water will then drain back to the sifon and fill it.

6.2 Frost protection

The boiler is protected against frost.
During longer periods of absence in the winter, the installation should remain functioning by partly opening the radiator valves.
Don't set the room thermostat to a lower value than 15 °C.

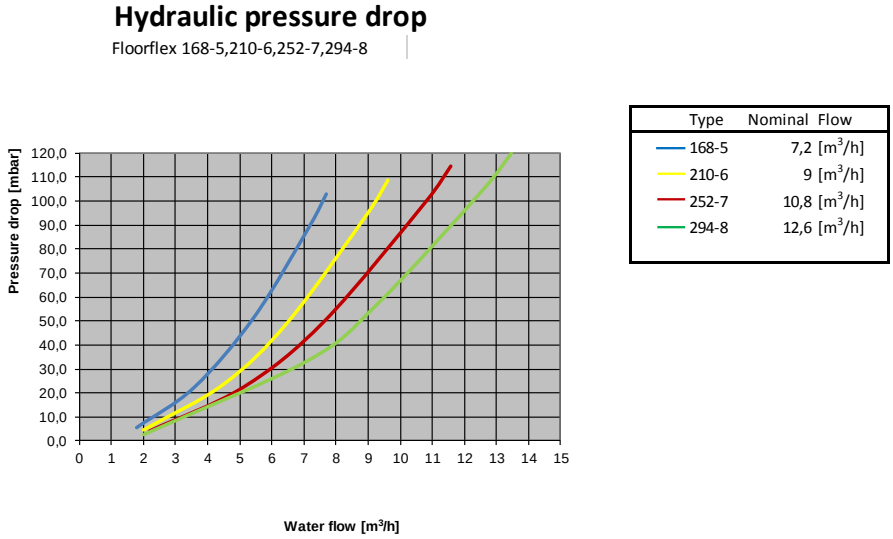
If the flow NTC senses a temperature lower than 8 ºC the CH-pump will be activated. If temperatures keeps dropping the boiler will start at a flow temperature of 6 ºC and it will run on minimum load till the flow NTC senses a temperature of 15 °C. The CH-pump will stay running for another 10 minutes. **This is only a protection for the boiler and does not protect the installation and its radiators against freezing.**

To protect frost sensitive radiators against frost it is possible to connect a frost thermostat in parallel with the room thermostat.
Another possibility is the use of an outdoor sensor in combination with OTC settings (to be set by the installer).The CH pump will be activated if the outdoor temperature drops below 8 ºC.

6.3 Water connection

6.3.1 Pump

The boiler does not have a built in CH-pump. Therefore a CH-pump should be mounted into the installation. Select a pump that matches the hydraulical resistance of the boiler and the installation.
In the graph below you'll find the resistance characteristics for all types ;



For electrical connections see chapter 6.6.

6.3.2 Minimum flow

The minimum flows as indicated in the table beneath should be guaranteed.

Type	**Flow [m³/h] @ dT25 full load**	**Flow [m3/h] @ dT30 Start=20%**	**Flow [m³/h] @ dT30 part load**
168-5	5,8	1,73	0,96
210-6	7,2	2,16	1,20
252-7	8,7	2,60	1,45
294-8 [1)]	10,0	3,03	1,69

6.3.3 Water-treatment

- Before filling up the installation (old and new), the installation should be rinsed thoroughly with clean water from the tap. Preferably using water treatment cleaning products as listed below.
- The pH should be kept between 6,5 and 8,5 at all times
- The maximum allowed content of chlorides is 250 mg/ltr.
- At total hardness of 11,2 ºD (= 2 mmol/liter) the total volume of filled, refilled and topped up water must not exceed 20 liters / kW
  If this hardness value is exceeded then the total amount of filling, refilling and topping up water is calculated using the following formula : (11/hardness in ºD) x value given above.
  Example ; in case of water hardness of 15 ºD : (11/15) x 20 = 14,7 ltr/kW.
  If larger values are achieved the water should be softened.
  The water may only be partly softened until a value of 20 % of its original value, so if the initial hardness is 15°D, then it may only be softened to 3,0 ºD
  Note that water softening by means of ion exchange principle is not allowed.
  Never fill the installation with demineralised or destilled water because it will corrode the aluminum heat exchanger severly.
- The conductivity of the non treated installation water must not exceed the value of 600 µs/cm.
  If the installation water is treated with one of the products described below and according to the manufacturers instructions, the conductivity must not exceed 2000 µs/cm.
  If the conductivity is higher than the values mentioned, empty the system, flush and fill with clean tap water, preferably by adding the recommended cleaning products.
- There are many products available on the market which pretend to clean and protect heating systems. Unfortunately there are only a few that have really proven this in practice.Therefore DEJATECH only allows the following quality products for water treatment ;
  Producer : Fernox www.fernox.com
  - Cleaner F3 : removes corrosion, lime and sludge
  - Protector F1 : protects against corrosion, lime and sludge
  - Alphi-11 : anti-freeze and protection against corrosion and lime

  Producer : Jenaqua GmbH www.jenaqua.eu
  - Jenaqua 100 : general protection
  - Jenaqua 200 : de-scaling
  - Jenaqua 300 : cleaning of grease and flux for new installations
  - Jenaqua 400 : cleaning of sludge for old installations
  - Jenaqua 500 : anti-freeze and general protection

  Note that these products have to be used strictly in accordance with the water treatment manufacturers instructions.

Furthermore we strongly recommend the following ;

- Use the above mentioned water treatment protection products to fill and protect the installation
- Use a log book to record waterfilling, refilling, topping up, water quality measurements and water treatment
- Only use diffusion tight material, especially for under floor heating
- always mount de-airing devices at the highest points in the installation.

- install valves in the installation near the boiler and on strategic locations (anticipating on future expansions of the system) to avoid fills, refills and topping up as much as possible.
- install a water meter to check the amount of filled, refilled and topped up water.
- install a filter in the return.
- install an extra heat-exchanger to separate the boiler from the installation in case of any doubts.
- avoid leakages and if there is a leakage repair as soon as possible.

6.3.4 Water connection general

1. Water connections for flow and return are size 2”
2. The installation must have a pressure relief valve (with a capacity higher than the boiler output) and an expansion vessel. The capacity of this vessel should be sufficient for the installation.
3. To avoid blocking and non volatile lock-out of the boiler control it is recommended to install a by-pass in the installation to guarantee the minimum flow through the boiler.
   The by-pass valve should be mounted as far away from the boiler as possible to have the biggest possible content of the bypass-circuit (also a big radiator without valves could be used).
4. Drain the condensate by a funnel and a stench-trap to the sewer.
5. At the highest point of the installation a de-airing device should be mounted.

6.4 Gas connection

1. The gas connection should be made according to the applicable rules and regulations.
2. The gaspipe of the boiler has connection R 1”
3. In order to avoid blockage of the gasvalve, ensure that there is no dirt left in the gas pipework towards the boiler.
4. The highest allowable inlet pressure for the gasvalve is 50 mbar.
5. Check the heat input of the boiler.

6.5 Air-supply and flue-gas connection

Air connection : All types have air connection ø 110 mm
Flue gas connection : ø 200 mm for all types

Allowed Appliance types:

Possibilities for air / flue system ; B23 C13 C33 C53 C63
Note : C63 is not possible for Belgium.

6.5.1 B23

As standard the boiler is delivered as type B23 where the supply air is taken from the room where the boiler has been installed in.

If the inlet air contains dust or dirt one should install a filter or a leaf catcher in the air supply

A vertical terminal is recommended.

