

Instruction manual

Contents

1. Intended use	5
2. Technical description	5
Control panel appearance - For types DC18SP, DC25SP, DC30SPX, DC32SP	6
3. Technical data	7
Boiler drawings key	8
Technical data	8
Drawings of boilers	9
Cut away view – types DC18SP DC25SP, DC30SPX, DC32SP	9
Exhaust fan schematics	9
4. Type and seating of shaped pieces into combustion area	10
5. Boiler accessories	10
6. Fuel	11
Basic wood burning data	11
Fuel heating capacity	12
7. Boiler bases	12
8. Environment type and boiler placement in a boiler room	12
9. Chimney	13
10. Flue-gas duct	13
11. Fire prevention during installation and use of heating appliances	14
12. Connecting boilers to the electric network	15
13. Electric diagram of the burner ATMOS A25 - 6-pin connector - model AC07X - (R, R2, R3, R4, sensors TV, TS, TK, TSV)	18
14. Wiring diagram connection of electromechanical regulation for DC18SP, DC25SP, DC30SPX, DC32SP boilers with exhaust fan type UCJ 4C52, AC07X model with 6-pin connector and module AD03 to control exhaust fan of the boiler and pump in the boiler circuit	19
15. Obligatory ČSN EN standards dealing with boiler designing and installation	20
16. Choice and connection method of control and heating elements	21
17. Boiler corrosion protection	22
18. Connection of DCxxSP(X) boilers with two accumulation tanks (connected in series) for burner control on the basis of TS and TV sensors, control of the boiler, burner and boiler pump based on TSV and TK sensors	23
Function for automatically starting the burner after the wood burns out	23
19. Connection of DCxxSP(X) boiler with two accumulation tanks (connected in parallel). Boiler, burner and heating system operation is controlled from the ACD 03 (04) controller. Function for automatically starting the burner after the wood burns out	24
20. Connection of DCxxSP(X) boiler with accumulation tank for burner control on the basis of TS and TV sensors, control of the boiler, burner and boiler pump based on TSV and TK sensors	25
Function for automatically starting the burner after the wood burns out	25
21. Recommended wiring diagram with Laddomat 22 and accumulation tanks	26
22. Laddomat 22	27
23. Thermoregulatory valve	27
24. Operating system with accumulation tanks when burning wood	28
The standard ATMOS accumulation tanks provided	28
Tank insulation	28
Advantages	28
25. Connection of overheat protecting cooling loop with a safety valve Honeywell TS 131 - 3/4 ZA or WATTS STS20	29
26. Operating instructions	30
Preparing boilers for operation	30
Boiler setting and launching when burning pellets	30
Heating with pellets	30
Automatic start of pellet burner after wood burnout	31
Boiler system with an external storage container and conveyor	32
Relation of waste gas temperature to boiler (burner) output when burning pellets	34
Boiler-room with a separate pellet tank 500 l and conveyor 1,5 m	35
Boiler-room with textile pellet silo 5,5 - 7,9 m ³ and long conveyor	36
Boiler room with a built-in pellet storage	37
Boiler setting and launching when burning wood	38
Heating with wood	38
Ignition and operation in wood-burning mode	38
Waste gas thermostat setting	39
Output regulation in wood burning mode - electromechanical	39
Draught regulator - HONEYWELL Braukmann FR 124 – Assembly instructions	40
27. Setting the boiler output and combustion when burning wood	40
28. Closing flap controlled by an actuator Belimo	41
29. Boiler output and combustion setting when heating with pellets	42
30. Fuel refill when burning wood	45
31. Slow-burning operation when burning wood	45
32. Boiler cleaning	45
Maximum ash quantity – in the middle and lower combustion chambers	48
General safety instructions - recapitulation and residual risks	49
33. Heating system maintenance - including boilers	50
34. Use and inspections	50
35. Possible failures and troubleshooting	51
36. Spares parts	53
Heatproof shaped piece (nozzle) replacement	53
Door sealing cord replacement	54
Adjusting the door hinges and locks	54
37. Environmental protection	55
Disposal of the boiler after expiration of its service life	55
GUARANTEE CONDITIONS	56
BOILER INSTALLATION REPORT	57
ANNUAL INSPECTIONS RECORDS	58
RECORDS OF GUARANTEE PERIOD AND POST-GUARANTEE PERIOD REPAIRS	59

WE HOPE THAT YOU ARE SATISFIED WITH OUR PRODUCT AND WE KINDLY RECOMMEND YOU TO FOLLOW THESE MAIN RULES IMPORTANT FOR A LONG SERVICE LIFE AND THE CORRECT FUNCTIONALITY OF THE BOILER

1. Installation, ignition test and operator's training **will be carried out by an installation company trained by the manufacturer**. This company also completes a boiler installation report (p. 57).
2. When burning pellets **use only good quality fuel of 6 – 8 mm diameter** made from soft barkless wood (white pellets).
3. During the **gasification process, wood tar and condensates (acids)** form in the fuel storage tank. Therefore, there must be a Laddomat 22 or a TV 60 °C (65/70/72/77 °C) thermoregulatory valve installed behind the boiler in order to keep the **minimum temperature of water returning to the boiler at 65 °C**.
Operating temperature of water in the boiler must be in the **80 - 90 °C** range.
4. When the boiler operates in the wood-burning mode, **it must not be permanently** operated in an output **lower than 50 %**.
5. Every circulating pump in the system must be regulated by an individual thermostat in order to keep the **specified minimum temperature of water returning to the boiler**.
6. The boiler operates environmentally-friendly if burning wood at the nominal output level.
7. We therefore recommend to install the boiler with **accumulating storage tanks and Laddomat 22, which provides 20 - 30 % fuel-wood consumption decrease in wood-burning mode, longer service life of both – the boiler and the chimney and user-friendlier operation**.
8. If you cannot install the boiler into an accumulation system, then we recommend installing it at least with **one equalising tank**; the volume of which should be 500 – 1000 l. This increases the pellet burner's service life.
9. When operating the boiler in a **lower output mode** (summer operation or heating up hot potable water) and burning pieces of wood, it is **necessary to fire-up daily**.
10. Use only dry **fuel wood with 12 - 20 % moisture content – higher moisture content decreases the boiler's performance and increases consumption**.



CAUTION – if the boiler is installed with a Laddomat 22 or with a TV 60 °C (65/70/72/77 °C) thermoregulatory valve and with the accumulation tanks (see attached schematics), the guarantee period for the boiler drum is extended from 24 to 36 months. The guarantee period for other parts remains unaffected. In non-compliance with these instructions the drum's and the heatproof shaped pieces' service life may dramatically decrease. The boiler drum may corrode in as little time as 2 years.



CAUTION - INSTALLER SHOULD ALWAYS COMPLY WITH LOCAL PLANNING AND BUILDING REQUIREMENTS.

1. Intended use

The environmentally friendly boilers ATMOS DC18SP, DC25SP, DC30SPX, DC32SP are designed for domestic heating using pellets and wood. Boilers are suitable for buildings with heat loss ranging between 5 - 35 kW.

Good quality pellets of 6 – 8 mm diameter and dry firewood of 330 - 530 mm length (depending on the boiler type) may be used for heating. The boiler is not intended for burning saw dust or small-particle wood waste. These can be burnt in small quantities only, together with log-firewood. MAX.10 %. Due to their huge feeding hoppers, the boilers save the user a lot of laborious wood treating and splitting operations. They save both - the physical effort and also the time dedicated to these operations.

2. Technical description

The boilers are designed for electronically controlled burning of pellets in a pellet burner and for wood burning, both based on the generator gasification principle utilising an extraction ventilator which extracts the waste gas from the boiler.

The boiler drum is manufactured as a welded structure from 3 - 8 mm thick steel sheets. The boiler's upper section which comprises of two chambers one on top of the other and which is intended for wood burning, consists of a fuel feeding hopper which is in the lower section equipped with a heatproof shaped piece with a longitudinal opening allowing combustion products and gases to penetrate into the lower burn-off chamber. The burn-off chamber is equipped with ceramic shaped pieces allowing ideal burn off of all combustible materials. Below the burn-off chamber, there is a separate combustion chamber lined with ceramics into which a pellet burner ATMOS A25 with modification for SP models is inserted from the front. This chamber also serves as an ash area when in pellets burning mode. There is a vertical combustion gas duct in the back of the boiler body, which is in the upper section equipped with a heating valve and the gas outlet pipe for connecting to chimney. Waste gas exhausts from the middle (wood) and lower (pellets) combustion chambers lead into the vertical waste gas duct. An aperture for setting the quality of the burner's combustion utilising a waste gas analyser is fitted in the lower part of the waste gas duct.

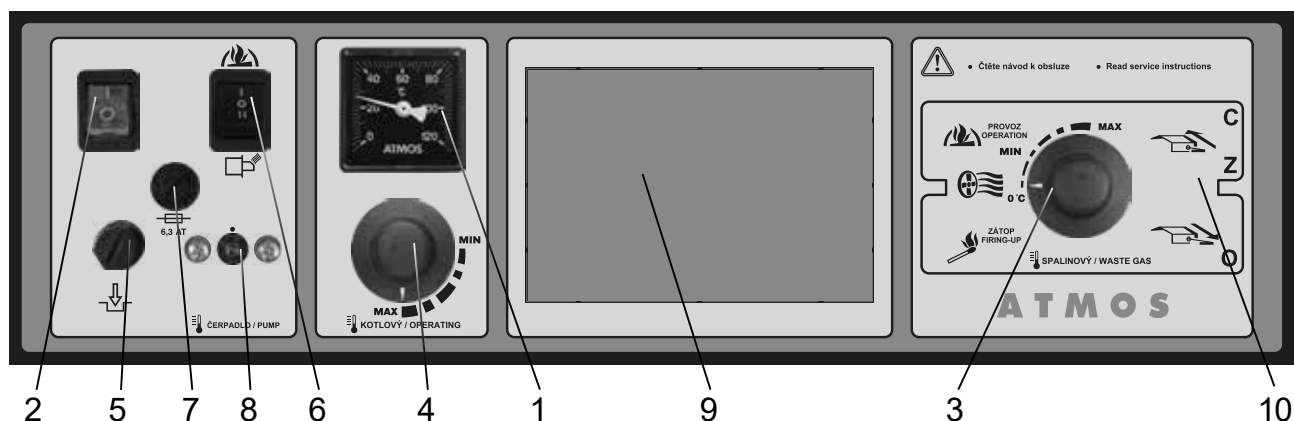
The front boiler wall is fitted with three stoking doors. The upper door of the wood stoking chamber is equipped with a limit switch which renders the lower chamber burner out of operation when the door is opened. **This safety feature prevents using both systems simultaneously.** To re-ignite the pellet burner the **limit switch button** on the left or right near the upper door **must be pressed**. In the front section of the upper hood there is an ignition valve pull rod. The boiler's drum is externally heat insulated by mineral wool placed beneath the sheet metal covers of the boiler's external housing. A control panel for electromechanical regulation is situated in the upper part of the boiler. In the rear section of the boiler, there is a primary and secondary air feeding duct fitted with a control valve. The control valve is designed for output regulation when burning wood.

For optimal function of this double-fuel boiler technical elements (regulation) were chosen to automatically adjust the boiler settings (flaps positions and air supply) to the specific fuel.

When burning wood, a **special flap with actuator** is closed in the Atmos A25 burner in version for SP to prevent any suction of false air to enter pellets when firing wood. Adjustment of this flap (valve) is fully automatic.

When heating with pellets the **air closing flap (valve) with the actuator** which is located at the inlet of the total combustion air into the boiler is **completely closed**. Closing this flap ensures that no false air enters the boiler when firing pellets. Adjustment of this flap (valve) is fully automatic.

Control panel appearance - For types DC18SP, DC25SP, DC30SPX, DC32SP



- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Thermometer 2. Main switch 3. Waste gas thermostat 4. Control (boiler) thermostat 5. Safety irreversible thermostat 6. Selector switch (wood I / pellets II) | <ol style="list-style-type: none"> 7. Fuse (6,3A) 5x20/T6,3A/1500 - type H 8. Pump thermostat 9. Area for electronic regulation of the heating system (92x138 mm) 10. Ignition valve pulling rod (control) |
|--|--|

Description:

1. **Thermometer** – monitors the temperature of water exiting the boiler
2. **Main switch** – allows for completely shutting down boiler if necessary.
3. **Waste gas thermostat** – is used to switch off the ventilator when the fuel has burnt out (for model AC07X with 6-pin connector as well as control pump in the boiler circuit)



CAUTION – when firing up (igniting), set the waste gas thermostat to („0 °C“ - firing-up). After flaring up, set the waste gas thermostat to „operation“. Should the waste gas temperature fall below the preset value, the thermostat switches the extraction ventilator off. If you want the ventilator to start operating, set a lower temperature on the waste gas thermostat (set to „0 °C“ - firing-up). It is necessary to detect the optimal operating position.

4. **Control thermostat** – controls the boiler (exhaust fan) operation depending on the temperature of water exiting the boiler.
5. **Safety irreversible thermostat** – serves as boiler protection against overheating in case of control thermostat failure or as an indication of exceeding the emergency temperature. If such exceeding occurs, it is then necessary to depress the thermostat (dual-circui).
6. **Selector switch** – is used to set the boiler operation mode. In position I, the boiler is set for heating the building with firewood utilising an extraction ventilator which is controlled by the waste gas and control thermostats. In position II, the boiler is set for operation with the pellets burner, controlled solely by the control thermostat; depending on the temperature of water exiting the boiler. In this case the waste gas thermostat and the extraction ventilator are put out of operation. The safety thermostat and fuse protect the boiler in both cases.
7. **Fuse (6,3A)** - 5x20/T6,3A/1500 - type H – burner electronics protection
8. **Pump thermostat** – is used for switching the boiler circulation pump on and off
9. **Area for electronic regulation** of the heating system can be used to house any type of regulation that fits into an aperture of 92x138 mm. The electric harness is prefabricated and ready to be used for the regulation's power supply.
10. **Ignition valve pulling rod** – serves for opening the ignition valve during heating or inserting fuel.

3. Technical data

Type of boiler ATMOS		DC18SP	DC25SP	DC30SPX	DC32SP
Boiler heat output - pellets - wood	kW	4,5 - 15 20	6 - 20 27	6 - 20 30	6 - 20 35
Boiler thermal input - pellets - wood		4,9 - 16,2 22,2	6,5 - 21,9 30	6,5 - 21,9 33,4	6,5 - 21,9 39,4
Heating surface	m ²	2,5	3,3	3,3	3,8
Fuel shaft volume	dm ³ (l)	60	95	95	135
Feeding hole dimensions	mm	450x260	450x260	450x260	450x260
Specified chimney draught - pellets - wood	Pa/mbar	15 / 0,15 20 / 0,20	18 / 0,18 23 / 0,23	18 / 0,18 23 / 0,23	18 / 0,18 24 / 0,24
Max. operating water-pressure	kPa/bar	250 / 2,5	250 / 2,5	250 / 2,5	250 / 2,5
Boiler weight	kg	435	531	537	596
Flue gas-outlet pipe diameter	mm	150/152	150/152	150/152	150/152
Boiler height	mm	1695	1695	1695	1772
Boiler width	mm	643	643	643	678
Boiler depth	mm	757	957	957	957
Electric parts ingress protection	IP	20			
Electric input (auxiliary) - at start-up - pellets (max.) - in operation - pellets (max.) - in operation - wood	W	522 (572) / 1042 (1092) 42 (92) 50			
Electrical input in standby mode	W	3,3			
Ignition mode manual		automatic / manual			
Boiler effectiveness - pellets - wood	%	92,5 90,1	91,2 89,9	91,2 89,9	91,2 88,9
Boiler class		5	5	5	5
Boiler category		1			
Operating mode		non-condensing			
Energy efficiency class		A+	A+	A+	A+
Waste gas temperature at nominal output as per EN 303-5 - pelles - wood	°C	109 157	139 177	139 177	139 185
Flue gas temperature / draught for calculating the flue gas path (chimney) - fuel wood	°C / Pa	177 / 20	197 / 23	197 / 23	205 / 24
Waste gas combustion products flow weight at nominal output - pellets - wood	kg/s	0,008 0,012	0,010 0,015	0,010 0,017	0,010 0,018
Max. noise level - according to EN15036-1	dB	65	65	65	65
Specified fuel (preffered)		dry wood (logs) of 15 - 17 MJ.kg ⁻¹ caloric power, 12 - 20 % moisture content and 80 - 150 mm diameter			
Specified fuel		good quality pellets of 6 - 8 cm diameter and 15 - 18 MJ.kg ⁻¹ caloric power			
Average fuel consumption - wood type	kg.h ⁻¹	5,6	7,2	7,6	9,2
Per heating season		1 kW = 1 spatial cubic meter			
Wood length	mm	330	530	530	530
Burning time at nominal output - wood type	hours	2	3	2	2
Boiler water volume	l	78	109	109	160
Hydraulic pressure drop	mbar	0,22	0,23	0,23	0,23
Equalising tank minimum volume	l	500	500	500	500
Connecting voltage	V/Hz	230/50			
Specified minimum temperature of water returning to boiler is 65 °C when in operation.					
Specified boiler operating temperature is 80 - 90 °C.					

