

# INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS

for the Installer and the User



## Compact Condens

170 - 210 - 250 - 300

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## GENERAL RECOMMENDATIONS

### NOTE

This manual contains important information with respect to the installation, the starting up and the maintenance of the appliance.

This manual must be provided to the user, who will read it carefully and keep it in a safe place.

We accept no liability should any damage result from the failure to comply with the instructions contained in this technical manual.



#### Essential recommendations for safety

- It is prohibited to carry out any modifications to the appliance without the manufacturer's prior and written agreement.
- The product must be installed by a qualified engineer, in accordance with applicable local standards and regulations.
- The installation must comply with the instructions contained in this manual and with the standards and regulations applicable to heating systems.
- Failure to comply with the instructions in this manual could result in personal injury or a risk of environmental pollution.
- The manufacturer declines all liability for any damage caused as a result of incorrect installation or in the event of the use of appliances or accessories that are not specified by the manufacturer.



#### Essential recommendations for the correct operation of the appliance

- In order to ensure that the appliance operates correctly, it is essential to have it serviced by a certified installer or maintenance contractor every year.
- In case of anomaly, please call your service engineer.
- Faulty parts may only be replaced by genuine factory parts.



#### General remarks

- The availability of certain models as well as their accessories may vary according to markets.
- The manufacturer reserves the right to change the technical characteristics and features of its products without prior notice.
- In spite of the strict quality standards that ACV applies to its appliances during production, inspection and transport, faults may occur. Please immediately notify your approved installer of any faults.

## SAFETY INSTRUCTIONS

### If you smell gas:

- Immediately isolate the gas supply.
- Open windows and doors to ventilate the area.
- Do not use any electrical appliances and do not operate any switches.
- Immediately notify your gas supplier and/or your installer.

#### Essential recommendations for safety

- Do not store any flammable or corrosive products, paint, solvents, salts, chloride products and other detergent products near the appliance.
- Make sure that the condensate outlet is never obstructed and that a condensate neutralisation system is installed if required.
- This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless supervised or unless they have been given instruction concerning the use of the appliance by a person responsible for their safety.
- Children should be supervised to ensure that they do not play with the appliance.



#### General remarks

- The end user is only allowed to carry out the basic set-up operations mentioned in "Boiler Setup Guide for the User" on page 8, after he has received all relevant instructions from the installer. Any other set-up must be carried out by an approved installer.
- If the end user misuses the installer code to access installer-specific parameters and makes changes that cause a system failure, any warranty claim will be void.

## MEANING OF SYMBOLS

Symbols on the packaging	Meaning
	Fragile
	Keep dry
	Keep standing, up
	Danger of tipping over
	Hand truck or pallet truck required for transport
	Do not cut packaging to open
	Do not stack

Symbols on the appliance	Meaning
	Heating circuit
	Domestic Hot Water circuit

Symbols in the manual	Meaning
	Essential recommendation for safety (safety of persons and equipment)
	Essential recommendation for electrical safety (electrical hazard)
	Essential recommendation for the correct operation of the appliance or the system
	General remark

**BOILER MARKING**

Location: At the back of the boiler



The part number (Typ) and serial number of the appliance are indicated on its rating plate and must be provided to ACV in case of warranty claim. Failure to do so will make the claim void.

		<b>MADE IN BELGIUM</b>		<b>CE 0063-2016</b>	
ACV INTERNATIONAL OUDE VIJVERWEG N°6 1653 DWORP		0063CQ3790			
<b>Typ</b>	<b>100394 / A1002889</b>	<b>Country P[mbar]Cat</b>			
<b>Model</b>	<b>Compact Condens 170</b>	AT 20 I2H			
<b>Qn (Hi)</b>	<b>33,6 - 168 kW</b>	BE 20/25 I2E (R)			
<b>Pn (50-30)</b>	<b>172,7 kW</b>	CH 20 I2H			
<b>Pn (80-60)</b>	<b>32,6 - 163,6 kW</b>	DE 20 I2E			
<b>Tmax</b>	<b>90 °C</b>	ES 20 I2H			
<b>PMS</b>	<b>6 bar</b>	FR 20/25 I2Esi			
<b>V</b>	<b>20 L</b>	GB 20 I2H			
<b>Pe (max)</b>	<b>1150 Watt</b>	IE 20 I2H			
<b>IP</b>	<b>00b</b>	IT 20 I2H			
<b>230 VAC</b>	<b>50 Hz 5 A</b>	LU 20 I2E			
<b>Ser. Nr.</b>	<b>10039414116160000002</b>	NL 25 I2L, I2EK			
		PL 20 I2H			
		B23 C33 C53 C63			
		EN 15502-1,15502-2-1			

Compact Condens 170

		<b>MADE IN BELGIUM</b>		<b>CE 0063-2016</b>	
ACV INTERNATIONAL OUDE VIJVERWEG N°6 1653 DWORP		0063CQ3790			
<b>Typ</b>	<b>100396 / A1002891</b>	<b>Country P[mbar]Cat</b>			
<b>Model</b>	<b>Compact Condens 250</b>	AT 20 I2H			
<b>Qn (Hi)</b>	<b>50,4 - 252 kW</b>	BE 20/25 I2E (R)			
<b>Pn (50-30)</b>	<b>259,0 kW</b>	CH 20 I2H			
<b>Pn (80-60)</b>	<b>48,9 - 245,4 kW</b>	DE 20 I2E			
<b>Tmax</b>	<b>90 °C</b>	ES 20 I2H			
<b>PMS</b>	<b>6 bar</b>	FR 20/25 I2Esi			
<b>V</b>	<b>28 L</b>	GB 20 I2H			
<b>Pe (max)</b>	<b>1150 Watt</b>	IE 20 I2H			
<b>IP</b>	<b>00b</b>	IT 20 I2H			
<b>230 VAC</b>	<b>50 Hz 5 A</b>	LU 20 I2E			
<b>Ser. Nr.</b>	<b>10039614116160000001</b>	NL 25 I2L, I2EK			
		PL 20 I2H			
		B23 C33 C53 C63			
		EN 15502-1,15502-2-1			

Compact Condens 250

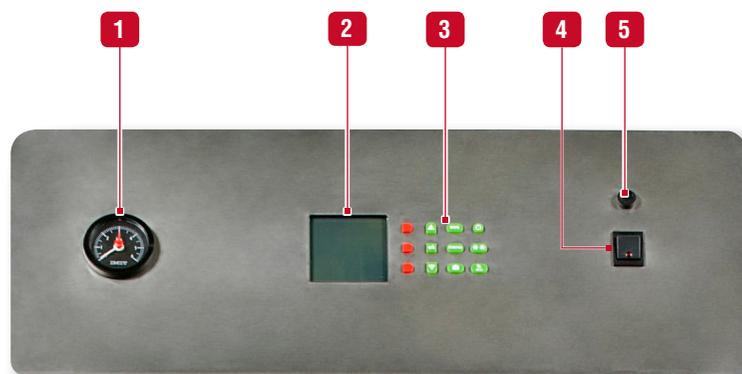
		<b>MADE IN BELGIUM</b>		<b>CE 0063-2016</b>	
ACV INTERNATIONAL OUDE VIJVERWEG N°6 1653 DWORP		0063CQ3790			
<b>Typ</b>	<b>100395 / A1002890</b>	<b>Country P[mbar]Cat</b>			
<b>Model</b>	<b>Compact Condens 210</b>	AT 20 I2H			
<b>Qn (Hi)</b>	<b>42 - 210 kW</b>	BE 20/25 I2E (R)			
<b>Pn (50-30)</b>	<b>215,9 kW</b>	CH 20 I2H			
<b>Pn (80-60)</b>	<b>40,7 - 204,5 kW</b>	DE 20 I2E			
<b>Tmax</b>	<b>90 °C</b>	ES 20 I2H			
<b>PMS</b>	<b>6 bar</b>	FR 20/25 I2Esi			
<b>V</b>	<b>24 L</b>	GB 20 I2H			
<b>Pe (max)</b>	<b>1150 Watt</b>	IE 20 I2H			
<b>IP</b>	<b>00b</b>	IT 20 I2H			
<b>230 VAC</b>	<b>50 Hz 5 A</b>	LU 20 I2E			
<b>Ser. Nr.</b>	<b>100395141161600000001</b>	NL 25 I2L, I2EK			
		PL 20 I2H			
		B23 C33 C53 C63			
		EN 15502-1,15502-2-1			

Compact Condens 210

		<b>MADE IN BELGIUM</b>		<b>CE 0063-2016</b>	
ACV INTERNATIONAL OUDE VIJVERWEG N°6 1653 DWORP		0063CQ3790			
<b>Typ</b>	<b>100397 / A1002892</b>	<b>Country P[mbar]Cat</b>			
<b>Model</b>	<b>Compact Condens 300</b>	AT 20 I2H			
<b>Qn (Hi)</b>	<b>58,8 - 290 kW</b>	BE 20/25 I2E (R)			
<b>Pn (50-30)</b>	<b>298,1 kW</b>	CH 20 I2H			
<b>Pn (80-60)</b>	<b>57,0 - 282,5 kW</b>	DE 20 I2E			
<b>Tmax</b>	<b>90 °C</b>	ES 20 I2H			
<b>PMS</b>	<b>6 bar</b>	FR 20/25 I2Esi			
<b>V</b>	<b>32 L</b>	GB 20 I2H			
<b>Pe (max)</b>	<b>1150 Watt</b>	IE 20 I2H			
<b>IP</b>	<b>00b</b>	IT 20 I2H			
<b>230 VAC</b>	<b>50 Hz 5 A</b>	LU 20 I2E			
<b>Ser. Nr.</b>	<b>100397141161600000001</b>	NL 25 I2L, I2EK			
		PL 20 I2H			
		B23 C33 C53 C63			
		EN 15502-1,15502-2-1			

Compact Condens 300

## CONTROL PANEL AND DISPLAY

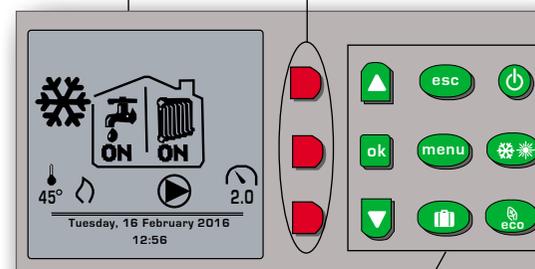
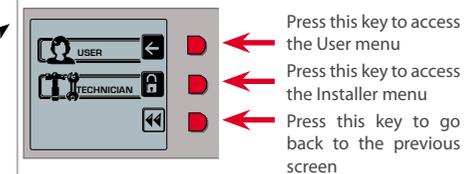


### Panel Description

- 1. Pressure gauge** - Indicates the primary circuit pressure (min. 1 bar when cold).
- 2. MAXSYS LCD Display** - It is the setup interface of the boiler and indicates the parameter values, the error codes and the set-up status of the parameters. It displays a series of screens, each showing information and/or icons.
- 3. Keypad** - to browse through the screens of the MAXSYS controller, set up the boiler, increase and decrease the displayed values and validate the selections and access the User or Installer set-up screens. See detail on the right.
- 4. ON/OFF master switch of the boiler** - To turn the appliance ON and OFF.
- 5. 5A Fuse** - To protect the electrical system of the boiler.

**Home screen** : It shows the status of CH and DHW circuits (ON or OFF, as defined by the user/installer in the setup), the activation of the anti-freeze function, the current temperature of ???, the current pressure, the operation of the circulation pump, the current date and time. A flame symbol is also displayed when the unit is fired.

**Red keys**: Allow to select specific items on the display, as well as increase/decrease the values shown on specific screens (when associated with "+" or "-" symbol on the display) or go back to the previous screen (when associated with "◀" on the display). See the example below.



Key	Function
▲	To scroll up the menus on the display
ok	To validate a selection or a value
▼	To scroll down the menus on the display
esc	To exit a screen and go back to the Home screen
menu	To access the User / Installer menu selection screen
🧳	To activate the "Holiday function"
⏻	To put the boiler in OFF mode
❄️ ⚙️	To enable/disable the CH and DHW functions
🌿	To enable the ECO function

## WHAT TO CHECK ON A REGULAR BASIS

### Essential recommendations for the correct operation of the appliance

ACV recommends to check the system at least every 6 months as follows:

- Check that the system water pressure is at least 1 bar when cold. If the pressure drops below 0.8 bar, the built-in pressure sensor blocks the appliance until the pressure exceeds 1.2 bar.
- If it is required to top up the system to maintain the minimum recommended water pressure, always turn the appliance off and only add small amounts of water at a time. If a large amount of cold water is added in a hot boiler, the boiler can be damaged definitively.
- If the system needs to be refilled repeatedly with water, please contact your installer.
- Check that there is no water on the floor under the boiler. If there is, please call your installer.
- If a condensate neutralisation system is installed, check it and have it cleaned regularly.
- Check regularly that there is no error code (lockout) flashing on the display. Refer to paragraph below.

## LOCKOUT SCREEN

If a problem occurs, the Lockout screen replaces the Home screen. The error is indicated by a code and message on the display. Pressing the OK key will reset the boiler.

Using the code on the display, solve the problem with the table on the right, then reset the boiler.

If the problem cannot be solved and/or if the code is not provided in this table, please contact your installer.

## IN CASE OF PROBLEM...

Check the list of faults and corresponding codes below to get the solution(s). If no solution is provided here, please contact your installer who will determine the correct solution.

