







INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS

for the Installer and the User



Compact Condens

170 - 210 - 250 - 300

- APPLICABILITY :**
-  664Y4900 - Rev E - Delta Pro S -Pro Pack, Installation, Operation and Maintenance Instructions
 -  664Y6100 - Rev B - HeatMaster 71 - 101 - 201 (V13), Installation, Operation and Maintenance Instructions
 -  664Y6300 - Rev B - HeatMaster 200N, Installation, Operation and Maintenance Instructions
 -  664Y6700 - Rev D - Prestige 24-32 Solo/Excellence, Installation, Operation and Maintenance Instructions
 -  664Y6900 - Rev D - HeatMaster 25 - 35 - 45 - 70 - 85 - 120 TC, Installation, Operation and Maintenance Instructions
 -  664Y7000 - Rev B - HeatMaster 25C, Installation, Operation and Maintenance Instructions
 -  664Y7200 - Rev B - Compact Condens 170 - 210 - 250 - 300, Installation, Operation and Maintenance Instructions
 -  664Y7300 - Rev C - WaterMaster 25 - 35 - 45 - 70 - 85 - 120, Installation, Operation and Maintenance Instructions



- EN** Make sure that the appliance is connected to the earth.
- FR** Veiller à ce que l'appareil soit raccordé à la terre.
- NL** Zorg ervoor dat het toestel is geaard.
- ES** Asegúrese de que el aparato esté conectado a tierra.
- IT** Assicurarsi che l'apparecchio sia elettricamente collegato alla messa a terra dell'impianto.
- DE** Stellen Sie sicher, dass das Gerät geerdet ist.
- PL** Upewnij się, że urządzenie jest uziemione.
- RU** Убедитесь, что прибор заземлен.



- EN** Check that the gas type and pressure from the distribution network are compatible with the appliance settings.
- FR** Vérifier que le type de gaz et la pression du réseau de distribution sont compatibles avec les réglages de l'appareil.
- NL** Controleer of het type gas en de druk van het distributienetwerk in overeenstemming zijn met de toestelinstellingen.
- ES** Compruebe que el tipo de gas y la presión de la red de distribución son compatibles con los ajustes del aparato.
- IT** Controllare che il tipo di gas e la pressione della rete di distribuzione siano compatibili con le impostazioni dell'apparecchio.
- DE** Stellen Sie sicher, dass die Gasart und der Druck des Verteilungsnetzes mit den Geräteeinstellungen kompatibel sind.
- PL** Sprawdzić, czy typ gazu i ciśnienie sieci dystrybucyjnej są zgodne z ustawieniami urządzenia.
- RU** Убедитесь, что тип газа и давление в распределительной сети совместимы с настройками прибора.

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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 (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.

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

Compact Condens 170

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

Compact Condens 250

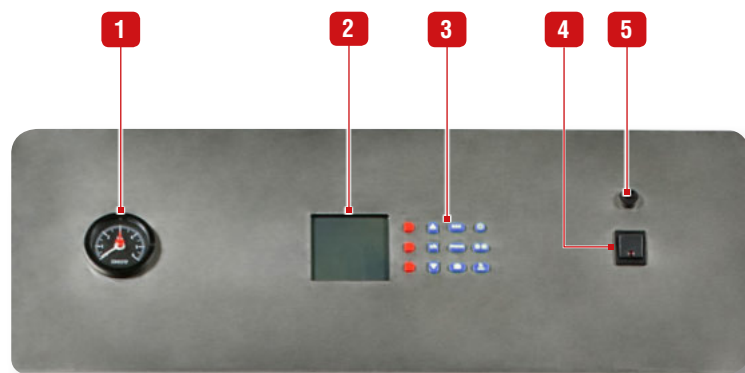
		ACV INTERNATIONAL OUDE VIJVERWEG N°6 1653 DWORP		CE 0063-2016 0063CQ3790	
Typ	100395 / A1002890	Country P[mbar]Cat		AT	20 I2H
Model	Compact Condens 210	BE	20/25 I2E (R)	CH	20 I2H
Qn (Hi)	42 - 210 kW	DE	20 I2E	ES	20 I2H
Pn (50-30)	215,9 kW	FR	20/25 I2Esi	GB	20 I2H
Pn (80-60)	40,7 - 204,5 kW	IE	20 I2H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

Compact Condens 210

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

Compact Condens 300

CONTROL PANEL AND DISPLAY

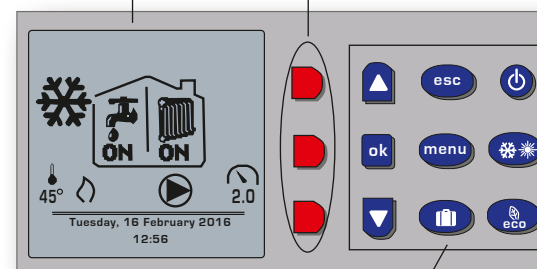
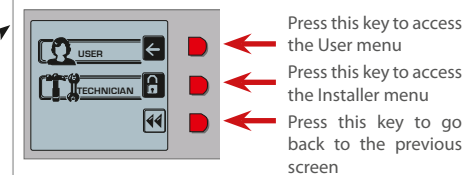


Panel Description

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, 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.

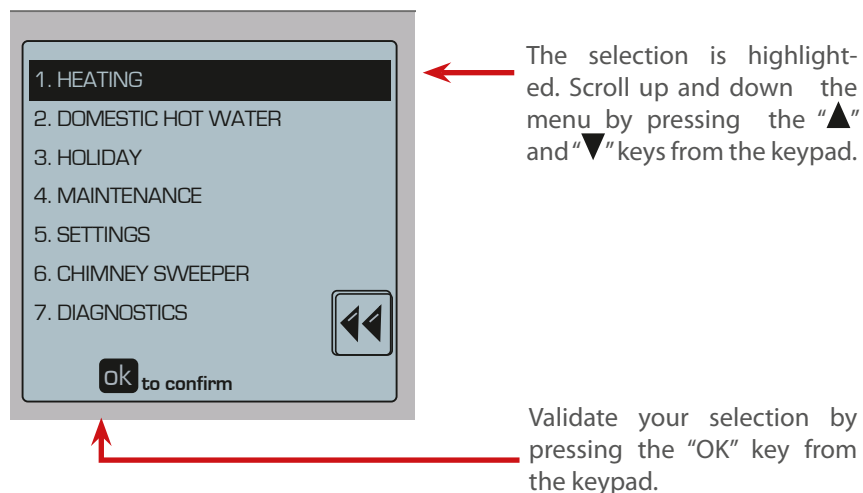
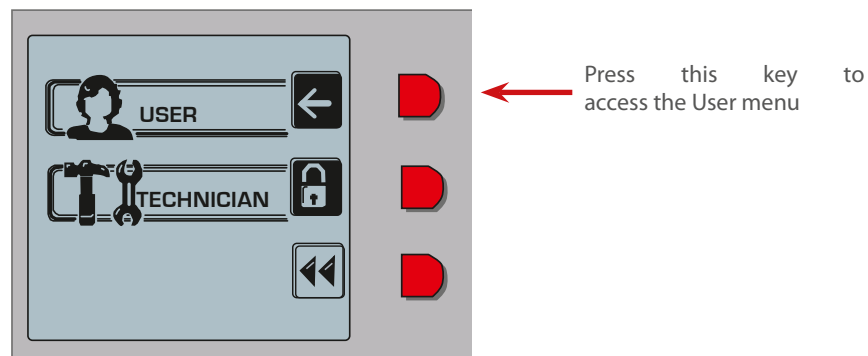
Fault code	Problem	Possible Cause(s)	Solution
-	The appliance does not turn on when pressing the ON/OFF Master switch	No power supply	Check the power supply and that the appliance power plug is connected to the network.
E1	Failed ignition	The burner failed to light after 3 ignition attempts	Check gas 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 14.

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

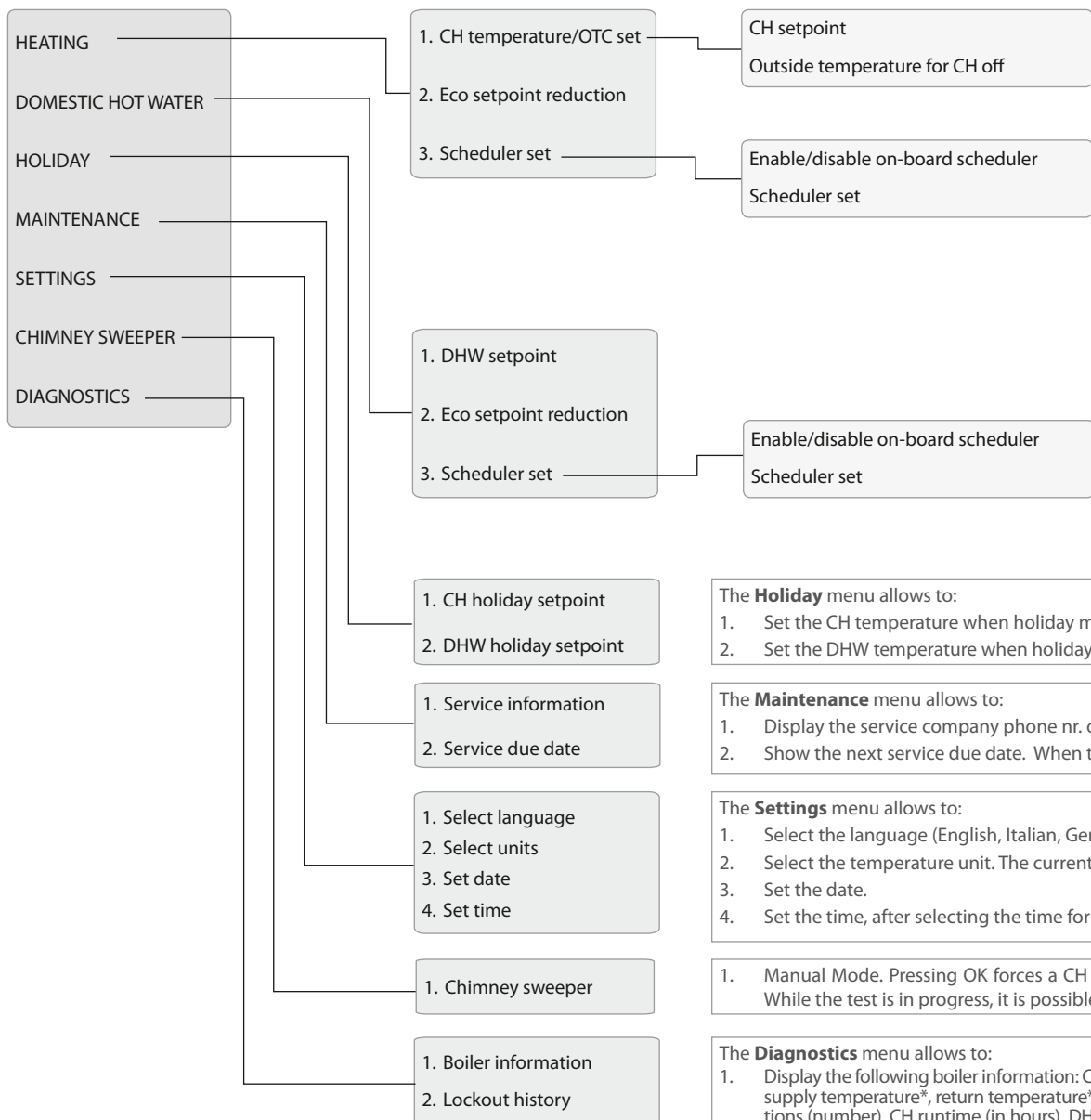


Through the User menu, the following parameters can be set :

Heating	The user can define the CH setpoint, 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.
Domestic Hot Water	When an external DHW tank is installed in the system, the user can define the DHW setpoint, the temperature reduction for the Eco mode, as well as schedule the operation of the DHW circuit.
Holiday	This menu allows to define the CH and DHW setpoints applicable in holiday mode.
Maintenance	This function provides information related to the maintenance operations (contact details and maintenance due date).
Settings	In this menu, various general settings can be defined, such as language, units, date, time, etc.
Diagnostics	In the diagnostics, the user can find the boiler usage information as well as the history of errors.

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

USER'S MENU AND PARAMETER DESCRIPTIONS



The **Heating** menu (user) allows to:

- Set the CH temperatures and OTC curve parameters :
 - CH setpoint**: to adjust the setpoint of CH circuit.
 - Outside temperature for CH off**: to set the external temperature at which heat demand is stopped. If set to OFF, the heat demand will never be stopped by the controller (unless RT is removed, or there is a bridge between terminal strip C2: 1, 2).
- Set the temperature that will be subtracted from actual setpoint if ECO mode is active, using the **Eco setpoint reduction**.
- Display the scheduler menu
 - Enable/disable scheduler**: to Enable or disable the CH on board scheduler.
 - Scheduler set**: to program scheduler according to the days of the week, per day, or per range of days.

The **Domestic Hot Water** menu (user) allows to:

- Set the actual DHW temperature (in case there is a sensor in the DHW circuit) OR set the base boiler flow temperature (in case there is a switch).
- Set the temperature that will be subtracted from actual setpoint if ECO mode is activated, using the **Eco setpoint reduction**.
- Display the scheduler menu
 - Enable/disable scheduler**: to Enable or disable the DHW on board scheduler.
 - Scheduler set**: to program scheduler according to the days of the week, per day, or per range of days.

The **Holiday** menu allows to:

- Set the CH temperature when holiday mode is active.
- Set the DHW temperature when holiday mode is active.

The **Maintenance** menu allows to:

- Display the service company phone nr. or any other entered information.
- Show the next service due date. When the period is expired, an indication shows on the screen.

The **Settings** menu allows to:

- Select the language (English, Italian, German or Russian). The current language is highlighted
- Select the temperature unit. The current unit used in the controller is highlighted.
- Set the date.
- Set the time, after selecting the time format (24/12 hours).

- Manual Mode. Pressing OK forces a CH demand that will ignite the boiler, which will operate at % of power (timeout: 15 minutes). While the test is in progress, it is possible to navigate the other menus.