Boiler drawings key

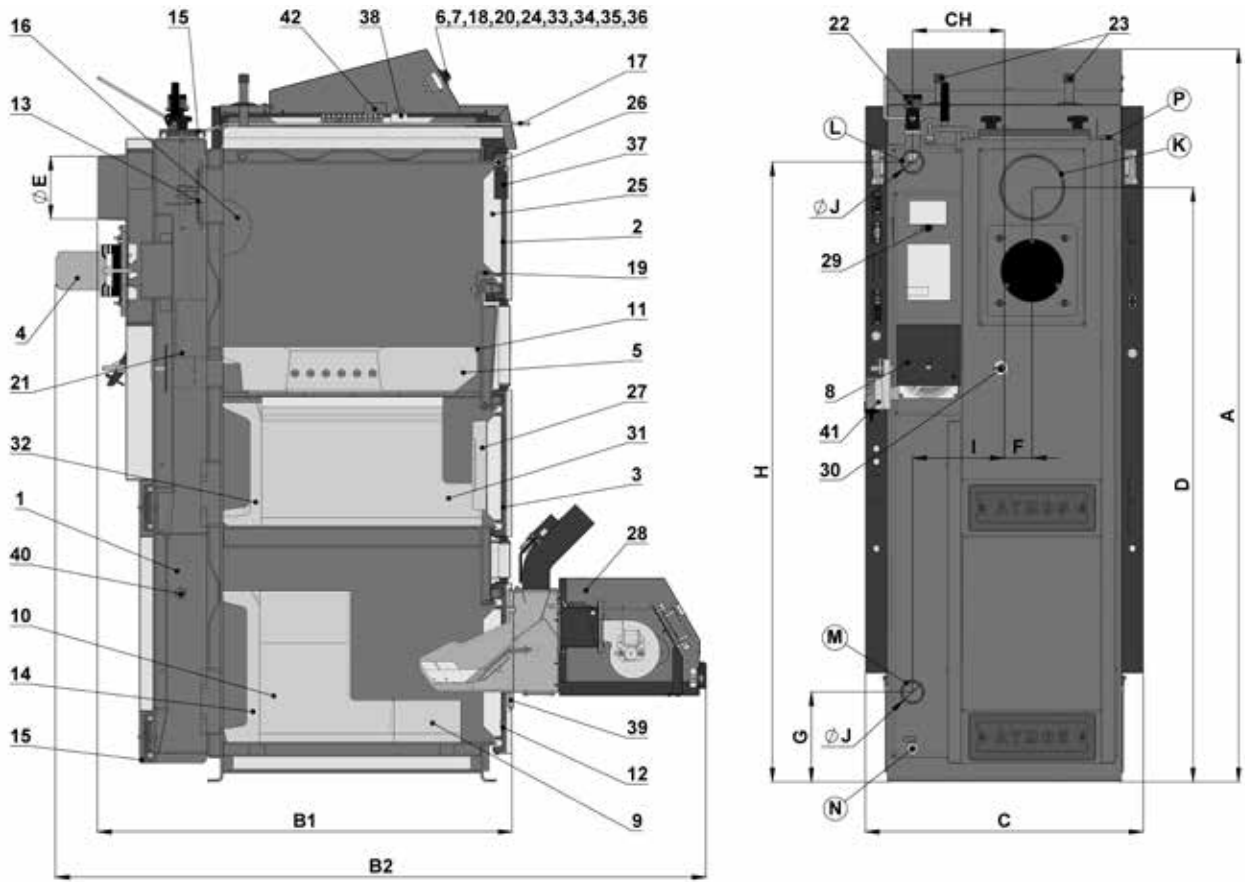
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|---|--|
| <ol style="list-style-type: none"> 1. Boiler drum 2. Loading door 3. Ash-pan door 4. Exhaust fan 5. Heatproof shaped piece - nozzle 6. Control panel 7. Safety thermostat (Caution – in overheat condition must be depressed) 8. Control valve 9. Heatproof shaped piece – extension of the spherical space - pellets (except DC18SP) 10. Heatproof shaped piece – spherical space - pellets 11. Sealing – nozzle - 12x12 12. Door for the pellet burner 13. Ignition valve 14. Heatproof shaped piece – rear face of the spherical space - pellets 15. Cleaning lid 16. Screen 17. Ignition valve pulling rod 18. Thermometer 19. Frame shield 20. Switch with an indicator light 21. Waste gas brake (only DC30SPX) 22. Output regulator - Honeywell FR 124 23. Cooling loop protecting against overheating 24. Control thermostat | <ol style="list-style-type: none"> 25. Door filling - Sibrál 26. Door sealing – cord 18 x 18 27. Heatproof shaped piece - half moon (door shield) 28. Pellet burner ATMOS A25 29. Primary air regulation 30. Secondary air regulation 31. Heatproof shaped piece – spherical space - wood 32. Heatproof shaped piece – rear face of the spherical space - wood 33. Pump thermostat 34. Fuse (6,3A) 5x20/T6,3A/1500 - type H 35. Waste gas thermostat 36. Selector switch I-0-II 37. Limit switch with a push-button 38. Capacitator for exhaust fan - 1µF 39. Sealing under burner 40. Measurement point for the waste gas analyzer 41. BELIMO actuator with flap 42. Module AD03 <p>K - gas outlet pipe
 L - the boiler water outlet
 M - the boiler water inlet
 N - filling valve pipe sleeve
 P - pipe sleeve for valve sensor controlling the cooling loop (TS 131, STS 20)</p> |
|---|--|

Technical data

Dimensions	DC18SP	DC25SP / DC30SPX	DC32SP
A	1695	1695	1772
B	757	957	957
C	643	643	678
D	1375	1375	1448
E	150/152	150/152	150/152
F	65	65	70
G	207	207	184
H	1436	1436	1507
CH	212	212	256
I	212	212	256
J	6/4"	6/4"	6/4"

Drawings of boilers

Cut away view – types DC18SP DC25SP, DC30SPX, DC32SP



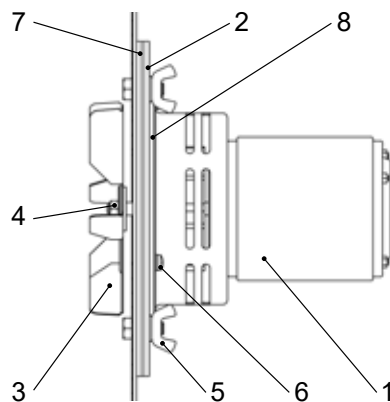
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Exhaust fan schematics



CAUTION – The exhaust fan (S) is provided disassembled. Place it over the rear flue-gas duct, tighten everything well, connect into a socket and test for its smooth operation.

- 1 - Motor
- 2 - Plate
- 3 - Rotating wheel (stainless steel)
- 4 - **Nut with left-handed thread** and washer
- 5 - Wing nut
- 6 - Bolt
- 7 - Large gasket (2 pcs)
- 8 - Small gasket



4. Type and seating of shaped pieces into combustion area

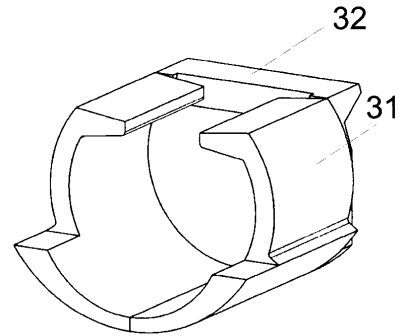
a) The middle wood combustion chamber for DC18SP, DC25SP, DC30SPX, DC32SP types

31. The shaped piece (spherical space L+P) must be assembled in a way that ensures that the front section of the piece /31/ is 3 cm away from the front edge of the boiler frame.

32. Ceramics – rear face with a rearward recess.



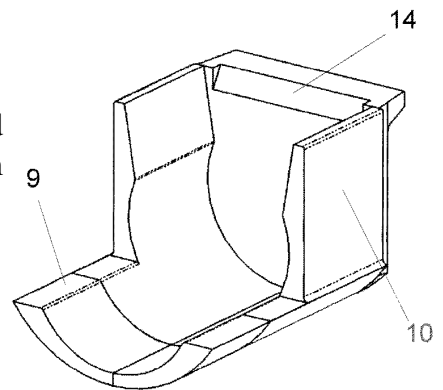
CAUTION – when handling do not turn the rear face



b) The lower pellets combustion chamber for DC18SP, DC25SP, DC30SPX, DC32SP types

9 a 10. The shaped piece (spherical space L+P) must be assembled in a way that ensures that the front section of the piece /9/ is 3 cm away from the front edge of the boiler frame.

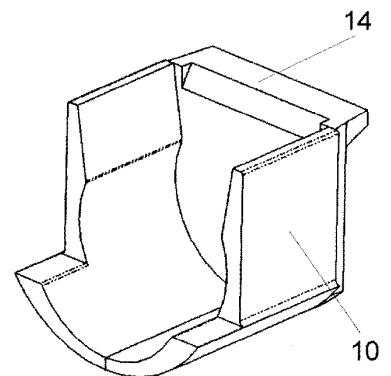
14. Ceramics – rear face with a rearward recess.



DC18SP - without prolonging /9/



CAUTION – when handling do not turn the rear face



5. Boiler accessories

Steel brush with accessories	1 pc
Poker	1 pc
Filling-in valve	1 pc
Operating and maintenance instructions manual	1 pc
Draught regulator - Honeywell FR 124	1 pc
Ash-pan	1 pc

6. Fuel

The specified fuel are good quality wood pellets (white) of 6 - 8 cm diameter and length 10 - 25 mm with a caloric power of 16 - 19 MJ.kg⁻¹. Good quality pellets are such that do not disintegrate into sawdust and are made from soft barkless wood.

Dry split log firewood of 80 – 150 mm diameter, minimum age of 2 years and moisture content between 12 – 20 %. The split log length is 330 mm for the DC18SP type and 530 mm for the DC25SP, DC30SPX and DC32SP types with a caloric power of 15 - 17 MJ.kg⁻¹. It is also possible to burn large pieces of wood waste together with crude logs. The fuel must comply with requirements set out in EN ISO 17225. The fuel storage facility must comply with requirements set out in EN ISO 200232.



High-quality wooden pellets - white without black dots (bark)



Poor-quality wooden pellets - dark with bark (with black dots)

Basic wood burning data

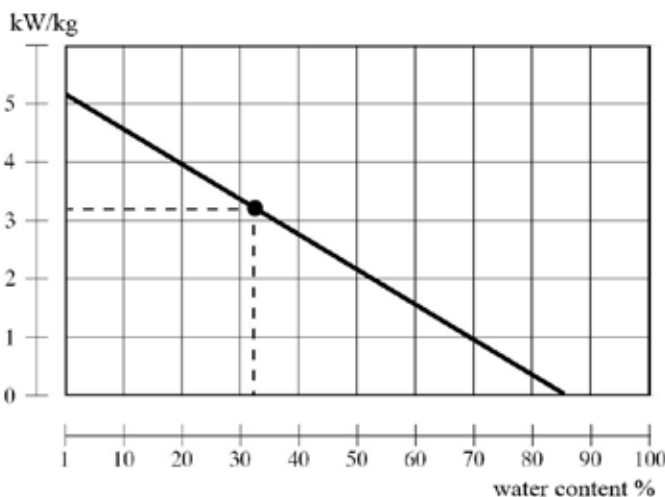
You can ensure maximum output and a long service life if you burn wood which has been left for at least 2 years to dry. The following graph illustrates the relationship of moisture content to heating capacity of the fuel. The energy content declines dramatically with increased water contents.

Example:

Wood with 20 % moisture contents has thermal power of 4 kWh /1 kg of wood

Wood with 60 % moisture contents has thermal power of 1.5 kWh /1 kg of wood

● Example – spruce wood which has been stored for 1 year under shelter – see graph



The boilers maximum output with wet fuel illustrated in the graph

Boiler Type	Maximum Output (kW)
DC18SP	13
DC25SP	19
DC30SPX	22
DC32SP	25

The information is relevant to other gasification boiler types.



CAUTION - Boilers are not suitable for burning wood with moisture content lower than 12 %.

Fuel heating capacity

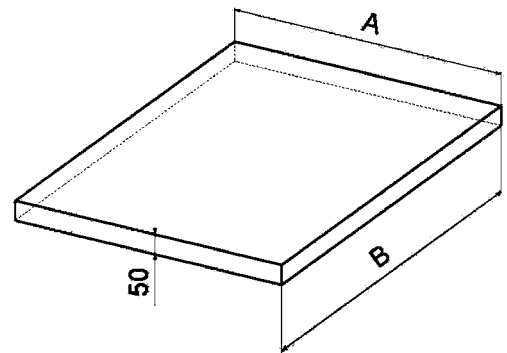
Wood - type	Heating capacity per 1 kg		
	kcal	kJoule	kWh
spruce	3900	16250	4,5
pine	3800	15800	4,4
birch	3750	15500	4,3
oak	3600	15100	4,2
beech	3450	14400	4,0



INFO - Raw wood does not burn easily, produces a lot of smoke and substantially decreases the service life of your boiler and chimney. Boiler output drops as low as 50 % and fuel consumption doubles.

7. Boiler bases

Boiler type (mm)	A	B
DC18SP	600	600
DC25SP, DC30SPX	600	800
DC32SP	700	800

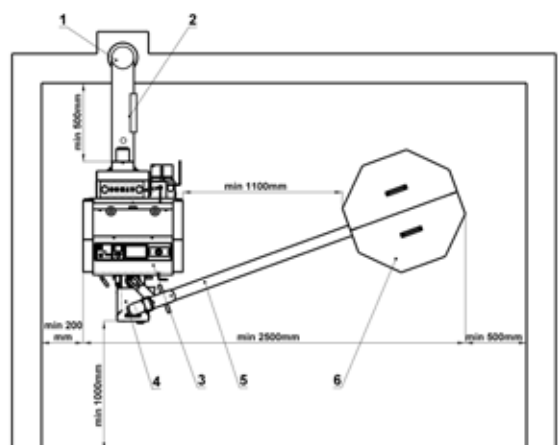


We recommend providing a concrete (metal) base under the boiler.

8. Environment type and boiler placement in a boiler room

Boilers may be used in a “basic environment” - AA5/AB5 as specified in Czech standard ČSN3320001. Boilers must be placed in a boiler room with sufficient air access necessary for combustion. Placing boilers in living areas (including halls) is not permitted. The combustion air inlet aperture in the boiler room must be of minimum 250 cm² for boilers of 15 - 35 kW outputs.

- 1 - Chimney
- 2 - Flue-gas duct
- 3 - Boiler
- 4 - Burner
- 5 - Conveyor
- 6 - Pellets silo



CAUTION - No other devices may be installed in the boiler room if they could create vacuum at the boiler installation site.

Maximum permissible vacuum in the boiler room (boiler installation site) is 0 Pa.

9. Chimney

Connecting the appliance to the chimney vent stack must always be carried out with the permission of the appropriate chimney authority. The vent stack must always be capable of providing sufficient draught and it must discharge the waste gas into the open atmosphere in a reliable manner for all possible operating conditions. The dimensions of the individual vent stack must be correct to ensure good functionality of the boiler; **because the draught influences combustion, performance and the service life of the boiler.** The chimney draught is directly dependent on its cross section, height and the inner wall ruggedness. It is not permitted to connect another appliance into a chimney into which a boiler is connected. **The chimney diameter must not be smaller than the boiler outlet (min. 150 mm).** The chimney draught must comply with the specified values (see technical data, page 7). The chimney must not be excessively high, otherwise the boiler effectiveness is decreased and the combustion is affected (the flame “breaks”). In case of excessive draught, install a throttle valve in the flue gas duct between the boiler and the chimney.

Indicative values of the chimney cross section dimensions:

20 x 20 cm	height 7 m
Ø 20 cm	height 8 m
15 x 15 cm	height 11 m
Ø 16 cm	height 12 m

Exact chimney dimensions are stipulated in Czech standard ČSN 73 4201.

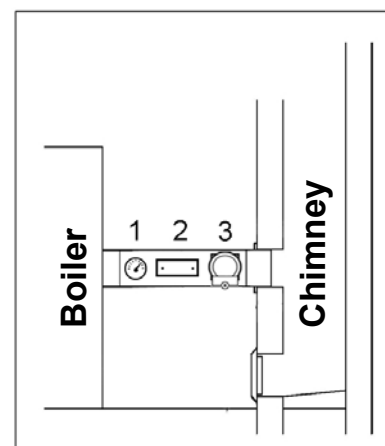
Specified chimney draught is stated in section 3 „Technical Data“.