Roof terminals and extensions and/or condensate trap/collector must be obtained by M&G. See page 43.

6.5.2 C13

The wall terminal (see page 43) with its expander and/or condensate trap/collector must be obtained by M&G.

For pressure drop calculation of appliance type C13 use the table for pressure drop per component and the table for total pressure drop calculation. See page 41.

For total available pressure drop see table on page 40.

6.5.3 C33

A vertical terminal is recommended.

Roof terminals and extensions and/or condensate trap/collector must be obtained by M&G. See page 43.

For pressure drop calculation of appliance type C33 use the table for pressure drop per component and the table for total pressure drop calculation. See page 41.

For total available pressure drop see table on page 40

Terminals should be installed in the same pressure area (within a plane of 1m^2)

6.5.4 C53

Roof and wall terminals (see page 43) and expanders and/or condensate trap/collector must be obtained by M&G.

For pressure drop calculation of appliance type C53 use the table for pressure drop per component and the table for total pressure drop calculation. See page 41.

For total available pressure drop see table on page 40.

Notice : Do not install the terminals for supply of combustion air and for the evacuation of combustion products on opposite walls of the building Terminals should be installed in the same pressure area (within a plane of 1m^2)

6.5.5 C63

C63 appliances may only be equipped with Gastec QA materials and terminals or according NEN 14989-2
Notice : One has to check if C63 is allowed in the country were the boiler is going to be installed.

It is recommended to use a full aluminium flue system. A PP (Temperature class T120) or stainless steel flue system can also be used (See TPW table below). In this case the condensate must be drained before it flows back into the aluminium parts of the boiler. Otherwise aggressive condensate from the non-aluminium flue system can corrode the aluminium parts of the boiler. A condensate trap/collector must be mounted just before entering the silencer(s) of the boiler (also see 6.6.1 general).

T-P-W Class	
Temperature range	T120
Pressure range	P1
Condensate resistance (W=wet / D=Dry)	W

The minimal combustion products temperature and mass flow rate and the CO_2 are given in the table below

Floorflex	part load	Vol. Flue m3/h	Vol. Air m3/h	Co2 %	T fluegas °C	rho kg/m3
168-5	33,6	43	38	9,1	30	1,12
210-6	42	54	47	9,1	30	1,12
252-7	50,4	65	57	9,1	30	1,12
294-8	58	75	65	9,1	30	1,12

The maximum allowed recirculation rate under wind conditions is 10 %

Maximum allowable combustion air temperature 45 °C

The tables below give an indication of maximum lengths (in mtrs) for parallel air supply and flue outlet pipes. Also the equivalent of pipe length in mtrs of bends 90 ° and 45 ° is given

type	max. allowed pressure drop	Parallel Air/Fluegas Ø110/ø200	Parallel Air/Fluegas ø180/ø180	Parallel Air/Fluegas Ø150/ø200	Parallel Air/Fluegas ø200/ø200
168-5	150 Pa	13 m	112 m	83 m	
210-6	150 Pa	9 m	75 m	53 m	120 m
252-7	150 Pa	6 m	45 m	36 m	82 m
294-8	150 Pa	4 m	33 m	26 m	60 m

Table below gives the equivalent of pipe length in meter of bend 90°, 45°

Equivalent of pipe length in meters				
Bend	Pipe diameter			
	ø200 mm	Ø180 mm	ø150 mm	Ø110 mm
Bend 90°	5,75	4,5	4	3,5
Bend 45°	3,75	2,5	1,7	1,5

Notice : Do not install the terminals for supply of combustion air and for the evacuation of combustion products on opposite walls of the building
Terminals should be installed in the same pressure area (within a plane of 1m^2)

6.5.6 Pressure drop calculations

Flue-outlet and air-supply calculations;
Total pressure drop available for flue-outlet and air-supply is given in the table below
Air connection : all types have air connection ø 110 mm
Flue gas connection : ø 200 mm for all types

Type Boiler	Total available Pressure drop In [Pa] for B23, C13, C33, C53, C63
168-5	150
210-6	150
252-7	150
294-8	150

For pressure drop calculation of appliance types B23, C13, C33 and C53 use the next two tables on the following pages

.

Pressure drop table per component

Boiler type								
	1	2	3	4	5	6	7	8
Component	168-5		210-6		252-7		294-8	
Pressure drop [Pa]	Flue gas [Pa]	Air [Pa]	Flue gas [Pa]	Air [Pa]	Flue gas [Pa]	Air [Pa]	Flue gas [Pa]	Air [Pa]
Pipe length 1 m Ø 200mm	0,4		0,7		1,0		1,4	
Pipe length 1 m Ø 150mm		1,4		2,1		3,1		4,2
Bend 90° Ø 200mm	2,5		4,0		5,7		7,8	
Bend 90° Ø 150mm		5,3		8,3		12,0		16,4
Bend 45° Ø 200mm	1,7		2,6		3,7		5,1	
Bend 45° Ø 150mm		2,3		3,5		5,1		6,9
Terminal C33 Ø200mm,Ø150mm	12,4		19,4		27,9		36,9	
Terminal C13 Ø200mm,Ø150mm	6,4		10,0		14,4		19,1	
Terminal B23 Ø200mm	3,7		5,8		8,4		11,1	
Terminal C53 Ø200mm,Ø150mm	3,7	12,2	5,8	19,0	8,4	27,4	11,1	36,3
Condensate trap Ø200mm T + Bend 90°	5,0		8,0		11,4		15,4	
Expander 110/150		0,7		1,0		1,5		2,1

Table for total pressure drop calculation

1	2	3	4	5	6	7	8
	Number Flue gas Ø200mm	Number Air Ø150mm	delta pressure component Fluegas	delta pressure component Air	Total pressure drop Fluegas out [Pa] (2*4)	Total pressure drop Air in [Pa] (3*5)	Total pressure drop Fluegas + air in [Pa] (6 + 7)
1 Meter Pipe							
Bend 90°							
Bend 45°							
Condensate trap							
Expander							
Terminal:							
	Total delta pressure [Pa]						

How to use the table:

- Column 1 : used material
- Column 2: total number of used material of column 1 for flue gas out
- Column 3: total number of used material of column 1 for air in
- Column 4: pressure drop from pressure drop table /component for flue gas components
- Column 5: pressure drop from pressure drop table /component for air components

  Select the correct column for the selected boiler type

  (168-5: 1,2 , 210-6: 3,4 , 210-7: 5,6 294-8: 7,8)

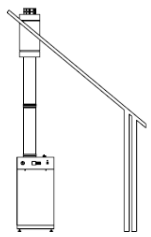
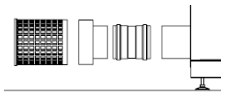
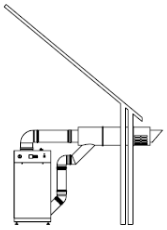
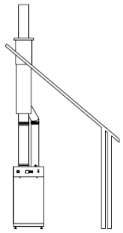
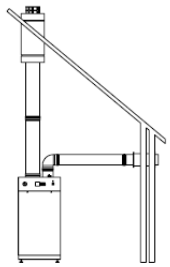
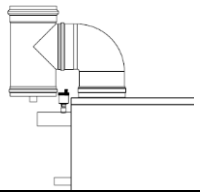
- Column 6: total pressure drop flue gas: multiply column 2 *4
- Column 7: total pressure drop air: multiply column 3 *5
- Column 8: total pressure drop flue gas and air: column 6 + 7
- Finally add all together column 8

Total pressure drop must be lower than 150 Pa.

