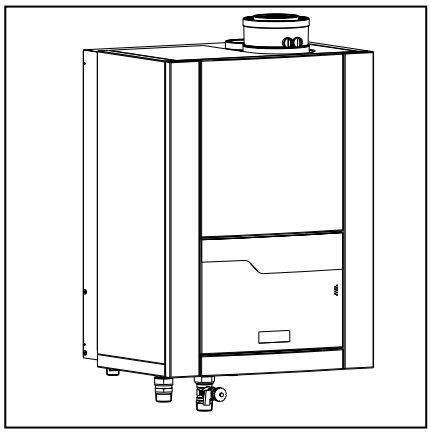
Operating Manual
for authorized technicians only

THISION S PLUS / Combi



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General regulations
This document contains important information with regard to safety and reliability of the installation, its commissioning and the operation of the THISION S PLUS boiler. All described activities must be carried out exclusively by authorized technicians.

Only OEM parts of the boiler manufacturer may be used; in contrary cases, our warranty and guarantee provisions are excluded.

Intended use
The THISION S PLUS is a condensing and modulating gas boiler, which is suspended from walls and is delivered with a pre-mix burner, either with or without integrated warm water heating. The maximum target temperature of the boiler is 85°C.

Standards and regulations
All applicable standards (both European and national) must be observed during the installation and operation of the THISION S PLUS boiler, including:
- Local building regulations, with regard to the installation of heating facilities and waste gas exhaust systems;
- Regulations about a connection to the electrical utility network (mains);
- Regulations of the local gas utility;
- Standards and regulations concerning safety facilities for heating systems;
- Additional local laws/regulations, which are applicable to the installation and operation of heating systems.
- See the chapter “Commissioning”, for those regulations applicable to heating water and warm water quality.

The THISION S PLUS boiler is CE-certified and conforms to the following European directives and standards:
- 92 / 42 / EEC (Efficiency of hot water heating systems)
- 2009 / 142 / EEC (Gas consuming facilities)
- 2006 / 95 / EEC (Safety of electrical operating resources)
- 2004 / 108 / EEC (EMC compatibility)
- EN 483 (Requirements for gas-fired systems up to 70 kW)
- EN 15420 (Requirements for gas-fired systems – type C boiler 70 kW – 1000 kW)
- EN 15417 (Special requirements for condensing gas-fired boilers 70 kW – 1000 kW)
- EN 50165
  Electrical equipment for non-electric appliances, intended for household use and similar purposes - safety requirements
- EN 15502-1 (Requirements for gas-fired systems – Part 1: General requirements and tests)
- EN 55014-1 (2000) EMC – Requirements for household appliances, electrical tools and similar equipment – Part 1: Emissions
- EN 55014-2 (1997) EMC – Requirements for household appliances, electrical tools and similar equipment – Part 2: Safety - product family standard
- EN 61000-3-2 (2000) Electromagnetic compatibility (EMC) - Part 3-2: Framework conditions - framework conditions for current fluctuations (current drain 16 A per phase)
- EN 61000-3-3 (2001) Electromagnetic compatibility (EMC) - Part 3-3: Framework conditions for voltage fluctuations, voltage loss and flicker in public low-voltage networks, for equipment with a nominal 16 A current per phase, which are not subject to any special connection regulations.
- EN 60335-1 (2002) Household and similar electrical equipment - Safety - Part 1: General requirements
- EN 60335-2-102 (2006) Household and similar electrical equipment - Safety - Part 1: Special requirements for gas, oil and solid fuel-fired equipment with electrical connections

In addition to this, the following national standards must be observed:

UK:
- Gas Safety Installation & Use Regulations
- BS 5440-1:2008
- BS 5440-2:2009
- BS 6798:2014

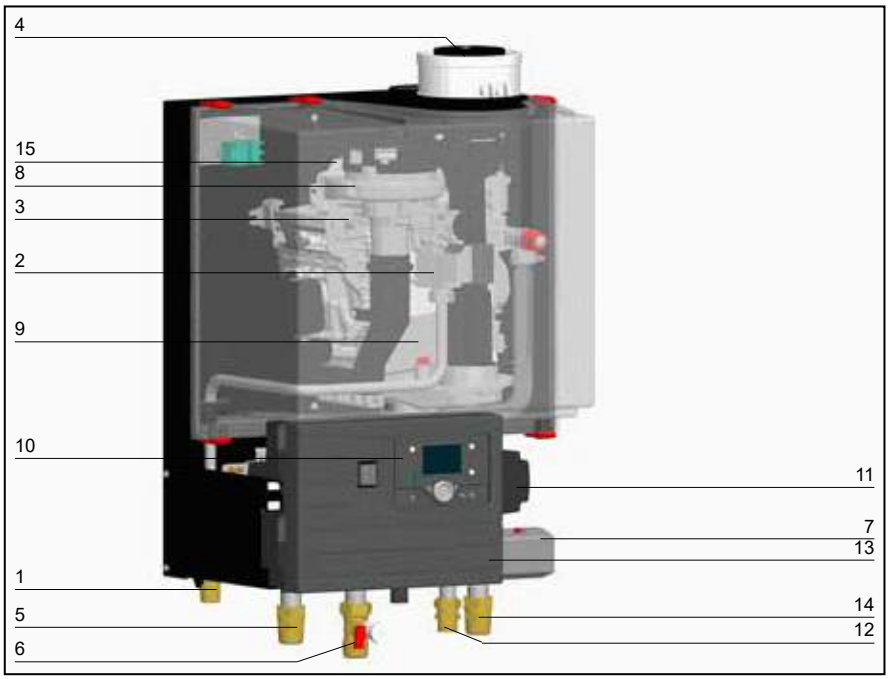
The facility may only be operated by authorized persons, who have been trained with regard to the functions and the use of the system. Inexpert use can damage the equipment or the connected system.

The equipment may not be used by children, by persons with a hindrance of bodily, mental or sensory capacities, or which insufficient experience and know-how, unless they are supervised or have received corresponding instructions.

It must be ensured that children cannot play with the equipment.

Product description

THISION S PLUS



Legend:
1 Gas connection
2 Gas armature
3 Gas burner
4 Flue gas connection
5 Boiler flow connection
6 Boiler return connection
7 3-way valve*
8 Fan 230 V
9 Heat exchanger
10 Control panel with heating manager
11 Boiler pump
12 Expansion vessel connection
13 Analog manometer (not visible here)
14 Cylinder outflow
15 Flue gas non-return valve

Product description
The THISION S PLUS is a condensing and modulating gas boiler with a pre-mix burner, which is attached to a wall. It is characterized by the following features:
- A large modulation range that guarantees a long burner service life, while minimizing standby losses, start-up emissions and material wear-and-tear.
- Flue gas temperature below 80°C
- Flue gas temperature fuse
- Also suitable for room sealed conditions
- Control panel with all operational elements
- Microprocessor, with multi-functional display
- Automated ignition, with repetition and ionization monitoring
- Water pressure monitoring
- Analog manometer
- Energy-saving pump
- Installed safety valve
- Stainless steel heat exchanger with smooth tube condenser
- Very maintenance-friendly
- Weather-compensated control with room unit/remote control QAA 55, or with room unit/remote control QAA 75/78 (accessory)
- Modern metal panelling, stove-enamelled

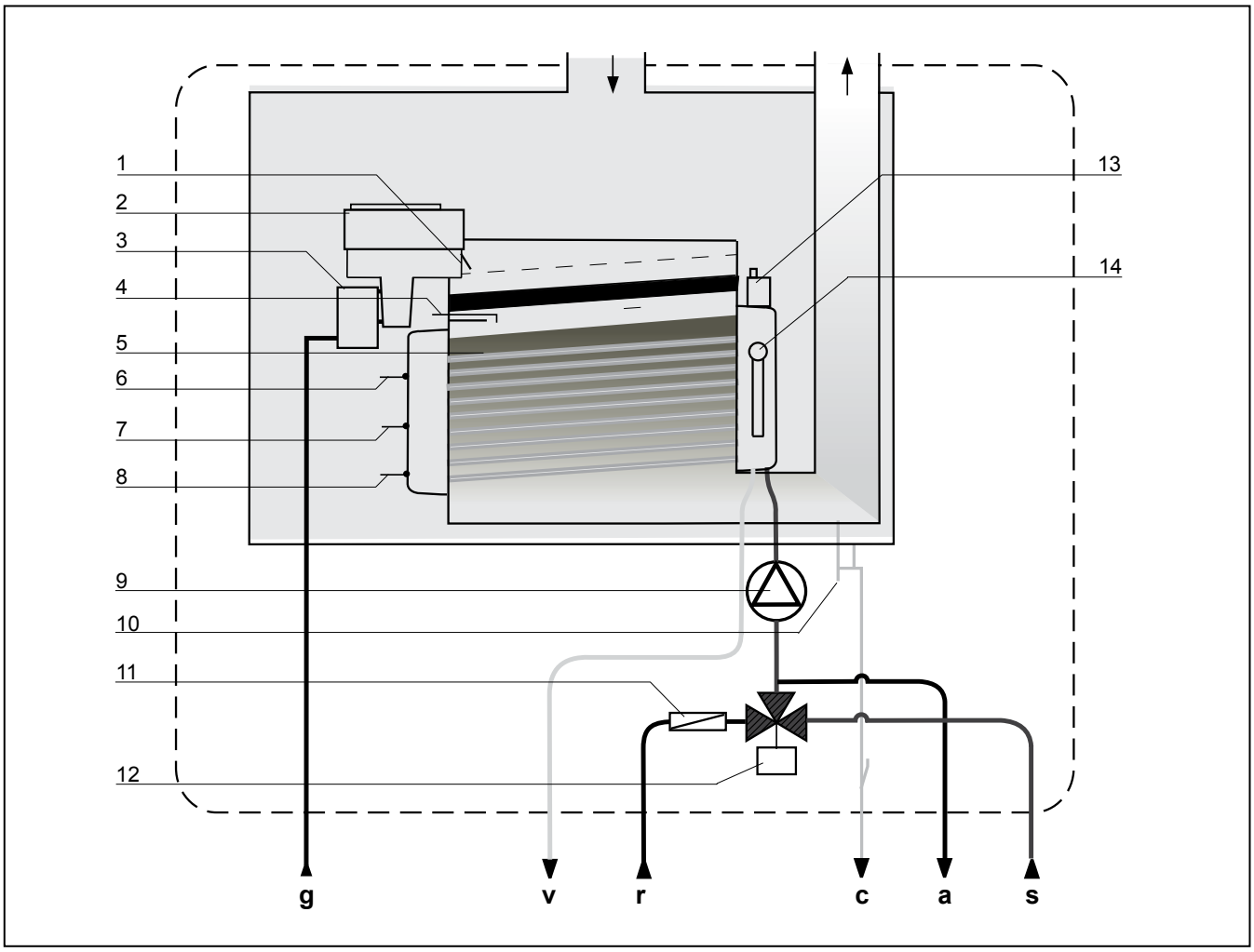
Functional description
The control unit modifies the heating performance to the current heating requirements, by changing the default values of the fan rotating speed. In this regard, the boiler flow temperature is continually measured via a sensor. In case of a deviation of the actual temperature from the target temperature, the control unit reacts immediately and adjusts the RPM of the Fan, and with that the boiler performance via the gas armature. A deviation can be due to:
- A changed default value of the boiler temperature, via the LMS 14 heating control unit
- A change on the outdoor temperature
- Request for warm water
- Changed heating curve
- Changed volume flow in the heating system (due to thermostat valves and mixer)

By means of the integration of the individual components in a system, and within the control range of the equipment, it is ensured that the boiler performance always corresponds to the actual heating requirements.

Delivery scope
The boiler, which has been assembled at the factory and is ready to use, is delivered in cardboard packaging. The following is contained in the delivery scope of the THISION S PLUS:
- Modulating high efficiency gas-fired boiler, 4.5 to 54 kW
- Installed safety valve
- Installed 3-way valve*
- Outdoor sensor QAC 34
- DHW sensor QAZ 36
- Room unit QAA 55

* Only for THISION S PLUS 13, 19 and 24. Available for the types THISION S PLUS 34, 35L, 46 and 54 as an optional accessory.

THISION S PLUS hydraulic circuit diagram



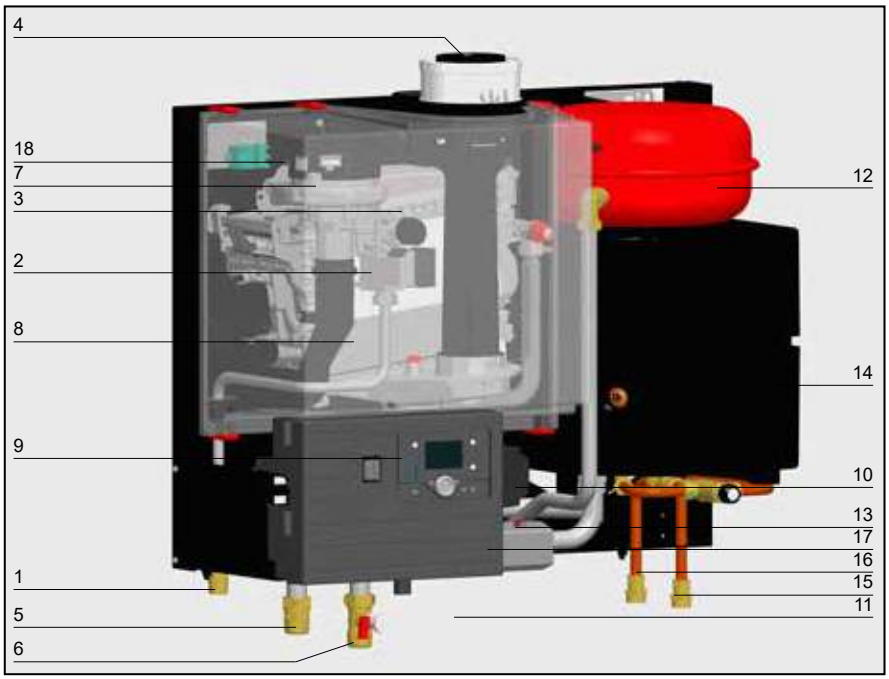
Legend:

1 Flue gas non-return valve
2 Modulating Fan
3 Gas valve
4 Ionization and ignition electrode
5 Primary heat exchanger
6 Boiler flow sensor NTC1
7 Boiler return sensor NTC2
8 Water pressure sensor P1
9 High-efficiency pump
10 Siphon
11 Heater dirt trap
12 3-way valve
(Only for THISION S PLUS 13, 19 and 24. Available for the types THISION S PLUS 34, 35L, 46 and 54 as an optional accessory.)
13 Automatic ventilator
14 3 bar safety valve

g Gas connection
v Boiler flow connection
r Boiler return connection
c Condensate drain
a Expansion vessel connection (only types 13, 19 and 24. This is only available for the types 34, 46 and 54, when a 3-way valve has been installed as an accessory)
s Cylinder return connection
(Only types 13, 19 and 24. This is only available for the types 34, 35L, 46 and 54, when a 3-way valve has been installed as an accessory)

Product description

THISION S PLUS Combi



Legend:
1 Gas connection
2 Gas armature
3 Gas burner
4 Flue gas connection
5 Boiler flow connection
6 Boiler return connection
7 Fan 230 V
8 Heat exchanger
9 Control panel with heating manager
10 Boiler pump
11 Expansion vessel connection (Combi 34)
12 Expansion vessel (Combi 24)
13 3-way valve
14 DHW tank
15 Cold water connection
16 Warm water connection
17 Analog manometer (not visible here)
18 Flue gas non-return valve

Illustration: THISION S PLUS Combi 24

Product description
The THISION S PLUS Combi is a condensing and modulating gas boiler with a pre-mix burner, which is attached to a wall. It is characterized by the following features:
- A large modulation range that guarantees a long burner service life, while minimizing standby losses, start-up emissions and material wear-and-tear.
- Flue gas temperature below 80°C
- Flue gas temperature fuse
- Also suitable for operation independent of room air
- Control panel with all operational elements
- Microprocessor with a multi-function display
- Automated ignition, with repetition and ionization monitoring
- Water pressure monitoring
- Analog manometer
- Energy-saving pump
- Installed safety valve
- Stainless steel heat exchanger with smooth tube condenser
- Very maintenance-friendly
- Weather-compensated control with room unit/remote control QAA 55, or with room unit/remote control QAA 75/78 (accessory)
- Modern metal panelling, stove-enamelled

Functional description
The control unit modifies the heating performance to the current heating requirements of the heating system, by changing the default values of the Fan rotating speed. In this regard, the boiler flow temperature is continually measured via a sensor. In case of a deviation of the actual temperature from the target temperature, the control unit reacts immediately and adjusts the RPM of the fan, and with that the boiler performance via the gas armature. A deviation can be due to:
- A changed default value of the boiler temperature, via the LMS 14 heating control unit
- A change on the outdoor temperature
- Request for warm water
- Changed heating curve
- Changed volume flow in the heating system (due to thermostat valves and mixer)

By means of the integration of the individual components in a system, and within the control range of the equipment, it is ensured that the boiler performance always corresponds to the actual heating requirements.

Delivery scope
- Modulating gas burner, with DHW preparation in a circulation system
- Comfort DHW performance by means of an integrated flash tank
14 litres (Combi 24)
25 litres (Combi 34)
- DHW performance
13.4 l/min. (Combi 24)
16.6 l/min. (Combi 34)
at ΔT 30 K, according to EN625
- Installed safety valve
- Outdoor sensor QAC 34
- Room unit/remote control QAA 55

THISION S PLUS Combi hydraulic circuit diagram

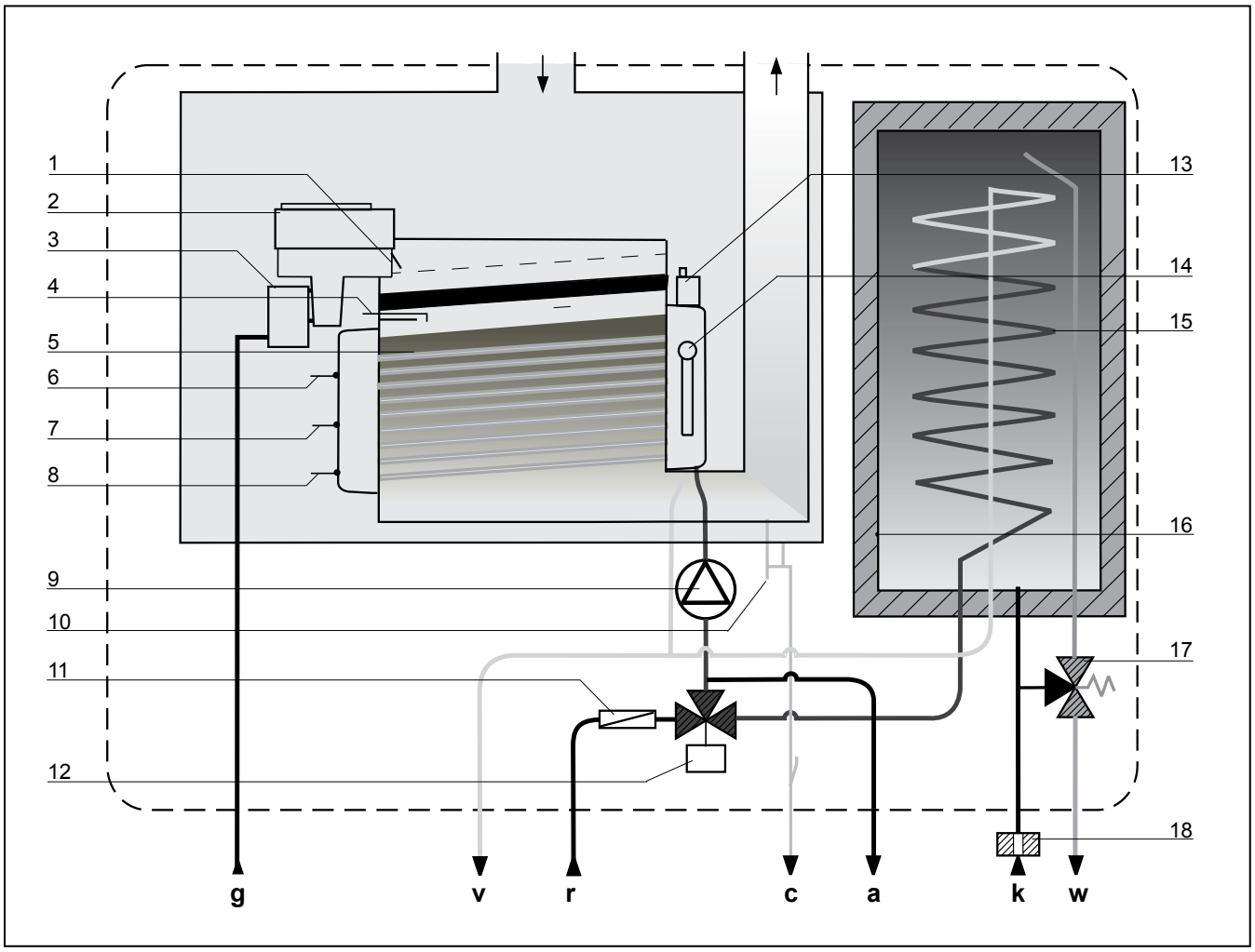


Illustration: THISION S PLUS Combi 34

Legend:

1 Flue gas non-return valve
2 Modulating Fan
3 Gas valve
4 Ionization and ignition electrode
5 Primary heat exchanger
6 Boiler flow sensor NTC1
7 Boiler return sensor NTC2
8 Water pressure sensor P1
9 High-efficiency pump
10 Siphon
11 Heater dirt trap
12 3-way valve
13 Automatic ventilator
14 3 bar safety valve
15 Reserve tank heat exchanger for warm water
16 Warm water sensor NTC3
17 Mixing valve thermostat
18 Flow-through limiter

g Gas connection
v Boiler flow connection
r Boiler return connection
c Condensate drain
a Expansion vessel connection (C 34)
k Cold water connection
w Warm water connection

Technical data for THISION S PLUS

Type THISION S PLUS					13	19	24	34	35L	46	54
Permit Category SVGW number					CE0063BQ3021 BE-I2E(S), I3P						
Heat exchanger type					OSS1	OSS1	OSS1	OSS2	OSS4	OSS4	OSS4
Output	G20	Full load	80/60°C	kW	13,9	18,2	22,1	33,6	34,2	44,9	52,9
			40/30°C	kW	14,4	19,7	23,9	36,3	37,0	48,7	57,3
		Low load	80/60°C	kW	3,5	3,5	3,5	4,9	8,8	8,8	8,8
			40/30°C	kW	3,9	3,9	3,9	5,3	9,8	9,8	9,8
	G25	Full load	80/60°C	kW	11,3	14,9	18,0	27,3	27,8	36,6	43,1
		Low load	80/60°C	kW	3,1	3,1	3,1	4,1	7,5	7,5	7,5
	G31	Full load	80/60°C	kW	13,9	18,2	22,1	33,6	34,2	44,9	52,9
			40/30°C	kW	14,9	19,4	23,6	35,9	36,6	48,2	56,7
		Low load	80/60°C	kW	9,9	9,9	9,9	15,8	31,7	31,7	31,7
			40/30°C	kW	11,0	11,0	11,0	17,6	35,2	35,2	35,2
Input	G20	Full load		kW	14,1	18,5	22,5	34,2	34,9	45,9	54,0
		Low load		kW	3,6	3,6	3,6	5	9	9	9
	G25	Full load		kW	11,5	15,2	18,4	27,9	28,4	37,3	44,0
		Low load		kW	3,2	3,2	3,2	4,2	7,5	7,5	7,5
	G31	Full load		kW	14,1	18,5	22,5	34,2	34,9	45,9	54,0
		Low load		kW	10	10	10	16	32,0	32,0	32,0
Boiler efficiency		Full load	80/60°C	%	98,4	98,3	98,2	98,2	97,9	97,9	97,9
		Low load	40/30°C	%	109,7	109,7	109,7	109,1	109,3	109,3	109,3
Gas type					Natural gas or propane gas						
CO_2 natural gas		min./max.		Vol. %	8,8 / 9,2						
CO_2 propane gas		min./max.		Vol. %	10,5						
O_2 natural gas		min./max.		Vol. %	4,6 / 5,4						
NOx annual emissions value			($3\%O_2$)	mg/m^3	14	20	22	22	16	16	21
CO annual emissions value			($3\%O_2$)	mg/m^3	17	15	13	11	28	29	24
Standby losses			Tk 70°C	W	42	42	42	55	89	89	89
Max. flue gas temperature				80/60°C	68	68	68	69	70	70	70
Mass flow of flue gas		max.		g/s	6,2	8,2	10,3	15,6	16,4	21,0	24,7
Overpressure at boiler output		max.		Pa	75	75	75	75	90	90	90
Water volume in heating circuit				l	3,5	3,5	3,5	5	7	7	7
Weight				kg	50	50	50	53	64	64	64
Gas flow pressure - standard				mbar	20						
Gas flow-pressure min./max.				mbar	17 / 25						
Operating pressure of heating unit		min./max.		bar	1 / 3						
Operating temperature of warm water		max		°C	65						
Voltage/frequency		min./max.		Volt/Hz	230 / 50						
Boiler power consumption				W	70	75	79	93	88	125	143
Pump power consumption		min./max.		W	12 / 23	12 / 30	12 / 31	12 / 51	25 / 45	12 / 45	12 / 60
Width / depth / height				mm	500 x 385 x 680				660 x 385 x 680		
External thread of gas connection				R	3/4”	3/4”	3/4”	3/4”	3/4”	3/4”	3/4”
Flow/return external thread				R	1”	1”	1”	1”	1 1/4”	1 1/4”	1 1/4”
Flue gas connection PPS		Diameter		DN	80	80	80	80	80	80	80
Outdoor air connection		Internal		Ø mm	125	125	125	125	125	125	125
Condensate connection PVC		External		Ø mm	24	24	24	24	24	24	24
Product characteristics, for calculating the system consumption value according to DIN V4701-10:											
Nominal heat output				Qn (kW)	13,9	18,2	22,1	33,6	34,2	44,9	52,9
Efficiency level at nominal heat output				η100% (%)	98,4	98,3	98,2	98,2	97,9	97,9	97,9
Partial load efficiency level				η30% (%)	109,7	109,7	109,7	109,1	109,3	109,3	109,3
return temperature, when measuring at 30% partial load efficiency level				T 30% (°C)	30	30	30	30	30	30	30
Standby heat loss				q B,70 (%)	0,30	0,23	0,19	0,16	0,26	0,19	0,16
Auxiliary energy: Boiler incl. integrated heating circuit pump				PHE (W)	70	75	79	93	88	125	143