INFO - There must not be great changes in the chimney draught during operation and measurement of the boiler. (e.g., due to wind) **Maximum ± 2 Pa (0.02 mbar)**

10. Flue-gas duct

The flue-gas duct must be connected into the chimney vent stack. If the boiler cannot be connected to the chimney directly, the appropriate flue-gas duct extension must be as short as possible in the given circumstances, but **not longer than 1m**, it must be without additional heating surface and must **incline upwards in the direction towards the chimney**. Flue-gas ducts must be mechanically durable and sealed against combustion products and gas penetration, and it must be possible to clean them inside. The flue-gas ducts must not be lead through another person’s apartment or property. The internal diameter of the flue-gas duct must not be larger than the internal diameter of the chimney intake and it must not decrease in width in the direction towards the chimney. Use of elbow-pipes is not suitable. Methods for providing flue-gas duct entries through flammable material structures are stipulated in appendices 2 and 3 of the Czech standard ČSN 061008. These are appropriate for mobile installations, wooden cottages etc.



- 1 - Waste gas thermometer
- 2 - Cleaning aperture
- 3 - Draught regulator (reducer) / throttle valve



INFO - In case of too strong draught of the chimney install a draught regulator (reducer) /3/ or throttling flap in the flue gas duct.

11. Fire prevention during installation and use of heating appliances

Selected from ČSN 061008 – Fire safety of local appliances and heat sources.

Safe distances

When installing the appliance, keep a minimum safe distance of 200 mm from building materials. This distance is valid for boilers and flue-gas ducts positioned near flammable materials of the B, C1 and C2 flammability class materials (the flammability classes are listed in chart 1). It is necessary to double the 200 mm safe distance if the boilers and flue-gas ducts are placed near flammable materials of C3 class (see chart 1). It is also necessary to double the safe distance if the flammability class of the material in question cannot be determined. The safe distance can be decreased to one half (to 100 mm) if a heat insulating, non-combustible screen (asbestos board) of a 5 mm minimum thickness, is placed 25 mm from the protected combustible material (so called flammable insulation). The screening board or protection screen (on the protected object) must exceed the boiler outline including its flue-gas duct on each side by at least 150 mm and by at least 300 mm above its upper surface. The screening board or protection screen must be also used for all fixtures and fittings from combustible materials in cases where the safe distance cannot be maintained (such as in mobile structures or wooden cottages etc. - for more details see ČSN 061008 standard). The safe distance must be maintained even when placing fixtures and fittings near the boilers.

If boilers are placed on floors from combustible materials, the floor must be fitted with a non-combustible, heat insulating pad exceeding the boiler's ground-outline on the side where the stoking and ash-pan apertures are, by at least 300 mm (in front of the aperture) and on all the other sides by at least 100 mm. The non-combustible, heat insulating pad can be made from any material of A flammability class.

Chart 1

Flammability classes of building materials and products	
A – non-combustible	granite, sandstone, concrete, bricks, ceramic tiles, mortars, fireproofing plasters etc.)
B – non-easily flammable	Akumin, Izomin, Heraklit, Lignos, basalt felt boards, fibreglass boards, Novodur
C1 – low degree of flammability	deciduous tree wood (oak, beech), Hobrex boards, plywood, Sirkolit, Werzalit, hardened paper (Formica),
C2 – medium degree of flammability	coniferous tree wood (pine tree, larch, spruce), chipboards and cork boards, rubber flooring (Industrial, Super)
C3 – high degree of flammability	fibreboards (Hobra, Sololak, Sololit), cellulose materials, polyurethane, polystyrene, polyethylene, foamed PVC



NOTE - In circumstances when there is a risk of temporary access of flammable gases or fumes, or during works when a temporary fire or explosion risk may possibly occur (such as gluing linoleum, PVC etc.) the boilers must be put out of operation long enough before the risk occurrence. **No items from flammable materials may be placed on the boilers or near them for a distance lower than the specified safe distance.** (more ČSN EN 13501-1)

12. Connecting boilers to the electric network

Boilers are to be connected to a 230 V, 50 Hz electric network with electric cord without plug. The mains supply cable in case of repair it must be replaced with the same type by the servicing organization. Connection, maintenance and reparation can be made only by a qualified person in accordance with valid regulations of the particular country.



CAUTION – the electric cord must not be fitted with a termination (male plug for a socket). A permanent connection into a distribution box must be made.

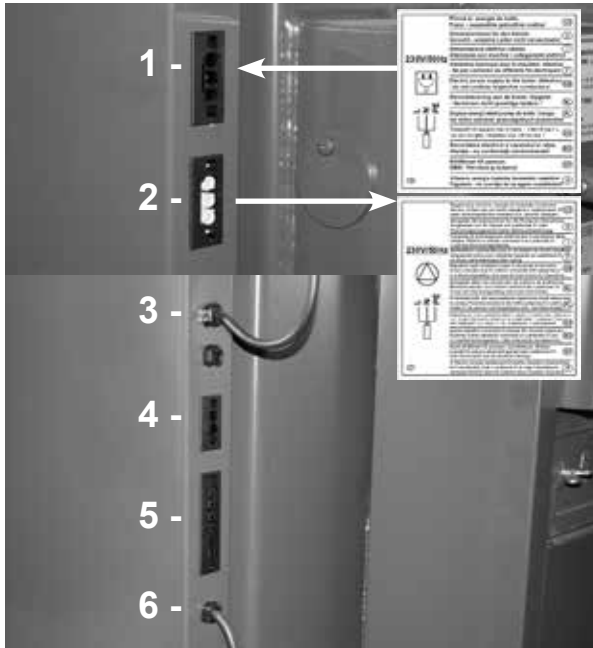
Mains cable must be regularly checked and maintained in the prescribed condition. It is forbidden to interfere in to the safety circuits and elements for safe and reliable operation of the boiler. If any damage of electrical equipment must be the boiler out of operation, disconnect from the mains and ensure a qualified repair according to applicable standards and regulations.



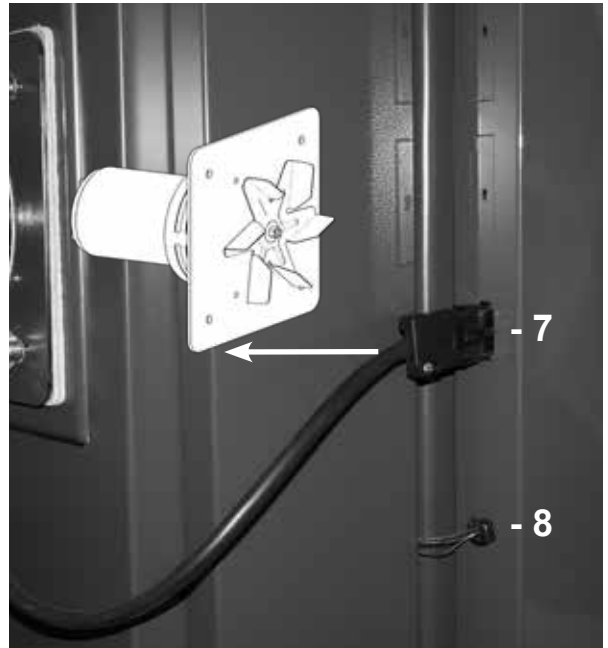
NOTE - **The default setting of exhaust fan is off to enable operation with pellets (parameter S6 = 11).** In case of erratic chimney draught the exhaust fan can be commissioned together with the pellet burner by setting the **parameter S6 = 4.**

In position 0 of the doubleswitch the suction ventilator is in operation when the temperature of waste gas is higher then set on the waste gas thermostat.

Connectors in side hoods of the boiler:

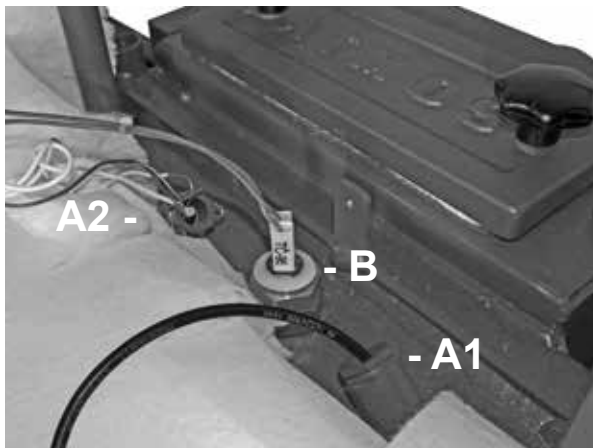


Connectors in the right side hood

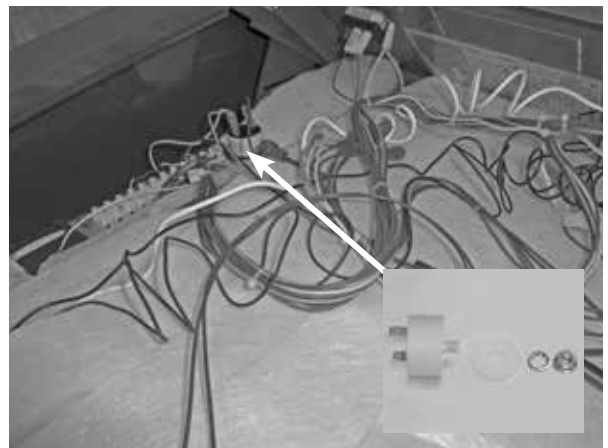


Connectors in the left side hood

- 1 - connector for power cord - black (L - brown, N - blue, PE - green/yellow)
- 2 - connector for pump in boiler circuit - light gray (L - brown, N - blue, PE - green/yellow)
- 3 - BELIMO actuator connection
- 4 - additional cable with 2-pin connector (R3 and R4) - to control the boiler actuator from burner
- 5 - connector for burner ATMOS connection model AC07X - (L1, L2, R, R2, N, PE)
- 6 - TK sensor (boiler water temperature) and TSV sensor (flue gas temperature) for connection into the burner ATMOS A25
- 7 - connector for extraction fan
- 8 - placing of capillary for flue gas thermostat and TSV sensor (flue gas temperature)



A1/2 - pockets for thermostats (sensors)
B - Pump safety thermostat TČ 95 °C



Capacitator for exhaust fan - 1 μ F

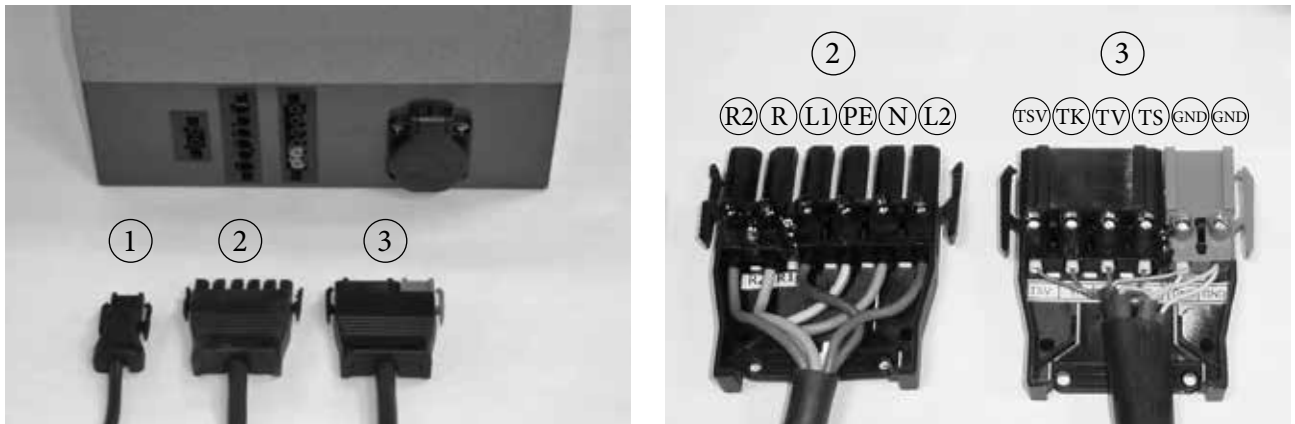
Boiler (burner) control per TS and TV temperature in accumulation tank

The range of accessories to these boilers include **two sensors KTF 20 with a 5 m which are not connected**. If desired, this function of the burner can be utilised upon simple connection of both sensors into the **6-pin connector** (blue-black colour) which comes out of the back part of the boiler and where are already connected sensors TK and TSV.

TV - temperature at the top part of tank – this temperature will initiate commissioning (start) of the pellet burner (**parameter S16 = 60 °C / default settings**)

TS - temperature at the bottom part of tank – this temperature will initiate shutdown (stop) of the pellet burner (**parameter S17 = 75 °C / default settings**)

Wiring of connectors



- 1 - additional cable with 2-pin connector (R3 and R4)
- 2 - supply cable with connector (L1, L2, R, R2, N, PE)
- 3 - connectors for temperature sensors (TS, TV, TK, TSV)

2 - supply cable with connector
(L1, L2, R, R2, N, PE)

R2 - red
R - grey
L1 - black
PE - green-yellow
N - blue
L2 - brown

3 - connector for temperature sensors

TSV - first conductor - waste gas temperature sensor
TK - first conductor - boiler temperature sensor
TV - first conductor - tank top temperature sensor
TS - first conductor - tank bottom temperature sensor
GND - second conductor from TSV and TK sensors
GND - second conductor from TV and TS sensors



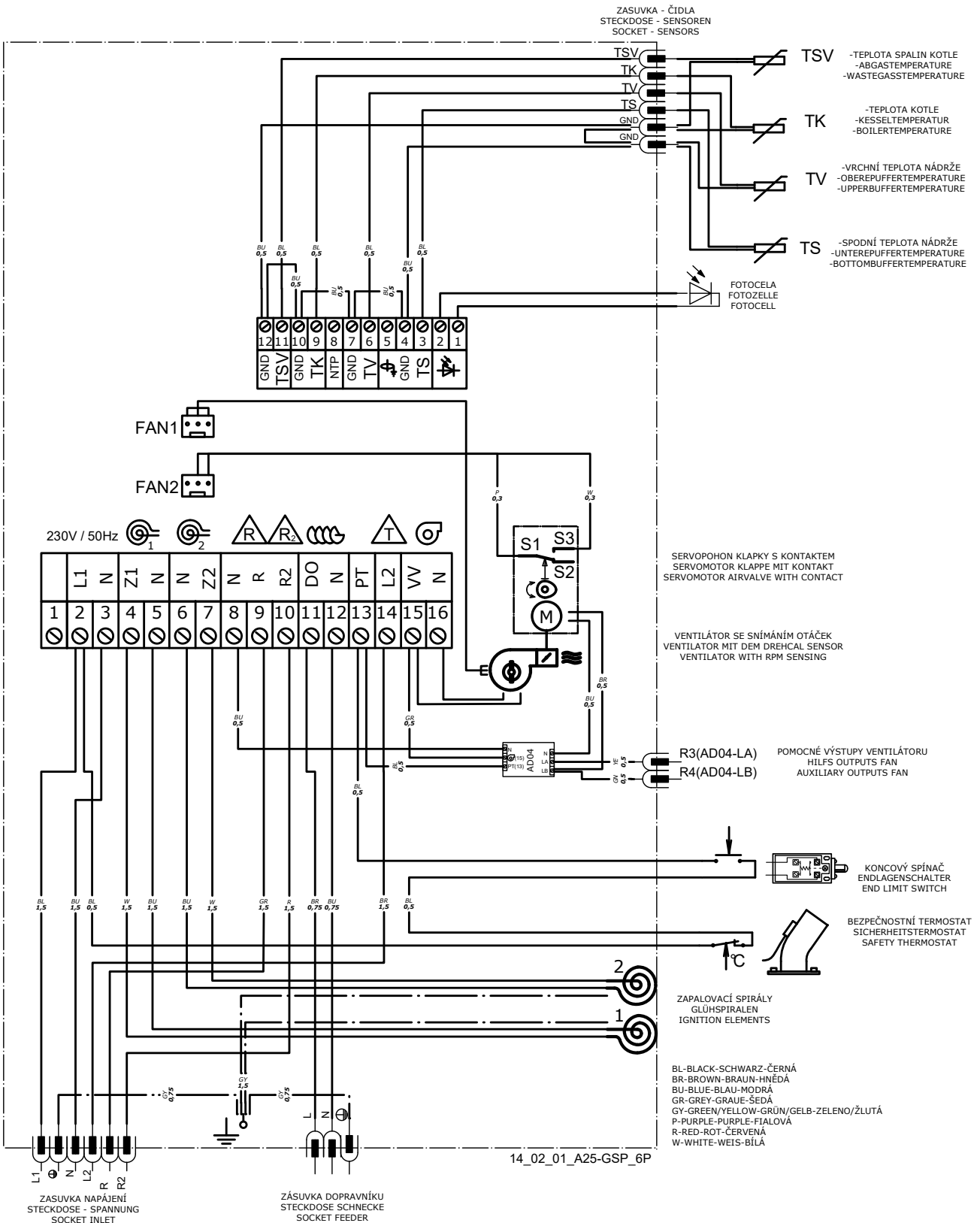
Conductors (colours) can be shuffled!



