

VIADRUS

VIADRUS GARDE G 42 ECO

MANUAL FOR BOILER OPERATION
AND INSTALLATION

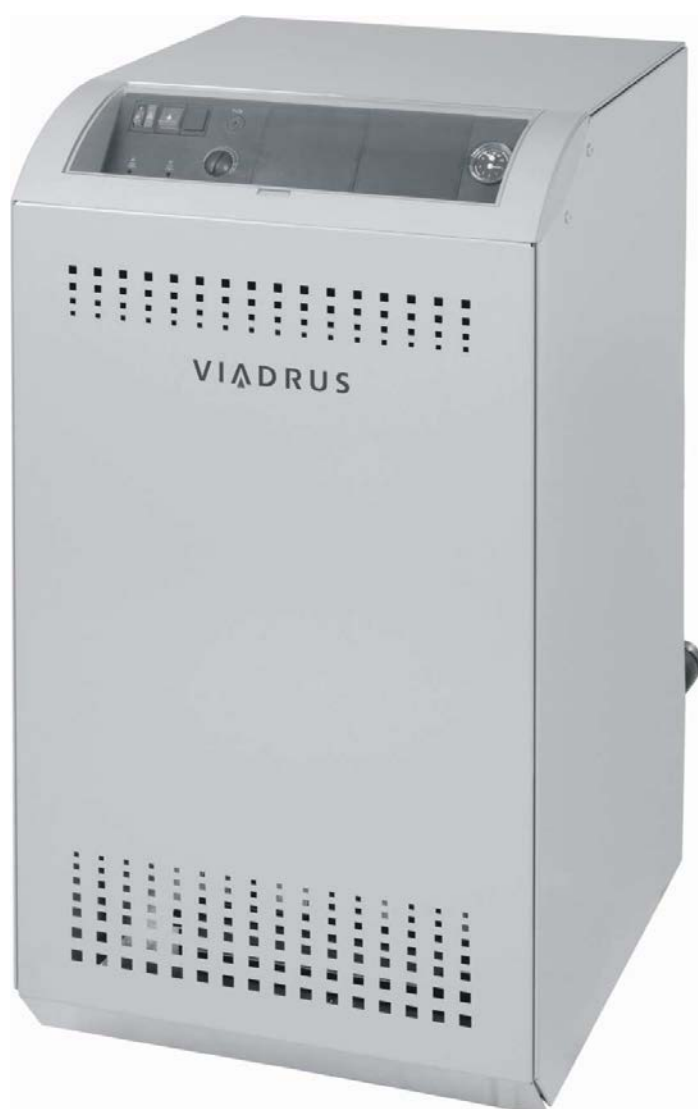


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Dear customer

We thank you that you have bought the VIADRUS GARDE G 42 gas boiler thus having shown your confidence in VIADRUS a.s.

For you to get used to a correct way of handling your new product from the beginning please read at first this manual for its usage (first of all the chapter no. 12 – Boiler operation by user and chapter no. 13 – Important warnings). Please follow the undermentioned information especially the prescribed annual inspections carried out by a professional firm in order to guarantee a long-time and trouble-free boiler operation to both your and our satisfaction.

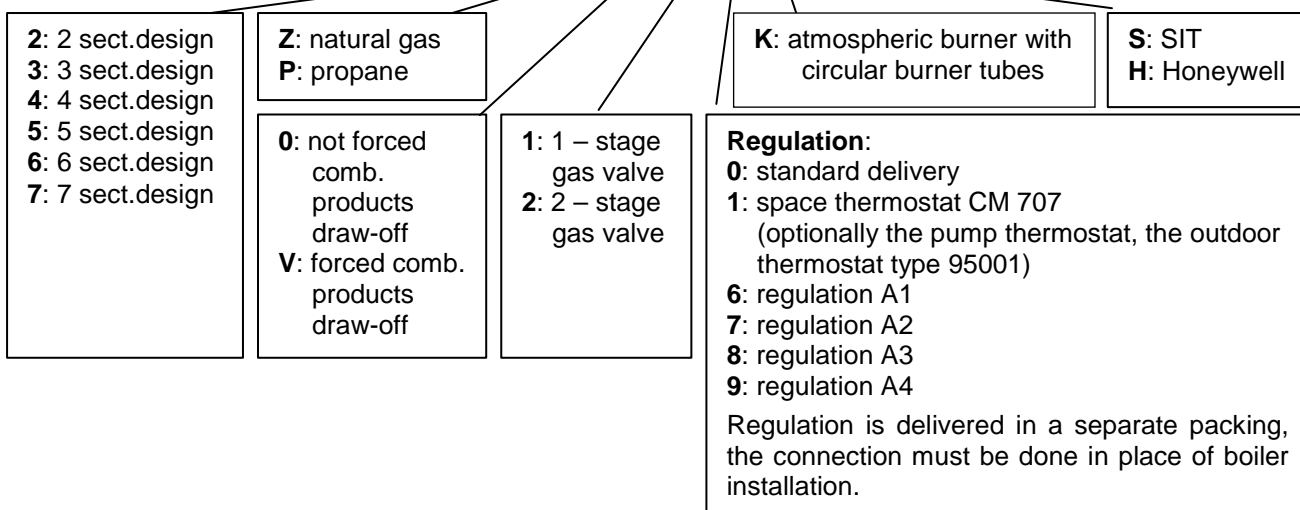
1. Manufactured boiler variants

1.1 Purchase order

In the purchase order it is necessary to define following data:

Purchase order specification code

G 42 X X X X X X X



Tab.no.1a): Manufactured variants

Basic boiler variants	Size	Fuel		Combust. products outlet		Gas valve		Regulation						Burner	Design	
	X	X		X		X		X						X	X	
		Z	P	0	V	1	2	0	1	6	7	8	9	K	S	H
NG boiler 2 – stage gas valve	2 sect.															
	3 sect.	x		x	x		x	x	x	x	x	x		x	x	x
	4 sect.	x		x	x		x	x	x	x	x	x		x	x	x
	5 sect.	x		x	x		x	x	x	x	x	x		x	x	x
	6 sect.	x		x	x		x	x	x	x	x	x		x	x	x
NG boiler 1 – stage gas valve	2 sect.	x		x	x	x		x	x					x		x
	3 sect.	x		x	x	x		x	x	x	x	x	x	x		x
	4 sect.	x		x	x	x		x	x	x	x	x	x	x		x
	5 sect.	x		x	x	x		x	x	x	x	x	x	x		x
	6 sect.	x		x	x	x		x	x	x	x	x	x	x		x
Propane boiler 1 – stage gas valve	2 sect.		x	x	x	x		x	x					x		x
	3 sect.		x	x	x	x		x	x	x	x	x	x	x		x
	4 sect.		x	x	x	x		x	x	x	x	x	x	x		x
	5 sect.		x	x	x	x		x	x	x	x	x	x	x		x
	6 sect.		x	x	x	x		x	x	x	x	x	x	x		x
	7 sect.		x	x	x	x		x	x	x	x	x	x	x		x

Note.: 2° boiler with indoor thermostat (CM 707) can be equipped with outdoor thermostat type 95001.

Purchase order specification code

G 42 ECO X X X X X X X

2: 2 sect.design
3: 3 sect.design
4: 4 sect.design
5: 5 sect.design
6: 6 sect.design
7: 7 sect.design

Z: natural gas
P: propane

0: not forced
comb. products
draw-off
V: forced comb.
products draw-
off

1: 1 – stage gas
valve
2: 2 – stage gas
valve

T: Třinec low-emission burner
F: low-emission burner Furigas

S: SIT
H: Honeywell

Regulation:

0: standard delivery

1: space thermostat CM 707

(optionally the pump thermostat, the outdoor
thermostat type 95001)

6: regulation A1

7: regulation A2

8: regulation A3

9: regulation A4

Regulation is delivered in a separate packing, the
connection must be done in place of boiler installation.

Tab.no.1b): Manufactured variants

Basic boiler variants	Size	Fuel		Combust. products outlet		Gas valve		Regulation						Burner		Design	
	X	X		X		X		X						X		X	
		Z	P	0	V	1	2	0	1	6	7	8	9	T	F	S	H
NG boiler 2 – stage gas valve	2 sect.																
	3 sect.	x		x	x		x	x	x	x	x	x		x		x	x
	4 sect.	x		x	x		x	x	x	x	x	x		x	x	x	x
	5 sect.	x		x	x		x	x	x	x	x	x		x	x	x	x
	6 sect.	x		x	x		x	x	x	x	x	x		x	x	x	x
	7 sect.	x		x	x		x	x	x	x	x	x		x	x	x	x
NG boiler 1 – stage gas valve	2 sect.	x		x	x	x		x	x					x			x
	3 sect.	x		x	x	x		x	x	x	x	x	x	x			x
	4 sect.	x		x	x	x		x	x	x	x	x	x	x	x		x
	5 sect.	x		x	x	x		x	x	x	x	x	x	x	x		x
	6 sect.	x		x	x	x		x	x	x	x	x	x	x	x		x
	7 sect.	x		x	x	x		x	x	x	x	x	x	x	x		x
Propane boiler 1 – stage gas valve	2 sect.		x	x	x	x		x	x					x			x
	3 sect.		x	x	x	x		x	x	x	x	x	x	x			x
	4 sect.		x	x	x	x		x	x	x	x	x	x	x			x
	5 sect.		x	x	x	x		x	x	x	x	x	x	x			x
	6 sect.		x	x	x	x		x	x	x	x	x	x	x			x
	7 sect.		x	x	x	x		x	x	x	x	x	x	x			x

2. Boiler use and advantages

Cast-iron sectional gas boiler VIADRUS GARDE G 42 or G 42 ECO (only generally G 42 hereinafter) equipped with atmospheric burner is designated for combustion of low-pressure natural gas and propane. The boiler is manufactured in design **B_{11BS}**, it means it is equipped with combustion products return flow fuse. The two and three sectional size is suitable for heat sources reconstructions in individual flat units and for smaller housing and recreation facilities. The bigger sizes suit the demands on heating the houses, shops, schools etc.

The boiler is only manufactured in hot water design with forced circulation and working overpressure up to 400 kPa (4 bar). Before dispatch it is checked for tightness by test overpressure 800 kPa (8 bar); it stands the insulation and transient resistance tests.

If you require preferential heating of hot service water you can order separately stationary VIADRUS OV 100L heater the design of which corresponds to VIADRUS GARDE G 42 boiler

By its electric connection the boiler is adjusted to the connection of the stack hot service water heater ensuring the service water preferential heating.

The low-temperature cast-iron boiler VIADRUS by its top quality construction of cast-iron sections reduces the condensation thus also the danger of low-temperature corrosion.

The heating (convection) surfaces of the boiler drum achieve a high use of heat contained in combustion products. Thanks to the use of high quality cast-iron the boiler is able to transfer the absorbed heat maximally to the heating water, this evenly to all parts of boiler.

The heating water needn't be kept at a temperature above 50 °C because at the temperatures of return water about 30 °C this boiler isn't damaged by low-temperature corrosion.

In boiler construction there is fully used the empiric knowledge in boilers operation under our climatic conditions when especially in the transient time of heating season the boilers happen to be operated at a lower heating temperature. This operation on one hand increases the boiler efficiency but the other hand it increases the risk of exchanger low- temperature corrosion.

At VIADRUS GARDE G 42 boiler this economical operation does not generate any negative effects either.

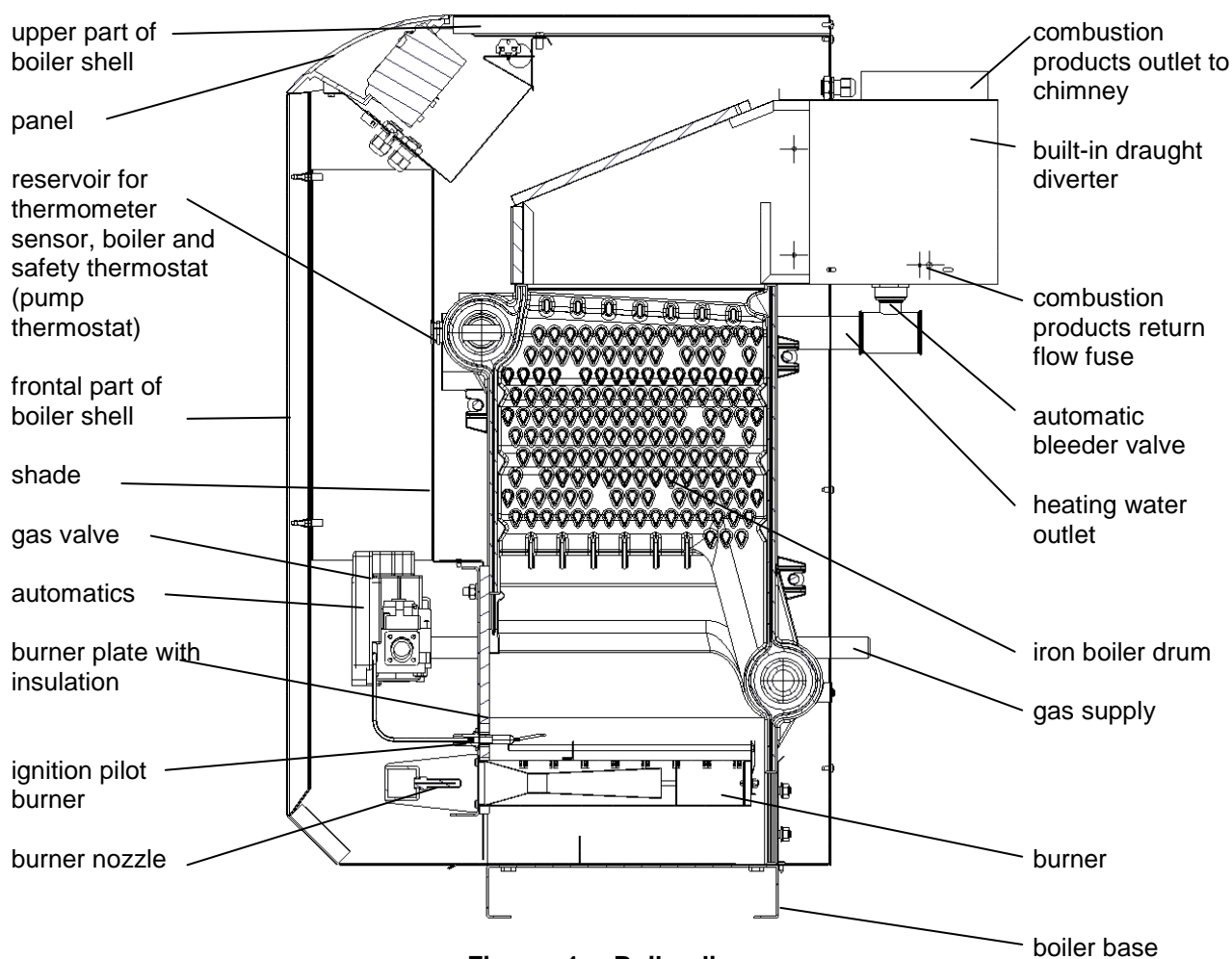


Fig. no. 1 Boiler diagram

Boiler advantages:

1. A high operating liability and long service life thanks to high quality grey cast iron with lamellar graphite.
2. Top quality construction of cast-iron sections with reduced weight compared to previous versions, which reduces the condensation occurrence thus the danger of low-temperature corrosion.
3. Economical low-temperature operation without condensation occurrence.
4. High boiler efficiency up to 93 %.
5. Regulation and safety elements reliability.
6. Equipped with combustion products return flow fuse which in case of an insufficient chimney draught shuts down the boiler thus increasing the boiler safety.
7. Possibility to connect some of offered superior regulations according to the customer's demand on the heating comfort level.
8. Two-stage boiler working regime by means of HIGH-LOW coil.
9. Low contents of pollutants in combustion products (VIADRUS GARDE G 42 ECO) is deeply below the values set by MZP 05-97 „ Environmentally friendly product“ Direction „ and it meets the requirements set by the most strict European standards like the “Blue angel “ limits.
10. A high combustion space enables a clean flame burnout.
11. When using the pump thermostat there is watched the minimum boiler water temperature.
12. The boiler enables to connection to stack hot service water heater and guarantees its preferential heating.
13. Simple operation and maintenance. The boiler drum can be easily cleaned mechanically by using the enclosed brush.
14. The boiler can also be installed in the spaces where connection to chimney is impossible if there is mounted the combustion products ventilator that enables the combustion products drawing-off into outdoor air directly through the enclosure wall.

3. Technical data of boiler**Tab. no. 2 Dimensions, operating temperatures a electrical values of boiler**

Number of sections	pc	2	3	4	5	6	7
Boiler design		B _{11BS} in NG propane design					
Appliance category		II _{2H3P}					
Heat output (G 42 ECO) - natural gas	kW	8	12-17	18-26	27-34	35-41	42-49
Heat output (G 42 ECO) - propane	kW	7	14	22,5	30	36	42
Heat output (G 42) - natural gas	kW	8	12-17	18-26	27-34	35-41	42-49
(G 42) - propane	kW	7	14	21	26	33	40
Weight	kg	75	100	122	146	172	193
Water space volume	l	7	9,2	11,4	13,6	15,8	18
Diameter of smoke socket	mm	80	110	130	160	170	180
Boiler dimensions - width	mm	485	485	485	570	740	740
- depth x height	mm	733 x 934				773 x 934	
Water working overpressure	kPa (bar)	400 (4)					
Water test overpressure	kPa (bar)	800 (8)					
Heating water maximum temperature	°C	85					
Heating water minimum temperature	°C	45					
Return water minimum temperature	°C	45 (25*)					
Noise level	dB	max. 65 dB (A)					
Chimney draught	mbar	min. 0,025					
Boiler connections - heating water	Js	1"					
- return water	Js	1"					
- gas	Js	1/2"					
Connecting voltage		1/N/PE 230 V AC 50 Hz TN-S					
Electric input	kW	0,1					
Electric coverage		IP 40					

* When adhering to the lowest heating water temperature

Tab. no. 3a) Thermal - technical parameters of G 42 boiler equipped with SINGLE STAGE or DOUBLE STAGE GAS VALVE and designated for NATURAL GAS combustion
(thermal power 34,16 MJ.m⁻³, gas temperature 15 °C and bar. air pressure 1013,25 mbar)

Number of sections	pc	2	3	4	5	6	7
Rated heat output maximum	kW	8	17	26	34	41	49
Rated heat output minimum	kW	-	12	18	27	35	42
Rated heat input maximum	kW	8,84	18,78	28,02	37,20	44,85	53,18
Rated heat input minimum	kW	-	13,18	19,66	29,8	38,34	45,90
Gas volume flow rate at maximum heat output	m ³ .h ⁻¹	0,932	1,980	2,953	3,920	4,727	5,605
Gas volume flow rate at minimum heat output	m ³ .hod ⁻¹	-	1,390	2,072	3,141	4,041	4,837
Gas volume flow rate at maximum heat output	dm ³ .min ⁻¹	15,53	33,0	49,22	65,33	78,78	93,42
Gas volume flow rate at minimum heat output	dm ³ .min ⁻¹	-	23,17	34,53	52,35	67,35	80,62
Efficiency at maximum heat output	%	90,5 – 93					
Efficiency at minimum heat output	%	90,5 – 91,5					
No _x category		2					
Combustion products temperature in smoke flue at maximum heat output	°C	90 – 120					
Combustion products temperature in smoke flue at minimum heat output	°C	80 – 90					
Real volume of dry combustion products at maximum heat output	m ³ .m ⁻³	17,80	23,33	19,23	23,89	20,66	18,25
Real volume of dry combustion products at minimum heat output	m ³ .m ⁻³	-	25,09	27,52	28,67	23,65	25,09
Connecting gas overpressure	mbar	20					
Gas overpressure on burner nozzles at maximum heat output	mbar	13,7	13,2	15,8	14,2	14,7	14,3
Gas overpressure on burner nozzles at minimum heat output	mbar	-	6,8	7,8	8,9	10,8	10,6
Number of cool. sticks on a tube	pc	2	3	3	3	3	3
Number of nozzles	pc	1	2	3	4	5	6
Nozzles diameter	mm	2,4	2,52	2,52	2,52	2,45	2,45
Connecting gas overpressure	mbar	13					
Gas overpressure on burner nozzles at maximum heat output	mbar	10	10	11	11	11,7	11,5
Gas overpressure on burner nozzles at minimum heat output	mbar	4,6	4,7	4,8	6,8	8,8	8,6
Number of cool. sticks on a tube	pc	2	3	3	3	3	3
Number of nozzles	pc	1	2	3	4	5	6
Nozzles diameter	mm	2,7	2,7	2,7	2,7	2,7	2,7

Note: At a single stage valve the heat output is pre-set by the manufacturer to the maximum.

Tab. no. 3b) Thermal - technical parameters of G 42 boiler equipped with SINGLE STAGE GAS VALVE and designated for PROPANE combustion
(thermal power 87,75 MJ.m⁻³, gas temperature 15 °C a bar. air pressure 1013,25 mbar)

Number of sections	pc	2	3	4	5	6	7
Rated heat output	kW	7	14	21	26	33	40
Rated heat input	kW	7,73	15,21	22,82	28,32	35,90	43,79
Fuel volume rated flow	m ³ .h ⁻¹	0,317	0,624	0,936	1,162	1,473	1,796
Fuel volume rated flow	dm ³ .min ⁻¹	5,28	10,40	15,60	19,37	24,55	29,93
Boiler efficiency	%	90,5 – 92					
No _x category		2					
Combustion products temperature in smoke flue	°C	90 – 110					
Real volume of dry combustion products	m ³ .m ⁻³	46,42	59,5	95,87	67,3	58,55	56,15
Connecting fuel overpressure	mbar	30					
Gas overpressure on burner nozzles	mbar	27,5	28,5	28	27	27,5	27,5
Number of cool. sticks on a tube	pc	2	3	2	3	3	3
Number of nozzles	pc	1	2	3	4	5	6
Nozzles diameter	mm	1,55	1,55	1,5	1,5	1,5	1,5

Tab. no. 4a) Thermal - technical parameters of G 42 ECO boiler with burner OVO Třinec equipped with SINGLE STAGE or DOUBLE STAGE GAS VALVE and designated for NATURAL GAS COMBUSTION
(thermal power 34,16 MJ.m⁻³, gas temperature 15 °C a bar. air pressure 1013,25 mbar)

Number of sections	pc	2	3	4	5	6	7
Rated heat output maximum	kW	8	17	26	34	41	49
Rated heat output minimum	kW	-	12	18	27	35	42
Rated heat input maximum	kW	8,87	18,52	28,32	36,99	44,56	54,44
Rated heat input minimum	kW	-	12,95	19,25	29,18	38,34	45,75
Gas volume flow rate at maximum heat output	m ³ .h ⁻¹	0,935	1,952	2,985	3,899	4,696	5,737
Gas volume flow rate at minimum heat output	m ³ .h ⁻¹	-	1,365	2,029	3,075	4,041	4,822
Gas volume flow rate at maximum heat output	dm ³ .min ⁻¹	15,58	32,53	49,75	64,98	78,27	95,62
Gas volume flow rate at minimum heat output	dm ³ .min ⁻¹	-	22,75	33,82	51,25	67,35	80,37
Boiler efficiency at maximum heat output	%	90 – 92					
Boiler efficiency at minimum heat output	%	90 – 93,5					
No _x category		5					
Combustion products temperature in smoke flue at maximum heat output	°C	105 – 125					
Combustion products temperature in smoke flue at minimum heat output	°C	80 – 100					
Real volume of dry combustion products at maximum heat output	m ³ .m ⁻³	17,38	23,33	19,71	23,89	20,04	19,86
Real volume of dry combustion products at minimum heat output	m ³ .m ⁻³	-	25,09	27,10	28,67	23,27	25,09
Connecting gas overpressure gas	mbar	20					
Gas overpressure on burner nozzles at maximum heat output	mbar	13,2	14,9	14,8	14,7	14,9	15,2
Gas overpressure on burner nozzles at minimum heat output	mbar	-	8	7,6	9,8	11,4	10,9
Number of nozzles	pc	1	2	4	5	6	7
Nozzles diameter	mm	2,45	2,45	2,20	2,20	2,20	2,25
Connecting gas overpressure	mbar	13					
Gas overpressure on burner nozzles at maximum heat output	mbar	10	10	11	11	11,7	11,5
Gas overpressure on burner nozzles at minimum heat output	mbar	4,6	4,7	4,8	6,8	8,8	8,6
Number of cool. sticks on a tube	pc	2	3	3	3	3	3
Number of nozzles	pc	1	2	3	4	5	6
Nozzles diameter	mm	2,7	2,7	2,7	2,7	2,7	2,7

Note: At a single stage valve the heat output is pre-set by the manufacturer to the maximum.