Product description

Technical data for THISION S PLUS

Type THISION S PLUS					Combi 24	Combi 34
Permit Category SVGW number					CE0063BQ3021 BE-I2E(S), I3P	
Heat exchanger type					OSS2	OSS2
Output	G20	Full load	80/60°C	kW	22,1	33,6
			40/30°C	kW	24,7	37,3
		Low load	80/60°C	kW	4,9	4,9
			40/30°C	kW	5,3	5,3
	G25	Full load	80/60°C	kW	18	27,3
		Low load	80/60°C	kW	4,1	4,1
	G31	Full load	80/60°C	kW	22,1	33,6
			40/30°C	kW	23,6	35,9
		Low load	80/60°C	kW	15,8	15,8
			40/30°C	kW	17,6	17,6
DHW flow (according to EN 625)				l/min.	10,7	13,3
Input	G20	Full load		kW	22,5	34,2
		Low load		kW	5	5
	G25	Full load		kW	18,4	27
		Low load		kW	4,2	4,2
	G31	Full load		kW	22,5	34,2
		Low load		kW	16	16
Boiler efficiency		Full load	80/60°C	%	98,2	98,2
		Low load	40/30°C	%	109,7	109,1
Gas type					Natural gas or propane gas	
CO_2 natural gas		min./max.		Vol. %	8,8 / 9,2	
CO_2 propane gas		min./max.		Vol. %	10,5	
O_2 natural gas		min./max.		Vol. %	4,6 / 5,4	
NOx annual emissions value			($3\%O_2$)	mg/m^3	15	11
CO annual emissions value			($3\%O_2$)	mg/m^3	15	22
Standby losses			Tk 70°C	W	60	60
Max. flue gas temperature				80/60°C	68	69
Mass flow of flue gas		max.		g/s	14,4	15,6
Overpressure at boiler output		max.		Pa	75	75
Water volume in heating circuit				l	5	5
Water volume DHW circuit				l	14	25
Weight				kg	73	84
Gas flow pressure - standard				mbar	20	
Gas flow-pressure min./max.				mbar	17 / 25	
Operating pressure of heating unit		min./max.		bar	1 / 3	
DHW operating pressure		min./max.		bar	1 / 8	
DHW operating temperature		max		°C	60	
Content/pre-pressure of expansion vessel				l / bar	12 / 1	-
Voltage/frequency		min./max.		Volt/Hz	230 / 50	
Boiler power consumption				W	77	98
Pump power consumption		min./max.		W	12 / 35	12 / 56
Width / depth / height				mm	840 x 385 x 680	
External thread of gas connection				R	3/4”	3/4”
Flow/return external thread				R	1”	1”
Flue gas connection PPS		Diameter		DN	80	80
Outdoor air connection		Internal		Ø mm	125	125
Condensate connection PVC		External		Ø mm	24	24
Product characteristics, for calculating the system consumption value according to DIN V4701-10:						
Nominal heat output				Qn (kW)	22,1	33,6
Efficiency level at nominal heat output				η100% (%)	98,2	98,2
Partial load efficiency level				η30% (%)	109,7	109,1
return temperature, when measuring at 30% partial load efficiency level				T 30% (°C)	30	30
Standby heat loss				q B,70 (%)	0,27	0,18
Auxiliary energy: Boiler incl. integrated heating circuit pump				PHE (W)	77	98

ErP data for THISION S PLUS

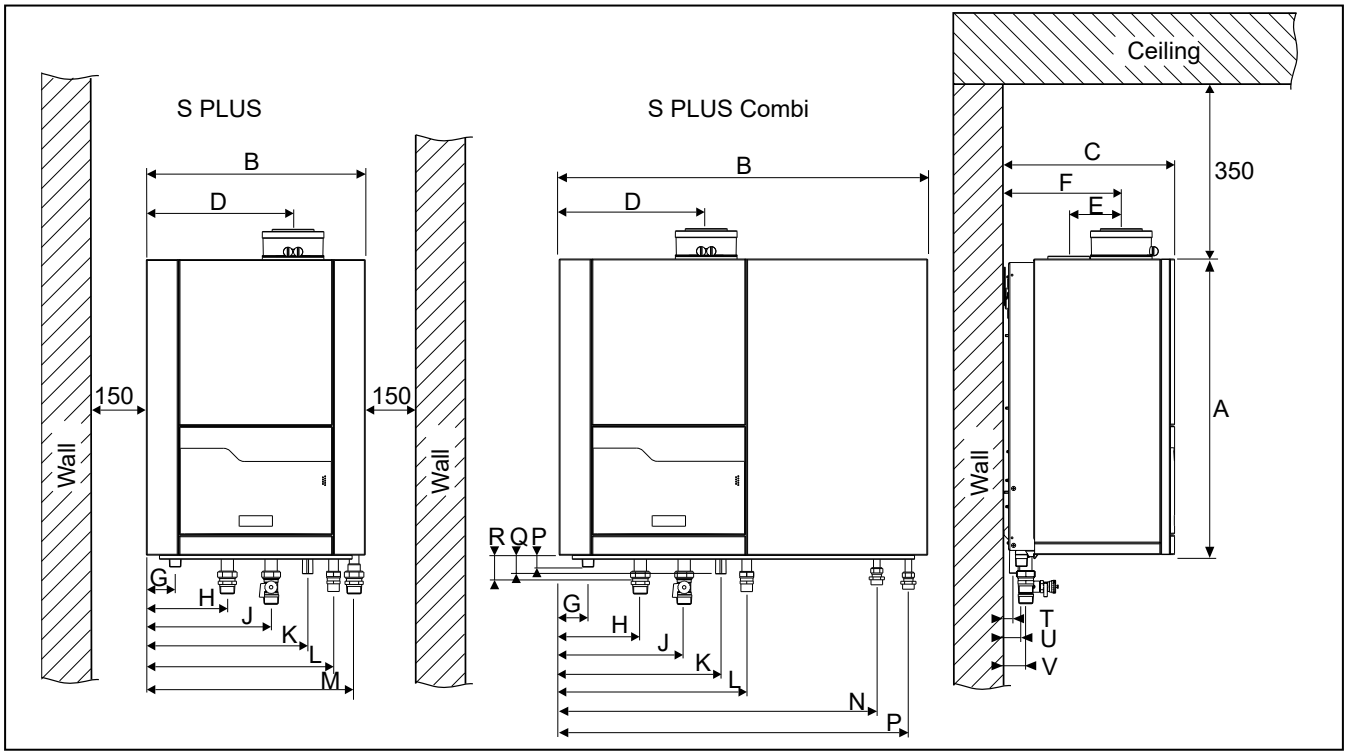
Type THISION S PLUS		13	19	24	34	35L	46	54
ErP data according to 2010/30/EU								
Seasonal room-heating energy efficiency class		**A**	**A**	**A**	**A**	**A**	**A**	**A**
Nominal heat output	P_n (kW)	14	18	22	34	34	45	53
Annual energy consumption	Q_{HE} (GJ)	5	6	7	11	10	15	17
Seasonal room-heating energy efficiency class	η_s (%)	94	94	94	94	94	94	94
Noise output level, inside	L_{WA} (dB)	39	43	46	50	50	51	51
Temperature regulator	+	**QAA 55 + AQC 34**						
Temperature regulation class	Class	VI	VI	VI	VI	VI	VI	VI
Contribution of the temperature regulation	%	4	4	4	4	4	4	4
Package		**Boiler with Temperature regulator QAA 55 + AQC 34**						
Seasonal energy efficiency of package for room heating	= %	98	98	98	98	98	98	98
Seasonal energy efficiency class of package for room heating		**A+**	**A+**	**A+**	**A+**	**A+**	**A+**	**A+**

ErP data for THISION S PLUS Combi

Type THISION S PLUS		Combi 24	Combi 34
ErP data according to 2010/30/EU			
Indicated load profile		XL	XL
Seasonal room-heating energy efficiency class		**A**	**A**
Energy efficiency class of warm water provision		**A**	**A**
Nominal heat output	P_n (kW)	22	34
Annual energy consumption	Q_{HE} (GJ)	7	11
Annual energy consumption	AEC (kWh)	82	93
Annual fuel consumption	AFC (GJ)	23	23
Seasonal room-heating energy efficiency class	η_s (%)	94	94
Energy efficiency class of warm water provision	η_{WH} (%)	80	80
Noise output level, inside	L_{WA} (dB)	47	50
Temperature regulator	+	**QAA 55 + AQC 34**	
Temperature regulation class	Class	VI	VI
Contribution of the temperature regulation	%	4	4
Package	**Boiler with Temperature regulator QAA 55 + AQC 34**		
Seasonal room heating energy efficiency of package	= %	98	98
Seasonal room heating energy efficiency class of package		**A+**	**A+**
Energy efficiency class of warm water provision by package		A	A

Product description

Dimensions of THISION S PLUS



	Type THISION S PLUS		13	19	24	34	35L	46	54	Combi 24	Combi 34
A	Boiler height	mm	680	680	680	680	680	680	680	680	680
B	Boiler width	mm	500	500	500	500	660	660	660	840	840
C	Boiler depth	mm	385	385	385	385	385	385	385	385	385
D	Flue gas nozzle	mm	335	335	335	335	495	495	495	335	335
E	Air intake	mm	120	120	120	120	120	120	120	120	120
F	Flue gas nozzle	mm	270	270	270	270	270	270	270	270	270
G	Gas connection	mm	65	65	65	65	65	65	65	65	65
H	Boiler flow connection	mm	185	185	185	185	185	185	185	185	185
J	Boiler return connection	mm	285	285	285	285	445	445	445	285	285
K	Condensate connection	mm	370	370	370	370	530	530	530	370	370
L	Expansion vessel	mm	430	430	430						
M	Cylinder return connection	mm	475	475	475						
N	Warm water	mm								725	725
P	Cold water	mm								795	795
Q	Connector length of g	mm	18	18	18	18	18	18	18	18	18
R	Connector length of c	mm	40	40	40	40	40	40	40	40	40
S	Connector length of v, r, a, k and w	mm	60	60	60	60	60	60	60	60	60
T	Condensate connection c	mm	25	25	25	25	25	25	25	25	25
U	Gas connector g	mm	40	40	40	40	40	40	40	40	40
V	Boiler flow and return v and r Cold and warm water k and w	mm	50	50	50	50	50	50	50	50	50
	Boiler connections										
	Flue gas nozzle	mm	80	80	80	80	80	80	80	80	80
	Air supply connector	mm	125	125	125	125	125	125	125	125	125
g	Gas connection		3/4"R	3/4"R	3/4"R	3/4"R	3/4"R	3/4"R	3/4"R	3/4"R	3/4"R
v	Boiler flow connection	mm	28 x 1"R	28 x 1"R	28 x 1"R	28 x 1"R	35 x 1 1/4"R	35 x 1 1/4"R	35 x 1 1/4"R	28 x 1"R	28 x 1"R
r	Boiler return connection	mm	28 x 1"R	28 x 1"R	28 x 1"R	28 x 1"R	35 x 1 1/4"R	35 x 1 1/4"R	35 x 1 1/4"R	28 x 1"R	28 x 1"R
c	Condensate connection	mm	24	24	24	24	24	24	24	24	24
a	Expansion vessel	mm	22 x 3/4"R	22 x 3/4"R	22 x 3/4"R	22 x 3/4"R*	22 x 3/4"R*	22 x 3/4"R*	22 x 3/4"R*		22 x 3/4"R
k	Cold water	mm								15 x 3/4"R	15 x 3/4"R
w	Warm water	mm								15 x 3/4"R	15 x 3/4"R
s	Cylinder return connection	mm	28 x 1"R	28 x 1"R	28 x 1"R	28 x 1"R*	28 x 1"R*	28 x 1"R*	28 x 1"R*		

* Only with installed 3-way valve

Delivery scope

Standard version
Accessories

Standard version
The delivery scope of a boiler consists of the following components:

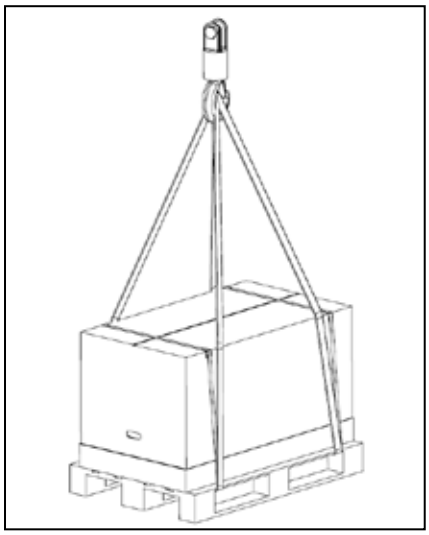
Components		Packaging type
Completely assembled and tested boiler	1	In cardboard box
Mounting rail	1	In boiler packaging, mounted on back side of the boiler
Connectors	1	Separate cardboard box in the boiler packaging
Outdoor sensor	1	Separate cardboard box in the boiler packaging
Room unit	1	Separate cardboard box in the boiler packaging
Cylinder sensor (not for THISION S PLUS Combi)	1	Separate cardboard box in the boiler packaging
Operating manual THISION S PLUS / Combi technician	1	In document bag in boiler packaging
Operating manual THISION S PLUS operator	1	
Replacement part list	1	
ERP label	1	

Accessories
The following accessories can be ordered:

- Flue gas pipes
- Sludge separator
- 3-way valve set (only for the types 34, 46 and 54)
- Expansion module AGU2.550, for controlling a mixed heating circuit, or for control on an air supply ventilator and/or external gas valve, in combination with an alarm terminal. A maximum of 3 AGU2.550 modules can be installed;
- Additional control unit LOGON B G2Z2, in case of more than 3 makes heating circuits, (incl. wall housing, all required sensors and plugs, as well as the necessary material for bus communications).

Listed accessory parts have been a specially constructed or selected for the THISION S PLUS boiler, which means they are very easy to install (plug and play). You can compose your own system solution, by selecting the accessory combination that fits your needs. For details and prices, please take a contact with the Elco Sales Department.

Boiler transport



Boiler transport
The THISION S PLUS is a fully equipped compact heating system, which has been pre-set and tested at the factory.
The dimensions of the packaging are:
- 13, 19, 24, 34:
  590 x 990 x 470 mm (WxHxD)
- 35L, 46, 54:
  750 x 990 x 470 mm (WxHxD)
- Combi 24 and 34:
  930 x 990 x 470 mm (WxHxD)

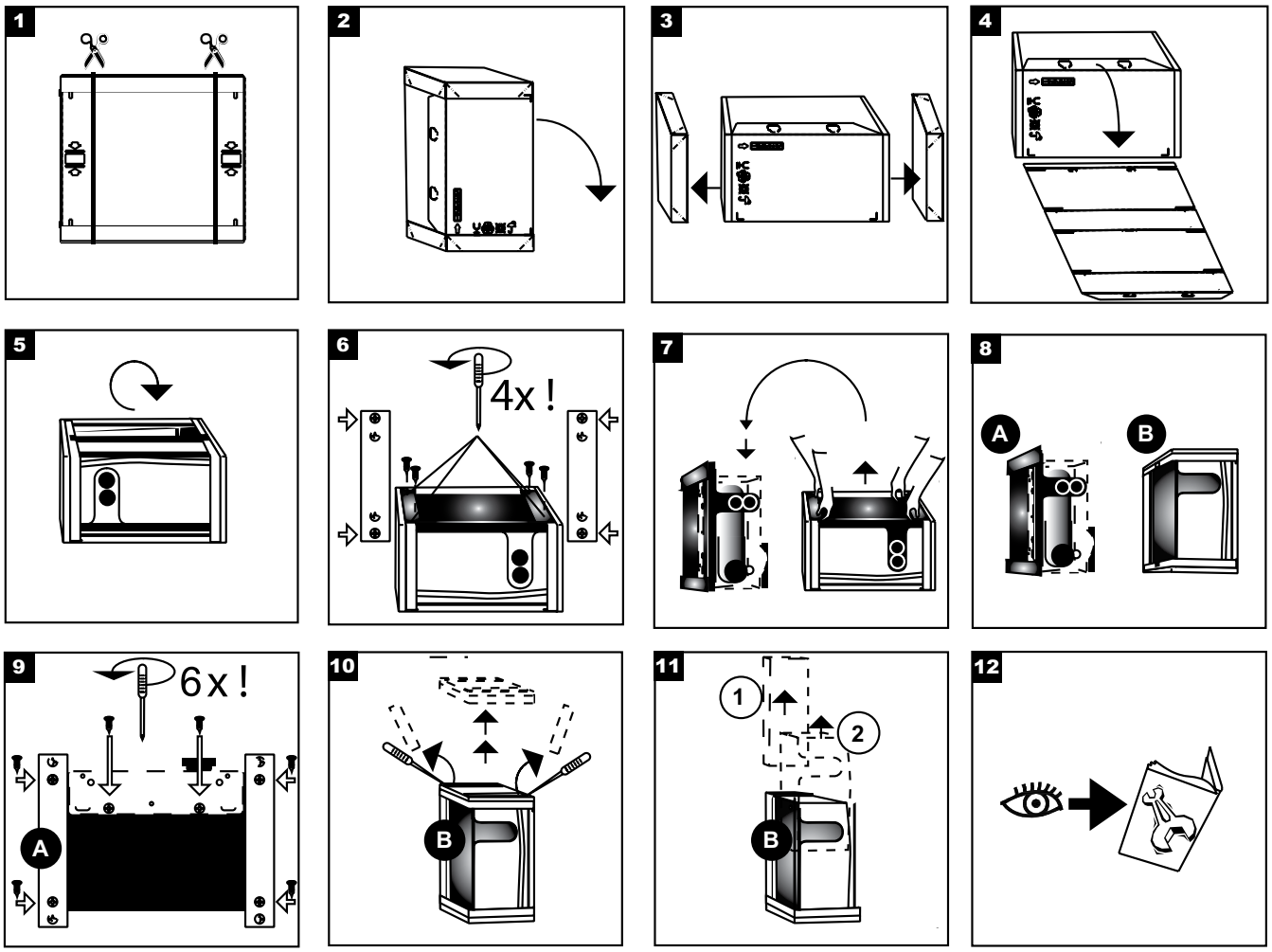
This makes it possible to transport all models in one piece through a normal door. The boiler can be picked up sideways or from the front with a forklift truck for transport.

The THISION S PLUS can be transported with a crane. However, it must be ensured that the boiler is attached in its packaging to a pallet. Loading belts should be attached to the pallet.

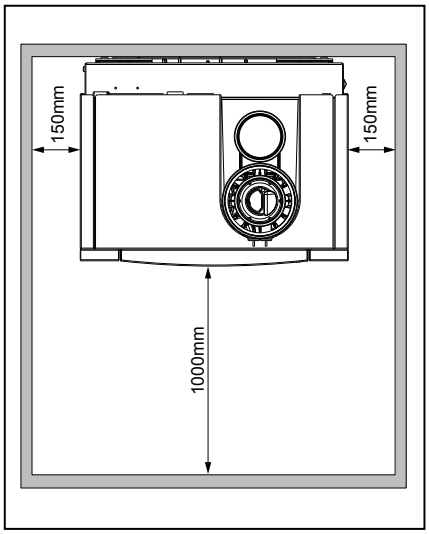
Unpacking instructions are printed on the cardboard box. Please follow the proposed steps.

Disassembly of panelling
The panelling has been packed separately from the boiler in the packaging. The panelling of the boiler should be set aside, before the assembly and until the boiler is taken into operation, so as to avoid damage.

Panelling should be attached and secured with the supplied screw, after assembly of the boiler, or after maintenance works.

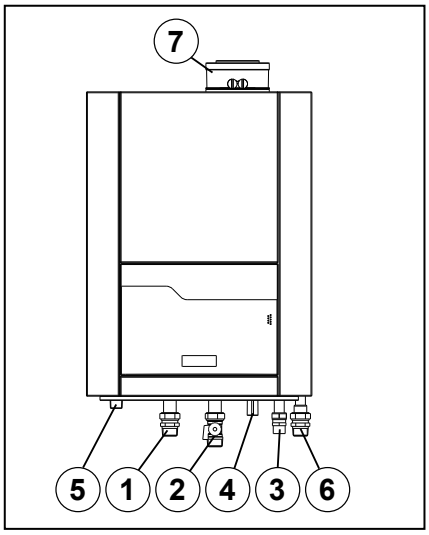


Installation Connections



Install the boiler in a sufficiently ventilated room, which conforms to current regulations.

The boiler should always be installed in a space protected against frost. When setting up the boiler, please observe the intervals recommended on the adjacent sketch Maintenance works become more difficult, in case of smaller intervals.



1 Boiler flow connection
2 Boiler return connection
3 Expansion vessel
4 Condensate drain
5 Gas
6 DHW tank return connection
7 Air supply / flue gas

Connections
The following chapter describes how the various connection must be made on the boiler:
- Hydraulic connections
- Condensate drainage connection
- Gas connection
- Flue gas connection
- Air supply connection
- Electrical connection

The boiler must be connected in such a way that the system conforms to the relevant standards and regulations (European, national and local). It is the responsibility of the installing technician that these standards and regulations are observed.

Hydraulic connections
The THISION S PLUS must be installed in such a way so that a prescribed minimum flow is always ensured. In systems where the radiators are fitted with thermostatic valves, it is recommended to install a pressure operated by-pass valve downstream of the last radiator on the heating circuit, or a differential pressure by-pass valve (available as an accessory item) between the flow (1) and return (2) pipes.

The boiler contains an installed safety valve of 3 bar. The drain of the safety valve has an open connection to the condensate drain.
There are connection possibilities for an (optional) filling/emptying cock and a connection to an expansion vessel (3). The filling/emptying cock and connection to an expansion vessel should be made in the return pipe of the boiler. The Combi 24 model has an installed expansion vessel of 12 litres.

Condensate connection (4)
Connection to the drainage system is always installed in an “open” fashion, so that a reflux into the boiler is avoided, in case of a stopped up drainage system.

Gas connection (5)
The type plate of the THISION S PLUS has been attached at the factory on the left-hand side of the boiler system (after removal of the panelling). The gas type (natural gas or liquid gas) must conform to the information on the type plate, which contains the installation information for the boiler.

The connection of the system to gas must be carried out by an certified technician. Here too, the national and local standards and regulations are applicable.

The gas pipe must be attached leak-proof to the gas connection (6) of the boiler. It is recommended to install a gas meter behind the THISION S PLUS system.

A gas filter can be mounted directly on the gas connector.

Connection for the DHW tank return connection (6).

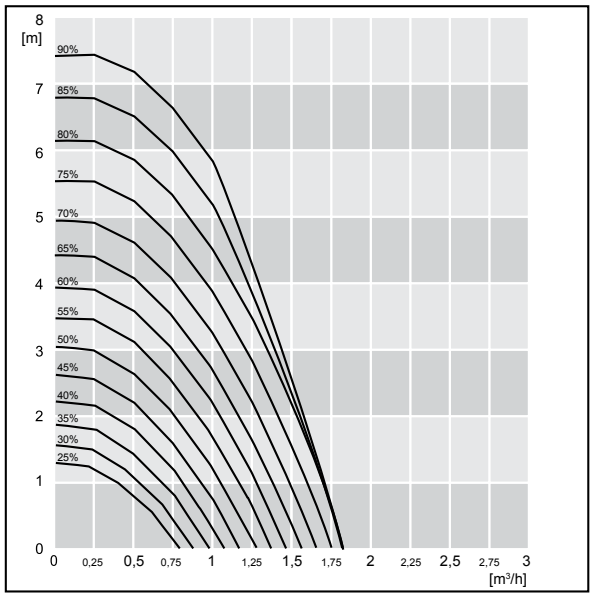
Air supply / waste gas flow (7).

Hydraulics
Circulation pumps

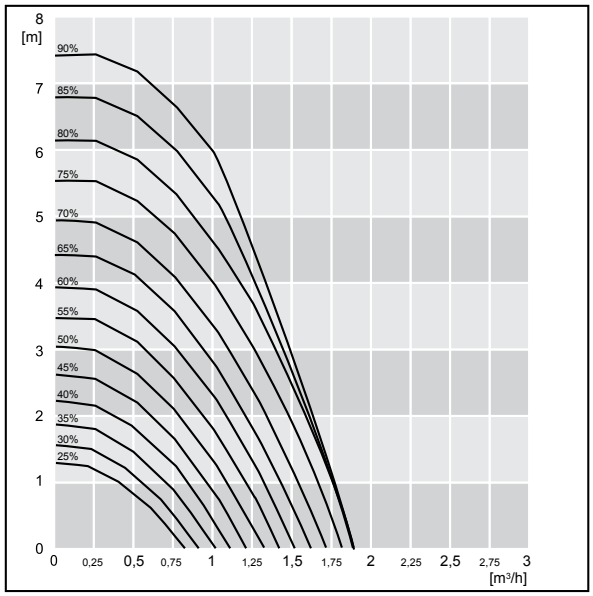
The GRUNDFOS UPM3 25-75 ciculation pump, which is installed at the factory for the boiler, operates continuously and adapts its pump speed to heat requirements (ΔT).

A low pump setting is only permitted, when a hydraulic switch or system separation has been installed.

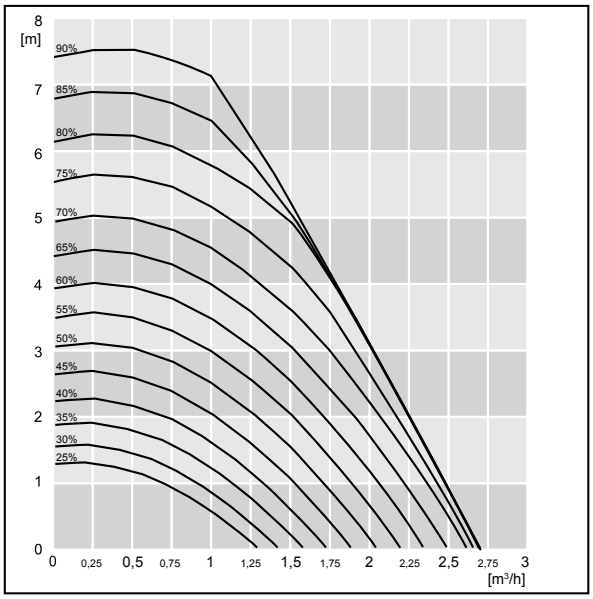
Notes on flow noises see next page.