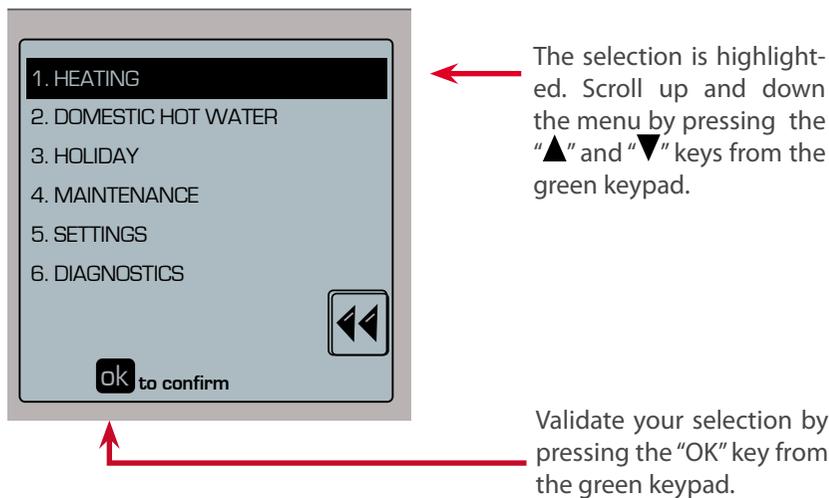
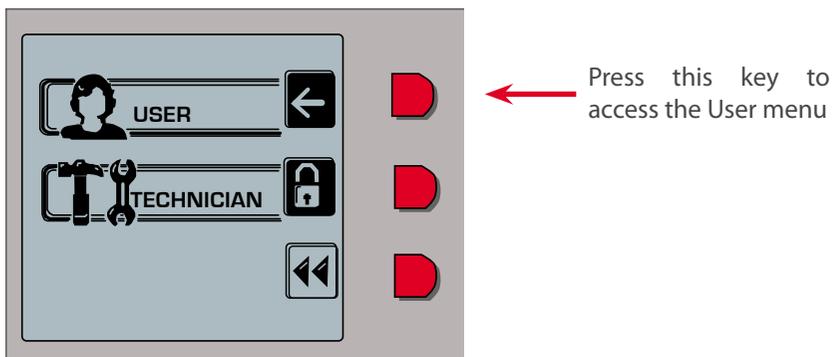
Fault code	Problem	Possible Cause(s)	Solution
-	The appliance does not turn on when pressing the ON/OFF Master switch	No power supply	Check the power supply and that the appliance power plug is connected to the network.
E1	Failed ignition	The burner failed to light after 3 ignition attempts	Check gas supply to the boiler.
E13	Reset limit reached	Resets are limited to 5 every 15 minutes	Turn unit OFF and ON to resume normal operation.
E34	Low voltage	Line voltage has fallen below an acceptable operating level	The boiler will automatically reset once line voltage returns to normal.
E37	Low Water	Water pressure has fallen below an acceptable operating level (0.8 bar)	Refill the system to reach a normal range pressure. The boiler will automatically reset once water pressure returns to normal.
E94	Internal Display Fault	Display memory error	Turn appliance off and on to resume normal operation.

## BOILER SETUP GUIDE FOR THE USER

The main parameters of the Compact Condens boilers can be set up by the user using the user setup function of the controller. It allows the user/installer to quickly setup the appliance for immediate operation according to the system configuration.

A more extensive menu is also provided for the Installer, refer to "Installer's menu and parameter descriptions" on page 12.

**Accessing the User menu** - Press the "menu" key from the green keypad to access the screen shown below

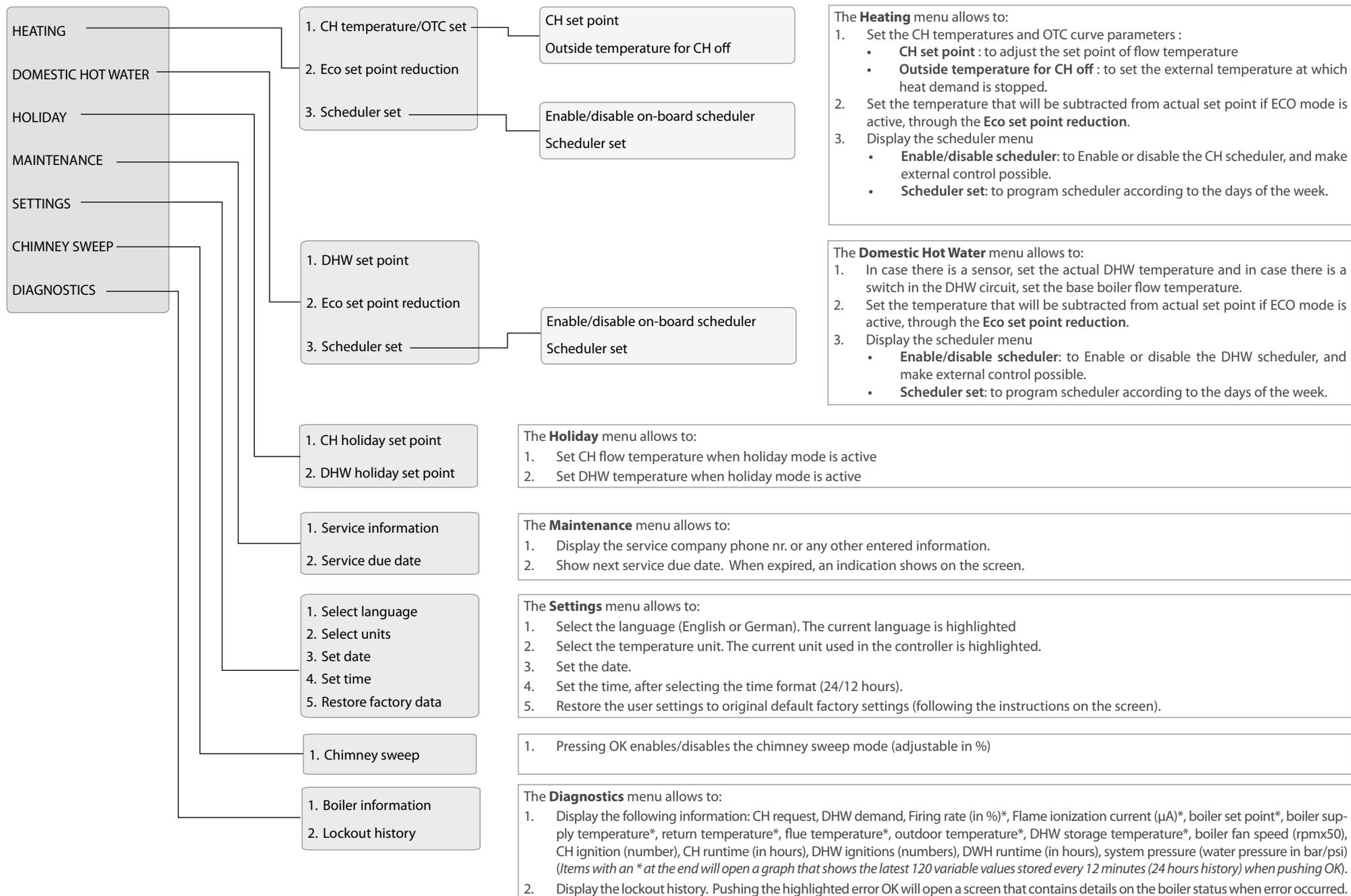


Through the User menu, the following parameters can be set :

<b>Heating</b>	The user can define the CH set point, the outside temperature at which the heating must be stopped (Outside air temp. sensor required), the temperature reduction for the Eco mode, and he can schedule the operation of the CH circuit.
<b>Domestic Hot Water</b>	When an external DHW tank is installed in the system, the user can define the DHW set point, the temperature reduction for the Eco mode, as well as schedule the operation of the DHW circuit.
<b>Holiday</b>	This menu allows to define the CH and DHW set points applicable in holiday mode.
<b>Maintenance</b>	This function provides informations related to the maintenance operations (contact details and maintenance due date).
<b>Settings</b>	In this menu, various general settings can be defined, such as language, units, date, time, etc.
<b>Diagnostics</b>	In the diagnostics, the user can find the boiler usage information as well as the history of errors.

For a detail of the user's menu screens and descriptions, see the diagram on next page.

**USER'S MENU AND PARAMETER DESCRIPTIONS**



## PRINCIPLES OF OPERATION

### General

The Compact Condens is a room sealed boiler, equipped with a cast aluminium heat-exchanger. The boiler is provided with a heating circuit, but no internal Domestic Hot Water production tank. However, an external DHW tank can be installed in the system. Refer to "System Configurations" on page 26

The CH circuit is not provided with a CH-pump. The installer must therefore install one in the system, whose hydraulic resistance will match the hydraulic resistance of the boiler(s) and system. Please contact your ACV representative for the correct accessories.

The Compact Condens boilers (both CH and DHW circuits) are controlled by the MAXSys processor.

### Heating Circuit

The heating circuit can be controlled through:

- **On-off room thermostat (standard)** - As standard the boiler is programmed for using an on-off room thermostat. The desired flow temperature is adjustable, but as standard is set to 80 °C. At CH heat request from the room thermostat (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 80 °C towards the CH-circuit is achieved.
- **0-10V signal (optional)** - The boiler can be programmed for using a 0-10 VDC signal (must be disturbance-free). The maximum desired flow temperature is adjustable, but as standard set to 80 °C. Please contact your ACV representative for more details and the correct accessories.
- **Outside Temperature Control OTC (optional)** - The boiler is prepared to work with an outdoor sensor. The sensor should be installed on the north-side of the building at a height of approximately 2 meters. Once it is connected to the terminal strip of the boiler, the outdoor sensor is automatically detected by the controller. Please contact your ACV representative for more details and the correct accessories.
- **Digital communication (optional)** - The boiler is also prepared for digital communication with room thermostats with communication protocols like Open-Therm (automatically recognised if correctly connected to the terminal strip). Please contact your ACV representative for more details and the correct accessories.

### Domestic Hot Water preparation (DHW)

**External storage tank with thermostat** - 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 a :

- 230 VAC DHW pump (Default configuration 2 Pump: DHW- and CH pump)
- Electric 3-way valve.

DHW heat request for warm water is generated when the thermostat closes. The tank thermostat also determinates the hysteresis (difference in °C between on and off of the boiler) for keeping the storage tank at temperature.

The standard storage tank set temperature is 80 °C .

During operation the boiler will heat up until a flow temperature of 80 °C is reached.



**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).**

**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, refer to "Boiler Setup Guide for the Installer" on page 11.



**The resistance of the NTC sensor must have a value of 12 kOhm at 25 °C.**

Heat request and keeping on temperature of the storage tank is done at an adjustable temperature (default set at 65°C).



**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).**

### General behaviour with external storage tank

Disabling/Enabling warm water operation : press Summer-Winter button.



**In some countries, at outputs  $\geq 40$  kW double separation between exchanging media is required.**

### Safety features

The Compact Condens features various safety devices to protect the boiler and the complete system:

- **Main fuse (5A)**, located near the On/Off switch, on the right side of the control panel
- **Syphon pressure switch**, connected to the sump (P1), prevents overflow of the syphon in case of too high back pressure in the chimney
- **Overheat limit switch(thermostat)**, set at 105°C.
- **Air pressure switch**, connected to the venturi, checks the amount of air (by means of a  $\Delta p$  measurement) before start.
- **A Frost protection mechanism**: This function protects the **boiler only**, not the system. As soon as the flow temperature drops below 8°C, the central heating pump is activated. As soon as the flow temperature is at 6°C, the burner starts up at minimum load until the flow temperature rises to 15°C. The CH-pump will continue to run for 10 minutes. The function can be enabled or disabled through the installer menu. When the frost protection is disabled, only the pump operate.
- An **anti-freeze function** is also available using a frost thermostat connected 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 °C. In order to enable the Compact Condens boiler to protect the whole system against freezing, all the valves of the radiators and the convectors should be completely open.

### Other features

**Eco working mode** - When the Eco button  (eco) is pressed a programmable value is subtracted from the flow temperature set point.

**Holiday mode** - When the Holiday button  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.

### Start up process

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 fan speed. Once the air pressure switch is closed the fan goes to ignition fan speed.

After 5 seconds pre-purge on ignition fan speed, 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 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.

### "Slow start" principle

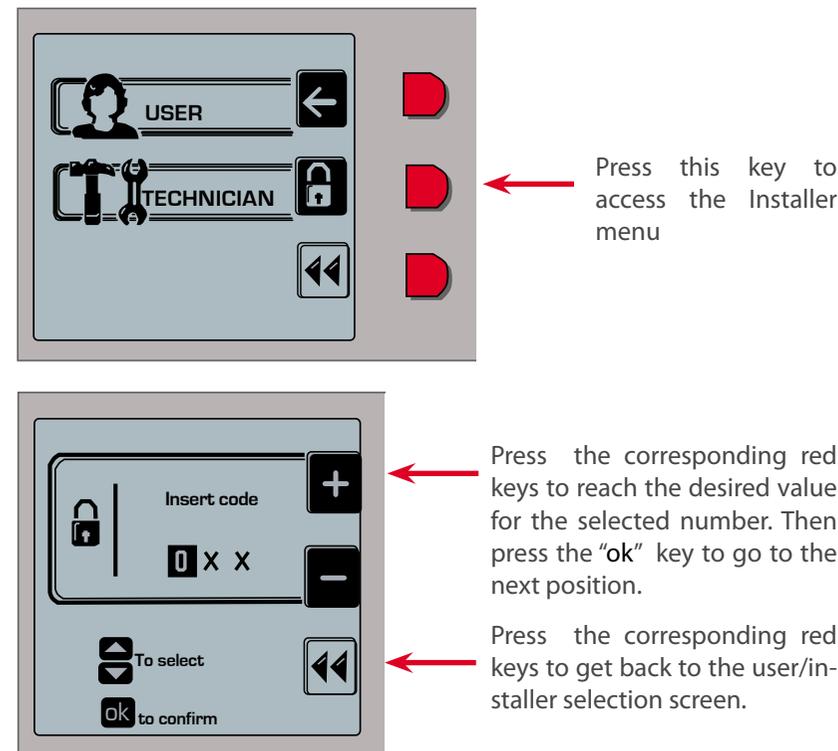
Standard setting of the boiler involves the "slow start" principle in order to avoid the boiler and installation to heat up too quickly.

After "zero check" APS and closure APS with pre purge, ignition starts. After a stabilizations time the boiler 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 pre-purge period.

### BOILER SETUP GUIDE FOR THE INSTALLER

The parameters of the Compact Condens boilers can be set up by the installer using the Technician setup function of the controller. It allows the installer to setup extensively the appliance according to the system configuration.

**Accessing the Installer menu** - Press the "menu" key from the green keypad to access the screen shown below. Then type the Installer code "231" using the red keys corresponding to the "+" and "-" signs on the display..

