ALARKO

ALDENS F

CONDENSING BOILER

ASSEMBLY AND USER MANUAL



ENGLISH

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1. GENERAL INFORMATION

First of all, thank you for choosing ALARKO. This manual is intended for the 175-200-235-265-310-350-425 model floor type condensing, gas-burning devices that form the ALARKO branded Aldens F boiler product range. Keep this manual for reference when necessary and keep it handy. Our authorized dealers will provide you with the necessary information regarding the use and maintenance of the device after the boiler installation and connections are made and commissioned by the authorized service. You can ask again about the issues that are not clear. Our specialists will be glad to answer your questions. In order to operate your device safely with high efficiency and economy, and to use it smoothly and for a long time, please carefully review this manual and carefully follow the specified safety rules and warnings.

1.1. Safety Instructions and Recommendations

General Warnings

The warnings in this section are intended for the device user, installer and service representative. Since it contains information about the start-up and operating limits of the device, it is necessary to read and understand the user manual carefully.

Aldens F floor type condensing boilers are only suitable for operation with natural gas.

The device must be installed by professional qualified personnel according to applicable laws and standards and in accordance with the manufacturer's instructions.

"Professional qualified personnel" refers to experts who have technical knowledge about the installation and maintenance of central heating and domestic hot water production systems for domestic and industrial use. The device should only be used for the purpose of producing hot water in pressurized heating systems. Any other use will be considered inappropriate and hazardous. The manufacturer assumes no responsibility for any damage, loss, or injury to persons, animals, or property caused by errors in the installation and/or use of the device or failure to comply with existing local and national standards and/or manufacturer's instructions.

The assembly and operating manual are an integral part of the product and must always be kept close to the device.

This manual must be kept in a safe place and kept handy for reference when necessary. If the appliance is sold or transferred to someone else, this manual should also be provided with the appliance to be read by the new user and/or installer.

After unpacking, check the appliance for damage. In case of any doubt, do not use the product and consult your dealer. Packaging materials (cardboard box, staples, nylon bag, polyester, etc.) should be kept away from children. Since these materials pose a potential hazard, they must be disposed of reliably.

Before any cleaning or maintenance, disconnect the appliance from the mains voltage by switching off the mains switch and/or other disconnecting switches.

Do not block air inlet or flue gas outlet grilles in any way.

Do not block the air inlet or flue gas outlet terminals.

In the event of a fault and/or malfunction exist in the appliance, switch off the system. Do not attempt any intervention or repair. Only call a professionally qualified, authorized technical service.

All warranty repairs of the appliance shall only be carried out by services authorized by the manufacturer, using original spare parts. Failure to comply with the above requirements may endanger the safety of the device and override the warranty. In order to guarantee efficiency and correct operation, the appliance must be maintained regularly and in accordance with the manufacturer's instructions by the authorized service.

Only original accessories or optional parts (including electrical parts) should be used with the appliance.

As ruled by the applicable law, the installation of this device should only be carried out by authorized personnel. Before the start-up of boiler, make sure that it is connected to a suitable water supply and heating system that meets its performance specifications.

The room must be ventilated by means of an air inlet protected by a grille. Make sure that the grill does not obstruct the air passage.

Also check the data on the packaging and if the device is suitable for the type of gas to be burned.

Make sure that the pipes and fittings used in the gas system are tightened firmly and there is no gas leakage.

Before operation, the heating pipes must be flushed to remove deposits and debris that may endanger the operation of the appliance.

The appliance is considered electrically safe as long as it is connected to an effective earthing system installed in accordance with current safety standards. This basic safety measure must be checked and verified. In case of doubt, the electrical system must be checked by an expert electrician. The manufacturer shall not be held responsible for any damage or loss of property or life caused by an ineffective grounding system or the absence of a grounding system.

Ensure that the electrical supply at the location where the appliance will be assembled is controlled by an expert electrician to ensure that the appliance will support the maximum power absorption shown in the assembly and operating manual. In particular, make sure that the cable dimensions are suitable for the power drawn by the appliance.

Do not use adapters, multiple plugs, or extension cables to connect the appliance to mains power.

The device must be connected to the mains supply using a suitable electrical fuse according to the current electrical regulations.

The following basic rules must be observed when using electrical appliances:

- Do not touch the appliance with wet or damp parts of your body or barefoot. Do not pull the electrical cables.
- Do not expose the device to atmospheric conditions (rain, sunlight, etc.).
- Do not allow children or people who are not familiar with the usage of the device to use the device.
- The power cord must not be replaced by the user.
- If the cable is damaged in any way, turn off the appliance and have the cable replaced by an authorized service.

Keep this installation manual carefully and read it thoroughly.

Warranty

The appliance is under warranty only if it is assembled by authorized persons in accordance with the Operation and Assembly manual and commissioned by Alarko Carrier authorized services.

General Information

Natural gas is an environment-friendly fuel. Therefore, your natural gas condensing appliances are a high-value product and are equipped with the most recent safety measures.

The maintenance period of your appliance is 1 year. Have your boiler serviced by your Alarko Carrier authorized services on a regular basis every year.

1.2. Product Declaration of Conformity

Alarko Carrier declares that all its products are produced of high quality and comply with the relevant standards.

Alarko condensing boilers comply with the following regulations and relevant standards:

2016/426/EU – REGULATION ON GAS BURNING APPLIANCES

2014/30/EC – ELECTROMAGNETIC COMPATIBILITY DIRECTIVE

2014/35/EC – LOW VOLTAGE DIRECTIVE

2006/42/EC – MACHINERY SAFETY DIRECTIVE

2010/30/EU – ENERGY LABELING REGULATION COVERING BOILERS AND COMBI BOILERS

2009/125/EC – ECODESIGN REGULATION FOR BOILERS AND COMBI BOILERS

Standards:

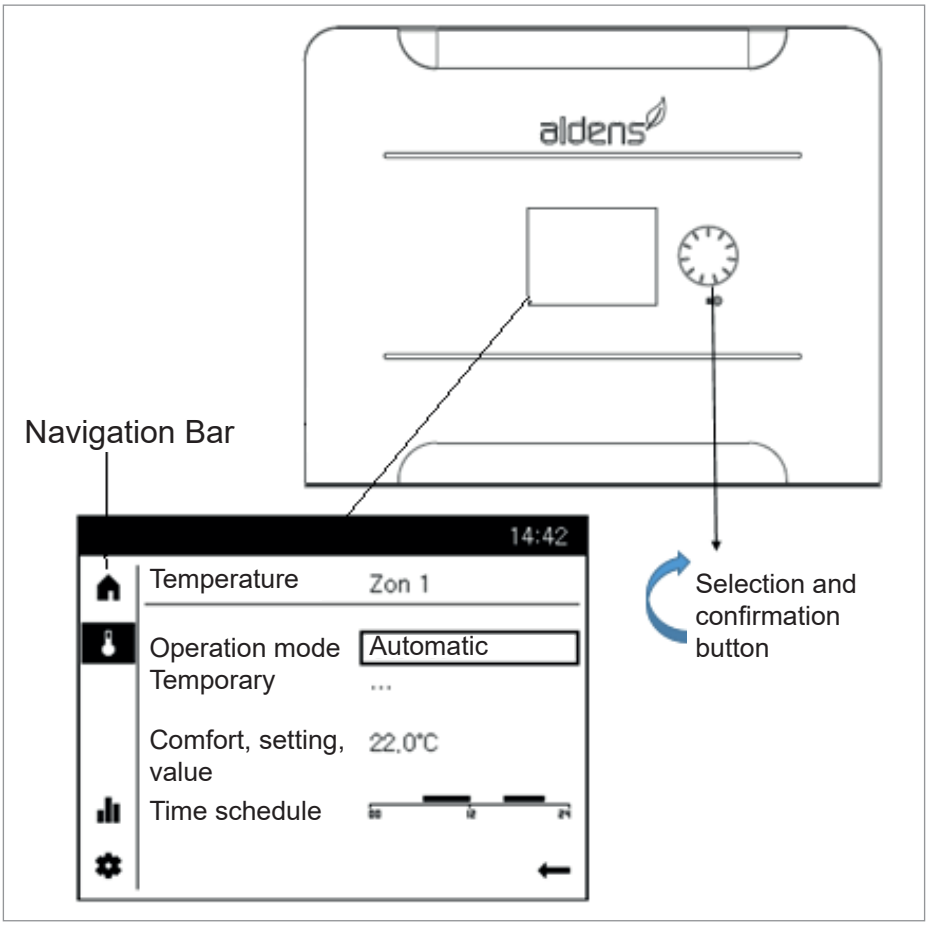
EN 15502-1:2012+A1:2015 – Gas burning central heating boilers – Part 1 EN 15502-2-1:2013 – Gas burning central heating boilers – Part 2

EN 15502-2-2: Gas-burning central heating boilers – Part 2-2: Standards for B1 devices

If the appliance is used in accordance with the instructions for use, its economic life is 10 years.

2. IDENTIFICATION/DESCRIPTION OF THE PRODUCT

2.1. Technical Specifications



Meaning of Symbols

Accessible by end user and experts:	
	Home page: The status of facility. Access to the facility key (or area key).
	Temperature page. Heating access.
	Information pages: ● Messages (errors, events) ● Facility information ● Time-axis energy data and consumption
	Service/settings page: ● Setting options in the device or facility ● special mode operation (e.g. for maintenance operation) ● Introduction to expert level
In addition for experts:	
	Diagnostic pages: Analysis and testing of the facility.
	Adjustment and repair: ● Adaptation of parameters in the “All parameters list” ● Access to commissioning wizards.

Panel light		Appearance	Description
Off		**-**	**Boiler pending**
Blue		**Continuous**	**Burner activated**
Red		**Flashing**	**Boiler failure**
Purple		**Temporary and continuous**	**This is seen when the boiler is first powered for a short time and during the loading of the parameters.**

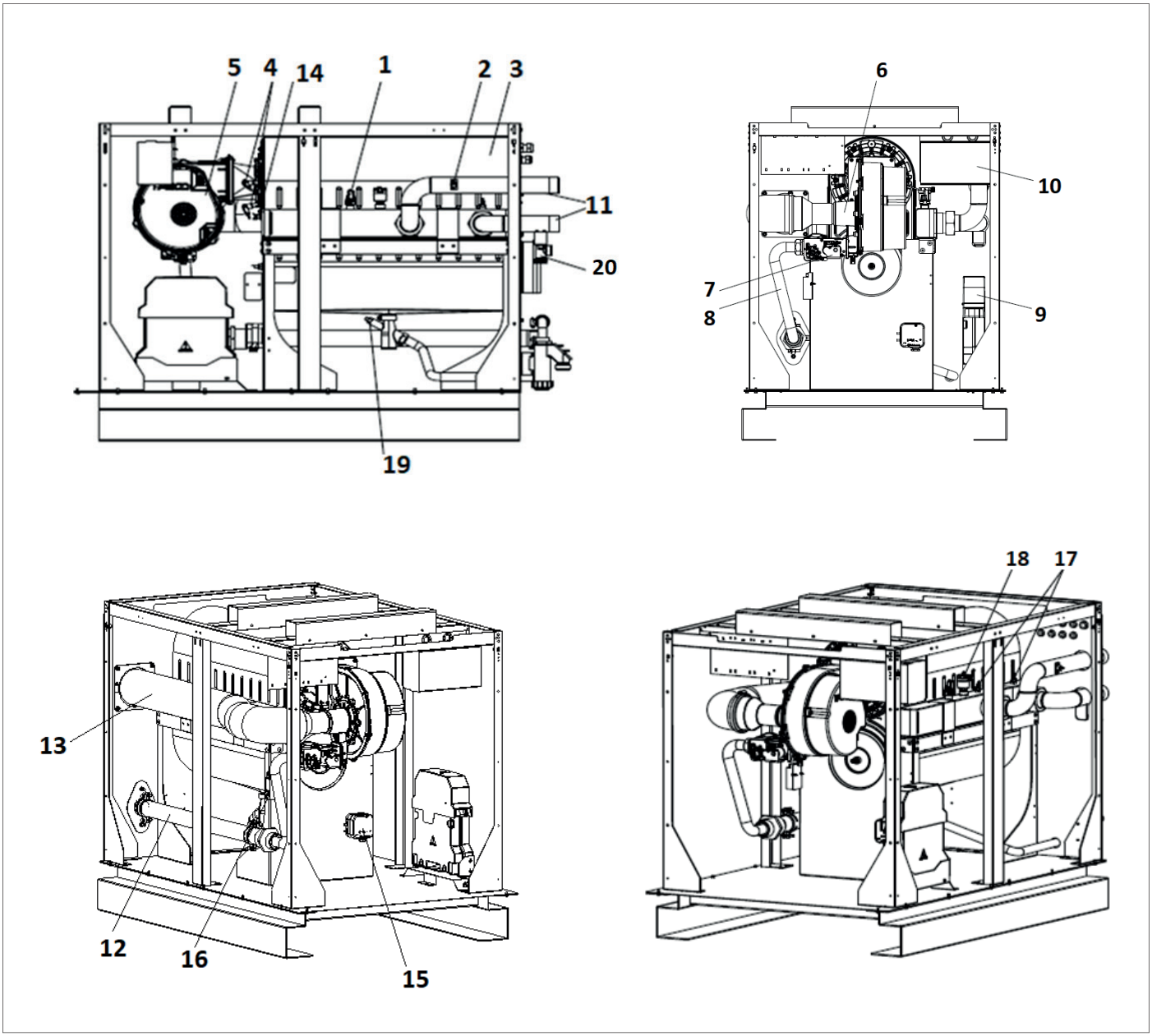
2.2. Control Panel and Indicators

FEATURE	Unit	Aldens F-175	Aldens F-200	Aldens F-235	Aldens F-265	Aldens F-310	Aldens F-350	Aldens F-425
Fuel	-	**Natural Gas (G20)**						
Inlet Pressure	mbar	20						
Fuel consumption at maximum load (50/30°C)	m^3/h	16,1	19	21,4	23,51	27,57	31,63	38,7
Fuel consumption at minimum load (50/30°C)	m^3/h	2,9	2,83	3,52	4,01	4,61	4,96	7,04
Technical Parameters ErP Directive								
P_{rated}	kW	161	182	212	238	281	317	394
P_n – Rated Thermal Power (50/30 °C)	kW	175	196,1	228,9	254,7	306,7	346	425
P_4 – Thermal Power @ Max Power (80/60 °C)	kW	161	181,9	212,1	238,2	281,3	317,1	394
P_1 – Thermal Power @ Partial load	kW	31,8	64,6	69,22	77,53	90,68	98,97	77
η_4 – Useful Efficiency @ Max load (80/60 °C)	%	87,01	86,96	86,77	87,4	86,49	86,51	87,86
η_1 – Useful Efficiency @ Partial load (50/30°C)	%	97,5	96,72	96,44	93,7	95,36	98,97	97,17
NOx Class	-	6						
Rated heat load Max/min	kW	167,0/29,0	189,0/30,0	220,0 /37,0	245,0/40,0	293,0/47,0	330,0/55,0	405,0/71,0
Max/Min Power (50/30°C)	kW	175,0/31,2	196,1/31,9	228,9/39,4	254,7/42,4	306,7/49,0	346 /58,2	425,0/76,4
Max/Min Power (80/60 °C)	kW	161,00/27,9	181,90/28,9	212,10/34,9	238,20/38,1	281,30/44,6	317,10/51,8	394,00/68,8
NOx Class	mg/ kWh	32	54,9	53,73	45,52	52	55,6	44
Electrical Supply (Voltage/Frequency	VAC/Hz	230 / 50						
Fuse to be Used	A	6,3						
Electricity Consumption in Standby (Off) State	W	4						
Max/Min Electricity Consumption	W	252/50	223/44	290/62	389/67	445/81	546/84	741/69
IP	-	4						
Installation								
Gas Connection	inch	1 ½ ''	1 ½''	1 ½''	1 ½''	2''	2''	2''
Water Outlet/Return Connections	inch	1 ½ ''	1 ½''	1 ½''	1 ½''	2 ½''	2 ½''	2 ½''
Maximum Operating Pressure	bar	6						
Minimum Operating Pressure	bar	1						
Max water flow rate	m3/h	7,2	8,1	9,4	10,5	12,6	14,2	17,4
Boiler water volume	lt	14,5	17	17	19,5	41,5	41,5	48,9
Max operating temperature	°C	85						
General Specifications								
Net Device Dimensions (WidthxDepthxHeight)	mm	793x1247x1002	793x1247x1002	793x1247x1002	793x1355x1002	816x1182x1265	816x1182x1265	816x1306x1265
Packaging Dimensions (WidthxDepthxHeight)	mm	970x1545x1000	970x1545x1000	970x1545x1000	970x1645x1000	970x1545x1000	970x1545x1000	970x1645x1000
Device Weight	kg	211,5	225,5	232	242,5	385	385	423
Weight with Package	kg	241	255	261,5	278,5	425,5	425,5	463,5
Flue pipe diameter	mm	150	150	150	150	200	200	200
Type	-	Hermetic/full condensing						
Ignition system	-	Electronic						
Floor Heating	-	YES						
Cascade Operation	-	Maximum 16						
Freeze Protection	-	YES						

FEATURE	Unit	Aldens F-500	Aldens F-575	Aldens F-700	Aldens F-850	Aldens F-1000	Aldens F-1150
Fuel	-	Natural Gas (G20)					
Inlet Pressure	mbar	20					
Fuel consumption at maximum load (50/30°C)	m^3/h	50,3	56,7	65,6	84,7	87,11	98,8
Fuel consumption at minimum load (50/30°C)	m^3/h	8,57	9,47	11,35	14,4	17,2	17,8
Technical Parameters ErP Directive							
P_{rated}	kW	454	529	640	762	909	1045
P_n – Rated Thermal Power (50/30 °C)	kW	496,4	575	700	850	1000	1150
P_4 – Thermal Power @ Max Power (80/60 °C)	kW	454	528,5	640	761,6	908,6	1044,6
P_1 – Thermal Power @ Partial load	kW	147,4	173,4	210,4	148,6	172	196
η_4 – Useful Efficiency @ Max load (80/60 °C)	%	86,1	86,7	87,6	86,6	87,8	87,7
η_1 – Useful Efficiency @ Partial load (50/30°C)	%	94,14	95,3	97,09	95,1	97,3	97
NOx Class	-	6					
Rated heat load Max/min	kW	476/83	550/90	660/116	800 / 140	934 / 170	1075 /195
Max/Min Power (50/30°C)	kW	496,4/86,3	575/94	700/147	850 / 148,6	1000,7 / 180,9	1150,6/209,4
Max/Min Power (80/60 °C)	kW	454/77,1	528,5/85	640/112	761,6 / 134,4	908,6 / 166,2	1044,6/188,8
NOx Class	mg/ kWh	38,2	45,4	39	33	34	36
Electrical Supply (Voltage/Frequency	VAC/Hz	230/50			400 / 50		
Fuse to be Used	A	6,3					
Electricity Consumption in Standby (Off) State	W	4			6		
Max/Min Electricity Consumption	W	901/98	966/85	1183/61	1315/ 59	1873/ 60	2065 / 71
IP	-	4					
Installation							
Gas Connection	inch	2''	2''	2''	2''	2''	2''
Water Outlet/Return Connections	inch	2 ½''	2 ½''	2 ½''	2 ½ ''	4''	4''
Maximum Operating Pressure	bar	6					
Minimum Operating Pressure	bar	1					
Max water flow rate	m3/h	21,8	24,3	28,7	34	39	44
Boiler water volume	lt	48,9	61,5	61,5	74,8	130,9	130,9
Max operating temperature	°C	85					
General Specifications							
Net Device Dimensions (WidthxDepthxHeight)	mm	816x1306x1265	816x1690x1360	816x1690x1360	1250x2200x1650	1250x2200x1750	1250x2200x1750
Packaging Dimensions (WidthxDepthxHeight)	mm	970x1645x1000	970x1910x1400	970x1910x1400	1320x2300x1800	1320x2300x1900	1320x2300x1900
Device Weight	kg	423	500	500	680	830	830
Weight with Package	kg	463,5	549	549	800	950	950
Flue pipe diameter	mm	200	250	250	250	300	300
Type	-	Hermetic/full condensing					
Ignition system	-	Electronic					
Floor Heating	-	YES					
Cascade Operation	-	Maximum 16					
Freeze Protection	-	YES					

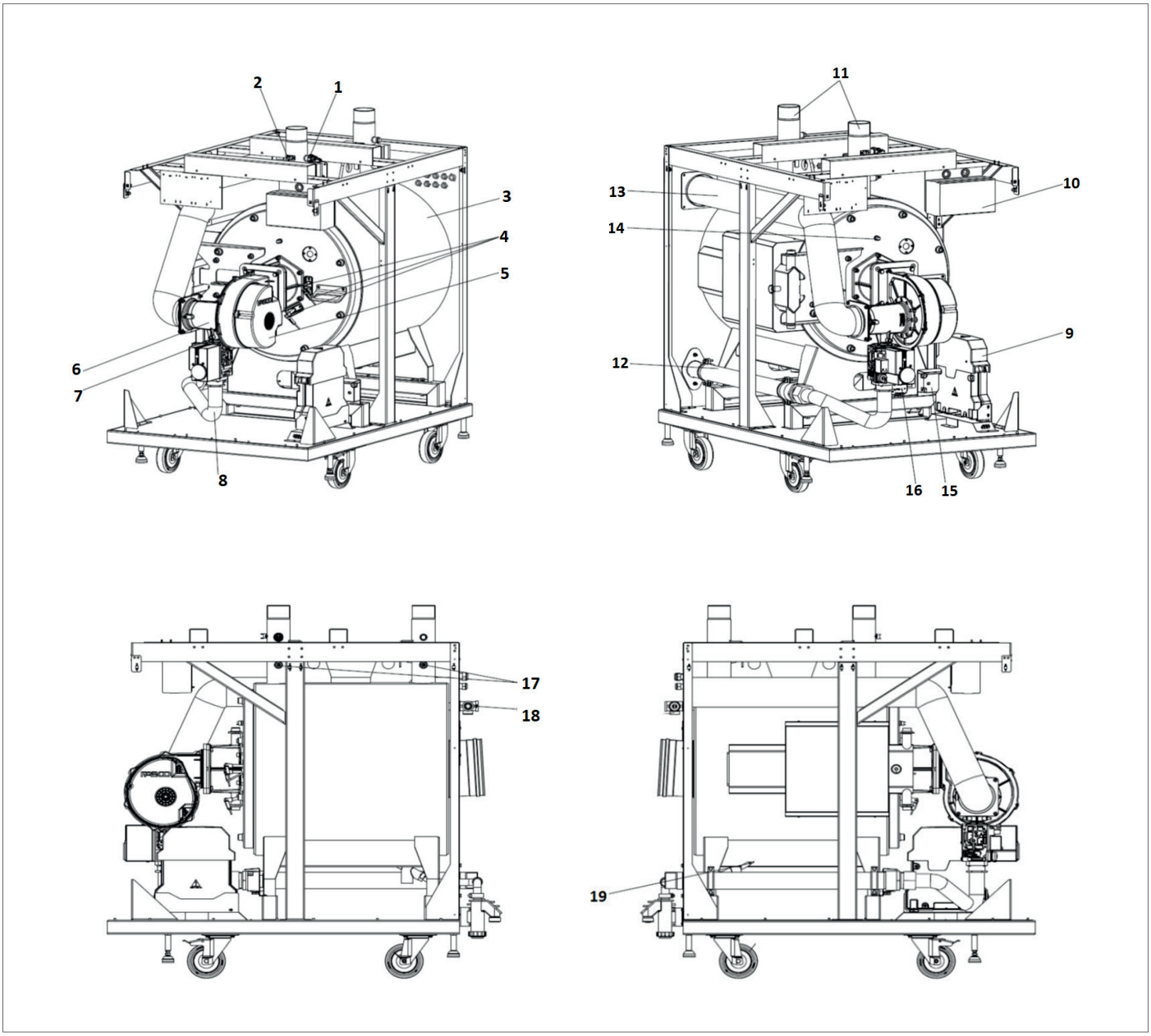
2.3. Overview and Sub- Components

Aldens F-175, F-200, F-235, F-265



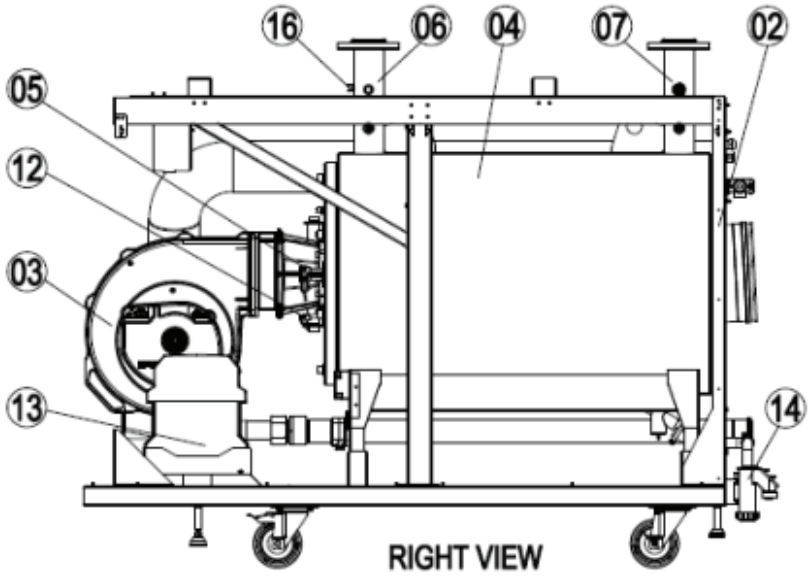
No	PART	No	PART
1	PRESSURE SENSOR	11	WATER INLET/OUTLET PIPE
2	LIMIT THERMOSTAT	12	GAS PIPE
3	EXCHANGER	13	CLEAN AIR CONNECTION
4	IGNITION/IONIZATION ELECTRODE	14	LIMIT THERMOSTAT
5	FAN	15	PRESSURESTAT
6	VENTURI	16	IGNITION TRANSFORMER
7	GAS VALVE	17	TEMPERATURE SENSOR
8	GAS CONNECTION	18	AIR PURGER
9	CONTROL CARD	19	SIPHON SENSOR
10	ELECTRICAL BOX	20	6 BAR SAFETY VALVE