Pump head diagram
THISION S PLUS 13
THISION S PLUS 19
THISION S PLUS 24



Pump head diagram
THISION S PLUS 34
THISION S PLUS 24 Combi
THISION S PLUS 34 Combi



Pump head diagram
THISION S PLUS 35L*
THISION S PLUS 46*
THISION S PLUS 54*

*** Note:**
This boiler has to be connected to a low velocity header and secondary circuit pump.

Hydraulics
Circulation pumps

GRUNDFOS UPM3 25-70 Boiler type	Circulating water volume (ΔT=20K)		Residual head		Energy consumption		
	l/min	l/u	mbar	kPa	PWM (%)	Pmax pump [W]	EEI
13	9,5	570	200	20	45	15	< 0,20
19	13,0	781	200	20	55	25	< 0,20
24	15,8	950	200	20	60	28	< 0,20
34	24,1	1444	200	20	75	55	< 0,20
35L*	24,6	1473	200	20	55	25	< 0,20
46*	32,3	1938	200	20	70	49	< 0,20
54*	38,0	2279	200	20	90	60	< 0,20
Combi 24	15,8	950	200	20	60	28	< 0,20
Combi 34	24,1	1444	200	20	80	57	< 0,20

*** Note:**
This boiler has to be connected to a low velocity header and secondary circuit pump.

Line no.	Selection possibilities	Factory setting
2317	Temp differential nominal	20 [1]
2320	Pump modulation	Temp differential nominal [2]
2321	Starting speed	100
2322	Pump speed min	45
2323	Pump speed max	THI S PLUS 13: 45 THI S PLUS 19: 55 THI S PLUS 24 / Combi 24: 60 THI S PLUS 34 / Combi 34: 75 THI S PLUS 35L: 55 THI S PLUS 46: 70 THI S PLUS 54: 90

[1] Adjust value to hydraulic system

[2] Do not adjust this value

Pump modulation
A number of functions are available for the modulating boiler pump.
- None (Function is switched-off)
- Demand (Do not use this function)
- Boiler setpoint (Do not use this function)
- Temp differential nominal
- Burner output (Do not use this function)

Temp differential nominal
The LMS continues to control the boiler's output such that the boiler temperature setpoint is maintained. Pump speed control controls the boiler pump's speed in a way that the parameterized nominal temperature differential of boiler return and boiler flow is maintained.
If the effective differential is greater than the nominal differential, the pump's speed is increased, otherwise it is decreased.
The pump's speed is limited by the parameterized minimum and maximum speed.
Recommended settings:

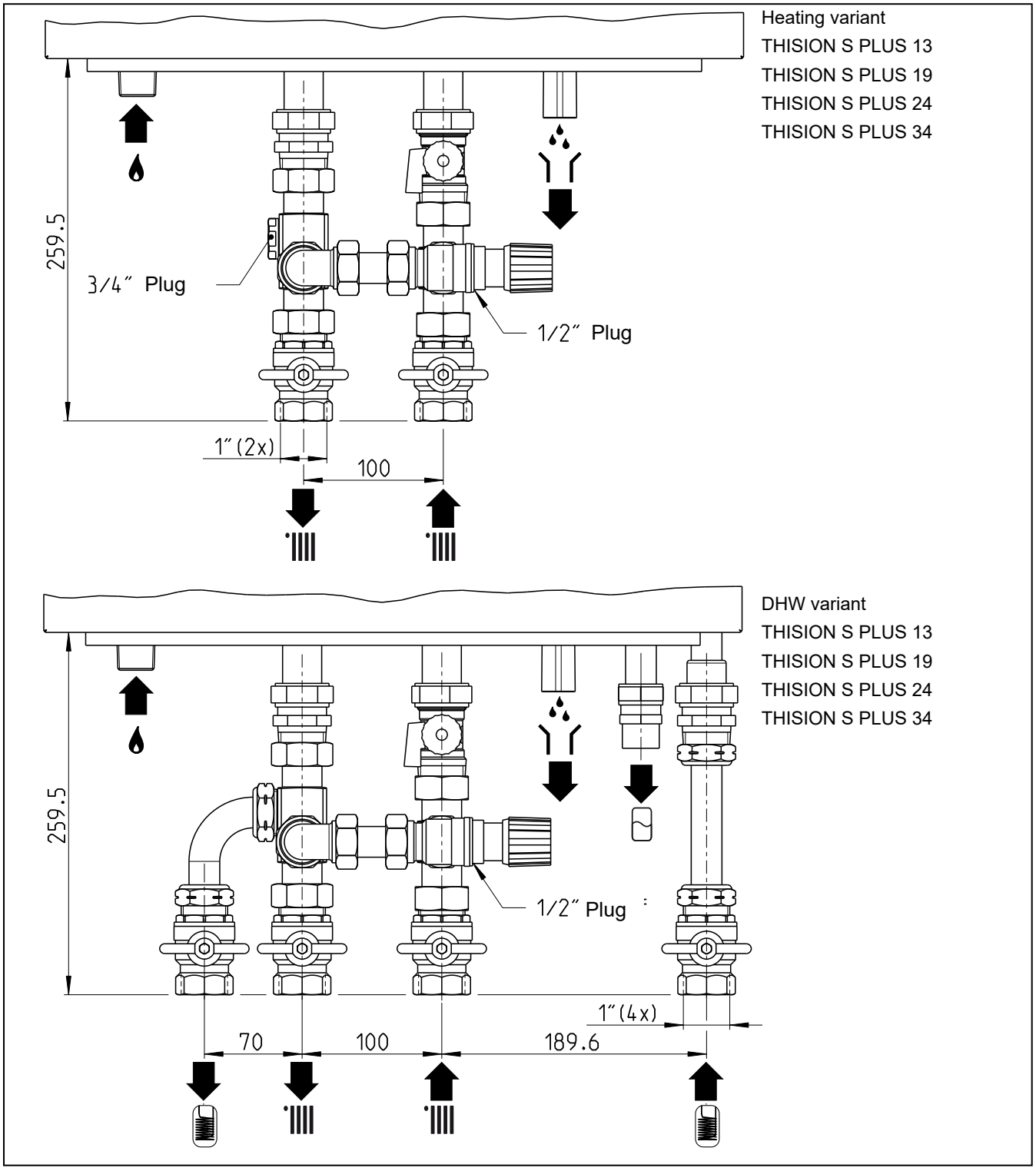
Radiators	20K
Under floor heating	10K
Mixed systems	10K
System separation (LV header/Plate heat exchanger)	20K

Minimum speed of the boiler pump
Values less than 45% only set in case of flow noises during commissioning. In this case read new residual head from chart and adjust the bypass accordingly.

The use of a low velocity header or plate heat exchangers can be set up to min. 25% (OEM limitation).

Note:
Too low pump speeds can lead to unfavorable temperature conditions during ignition load and may result in error messages.

Differential pressure overflow valve - accessory for THISION S PLUS 13, 19, 24, 34, Combi 24, 34



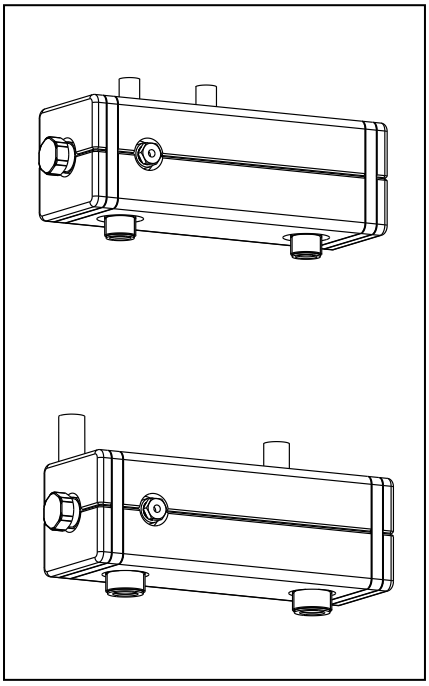
Technical data:

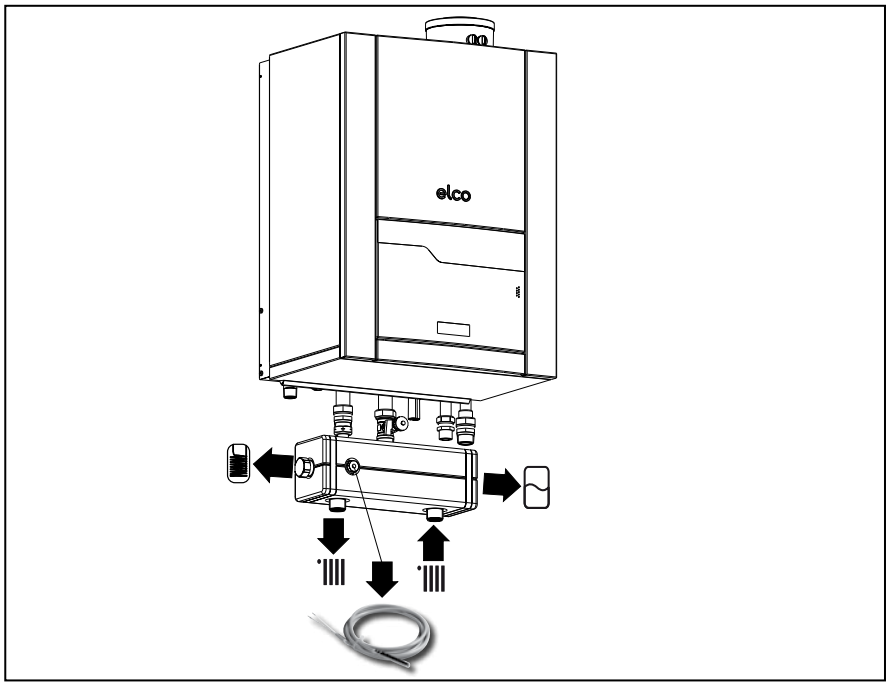
Max. pressure:	10 bar
Max. temperature:	110°C
Setting scale:	0.1 - 0.6 bar
Connector dimensions:	2 x 1/2" - self-sealing
Factory setting:	0.2 bar

Setting:

The ideal setting for a single- or two-family house should set at 0.2 bar. Turn the button (attention the securing screw) and set the value in the setting scale. After setting the value, tighten the securing screw.

Low loss header - accessories





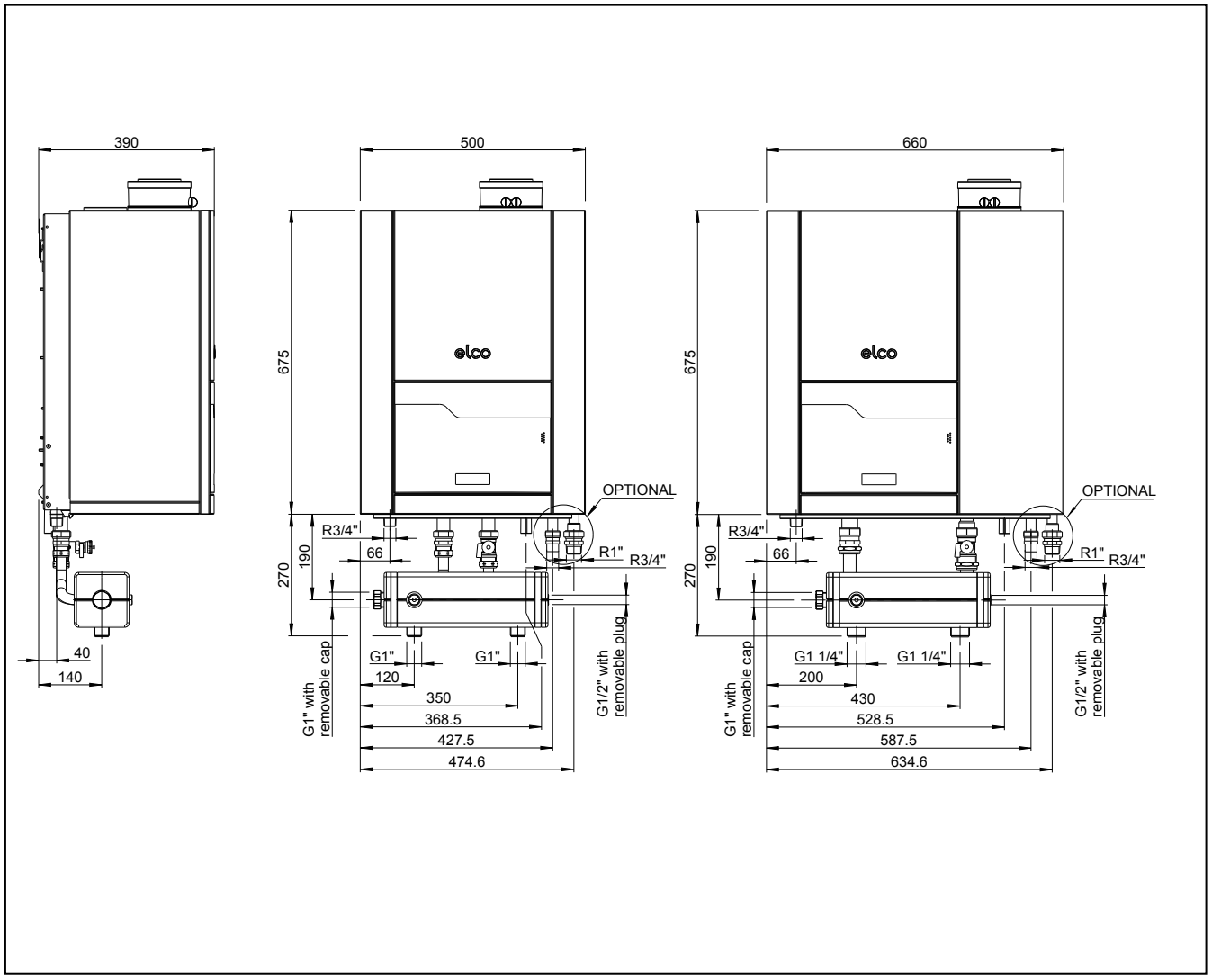
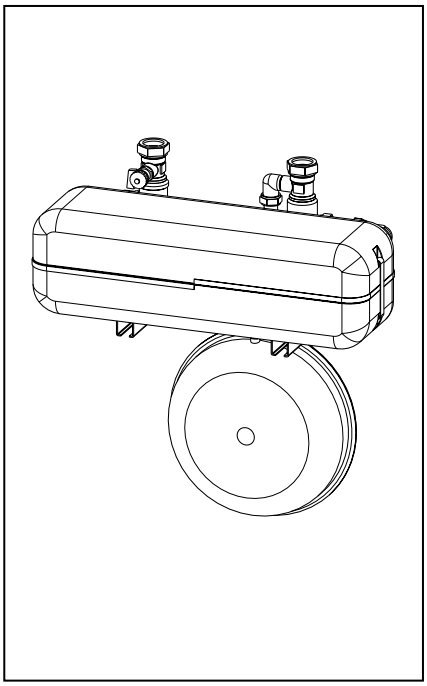
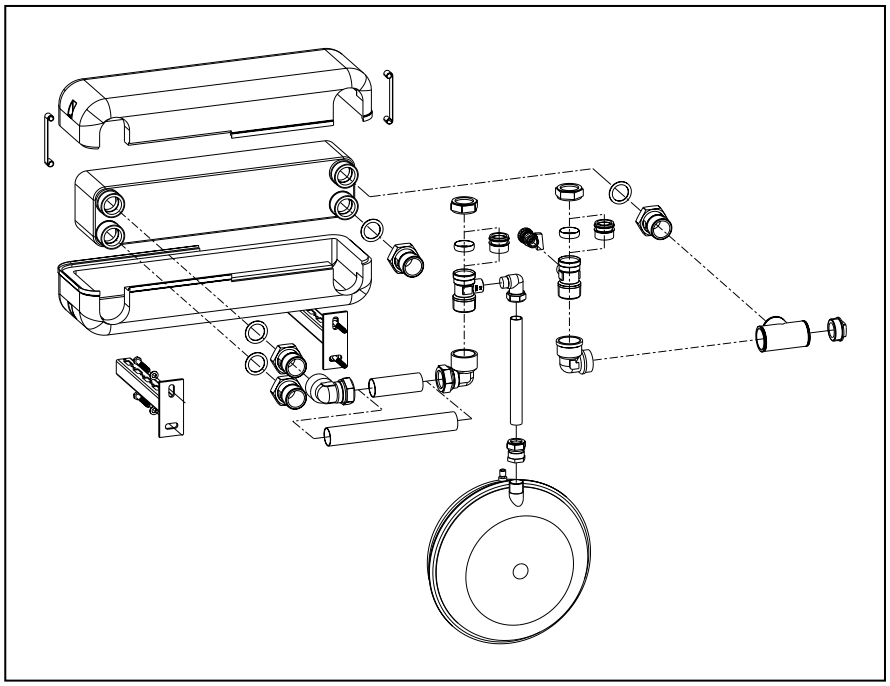
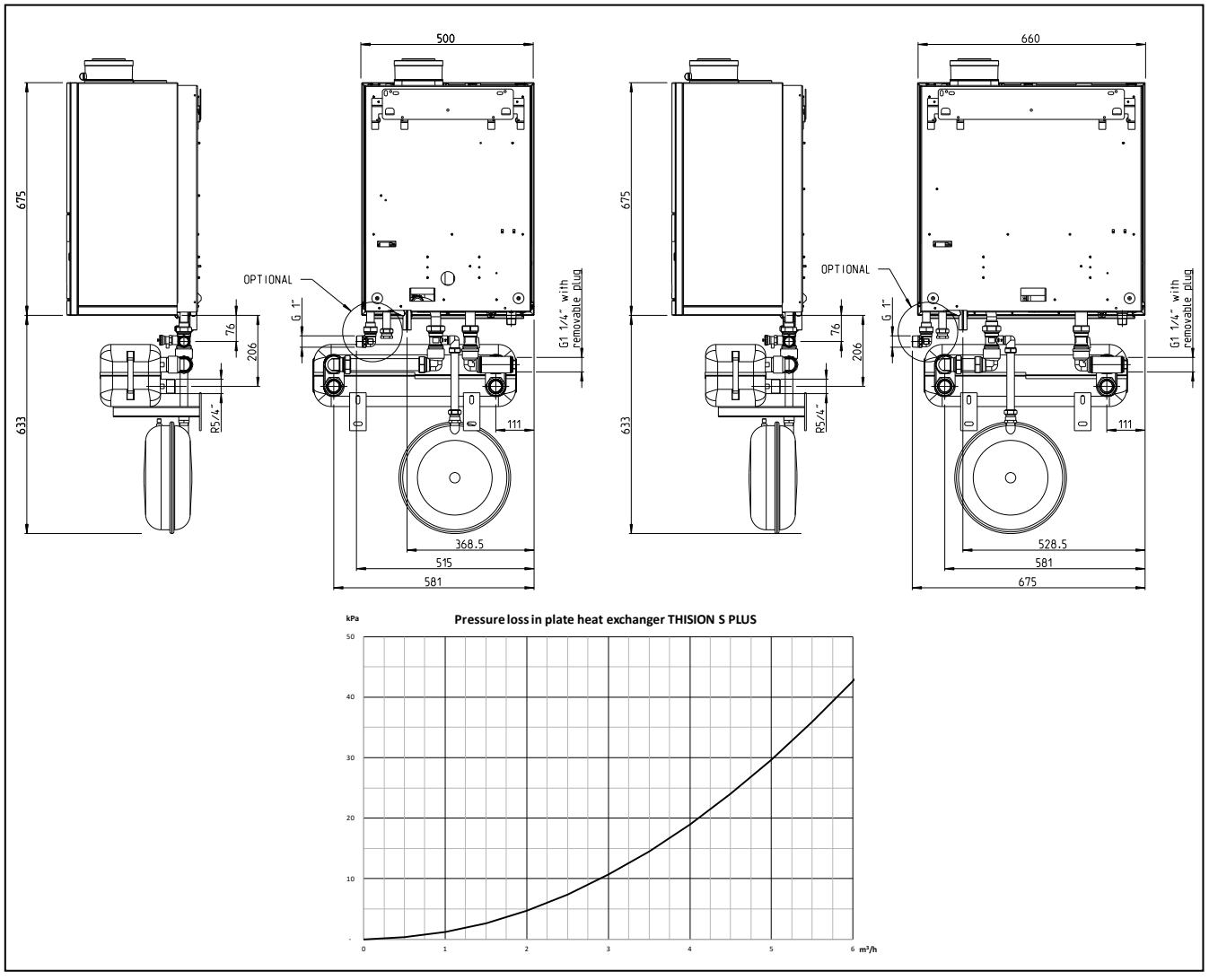


Plate heat exchanger - accessories







Water and hydraulic system
Heating water quality

Fill the installation with drinking water.

In most cases, a central heating installation can be filled with water according to the nationally valid regulations, whereby a treatment of the water is not necessary.
To avoid problems, the quality of the filling water must conform to the requirements in Table 1.
If the filling water should not conform to these requirements, then it is recommended to treat the water correspondingly (see VDI2035).

Warranty claims become invalid if the system has not been flushed during installation, or if the filling water quality does not conform to the ELCO requirements (see Table 1).
If anything should not be clear, or in case of deviations, always take up contact with ELCO first. The warranties lapse, if any changes are made without an advance agreement/ release by ELCO.

Installation:
- The use of groundwater, demineralized water and distilled water, is not permitted (an explanation of these terms can be found on the next page).
- If the drinking water quality lies within the limits of the values in Table 1, then one can proceed with the installation of the system and the flushing of the equipment.
- Residues of corrosion products (magnetite), assembly materials, cutting oil and other undesirable products, must be removed during the flushing operation.
- Another possibility for removing dirt is the use of a filter. The filter type must conform to the system-specific requirements and the type of contamination. ELCO recommends the use of a filter. In such a case, one should make sure to take the entire piping system into consideration.
- The central heating installation must be de-aerated properly, before it is taken into operation. Please review the Chapter “Commissioning” in this regard.
- If a regular topping up of water is required (> 5% per year), then there is a problem with the system that must be remediated by a certified technician. Regular topping up with fresh water and oxygen adds lime to the system, which leads to deposits.
- If an anti-frost agent or other additives are used, then it must be regularly checked that the filling water quality conforms to the manufacturer requirements.
- Inhibitors may only be used after consultation with ELCO.
- The use of such agents must be protocolled.

Floor heating
When a floor heating system is connected that uses plastic pipes, it must be ensured that it conforms to the standard DIN 4726-4729. If the system does not fulfil the standard, then a system separation must be foreseen.

If the regulations with regard to plastic piping are not observed, then warranty claims become null and void (see the warranty conditions).

Parameters	Value
Water type	Drinking water Softened water
pH	6.0-8.5
Conductivity (at 20°C in µS/cm)	Max. 2500
Iron (ppm)	Max. 0.2
Hardness (°dH / °fH)	
Installation volume/performance <20 l/kW	1-12 °dH / 1-21.5 °fH
Installation volume/performance >=20 l/kW	1-7 °dH / 1-12.5 °fH
Oxygen	Oxygen diffusion is not permitted during operations. Max. 5% of the system volumes may be topped up annually.
Corrosion inhibitors	See the Chapter "System water additives (inhibitors)"
pH raising or lowering agents	See the Chapter "System water additives"
Anti-frost additives	See the Chapter "System water additives"
Other chemical additives	See the Chapter "System water additives"
Solid substances	Not permitted
Residues in the heating water, which are not a component of the drinking water are	not permitted

Table 1

Water and hydraulic system
DHW quality

Water quality for DHW facilities

- When the amount of chloride is above the required specifications mentioned above in table 2, in case of the use of a combi boiler will void the warranty for DHW parts of the boiler.

Definition of water types

Drinking water
- Tap water, in conformity with the European Drinking Water Directive: 98/83/EC, dated 3 November 1998.

Softened water
- Water, from which calcium and magnesium ions have been partially removed.

Demineralized water
- Water, from which almost all salts have been removed (very low conductivity).

Distilled water
- Water, in which no more salts are present

Parameters	Value
Water type	Drinking water
pH	7.0-9.5
Conductivity (at 20°C in µS/cm)	Max 2500
Chloride (ppm)	Max 150
Iron (ppm)	Max. 0.2
Hardness (°dH / °fH)	1-12 °dH / 1-21.5 °fH
Number of bacteria colonies at 22°C (number/ml) according to EN ISO 6222	Max. 100

Table 2

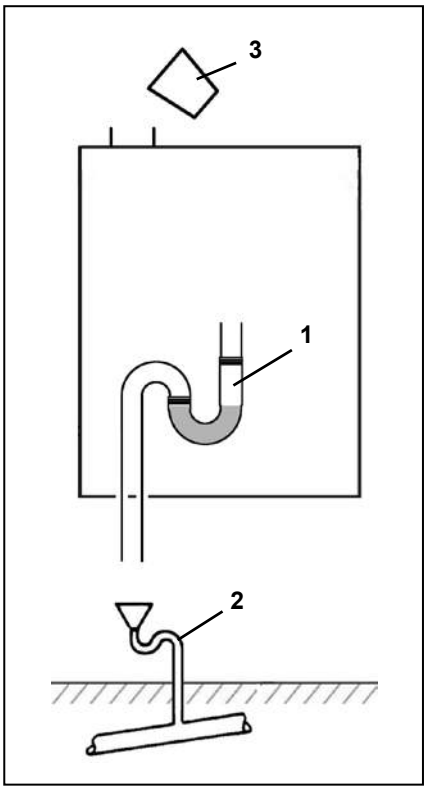
Condensate connection

HAZARD:
Danger of death due to poisoning! If the siphon is not filled with water, or if any connections are open, then escaping waste gas can pose a hazard of death for people.

Condensate connection
For every m3 of natural gas that is burned, between 0.7 and 1.0 litres of water can accumulate, due to a very high energy utilization. Condensate, which accumulates in the boiler, in the waste gas pipe or in the chimney, must be drained to the public sewage system.
In this regard, country-specific regulations must be taken into account. A neutralization of the condensate may be required. It must be possible for the condensate to visibly drain into a funnel-siphon (2) at the installation site. A fixed connection to the public sewer system is not permitted.

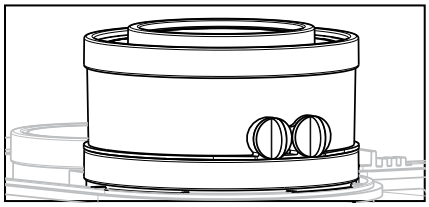
For condensate drainage, only corrosion-resistant and certified materials may be used. The drainage must be carried out in a frost-free space. The drainage pipe should have a slope, so as to avoid a backwash of the condensate.

Filling of the siphon
Before the boiler is taken into operation, the equipment siphon (1) must be filled with water, so as to prevent an emission of waste gas from the condensate connection. Filling is carried out most easily by pouring approximately 0.5 litres of water into the waste gas pipe (3); otherwise screw off the siphon to fill it.
The condensate drain should be cleaned during maintenance and inspection works, however at least once each year, whereby the siphon and the waste gas connections are also check for leakproofness and the equipment siphon is filled with water.



Connections
Air- / flue gas ducts

All boiler models have an ø80/125 concentric flue connection.



Flue gas connection
We recommend the use of ELCO's comprehensive range of flue gas components.
For further information, please see the installation instructions:
- ELCO wall terminals
- ELCO roof terminals
- ELCO flue pipe components, both individual pipes and concentric tubes.

Regulations about the construction and installation of flue gas systems are different from country to country.
It must be ensured that all national regulations with regard to chimney systems are observed.

It is not necessary to install a separate condensate drain for the flue gas system, since the condensate will be flushed out via the boiler and into the siphon. Please observe the following recommendations:
- Only use corrosion-resistant material
- The diameter must be calculated and selected according to the national regulations.
- The length of the flue gas system must be kept as short as possible (and must not exceed the maximum permitted length, see the documentation for planners)
- Horizontal flue gas tubes must have an inclination of at least 3° back towards the boiler.

Air supply connection
If required, a separate room sealed air supply tube may be connected via the inclusion of the optional air supply connector fitting. The diameter must be calculated in conformity with national regulations and in combination with the flue gas gas system. The overall resistance of the air supply and flue gas tubes may not exceed the maximum supply pressure of the Fan at any time. (Also see the Chapter "Technical data")

Notes
The tables below give guidance on the maximum lengths of air and flue gas tubes that may be connected. If a room sealed installation is being made utilising separate air and flue gas tubes, the lengths of both tubes must be added together and not exceed the relevant value given in the tables.
In all cases, the concentric flue/air connection on the top of the boiler case is 80/125. When using 110/150 flue components, an allowance for the necessary 80/125 to 110/150 adaptor fitting has been included in the flue lengths indicated in the tables.
The maximum length of any external section of flue pipe must not exceed 5m.

The radius of any bend used in the flue gas system must not exceed 87.5°.