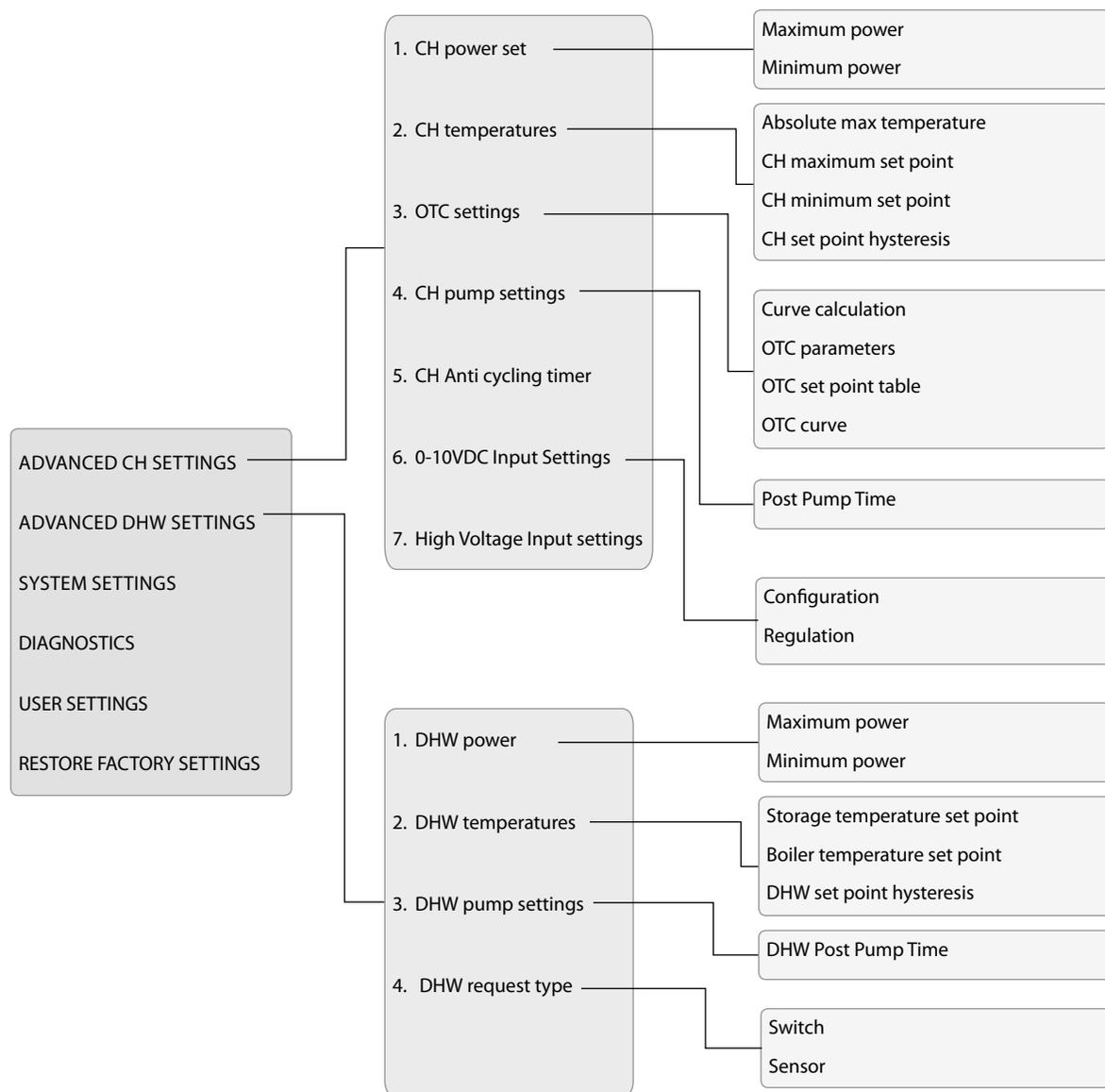


The following parameters can be accessed by the installer.

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

See the following pages for more details.

## INSTALLER'S MENU AND PARAMETER DESCRIPTIONS

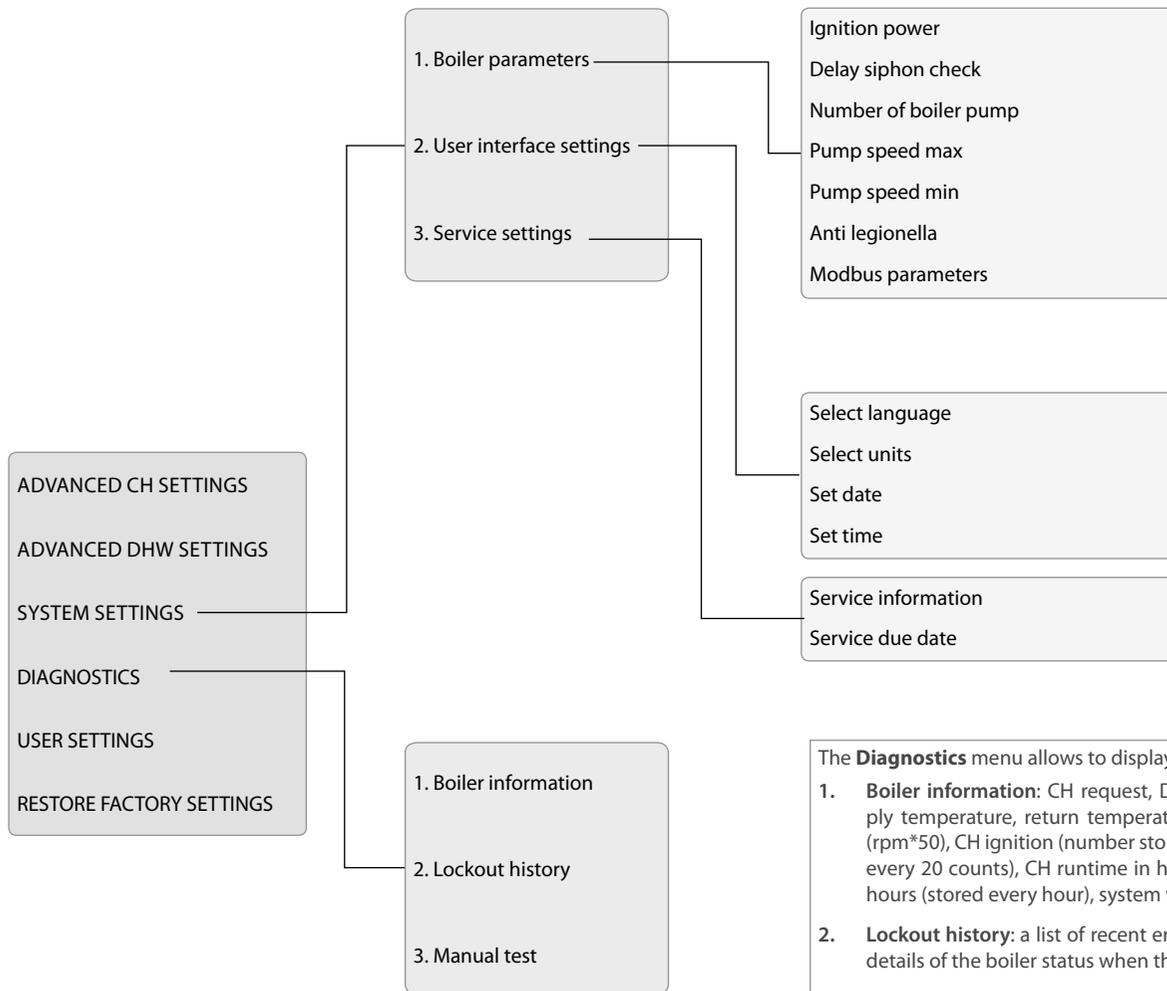


The **Advanced CH Settings** menu allows to:

- Set % of boiler maximum / minimum power in CH mode
- Show and set boiler CH temperatures:
  - Set absolute CH max temperature that CH circuit will never exceed
  - Set the maximum CH set point
  - Set the minimum CH set point
  - Sets CH set point hysteresis (temperature above set point at which boiler will switch off)
- Set OTC settings:
  - Curve calculation (2 points calculation, 4 point calculation, CH set point).
  - OTC parameters (Outside temp for max. CH, Outside temp. for min. CH, Outside temp. for CH off).
  - OTC set point table (Show in a table the link between external temperature and actual set point determined by OTC parameter selection).
  - Show the curve for OTC temperatures.
- Adjust pump related parameters
  - Pump overrun time after heat demand
- Determines minimum time between boiler stop and next ignition
- Determines the use of a 0-10 V signal to control the system
  - Configuration: WP sensor, analog voltage input
  - Regulation: set point percentage
- This function is not active

The **Advanced DHW Settings** menu allows to:

- Set % of boiler maximum / minimum power in DHW mode
- Show and set DHW temperatures
  - Sets flow temperature during DHW demand coming from thermostat (switch)
  - Sets flow temperature during DHW demand coming from sensor
  - Sets temperature above set point at which boiler will be switched off
- Adjusts pump related parameters in DHW mode
  - Pump overrun time after DHW demand
- Define demand by switch or sensor
  - DHW starts when switch (thermostat) closes
  - DHW starts based on difference between actual and required DHW temperature

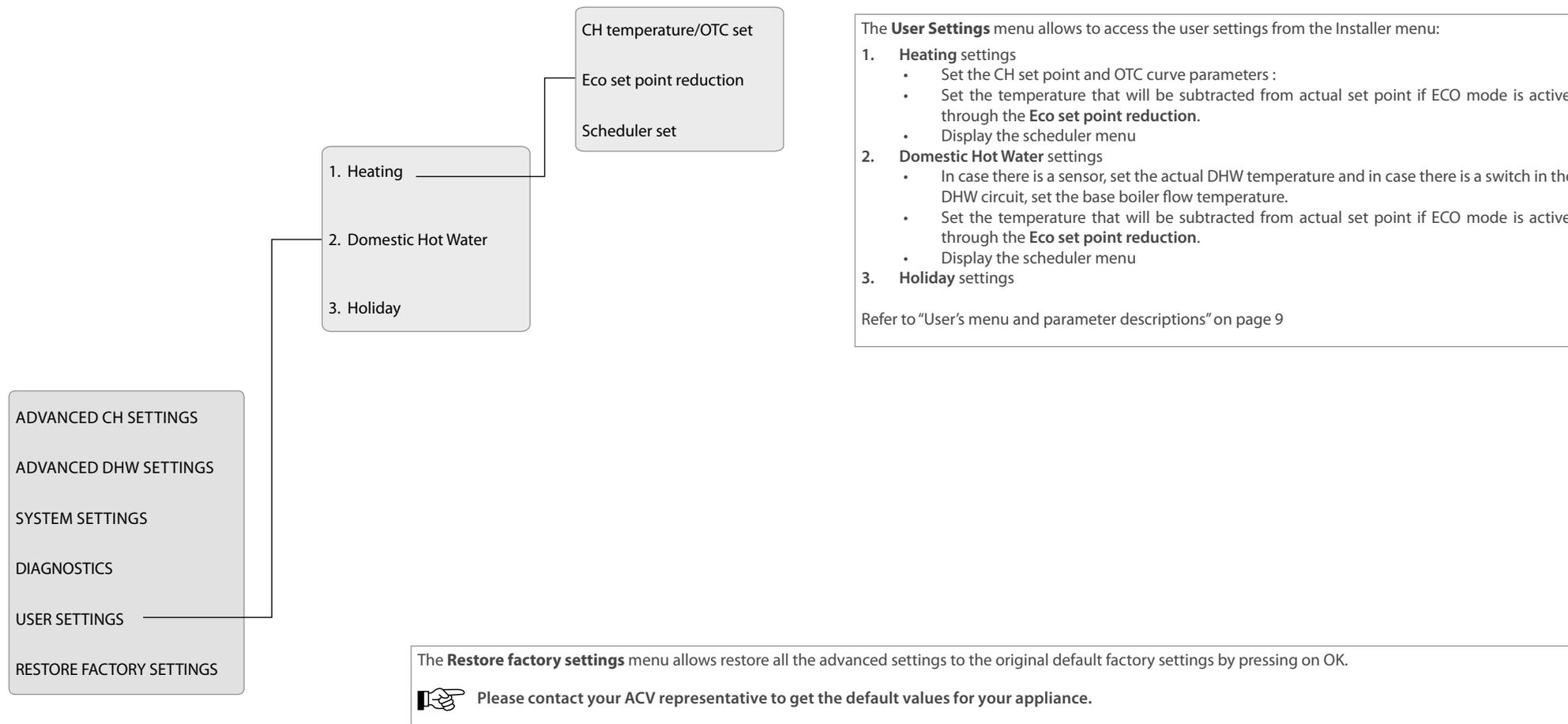


The **System Settings** menu allows to:

1. Define several boiler parameters:
  - Set power % used during ignition boiler
  - Delay time to validate a siphon error
  - Define the number and type of pumps (pump and 3-way valve or 2 pumps)
  - Define the pump max and min speeds (%)
  - Enable/disable anti legionella function
  - Allows assignment of Modbus address. By pushing the OK button the address is saved and the baud rate screen will appear. Once the baud rate is adjusted and the OK button to confirm is pushed, the modbus frame screen will appear in which it is possible to select modbus frame characteristics. Once confirmed by pushing the OK button the boiler parameter screen will appear
2. Define user interface parameters:
  - Current language is highlighted. Two languages are available : EN and DE
  - Current temperature unit is highlighted. Two units are available : °C and °F
  - Set system date
  - Set system time
3. Define service settings:
  - Service company phone number can be inserted.
  - Next service due date

The **Diagnostics** menu allows to display the following information:

1. **Boiler information:** CH request, DHW demand, Firing rate (in %), flame ionization current (µA), boiler set point, boiler supply temperature, return temperature, flue temperature, outdoor temperature, DHW storage temperature, boiler fan speed (rpm\*50), CH ignition (number stored every 20 counts), CH runtime in hours (stored every hour), DHW ignitions (number stored every 20 counts), CH runtime in hours (stored every hour), DHW ignitions (number stored every 20 counts), DHW runtime in hours (stored every hour), system water pressure in bar/psi for \*
2. **Lockout history:** a list of recent errors. Pushing the OK button on the highlighted error will open a new screen that contains details of the boiler status when the error occurred. Maximum length of list 8 errors
3. **Manual test:** a CH demand can be forced that will ignite the boiler (in absence of error) at the indicated power. Manual test mode is enabled/disabled by pushing the OK button or is ended after technician code time-out (default 15 minutes). Leaving the manual test screen while test is in progress allows technician to navigate through other menus to check boiler status and functionality.



## APPLIANCE DESCRIPTION

### MODELS - COMPACT CONDENS 170- 210 - 250 - 300

The Compact Condens is a floor-installed gas condensing boiler meeting the requirements of current "HR-Top" standards in Belgium. The boiler is certified compliant with "EC" standards as a connected appliance: C33(x) - C53(x) - C63(x), but it can also be connected as an open appliance in category B23, which can operate with a positive pressure.