The **Diagnostics** menu allows to:

- Display the following boiler information: CH request, DHW demand, Firing rate (in %)*, Flame ionization current (µA)*, boiler setpoint*, boiler supply temperature*, return temperature*, flue temperature*, outdoor temperature*, DHW storage temperature*, boiler fan speed, CH ignitions (number), CH runtime (in hours), DHW ignitions (number), DHW runtime (in hours), system pressure (water pressure in bar/psi) , Heat exchanger temp., 0-10V input, Target power (Items with an * at the end will open a graph that shows the latest 120 variable values stored every 12 minutes (24 hours history) when pushing OK).
- Display the list of recent errors. Pushing on OK when the lockout is highlighted will open a screen that contains details on the boiler status when the error occurred.

FACTORY SETTINGS

USER MENU

				Default	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			

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 35.

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 using various devices (see also "Electrical connections" on page 12):

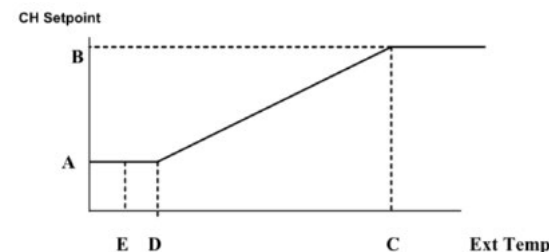
- **On-off room thermostat (standard)** - As standard the boiler is programmed to use an on-off room thermostat. The desired flow temperature is adjustable, but as standard is set to 80 °C. At CH heat request from the room thermostat (and no DHW heat request present) the CH-pump is activated after 10 seconds. The controller will adjust the burner-input in such a way that a flow-temperature of 80 °C is achieved towards the CH-circuit.
- **0-10V Control (optional)**
 - Optional 0-10V
In the **Technician menu, advanced CH settings, CH request**, either 0-10Vdc % or 0-10Vdc SP can be selected.
 - 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 cancelled 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 displayed.
 - 0-10Vdc Setpoint
A value between 2 and 10Vdc generates a CH setpoint demand proportional to this value, between minimum CH flow temperature and maximum CH flow temperature. The heat demand is cancelled below 1 volt.
The minimum and maximum CH flow temperatures 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 displayed.

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

- **Outside Temperature Control OTC (optional)**

The boiler is prepared to work with an outdoor sensor.

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 approximately 2 meters high.

 The resistance of the outdoor NTC should be 12 kOhm at 25 °C.

- **Digital communication (optional)** - The boiler is also prepared for digital communication with room thermostats, using communication protocols like Open-Therm (automatically recognised if correctly connected. Please contact your ACV representative for more details and the correct accessories.

Domestic Hot Water preparation (DHW)

- **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 and CH pump
- an electric 3-way valve with a maximum travel time of 255 sec. 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 as indicated in "Electrical connections" on page 12.

When 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**.

- **External storage tank with NTC sensor** - If the storage tank is equipped with an NTC sensor, adjust the setting in **Technician menu, advanced DHW settings, DHW request** to "Sensor".

 **The resistance of the outdoor NTC should be 12 kOhm at 25 °C.**

The 2 wires of the tank NTC sensor need to be connected as indicated in "Electrical connections" on page 12.

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).

 **In case of a CH heat request, immediately after finishing the heat request for DHW, there is a risk of hot water flowing into the CH system (hot shot).**

General behaviour with external storage tank (DHW priority)

- Disabling/Enabling warm water operation : press the Summer-Winter button.
- In the default boiler configuration, meaning 2 pumps (DHW and CH pump), a DHW request has priority over CH request
- In the **Technician menu, Advanced DHW settings, DHW priority**, the "DHW priority over CH" can be disabled or the period after which the DHW priority ends can be defined. The CH circuit can be served for the same amount of time.
- In case the DHW priority is disabled and both demands are active at the same time, both pumps (CH and DHW) will be activated. During that time, the flow temperature is set to either 80 °C (thermostat) or DHW setpoint + 20K (NTC sensor).

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



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.
- **Siphon pressure switch**, connected to the sump (P1), prevents overflow of the siphon in case the back pressure is too high 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 Δp 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 Technician's 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 the 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 () is pressed, a programmable value is subtracted from the flow temperature setpoint. The value can be changed through the "ECO setpoint reduction" in the User menu or the Installer menu.

 **Holiday mode** - When the Holiday button () is pressed, a request is displayed, asking to enter the start and end dates of the holiday period. It is also possible to set the CH flow and DHW temperatures wished for this period.

Manual mode (Chimney Sweeper) - For periodical maintenance and/or service, a CH request can be generated to force the burner (not in "error" condition) to a specific load, from minimum to nominal (100%). The chimney sweeper 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.

CH and DHW Schedulers - For CH and DHW, separate schedulers can be set. By 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**.

Cascade - The boilers can be set up in a cascade configuration, without the used of an external controller. Please refer to "Integrated Cascade Functionality" on page 18.

Modbus - A Modbus controller can also be used to control the boiler(s). Refer to «Modbus» on page 22.

Electrical connections

	To be connected to	Remark
0-10 V control	Strip C2, pin 3 (negative 0Vdc) and pin 4 (+ positive)	Shortcut to be installed on terminal C2, between pins 1 & 2
Outside Temperature Control (OTC)	Strip C2, pins 5 and 6	Bridge to be installed on terminal C2, between pins 1 & 2 (or use them to connect room thermostat on/off)
Digital communication (Open therm)	Strip C2, pins 1 and 2	
DHW pump	Strip C1, pins 6, 7 and 8	
CH pump	Strip C1, pins 9, 10 and 11	
Hydraulic 3-way valve	Strip C1, pins 6, 7 and 8	
Electric 3-way valve	Strip C1, pins 6, 7, 8 and 9	
Tank thermostat	Strip C2, pins 7 and 8	
Tank NTC sensor	Strip C2, pins 7 and 8	
Cascade	Special Kit (Terminal strip C3 to be installed + cables)	Refer to "Integrated Cascade Functionality" on page 18
Modbus	Special Kit (Terminal strip C3 to be installed + cables)	Refer to "Modbus" on page 22

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

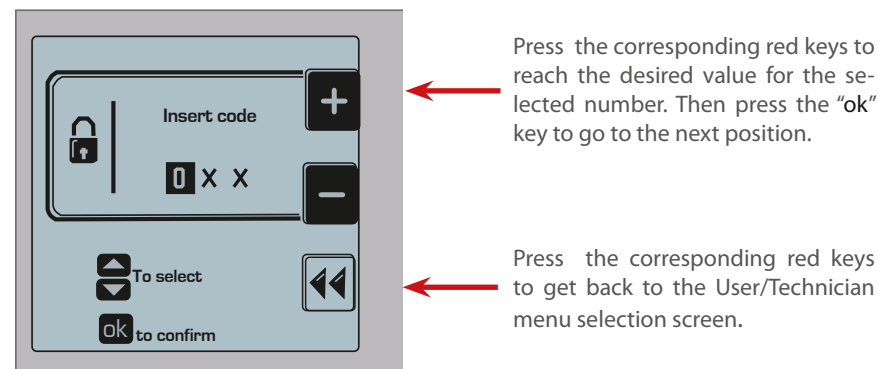
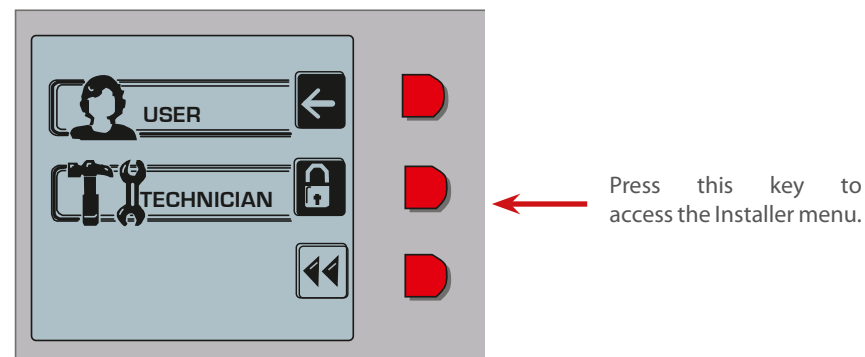
Standard setting of the boiler involves the "slow start" principle in order to avoid the boiler and system to heat up too quickly.

After APS "zero check" and APS closure with pre purge, ignition starts. After a stabilisation 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 Technician menu - Press the "menu" key from the 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.

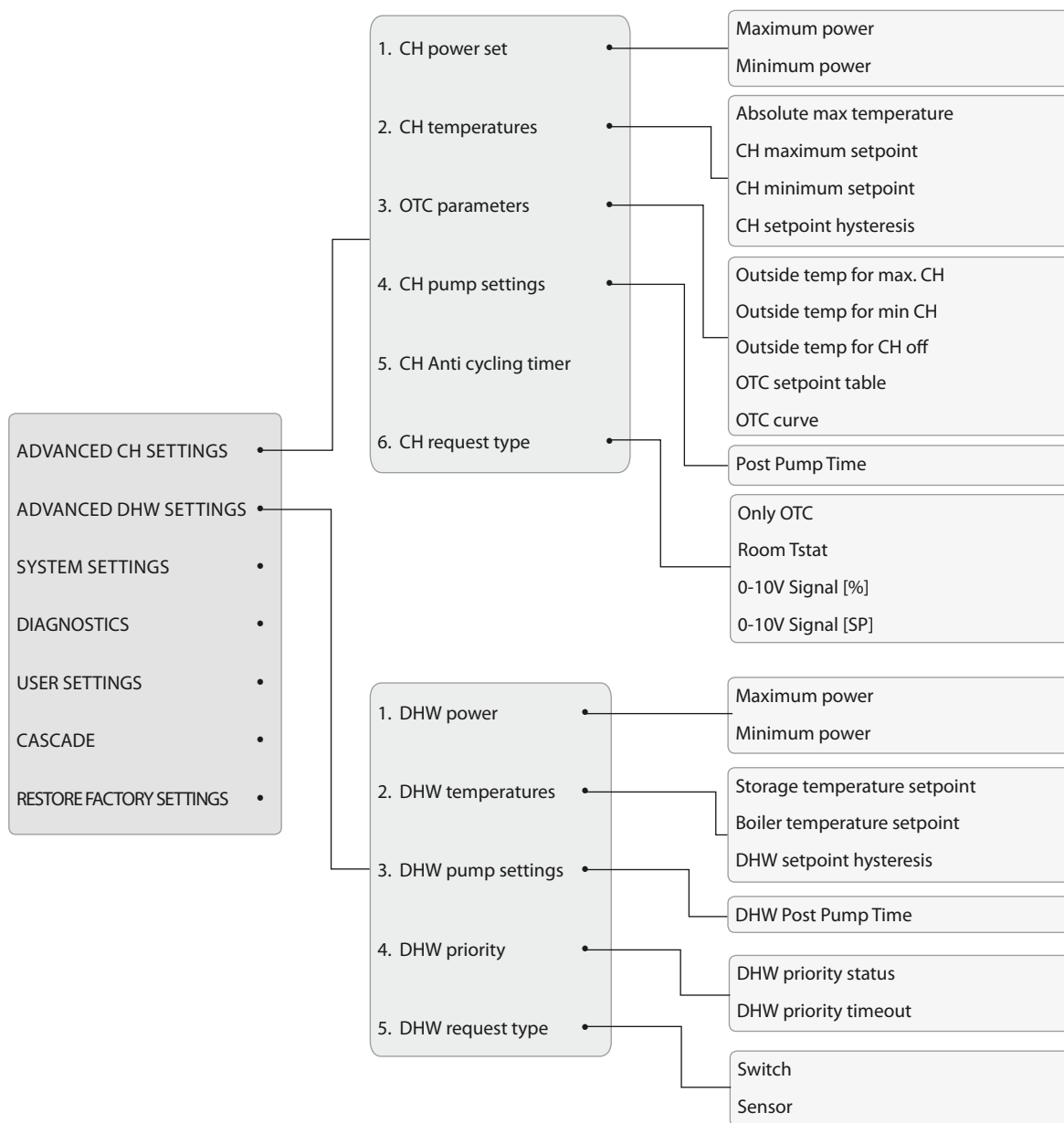


The following parameters can be accessed by the installer.

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

See the following pages for more details.