Tab. no. 4b) Thermal - technical parameters of G 42 ECO boiler with burner OVO Třinec equipped with SINGLE STAGE GAS VALVE and designated for PROPANE combustion
(thermal power 87,75 MJ. m⁻³, gas temperature 15°C a bar. air pressure 1013,25 mbar)

Number of sections	pc	2	3	4	5	6	7
Rated heat output	kW	7	14	22,5	30	36	42
Rated heat input	kW	7,71	15,22	24,43	32,61	39,13	45,78
Fuel volume rated flow	m ³ .h ⁻¹	0,316	0,624	1,002	1,338	1,605	1,878
Fuel volume rated flow	dm ³ .min ⁻¹	5,27	10,40	16,70	22,30	26,75	31,30
Boiler efficiency	%	90,7 - 92					
No _x category		category 5					
Combustion products temperature in smoke flue	°C	105 – 125					
Real volume of dry combustion products	m ³ .m ⁻³	44,55	59,5	81,67	67,6	58,55	50,05
Connecting fuel overpressure	mbar	30					
Gas overpressure on burner nozzles	mbar	27,8	27,84	27,8	28,24	27,74	27,5
Number of nozzles	pc	1	2	4	5	6	7
Nozzles diameter	mm	1,55	1,54	1,42	1,42	1,42	1,42

Tab. no. 5) Thermal - technical parameters of G 42 ECO boiler with burner Furigas equipped with SINGLE STAGE or DOUBLE STAGE GAS VALVE and designated for NATURAL GAS COMBUSTION

(thermal power 34,26 MJ. m⁻³, gas temperature 15°C a bar. air pressure 1013,25 mbar)

Number of sections	pc	4	5	6	7
Rated heat output maximum	kW	26	34	41	49
Rated heat output minimum	kW	18	27	35	42
Rated heat input maximum	kW	28,04	37,28	44,71	53,73
Rated heat input minimum	kW	19,37	29,68	38,38	46,34
Gas volume flow rate at maximum heat output	m ³ .h ⁻¹	2,946	3,917	4,698	5,646
Gas volume flow rate at minimum heat output	m ³ .hod ⁻¹	2,035	3,119	4,033	4,869
Gas volume flow rate at maximum heat output	dm ³ .min ⁻¹	49,10	65,28	78,30	94,10
Gas volume flow rate at minimum heat output	dm ³ .min ⁻¹	33,92	51,98	67,22	81,15
Boiler efficiency at maximum heat output	%	91 – 93			
Boiler efficiency at minimum heat output	%	90,5 – 93			
No _x category		category 5			
Combustion products temperature in smoke flue at maximum heat output	°C	104 – 125			
Combustion products temperature in smoke flue at minimum heat output	°C	80 – 100			
Real volume of dry combustion products at maximum heat output	m ³ .m ⁻³	26,97	23,89	21,15	19,43
Real volume of dry combustion products at minimum heat output	m ³ .m ⁻³	42,03	29,3	23,96	25,2
Connecting gas overpressure	mbar	20			
Gas overpressure on burner nozzles at maximum heat output	mbar	15,5	14,8	14,7	13,3
Gas overpressure on burner nozzles at minimum heat output	mbar	7,8	0,95	11,3	0,99
Number of nozzles		3	4	5	6
Nozzles diameter	mm	2,45	2,45	2,45	2,5

Note: At a single stage valve the heat output is pre-set by the manufacturer to the maximum.

4. Boiler construction

The **cast-iron sectional boiler drum** made of grey cast iron according to ČSN 42 2420 - „Cast iron 42 2420 with laminated graphite“ is the main part of the boiler.

The boiler construction corresponds to the strength requirements according to

ČSN 07 0240 Warm-water and low-pressure steam boilers

EN 297 Gas – fired central heating boilers – Type B₁₁ and B_{11BS} fitted with atmospheric burners of nominal heat input not exceeding 70 kW

The boiler output is determined by number of sections. Individual sections are connected by means of forced on insertions ϕ 47 mm (length 36 mm, angle 1°45") and are tightened by anchor bolts thus creating the combustion space, convection surface and boiler water volume inside the sections. The convection surface construction allows cleaning the boiler drum mechanically by using the enclosed brush. The heating water inlet and outlet in the rear part of boiler is equipped with pipes 1". At the return water connection there is installed the discharge valve. At the heating water outlet there must be installed an automatic bleeder valve which is included in the serial delivery. The whole boiler drum is insulated by using a harmless mineral insulation, which reduces the losses caused by heat transfer to the ambient.

To the upper part of boiler drum there is fastened by means of screws an **inbuilt draught diverter** with the neck for putting on a smoke pipe. The draught diverter is equipped with a dismountable cleaning cover.

The boiler drum is positioned on a **steel base** closing the burner space from below. The anticorrosive steel cover plate and thermal insulation belong to the boiler drum.

The boiler steel shell surface is coated with a good quality comaxit paint.

For version G 42 ECO the atmospheric burner consists of low-emission burner tubes in oval new type design made of anticorrosion steel with a long service life. Individual tubes are fastened on the burner plate by four screws. At **two and three sectional** boiler versions there are used the burner tubes of **VI OVO 1G**

type and at other (multi-sectional) versions the burner tubes of **VI OVO 1E type**. The tubes differ from each other only in perforation width. The emission standards, directions and regulations serve as a criterion for heat ecological and economical heat generation examination. The burner tubes represent an advanced special burner system which:

- Significantly spares the environment
- The emission values are significantly lower than those set by very strict values of MŽPČR 05/97 Direction for "Environmentally friendly products with demands on trademark impartation " and also the "Blue angel "limit requirements.
- The burner is certified not only for natural gas, but also for liquid gas - propane.

A progressive **burner** construction enables to close fully the boiler combustion space; all air necessary for combustion is brought into the burner tubes through the diffusers. The gas distributor incl. the gas nozzles is welded to the burner plate.

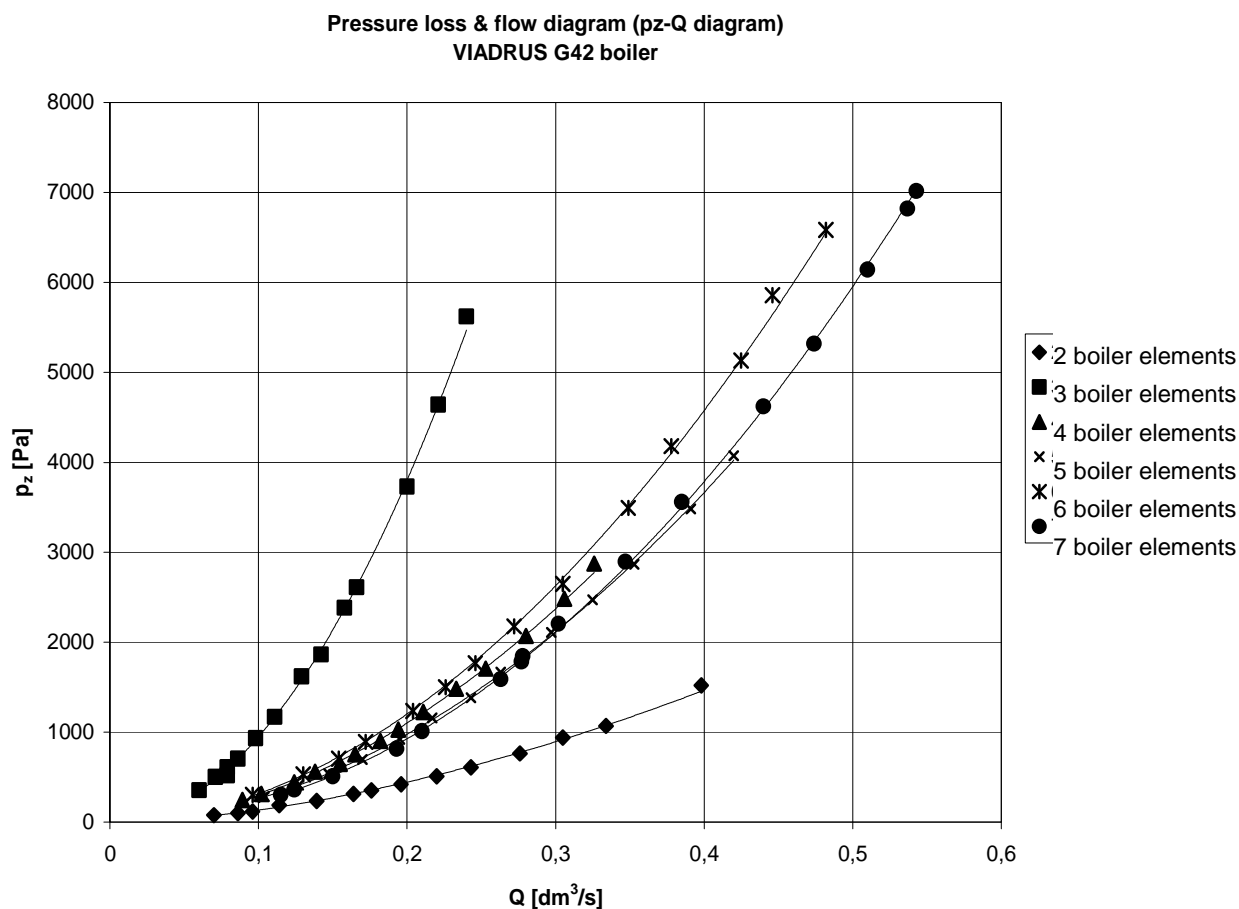


Fig. no. 2 Hydraulic resistance

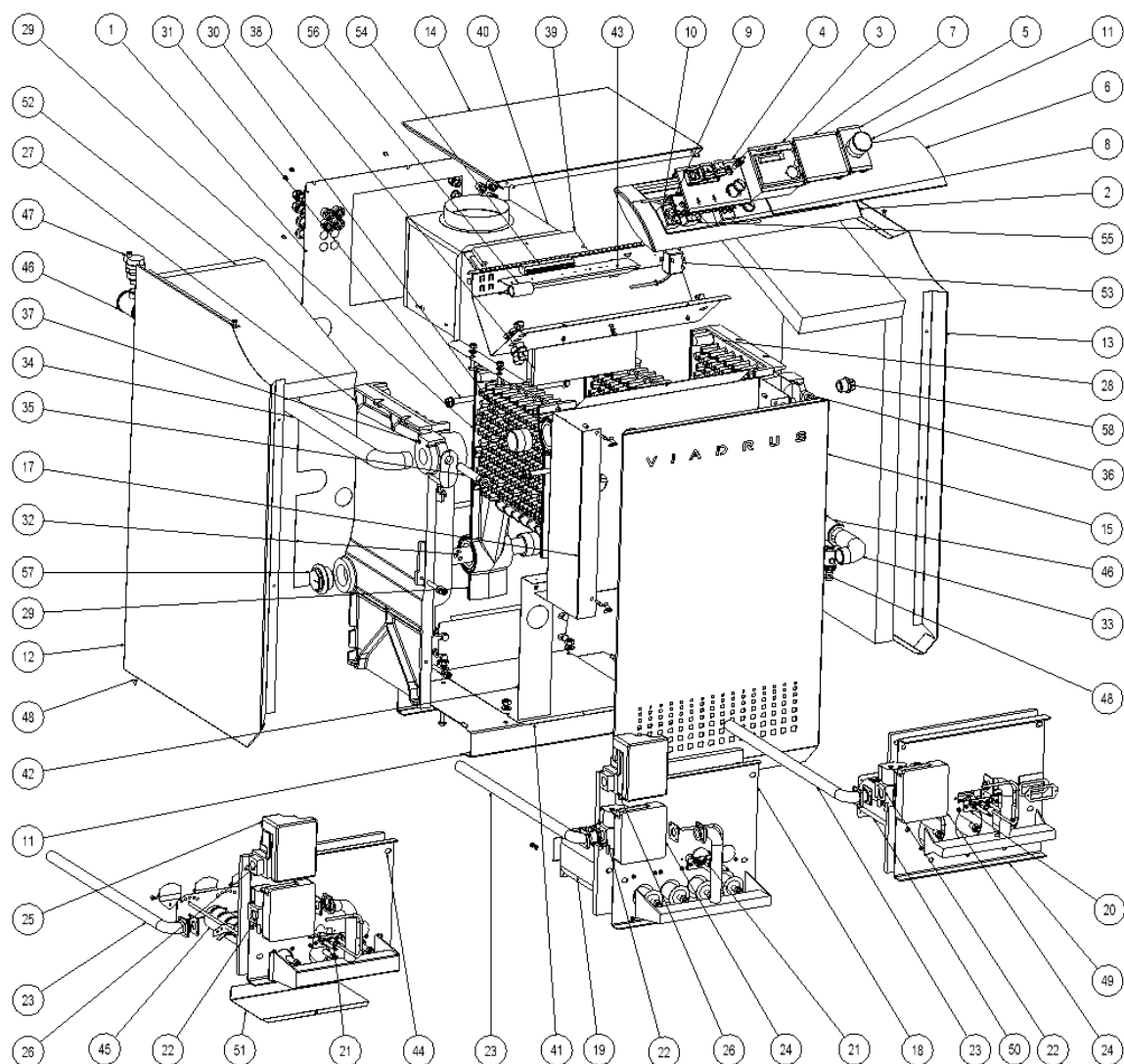
We offer the stationary low-temperature boiler together with safety and control automatics in natural gas and propane design with ignition pilot burner.

Then this boiler variant can be equipped with low-emission Furigas burner. This is equipped with low-emission oval type tubes.

Furigas burner is designated for natural gas combustion in single stage and double stage design at 4 - 7 sectional boilers.

For G 42 version—the atmospheric burner consisting of circular 5T tubes with cooling sticks is the basic design.

For G 42 ECO version – the atmospheric burner consisting of OVO tubes is the basic design.



- | | | |
|--------------------------------------|---|------------------------------------|
| 1. The rear part of boiler shell | 21. Ignition pilot burner Polidoro | 41. Combustion space cover plate |
| 2. Electrical panel | 22. Honeywell valve | 42. Shade |
| 3. RVA Regulator | 23. Gas supply pipe | 43. Electric panel bracket |
| 4. Network module | 24. Honeywell automatics | 44. Burner plate –circular tub. |
| 5. Blind flange with opening | 25. SIT automatics | 45. Burner tube - circular |
| 6. Electric panel cover | 26. Gas valve SIT | 46. Reduced extension |
| 7. Blind flange | 27. End section left | 47. Bleeder valve |
| 8. Operating thermostat | 28. End section right | 48. Discharge cock |
| 9. Mounting plate | 29. Central section | 49. Burner plate Furigas |
| 10. Safety thermostat | 30. Boiler insertion 47 diameter | 50. Burner tube Furigas |
| 11. Base | 31. Anchor screw | 51. Secondary air shade |
| 12. Side shell left | 32. Distribution pipe | 52. Boiler drum insulation |
| 13. Side shell right | 33. Inlet tube | 53. Boiler thermostat |
| 14. The upper part of boiler shell | 34. Outlet pipe | 54. Terminal board |
| 15. The frontal part of boiler shell | 35. Thermostat reservoir | 55. Combustion products thermostat |
| 16. The rear part of boiler shell | 36. Return valve to the thermomanometer | 56. Suppression component |
| 17. Shade | 37. Earth screw | 57. Plug 1/2" |
| 18. Burner plate | 38. Upper inbuilt draught diverter insulation | 58. Plug 1" |
| 19. Burner tube OVO | 39. Inbuilt draught diverter face insulation | 59. Peephole sheet |
| 20. Ignition pilot burner Furigas | 40. Inbuilt draught diverter | 60. Peephole sealing |
| | | 61. Glass cap (of peephole) |

Fig. no. 3 Boiler assembly VIADRUS GARDE G 42 a G 42 ECO

The boiler designated for natural gas combustion

Is equipped (optionally) with one of three offered gas valves:

1. DOUBLE STAGE COMBINED ELECTROMAGNETIC VALVE HONEYWELL

VK 4100 Q 2003B OR VK 4100 P 2004 EQUIPPED WITH A HIGH-LOW COIL (fig.no. 25a)

- Enables an automatic boiler operation in double stage working regime (rated output – reduced output)
- Automatic switching over between both output stages is ensured by Rego type 95001 outdoor thermostat
- The boilers equipped with this gas valve can be equipped with programmable Honeywell CM 707 regulator or with regulation A1 – A3 – at G 42 ECO boiler

2. DOUBLE STAGE COMBINED ELECTROMAGNETIC VALVE SIT

SIGMA 843 EQUIPPED WITH HIGH-LOW COIL (fig.no. 25b)

- Enables an automatic boiler operation in double stage working regime (rated output – reduced output)
- Automatic switching between both heat output stages is ensured by Rego type 95001 outdoor thermostat
- The boilers equipped with this gas valve can be equipped with programmable Honeywell CM 707 regulator or with regulation A1 – A3 – at G 42 ECO boiler

3. SINGLE STAGE COMBINED ELECTROMAGNETIC VALVE HONEYWELL

VK 4100 A 1002 (fig.no. 26)

- The boiler can only be operated at the output which can be firmly set according to tab. no.3a, 4a, 5 (adjustment can only be done by a contractual service organization trained by manufacturer)
- It enables the connection of all both offered types of regulation (Honeywell CM 707 programmable regulator or A1 – A4 regulation)

On the gas valve bodies of VK 4100Q 2003B and VK 4100A 1002 types there is installed the burner automatics type S 4565 BF 1088 or S 4565 BF 1112 with failure light signalling and unblocking push button.

On the SIT Sigma 843 gas valve there is installed the SIT 537 automatics.

The boiler designated for propane combustion is equipped with:

1. SINGLE STAGE COMBINED ELECTROMAGNETIC VALVE HONEYWELL

VK 4100 A 1002 (fig.no. 26)

- The boiler can only be operated at the output which stated in tab. no. 3b, 4b (the particular output is set by manufacturer)
- It enables the connection of all both offered types of regulation (Honeywell CM 707 programmable regulator or A1 – A4 regulation)

On the Honeywell gas valve body there is installed the S 4565 BF 1112 1 burner automatics.

We offer the burner ignition designs as follows:

a) Polidoro ignition pilot burner

- The burner ignition and watching operations are provided by low-emission ignition pilot burner. If the main burner ignition is required there automatically after $T_w = 1$ s waiting time the inbuilt lighter is switched on and the ignition pilot burner gas valve opens. The ignition spark lights the ignition pilot burner and its flame will be then sensed by the flame sensor. After the ignition pilot burner flame has settled the ignition is switched off and the main valve for main burner gas supply will open. If the ignition pilot burner does not ignite during $T_s = 55$ s ($T_s = 25$ s), (SIT $T_s = 60$ s) safety time then the blocking automatics will switch on. If the flame goes out during the normal operation the ignition automatics will repeat the ignition cycle.

b) Furigas ignition pilot burner

- its function and the function of above described Polidoro ignition pilot burner are identical.

The ignition pilot burner is switched off together with the main burner.

Other controlling, safety and signalling elements are installed in boiler control panel which is equipped with network module with elements as follows:

- the main switch
- exceeded temperature signalling (link to the safety thermostat and combustion products return flow fuse)
- automatics reset
- output switch (only at the boilers equipped with double stage electromagnetic valve)
- fuse 2,5 A
- safety thermostat reset (set to 97 °C)

- combustion products return flow fuse reset
- boiler thermostat (delivered as standard with 0 - 85°C range)

The control panel is then equipped with a combined thermometer and manometer. The combustion products return flow fuse sensor is installed in horizontal draught diverter and it shuts down the boiler in case of an insufficient combustion products drawing-off.

The boiler and safety thermostat sensors are installed in a reservoir (in upper part of left outer section), the manometer return valve is crewed in upper part of right outer section.

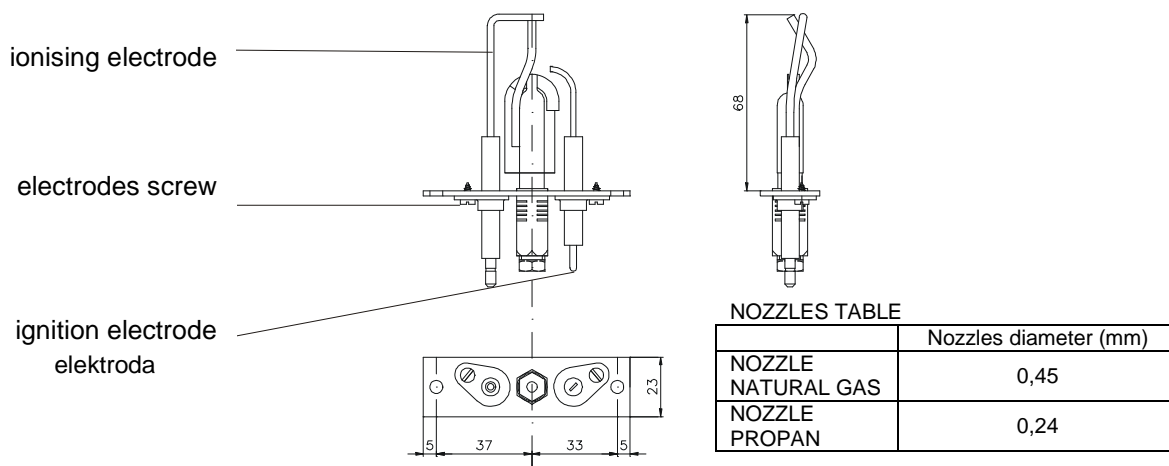


Fig. no. 4a) Polidoro ignition pilot burner

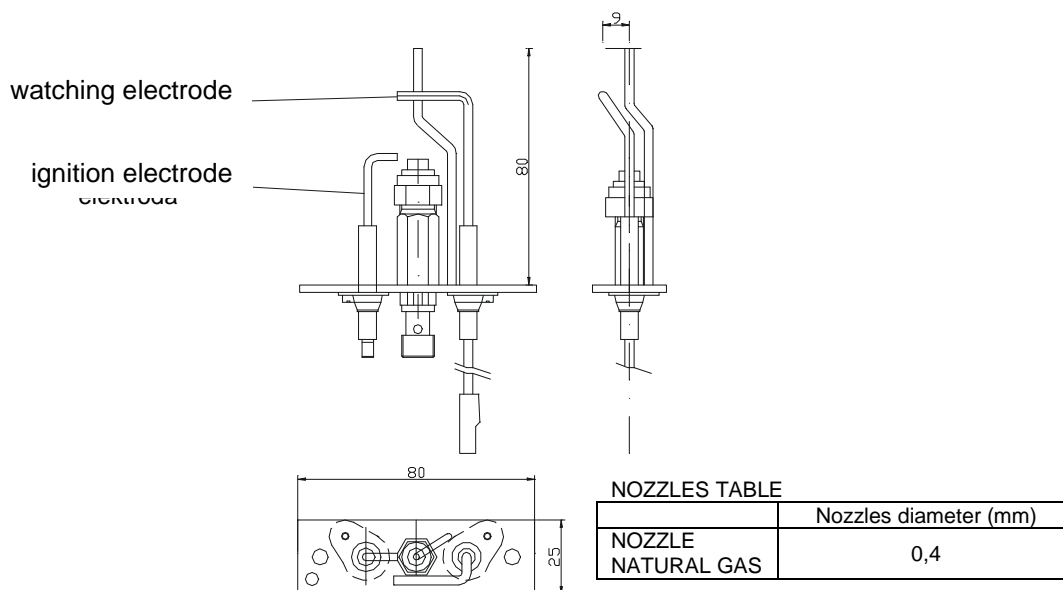


Fig. no. 4b) Furigas ignition pilot burner

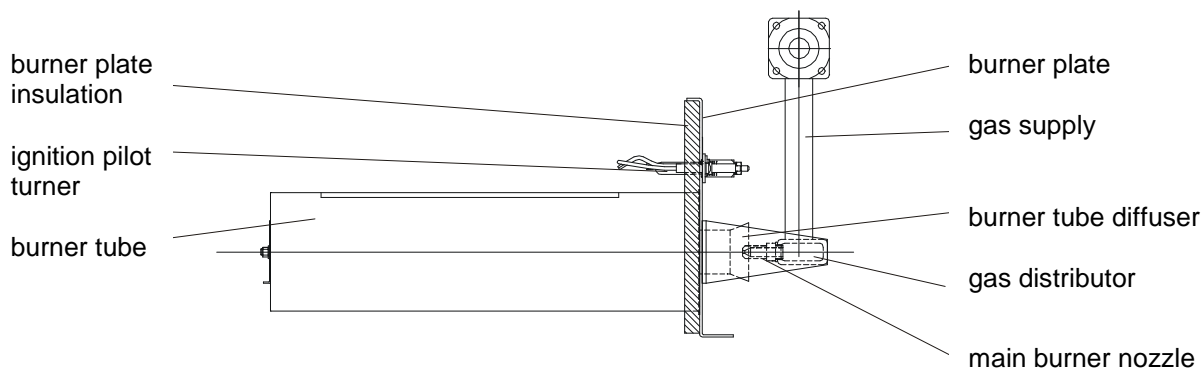


Fig. no. 5 Polidoro ignition pilot burner positioning above the burner (dimensions in mm)

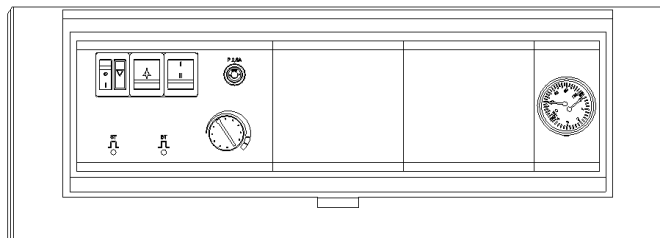
5. Regulation

5.1 Control, safety and regulation elements

As a standard the is delivered without the superior regulation and equipped with control panel with network module.