If the combined inlet/outlet system consumes more than the allowed maximum, this will result in a decrease of more than 5% of heat input. **This is not allowed.**

Components must be obtained by M&G

A list of allowed articles of M&G with corresponding OEM nrs is given on the next page

Appliance type	Fluegas outlet	Supply air inlet	
B23 	Roof terminal **ALU** 200 Or Roof terminal **PP** 200 7021	Leaf catcher **ALU** Expander 110-150 **EPDM**	B23 
C13 	Wall Terminal **ALU** 200/200-200/300	Expander 110-150 **EPDM**	
C33 	Roof Terminal **ALU** 200/200-200/300	Expander 110-150 **EPDM**	
C53 	Roofterm **ALU** 200 Or Roofterm **PP** 200 7021	Wall Terminal air **PP** 150 Expander 110-150 **EPDM**	
PP condensate trap 	TEE **PP** 200 90° + CONDENSATE TRAP ELBOW **PP** 200 90° EPDM		

Components		OEM Art.no M&G
PP Ø 200 mm		
ELBOW **PP** 200 90° EPDM		41.007.04.11
ELBOW **PP** 200 45° EPDM		41.007.04.12
EXTENSION **PP** 200x500		41.007.04.01
EXTENSION **PP** 200x1000		41.007.04.02
EXTENSION **PP** 200x1900		41.007.04.04
ROOFTERM **PP** 200 7021	B23-C53	41.007.04.39
PP Ø 150 mm		
ELBOW **PP** 150 90°		41.007.03.031
ELBOW **PP** 150 45°		41.007.03.032
EXTENSION **PP** 150 x 2000		41.007.03.024
EXTENSION **PP** 150 x 1000		41.007.03.022
EXTENSION **PP** 150 x 500		41.007.03.021
EXPANDER **EPDM** Ø110- Ø150		41.008.56.32
Aluminium		
ELBOW **ALU** 200 90°		41.008.05.40
ELBOW **ALU** 200 45°		41.008.05.41
EXTENSION **ALU** 200x1000		41.008.05.32
EXTENSION **ALU** 200x2000		41.008.05.33
EXTENSION **ALU** 200x500		41.008.05.31
ROOFTERM **ALU** 200	B23-C53	41.008.67.20
ROOFTERM **ALU** 200/200-200/300	C33	40.045.29.27
General		
Wall Bracket 200		41.008.71.98
Wall Bracket 150		41.008.71.96
Weather slate steep **LEAD** 210 25°-45°		41.007.04.01
Weather slate flat **ALU** 210 0°		41.007.96.12
Seal **EPDM** 200 mm		41.007.52.95
Seal **EPDM** 150 mm		41.002.73.58
EXTENSION **PP** + Sampling		41.007.04.06
TEE **PP** 200 90° + CONDENSATE TRAP		41.007.04.18
WALLTERM **PP** 150 AIR	C53	41.008.97.76
WALLTERM **ALU** 200/200-200/300	C13	41.002.78.30

6.6 Installing flue way and air inlet

6.6.1 General

- Do not use materials from different manufacturers for either flue way or air inlet
- Only the manufacturers of flue way and air inlet components as mentioned in this manual may be used
- Both systems (flue and air) should be mounted free of tension

Condensate, ice-free terminal, funnel and stench trap

The boilers can produce flue gasses with very low temperatures, what leads to condensation in the flue pipes and flue terminal. Therefore one should always mount an ice free terminal.
Drain the condensate by a funnel and a stench-trap to the sewer.

Air inlet

If PP material is used for the air inlet a minimum distance of 35 mm between flue way and air inlet should be respected.
The minimum insert length of the sleeve, leaf catcher or pipe must be 40 mm.

Flue way

A horizontal flue way pipe must be installed with a fall of 3° (50 mm per mtr) down wards to the boiler to allow condensate to flow back in the sump or condensate collector.
The minimum insert length into the sleeve and the minimum length of the pipe end for aluminium and stainless steel must be 40 mm.
If PP is used pay attention to the expansion (elongation) of the PP due to rise in flue gas temperature.
Insert the PP pipe into the sleeve and redraw over a length of 10 mm (10 mm for maximum pipe length of 2 mtr).
After mounting the minimum insert length into the sleeve and the pipe end must be 40 mm.

Condensate trap/collector

The condensate trap/collector must be either connected by a tube to a sifon that at least has the same height of water lock as the one that is delivered with the boiler or by a T-piece to the sifon as delivered with the boiler

6.6.2 Brackets, mounting

Air inlet

- The first bracket should be mounted 0.5 mtr away from the boiler
- Horizontal and non vertical pipes should be bracketed equally divided with a maximum distance of 1 mtr between the brackets
- Vertical pipes should be bracketed equally divided with a maximum distance of 2 mtrs between the brackets
- In case of a chimney shaft, first identify the air inlet. The end of the air inlet pipe should be at least 0.5 mtr above the shaft. The last component before entering the shaft should be fixated. If a bend is the last component also fixate the component before the bend.

Flue way

- A bracket should be mounted to every component except for the case that the length of the pipe before and after the bend < 0.25 mtr. In this case mount the first bracket at a length of max 0.5 mtr away from the boiler
- Horizontal and non vertical pipes that have a distance between the fixing brackets > 1 mtr should be equipped with a non clamping (to allow very little movement) bracket in between
- Vertical pipes should be bracketed equally divided with a maximum distance of 2 mtrs between the brackets
- In case of a chimney shaft, first identify the flue outlet. Check if the used shaft pipes are damaged or blocked.The ens of the flue way pipe should be at least 0.5 mtr above the shaft. The last component before entering the shaft should be fixated. If a bend is the last component also fixate the component before the bend.

6.6.3 Sealings and conjunctions

- Prevent damnage of sealings by shortening pipes squarely and by deburring after shortening.
- Conjunctions/connections in the flue way may not be screwed.
- In the air inlet only aluminium or stainless steel conjuctions/connections may be screwed. It is not allowed t o screw PP conjunctions/connections.
- Do not use glue or foam like silicon or PUR.
- To assure soundness all components should have sealings.
- For smooth conjunction only use a soap solution (1% in water). Do not use oil, grease or (acid free) vaseline

Important notice

If instructions as written above are not followed and or the materials for air inlet and fluegas outlet as quoted above are not used Dejatech can not be held responsible for eventual consequences