The boiler is a room sealed boiler, equipped with a cast aluminium heat-exchanger.

As standard the boiler is programmed to operate with an on-off room thermostat. It can also be operated using either an optional 0-10V signal, or an Outside temperature control system. The boiler also features an optional function for digital communication with room thermostats.

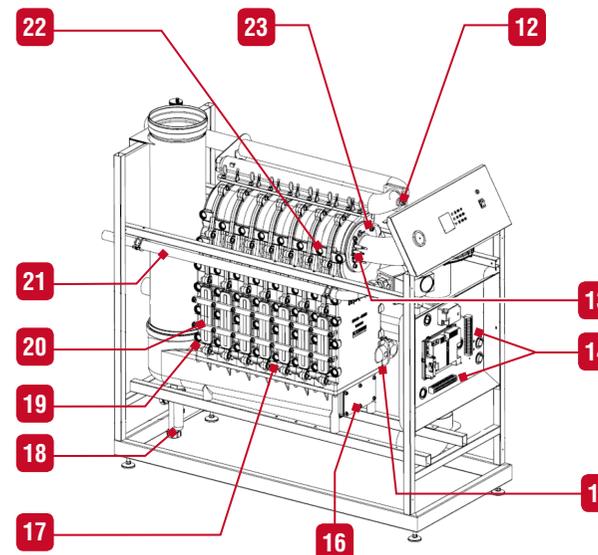
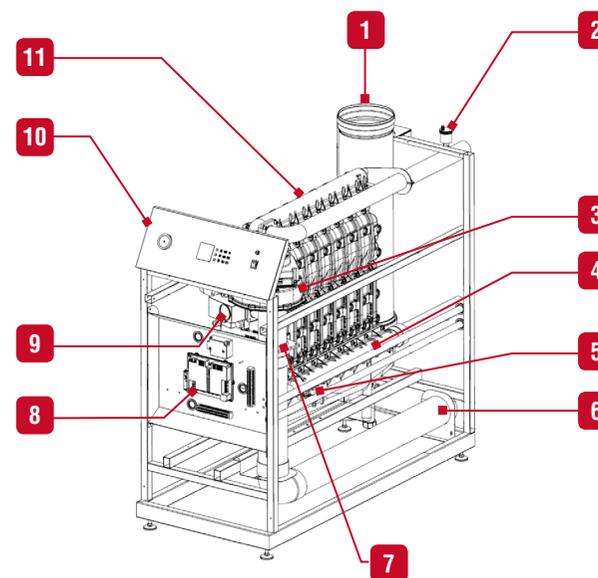
An external DHW tank with a thermostat or sensor can be installed in the system. It will be controlled by the built-in MAXSys controller.

Among the operating modes, the boiler can operate either in holiday mode or in eco mode, taking into account the user's schedules.

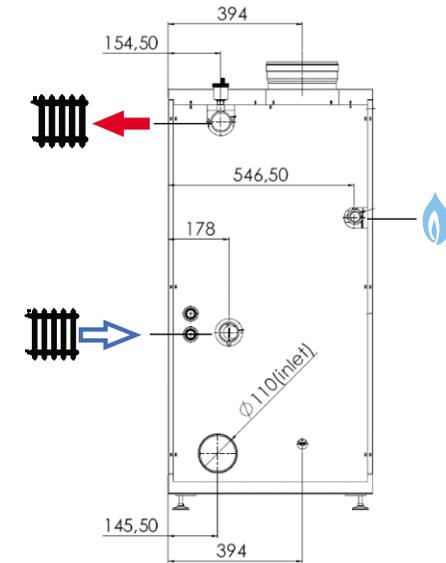
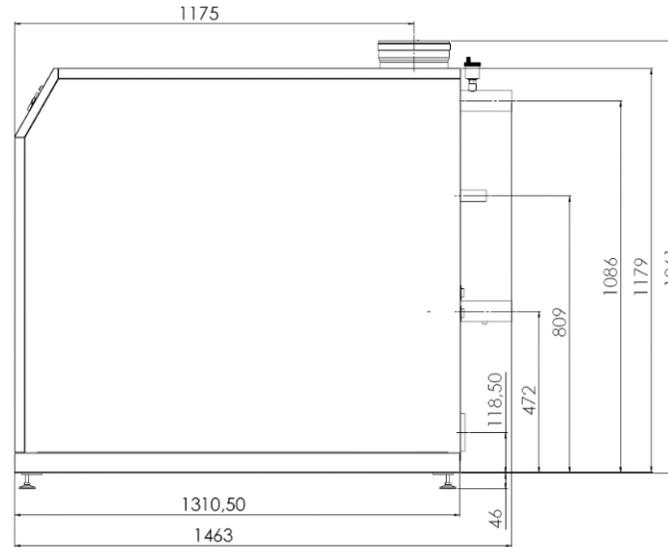
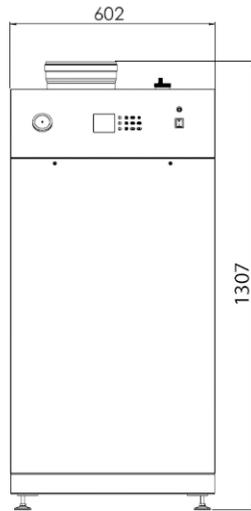
The boiler also features a built-in frost protection mechanism, as well as an anti-freeze function that will protect both the appliance and the system. For more information and details on the boiler's capabilities, refer to "Principles of Operation" on page 10.

### Key

1. Chimney connection  $\varnothing$  200
2. Auto air vent
3. Fan
4. Heating return and return NTC
5. Fill and drain valve (+ water pressure sensor)
6. Air inlet ( $\varnothing$  110)
7. Venturi
8. MAXSys Controller
9. Gas valve
10. Control panel with display and pressure gauge
11. Heating supply
12. Flow NTC
13. Ignition and ionization electrodes (2x)
14. C1 & C2 terminal strips for electrical connections
15. Air pressure switch (backside)
16. Inspection sump cover
17. Cast aluminium heat exchanger
18. Condensate trap (syphon)
19. Syphon pressure switch + flue gas NTC
20. Inspection cover
21. Gas pipe
22. Overheat limiter switch
23. Flame sight glass



## DIMENSIONS



## COMPACT CONDENS

		170	210	250	300
 [M]	"	2	2	2	2
 [M]	"	1	1	1	1
Min. $\varnothing$ of flue pipe	mm	200	200	200	200
Drained weight	Kg	209	217	233	259
Clearance required (on access side(s))	mm	1000	1000	1000	1000

COMBUSTION CHARACTERISTICS

			COMPACT CONDENS			
			170	210	250	300
Input (PCI)	max	kW	168	210	252	290
	min	kW	33.6	42	50.4	58.8
Output at 100%	(80/60°C)	kW	163.6	204.5	245.4	282.5
Efficiency at 100%	(80/60°C)	%	97.4	97.4	97.4	97.4
	(50/30°C)	%	102.8	102.8	102.8	102.8
Efficiency at 30% load (EN677)		%	107.5	107.5	107.5	107.5
NOx (Class 5)	Weighted	mg/kWh	50	50	50	50
CO	Max. output	mg/kWh	40.8	41.8	39.7	37.5
CO <sub>2</sub>	Max. output	%CO <sub>2</sub>	9.3	9.3	9.3	9.3
	Min. output	%CO <sub>2</sub>	9.1	9.1	9.1	9.1
Max gas flow rate G20/G25	G20 (20 mbar)	m <sup>3</sup> /h	17.4	21.8	26.2	30.2
	G25 (25 mbar)	m <sup>3</sup> /h	20.2	25.2	30.3	34.9
Temp. of flue gases	Nominal	°C	70	70	70	70
	Max.	°C	70-75	70-75	70-75	70-75
	Min.	°C	65-70	65-70	65-70	65-70
Mass flow rate** of flue gases	Nominal	g/s	80	108	120	138
	at min output	g/s	15	19	23	27

\*\* Mass flow rate values were calculated for G20 with an air factor of 1.3.

GAS CATEGORIES

Gas type		G20	G25	G20 ↔ G25
Pressure (mbar)		20	25	20 ↔ 25
Country code	Category			
AT	I <sub>2</sub> H	●		
BE	I <sub>2</sub> E(R)			●
BG	I <sub>2</sub> H	●		
CH	I <sub>2</sub> H	●		
CY	I <sub>2</sub> H	●		
CZ	I <sub>2</sub> H	●		
DE	I <sub>2</sub> E	●		
DK	I <sub>2</sub> H	●		
EE	I <sub>2</sub> H	●		
ES	I <sub>2</sub> H	●		
FI	I <sub>2</sub> H	●		
FR	I <sub>2</sub> Esi			●
GB	I <sub>2</sub> H	●		
GR	I <sub>2</sub> H	●		
HR	I <sub>2</sub> H		●	
IE	I <sub>2</sub> H	●		
IT	I <sub>2</sub> H	●		
LI	I <sub>2</sub> H	●		
LT	I <sub>2</sub> H	●		
LU	I <sub>2</sub> E	●		
LV	I <sub>2</sub> H	●		
NL	I <sub>2</sub> L		●	
	I <sub>2</sub> K		●	
NO	I <sub>2</sub> H	●		
PL	I <sub>2</sub> H	●		
PT	I <sub>2</sub> H	●		
RO	I <sub>2</sub> E	●		
	I <sub>2</sub> H	●		
SE	I <sub>2</sub> H	●		
SI	I <sub>2</sub> H	●		
SK	I <sub>2</sub> H	●		
SL	I <sub>2</sub> H	●		

**ELECTRICAL CHARACTERISTICS COMPACT CONDENS 170 - 210 - 250 - 300**

Main Characteristics		COMPACT CONDENS			
		170	210	250	300
Rated voltage	V~	230	230	230	230
Rated frequency	Hz	50	50	50	50
Electrical consumption	W	1150	1150	1150	1150
Electrical consumption in standby	W	5	5	5	5
Class	IP	00b	00b	00b	00b
Fuse	A	5	5	5	5

Min cross section of supply wire : 3 x 1.0 mm<sup>2</sup>

**NTC RESISTANCE**

Internal NTC (Flow/Return/Flue) : 12 K [Ω] at 25°C

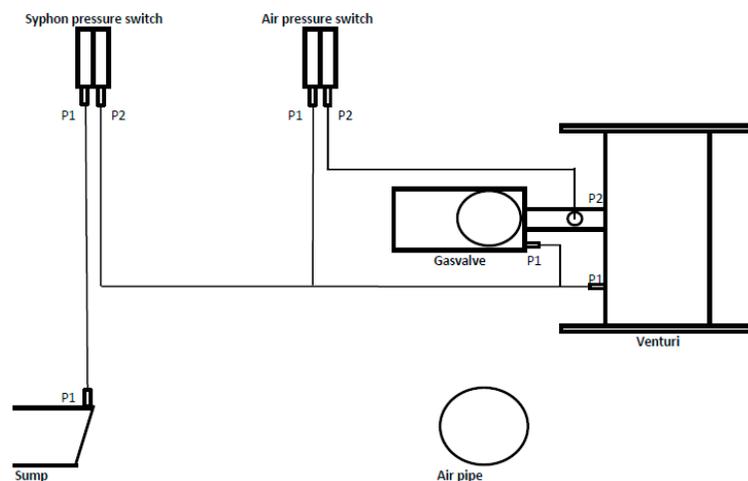
Outdoor sensors : 10 K [Ω] at 25°C

**WIRING DIAGRAM AND ELECTRICAL CONNECTIONS**

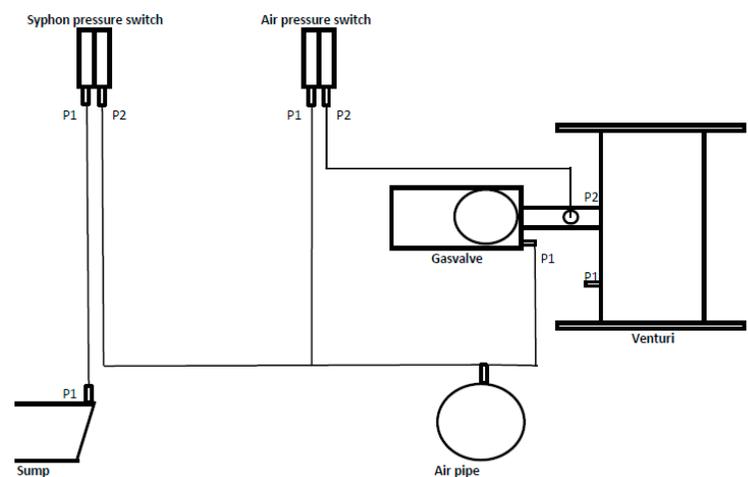
Ref	Description	To be connected to
BC	Burner Control	
D	Display	
C1	Connector 230V	
C2	Connector low voltage	
CH-P	Central Heating pump	Strip C1, pins 4 + 5 + 6
DHW-P	Domestic Hot Water pump	Strip C1, pins 7 + 8 + 11
PWM-P	Modulating pump	
HE	Heat exchanger	
MT	Overheat limit switch	
NTC1	Flow temperature sensor	
NTC2	Return temperature sensor	
NTC3	Domestic Hot Water sensor or switch	Strip C2, pins 7 and 8
NTC4	Outside temperature sensor or switch	Strip C2, pins 5 and 6
NTC5	Flue gas temperature sensor	
WPS	Water pressure switch	
APS	Air pressure switch	
SPS	Siphon pressure switch	
GPS	Gas pressure switch	
GV	Gas valve	
S	On/Off switch	
3WV	3-way valve	
OT-RT	Open Therm or room thermostat On/Off	Strip C2, pins 1 + 2 (for automatic recognition)
F	Fuse	
SPS-B	Siphon pressure switch block	
B-L	Burner lock	
P-O	Pump On	
B-O	Burner On	
B-B	Burner block	
PE	Earth cable or connector	
Fr	Frame	



PNEUMATIC CONNECTIONS



Compact Condens 170 (5 sections) and 300 (8 sections)



Compact Condens 210 (6 sections) and 250 (7 sections)

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

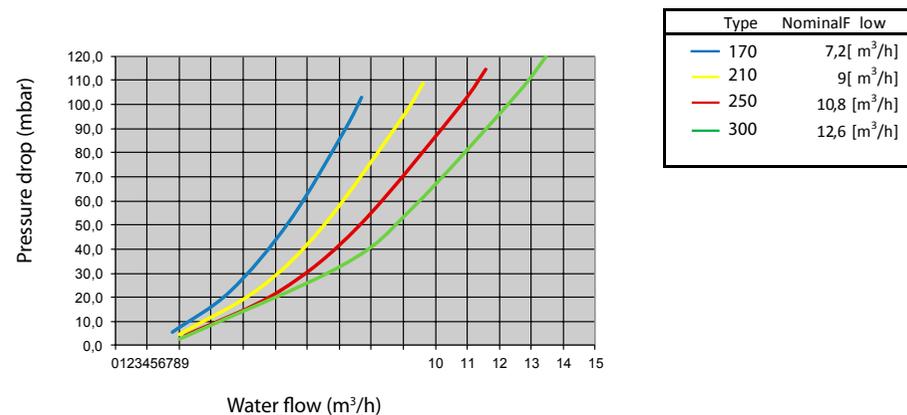
The air pressure switch, (P1 and P2), connected to the venturi, checks the amount of air (by means of a  $\Delta p$  measurement) before start.