INSTALLER'S MENU AND PARAMETER DESCRIPTIONS

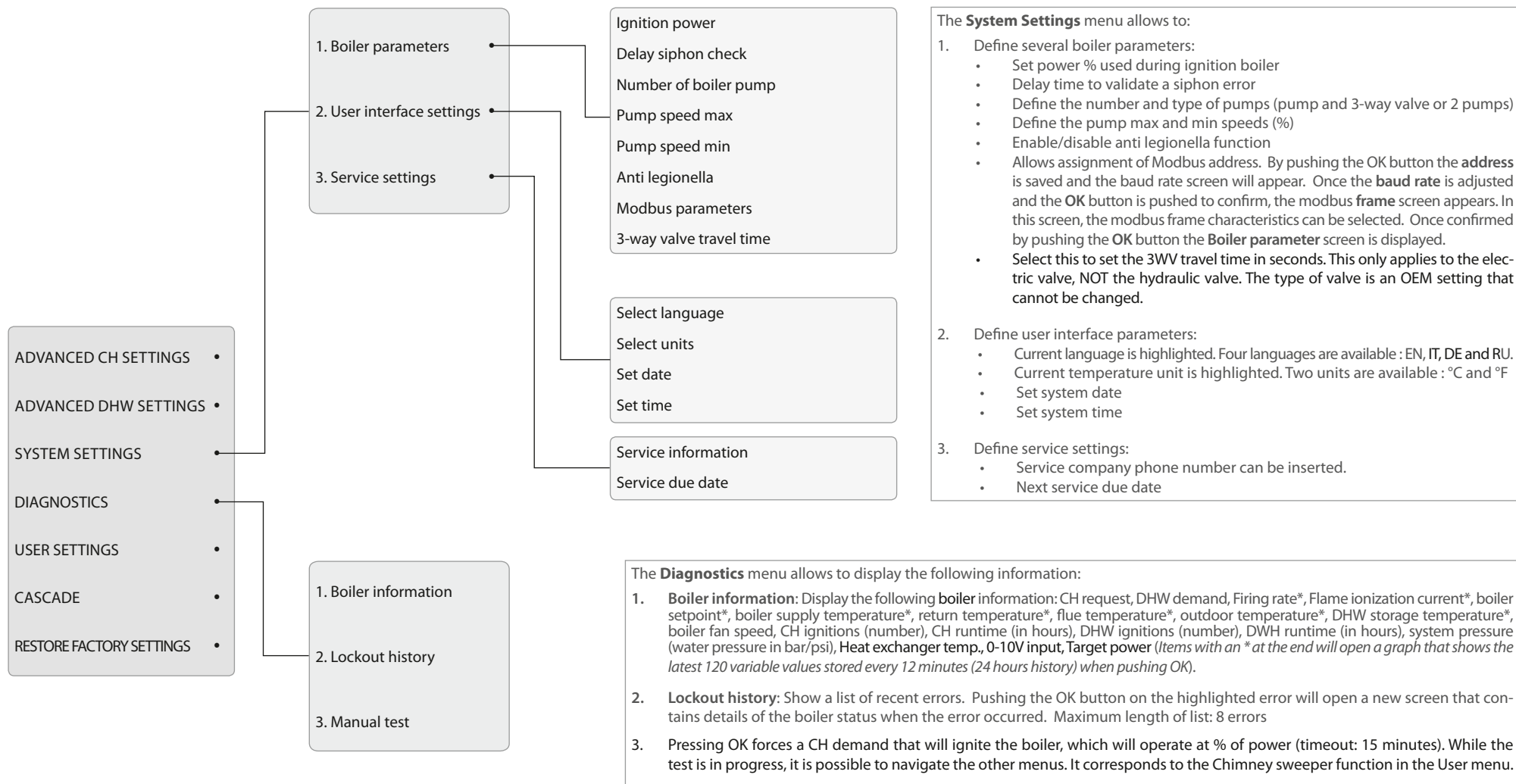


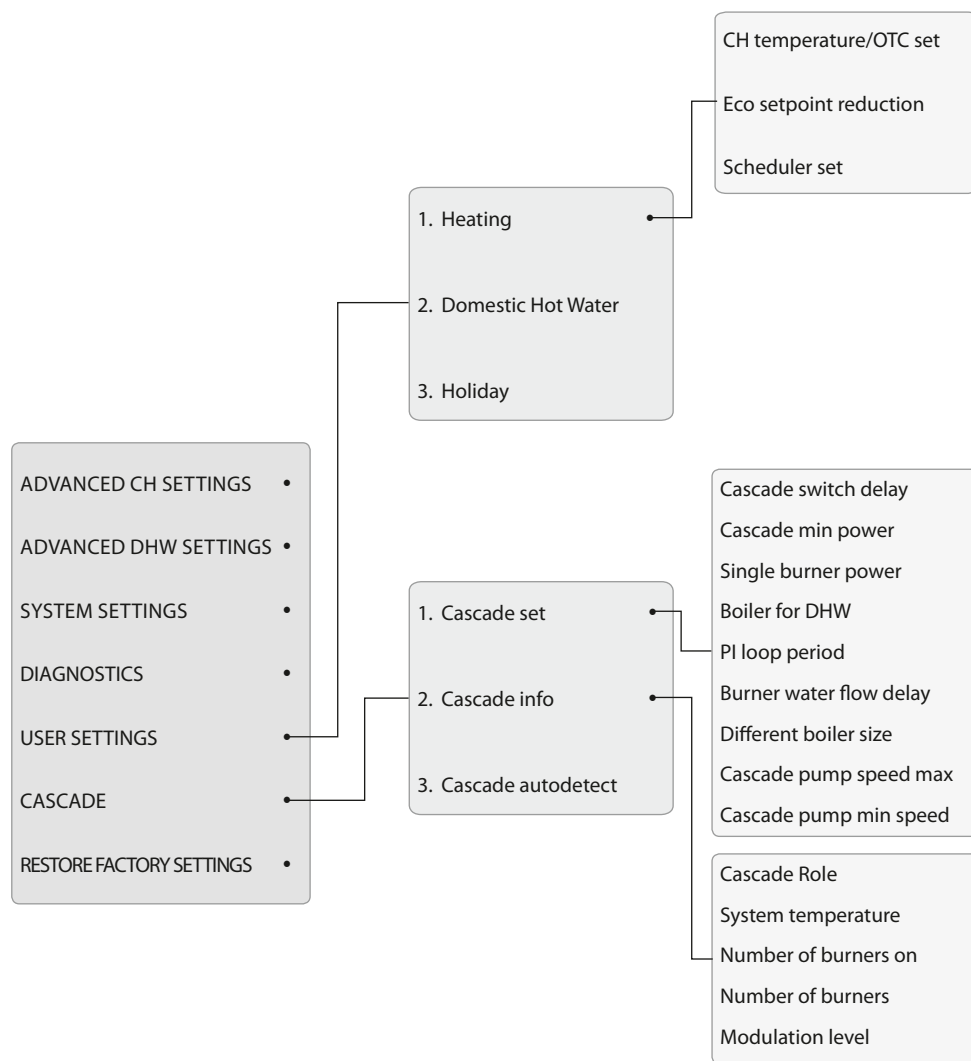
The **Advanced CH Settings** menu (Technician) allows to:

- 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 temperature.
 - Set the minimum CH temperature.
 - Set CH setpoint hysteresis (temperature above setpoint at which boiler will switch off).
- Set OTC parameters:
 - Define external temperature at which OTC will set a maximum CH setpoint.
 - Define external temperature at which OTC will set a minimum CH setpoint.
 - Set the external temperature at which heat demand is stopped. If set to OFF, heat demand will never be stopped by the controller (only by removing RT or bridge between pins 1 & 2 on strip C2).
 - Show in a table the link between external temperature and actual setpoint determined by the OTC parameter selection.
 - Show in a curve the link between external temperature and actual setpoint determined by the OTC parameter selection.
- Adjust pump related parameters
 - Pump overrun time after heat demand.
- Determines the minimum time between boiler stop and next ignition.
- Allows the selection of different CH requests:
 - Outdoor Temperature Controller
 - Room thermostat or Open therm
 - 0-10V input for Power mode
 - 0-10V input for Setpoint mode

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

- Set % of boiler maximum / minimum power in DHW mode.
- Show and set DHW temperatures
 - Set DHW temperature setpoint coming from thermostat (switch).
 - Set flow temperature during DHW demand coming from sensor.
 - Set temperature above setpoint at which boiler will be switched off.
- Adjusts pump related parameters in DHW mode
 - Pump overrun time after DHW demand.
- Define DHW priority over CH
 - Enable/disable the DHW priority over CH.
 - Define after how much time the DHW priority is ended (CH can be served if present for the same amount of time). Select OFF for no timeout while DHW priority status is enabled, or Minutes to set timeout in minutes.
- Define demand by switch or sensor
 - DHW starts when switch (thermostat) closes
 - DHW starts based on difference between actual and required DHW temperature





The **User Settings** menu allows to access the user settings from the Installer menu:

- Heating settings**
 - Set the CH temperature and OTC curve parameters (adjust CH setpoint and outside temperature for CH off).
 - Set the temperature that will be subtracted from actual setpoint if ECO mode is active, through the **Eco setpoint reduction**.
 - Display the scheduler menu
- Domestic Hot Water settings**
 - In case there is a sensor, set the actual DHW temperature and in case there is a switch in the DHW circuit, set the base boiler flow temperature.
 - Set the temperature that will be subtracted from actual setpoint if ECO mode is active, through the **Eco setpoint reduction**.
 - Display the scheduler menu
- Holiday settings**

Refer to "User's menu and parameter descriptions" on page 9 for more details.

The **Cascade** menu allows to access the cascade-related parameters:

- Cascade set**
 - Cascade switch delay: delay between switching on and off different boilers.
 - Cascade min power : minimum power of boilers in cascade.
 - Single burner power : Max power of SINGLE boiler in the cascade.
 - Boiler for DHW: Number of boilers assigned to DHW.
 - PI loop period: Base time for PI loop calculation.
 - Burner water flow delay: water propagation time delay.
 - Different boiler size: Heterogeneous mode, with 2 power groups (DHW+CH / CH only), that can be enabled/disabled
 - Cascade pump speed max: Cascade pump full speed
 - Cascade pump min speed
- Cascade info** menu provides information related to the cascade
 - Cascade Role : Role of boiler in cascade mode (Master, Slave, Terminal Slave or Standalone if not in cascade mode).
 - System temperature: Cascade temperature value. Pushing on OK when it is highlighted will open a 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.
 - Number of burners on : number of burners that are switched on.
 - Number of burners: number of burners in a cascade.
 - Modulation level: Actual percentage of cascade modulation level
- Cascade autodetect** - Pressing **OK** will start the autodetection process of the cascade configuration. It can only get started from the Master boiler.

Refer to "Integrated Cascade Functionality" on page 18 for more details.

The **Restore factory settings** menu allows to restore all the advanced settings to the original default factory settings by pressing on OK.



Please contact your ACV representative to get the default values for your appliance.

FACTORY SETTINGS

		TECHNICIAN MENU		default	Min	Max	After factory reset		
1	ADVANCED CH SETTINGS	1	CH power set	1 Maximum power	100	0	100		
				2 Minimum power	0	0	100		
		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	
		3	OTC parameters	4 CH setpoint hysteresis	5	2	10	3	
				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								
4	CH pump settings	5 OTC curve	OTC curve						
		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
						2 Minimum power	0	0	100
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	
				1 DHW priority Status	Enabled	Enabled	Disabled	Enabled	
4	DHW priority			2 DHW priority TimeOut	Off	1	60	Off	
				5 DHW request type	Switth	Switch	Sensor	Switch	
3	SYSTEM SETTINGS			1	Boiler parameters	1 Ignition power	10	0	20
		Higher than 20 not allowed							
		2 Delay siphon check	3			0	20		
		check syphon is not emptied by new valve							
		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			
				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 telephone number				
				2 Service due date	Set service date				
		4	DIAGNOSTICS	1 Boiler information	Real time boiler status				
				2 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 ECO setpoint reduction	2 Outside temperature for CH off	off	7	25	off
				3 Scheduler set	1 Enable/disable on board scheduler	Enabled	Disabled	Enabled	
		2	Domestic hot water	2 Scheduler set	Set time scheduler (Time/On/ECO/OFF)				
				1 DHW setpoint (NTC sensor)	60	35	65	60	
				1 DHW setpoint (Thermostated)	80	35	85	80	
				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= 170,210,250,290 boiler specific) kW	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 detection	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							

INTEGRATED CASCADE FUNCTIONALITY

General

The integrated cascading functionality (boilers delivered from November 2016) makes it possible to connect up to 4 boilers together without requiring the use of an external cascading controller and to manage the cascade from the Master boiler display. The cascade algorithm is designed to run in parallel as many boilers as possible and is optimised for condensing boilers.

The **first boiler** of the chain is the master of the cascading logic and handles the heat requests. All other boilers in the chain are slaves. The **last boiler** is called the terminal slave. All displays (DSP) are equal and can be swapped. After having been correctly wired, using a special cascade kit for each boiler (available as an accessory), the auto-detection of the cascading chain is initiated from the master boiler (refer to «Wiring the cascade chain», page 4).

After a successful auto-detection, the role of each single boiler (master, slave, terminal slave) is shown in the installer menu of each boiler (**Technician menu > cascade > cascade info > CASCADE ROLE**).

Cascade operation

In a regular cascade systems, all boilers are managed for CH and/or DHW. The CH and/or DHW demand is validated by an external controller which generates a CH demand. The cascade system will only ensure that a certain temperature is reached at its output (at the cascade temperature sensor).

With this integrated cascade controller, it is possible to let the cascade system perform the DHW validation by itself. The DHW sensor or switch has to be connected to only the first (master) boiler. In case of a DHW demand, the cascade controller will regulate the cascade sensor directly to the DHW setpoint. All boilers will be on, without the need to follow the CH algorithm. The cascade system pump output relays from the master boiler will be switched off. The DHW pump or 3WV of each boiler will be switched on.

If a CH demand is also connected to the first (master) boiler, the cascade system will follow the CH algorithm (minimum time, slope) and regulate the cascade sensor to the CH setpoint. The cascade system pump output relay (master only) will be activated. Boilers are added clockwise and removed counter-clockwise. At every heat demand, the next boiler (clockwise) will be the first to start. When a demand lasts for more than 24 hours, a rotation will also take place.

The CH and/or DHW request type must be set correctly from the master boiler display. All boilers in the chain are supposed to be equal, meaning that they have the same maximum capacity and minimum modulation level. Both are parameters of the cascade setting.

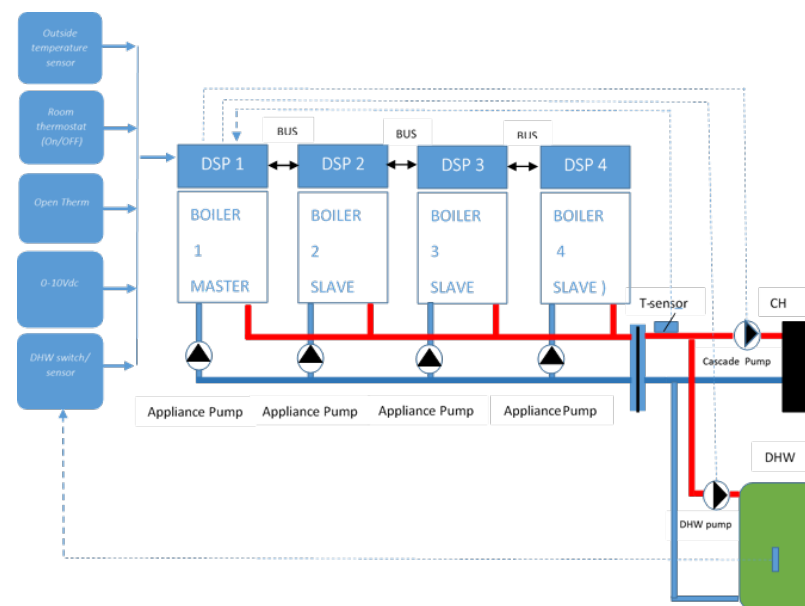
The minimum cascade power is the minimum modulation level of a single boiler, while the maximum cascade power is the maximum single boiler power multiplied with the number of boilers in the chain.

A parameter CASCADE SWITCH DELAY can be set to prevent that boilers are too frequently added or removed to obtain the requested cascade power.