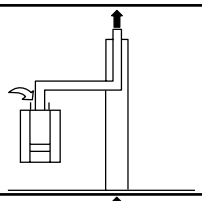
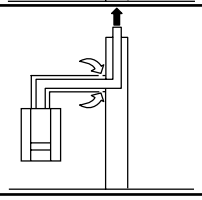
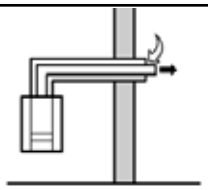
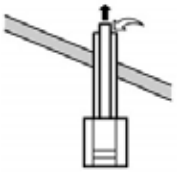
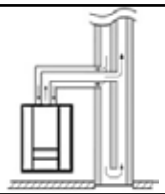
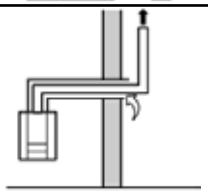
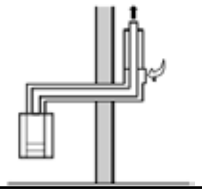
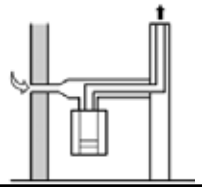
Dimensioning (reference value)

	Maximum length in metres of D80 and D110 Ø tubes **(open or parallel tubes room sealed installation)**											
					D 80 mm				D 110 mm			
Changes of direction					**0**	**2**	**3**	**4**	**0**	**2**	**3**	**4**
13					60	58,6	57,9	57,3	80	79,5	79,3	79,0
19					60	57,6	56,5	55,3	80	79,2	78,7	78,3
24					60	56,5	54,8	53,0	80	78,8	78,1	77,5
Combi 24					60	56,6	54,9	53,2	80	78,8	78,2	77,6
34					30	22,0	18,0	14,0	80	77,1	75,7	74,3
Combi 34					30	22,0	18,0	14,0	80	77,2	75,8	74,4
35L					12	3,6			55	52,0	50,5	49,1
46					12				55	49,9	47,3	44,7
54					11				50	42,9	39,3	35,8

	Maximum length in metres for concentric room sealed installations D 60/100, D 80/125 and D 110/150											
	D 60/100 mm				D 80/125 mm				D 110/150 mm			
Changes of direction	**0**	**2**	**3**	**4**	**0**	**2**	**3**	**4**	**0**	**2**	**3**	**4**
13	14	8,8	6,2	3,6	40	38	37	36	40	39	38,5	38
19	14	5	0,5		40	36,6	34,9	33,2	40	38,2	37,3	36,4
24	14	0,6			40	35	32,5	30	40	37,4	36,1	34,8
Combi 24	4	0,6			25	35	32,5	30	40	37,4	36,1	34,8
34	4				25	13,6	7,9	2,2	40	34,2	31,3	28,4
Combi 34	4				25	13,6	7,9	2,2	40	34,2	31,3	28,4
35L	4				12	0,2			40	33,8	30,7	27,6
46					12				30	19,4	14,1	8,8
54					11				30	15,4	8,1	0,8

Required minimum (flue enclosure) shaft cross-section		
Diameter flue duct	Square shafts	Round shafts
80 mm	120 x 120 mm	130 mm
110 mm	140 x 140 mm	160 mm

Connections
Air- / flue gas ducts - installation variants

Ambient combustion air, ø80 PP		
B23	Flue gas duct into the chimney, aspiration of air from the surroundings. End section of the waste gas duct above the roof.	
B33	Flue gas duct into the chimney, aspiration of air from the surroundings. End section of the waste gas duct above the roof.	
Combustion air taken from the surroundings, ø 80/125 PP/sheet steel white		
C13 C13x	Flue gas duct and suction air over the outer wall, in the same pressure range.	
C33 C33x	The waste gas and suction air ducts via the chimney must operate in the same pressure range. Vertical end section of the waste gas duct.	
C43 C43x	Suction air and waste gas duct via the chimney system, which is integrated in the building.	
C53 C53x	Section the air and waste gas exhaust to the outside, in areas with different pressures. Vertical end section of the waste gas duct.	
C63* C63x	Specially developed equipment, for connection to certified air-/waste gas systems that operate separately from one another. * Not permitted in Belgium	
C83 C83x	Air suction on the outside of the building, waste gas duct via the chimney.	
C93 C93x	Air and waste gas piping to the waste gas chimney, via installation in the roof and in a humidity-resistant waste gas chimney. Min. annular gap for waste gas piping: Ø80 = 45mm Ø100 = 50mm Ø110 = 40mm	

Electrical connection

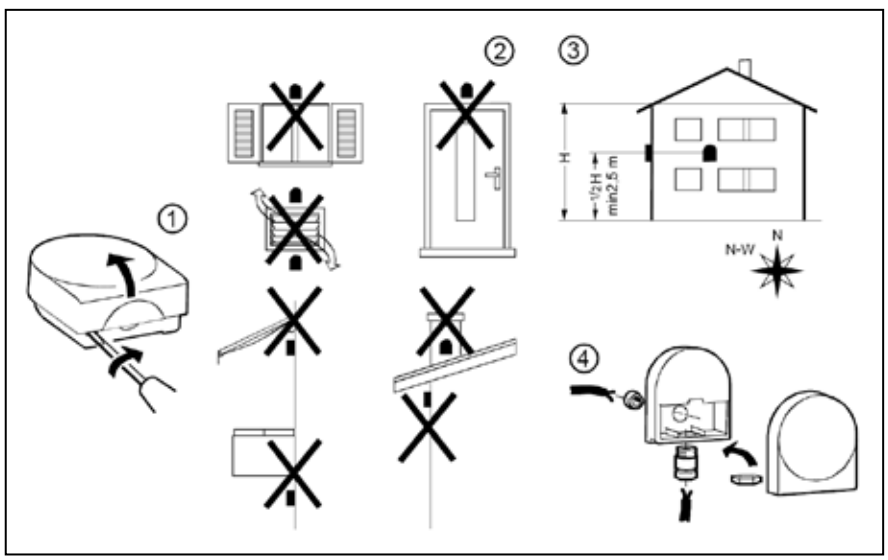
Electrical connection
Electrical connections must be carried out by an authorized electrical technician, and in conformity with valid national and local standards and regulations.
An insulated mains switch must be used for the power supply, with at least 3 mm contact openings. It must be mounted inside of the boiler room. The mains switch is used for switching off the power supply during maintenance works.

All cables are passed through the cable gland at the bottom of the boiler, and are led to the electronics panel at the front of the boiler.

The electric diagram must be observed during all electrical connection works (see the following pages).

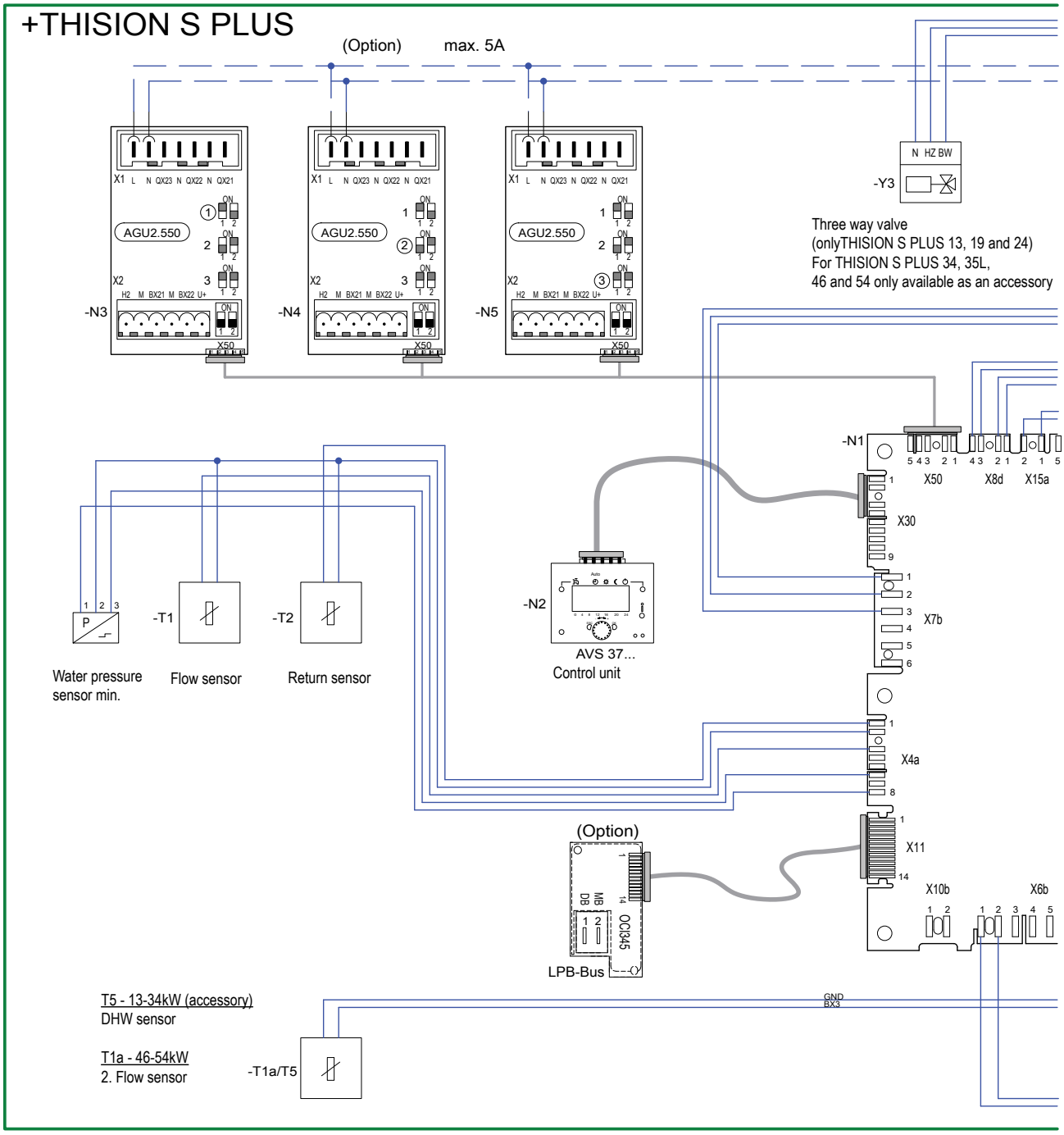
CAUTION:
Ensure that the right polarity is used for the equipment.

If malfunction 133 occurs during commissioning of the facility, then, as a first step, the polarity of the electrical connection must be tested, after which the boiler can be taken into operation again.

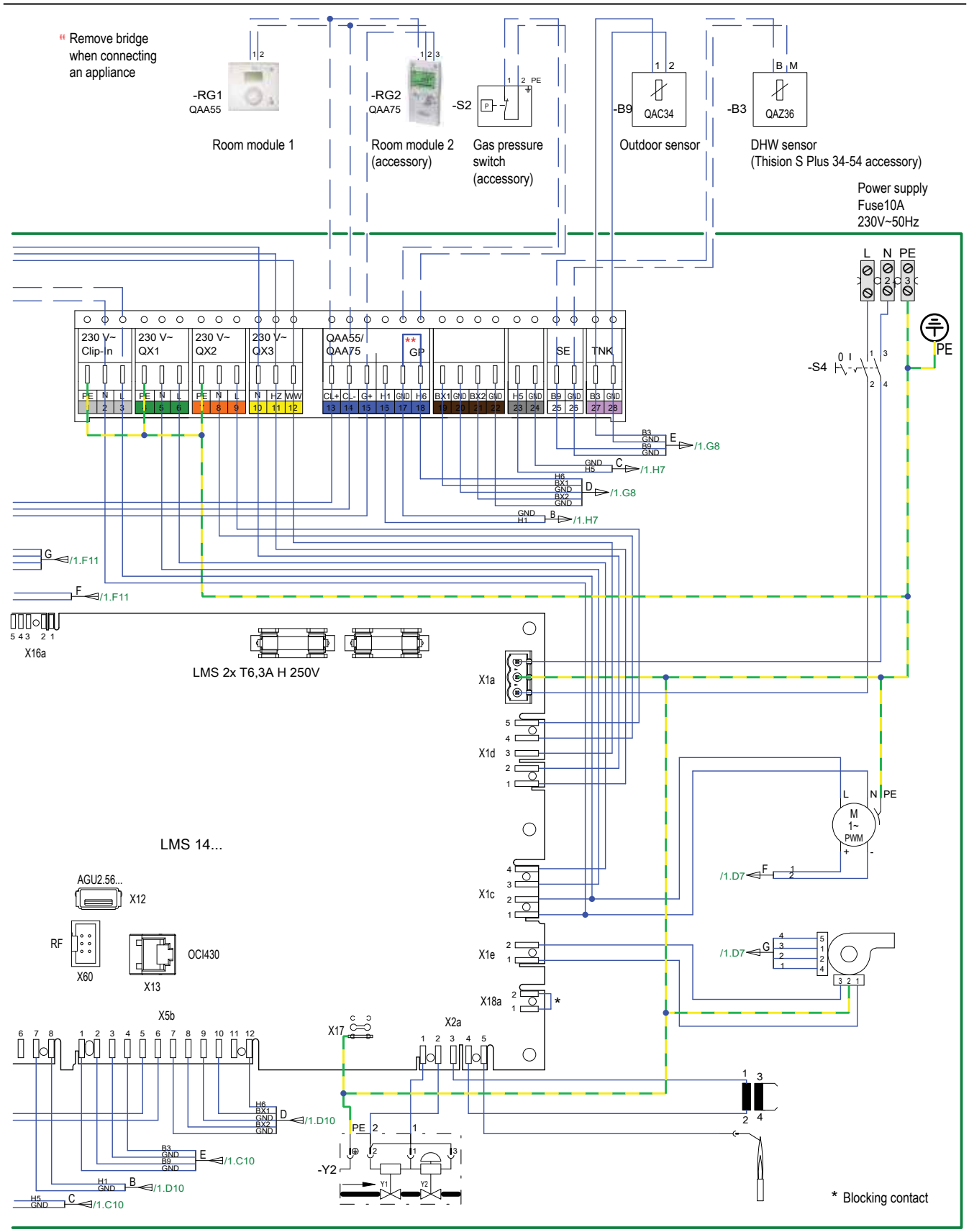


Installation of outdoor sensor
If an outdoor sensor is connected to the boiler, then the sensor must be positioned in conformity with the adjacent drawing.
If an outdoor sensor is not connected, then please proceed that to set parameter 6120 to ‘OFF, and save this setting with the parameter 6200.
This helps to avoid error number 10 (outdoor sensor).

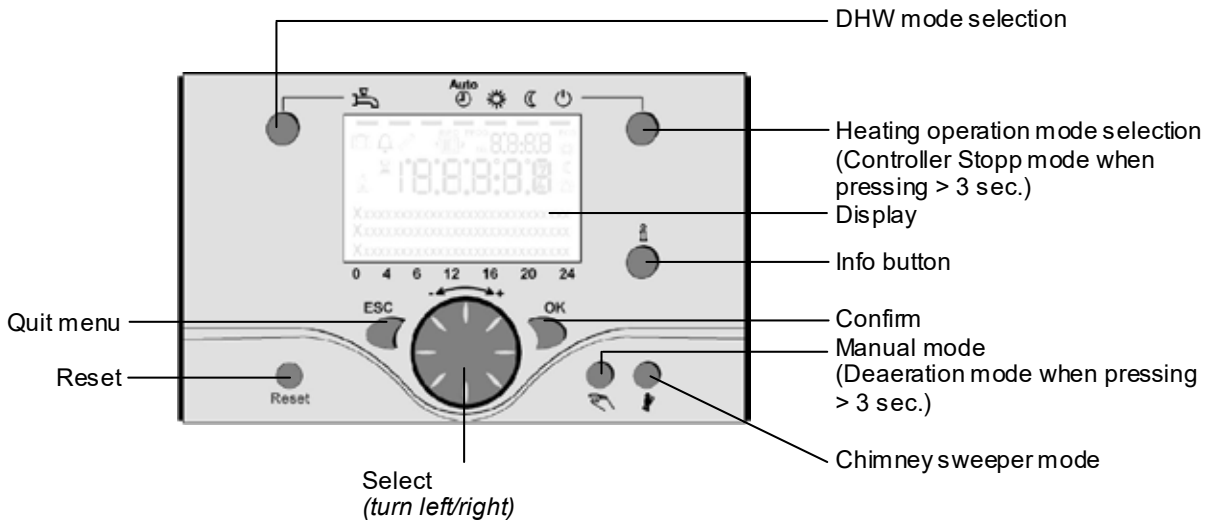
Electrical connection
Electrical diagram - boiler



Electrical connection
Electrical diagram - accessories



Description of display Programming



Heating to comfort setpoint Info level activated

Heating to reduced setpoint Programming activated

Heating for frost protection setpoint Heating temporarily switched off

Process running – please weit ECO function active

Burner operating (only oil / gas boiler)

Error messages

INFO Info level activated

PROG Programming activated
Heating temporarily switched off

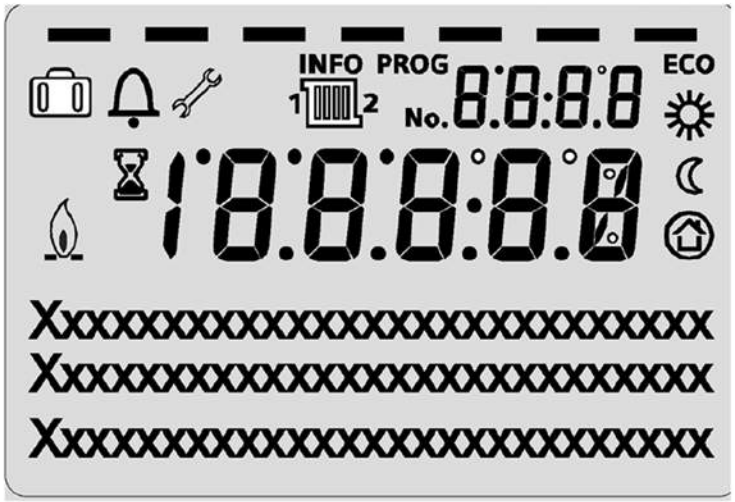
ECO ECO function active

Holiday function active

Reference to heating circuit

Maintenance / special operation

No. Parameter number



Programming

Default mode
(buttons)

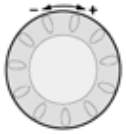
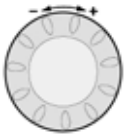
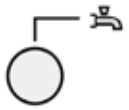
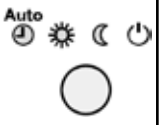
Press ***OK*** (1x)

Press ***OK*** (1x)
Press ***INFO*** (4 sec.)

Enduser
- choose menu - confirm w ith ***OK*** button - choose parameter - confirm w ith ***OK*** button - change value + - with wheel - confirm w ith ***OK*** button - return to main menu w ith ***ESC*** button

Commissioning	Expert
- choose user level - confirm w ith ***OK*** button - choose menu - confirm w ith ***OK*** button - choose parameter - confirm w ith ***OK*** button - change value + - with wheel - confirm w ith ***OK*** button - return to main menu w ith ***ESC*** button	

Main functions of the control panel

Button	Action	Procedure	Display / Function
	Setting up the required room temperature	**HC2 jointly with HC1** Turn the rotating button left or right Turn the rotating button again for storing with OK button or wait for 5 sec. or push ESC	comfort target value with blinking temperature display blinking temperature display in steps of 0.5° centigrade, from 10.0 to 30°C **Comfort value active** **Comfort value not active** - Basic display appears after 3 sec.
	Setting the required room temperature for HC1 or HC2	or **2nd HC independent of HC1** Turn rotating button left/right Then push OK Turn rotating button left/right Save with OK button or wait for 5 sec. or push ESC	Select heating circuit Heating circuit active blinking temperature display in steps of 0.5° centigrade, from 10.0 to 30°C **Comfort target value active** **Comfort target value not active** - Basic display appears after 3 sec.
	Switching warm water operations ON or OFF	Push button	**Warm water operation ON / OFF** (segmented bar under symbol for warm water visible/invisible) - ON: Warm water preparation according to switching program - OFF: No warm water preparation - Safety function active
	Change operating mode	Factory setting 1 x short push of button and then once more, short push of button	**Automatic operating mode ON, with:** - heating operation according to timer program - Temperature target values according to heating program - Safety function active - Summer/Winter - automatic switching active - ECO functions active (segmented bar under corresponding symbol visible) **Continuous COMFORT heating ON, with:** - Heating operation without timer program, at comfort target value - Safety function active **Continuous REDUCED heating ON, with:** - Heating operation without timer program, at reduced target value - Safety function active - Summer/Winter - automatic switching active - ECO functions active **Automatic safety mode ON, with:** - Heating operations switched off - Temperature according to frost protection value - Safety function active
	Control stop function	1 x push button (> 3 sec) push button once more (> 3 sec)	**304: Control stop function** **Set target value** Basic display appears after 3 sec.
	Display of various information	1 x push button push button again push button again Push button	INFO section is displayed - Boiler status - Room temperature - Room temperature minimum - Warm water status - Room temperature maximum - Status heating circuit 1 - Outdoor temperature - Status heating circuit 2 - Minimum outdoor temperature - Maximum outdoor temperature - Time / date - Water temperature 1 - Error message - Boiler temperature - Maintenance report - Flow temperature (Display of the information lines depends on the configuration) Back to basic display; INFO segment is suppressed
	Operating mode according to target values that are set manually Change of the factory setting for boiler temperature	short push of button short push of button i short push of button OK Rotating button turn -/+ short push of button OK short push of button ESC short push of button	**Manual operating mode ON** (spanner symbol is visible) - Heating operations at preset boiler temperature (factory setting = 60°C) **301: Manual operation mode operation?** **Set target value for manual** Blinking temperature display Set required target value **Boiler status** Manual operating mode OFF (spanner symbol disappears)
	De-aeration function	1 x push button (> 3 sec) push button once more (> 3 sec)	312: De-aeration function ON De-aeration function OFF
	Activation of chimney sweep function	Push button (> 3 sec) push button once more (> 3 sec)	Chimney sweep function ON Chimney sweep function OFF
	Short-term reduction of room temperature at QAA75 / 78	Push button push button again	Heating at reduced target value Heating at comfort target value
RESET	Reset button	Push button (< 3 sec.) push button again > 3 sec.	Facility is manually locked, unreleased equipment is unlocked, alarm bell disappears

OK = Confirmation ESC = Abort or back to basic display

Parameters end users

Basic display “Boiler temperature”
- Push OK button once
- Use +- rotating button for selecting for instance “Drinking water menu”
- Push OK button once
- Use +- rotating button, for instance in the drinking water menu, for selecting “Parameter no. 1612 - Reduced target value”
- Push OK button once
- Use +- rotating button to change the currently set value
- Push OK button once -> the value is stored
- Push 2 x ESC to return to the basic display “Boiler temperature . .“

Menu	Line no.	Selection possibilities	Unit	Min.	Max	Factory setting
Time of day and date	1	Hours / Minutes	hh:mm	00:00	23.59	--.--
	2	Day / Month	dd:MM	01.01	31.12.	--.--
	3	Year	yyyy	2004	2099	--.--
Operator section	20	Language	-	English, German, French, Italian, Danish, Dutch, Spanish, Czech, Slovenian, Turkish		German
Time program HC 1	500	Preselection	-	Mo-Su, Mo-Fr, Sa-Su	Mo-Su, Mo-Fr, Sa-Su	Mo-Su
	501	Mo-Su: 1. Phase On	uu:mm	00:00	24:00	06:00
	502	Mo-Su: 1. Phase Off	uu:mm	00:00	24:00	22:00
	503	Mo-Su: 2. Phase On	uu:mm	00:00	24:00	--.--
	504	Mo-Su: 2. Phase Off	uu:mm	00:00	24:00	--.--
	505	Mo-Su: 3. Phase On	uu:mm	00:00	24:00	--.--
	506	Mo-Su: 3. Phase Off	uu:mm	00:00	24:00	--.--
	516	Default values	-	Yes	No	No
Time program HC 2 **(When activated)**	520	Preselection	-	Mo-Su, Mo-Fr, Sa-Su	Mo-Su, Mo-Fr, Sa-Su	Mo-Su
	521	Mo-Su: 1. Phase On	uu:mm	00:00	24:00	06:00
	522	Mo-Su: 1. Phase Off	uu:mm	00:00	24:00	22:00
	523	Mo-Su: 2. Phase On	uu:mm	00:00	24:00	--.--
	524	Mo-Su: 2. Phase Off	uu:mm	00:00	24:00	--.--
	525	Mo-Su: 3. Phase On	uu:mm	00:00	24:00	--.--
	526	Mo-Su: 3. Phase Off	uu:mm	00:00	24:00	--.--
	536	Default values	-	Yes	No	No
Time program 3/HC3	540	Preselection	-	Mo-Su, Mo-Fr, Sa-Su	Mo-Su, Mo-Fr, Sa-Su	Mo-Su
	541	Mo-Su: 1. Phase On	uu:mm	00:00	24:00	06:00
	542	Mo-Su: 1. Phase Off	uu:mm	00:00	24:00	22:00
	543	Mo-Su: 2. Phase On	uu:mm	00:00	24:00	--.--
	544	Mo-Su: 2. Phase Off	uu:mm	00:00	24:00	--.--
	545	Mo-Su: 3. Phase On	uu:mm	00:00	24:00	--.--
	546	Mo-Su: 3. Phase Off	uu:mm	00:00	24:00	--.--
	556	Default values	-	Yes	No	No
Time program 4/DHW	560	Preselection	-	Mo-Su, Mo-Fr, Sa-Su	Mo-Su, Mo-Fr, Sa-Su	Mo-Su
	561	Mo-Su: 1. Phase On	uu:mm	00:00	24:00	06:00
	562	Mo-Su: 1. Phase Off	uu:mm	00:00	24:00	22:00
	563	Mo-Su: 2. Phase On	uu:mm	00:00	24:00	--.--
	564	Mo-Su: 2. Phase Off	uu:mm	00:00	24:00	--.--
	565	Mo-Su: 3. Phase On	uu:mm	00:00	24:00	--.--
	566	Mo-Su: 3. Phase Off	uu:mm	00:00	24:00	--.--
	576	Default values	-	Yes	No	No

Parameters end users

Menu	Line no.	Selection possibilities	Unit	Min.	Max	Factory setting
Time program 5	600	Preselection	-	Mo-Su, Mo-Fr, Sa-Su	Mo-Su, Mo-Fr, Sa-Su	Mo-Su
	601	Mo-Su: 1. Phase On	uu:mm	00:00	24:00	06:00
	602	Mo-Su: 1. Phase Off	uu:mm	00:00	24:00	22:00
	603	Mo-Su: 2. Phase On	uu:mm	00:00	24:00	--.--
	604	Mo-Su: 2. Phase Off	uu:mm	00:00	24:00	--.--
	605	Mo-Su: 3. Phase On	uu:mm	00:00	24:00	--.--
	606	Mo-Su: 3. Phase Off	uu:mm	00:00	24:00	--.--
	616	Default values	-	Yes	No	No
Holidays HC1	641	Preselection	-	Period 1, 2, 3, 4, 5, 6, 7, 8		Period 1
	642	Period Start Day / Month	tt.MM	01.01	31.12	--.--
	643	Periode End Day / Month	tt.MM	01.01	31.12	--.--
	648	Operating level	-	Frost protection, Reduced	Frost protection	Frost protection
Holidays HC2	651	Preselection	-	Period 1, 2, 3, 4, 5, 6, 7, 8		Period 1
(When activated)	652	Period Start Day / Month	tt.MM	01.01	31.12	--.--
	653	Periode End Day / Month	tt.MM	01.01	31.12	--.--
	658	Operating level	-	Frost protection, Reduced	Frost protection	Frost protection
HC1	710	Comfort setpoint	°C	Value from Line no. 712	35	20.0
	712	Reduced setpoint	°C	4	Value from Line no. 710	16.0
	714	Frost protection setpoint	°C	4	Value from Line no. 712	10.0
	720	Heating curve slope	-	0.10	4.00	1.50
	730	Summer/winter heating limit	°C	---/8	30	20
HC 2	1010	Comfort setpoint	°C	Value from Line no. 1012	35	20.0
	1012	Reduced setpoint	°C	4	Value from Line no. 1010	16.0
	1014	Frost protection setpoint	°C	4	Value from Line no. 1012	10.0
(When activated)	1020	Heating curve slope	-	0.10	4.00	0.8
	1030	Summer/winter heating limit	°C	---/8	30	0
DHW	1600	Operating mode	-	Off, On, Eco		Off
	1610	Nominal setpoint	°C	Value from Line no. 1612	80	55
	1612	Reduced setpoint	°C	8	Value from Line no. 1610	40
Swimming pool	2055	Pool setpoint solar heating	°C	8	80	26
	2056	Pool sepoint boiler heating	°C	8	80	22
Boiler	2214	Setpoint manual control	°C	10	90	50
Error	6700	Error message	-	-	-	Indication only
	6705	SW Diagnose Code	-	-	-	Indication only
	6706	Burner ctrl phase lockout pos	-	-	-	Indication only

Parameters technician

Basic display “Boiler temperature”
- Push OK button once
- Push Info button for 4 sec.
- Use the +- rotating button for selecting commissioning or technician level
- Push OK button once
- Use +- rotating button for selecting for instance “Drinking water menu”
- Push OK button once
- Use the +- rotating button, for instance in the drinking water menu, for selecting “Parameter no. 1612 - Reduced target value”
- Push OK button once
- Use +- rotating button to change the currently set value
- Push OK button once -> the value is stored
- Push 2 x ESC to return to the basic display “Boiler temperature”

Overview of commissioning parameters
The parameter lines with a grey background only become visible at the commissioning level.
The complete parameter list becomes visible at the technician level.