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6.7 Electrical connection

1. The electrical installation should be in accordance with national and local regulations.
2. As standard the boiler is configured for 230 VAC / 50 Hz
3. The terminal strip is accessible by opening the front cover behind which the control is mounted.
4. Means for disconnection must be incorporated in the fixed wiring in accordance with the wiring rules. As it is a stationary appliance without means for disconnection from the supply a contact separation in all poles that provide full disconnection under voltage category III must be provided. The minimum cross section of the supply wire is 3 x 1.0 mm^2 and must be connected to the numbers, 0 (=PE), 1 (=L) and 2 (=N) of strip C1.
5. It is not allowed to change the internal wiring fitted by the manufacturer.
6. The contacts of the room thermostat have to be potential free (24VDC, 5mA). On-Off room thermostat to be connected to the numbers 1 and 2 of the strip C2. Select from the technician menu, advanced settings, CH request for Room Tstat. The 0-10 V DC (Power or Setpoint mode) should be connected to the numbers 3 (=negative-) and 4 (=plus+) and a short cut (wire) should be placed between the numbers 1 and 2 of strip C2. Finally from the technician menu, advanced CH settings, CH request select either 0-10V % (power mode) or 0-10 V SP (setpoint mode).
   Digital communication (open Therm OT+ version 3.0) should be connected to the numbers 1 and 2 of the strip C2. Select from the technician menu, advanced CH settings, CH request for Room Tstat.
   For digital communication with EBV like RS30 or Theta an additional communication module is required.
   For the internal OTC (outdoor temperature controller) a 12 kohm at 25º C (see NTC table at 6.2.2) should be connected to the numbers 5 and 6 of strip C2 and a short cut (wire) should be placed between the numbers 1 and 2 of strip C2. Finally from the technician menu, advanced CH settings, CH request, select for only OTC.
7. If a storage tank is connected to the boiler, the tank thermostat (or the tank NTC) should be connected to the numbers 7 and 8 on the strip C2.
   Note that a tank NTC should have a 12 kohm at 25 ºC (see NTC table at 6.6.2.)
8. The CH system pump should be connected to the numbers 3 (=PE), 4 (=L), 5 (=N) on strip C1 if in use in combination with a 3-way valve. (also see chapter 4.3).
   A PWM pump should be connected to 14 (=PE), 12 (=L) and 13 (=N) on strip C1.The PWM signal should be connected to 14 (PWM signal) and 13 (PWM ground) om strip C2. From the technician menu, system settings, boiler parameters the max and min pump speed can be set.
9. The DHW pump (or 230 VAC 3-way valve) should be connected to 6 (=PE), 7 (=L), and 8 (=N) on strip C1. If a CH pump is used it should be connected to 11 (=PE), 9 (=L) and 10 (=N) on strip C1.
10. If the system pump, CH pump, PWM pump, DHW pump, alarm connection or the 3-way valve consumes more than 0,8 A, it needs to be switched by an auxiliary relay.
11. The alarm output on the numbers 17 and 18 on strip C1 is a potential free relay output (230 VAC), max 0,8 A).
    The cascade/system pump output on the numbers 19 and 20 on strip C1 is a potential free relay output (230 VAC, 0,8A).

12. The B-B (Burner Block) on the numbers 21 and 22 on strip C1 provides an external (remote) burner block (error 77). The external contact must be a potential free contact (230 VAC).
13. The SPS_B (Burner Block) on the numbers 11 and 12 on strip C2 provides also an external (remote) burner block (error 77). In this case the external contact must be potential free (24 VDC).
14. The B-L (Burner Lock) on the numbers 9 and 10 on strip C2 provides an external burner lock (error 3). The external contact must be a potential free contact (24 VDC).
15. The main-fuse (5,0 A) is near the on/off switch on the right side of the control panel.

General remarks :

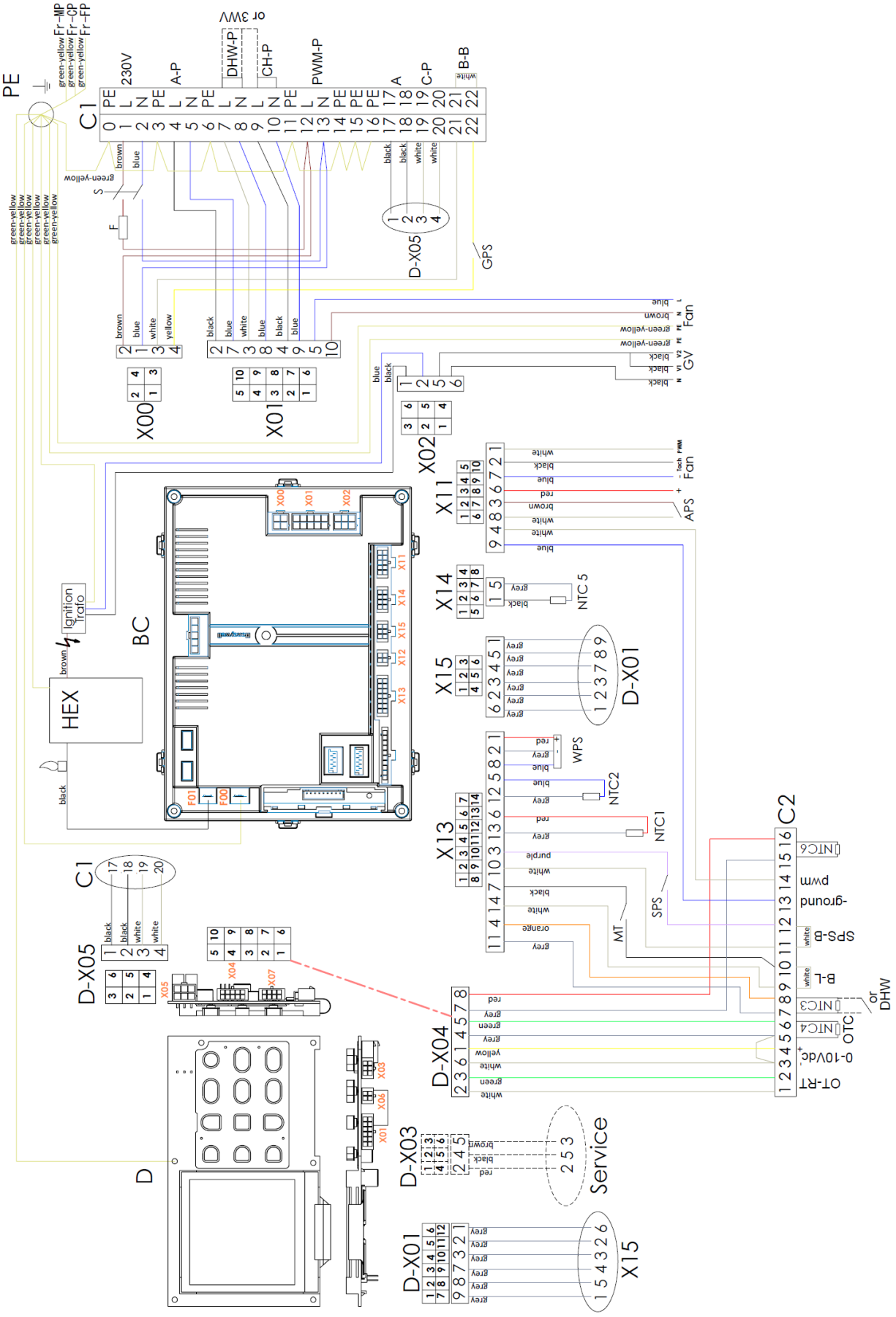
Use the lowest tube on the right side to guide the low voltage connections from C2

Use the two upper tubes on the right side to guide the 230 V connections from C1

Also see wiring diagram on next page

6.7.1 Wiring diagram

BC	Burner control
D	Display
C1	Connector 230V
C2	Connector low voltage
CH-P	Central heating pump
DHW-P	Domestic hot water pump
PWM-P	Modulating pump
A-P	Appliance pump max 0,8A
HE	Heat exchanger
NTC1	Flow temperature sensor
NTC2	Return temperature sensor
NTC3	Domestic hot water sensor or switch
NTC4	Outside temperature sensor
NTC5	Flue gas temperature sensor
NTC6	Cascade sensor
WPS	Waterpressure sensor
APS	Air pressure switch
SPS	Siphon pressure switch
GPS	Gas pressure switch
GV	Gas valve
S	Switch on/off
3WV	3 way valve
OT-RT	Open therm or room thermostat on / off
OTC	Outdoor temperature control 12K
F	Fuse
SPS-B	Siphon pressure switch block
B-L	Burner lock
A	Alarm potential free contact
C-P	Cascade pump potential free contact
B-B	Burner block
PE	Earth cable or connector
Fr	Frame
MP	Mounting plate
CP	Cover plate
FP	Front plate