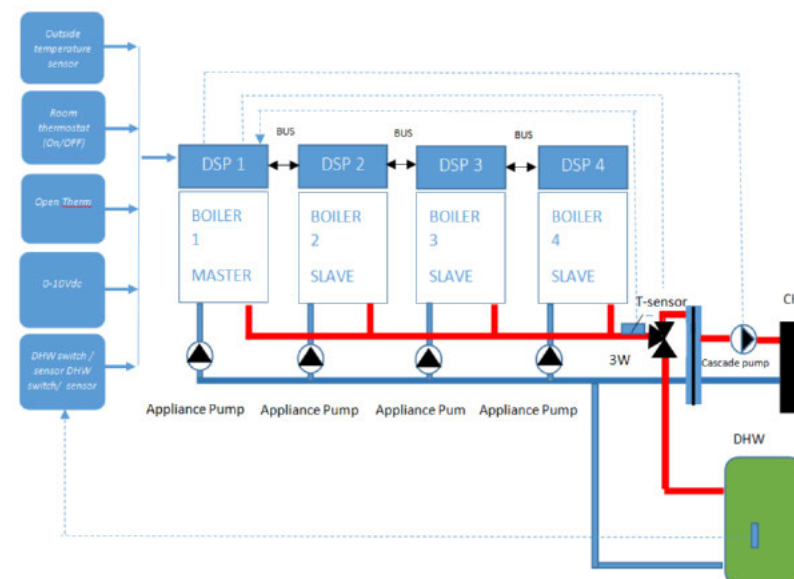
From the master display, the parameter BOILERS FOR DHW must be set to 0 (default) and DIFFERENT BOILER SIZE must be disabled (default).

Capacity limitations for either CH or DHW done from the master menu (Advanced settings) will limit the capacity for each boiler in the chain. Refer to «Installer's menu and parameter descriptions» on page 14 for the menu layout. (**Technician > Cascade > cascade set >...**).

Example 1 : Cascade system. Each boiler is equal, and all boilers for CH and / or DHW



Example 2 : Cascade system. Each boiler is equal, and all boilers for CH and / or DHW



Split DHW

Instead of assigning all boilers to CH and/or DHW, it is also possible to assign only some of the boilers to CH + DHW while the other boilers are available to serve only CH. This is called "split DHW". In case there is no DHW heat demand, all the boilers will be available for CH.

Split DHW configuration is done by setting the parameter BOILER FOR DHW in the cascade set menu (MASTER) to the number of boilers that should serve DHW (See example 3). The DHW boilers must be the first boilers in the cascade chain.

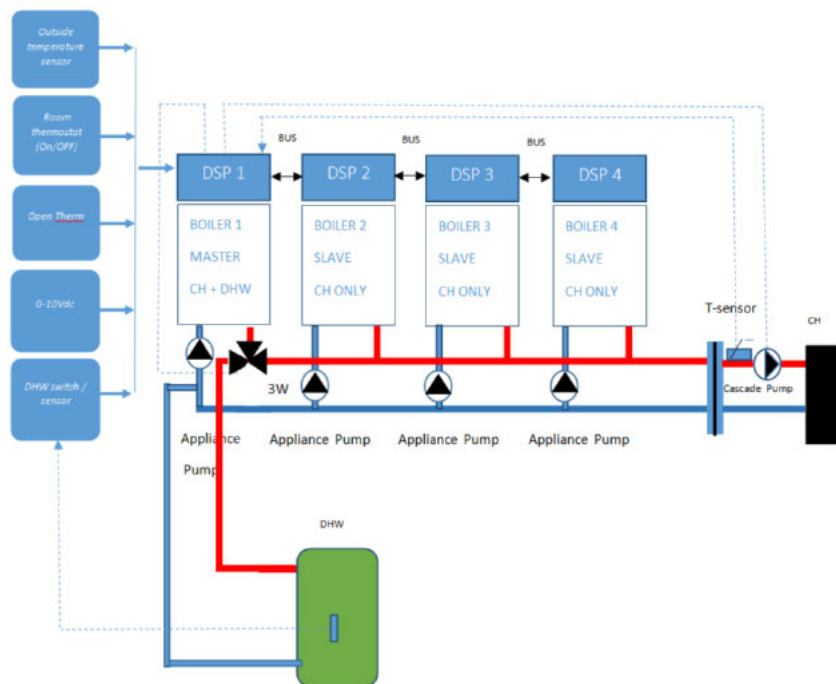
The CH and DHW heat demands are connected to and managed by the first (master) boiler. In case of a DHW request, all DHW boilers will regulate the temperature to the DHW setpoint and control the pump(s) and 3WV as in a normal local DHW demand.

In case of a CH request and there is no DHW request at the same time, the demand is processed by a rotating system, where boilers are added clockwise and removed counterclockwise, respecting the CASCADE SWITCH DELAY parameter.

In case of a mutual request (CH and DHW), each boiler will either serve for DHW or CH depending on the group it belongs to.

Remember to set the parameters of the CH and DHW request from the first (master) boiler. Instead of a 3WV a DHW pump may be configured.

Example 3 : Split DHW cascade system. Each boiler is equal, 3 for CH only and 1 for CH + DHW (Parameter in cascade set , BOILER FOR DHW =1, but may differ)



Heterogeneous cascade

Besides creating two groups (DHW + CH group and CH only) in which each boiler is equal, it is also possible to allow a different power rating to the DHW + CH group boilers compared to the CH only group boilers.

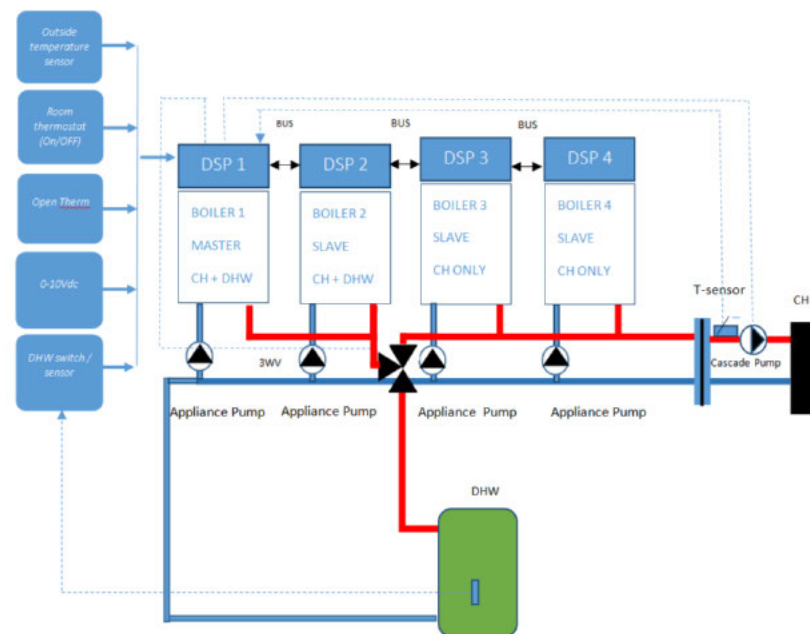
This is called a heterogeneous cascade system (example 4). In the cascade set menu the parameter DIFFERENT BOILER SIZE must be enabled.

The parameters SINGLE BURNER POWER and CASCADE MIN POWER in the master display are obtained from the first DHW + CH boiler and set for all the boiler belonging to the same group.

Likewise is the power rating for each boiler in the CH only group equal and set after AUTO-DETECTION initialized from the master.

In case of a CH request and there is no DHW request, the demand is processed by the CH only boilers first and after reaching the maximum modulation level also the CH + DHW boilers are added to serve for CH demand.

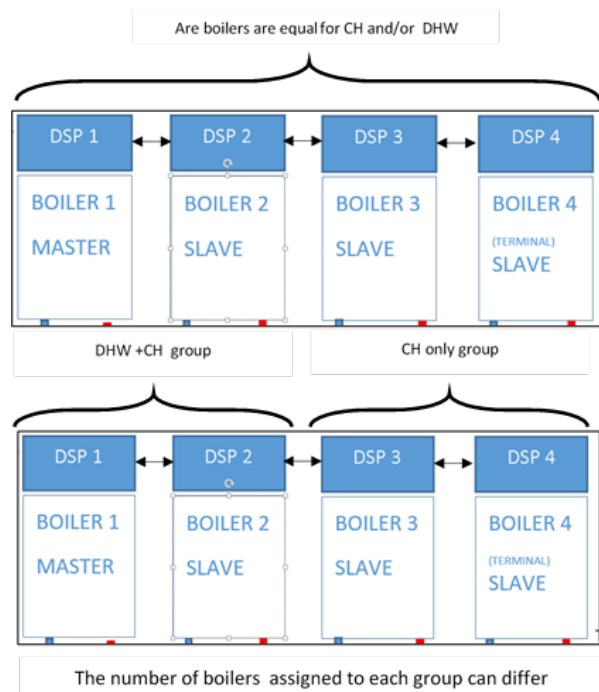
Example 4 : Heterogeneous Cascade system. 2 CH only and 2 CH + DHW boilers.



Wiring the cascade chain

The integrated cascading functionality of the display (boilers delivered from November 2016), makes it possible to connect up to 4 boilers together without requiring an external cascading controller.


When all boilers are equal, the first boiler in the chain is the master and the others are slaves. When two groups are defined, (DHW + CH group and CH only group) start the chain with all boilers of the CH + DHW group followed by all boilers of the CH only group. The first DHW + CH boiler is the master. All the others are slaves.



Each boiler is wired up to the next boiler using a special cascade connection kit (3-wire shielded cable + terminal strip C3 to be installed). Please contact your ACV representative for the correct accessory.

Wiring procedure

1. Disconnect the 230V supply from all the boilers and open the front panel of each boiler.
2. On each boiler, mount terminal strip C3 left of the low voltage terminal strip C2, as shown in the picture on the right.

 **On the master boiler, do not replace the existing connection on X03, which is used for the diagnostic connector.**

3. On the master, connect X06 and X07 **BUT NOT** X03
4. On all the slaves (second to the last boiler) connect X03, X06 and X07 to the display. X03 replaces the connection coming from the diagnostic connector in the left upper corner.
5. Starting from the first boiler to the next and the next, to the last, wire up the cascade chain as shown in the picture on the right.



General Remarks

- The heat demands (CH, DHW) must be connected to the first (master) boiler to terminal strip C2.
- From the master boiler Technician menu, select the correct CH and DHW requests.
- DHW pump and or 3WV connections can be done from every boiler in the DHW + CH group, depending on the configuration of the DHW of each boiler but preferred from only the master, this because of the communication delay.
- Connect the cascade supply sensor (12k at 25 °C) terminal strip C2 : 15, 16 of the master boiler, otherwise Error 92 will occur.
- The terminal strip C1 contacts 19 and 20 of the master boiler provides the cascade system with pump potential free relays output (230V, max 0,8 A).
- The terminal strip C1 contacts 17 and 18 of each boiler provides potential free alarm relays output (230V max 0,8 A).

Electrical connections

	To be connected to	Remark
Terminal strip C3	X03, X06 and X07 on all boiler displays EXCEPT on Master boiler connect to next boiler	Refer to diagram on following page
Cascade supply sensor	Master boiler, Strip C2, pins 15 and 16,	

Auto-detection

After being correctly wired, the auto-detection of the cascading chain is initiated from the master boiler. In case the (hydraulic) configuration is designed to operate as a split DHW system, set the parameter BOILERS FOR DHW to the number of boilers belonging to the CH +DHW group.

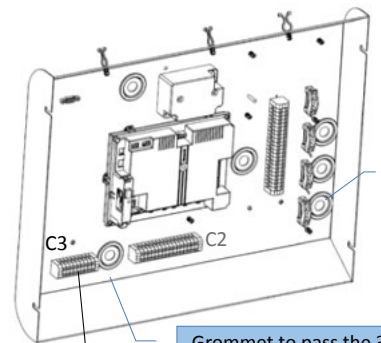
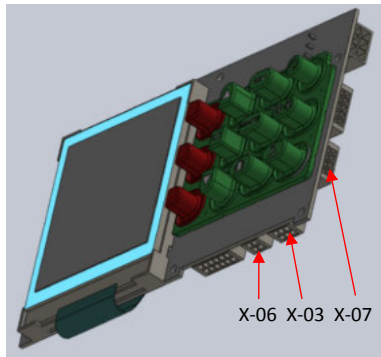
When the "CH only" group has a different power rating, set the parameter DIFFERENT POWER SIZE to "enabled". Disable all heat demands and power on all the boilers. Set the correct CH and/or DHW request type and the correct numbers of pumps (or pump and 3WV) from the first (master) boiler.

From the first (master) boiler start the AUTO-DETECTION. When successful, the numbers of burners (boilers) is shown on the display. Press the OK button to confirm. If the number is incorrect, press ESC on the keypad and check the wiring between the boilers.

After a successful configuration, each display will show the cascade symbol in the upper right corner. Create a CH and/or demand and check for correct operation of the cascade chain. After changing a Cascade set parameter, perform an auto-detection once again.