Menu	Line no.	Selection possibilities	Unit	Min.	Max	Factory setting
Time of day and date	1	Hours / Minutes	hh:mm	00:00	23.59	--.--
	2	Day / Month	dd:mm	01.01	31.12.	--.--
	3	Year	yyyy	2004	2099	--.--
	5	Start of summertime Day / Month	dd:mm	01.01	31.12.	25.03.
	6	End of summertime Day / Month	dd:mm	01.01	31.12.	25.10.
Operator section	20	Language	-	English, German, French, Italian, Danish, Dutch, Spanish, Czech, Slovenian, Turkish		German
	22	Info	-	Temporarily, Permanently		Temporarily
	26	Operation lock	-	Off, On		Off
	27	Programming lock	-	Off, On		Off
	28	Direct adjustment	-	Automatic storage, Storage with confirmation		Storage with confirmation
	44	Operation HC2	-	Jointly with HC1, Independently		Jointly with HC1
	46	Operation HC3/P	-	Jointly with HC1, Independently		Jointly with HC1
	70	Software Version	-	0	99.0	Indication only
Time program HC 1	500	Preselection	-	Mo-Su, Mo-Fr, Sa-Su		Mo-Su
	501	Mo-Su: 1. Phase On	hh:mm	00:00	00:00	06:00
	502	Mo-Su: 1. Phase Off	hh:mm	00:00	00:00	22:00
	503	Mo-Su: 2. Phase On	hh:mm	00:00	00:00	--.--
	504	Mo-Su: 2. Phase Off	hh:mm	00:00	00:00	--.--
	505	Mo-Su: 3. Phase On	hh:mm	00:00	00:00	--.--
	506	Mo-Su: 3. Phase Off	hh:mm	00:00	00:00	--.--
	516	Default values	-	Yes, No		No
Time program HC 2 (when activated)	520	Preselection	-	Mo-Su, Mo-Fr, Sa-Su		Mo-Su
	521	Mo-Su: 1. Phase On	hh:mm	00:00	00:00	06:00
	522	Mo-Su: 1. Phase Off	hh:mm	00:00	00:00	22:00
	523	Mo-Su: 2. Phase On	hh:mm	00:00	00:00	--.--
	524	Mo-Su: 2. Phase Off	hh:mm	00:00	00:00	--.--
	525	Mo-Su: 3. Phase On	hh:mm	00:00	00:00	--.--
	526	Mo-Su: 3. Phase Off	hh:mm	00:00	00:00	--.--
	536	Default values	-	Yes, No		No
Time program HC3/P	540	Preselection	-	Mo-Su, Mo-Fr, Sa-Su		Mo-Su
	541	Mo-Su: 1. Phase On	hh:mm	00:00	00:00	06:00
	542	Mo-Su: 1. Phase Off	hh:mm	00:00	00:00	22:00
	543	Mo-Su: 2. Phase On	hh:mm	00:00	00:00	--.--
	544	Mo-Su: 2. Phase Off	hh:mm	00:00	00:00	--.--
	545	Mo-Su: 3. Phase On	hh:mm	00:00	00:00	--.--
	546	Mo-Su: 3. Phase Off	hh:mm	00:00	00:00	--.--
	556	Default values	-	Yes, No		No
Time program 4 DHW	560	Preselection	-	Mo-Su, Mo-Fr, Sa-Su		Mo-Su
	561	Mo-Su: 1. Phase On	hh:mm	00:00	00:00	06:00
	562	Mo-Su: 1. Phase Off	hh:mm	00:00	00:00	22:00
	563	Mo-Su: 2. Phase On	hh:mm	00:00	00:00	--.--
	564	Mo-Su: 2. Phase Off	hh:mm	00:00	00:00	--.--
	565	Mo-Su: 3. Phase On	hh:mm	00:00	00:00	--.--
	566	Mo-Su: 3. Phase Off	hh:mm	00:00	00:00	--.--
	576	Default values	-	Yes, No		No

Parameters technician

Menu	Line no.	Selection possibilities	Unit	Min.	Max	Factory setting
Time program 5	600	Preselection	-	Mo-Su, Mo-Fr, Sa-Su		Mo-Su
	601	Mo-Su: 1. Phase On	hh:mm	00:00	00:00	06:00
	602	Mo-Su: 1. Phase Off	hh:mm	00:00	00:00	22:00
	603	Mo-Su: 2. Phase On	hh:mm	00:00	00:00	--.--
	604	Mo-Su: 2. Phase Off	hh:mm	00:00	00:00	--.--
	605	Mo-Su: 3. Phase On	hh:mm	00:00	00:00	--.--
	606	Mo-Su: 3. Phase Off	hh:mm	00:00	00:00	--.--
	616	Default values	-	Yes, No		No
Holidays HC1	641	Preselection	-	Period 1, 2, 3, 4, 5, 6, 7, 8		Period 1
	642	Period Start Day / Month	dd:mm	01.01	31.12	--.--
	643	Periode End Day / Month	dd:mm	01.01	31.12	--.--
	648	Operating level	-	Frost protection, reduced		Frost protection
Holidays HC2	651	Preselection	-	Period 1, 2, 3, 4, 5, 6, 7, 8		Period 1
(When activated)	652	Period Start Day / Month	dd:mm	01.01	31.12	--.--
	653	Periode End Day / Month	dd:mm	01.01	31.12	--.--
	658	Operating level	-	Frost protection, reduced		Frost protection
HC 1	700	Operating mode HC1	-	Protection, Automatic mode, Continuously comfort, Continuously reduced		Automatic mode
	710	Comfort setpoint	°C	Value from Line no. 712	35	20.0
	712	Reduced setpoint	°C	Value from Line no. 714	Value from Line no. 710	16.0
	714	Frost protection setpoint	°C	4	Value from Line no. 712	10.0
	720	Heating curve slope	-	0.10	4.00	1.50
	721	Heating curve parallel displacement	°C	-4.5	4.5	0.0
	726	Heating curve adaption	°C	Off, On		Off
	730	Summer/winter heating limit	°C	---/8	30	0
	732	24-hour heating limit	°C	---/-10	10	-3
	733	Ext'n 24-hour heating limit	-	No, Yes		Yes
	740	Flow temp setpoint min	°C	8	Value from Line no. 741	8
	741	Flow temp setpoint max	°C	Value from Line no. 740	80	80
	742	Flow temp setpoint room stat	°C	Value from Line no. 740	Value from Line no. 741	65
	746	Delay heat request	s	0	600	0
	750	Room influence	%	---/0	100	20
	760	Room temp limitation	°C	---/0.5	4	1
	770	Boost heating	°C	---/0	20	2
	780	Quick setback	-	Off, Down to Reduced setpoint, Down to Frost protection setpoint		Down to Reduced setpoint
	790	Optimum start control max	min	0	360	0
	791	Optimum Stop control max	min	0	360	0
	800	Reduced setp increase start	°C	---/30	10	-5
	801	Reduced setp increase end	°C	-30	Value from Line no. 800	-15
	820	Overtemp prot pump circuit	-	Off, On		On
	830	Mixing valve boost	°C	0	50	5
	832	Actuator type	-	2-position, 3-position		3-position
	833	Switching differential 2-pos	°C	0	20	2
	834	Actuator running time	s	30	873	135
	835	P-Band (Xp) HC1	°C	1	100	24
	836	Integral action time (Tn) HC1	s	10	873	90
	850	Floor curing function	-	Off, Functional heating, Curing heating, Manual		Off
	851	Floor curing setp manually	°C	0		25
	855	Floor curing setp current	°C	-		Indication only
	856	Floor curing day current	-	0		0
	861	Excess heat draw	-	Off, Heating mode, Always		Off
	870	With buffer	-	No, Yes		Yes
	872	With prim contr/system pump	-	No, Yes		Yes
	890	Flow setp readj speed ctrl	-	No, Yes		No
	898	Operating level change over	-	Frost protection, Reduced, Comfort		Reduced
	900	Optg mode changeover	-	None, Protection, Reduced, Comfort, Automatic		Protection

Parameters technician

Menu	Line no.	Selection possibilities	Unit	Min.	Max	Factory setting
HC 2	1000	Operating mode HC2	-	Protection, Automatic mode, Reduced		Protection
(when activated)	1010	Comfort setpoint	°C	Value from Line no. 1012	35	20.0
	1012	Reduced setpoint	°C	Value from Line no. 1014	Value from Line no. 1010	16.0
	1014	Frost protection setpoint	°C	4	Value from Line no. 1012	10.0
	1020	Heating curve slope	-	0.10	4.00	0.8
	1021	Heating curve parallel dis-	°C	-4.5	4.5	0.0
	1026	Heating curve adaption	°C	Off, On		Off
	1030	Summer/winter heating limit	°C	---/8	30	20
	1032	24-hour heating limit	°C	---/-10	10	-3
	1033	Ext'n 24-hour heating limit	-	No, Yes		Yes
	1040	Flow temp setpoint min	°C	8	Value from Line no. 1041	8
	1041	Flow temp setpoint max	°C	Value from Line no. 1040	80	50
	1042	Flow temp setpoint room stat	°C	Value from Line no. 1040	Value from Line no. 1041	50
	1046	Room influence	s	0	600	0
	1050	Room temp limitation	%	---/0	100	20
	1060	Boost heating	°C	---/0.5	4	1
	1070	Summer/winter heating limit	°C	---/0	20	2
	1080	Quick setback	-	Off, Down to Reduced setpoint, Down to Frost protection setpoint		Down to Reduced setpoint
	1090	Optimum start control max	min	0	360	0
	1091	Optimum Stop control max	min	0	360	0
	1100	Reduced setp increase start	°C	---/30	10	-5
	1101	Reduced setp increase end	°C	-30	Value from Line no. 1100	-15
	1120	Overtemp prot pump circuit	-	Off, On		On
	1130	Mixing valve boost	°C	0	50	5
	1132	Actuator type	-	2-position, 3-position		3-position
	1133	Switching differential 2-pos	°C	0	20	2
	1134	Actuator running time	s	30	873	135
	1135	P-Band (Xp) HC1	°C	1	100	24
	1136	Integral action time (Tn) HC1	s	10	873	90
	1150	Floor curing function	-	Off, Functional heating, Curing heating, Manual		Off
	1151	Floor curing setp manually	°C	0	95	25
	1155	Floor curing setp current	°C	-	-	Indication only
	1156	Floor curing day current	-	0	32	0
	1161	Excess heat draw	-	Off, Heating mode, Always		Off
	1170	With buffer	-	No, Yes		Yes
	1172	With prim contr/system pump	-	No, Yes		Yes
	1190	Flow setp readj speed ctrl	-	No, Yes		No
	1198	Operating level change over	-	Frost protection, Reduced, Comfort		Reduced
	1200	Optg mode changeover	-	None, Protection, Reduced, Comfort, Automatic		Protection

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Menu	Line no.	Selection possibilities	Unit	Min.	Max	Factory setting
Domestic hot water	1600	Operating mode	-	Off, On, Eco		Off
	1610	Nominal setpoint	°C	8	80	55
	1612	Reduced setpoint	°C	8	80	40
	1614	Nominal setpoint max	°C	8	80	65
	1620	Release	-	24h/Day, Time programs HCs, Time program 4/DHW		Time programs HCs
	1630	Charging priority	-	Absolute, Shifting, None, MC shifting PC absolute		MC shifting PC absolute
	1640	Legionella function	-	Off, Periodically, Fixed weekday		Off
	1641	Legionella function periodically	-	1	7	7
	1642	Legionella funct Day	-	Mo,Tu,We,Th,Fr,Sa,Su		Montag
	1644	Legionella funct time	uu:mm	00:00	23:50	---
	1645	Legionella funct setpoint	°C	55	95	65
	1646	Legionella funct duration	min	10	360	30
	1647	Legionella funct circ pump	-	Off, On		On
	1660	Circulating pump release	-	Time program 3/HCP, DHW release, Time program 4/DHW, Time program 5		DHW release
	1661	Circulating pump cycling	-	Off, On		Off
	1663	Circulation setpoint	°C	8	80	45
	1680	Optg mode changeover	-	None, Off, On		None
Consumer circuit 1	1859	Flow temp setp cons request	°C	8	120	70
	1874	DHW charging priority	-	No, Yes		Yes
	1875	Excess heat draw	-	No, Yes		No
	1878	With buffer	-	No, Yes		Yes
	1880	With prim contr/system pump	-	No, Yes		Yes
Consumer circuit 2	1909	Flow temp setp cons request	°C	8	120	70
	1924	DHW charging priority	-	No, Yes		Yes
	1925	Excess heat draw	-	No, Yes		No
	1928	With buffer	-	No, Yes		Yes
	1930	With prim contr/system pump	-	No, Yes		Yes
Consumer circuit 3	1959	Flow temp setpoint	°C	8		45
	1974	DHW charging priority	-	No, Yes		Yes
	1975	Excess heat draw	-	No, Yes		No
	1978	With buffer	-	No, Yes		Yes
	1980	With prim contr/system pump	-	No, Yes		Yes
Swimming pool	2055	Pool setpoint solar heating	°C	8	80	26
	2056	Pool setpoint producer heating	°C	8	80	22
	2065	Pool charging priority solar	-	Priority 1, Priority 2, Priority 3		Priority 3
	2070	Pool temperature maximum	°C	8	95	30
	2080	Pool with solar	-	No, Yes		Yes
Primary control/ System pump	2110	Flow temp min limitation	°C	8	95	8
	2111	Flow temp max limitation	°C	8	95	80
	2121	Syst pump on heat gen lock	-	Off, On		Off
	2130	Mixing valve boost	°C	0	50	5
	2132	Actuator type	-	2-position, 3-position		3-position
	2133	Switching differential 2-pos	°C	0	20	2
	2134	Actuator running time	s	30	873	120
	2135	P-Band (Xp	°C	1	100	32
	2136	Integral action time (Tn) HC1	s	10	873	120
	2150	Primary control/System pump	-	Upstream of buffer, Downstream of buffer		Downstream of buffer

Parameters technician

Menu	Line no.	Selection possibilities	Unit	Min.	Max	Factory setting
Boiler	2210	Setpoint min	°C	8	95	20
	2212	Setpoint max	°C	8	120	85
	2214	Setpoint manual control	°C	8	120	50
	2233	P-Band Xp HCs	°C	1	200	64
	2234	Int action time Tn HCs	s	4	873	75
	2235	Der action time Tv HCs	s	0	30	0
	2236	P-Band Xp DHW	°C	1	200	21
	2237	Int action time Tn DHW	s	4	873	75
	2238	Der action time Tv DHW	s	0	30	0
	2241	Burner running time min	min	0	20	0
	2243	Burner off time min	min	0	60	15
	2245	SD burner off time	°C	0	80	15
	2250	Pump overrun time	min	0	240	3
	2253	Pump overr time after DHW	min	0	20	1
	2270	Return setpoint min	°C	8	95	8
	2301	Boiler pump on heat gen lock	-	Off, On		Off
	2305	Impact heat generation lock	-	Heating mode only, Heating and DHW mode		Heating mode only
	2316	Temp differential max	°C	0	80	25
	2317	Temp differential nominal	°C	0	80	20
	2320	Pump modulation	-	None, Demand, Boiler setpoint, Temp differential nominal, Burner output		Temp differential nominal
	2321	Starting speed	%	0	100	100
	2322	Pump speed min	%	0	100	45
	2323	Pump speed max	%	0	100	THI S PLUS 13: 45 THI S PLUS 19: 55 THI S PLUS 24 / Combi 24: 60 THI S PLUS 34 / Combi 34: 75 THI S PLUS 35L: 55 THI S PLUS 46: 70 THI S PLUS 54: 90
	2324	Speed Xp	°C	1	200	32
	2325	Speed Tn	s	10	873	120
	2326	Speed Tv	s	0	30	10
	2329	Pump setpoint reduction	°C	0	20	10
	2330	Output nominal	kW	0	2000	THI S PLUS 13: 13 THI S PLUS 19: 19 THI S PLUS 24 / Combi 24: 24 THI S PLUS 34 / Combi 34: 34 THI S PLUS 35L: 35 THI S PLUS 46: 46 THI S PLUS 54: 54
	2331	Output basic stage	kW	0	2000	THI S PLUS 13: 4 THI S PLUS 19: 4 THI S PLUS 24 / Combi 24: 4 THI S PLUS 34 / Combi 34: 6 THI S PLUS 35L: 9 THI S PLUS 46: 9 THI S PLUS 54: 9
	2334	Output at pump speed min	%	0	100	0
	2335	Output at pump speed max	%	0	100	100
	2441	Fan speed heating max	rpm	0	1000	THI S PLUS 13: 3580 THI S PLUS 19: 4620 THI S PLUS 24: 5450 THI S PLUS Combi 24: 3720 THI S PLUS 34 / Combi 34: 5600 THI S PLUS 35L: 3600 THI S PLUS 46: 4750 THI S PLUS 54: 5400
	2442	Fan speed full charging max	rpm	0	1000	See Line no. 2441
	2444	Fan speed DHW max	rpm	0	1000	THI S PLUS 13: 3580 THI S PLUS 19: 4620 THI S PLUS 24: 5450 THI S PLUS Combi 24: 5130 THI S PLUS 34 / Combi 34: 5600 THI S PLUS 35L: 3600 THI S PLUS 46: 4750 THI S PLUS 54: 5400

Parameters technician

Menu	Line no.	Selection possibilities	Unit	Min.	Max	Factory setting
Boiler	2445	Fan shutdown heating mode	-	Uit, Aan		Uit
	2446	Fan shutdown delay	s	0	200	3
	2450	Controller delay	-	Off, Heating mode only, DHW mode only, Heating and DHW mode		Heating mode only
	2452	Controller delay speed	rpm	0	10000	1500
	2453	Controller delay duration	s	0	255	30
	2470	Delay heat req special op	s	0	600	0
	2630	Auto deaeration procedure	-	Off, On		Off
	2655	ON time deaeration	s	0	240	20
	2656	OFF time deaeration	s	0	240	10
	2657	Number of repetititions	-	0	100	3
	2662	Deaeration time heat circuit	min	0	255	3
	2663	Deaeration time DHW	min	0	255	2
Cascade (when activated)	3510	Lead strategy	-	Late on early off, Late on late off, Early on late off		Late on early off,
	3511	Output band min	%	0	100	40
	3512	Output band max	%	0	100	90
	3530	Release integral source seq	°C*min	0	500	100
	3531	Reset integral source seq	°C*min	0	500	8
	3532	Restart lock	s	0	1800	300
	3533	Switch on delay	min	0	120	5
	3534	Forced time basic stage	s	0	1200	60
	3540	Auto source seq ch'over	h	10	990	500
	3541	Auto source seq exclusion	-	None, First, Last, First and Last		None
	3544	Leading source	-	1	16	Source 1
	3560	Return setpoint min	°C	8	95	8
Solar	3810	Temp diff on	°C	0	40	8
	3811	Temp diff off	°C	0	40	4
	3812	Charge temp min DHW	°C	8	95	30
	3813	Temp diff on buffer	°C	0	40	8
	3814	Temp diff off buffer	°C	0	40	4
	3815	Charging temp min buffer	°C	8	95	30
	3816	Temp diff on pool	°C	0	40	8
	3817	Temp diff off pool	°C	0	40	4
	3818	Charging temp min pool	°C	8	95	30
	3822	DHW storage tank	-	None, DHW storage tank, Buffer		DHW storage tank
	3825	Charging time relative priority	min	2	60	20
	3826	Waiting time relative priority	min	1	40	5
	3827	Waiting time parallel operation	min	0	40	20
	3828	Delay secundary pump	s	0	600	60
	3830	Collector start function	min	5	60	30
	3831	Min run time collector pump	s	5	120	30
	3834	Collector start funct grad	min/°C	1	20	4
	3840	Collector frost protection	°C	-20	5	---
	3850	Collector overtemp protection	°C	30	350	80
	3860	Evaporation heat carrier	°C	60	350	110
	3870	Pump speed min	%	0	100	40
	3871	Pump speed max	%	0	100	100
	3880	Antifreeze		None, Ethylene glycol, Propylene glycol, Ethyl and propyl glycol		None
	3881	Antifreeze concentration	%	1	100	30
	3884	Pump capacity	l/u	10	1500	200
	3887	Pulse count yield	l	0	100	10

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Menu	Line no.	Selection possibilities	Unit	Min.	Max	Factory setting
Solid fuel boiler	4102	Lock other heat sources		Uit, Aan		Aan
	4110	Setpoint min	°C	8	120	60
	4130	Temp diff on	°C	1	40	8
	4131	Temp diff off	°C	0	40	4
	4133	Comparative temp		DHW sensor B3, DHW sensor B31, Buffer sensor B4, Buffer sensor B41, Flow temp setpoint, Setpoint min		Buffer sensor B41
	4141	Excess heat discharge	°C	60	140	90
	4170	Frost prot plant boiler pump		Off, On		On
Buffer	4720	Auto heat gen lock	-	None, with B4, with B4 and B42/B41		with B4
	4721	Auto heat gen lock SD	°C	0	20	3
	4722	Temp diff buffer/HC	°C	-20	20	-4
	4724	Min st tank temp heat mode	°C	8	95	8
	4750	Charging temp max	°C	8	95	80
	4755	Recooling temp	°C	8	95	60
	4756	Recooling DHW/HCs	-	Off, On		Off
	4757	Recooling collector	-	Off, Summer, Always		Summer
	4783	With solar integration	-	No, Yes		No
	4790	Temp diff on return div	°C	0	40	10
	4791	Temp diff off return div	°C	0	40	5
	4795	Compar temp return div	-	With B4, With B41, With B42		With B4
	4796	Optg action return diversion	-	Temperature decrease, Temp increase		Temp increase
	4800	Partial charging setpoint	°C	8	95	60
	4810	Full charging	-	Off, Heating mode, Always		Off
	4811	Full charging temp min	°C	8	80	8
	4813	Full charging sensor	-	With B4, With B42/B41		With B42/B41
DHW Storage tank	5010	Charging	-	Once/day, Several times/day		Several times/day
	5020	Flow setpoint boost	°C	0	30	16
	5021	Transfer boost	°C	0	30	8
	5022	Type of charging	-	Recharging, Full charging, Full charging legio, Full charg 1st time day, Full charg 1st time day legio		Recharging
	5024	Switching diff	°C	0	20	5
	5030	Charging time limitation	min	10	600	60
	5040	Discharging protection	-	Off, Always, Automatic		Automatic
	5050	Charging temp max	°C	8	95	70
	5055	Recooling temp	°C	8	95	70
	5056	Recooling heat gen/HCs	-	Off, On		Off
	5057	Recooling collector	-	Off, Summer, Always		Always
	5060	El imm heater optg mode	-	Substitute, Summer, Always		Substitute
	5061	El immersion heater release	-	24h/day, DHW release, Time program 4/DHW		DHW release
	5062	El immersion heater control	-	External thermostat, DHW sensor		DHW sensor
	5070	Automatic push	-	Off, On		On
	5085	Excess heat draw	-	Off, On		On
	5090	With buffer	-	No, Yes		No
	5092	With prim contr/system pump	-	No, Yes		No
	5093	With solar integration	-	No, Yes		Yes
	5101	Pump speed min	%	0	100	100
	5102	Pump speed max	%	0	100	100
	5130	Transfer strategy	-	Off, Always, DHW release		Always
	5131	Comparison temp transfer	-	DHW sensor B3, DHW sensor B31		DHW sensor B3

Parameters technician

Menu	Line no.	Selection possibilities	Unit	Min.	Max	Factory setting
Configuration	5700	Presetting	-	1	4	1
	5710	Heating circuit 1	-	Off, On		On
	5715	Heating circuit 2	-	Off, On		Off
	5721	Heating circuit 3	-	Off, On		Off
	5730	DHW sensor	-	DHW sensor B3, Thermostat, DHW outlet sensor B38		DHW sensor B3
	5731	DHW controlling element	-	No charging request, Charging pump, Diverting valve		Charging pump
	5734	Basic pos DHW div valve	-	Last request, Heating circuit, DHW		Last request
	5736	DHW separate circuit	-	Off, On		Off
	5737	Optg action DHW div valve	-	Position On DHW, Position On HC		Position On DHW
	5774	Ctrl boiler pump/DHW valve	-	All requests, Request HC1/DHW only		All requests
	5840	Solar controlling element	-	Charging pump, Diverting valve		Charging pump
	5841	External solar exchanger	-	Jointly, DHW storage tank, Buffer storage tank		Jointly
	5870	Combi storage tank	-	No, Yes		No
	5890	Relay output QX1	-	0: None 1:Circulating pump Q4 2:El imm heater DHW K6 3:Collector pump Q5 4:Cons circuit pump VK1 Q15 5:Boiler pump Q1 6:Bypass pump Q12 7:Alarm output K10 8:2nd pump speed HC1 Q21 9:2nd pump speed HC2 Q22 10:2nd pump speed HC3 Q23 11:Heat circuit pump HC3 Q20 12:Cons circuit pump VK2 Q18 13:System pump Q14 14:Heat gen shutoff valve Y4 15:Solid fuel boiler pump Q10 16:Time program 5 K13 17:Buffer return valve Y15 18:Solar pump ext exch K9 19:Solar ctrl elem buffer K8 20:Solar ctrl elem swi pool K18 22: Swimming pool pump Q19 25:Cascade pump Q25 26:St tank transfer pump Q11 27:DHW mixing pump Q35 28:DHW interm circ pump Q33 29:Heat request K27 30:Refrigeration request K28 33:Heat circuit pump HC1 Q2 34:Heat circuit pump HC2 Q6 35:DHW ctrl elem Q3 36:Instant heater ctrl elem Q34 38:Water filling K34 39:2nd boiler pump speed Q27 40:Status output K35 41:Status information K36 42:Flue gas damper K37 43:Fan shutdown K38		None
	5891	Relay output QX2	-			None
	5892	Relay output QX3	-			DHW ctrl elem Q3
	5930	Sensor input BX1	-	0: None 1:DHW sensor B31 2:Collector sensor B6 4:DHW circulating sensor B39 5:Buffer sensor B4 6:Buffer sensor B41 7:Flue gas temp sensor B8 8:Segment flow sensor B10 9:Solid fuel boiler sensor B22 10:DHW charging sensor B36 11:Buffer sensor B42 12:Segment return sensor B73 13:Cascade return sensor B70 14:Pool sensor B13 16:Solar flow sensor B63 17:Solar return sensor B64 19: Primary exch sensor B26		None
	5931	Sensor input BX2	-			None
	5932	Sensor input BX3	-			Flue gas temp sensor B8