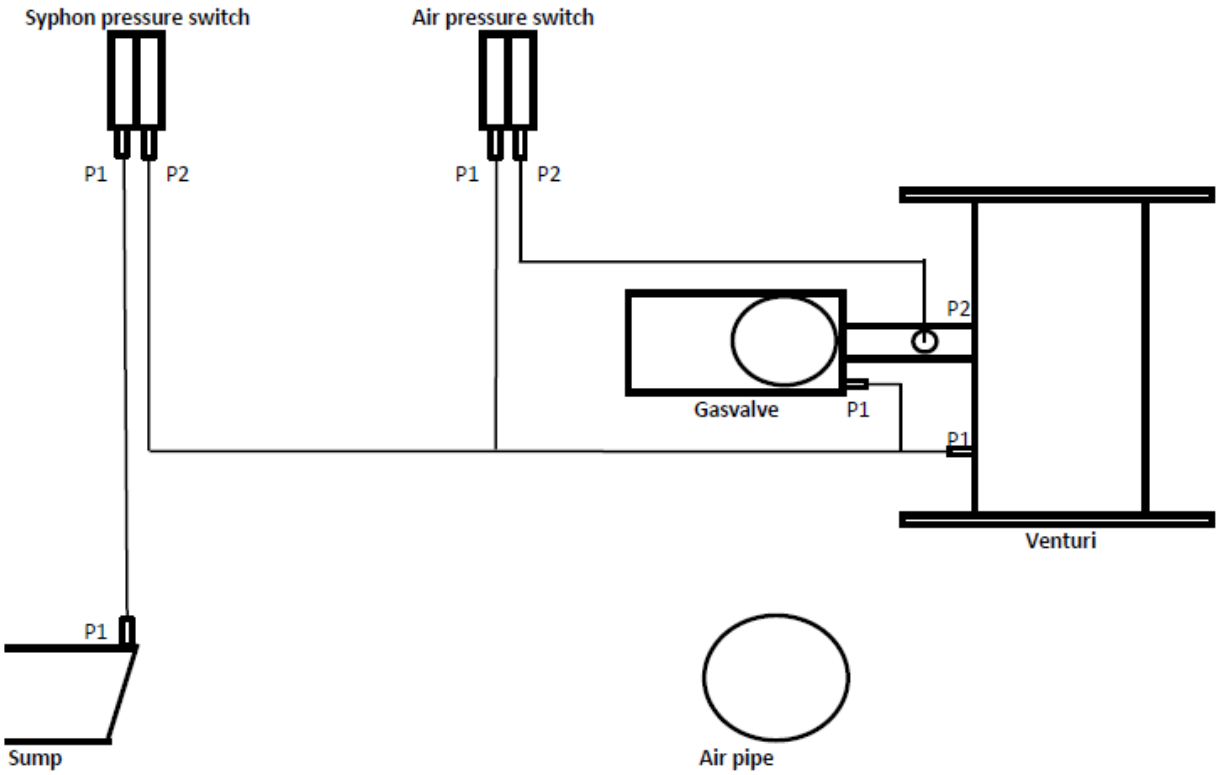

PE
C1
230V
A-P
DHW-P
or 3WV
CH-P
PWM-P
B-B
C-P
green-yellow Fr-MP
green-yellow Fr-CP
green-yellow Fr-FP
brown
blue
green-yellow
S
F
black
white
D-X05
GPS
X00
X01
X02
Fan
GV
X11
APS
X14
NTC 5
X15
D-X01
WPS
X13
NTC2
NTC1
SPS
MT
C2
NTC6
pwm
-ground
SPS-B
B-L
NTC3
or DHW
NTC4
OTC
0-10Vdc
OT-RT
D-X04
BC
HEX
Ignition Trafo
D
D-X03
Service
X03
X06
X01
X04
X05
X07

6.7.2 Table resistance NTC's

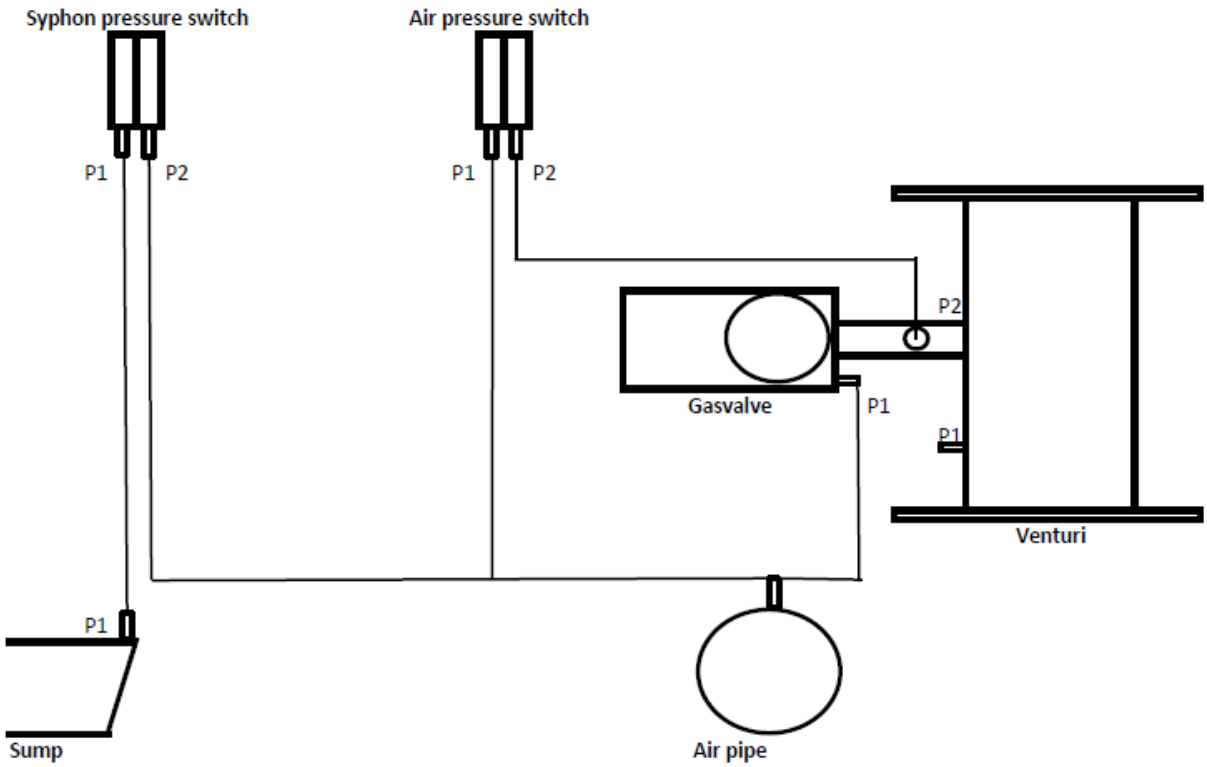
Temperature [°C]	resistance [Ω]
	12K
-30	
-20	98.200
-15	75.900
-10	58.800
-5	45.900
0	36.100
5	28.600
10	22.800
15	18.300
20	14.700
25	**12.000**
30	9.800
35	8.050
40	6.650
45	5.520
50	4.610
55	3.860
60	3.250
65	2.750
70	2.340
75	1.940
80	1.710
85	1.470
90	1.260
95	1.100
100	950
105	
110	
115	
120	

6.8 Pneumatic connections

A pneumatic diagram for the Floorflex 168 (5 sections) and the Floorflex 294 kW (8 sections) is given in the figure below.