Cascade parameters

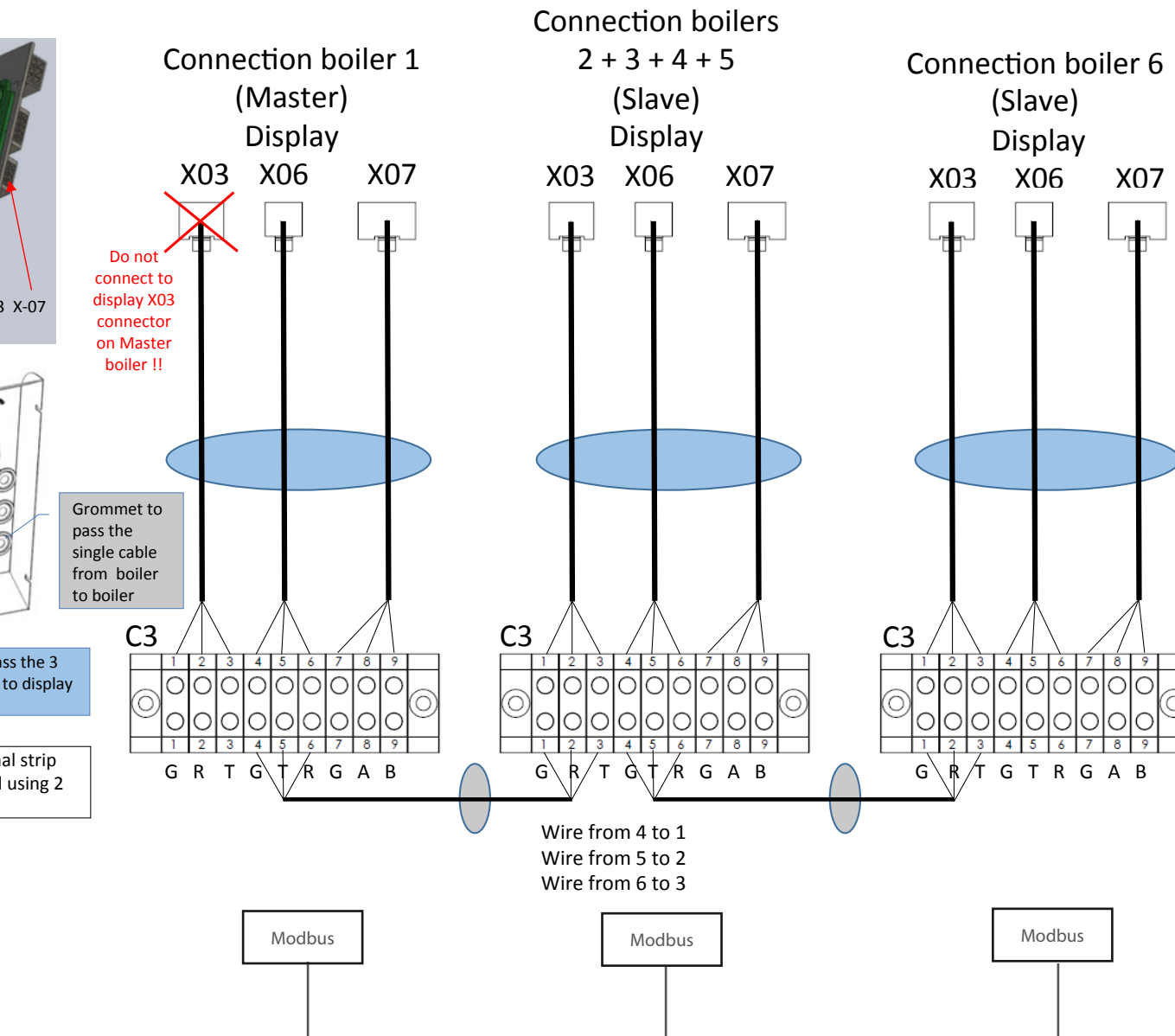
The cascade-related parameters can be set from the first (master) boiler, **Technician menu, Cascade, Cascade set**, refer to "Installer's menu and parameter descriptions" on page 14.



Grommet to pass the single cable from boiler to boiler

Grommet to pass the 3 cables from C3 to display connectors

Additional terminal strip C3 to be attached using 2 screws



Cascade errors

Each boiler has a potential free alarm relay contact on terminal strip C1 (17, 18) which closes when an error (Lock, block) occurs, as it would when operating in standalone mode. In addition, the corresponding error code is displayed on the user interface of the concerned boiler.

As the master manages all the heat requests, the same error is also visible on the master display. A reset can be done from either the master or boiler with the error, after resolving the problem.

In the upper right corner of the master display, the number of the boiler with the error is indicated. Eventually the alarm relay output of the master boiler will close, to indicate there is a problem in the cascade chain.

The power of a single boiler in the chain, even when in error mode may not be switched off. When switched off, the next boiler(s) cannot be reached by the master, resulting in a cascade bus error (E98).

When a boiler must be switched off for a longer time, the cascade chain must be rewired temporarily, taking the boiler out of the chain. Terminal strip C3 (pins 4, 5, 6) of the boiler located before the boiler with the error must be connected to terminal strip C3 (pins 1, 2, 3) of the boiler located after the boiler with the error.

After re-wiring, perform an AUTO-DETECTION again. The new numbers of boilers will be detected. When bringing a boiler back into the chain, do not forget to rewire in the original sequence, then to repeat the AUTO-DETECTION. The original number of boilers will be displayed.

The Cascade-related error codes are E89 to E92, E95, and E97 to E99.

Refer to "Locking Codes" on page 45 for a detail of the cascade-related codes.

MODBUS

To connect a Modbus controller, an additional kit (terminal strip C3 + shielded cable) is required. Contact your ACV representative for the correct accessory. In case of a cascade configuration, refer to wiring diagram on previous page.

Supported commands

The following basic Modbus commands are built in the boiler display:

- 0x03 Read Holding Registers
- 0x04 Read input Registers
- 0x06 Write Single Register
- 0x10 Write Multiple Registers
- 0x11 Report Slave ID

Wiring procedure

1. Disconnect the 230V supply from the boiler(s) and open the front panel.
2. Mount terminal strip C3 left to the low voltage terminal C2 as shown in the picture on previous page.
3. Connect X06 and X07 to the display.

 **Do not replace the existing connection on X03 used for the diagnostic connector.**

4. For Modbus connections only use pins 7 (GND), 8 (A) , 9 (B) of terminal strip C3.
5. Use a 3 wire (shielded) cable and route it through the bottom (low voltage) cable guide.

Electrical connections

	To be connected to	Remark
Terminal strip C3	X06 and X07 on boiler display	Refer to diagram on previous page
Modbus controller	Strip C3, pins 7 (GND), 8 (A) and 9 (B)	

Configuration parameters

The Modbus communication line is set to 38,400 b/s by default and can be changed from the Technician menu via the boiler display (**Technician menu, system settings, boiler parameters, Modbus**).

In addition, the default communication frame is set to 8 bit, 1 stop, parity none (8N1).

The default Modbus address is 1.

MODBUS register map

The table below shows the Modbus register map.

ID	R/W	Accessible by command	Name	Format	Range	Notes
0	R/-	0x04 (Input registers)	MB: Esys flags	Flag8	0-255	Bit: description 0: CH mode 1: DHW mode 2: Test mode 3: flame
			LB: Esys flags	Flag8	0-255	Bit: description 0: fault 1: valve1 2: valve2 3: aps 4: fan 5: pump
1	R/-	0x04 (Input registers)	MB: Error flags	Flag8	0-255	Bit: description 1: lockout
			LB: Error code	U8	0-99	OEM specific error number.
2	R/-	0x04 (Input registers)	MB:			
			LB: Error source	U8	0-F	0 : Esys burner controller in cascade F : Dot-Matrix display
3	R/-	0x04 (Input	MB:			

ID	R/W	Accessible by command	Name	Format	Range	Notes
		registers)	LB: Comfort state	U8	0-255	Cascade comfort state: 0: Standby 1: Test mode 2: DHWCH init 3: DHWCH mode 4: DHWCH cool mode 5: DHWCH frost mode 6: DHW init 7: DHW mode 8: DHW cool mode 9: CH init 10: CH mode 11: CH cool 12: Frost mode
4	R/-	0x04 (Input registers)	MB LB: Cascade status	Flag8 Flag8	0-255 0-255	Bit description 0: test mode [active, inactive] 1: DHW mode [active, inactive] 2: CH mode [active, inactive] 3: frost mode [active, inactive] 4: flame present [present, not present] 5: CH pump [active, inactive] 6: DHW pump [active, inactive] 7: cascade pump [active, inactive]
256	-W	0x06 (Write single register)	MB: 0xAA LB: 0x55	U8 U8		Dot-Matrix display provides a reset command on device which is filled in Error source. The resetting is done when previous command return none zero value.
512	R/W	0x03 (Read Holding Registers) 0x06 (Write single register) 0x10 (Write multiple registers)	MB: Heat demand flags LB: Heat demand	U8 U8	0-255 0-255	Bit: description 0: DHW enable Reading: 0 = No heat demand detected 0xFF = Heat demand present Write: 0 = no heat demand 0x55 = CH demand 0xFF = Test demand Value is valid for 30s from the last successful write. When this register is written, the modbus control logic is activated and registers 513, 514 are used for control.
513	R/W	0x03 (Read Holding Registers) 0x06 (Write single register)	MB: LB: Max percentage	U8	0-100	0-100% maximal percentage power Used for Modbus control

ID	R/W	Accessible by command	Name	Format	Range	Notes
		0x10 (Write multiple registers)				
514	R/W	0x03 (Read Holding Registers) 0x06 (Write single register) 0x10 (Write multiple registers)	MB: LB: Control Set point	U8	Limited to OTC offset, CH set point and Abs max set point	Control set point in degrees of Celsius. This value is used as a target temperature for supply sensor, when Modbus heat demand is generated.
768	R/-	0x04 (Input registers)	CH supply temperature	S16		Value *0,1 [°C] example : 278 = 27,8°C 0x8000 invalid value
769	R/-	0x04 (Input registers)	MB: LB: CH return temperature	S8		Value in degrees of Celsius
770	R/-	0x04 (Input registers)	MB: LB: DHW temperature	S8		Value in degrees of Celsius
771	R/-	0x04 (Input registers)	MB: LB: Flue temperature	S8		Sensor : Value in degrees of Celsius 0x8000 – invalid value Switch: ad value > 250 0x7FFF – Flue sensor open ad value < 5 0x0000 – Flue sensor closed If switch input is outside limits 0x8000 – invalid value
772	R/-	0x04 (Input registers)	MB: LB: OTC temperature	S8		Outside temperature sensor Value in degrees of Celsius 0x8000 – invalid value
773	R/-	0x04 (Input registers)	MB: LB: Water pressure [bar]	U8		value from water pressure sensor/switch value * 0.1 [bar]
774	R/-	0x04 (Input registers)	MB:			

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 (OTC) system. The boiler also features an optional function for digital communication with room thermostats.

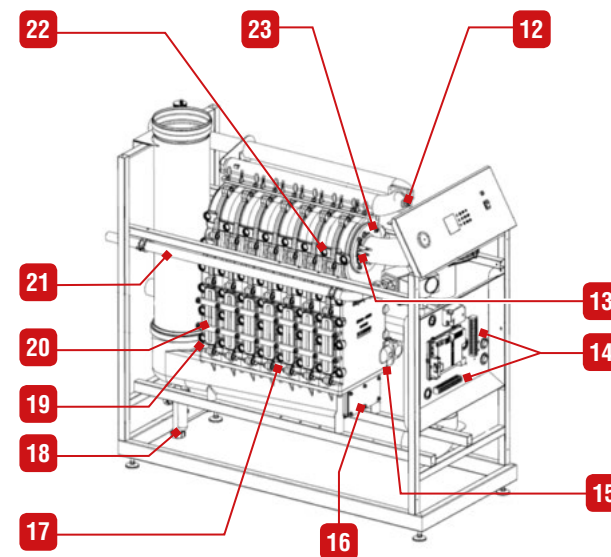
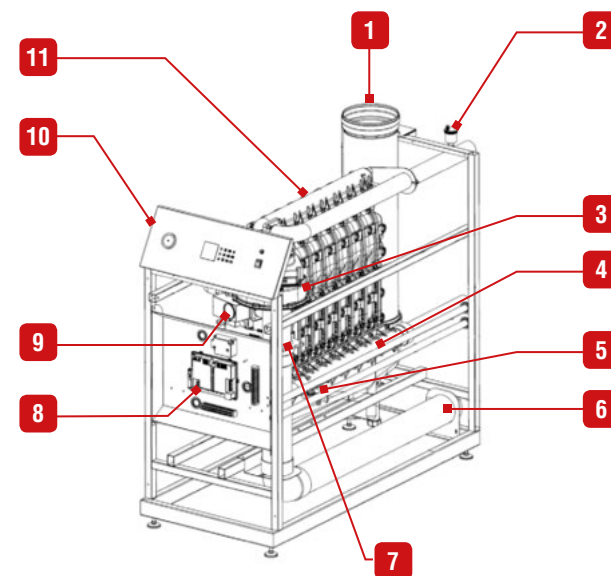
An external DHW tank with a thermostat or sensor can be installed in the system. It will be controlled by the built-in MAXSys controller.

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

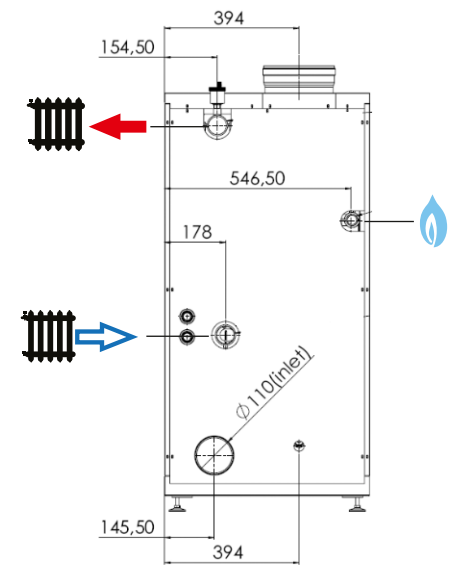
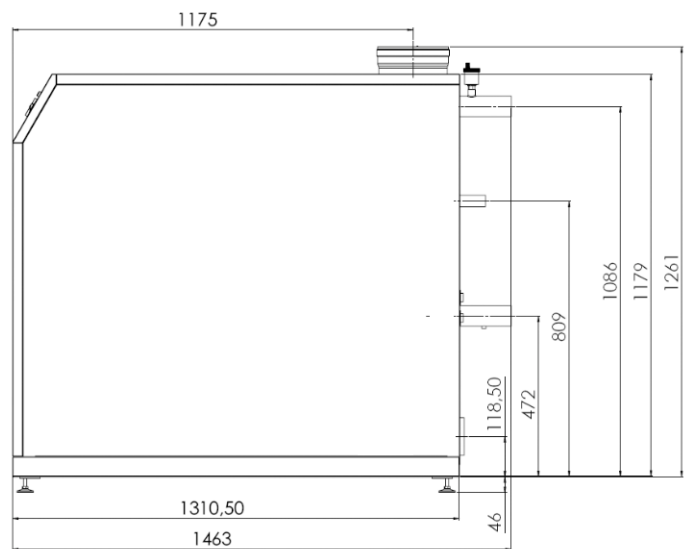
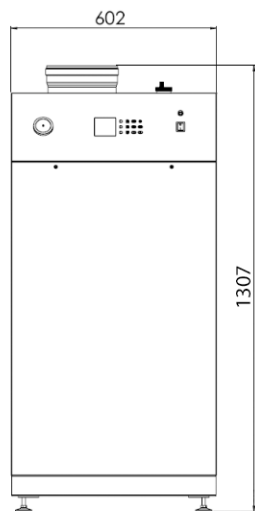
The boiler also features a built-in frost protection mechanism, as well as an anti-freeze function that will protect both the appliance and the system. For more information and details on the boiler's capabilities, refer to "Principles of Operation" on page 11.