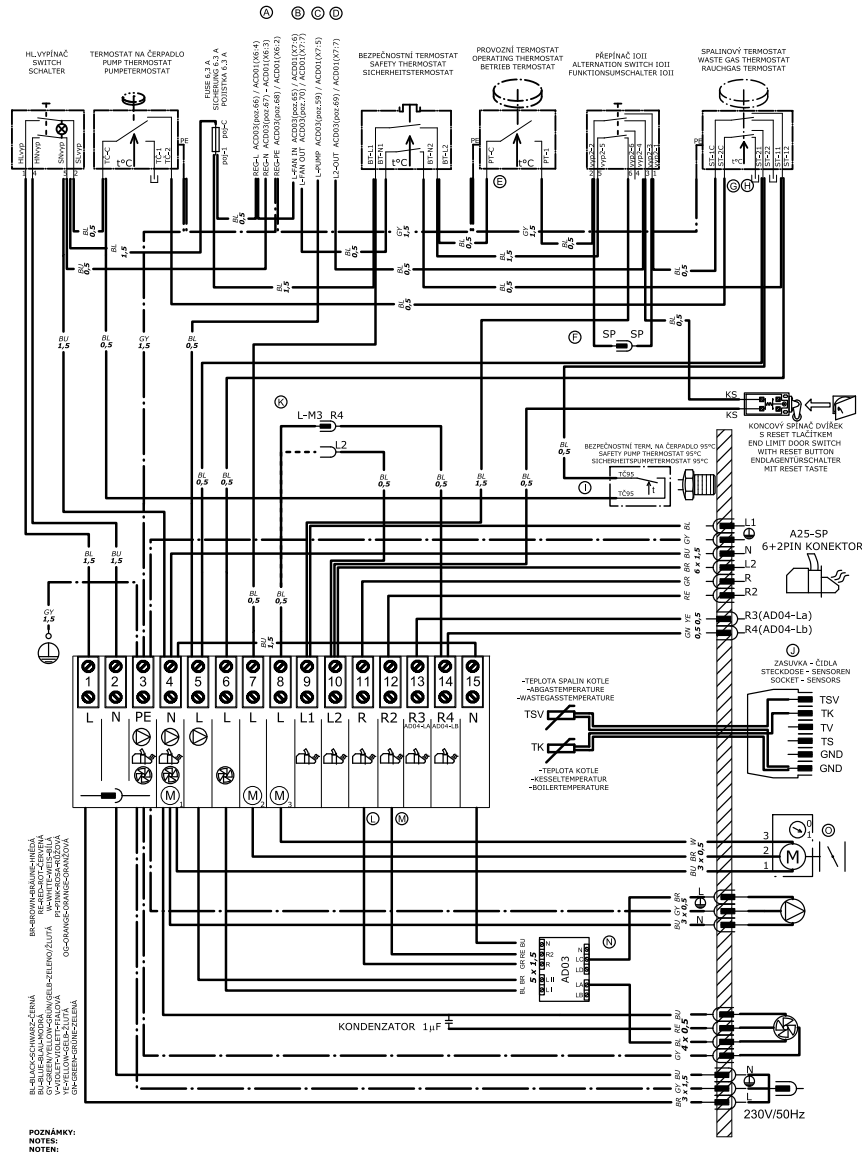
NOTE - When installing the **ATMOS ACD 03** equithermal controller in the boiler, we can use already installed sensors from the factory for connection directly to the regulator. These are the **AGF (TSV) and WF (TK)** sensors and the accumulation tank **PF (TV) and FPF (TS)** sensors, which we can use (connect) to the ATMOS ACD 03 controller.

13. Electric diagram of the burner ATMOS A25 - 6-pin connector - model AC07X - (R, R2, R3, R4, sensors TV, TS, TK, TSV)

EN



14. Wiring diagram connection of electromechanical regulation for DC18SP, DC25SP, DC30SPX, DC32SP boilers with exhaust fan type UCJ 4C52, AC07X model with 6-pin connector and module AD03 to control exhaust fan of the boiler and pump in the boiler circuit



POZNÁMKY:
NOTES:
NOTEN:

- A** VARIANTY NAPÁJECÍCH SVÝVEK "REG_L1,N,PE" (DUTINKA/FASTON 6,3) PRO ELEKTRONICKOU REGULACI. VARIANTY OF RESERVOIR POINTS "REG_L1,N,PE" (FERUL/FASTON 6,3) FOR ELECTRONIC REGULATION. ANSCHLUSSELEKTRONIKVARIANTEN "REG_L1,N,PE" (ADRENDHÜLSE/FASTON 6,3) FÜR ELEKTRONISCHE REGELUNG.
- B** PŘÍPOJNÝ SVÝVRKA "L1-FAN-IN" A "L1-FAN-OUT" KOTLOVÉHO VENTILÁTORU DO ELEKTRONICKE REGULE. RESERVOIR POINT "L1-FAN-IN" AND "L1-FAN-OUT" OF BOILER FAN TO THE ELECTRONIC REGULATION. ANSCHLUSSELEKTRONIK "L1-FAN-IN" UND "L1-FAN-OUT" DER KESSELGEBLÄSE FÜR DIE ELEKTRONISCHE REGELUNG.
- C** PŘÍPOJNÝ SVÝVRKA "L2-PUMP" KOTLOVÉHO ČERPADLA DO ELEKTRONICKE REGULE. RESERVOIR POINT "L2-PUMP" OF BOILER PUMP TO THE ELECTRONIC REGULATION. ANSCHLUSSELEKTRONIK "L2-PUMP" DER KESSELpumPE FÜR DIE ELEKTRONISCHE REGELUNG.
- D** PŘÍPOJNÝ SVÝVRKA "L2-OUT" HOŘÁKU DO ELEKTRONICKE REGULE. RESERVOIR POINT "L2-OUT" OF BURNER TO THE ELECTRONIC REGULATION. ANSCHLUSSELEKTRONIK "L2-OUT" DER BRENNER FÜR DIE ELEKTRONISCHE REGELUNG.
- E** KONKORTNÝ "P1-C" A "P1-T" ODPOJIT PŘI OVLÁDÁNÍ HOŘÁKU A VENTILÁTORU KOTLE ELEKTRONICKOU REGULACI. WHEN ELECTRONIC REGULATION CONTROL, BURNER AND FAN + CONNECTORS "P1-C" AND "P1-T" MUST BE UNCONNECTED. KONNEKTOREN "P1-C" UND "P1-T" ABKLEMMEN BEI DER BRENNERBEDIENUNG UND KESSELGEBLÄSEBEDIENUNG DER ELEKTRONICKE REGELUNG.
- F** KOTLE VENTILÁTORU KOTLE + PROFORKA "SP/SP" MEZI "V1P2+L1/V1P2-2" JE ZAPOJENÁ POUZE S FUNKCÍ "AUTOSTART" V HOŘÁKU ATMOS. KLEPME KESSEL FAN + KLEPME "SP/SP" ZWISCHEN "V1P2+L1/V1P2-2" IST VERBUNDEN NUR MIT FUNKTION "AUTOSTART" IN BRENNER ATMOS. KONTAKT "SP/SP" A "SP/SP" ODPÓJIT PŘI OVLÁDÁNÍ ČERPADLA KOTLE ELEKTRONICKOU REGULACI.
- G** WHEN ELECTRONIC REGULATION CONTROL, BOILER PUMP + CONNECTORS "S1-C" AND "S1-L2" MUST BE UNCONNECTED. KONNEKTOREN "S1-C" UND "S1-L2" ABKLEMMEN BEI DER KESSELpumPEBEDIENUNG DER ELEKTRONICKE REGELUNG.
- H** KONKORTNÝ "S1-C" A "S1-L2" ODPOJIT PŘI OVLÁDÁNÍ VENTILÁTORU KOTLE ELEKTRONICKOU REGULACI. WHEN ELECTRONIC REGULATION CONTROL, BOILER FAN + CONNECTORS "S1-C" AND "S1-L2" MUST BE UNCONNECTED. KONNEKTOREN "S1-C" UND "S1-L2" ABKLEMMEN BEI DER KESSELGEBLÄSEBEDIENUNG DER ELEKTRONICKE REGELUNG.
- I** KONKORTNÝ "T9-S" ODPOJIT PŘI OVLÁDÁNÍ ČERPADLA KOTLE ELEKTRONICKOU REGULACI. WHEN ELECTRONIC REGULATION CONTROL, BOILER PUMP + CONNECTORS "T9-S" MUST BE UNCONNECTED. KONNEKTOREN "T9-S" ABKLEMMEN BEI DER KESSELpumPEBEDIENUNG DER ELEKTRONICKE REGELUNG.
- J** SENZOR "TK" A ČIDLO "TSV" PRO HOŘÁK A25-SP. FÜHLER TK UND FÜHLER TSV FÜR BRENNER A25-SP.
- K** OVLÁDÁNÍ SERVOVÝKLVAPÍ: L43-R4 s hořákem A25-SP (s modulem AD04) / L43-L2 s hořákem A25 bez module AD04 (NEPOUŽÍVAT - KOLIZE S FUNKCÍ "AUTOSTART"). CONTROL OF SERVO AIR FLAP VALVE: L43-R4 with burner A25-SP (with module AD04) / L43-L2 with burner A25 without module AD04 (DO NOT USE - COLLISION WITH FUNCTION "AUTOSTART"). SERVOKLVAPÍBEDIENUNG: M43-R4 mit Brenner A25-SP (mit module AD04) / L43-L2 mit Brenner A25 ohne module AD04 (NICHT VERWENDEN - KOLLISSION MIT DEN FUNKTION "AUTOSTART").
- L** KODÍČ ODPOJIT PŘI OVLÁDÁNÍ VENTILÁTORU KOTLE ELEKTRONICKOU REGULACI. WHEN ELECTRONIC REGULATION CONTROL, BOILER FAN + CABLE MUST BE UNCONNECTED. KABEL ABKLEMMEN BEI DER KESSELGEBLÄSEBEDIENUNG DER ELEKTRONICKE REGELUNG.
- M** KODÍČ ODPOJIT PŘI OVLÁDÁNÍ ČERPADLA KOTLE ELEKTRONICKOU REGULACI. WHEN ELECTRONIC REGULATION CONTROL, BOILER PUMP + CABLE MUST BE UNCONNECTED. KABEL ABKLEMMEN BEI DER KESSELpumPEBEDIENUNG DER ELEKTRONICKE REGELUNG.
- N** MODUL AD03 K OVLÁDÁNÍ VENTILÁTORU A ČERPADLA KOTLE HOŘÁKEM A25-SP. MODUL AD03 FÜR OVLÁDÁNÍ VENTILÁTOR UND BOILERpumPE VOM BRENNER A25-SP. MODUL AD03 FÜR BEDIENUNG KESSELGEBLÄSE UND KESSELpumPE BEI DEM BRENNER A25-SP.
- O** MASTAVENÍ PŘEPÍNAČE SMYSLU OTÁČENÍ NA MOTORU SERVOVÝKLVAPÍ = 1. SET OF DIRECTION OF ROTATION ON SERVO AIR FLAP VALVE = 1. STELLEN DIP DREHRICHTUNG AUF DEM SERVOKLVAPÍ = 1.

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15. Obligatory ČSN EN standards dealing with boiler designing and installation

EN

ČSN EN 303-5	- Solid fuel boilers for central heating, hand or automatically stocked, nominal heat output of up to 500 kW - Terminology, requirements, testing and marking
ČSN 06 0310	- Heating systems in buildings – Design and installation
ČSN 06 0830	- Heating systems in buildings – Safety devices
ČSN 73 4201	- Chimneys and connecting flue pipes – Design, construction and installation of heating appliances
ČSN EN 1443	- Chimneys - General requirements
ČSN 06 1008	- Fire protection of heating appliances
ČSN EN 13501-1	- Fire classification of construction products and construction of buildings - Part 1: Classification using test data from reaction to fire tests
ČSN EN 1264-1	- Water based surface embedded heating and cooling systems – Definitions and symbols
ČSN EN 1264-2	- Water based surface embedded heating and cooling systems - Part 2: Floor heating: Prove methods for the determination of the thermal output using calculation and test methods
ČSN EN 1264-3	- Water based surface embedded heating and cooling systems - Part 3: Dimensioning
ČSN EN 442-2	- Heaters – Testing and test analysis
ČSN EN ISO 17225-2	- Solid biofuels – Fuel specifications and classes - Part 2: Graded wood pellets
ČSN EN ISO 17225-5	- Solid biofuels – Fuel specifications and classes - Part 5: Graded firewood
ČSN EN ISO 20023	- Solid biofuels – Safety of solid biofuel pellets – Safe handling and storage of wood pellets in residential and other small-scale applications
EU 2015/1189	- COMMISSION REGULATION implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for solid fuel boilers

Standards for evaluation of conformity and other technical standards:

ČSN EN ISO 12100:2011, ČSN EN ISO 14120:2017, ČSN ISO 1819:1993, ČSN EN ISO 13857:2022, ČSN EN ISO 11202:2010, ČSN EN ISO 3746:2011, ČSN EN 15036-1:2007



CAUTION – the boiler must be installed in compliance with a design prepared in advance. Installation may only be carried out by persons trained by the manufacturer.

16. Choice and connection method of control and heating elements

Boilers are provided to the user with the basic boiler performance control elements compliant with requirements for convenient heating and its safety. The regulation ensures that the required temperature of the water exiting the boiler (80 - 90 °C) is adhered to. Boilers are fitted with an integral pump thermostat for switching the pump in the boiler circuit (factory setting 70 °C) and with pump safety thermostat TČ 95 °C.

Connection of these elements is illustrated in the wiring diagram. Each pump in the system must always be controlled to avoid a temperature drop of water returning to the boiler under 65 °C. When connecting the boiler without an accumulation tank or equalizing tank, the pump placed in the heated building circuit must be switched on and off by an individual thermostat or electronic regulation so that it only operates when the pump in boiler circuit operates.

If there is an adequately functioning gravity water circulation between the boiler and the system, which prolongs the required temperature build-up, the value of the thermostat designated for switching the boiler circuit pump can be reduced.

Setting the required water temperature for the building is always achieved by means of a three-way mixing valve. The mixing valve can be regulated manually or by electronic regulation, which contributes to a more convenient and economical operation of the heating system. **The connection of all the elements is designed to suit specific conditions of the heating system.** Electric installations related to the additional equipping the boilers with the above mentioned elements must be carried out by an expert in compliance with valid ČSN EN standards.



When installing the boiler, we can use a closed expansion tank. However, an open tank may also be used if permitted in the standards of the specific country. The boiler must always be installed in a way which prevents overheating (and subsequent damage) even during a power cut. It is because the boiler has certain momentum.



There are several ways of protecting the boiler from overheating. Connecting an overheat prevention cooling loop with a TS 131 3/4 ZA (95 °C) or WATTS STS 20 (97 °C) valve to the public water system. In cases of personal wells, the boiler can be additionally protected by using a back-up power supply (battery with an exchanger) for operation back up of at least one pump. Another option is connecting the boiler to an after-cooling tank and reversal zone valve.



When installing the boiler, position the rear section 10 mm higher in order to facilitate circulating and air-bleeding.

For the heating system regulation we recommend regulation elements:

ATMOS ACD 03 / 04 - Eqvithermal controller set for solid fuel boilers

17. Boiler corrosion protection

EN The specified solution is connecting the boiler with Laddomat 22 or thermoregulatory valve, which can separate the boiler circuit from the heating circuit (primary and secondary circuits), and provide **minimum of 65 °C for water returning to boiler**. As other recommended connection it is also possible to keep the minimum temperature of the returning water (65 - 75 °C) by utilising a three-way mixing valve with an actuator and electronic controller ACD 03 (ACD 04).