Parameters technician

Menu	Line no.	Selection possibilities	Unit	Min.	Max	Factory setting
Configuration	5950	Function input H1	-	0: None 1:Optg mode change HCs+DHW 2:Optg mode changeover DHW 3:Optg mode changeover HCs 4:Optg mode changeover HC1 5:Optg mode changeover HC2 6:Optg mode changeover HC3 7:Heat generation lock 8:Error/alarm message 9:Consumer request VK1 10:Consumer request VK2 11:Release swi pool source heat 12:Excess heat discharge 13:Release swi pool solar 14:Operating level DHW 15:Operating level HC1 16:Operating level HC2 17:Operating level HC3 18:Room thermostat HC1 19:Room thermostat HC2 20:Room thermostat HC3 21:DHW flow switch 22:DHW thermostat 24: Pulse count 28:Checkb sign flue gas damper 29:Start prevention 31:Boiler flow switch 32:Boiler pressure switch 51:Consumer request VK1 10V 52:Consumer request VK2 10V 54: Pressure measurement 10V 58: Preselected output 10V		None
	5960	Function input H3	-			Consumer request VK1 10V
	5951	Contact type H1	-	NC, NO		NO
	5961	Contact type H3	-			NO
	5953	Voltage value 1 H1	V	0	10	2
	5954	Function value 1 H1	-	-1000	5000	200
	5955	Voltage value 2 H1	V	0	10	10
	5956	Function value 2 H1	-	-1000	5000	850
	5970	Function input H4	-	0: None 1:Optg mode change HCs+DHW 2:Optg mode changeover DHW 3:Optg mode changeover HCs 4:Optg mode changeover HC1 5:Optg mode changeover HC2 6:Optg mode changeover HC3 7:Heat generation lock 8:Error/alarm message 9:Consumer request VK1 10:Consumer request VK2 11:Release swi pool source heat 12:Excess heat discharge 13:Release swi pool solar 14:Operating level DHW 15:Operating level HC1 16:Operating level HC2 17:Operating level HC3 18:Room thermostat HC1 19:Room thermostat HC2 20:Room thermostat HC3 21:DHW flow switch 22:DHW thermostat 24: Pulse count 28:Checkb sign flue gas damper 29:Start prevention 31:Boiler flow switch 32:Boiler pressure switch 50: Flow measurement Hz		None
	5971	Contact type H4	-	NC, NO		NO
	5973	Frequency value 1 H4	-	0	1000	0
	5974	Function value 1 H4	-	-1000	5000	0
	5975	Frequency 2 H4	-	0	1000	0
	5976	Function value 2 H4	-	-1000		0

Parameters technician

Menu	Line no.	Selection possibilities	Unit	Min.	Max	Factory setting
Configuration	5977	Function input H5	-	0: None 1:Optg mode change HCs+DHW 2:Optg mode changeover DHW 3:Optg mode changeover HCs 4:Optg mode changeover HC1 5:Optg mode changeover HC2 6:Optg mode changeover HC3 7:Heat generation lock 8:Error/alarm message 9:Consumer request VK1 10:Consumer request VK2 11:Release swi pool source heat 12:Excess heat discharge 13:Release swi pool solar 14:Operating level DHW 15:Operating level HC1 16:Operating level HC2 17:Operating level HC3 18:Room thermostat HC1 19:Room thermostat HC2 20:Room thermostat HC3 21:DHW flow switch 22:DHW thermostat 24: Pulse count 28:Checkb sign flue gas damper 29:Start prevention 31:Boiler flow switch 32:Boiler pressure switch		None
	5978	Contact type H5	-	NC, NO		NC
	6020	Function extension module 1	-	0: None 1:Multifunctional 2:Heating circuit 1 3:Heating circuit 2 4:Heating circuit 3 5:Return temp controller 6:Solar DHW 7:Primary contr/system pump		No function
	6021	Function extension module 2	-			No function
	6022	Function extension module 3	-			No function
	6024	Funct input EX21 module 1	-	0: None 25: Limit thermostat HC		None
	6026	Funct input EX21 module 2	-			None
	6028	Funct input EX21 module 3	-			None
	6030	Relay output QX21 module 1	-	0: None 1:Circulating pump Q4 2:El imm heater DHW K6 3:Collector pump Q5 4:Cons circuit pump VK1 Q15 5:Boiler pump Q1 6:Bypass pump Q12 7:Alarm output K10 8:2nd pump speed HC1 Q21 9:2nd pump speed HC2 Q22 10:2nd pump speed HC3 Q23 11:Heat circuit pump HC3 Q20 12:Cons circuit pump VK2 Q18 13:System pump Q14 14:Heat gen shutoff valve Y4 15:Solid fuel boiler pump Q10 16:Time program 5 K13 17:Buffer return valve Y15 18:Solar pump ext exch K9 19:Solar ctrl elem buffer K8 20: Solar ctrl elem swi pool K18 22: Swimming pool pump Q19 25:Cascade pump Q25 26:St tank transfer pump Q11 27:DHW mixing pump Q35 28:DHW interm circ pump Q33 29:Heat request K27 30:Refrigeration request K28 33:Heat circuit pump HC1 Q2 34:Heat circuit pump HC2 Q6 35:DHW ctrl elem Q3 36:Instant heater ctrl elem Q34 38:Water filling K34 39:2nd boiler pump speed Q27 40:Status output K35 41:Status information K36 43: Fan shutdown K38		None
	6031	Relay output QX22 module 1	-			None
	6032	Relay output QX23 module 1	-			None
	6033	Relay output QX21 module 2	-			None
	6034	Relay output QX22 module 2	-			None
	6035	Relay output QX23 module 2	-			None
	6036	Relay output QX21 module 3	-			None
	6037	Relay output QX22 module 3	-			None
	6038	Relay output QX23 module 3	-			None

Parameters technician

Menu	Line no.	Selection possibilities	Unit	Min.	Max	Factory setting
Configuration	6040	Sensor input BX21 module 1	-	0: None 1: DHW sensor B31 2: Collector sensor B6 4: DHW circulation sensor B39 5: Buffer sensor B4 6: Buffer sensor B41 7: Flue gas temp sensor B8 8: Common flow sensor B10 9: Solid fuel boiler sensor B22 10: DHW charging sensor B36 11: Buffer sensor B42 12: Common return sensor B73 13: Cascade return sensor B70 14: Swimming pool sensor B13 16: Solar flow sensor B63 17: Solar return sensor B64 19: Primary exch sensor B26		None
	6041	Sensor input BX22 module 1	-			None
	6042	Sensor input BX21 module 2	-			None
	6043	Sensor input BX22 module 2	-			None
	6044	Sensor input BX21 module 3	-			None
	6045	Sensor input BX22 module 3	-			None
	6046	Function input H2 module 1	-	0: None 1: Optg mode change HCs+DHW 2: Optg mode changeover DHW 3: Optg mode changeover HCs 4: Optg mode changeover HC1 5: Optg mode changeover HC2 6: Optg mode changeover HC3 7: Heat generation lock 8: Error/alarm message 9: Consumer request VK1 10: Consumer request VK2 11: Consumer request VK3 12: Excess heat discharge 13: Release swi pool solar 14: Operating level DHW 15: Operating level HC1 16: Operating level HC2 17: Operating level HC3 18: Room thermostat HC1 19: Room thermostat HC2 20: Room thermostat HC3 21: DHW flow switch 22: DHW thermostat 25: Limit thermostat HC 29: Start prevention 31: Boiler flow switch		None
	6054	Function input H2 module 2	-			None
	6062	Function input H2 module 3	-			None
	6047	Contact type H2 module 1	-	NC, NO		NO
	6055	Contact type H2 module 2	-			NO
	6063	Contact type H2 module 3	-			NO
	6049	Voltage value 1 H2 module 1	V	0	10	0
	6057	Voltage value 1 H2 module 2	V			0
	6065	Voltage value 1 H2 module 3	V			0
	6050	Function value 1 H2 module 1	-	-1000	5000	0
	6058	Function value 1 H2 module 2	-			0
	6066	Function value 1 H2 module 3	-			0

Parameters technician

Menu	Line no.	Selection possibilities	Unit	Min.	Max	Factory setting
Configuration	6051	Voltage value 2 H2 module 1	V	0	10	0
	6059	Voltage value 2 H2 module 2	V			0
	6067	Voltage value 2 H2 module 3	V			0
	6052	Function value 2 H2 module 1	-	-1000	5000	0
	6060	Function value 2 H2 module 2	-			0
	6068	Function value 2 H2 module 3	-			0
	6097	Sensor type collector	-	NTC, PT 1000		NTC
	6098	Readjustm collector sensor	°C	-20	20	0
	6100	Readjustm outside sensor	°C	-3	3	0
	6110	Time constant building	h	0	50	5
	6117	Central setpoint shift	°C	1	100	5
	6118	Setpoint reduction delay	K/min	Off , 1 - 200		20
	6120	Frost protection plant	-	Off, On		On
	6200	Save sensors	-	No, Yes		No
	6205	Reset to default parameters	-	No, Yes		No
	6212	Check nr heat source 1	-	0	199999	0
	6213	Check nr heat source 2	-	0	199999	0
	6215	Check nr storage tank	-	0	199999	0
	6217	Check nr heating circuits	-	0	199999	0
	6220	Software version	-	0	99	0
LPB	6600	Device address	-	0	239	1
	6601	Segment address	-	0	16	0
	6604	Bus power supply function	-	Off, Automatically		Automatically
	6605	Bus power supply state	-	Off, On		On
	6610	Display system messages	-	No, Yes		No
	6612	Alarm delay	min	2-60 min		10
	6620	Action changeover functions	-	Segment, System		Segment
	6621	Summer changeover	-	Locally, Centrally		Locally
	6623	Optg mode changeover	-	Locally, Centrally		Locally
	6624	Manual source lock	-	Off, Automatically		Automatically
	6625	DHW assignment	-	Local HCs, All HCs in segment, All HCs in system		All HCs in system
	6632	Note OT limit ext source	-	No, Yes		No
	6640	Clock mode	-	Autonomously, Slave without remote setting, Slave with remote setting, Master		Autonomously
	6650	Outside temp source	-	0	239	0

Parameters technician

Menu	Line no.	Selection possibilities	Unit	Min.	Max	Factory setting
Errors	6700	Message	-	0	65535	0
	6705	SW diagnostic code	-	0	65535	0
	6706	Burn ctrl phase lockout pos	-	0	255	0
	6710	Reset alarm relay	-	0	1	0
	6740	Flow temp 1 alarm	min	10	240	---
	6741	Flow temp 2 alarm	min			---
	6742	Flow temp 3 alarm	min			---
	6743	Boiler temp alarm	min			---
	6745	DHW charging alarm	h	1	48	---
	6800 6810 6820 6990	Time stamp error Note 1 Note 2 ..... Note 20	h:m	00:00	23:59	04
	6803 6813 6823 6993	Error code Note 1 Note 2 ..... Note 20	-	0	9999	0
	6805 6815 6825 6995	SW diagnostic code Past value 1 Past value 2 ..... Past value 20	-	0	9999	0
	6806 6816 6826 6996	Burner control phase Past value 1 Past value 2 ..... Past value20	-	0	255	0
Maintenance/Special mode	7040	Burner hours interval	h	100	10000	1500
	7041	Burn hrs since maintenance	h	0	10000	0
	7042	Burner start interval	-	100	65500	9000
	7043	Burn starts since maint	-	0	65535	0
	7044	Maintenance interval	Months	1	240	24
	7045	Time since maintenance	Months	0	240	0
	7050	Fan speed ionization current	rpm	0	10000	0
	7051	Message ionization current	-	No, Yes		No
	7130	Chimney sweep function	-	Off, On		Off
	7131	Burner output	-	Partial load, Full load, Max heating load		Full load
	7140	Manual control	-	Off, On		Off
	7143	Controller stop function	-	Off, On		Off
	7145	Controller stop setpoint	%	0	100	50
	7146	Deaeration function	-	Off, On		Off
	7147	Type of venting	-	None, Heating circuit continuous, Heating circuit cycled, DHW continuous, DHW cycled		None
	7170	Telephone customer service	-	0	9	0
	7250	PStick storage pos	-	0	250	0
	7251	PStick data description	-	0	255	0
	7252	PStick command	-	No operation, Reading from stick, Writing on stick		No operation
	7253	PStick progress	%	0	100	0
	7254	PStick status	-	0: No stick 1: No operation 2: Writing on stick 3: Reading from stick 4: EMC test active 5: Writing error 6: Reading error 7: Incompatible data set 8: Wrong stick type 9: Stick format error 10: Check data set 11: Data set disabled 12: Reading disabled		No Stick

Parameters technician

Menu	Line no.	Selection possibilities	Unit	Min.	Max	Factory setting
I/O-Test	7700	Relay test	-	0: No test 1: Everything off 2: Relay output QX1 3: Relay output QX2 4: Relay output QX3 5: Relay output QX4 6: Relay output QX21 module 1 7: Relay output QX22 module 1 8: Relay output QX23 module 1 9: Relay output QX21 module 2 10: Relay output QX22 module 2 11: Relay output QX23 module 2 12: Relay output QX21 module 3 13: Relay output QX22 module 3 14: Relay output QX23 module 3		No test
	7713	Output test P1	%	0	100	---
	7714	PWM output P1	%	0	100	0
	7730	Outside temp B9	°C	-50	50	0
	7750	DHW temp B3/B38	°C	0	140	0
	7760	Boiler temp B2	°C	0	140	0
	7820	Sensor temp BX1	°C	-28	350	0
	7821	Sensor temp BX2	°C	-28	350	0
	7822	Sensor temp BX3	°C	-28	350	0
	7823	Sensor temp BX4	°C	-28	350	0
	7830	Sensor temp BX21 module 1	°C	-28	350	0
	7831	Sensor temp BX22 module 1	°C	-28	350	0
	7832	Sensor temp BX21 module 2	°C	-28	350	0
	7833	Sensor temp BX22 module 2	°C	-28	350	0
	7834	Sensor temp BX21 module 3	°C	-28	350	0
	7835	Sensor temp BX22 module 3	°C	-28	350	0
	7840	Voltage signal H1	V	0	10	0
	7841	Contact state H1	-	Open, Closed		Open
	7845	Voltage signal H2 module 1	V	0	10	0
	7846	Contact state H2 module 1	-	Open, Closed		Open
	7848	Voltage signal H2 module 2	V	0	10	0
	7849	Contact state H2 module 2	-	Open, Closed		Open
	7851	Voltage signal H2 module 3	V	0	10	0
	7852	Contact state H2 module 3	-	Open, Closed		Open
	7854	Voltage signal H3	V	0	10	0
	7855	Contact state H3	-	Open, Closed		Open
	7862	Frequency H4	-	0		0
	7860	Contact state H4	-	Open, Closed		Open
	7865	Contact state H5	-	Open, Closed		Open
	7872	Contact state H6	-	Open, Closed		Open
	7874	Contact state H7	-	Open, Closed		Open
	7950	Input EX21 module 1	-	0V, 230V		0V
	7951	Input EX21 module 2	-	0V, 230V		0V
	7952	Input EX21 module 3	-	0V, 230V		0V
Status	8000	State heating circuit 1	-	0: --- 1: STB tripped . . . . . . 254: Value 550; 254 255: Value 550; 255		---
	8001	State heating circuit 2	-			---
	8002	State heating circuit 3	-			---
	8003	State DHW	-			---
	8005	State boiler	-			---
	8007	State solar	-			---
	8008	State solid fuel boiler	-			---
	8009	State burner	-			---
	8010	State buffer	-			---
	8011	State swimming pool	-			---

Parameters technician

Menu	Line no.	Selection possibilities	Unit	Min.	Max	Factory setting
Diagnostics cascade (when activated)	8100	Priority source 1	-	0	16	Indication only
	8101	State source 1	-	0: Missing 1: Faulty 2: Manual control active 3: Heat generation lock active 4: Chimney sweep funct active 5: Temporarily unavailable 6: Outside temp limit active 7: Not released 8: Released		
	8102	Priority source 2	-	0	16	
	8103	State source 2	-	See Line no. 8101		
	8104	Priority source 3	-	0	16	
	8105	State source 3	-	See Line no. 8101		
	8106	Priority source 4	-	0	16	
	8107	State source 4	-	See Line no. 8101		
	8108	Priority source 5	-	0	16	
	8109	State source 5	-	See Line no. 8101		
	8110	Priority source 6	-	0	16	
	8111	State source 6	-	See Line no. 8101		
	8112	Priority source 7	-	0	16	
	8113	State source 7	-	See Line no. 8101		
	8114	Priority source 8	-	0	16	
	8115	State source 8	-	See Line no. 8101		
	8116	Priority source 9	-	0	16	
	8117	State source 9	-	See Line no. 8101		
	8118	Priority source 10	-	0	16	
	8119	State source 10	-	See Line no. 8101		
	8120	Priority source 11	-	0	16	
	8121	State source 11	-	See Line no. 8101		
	8122	Priority source 12	-	0	16	
	8123	State source 12	-	See Line no. 8101		
	8124	Priority source 13	-	0	16	
	8125	State source 13	-	See Line no. 8101		
	8126	Priority source 14	-	0	16	
	8127	State source 14	-	See Line no. 8101		
	8128	Priority source 15	-	0	16	
	8129	State source 15	-	See Line no. 8101		
	8130	Priority source 16	-	0	16	
	8131	State source 16	-	See Line no. 8101		
	8138	Cascade flow temp	°C	0	140	
	8139	Cascade flow temp setpoint	°C	0	140	
	8140	Cascade return temp	°C	0	140	
	8141	Cascade return temp	°C	0	140	
	8150	Source seq ch'over current	h	0	990	

Parameters technician

Menu	Line no.	Selection possibilities	Unit	Min.	Max	Factory setting
Diagnostics heat generation	8304	Boiler pump Q1	-	Off, On		Indication only
	8308	Boiler pump speed	%	0	100	
	8310	Boiler temp	°C	0	140	
	8311	Boiler setpoint	°C	0	140	
	8312	Boiler switching point	°C	0	140	
	8313	Inst heater switching point	°C	0	140	
	8314	Boiler return temp	°C	0	140	
	8316	Flue gas temp	°C	0	350	
	8318	Flue gas temp max	°C	0	350	
	8321	Primary exchanger temp	°C	0	140	
	8323	Fan speed	omw./min	0	8000	
	8324	Setpoint fan	omw./min	0	8000	
	8325	Current fan control	%	0	100	
	8326	Burner modulation	%	0	100	
	8327	Water pressure	-	0	10	
	8329	Ionization current	µA	0	100	
	8330	Hours run 1st stage	h	00:00:00	2730:15:00	
	8331	Start counter 1st stage	-	0	2147483647	
	8338	Hours run heating mode	h	00:00:00	8333:07:00	
	8339	Hours run DHW	h	00:00:00	8333:07:00	
	8390	Current phase number	-	0: Value 777; 0 1: TNB . . . . . . 254: Value 777; 254 255: Value 777; 255		
	8499	Collector pump 1	-	Off, On		
	8501	Solar ctrl element buffer	-	Off, On		
	8502	Solar ctrl elem swimming	-	Off, On		
	8505	Speed collector pump 1	%	0	100	
	8506	Speed solar pump ext exch	%	0	100	
	8507	Speed solar pump buffer	%	0	100	
	8508	Speed solar pump swi pool	%	0	100	
	8510	Collector temp 1	°C	-28	350	
	8511	Collector temp 1 max	°C	-28	350	
	8512	Collector temp 1 min	°C	-28	350	
	8513	dT collector 1/DHW	°C	-168	350	
	8514	dT collector 1/buffer	°C	-168	350	
	8515	dT collector 1/swimming pool	°C	-168	350	
	8519	Solar flow temp	°C	-28	350	
	8520	Solar return temp	°C	-28	350	
	8526	24-hour yield solar energy	kWh	0	999,9	
	8527	Total yield solar energy	kWh	0	9999999,9	
	8530	Hours run solar yield	h	00:00:00	8333:07:00	
	8531	Hours run collect overtemp	h	00:00:00	8333:07:00	
	8532	Hours run collector pump	h	00:00:00	8333:07:00	
	8560	Solid fuel boiler temp	°C	0	140	
	8570	Hours run solid fuel boiler	h	00:00:00	8333:07:00	

Parameters technician

Menu	Line no.	Selection possibilities	Unit	Min.	Max	Factory setting
Diagnose User	8700	Outside temp	°C	-50	50	
	8701	Outside temp min	°C	-50	50	
	8702	Outside temp max	°C	-50	50	
	8703	Outside temp attenuated	°C	-50	50	
	8704	Outside temp composite	°C	-50	50	
	8730	Heating circuit pump 1	-	Uit, Aan		
	8731	Heat circ mix valve 1 open	-	Uit, Aan		
	8732	Heat circ mix valve 1 close	-	Uit, Aan		
	8735	Speed heating circuit pump 1	%	0	100	
	8740	Room temp 1	°C	0	50	
	8741	Room setpoint 1	°C	4	35	
	8743	Flow temp 1	°C	0	140	
	8744	Flow temp setpoint 1	°C	0	140	
	8749	Room thermostat 1	-	No demand, demand		
	8760	Heating circuit pump 2	-	Off, On		
	8761	Heat circ mix valve 2 open	-	Off, On		
	8762	Heat circ mix valve 2 close	-	Off, On		
	8765	Speed heating circuit pump 2	%	0	100	
	8770	Room temp 2	°C	0	50	
	8771	Room setpoint 2	°C	4	35	
	8773	Flow temp 2	°C	0	140	
	8774	Flow temp setpoint 2	°C	0	140	
	8779	Room thermostat 2	-	No demand, demand		
	8790	Heating circuit pump 3	-	Off, On		
	8791	Heat circ mix valve 3 open	-	Off, On		
	8792	Heat circ mix valve 3 close	-	Off, On		
	8795	Speed heating circuit pump 3	%	0	100	
	8800	Room temp 3	°C	0	50	Indication only
	8801	Room setpoint 3	°C	4	35	
	8803	Flow temp 3	°C	0	140	
	8804	Flow temp setpoint 3	°C	0	140	
	8809	Room thermostat 3	-	No demand, demand		
	8820	DHW pump	-	Off, On		
	8825	Speed DHW pump	%	0	100	
	8826	Speed DHW interm circ pump	%	0	100	
	8827	Speed inst DHW heater pump	%	0	100	
	8830	DHW temp 1	°C	0	140	
	8831	DHW temp setpoint	°C	8	80	
	8832	DHW temp 2	°C	0	140	
	8835	DHW circulation temp	°C	0	140	
	8836	DHW charging temp	°C	0	140	
	8852	DHW consumption temp	°C	0	140	
	8853	Instant WH setpoint	°C	0	140	
	8860	DHW flow	l/min	0	30	
	8875	Flow temp setpoint VK1	°C	5	130	
	8885	Flow temp setpoint VK2	°C	5	130	
	8895	Flow temp setpoint VK3	°C	5	130	
	8900	Swimming pool temp	°C	0	140	
	8901	Swimming pool setpoint	°C	8	80	
	8930	Primary controller temp	°C	0	140	
	8931	Primary controller setpoint	°C	0	140	
	8950	Common flow temp	°C	0	140	
	8951	Common flow temp setpoint	°C	0	140	
	8952	Common return temp	°C	0	140	

Parameters technician

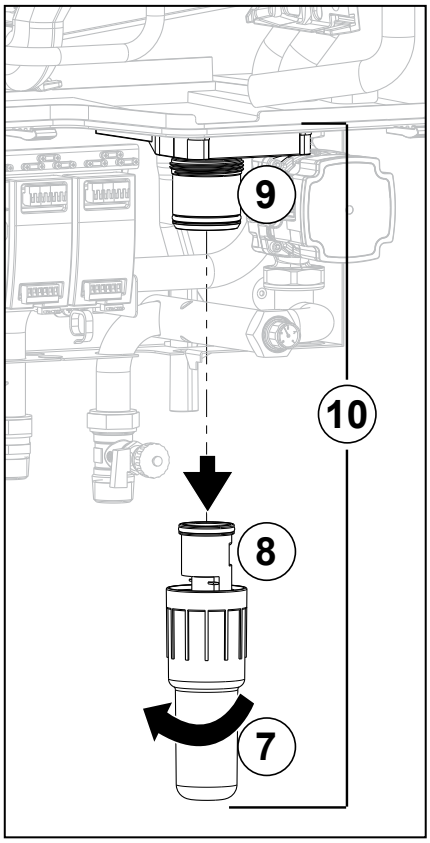
Menu	Line no.	Selection possibilities	Unit	Min.	Max	Factory setting
Diagnose User	8962	Common output setpoint	%	0	100	Indication only
	8980	Buffer temp 1	°C	0	140	
	8981	Buffer setpoint	°C	0	140	
	8982	Buffer temp 2	°C	0	140	
	8983	Buffer temp 3	°C	0	140	
	9005	Water pressure H1	bar	0	10	
	9006	Water pressure H2	bar	0	10	
	9009	Water pressure H3	bar	0	10	
	9031	Relay output QX1	-	Off, On		
	9032	Relay output QX2	-	Off, On		
	9033	Relay output QX3	-	Off, On		
	9034	Relay output QX4	-	Off, On		
	9050	Relay output QX21 module 1	-	Off, On		
	9051	Relay output QX22 module 1	-	Off, On		
	9052	Relay output QX23 module 1	-	Off, On		
	9053	Relay output QX21 module 2	-	Off, On		
	9054	Relay output QX22 module 2	-	Off, On		
	9055	Relay output QX23 module 2	-	Off, On		
	9056	Relay output QX21 module 3	-	Off, On		
	9057	Relay output QX22 module 3	-	Off, On		
	9058	Relay output QX23 module 3	-	Off, On		
	-	2nd speed HC1 pump Q21	-	Off, On		Indication only
	-	Optg mode changeover HC1	-	Inactive, Active		
	-	2nd speed HC2 pump Q22	-	Off, On		
	-	Optg mode changeover HC2	-	Inactive, Active		
	-	2nd speed HC2 pump Q23	-	Off, On		
	-	Optg mode changeover HC3	-	Inactive, Active		
	-	El imm heater K6	-	Off, On		
	-	Circulating pump Q4	-	Off, On		
	-	Optg mode changeover DHW	-	Inactive, Active		
	-	H1 pump Q15	-	Off, On		
	-	H2 pump Q18	-	Off, On		
	-	H3 pump Q19	-	Off, On		
	-	Prim contr/system pump Q14	-	Off, On		
	-	Precontroller mixing valve opens Y19	-	Off, On		
	-	Precontroller mixing valve closes Y20	-	Off, On		
	-	Heat generation lock Y4	-	Off, On		
	-	Time switch program 5 relais K13	-	Off, On		
	-	Return temp valve Y15	-	Off, On		
	-	Heat demand K27	-	Off, On		
	-	Instantaneous heater pump Q34	-	Off, On		
	-	Storage transfer pump Q11	-	Off, On		
	-	DHW stirring pump Q35	-	Off, On		
	-	DHW intermediate circuit pump Q33	-	Off, On		
	-	Flowswitch	-	Off, On		

Parameters technician

Menu	Line no.	Selection possibilities	Unit	Min.	Max	Factory setting
Burner control	9500	Prepurge time	s	0	51	0
	9512	Required speed ignition	rpm	0	10000	THI S PLUS 13: 3500 THI S PLUS 19: 3500 THI S PLUS 24: 3500 THI S PLUS 34: 2800 THI S PLUS 35L: 3400 THI S PLUS 46: 3400 THI S PLUS 54: 3400 THI S PLUS Combi 24: 3500 THI S PLUS Combi 34: 2800
	9524	Required speed LF	rpm	0	10000	THI S PLUS 13: 1350 THI S PLUS 19: 1350 THI S PLUS 24: 1350 THI S PLUS 34: 1250 THI S PLUS 35L: 1100 THI S PLUS 46: 1100 THI S PLUS 54: 1100 THI S PLUS Combi 24: 1350 THI S PLUS Combi 34: 1250
	9529	Required speed HF	rpm	0	10000	THI S PLUS 13: 3510 THI S PLUS 19: 4340 THI S PLUS 24: 5130 THI S PLUS 34: 5450 THI S PLUS 35L: 3600 THI S PLUS 46: 4430 THI S PLUS 54: 5200 THI S PLUS Combi 24: 5130 THI S PLUS Combi 34: 5450
	9540	Postpurge time	s	0	51	10
	9615	Forced prepurging on error	-	Off, On		On
	9650	Chimney drying	-	Off, Temporarily, Permanently		Off

Commissioning

Gas supply
Condensate connection
Connectors for flue gas, air supply and water pressure



Gas supply
Check the connection for the gas supply to the boiler for a leakproofness. Possible leaks of must be sealed before the boiler is started.