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 (siphon)
19. Siphon 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. Ø 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

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 mm²

NTC RESISTANCE

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

Outdoor sensors : 12 K [Ω] at 25°C

WIRING DIAGRAM AND ELECTRICAL CONNECTIONS

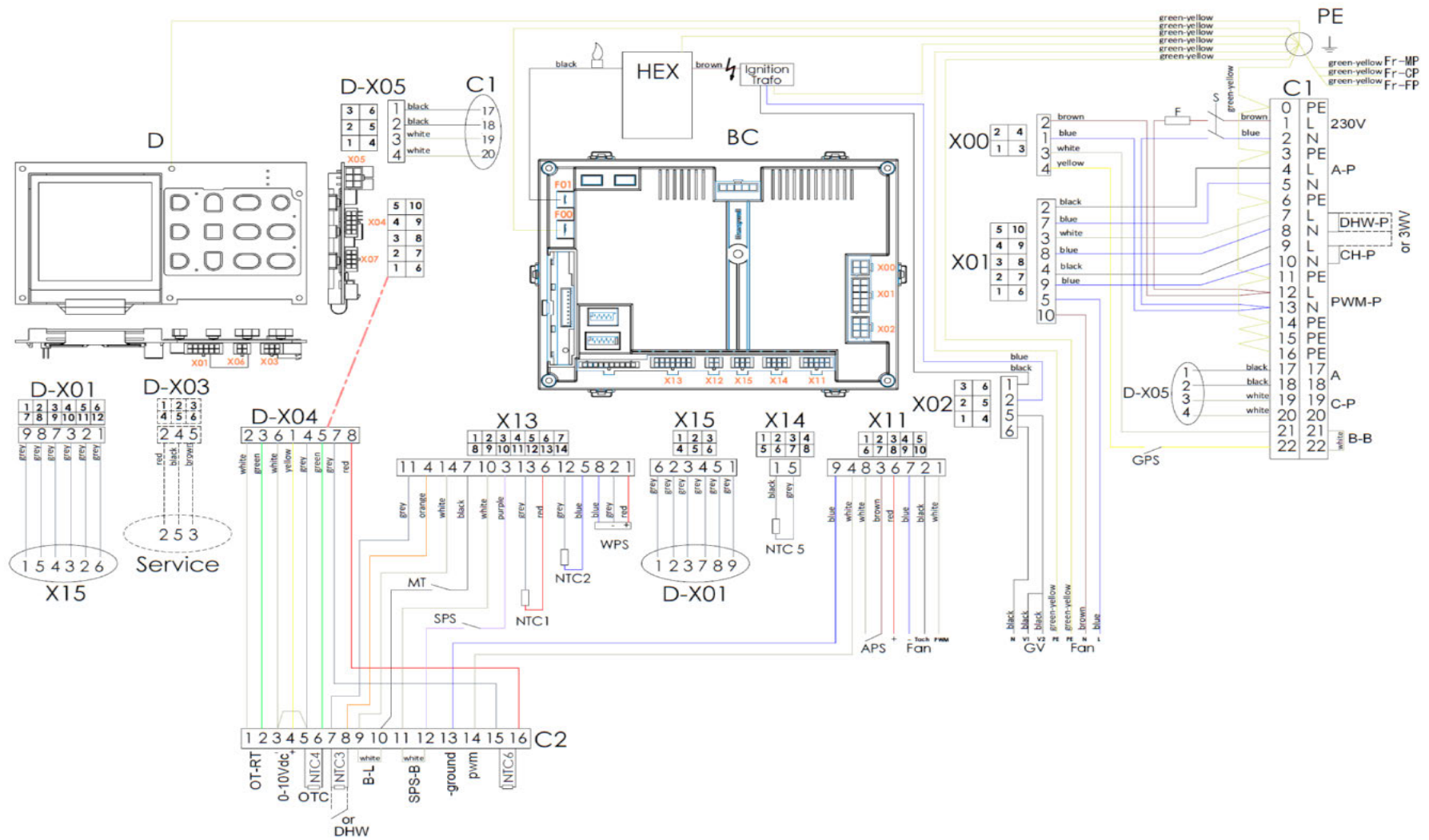
Ref	Description	To be connected to
BC	Burner Control	
D	Display	
C1	230V Connector (terminal strip)	Pins 0 (PE), 1 (L) and 2 (N) to be used for supply wire connection
C2	Low voltage Connector (terminal strip)	
C3	Optional Cascade/Modbus terminal strip (refer to "Integrated Cascade Functionality" on page 18)	
CH-P	Central Heating pump	Strip C1, pins 11 (PE), 9 (L) and 10 (N) (see A-P if 3WV installed)
DHW-P	Domestic Hot Water pump	Strip C1, pins 6 (PE), 7 (L) and 8 (N) OR Strip C1, pins 11 (PE), 9 (L) and 10 (N) if 3WV installed
PWM-P	Modulating pump	Strip C1, pins 14 (PE), 12 (L) and 13 (N) PWM signal : Strip C2, pins 14 (PWM signal) and 13 (PWM ground)
A-P	Appliance Pump (CH) (max 0,8 A) (if 3WV installed)	Strip C1, pins 3 (PE), 4 (L) and 5 (N)
HE	Heat exchanger	

Ref	Description	To be connected to
MT	Overheat limit switch	
NTC1	Flow temperature sensor	
NTC2	Return temperature sensor	
NTC3	Domestic Hot Water sensor or switch (12 kΩ at 25°C)	Strip C2, pins 7 and 8
NTC4	Outside temperature sensor or switch	Strip C2, pins 5 and 6
NTC5	Flue gas temperature sensor	
NTC6	Cascade sensor	Strip C2, pins 15 and 16
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	Strip C1, pins 6 (PE), 7 (L) and 8 (N) (+ pin 9, if electric 3WV)
OT-RT	Open Therm, Room Thermostat On/Off (24 Vdc, 5mA), 0-10 V	OT et RT : Strip C2, pins 1 + 2 (for automatic recognition) 0-10 V : strip C2, pins 3 (-) and 4 (+) (+ short cut installed between pins 1 + 2)
OTC	Outdoor Temperature Control 12K	Strip C2, pins 5 + 6 (+ short cut installed between pins 1 + 2)
F	Fuse	
SPS-B	Siphon pressure switch block (potential free contact, 24 Vdc)	
B-L	Burner lock (Err 3) (potential free contact, 24 Vdc)	
A	Alarm potential free contact (potential free relay output, 230 Vac, max 0,8 A)	
C-P	Cascade Pump potential free contact (potential free relay output, 230 Vac, max 0,8 A)	
B-B	Burner block (Err 77) (potential free contact, 230 Vac,)	
PE	Earth cable or connector	
Fr	Frame	
MP	Mounting Plate	
CP	Cover Plate	
FP	Front Plate	



General remark

Use the right lower grommet to route the low voltage cables from C2, and the 2 right upper grommets for the 230V connections from C1.



COMBUSTION CHARACTERISTICS

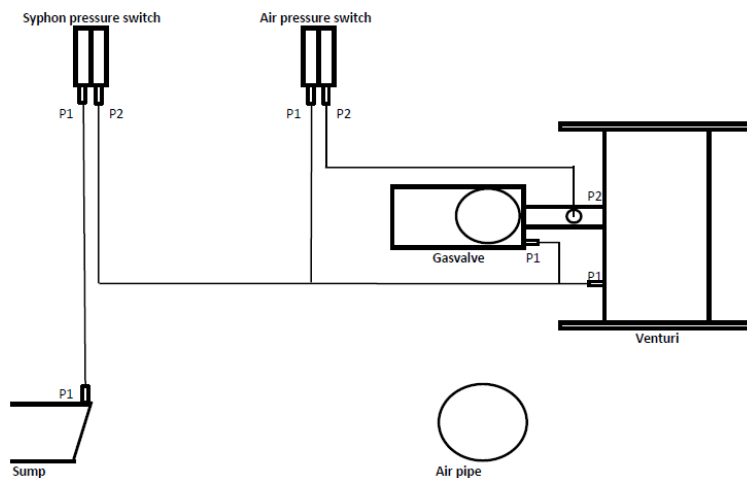
			COMPACT CONDENS			
			170	210	250	300
Input (PCI)	max	kW	168	210	252	290
	min	kW	33.6	42	50.4	58.8
Output at 100%	(80/60°C)	kW	163.6	204.5	245.4	282.5
Efficiency at 100%	(80/60°C)	%	97.4	97.4	97.4	97.4
	(50/30°C)	%	102.8	102.8	102.8	102.8
Efficiency at 30% load (EN677)		%	107.5	107.5	107.5	107.5
NOx (Class 5)	Weighted	mg/kWh	50	50	50	50
CO	Max. output	mg/kWh	40.8	41.8	39.7	37.5
CO ₂	Max. output	%CO ₂	9.3	9.3	9.3	9.3
	Min. output	%CO ₂	9.1	9.1	9.1	9.1
Max gas flow rate G20/G25	G20 (20 mbar)	m ³ /h	17.4	21.8	26.2	30.2
	G25 (25 mbar)	m ³ /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.

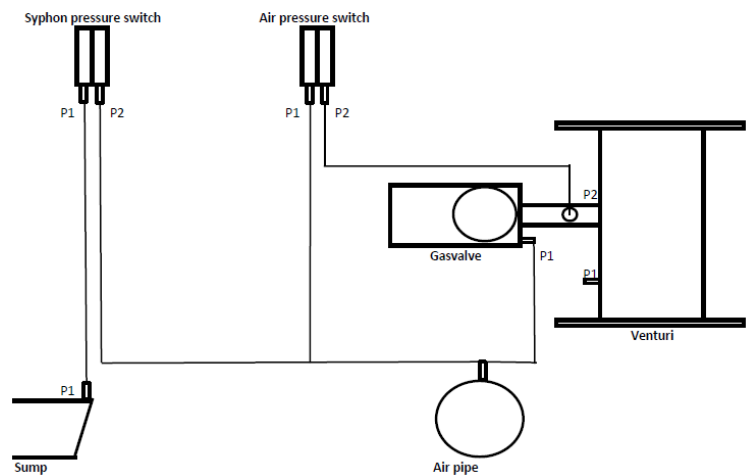
GAS CATEGORIES

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

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.

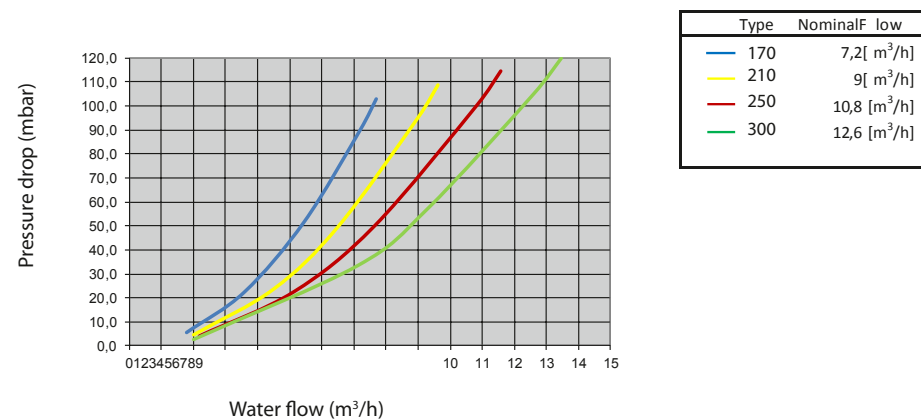
The air pressure switch, (P1 and P2), connected to the venturi, checks the amount of air (by means of a Δp measurement) before start.

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	m ³ /h	5,800	7,200	8,700	10,000

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 : $(11/\text{hardness in } ^\circ\text{D}) \times \text{value given above}$.
Example ; in case of water hardness of 15 °D : $(11/15) \times 20 = 14,7$ 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) and Sentinel (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(HCO ₃) 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

INSTALLATION

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.

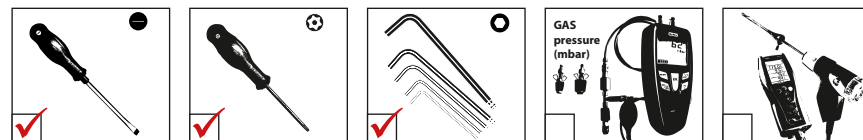
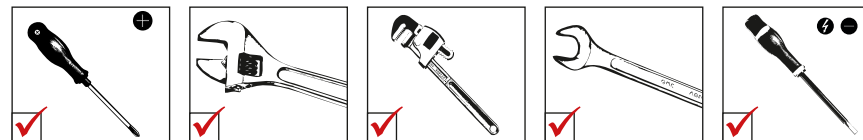


At product reception and after removal of packaging, check the package contents and that the appliance is free of damages.

Contents

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

TOOLS REQUIRED FOR THE INSTALLATION



BOILER PREPARATION

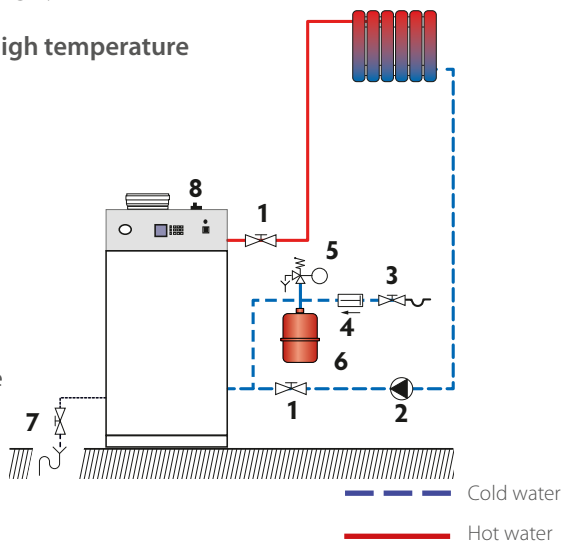
- Remove the sealing/protection caps from the connection tubes. Some dirty water might come out.
- Fill the condensate trap with water by pouring some water into the cast aluminium exhaust connection at the back.
- Make all the required electrical connections of accessories (pumps, thermostats, etc.). Refer to "Wiring Diagram and Electrical Connections" on page 26.