The manufacturer does not recommend to operate boiler without regulation. The standard version (without regulation) is determined for customers who have their own system of boilers control.

Besides the network module in the control panel there is mounted the combined device - the thermomanometer.



The network module is equipped with following elements (according to individual boiler variants):

- the main switch with signalling
- exceeded temperature signalling (safety thermostat and combustion products return flow fuse)
- automatics failure unblocking
- reduced/rated boiler output switch
- safety thermostat unblocking (at the open systems keep the setting by manufacturer it means to 97 °C) at the closed systems with pressure expansion reservoir can be set up to 105 °C)
- combustion products return flow fuse unblocking (set to 75 °C)
- boiler thermostat (0 – 85 °C range, recommended to be set to 85 °C)
- network fuse 2,5 A

The combustion products return flow fuse sensor is installed in horizontal draught diverter and in case of an insufficient combustion products drawing-off it closes down the boiler. The sensors of boiler and safety thermostats (possibly also the of pump thermostat) and of the thermometer are installed in the reservoir of left outer section and the manometer clack valve is installed in upper part of the right outer section.

5.1.1 Equitherm regulation

Optionally together with boiler there is delivered one of four kinds of regulation, or their combination according to the purchase order key stated in chapter no. 1.1. The regulators are delivered in a separate packing and in the place of boiler installation there is mounted the control panel according to the requirements. The vacant places in panel are in standard delivery equipped with blind flanges.

The most important characteristics of Siemens regulators:

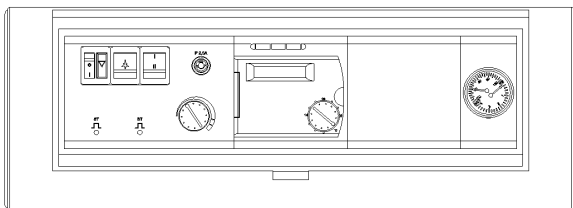
- equitherm regulation
- a quick inhibition and a quick change in heating medium temperature (quick inhibition and a quick heating)
- summer/ winter automatic switching-over
- boiler relief when starting
- boiler protection against overheating (pump operation drifting)
- pre-setting of minimum and maximum value of boiler heating water temperature (boiler outlet heating water temperature)
- anti-freeze protection of buildings and facilities
- pumps protection by means of a regular start
- heating schedule (every day during a week can be programmed separately)
- possibility of mutual co-operation of up to 16 regulators in RVA series...
- when connecting the indoor device QAA50 or QAA70 it is possible to control the boiler remotely and there is guaranteed the adaptation of heating curves in dependence on buildings construction and heat consumption.

On top of it RVA 33.121, RVA 43.222 and RVA 63.280 regulators have:

- the function of a “chimney sweeper” – the boiler is automatically set into operation for required combustion products measurement- the boiler is operated in full swing regardless the preset automatic regime.
- Registration of operation hours and number of burner starts

A1 - EQUITHERM REGULATOR RVA 43. 222

Is the regulator for boiler and heating circuit for: double stage burner, with the possibility to produce HWS, with pump heating circuit (without a mixing valve).

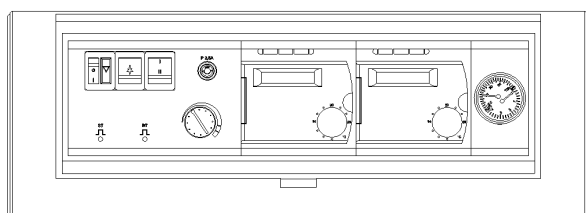


Other regulator characteristics:

- heating circuit regulation with circulation pump (without a mixing valve) **or** a cascade connection (up to 4 boilers)*

A2 - EQUITHERM REGULATOR RVA 46. 531 + RVA 43.222

Is a set of boiler and heating circuit regulators for: double stage burner, with the possibility to produce HWS incl. the mixing valve in heating circuit.

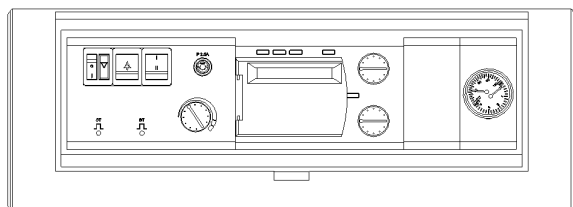


Other regulator characteristics:

- Suitable first of all for a cascade connection (up to 16 boilers) *

A3 - EQUITHERM REGULATOR RVA 63.280

Is a boiler and heating circuit regulator for: double stage burner, with the possibility to produce HWS with two sensors, incl. two mixing valves.

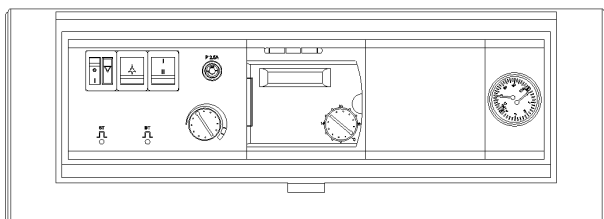


Other regulator characteristics:

- The heating circuits can be preset as independent (two independent heating circuits) or as dependent (floor heating combined with radiators)
- The independent schedule for hot service water preparation

A4 - EQUITHERM REGULATOR RVA 33. 121

Is a boiler and heating circuit regulator for: single stage burner, with the possibility to produce HWS with pump heating circuit (without a mixing valve).



Other regulator characteristics:

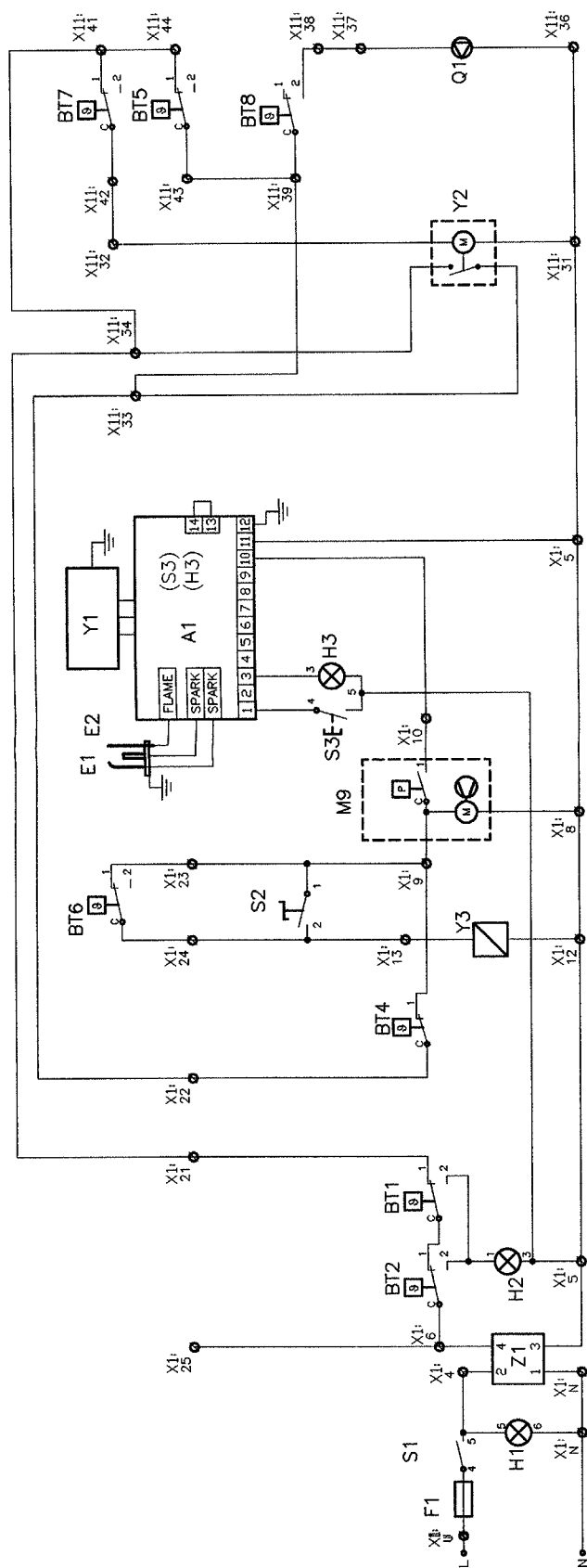
- The independent schedule for hot service water preparation
- **No other RVA regulators can be connected**

* Note:

In case of a cascade connection every boiler must be equipped with RVA 43.222 regulator and at least one boiler also with RVA 46.531 regulator (number of RVA 46.531 regulators must correspond to the number of operated heating circuits).

The regulator is enclosed according to the purchase order including a separate operation manual. As a standard the regulators are delivered incl. QAZ 21 immersion thermometer sensor for heating water.

5.2 Electric wiring diagrams



Legend:

F1	Fuse 2,5A	E1	ignition electrode
S1	main switch	E2	ionising electrode
H1	"boiler under voltage" signalling	Y1	SIGMA 843 gas valve
Z1	suppression component TC241	A1	SIT 537.201 ABC automatics
BT2	combustion products thermostat	S3	Reset button
H2	"failure" signalling	H3	"ionising failure" signalling
BT1	safety thermostat	Y2	three-way valve
BT4	boiler thermostat	BT7	TUV heater thermostat
BT6	outdoor thermostat	BT5	indoor thermostat
S2	reduced/rated output switch	BT8	circulation pump thermostat
Y3	2* valve coil	Q1	circulation pump
M9	combustion products ventilator		

Fig. no. 6a) VIADRUS GARDE G 42 a VIADRUS GARDE G 42 ECO boiler wiring diagram for version NG 2° SIT automatics

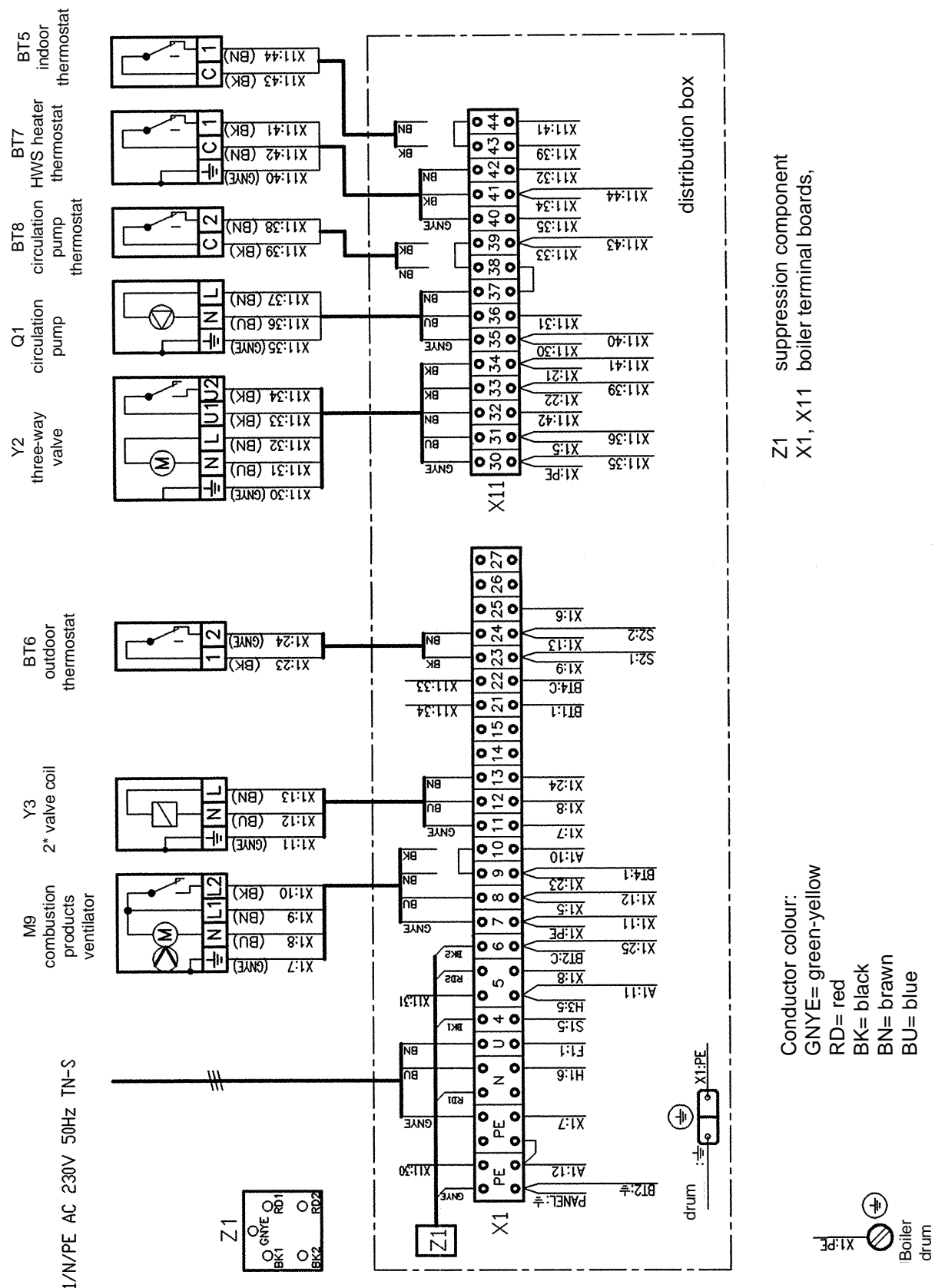


Fig. no. 6b)/1 VIADRUS GARDE G 42 and VIADRUS GARDE G 42 ECO boiler wiring diagram for version for version NG 2° with SIT automatics

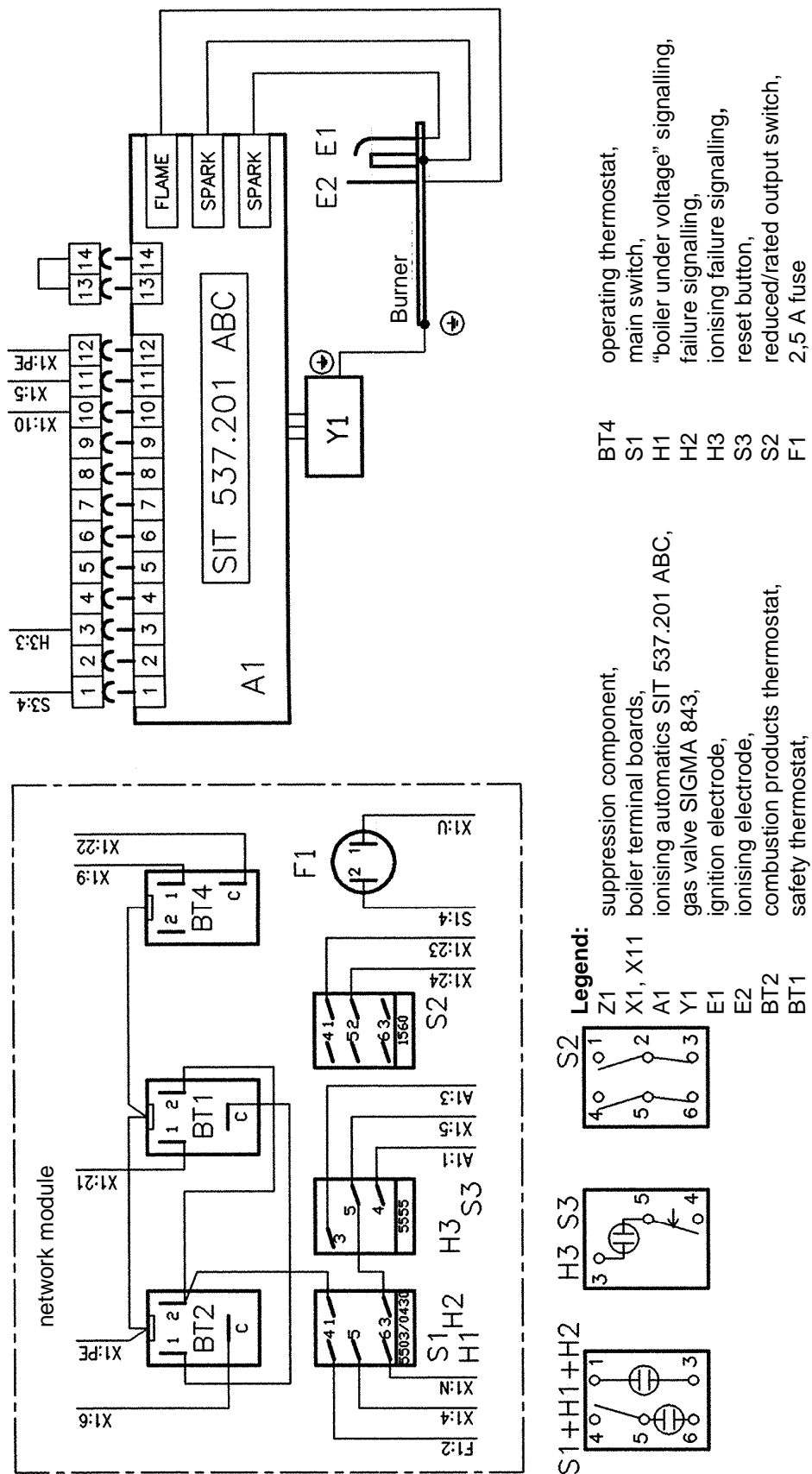
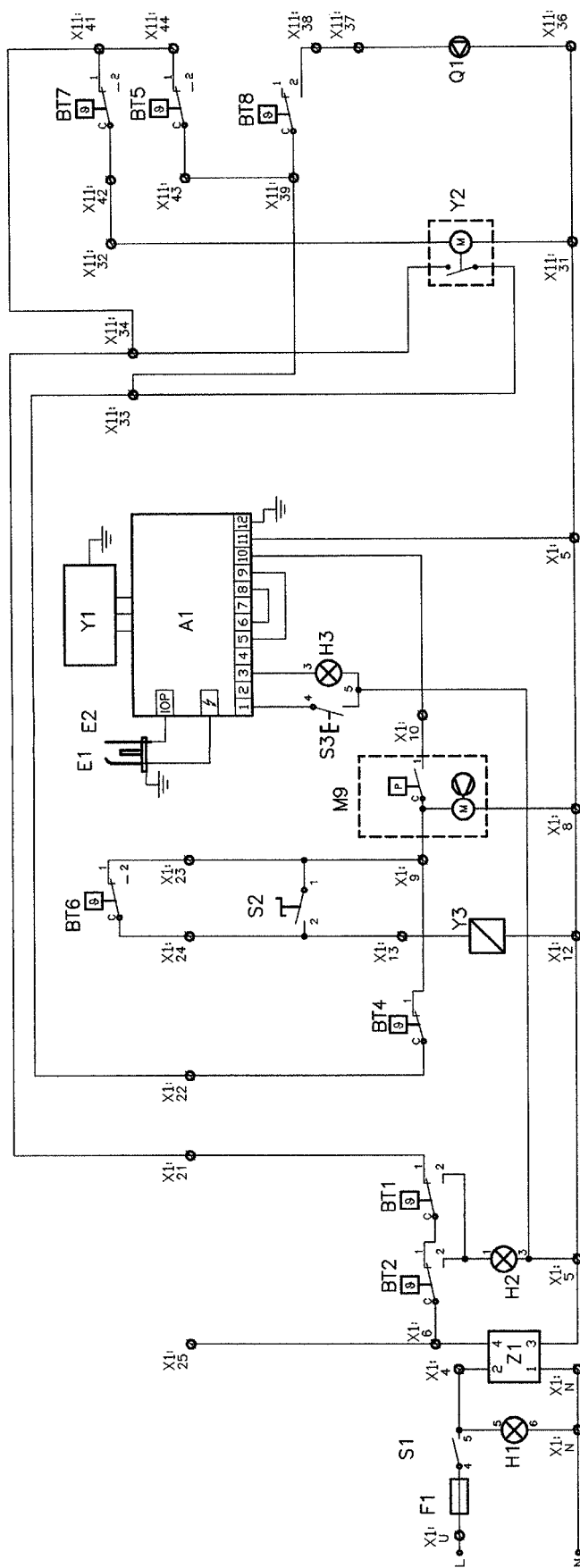


Fig. no. 6b)/2 VIADRUS GARDE G 42 and VIDRUS G 42 ECO boiler wiring diagram for version for version NG 2° with SIT automatics



Legend:

F1	Fuse 2,5A
S1	main switch
H1	"boiler under voltage" signalling
Z1	suppression component TC241
BT2	combustion products thermostat
H2	"failure" signalling
BT1	safety thermostat
BT4	boiler thermostat
BT6	outdoor thermostat
S2	reduced/rated output switch
Y3	2* valve coil

M9

E1	combustion products ventilator
E2	ignition electrode
Y1	ionising electrode
A1	VK4100 Q 2003 B Honeywell gas valve
S3	S 4565 BF 1112 1 Honeywell automatics
H3	Reset button
Y2	"ionising failure" signalling
BT7	three-way valve
BT5	HWS heater thermostat
BT8	indoor thermostat
Q1	circulation pump thermostat
	circulation pump

Fig. no. 7a) VIADRUS GARDE G 42 a VIADRUS GARDE G 42 ECO boiler wiring diagram for version NG 2° Honeywell automatics