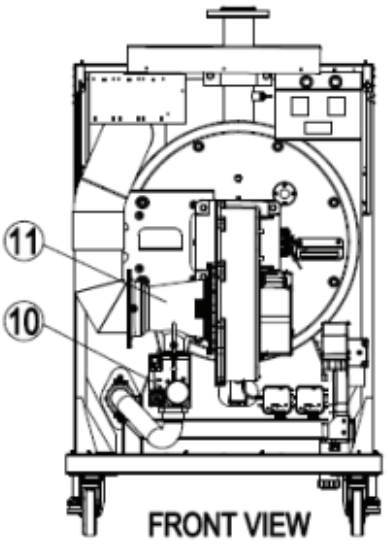
Aldens F-310, F-350, F-425

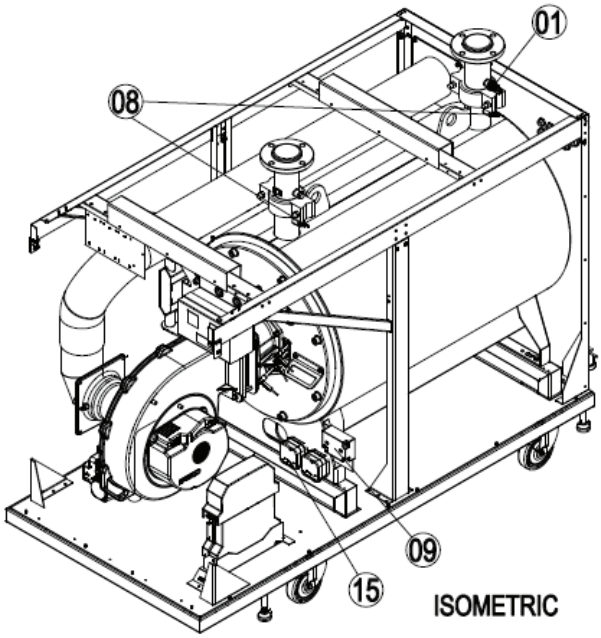


No	PART	No	PART
1	PRESSURE SENSOR	11	INLET/OUTLET PIPE
2	LIMIT THERMOSTAT	12	GAS PIPE
3	EXCHANGER	13	CLEAN AIR CONNECTION
4	IGNITION/IONIZATION ELECTRODE	14	LIMIT THERMOSTAT
5	FAN	15	IGNITION TRANSFORMER
6	VENTURI	16	PRESSURESTAT
7	GAS VALVE	17	TEMPERATURE SENSOR
8	GAS CONNECTION	18	6 BAR SAFETY VALVE
9	CONTROL CARD	19	SIPHON SENSOR
10	ELECTRICAL PANEL		

Aldens F-500, F-575, F-700

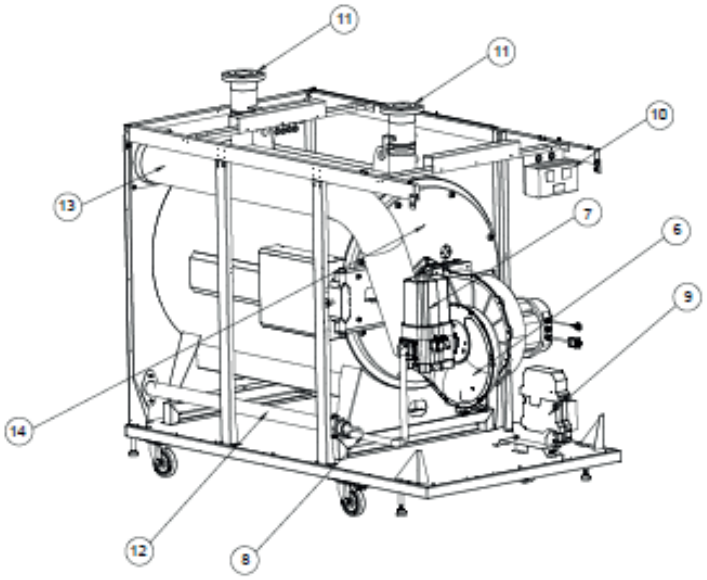


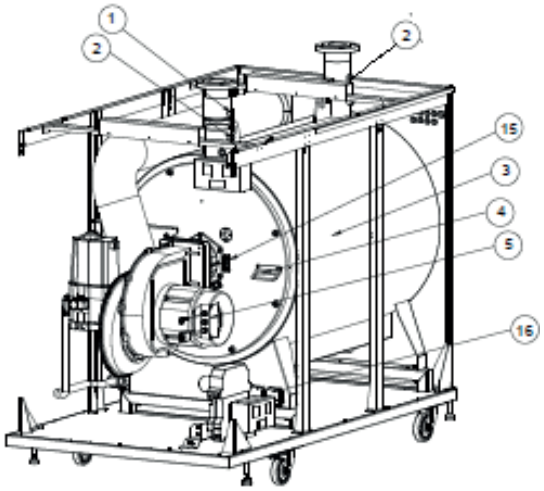


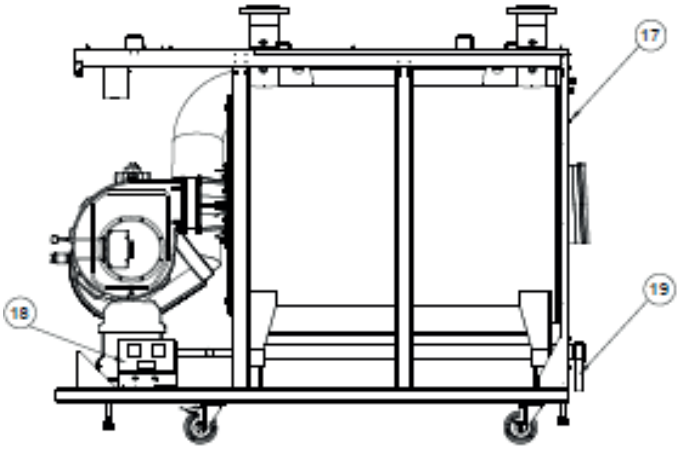


NO	PART	NO	PART
1	PRESSURE SENSOR	11	VENTURI
2	LIMIT THERMOSTAT	12	IONIZATION ELECTRODE
3	FAN	13	CONTROL CARD
4	EXCHANGER	14	SIPHON
5	IGNITION/ELECTRODE	15	PRESSURESTAT
6	HOT WATER OUTLET PIPE	16	LIMIT THERMOSTAT
7	HOT WATER OUTLET PIPE		
8	NTC SENSOR		
9	IGNITION TRANSFORMER		
10	GAS VALVE		

Aldens F-850, F-1000, F-1150





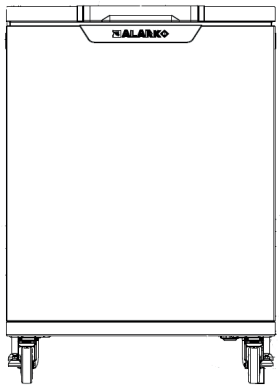
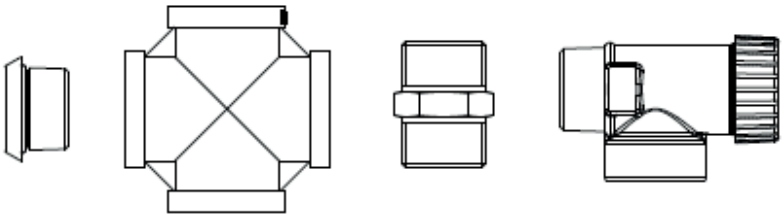


No	PART	No	PART
1	PRESSURE SENSOR	11	INLET/OUTLET PIPE
2	LIMIT THERMOSTAT	12	GAS PIPE
3	EXCHANGER	13	CLEAN AIR CONNECTION
4	IGNITION/ELECTRODE	14	LIMIT THERMOSTAT
5	FAN	15	IGNITION TRANSFORMER
6	VENTURI	16	PRESSURESTAT
7	GAS VALVE	17	3 PHASE ELECTRICAL PANEL
8	GAS CONNECTION	18	6 BAR SAFETY VALVE
9	CONTROL CARD	19	SIPHON SENSOR
10	ELECTRICAL PANEL		

2.4. What You Need to Know Before Assembly

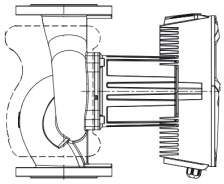
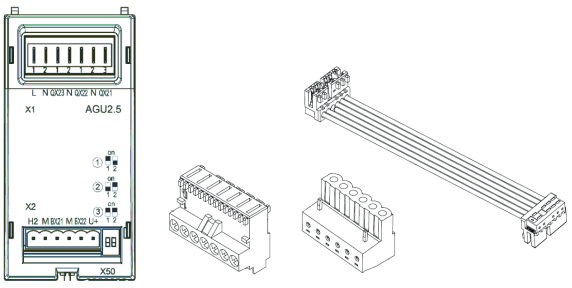
2.4.1. Shipment List

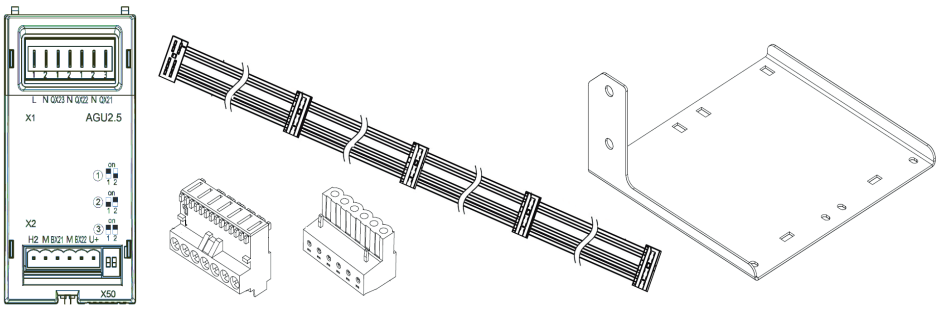
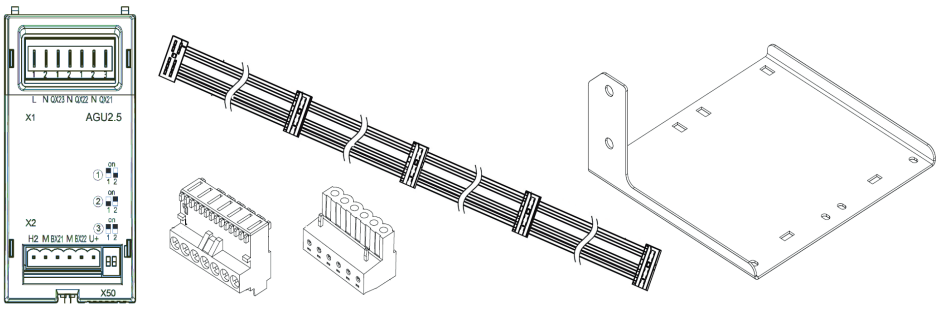
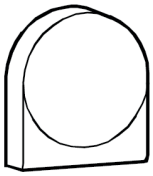
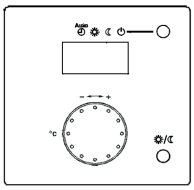
When you unpack your Aldens F floor type condensing boiler, you will find the following parts:

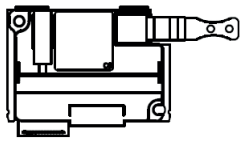
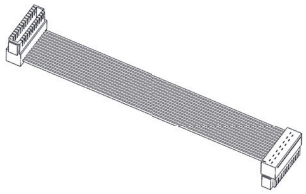
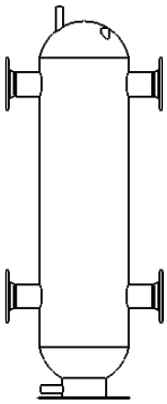
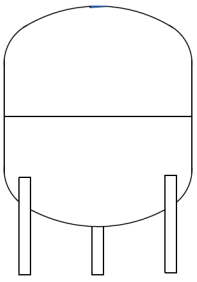
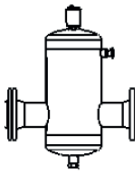
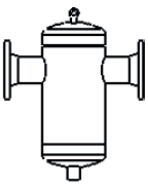
Aldens F Floor Type Condensing Boiler	 x1
Safety Discharge Valve and Fittings	 x1 x1 x1 x1
Operating and Assembly Manual	x1

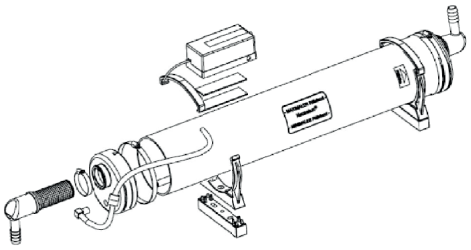
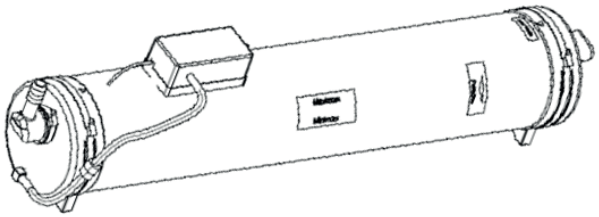
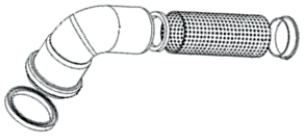
2.4.2. External Accessories

All products in the External Accessories list are available through Alarko dealers.

Pump	 For detail see Water Management
AGU2.550A109 Single Expansion Module Kit	 x1 x1 x1 x1

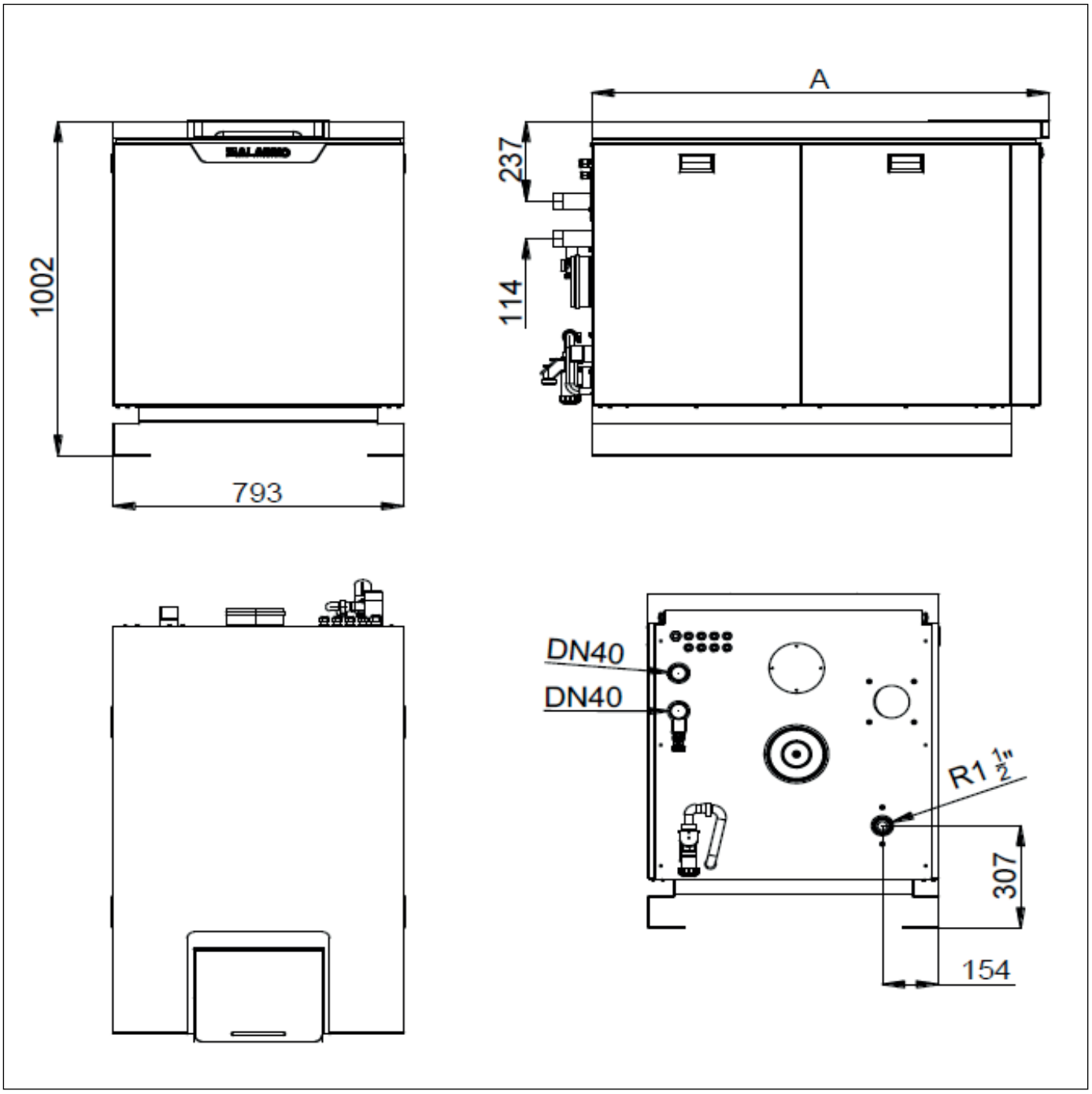
AGU2.550A109 Dual Expansion Module Kit	 x2 x2 x2 x1 x1
AGU2.550A109 Triple Expansion Module Kit	 x3 x3 x3 x1 x1
QAZ36.522/109 Immersion Type Sensor	 For boiler and balance container (PVC, 2m)
QAZ36.481/101 Immersion Type Sensor	 For solar collector (Silicone, 1.5m)
QAD36/101 Clamp Type Sensor	 For blend circuit and separator plate exchanger
QAC34/101 Outside Air Sensor	
QAA55.110/101 Indoor Room Unit	

OCI345 Cascade Module Set	 x1  x1
OCI700.1 Service Kit	
Balance Container	 It must be selected in accordance with the installation
Expansion Tank	 An expansion tank with a capacity of 24 liters should be installed in each boiler. Secondary circuit (installation side) expansion tanks should be selected by the installation company according to the installation needs.
Air Separator	
Sludge (Sediment) Holder	

fNeutralizer (300 kW 04/BGN)	
Neutralizer (650 kW 08/BGN)	
Neutralizer Container Inlet Elbow (40mm)	

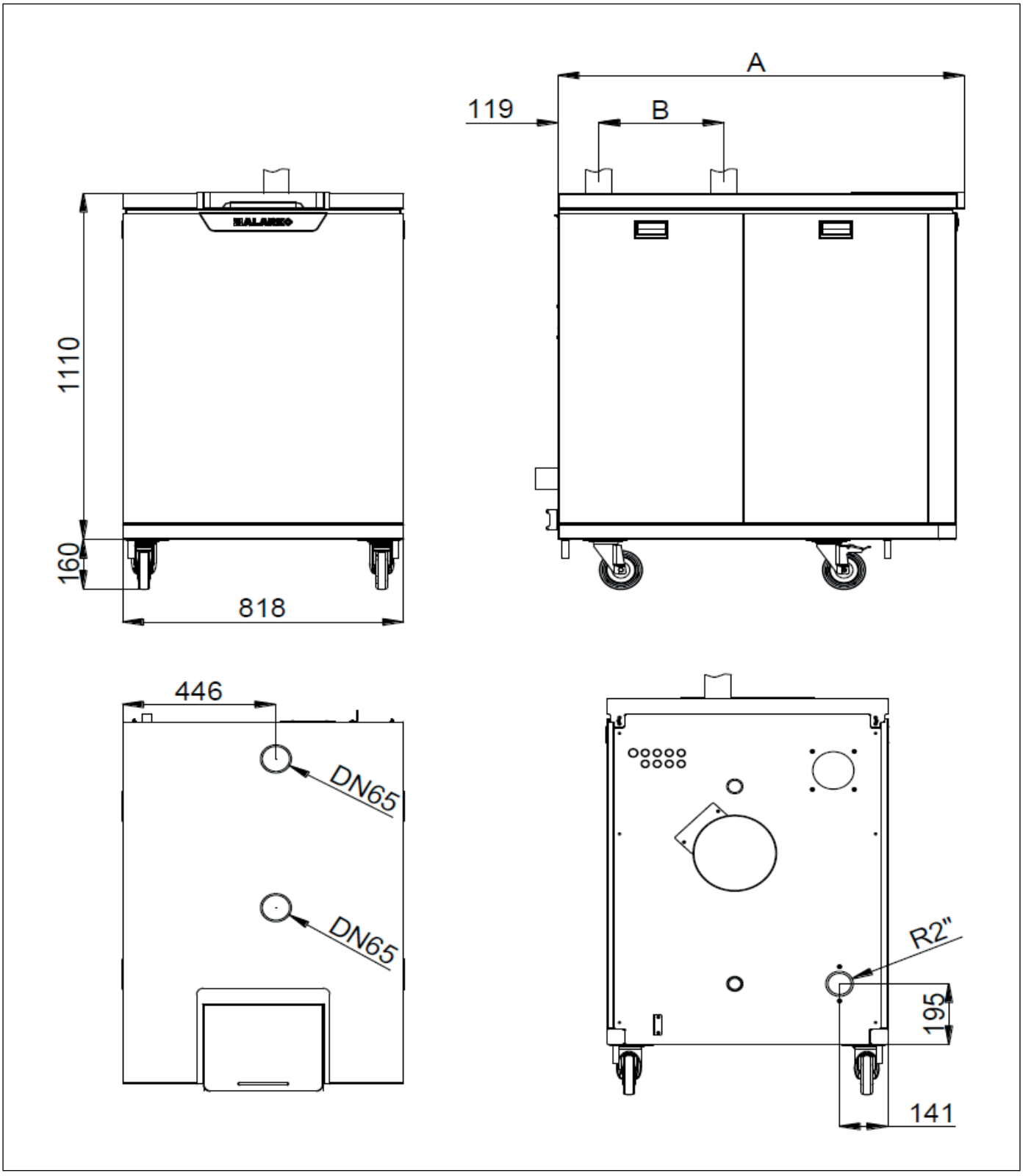
2.5. Device and Installation Connection Dimensions