A pneumatic diagram for the Floorflex 210 (6 sections) and the Floorflex 252 kW (7 sections) is given in the figure below.



The siphon pressure switch, connected to the sump (P1), prevents overflow of the syphon in case of too high back pressure in the chimney.

The air pressure switch, (P1 and P2), connected to the venturi, checks the amount of air (by means of a Δp measurement) before start.

6.9 PC-connection

For information regarding connection of a PC to the boiler you can contact your supplier.

7 PUTTING INTO OPERATION

1. Fill and de-air the installation. Fill the boiler until a pressure between 1.5 and 2 bar is achieved. The maximum working pressure is 6 bar. The boiler (not the installation !) is de-aired by a built in automatic de-airing device.

2. Check all gas and water connections thoroughly for leaks.

3. De-air the gastube.

4. As standard the boiler is set for G20 or G25
   Check that the installation provides the right type of gas to the boiler.

5. Check the inlet pressure : 20 mbar or 25 mbar

6. Turn on the electrical boiler circuit by setting the mainswitch on the controlpanel of the boiler to position 1.

7. Create a heat request.

8. Just before ignition the control checks if the contacts of the gas pressure, siphon pressure and water pressure are closed.
   If not, the boiler will block and the display will show E76.

9. If gas, water and siphon pressure are o.k. the burner will be ignited.

10. Have a thorough check on flue-gas joints for leakage.

11. Check the heat input and the gas pressure at maximum load.

12. Heat up the installation. Finish the heat request.

13. De-air the installation again, topping up the water system pressure if required.

14. Explain the functioning and operating of the boiler to the user.

15. Explain to the user the significance of error codes and the need to report them when requesting service engineer support.

16. After installation the datasheet as shown in chapter 9.1 should be filled in. This has to be repeated at every service-interval.

17. Safely store the installation and the user manual preferably in close proximity to the boiler.

7.1 Gas category

The types of gas and supply pressures vary per country.

In the table below the gas category and supply pressure are listed per country.

Countries	Countries	Category	Pressure [mbar]
AT	Austria	I2H	20
BE	Belgium	I2E(R)	20/25
BG	Bulgaria	I2H	20
HR	Croatia	I2H	20
CY	Cyprus	I2H	20
CZ	Czech Republic	I2H	18
DE	Germany	I2E	20
DK	Denmark	I2H	20
EE	Estonia	I2H	20
ES	Spain	I2H	20
FI	Finland	I2H	20
FR	France	I2Esi , I2Er	20 / 25
GB	United Kingdom	I2H	20
GR	Greece	I2H	20
HU	Hungary	I2H	25
IE	Ireland	I2H	20
IT	Italy	I2H	20
LT	Lithuania	I2H	20
LU	Luxembourg	I2E	20
LV	Latvia	I2H	20
NL	Netherlands, the	I2L , I2EK	25
PL	Poland	I2E	20
PT	Portugal	I2H	20
RO	Romania	I2E, I2H	20
SE	Sweden	I2H	20
SL	Slovenia	I2H	20
SK	Slovakia	I2H	20
NO	Norway	I2H	20
CH	Switzerland	I2H	20
LI	Liechtenstein	I2H	20
IS	Iceland		
MT	Malta		

As the responsible manufacturer of my products, I'm aware that the above mentioned countries have adopted the Gas Appliance Directive 2009/142/EC in their national law. I understand that the CE mark has meaning only in these countries, where the GAD is implemented in the national regulations.
Although other countries might value and respect the CE mark, it has no formal value.

This boiler can be adjusted for category K(I_{2K}) and is in this case suitable for the use of G and G+ distribution gasses according to the specifications as shown in NTA 8837:2012 Annex D with Wobbe-index 43,46-45,3 MJ/m^3 (dry, 0 °C, H_s) or 41,23 – 42,98 (dry, 15 °C, H_s)
This boiler can also be converted and re-adjusted for category E (I_{2E})
This means that the boiler : either is suitable for G+ gas and H-gas or provable suitable is for G+ gas and provable can be made suitable for H-gas as meant by "Besluit van 10 Mei 2016" til changes in this document are made

7.2 Adjustment % CO_2 and check on input

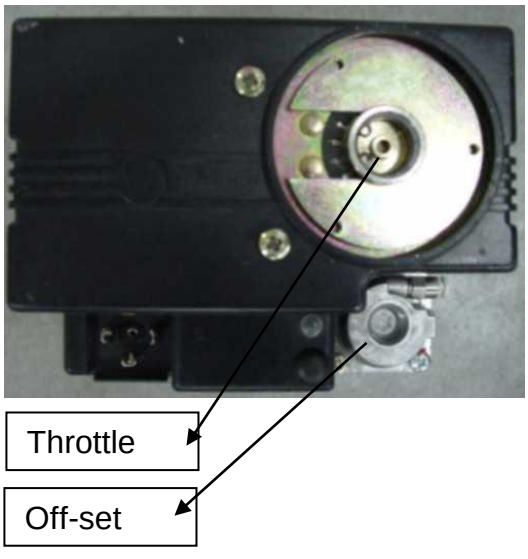
The boiler is equipped with an automatic gas/air regulator. This means that the amount of gas is regulated depending on the amount of air. The % CO_2 needs to be adjusted according to the table below ;

Type of boiler	Gas type	inlet pressure	%CO_2 on max load	%CO_2 on min load
168-5	G20 / G25	20 / 25 mbar	9,3 +0,2-0,05	9,1 +0,15-0,2
210-6	G20 / G25	20 / 25 mbar	9,3 +0,2-0,05	9,1 +0,15-0,2
252-7	G20 / G25	20 / 25 mbar	9,3 +0,2-0,05	9,1 +0,15-0,2
294-8	G20 / G25	20 / 25 mbar	9,3 +0,2-0,05	9,1 +0,15-0,2

The boiler has a gas valve that is connected to a venturi. See figure below ;

Adjustment for <u>max. load</u> ;
- wait until the boiler is stable and measure % CO2
- if required, correct CO_2 with the throttle ; turning to the right gives a lower CO_2 percentage (a ½ turn (180°) gives a change of approximately 0,2 % CO_2)

Adjustment for <u>min. load</u> ;
- wait until the boiler is stable
- if required, correct the CO_2 with the offset ; turning to the right gives a higher CO_2 percentage Notice : this offset adjustment is very sensitive : half a turn (180°) gives a change of approximately 1 % CO_2.



Check on heat input
In the table below the relationship between nominal input and rpm and gasflow is given. The nominal fanspeed can be ± 5% due to adjustments in production

Nominal input	168	210	252	290	**[kW H_i]**
Fanspeed nominal	5300	5450	5850	5800	[**rpm]**
Gasflow G20	17,4	21,8	26,2	30,5	**[m^3/h]**

If the gas flow is too low there is probably dirt (obstruction) in the air/flue system. Check and if necessary clean. The gas flow has to be checked again.

8 ERRORS

8.1 General

If there is no data visible on the display, the fuse (5,0 AT) in the controlpanel near the mainswitch should be checked (as well as the position of the on/off switch) and should if required be replaced (after the cause for break down has been determined).