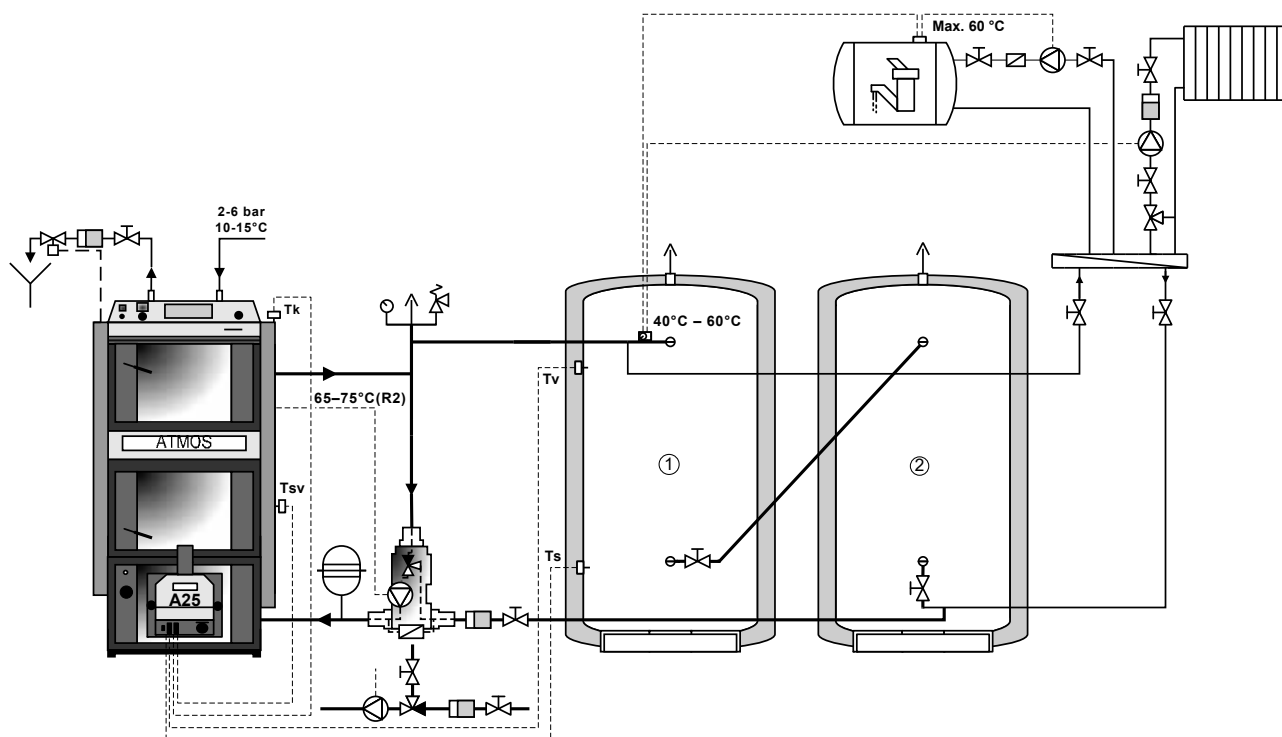
The higher the temperature of water returning to the boiler, the fewer tars and acids condensing; which damage the boiler. **Temperature of the outgoing water must permanently range between 80 - 90 °C**. The combustion products (waste gas) temperature must not drop **below 110 °C** during normal operation. Low waste gas temperature causes condensation of tars and acids even when the specified outgoing water temperature of (80 - 90 °C) and returning water temperature of (65 °C) are adhered to. These conditions may occur when using the boiler to heat domestic hot water (DHW) in summer, or when heating only a section of the building. In this case we recommend connecting the boiler with accumulation tanks, or daily firing-up.



CAUTION - we always recommend to connect DC18SP, DC25SP, DC30SPX and DC32SP boilers with at least **buffer tank 500 - 1000 l** for optimal control of the boiler operation according **two sensors (TV and TS) on the accumulation (buffer) tank**.

18. Connection of DCxxSP(X) boilers with two accumulation tanks (connected in series) for burner control on the basis of TS and TV sensors, control of the boiler, burner and boiler pump based on TSV and TK sensors

Function for automatically starting the burner after the wood burns out



INFO - The TK sensor on the boiler, waste gas sensor TSV on the side of the flue pipe, sensors TV and TS on the accumulation tank, all connected directly to the burner. AD03 module inserted under the boiler control panel and connected to terminal box of the boiler (factory setting) where it controls boiler extraction fan and the pump in the boiler circuit.

In this connection the pellet burner charges only the first accumulation tank.

Required accessories (supplied with the boiler): AD03 module, two KTF 20 sensors with a 5 m cable (TV and TS), flue gas temperature sensor TSV - AGF2 up to 400 °C (a built-in part of the boiler), TK boiler water temperature - KTF 20 with 2 m cable

System configuration of parameters: S6 = 11, S14 = 13, S15 = 2, S34 = 2, S40 = 1, S16 = 60, S17 = 75 (reserve R - parameter S6 controls the boiler fan, reserve R2 - parameter S14 controls the boiler pump)



CAUTION – in DCxxSP(X) boilers the function for controlling solar heating directly from the pellet burner cannot be used. Flue gas sensor TSV does not show current temperature of the flue gas but a specific temperature required for functions of the burner.

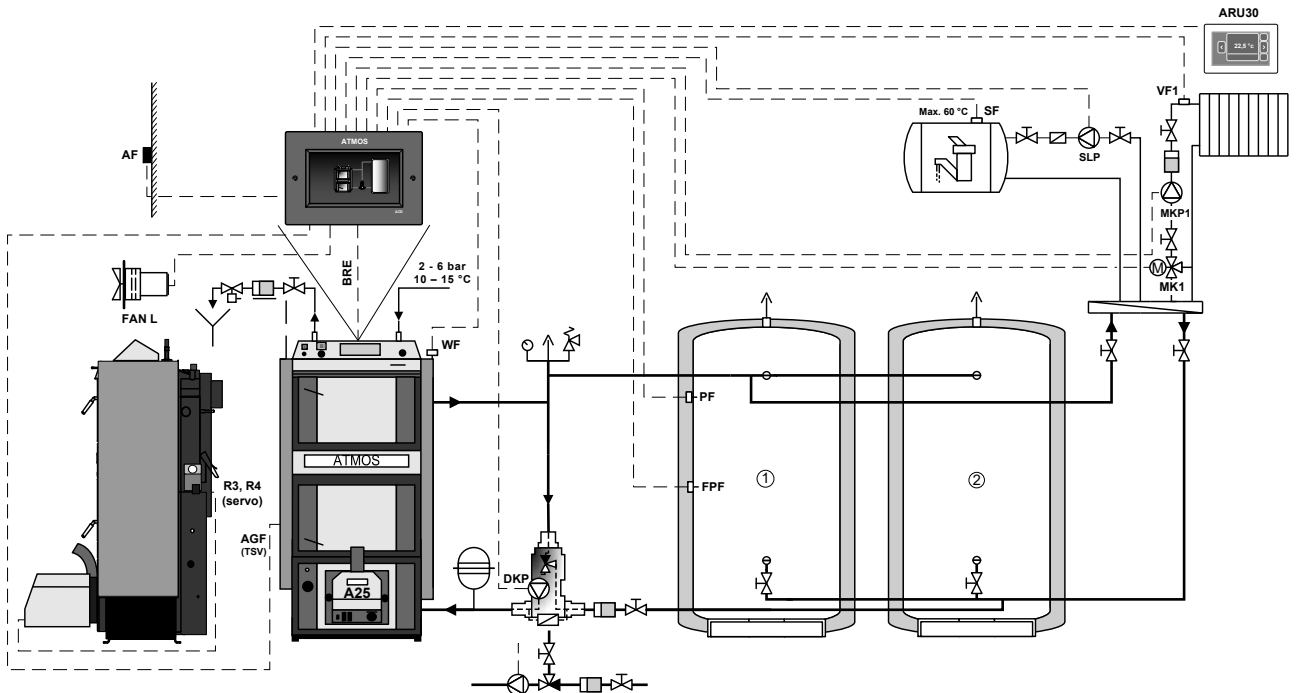


INFO - When installing regulator ATMOS ACD01 we recommend to use hydraulic scheme number 0003. ACD01 regulator do not control boiler operation, but control only heating system including DHW heating.

19. Connection of DCxxSP(X) boiler with two accumulation tanks (connected in parallel).

Boiler, burner and heating system operation is controlled from the ACD 03 (04) controller.

Function for automatically starting the burner after the wood burns out



Combined boiler controlled with a controller with manual (wood) and automatic (pellet burner) stocking controlled on the basis two sensors on the first accumulation (buffer) tank (PF and FPF sensors).

The ACD 03/04 controller allows the burner operation (BRE) to be switched on and off as required by the operator (for example when cleaning the boiler). Automatic start of the pellet burner after all wood is burnt out (according to WF and AGF sensors). Switching sources - wood/pellets. It also controls the operation of the pump in the boiler circuit (DKP), one heating circuit (MK1) and DHW heating tank (boiler) (SLP).

The boiler flap with servo actuator is controlled with outputs (R3 a R4) from the burner.

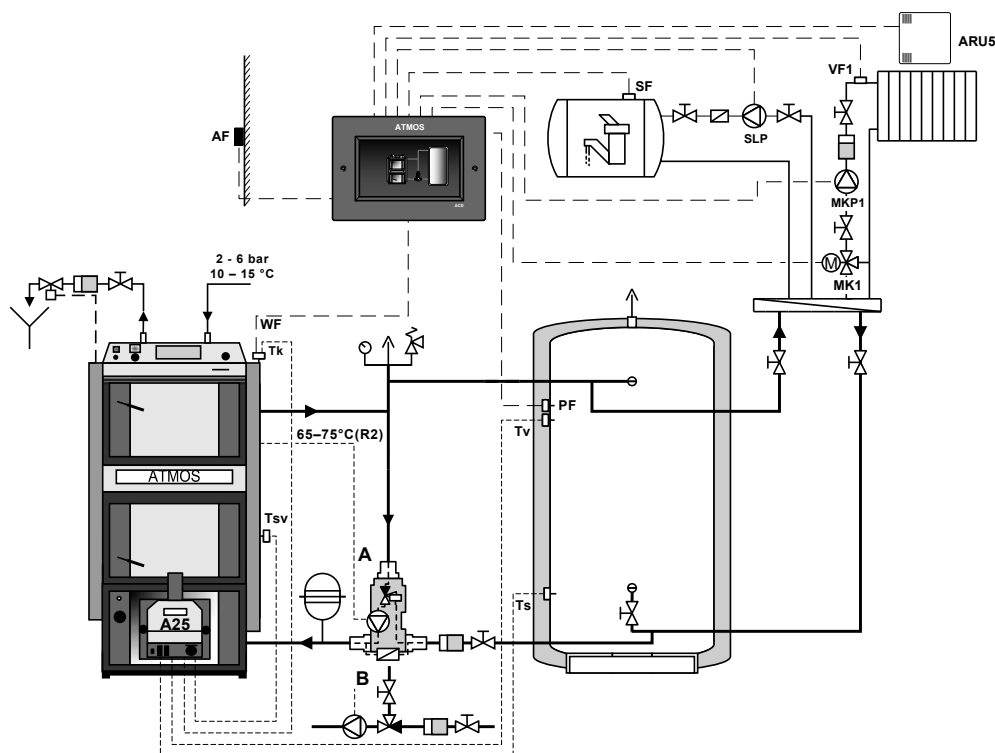
In this connection the pellet burner charges both accumulation tanks so it is necessary to close the valve on the second accumulation tank when heating with the pellet burner, so that both tanks are not charged at the same time or place the FPF sensor in the middle of the accumulation tank (heating both tanks with a burner up to 1/2).

System configuration of parameters: S6 = 1, S14 = 0, S15 = 1, S34 = 0
(rezerve R – not used, rezerve R2 – not used)



INFO - DCxxSP(X) and DCxxGSP boilers are factory equipped with installed **AGF (TSV) and WF (TK) sensors**, which can be used (connected) to the **ACD 03 (04) controller**. Likewise we can use **PF (TV) and FPF (TS) sensors**, which are included in the boiler delivery.

20. Connection of DCxxSP(X) boiler with accumulation tank for burner control on the basis of TS and TV sensors, control of the boiler, burner and boiler pump based on TSV and TK sensors Function for automatically starting the burner after the wood burns out



INFO - The TK sensor on the boiler, waste gas sensor TSV on the side of the flue pipe, sensors TV and TS on the accumulation tank, all connected directly to the burner. AD03 module inserted under the boiler control panel and connected to terminal box of the boiler (factory setting) where it controls boiler extraction fan and the pump in the boiler circuit.

In this connection the pellet burner charges only the first accumulation tank.

Required accessories (supplied with the boiler): AD03 module, two KTF 20 sensors with a 5 m cable (TV and TS), flue gas temperature sensor TSV - AGF2 up to 400 °C (a built-in part of the boiler), TK boiler water temperature - KTF 20 with 2 m cable

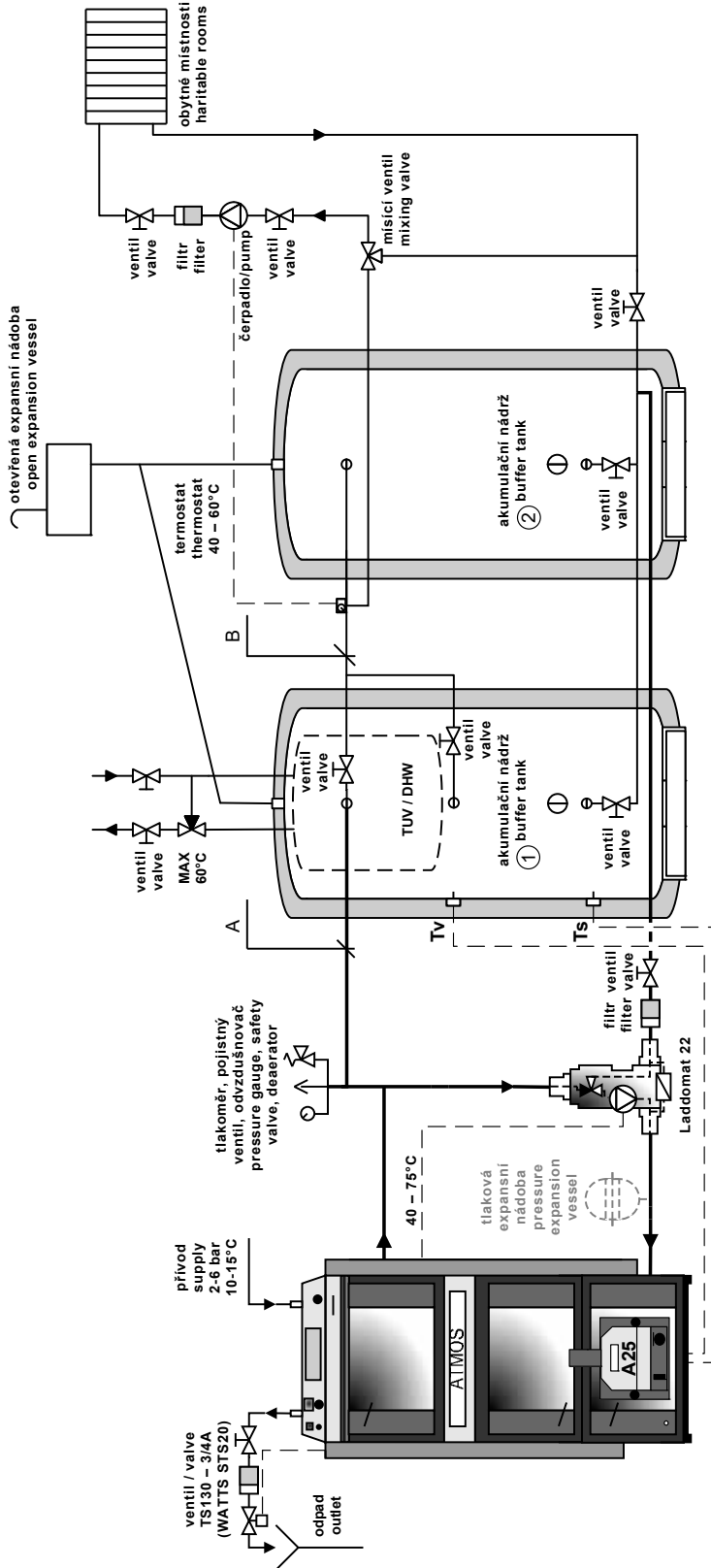
System configuration of parameters: S6 = 11, S14 = 13, S15 = 2, S34 = 2, S40 = 1, S16 = 60, S17 = 75 (reserve R - parameter S6 controls the boiler fan, reserve R2 - parameter S14 controls the boiler pump)

The ACD 03 controller controls only the operation of the heating system (according to the tank temperature (PF sensor)), namely one heating circuit (MK1) and DHW heating tank (boiler) (SLP). ATMOS ACD 03 controller situated on the wall in the ATMOS SWS 18 box.



CAUTION – in DCxxSP(X) boilers the function for controlling solar heating directly from the pellet burner cannot be used. Flue gas sensor TSV does not show current temperature of the flue gas but a specific temperature required for functions of the burner.