2.5.1. Aldens F-175, F-200, F-235, F-265



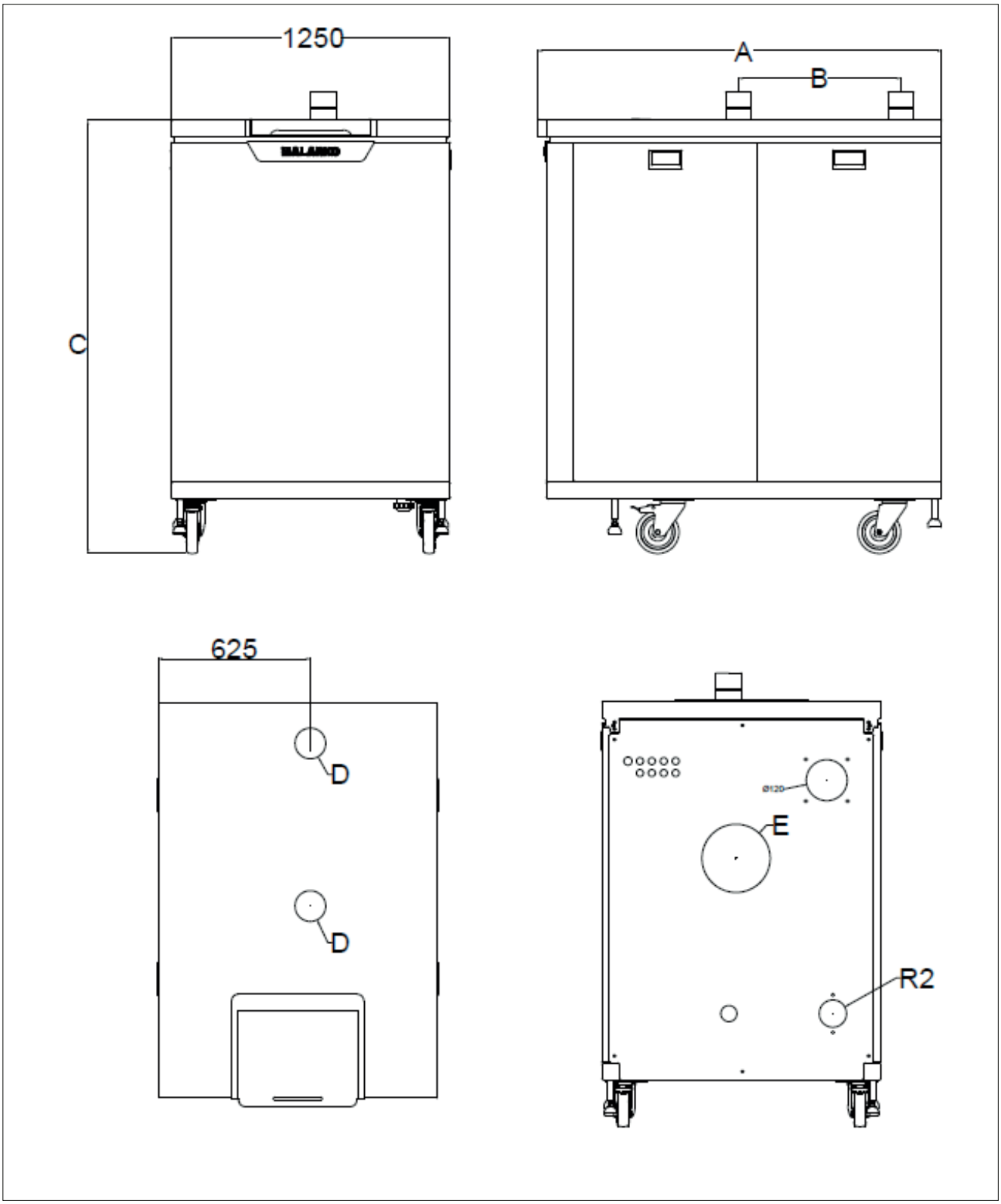
Boiler	A [mm]
175-200-235	1247
265	1355

2.5.2. Aldens F-310, F-350, F-425, F-500, F-575, F-700



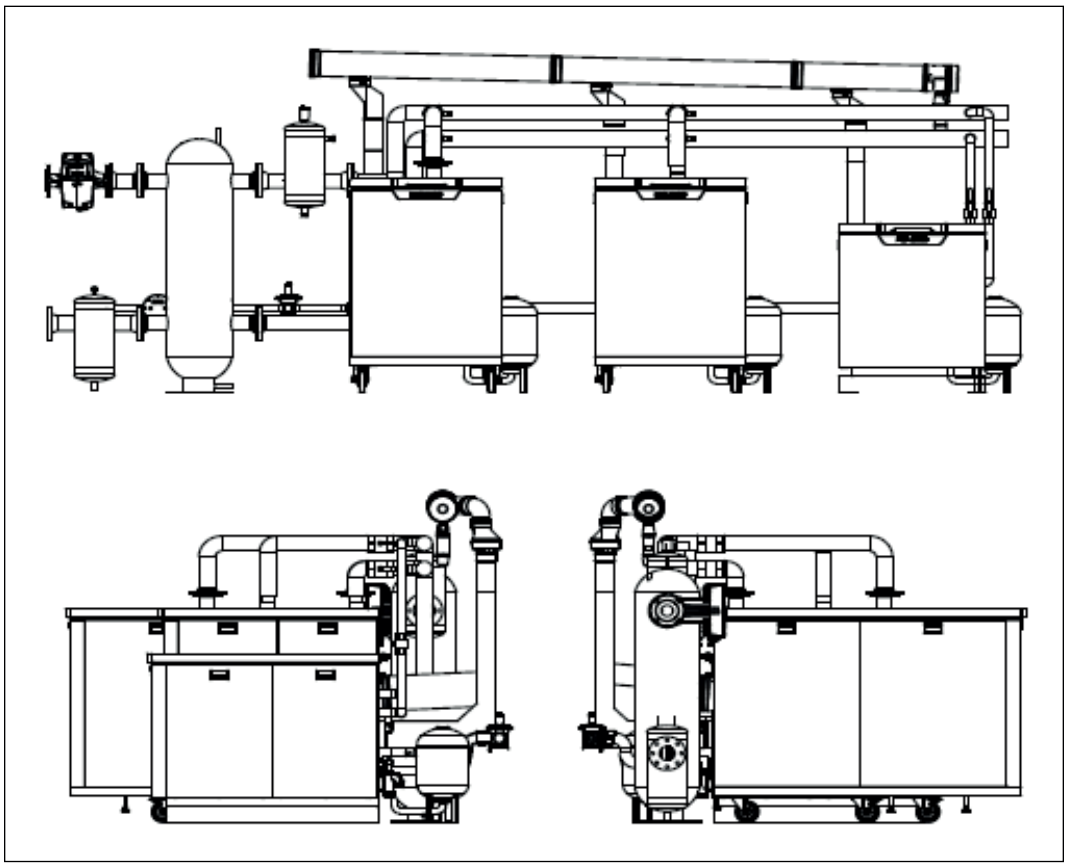
Boiler	A [mm]	B [mm]
310-350	1182	476,5
425-500	1306	598
575-700	1686	806

2.5.3. Aldens F-850, F-1000, F-1150



Boiler	A mm	B mm	C mm	D	E mm
850	2200	1022	1500	DN65	250
1000/1150	2200	1035	1600	DN100	300

2.5.4. Assembled Dimensions in Cascade System

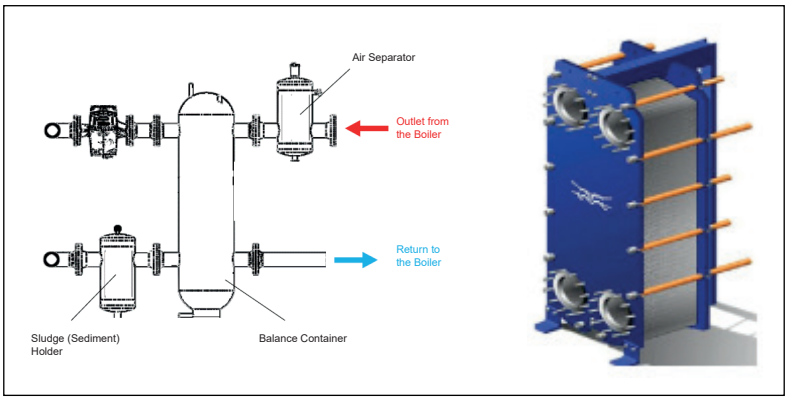


The slope for the flue to be connected in the cascade system assembly will be approximately 1.5 degrees.

2.5.5. What is Required in the Primary Circuit of the Installation for the Long Life and Correct Operation of Your Appliance

Whether you are going to operate your condensing boiler as a singular or as a cascade, the system must have the following elements. This is a requirement for the long life of your system and the warranty coverage of your appliance. These accessories are not supplied with the boiler

- Air Separator
- Balance container or Plate Exchanger (Plate exchanger is used in non-oxygen barrier plastic piped installations and in systems where water conditions are not appropriate)
- Sludge / Sediment Holder
- Expansion Tank (separate for each boiler)

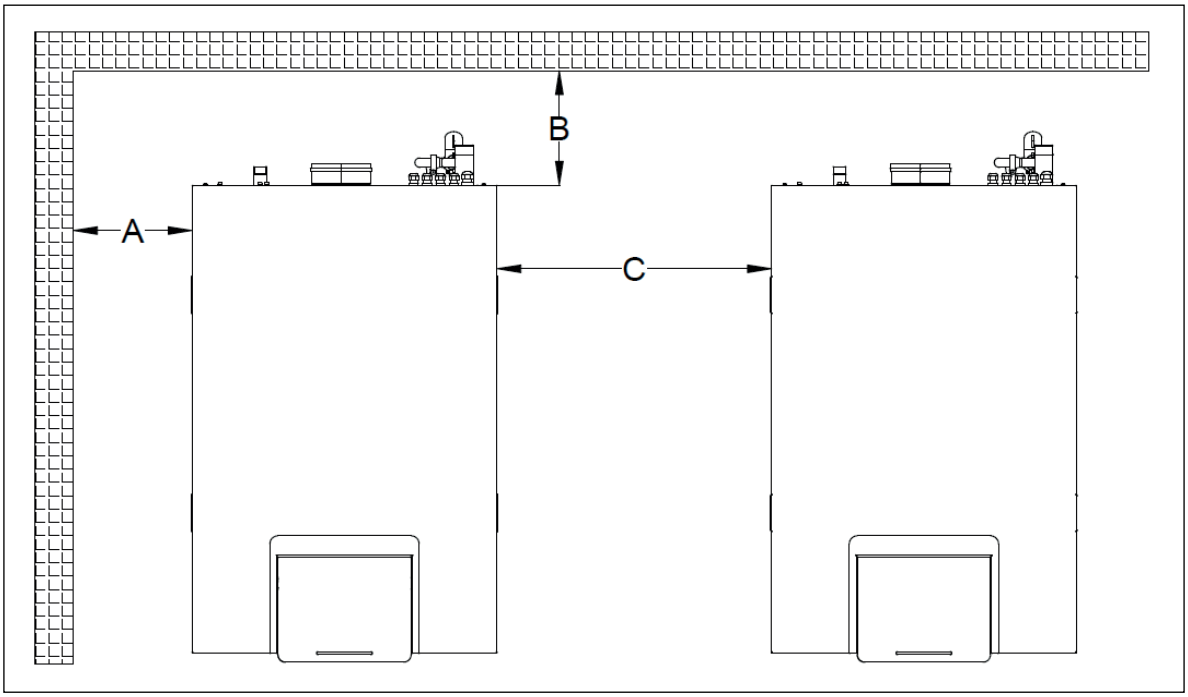


There should not be a shut-off valve in the direct circuit between the expansion tank and the boiler.

2.5.6. Additional Issues Regarding the Installation

- Each boiler must have its own boiler recirculation pump. The pump selection for your Aldens F Condensing Boiler to work together is included in the following sections. Necessary details and relationships about boiler exchanger and pump discharge height can also be found in the same section.
- Condensate (from the heat exchanger or flue gas/collector installation) is acidic and must be neutralized before discharge. Contact an Alarko Carrier authorized service for assistance and further information.
- An expansion tank should be installed in each boiler. Secondary circuit (installation side) expansion tanks should be selected by the installation company according to the installation needs.

2.5.7. Minimum Distances to be Left Between Wall and Boiler



A [cm]	B [cm]	C [cm]
60	100	60

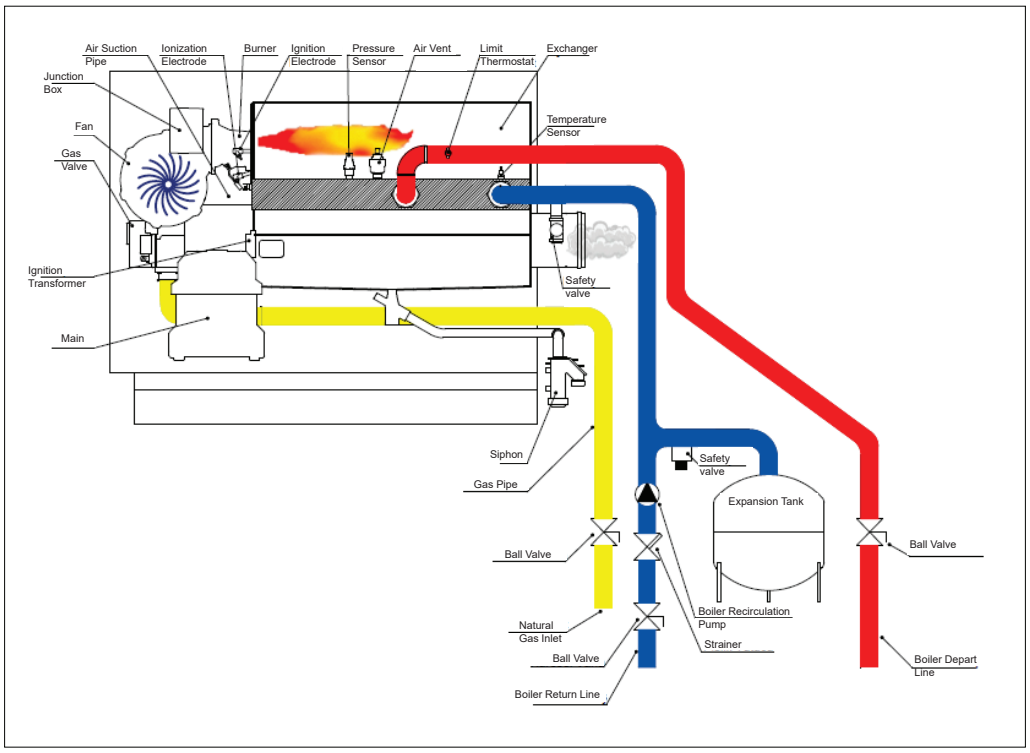
The minimum distances to be left from the floor, ceiling, and the right and left sides of the appliance in the assembly of Aldens F Condensing Boiler are specified by considering the requirements for the personnel intervening in case of necessary maintenance to operate ergonomically by opening the covers of the boiler comfortably.

The LMS 14 boiler control board has a frost protection function. In order for this function to be active, the system must have frost protection enabled via parameter settings and also the system must have a continuous electrical connection. Even in the places designated as a boiler room, it is very rarely possible for water to freeze, so it is recommended to take this into consideration.

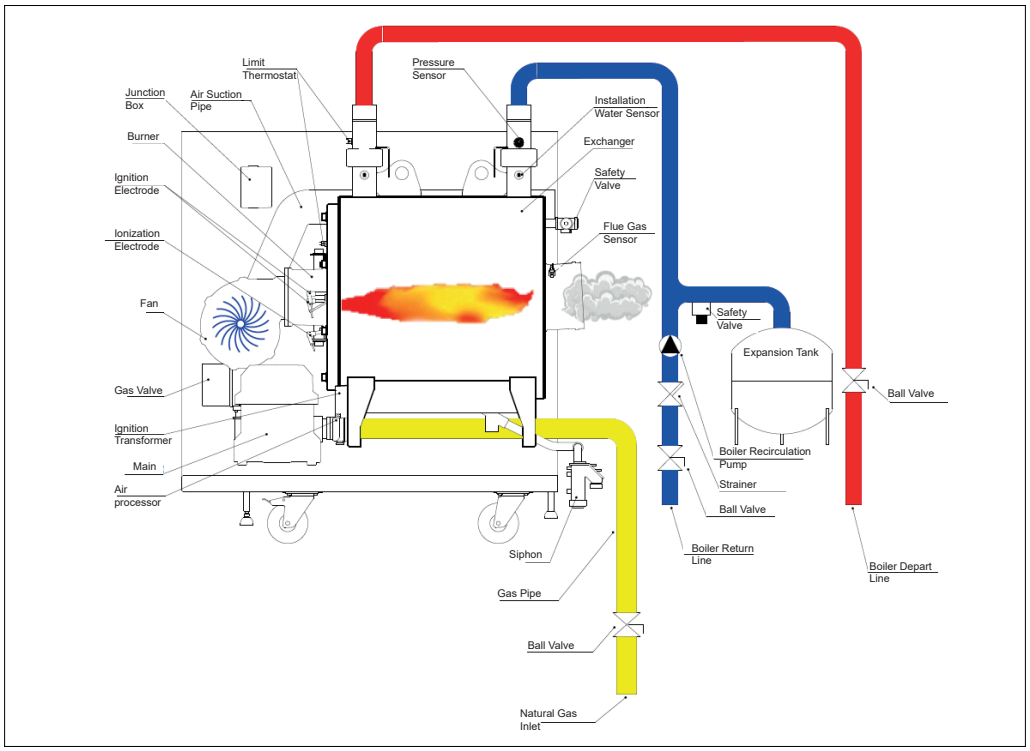
If a hermetic flue set with concentric waste gas and fresh air suction is used, attention should be paid to the distances from both the roof and the edges of the sloping roof in order to prevent the exhaust gas from mixing with the suction air or to cause health problems to humans and other living things.

2.5.8. Mechanical Circuit Diagrams (Hydraulic, Gas, Exhaust)

Aldens F-175, F-200, F-235, F-265



Aldens F-310, F-350, F-425, F-500, F-575, F-700, F-850, F-1000, F-1150



In the figure above, the schematic system diagram showing the functions of the Aldens F floor type Condensing Boiler is shown in the simplest way. The flue system is not only a system that discharges waste gas. While performing this function, it may also be necessary to provide the system with the fresh air required for combustion in the combustion chamber of the boiler.

All this is possible by installing the correct and regulations-compliant flue installation. Detailed information on the subject is given in “Flue Types and Elements”.

2.5.9. Water Management
Circulation Pump Specifications and Characteristic Curves

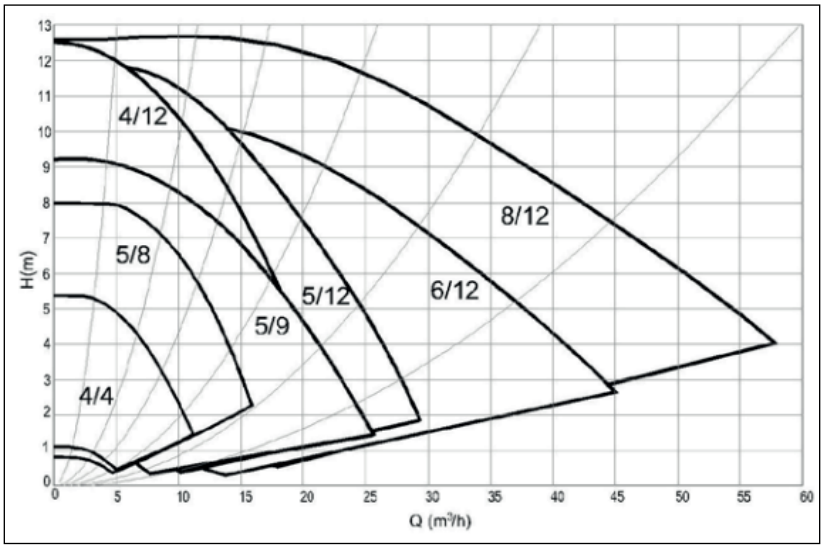
The list of pumps recommended for use with the boiler is given below. The pumps in this list are supplied with connection pipes as a set. Since the recirculation pump is located outside the appliance, high energy class pumps have been selected in accordance with the new ErP regulations. The pumps are supplied by the boiler board (LMS 14) (230VAC) and driven by the pwm signal if modulated.

There is no need to reach the boiler board for connections, they can be made easily to the terminals behind the boiler board.

The pump must be capable of circulating between the boiler and the balance container when appropriate installation diameters are used. In the cascade system, when using a balance container or a plate heat exchanger, the pumping heights required according to the aforementioned Aldens F boiler model change, so it is necessary to make the appropriate selection according to the conditions. The LMS 14 boiler control board adjusts the pump speed so that the difference between return and outlet water temperatures is 20°C.

Boiler Connection	Water [m^3/h]	Model	dP boiler (mSS)	Total pressure loss with surge tank (mSS)	Total pressure loss with exchanger (mSS)	If the balance tank is to be used, a suitable pump	If a heat exchanger is to be used, a suitable pump
1 ½''	7,54	ALDENS 175	3,5	5	7,5	Optima 3/12	Optima 3/12
	8,62	ALDENS 200	3,4	4,9	7,4	Optima 3/12	Optima 4/5/8
	10,13	ALDENS 235	4,7	6,2	8,7	Optima 4/5/8	Optima 4/12
	11,42	ALDENS 265	4,5	6	8,5	Optima 5/9	Optima 4/12
2 ½''	13,36	ALDENS 310	2	3,5	6	Optima 4/5/8	Optima 5/9
	15,08	ALDENS 350	2,3	3,8	6,3	Optima 5/9	Optima 5/9
	18,31	ALDENS 425	1,7	3,2	5,7	Optima 5/9	Optima 5/9
	21,55	ALDENS 500	1,2	2,7	5,2	Optima 5/12	Optima 5/12
	24,78	ALDENS 575	1,3	2,8	5,3	Optima 5/12	Optima 5/12
	30,16	ALDENS 700	3,1	4,6	7,1	Optima 6/12	Optima 6/12
	36,63	ALDENS 850	2,8	4,3	6,8	Optima 6/12	Optima 8/12
4''	43,09	ALDENS 1000	3,2	4,7	7,2	Optima 8/12	Optima 8/12
	49,56	ALDENS 1150	3,8	5,3	7,8	Optima 8/12	Optima 6/12 2

The total water pressure loss curves of the appliance according to the Aldens F boiler model are as follows.



Water Pressure Monitoring and Control System

There are two water pressure Hx monitoring and evaluation systems defined as “Static Pressure Management (SPM)” and “Dynamic Pressure Management (DPM)” within the LMS 14 boiler card. The water pressure management function, which is the combined use SPM and DPM, is a priority of boiler control. If necessary, it takes the boiler to low flame (LF / minimum capacity) operation, stops the boiler, prevents the boiler from starting (start prevention) and/or puts the boiler in the position called lockout.

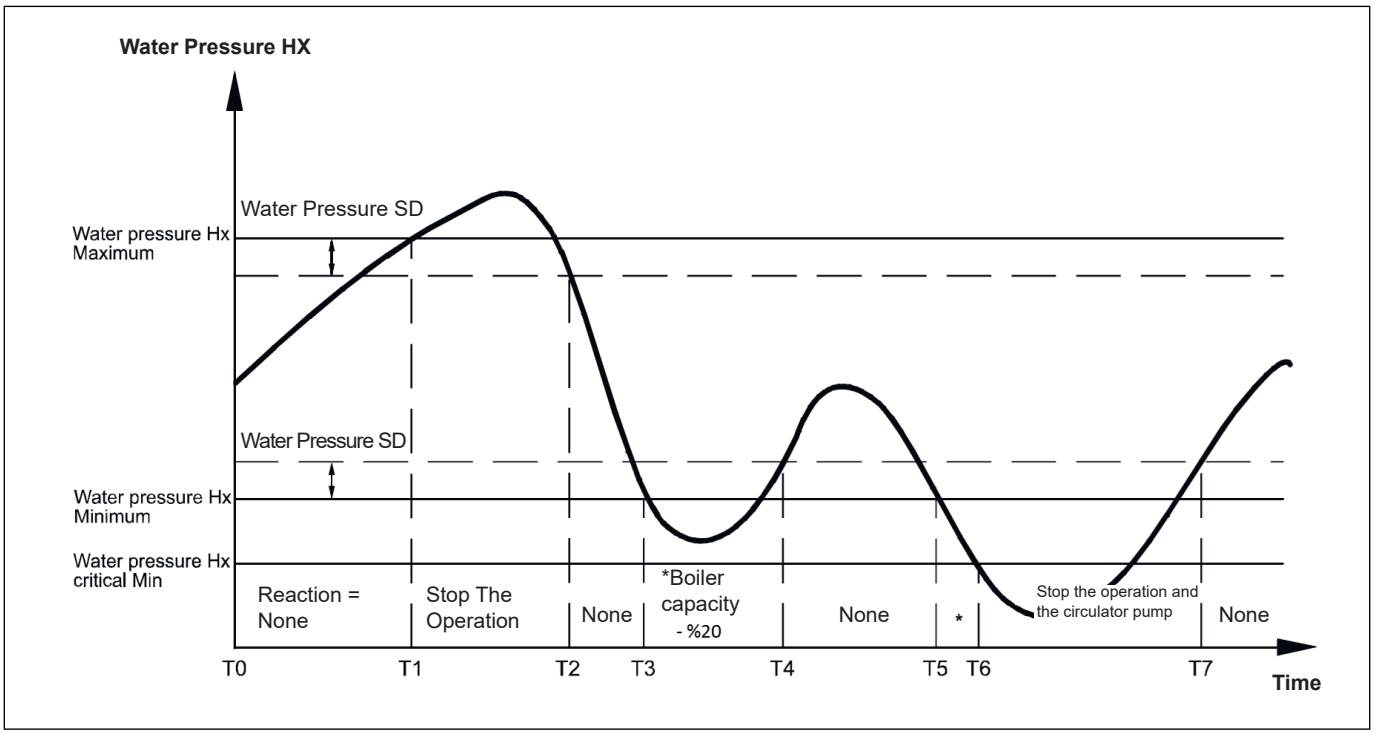
Static Pressure Management (SPM)

When the excessively low or excessively high value in the water pressure returns to normal, the boiler is released by the (SPM) function without time delay. There are maximum, minimum, and critical minimum values allowed.

In the following graph, the operating modes of SPM as a result of changes in water pressure due to reasons other than boiler depending on time are exemplified. The switching differential serves as some safety difference in the transition of water pressure from abnormal values to normal range.

When the maximum permissible water pressure is reached, LMS 14 closes the gas valve, but it does not cut the power of the circulation pump. In other words, water circulation continues. When the pressure starts to drop again, the boiler starts again and leaves the maximum water pressure value on a certain safety band (switching differential). If there is a pressure lower than the “Minimum water pressure” value but higher than the “Critical Minimum water pressure” value, it reduces the boiler capacity by 20% compared to its

current value. If the water pressure rises, the boiler can move to load stages higher than the minimum load if pressure is created that will leave the “minimum water pressure” down only to the “switching differential” level. If the water pressure of the boiler running between the minimum and the critical minimum – and in low flame – continues to decrease further and falls below the “critical minimum water pressure” value, then LMS 14 cuts the power of both the gas valve and the boiler (circulator) pump.