De-aerate the gas pipe and the gas valve.

Request information on the gas type and values from the local gas supplier, so as to make sure that the boiler is operated with the correct gas type.

After assembly of the boiler, all gas-carrying pipes must be checked for leaks.

Condensate connection
Make sure that the siphon has been filled before the boiler is started up, so as to prevent emission of waste gases from the condensate connector.

Filling the siphon after assembly.
Removed the siphon (7) from the condensate connector in the boiler. Fill it with 0.3 litres of water and then turn it hand-tight back into its original position.

Flue gas and air supply connections
Check that the connectors for waste gas and air supply correspond to the domestic and regional regulations. Facilities that do not fulfil these regulations may not be taken into operation.

Make sure that all connectors are free.

Flue gas and air supply connectors may not be reduced in size.

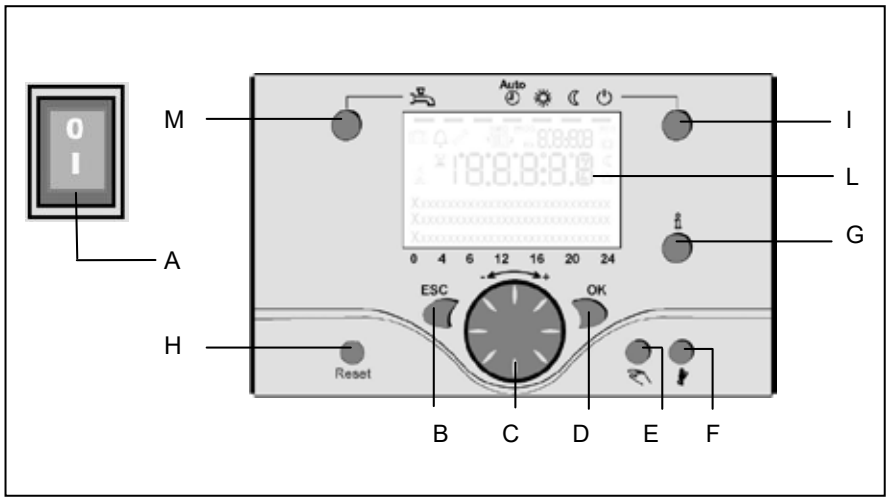
Before taking the boiler into operation, it must be ensured that dirt particles, which may be present in the heating facility, are removed by a thorough flushing of the piping system.

Water pressure
Open the valves to the system. Check the water pressure in the system. If the water pressure is too low (minimum operating pressure > 1.0 bar), then it must be increased at least to the minimum water pressure in the table.

Hydraulic system
Check that the boiler is connected to hydraulic system in such a way that a water flow is insured at all times, when the boiler is in operation. The water flow is monitored by an ΔT surveillance in the boiler. A too low flow rate means that the boiler will stop operating and be switched off immediately.

Preparations for 1st use

Legend:
A On/Off switch
B Back button (ESC)
C Room temperature control button
D Confirmation button (OK)
E Function button for manual operation
F Chimney sweep function button
G Info button
H Reset button
I Operation mode button for heating circuit(s)
L Display
M Operating mode button for DHW



***CAUTION:**
Ensure that the right polarity is used for the equipment.

If malfunction 133 occurs during commissioning of the facility, then the polarity of the electrical connection must be tested as a first step, after which the boiler can be taken into operation again.

De-aeration function
If the “Hand” button (E) is pushed for longer than 3 sec., then an automatic de-aeration will be carried out on the water-side of the system,
for instance after the system is filled for the first time. During this procedure, the system is set to “Safety mode” (symbol: circle with bar).
The pump(s) is(are) switched on and off several times.
If a 3-way valve has been installed, then the system is set to the warm water position, and the pump(s) is(are) switched on and off several times.
At the end of this function, the boiler switches back to normal operations.
Always activate the de-aeration function first, during the initial commissioning or after filling or topping up the heating facility.

Filling and de-aeration of the THISION S PLUS and the heating facility
The heating facility is filled according to the standard method.
The facility must have been de-aerated, both on the heating and the warm water side.
The water pressure can be read off in bar, either on the analog pressure indicator or via the Info button. As soon as the heating facility has been filled and de-aerated, the boiler will be ready for operation.
The water pressure should be checked after an appropriate period and, if necessary, water should be topped up. (Note: Before topping up the water, first fill the hose with water, which prevents the entry of air into the heating system).

Preparations for 1st use

- Push the mains circuit breaker, for connecting the boiler to electrical power;
- Use the ON/OFF switch (A) to turn the boiler on *;
- Ensure that the boiler remains in standby mode;
- Test the pump function;
- Use the pump de-aeration function, to remove all air from the pump and the boiler: Hold down the E button for more than 3 seconds. This function runs for approximately 16 minutes.
- Open the gas connection;

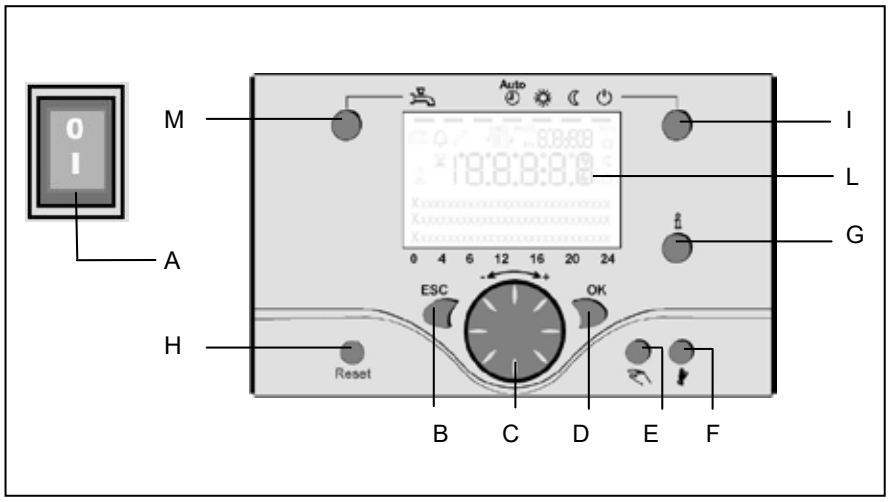
During commissioning (1st operation), it is recommended to operate the boiler at a capacity of 50%, since this is easiest for initiating a combustion analysis. This can be ensured as follows:

Starting the stop function
- Push the button I > 3 sec., with which the control unit of the boiler is set to the stop function;
- Push on the Info button (G); the current boiler performance will be shown in %;
- Via “set” by pressing the OK button (D) the actual value blinks, so now it is possible to adjust the boiler performance; to do this, turn the rotating button (C) and confirm the value of 50% with the OK button.

The control unit stop function can be terminated, when the settings for commissioning (see the next page) have been completed, by pushing the operating type switch (I) > 3 sec.

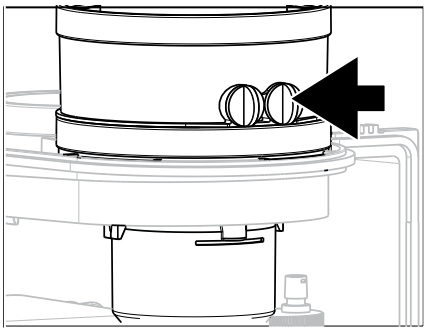
Combustion analysis
Full load (Step 1/3)

Legend:
A On/Off switch
B Back button (ESC)
C Room temperature control button
D Confirmation button (OK)
E Function button for manual operation
F Chimney sweep function button
G Info button
H Reset button
I Operation mode button for heating circuit(s)
L Display
M Operating mode button for DHW



The O_2 / CO_2 check consists of 2 steps or, if necessary, 3 steps:

Step 1: Check on full load
Step 2: Check on low load
Step 3: Adjustment (if necessary). Not for Belgium



Legend

a Measuring point of the waste gas probe

Step 1: O_2 / CO_2 check on full load
The O_2 or CO_2 setting is preset at the factory to E, namely natural gas, for all equipment units. A calibrated O_2 or CO_2 control measurement must be carried out during commissioning.

- Ensure that the boiler is in operation and that the heat, which it produces, can be discharged.

Set the full load
You can set the full load of the boiler as follows:
- Push the button I > 3 sec., with which the control unit of the boiler is set to the stop function;
- Push the button “G” until the number “50%” appears.
- Push the button “D” once (OK button for confirmation) until the number “50%” blinks.
- Turn the rotating button “C” (temperature control / menu selection switch) in a clockwise direction, until the number “100%” is displayed.
- Push the “D” (OK) button once, so that the number “100%” no longer blinks.
  Now the equipment unit will operate at full load (100%).
- Calibrate the O_2/CO_2 measuring tool, and then insert the waste gas probe of the measuring tool into the waste gas pipe “A” (see illustration).
- Wait for one minute and then carry out a combustion analysis.
  Check whether the O_2/CO_2 values that are listed below correspond to the measured value.

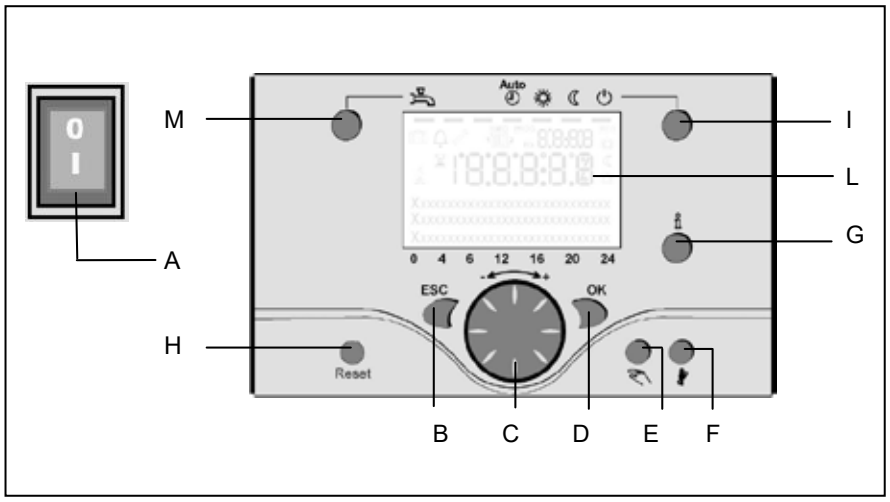
After this setting has been made, once more test the O_2/CO_2 value at low load (see Step 2 on page 54). If there are any changes in the result, then these must be corrected (see Step 3 on page 55).

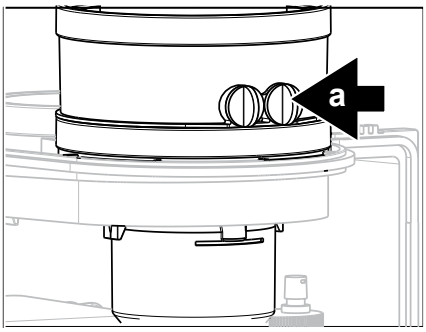
O_2 / CO_2 check on full load (Step 1)		
Full load	**Natural gas E (G20), LL (G25)**	**Propane (G31)**
O_2	Nominal 4,7%	Nominal 5,1%
	Minimum 3,6%, maximum 5,5%	Minimum 4,1%, maximum 5,8%
CO_2	Nominaal 9,0%	Nominaal 10,3%
	Minimum 8,6%, maximum 9,6%	Minimum 9,9%, maximum 11,0%

Values valid with closed air box.

Combustion analysis
Low load (Step 2/3)

Legend:
A On/Off switch
B Back button (ESC)
C Room temperature control button
D Confirmation button (OK)
E Function button for manual operation
F Chimney sweep function button
G Info button
H Reset button
I Operation mode button for heating circuit(s)
L Display
M Operating mode button for DHW





Legend

a Measuring point of the waste gas probe

Step 2: O_2 / CO_2 check on low load

Setting the low load
The low load of the boiler can be set by you as follows:
- Push the button “D” once (OK button for confirmation) until the number “100%” blinks.
- Turn the rotating button “C” (temperature control / menu selection button) in a counterclockwise direction, until the number “0%” is displayed.
- Push the button “D” once (OK) until the number “0” no longer blinks. Now the equipment unit will operate at low load (0%).
- Use the measuring tool to carry out a O_2/CO_2 control measurement. The detected values must lie in the measuring range shown below.

The O_2 value at low load must lie higher than the CO_2 value at full load. The measuring procedure must be carried out, until a constant measuring result is achieved. Please take up contact with ELCO, if the values should lie outside of the applicable tolerances.

Switching off
- Push the button “I” and keep the button pressed until the stop function switches off. The standard display appears.

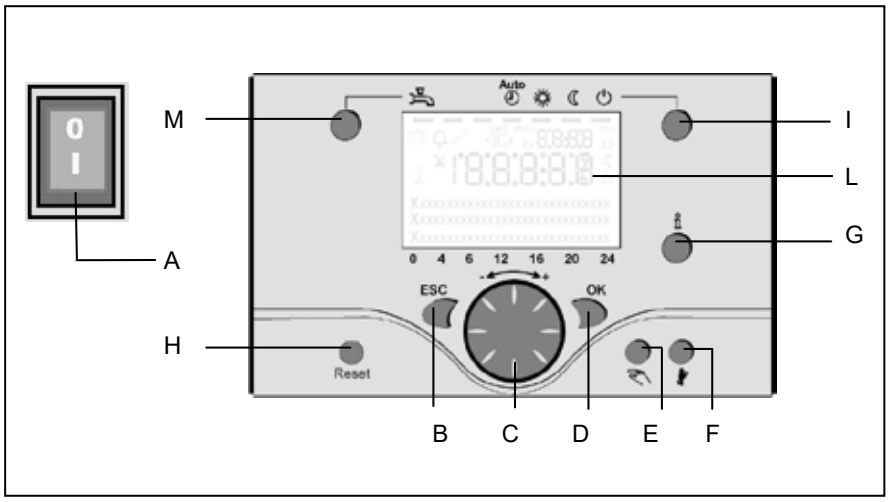
The maximum operating time of the stop function is 4 hours without interruption.

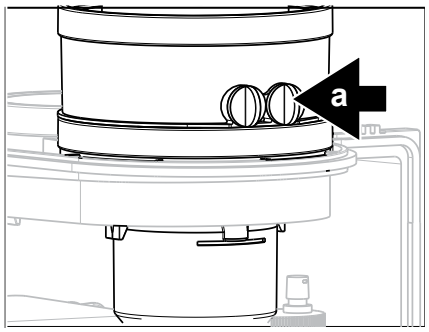
O_2 / CO_2 check on low load (Step 2)		
Low load	**Natural gas E (G20), LL (G25)**	**Propane (G31)**
O_2	Minimal 0,5% higher than measured on full load	Minimal 0,2% higher than measured on full load
	Maximum 7,5%	Maximum 7,3%
CO_2	Minimal 0,3% lower than measured on full load	Minimal 0,1% lower than measured on full load
	Minimum 7,5%	Minimum 8,9%

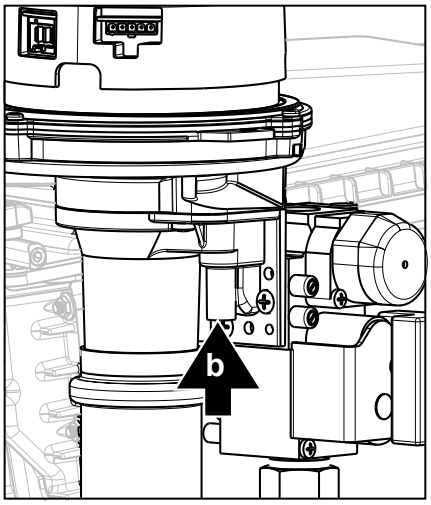
Values are valid with closed cover/air box.

Combustion analysis
Settingson the gas valve (Step 3/3) (not for Belgium)

Legend:
A On/Off switch
B Back button (ESC)
C Room temperature control button
D Confirmation button (OK)
E Function button for manual operation
F Chimney sweep function button
G Info button
H Reset button
I Operation mode button for heating circuit(s)
L Display
M Operating mode button for DHW







Legend

a Measuring point of the waste gas probe
b Set screw for O_2/CO_2

Step 3: Adjustment on the gas valve

Only if the measured values are outside the range of the table on the previous page.

- Open the boiler as described on page 57.
- Set the boiler on full load (see Step 1)
- The O_2/CO_2 values are set by using an Allen key (4 mm), or a large flat head screwdriver, on the screw “B”. Please observe the following rotating direction:
  - Clockwise means more O_2/ less CO_2
  - Counterclockwise means less O_2 / more CO_2

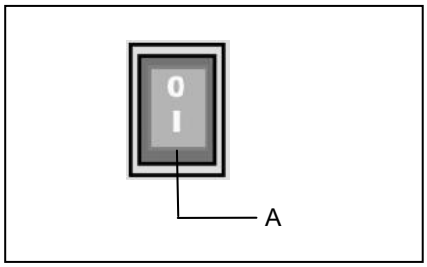
After this setting has been made, once more test the O_2/CO_2 value at full load and low load. See Step 1 and 2.

Adjustment of the gas valve in case the measured values lies out of range of the values on full load (Step 3)		
Full load	**Natural gas E (G20), LL (G25)**	**Propane (G31)**
O_2	4,7%	5,1%
CO_2	9,0%	10,3%

Values valid with closed air box.

Decommissioning and maintenance works
Inspection and maintenance interval

Maintenance works
- Switch the boiler to stand-by operating mode (see page 28);
- Use the ON/OFF switch (A) to turn the boiler off;



- Interrupt the power supply to the boiler, by operating the mains circuit breaker in the boiler room.
- Interrupt the gas supply to the boiler.

During emptying of the boiler, it is possible that a part of the heating water stays behind. Make sure that any remaining heating water cannot freeze, in case of a frost hazard.

Decommissioning
It may be necessary to take the boiler of operations in some situations. Switch the boiler to stand-by operating mode (see page 28). The boiler should remain connected to mains, whereby the pump and the 3-way valve are operated once every 24 hours, so as to prevent seizing of the facility.

In case of a frost hazard, it is recommended to empty the boiler and/ or the entire installation.

Maintenance
Please observe the following safety instructions:

All works on the boiler and the heating facility (assembly, maintenance, repairs) may only be carried out by authorized technicians, by using suitable tools and calibrated measuring instruments. The exchange of components requires original ELCO replacement parts.

The main stopcock for gas must be closed and secured against reopening.

The panelling must first be removed, to be able to carry out maintenance on the boiler. The panelling is secured by a screw behind the door. After loosening the screw, the panelling can be removed by shortly lifting and pulling it forward.

All equipment is preset at the factory. An O_2 / CO_2 control measurement must be carried out during commissioning.

No change should be made on the zero-point setting. The zero-point setting must only be checked after a malfunction, or after an exchange of the gas valve, the venturi or the ventilator motor.

The zero-point setting does not serve for setting up the combustion-technical characteristic values. These are made exclusively through the O_2 / CO_2 setting.

All gas pipes and screws must be tested for leakproofness, using a leak-detecting spray, whenever maintenance or repair works have been carried out on the boiler.

In this regard, please observe all of the individual maintenance steps documented on page 56 ff., as well as the overview of inspection and maintenance procedures provided on page 60 to 61.

Inspection interval
An inspection must be carried out after every 4,000 boiler operating hours, however at least once every year.

An inspection consists of a visual check, of the general condition of the boiler and the installation.

The objectives of an inspection is an assessment of the condition of the equipment, and an evaluation as to when maintenance works are required. A visual inspection can lead to a maintenance procedure.
No tools are required during an inspection (except for tools for removing the panelling). If necessary, the corresponding individual maintenance steps must be carried out, which are listed as of page 56.

Maintenance interval
An inspection of the burner must be carried out after every 8,000 operating hours, however at least once every 2 years.

Maintenance consists of control and cleaning, or a possible exchange of components of the equipment or installation, which are subject to contamination and wear and tear.

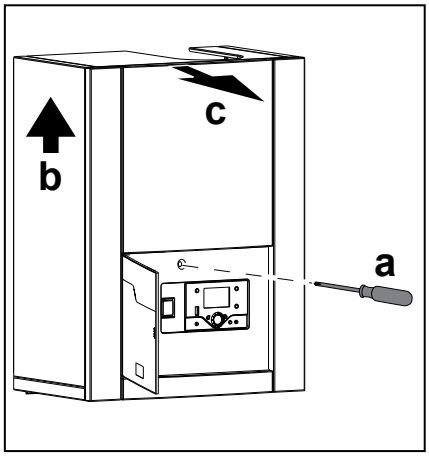
The objective of maintenance is to ensure a long-term functional security and a cost-effective operation of the equipment. Through a reduction of emissions that are due to the production of heat, primary energy requirements and a burdening of the environment can be substantially reduced.

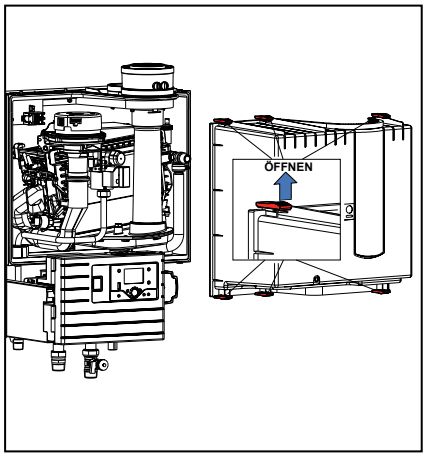
A visual inspection must always precede the carrying out of maintenance works. In this regard, also see the inspection interval above.

All gas pipes and screws must be tested for leakproofness, after maintenance or repair works have been carried out on the boiler.

Both the gas connection and the pressure on the connection must be checked.

Maintenance details





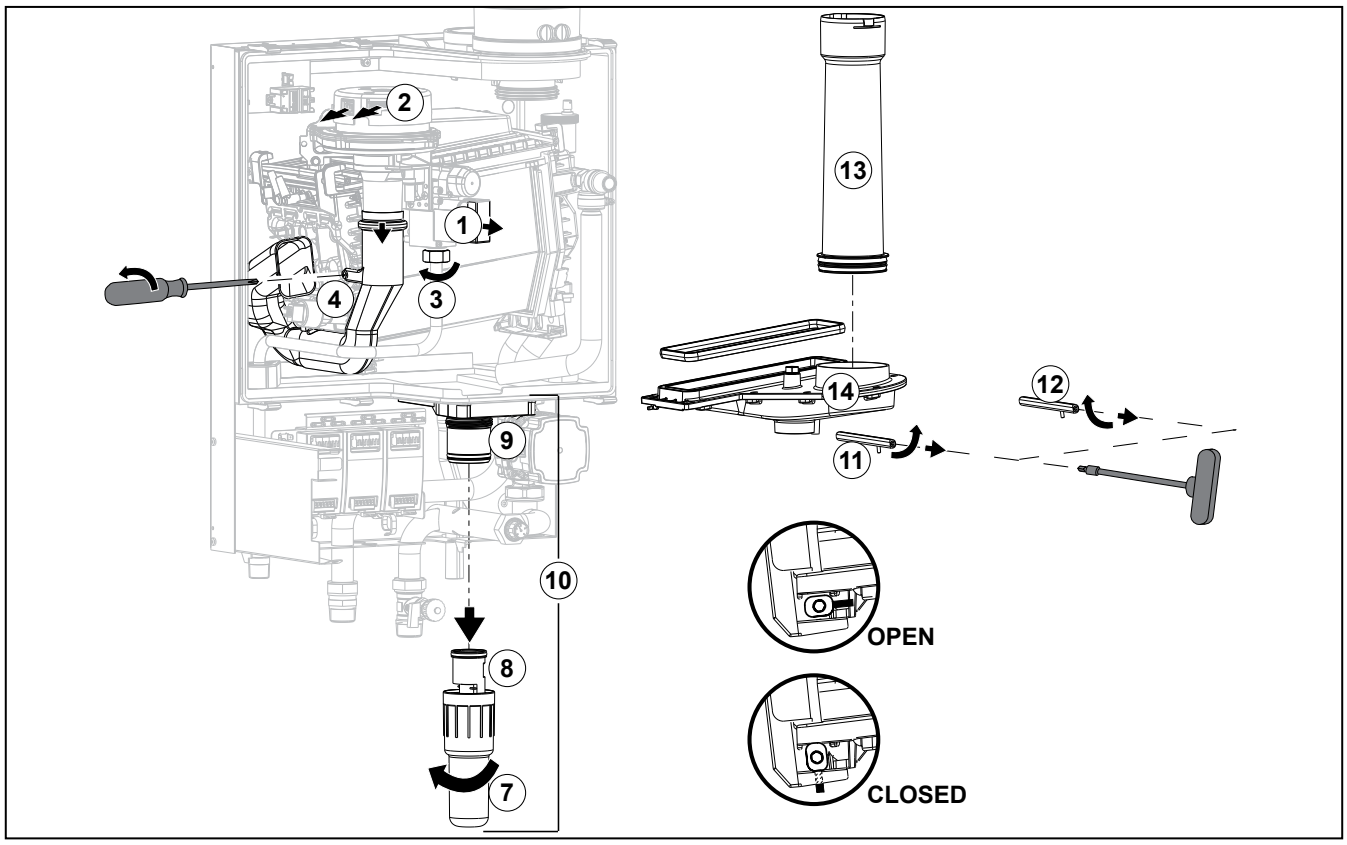
Removal of panelling
The panelling must first be removed, to be able to carry out maintenance on the boiler. The panelling is secured by a screw (a) behind the door. After loosening the screw, the panelling can be removed by shortly lifting (b) and pulling it forward (c).
The panelling of the equipment consists of metal and plastic parts, which can be cleaned with a mild (non-aggressive) cleaning agent.

Air box
- Please remove the transparent air box, by opening the 6 red locking clamps and removing the box towards the front.
- The air box must be cleaned with a humid cloth.

When carrying out maintenance works, only original ELCO replacement parts may be used.

CAUTION:
Always interrupt the power supply, before carrying out maintenance or repair works on the boiler.

Fan unit and burner cassette
- Close the gas stop valve.
- Remove the plug connectors from the gas valve (1) and from the ventilator motor (2).
- Open the screw connection (3) of the gas valve.
- Exchange the seal in the gas valve for a new one.
- Loosen the front Phillips screw (4) at the left-hand side of the air suction damper.
- Remove the siphon (7) and the siphon insert (8), then empty and clean these.
- Loosen the two clamping rods (11 and 12) with a 45° turn (below the condensate collection tray), using a hexagonal key, and pull these forward and out.
- By lifting the internal waste gas pipe (13) out of the condensate collection tray (14), and by simultaneously pressing together the two bulges at the top of the waste gas pipe, the collection tray and the internal waste gas pipe can be disassembled.



Maintenance details

Check the disassembled components for soiling and, if necessary, clean them.