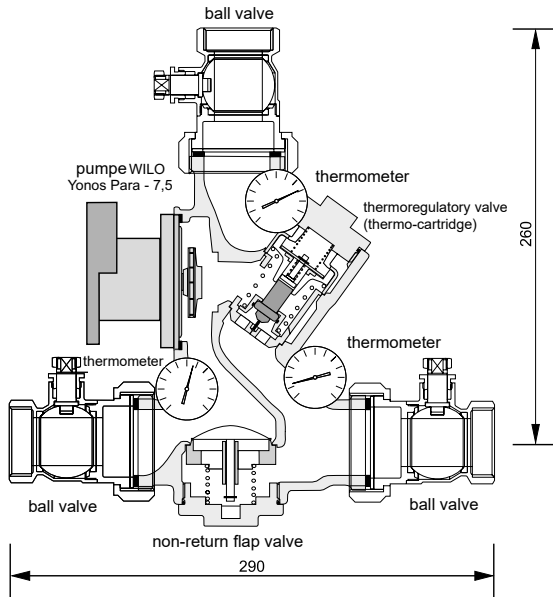
21. Recommended wiring diagram with Laddomat 22 and accumulation tanks



Minimum permitted pipeline diameters if boiler connected with accumulation tanks

Boiler type and output	Section A		Section B	
	in copper	in steel	in copper	in steel
DC18SP	28x1	25 (1")	28x1	25 (1")
DC25SP	28x1	25 (1")	28x1	25 (1")
DC30SPX, DC32SP	35x1,5	32 (5/4")	28x1	25 (1")

22. Laddomat 22



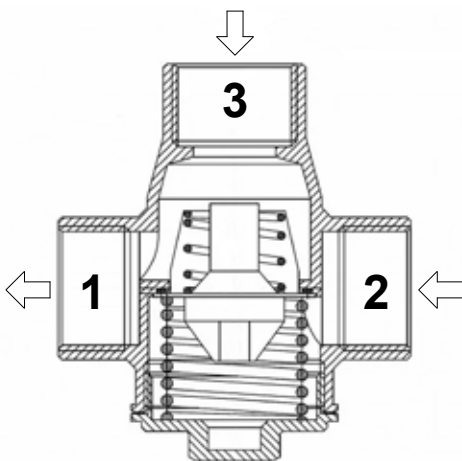
With its construction, Laddomat 22 replaces the traditional connection composed of individual parts. It is composed of a cast-iron body, thermoregulatory valve, pump, non-return flap valve, ball valves and thermometers. When the water temperature reaches 78 °C, the thermoregulatory valve opens the water supply from the storage tank. The connection with Laddomat 22 is considerably easier and therefore, we recommend it. A spare thermo-cartridge of 72 °C is supplied with the Laddomat 22 device. It is used for boilers over 32 kW.

OPERATION DATA	
Max. operating pressure	0,25 MPa / 2,5 bar
Design pressure	0,25 MPa / 2,5 bar
Test pressure	0,33 MPa / 3,3 bar
Max. operating temperature	100 °C



WARNING - For boilers with an output from 15 up to 100 kW we recommend using **Laddomat 22**, which is factory fitted with thermo-cartridge of 78 °C.

23. Thermoregulatory valve



Thermoregulatory valve type TV 60 °C (65/70/72/77 °C) is used with solid fuel boilers. When the boiler water temperature reaches +60 °C (65 °C), the thermoregulatory valve opens and fluid from the building heating circuit (accumulation tanks) (2) enters the boiler circuit (3→1). Inlets 1 and 3 always remain open. This ensures that the minimum temperature of the water returning to the boiler is maintained. If need be, a thermoregulatory valve set to a higher temperature (E.g. 70/72/77 °C) may be used.

Recommended sizes of the thermoregulatory valve TV 60 °C (65/70/72/77 °C).

For boilers: DC18SP, DC25SP DN 25
 DC30SPX, DC32SP DN 32

24. Operating system with accumulation tanks when burning wood

Ignite the boiler and allow the accumulation tanks to “charge” to the required water temperature of 90 - 100 °C by the boiler’s maximum output operation (2 to 4 loads). Then leave the boiler to stop burning. Then keep withdrawing heat from the storage utilising three-way valve for a period of time corresponding to the size of accumulation tanks and the external temperature. In the heating season (and if adhering to specified min. accumulation tanks volumes – see chart) this could take 1 – 3 days. If the accumulation method cannot be used, then we recommend using at least one tank of 500 - 1000 l volume for equalising the boiler start-ups and run-outs of heating system.

MINIMUM ACCUMULATION TANK VOLUMES			
Type	DC18SP	DC25SP DC30SPX	DC32SP
Output	15 - 20	25 - 30	30 - 35
Volume	1000 - 1500	1500 - 2000	2000 - 2500

The standard ATMOS accumulation tanks provided

TANK TYPE	VOLUME (l)	DIAMETER (mm)	HEIGHT (mm)
AN 500	500	600	1970
AN 600	600	750	1611
AN 750	750	750/790*	2010/1750*
AN 800	800	790*	1910*
AN 1000	1000	850/790*	2065/2210*

* type DH

Tank insulation

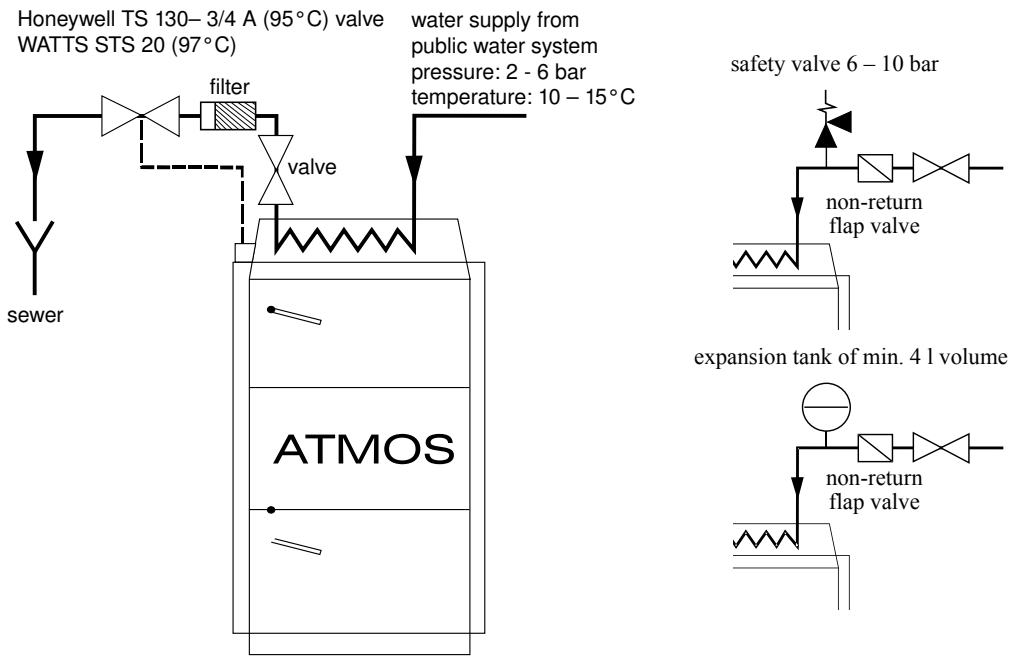
A suitable solution is joint mineral wool insulation of the particular number of tanks (of required volume) placed together into a plasterboard structure, or additional filling with granular insulation. When using the mineral wool, the specified minimum insulation thickness is 120 mm. Another option is purchasing tanks in a leather-cloth housing from our offer (see the price list).

Advantages

When burning fire wood, the installation with accumulation tanks provides several advantages:

- lower fuel consumption (by 20 – 30 %), the boiler operates in full output and at an optimal effectiveness of 83 - 89 % until the complete combustion of the fuel
- prolonged boiler and chimney service life – minimum formation of wood-tars and acids
- possibility to combine it with other heating methods – accumulated electric power, solar collectors
- combination of wall radiators and floor heating
- convenient heating and ideal fuel combustion
- environmentally friendlier heating

25. Connection of overheat protecting cooling loop with a safety valve Honeywell TS 131 - 3/4 ZA or WATTS STS20 (valve opening temperature 95 - 97 °C)



CAUTION – in compliance with the EN ČSN 303-5, the cooling loop must not be used for any other purpose than overheat protection (never for heating hot potable water)

The TS 131 - 3/4 ZA or WATTS STS 20 valves, the sensor of which is placed in the rear of the boiler, prevent overheating in the following way: if the boiler water temperature rises above 95 °C, the valve opens and allows water from public water supply system to enter the cooling loop. This water then absorbs the excessive energy and exits to the sewer. In case that a non-return flap valve has been installed to the cooling loop water inlet for the purpose of preventing reversed water flow (which might be caused by pressure drop in the public water supply system), the cooling loop must be fitted with a 6 – 10 bar safety valve or with an expansion vessel of minimum 4 l volume.

26. Operating instructions



CAUTION - The boiler may only be put in operation by a qualified person in accordance with valid regulations and standards, trained by the manufacturer. Wood boilers must be operated in compliance with the instructions stipulated in this manual so that satisfactory and safe functioning is achieved.

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Preparing boilers for operation

Before putting boilers into operation, it is necessary to ensure that the system has been filled with water, and air-bled.

Boiler setting and launching when burning pellets

Before burning pellets, several steps must be carried out:

Ensure that all three doors are fully closed. Secure the lower door with an M12 screw to prevent accidental opening. Check that the burner is well drawn towards the door through its gasket and the limit switch position stop (thrust block) is in its place.

Ensure that the tube between the burner and conveyor so that it is stretched and at a sufficient angle to ensure that the pellets can drop without difficulty into the burner. They must not cumulate inside the tube! The screw conveyor should be at a maximum of 45° angle otherwise the boilers might not reach their nominal output.

Check and if necessary clean the bottom cleaning lid on the flue-gas duct, that the combustion gases could freely leave in to the chimney!

Close the ignition valve used when loading firewood in wood-burning mode.

Load pellets into the conveyor by plugging the conveyor's lead into a regular 230V 50Hz electric socket. When the pellets start dropping from the conveyor, slide the cable back into its socket on the burner and proceed with setting up the boiler.

Depress the limit switch button situated to the left or right near the upper door. This button springs up and switches the pellet burner in cases where the upper door has been opened before or during the burner's operation. This is a necessary safety feature stipulated by valid standards.

Turn the main switch of the boiler (green) and move the change-over switch /6/ in position II (pellet burner) and set the desired temperature on the control thermostat (80 - 90 °C). Hereby the boiler will be put into operation.

Heating with pellets

Pellet firing is enabled by means of the **air valve with servo drive** located at the inlet for total combustion air in the boiler at **fully closed position**. Closing this valve ensures that no false air enters the boiler when firing pellets. Adjustment of this valve is fully automatic.

The default setting of exhaust fan is off to enable operation with pellets (parameter S6 = 11). In case of erratic chimney draught the exhaust fan can be commissioned together with the pellet burner by setting the **parameter S6 = 4**.

This change requires re-setting of the opening of the burner fan valve. There is no other change performed.

Control thermostat - in case the **sensors TS and TV are not connected (parameter S15 = 1 / default setting)**, this device controls the burner operation depending on the temperature of water in boiler.

If the **sensors TS and TV are connected (parameter S15 = 2) behind the reservoir**, the control thermostat will serve as the secondary safety thermostat only. For this reason, set the control thermostat to its maximum (95 °C). The boiler is controlled by two temperature values (TS, TV) on the accumulation tank.



INFO - in case the control thermostat deactivates the pellet burner before the required low temperature is reached on the reservoir TS, proceed as follows:

- optimise the flow through the boiler circuit – pump set to its maximum, the control valve at the short of boiler circuit throttled down as needed (45° angle / half cross-section).
- reduce the required TS temperature (**parameter S17 = 75 °C / default setting**)
- double-check the set burner output, which must match the output of pump used and the diameter of piping in the boiler circuit.

Automatic start of pellet burner after wood burnout

The Atmos A25 burner modified for SP models is provided with **default settings featuring the activated automatic launch function** after burnout of wood. The launch of this burner is controlled by the temperature of waste gas (TSV) and the boiler temperature (TK) - default settings (**parameter S34 = 2**).

This is why boilers leave the factory fitted with sensors of the boiler temperature (**TK**) and the waste gas (**TSV**) respectively.

These sensors are provided with cable plugs in the rear side of the boiler fitted with **6-pin connectors** to be inserted into the pellet burner.

DCxxSP(X) boilers are provided with the **special additional connecting cable** fitted with **2-pin connectors to control the flap with actuator on the boiler from the pellet burner. This cable is essential for normal operation of the boiler** (included within burner accessories).

Automatic Start

For **wood heating, swich the selector switch to the top position (I)** – the wood burning symbol.

To start **heating with pellets, swich the selector switch the bottom position (II)** – the pellet burner symbol. Model DCxxSP(X) with the automatic start function activated (default settings) allows **swich the selector switch at any time**, regardless of fuel being fired.

Setting the **selector** switch into the position for pellets with initiate the burner **DIAGNOSTICS** to determine the existing boiler status (waste gas temperature, boiler temperature, temperature inside the buffer tank).

In case the preconditions for immediate burner launch are not met, that means the boiler **is at the wood firing or burnout stage, when the magazine still contains sufficient quantity of wood, the burner will be set into standby. The exhaust fan on the boiler will remain in operation** (provided the parameter S6 = 11, 4 has been set) **to ensure proper burnout of wood.**

The burner display will show the AUTOSTART message at this stage.

If the **AUTOSTART message keeps flashing slowly**, the precondition defined for particular function (S34 = 1 or S34 = 2) has not been met – the wood burnout is still in progress.

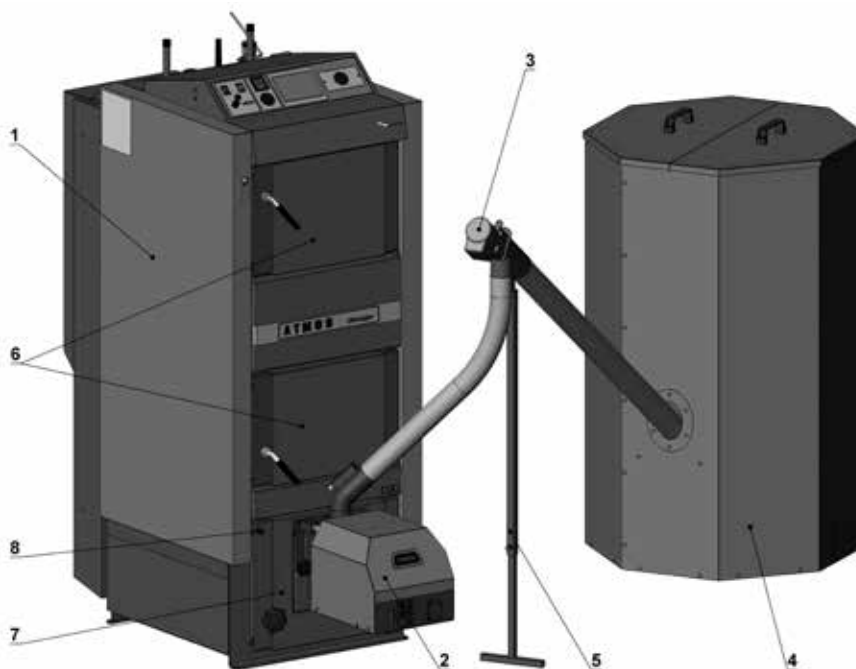
If the **AUTOSTART is flashing fast** (wood burnout is completed), the precondition defined by the particular function has not been met (S15 = 2), which means that the temperature TV on the accumulation (buffer) tank has not dropped below the set value given by the parameter S16 (the energy from the accumulation tank has not been exhausted). This condition may also occur, if the control thermostat on boiler has not been activated or if the end limit switch on the top stoking doors has not been pushed (no star symbol lit up at the thermostat symbol in the burner display).

Once all the preconditions for burner launch have been met (wood burnt out, accumulation tank exhausted), it will be commissioned. **The exhaust fan will not be in use during regular pellet firing process (parameter S6 = 11).**



CAUTION - never forget to push limit switch with a push-button!

Boiler system with an external storage container and conveyor



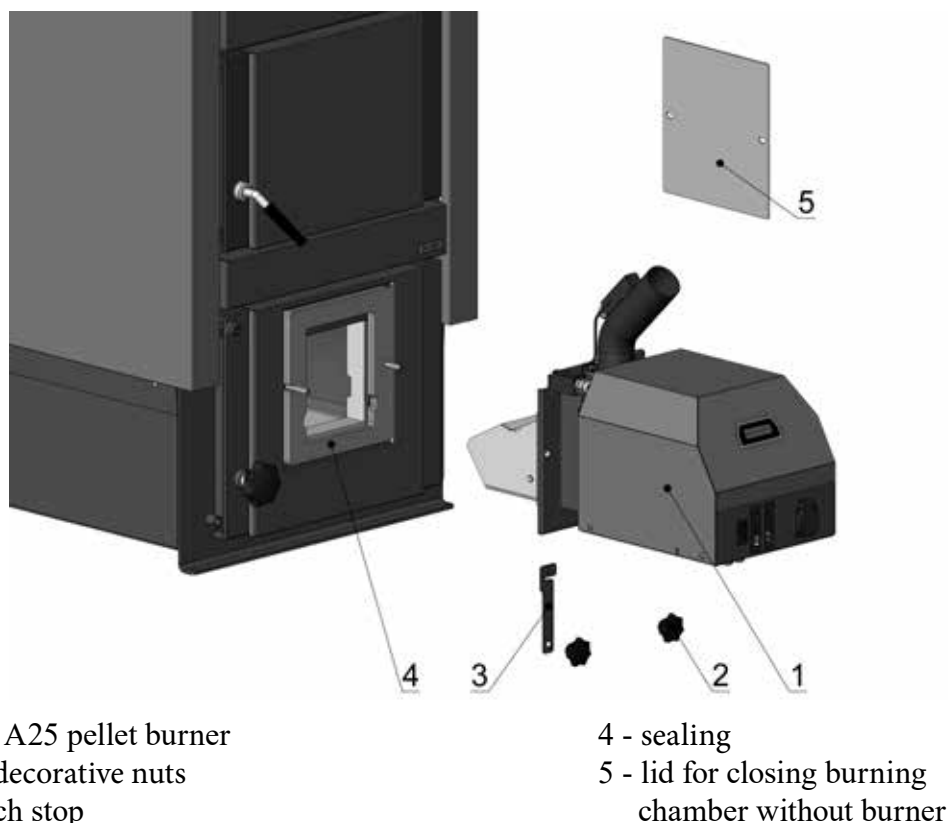
- 1 - boiler ATMOS DCxxSP(X)
- 2 - pellet burner ATMOS A25
- 3 - conveyor
- 4 - pellets silo (250, 500 a 1000 l)

- 5 - conveyor leg
- 6 - doors for burning wood
- 7 - door with inbuilt burner
- 8 - door locking screw



INFO - We recommend you to clean the fuel container from dust and dirt that have accumulated in the bottom part of the container during the heating season once a year, best after the heating season.