HYDRAULIC CHARACTERISTICS

		COMPACT CONDENS			
Main Characteristics		170	210	250	300
Capacity (primary)	L	16.9	21.3	24.7	30.2
Max. operating pressure of primary circuit	bar	6	6	6	6
Water pressure drop (primary circuit) ( $\Delta t = 20$ K)	mbar	90	96	99	103
Min. required flow rate	L/h	7,200	9,000	10,800	12,600

HYDRAULIC PRESSURE DROP CURVE OF THE BOILER

Compact Condens - Pressure drop vs Water flow



MAXIMUM OPERATING CONDITIONS

Maximum Service Pressure \*

- Primary circuit : ..... 6 bar

Maximum Operating Conditions

- Maximum temperature (primary) : .....80°C

Water Quality

See "Recommendations for the Prevention of Corrosion and Scaling in Heating Systems" on the following page.

\* The hydraulics of the boiler have been tested according to EN-15502, and the boiler is classified as a pressure class 3 appliance.

## RECOMMENDATIONS FOR THE PREVENTION OF CORROSION AND SCALING IN HEATING SYSTEMS

### How oxygen and carbonates can affect the heating system

Oxygen and dissolved gasses in the water of the primary circuit contribute to the oxidation and the corrosion of the system components that are made of ordinary steel (radiators, ...). The resulting sludge is then deposited in the boiler exchanger.

The combination of carbonates and carbon dioxide in the water results in the formation of scale on the hot surfaces of the installation, including those of the boiler exchanger.

These deposits in the heat exchanger reduce the water flow rate and thermally insulate the exchange surfaces, which is likely to damage them.

### Sources of oxygen and carbonates in the heating circuit

The primary circuit is a closed circuit; the water it contains is therefore isolated from the mains water. When maintaining the system or filling up the circuit, water renewal results in the addition of oxygen and carbonates in the primary circuit. The larger the water volume in the system, the larger the addition.

Hydraulic components without an oxygen barrier (PE pipes and connections) admit oxygen into the system.

### Prevention Principles

#### 1. Clean the existing system before installing a new boiler

- Before the system is filled, it must be cleaned in accordance with standard EN14336. Chemical cleaning agents can be used.
- If the circuit is in bad condition, or the cleaning operation was not efficient, or the volume of water in the installation is substantial (e.g. cascade system), it is recommended to separate the boiler from the heating circuit using a plate-to-plate exchanger or equivalent. In that case, it is recommended to install a hydrocyclone or magnetic filter on the installation side.

#### 2. Limit the fill frequency

- Limit fill operations. In order to check the quantity of water that has been added into the system, a water meter can be installed on the filling line of the primary circuit.
- At total hardness of 11,2 °D (= 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 °D) x value given above.  
Example ; in case of water hardness of 15 °D : (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 °D Note that water softening by means of ion exchange principle is not allowed
- Never fill the installation with de-mineralised or distilled water because it will corrode the aluminium heat exchanger severely
- Automatic filling systems are not recommended.
- If your installation requires frequent water refilling, make sure your system is free of water leaks.
- Inhibitors may be used in accordance with standard EN 14868.

#### 3. Limit the presence of oxygen and sludge in the water

- A de-aerator (on the boiler flow line) combined with a dirt separator (upstream of the boiler) must be installed according to the manufacturer's instructions.
- ACV recommends using additives that keep the oxygen in solution in the water, such as Fernox ([www.fernox.com](http://www.fernox.com)) and Sentinel ([www.sentinel-solutions.net](http://www.sentinel-solutions.net)) products.
- The additives must be used in accordance with the instructions issued by the manufacturer of the water treatment product.

#### 4. Limit the carbonate concentration in the water

- The fill water must be softened if its hardness is higher than 20° fH (11,2° dH).
- Check regularly the water hardness and enter the values in the service log.
- Water hardness table :

Water hardness	°fH	°dH	mmolCa(HCO3)2 / l
Very soft	0 - 7	0 - 3.9	0 - 0.7
Soft	7 - 15	3.9 - 8.4	0.7 - 1.5
Fairly hard	15 - 25	8.4 - 14	1.5 - 2.5
Hard	25 - 42	14 - 23.5	2.5 - 4.2
Very hard	> 42	> 23.5	> 4.2

#### 5. Control the water parameters

- In addition to the oxygen and the water hardness, other parameters of the water must be checked.
- Treat the water if the measured values are outside the range.

Acidity	7,2 < pH < 8,5
Conductivity	< 400 µS/cm (at 25°C)
Chlorides	< 125 mg/l
Iron	< 0,5 mg/l
Copper	< 0,1 mg/l

## SAFETY INSTRUCTIONS FOR THE INSTALLATION



### General remark

- The connections (electrical, flue pipe, hydraulic, gas/fuel) must be carried out in accordance with current standards and regulations in force.



### Essential recommendations for the correct operation of the appliance

- The boiler must be installed in a dry and protected area, with an ambient temperature comprised between 0 and 45°C.
- Install the appliance to ensure easy access at all times.
- Make sure that the mains water used to fill the boiler has a minimum pressure of 1.2 bar.
- Make sure to install a pressure reducing valve set at 4.5 bar if the mains supply pressure is in excess of 6 bar.
- If works need to be performed (in the boiler room or close to the air vents), make sure to turn off the boiler to prevent dust from entering and accumulating in the boiler heating system.



### Essential recommendations for safety

- Install the boiler on a base made of non-combustible materials.
- Do not store any corrosive products, paint, solvents, salts, chloride products and other detergent products near the appliance.
- Make sure that all air vents are unobstructed at all times.
- A condensation outlet connected to the sewer must be fitted close to the boiler to prevent the condensation products from the flue pipe from running into the boiler.
- Install a condensate neutralisation system if required by national and/or local regulations and have it cleaned regularly.
- The horizontal flue pipes must be installed with a slight slope of 5 cm per meter, so that the acid condensation water flows to a condensate recovery container and does not damage the heating body.
- Only use ACV flue systems to connect this appliance to ensure that the pipe and connection diameters all match.



### Essential recommendations for the electrical safety

- Only an approved installer is authorized to carry out the electrical connections.
- Install a 2-way switch and a fuse or circuit breaker of the recommended rating outside the appliance, so as to be able to shut power down when servicing the appliance or before performing any operation on it.
- Isolate the external electrical supply of the appliance before performing any operation on the electrical circuit.
- This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless supervised or unless they have been given instruction concerning the use of the appliance by a person responsible for their safety.

## PACKAGE CONTENTS

The Compact Condens boilers are delivered assembled and packaged.

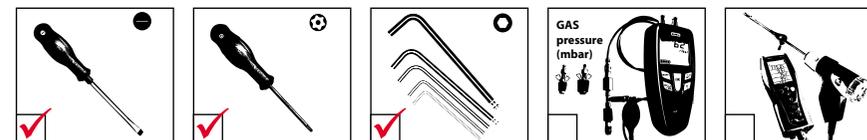


At product reception and after removal of packaging, check the package contents and that the appliance is free of damages.

### Contents

- Boiler
- Installation, Operation and Maintenance Instructions, for the User and the Installer

## TOOLS REQUIRED FOR THE INSTALLATION



## BOILER PREPARATION

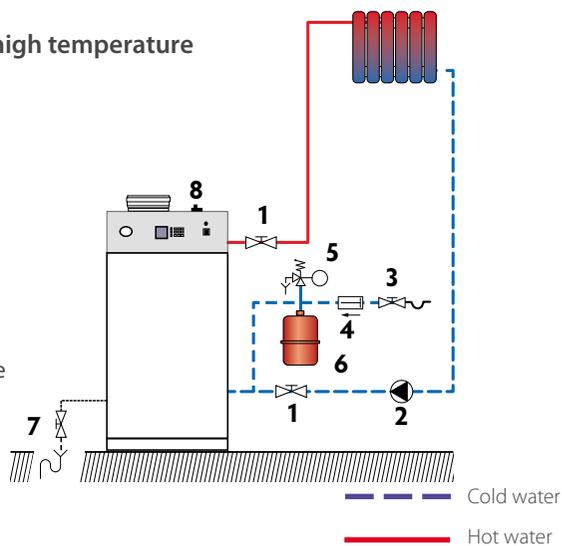
- Remove the sealing/protection caps from the connection tubes. Some dirty water might come out.
- Fill the condensate trap with water by pouring some water into the cast aluminium exhaust connection at the back.
- Make all the required electrical connections of accessories (pumps, thermostats, etc.). Refer to "Wiring Diagram and Electrical Connections" on page 18.

## HEATING CONNECTION

### Typical connection - high temperature

#### Description

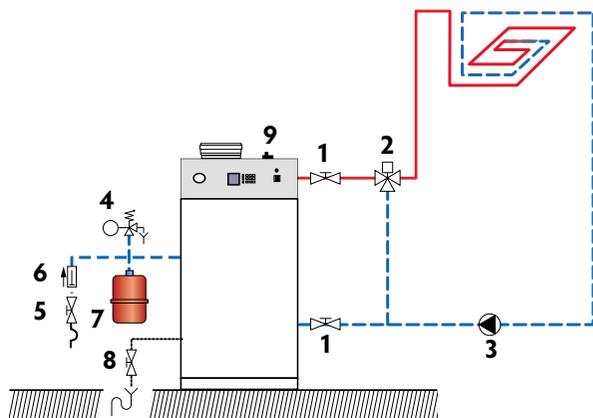
1. Isolating valve
2. Heating pump
3. Filling valve
4. Check valve
5. Safety valve
6. Expansion vessel
7. Drain valve
8. Auto air bleed valve



### Typical connection - low temperature

#### Description

1. Isolating valve
2. 3-way mixing valve
3. Heating pump
4. Safety valve
5. Filling valve
6. Check valve
7. Expansion vessel
8. Drain valve
9. Auto air bleed valve



#### Essential recommendations for the correct operation of the system

- As there is no built-in safety group (safety valve + pressure release valve) in the boiler, make sure to install them in the system.
- As there is no built-in CH pump in the boiler, the installer must provide one in the system.
- The heating circuit must be designed so as to ensure a continuous flow in the boiler; this flow may be obstructed if all the thermostatic valves are closed. In this case, install a bypass.

## REMOVAL AND INSTALLATION OF THE FRONT AND SIDE PANELS

### Set-up conditions

- External power supply isolated

### Removal Procedure

#### Front panel

1. Using a cross-head screwdriver, release two screws (1) located at the top of the front panel. Retain for re-installation.
2. Pull slightly the panel top towards you, then lift the whole panel to disengage the bottom lug from the boiler casing mounting slot.
3. Disconnect the earth wire.

#### Side panels

1. Release 3 screws at the back of the boiler and remove the top cover.
2. On the side where access is required, release the attaching screws from the back, the top and the front locations. Retain the screws for re-installation.
3. Remove the panel.

### Installation procedure

#### Side panels

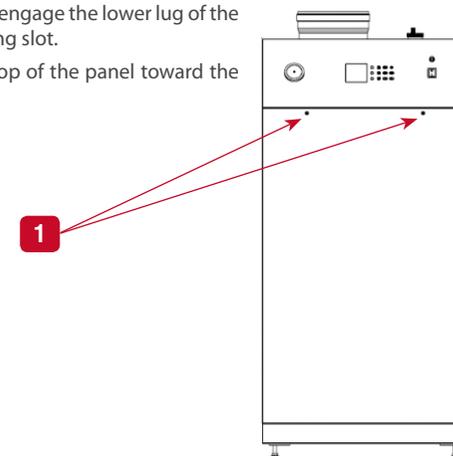
1. Place the panel in position.
2. Install and tighten the screws retained at removal in their front, top and back locations.
3. Install the top cover and tighten 3 attaching screws retained at removal.

#### Front panel

1. Connect the earth wire.
2. Hold the front panel at a slight angle to engage the lower lug of the front panel in the boiler casing mounting slot.
3. Lower panel in the slot and push the top of the panel toward the boiler.
4. Install 2 screws (1) retained at removal.

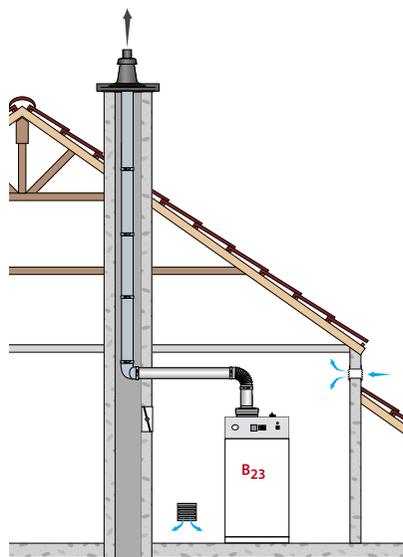
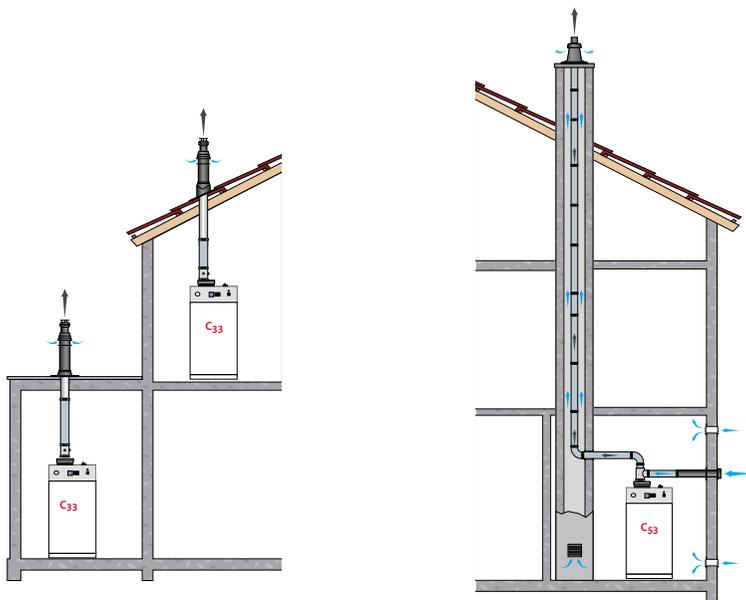
### Follow-on tasks

None



## CHIMNEY CONNECTION

 It is mandatory to ventilate the boiler room. The high or low air vent opening dimensions depend on the boiler power and the boiler room size. Refer to the local regulations in force.