HEATING CONNECTION

Typical connection - high temperature

Description

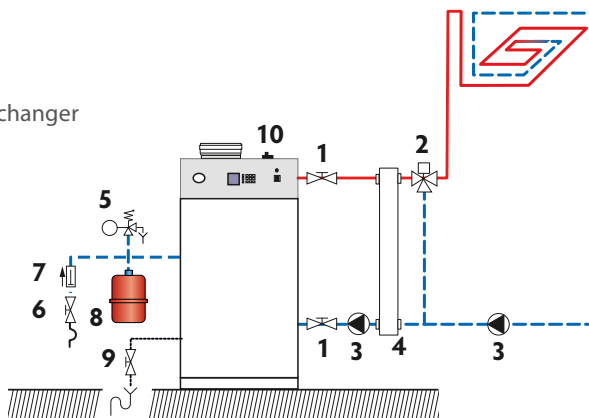
1. Isolating valve
2. Heating pump
3. Filling valve
4. Check valve
5. Safety valve
6. Expansion vessel
7. Drain valve
8. Auto air bleed valve



Typical connection - low temperature

Description

1. Isolating valve
2. 3-way mixing valve
3. Plate-to-plate heat exchanger
4. Heating pump
5. Safety valve
6. Filling valve
7. Check valve
8. Expansion vessel
9. Drain valve
10. 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

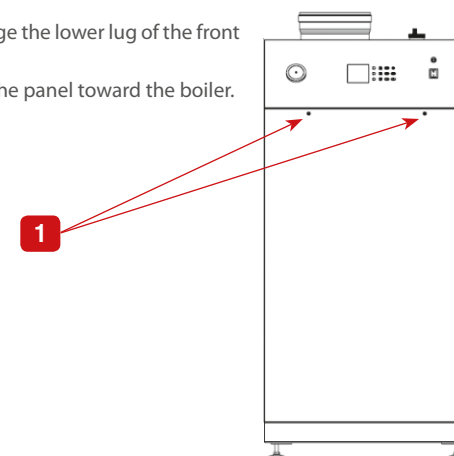
1. Place the panel in position.
2. Install and tighten the screws retained at removal in their front, top and back locations.
3. Install the top cover and tighten 3 attaching screws retained at removal.

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.

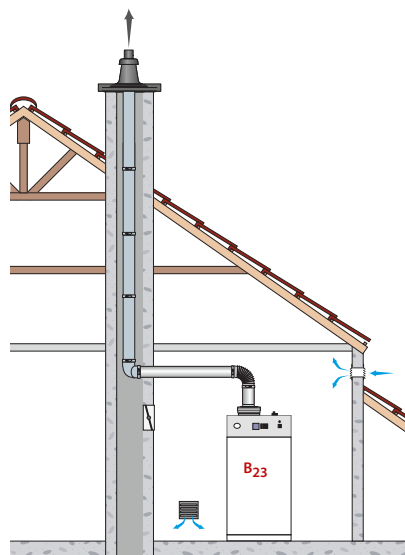
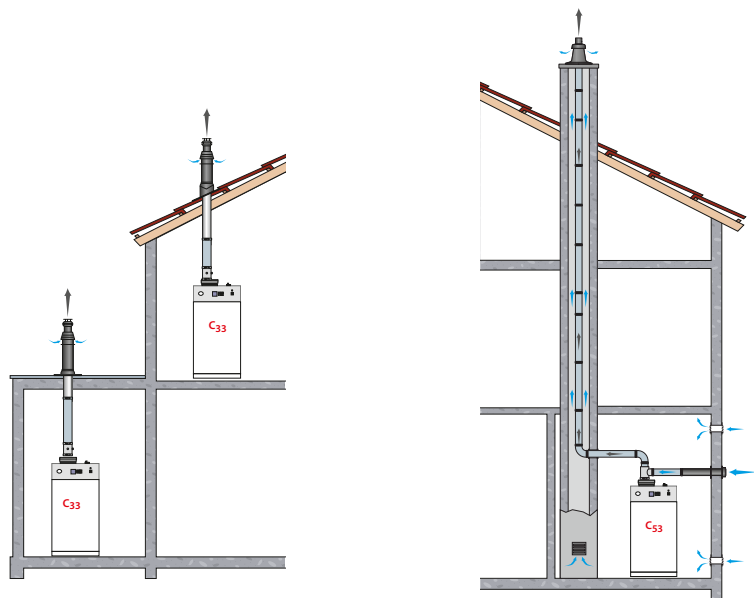
Follow-on tasks

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 Ø150/200
170	150 Pa**	83 m
210		53 m
250		36 m
300		26 m

* Without terminal, condensate trap and bend.

** Sum of flue + air pressure drop

Pressure drop (Pa) per component

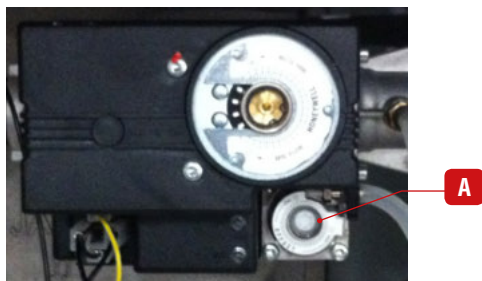
Component	Model	Pressure drop (Pa) per component							
		170		210		250		300	
		Flue	Air	Flue	Air	Flue	Air	Flue	Air
Straight pipe (1m)	Ø200 mm	0.4		0.7		1.0		1.4	
	Ø150 mm		1.4		2.1		3.1		4.2
Elbow (90°)	Ø200 mm	2.5		4.0		5.7		7.8	
	Ø150 mm		5.3		8.3		12.0		16.4
Elbow (45°)	Ø200 mm	1.7		2.6		3.7		5.1	
	Ø150 mm		2.3		3.5		5.1		6.9
C33 Terminal	Ø200 mm								
	Ø150 mm		11.7		18.3		26.3		35.8
B23 Terminal	Ø200 mm		4.7		7.4		10.6		14.5
	Ø150 mm								
C53 Terminal	Ø200 mm	7.4	16.4	7.4	25.7	10.6	37.0	14.5	50.3
	Ø150 mm								
Condensate trap Ø200 mm T + Bend 90°		5.0		8.0		11.4		15.4	
Expander 110/150mm			0.7		1.0		1.5		2.1

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 CO₂ 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 CO₂ 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 the integrated cascade function or using an external controller). Refer to "Integrated Cascade Functionality" on page 18. 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 to achieve 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 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 of an insufficient water flow through the boiler.

Flow and return temperatures can be read in the boiler information menu (in the DIAGNOSTICS menu, refer to "User's menu and parameter descriptions" on page 9 and "Installer's menu and parameter descriptions" on page 14).

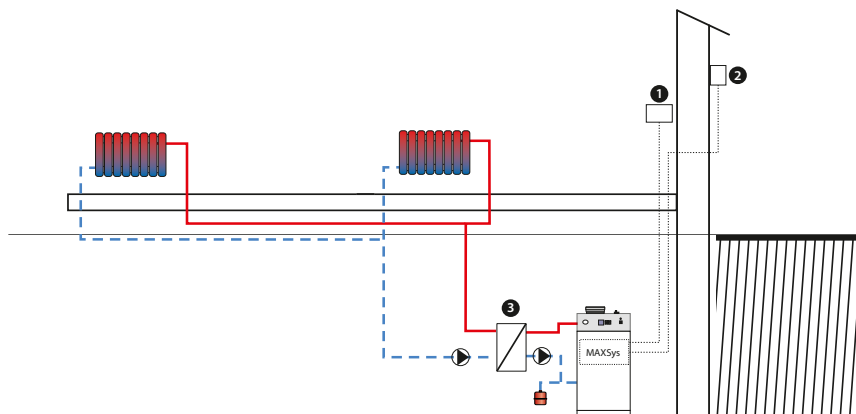
Valves, malfunctioning pumps, dirt, corrosion products from the system, dirty filters etc. can have a negative impact on water flow through the boiler.

Before ignition the boiler control checks ΔP 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.

Siphon 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 43 for more information and to "Maintenance" on page 39.

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, 12kΩ	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 26.

STARTING UP

SAFETY INSTRUCTIONS FOR STARTING UP



General remark

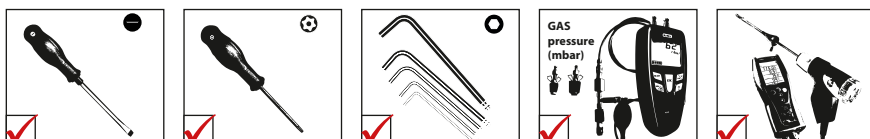
- In normal operation, the burner starts automatically as soon as the boiler temperature drops below the preset temperature.



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

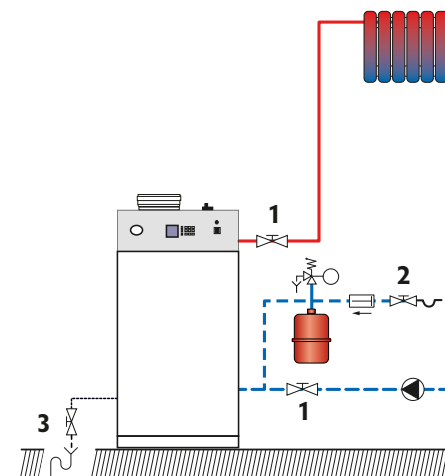
- External power supply isolated
- DHW circuit (if any) under pressure

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 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 38.
8. Set the central heating temperature to the required value using the control panel. Refer to "Installer's menu and parameter descriptions" on page 14.
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 to 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 CO₂ rate must be within the limits mentioned in the technical characteristics, (see "Combustion Characteristics" on page 28).

Set-up conditions

- Operating boiler

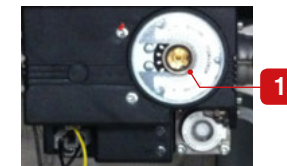
Procedure

1. Check if the MAXSYS parameters are set to meet the user's requirements (refer to "Installer's menu and parameter descriptions" on page 14), and change them if required.
2. Put the boiler to maximum power mode (refer to "Installer's menu and parameter descriptions" on page 14, 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 CO₂ values displayed with those indicated in the combustion characteristics table. Refer to "Combustion Characteristics" on page 28.
6. If the CO₂ value differs by more than +0.2% / -0.05 from the value mentioned in the "Combustion Characteristics" on page 28, carry out the adjustment as follows :
 - Turn the throttle to the right to lower the CO₂ percentage (a ½ turn (180°) gives a change of approximately 0,2 % CO₂)
7. Then put the boiler to the minimum power mode (Refer to "Installer's menu and parameter descriptions" on page 14).
8. Allow the boiler to stabilize for a few minutes.
9. Measure the CO₂ 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 48.

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

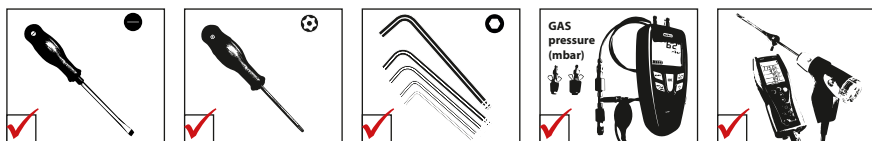
- Water flowing out of the drain valve may be extremely hot and could cause severe scalding.
- Check the tightness of the flue pipe connections.



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 ₂), see "Checking and Adjusting the Burner" on page 38.		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 40			X
9. Remove the burner and clean the exchanger, see "Removal, Check and Installation of the Burner" on page 41 and "Cleaning the Exchanger" on page 42.			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 recovery dish, open the side panel, refer to "Removal and Installation of the Front and Side Panels" on page 32.

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

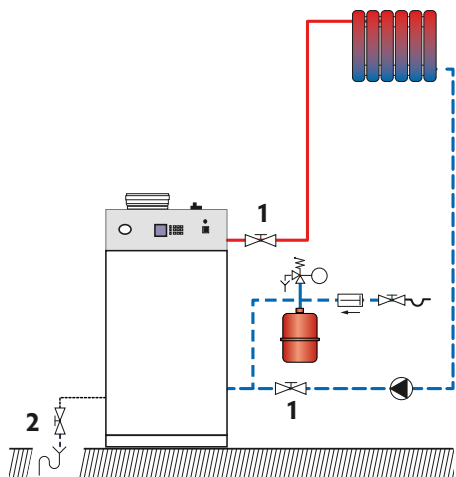
- Boiler switched off using the ON/OFF master switch
- DHW circuit (if any) isolated
- External power supply isolated
- Gas supply closed

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 and remove hose as required.

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 32.

Removal procedure

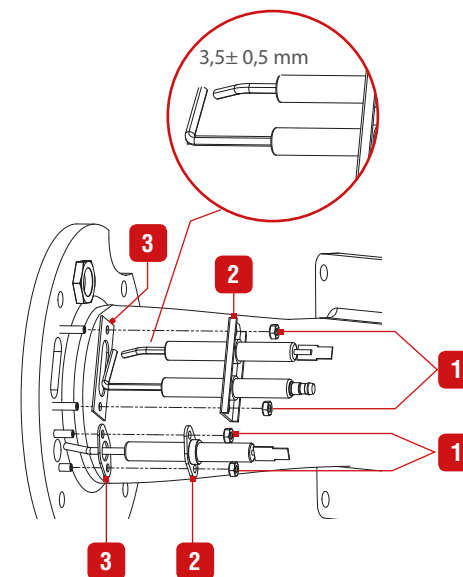
1. Disconnect all the cables from the electrodes.
2. Remove two mounting screws (1) and retain them for re-installation.
3. Remove the 2 electrodes (2) and their gasket (3).
4. Check the correct alignment of the electrode ends and that the gap corresponds to the value indicated on the figure below.
5. 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 32).