Connecting the burner ATMOS A25



CAUTION – the burner must be well drawn towards the door.



When the boiler is put in operation for the first time, an installer or qualified technician should adjust combustion of the burner with the use of a flue gas analyzer the sensor of which is to be inserted into the measurement place (opening) in the flue gas duct at the back of the boiler (position 40 on the page 9). At this place we do not measure waste gas temperature because there is exchanger along in waste gas duct. Waste gas temperature and chimney draught is measured 0,5 m away from the boiler in flue duct. Always adjust the burner in a stabilized condition, approx. 30 - 60 minutes after fuel ignition.

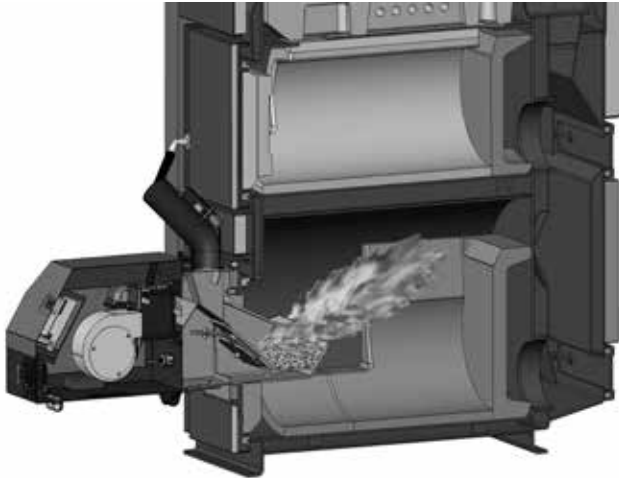
If there is no flue gas analyzer available for the boiler adjustment at the moment, you can adjust the pellet burner „roughly by guesswork“. Set the quantity of fuel and combustion air in such a way to stop the flame just before the opposite wall (the flame should not touch the wall). The flames must not turn at the opposite wall in any case. In such a case add combustion air by opening the flap of the burner fan or reduce the fuel supply.

After the adjustment of the burner the operation of the boiler is completely automatic, the customer only replenishes fuel and removes ash in regular intervals.

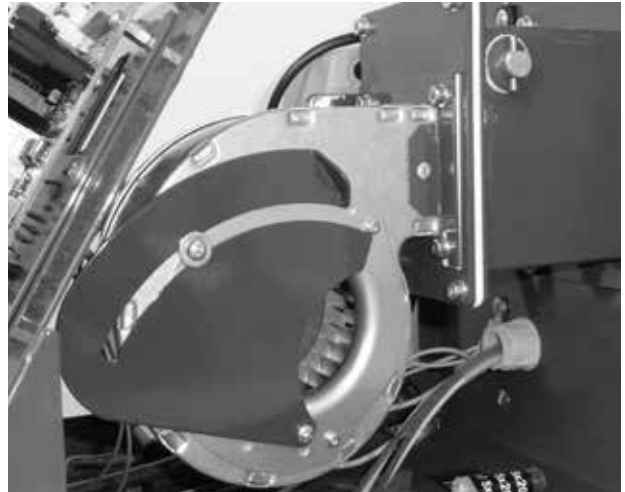


CAUTION - The adjustment by the flame length does not replace adjustment made with the use of a flue gas analyzer by a qualified person. Changes of settings of the boiler and burner may only be performed by a person that is qualified in accordance with all the valid regulations and ČSN EN standards. Before the adjustment of the burner the combustion chamber of the burner and boiler and the chimney with the flue must be completely cleaned.

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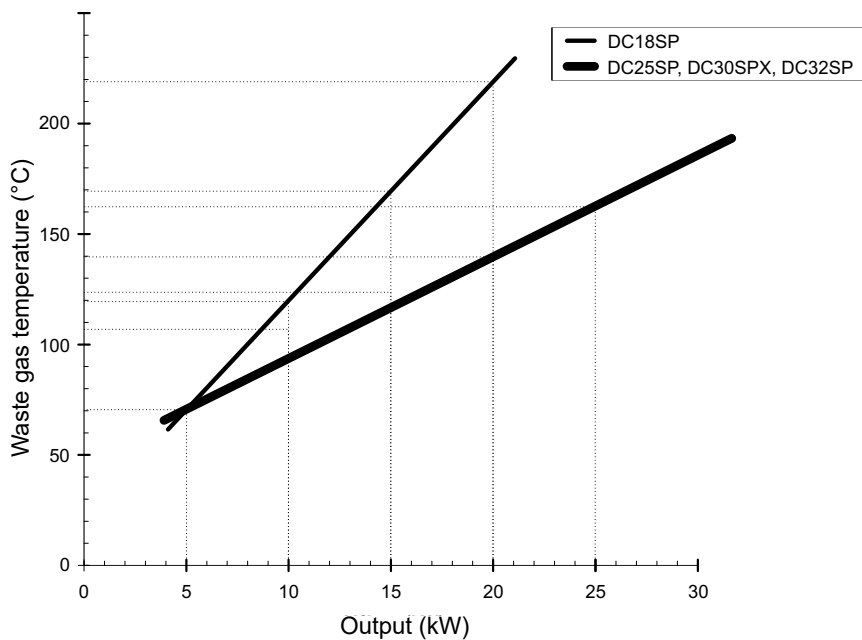


Burner flame ending 1 - 3 cm before the opposite wall



Fan of the burner with an air flap
By opening the air flap you will reduce the length of the flame

Relation of waste gas temperature to boiler (burner) output when burning pellets



INFO - According to the relation of waste gas temperature to output we can easily estimate the actual output of the burner. The displayed curves correspond to a stabil state after 2 hours from pellet burner start in the cleaned boiler.

Boiler-room with a separate pellet tank 500 l and conveyor 1,5 m

Description:

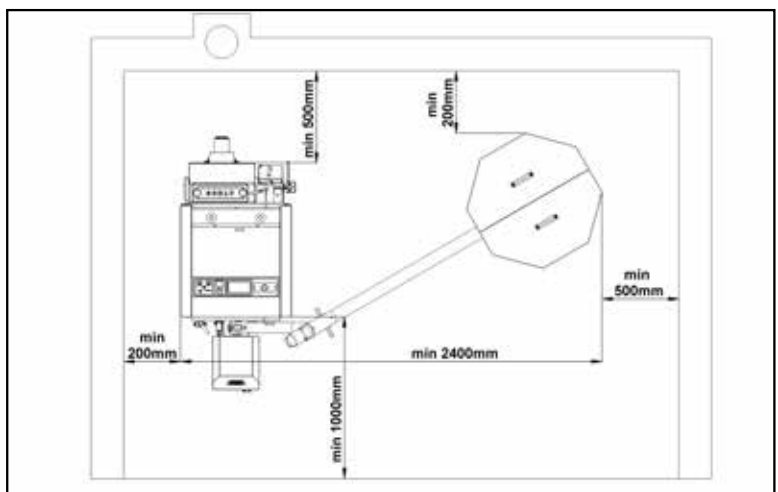
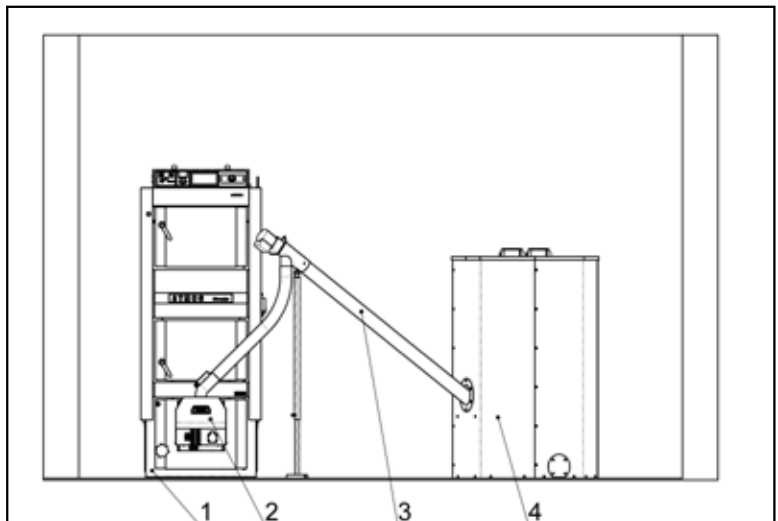
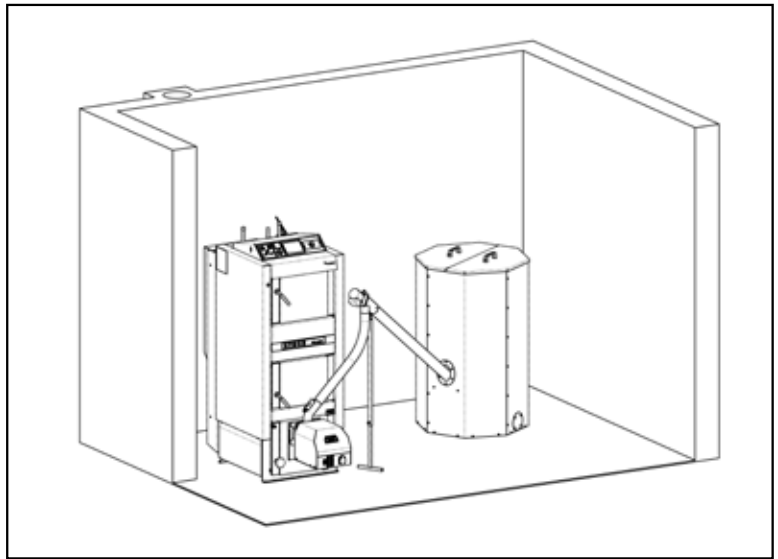
A boiler-room with a separate container with a volume of 500 l that can hold 325 kg of pellets. The length of the conveyor should be at least 1.5 m to achieve the length of the hose between the burner and conveyor of at least 20 cm (ideally 30 - 60 cm) for safety reasons. The maximum length of the hose should not exceed 1 m.

Every conveyor is provided with a support leg. In confined spaces we recommend that the leg be replaced with a chain hanging from the ceiling to which the conveyor is attached (contained in the conveyor delivery). The angle of the auger conveyor should be 45° at the most.

External pellet containers are delivered in the sizes of 250 l, 500 l and 1000 l as standard, which is sufficient for 3 to 14 days of heating depending on the required output. The bigger container, the better.

Legend:

- 1 - Boiler
- 2 - Burner
- 3 - Conveyor
- 4 - Pellet tank



Boiler-room with textile pellet silo 5,5 - 7,9 m³ and long conveyor

Description:

Boiler-room with external textile pellet silo placed next to the boiler or in to the next room with direct feeding of pellet in to the burner by long conveyor.

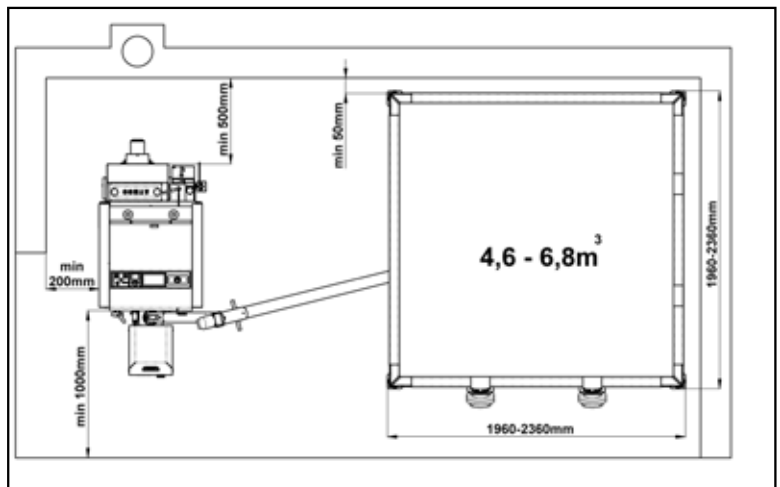
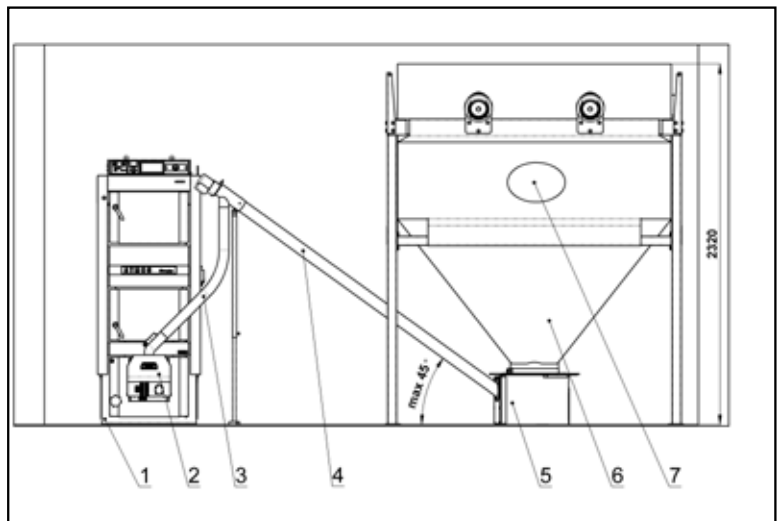
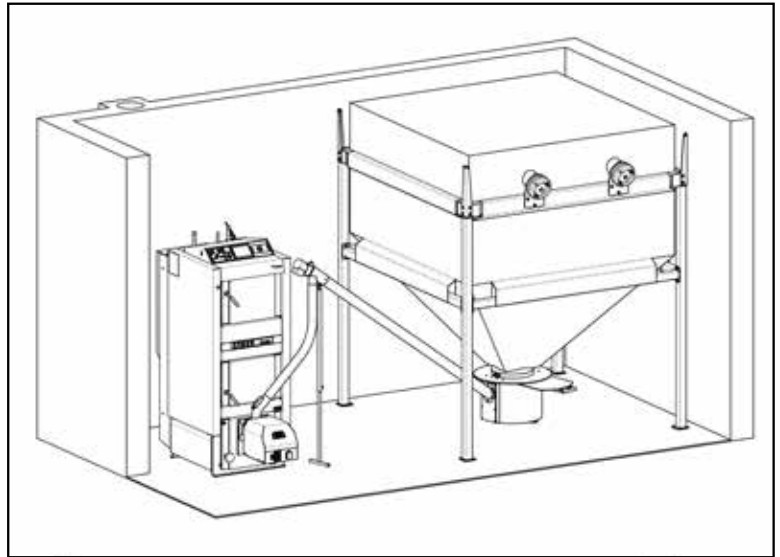
Textile silo with volume of 5,5 - 7,9 m³, which contains 3500 - 5100 kg pellets (depend on type), it is enough big to be filled ones or thrice a season. Pellet feeding we do from cistern-truck or in case of emergency from 15 kg bags.

There are two flanges in upper part of the textile silo with holes for comfort filling of pellet from cistern-truck. Material of textile silo prevent moistening of the fuel and it is easy to assemble how the customer need.

All the walls of textile silo are directed at the lowest point of the silo, universal container, from which the auger pellet conveyor with lenght 2, 2.5, 3, 4 nebo 5 m picks the pellets up.