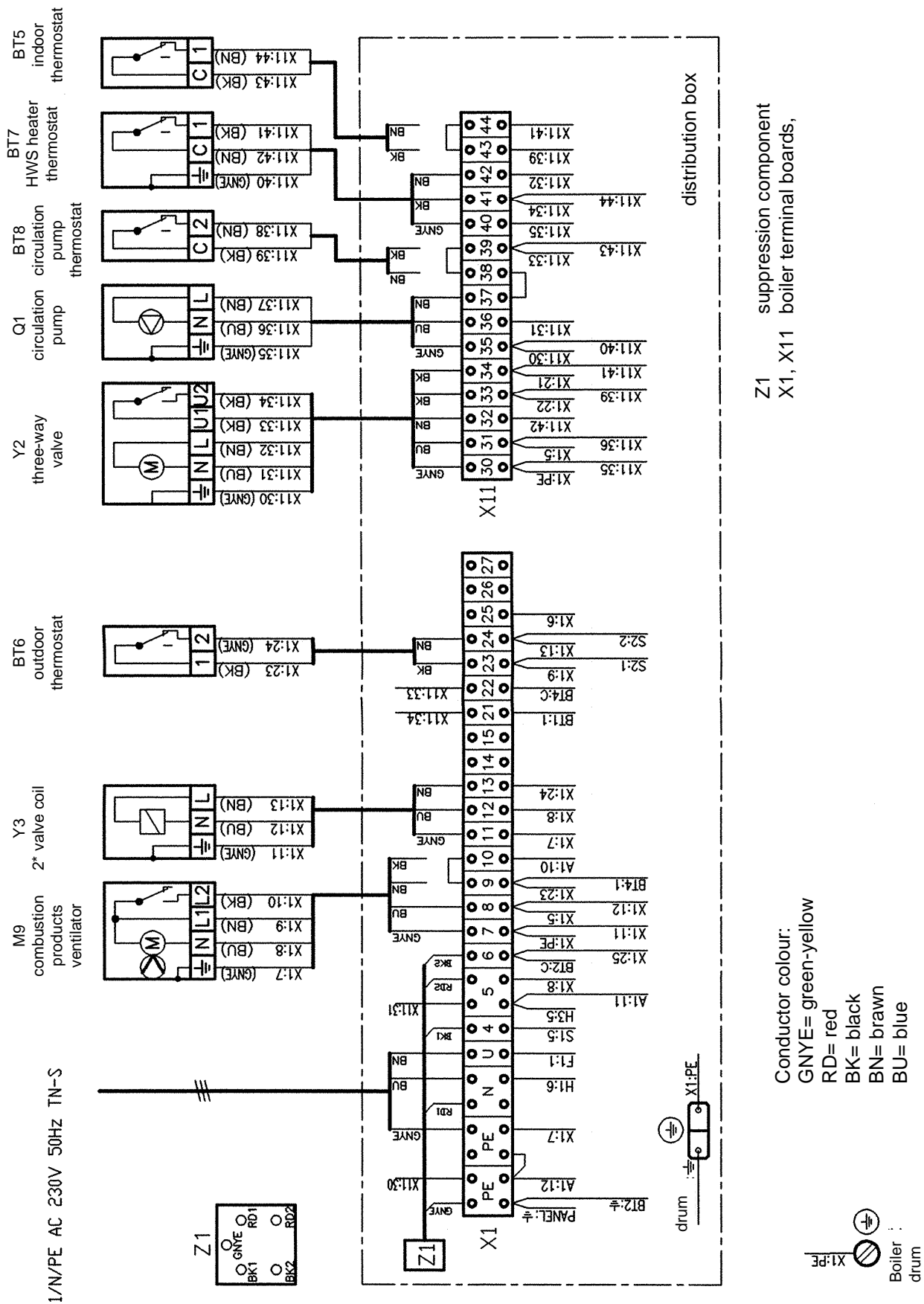
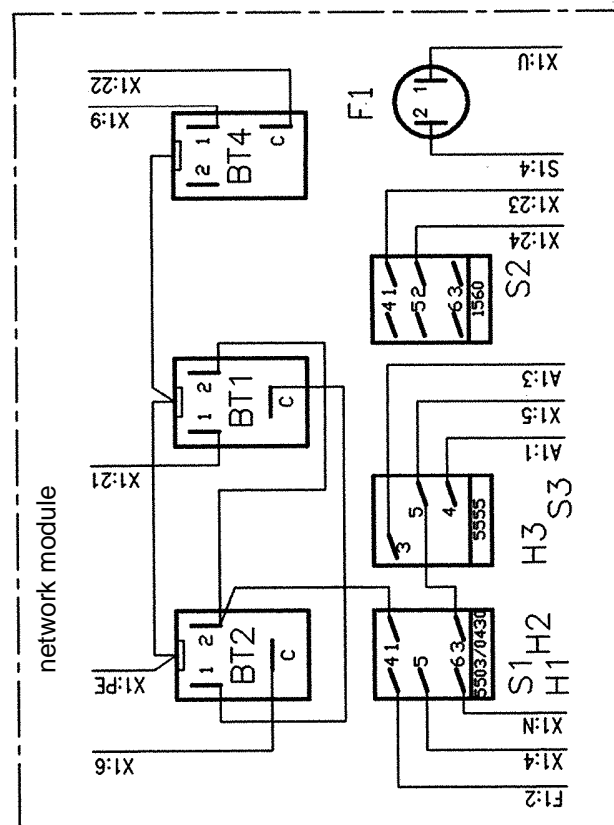
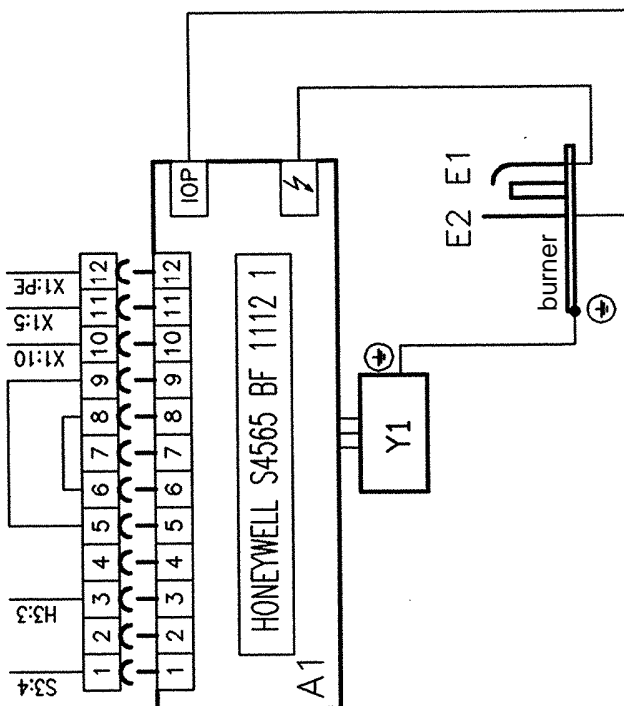


Fig. no. 7b)/1 VIADRUS GARDE G 42 and VIADRUS GARDE G 42 ECO wiring diagram for version NG 2° with Honeywell automatics



Legend:

- A1 ionising automatics Honeywell S4565 BF 1112 1
- Y1 gas valve VK 4100 Q 2003 B
- E1 ignition electrode
- E2 ionising electrode
- BT2 combustion products thermostat
- BT1 safety thermostat
- BT4 operating thermostat
- S1 main switch
- H1 "boiler under voltage" signalling
- H2 failure signalling
- H3 ionising failure signalling
- S3 reset button
- S2 reduced/rated output switch
- F1 2,5 A fuse

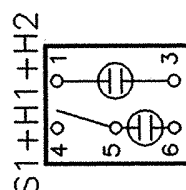
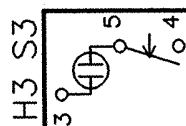
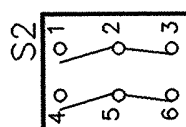
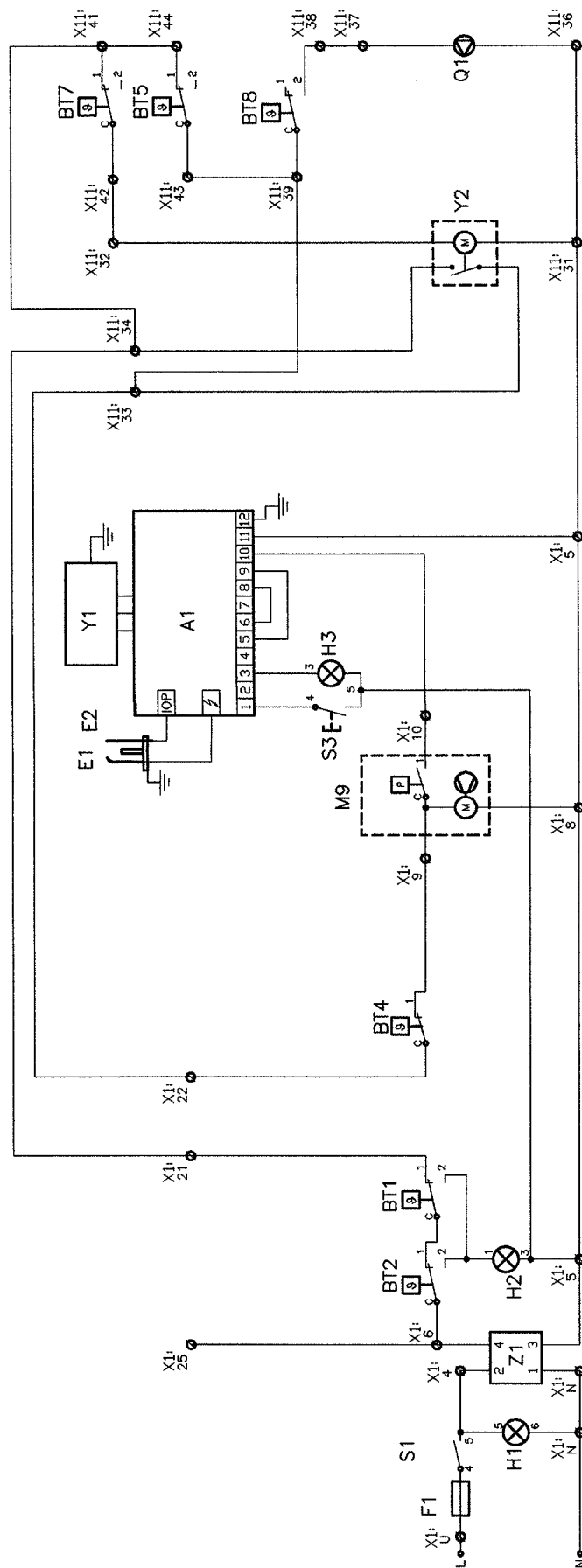


Fig. no. 7b)/2 VIADRUS GARDE G 42 and VIADRUS GARDE G 42 ECO wiring diagram for version NG 2° with Honeywell automatics



Legend:	
F1	Fuse 2,5A
S1	main switch
H1	"boiler under voltage" signalling
Z1	suppression component TC241
BT2	combustion products thermostat
H2	"failure" signalling
BT1	safety thermostat
BT4	boiler thermostat
M9	combustion products ventilator
E1	ignition electrode
E2	ionising electrode
Y1	VK4100 A 1002 gas valve
A1	S 4565 BF 1112 1 Honeywell automatics
S3	Reset button
H3	"ionising failure" signalling
Y2	three-way valve
BT7	TUV heater thermostat
BT5	indoor thermostat
BT8	circulation pump thermostat
Q1	circulation pump

Fig.no. 8a) VIADRUS GARDE G 42 a VIADRUS GARDE G 42 ECO wiring diagram for version NG 1°with Honeywell automatics

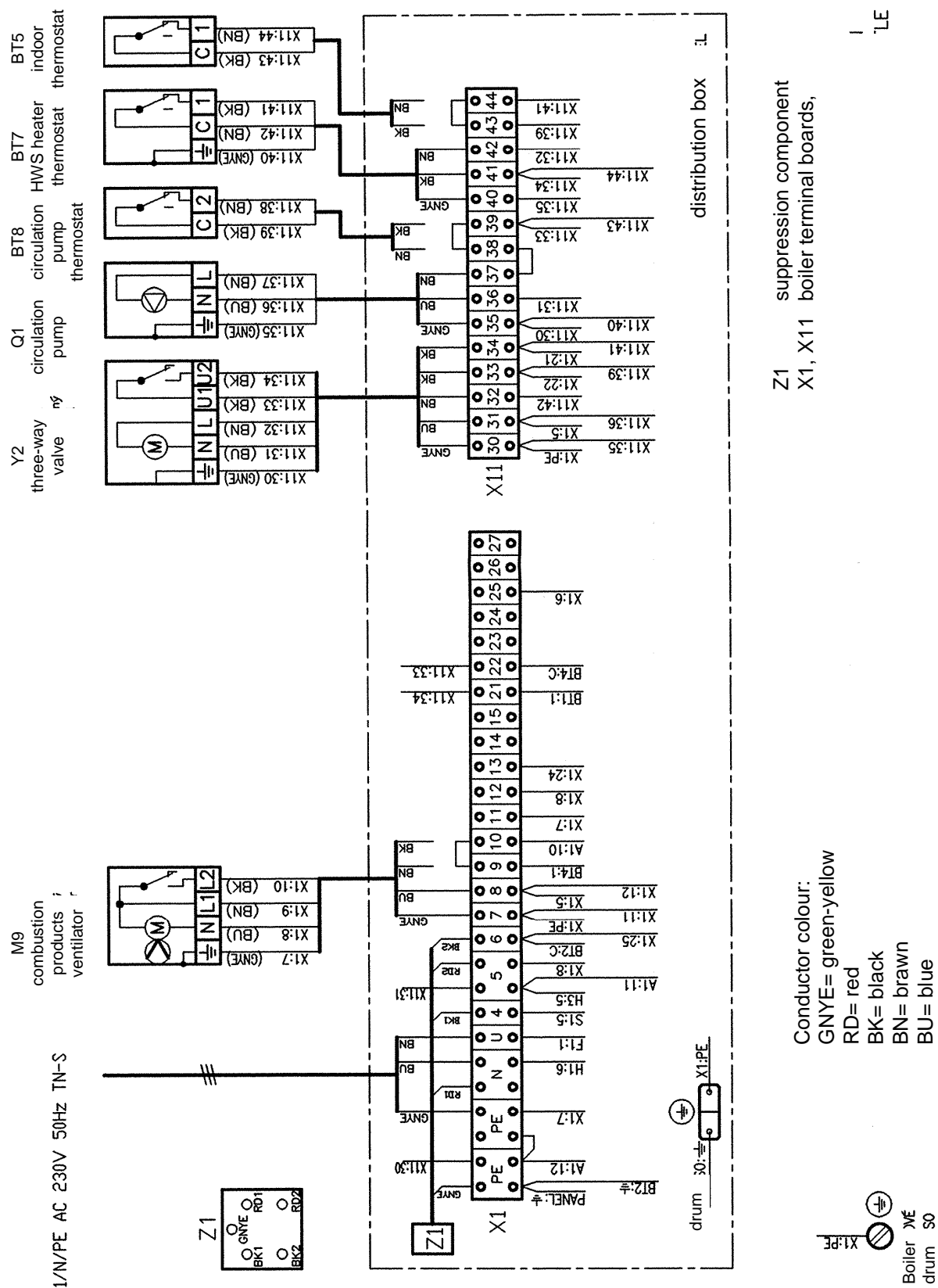
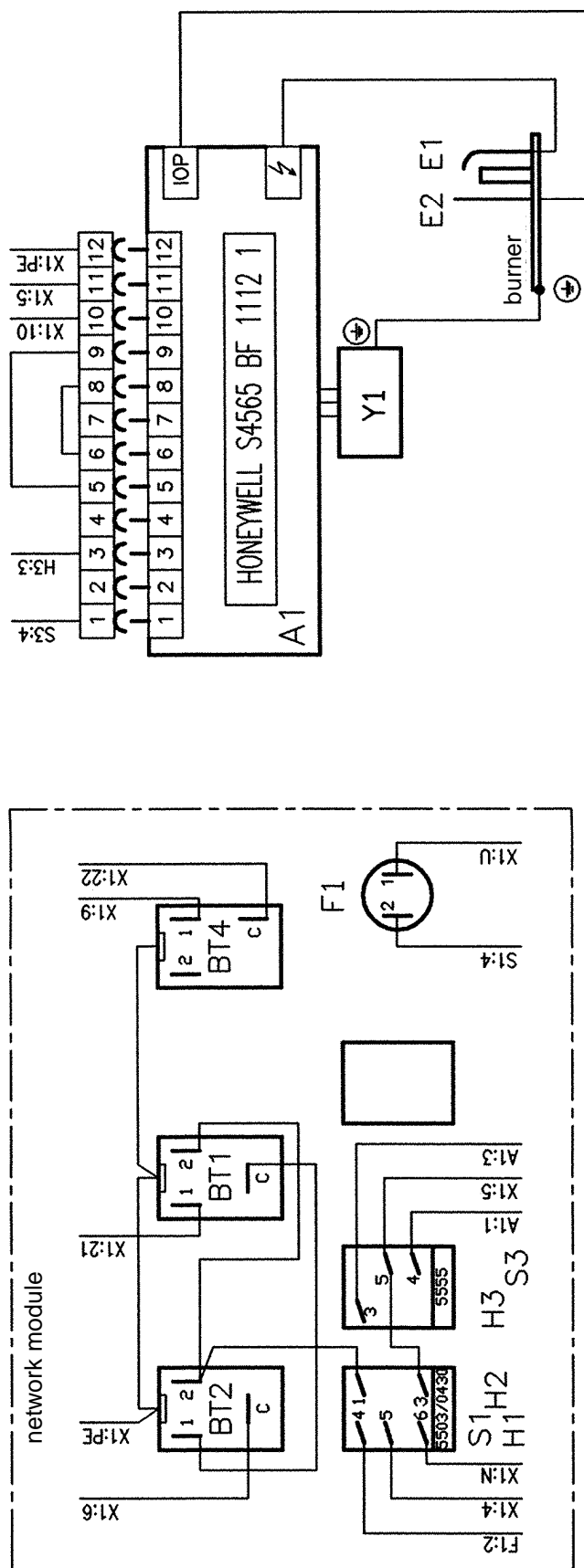


Fig. no. 8b)/1 VIADRUS GARDE G 42 and VIADRUS GARDE G 42 ECO wiring diagram for version NG 1° with Honeywell automatics



- Legend:**
- A1 ionising automatics Honeywell S4565 BF 1112 1
 - Y1 gas valve VK 4100 A 1002
 - E1 ignition electrode
 - E2 ionising electrode
 - BT2 combustion products thermostat
 - BT1 safety thermostat
 - BT4 operating thermostat
 - S1 main switch
 - H1 "boiler under voltage" signalling
 - H2 failure signalling
 - H3 ionising failure signalling
 - S3 reset button
 - S2 reduced/rated output switch
 - F1 2,5 A fuse

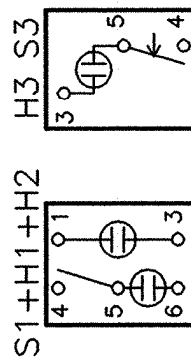
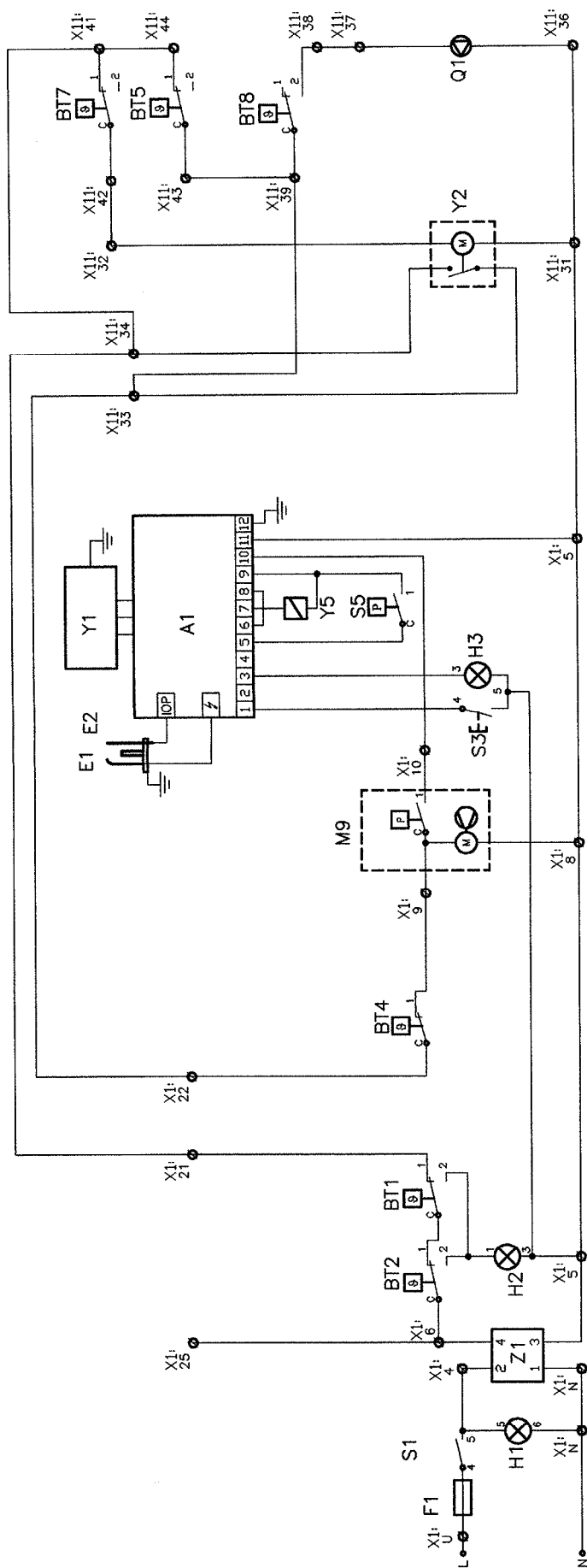


Fig. no. 8b)/2 VIADRUS GARDE G 42 and VIADRUS GARDE G 42 ECO wiring diagram for version NG 1° with Honeywell automatics



Legend:

F1	Fuse 2,5A	E1	ignition electrode
S1	main switch	E2	ionising electrode
H1	"boiler under voltage" signalling	Y1	VK4100 A 1002 gas valve
Z1	suppression component TC241	A1	S 4565 BF 1112 1 Honeywell automatics
BT2	combustion products thermostat	S3	Reset button
H2	"failure" signalling	H3	"ionising failure" signalling
BT1	safety thermostat	S5	gas pressure sensor at the reservoir
BT4	boiler thermostat	Y5	gas valve at the reservoir
M9	combustion products ventilator	Y2	three-way valve
		BT7	TUV heater thermostat
		BT5	indoor thermostat
		BT8	circulation pump thermostat
		Q1	circulation pump

Fig.no.9a)

VIADRUS GARDE G 42 and VIADRUS GARDE G 42 ECO wiring diagram for propane version

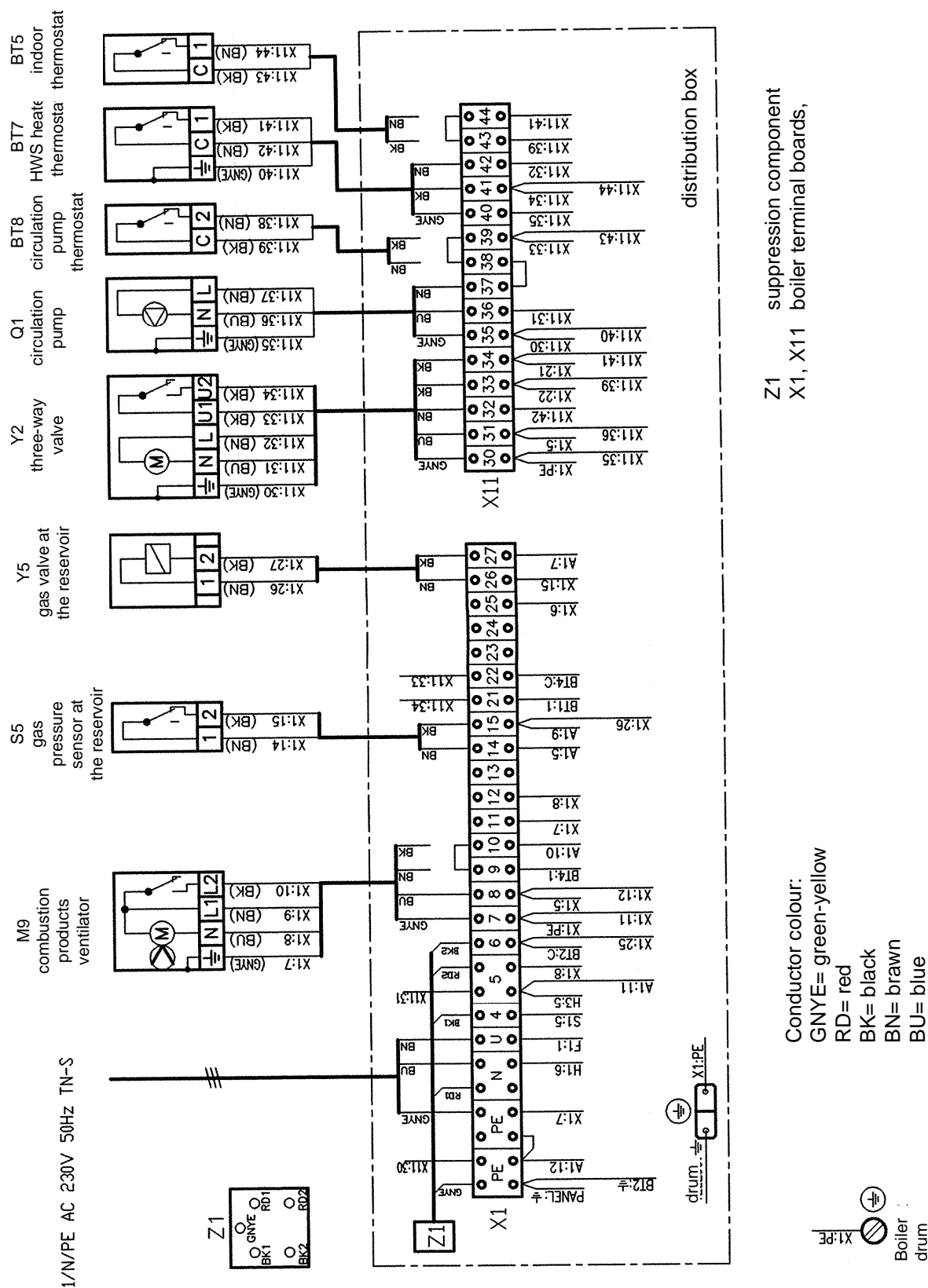


Fig. no. 9b)/1 VIADRUS GARDE G 42 and VIADRUS GARDE G 42 ECO wiring diagram for version for propane version