Removal procedure

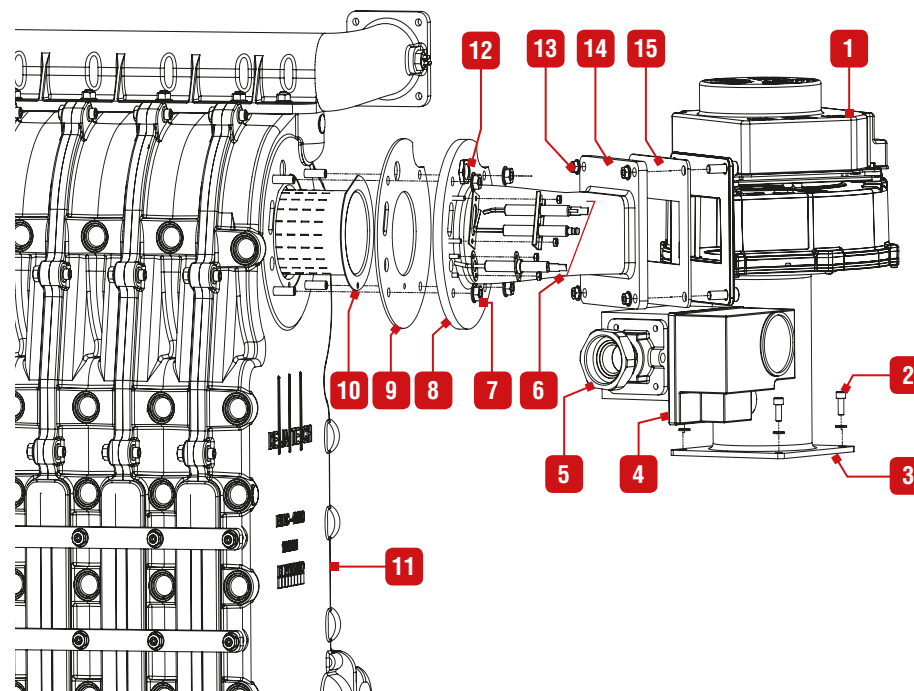
1. Disconnect all plugs and tubes from the fan assembly (1), the gas valve (4) and the electrodes (6), as required.
2. Release the gas connection (5).
3. Release 4 attaching bolts (13) from the fan assembly flange (14). Discard the gasket (15). Retain the bolts for re-installation.
4. Release 4 screws (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 42.
8. If not removed previously, remove, check and reinstall the electrodes, refer to "Removal, Check and Installation of the Burner Electrodes" on page 40.

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 41.
- Front and side panel(s) open, refer to "Removal and Installation of the Front and Side Panels" on page 32.

Procedure

1. Open the inspection sump cover, refer to "Models - Compact Condens 170- 210 - 250 - 300" on page 24 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 siphon with clean water.

Follow-on tasks

1. Reinstall the siphon.
2. Close all inspection covers.
3. Reinstall the burner according to procedure "Removal, Check and Installation of the Burner" on page 41.
4. Restart the boiler in accordance with procedure "Restarting after Maintenance" on page 42.

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 CO₂ adjustment in accordance with "Checking and Adjusting the Burner" on page 38.

Follow-on tasks

1. Close all opened panels, refer to "Removal and Installation of the Front and Side Panels" on page 32.
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
1. No data visible on the display	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
		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 26).
	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"> Through the Diagnostics menu/manual test, set the boiler to a fixed fan speed between minimum and maximum CH-fanspeed. 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 ($\Delta P > 40$ Pa), starting procedure will continue.
4. Error code shown on display		Refer to "Errors (hard and soft lockouts)" on page 44 and section "Locking Codes" on page 45.

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 14
	Faulty room thermostat	Check wiring connection, refer to "Wiring Diagram and Electrical Connections" on page 26 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 26 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 14.
	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 26.
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 14.
	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 41
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 26.
	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 14. A list of all the error codes and the solution(s) to the fault can be found in the section "Locking Codes" on page 45.

Codes	Description of the fault	Solution for the fault
E 01	Failed ignition: The burner failed to light after 3 ignition attempts.	<ol style="list-style-type: none"> 1. Check gas supply to boiler. 2. Check Ignition cable connection in control box. 3. Check electrode for defects, and distance between the pins. 4. Check gas valve and electrical connections to gas valve.
E 02	False flame: Flame detected prior to ignition.	<ol style="list-style-type: none"> 1. Check good electrical ground connection to unit. 2. Check electrode for pollution and deposition of dirt.
E 03	High Boiler temp. : The boiler temperature exceeds 105°C	<p>Correct condition which caused high temperature or limit to open.</p> <ol style="list-style-type: none"> 1. Check water flow in the system (radiator valves). 2. Check Pump and pump electrical connections.
E 04	APS failed zero position check : Air pressure switch closed at appliance start,	<ol style="list-style-type: none"> 1. Check the draft over the appliance Air intake and flue outlet when at rest. Switchpoints Airpressure switch: On at 0,4 mbar, Off at 0,25 mbar.
E 05	Blower speed: Blower speed not correct or speed signal is not received by MAXSYS.	<ol style="list-style-type: none"> 1. Check blower and wiring harness. 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). 3. Only exception when actual fan speed > 3000 rpm at max. PWM.
E 06	Air flow/Airpressure switch open during appliance run : APS opened more then 5 times during heat demand.	<ol style="list-style-type: none"> 1. Check the Air inlet / flue outlet for any obstructions. 2. Check if the flue system is sensitive to backdraft / Wind.
E 07	High Flue temp.: Flue temperature exceeds high limit.	<ol style="list-style-type: none"> 1. Heat exchanger may require cleaning. 2. Boiler will automatically reset once flue temperature returns to normal range.
E 08	Flame Circuit Error: Flame circuit test failed	<ol style="list-style-type: none"> 1. Turn boiler off. 2. Check and clean the electrode. 3. Check ignition and grounding cables are firmly connected.
E 09	Gas valve circuit error: Gas valve circuit test failed.	<ol style="list-style-type: none"> 1. Check the gas valve and wiring harness. 2. If the problem persists replace the "MAXSYS" circuit board.
E 12	Internal Control Fault: EEPROM misconfiguration	<ol style="list-style-type: none"> 1. Turn unit off and on to resume normal operation. 2. If the problem persists replace the "MAXSYS" circuit board.
E 13	Reset limit reached: Resets are limited to 5 every 15 minutes.	<ol style="list-style-type: none"> 1. Turn unit off and on to resume normal operation. 2. If the problem persists replace the "MAXSYS" circuit board.
E 15	Sensor Drift: Supply or return sensor reading has drifted.	Check supply and return temperature sensors and wiring harness.
E 16	Supply Sensor Stuck: Supply sensor reading is not changing.	<ol style="list-style-type: none"> 1. Check supply temperature sensor and wiring harness for shortcuts or other defects. 2. Check waterflow and the temperature balance in the system, because CH supply temperature does not change.
E 17	Return Sensor Stuck: Return sensor reading is not changing.	<ol style="list-style-type: none"> 1. Check return temperature sensor and its position, check wiring harness for shortcuts or other defects. 2. Check waterflow and the temperature balance in the system, because CH return temperature does not change. 3. Failure may happen at low output capacity when supplying from a big tank !
E 18	Sensor Failure: Supply or return sensor reading changed very rapidly.	Check supply and return temperature sensors and wiring harness.
E 21	Internal Control Fault: A / D conversion error.	Turn unit off and on then press OK to resume normal operation.
E 25	Internal Control Fault: CRC check error.	Turn unit off and on to resume normal operation.

Codes	Description of the fault	Solution for the fault
E 30	Supply Sensor Shorted: A short circuit has been detected in the boiler supply temperature sensor circuit	<ol style="list-style-type: none"> 1. Check supply temperature sensor and wiring harness for a short circuit. 2. If necessary replace the sensor, or the wire harness. 3. After fixing the problem, reset the appliance and resume normal operation.
E 31	Supply Sensor Open: An open circuit has been detected in the boiler supply temperature sensor circuit	<ol style="list-style-type: none"> 1. Check supply temperature sensor, connectors and wiring harness for an open circuit. 2. If necessary replace the sensor, or the wire harness. 3. After fixing the problem reset the appliance and resume normal operation.
E 32	DHW Sensor Shorted: A short circuit has been detected in the DHW temperature sensor circuit	<ol style="list-style-type: none"> 1. Check DHW temperature sensor and wiring harness for a short circuit. 2. If necessary replace the sensor, or the wire harness. 3. After fixing the problem reset the appliance and resume normal operation.
E 33	DHW Sensor Open: An open circuit has been detected in the DHW temperature sensor circuit	<ol style="list-style-type: none"> 1. Check DHW temperature sensor, connectors and wiring harness for an open circuit. 2. If necessary replace the sensor, or the wire harness. 3. After fixing the problem reset the appliance and resume normal operation.
E 34	Low Voltage: Line voltage has fallen below an acceptable operating level.	The boiler will automatically reset once line voltage returns to normal.
E 37	Low Water: Water level has fallen below 0.7 bar.	<ol style="list-style-type: none"> 1. Increase pressure to normal range. 2. The boiler will automatically reset once water level returns to normal.
E 43	Return Sensor Shorted: A short circuit has been detected in the boiler return temperature sensor circuit.	<ol style="list-style-type: none"> 1. Check return temperature sensor and wiring harness for a short circuit. 2. If necessary replace the sensor, or the wire harness. 3. After fixing the problem, reset the appliance and resume normal operation.
E 44	Return Sensor Open: An open circuit has been detected in the boiler return temperature sensor circuit.	<ol style="list-style-type: none"> 1. Check return temperature sensor, connectors and wiring harness for an open circuit. 2. If necessary replace the sensor, or the wire harness. 3. After fixing the problem, reset the appliance and resume normal operation.
E 45	Flue Sensor Shorted: A short circuit has been detected in the boiler flue temperature sensor circuit	<ol style="list-style-type: none"> 1. Check flue temperature sensor and wiring harness for a short circuit. 2. If necessary replace the sensor, or the wire harness. 3. After fixing the problem reset the appliance and resume normal operation.
E 46	Flue Sensor Open: An open circuit has been detected in the boiler flue temperature sensor circuit.	<ol style="list-style-type: none"> 1. Check flue temperature sensor, connectors and wiring harness for an open circuit. 2. If necessary replace the sensor, or the wire harness. 3. After fixing the problem reset the appliance and resume normal operation.
E 47	Water pressure sensor error: Water pressure sensor is disconnected or broken	<ol style="list-style-type: none"> 1. Check water pressure sensor, connectors and wiring harness. 2. If necessary replace the sensor, or the wire harness. 3. After fixing the problem reset the appliance and resume normal operation.
E 76	External Limit Open: An external automatic reset boiler limit has opened.	<ol style="list-style-type: none"> 1. Correct condition which caused limit to open. 2. Boiler will automatically reset once external limit closes
E 77	Siphon error : Siphon switch open	Check the air intake and the flue outlet for any obstructions. The pressure over the appliance is too high. Delta P < 8,3 mbar

Codes	Description of the fault	Solution for the fault
E 80	Return > Supply: Return temperature is higher than supply temperature.	Confirm water flows in boiler return and out boiler supply.
E 81	Sensor Drift: Supply and return temperatures are not equal.	<ol style="list-style-type: none"> 1. Check water is flowing through boiler. 2. Wait a few minutes for the water to equalise the temperature, the boiler will automatically reset once temperatures become equal. 3. If boiler doesn't reset, check the NTC's and check the wire harness, replace if necessary.
E 87	Overtemp lockout: An external boiler limit has opened.	<ol style="list-style-type: none"> 1. Correct condition which caused limit to open, then reset boiler. 2. The boiler needs to be reset once external limit closes.
E 89	Incorrect Setting: A parameter setting is outside the settings range.	<ol style="list-style-type: none"> 1. Check that the controller and display types are correct. 2. Review CH & DHW settings and OTC setting and correct as necessary. 3. The boiler will automatically reset once corrected.
E 90	Firmware Mismatch: Control module and display firmware versions are incompatible.	One or several components are not compatible with the system. Replace mismatched component(s).
E 91	Cascade Sensor Shorted: A short circuit has been detected in the system temperature sensor circuit	<ol style="list-style-type: none"> 1. Check the Cascade temperature sensor is correctly wired (Terminal strip C2, pins 15 and 16) and the absence of short circuit. 2. If necessary replace the sensor, or the wire harness. 3. After fixing the problem reset the appliance and resume normal operation.
E 92	Cascade Sensor Open: An open circuit has been detected in the system temperature sensor circuit.	<ol style="list-style-type: none"> 1. Check the Cascade temperature sensor is correctly wired (Terminal strip C2, pins 15 and 16) and the absence of an open circuit. 2. If necessary replace the sensor, or the wire harness. 3. After fixing the problem reset the appliance and resume normal operation.
E 93	Outdoor Sensor Shorted: A short circuit has been detected in the outdoor temperature sensor circuit.	<ol style="list-style-type: none"> 1. Check outdoor temperature sensor and wiring for a short circuit. 2. If necessary replace the sensor, or the wire harness. 3. After fixing the problem reset the appliance and resume normal operation.
E 94	Internal Display Fault: Display memory error	Turn unit off and on to resume normal operation.
E 95	Cascade CH Supply Sensor Error: Supply sensor reading is invalid	<ol style="list-style-type: none"> 1. Check wiring between display and control module. 2. If necessary replace the sensor, or the wire harness. 3. After fixing the problem reset the appliance and resume normal operation.
E 96	Outdoor Sensor Open: An open circuit has been detected in the outdoor temperature sensor circuit.	<ol style="list-style-type: none"> 1. Check outdoor temperature sensor and wiring for an open circuit. 2. If necessary replace the sensor, or the wire harness. 3. After fixing the problem reset the appliance and resume normal operation.
E 97	Cascade Mismatch: Cascade configuration has changed.	<ol style="list-style-type: none"> 1. Run autodetection if change was intentional, or else check wiring between boilers. 2. Boiler will automatically reset once repaired.
E 98	Cascade Bus Error: Communication with other boilers has been lost.	<ol style="list-style-type: none"> 1. Check wiring between boilers. 2. Boiler will automatically reset once repaired.
E 99	Controller Bus Error: Communication between boiler display and control module has been lost.	<ol style="list-style-type: none"> 1. Check wiring between components. 2. Boiler will automatically reset once repaired.



DECLARATION OF CONFORMITY - CE

1/1

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

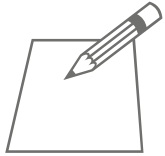
We declare under our sole responsibility that the product **Compact Condens** complies with the following standards:

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



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