The reading of the LMS 14, which can control three different heating circuits at the same time, with the water pressure sensor, can be displayed on the screen with the parameters coded 9005, 9006, or 9007.

Aldens F floor type condensing boiler default static pressure setting values are as follows:

- ***Critical Minimum Water Pressure*** = ***0,8 bar***
- ***Minimum Water Pressure*** = ***1 bar***
- ***Maximum Water Pressure*** = ***6 bar***

Only and primarily Alarko Carrier authorized services have the necessary knowledge, equipment, and authority about the water management and pressure control of your Aldens F Condensing Boiler manufactured in Alarko Carrier production facilities.

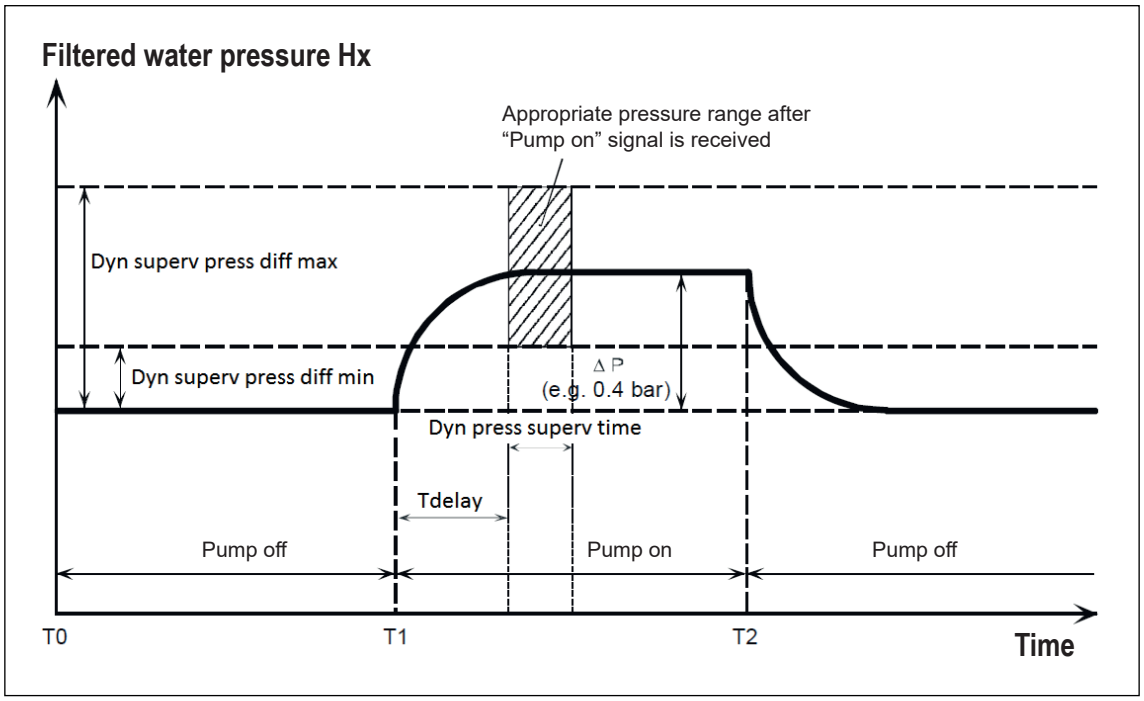
Dynamic Pressure Management (DPM)

This function is used to monitor and evaluate the changes expected to occur in the system water pressure due to the activation of the boiler circulation pump or the heating/domestic water circuit circulation pumps in a controlled manner and primarily to control the system water pressure mainly from the circulation pump.

If the LMS 14 does not read a valid pressure value after the pump operation signal is received, the Dynamic Pressure Management (DPM) function will not allow the boiler to start with the ***"start prevention"*** feature or will put the system in ***lockout*** mode ***(2490 - Dyn press superv sh'down).***

The LMS 14 boiler board starts a water pressure control process that will start after ***Tdelay*** (start-of-reading delay time) and last up to DPM time (2495) after receiving the ***pump on*** signal. It calculates ***the absolute value*** of the difference between the pressure and the pressure before pump operation by taking the time average with 200 milliseconds interval sampling and checking whether it remains between the minimum and maximum limits of the DPM differential.

If the system does not meet the pressure requirements during the start protection, it will try to restart if the "start protection error repetition number" has not been reached yet. If reached, the system will switch to ***lockout*** state. Even if the pump is running during the start protection, it will stop in the last seconds (Tdelay + 2 seconds later) of the start protection. Parameter 2490 ***(Dyn press superv sh'down)*** is used for the reactivation of the system entering the lockout mode.



Parameter 8327 shows the dynamic pressure value in the system. This value can be read as well.

Filling / Draining of Water in the Installation

It is necessary to know both how to add water to the installation (also called water pumping) or how to add water or discharge it to disable the system for an efficient operation.

- The permissible water pressure level for Aldens F floor type condensing boilers is a maximum of 6 bar (the standard equipment of your appliance is a safety valve allowing a maximum of 6 bar).
- In order for your boiler to operate efficiently, the cold water pressure must be between 1 and 1.5 bar. The installation pressure should be increased when pressure falls below this.
- There must be a drain tap in the water circuit. It is essential that the tap in question is ready for use and that there are no obstructive blind tap etc. elements on the drainage side.

Notes on Hardness, Conductivity, and Calcification of Water

It is necessary to clean the installation before filling the heating circuit installation with water. In the first filling of the system, fill the system with potable water.

- If the water supplied to the system does not have these features, it is also necessary to install a water treatment system.
- Treated water must be used when replenishing the heating circuit water as a result of water shortages in the closed circuit.
- The water used should be in the range of 7.5 < pH < 9.5 after the first cycle for initial filling and cleaning of the installation and in a permanent operation to be reached.
- If aluminum material is used in the installation (e.g. aluminum radiator) pH should be < 8.5.
- The total hardness (TH) value allowed for the water to be used in the water circuit shall be defined according to the VDI 2035 standard and shall be in the range of 5 Fr < TH < 15 Fr.

Total Installed System Power (kW)	Hardness	
	°f (Fr)	*mol/m³*
<600	5 - 15	0,5 – 1,5
>600	5 – 7	0,5 - 0,7

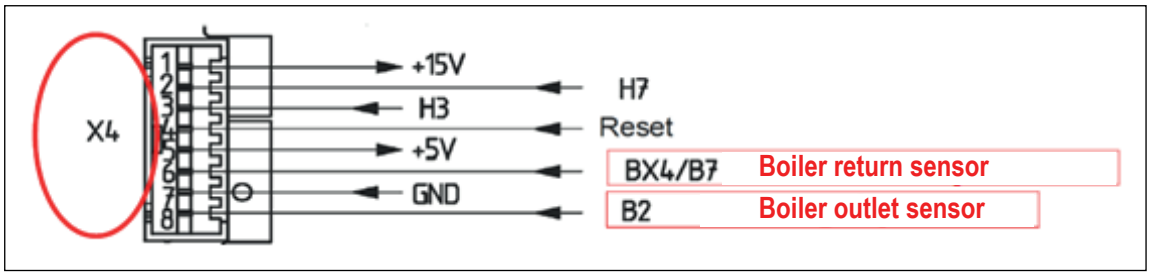
- The maximum total hardness and the corresponding maximum conductivity vary according to the appliance capacity and installation volume.

Over Delta T (∆T) Prevention System

It is not desirable that the difference between the outlet and return water temperatures of your appliance be higher than a certain value. The main reason for this is to prevent the heat exchanger from being exposed to thermal stresses. This function can reduce the current operating capacity of your appliance by 20%, reduce it to the minimum value or cause lockout – start prevention for safety purposes due to its design.

The exchanger protection function performs the following operations if the temperature between the outlet and return water exceeds the specified limits.

Parameter	Description	Description
[3916.1]	*Flow-return max. difference*	*ΔT > [MaxDeltaOutletReturn]: Power reduced by 20%*
-	*Boiler power is reduced by 20% if the ΔT value is greater than the [maximum permissible ΔT] value.*	
[6604.1]	*SLT T low flame*	*ΔT > [MaxDeltaOutletReturn] + [STB Delta-T Offset Partial load]: Power minimized*
-	*Boiler power is minimized if the ΔT value is greater than the [maximum permissible ΔT] + [6604.1] value.*	
[6605.1]	*SLT T*	*ΔT > MaxDeltaOutletReturn + STB Delta-T Offset start prevention*
[3921.1]	*Number of d-T errors in 24h*	
-	*The boiler switches to "start prevention" mode if the ΔT value is greater than the [maximum permissible ΔT] + [6605.1] value.*	



"Boiler outlet and return sensor connections on the main board (LMS 14)."

3. UNPACKING AND ASSEMBLY

3.1. General and Safety Warnings

3.1.1. Installation Safety Warnings and Information

There is a vital issue to note about the assembly of your Aldens F Condensing Boiler. “Neither a manual nor an automatic valve must be installed” in the section between the circulation pump and the boiler on both the hot water outlet circuit and the cold water return circuit.

In such a case:

1. Open either water outlet or return line valves immediately (make sure to allow water passage).

Attention: The line must be in line with the valve lever!

2. If the valves in question are open, leave them as they are.

3. If the appliance is operating, be sure to stop it (off position/standby) and then close the fuel (gas line) valve (turn it in the direction of the red arrow as shown in the left picture).

4. Always contact an authorized Alarko Carrier service for assistance before restarting.

You can visit www.alarko-carrier.com.tr for a list of authorized services.

As it can be understood from the measures listed for the above-mentioned situation, in order for the safety valve included in the packaging of your appliance to function, the correct and safe sequence by moving away from the boiler must be as follows:

i. ***Assembly of Safety Valve and Expansion Tank Connection***

ii. ***Circulation Pump***

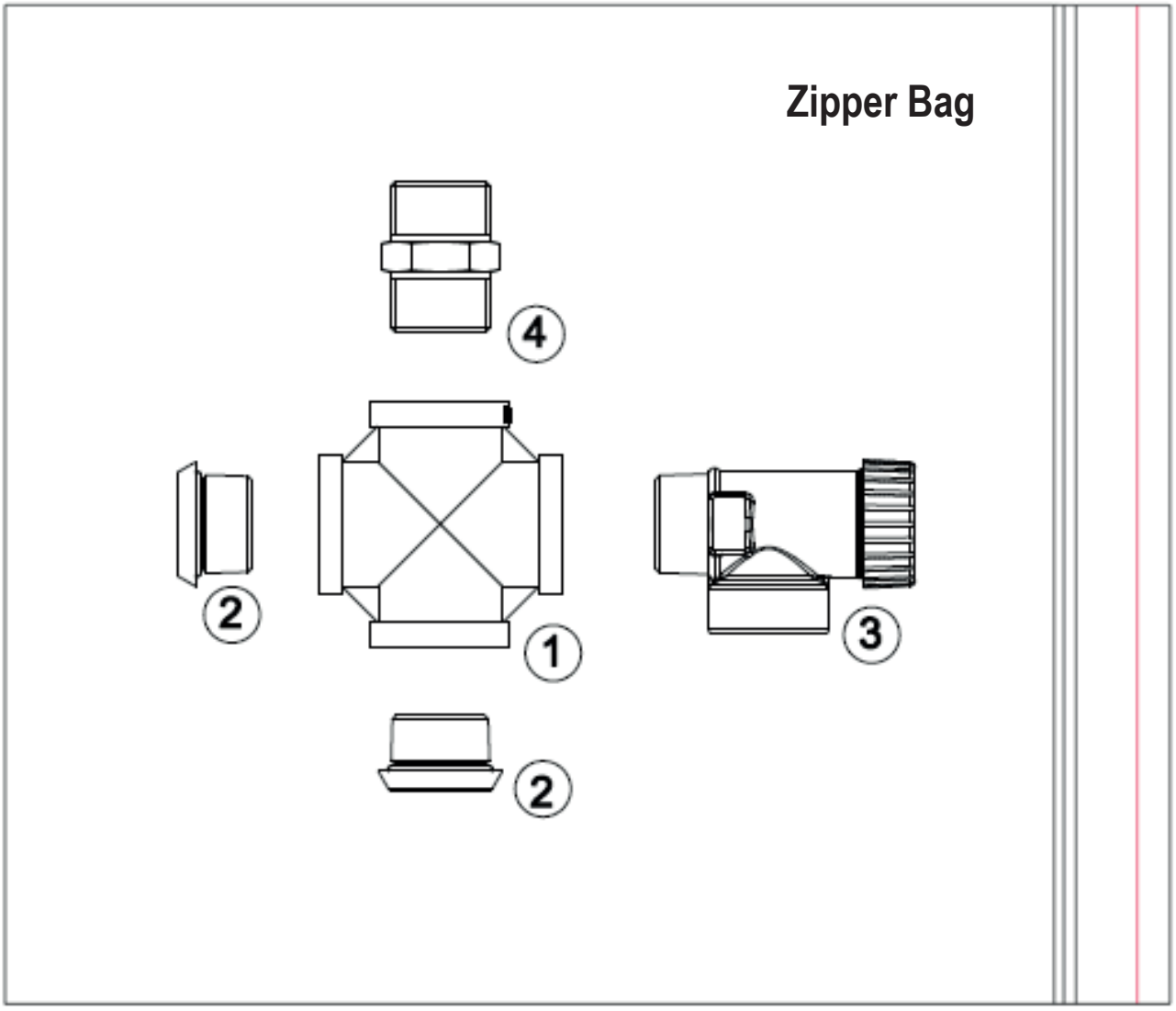
iii. ***Strainer***

iv. ***Valve***

When the packaging of your Aldens F Condensing Boiler is opened, a number of safety valve assembly accessories other than your appliance will be included in the package.

For Aldens F floor type condensing boiler models:

- ***4-way T Adapter***
- ***Blind Plug***
- ***6 Bar Safety Valve***
- ***Nipple***



The assembly of both the assembly elements included in the packaging of your product and any other assembly accessories described in this manual should only be carried out by “authorized and trained persons”. Never allow an unauthorized person to assemble or interfere with your installation.

It is recommended to use one of the Pump and Connection Accessories Kits available through your Alarko Carrier dealer for use with your product. These additional accessories, which are shown below, are not included in the standard packaging of your appliance. In addition to the standard kit that is included in the packaging of your Aldens F Condensing Boiler, you can also supply the correct pump and connection kit externally through our authorized dealers and use it in your boiler installation.

- The recirculation pumps included in the additional kit and the required technical data are included in the previous section of the manual. You can use the relevant table to select the appropriate pump according to the use case.

3.1.2. Safety Warnings and Useful Information About the Exchanger, Fan, and Venturi Group

Never disassemble any of the front or side protection covers while your boiler is in operation, do not allow them to be disassembled. This warning is especially important for your safety. In addition, if it is detected that they are removed, your appliance will not be covered by the warranty.

During maintenance and troubleshooting, only Alarko Carrier authorized services have the authority and experience to perform this operation. Never put any part of your body, including the service personnel, into the suction port of the venturi while the device is in operation, do not throw any

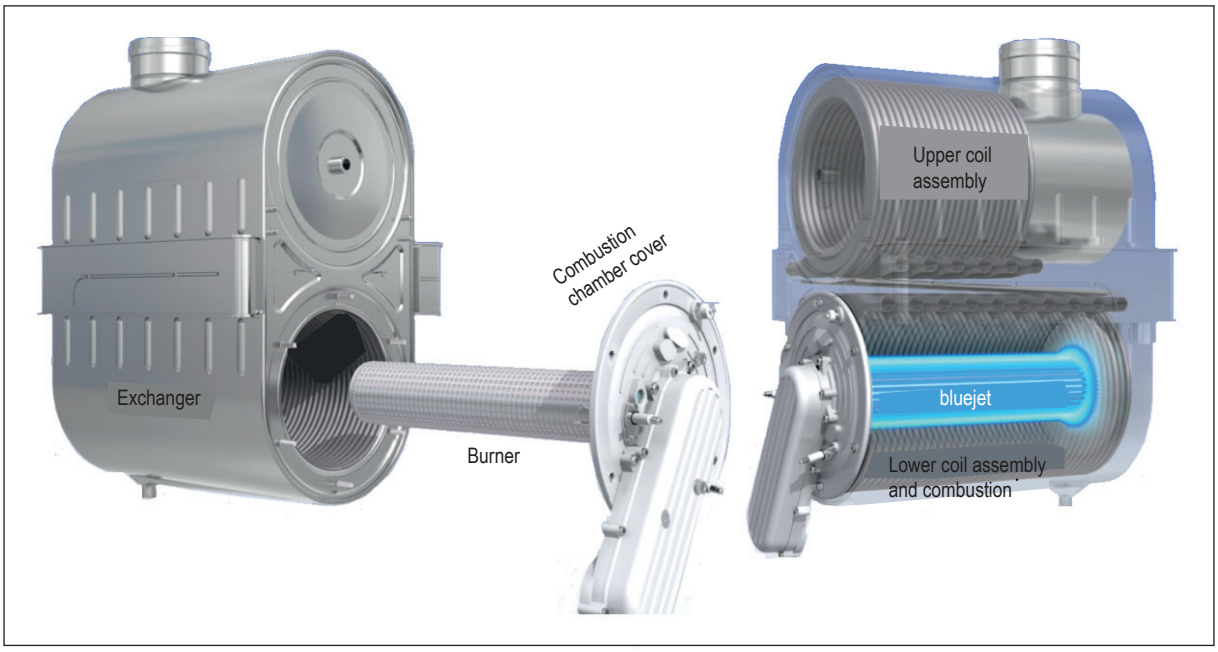
objects into the suction port, in order to prevent it from entering, also make sure that there are no small objects (washer, nut or any plastic part, etc.) inside the device before closing the side and front covers of your device after maintenance.

Aldens F Burner and Condensation Technology

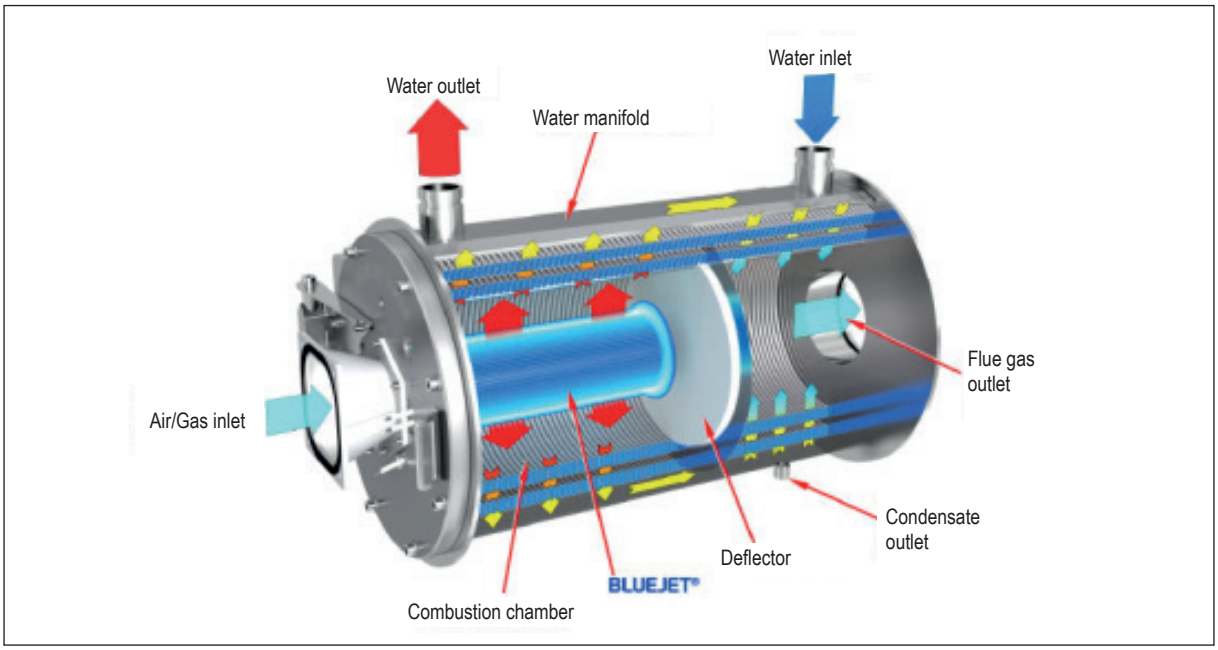
The burner technology of your Aldens F Condensing Boiler has blue flame (bluejet®) technology that provides optimum and undisturbed combustion within natural gas combustion reaction limits.

Features;

- Using the flame by organizing the fluctuations in the gas pressure supplied from the natural gas line in the best way and to ensure the stability of the flame permanently.
- Transferring the sensible heat of the water vapor in the waste gas passing around the coils to the primary circuit water in the best way by using the condensation technology in terms of their design superiority.



A. Aldens F-175,F-200,F-235,F-265 type exchanger



B. Aldens F-310, F-350, F-425, F-500, F-575, F-700, F-850, F-1000, F-1150 type exchanger

The periodic maintenance period of your appliance is 1 year. Every year, you need to have your boiler serviced by Alarko Carrier authorized services. One of the most important steps of boiler maintenance is the maintenance of the exchanger and the use of Sentinel brand cleaning and maintenance products is recommended for the efficient and long-lasting operation of your exchanger. The products listed below with their intended use are available from Totaline stores, an Alarko Carrier organization. (www.totaline.com.tr).

Product Usage Area	Sentinel Product	Purpose
Corrosion / calcification inhibitor	X100, X500	Preventive
Noise reduction	X200	Preventive
Cleaning	X300	Problem solver
Sludge disposal	X400	Problem solver
Antifreeze	X500	Preventive
Sealing	Sealing products	Problem solver

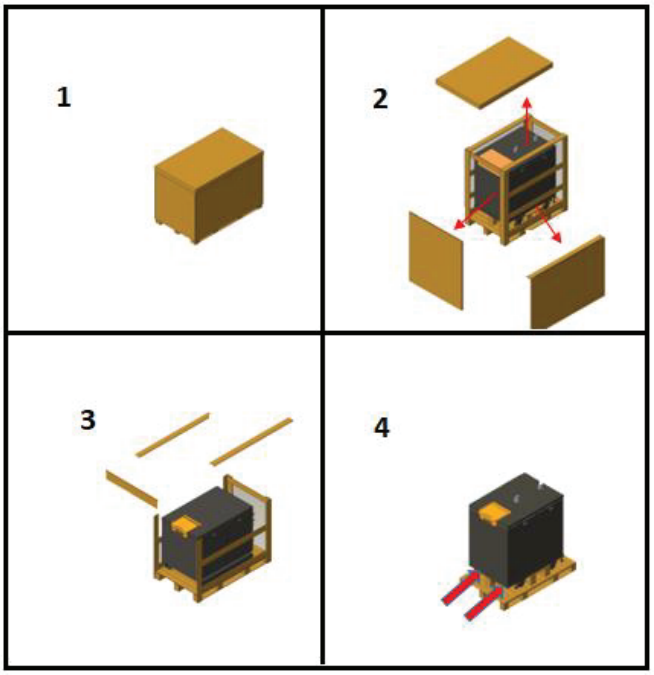
3.2. Unpacking the Appliance

The cardboard material used in the packaging of your product is made entirely of recyclable material.

It is recommended that the packaging be opened right before the product assembly. Alarko Carrier is not responsible for the negative consequences of storing the product under incorrect conditions.

Materials used in packaging (plastic bags/nylon, foam/polystyrene, nails, screws, staples, etc.) should not be kept within reach of children.

Ask at least 1 more person if possible for help with the following actions. It is recommended to use a vehicle like a lift to lift the boiler from the pallet. Follow the sequence below for opening the package and then lifting the boiler.