## FLUE PIPE CONNECTION TYPES

 It is mandatory to use ACV flue systems to connect the appliance.

- B23** : Connection to an exhaust duct that discharges the combustion products outside the room where it is installed, with the combustion air being drawn directly from the boiler room.
- C33(x)** : Connection using pipes fitted with a vertical terminal that simultaneously takes in fresh air for the burner and discharges combustion products outside through openings that are either concentric or close enough together to be subjected to similar wind conditions, i.e. openings shall fit inside a square of 50 cm for boilers up to 70 kW and inside a square of 100 cm for boilers above 70 kW.
- C53(x)** : Connection to separate ducts for supplying combustion air and discharging combustion products; these ducts may end in zones with different pressure levels, but are not allowed to be installed on opposite walls of the building.
- C63(x)** : Type C boiler meant to be connected to a system for supplying combustion air and discharging combustion products, that is approved and sold separately (**Prohibited in Belgium**). Terminals for the supply of combustion air and for the evacuation of combustion products are not allowed to be installed on opposite walls of the building. See also the following additional specifications:
- Maximum allowable draught is 200 Pa.
  - Maximum allowable pressure difference between combustion air inlet and flue gas outlet (including wind pressures) is 150 Pa.
  - Condensate flow is allowed into the appliance.
  - Maximum allowable recirculation rate of 10% under wind conditions.
  - Only use approved C63 flue system

## CALCULATION OF THE FLUE PIPE LENGTH



When connecting the flue pipes, make sure not to exceed the maximum flue pressure drop value, or the maximum length in meters of straight pipes recommended for the product, otherwise the system pressure might decrease.

The flue pipe dimensions can be calculated using the following tables, indicating the corresponding length in meters of straight pipes, applied to each of the connection components, as well as the pressure drop value per component. Then compare the calculation result to the recommended maximum flue pipe length or maximum pressure drop value for each type of Compact Condens model.



The following tables are based on ACV equipment and cannot be applied as a rule.

Maximum length (in meters) for C63 connection type

Model	Max. allowed pressure drop	Parallel air/flue gas Ø110/200	Parallel air/flue gas Ø180/180	Parallel air/flue gas Ø150/200	Parallel air/flue gas Ø200/200
170	150 Pa	13 m	112 m	83 m	—
210	150 Pa	9 m	75 m	53 m	120 m
250	150 Pa	6 m	45 m	36 m	82 m
300	150 Pa	4 m	33 m	26 m	60 m

Equivalent length (in m)

	Pipe diameter			
	Ø 200 mm	Ø 180 mm	Ø 150	Ø 110
1 m straight pipe	1	1	1	1
90° elbow	5.75	4.5	4.0	3.5
45° elbow	3.75	2.5	1.7	1.5

Pressure drop (Pa) per component

Component	Model	Pressure drop (Pa) per component							
		150		210		250		300	
		Flue	Air	Flue	Air	Flue	Air	Flue	Air
Straight pipe (1m)	Ø200 mm	0.4		0.7		1.0		1.4	
	Ø150 mm		1.4		2.1		3.1		4.2
Elbow (90°)	Ø200 mm	2.5		4.0		5.7		7.8	
	Ø150 mm		5.3		8.3		12.0		16.4
Elbow (45°)	Ø200 mm	1.7		2.6		3.7		5.1	
	Ø150 mm		2.3		3.5		5.1		6.9
C33 Terminal	Ø200 mm								
	Ø150 mm		16.4		25.7		36.9		50.3
B23 Terminal	Ø200 mm								
	Ø150 mm		4.7		7.4		10.6		14.5
C53 Terminal	Ø200 mm								
	Ø150 mm		7.4	16.4	7.4	25.7	10.6	37.0	14.5
Condensate trap Ø200 mm T + Bend 90°			5.0		8.0		11.4		15.4
Expander 110/150mm				0.7		1.0		1.5	

## GAS CONNECTION



### Essential recommendations for safety

- The gas connection must comply with all applicable local standards and regulations, and the circuit will be equipped with a gas pressure regulator as required.
- The gas burners are factory preset for use with natural gas [equivalent to G20].
- The CO<sub>2</sub> gas flow rate, air flow rate and air/gas supply parameters are factory-preset and may not be modified in Belgium, except for type I 2E(R)B boilers.
- Do not change the OFFSET (A) setting of the gas valve: it is factory-preset and sealed.



### Essential recommendations for the correct operation of the appliance

- Refer to the technical characteristics of this manual or to the burner documentation to know the connection diameters.
- Bleed the gas duct and check thoroughly if all the boiler tubes, both internal and external, are tight.
- Check the system gas pressure. Refer to the table containing all relevant data in the section "Technical characteristics".
- Check the boiler electrical connection, the boiler room air vent system, the tightness of flue gas outlet pipes and of the burner chamber plate.
- Control the gas pressure and consumption at appliance start up.
- Check the boiler CO<sub>2</sub> adjustment (refer to the adjustment procedure and the technical data).

## SYSTEM CONFIGURATIONS

The Compact Condens boilers can be setup in different types of systems, either high or low temperature, or both, with or without Domestic Hot Water tank. They can also be configured in a Cascade system (using an external controller like a 0-10V modulation signal or a control unit). Only the hydraulics and electronics systems can be connected in a cascade, not the flue system.

It is up to the installer to determine the best solution for the results the user is expecting.

One basic configuration is shown in this manual (see next page), for any other configuration, please contact your ACV representative.

## BOILER LOAD SETTINGS

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 a malfunction of the fan.

At maximum load, the system should be designed for a nominal  $\Delta T$  of 15 K to 20 K.

When the  $\Delta T$  is higher than 25 K, the boiler cannot run on maximum load anymore and will start to modulate because of an insufficient water flow through the boiler.

Flow and return temperatures can be read in the boiler information menu (through the DIAGNOSTICS menu, refer to "User's menu and parameter descriptions" on page 9 and "Installer's menu and parameter descriptions" on page 12).

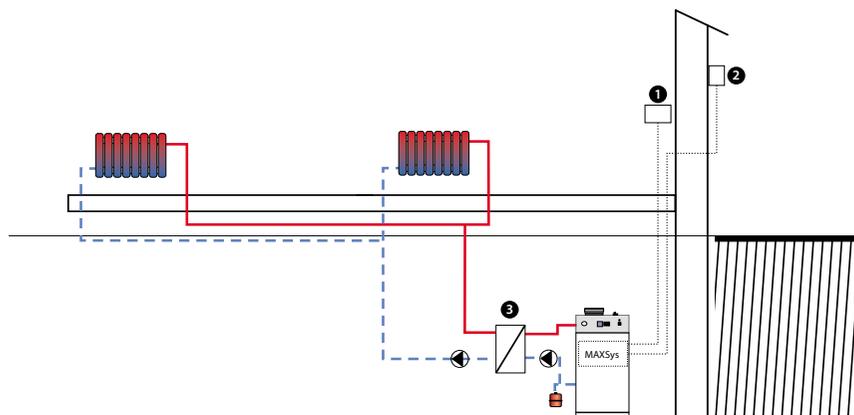
Valves, malfunctioning pumps, dirt, corrosion products from the system, dirty filters etc. can have negative impact on water flow through the boiler.

Before ignition the boiler control checks  $\Delta P$  aps during pre-purge. 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. Refer to "Troubleshooting" on page 34 for more information and to "Maintenance" on page 30.

**BASIC CONFIGURATION - COMPACT CONDENS: HIGH TEMPERATURE HEATING CIRCUIT CONTROLLED BY ROOM THERMOSTAT AND OPTIONAL OUTDOOR SENSOR.**



ITEM	DESCRIPTION	QTY	ELECT. TERMINALS TO CONNECT TO**
1	Room thermostat	1	Strip C2 Pins 1 & 2
2	Outdoor temperature sensor, 10kΩ	1	Strip C2 Pins 5 & 6
3	Plate-to-Plate heat exchanger	1	-
	Circulation pump	2	--

**BLOCK DIAGRAM**

The heating system (radiators) is controlled by an On/Off room thermostat.

In this configuration, the boiler constantly adapts its operation to the outdoor temperature, if an outdoor temperature sensor is connected.

The heating pump is triggered as soon as the room thermostat generates a heat demand.

\* The illustrations are for information only. For more details on the required accessories, refer to your ACV representative.

\*\* For electrical detail, refer to wiring diagram in "Wiring Diagram and Electrical Connections" on page 18.

## SAFETY INSTRUCTIONS FOR STARTING UP



### General remark

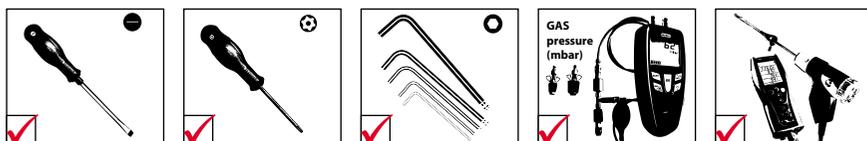
- In normal operation, the burner starts automatically as soon as the boiler temperature drops below the preset temperature.



### Essential recommendations for safety

- The components inside the control panel may only be accessed by an approved installer.
- Set the water temperature in accordance with usage and local plumbing codes.
- Make sure that the heating circuit filling valve is closed once the starting up process is complete.

## TOOLS REQUIRED FOR STARTING UP



## CHECKS BEFORE STARTING UP



### Essential recommendation for safety

- Check the tightness of the flue pipe connections.



### Essential recommendation for the correct operation of the appliance

- Control the tightness of the hydraulic circuit connections.

## FILLING THE HEATING CIRCUIT



If the system is fitted with an external hot water tank, first put the DHW circuit under pressure before pressurizing the heating (primary) circuit. Refer to the hot water preparation tank manual for more information.

### Set-up conditions

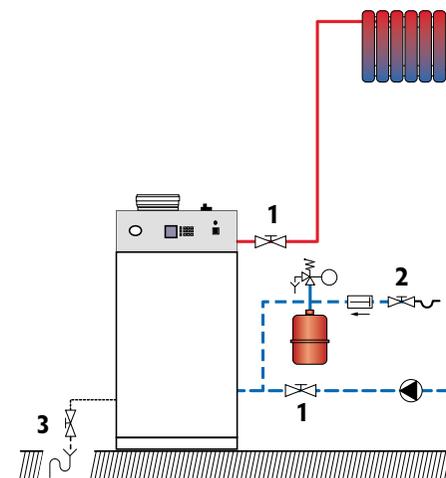
- External power supply isolated
- DHW circuit (if any) under pressure

### Filling procedure

- Open the isolating valves (1).
- Make sure that the drain valve (3) is tightly closed.
- Open the filling valve (2).
- Once the system is bled from air, bring the pressure to the static pressure between 1.5 bar and 2 bar.
- Close the filling valve (2)

### Follow-on task

- Check there is no leak.



## STARTING UP

### STARTING UP THE BOILER

#### Set-up conditions

- All connections made
- Condensate trap full of water
- Electrical power supply on
- Gas supply open
- Hydraulic circuit full of water

#### Procedure

1. Check that there is no gas leak.
2. Set the ON/OFF master switch on the "I" position.
3. If a room thermostat is installed, possibly increase the temperature set-point to generate a demand.
4. Check that the gas pressure, siphon pressure and water pressure contacts are closed. If not, the boiler will block and display the E76 error code.
5. Check the gas pressure and allow the boiler to heat up for a few minutes.
6. Check there is no leak at flue-gas joints.
7. Check and adjust the burner according to local standards and regulations, refer to "Checking and Adjusting the Burner" on page 29.
8. Set the central heating temperature to the required value using the control panel. Refer to "Installer's menu and parameter descriptions" on page 12.
9. After 5 minutes of operation, bleed the heating circuit until all air is evacuated and restore a 1.5 bar pressure.
10. Bleed the central heating circuit once again and top it up with water to get the required pressure, if necessary.
11. Make sure that the central heating system is properly balanced and, if needed, adjust the valves to prevent certain circuits or radiators from getting a flow rate that is far above or below the set rate.

#### Follow-on tasks

1. Check that there are no leaks.
2. Check that the flow rate in the appliance is sufficient as follows :
  - Operate the boiler at maximum power
  - Once the temperatures are stable, read out the supply and return temperatures
  - Check that the difference between the supply and return temperature is equal or lower than 20k.
  - If the Delta T is higher than 20k, check the pump settings/specifications.

### CHECKING AND ADJUSTING THE BURNER

 When the burner operates at full power, the CO<sub>2</sub> rate must be within the limits mentioned in the technical characteristics, (see "Combustion Characteristics" on page 17).

#### Set-up conditions

- Operating boiler

#### Procedure

1. Check if the MAXSYS parameters are set to meet the user's requirements (refer to "Installer's menu and parameter descriptions" on page 12), and change them if required.
2. Put the boiler to maximum power mode (refer to "Installer's menu and parameter descriptions" on page 12, chimney sweeper function).

 The boiler is equipped with an automatic gas/air regulator. This means that the amount of gas is regulated according to the amount of air.

3. Using a pressure tester, check that the dynamic gas pressure at the gas valve is at least 18 mbar.
4. Allow the appliance to heat for a few minutes until its temperature is stable.
5. Measure the burner combustion by placing the flue gas analyser probe into the measurement unit port on the flue pipe and compare the CO and CO<sub>2</sub> values displayed with those indicated in the combustion characteristics table. Refer to "Combustion Characteristics" on page 17.
6. If the CO<sub>2</sub> value differs by more than +0.2% / -0.05 from the value mentioned in the "Combustion Characteristics" on page 17, carry out the adjustment as follows :
  - Turn the throttle to the right to lower the CO<sub>2</sub> percentage (a ½ turn (180°) gives a change of approximately 0,2 % CO<sub>2</sub>)
7. Then put the boiler to the minimum power mode (Refer to "Installer's menu and parameter descriptions" on page 12).
8. Allow the boiler to stabilize for a few minutes.
9. Measure the CO<sub>2</sub> level. It must be lower than the value at full power, with a maximum of 0.5%. In case of significant deviation, please contact ACV's Maintenance department.