- Loosen the upper left-hand (5) and right hand (6) clamping rod with a hexagonal key (4 mm) by turning it by a 45° (please pay attention to the red markings on the clamping rods).
- Pull the clamping rods out towards the front.
- Remove the entire fan unit, including the gas valve, from the heat exchanger.
- Remove the burner cassette (15) from the mixing head (16).
- Inspect the burner cassette for wear and tear, soiling and defective burner blocks. The burner cassette should be cleaned with a soft brush and a vacuum cleaner. In case of a torn burner cassette/burner block, it will be necessary to exchange the entire cassette.
- Check the fan unit and the gas-air distribution plate for soiling. Whenever necessary, these can be cleaned with a soft brush in combination with a vacuum cleaner.

Fan unit (17)
Inspect the fan unit and the gas-air distribution plate for soiling. Whenever necessary, these can be cleaned with a soft brush, in combination with a vacuum cleaner.

Non-return valve (18)
Check the installed non-return valve for smooth operation.

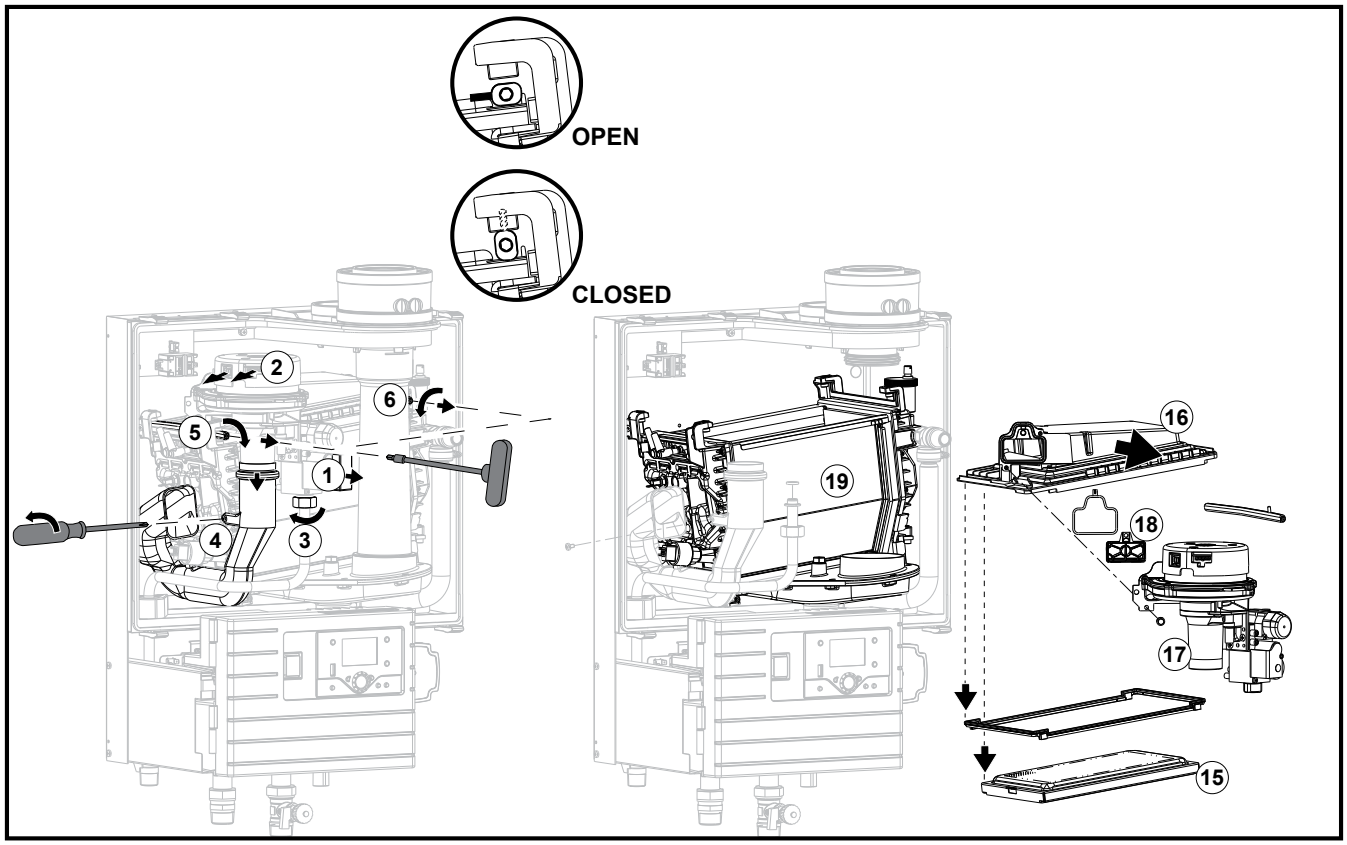
CAUTION:
Hazard to life by poisoning!
In case of systems with multiple users, an incorrect function of the non-return valve can endanger the lives of people through leaking flue gas.

Heat exchanger (19)
Check the heat exchanger for soiling. Clean the heat exchanger with a soft brunch and a vacuum cleaner.

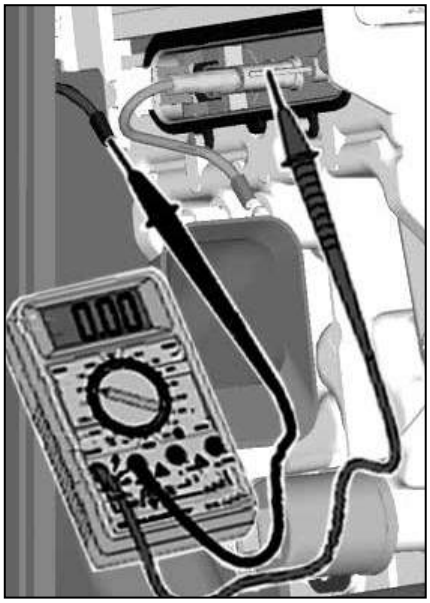
CAUTION:
Please make sure that no dirt particles fall down into the heat exchanger.
Flushing the heat exchanger from the top with water is not permitted.

An assembly must be carried out in reverse order.

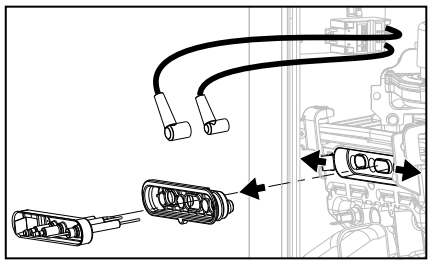
During the assembly, attention must be paid that the red markings on the attachment rods stand in a vertical position.



Maintenance details



Ignition electrode
The ignition electrode is a consumption part and must be checked annually. The electrode must be renewed, if damages or any wear and tear is detected. Furthermore, the value of the ionization current can be detected through measurements. Under full load operations, the minimum ionization current must amount to 4µ A. If the inspection glass should be damaged, then the entire ignition electrode must be exchanged.



Exchange of the ignition electrode
- Remove all plug connections from the ignition electrode.
- Push the clips at both sides of the electrode outward and pull out the electrode. Examine the seal of the ignition electrode and replace it in case of defect.

Assembly is carried out in the reverse order.

Maintenance details

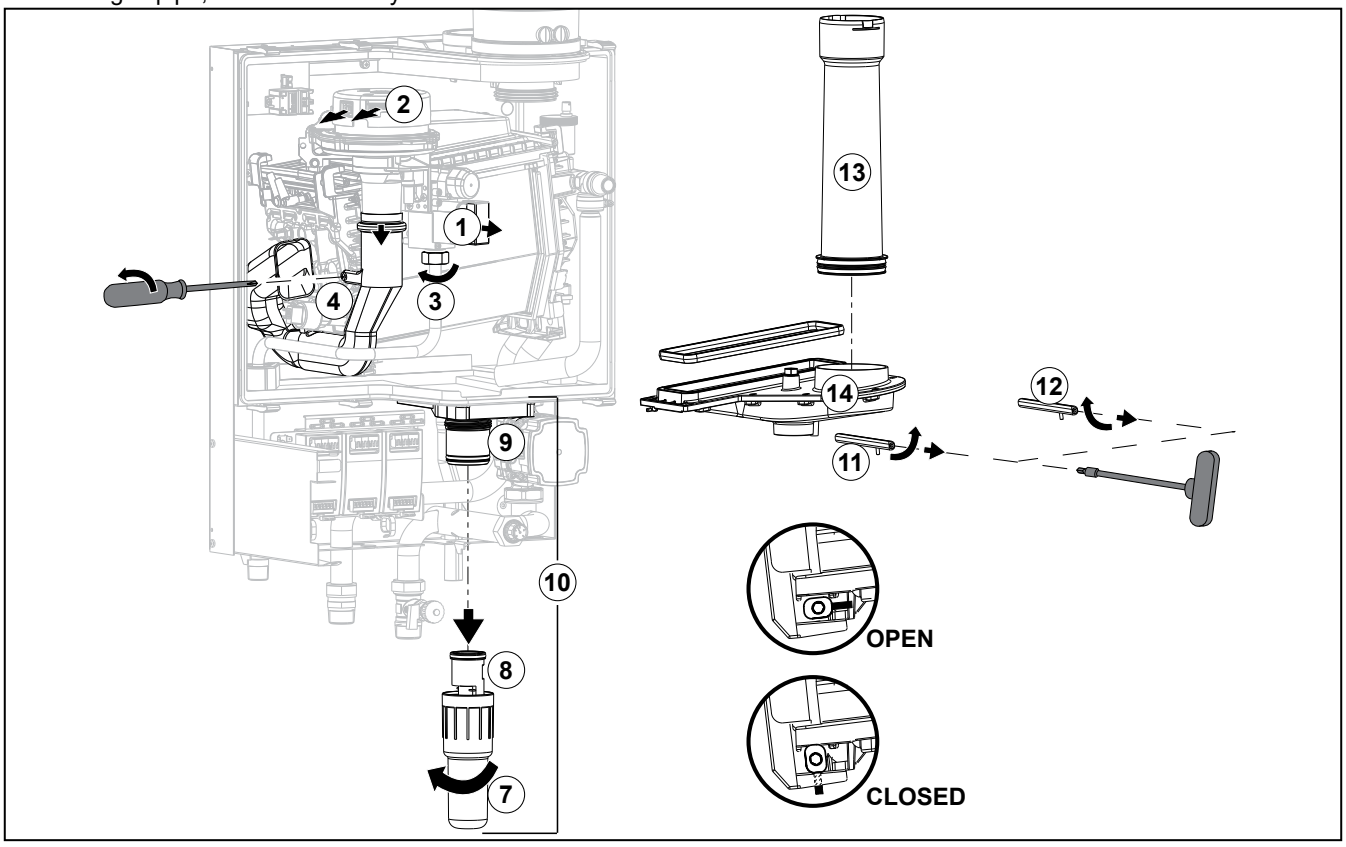
Siphon and condensate tray

- Loosen the front Phillips screw (4) at the left-hand side of the air suction damper.
- Remove the siphon (7) and the siphon insert (8), and then empty and clean these.
- Loosen the two clamping rods (11 and 12) with a 45° turn (below the condensate collection tray) by using a hexagonal key, and then pull these forward and out.
- By lifting the internal waste gas pipe (13) out of the condensate collection tray (14), and by simultaneously pressing together the two bulges at the top of the waste gas pipe, the collection tray and the internal waste gas pipe can be disassembled. Check the disassembled components for soiling and, if necessary, clean them.
- Inspect the O-rings and the siphon beaker, and exchange these in case of any defect.
- Both components can be cleaned with a brush and water.
- The O-rings should be lightly lubricated for an easier insertion.
- If the siphon (10) needs renewal and it must be completely exchanged.

Assembly is carried out in the reverse order.

When assembling the condensate tray, please make sure that the seal fits tightly all-around.

During assembly, attention must be paid that the red markings on the clamping rods stand in a vertical position.



After completion of the maintenance works, and in advance of taking the system back into operation, it must be checked for leakproofness and a correct seating of components.

Use a leak-detecting spray, to check all gas pipes and screw connections for leakproofness.
An O_2 / CO_2 check should be carried out (see pages 53 and 54).

Inspection overview

Pos. No.:	Inspection overview - THISION S PLUS	At least every 4,000 hours or at the latest once every year	Works carried out	Complaints
	Disconnect the facility from mains and close the gas stopcock!			
	Ensure that water levels are according to assembly instructions			
1	**Airbox/paneling**			
1.0.1	Remove outer paneling	√		
1.0.2	Remove paneling of airbox	√		
1.0.3	Seal of paneling/airbox, check for wear and tear	√		
1.0.4	Clean to ensure maintenance of functionality	√		
2	**Gas-conveying pipes**			
2.0.1	All gas-conveying pipes must be professionally checked for leakproofness	√		
2.0.2	Leakproofness of all screwed connections must be professionally checked	√		
2.0.3	Additionally check all pipe components for corrosion and damages	√		
2.0.4	Check connection pressure and flow pressure when connected	√		
3	**Pressure conditions**			
3.0.1	Check filling and drainage facilities for functionality	√		
3.0.2	System pressure (plausibility test)	√		
3.0.3	Check input pressure on membrane expansion vessel, possibly adjust to system conditions	√		
4	**Check components for damage, corrosion, functionality and leakproofness:**			
4.0.1	Gas armature / Gas control block / Venturi valve	√		
4.0.2	Safety valve	√		
4.0.3	Automatic high-speed ventilator	√		
4.0.4	Hydraulic connections	√		
4.0.5	Siphon and condensation drain	√		
4.0.6	Electrode block	√		
4.0.7	Heat exchanger	√		
4.0.8	Waste gas collection tray	√		
5	**Facility/burner, without paneling/airbox:**			
5.0.1	Inspection of flame pattern	√		
5.0.2	No even flame pattern - check settings and burner	√		
5.0.3	Control measurement under full and low load O_2/CO_2 and ionization current	√		
6	**Final control tasks:**			
6.0.1	Inspection of all components subject to overpressure (dew point meter)	√		
6.0.2	Check on combustion air infeed (annular gap measurement)	√		
6.0.3	Detect and test gas flow rate (plausibility check)	√		
6.0.4	Carry out a waste gas analysis and an O_2/CO_2 measurement	√		
6.0.5	Reassemble the airbox/paneling	√		
7	**Facility/burner, with paneling/airbox:**			
7.0.1	Functional test of heating operations	√		
7.0.2	Functional test of hot water operations	√		
7.0.3	In each case, compare the target and the actual values (plausibility check)	√		

Maintenance overview

Pos. No.:	Maintenance overview - THISION S PLUS	At least every 8,000 hours	at the latest every 2 years	Works carried out	Complaints
	Disconnect the facility from mains and close the gas stopcock!				
	Ensure that water levels are according to assembly instructions				
1	**Airbox/panelling**				
1.0.1	Check for external soiling and damages	√			
1.0.2	Clean to ensure maintenance of functionality	√			
1.0.3	Check for leakproofness, replace the seal if required	√			
2	**Ventilation unit/burner cartridge**				
2.0.1	Check and clean the ventilation unit	√			
2.0.2	Check and clean the burner cartridge	√			
2.0.3	Check and clean the Venturi valve	√			
2.0.4	Check the gas armature for corrosion and damages	√			
2.0.5	Renew the seals of components that have come in contact with gas and waste gas	√			
3	**OSS/heat exchanger unit**				
3.0.1	Check the heat exchanger for corrosion and damages	√			
3.0.2	Check the heat exchanger for contamination and clean it	√			
3.0.3	Renew the seal of the heat exchanger/mixing head	√			
3.0.4	Renew the seal of the burner/mixing head	√			
	Never flush the heat exchanger with water from above!				
4	**Insulating panels**				
4.0.1	Inspect the insulating panels and renew them, if required	√			
5	**Check components for damage, corrosion, functionality and leakproofness, and renew them if required:**				
5.0.1	Gas armature / Gas control block / Venturi unit	√			
5.0.2	Safety valve	√			
5.0.3	Automatic high-speed ventilator	√			
5.0.4	Hydraulic connections	√			
5.0.5	Siphon and condensation drain	√			
5.0.6	Electrode block	√			
5.0.7	Heat exchanger	√			
5.0.8	Waste gas collection tray	√			
6	**Siphon/condensation drain**				
6.0.1	Cleaned the siphon and condensation drain	√			
6.0.2	Check the siphon and the condensation drain for leakproofness	√			
6.0.3	If required, renew the seals on the siphon and the condensation drain	√			
7	**Waste gas collection tray**				
7.0.1	Check the condensation tray for corrosion and damages	√			
7.0.2	Clean the condensation tray	√			
7.0.3	Renew the seal of the condensation tray	√			
8	**Circulation pump**				
8.0.1	Check for proper functionality	√			
8.0.2	Check for damages, (outer) corrosion and noise	√			
8.0.3	Check for leakproofness (visual inspection)	√			
9	**Concluding measures**				
9.0.1	Detect and test gas flow rate (plausibility check)	√			
9.0.2	Carry out a complete inspection, after all measures have been carried out!	√			
9.0.3	Open the gas supply tap, switch on the master switch	√			
9.0.4	Functional test of heating operations	√			
9.0.5	Functional test of hot water operations	√			

Errors

If the facility is shut down, then a warning signal ( ) and a blinking error code is displayed on screen. The cause of the shutdown must first be remediated, before one can proceed with a reset of the THISION S PLUS boiler. The attached to list shows possible reasons for shutdowns and the possible cause of the malfunction.

Code	Description of the error
0	No error
10	Outdoor temperature sensor error
20	Boiler temperature 1 - sensor defect
26	Joint inlet temperature sensor error
28	Smoke/ waste gas temperature sensor error
30	Inlet temperature 1 - sensor defect
32	Inlet temperature 2 - sensor defect
38	Inlet temperature of pre-controller sensor error
40	Return temperature 1 - sensor defect
46	Return temperature cascade sensor error
47	Joint return temperature sensor error
50	Drinking water temperature 1 sensor error
52	Drinking water temperature 2 sensor error
54	Drinking water pre-controller sensor error
57	Drinking water circulation temperature sensor error
60	Room temperature 1 - sensor defect
65	Room temperature 2 - sensor defect
70	Buffer tank temperature 1 sensor error
71	Buffer tank temperature 2 sensor error
72	Buffer tank temperature 3 sensor error
73	Collector temperature 1 sensor error
74	Collector temperature 2 sensor error
82	LPB address collision
83	BSB wire short-circuit
84	BSB address collision
85	BSB radio communications error
91	EEPROM error with locking information
98	Expansion module 1 error (combined error)
99	Expansion module 2 error (combined error)
100	Two master clocks (LPB)
102	Master clock without power reserve (LPB)
103	Communications error
105	Maintenance report
109	Boiler temperature monitoring
110	Safety temperature limiter defect shutdown
111	Temperature monitor shutdown
119	Safety thermostat of burner door interrupted
121	Flow temperature 1 (heating circuit 1) monitoring
122	Flow temperature 2 (heating circuit 2) monitoring
125	Pump monitoring error
126	Drinking water filling monitoring
127	Anti-legionella temperature not reached
128	Flame failure during operations
129	Fan failure or air pressure monitor error
130	Limit value of waste gas temperature exceeded
131	Burner malfunction
132	Gas pressure monitor or air pressure monitor error
133	No flame during safety interval
146	Configuration error group report
151	Internal error
152	Parameterization error
153	Facility manually locked
160	Fan error
162	Air pressure monitor error - does not close
164	Heating circuit flow switch error
166	Air pressure monitor error - does not open
171	Alarm contact H1 or H4 active
172	Alarm contact H2 (EM1, EM2 or EM3) or H5 active
173	Alarm contact H6 active
174	Alarm contact H3 or H7 active
178	Temperature monitor heating circuit 1

Errors

Code	Description of the error
179	Temperature monitor heating circuit 2
183	Equipment in parameterization mode
193	Pump monitor error after flame activation
216	Boiler malfunction
217	Sensor error
241	Solar sensor flow error
242	Return sensor solar sensor error
243	Swimming pool temperature sensor error
270	Monitoring function
317	Mains frequency outside of permitted range
320	Drinking water filling temperature sensor error
322	Water pressure too high
323	Water pressure too low
324	BX same sensors
325	BX / Expansion module same sensors
326	BX / Mixing group same sensors
327	Expansion module same function
328	Mixing group same function
329	Expansion module / mixing group same function
330	Sensor BX1 no function
331	Sensor BX2 no function
332	Sensor BX3 no function
333	Sensor BX4 no function
334	Sensor BX5 no function
335	Sensor BX21 no function (EM1, EM2 or EM3)
336	Sensor BX22 no function (EM1, EM2 or EM3)
337	Sensor BX1 no function
338	Sensor BX12 no function
339	Collector pump Q5 is missing
340	Collector pump Q16 is missing
341	Collector sensor B6 is missing
342	Solar drinking water sensor B31 is missing
343	Solar integration is missing
344	Solar actuator buffer K8 is missing
345	Solar actuator swimming pool K18 is missing
346	Solid boiler pump Q10 is missing
347	Solid boiler pump comparison sensor is missing
348	Solid boiler address error
349	Buffer return valve Y15 is missing
350	Buffer memory address error
351	Pre-controller / supply pump address error
352	Hydraulic separator address error
353	Rail flow sensor B10 is missing
371	Flow temperature 3 (heating circuit 3) monitoring
372	Temperature monitor heating circuit 3
373	Expansion module 3 error (combined error)
378	Repetition counter internal error expired
379	Repetition counter stray light
380	Repetition counter flame failure during operation expired
381	Repetition counter no flame during safety interval expired
382	Repetition counter below error expired
383	No repetition permitted
384	Stray light
385	Mains undervoltage
386	Fan rotation speed outside of permitted range
388	Drinking water sensor no function
426	Response from waste gas damper
427	Configuration waste gas damper
431	Sensor primary heat exchanger
432	Functional earth not connected
433	Temperature primary heat exchanger to high

Sensor resistance

Sensor resistance
In the adjacent table contains a list of values for all boiler sensors, and for the optional sensors that are contained in the accessory kits.
These tables show average values, since all sensors are subject to fluctuations.

When measuring resistance values, he boiler should always be switched off. Carry out measurements near to the sensor, so as to avoid deviations from the values.

Heating flow sensor Heating return sensor DHW sensor Flue gas sensor	
NTC10k (25°C)	
Temperature [°C]	Resistance [Ohm]
-10	55.047
0	32.555
10	19.873
12	18.069
14	16.447
16	14.988
18	13.674
20	12.488
22	11.417
24	10.449
26	9.573
28	8.779
30	8.059
32	7.406
34	6.811
36	6.271
38	5.779
40	5.330
42	4.921
44	4.547
46	4.205
48	3.892
50	3.605
52	3.343
54	3.102
56	2.880
58	2.677
60	2.490
62	2.318
64	2.159
66	2.013
68	1.878
70	1.753
72	1.638
74	1.531
76	1.433
78	1.341
80	1.256
82	1.178
84	1.105
86	1.037
88	974
90	915

Outdoor temperature sensor	
NTC1k (25°C)	
Temperature [°C]	Resistance [Ohm]
-10	4.574
-9	4.358
-8	4.152
-7	3.958
-6	3.774
-5	3.600
-4	3.435
-3	3.279
-2	3.131
-1	2.990
0	2.857
1	2.730
2	2.610
3	2.496
4	2.387
5	2.284
6	2.186
7	2.093
8	2.004
9	1.920
10	1.840
11	1.763
12	1.690
13	1.621
14	1.555
15	1.492
16	1.433
17	1.375
18	1.320
19	1.268
20	1.218
21	1.170
22	1.125
23	1.081
24	1.040
25	1.000
26	962
27	926
28	892
29	858
30	827
35	687
40	575

System water additives

The system water additives, which are listed in the table, have been released by the manufacturer and take into consideration the indicated dosage quantities.

In case of a wrong use, and if the maximum concentration quantities are exceeded, then the guarantee for all components that come in contact with heating water are null and void.

Additive type	Supplier and specifications	Max. concentration	Application
Corrosion inhibitors	Sentinel X100 Corrosion resistant protection agent of CH systems Kiwa certified	1-2 l/100 litres CH water content	Aqueous solution of organic and inorganic agents preventing corrosion and scale forming
	Fernox F1 Protector Corrosion resistant protection agent of CH systems Kiwa certified KIWA-ATA K62581, Belgaqua certified Cat III	500 ml can or 265 ml Express / 100 litres CH water content	Preventing corrosion and scale forming
Anti-freeze	Kalsbeek Monopropyleneglycol / propane-1,2-diol + inhibitors AKWA-Colpro KIWA-ATA Nr. 2104/1	50% w/w	Anti-freeze
	Tyfocor L Monopropyleneglycol / propane-1,2-diol + inhibitors	50% w/w	Anti-freeze
	Sentinel X500 Monopropyleneglycol + inhibitors Kiwa certified	20-50% w/w	Anti-freeze
	Fernox Alphi 11 Monopropyleneglycol + inhibitors Kiwa certified KIWA-ATA K62581, Belgaqua certified Cat III	25-50% w/w	Anti-freeze in combination with F1 Protector
System cleaners	Sentinel X300 Solution of phosphate, organic heterocyclic compounds, polymers and organic bases Kiwa certified	1 litre / 100 litres	For new CH installations Removes oils/grease and flow control agents
	Sentinel X400 Solution of synthetic organic polymers	1-2 litres / 100 litres	For cleaning existing CH-installations Removes sediments.
	Sentinel X800 Jetflo Aqueous emulsion of dispersants, moistening agents and inhibitors	1-2 litres / 100 litres	For cleaning new and existing CH-installations Removes iron and lime-related sediments.
	Fernox F3 Cleaner Liquid pH neutral universal cleaner for pre-commissioning new systems	500 ml / 100 litres	For cleaning new and existing CH-installations Removes sludge, limescale and other debris.
	Fernox F5 Cleaner, Express pH neutral universal cleaner concentrate for pre-commissioning new systems	295 / 100 litres	For cleaning new and existing CH-installations Removes sludge, limescale and other debris.

Declaration of Conformity

We, ELCO GmbH, D-71379 Hechingen on behalf of the marketing companies

ELCO Italia, I-31023 Resana (TV)
ELCO GmbH, D-64546 Mörfelden
ELCO Belgium, n.v./s.a. B-1070 Brüssel
ELCO Austria GmbH, A-2544 Leobersdorf
ELCOTHERM AG, CH-7324 Vilters
ELCO BV, NL 6465 Kerkrade
ELCO UK, UK-Basildon, Essex, SS156SJ
ELCO France, F-93521 Saint-Denis Cedex

Declare under our responsibility that the product

THISION S PLUS 13-19-24-34-35L-46-54
THISION S PLUS COMBI 24-34

is in conformity with the following standards:

Directive	2009/142/EC	EN 15502-2-1: 2012 EN 15502-1: 20120	EN 60335-1: 2011 EN 60335-2-102: 201
Ecodesign Directive	92/42/EEC	EN 15502-2-2: 2014	
Boiler efficiency directive	2014/35/EU	EN 60335-1: 2011 EN 60335-2-102: 2010	
Electro Magnetic Compatibility Directive	2014/30//EU	EN 61000-3-2: 2013 EN 61000-3-3: 2014 EN 60335-2-102: 2010	EN 55014-1: 2011 EN 55014-2: 2008
Gas Boiler Directive	2009/125/EC	EN 13203-2: 2014 EN 15036-1: 2006 EN 15502-1: 2012	
Low Voltage Directive	2010/30/EU		

This product is designated with CE number:

CE – 0063BQ3021

Hechingen, 16.06.2016

ELCO GmbH

i.V. Stefan Salewsky

Service:

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ELCO Austria GmbH
A - 2544 Leobersdorf
ELCOTHERM AG
CH - 7324 Vilters
ELCO BV
NL - 6465 AG Kerkrade
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