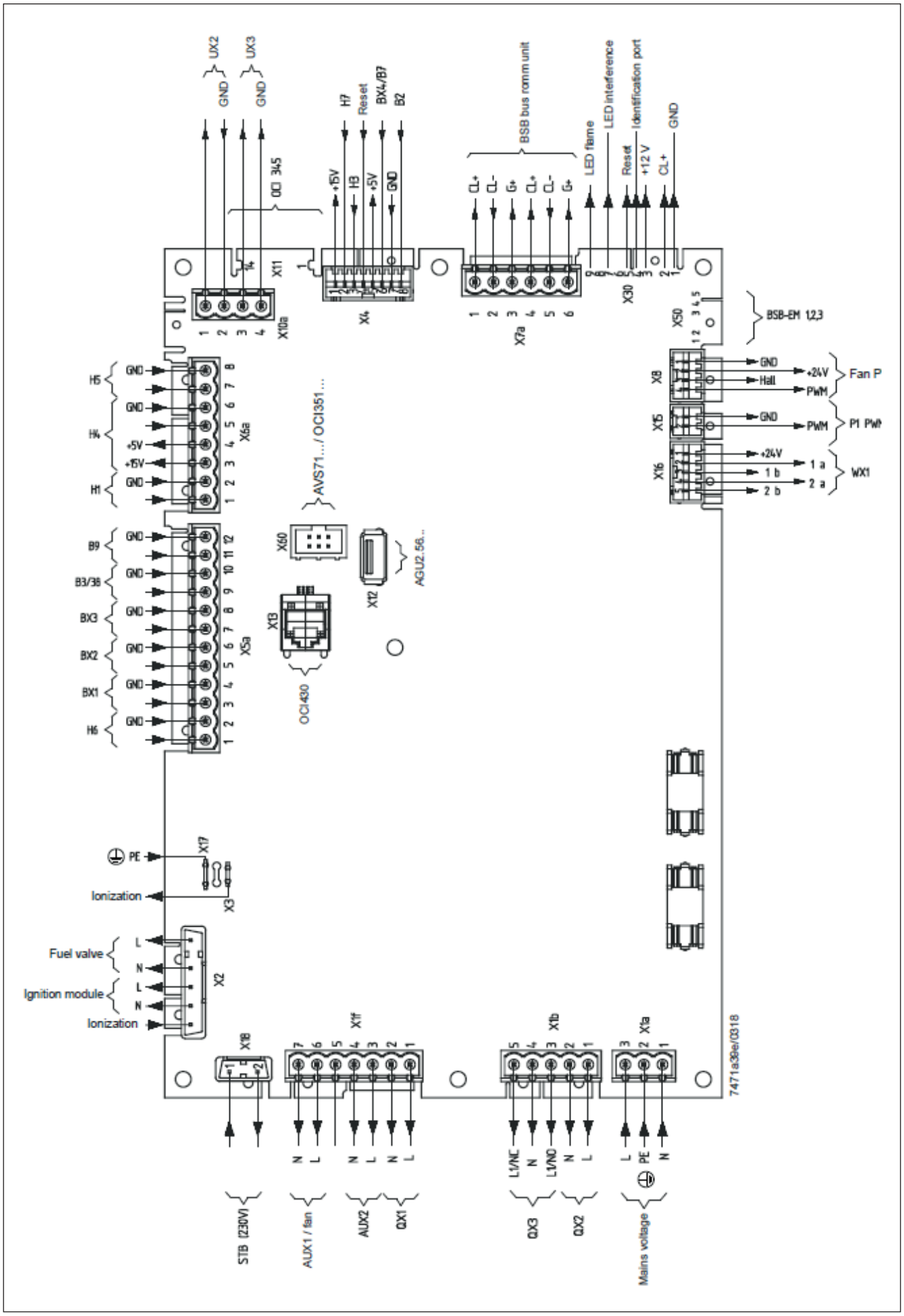


3.3. Basic Electrical Diagram and External Connections

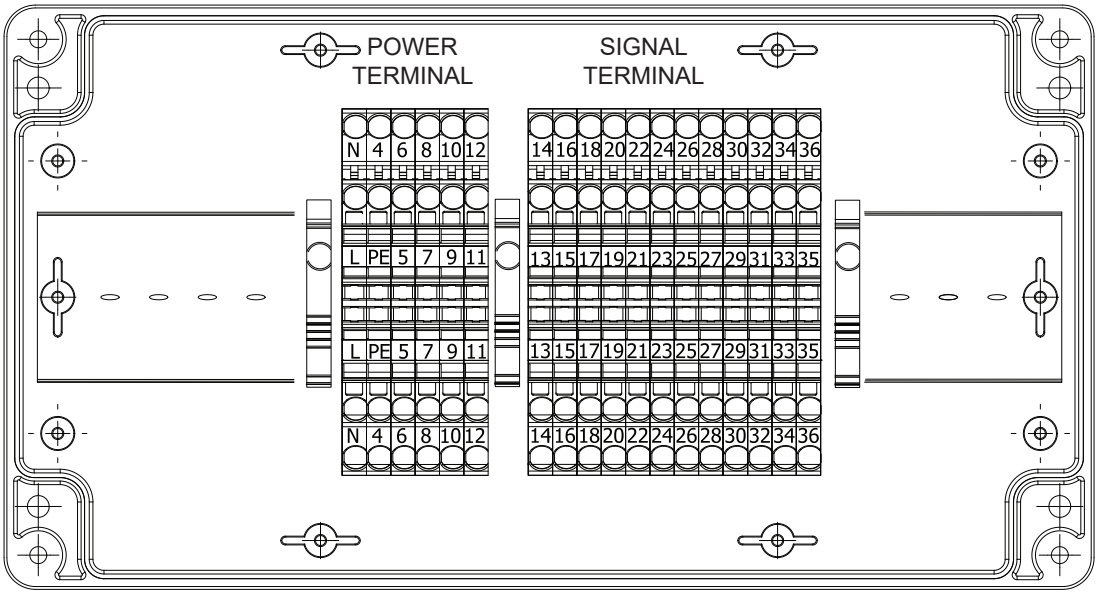
The system should be commissioned with the necessary connections for the control of the three-way valve and a storage tank as in the example below. This example will also help to better understand how to use your condensing boiler for hot water (DHW) production and storage (in the storage tank).

The following values should be taken into consideration for the cross-sectional areas of the cables used in the system and the maximum length value of these cables. This information is for sensor cables.

Section area	Maximum length
0.25 mm^2	20 m
0.5 mm^2	40 m
1.mm^2	80 m
1.5 mm^2	120 m


UX2
GND
UX3
GND
OCI 345
X11
X10a
H7
Reset
BX4/B7
B2
+15V
H3
+5V
GND
X4
BSB bus comm unit
CL+
CL-
G+
CL+
CL-
G+
X7a
LED flame
LED interference
Reset
Identification port
+12 V
CL+
GND
X30
X50
BSB-EM 1,2,3
X8
GND
+24V
Hall
PWM
Fan P
X15
GND
PWM
P1 PWM
X16
+24V
1 a
1 b
2 a
2 b
WX1
H5
H4
H1
GND
+5V
+15V
GND
X6a
AVS71.../ OCI351...
B9
B3/38
BX3
BX2
BX1
H6
X5a
X60
X12
AGU2.56...
X13
OCI430
PE
X17
Ionization
X3
Fuel valve
Ignition module
Ionization
L
N
L
N
X2
X18
X1f
X1b
X1a
7471a38e/0318
N
L
STB (230V)
AUX1 / fan
AUX2
QX1
L1/NC
N
L1/NO
QX3
QX2
L
PE
N
Mains voltage

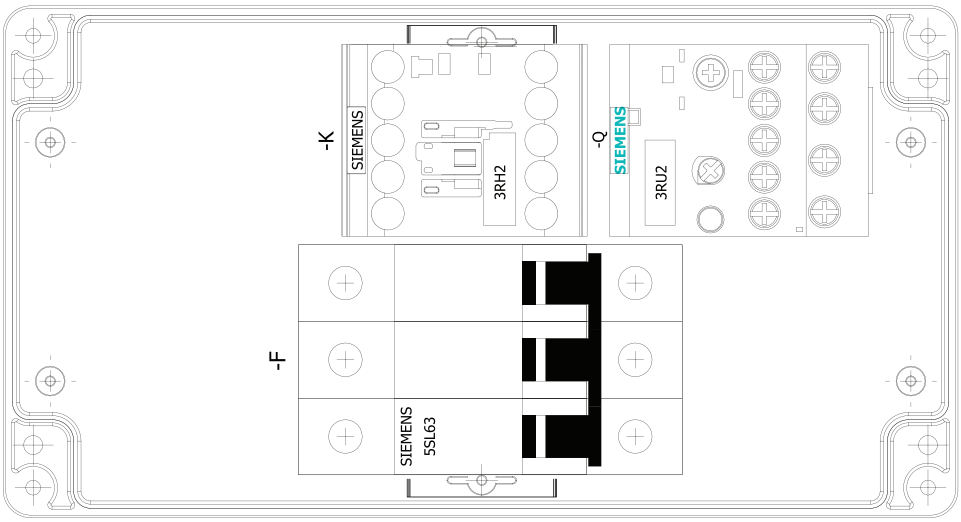
ALDENS F-175, F-200, F-235, F-265, F-310, F-350, F-425, F-500, F-575, F-700



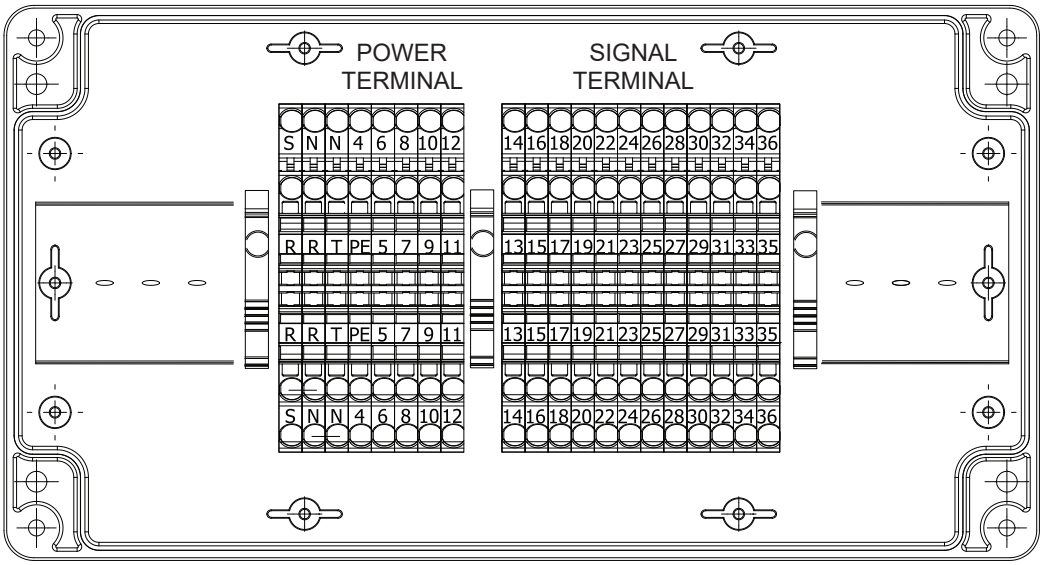
POWER TERMINALS:
L-MAIN SUPPLY (CUSTOMER)
N-MAIN SUPPLY (CUSTOMER)
PE-MAIN SUPPLY (CUSTOMER)
4-QX2- CH PUMP SUPPLY (L)
5-QX2- CH PUMP SUPPLY (N)
6-QX3- HOT WATER TANK (L1/NO)
7-QX3- HOT WATER TANK (N)
8-QX3- HOT WATER TANK (L1/NC)
9-QX1- BOILER PUMP SUPPLY (L)
10-QX1- BOILER PUMP SUPPLY (N)
11-AUX2- MODULATING PUMP SUPPLY (L)
12-AUX2- MODULATING PUMP SUPPLY (N)

SIGNAL TERMINALS:
13-BX1- CASCADE SENSOR
14-BX1- CASCADE SENSOR (GND)
15-B3/38- DHW SENSOR
16-B3/38- DHW SENSOR (GND)
17-B9- OUTDOOR TEMPERATURE SENSOR
18-B9- OUTDOOR TEMPERATURE SENSOR (GND)
19-H5- ROOM THERMOSTAT
20-H5- ROOM THERMOSTAT (GND)
21-BSB Bus room unit- ADJUSTABLE ROOM THERMOSTAT (CL+)
22-BSB Bus room unit- ADJUSTABLE ROOM THERMOSTAT (CL-)
23-BSB Bus room unit- ADJUSTABLE ROOM THERMOSTAT (G+)
24-BX2- SENSOR
25-BX2- SENSOR- (GND)
26-SPARE
27-P1 PWM- MODULATING PUMP (PWM)
28-P1 PWM- MODULATING PUMP (GND)
29-USER INTERFACE CONNECTION CABLE AVS 74
30-USER INTERFACE CONNECTION CABLE AVS 74
31-USER INTERFACE CONNECTION CABLE AVS 74
32-USER INTERFACE CONNECTION CABLE AVS 74
33-USER INTERFACE CONNECTION CABLE AVS 74
34-BSB Bus room unit- ADJUSTABLE ROOM THERMOSTAT-2 (CL+)
35-BSB Bus room unit- ADJUSTABLE ROOM THERMOSTAT-2 (CL-)
36-BSB Bus room unit- ADJUSTABLE ROOM THERMOSTAT-2 (G+)

ALDENS F-850, F-1000, F-1150



-F - AUTOMATIC FUSE
-K - CONTACTOR
-Q - THERMAL MAGNETIC SWITCH

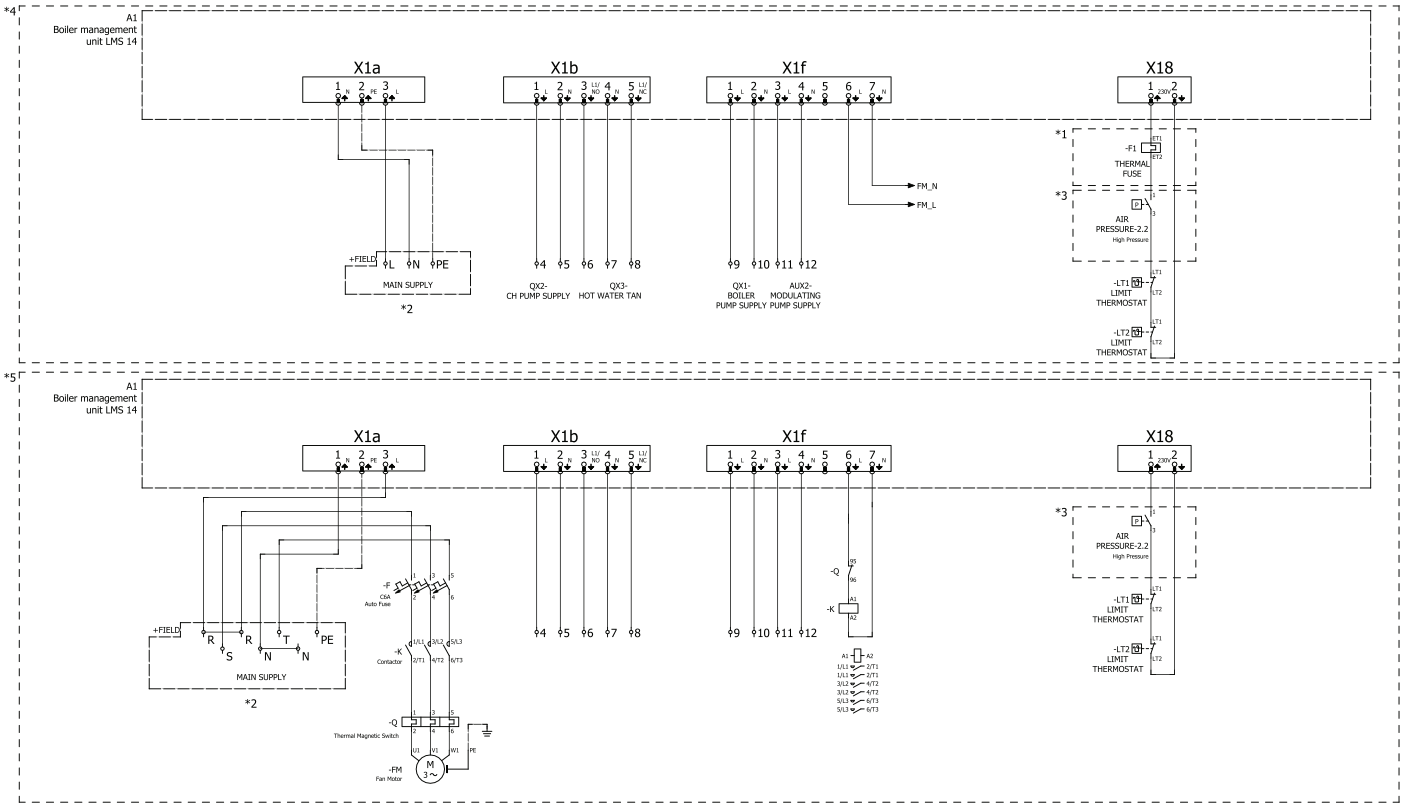


POWER TERMINALS

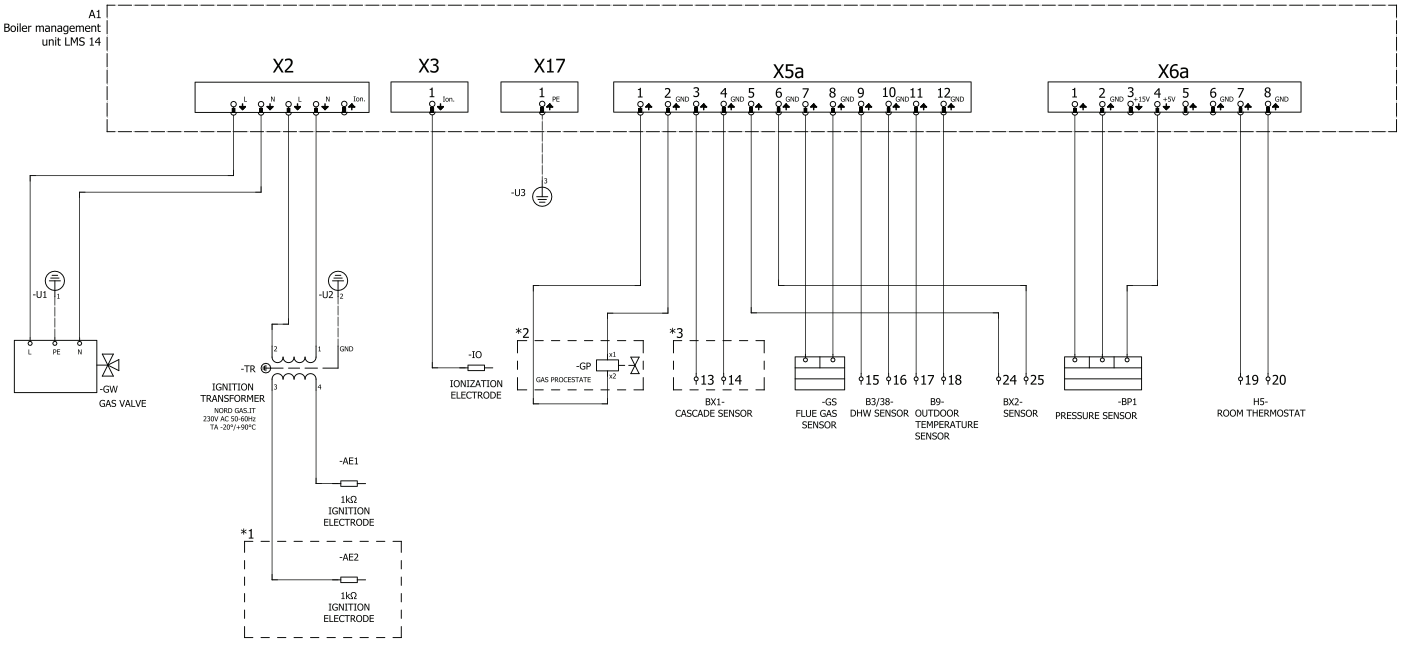
R-MAIN SUPPLY (CUSTOMER)
S-MAIN SUPPLY (CUSTOMER)
R-MAIN SUPPLY (CUSTOMER)
N-MAIN SUPPLY (CUSTOMER)
T-MAIN SUPPLY (CUSTOMER)
N-MAIN SUPPLY (CUSTOMER)
PE-MAIN SUPPLY (CUSTOMER)
4-QX2- CH PUMP SUPPLY (L)
5-QX2- CH PUMP SUPPLY (N)
6-QX3- HOT WATER TANK (L1/NO)
7-QX3- HOT WATER TANK (N)
8-QX3- HOT WATER TANK (L1/NC)
9-QX1- BOILER PUMP SUPPLY (L)
10-QX1- BOILER PUMP SUPPLY (N)
11-AUX2- MODULATING PUMP SUPPLY (L)
12-AUX2- MODULATING PUMP SUPPLY (N)

SIGNAL TERMINALS

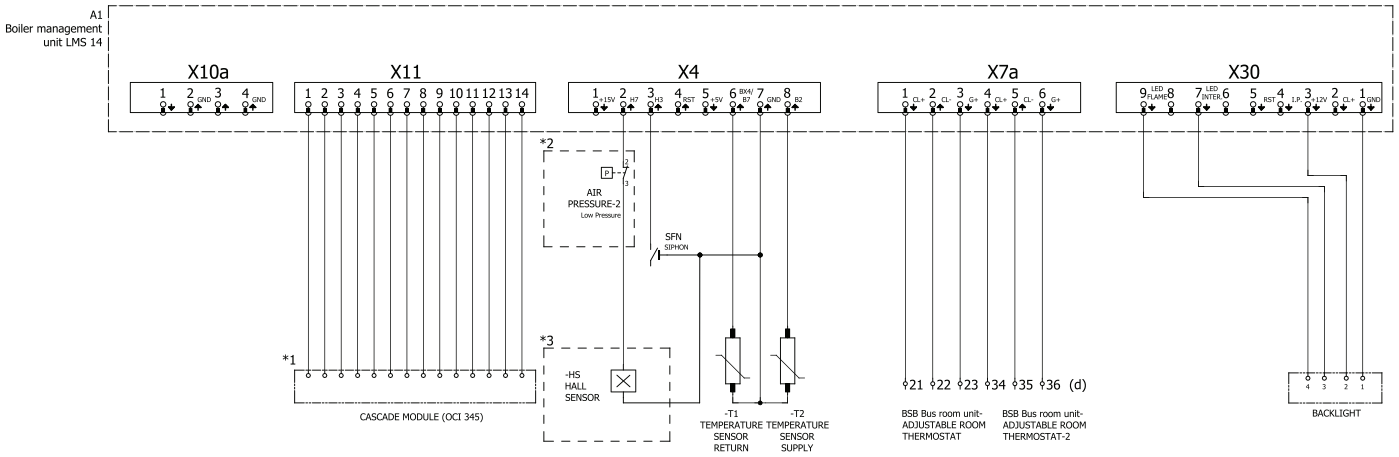
13-BX1- CASCADE SENSOR
14-BX1- CASCADE SENSOR (GND)
15-B3/38- DHW SENSOR
16-B3/38- DHW SENSOR (GND)
17-B9- OUTDOOR TEMPERATURE SENSOR
18-B9- OUTDOOR TEMPERATURE SENSOR (GND)
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20-H5- ROOM THERMOSTAT (GND)
21-BSB Bus room unit- ADJUSTABLE ROOM THERMOSTAT (CL+)
22-BSB Bus room unit- ADJUSTABLE ROOM THERMOSTAT (CL-)
23-BSB Bus room unit- ADJUSTABLE ROOM THERMOSTAT (G+)
24-BX2- SENSOR
25-BX2- SENSOR- (GND)
26-SPARE
27-P1 PWM- MODULATING PUMP (PWM)
28-P1 PWM- MODULATING PUMP (GND)
29-USER INTERFACE CONNECTION CABLE AVS 74
30-USER INTERFACE CONNECTION CABLE AVS 74
31-USER INTERFACE CONNECTION CABLE AVS 74
32-USER INTERFACE CONNECTION CABLE AVS 74
33-USER INTERFACE CONNECTION CABLE AVS 74
34-BSB Bus room unit- ADJUSTABLE ROOM THERMOSTAT-2 (CL+)
35-BSB Bus room unit- ADJUSTABLE ROOM THERMOSTAT-2 (CL-)
36-BSB Bus room unit- ADJUSTABLE ROOM THERMOSTAT-2 (G+)



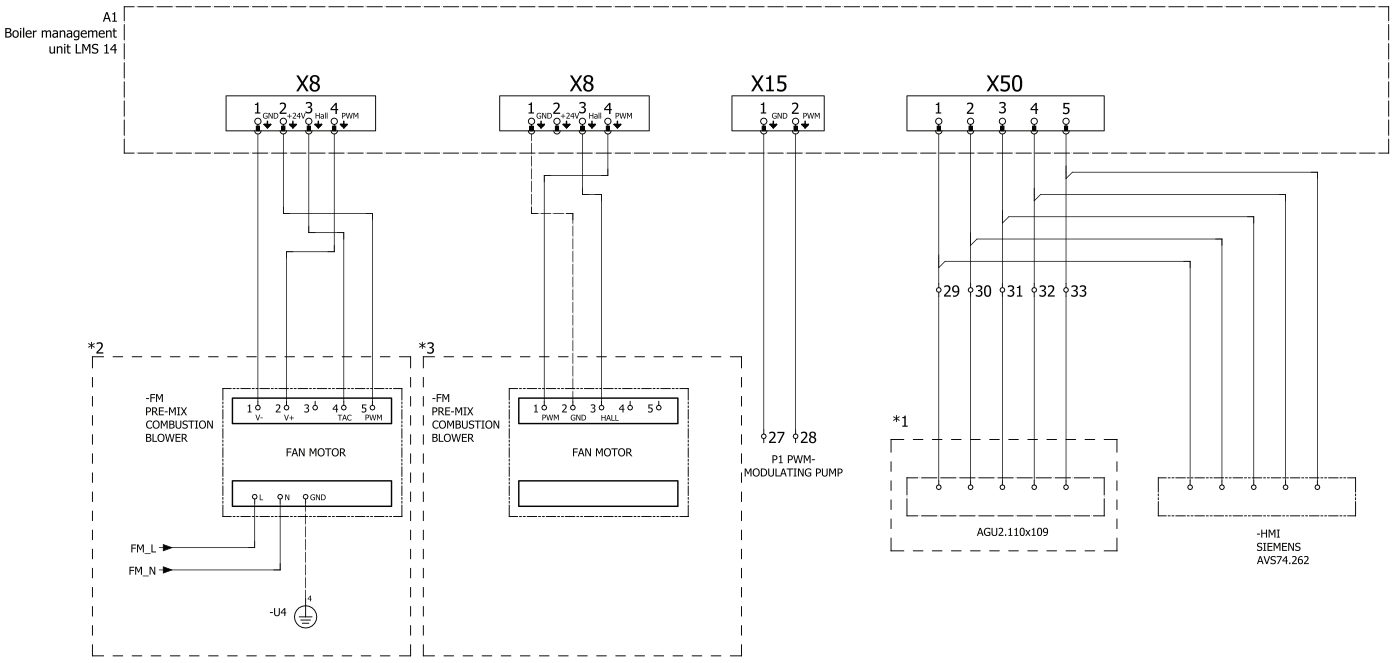
NOTE :
*1 - THERE WILL BE A THERMAL FUSE IN ALDENS 175-200-235-265 DEVICES.
*2 - MAIN POWER CONNECTION WILL BE APPLIED BY THE CUSTOMER FROM THE FIELD ENTRANCES.
*3 - THERE WILL BE 2 AIR PRESSURE STATUS IN ALDENS 500-575-700-800-1000-1150 DEVICES AND THE 2ND AIR PRESSURE STATUS WILL BE CONNECTED TO X4 SOCKET.
*4 - CONNECTION DIAGRAM TO BE APPLIED IN ALDENS 175-200-235-265-310-350-425-500-575-700 DEVICES.
*5 - CONNECTION DIAGRAM TO BE APPLIED IN ALDENS 800-1000-1150 DEVICES.