#### Follow-on tasks

10. Fill in the service log with the required initial values, in order to be able to compare the boiler changes over time. Refer to "Service log" on page 39.

## SAFETY INSTRUCTIONS FOR THE BOILER MAINTENANCE



### Essential recommendations for the electrical safety

- Turn off the boiler by pushing on the ON/OFF master switch.
- Isolate the external power supply of the appliance before performing any operation, unless it is required to take measurements or perform system setup.



### Essential recommendations for safety

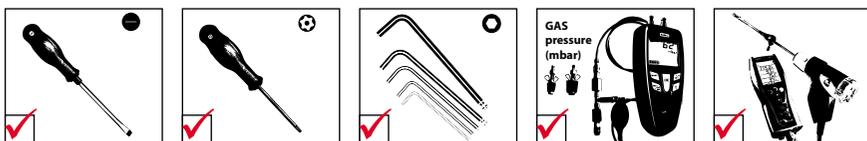
- Water flowing out of the drain valve may be extremely hot and could cause severe scalding.
- Check the tightness of the flue pipe connections.



### Essential recommendations for the correct operation of the appliance

- It is recommended to have the boiler and the burner serviced at least once a year or every 1,500 hours. More frequent servicing may be required depending on boiler use. Please consult your installer for advice.
- The boiler and burner maintenance will be carried out by a qualified engineer, and the defective parts may only be replaced by genuine factory parts.
- Control the tightness of the hydraulic circuit connections.
- Make sure to replace the gaskets of the removed items before reinstalling them.

## TOOLS REQUIRED FOR MAINTENANCE



## BOILER SHUT-DOWN FOR MAINTENANCE

1. Switch the boiler off using the ON/OFF master switch and isolate the external power supply.
2. Close the gas supply valve of the boiler.

## PERIODIC BOILER MAINTENANCE TASKS

Tasks	Frequency		
	Periodic inspection	1 year	2 years
	End-user	Professional	
1. Make sure that the system water pressure is at least 1 bar when cold. Top up the system if necessary, adding small quantities of water at a time. In case of repeated fills, call your installer.	X	X	
2. Check that there is no water on the floor under the boiler. Call your installer if there is.	X	X	
3. Check that no error code is displayed on the control panel. Call your installer if necessary.	X	X	
4. Check that all gas, hydraulic and electrical connections are correctly fastened and tight.		X	
5. Check the flue gas exhaust: correct fastening, correct installation, no leaks or clogging.		X	
6. Check the combustion parameters (CO and CO <sub>2</sub> ), see "Checking and Adjusting the Burner" on page 29.		X	
7. Check visually the heating body: no evidence of corrosion, soot deposits or damages. Carry out all required cleaning tasks, repairs and replacements that might be required.		X	
8. Check the electrodes, see "Removal, Check and Installation of the Burner Electrodes" on page 31			X
9. Remove the burner and clean the exchanger, see "Removal, Check and Installation of the Burner" on page 32 and "Cleaning the Exchanger" on page 33.			X
10. Check that the condensate trap is not clogged. If it is, remove it, clean it, and reinstall it.*		X	
11. Open and inspect the condensate recovery dish.*		X	
12. If a condensate neutralisation system is installed, check it and have it cleaned.	X	X	

\* To access the condensate trap and the condensate dish, open the side panel, refer to "Removal and Installation of the Front and Side Panels" on page 23.

## DRAINING THE HEATING CIRCUIT OF THE BOILER



### Essential recommendations for safety

- If the system is fitted with an external hot water tank, isolate the DHW circuit before draining the heating (primary) circuit.
- Water flowing out of the drain valve may be extremely hot and could cause severe scalding. Keep people away from the hot water discharge.

### Set-up conditions

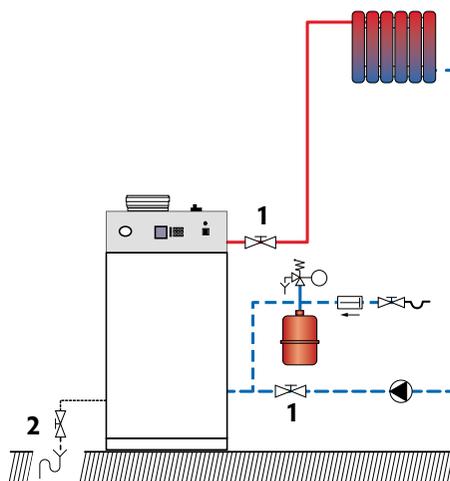
- Boiler switched off using the ON/OFF master switch
- DHW circuit (if any) isolated
- External power supply isolated
- Gas supply closed

### Heating circuit draining procedure

1. Close the isolating valves (1).
2. Connect the drain valve (2) to the sewer with a hose.
3. Open the drain valve (2) to empty the heating circuit of the boiler.
4. Close the drain valve (2) once the heating circuit of the boiler is empty.

### Follow-on task

1. None



## REMOVAL, CHECK AND INSTALLATION OF THE BURNER ELECTRODES



### Essential recommendations for the correct operation of the appliance

- Remove the electrodes to control them in case of ignition problems.

### Set-up conditions

- Boiler shut down
- External power supply isolated
- Gas supply closed
- Front panel open, refer to "Removal and Installation of the Front and Side Panels" on page 23.

### Removal procedure

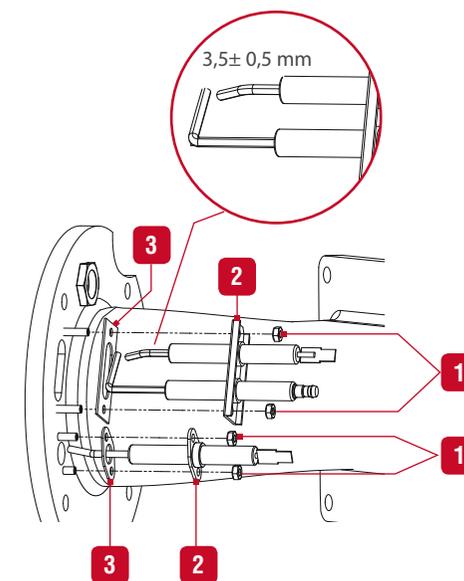
1. Disconnect all the cables from the electrodes.
2. Remove two mounting screws (1) and retain them for re-installation.
3. Remove the 2 electrodes (2) and their gasket (3).
4. Check the correct alignment of the electrode ends and that the gap corresponds to the value indicated on the figure below.
5. Replace the electrodes if required.

### Installation procedure

1. Install a new gasket.
2. Install both electrodes (2) using their two retained screws (1).

### Follow-on tasks

1. Reconnect all the cables to the electrodes.



## REMOVAL, CHECK AND INSTALLATION OF THE BURNER

### Set-up conditions

- Boiler shut down
- External power supply isolated
- Gas supply closed
- Front and side panel(s) removed (refer to "Removal and Installation of the Front and Side Panels" on page 23).

### Removal procedure

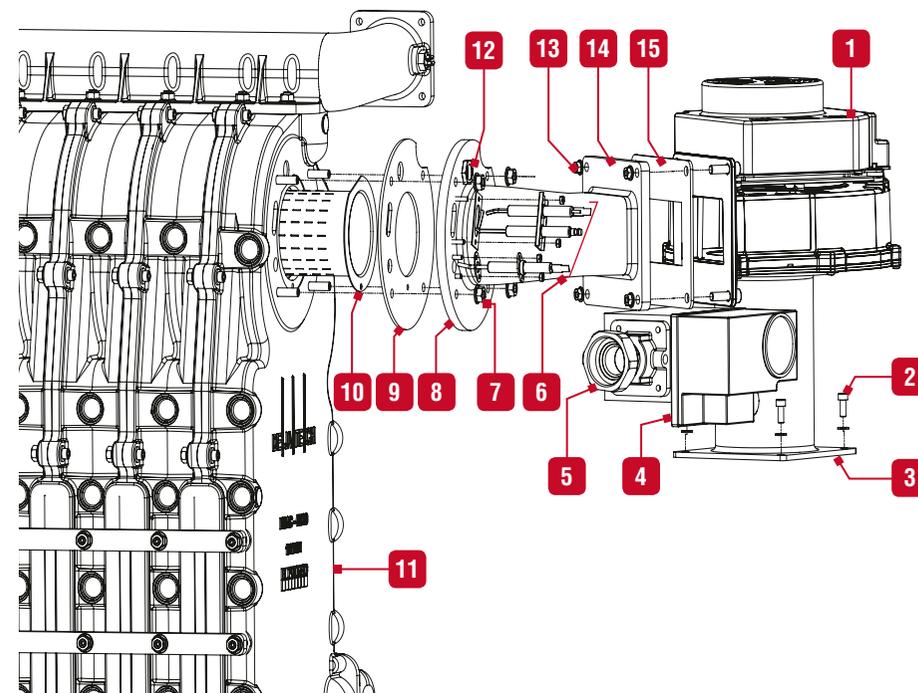
1. Disconnect all plugs and tubes from the fan assembly (1), the gas valve (4) and the electrodes (6), as required.
2. Release the gas connection (5).
3. Release 4 attaching bolts (13) from the fan assembly flange (14). Discard the gasket (15). Retain the bolts for re-installation.
4. Release 4 screws (2) from the air inlet flange (3) and disconnect the air inlet. Retain the screws and washers for re-installation.
5. Using a socket wrench, release the burner hood (8) attaching nuts (7) and retain them for re-installation.
6. Pull the burner assembly out of the exchanger (11).
7. If required, clean the exchanger, see "Cleaning the Exchanger" on page 33.
8. If not removed previously, remove, check and reinstall the electrodes, refer to "Removal, Check and Installation of the Burner Electrodes" on page 31.

### Installation procedure

1. Check the burner hood insulation block (9) condition. Replace if required.
2. Reinstall the burner assembly into the exchanger (11).
3. Install the attaching nuts (7) of the burner hood (8) and fasten them in a crosswise pattern
4. Install the fan assembly on the fan assembly flange (14), with a new gasket (15). Tighten 4 attaching bolts (13) retained at removal.
5. Install the air inlet on the air inlet flange (3) using 4 screws and washers (2) retained at removal.
6. Reconnect the gas connection (5).
7. Reconnect all plugs and tubes disconnected at removal, to the electrodes (6), the gas valve (4) and the fan assembly (1), as required.

### Follow-on tasks

None



### Key

1. Fan assembly
2. Air inlet attaching screws and washers
3. Air inlet flange
4. Gas valve
5. Gas connection
6. Electrodes
7. Burner attaching nuts
8. Burner hood
9. Burner hood insulation block
10. Burner tube
11. Heat exchanger
12. Flame sight glass
13. Fan assembly attaching bolts
14. Fan assembly flange
15. Fan assembly gasket

## CLEANING THE EXCHANGER

### Set-up conditions

- Boiler shut down
- External power supply isolated
- Gas supply closed
- Burner and fan assembly removed i.a.w. procedure "Removal, Check and Installation of the Burner" on page 32.
- Front and side panel(s) open, refer to "Removal and Installation of the Front and Side Panels" on page 23.

### Procedure

1. Open the inspection sump cover, refer to "Models - Compact Condens 170- 210 - 250 - 300" on page 15 for location.
2. Inspect and clean the inner part of the sump and the bottom part of the heat-exchanger using a nylon brush and a vacuum cleaner.
3. In case of clogging in this section, remove the left inspection covers and clean this section.

**Never use a metal brush to clean the heat exchanger.**



4. Using a nylon brush, and a vacuum cleaner, clean the combustion chamber.
5. Pour some water in the chamber to flush away any foreign deposits that may be present in the heat exchanger.
6. Clean the condensate trap and fill the syphon with clean water.

### Follow-on tasks

1. Reinstall the syphon.
2. Close all inspection covers.
3. Reinstall the burner according to procedure "Removal, Check and Installation of the Burner" on page 32.
4. Restart the boiler in accordance with procedure "Restarting after Maintenance" on page 33.

## RESTARTING AFTER MAINTENANCE

### Set-up conditions

- All removed components reinstalled
- All connections made
- Power supply
- Gas supply open
- Hydraulic circuit(s) full of water

### Procedure

1. Make sure there is no gas leak at the gas connections.
2. Switch the appliance on using the ON/OFF master switch.
3. Set the appliance at maximum power and check the absence of gas leaks.
4. Check the gas pressure and CO<sub>2</sub> adjustment in accordance with "Checking and Adjusting the Burner" on page 29.

### Follow-on tasks

1. Close all opened panels, refer to "Removal and Installation of the Front and Side Panels" on page 23.
2. Check there are no leaks.

## GENERAL

Problem	Probable cause(s)	Solution(s)
	On/Off Master switch on "O" position	Place On/Off Master switch on "I" position
	Fuse (5,0 AT) in the control panel blown	THIS FUSE IS PART OF THE 230 V CIRCUIT. SO FIRST SWITCH OFF FROM THE MAIN ! Check fuse - Replace as required
1. No data visible on the display		Connect the boiler to the power supply Check if there is 230 VAC tension on the connections "L" and "N" of connector X1 in the MAXSYS (see "Wiring Diagram and Electrical Connections" on page 18).
	230 VAC tension	If there is tension, replace 230 V fuses F1 and F2 inside the Maxsys (no need to remove MAXsys controller from panel, just release the 6 clips with a screwdriver to remove the cover). Check flat cable of the display. If it is OK, replace MAXSys controller
2. Blown fuse F1 2 AF inside the Maxsys	Short-circuited pump	Check wiring of CH pump and DHW pump if any. Replace faulty pump if required.
3. Data visible on the display, but no boiler activity	Fuse F3 4 AT inside the Maxsys is blown	Check fuse and replace as required
	No heat demand generated	Generate a heat demand : <ul style="list-style-type: none"> <li>Through the <b>Diagnostics menu/manual test</b>, set the boiler to a fixed fan speed between minimum and maximum CH-fanspeed.</li> <li>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 air pressure switch has closed (<math>\Delta P &gt; 40</math> Pa), starting procedure will continue.</li> </ul>
4. Error code shown on display		Refer to "Errors (hard and soft lockouts)" on page 35 and section "Locking Codes" on page 36.