6. Circulation pumps

To the boiler you can order a three-speed circulation pump Grundfos UPS 25-40. The pump operation is controlled according to electric interconnection of the boiler with selected regulation:

1. Standard boiler design (without regulation) – after having switched on the boiler using the main switch the circulation pump is running (unless the pump thermostat is connected).
2. Boiler equipped with a programmable regulator Honeywell CM 707 – the pump is controlled by the indoor thermostat
3. Stack water heater connection - the pump is controlled by the heater thermostat ; after its disconnection the indoor thermostat takes over the control functions.
4. Boiler equipped with equitherm regulator according to regulation A1 - A4 -the pump operation is controlled according to regulator programme (see. chap. 5.1)

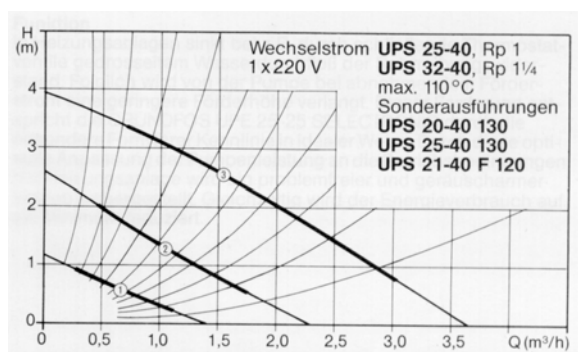


Fig. no. 10 Grundfos UPS 25-40 pump characteristics

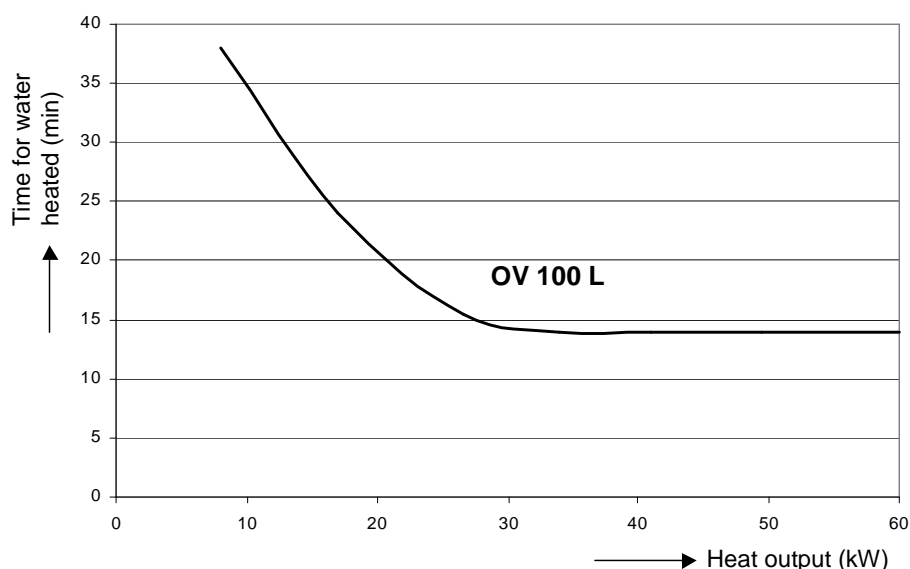
7. Stack hot service water heaters

7.1 Technical data of recommended hot service water heaters

Tab. no. 6 Thermal-technical parameters of VIADRUS OV 100 L heater

Heater volume	I	100
Heater heat output (spiral heating wire)	kW	23
Heating insertion (heater) heat transfer surface	m ²	~ 0,9
Connections: - heating water	Js	3/4"
- hot service water	Js	1/2"
Heater dimensions: - height	mm	886
- width	mm	574
- depth	mm	587
Weight	kg	60
Heating body rated overpressure	kPa (bar)	400 (4)
Maximum working overpressure for HWS	kPa (bar)	600 (6)
Adjustment range	°C	0 – 90 °C ***)
Time for water heated from 10 °C to 60 °C (boiler output 26,5 kW and water temperature 85 °C) *)	min	14
Water flow rate (boiler output 26,5 kW) **)	l/h	610
Connecting voltage		1/N/PE 230 V AC 50 Hz TN-S
Electric coverage		IP 40
Environment		normal, according to ČSN 33 2000 – 3

*) For a boiler output different from 26,5 kW and at the same conditions like those stated in table the heating interval varies as follows:



**) The water rated flow is stated at 85 °C heating water temperature and hot service water temperature gradient 35 °C (TUV inlet temperature 10 °C, TUV outlet temperature 45 °C). If for the heater a boiler with an output different from 26,5 kW is used, then the water flow rate at keeping the above mentioned inlet conditions varies as follows:

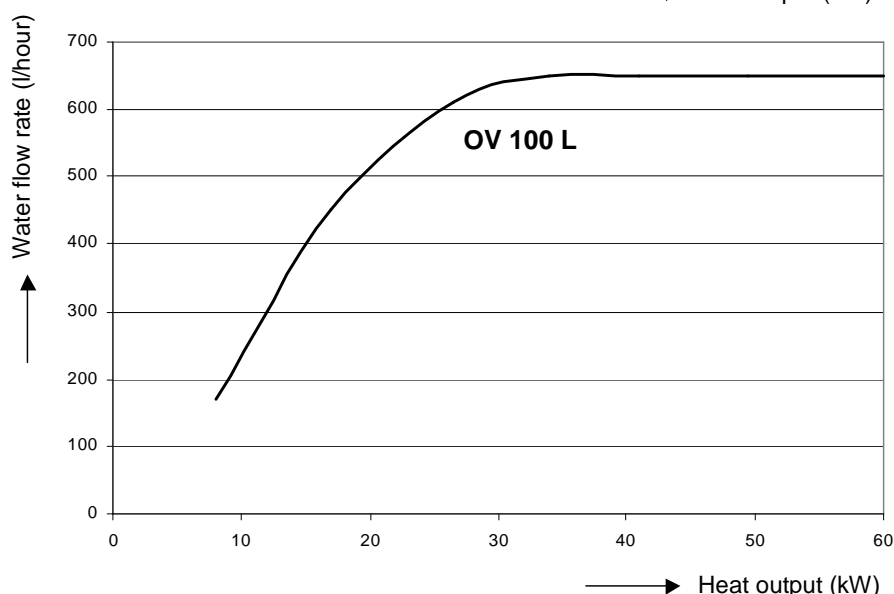


Fig. no. 11 OV 100 L water heater characteristics

The stated heating intervals and water flow rates apply in case that in the heating system there is installed the Grundfos pump and its revolutions switch is in position 3 (corresponds to 650 l/h flow rate.) If the pump works with lower revolutions (lower flow rate), the time necessary for hot service water heating will be longer.

***) **IMPORTANT WARNINGS!**

Set the thermostat of the heater to max. 60 °C temperature (note: The regulations in the Czech Republic do not allow to distribute water of temperatures higher than 60°C).

Once a week set the thermostat of the heater to 65 °C temperature in order to avoid the formation of legionella (bacillary bacteria originating in water. They die between 60 and 65 °C temperature within several minutes and at 70 °C temperature they die within several seconds.).

7.2 Heater construction

To the boiler you can order VIADRUS OV 100L separate stack heater for a preferential hot service water preparation in the same design as G 42 boiler. The reservoir is thermally insulated by using polyurethane and its internal surface is coated by double enamelled layer which guarantees a long service life. The operation and installation manual is enclosed to the heater.

The boiler standard electric connection is adjusted to Honeywell V 4044 F three-way valve connection ensuring the HWS preferential heating. The thermostat is a part of heater.

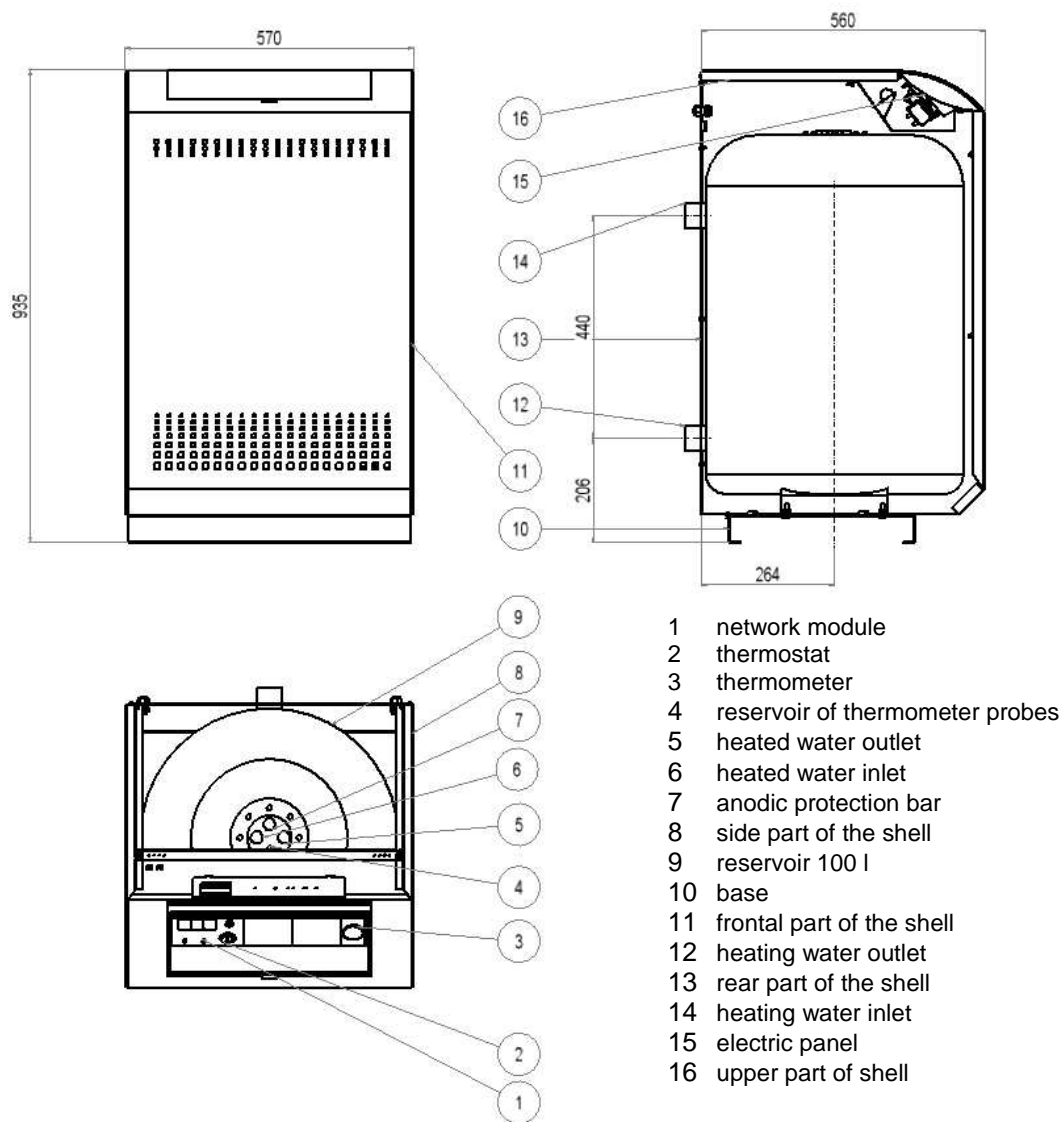
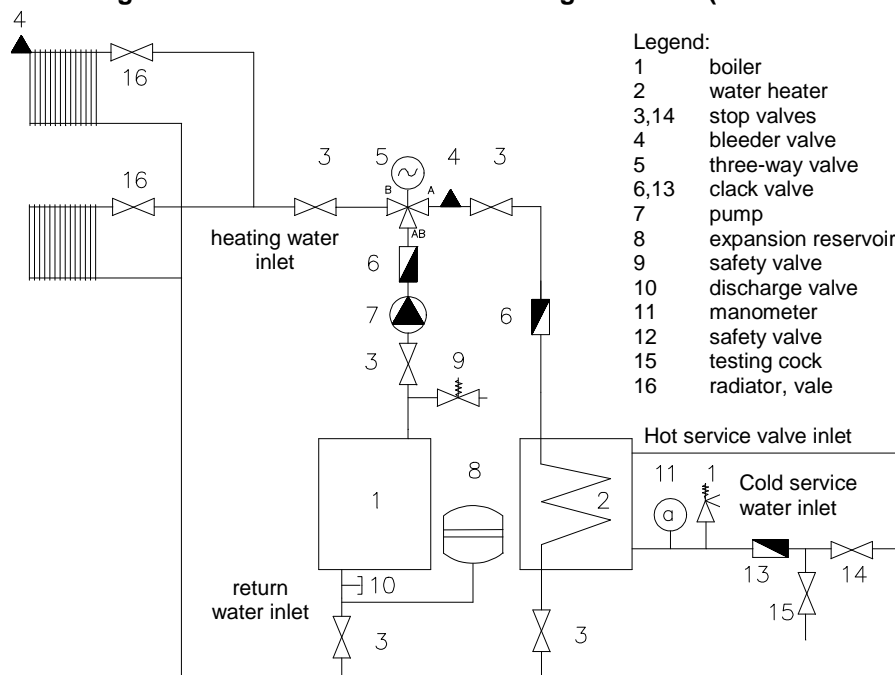


Fig. no. 12 VIADRUS OV heater diagram 100 L (dimensions in mm)



Note: It is possible to use a combined fitting consisting of a safety valve and a clack -valve.

Fig. no. 13 Recommended diagram for connection with preferential HWS heating

7.3 Honeywell V 4044F three-way valve technical data

Tab. no. 7 Honeywell V 4044F motor driven zonal three-way valve technical parameters

Maximum differential pressure for closing the valve (max. pressure difference between the inlet and outlet that the valve can work with)	mbar	550
Maximum ambient temperature	°C	50
Heating water temperature	°C	5 - 88
Mating dimensions (heating water inlet and outlet)	Js	Internal thread 1"
Connecting voltage		1/N/PE 230 V AC 50 Hz TN-S
Electric coverage		IP 40
Environment		according to ČSN 33 2000 - 7 – 701 the boiler must not be installed in 0,1,2 zones

Note: A five-core connecting cable is delivered together with the valve

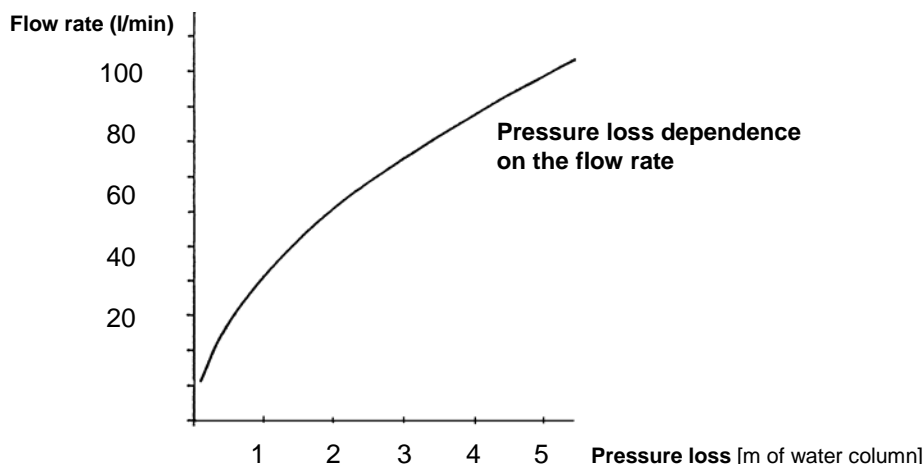


Fig. no. 14 Honeywell V 4044F three-way valve characteristic

8. Combustion products forced draw-off mechanism

The boiler can be equipped with a flue ventilator (only OSV hereinafter) which enables to install boiler also in the space where it cannot be connected to a chimney and combustion products can be led away into the outdoor space through the wall– according to TPG G 800 01 „Flue outfall from the gas fuel appliances on the exterior wall (façade)

This complementary equipment can be used in the whole output range of boilers designated for natural gas combustion. Two-sectional boilers can only be operated with rated output. OSV is offered in three sizes for outputs according to the table as follows:

Tab. no. 8a) OSV types assignment to VIADRUS GARDE G 42 boiler

Number of sections	2	3	4	5	6	7
boiler output– natural gas (kW)	8	12-17	18-26	27-34	35-41	42-49
boiler output – propane (kW)	7	14	21	26	33	40
OSV type	OSV 1-2	OSV 1-3	OSV 1-4	OSV 2-5	OSV 3-6	OSV 3-7
Neck diameter D (mm)	80	110	130	160	170	180

Tab. no. 8b) OSV types assignment to VIADRUS GARDE G 42 ECO boiler

Number of sections	2	3	4	5	6	7
boiler output– natural gas (kW)	8	12-17	18-26	27-34	35-41	42-49
boiler output – propane (kW)	7	14	22,5	30	36	42
OSV type	OSV 1-2	OSV 1-3	OSV 1-4	OSV 2-5	OSV 3-6	OSV 3-7
Neck diameter D (mm)	80	110	130	160	170	180

The operation safety is ensured by a differential pressure switch which switches on the burner only on condition of a proper exhaustion. Other safety element watching the combustion products escape into the boiler room is the combustion products return flow TS fuse which is belongs to boilers standard equipment.

The combustion products venting can be led in two ways according to the following figures:

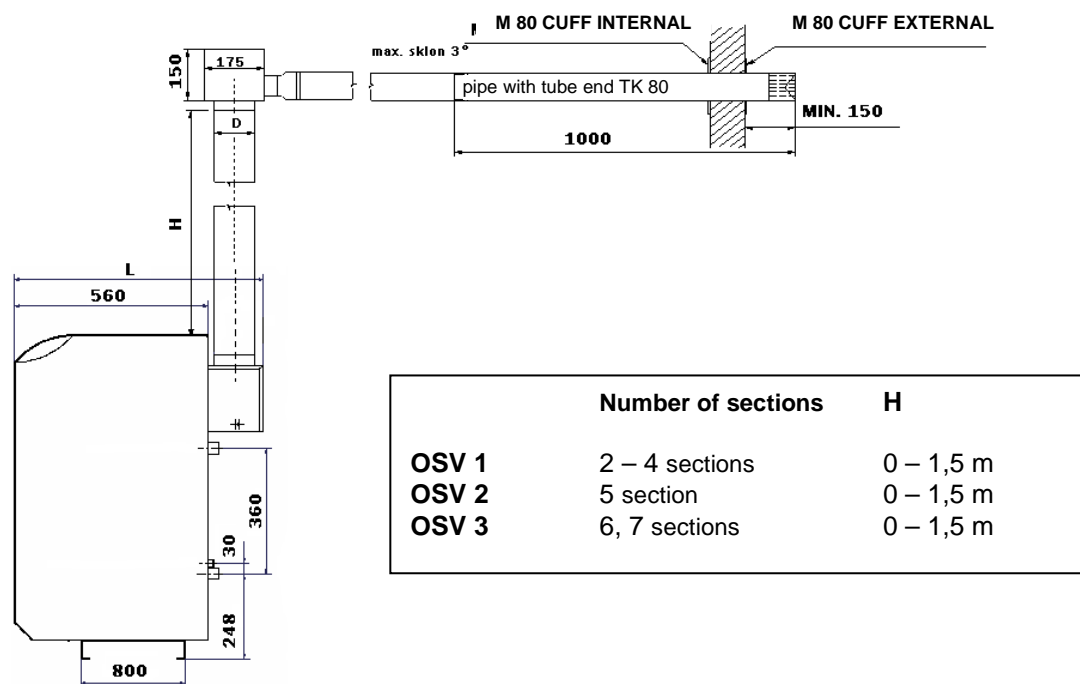


Fig. no. 15 Combustion products venting in a direct design

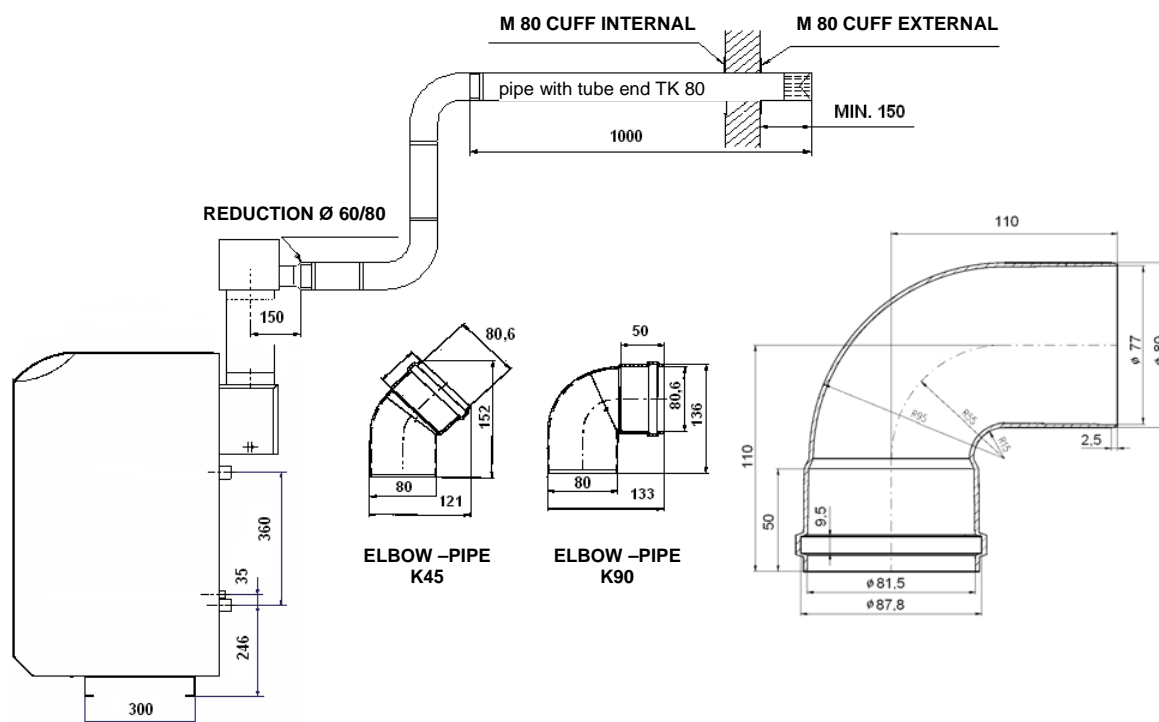


Fig.no.16 Combustion products venting in a combined design

We recommend to use the variant according to Fig.no.15 if the boiler is designed in the way making sure it observes the max. height $H = 1,5$ m and calculations according to tab. no. 9. This design has a minimum pressure loss.

Fig.no.16 shows an example of a combined design assembly with individual elements. The calculation according to tab. no.9 must be observed it means the max. value of flow resistance coefficient must not be exceeded.

The combustion products draw-off ventilator (OSV) is put on the boiler draught diverter neck or on the smoke-flue vertical tube inserted in the neck of the draught diverter. The neck extension must be direct and vertical, its diameter must be the same as the diameter of the neck and it must not be longer than $H - 1,5$ m.

OSV can rotate round the vertical axis by 90° to the left or to the right, according to the needed direction of combustion products outfall.

Wiring is done through the interconnection with boiler terminal board. Individual conductors are signed by numbers that correspond to numbers on boiler terminal board:

- Terminal no. 8 – blue conductor
- Terminal no. 9 – black conductor
- Terminal no. 10 – brown conductor
- Terminal PE – yellow & green conductor

In the boiler terminal board there must be removed the interconnection between terminals no. 9 and 10. The conductor from ventilator at point it enters the shell and the panel must be protected by MEOS clip against its rupture.