NOTE :
*1 - IN ALDENS 310-350-425-500-575-700-800-1000-1150 DEVICES, THERE ARE 2 IGNITION ELECTRODES.
*2 - IN ALDENS 175-200 DEVICES, THE GAS PROCESSOR IS NOT BE USED.
*3 - CASCADE SENSOR IS USED FOR THE CASCADE SYSTEM.



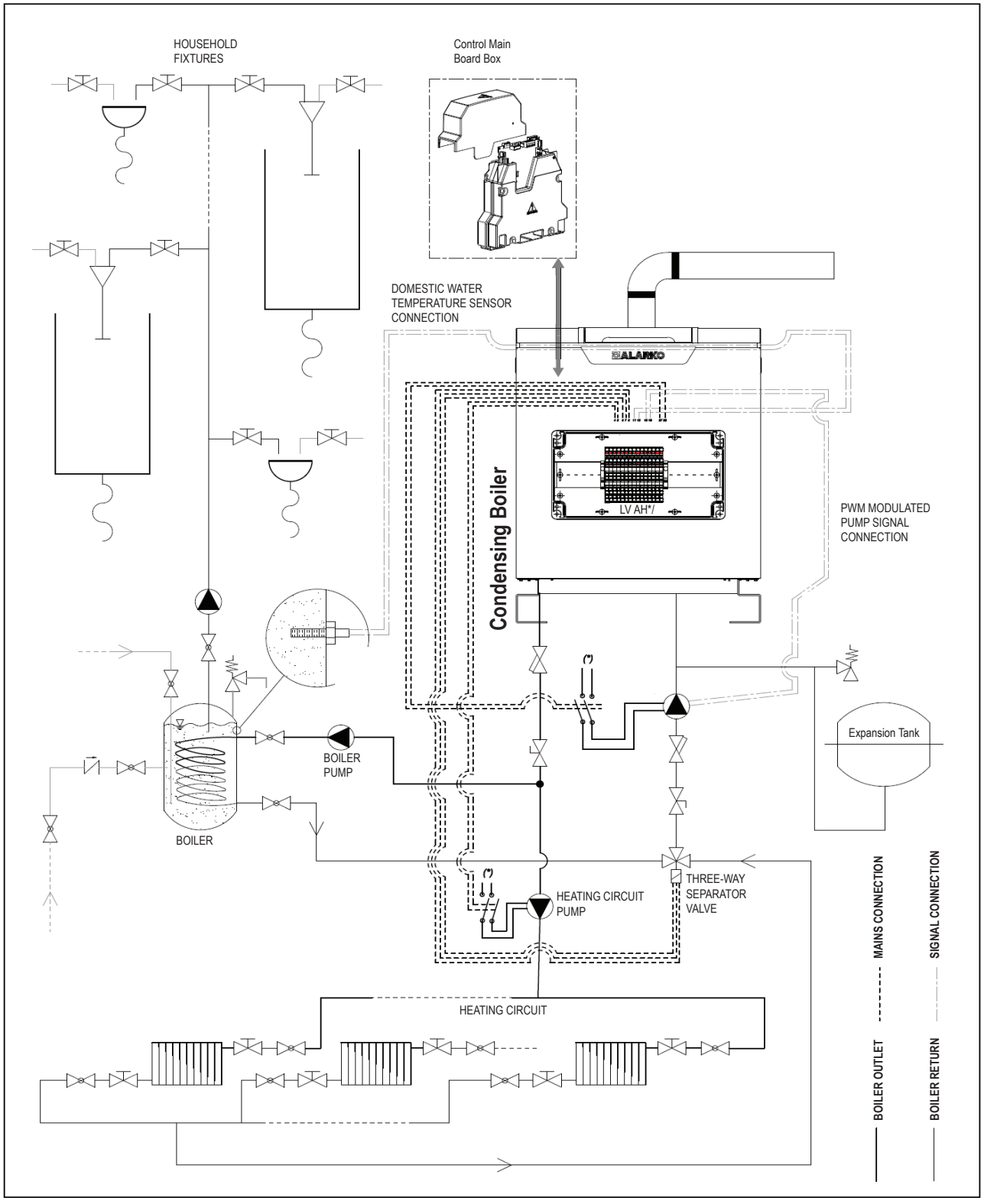
NOTE :
*1 - WHEN THE SYSTEM IS TO BE CASCADED, THE CASCADE MODULE SET WILL BE SUPPLIED BY THE CUSTOMER.
*2 - IN ALDENS 175-200-235-265-310-350-425 DEVICES, 1 AIR PRESSURE PROSESTAT IS APPLIED.
*3 - IN ALDENS 500-575-700-800-1000-1150 DEVICES, HALL SENSOR CONNECTION IS NOT APPLIED.



NOTE :
*1 -CONNECTION DIAGRAM TO BE APPLIED WHEN AGU2 OPTION IS PREFERRED.
*2 -ALDENS 175-200-235-265-310-350-425-500-575-700 DEVICES, FAN MOTOR CONNECTION.
*3 -ALDENS 800-1000-1150 DEVICES, FAN MOTOR CONNECTION.

If a three-way valve or boiler is used, the system circuit diagram and the electrical connections to control this system should be installed as shown in the example below. The example will also give an idea of the connection of your Aldens F Condensing Boiler with a boiler or similar hot water tank to supply domestic water other than its standard use with the heating circuit.

If a cascade system is used, the B3/38 domestic water sensor must be connected to the relevant signal terminal of the same appliance where the boiler pump is connected from to the mains terminal (QX3). This is recommended for site applications.



Brief Information on the Sensors to be Used in the System

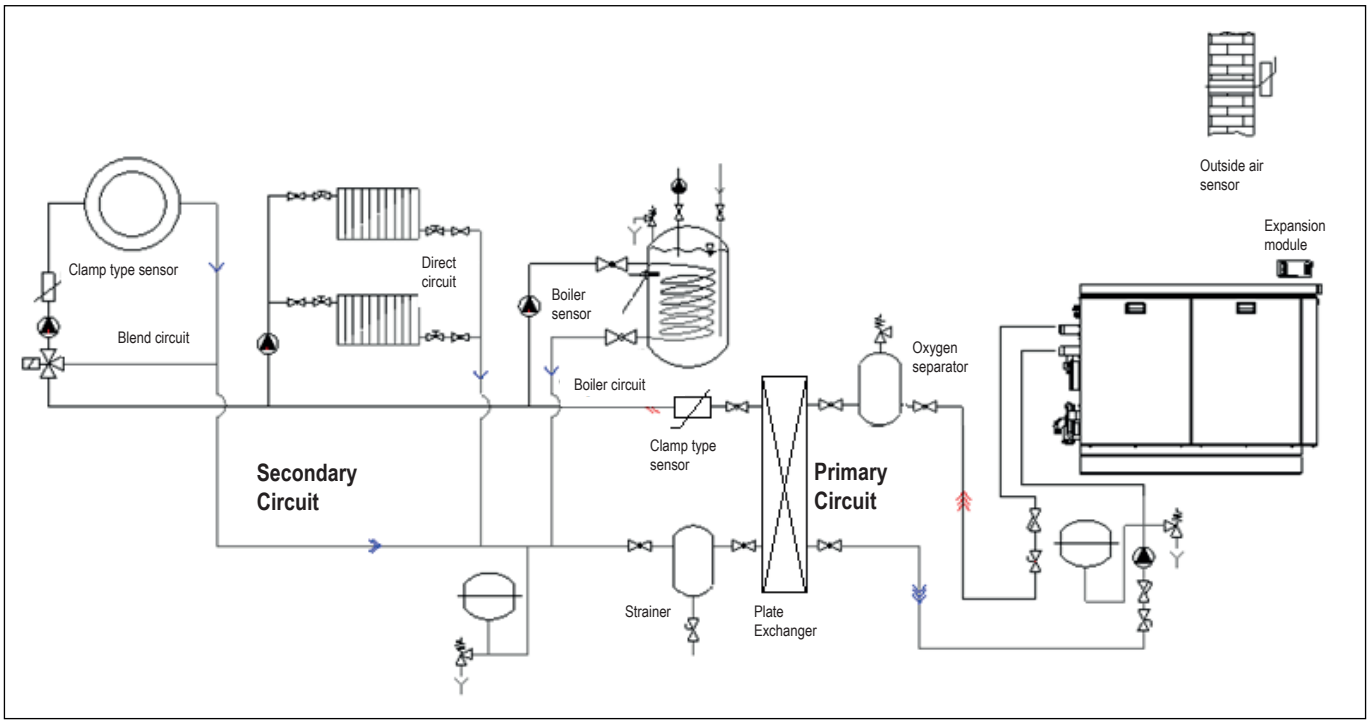


QAZ 36.522/109 NTC 10 kΩ

In order to transfer the temperature of the balance container used to the boiler control electronic board, wet type (immersion) sensors should be used primarily, but clamp type temperature sensors that can be mounted on the pipe can also be used.

- The balance container sensor that should be used in your system is QAZ 36.522/109 NTC 10 kΩ (0 / +95°C). If the sensor cable of the balance container is not sufficient, the second alternative is the QAZ36.526/109, which is 6m long.
- While the solar energy sensor you need to use in your system to monitor the temperature while storing the energy gained by solar energy in an accumulation tank may be the same as the balance tank sensor, it is recommended to use QAZ 36.481/101 NTC 10kΩ (-30 / +200°C) in places where it is possible (e.g. up to a maximum of 200°C) to be exposed to very variable temperatures.
- If there is another sensor you want to use, you can see the table below.

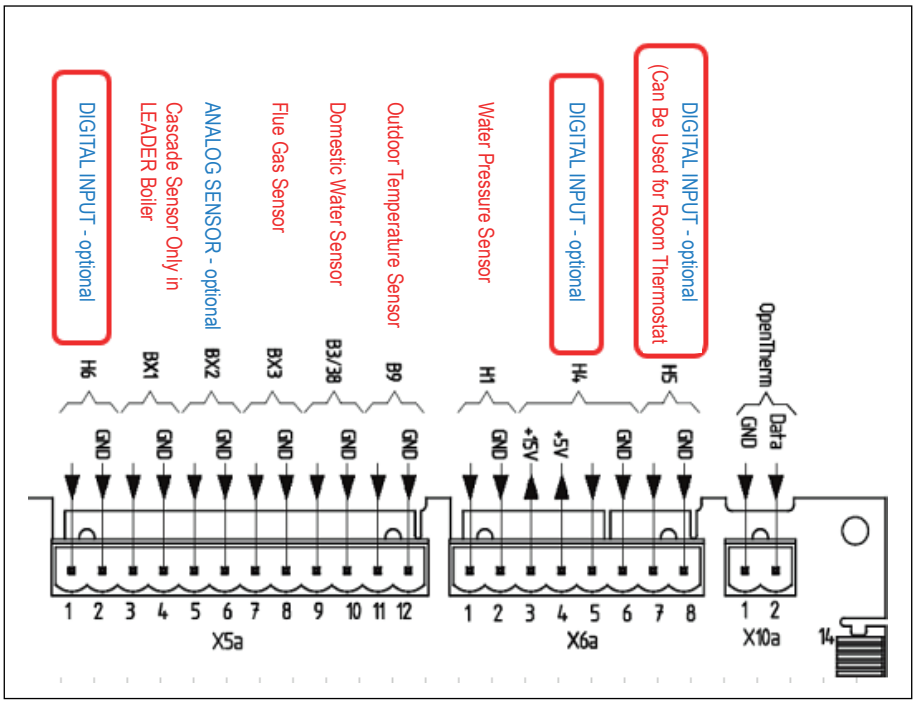
Place of Use	Type	Sensor name	Sensor type	Measuring Range	Tolerance	Time Constant	Cable Length	Appearance
Solar Collector	Immersion	QAZ36.481/101	NTC 10 kΩ - 25 °C	-30 / 200 °C	± 0,5 °C	30 s	1500 mm	
Balance Container or Boiler	Immersion	QAZ36.522/109	NTC 10 kΩ - 25 °C	0 / 95 °C	± 0,5 °C	30 s	2000 mm	
3-way Blend Valve or Exchanger with Primary-Secondary Circuit Separator Plate	Clamp	QAD36/101	NTC 10 kΩ - 25 °C	-30 / 125 °C	± 0,5 °C	6 s		
Outside Air Sensor	'	QAC 34/101	NTC 1 kΩ – 25 °C	-50 / 70 °C	± 1 °C	12 dk	Maximum allowed 120 m	



The clamp type sensor (QAD36/101) is used when a plate exchanger is used to separate the primary and secondary circuit, or when a 3-way valve is used for a blend circuit. The balance container sensor, boiler sensor, or solar collector sensor are immersion type sensors and a shell in which they are to be placed (immersed) is required where they will be used.

Use of Room Thermostat

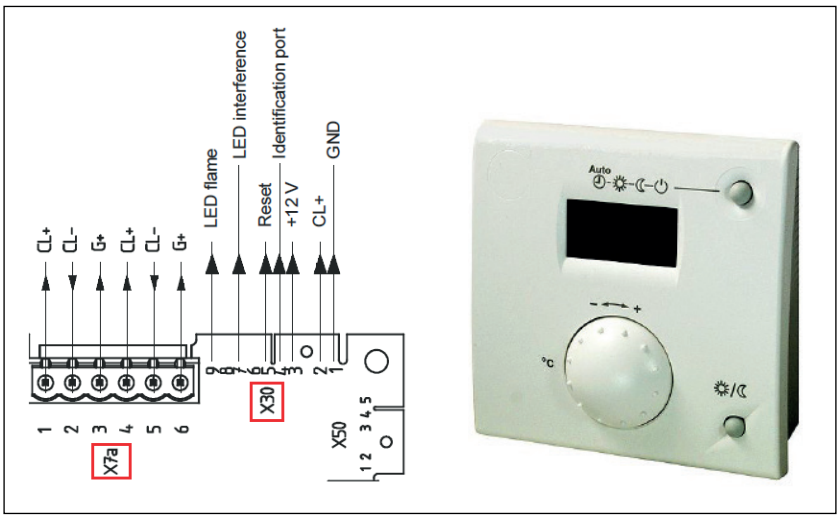
It is possible to place three room thermostats in your installed system, whether it is a singular or cascade system. Room thermostat can be placed in each of the 3 different zones. In other words, the boiler main board (LMS14) can be connected to three room thermostats. In this case, three different locations can transmit their heat demands to the main board digitally (on/off). Room thermostat connections can be made to H4, H5, or H6, which are digital inputs of LMS14.



Use of Indoor Room Unit

Alternatively, 2 indoor room units can be placed and two independent direct circuits can transmit their own heat demands to the system. LMS 14 can be connected with a maximum of 2 indoor room units.

If the indoor unit is used, the cable ends of the appliance should be connected to the contacts named CL+ and CL-. The relevant contact information can also be found in the LMS14 boiler main board terminal diagram. You may notice that it is located in terminals X7a and X30 for quick information. CL+ is BSB data connection, CL- is BSB ground connection. These connections will be used with the indoor room unit.



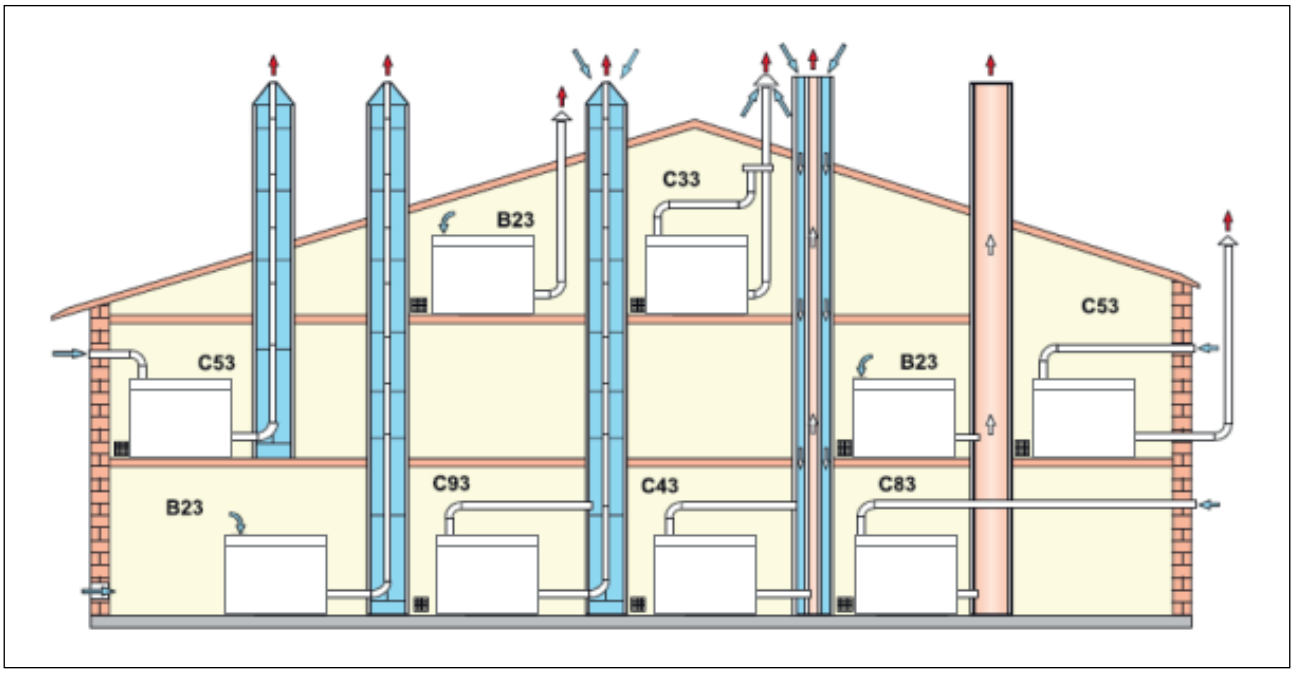
3.4. Flue Types and Elements

Chimney types and lengths are shown in the table below.

Tek kazanlı sistem

Flue Type	Flue radius [mm] (Air/Gas)	Horizontal Length [m]												
		175	200	235	265	310	350	425	500	575	700	850	1000	1150
B23 (P)*	160	60	60	60	56	26	16	-	-	-	-	-	-	-
	200	-	60	70	70	70	70	40	52	-	-	-	-	-
	250	-	-	70	70	70	70	90	70	54	70	-	-	-
	315	-	-	-	-	-	90	-	-	70	80	-	-	-
	400	-	-	-	-	-	-	-	-	-	-	45	39	36
	450	-	-	-	-	-	-	-	-	-	-	39	34	29
	500	-	-	-	-	-	-	-	-	-	-	34	29	26
C33 / C43	160/225	It should be calculated by a certified flue company comply with EN 13384 standard.												
	200/300													
	250/350													
	300/400													
	315/400													
	350/450													
	400/500													
C53	160/130	50	60	60	56	28	15	2	-	-	-	-	-	-
	200/130	-	60	60	60	60	60	48	-	-	-	-	-	-
	250/130	-	-	60	60	60	60	60	-	-	-	-	-	-
	200/300	-	-	-	-	-	-	-	56	-	-	-	-	-
	250/350	-	-	-	-	-	-	-	70	58	70	-	-	-
	315/400	-	-	-	-	-	-	-	-	70	80	-	-	-
	300/400	-	-	-	-	-	-	-	-	-	-	45	47	140
	350/450	-	-	-	-	-	-	-	-	-	-	39	40	100
	400/500	-	-	-	-	-	-	-	-	-	-	34	35	70
C63 / C83	160/225	It should be calculated by a certified flue company comply with EN 13384 standard.												
	200/300													
	250/350													
	300/400													
	315/400													
	350/450													
	400/500													
C93	160/130	32	24	22	20	24	22	-	-	-	-	-	-	-
	200/130	-	34	32	42	42	46	48	-	-	-	-	-	-
	250/130	-	-	30	38	36	40	50	-	-	-	-	-	-
	200/300	-	-	-	-	-	-	-	40	-	-	-	-	-
	250/350	-	-	-	-	-	-	-	48	6	52	-	-	-
	315/400	-	-	-	-	-	-	-	-	20	40	-	-	-
	300/400	-	-	-	-	-	-	-	-	-	-	-	-	-
	350/450	-	-	-	-	-	-	-	-	-	-	-	-	-
	400/500	-	-	-	-	-	-	-	-	-	-	-	-	-

Standard Flue Illustrations



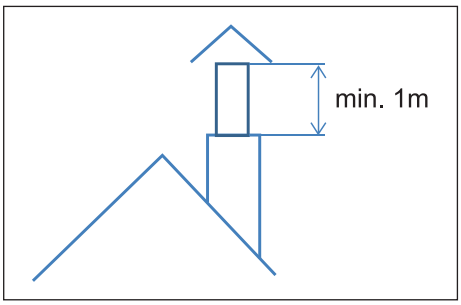
The condensate in the flue pipes should be flushed into the drain using the flue siphon. There must be a condensate pan in the freestanding flue, the condensate formed in the flue must not be transferred to the boiler or boiler flue connection pipes.

The flue types shown above are standard flue types in general use. Many applications are possible from the free suction of air from a ventilation shaft to both air intake and exhaust with a coaxial flue system in that shaft, to direct exhaust into the shaft with a split line while fresh air is sucked in by the building facade or to indirect exhaust where it passes through and reaches the roof, to direct exhaust and fresh air intake from the roof. Depending on the location or construction conditions where the commissioning will be made, you can project the air intake and exhaust installation of your cascade condensing boiler system or make a preliminary design with the flues described in this section, both with the existing types and with the standard flue kit equipment you can find below, or you can easily convey your requirements when you contact Alarko Carrier authorized dealers.

Standard Flue Types and Descriptions

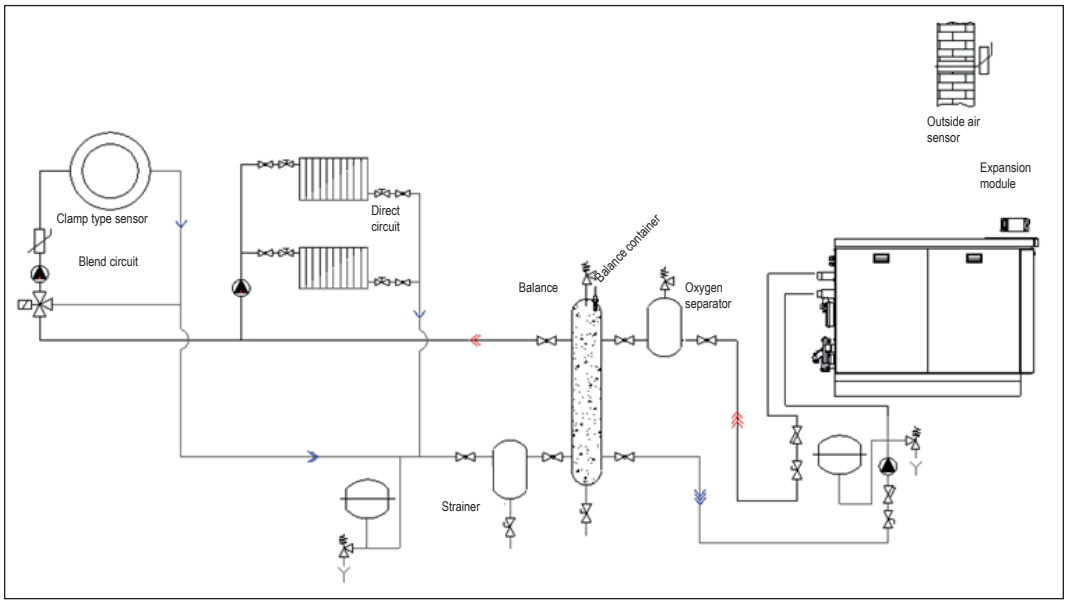
Flue Type	Description
B23	Waste gas pipe through the flue, fresh air from the room directly through the appliance (open type)
B23	Dual cascade waste gas pipe through the flue, fresh air from the room directly through the appliance (open type)
C33	Vertical concentric roof transition from sloping or flat roof (hermetic type)
C43	Connection to condensation-resistant fresh air/waste gas flue shaft, from appliance elbow center to flue connection maximum horizontal pipe length is 2m. (hermetic type)
C53	Waste gas pipe through the flue, fresh air from outside (hermetic type)
C83	Waste gas pipe through the flue, fresh air from outside (hermetic type)
C93	Waste gas pipe through the flue, fresh air pipe through flue shaft, horizontal concentric connection

In order to transfer the condensate formed in the flue pipes to the drain, the flue gas pipes should be installed with an upward slope towards the flue. The low gas collectors should be installed with an upward slope. This is essential in order to dispose of the condensate. The bottom end of the collector must have a condensate siphon.