## CH CIRCUIT

Problem	Probable cause(s)	Solution(s)
5. CH circuit remains cold	Faulty power supply	Refer to problem 1 above
	CH operation OFF	Activate CH operation through control panel. Refer to "Installer's menu and parameter descriptions" on page 12
	Faulty room thermostat	Check wiring connection, refer to "Wiring Diagram and Electrical Connections" on page 18 If connection is correct, replace thermostat
	CH preset temp too low	Change CH setting through control panel
	Faulty Outdoor temperature sensor	Check wiring connection, refer to "Wiring Diagram and Electrical Connections" on page 18 If connection is correct, replace Outdoor temperature sensor
	Faulty 3-way valve faulty	Check that 3-way valve is not stuck on the DHW circuit. Release or replace as required.

## DHW CIRCUIT

Problem	Probable cause(s)	Solution(s)
6. Boiler does not respond to DHW heat request	DHW operation OFF	Activate DHW operation through control panel. Refer to "Installer's menu and parameter descriptions" on page 12.
	Faulty storage tank-NTC or thermostat	Check the storage tank-NTC or thermostat and its wiring, refer to "Wiring Diagram and Electrical Connections" on page 18.
7. Insufficient DHW flow	Insufficient water pressure	Check water pressure from the mains
	Dirty filters in taps	Clean tap filters
8. DHW temperature too low	Setting of temperature too low	Define DHW preset temperature through control panel. Refer to "Installer's menu and parameter descriptions" on page 12.
	Leakage 3-way valve (towards CH-circuit)	Check 3-way valve for leak. Clean or replace as required.
	Faulty DHW pump	Check wiring of DHW pump. Replace faulty pump if required.
	Input too low due to too much resistance in air/flue system	Check the absence of obstruction in air/flue system. Clean air filter if any. Check the burner, refer to "Removal, Check and Installation of the Burner" on page 32
9. Boiler operates only for DHW	Faulty storage tank-NTC or thermostat	Check the storage tank-NTC or thermostat and its wiring, refer to "Wiring Diagram and Electrical Connections" on page 18.
	Faulty 3-way valve	Check that 3-way valve is not stuck on the DHW circuit. Replace as required.

## ERRORS (HARD AND SOFT LOCKOUTS)

Errors are indicated by a text and an E-code on the display. There are two types of errors :

- **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).
- **An error with a soft lockout.** The boiler will automatically resume normal operation after the cause of block is solved (eg gas pressure too low).

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

The cause of error (hard or soft lockout) can be found with the help of the error-list, refer to "Installer's menu and parameter descriptions" on page 12. A list of all the error codes and the solution(s) to the fault can be found in the section "Locking Codes" on page 36.

Codes	Description of the fault	Solution for the fault
E 01	<b>Failed ignition:</b> The burner failed to light after 3 ignition attempts.	<ol style="list-style-type: none"> <li>1. Check gas supply to boiler.</li> <li>2. Check ignition cable connection in control box.</li> <li>3. Check electrode for defects, and distance between the pins.</li> <li>4. Check gas valve and electrical connections to gas valve.</li> </ol>
E 02	<b>False flame:</b> Flame detected prior to ignition.	<ol style="list-style-type: none"> <li>1. Check good electrical ground connection to unit.</li> <li>2. Check electrode for pollution and deposition of dirt.</li> </ol>
E 03	<b>High Boiler temp.:</b> The boiler temperature exceeds 105°C	<p>Correct condition which caused high temperature or limit to open.</p> <ol style="list-style-type: none"> <li>1. Check water flow in the system (radiator valves).</li> <li>2. Check Pump and pump electrical connections.</li> </ol>
E 04	<b>Air flow/damper</b>	Please contact your ACV representative.
E 05	<b>Blower speed:</b> Blower speed not correct or speed signal is not received by MAXSYS.	<ol style="list-style-type: none"> <li>1. Check blower and wiring harness.</li> <li>2. Under normal condition if actual fan speed is 1000 rpm different from set fan speed an error is displayed (after 60sec in running and after 30 sec. at startup).</li> <li>3. Only exception when actual fan speed &gt; 3000 rpm at max. PWM.</li> </ol>
E 06	<b>Air flow/damper</b>	Please contact your ACV representative.
E 07	<b>High Flue temp.:</b> Flue temperature exceeds high limit.	<ol style="list-style-type: none"> <li>1. Heat exchanger may require cleaning.</li> <li>2. Boiler will automatically reset once flue temperature returns to normal range.</li> </ol>
E 08	<b>Flame Circuit Error:</b> Flame circuit test failed	<ol style="list-style-type: none"> <li>1. Turn boiler off.</li> <li>2. Check and clean the electrode.</li> <li>3. Check ignition and grounding cables are firmly connected.</li> </ol>
E 09	<b>Gas valve circuit error:</b> Gas valve circuit test failed.	<ol style="list-style-type: none"> <li>1. Check the gas valve and wiring harness.</li> <li>2. If the problem persists replace the "MAXSYS" circuit board.</li> </ol>
E 12	<b>Internal Control Fault:</b> EEPROM misconfiguration	<ol style="list-style-type: none"> <li>1. Turn unit off and on to resume normal operation.</li> <li>2. If the problem persists replace the "MAXSYS" circuit board.</li> </ol>
E 13	<b>Reset limit reached:</b> Resets are limited to 5 every 15 minutes.	<ol style="list-style-type: none"> <li>1. Turn unit off and on to resume normal operation.</li> <li>2. If the problem persists replace the "MAXSYS" circuit board.</li> </ol>
E 15	<b>Sensor Drift:</b> Supply or return sensor reading has drifted.	Check supply and return temperature sensors and wiring harness.
E 16	<b>Supply Sensor Stuck:</b> Supply sensor reading is not changing.	<ol style="list-style-type: none"> <li>1. Check supply temperature sensor and wiring harness for shortcuts or other defects.</li> <li>2. Check waterflow and the temperature balance in the system, because CH supply temperature does not change.</li> </ol>
E 17	<b>Return Sensor Stuck:</b> Return sensor reading is not changing.	<ol style="list-style-type: none"> <li>1. Check return temperature sensor and its position, check wiring harness for shortcuts or other defects.</li> <li>2. Check waterflow and the temperature balance in the system, because CH return temperature does not change.</li> <li>3. Failure may happen at low output capacity when supplying from a big tank !</li> </ol>
E 18	<b>Sensor Failure:</b> Supply or return sensor reading changed very rapidly.	Check supply and return temperature sensors and wiring harness.
E 21	<b>Internal Control Fault:</b> A / D conversion error.	Turn unit off and on then press OK to resume normal operation.
E 25	<b>Internal Control Fault:</b> CRC check error.	Turn unit off and on to resume normal operation.

Codes	Description of the fault	Solution for the fault
E 30	<b>Supply Sensor Shorted:</b> A short circuit has been detected in the boiler supply temperature sensor circuit	<ol style="list-style-type: none"> <li>1. Check supply temperature sensor and wiring harness for a short circuit.</li> <li>2. If necessary replace the sensor, or the wire harness.</li> <li>3. After fixing the problem, reset the appliance and resume normal operation.</li> </ol>
E 31	<b>Supply Sensor Open:</b> An open circuit has been detected in the boiler supply temperature sensor circuit	<ol style="list-style-type: none"> <li>1. Check supply temperature sensor, connectors and wiring harness for an open circuit.</li> <li>2. If necessary replace the sensor, or the wire harness.</li> <li>3. After fixing the problem reset the appliance and resume normal operation.</li> </ol>
E 32	<b>DHW Sensor Shorted:</b> A short circuit has been detected in the DHW temperature sensor circuit	<ol style="list-style-type: none"> <li>1. Check DHW temperature sensor and wiring harness for a short circuit.</li> <li>2. If necessary replace the sensor, or the wire harness.</li> <li>3. After fixing the problem reset the appliance and resume normal operation.</li> </ol>
E 33	<b>DHW Sensor Open:</b> An open circuit has been detected in the DHW temperature sensor circuit	<ol style="list-style-type: none"> <li>1. Check DHW temperature sensor, connectors and wiring harness for an open circuit.</li> <li>2. If necessary replace the sensor, or the wire harness.</li> <li>3. After fixing the problem reset the appliance and resume normal operation.</li> </ol>
E 34	<b>Low Voltage:</b> Line voltage has fallen below an acceptable operating level.	The boiler will automatically reset once line voltage returns to normal.
E 37	<b>Low Water:</b> Water level has fallen below 0.7 bar.	<ol style="list-style-type: none"> <li>1. Increase pressure to normal range.</li> <li>2. The boiler will automatically reset once water level returns to normal.</li> </ol>
E 43	<b>Return Sensor Shorted:</b> A short circuit has been detected in the boiler return temperature sensor circuit.	<ol style="list-style-type: none"> <li>1. Check return temperature sensor and wiring harness for a short circuit.</li> <li>2. If necessary replace the sensor, or the wire harness.</li> <li>3. After fixing the problem, reset the appliance and resume normal operation.</li> </ol>
E 44	<b>Return Sensor Open:</b> An open circuit has been detected in the boiler return temperature sensor circuit.	<ol style="list-style-type: none"> <li>1. Check return temperature sensor, connectors and wiring harness for an open circuit.</li> <li>2. If necessary replace the sensor, or the wire harness.</li> <li>3. After fixing the problem, reset the appliance and resume normal operation.</li> </ol>
E 45	<b>Flue Sensor Shorted:</b> A short circuit has been detected in the boiler flue temperature sensor circuit	<ol style="list-style-type: none"> <li>1. Check flue temperature sensor and wiring harness for a short circuit.</li> <li>2. If necessary replace the sensor, or the wire harness.</li> <li>3. After fixing the problem reset the appliance and resume normal operation.</li> </ol>
E 46	<b>Flue Sensor Open:</b> An open circuit has been detected in the boiler flue temperature sensor circuit.	<ol style="list-style-type: none"> <li>1. Check flue temperature sensor, connectors and wiring harness for an open circuit.</li> <li>2. If necessary replace the sensor, or the wire harness.</li> <li>3. After fixing the problem reset the appliance and resume normal operation.</li> </ol>
E 47	<b>Water pressure sensor error:</b> Water pressure sensor is disconnected or broken	<ol style="list-style-type: none"> <li>1. Check water pressure sensor, connectors and wiring harness.</li> <li>2. If necessary replace the sensor, or the wire harness.</li> <li>3. After fixing the problem reset the appliance and resume normal operation.</li> </ol>
E 76	<b>External Limit Open:</b> An external automatic reset boiler limit has opened.	<ol style="list-style-type: none"> <li>1. Correct condition which caused limit to open.</li> <li>2. Boiler will automatically reset once external limit closes</li> </ol>
E 77	<b>Siphon error</b>	Please contact your ACV representative..

Codes	Description of the fault	Solution for the fault
E 80	<b>Return &gt; Supply:</b> Return temperature is higher than supply temperature.	Confirm water flows in boiler return and out boiler supply.
E 81	<b>Sensor Drift:</b> Supply and return temperatures are not equal.	<ol style="list-style-type: none"> <li>1. Check water is flowing through boiler.</li> <li>2. Wait a few minutes for the water to equalise the temperature, the boiler will automatically reset once temperatures become equal.</li> <li>3. If boiler doesn't reset, check the NTC's and check the wire harness, replace if necessary.</li> </ol>
E 87	<b>Overtemp lockout:</b> An external boiler limit has opened.	<ol style="list-style-type: none"> <li>1. Correct condition which caused limit to open, then reset boiler.</li> <li>2. The boiler needs to be reset once external limit closes.</li> </ol>
E 89	<b>Incorrect Setting:</b> A parameter setting is outside the settings range.	<ol style="list-style-type: none"> <li>1. Review CH &amp; DHW settings and correct as necessary.</li> <li>2. The boiler will automatically reset once corrected.</li> </ol>
E 90	<b>Firmware Mismatch:</b> Control module and display firmware versions are incompatible.	One or several components are not compatible with the system. Replace mismatched component(s).
E 93	<b>Outdoor Sensor Shorted:</b> A short circuit has been detected in the outdoor temperature sensor circuit.	<ol style="list-style-type: none"> <li>1. Check outdoor temperature sensor and wiring for a short circuit.</li> <li>2. If necessary replace the sensor, or the wire harness.</li> <li>3. After fixing the problem reset the appliance and resume normal operation.</li> </ol>
E 94	<b>Internal Display Fault:</b> Display memory error	Turn unit off and on to resume normal operation.
E 95	<b>Supply Sensor Error:</b> Supply sensor reading is invalid	<ol style="list-style-type: none"> <li>1. Check wiring between display and control module.</li> <li>2. If necessary replace the sensor, or the wire harness.</li> <li>3. After fixing the problem reset the appliance and resume normal operation.</li> </ol>
E 96	<b>Outdoor Sensor Open:</b> An open circuit has been detected in the outdoor temperature sensor circuit.	<ol style="list-style-type: none"> <li>1. Check outdoor temperature sensor and wiring for an open circuit.</li> <li>2. If necessary replace the sensor, or the wire harness.</li> <li>3. After fixing the problem reset the appliance and resume normal operation.</li> </ol>
E 99	<b>Controller Bus Error:</b> Communication between boiler display and control module has been lost.	<ol style="list-style-type: none"> <li>1. Check wiring between components.</li> <li>2. Boiler will automatically reset once repaired.</li> </ol>





## DECLARATION OF CONFORMITY - CE

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Name and address of manufacturer: **ACV International SA / NV**  
**Oude Vijverweg, 6**  
**B-1653 Dworp**  
**Belgium**

Description of product type: **Gas condensing boilers**

Models: **Compact Condens 170**  
**Compact Condens 210**  
**Compact Condens 250**  
**Compact Condens 300**

CE #: **0063CQ3790**

We declare hereby that the appliance specified above is conform to the type model described in the CE certificate of conformity to the following directives:

Directives	Description	Date
2009/125/EC	Ecodesign Directive (implemented by EU regulation 813/2013)	21.10.2009
2009/142/EC	Gas Appliance Directive	30.11.2009
2006/95/EC	Voltage Limits Directive	12.12.2006
2004/108/EC	Electromagnetic Compatibility Directive	15.12.2004

We declare under our sole responsibility that the product **Compact Condens** complies with the following standards:

EN 15502-1                      EN 55014-1                      EN 61000-3-2  
 EN 15502-2                      EN 55014-2                      EN 61000-3-3  
 EN 60335-2-102

Dworp, 10/06/2016

Date

Director R & D  
 Henri-Jacques van Tichelen