Following principles must be observed when assembling the smoke-flue:

- Every joint of smoke-flue must be secured by at least one sheet-metal screw in order to prevent it from disjunction
- The length of individual parts insertion is 50 mm
- The neck of ventilator and draught diverter must be secured by at least two sheet-metal screws in against each other position at point of joint
- The combustion products must be vented either vertically or horizontally but never downwards (there is only allowed the max. gradient 3° downwards for condensate effluent, but no condensate should be produced with regard to a high ventilator output).
- Smoke-flue piping outfall protruding from the wall must be equipped with an end piece (see fig. no. 15,16)
- The whole smoke-flue assembly is limited by the used elements (see tab. no. 9)

When assembling the smoke-flue for:

- **8 – 34 kW** output the flow resistances summation must not exceed the value of **10**
- **41 – 49 kW** output the flow resistances summation must not exceed the value of **7** and no 90° elbow but only a bend is to be used in smoke-flue.

Tab. no. 9 Smoke-flue modular segments:

Order. code	Segment	Flow resistance
T 80	Pipe 76/80 – 1 m with sealing	1
K 45	Elbow 45° O/M-with sealing	2,5
K 90	Elbow 90° O/M-with sealing	3
O 90	Bend 90° (Rs 100) O/M-with sealing	2
TK 80	Pipe 1 m with an end piece	2
M 80	Cuff internal, external	
R 60/80	Reduction $\phi 60/80$ (OSV standard delivery)	
134 B	Slip-on head (through the roof) $\phi 80 \times 174$	

Smoke-flue calculation example for boiler of 26,5 kW output:

We use: 1 x elbow (K90), 1 x bend (O90), 2m piping (2 x T80), 1 m pipe with an end piece

Resistances summation = 3 + 2 + 2 x 1 + 2 = 9 is **satisfactory**

9. Positioning and installation

9.1 Regulations and directions

Boiler can be installed by a company holding a valid license to install and maintain the gas appliances. A project according to the valid regulations must be prepared for installation.

The heating system must be filled with water, that meets the ČSN 07 7401 requirements, especially its harness must not exceed the required parameters.

Recommended values		
Hardness	mmol/l	1
Ca ²⁺	mmol/l	0,3
Concentration of total Fe + Mn	mg/l	(0,3)*

*) recommended value

WARNING!!! The use of anti-freeze mixture is not recommended by the manufacturer.

a) to the heating system

ČSN 06 0310	Heating systems in buildings – Designing and installation
ČSN 06 0830	Heating systems in buildings – protecting device
ČSN 07 7401	Water and steam for thermal energy equipments with working pressure up to 8 MPa
EN 297	Gas – fired central heating boilers – Type B ₁₁ and B _{11BS} fitted with atmospheric burners of nominal heat input not exceeding 70 kW

b) to the gas distribution

EN 1775	Gas supply - Gas pipework for buildings - Maximum operating pressure less than or equal to 5 bar - Functional recommendations.
EN 12007-1	Gas supply systems – Pipelines for maximum operating pressure up to and including 16 bar – Part 1: General functional recommendations
EN 12007-2	Gas supply systems – Pipelines for maximum operating pressure up to and including 16 bar – Part 2: Specific functional recommendations for polyethylene (MOP up to and including 10 bar)
EN 12007-3	Gas supply systems – Pipelines for maximum operating pressure up to and including 16 bar – Part 3: Specific functional recommendations for steel
EN 12007-4	Gas supply systems – Pipelines for maximum operating pressure up to and including 16 bar – Part 4: Specific functional recommendations for renovation
ČSN 38 6405	Gas equipments. Operating principles
ČSN 38 6460	Regulations for installation and distribution of bottled gas in residential buildings
Act no. 222/94 Coll.	on the conditions of enterprise and public service performance in power industry sector and on the state energy inspection

c) to the electrical network

ČSN 33 0165	Electrical regulations. Marking the conductors with colours or digits. Implementing regulations.
ČSN 33 1500	Electrical regulations. Electrical equipments revision
ČSN 33 2000-3	Electrical regulations. Electrical equipments Part 3: Setting the basic characteristics.
ČSN 33 2000-4-41	Electric equipments: part 4: Safety chap. 41: Protection against electrical accident.
ČSN 33 2000-5-51 ed. 2	Electrical regulations. Electrical equipments construction.
ČSN 33 2130	Electrical regulations. Internal wiring.
ČSN 33 2180	Electrical regulations. Connection of electrical devices and appliances.
ČSN 34 0350	Electrical regulations. Regulations for mobile connections and cord extension sets.
EN 60 335-1 ed.2	Household and similar electrical appliances – Safety – Part 1: General requirements.
EN 60 335-2-102	Household and similar electrical appliances – Safety – Part 2-102: Particular requirements for gas, oil and solid-fuel burning appliances having electrical connections.
EN 60445 ed. 3	Basic and safety principles for man – machina interface, marking and identification – Identification of equipment terminals and conductor terminations
EN 60446	Basic and safety principles for man – machina interface, marking and identification – Identification of conductors by colours or numerals

d) to the chimney

ČSN 73 4201	Chimneys and flue gas ducting– designing, implementation and connection of fuel consumers.
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e) regarding the fire regulations

ČSN 06 1008	Fire safety of heat installations.
EN 13501-1	Fire classification of construction products and building elements – Part 1: Classification using test data from reaction to fire tests.

f) to the system of HWS heating

ČSN 06 0320	Heating systems in buildings – Hot water preparation – Designing and planning
ČSN 06 0830	Heating systems in buildings – Safety devices.
ČSN 73 6660	House water plumbing

9.2 Positioning possibilities

VIADRUS GARDE G 42 boiler can be installed in the basic environment AA5/AB5 according to ČSN 33 2000-3. It must not be installed in zones 0,1,2 according to ČSN 33 2000-7-701.

The boiler is equipped with a movable mains supply and a plug. The boiler must be according to EN 60 335 – 1 ed. 2 Art. 7.12.4 positioned in a way making sure that the plug is accessible.

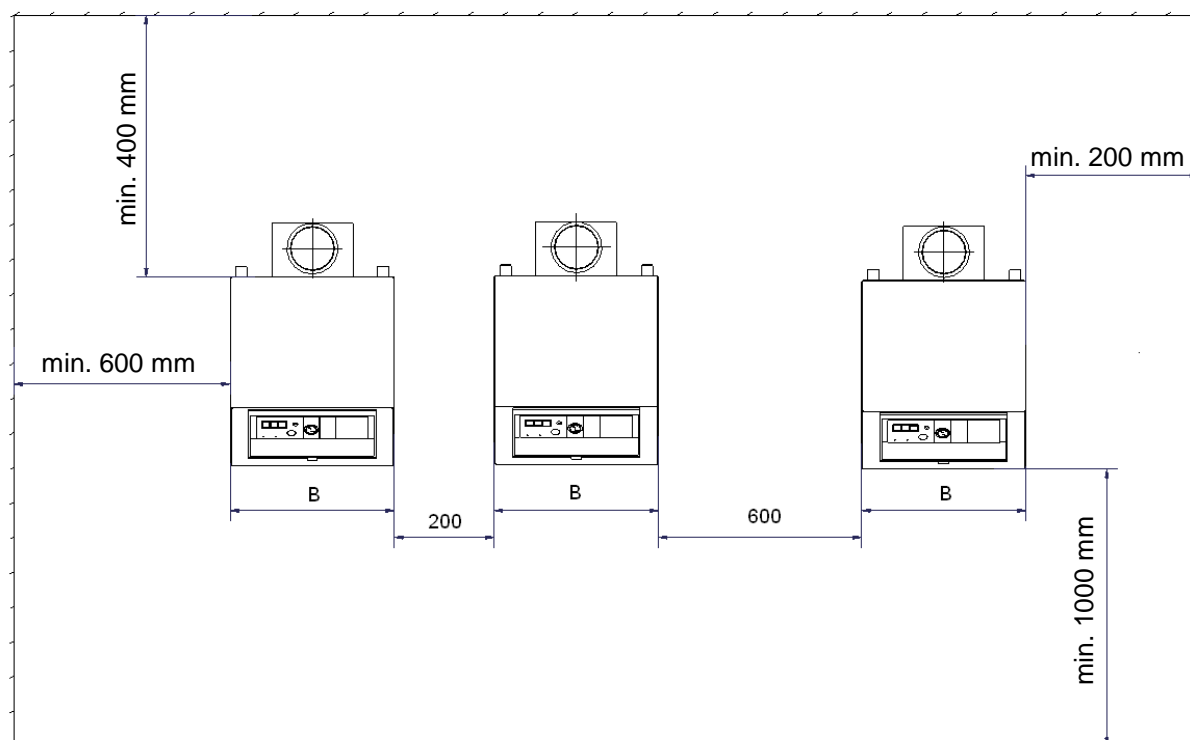
The installation of the boiler must comply with all requirements of ČSN 06 1008

Boiler positioning with regard to the fire regulations:

- Positioning on the floor made of combustible material
 - Install the boiler on a incombustible thermally insulating pad exceeding the boiler ground-plan by 15 mm on all sides.
 - If the boiler is installed in a cellar we recommend to install it on a retaining wall at least 50 mm high.
- A safe distance from the combustible materials:
 - when installing and operating the boiler it is necessary to keep a safety distance of 200 mm from the materials of combustibility grade A1, A2, B and C (D);
 - for easily combustible materials of combustibility grade E (F), which quickly burn and burn themselves even after removal of ignition source (such as paper, cardboard, asphalt and tar paper, wood and wood-fiber boards, plastics, floor coverings) the safe distance has to be doubled, i.e. to 400 mm;
 - safe distance should be doubled as bulb where the grade of reaction to fire has not been proved.
- Positioning of a boiler designated for propane combustion must comply with ČSN 38 6460.

Tab. no. 10 Grade of reaction to fire

Grade of reaction to fire	Examples of building materials and products included in the reaction to fire (Extract from EN 13 501-1 + A1)
A1 – incombustible	Granite, sandstone, concrete, bricks, ceramic tiles, mortars, fireproof plasters, ...
A2 – combustible with difficulty	acumin, izumin, heraklit, lignos, boards and basalt felt, fibreglass boards,...
B – hardly combustible	Beech and oak wood, hobrex boards, plywood, werzalit, umakart, sirkolit,...
C (D) – medium combustible	Pinewood, larch, whitewood, chipboard and cork boards, rubber flooring,...
E (F) – easily combustible	Asphaltboard, fibreboards, cellulose materials, polyurethane, polystyrene, polyethylene, PVC,...



Number of sections	2	3	4	5	6	7
Natural gas– output in kW	8	12-17	18-26	27-34	35-41	42-49
propane – output in kW	7	14	21-22,5	26-30	33-36	40-42
B	485	485	485	570	740	740

Fig. no. 17 Boilers positioning in a boiler room

Positioning of a boiler with regard to the necessary handling space:

- in front of boiler there must be left the handling space minimum 1000 mm
- minimum distance between the rear part of boiler and the wall is 400 mm
- at least from one side part there must be kept the space for accessing the rear part of boiler (minimum 600 mm)
- minimum distance from the side wall is 200 mm, in case of delivery together with heater OV 100L it can be positioned alongside the boiler from the left and right hand side (the boiler shell at this way of installation can only be dismantled after the heater shell has been dismantled)

Air supply requirements:

The boiler can only be installed in a room with a sufficient air supply according to EN 1775 "Gas supply- Pipelines in buildings– maximum operating pressure \leq 5 bar – Operating requirements "

Positioning on boiler equipped with forced combustion products venting

The conditions for gas fuels appliances *combustion products venting outfall* on the exterior wall (façade) are prescribed by TPG Technical rules - **G 800 01 equipment for gas combustion.**

10. Delivery and assembly

10.1 Delivery and accessories

VIADRUS GARDE G 42 boiler is delivered in an assembled conditions, on a pallet, protected by a foil and equipped (optionally) by one of four offered types of regulation (see chap. 1.1).

Standard accessories to all boiler variants:

- | | | | |
|---------------------------------|-------|---|------|
| ▪ Conductor inlets PG 9 | 4 pcs | ▪ Retaining plate 425315 REGULUS | 1 pc |
| ▪ Conductor inlets PG 11 | 4 pcs | ▪ Screw F/H 4,8 x 13 | 1 pc |
| ▪ Blind flanges PG 9 | 4 pcs | ▪ Brush for boiler drum mechanical cleaning | 1 pc |
| ▪ Blind flanges PG 11 | 4 pcs | ▪ Manual for boiler operation and installation, incl. the guarantee certificate | |
| ▪ Automatic bleeder valve | 1 pc | | |
| ▪ TE joint reduced 90° 1 x 1/2" | 2 pcs | | |
| ▪ Discharge valve | 1 pc | | |
| ▪ | | | |

	sect.	2	3	4	5	6	7
screw M 4 x 8	pc	5	5	5	7	7	14
washer Ø 4,3	pc	10	10	10	14	14	28
nut M 4	pc	5	5	5	7	7	14

Optionally:

- VIADRUS OV 100L stack heater
 - Honeywell V 4044F three-way valve (for preferential HWS heating)
 - UPS 25-40 circulation pump
 - Js 1" clack valve with a flange for pump connection
 - Spherical valve Js 1"with a flange for pump connection
- OSV combustion products ventilator incl. optional accessories according to tab. no. 8a, 8b
 - R 60/80 Reduction ϕ 60 /80 (OSV standard delivery)
 - T 80 Pipe 76/80 – 1 m with sealing
 - T 80/T1 Pipe 76/80 – 0,93 m without sealing
 - T 80/T0,5 Pipe 76/80 – 0,5 m without sealing
 - K 45 Elbow 45° O/M-with sealing
 - K 90 Elbow 90° O/M-with sealing
 - O 90 Bend 90° (Rs 100) M/M-with sealing
 - TK 80 Pipe 1 m with an end piece
 - M 80 Cuff internal, external
 - 134 B Slip-on head (through the roof) Ø 80x174
- Regulation according to purchase order specification code:
 - Space thermostat CM 707
 - Outdoor thermostat REGO type 95001 (for boiler equipped 2° gas valve)
 - Regulation A1: 1 pc regulator RVA 43.222 set of connectors SVA 43.222, terminal board WAGO 63 with a conductor bundle 43, submersible sensor B2 (type QAZ 21).

- Regulation A2: 1 pc regulator RVA 43.222, 1 pc regulator RVA 46.531, set of connectors SVA 43.222 and SVA 46.531, terminal board WAGO 46 with a conductor bundle 46, submersible sensor B2 (type QAZ 21).
- Regulation A3: 1 pc regulator RVA 63.280, set of connectors SVA 63.280, terminal board WAGO 63 with a conductor bundle 63, submersible sensor B2 (type QAZ 21), outside sensor B9 (type QAC 31).
- Regulation A4: 1 pc regulator RVA 33.121, set of connectors SVA 33.121, terminal board WAGO 33 with a conductor bundle 33, submersible sensor B2 (type QAZ 21)

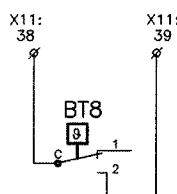
It possible to order accessory for regulation:

- Types of sensors:
 - outside temperature sensor QAC 31
 - submersible temperature sensor QAZ 21 (can also be used for HWS heating)
 - surface temperature sensor QAD 21
- Space instrument type:
 - indoor sensor QAA 70
 - indoor sensor QAA 50

Regulation is delivered in a separate package. The regulators must be connected to the electric panel in place of the boiler installation.

Optional boiler equipment isn't included in boiler basic price.

circuit diagram



wiring diagram

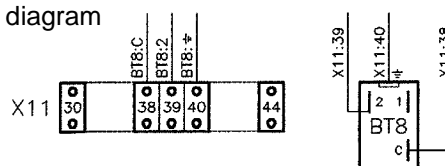


Fig. no. 18 Pump thermostat connection- delivery on call

10.2 Assembly procedure

1. **Put the boiler on the required standpoint** (it is necessary to respect the demands on boiler positioning stated in chap. 9) **according to the project documentation**. We recommend to transport the boiler to the determined standpoint while on a pallet, possibly still wrapped in protective packing. If this isn't possible due to the space restrictions the boiler is transported without the packing by transferring it by using the boiler base plate in which there are on the left and right hand side prepared two circular openings determined for putting on the "removal hooks". By means of hooks the boiler can be lifted and transported to the required standpoint. **It is forbidden to use the gas and heating water pipes for lifting the boiler**. The boiler must stand fast on the incombustible pad in its vertical position and well-balanced.

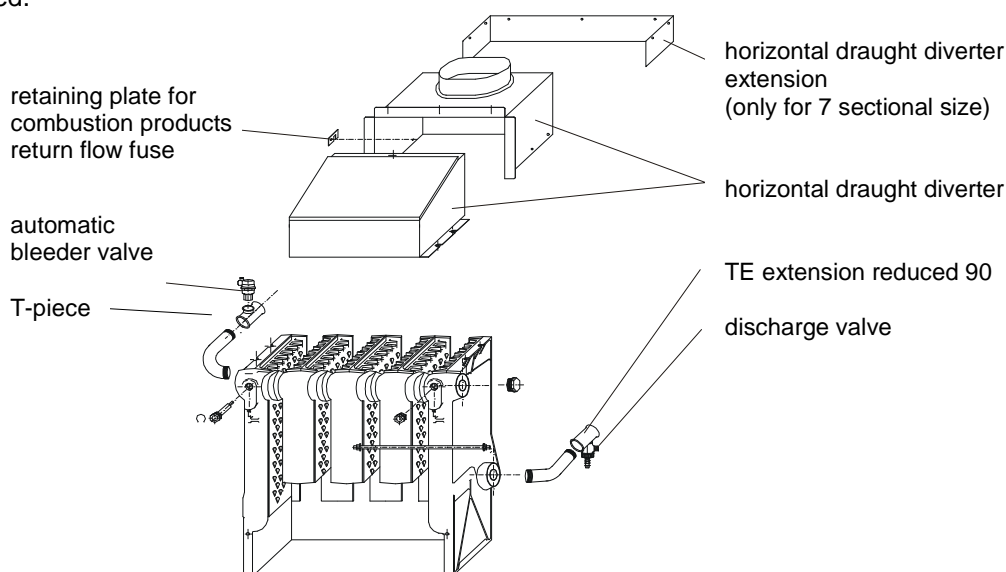
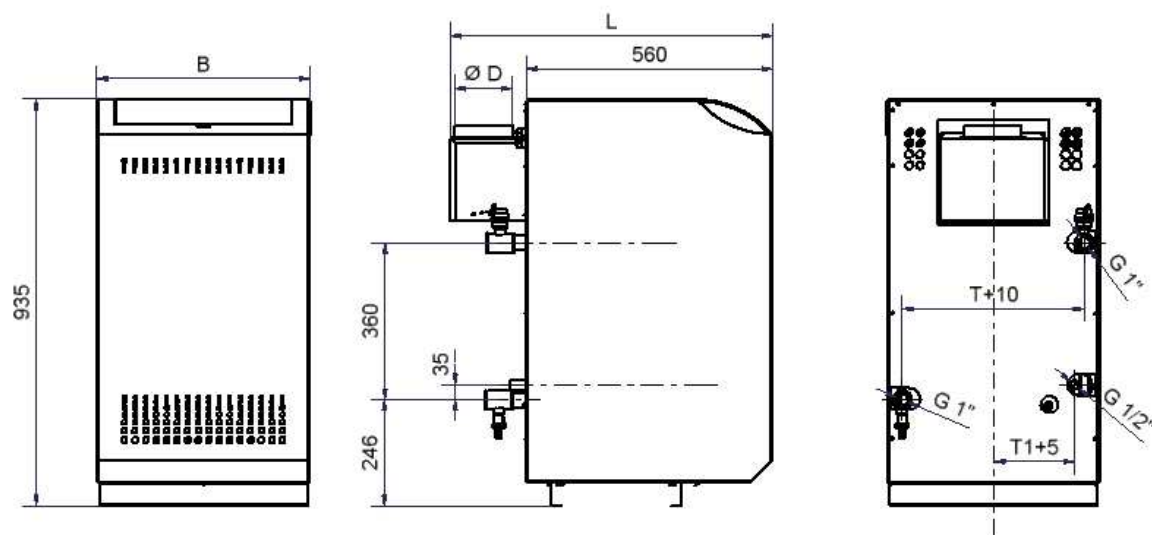


Fig. no. 19 Connection to the heating system and the draught diverter assembly

2. **Mount the TE-joint** at the heating water outlet from boiler, **the discharge valve** at the heating water inlet and **automatic bleeder valve** (Fig.no.19) at the heating water outlet. The parts are delivered together

with the boiler.

3. **Connect to the heating system** according to project documentation.
4. **Assemble the draught diverter, mount the combustion products return flow fuse.** The parts are delivered together with boiler.
5. **The combustion products return flow fuse must not be put out of operation. It is forbidden to interfere in an unskilled way with the combustion products return flow fuse. Only the original parts delivered by the manufacturer are allowed to be used for combustion products return flow fuse assembly and its faulty parts exchange.**
6. **Connect to the chimney.**



Number of sections	2	3	4	5	6	7
natural gas– output in kW	8	12-17	18-26	27-34	35-41	42-49
propane – output in kW (G 42)	7	14	21	26	33	40
propane–output in kW (G 42ECO)	7	14	22,5	30	36	42
D	80	110	130	160	170	180
T	410	410	410	495	665	665
T1	202	202	202	245	330	330
B	485	485	485	570	740	740
L	733	733	733	733	773	773

Fig. no. 20 Dimensions for connection

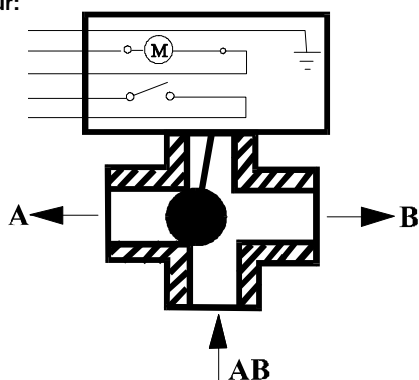
7. **Install the water heater (if it is required).** In order to ensure the preferential HWS heating it is necessary to use **Honeywell V 4044F** three-way valve. A clack valve is installed between the pump and the three-way valve. At the assembly it is necessary to observe the connection direction according to the signs on this valve.

Fig.no.21 shows the valve in a position when there is opened the heating water inlet into the heating system. In case of a requirement for the hot service water there is automatically closed the „B“outlet into the heating system and opened the „A“ outlet into the reservoir.

The valve must be mounted in position shown in fig. no. 21 and no. 22.

The valve must not be turned during the assembly!

Conductor colour:
Green & yellow
brawn
blue
orange
grey



A - stack water heater
B - heating system
AB - boiler

Fig. no. 21 Honeywell V 4044F three-way valve

8. Connection to gas.

Gas is connected to boiler **through the gas spherical closing cock.**

9. Release the bleeder screw of automatic bleeder valve. It must be released when filling the heating system with water and when operating the boiler.

10. Before you fill the system with water you must set the Honeywell V 4044F three-way valve operation lever from AUTO position into MAN-OPEN position (if HWS preparation is installed).

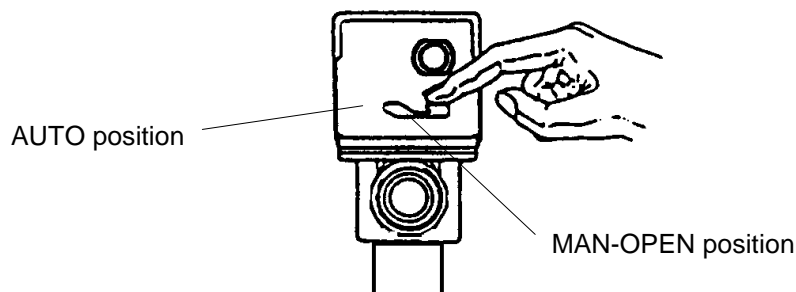


Fig. no. 22 Honeywell V4044F three-way valve operation

11. Filling the heating system with water. The heating system must be thoroughly flushed out in order to wash out all impurities that can be deposited in distribution system or in the radiators and cause the pump clogging.