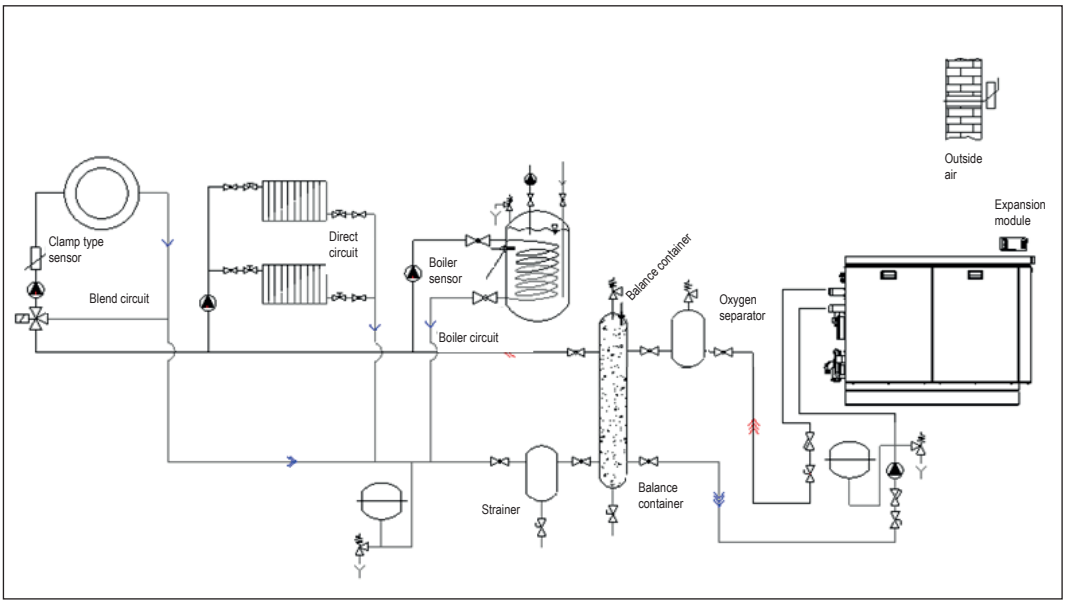


The distance between the flue gas pipe and the fresh air pipe should be at least 1 m in order to prevent the mixing of the waste gas and clean air.

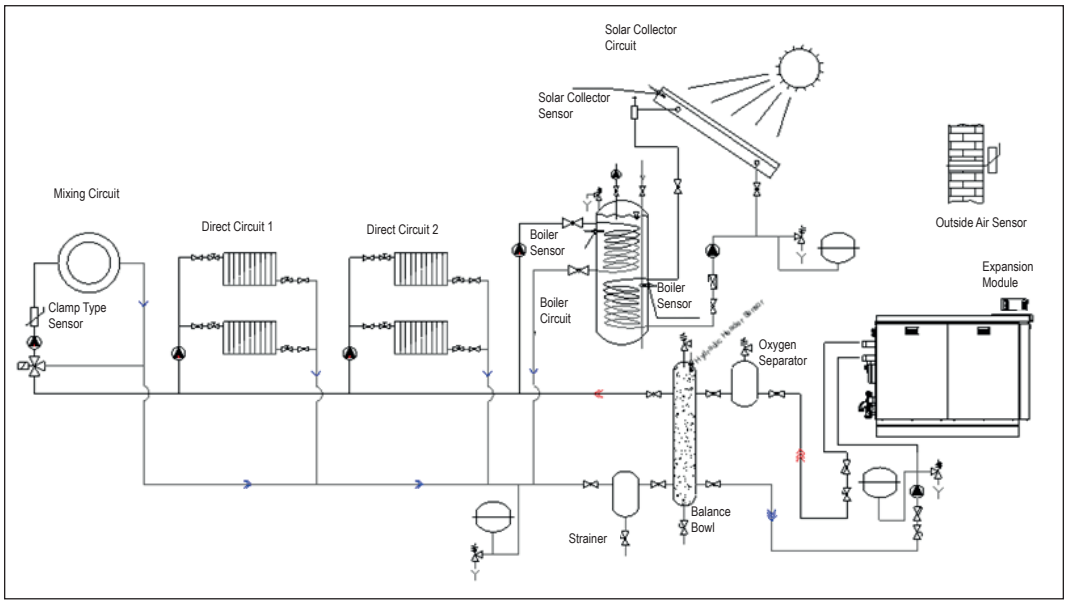
3.5. Boiler, Solar Collector, Direct and Blend Circuits, and Installation System Examples



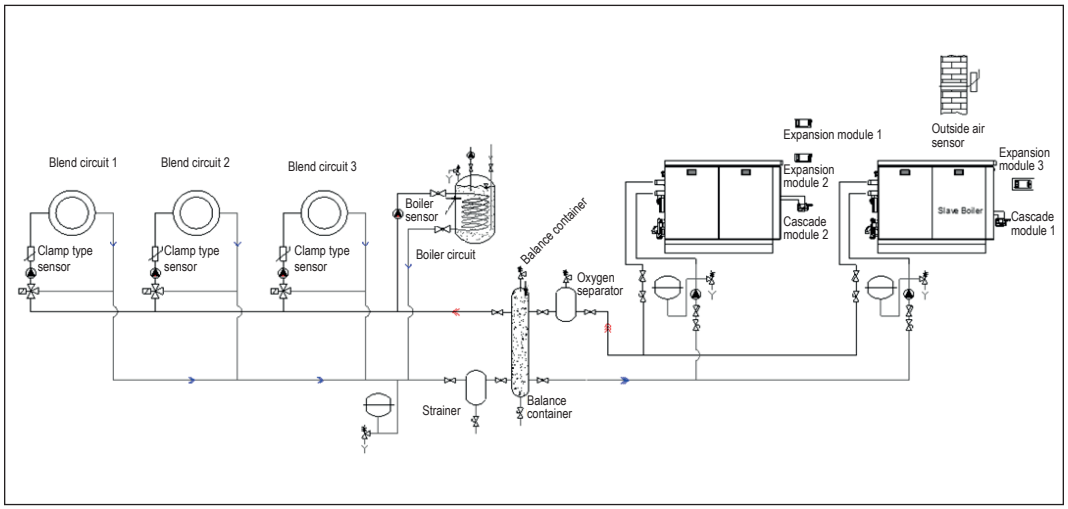
Single boiler, 1 direct circuit, 1 blend circuit connection example (with balance container)



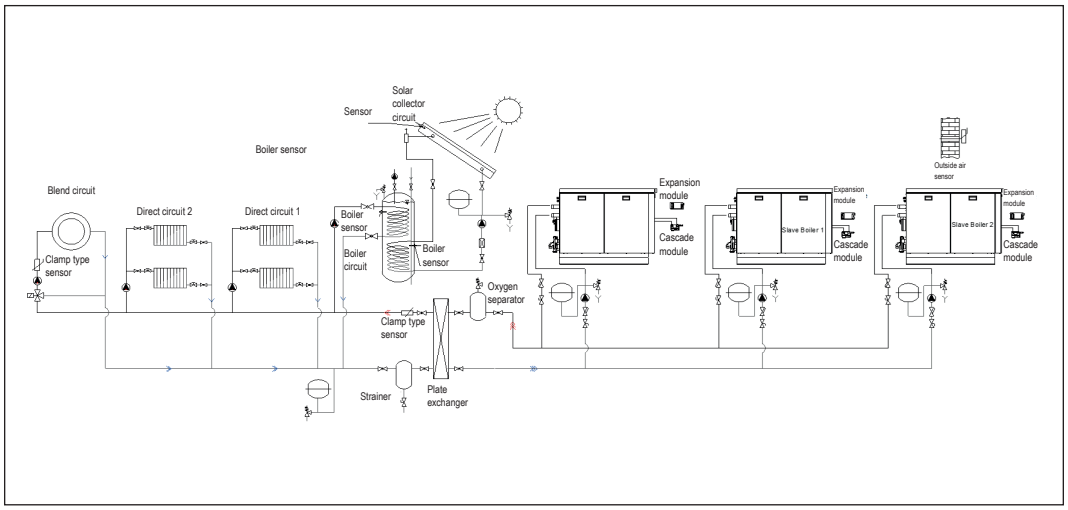
Single boiler, 1 direct circuit, 1 blend circuit, 1 boiler circuit connection example (with balance container)



Single boiler, 2 direct circuits, 1 blend circuit, 1 boiler circuit with solar collector connection example (with balance container)



Two (cascade) boilers, 3 blend circuits, 1 boiler circuit connection example (with balance container)



The connection example of three (cascade) boilers, 2 direct circuits, 1 blend circuit, 1 boiler circuit with solar collector with primary and secondary circuit separator plate exchanger

The following installations are examples of the availability of different system variations. Examples such as conventional domestic radiator heating with panel radiators as a direct circuit, as well as underfloor heating or a ventilation system to be used by transferring heat from water to air can also be given. It is possible to derive different variations.

Your Aldens F condensing boilers are suitable for up to 16 boiler cascade system installations. System management can be performed centrally through the OZW672 web server

3.6. Number of Boilers, Expansion Module, and Sensor Usage Numbers

Aldens F (pcs)	Boiler Pump	Direct Heating Circuit (Pump)	Blend Heating Circuit (Pump+3YMV+Sensor)	Solar Collector Circuit (Pump + Sensor)	Single Coil Boiler Circuit (Pump+Sensor)	Dual Coil Boiler Circuit (Pump+2xSensor)	Balance Container (Sensor)	Plate Exchanger (Sensor)	Cascade Module OCI345.06/101	Expansion Module AGU2.5	Outside Air Sensor OAC34.101	Clamp Type Sensor QAD36/101 (Blend Circuit & Plate Exchanger)	Immersion Type Sensor QAZ36.522/109 (Boiler & Balance Container)	Immersion Type Sensor QAZ36.481/109 (Solar Collector)
1	Stepped/PWM	1			1		1				1		2	
1	Stepped/PWM	1			1			1			1	1	1	
1	Stepped/PWM	2						1			1	1		
1	Stepped/PWM	3			1		1			1	1		2	
1	Stepped/PWM	3		1		1		1		1	1	1	2	1
1	Stepped	2			1		1			1	1		2	
1	PWM	2			1		1				1		2	
1	Stepped	2	1		1		1			2	1	1	2	
1	PWM	2	1		1		1			1	1	1	2	
1	Stepped/PWM	2	1	1		1	1			2	1	1	3	1
1	Stepped/PWM	1	1		1		1			1	1	1	2	
1	Stepped/PWM	1	2		1		1			2	1	2	2	
1	Stepped/PWM	1	2			1		1		2	1	3	2	
1	Stepped/PWM		1		1		1			1	1	1	2	
1	Stepped/PWM		2	1		1	1			2	1	2	3	1
1	Stepped/PWM		3	1		1	1			3	1	3	3	1
1	Stepped		3	2		1		1		4	1	4	2	2
1	PWM		3	2		1		1		3	1	4	2	2
2	Stepped/PWM	2	1		1			1	2	1	1	2	1	
2	Stepped/PWM		6	2		2	1		2	6	1	6	5	2
2	Stepped	3	3		2			1	2	4	1	4	2	
2	PWM	3	3		2			1	2	3	1	4	2	
3	Stepped	5			3		1		3	1	1		4	
3	PWM	5			3		1		3		1		4	
3	Stepped/PWM		9		1			1	3	9	1	10	1	
16	Stepped/PWM	24	24		8			1	16	24	1	25	8	
16	Stepped/PWM		48		16			1	16	48	1	49	16	

Notes

- In a cascade system, two consecutive different capacity boilers can be used, three different capacities or two large capacities cannot be used.
- There are 3 pump supply relays on the main board of each boiler. These are assigned as stepped boiler pump, direct circuit pump, and boiler pump. These can be changed.
- All stepped pumps with or without high energy class must be connected to the QX1 socket of the mains terminal or to one of the pump output relays of the expansion module using a contactor.
- High energy class pumps with PWM capability are connected to the AUX2 230V AC output socket of the mains terminal with a contactor and to the PWM connection socket of the signal terminal.
- Only 1 boiler pump can be controlled from each boiler, the boiler pump can be controlled up to the maximum number of boilers in the cascade.
- Expansion modules should be used at least as many as the number of blend circuits. Because the main board has no blend valve control.
- An expansion module can control the 3-way blend valve, pump, and sensor of a blend circuit. There is an additional 1 sensor output. If the blend circuit will not be controlled, 3 pumps can be controlled and 2 sensors can be connected.
- Up to 3 expansion modules can be installed on each boiler main board. Even if additional expansion modules are used in a boiler, maximum of 3 heating circuits (direct and/or blend circuit) can be controlled. 3 heating circuits can be seen from the display.
- Balance container or plate exchanger should be used as a separator between primary and secondary circuits, even if it is a single boiler or multiple boilers in the system.
- One outside air sensor is used in each system regardless of the number of boilers.
- Immersion type sensor is used in boiler and balance container.
- The clamp type sensor is used at the output of the blend circuit and the primary-secondary circuit separator plate exchanger.
- The boiler to be used in the solar collector system has dual coil and 2 boiler sensors are used.

4. SETTINGS AND MAINTENANCE

4.1. Access to Menus

To enter the menus, first navigate to the home screen. “Boiler temperature” or “Cascade temperature” will be displayed on the screen. There are 4 user levels in the LMS14 boiler control panel.

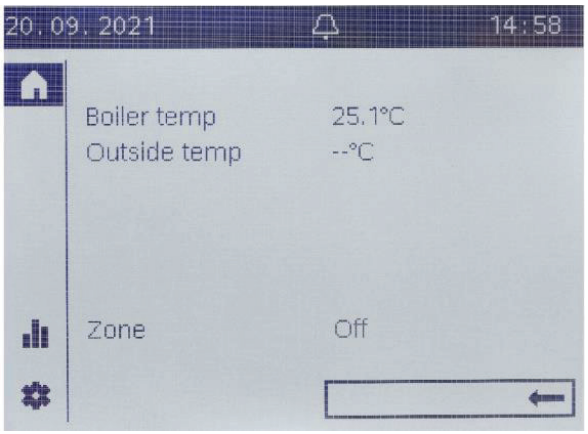
1. End user level – Used by authorized persons who are not Alarko personnel during the operation of the system.

2. Commissioning) – Used by Alarko’s authorized service during commissioning.

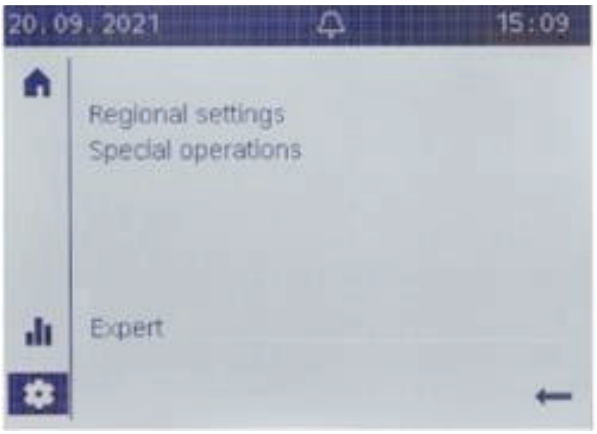
3. Heating engineer – Used by Alarko’s authorized service to perform operations at the engineering level.

4. OEM – Password is required to enter this level. It is only used in the factory.

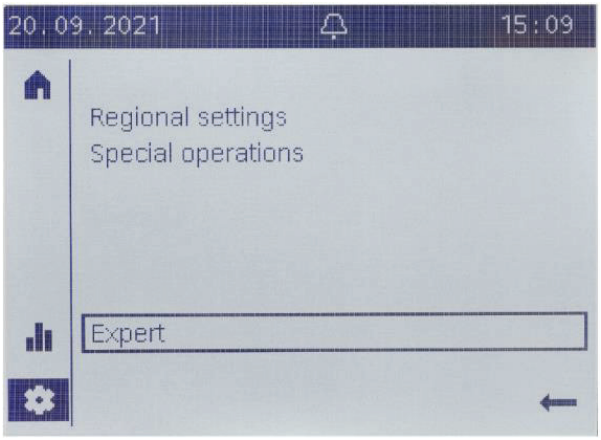
The authorized service that performs the commissioning should use the “Engineer” menu.

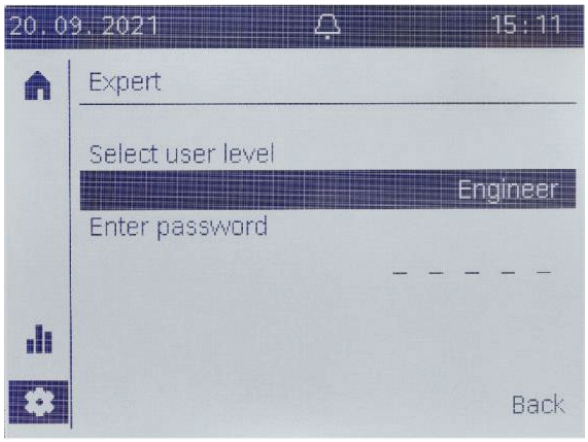


**Navigate to the end user screen.*



**Select the service/setting page.*
**Press the control button.*





**Turn the control knob and select “Expert”.*
**Press the control button. The user level will be displayed.*

4.1.1. Parameter Viewing and Setting

You can easily view and set parameters from the control panel. Some of these parameters are for display only and some can be set.

Navigating and Adjusting with the Control Knob

	The control knob is turned: Select the symbol in the navigation bar. The corresponding title is displayed in the workspace.
	The control knob is pressed: The title is selected. The first adjustable work item of the work area is selected.
	Go back using the back arrow button on the navigation bar.

Navigating to the Workspace and Setting Values

	The control knob is turned. The work item is selected.
	The control knob is pressed. The work item is selected. If the work item has multiple options (e.g. time schedule), the lowest level is displayed.
	The value is set.
	The set value is confirmed. The set work item is framed (preselection).
	Continue to navigate. ● In the titles on the selected page, you can go to other pages ● Go “Back” within the work area ● Return to the navigation bar with the back arrow

4.1.2. Automatic Mode Operation/Comfort Setting/Time Schedule Operation



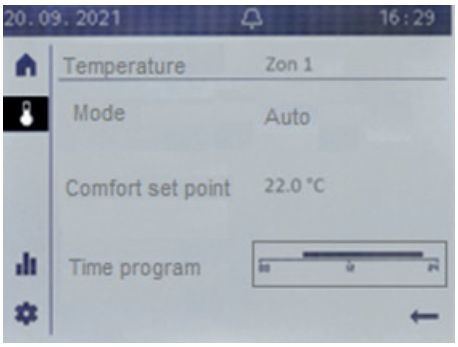
A s a rule, keep the operating mode in the Auto position. In this mode, the control is correct and the controller uses all means to save energy (e.g. summer/winter operation).

Another option is to operate the building or individual living spaces in Comfort, Economy or Frost protection operating modes without a continuous time schedule.



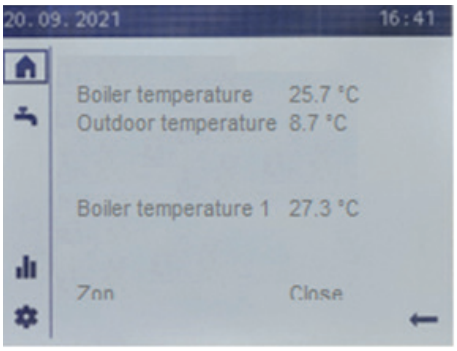
T he comfort temperature is the room temperature detected by the room unit in installations with a room unit.

In installations where the room unit is not used, it is a (composite) temperature that is detected after the temperature from the boiler outlet water detected by the system temperature sensor and the temperature read from the outside air sensor is processed in an algorithm embedded in the electronic card.



U se a time schedule to keep the building or living spaces at an economic temperature during daily free time or at night.

The time schedule is only used in Auto mode.



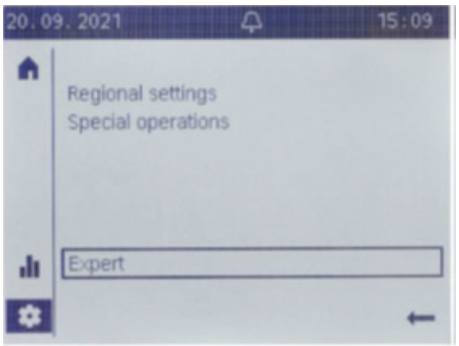
T he facility/area switch “Off” function is used to leave your building or apartment vacant for a long time. The building is switched to frost protection. Energy consumption is reduced to a minimum level.

If a return is made to the “Auto” mode, the entire site returns to operation mode.



Y ou can quickly access the relevant data in the building or living space using the information pages.

Pending device messages (symbols displayed in the status bar) are displayed on this page.



From the Settings page; Regional settings, Special operations, Settings and Expert tabs can be accessed.

From regional settings; Time, Date, Language settings can be made.

From special operations; Settings such as Device functions and Economy mode can be made.

From the Settings tab; Comfort adjustment, Frost protection adjustment, Heating curve inclination adjustment can be made.

In the Expert option, user-level parameter settings can be made.

For correct operation, it is first necessary to set the time and date of the device.

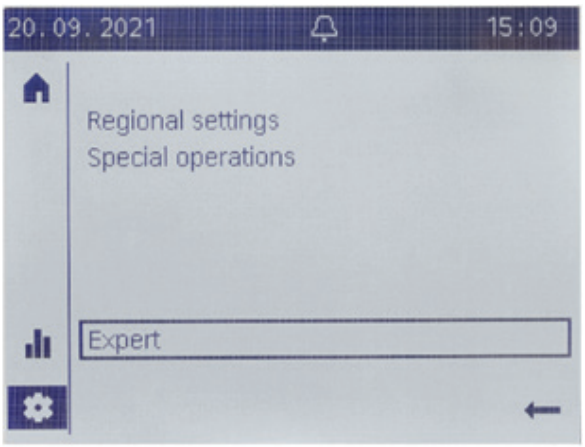
It is mandatory to use an outside air sensor in your system. If not, the boiler main board (LMS 14) detects the outside air temperature at 0°C.