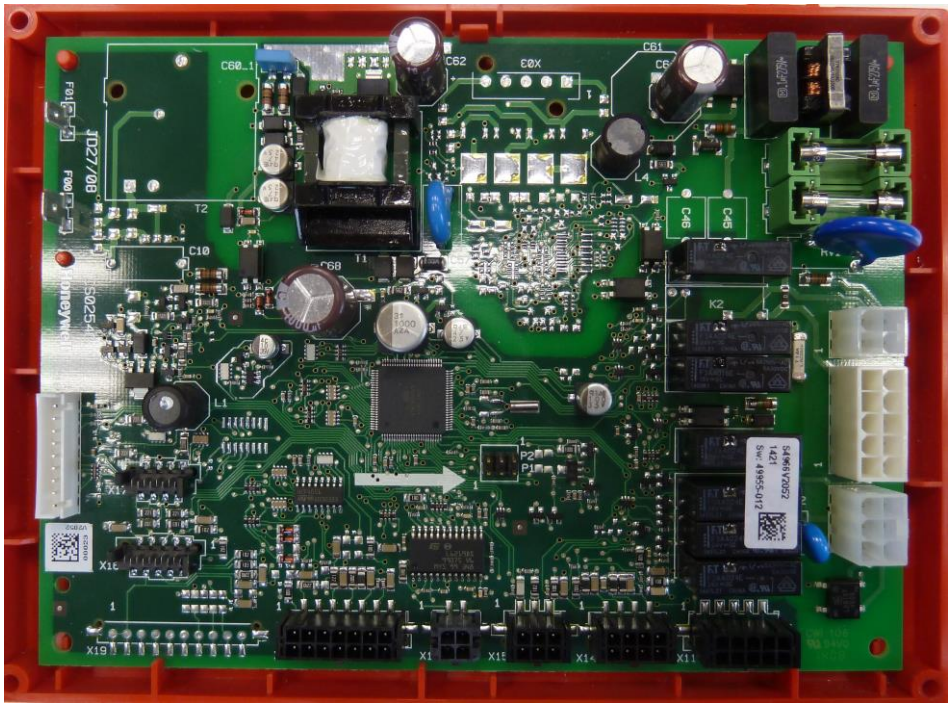
THIS FUSE IS PART OF THE 230 V CIRCUIT.
SO FIRST SWITCH OFF FROM THE MAIN !

If there is still no data visible on the display, one has to check if there is 230 VAC tension on the connections “L” and “N” of connector X1 in the MAXSYS.
Also see electrical wiring diagram.

If there is tension (terminal connector C1: 12,13) , then the 230 V fuses F1 and F2 inside the Maxsys should be renewed. Disconnect the boiler from the main 230V supply and remove the connectors from the Maxsys.
Notice : for this it is **not** necessary to unscrew the Maxsys from the mounting plate
Release the six security clips with a long thin screw driver. Then remove the protective cover of the Maxsys. Replace the 230 V fuse(s) F1: T3.15 AL 250V and/or F2 T3.15 AL 250V inside the Maxsys.
The blown fuse could be caused by a short-circuited pump. That is why the CH-pump and eventually the DHW pump should also be checked.

If the 230 V fuses are o.k. and the display is still blank, then the cable of the display to the Maxsys (X15) should be checked. If this one is also ok, the Maxsys should be replaced.

six security clips



F1: T3.15A 250 V

F2: T3.15A 250 V

If you are not sure there is any heat demand, you can force the boiler to start as described in 5.5.

At heat demand, the boiler control will perform zero-check of air pressure switch before starting the fan. After that the fan will start and wait for air pressure switch to close. As soon as APS has closed, starting procedure will continue.
APS closes at ΔP > 40 Pa.
If there is a problem with APS, display will show blower speed error.

The boiler control checks the status of the built-in pressure switches for water, gas and siphon just before ignition ; Water pressure should be > 1.4 bar (E47)
Gas pressure should be > 14 mbar (E76)
Syphon pressure should be < 8.3 mbar (E77)

8.2 DHW errors

Boiler does not respond to DHW heat request
- Check the storage tank-NTC or thermostat and its wiring (also see electrical wiring diagram).
- Check if warm water preparation is switched on

Insufficient DHW flow
- Dirty filters in taps.
- Insufficient waterpressure.

DHW temperature too low
- Tapping flow too high
- Setting of temperature too low
- Leakage 3-way valve (towards CH-circuit)
- Faulty DHW pump
- DHW operation set to off
- Storage tank-NTC or thermostat and or wiring defect.
- Input too low due to too much resistance in air/flue system.

Boiler operates only for DHW
- Storage tank-NTC or thermostat defect and or its wiring.
- 3-way valve defect (remains in direction towards storage tank)

8.3 CH-errors

CH circuit stays cold
- Incorrect connection to the main.
- Main switch off.
- Room thermostat defect, incorrect wiring, setting too low
- Outdoor sensor and/or its wiring defect.
- CH operation off
- 3-way valve defect (remains in direction towards storage tank)

8.4 Errors (hard and soft lockouts)

Errors are indicated by a text and an E-code on the bottom line on the display.
Error message can be displayed by pressing the ”information” button

An error with a hard lockout. This means that it is a final stop and that a manual reset is required to enable normal operation again (eg max temp limit).
These errors can be found under column “hard lockout code” in table beneath.

An error with a soft lockout. The boiler will automaticly resume normal operation after the cause of block is solved (eg gas pressure too low). They can be found under column “soft lockout code” in table beneath.

The cause of error (hard or soft lockout) can be found with the help of the error-list.

After the cause of error has been determined and the error has been solved, the boiler can be put back into operation again.

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Hard Lockout Code	*Description*
E1	Failed ignition
E2	False flame
E3	High boiler temperature
E4	Air flow/damper
E5	Blower speed
E6	Air flow/damper
E8	Flame circuit error
E9	Gas valve circuit error
E15	Sensor drift
E16	Supply sensor stuck
E17	Return sensor stuck
E18	Sensor failure
E21	Internal control fault
E30	Supply sensor shorted
E31	Supply sensor open
E43	Return sensor shorted
E44	Return sensor open
E80	Return > Flow
E87	External limit open