Water for filling the boiler and the heating system must be clear and colourless, with no suspended materials, oil and aggressive chemicals. Its hardness must comply with ČSN 07 7401 and in case that the water hardness doesn't comply with this standard it must be treated. Even heating the water with a higher hardness several times does not prevent the soils from getting precipitated on the boiler drum walls. Precipitation of 1 mm calcite reduces at a given point the heat transfer from the metal to water by 10%.

The heating systems with an open expansion tank enable a direct contact between the water and atmosphere. During the heating season the water expanding in the tank absorbs the oxygen which increases the corrosive effects and at same time water evaporates significantly. For a refill there can only be used water treated to the values according to ČSN 07 7401.

12. Bleed the heating system.

13. Boiler must be properly earthed. For grounding there is used an external protective clamp in the rear part of boiler.

14. Fill the heater with water (if the heater is connected). In case of a longer hot water distribution system the pipes must be insulated in order to reduce the heat loss.

15. After the system has been filled with water set the Honeywell V 4044F three-way valve operation lever from the MAN-OPEN position into AUTO position see. fig. no. 22 (if the HWS preparation is installed).

16. Connect the outdoor thermostat type 950 01 (only for boilers equipped with two-stage gas valve). The outdoor thermostat must be positioned at the northern or northwest wall of the building. The assembly and connection must follow the instructions stated in thermostat manual. The thermostat switching off temperature is set to 0°C and it can be changed within 0±8°C range as need may be.

17. Connect the selected type of regulation according to the enclosed manual..

18. The plastic foil, wooden pallet and cardboard packing after boiler unwrapping must be thrown out into the waste containers intended for this purpose.

During the heating season the water volume in heating system must be kept constant and the heating system has to be blown through. Water from boiler and the heating system must never be discharged or taken for usage except for the emergency cases like repairs etc. Water discharge and filling with new water increases the danger of corrosion and scale development.

In case we have to refill the heating system with water we only refill a cold boiler in order to prevent the boiler sections from disruption.

11. Commissioning- instructions for contractual service organization

The boiler commissioning, heat output setting and any interference with boiler electric part or connection of additional control elements can only be done by a contractual service organization authorized to do these activities.

11.1 Verification activities before commissioning

Before the boiler commissioning it is necessary to check:

- a) Filling the heating system with water (check the manometer).
- b) Adjustment of thermostats:
 - boiler thermostat 45 – 85 °C (in case of any superior regulation it is recommended to set 85 °C temperature);
 - heater thermostat (if connected) 0 – 90 °C; for a sufficiently fast HWS heating the TK boiler thermostat must be set to 85 °C.
- c) Gas input pressure before entering the boiler and bleeding of the gas connection.
- d) Connection to el. network and switching of the control thermostats ČSN 33 2180 Art. 6.2.2. – the sockets are to be connected in a way making sure that the protective plug is upwards and the phase are connected to the left hand side socket when looking on it from the front. The same applies to the double sockets.
- e) Release of bleeder screw of automatic bleeder valve.
- f) Connection to the chimney or to smoke flue in case of forced combustion products venting.
- g) Sparkling (**for boilers in natural gas design** do the check with boiler gas supply closed).
 - check by listening whether there is some sparking on the ignition electrode of ignition pilot burner;
 - sparking time depending on the used automatics;
 - because the gas supply is closed there must be signalled a failure;
 - „automatics unblocking“ by pushing down the "RESET" push in network.
- h) Check the lighting of the main burner by means of ignition pilot burner – applies to or **boilers in propane design**.
 - check with boiler gas supply closed;
 - check the gas pressure in propane reservoir according to the gas supplier 's instructions– behind the reservoir the pressure must be min. 30 mbar in order to achieve the individual boiler outputs according to tab. no. 3b, 4b;
 - safety interval depending on the used automatics;
 - as the boiler gas supply is closed the failure must be signalled on the burner automatics (see fig. no. 3);
 - unblock the automatics by pushing down the "RESET" button in the network module on the control panel (fig. no. 28).

11.2 Commissioning

The boiler equipped only with network module or an indoor thermostat (working without a superior regulation):

- 1. Open the gas closure and the water "closures" in the heating system.
 - Switch the main switch
 - We switch the power switch into position I when using the external sensor otherwise we select the power according to our need.
- 2. In case everything is in a good order the lighting burner is lit. From the lighting burner there is lit the main burner. If the ignition cycle has run and the burner hasn't been lit there lights up the failure signalling on the network module (see Fig. no. 28). If repeatedly the ignition fails it is necessary to switch off the main switch, detect and eliminate the failure (see chap. No. 16) and then repeat the whole process.
- 3. Check the gas escape.
- 4. Adjust and regulate the boiler heat output.
- 5. Stoking test.

Boiler equipped with some of A1 - A4 regulations:

- 1. Open the gas closure and water "closures" in heating system.
- 2. Switch on the main switch on boiler panel. Connection of boiler to the electric network is signalled by the green light.
- 3. Bring the main switch to the position I (automatic operation).

4. If everything is all right the reduced output is automatically ignited and in case of a superior regulation to a higher temperature the rated output is ignited. If the ignition cycle has run up without lighting the burner then the failure signalisation lights up on the automatics. (see fig. no. 28). If repeatedly the main burner hasn't been lit then the main switch must be switched off, the failure must be found out and eliminated (see chap. no. 16) and then repeat the whole procedure.
5. Check the gas escape.
6. Adjust and regulate the boiler heat output according to chap. no. 11. For the stoking test bring the regulator into "chimney sweeper's" operation. In this regime the boiler is operated with rated output regardless the regulator setting.
7. Stoking test.

If the boiler is equipped with forced combustion products venting then the following operations are to be carried out:

1. Set the boiler thermostat to temperature 85 °C.
2. Bring the heating water temperature to 75 – 85 °C.
3. Check whether there is vacuum in the draught diverter.
4. Check the correct function of smoke flue –the joints tightness.
5. Test by a full clogging of smoke-flue outlet (the burner must be shut down and the ventilator must stop within 60 sec.)
6. Release the smoke-flue (the burner is ignited again).
7. Electrically disconnect the ventilator and interconnect the terminals 9 and 10 (in case of emergency the combustion products return flow fuse must shut down the boiler burner within 60 sec.).
Attention: during this test there are escaping the combustion products into the boiler room.
8. Reinstall the original connection, switch off the burner through the operating thermostat (ventilator must also stop).

11.3 Boiler heat output setting and adjustment

Output adjustment procedure at the boiler designated for natural gas combustion equipped with DOUBLE STAGE GAS VALVE:

1. Put the boiler into operation
2. Measure the gas inlet pressure.
3. Before the adjustment itself let the **operating boiler pressure stabilize for a while.**
4. If there is installed the **outdoor thermostat it must be disconnected during the output adjustment.**
5. Remove the High-Low coil plastic protective cover

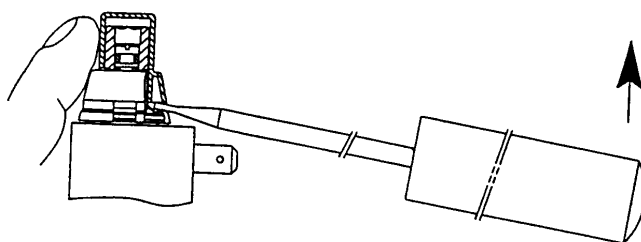


Fig. no. 23 High-Low coil plastic protective cover removal

6. Switch on and switch off several times the High-Low regulator by means of reduced output switch on the control panel.
7. Connect the manometer (U-tube) to the gas outlet pressure measuring point on the compact electromagnetic valve.
8. Switch over the switch I / II on the control panel to the maximum output (symbol II).
9. By means of a nut wrench no.8 (for SIT SIGMA 843 valve by means of nut wrench no.10) turn the outer adjusting screw for rated output setting. **By turning clockwise the gas overpressure is growing and vice-versa is dropping.**
10. Switch over the switch I / II on the control panel to the reduced output (symbol I).
11. By using the screwdriver 3,5 mm adjust the reduced output through the regulator internal screw. **By turning clockwise the gas overpressure is growing and vice-versa is dropping.**
12. After the adjustment completion check the correctness of set values after having switched on and off twice the switch I / II..
13. If the adjusted gas supply values do not correspond to the required values the whole procedure must be repeated.

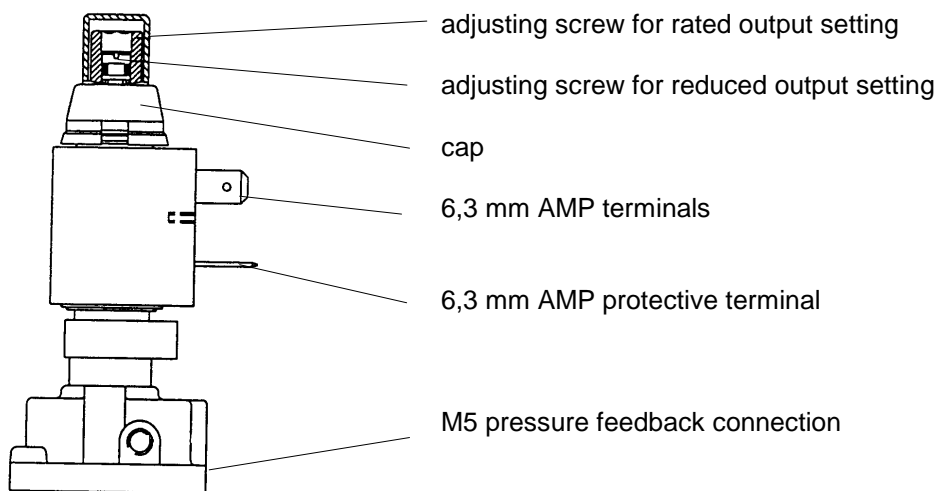


Fig. no. 24 High – Low coil

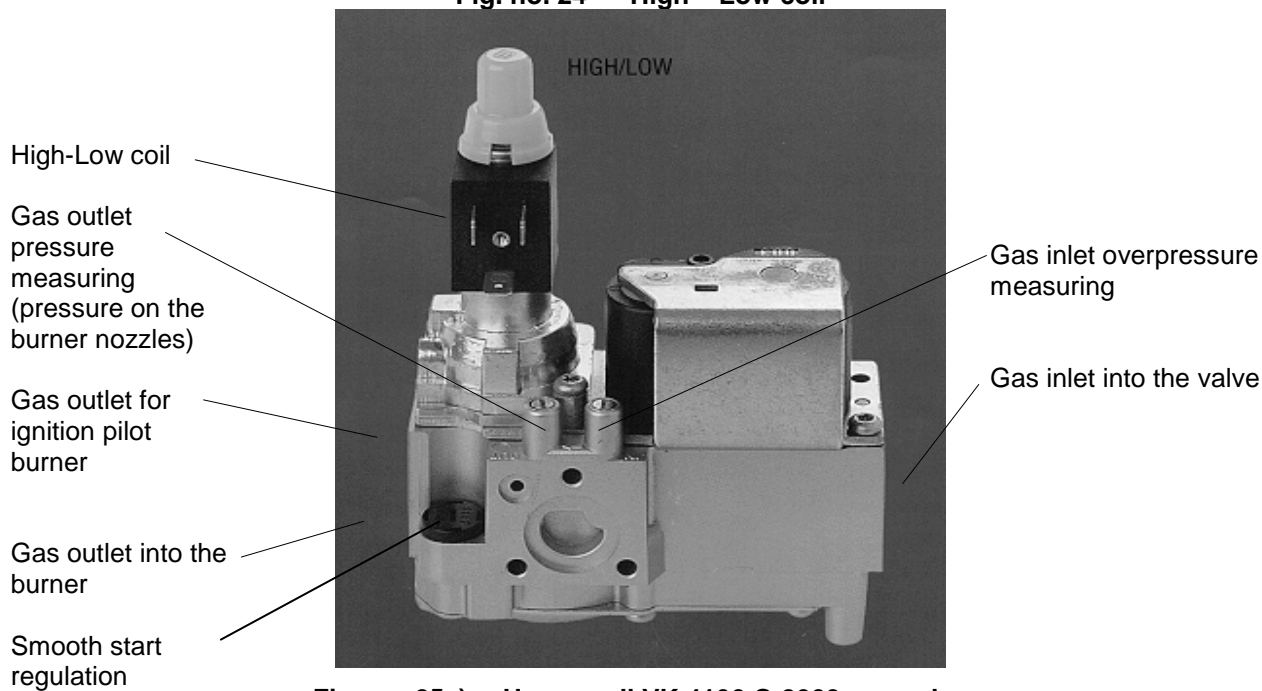


Fig. no. 25a) Honeywell VK 4100 Q 2003 gas valve

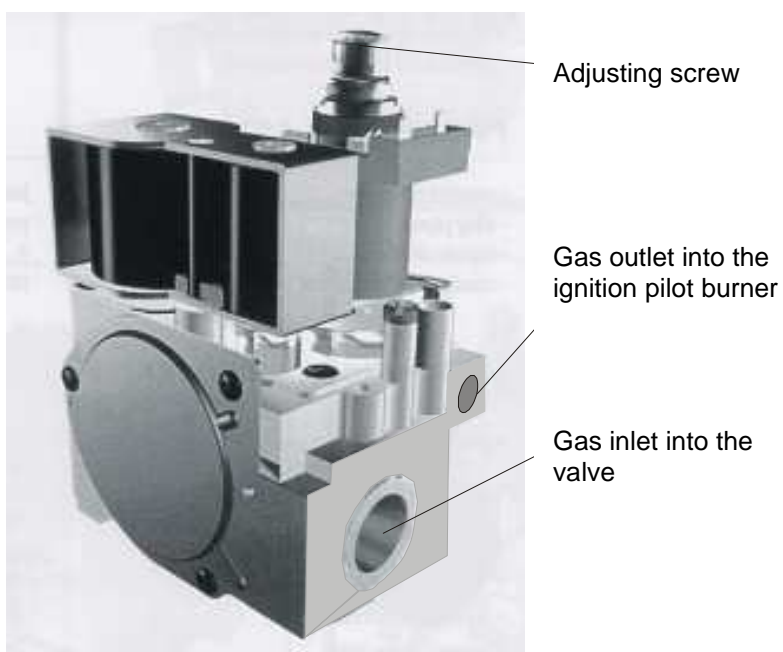


Fig. no. 25b) SIT SIGMA 843 Gas valve

Output adjustment procedure at the boiler designated for natural gas combustion and equipped with SINGLE STAGE GAS VALVE:

1. Put the boiler into operation.
2. Measure the gas inlet pressure.
3. Connect the manometer (U-tube) to the gas outlet overpressure measuring point on the compact electromagnetic valve.
4. By using the internal regulation screw adjust the necessary gas overpressure on valve gas pressure regulator. By turning clockwise the gas overpressure is growing and vice-versa is dropping. The output can be set according to the customer 's requirement to the value stated in table no. 3a (every size can be set within the range between the reduced and rated output).
5. If the adjusted values do not comply with required values repeat the whole procedure.

Regulation screw cover
(internal regulation screw is
accessible after having
unscrewed it)

Gas pressure regulator

Outlet gas overpressure
measuring (pressure on the
burner nozzles)

Gas outlet for ignition pilot
burner

Gas outlet into the burner

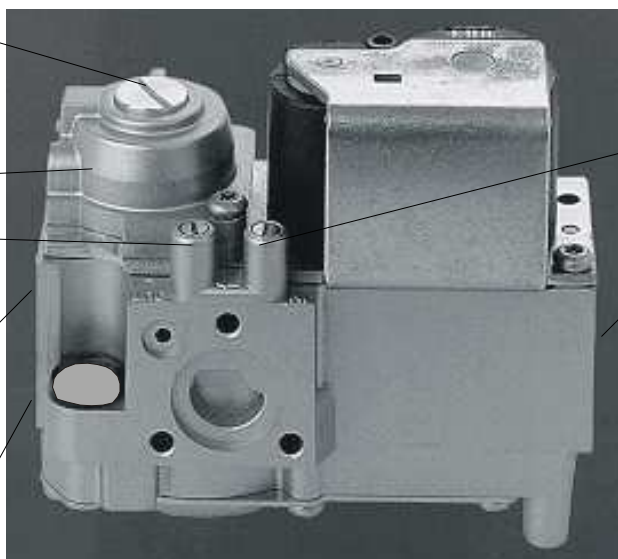


Fig. no. 26 Honeywell VK 4100 A 1002 gas valve

Smooth start regulation (starting regime setting)

Honeywell VK 4100Q 2003 valve is by its manufacturer set to the slowest start (see fig. no. 27 – MIN curve). In case of need to change the opening characteristics the adjustment can be done to the next points and fig. no. 27.

1. Remove the black cap (see. fig.25a – smooth start regulation), which has a bayonet thread.
2. Under the cap there is the red push button in shape off an arrow.
3. If the arrow is turned against the gas flow direction the start is the slowest (see. fig. no. 27 - curve MIN)
4. If the arrow is turned in the gas flow direction the start is the fastest (see. fig.27 - curve MAX)

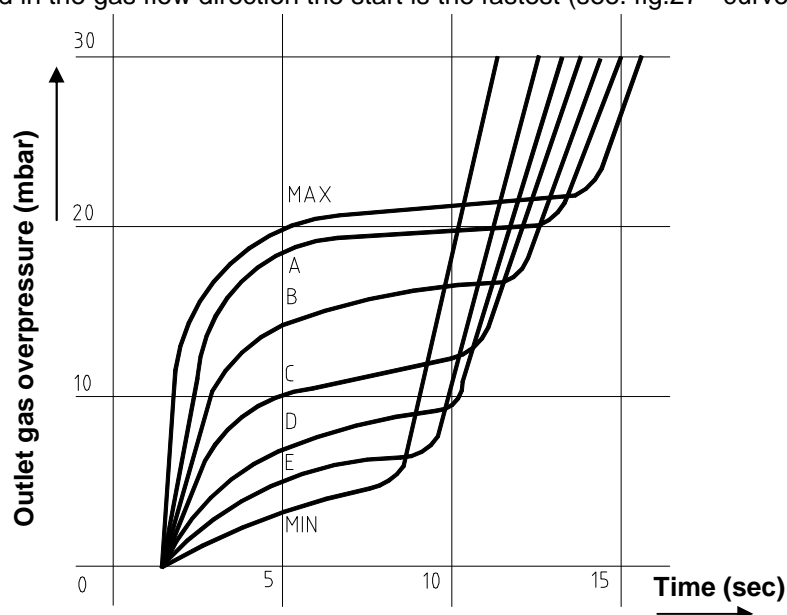


Fig.no. 27 Main valve opening characteristics

Procedure for output adjustment (boilers designated for propane combustion):

The pressure regulator on the valve is put out of operation (set on the max. gas flow) and the gas supply doesn't have to be regulated on condition that the gas inlet pressure on gas pressure regulator before entering the boiler is set on 30 mbar. If a different value is set on the gas pressure regulator before entering the boiler (permissible 30 – 45 mbar range), the readjustment can be done directly on it (this only can be done by a service worker of propane reservoir supplier 's).

Warning:

After the propane boiler has been put into operation there must be properly discharged the inert gas from a given reservoir in order to achieve the propane heating medium purity in compliance with ČSN 65 6481.

If the prescribed propane purity isn't achieved there cannot be guaranteed a trouble-free boiler commissioning.

11.4 Boiler conversion from „propane“ to „natural gas“

For the conversion from propane to natural gas the boiler will always work in single stage regime (only the rated boiler output). The gas valve isn't equipped with a High – Low coil which enables the boiler double stage regime (rated - reduced output).

Conversion procedure:

1. Exchange the gas nozzles in burner of boiler. The nozzles for both types of gas differ in their diameters (see. tab. no.4a and no.4b.), other dimensions are identical.
2. Exchange the gas nozzles in ignition pilot burner. The nozzles for both types of gas differ in their diameters (see. tab. no. 11)
3. Fasten the burner.
4. Adjust the boiler output according to chap. no. 11.3.
5. **The service worker is obliged to put a new boiler label on the boiler with all necessary data for a given kind of fuel. This change must be recorded in guarantee certificate.**

Tab. no. 11 Nozzles marking in Polidoro ignition pilot burner

Kind of gas	Nozzle marking in ignition pilot burner
Natural gas	0,45 A
Propane	0,24 P

11.5 Boiler conversion from “ natural gas” to „propane“

The boiler conversion from „natural gas“ to „propane“ is only possible for OVO Třinec burner system in case of ECO version and in case of basic design with circular burner tubes.

For the conversion from natural gas to propane the boiler will always work in single stage regime (only the boiler rated output). The gas valve isn't equipped with High – Low coil which enables the double stage boiler regime (rated- reduced output), but the with a single regulator V 5306E1234.

Conversion procedure:

1. If you have VK 4100 Q 2003B or VK 4100 P 2004 two-stage gas valves designed for natural gas combustion such a valve must be changed for the VK 4100 A 1002 single-stage valve. We disconnect the feeder cable for High-Low coil from the electro-panel.
2. Change of the gas nozzle in the boiler burner. The nozzles for both types of gas differ in diameter (see table no.3a and no. 3b), other dimensions are identical.
3. Change of the gas nozzle in the lighting burner. The nozzles for both types of gas differ in diameter (see table no.11).
4. Fasten the burner.
5. Adjust the boiler output according to chap. no. 11.3.
6. **The service worker is obliged to put a new boiler label on the boiler with all necessary data for a given kind of fuel. This change must be recorded in guarantee certificate.**

12. Boiler operation by user

The boiler works automatically according to the regulation elements setting and the user only does the following service activities that the worker who puts the boiler into operation is obliged to acquaint him with:

1. **Boiler switching on and switching off** by means of a network switch on the boiler control panel.
2. **Boiler operation by means of selected regulation**, to which there is always delivered a separate operation manual.
3. Required **heating water temperature setting and control**. We set the boiler thermostat to the maximum 85°C temperature. If the boiler is regulated only by boiler thermostat we require the temperature to be set in 45° - 85 °C range.
4. **The hot service water setting** (only in case of a stack heater connection) on the heater thermostat without regulation or with an indoor thermostat or on some of A1 - A4 regulations. **In order to ensure a sufficiently quick HWS heating we must keep the minimum 15°C difference in setting the temperatures on the heater and boiler thermostats (set the boiler thermostat to the maximum position).** The time necessary for HWS heating depends on heater volume and its heat output (this time is different for various types of heaters).