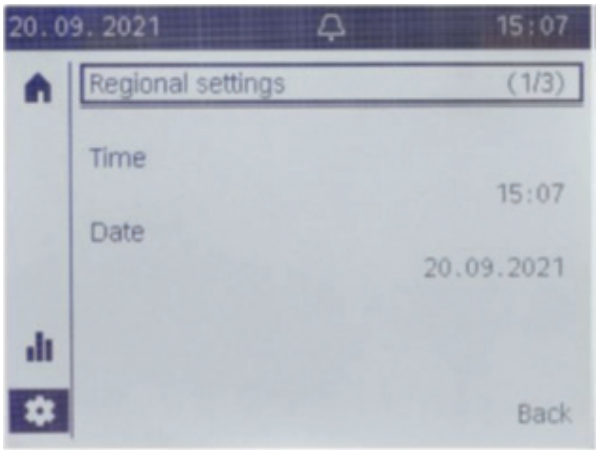
4.1.3. Practical Setting Information for Quick Commissioning

Regional Settings

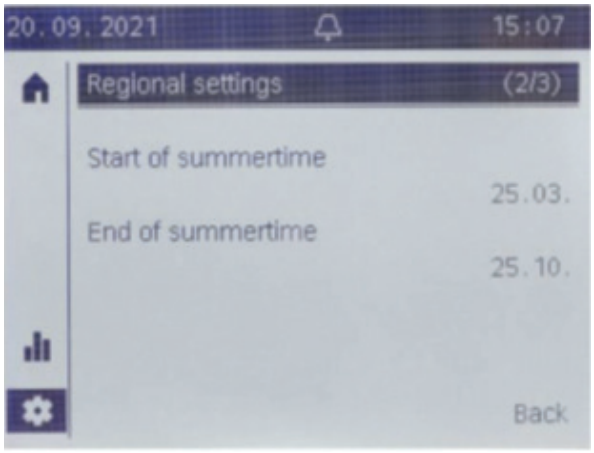
Menus to adjust

1. Time
2. Date
3. Daylight saving time start / Daylight saving time end
4. Language

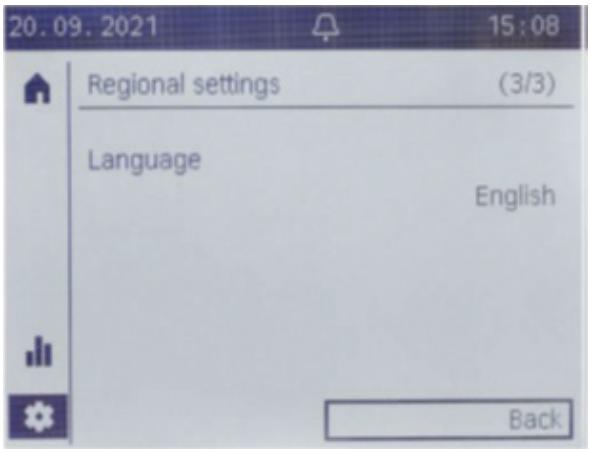




**Turn the control knob and select Regional settings.*
**Press the control button. 'Regional settings' will open.*



**Turn the control knob, enter the summer period settings.*
**Press the control button and save.*



**Turn the control knob, enter the language settings.*
**Press the control button and save.*

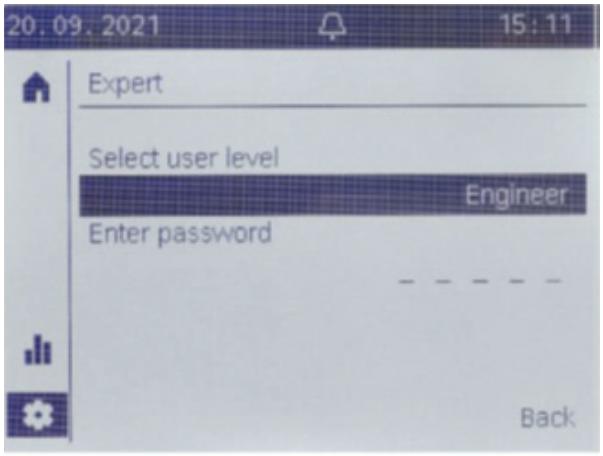
Adjusting at the engineer level

When you reach the engineer level by performing the above operations, the description of the parameters you will encounter will be as follows. Below are the parameters you will use frequently. When you reach the Engineer menu, you can go to the desired parameter by turning the control knob.

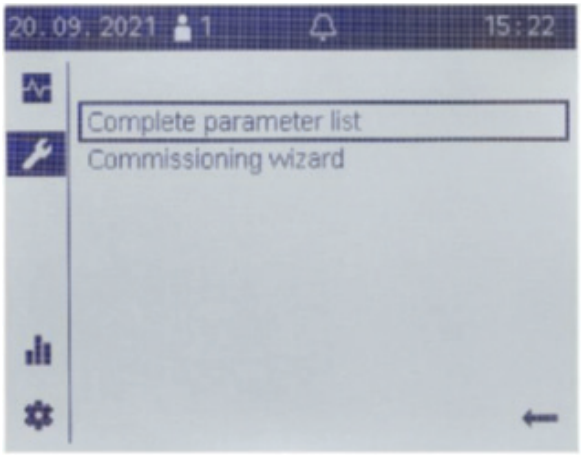
For correct operation, first set the time and date information of the device. This is necessary for automatic operation.

Building time constant

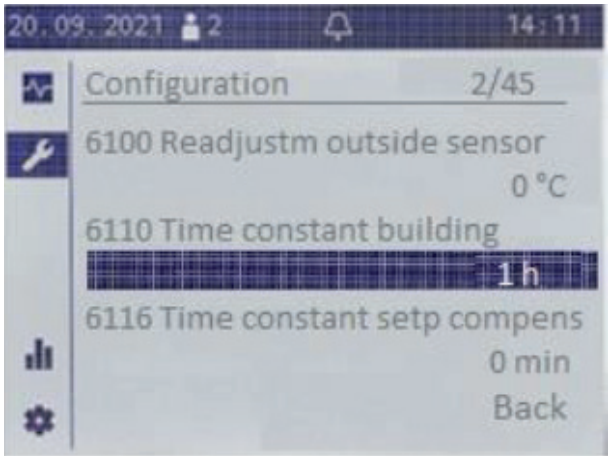
The value of no. 6110 “Building time constant” on the Engineer Configuration page should be 1. The factory setting is 1. This parameter determines the system’s self-adjusted outside air temperature is the “how long ago” value stored in its memory. If the value is set to “1”, it means that it uses the outdoor air temperature 1 hour ago to make a decision at that moment. Due to the increase in the temperature difference between day and night in seasonal transitions, the fact that this value is large may lead to the perception of insufficient heating. Never set this value to “0 (zero)”!



**Select the Engineer User level.*



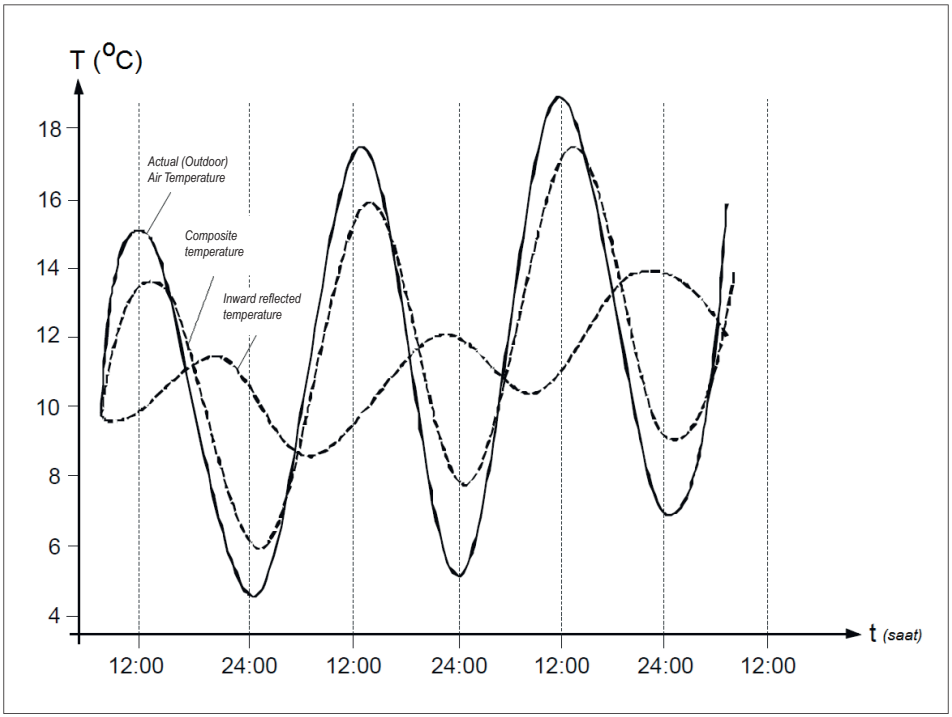
**Select “List of all parameters” from the settings page.*



**Select the configuration subtitle. Set the parameter 6110 as 1.*

Compound Temperature	Building time constant						
	0h	2h	5h	10h	15h	20h	50h
15 °C	0	3.1	7.7	15.3	23	30.6	76.6
10 °C	0	1.3	3.3	6.7	10	13.4	33.5
5 °C	0	0.9	2.1	4.3	6.4	8.6	21.5
0 °C	0	0.6	1.6	3.2	4.7	6.3	15.8
-5 °C	0	0.5	1.3	2.5	3.8	5	12.5
-10 °C	0	0.4	1	2.1	3.1	4.1	10.3
-15 °C	0	0.4	0.9	1.8	2.6	3.5	8.8
-20 °C	0	0.3	0.8	1.5	2.3	3.1	7.7

It should be noted that the temperatures given here are composite temperatures. The composite temperature is the average of the sudden and real outdoor temperature and the “supposed” outdoor air temperature. The graph below shows an example of the composite temperature depending on the outside and indoor air temperature.



Room effect and Room Thermostat

The composite temperature, which is the average of the indoor (site) and outdoor air temperatures with a certain ratio, is adjusted with the “Room Effect” parameters. The unit is % and the value range is between 1 and 100.

750 | RmTmp gain factor ID1 – For heating circuit 1

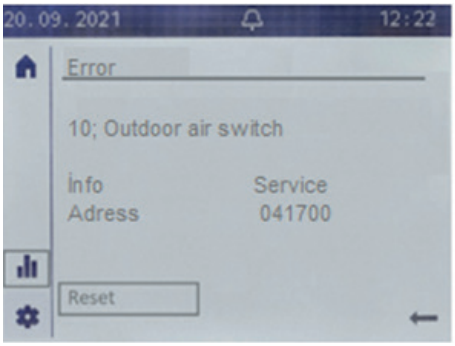
1050 | RmTmp gain factor ID2 – For heating circuit 2

1350 | RmTmpAuthority ID3/P – For heating circuit 3

Value	Averaging Type
---- %	Decision making only with outdoor air temperature (*)
1...99 %	Decision making with outdoor air temperature including
100 %	Decision making only with room thermostat
(*) Outdoor air temperature sensor is required.	

It is mandatory to use room thermostat in your system. If not, the boiler main board (LMS 14) will detect the outside air temperature as 0°C.

4.1.4. Managing Error and Maintenance Messages



Errors are indicated by an alarm symbol in the status bar.

High-priority errors are shown first.

Up to 2 error messages are displayed simultaneously on the information page. Error messages that the user can fix are reset. After the troubleshooting, the error message disappears.



T he maintenance message is indicated by a maintenance symbol in the status bar. High-priority maintenance messages are shown first.

Up to 2 maintenance messages are displayed simultaneously on the information page.

The maintenance message will disappear after the maintenance reason is removed.

4.1.5. Frost Prevention Settings

During the period when the appliance is off, the operation is carried out according to parameter 712. This parameter is **“Economy Temperature”.**

In cases where you operate the system according to the time schedule, if the appliance continues to operate even if it switches to the “economy” position and you do not want it to operate at all during this time, you can reduce parameter 712 to the minimum value. The minimum value you can lower parameter 712 is the value of parameter 714 **(Frost prevention temperature).**

If you want to reduce the frost protection to an even lower value, first minimize parameter 714 and then minimize 712.

Examine the following example carefully.

As a factory setting, the operating temperatures reach you as follows. Parameter 710 (Comfort temperature) = 20°C

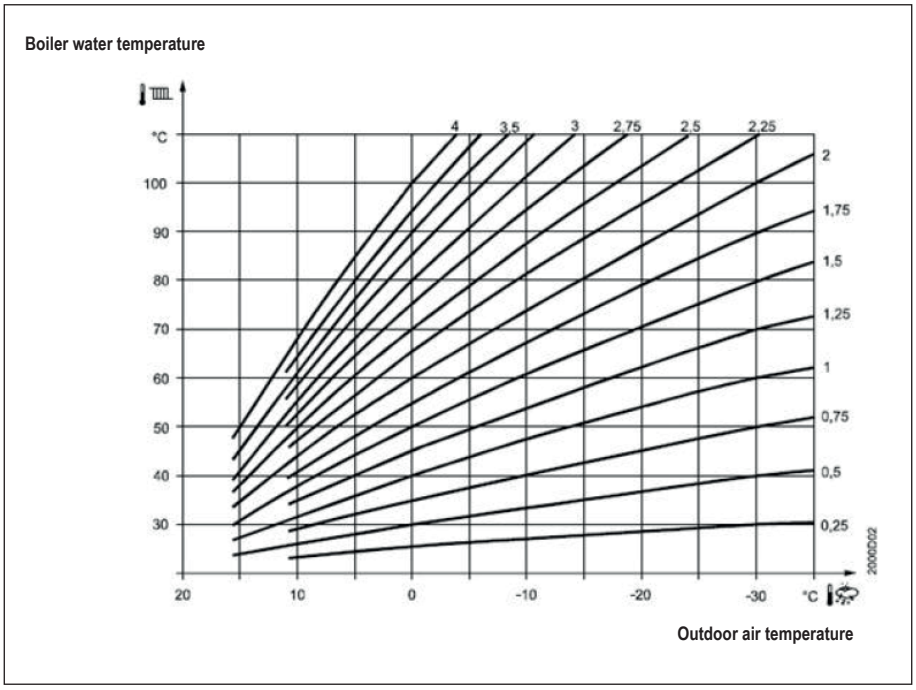
Parameter 712 (Economy temperature) = 16°C

Parameter 714 (Frost protection temperature) = 10°C

In these conditions, the Comfort Temperature cannot be lowered below 16°C. The Economy Temperature cannot be lowered below 10°C. These temperature values are interdependent.

Heating Curve

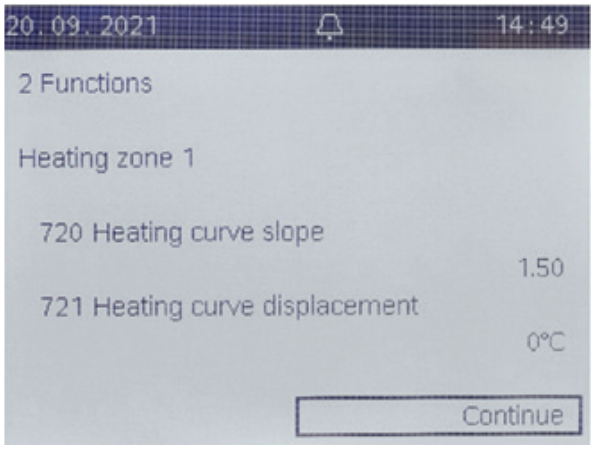
If heating is difficult despite the comfort temperature being raised, increase the parameter “Heating curve” (curve slope) on the heating circuits page.



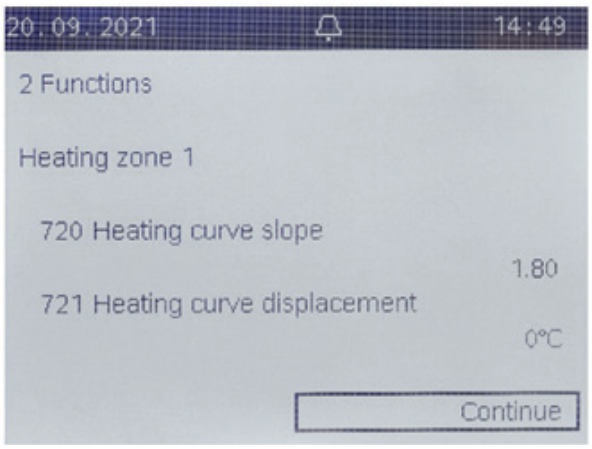
Thus, boiler water will be prepared at a higher temperature. During this preparation, the outside air and the comfort temperature also have an effect.

For example, in regions with 1.8 or continental climate, value 2 can be entered. The factory setting is 1.5. The heating curve change is made from the Settings page.

E.g.: Heating circuit 1 current value



E.g.: Heating circuit 1 escalated value



4.2. Main and Important Practical Parameters

Parameter	Intended Use	Unit	Transportation / Information (E: End user)
1	Hour/minute setting	hh:mm	E→Hour→1
2	Day/month setting	tt:MM	E→Hour→2
3	Year setting	jjjj	E→Hour→3
501	First on time	hh:mm	E→Time schedule Heating Circuit→501
502	First off time	hh:mm	E→Time schedule Heating Circuit→502
503	Second on time	hh:mm	E→Time schedule Heating Circuit→503
504	Second off time	hh:mm	E→Time schedule Heating Circuit→504
505	Third on time	hh:mm	E→Time schedule Heating Circuit→505
506	Third off time	hh:mm	E→Time schedule Heating Circuit→506
515	Copying operating time interval information to other active days	-	
710 /1010 /1310	Comfort temperature	(°C)	E→ Heating circuit 1^710 or from Home Screen
712 /1012 /1312	Economy temperature	(°C)	It can be scaled down to a maximum of 714. E→Heating circuit 1^712

Parameter	Intended Use	Unit	Transportation / Information (E: End user)
714 /1014 /1314	Frost prevention temperature	(°C)	E^ Heating circuit 1^714
720 /1020 /1320	Heating curve 1 slope	-	E^ Heating circuit 1^720
7170	Customer service / authorized service telephone number	-	XXXXXXXXX (9 digits) Reading: From the home screen

4.3. Boiler Maintenance Content

The items that should be checked without skipping in the maintenance of your Aldens F condensing boiler are listed below. Delaying or neglecting one or more of these items will have a life-limiting effect on your appliance and installation.

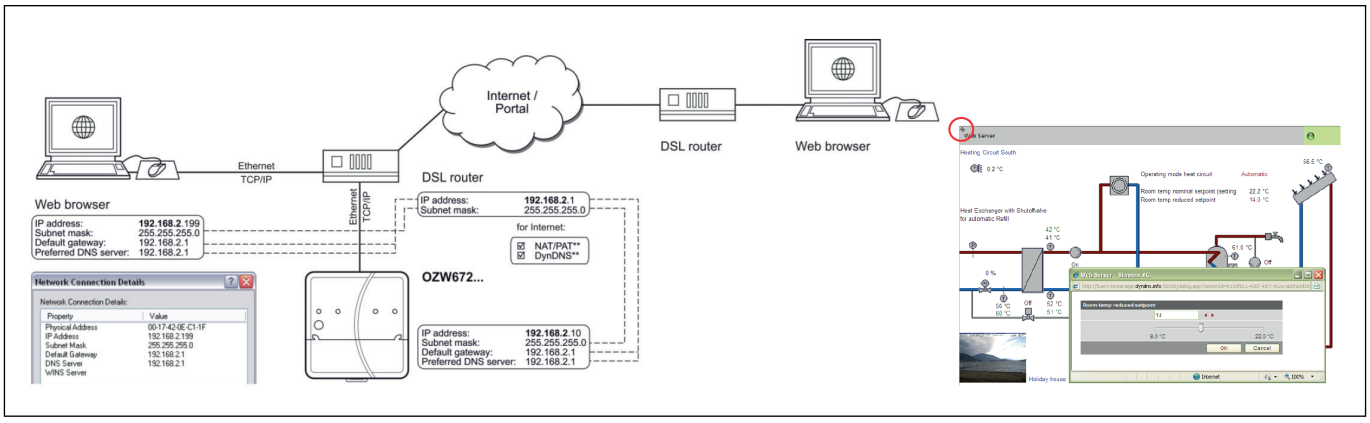
- Cleaning the exchanger
- Control of burners and electrodes
- Fan motor balance control
- Cleaning the fan fins Checking the thermostat and sensors Cleaning
- the siphon
- Checking the condensate drain
- Checking the pressure of the boiler expansion tanks, filling the gas if the pressure is low Checking the flue sealing

- Flue gas analysis and combustion control
- Gas leakage check of gas leak detector or detergent foam and pipe and gas valve-venturi connection after the gas valve
- Cleaning the strainer
- Cleaning the sludge/sediment holder
- Checking the level of the neutralizer container and granules, adding granules up to the level above the neutralizer container
- Checking that the system works properly with all sensors, modules, pumps, and 3YMVs Filling in the authorized service certificate

It is recommended that you ensure that the authorized service personnel who carry out the annual maintenance of your boiler on the issues mentioned here carry out the necessary examination in these matters and that they take the precautions.

4.4. System Monitoring and Control via Web Server and Local Network / Internet (OZW672)

In single, cascade, or combined systems (if there are other heating system elements such as solar collector, boiler, etc.), it is possible to control and monitor the system through the web server. With the use of OZW672 web server, it is possible to access your entire installed system via a local network or internet connection and to control it through the web browser. The elements of your heating system installed with this Siemens appliance are transformed into appliances that communicate within the local network and are connected to each other through OZW672 and to you through the web browser. It is possible to operate up to 16 boilers in a cascade.



5. ERRORS, PROBLEMS AND SOLUTION SUGGESTIONS

5.1. Error Codes

You can view the last 20 errors encountered by the LMS14 control panel on the “Error” page at the engineer level. As each new error occurs, the oldest errors in the memory are erased. The 20 most recent errors remain in memory. The error codes you may encounter in the system are as follows. When the errors in this list are encountered, you should contact the nearest authorized service. You can find the list of authorized services of your province and district on the last page of this manual. You can also visit http://www.alarko-carrier.com.tr/tr/alarko-carrier-yetkili-servis page for the updated authorized services list.

BSB* Error Code	LPB* Code	Error Definition BSB : Boiler System Bus LPB : Local Process Bus
10		Outdoor temperature, sensor error
20		Boiler temperature 1, sensor error
25		Solid fuel boiler temperature, sensor error
26		General flow water temperature, sensor error
28		Flue gas temperature, sensor error
30		Flow water temperature 1, sensor error
31		Flow water temperature 1, cooling, sensor error
32		Flow water temperature 2, sensor error
38		Flow water temperature, Main controller, sensor error
40		Return water temperature 1, sensor error
46		Cascade return water temperature, sensor error
47		General return water temperature, sensor error
50		Domestic water temperature 1 sensor error
52		Domestic water temperature 2 sensor error
54		Flow water temperature, sensor error
57		Domestic water, recirculation sensor error
60		Room temperature 1, sensor error
65		Room temperature 2, sensor error
68		Room temperature 3, sensor error
70		Storage tank temperature 1 (upper), sensor error
71		Storage tank temperature 2 (lower), sensor error
72		Storage tank temperature 3 (medium), sensor error
73		Collector temperature 1, sensor error

78		Water pressure, sensor error
82		LPB address conflict
83		BSB cable cross-sectional/no communication
84		BSB cable addresses conflict
85		BSB RF communication error
91		Overtime of data in EEPROM
98		Additional module 1, error
99		Additional module 2, error
100		2 time clocks leading
102		Leading time clock without backup
103		Communication error
105		Maintenance message
109		Boiler temperature inspection
110		STB (SLT) lockout
111		Temperature limit safety shutdown
117		Water pressure too high
118		Water pressure too low
119		Water pressure switch deactivation
121		Heating circuit 1 flow water temperature not reached
122		Heating circuit 2 flow water temperature not reached
125		Maximum boiler temperature exceeded
126		Domestic water supply temperature not reached
127		Domestic water legionella temperature not reached
128		Flame loss while running
129		Wrong air supply
130		Flue gas temperature limit exceeded
132		Gas pressure switch safety shutdown
133		Safety time for flame formation exceeded
146		Sensor/controller element configuration error
151		LMS14... internal error
152		Parameter error
153		The appliance is manually locked

160		Fan speed threshold not reached
162		Air pressure switch not closing
164		Flow/pressure switch, heating circuit error
166		Air pressure switch error, not opening
169		Sitherm Pro system error
170		Water pressure sensor error, primary side
171		Alarm contact 1 active
172		Alarm contact 2 active
173		Alarm contact 3 active
174		Alarm contact 4 active
176		Water pressure 2 too high
177		Water pressure 2 too low
178		Heating circuit 1 temperature limiter
179		Heating circuit 2 temperature limiter
183		The appliance is in parameter mode
195		Maximum time per charge exceeded
196		Maximum charging time per week exceeded
209		Heating circuit error
214		Monitoring the engine
215		Separator valve fan air error
216		Boiler error
217		Sensor error
218		Pressure inspection
241		Flow sensor error for efficiency measurement
242		Return sensor error for efficiency measurement
243		Swimming pool sensor error
260	217	Flow water temperature 3, sensor error
270	215	Exchanger temperature difference too high
317	214	Mains frequency out of allowed range
320	217	Domestic water supply temperature, sensor error
321	217	Domestic water outlet temperature, sensor error
322	218	Water pressure 3 too high

323	218	Water pressure 3 too low
324	146	BX input, same sensor
325	146	BX input/additional module, same sensor
326	146	BX input/blend group, same sensor
327	146	Additional module, same function
328	146	Blend group, same function
329	146	Additional module/blend group, same function
330	146	Sensor input BX1 no function
331	146	Sensor input BX2 no function
332	146	Sensor input BX3 no function
333	146	Sensor input BX4 no function
335	146	Sensor input BX21 no function
336	146	Sensor input BX22 no function
339	146	Collector pump Q5 missing
340	146	Collector pump Q16 missing
341	146	B6 sensor missing
342	146	Solar power supply B31 sensor missing
343	146	Solar energy integration lost
344	146	Solar energy control element spare tank K8 missing
345	146	Solar injector control element swimming pool K18
346	146	Solid fuel boiler pump Q10 missing
347	146	Solid fuel boiler comparison sensor missing
348	146	Solid fuel boiler address error
349	146	Accumulation tank return valve Y15 missing
350	146	Accumulation tank address error
351	146	Main controller/system pump, address error
352	146	Header without pressure, address error
353	146	B10 sensor missing
371	209	Heating circuit 3 flow water temperature
372	209	Heating circuit 3 temperature limiter
373	103	Additional module 3
374	169	Sitherm Pro calculation

375	169	BV step motor
376	169	Drift test limit value
377	169	Drift test prevented
378	151	Internal repetition
382	129	Repetition speed
384	151	Follower light
385	151	Mains low voltage
386	129	Fan speed tolerance
387	129	Air pressure tolerance
388	146	Domestic water sensor no function
426	151	Flue gas damper feedback
427	152	Flue gas damper configuration
429	218	Dynamic water pressure too high
430	218	Dynamic water pressure too low
431	217	Primary exchanger sensor
432	151	Ground function not connected
433	216	Primary exchanger temperature too high

Note: Manufacturer reserves the right to change any product specifications without notice.

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