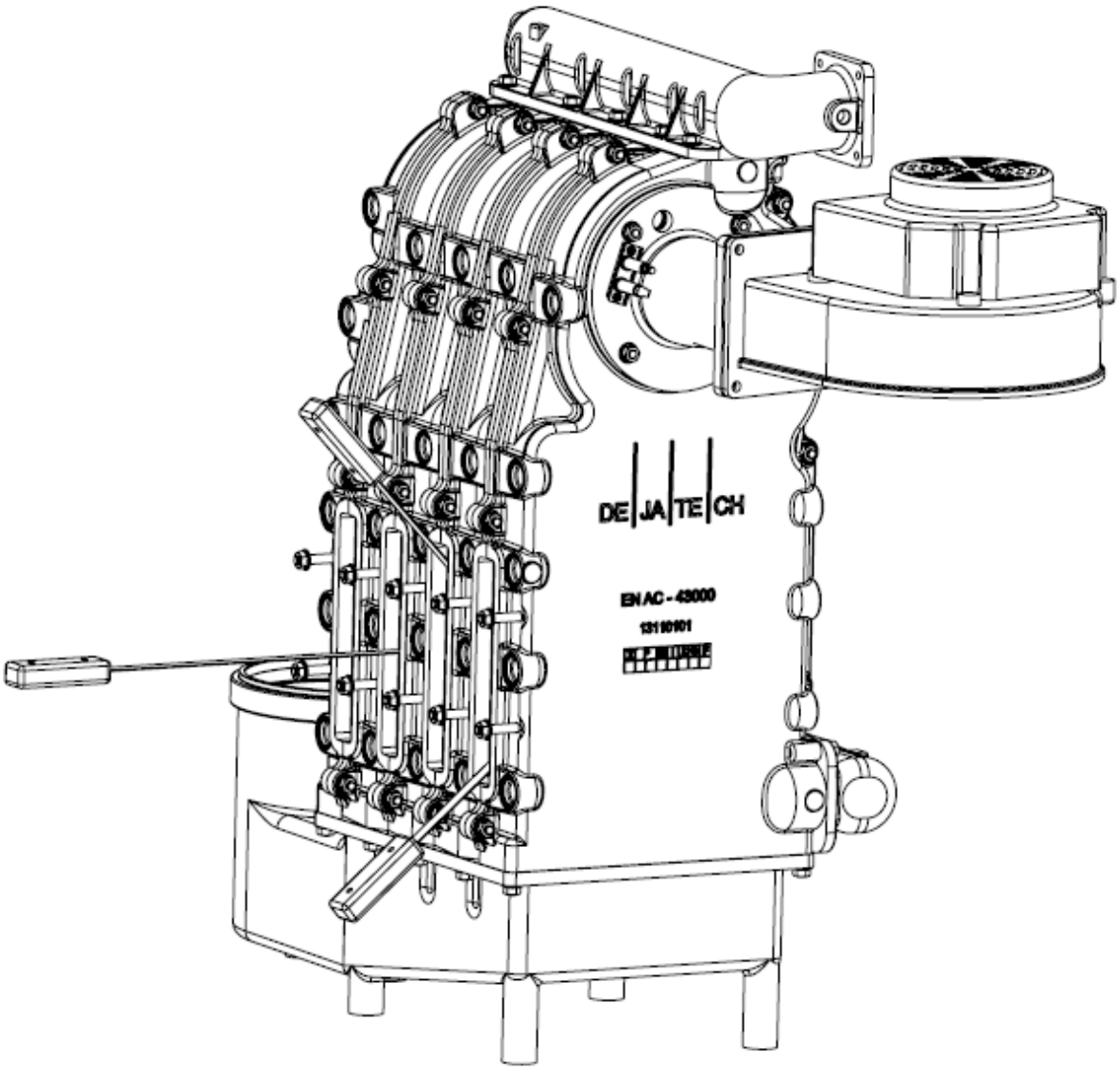
Soft Lockout Code	*Description*
E7	High flue temperature
E12	Internal control fault
E13	Reset limit reached
E25	Internal control fault
E32	DHW sensor shorted
E33	DHW sensor open
E34	Low voltage
E37	Low water
E45	Flue sensor shorted
E46	Flue sensor open
E47	Water pressure error
E76	Low gas pressure
E77	Siphon error
E81	Sensor drift
E82	
E83	
E84	
E87	Overtemp lockout
E89	Incorrect setting
E90	Firmware mismatch
E91	System sensor shorted
E92	System sensor open
E93	Outdoor sensor shorted
E94	Internal display fault
E95	Supply sensor error
E96	Outdoor sensor open
E97	Cascade mismatch
E98	Cascade bus error
E99	Controller bus error

9 MAINTENANCE

Maintenance should always be done by a qualified installer.
Every year this maintenance service-interval should be done (also see 9.1)

Put the boiler into operation on max. load (see description 5.5). Determine the heat input of the boiler. Check % CO_2 .
Compare the heat input with the one measured at installation. If the heat input is now considerably lower then there probably is an obstruction in the air inlet or the flue-outlet or in the boiler itself.
Switch off the boiler. First check the air-inlet and the flue-outlet.
Disconnect from the main. Remove the front cover, top cover and side cover.
Remove the syphon and clean it.

Remove the inspection cover***** of the sump on the frontside beneath the control.
The inner part of the sump and the bottom part of the heat-exchanger can be inspected and, if necessary, be cleaned.
If the bottom part of the heat-exchanger is clogged, the inspection covers on the left-side of the heat-exchanger should be removed*****. Using a special tool (see figure below) makes it possible to clean the heat-exchanger lids partially .
In case of pollution of the sump it is also advisible to inspect the upper part of the heat-exchanger as well. Remove the fan***** together with the burnerhood*****, the gasvalve***** and the gastube*****. Now the burner***** is visible and can be taken out and inspected. If necessary clean the cold side with a vacuum cleaner (or carefully with compressed air) and a nylon brush (**never use a steel brush)**. Inspect the combustion chamber. In case of a polluted heat-exchanger it can be cleaned with water. Check the burner sealing***** and replace if necessary.
Refill the condensate trap with clean water and reconnect it.
Check the electrode, especially the distance between the two pins (3,5± 0,5 mm).
Replace electrode if necessary.
Put everything back in its place. Check the CO_2-content and correct if necessary.
Check the gas-parts for leakages.
Check the flue-gas parts for flue-gas leakages and condensate leakages.
****Notice :*** be carefull during inspection not to damage sealings.
All damaged and/or by ageing or other causes influenced sealings should be replaced.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9.1 Service-maintenance table

When putting the boiler into operation for the first time, we advice to measure load, CO2, CO, T flow, T return, ΔP air pressure switch and P siphon pressure switch and write the values down in the table below.

Measure these values when the boiler is in equilibrium at maximum load (also see chapter 5.5).

During periodical maintenance we advice to measure and write down these values also and compare them to the previous values and analyse any change.

date	gasflow [m^3/h] or load [kW]	CO_2 [%]	CO [ppm]	T_{flow} [°C]	T_{return} [°C]	ΔP air pressure switch [mbar]	P siphon pressure switch [mbar]

At the factory the maximum load of the boiler was measured within 5% tolerance from the nominal load.
In the field the load can decrease due to more resistance in the boiler, the air inlet or the exhaust outlet or due to malfunctioning of the fan.

At maximum load the installation should be designed for nominal ΔT of 15 K to 20 K. When the ΔT is higher than 25 K, the boiler cannot run on maximum load anymore and will start to modulate because water flow through the boiler is insufficient.
T flow and T return can be read in “info mode” on the display (see 5.4 diagnostics)
Valves, malfunctioning pumps, dirt, corrosion products from the installation, dirty filters etc. can have negative impact on water flow through the boiler.

Before ignition the boiler control checks ΔP aps during prepurge. During burner operation this check will be carried out. If the value is decreasing over the years, this could indicate e.g. malfunctioning of the fan, polluted air inlet, polluted burner, polluted heat exchanger or polluted exhaust system.

Syphon pressure (P sps) should be smaller than the maximum allowable flue resistance. If P sps is too high (> 8,3 mbar), the boiler will be stopped.
In this case the exhaust system is probably blocked.

EC Conformity Declaration

CE 0063

0063CQ3790

Dejatech, hereby declares that the condensing central heating boilers, types

Floorflex 168-5, 210-6, 252-7, 294-8

Conform to and comply with the essential requirements of the following European standards and directives.

GAD	Directive 2009/142/EC (30-11-2009) Standards EN 15502-1 and EN 15502-2
BED	Directive 92/42/EEC (21-5-1992) and/or No. 813/2013 (2-8-2013) Standards EN 15502-1 and EN 15502-2
Low Voltage	Directives 73/23/EEC and 93/68/EEC Standard EN 60335-2-102
EMC	Directive 2004/108/EC Standards EN 55014-1, EN 55014-2, EN 610003-2 and EN 610003-3

Yours faithfully

J. Janssen

Managing director