If the interconnection between stack heater and the boiler is done according to the recommended connection diagram the HWS is heated preferentially to the central heating. After the water heater has been heated to the required temperature the three-way valve switches automatically to the heating position and heating water from boiler flows into radiators and boiler keeps running until an indoor or equitherm regulator hasn't switched off. If the central heating isn't needed (the indoor or equitherm regulators are switched off), then together with boiler there is switched off the circulation pump and the **clack valve between the pump and three-way valve prevents an automatic water circulation in heating system.**

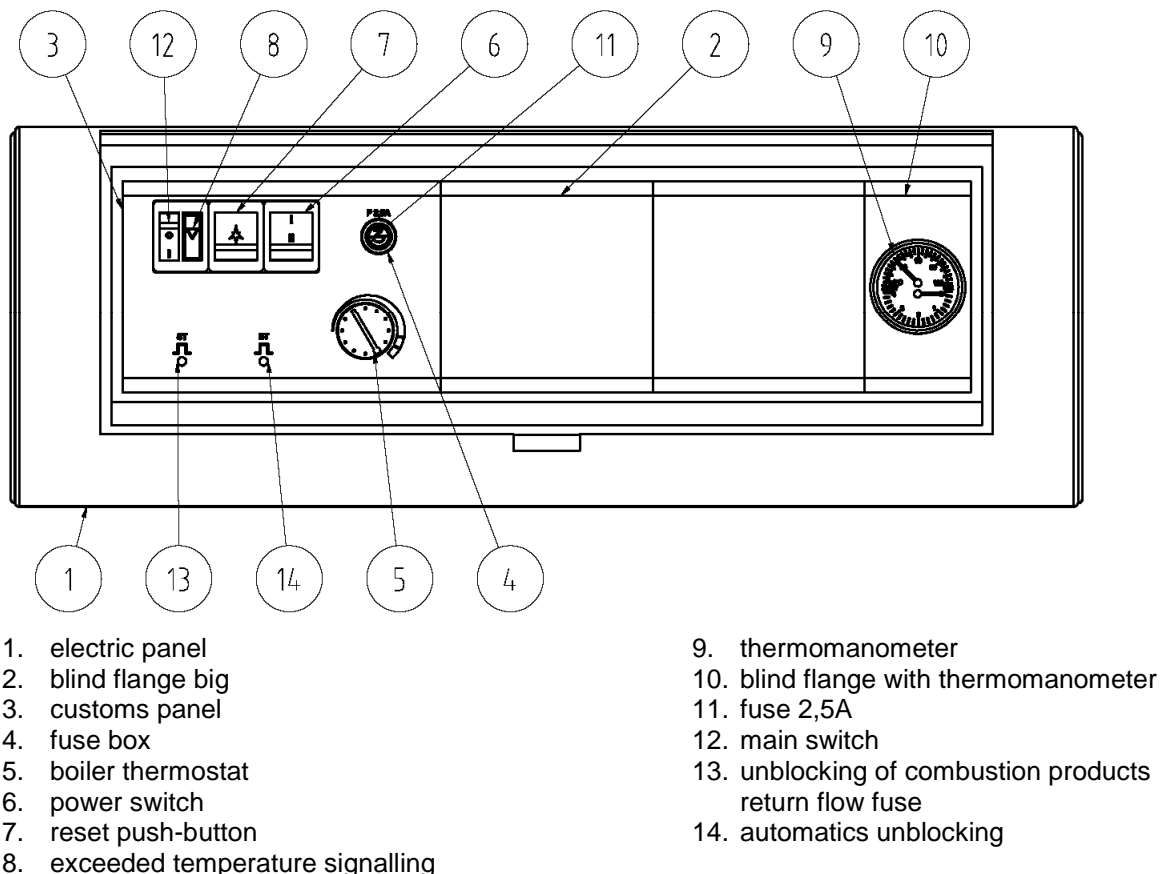
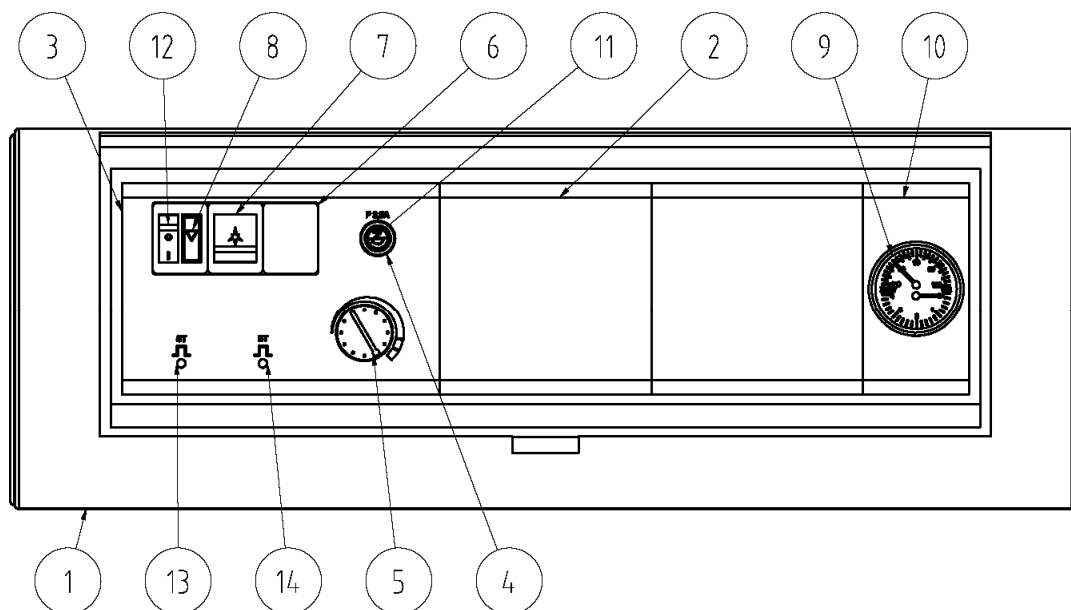


Fig. no. 28a) Standard control of panel boiler VIADRUS GARDE G 42 FOR BG 2°

5. **The output control switch (only at the boilers equipped with double stage gas valve).** The boiler output in dependence on the outdoor temperature is automatically switched over from the rated to reduced output by means of the outdoor thermostat. If the switch is in position I the boiler in case of outdoor temperature above 0 °C will be operated with a reduced output. If the outdoor temperature drops below 0 °C, the boiler will be operated with the rated output. If the switch is switched over into position II, the boiler will be operated still with the rated it means a higher output. (See tab.no.2).

- 6. If there occurs the boiler failure state**, the failure signalisation in automatics lights up. The most common reasons for failures and the possibilities to eliminate them are shown in chapter no.16. The user can only eliminate the failures signed with symbol „*“. In case of electricity outage the burner is put out of operation and after the voltage recovery in the electricity network the burner is restarted automatically. The failure is unblocked by means of “unblocking” button in the network module.
- 7. The safety thermostat unblocking.** If the boiler has been switched off by the safety thermostat then the “overheating” signal lamp lights up on boiler control panel. The thermostat can be unblocked by user in the network module (TB). Safety thermostat switching off can be caused by several reasons, see chapter no. 16.
- 8. Combustion products return flow fuse unblocking.** If the boiler has been switched of by the fuse then the “overheating” signal lamp lights up in network module. The TS fuse can be unblocked by user in the network module.



- | | |
|----------------------|---|
| 1. electric panel | 8. exceeded temperature signalling |
| 2. blind flange big | 9. thermomanometer |
| 3. customs panel | 10. blind flange with thermomanometer |
| 4. fuse box | 11. fuse 2,5A |
| 5. boiler thermostat | 12. main switch |
| 6. blind flange | 13. unblocking of combustion products return
flow fuse |
| 7. reset push-button | |

Fig.no. 28b) Standard control panel of VIADRUS GARDE G 42 and VIADRSU G 42ECO boilers with Honeywell automatics for NG and 1°a propane

13. IMPORTANT WARNINGS

1. The boiler only can be used for the purpose that it is destined for.
2. Boiler can only be operated by adult persons, children without being supervised by adults must not be left nearby the boiler.
3. The boiler is not destined for the use by persons (incl. children) whose physical, sensual or mental disability or lack of experience and knowledge prevent them from a safe use of the appliance unless they are supervised or if they were not instructed on the use of appliance by a person responsible for their safety.
4. Children should be supervised in order to ensure that they do not play with the appliance.
5. If the boiler is going to be put out of operation for a long time it must be disconnected from the electricity- from the socket.
6. The boiler room must be kept clean and dust-free. All sources of pollution must be removed from the boiler room and the boiler must be put out of operation during the works (insulation works, boiler room cleaning) that cause the dustiness. Even a partial clogging of burner with impurities will degrade the combustion process and endanger the economical and reliable operation of boiler. We don't recommend to keep the domestic animals (like cat, dogs etc.) in boiler room.
7. If there occurs the danger of development and penetration of combustible vapours or gases into the boiler room, or during the works where there arises a transient risk of fire or explosion (gluing the floorings, painting with combustible paints), the boiler must be put out of operation long enough before the works start.
8. In case of a failure in combustion products outlet from the combustion products draught diverter (countermove, clogged chimney) the combustion products return flow fuse will close the fuel supply to the boiler. The user can unblock the fuse by means of TS unblocking push-button. The boiler can only be restarted once the combustion products return flow fuse sensor has cooled down it means after 10 minutes.
9. Don't put any objects made of flammable material on boiler and within a distance smaller than the safe distance from it (see chapter no. 7.2.).
10. The user is obliged to put a professional contractual service accredited by VIADRUS a.s., the boiler manufacturer in trust with commissioning, regular maintenance and defects elimination, otherwise the boiler proper function isn't guaranteed. „VIADRUS GARDE G 42 boiler quality and completeness certification“ after having been filled out by contractual service organization serves as the „Guarantee certificate“.
11. The boiler regular maintenance must be done once a year according to the next chapter no.14.
12. Do not prolong in any way the combustion products routing through the venting unit in order to use the heat; it increase the condensate development possibility in the venting unit. Once a heating season you must check the venting unit condition.
13. If the pressure expansion tank proper connection and revision isn't certified the boiler connected to the pressure system cannot be put into operation.
14. An indoor thermostat or one of offered regulations can be connected to the boiler.
15. We recommend the low-temperature corrosion protection by installing the mixing equipment, this only in case that the temperature gradient is lower than the recommended 45/30 °C maximum. Follow the central heating manufacturer 's and designer 's instructions when installing this equipment in the system.
16. The socket is only reserved for G 42 boiler, don't connect the boiler through an adaptor.
17. During assembly, installation and operation of the appliance it is necessary to comply with standards that apply in the relevant country of destination.

If you don't adhere to these terms you cannot claim for guarantee repairs.

14. Maintenance

All interventions can only be done by a contractual service organization trained by the manufacturer.

1. Disconnect the boiler from the el. network.
2. Close the gas supply to the boiler.
3. Disconnect the burner from gas supply
4. Disconnect the conductors to ignition pilot burner and the watching burner.
5. Remove the frontal part of boiler shell in order to maintain the burner.
6. After the fastening nuts (4 pc of M8 nuts), the automatics with HIGH-LOW coil and the gas piping have been released the burner can be drawn out from the combustion space forwardly.
7. Remove the upper part of the shell and the thermal insulation.
8. Unscrew the draught diverter cover.
9. Check the boiler convection surface choking boiler and clean it chemically (like by using the METANO THERM – according to METANO THERM manufacturer's instructions). If no regular maintenance has been done and the convection surfaces are heavily choked with impurities they can be cleaned as follows:
 - a brush is appended to the boiler and it has to be used for mechanical cleaning;
 - pour a diluted detergent solution into all convection surfaces vents from above;
 - let the solution work for approx. 10 minutes;
 - spray the convection surfaces by a lower water pressure;
 - again by a higher water pressure complete the convection surfaces cleaning;
 - remove perfectly the impurities from burner space.
10. Check the burner tubes choking. In case they are fouled:
 - dismount the ignition pilot burner (Fig. No. 4a or 4b);
 - by means of a steel brush clean slightly the burner tubes perforation;
 - remove the dust by using the compressed air through the diffuser or by using the vacuum cleaner;
 - mount back the ignition pilot burner (see Fig. 4a or 4b) and then the whole burner;
 - remove the dust from ignition pilot burner by using the compressed air.
11. Mount back the draught diverter, insulation and the upper part of boiler shell.
12. Open the gas supply, connection to electricity supply and the boiler start.
13. Check the gas supply to the burner tightness.
14. Boiler adjustment and the check of set output values (according to chap. no. 11.3).
15. In case that the combustion products ventilator is connected:
 - Check the smoke-flue tightness;
 - Check or clean the ventilator internal space valve (the box, rotor- using the vacuum cleaner).

15. Instructions for disposal of product after its service life expiration

VIADRUS a.s., is contractual partner of firm EKO – KOM a.s. with client number F00120649.

The packages comply with EN 13427.

Because the product is manufactured of common materials we recommend to dispose them in the ways as follows:

- the exchanger (grey cast-iron) through a firm dealing with waste collection and disposal;
- piping, shell - through a firm dealing with waste collection and disposal;
- other metal parts - through a firm dealing with waste collection and disposal;
- gas fitting, breather - through a firm dealing with waste collection and disposal as the non-ferrous metal;
- ROTAFLEX insulation material - into the common waste.

We recommend to dispose the packages in the following way:

- plastic foil, cardboard cover, use a salvage point
- metal strapping tape, use a salvage point
- wooden base, is designated for a single usage and no longer can be used as a product. Its disposal is subject to Act. 477/2001 Sb. a 185/2001 Coll.as amended.

In case that the product has lost its serviceability you can take advantage of product “take back service” (if this is established); in case that the originator has declared that it is a scrap it must be handled according to the valid legislation of relevant country.

16. Defects and their elimination (rectification)

The defects can only be eliminated by a trained contractual service organization which is also obliged to enter the repair in the guarantee certificate.

The defects marked with symbol “*„ can be eliminated by the user himself.

If the safety thermostat or the combustion products return flow fuse get repeatedly blocked it is also necessary to call a contractual service worker.

	DEFECT	REASON	ELIMINATION
1.	After having switched on the boiler the control lamp on the main switch does not light up	No voltage on the boiler inlet Faulty control lamp Faulty fuse	Check the voltage in the socket Exchange the switch Exchange the fuse
2.	Boiler cannot be started – the ignition electrode for pilot burner ignition does not sparkle.	Faulty automatics Interrupted inlet to the ignition Faulty electrode	Exchange the automatics Check the perfect connection between the electrode and the HV output to the automatics Exchange the electrode
3.	Boiler cannot be started – sparking runs in the automatics spark gap (discharger) (audible sparking sound in automatics) (only the natural gas)	Wrong spark gap(discharger) setting Wrong conductors connection to electrodes or a faulty electrode	Adjust according to Fig. no. 4a, 4b Check the electrodes condition and connection of ignition and earth conductor
4.	Boiler doesn't ignite - the ignition electrode is sparking– Hon. Ts'= 55 s; SIT Ts'= 60 s (on the burner automatics the „ALARM“ control lamp lights up in the automatics with signalisation)	Boiler gas supply is interrupted Gas piping air lock Gas valve does not open	Check the gas pressure in gas connection * Check the appliance gas closure opening Bleed the piping Valve exchange
5.	Boiler lit but is out immediately (on the burner automatics the „ALARM“ signal lamp of automatics with signalisation lights up)	Wrong connection between the zero and phase conductors Wrong diameters of gas nozzles in burner Impassable filter of coarse impurities on gas valve inlet	Check and exchange the connection terminal U – phase conductor terminal N – zero conductor Check whether the nozzles diameter in the main burner corresponds to the values in tables no. 2 – 5. Clean the gas valve filter by blowing out (in case of fine impurities the dimensions of which are the same as the filter mesh diameter the whole gas valve must be exchanged)
6.	Boiler cannot be ignited– the safety thermostat switched off (on the control panel in the network module the exceeded temperature signal lamp lights up)	Faulty boiler thermostat Insufficient water circulation (the pump does not work) filter clogged before the pump Lack of water in the system	Exchange the boiler thermostat * Unblock the thermostat in network module - TB * Switch over the revolutions Check the pump operation (release the rotor) Exchange the pump * Clean the filter * Check the water pressure in the system and possible water refilling Check the pressure in the expansion tank (if a closed heating system is used) * Check the three-way valve (if the HWS heating is connected)
7.	Boiler does not switch over between the rated and reduced output at the temperature set on the outdoor thermostat and the reduced output switch is in position “I” (only at the boiler equipped with double stage gas valve)	Faulty outdoor thermostat Interrupted connection between the outdoor thermostat and the boiler Faulty High-Low coil	If need be exchange outdoor thermostat Check the connection Exchange the coil

	DEFECT	REASON	ELIMINATION
8.	To the boiler there is connected the stack HWS heater according to the recommended diagram and the HWS isn't heated preferentially	Faulty connection of Honeywell V 4044F three-way valve	Check the valve connection – see fig.no. 21
		Faulty three-way valve	Exchange the valve
9.	To the boiler there is connected the stack HWS heater according to the recommended diagram and HWS isn't heated to the required temperature or it does not show the required temperature	Wrong temperature setting on the thermostats	* Change the setting see chap. no. 11
		Faulty heater thermometer or thermostat, or the boiler thermostat	Exchange the faulty safety or regulation element
10.	The combustion products return flow fuse blocked	Clogged chimney	Clean the chimney
		Clogged the smoke-flue output end (at the boilers equipped with combustion products ventilator)	Check, unblock the combustion products return flow fuse
		A strong wind inducing the counter-pressure	* unblock the combustion products return flow fuse by using the "RESET" button in the network module.

17. Guarantee and liability for defects

VIADRUS a.s. provides the guarantee:

- For boilers 24 months after the boiler putting into operation, but maximum 30 months after the date it was dispatched from the manufacturing factory.
- For boiler drum 10 years after the date its dispatch from the manufacturing factory.

The manufacturer requires for the guarantee applicability:

- In sense of **Act no. 222/94 Coll. „On business conditions and government administration execution in certified branches and on State electricity inspection“** and **ČSN 38 6405, ČSN 38 6441** to inspect the gas boiler regularly once a year. The inspections can only be done by an authorized organization (contractual service), **accredited by VIADRUS a.s.**
- To document all records of carried out guarantee and after-guarantee repairs and regular annual inspections in the annex to the guarantee certificate enclosed to this manual.

Every defect must be announced immediately after having been found out and always in writing on the basis of an telephonic agreement.

If the above instructions are not observed then the guarantees provided by manufacturer will not be acknowledged

The guarantee does not apply to the:

- faults caused by improper assembly and improper attendance of the product and faults caused by improper maintenance see chap. 14;
- faults and damage caused by failure to observe water quality in heating system see chap. no. 9.1 and 10.2 or by using the anti-freeze mixture;
- faults caused by failure to observe instructions stated in this manual;
- products damaged during transport or by other mechanical damage;
- defects caused by an inconvenient way of storing.

The manufacturer reserves the right to make changes within the product innovations that needn't be included in this manual.

The manufacturer isn't responsible for damages caused by using the product in a discordance with conditions stated in this operation manual.

The manufacturer provides the product guarantee for a period and under the conditions that are quoted in guarantee certificate. The guarantee certificate is a part of delivery and its validity is conditioned by all data full, legible and truly filling in.

Information for customer

Packaging identification	Assessment reference
PE Plastic sacks, folie, corrugated board, iron and plastic fix line	

Identification of principal materials used. Paper, Polyethylene, iron, wood

Part 1: Summary of assessment

Standard/Report	Assessment requirement	Claim	Note
1.1 Prevention by source reduction		YES	
1.2 Heavy metals and	ensure below maximum permitted levels for components (CR 13695-1:2000)	YES	
1.3 Other noxious/hazardous substances	ensure in compliance with (CR 13695-2:2002, EN 13428:2000)	YES	
2 Reuse	ensure reusability in all terms of the standard for the functional packaging unit (EN 13429:2000)	NO	
3.1 Recovery by material recycling	ensure recyclability in all terms of the standard for the functional packaging unit (EN 13430:2000)	YES	
3.2 Recovery in the form of energy	ensure that calorific gain is achievable for the functional packaging unit (EN 13431:2000)	YES	Iron - NO
3.3 Recovery by composting	ensure compost ability in all terms of the standard for the functional packaging unit (EN 13432:2000)	NO	

NOTE Conformity with EN 13427 requires affirmative responses to sections 1.1; 1.2; 1.3 and to at least one of 3.1; 3.2; 3.3. In addition, where a claim of reuse is made section 2 should also record affirmative responses.
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Part 2: Statement of conformity

In the light of the assessment results recorded in part I above, this packaging is claimed to comply with the requirements of EN 13427:2000.
--

Intended for user

VIADRUS a.s.
Bezručova 300
735 81 Bohumín

Guarantee certificate and Quality and completeness certificate for VIADRUS GARDE G 42 boiler... and VIADRUS GARDE G 42 ECO...

Boiler serial number Boiler output

User (surname, name)

Address (street, town, postcode)

Telephone/Fax

Gas operating overpressure: 18 mbar natural gas 3 mbar propane

The boiler complies with requirements:

ČSN 07 0240 Warm-water and low-pressure steam boilers

EN 297 Gas – fired central heating boilers – Type B₁₁ and B_{11BS} fitted with atmospheric burners of nominal heat input not exceeding 70 kW

VIADRUS a.s. provides the guarantee:

- For boilers 24 months after the boiler putting into operation, but maximum 30 months after the date it was dispatched from the manufacturing factory.
- For boiler drum 10 years after the date its dispatch from the manufacturing factory.

Adjustment according to the boiler installation and operation manual will be carried out by a contracting service organization.

The completeness and the output adjustment according to „Operation and installation manual“ is guaranteed by the manufacturer through the contracting service organization.

The guarantee certificate is invalid without having been filled in.

Stoking test results:

Measured values	Numeric value		Units
	Rated thermal output minimal	Rated thermal output maximal	
Gas inlet pressure			mbar
Pressure on the nozzle			mbar
Gas consumption per an hour (gas-meter data)			m ³ .h ⁻¹

The user confirms that:

- the boiler adjusted by the contracting service organization didn't show any defect during the stoking test
- he received the „Operation and installation manual“ with properly filled in Guarantee certificate and Quality certificate
- he was acquainted with boiler operation and maintenance

.....
Manufacture date

.....
Manufacturer's stamp

.....
Controlled by (signature)

.....
Date of installation

.....
Installation company
(stamp, signature)

.....
User's signature

.....
Date of putting into operation

.....
Contractual service organization
(stamp, signature)

.....
User's signature

Annex to the guarantee certificate for customer- the user

Record of accomplished guarantee and after-guarantee repairs and regular annual product checks			
Record date	Carried out activity	Contracting service organization (stamp, signature)	Customer 's signature

Intended for service organization

VIADRUS a.s.
Bezručova 300
735 81 Bohumín

Guarantee certificate and Quality and completeness certificate for VIADRUS GARDE G 42 boiler... and VIADRUS GARDE G 42 ECO...

Boiler serial number Boiler output

User (surname, name)

Address (street, town, postcode)

Telephone/Fax

Gas operating overpressure: 18 mbar natural gas 3 mbar propane

The boiler complies with requirements:

ČSN 07 0240 Warm-water and low-pressure steam boilers

EN 297 Gas – fired central heating boilers – Type B₁₁ and B_{11BS} fitted with atmospheric burners of nominal heat input not exceeding 70 kW

VIADRUS a.s. provides the guarantee:

- For boilers 24 months after the boiler putting into operation, but maximum 30 months after the date it was dispatched from the manufacturing factory.
- For boiler drum 10 years after the date its dispatch from the manufacturing factory.

Adjustment according to the boiler installation and operation manual will be carried out by a contracting service organization.

The completeness and the output adjustment according to „Operation and installation manual“ is guaranteed by the manufacturer through the contracting service organization.

The guarantee certificate is invalid without having been filled in.

Stoking test results:

Measured values	Numeric value		Units
	Rated thermal output minimal	Rated thermal output maximal	
Gas inlet pressure			mbar
Pressure on the nozzle			mbar
Gas consumption per an hour (gas-meter data)			m ³ .h ⁻¹

The user confirms that:

- the boiler adjusted by the contracting service organization didn't show any defect during the stoking test
- he received the „Operation and installation manual“ with properly filled in Guarantee certificate and Quality certificate
- he was acquainted with boiler operation and maintenance

.....
Manufacture date

.....
Manufacturer's stamp

.....
Controlled by (signature)

.....
Date of installation

.....
Installation company
(stamp, signature)

.....
User's signature

.....
Date of putting into operation

.....
Contractual service organization
(stamp, signature)

.....
User's signature

Intended for manufacturer

VIADRUS a.s.
Bezručova 300
735 81 Bohumín

Guarantee certificate and Quality and completeness certificate for VIADRUS GARDE G 42 boiler... and VIADRUS GARDE G 42 ECO...

Boiler serial number Boiler output

User (surname, name)

Address (street, town, postcode)

Telephone/Fax

Gas operating overpressure: 18 mbar natural gas 3 mbar propane

The boiler complies with requirements:

ČSN 07 0240 Warm-water and low-pressure steam boilers

EN 297 Gas – fired central heating boilers – Type B₁₁ and B_{11BS} fitted with atmospheric burners of nominal heat input not exceeding 70 kW

VIADRUS a.s. provides the guarantee:

- For boilers 24 months after the boiler putting into operation, but maximum 30 months after the date it was dispatched from the manufacturing factory.
- For boiler drum 10 years after the date its dispatch from the manufacturing factory.

Adjustment according to the boiler installation and operation manual will be carried out by a contracting service organization.

The completeness and the output adjustment according to „Operation and installation manual“ is guaranteed by the manufacturer through the contracting service organization.

The guarantee certificate is invalid without having been filled in.

Stoking test results:

Measured values	Numeric value		Units
	Rated thermal output minimal	Rated thermal output maximal	
Gas inlet pressure			mbar
Pressure on the nozzle			mbar
Gas consumption per an hour (gas-meter data)			m ³ .h ⁻¹

The user confirms that:

- the boiler adjusted by the contracting service organization didn't show any defect during the stoking test
- he received the „Operation and installation manual“ with properly filled in Guarantee certificate and Quality certificate
- he was acquainted with boiler operation and maintenance

.....
Manufacture date

.....
Manufacturer's stamp

.....
Controlled by (signature)

.....
Date of installation

.....
Installation company
(stamp, signature)

.....
User's signature

.....
Date of putting into operation

.....
Contractual service organization
(stamp, signature)

.....
User's signature

VIADRUS

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