Legend:

- 1 - Boiler
- 2 - Pellet burner
- 3 - Pellet supply pipe
- 4 - Conveyor
- 5 - Universal container with collector probe under textile silo (H0510)
- 6 - Textile silo (5,5 - 7,9 m³)
- 7 - Openings for possible filling of pellets

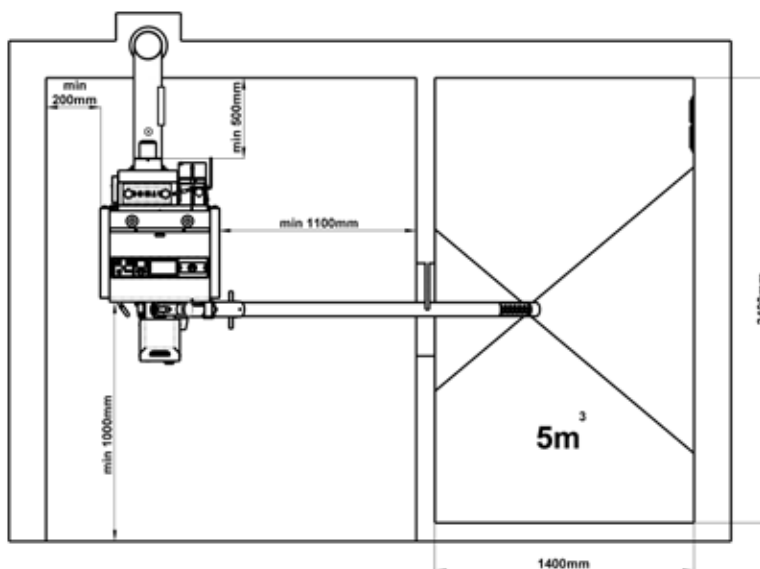
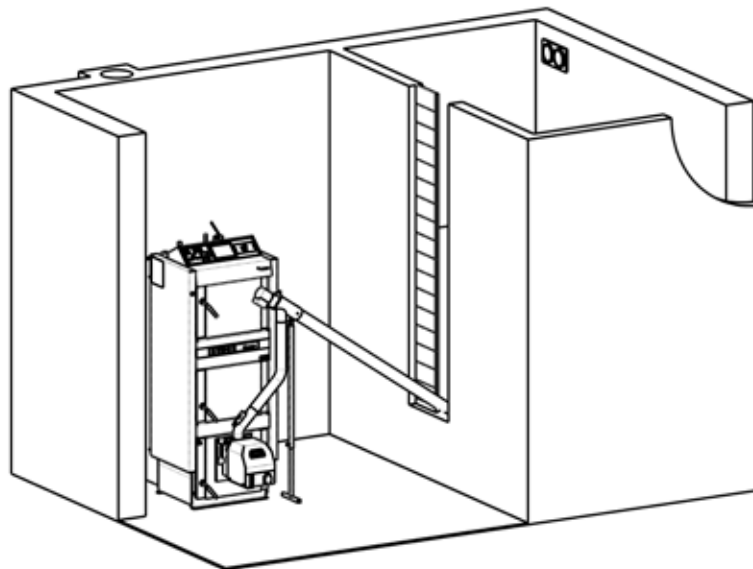


Boiler room with a built-in pellet storage

A boiler plant with a built-in pellet storage with the volume of e.g. 5 m³ in which you can store 3250 kg of pellets. (1m³ pellet = cca 650 kg) For this purpose a 2 m (2.5 m) conveyor is used.

For easy access to the storage a segmented opening is produced that can be adapted to the pellet level in the storage and enables cleaning of the storage from dust and dirt once a year. In the top part of the storage there are two openings for replenishment of pellets from a cistern that have different sizes with regard to pellet suppliers.

For optimum collapsing of the pellet heap the optimum angle of the inner walls in the storage must be at least 45°. All the walls are inclined to the lowest point of the storage from which the worm conveyor draws pellets.



CAUTION - If pellets are drawn to the storage in the boiler plant directly from the cistern, several principles must be observed that prevent their crushing during pneumatic transport. First of all you must make sure that they do not hit the hard wall of the storage, but a screen that is suspended in the centre of the storage from the ceiling. This way you will ensure even filling of the storage and prevent crushing into small pellets and dust. Ask the pellet suppliers about further possibilities and conditions of pellet drawing.



RECOMMENDATION - We recommend you to select the container size of 500 l to 1000 l, which will be sufficient for 3 to 14 days, depending on the consumed power. The larger the volume of the container, the better. The length of the conveyor may be 1.5 m, 2 m, 2.5 m, 3 m or 4 m. As the pellet storage you can also use a clearly delimited part of the room complying with fire regulations from which pellets may be drawn to an intermediate storage container at the boiler, or directly to the boiler.

Boiler setting and launching when burning wood

Before burning wood, several steps must be carried out:

Set required temperature of water exiting the boiler (80 - 90 °C) on the FR 124 draught regulator so that it effectively regulates the air intake on control valve in to the boiler.



INFO - If we have boiler connected with accumulation tanks, when burning wood we can set the thermostat for starting pump in the boiler circle on minimum (pump thermostat without knob (shaft) - placed on control panel). Pump in the boiler circle is operated by flue (waste) gas thermostat to prevent long time to get the boiler to the operation temperature.

Switch the main switch on, put the selector switch into position I. and ignite.

Heating with wood

Wood firing in the Atmos A25 burner with modification for SP models is ensured by means of integrated **special valve with servo drive (actuator)** to prevent any suction of false air to enter pellets when firing wood. Adjustment of this valve is fully automatic.

The output of this boiler is controlled in the same manner as for models DCxxS.

Operation (control) thermostat - controls the fan operation depending on the temperature of water at the boiler outlet.

Waste gas thermostat - used for deactivation of the exhaust fan and pump in the boiler circuit after the final burnout of wood.

depending on the waste gas temperature.

Draught regulator FR124 - used for fine control of the total amount of air depending on the temperature of outlet water. The device helps to protect the boiler from overheating.

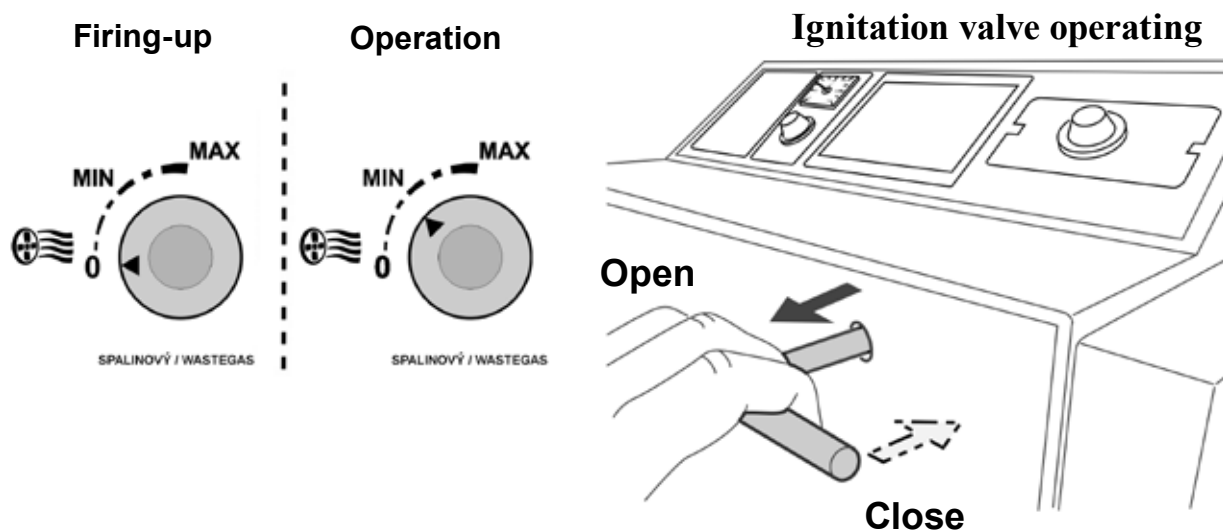


CAUTION – when switching the boiler operating mode from wood burning to pellets or the other way round, clean the boiler thoroughly from ash, pay particular attention to the rear flue-gas duct (remove ash from the lower lid), so that blockage of waste gas may not occur.

Ignition and operation in wood-burning mode

Put the selector switch into position I. Before fuel ignition, open the ignition valve /13/ by pulling the ignition valve pulling rod /17/ and reduce the waste gas thermostat for the ignition (to minimum - 0 °C). Through the top door /2/ insert dry wood kindling on the heatproof shaped piece /5/. Place the kindling perpendicularly to the channel recess in the shaped piece so that a 2 - 4 cm gap between the recess and fuel is created; which allows the waste gas passage. Place paper or wood wool on top of the kindling, then another layer of kindling and larger amount of dry wood. After ignition close the top door and open the lower door. For faster flaring up the extraction fan may be switched on. When the fuel has caught sufficient fire, close the lower door, fill the storage tank completely with fuel and close the ignition valve with its pulling rod /17/. Set the waste gas thermostat into the operating position which it is necessary to determine for ideal operation. On the FR 124 draught (output) regulator /22/ set the required outgoing water temperature 80 - 90 °C. If the boiler should work as a gasification appliance, then a layer of glowing charcoal must be kept (known as reduction zone) above the gasifying nozzle. This can be achieved by burning dry firewood of suitable size. When burning moist wood, the burner does not operate as a gasification appliance, the fuel consumption increases dramatically, the boiler does not reach the required output and the service life of both - the boiler and the chimney - decreases. **If the specified chimney draught is adhered to, the boiler operates up to 70 % output without the ventilator.**

Waste gas thermostat setting



CAUTION – when operating the boiler, all doors must be fully closed and the ignition valve pulling rod must be pushed in - otherwise the ventilator (S) may sustain damage.



NOTE – when burning wood for the first time, condensation occurs and condensed fluid leakage occurs – this is not a defect. Condensation will disappear later. When burning small wood waste particles, it is necessary to monitor the waste gas temperature which must not exceed 320 °C. Otherwise, the ventilator (S) may sustain damage. **Wood-tar and condensate formation in the hopper is a side effect of wood gasification.**

Output regulation in wood burning mode - electromechanical

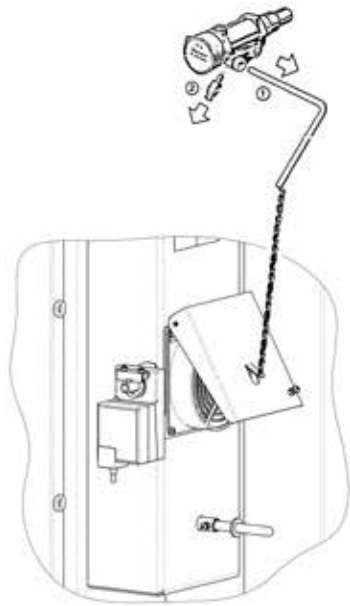
Output regulation is achieved by means of a **control flap valve /8/ operated by the FR 124 draught regulator /22/** which automatically opens up or shuts down the valve /8/; depending on the pre-set outgoing water temperature (80 - 90 °C). The output (draught) regulator adjustment should be done carefully because it not only regulates the output; but also protects the boiler against overheating. The setting should be in compliance with the enclosed ‘Assembly and Setting Instructions’ for the HONEYWELL Braukmann FR 124 type regulator. The overheat protection function can be monitored by checking the regulator’s functionality at temperature of 90 °C. At this temperature, the control valve /8/ must be almost closed. It is necessary to seek and discover the best setting. You can visually inspect the control valve’s /8/ position by looking from the rear side of the ventilator.

The exhaust fan is controlled by a **control (operating) thermostat** situated on the boiler’s panel. The regulation is based on the pre-set outgoing temperature value. The temperature set on the thermostat should be 5 °C lower than the temperature set on the FR 124 draught regulator. (Indicated by dots on the thermostat scale).

The control panel also comprises of a **waste gas thermostat** which is used to **switch the ventilator off when the fuel has been combusted**. When igniting, position to the “firing-up” position (minimum value). When the fuel has sufficiently flared up, set it to the operating position in which the ventilator runs until the fuel has completely burnt out. It is necessary to seek and discover an optimal position of the thermostat; which depends on type of fuel, chimney draught and other conditions. The outgoing water temperature should be monitored on the **thermometer /18/** situated on the control panel. There is also an irreversible **safety thermostat** on the panel.

Draught regulator - HONEYWELL Braukmann FR 124 – Assembly instructions

Disassemble the lever /1/ and coupler /2/ and screw the regulator into the boiler.



Setting

Heat the boiler to approx. 80 °C. Set the setting handle to the temperature read on the boiler thermometer. Tension the air flap valve chain in a way that provides the required boiler output; the gap at the air (control) flap valve may range between 3 - 50 mm. The valve minimum gap is set by a setscrew to 3 - 8 mm; boiler service-life prolonging feature - do not decrease. Otherwise, the boiler and ventilator may get covered in tar and their service life would be reduced. In cases where there are insufficient general draught conditions, slightly increase the permissible minimum gap.

Draught regulator functional check when burning wood

Set the setting handle to the required temperature of water exiting the boiler (80 - 90 °C). When the water temperature reaches its maximum of 95 °C, the control flap valve must be fully closed (only providing the setscrew gap). It is always necessary to fine-tune the specified operating temperature (80 - 90 °C) utilising the mixing valves behind the boiler either manually or by electronic regulation with electric actuator.

27. Setting the boiler output and combustion when burning wood

Setting of primary - air ratio

Optimum setting:

Fully closed (5 mm) + 8÷10 mm

Maximum setting:

Fully closed (5 mm) + 10÷20 mm

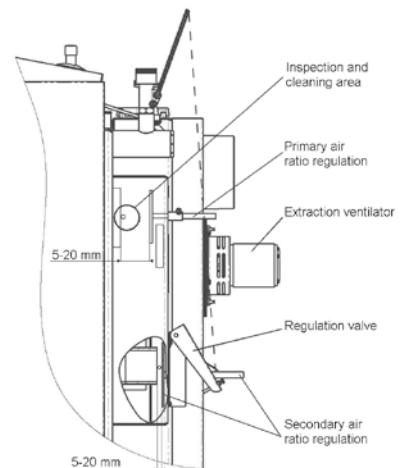
Setting of secondary - air ratio

Optimum setting:

Fully closed (5 mm) + maximum (completely pulled out)

Minimum setting:

Fully closed (5 mm) + 5 mm



The regulation is carried out by either pulling out (+) or retracting (-) the regulating pulling rod.



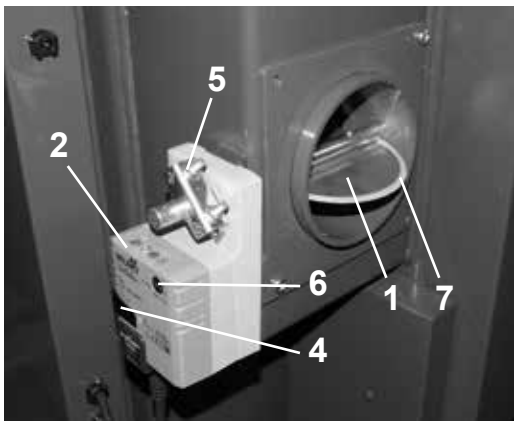
INFO - Adjustments to settings should be done on the basis of the waste gas analyzer and maximum temperature; which must not exceed 320 °C at the outlet to chimney, at stabilised nominal output /with closed ignition valve/. The boiler is set to optimal operating parameters by the manufacturer. Therefore, make adjustments to settings only in cases where the operation conditions are non-standard (for example - if insufficient chimney draught, pull the regulator pulling rod to its maximum).



CAUTION - When commissioning the boiler after installation, always check and adjust the boiler combustion.

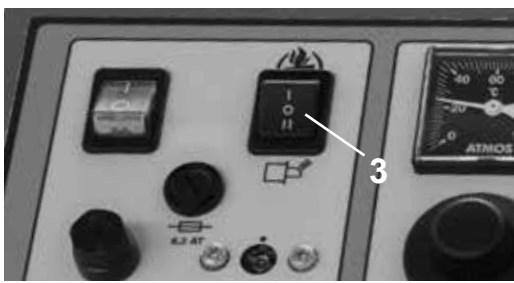
28. Closing flap controlled by an actuator Belimo

The closing flap /1/ is controlled with actuator Belimo /2/ through electronic unit of the burner and selector switch I-0-II /3/ on the boiler control panel. The flap is equipped with silicone gasket /7/ for perfect sealing.



In case of burning wood when the selector switch is in position I, the closing flap controlled by an actuator Belimo is open to the maximum.

During the pellet operation the selector switch is in position II, the flap is automatically fully closed. Closing this valve ensures that no false air enters the boiler when firing pellets. Closing of this flap is fully automatic.



Settings of the closing flap controlled by an actuator Belimo

Settings

- Settings of the actuator shackle stops:
- left = 0 (min)
 - right = 1 (max)

All setup is performed when the main switch on the boiler is OFF. Press the locking button /4/ to release the actuator shackle /5/ with the flap to do position changes and setting of the flap.

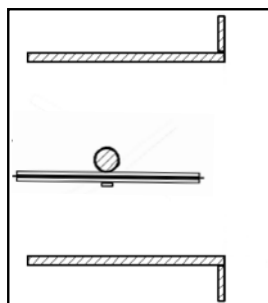


The default factory setting of the flap is made in the full closure of the regulating flap. Actuator shackle gripping the shaft is loose. With pressing the locking button on the actuator turn the shackle anticlockwise to the left stop 0 (min). In this position the shackle tightened so that the shaft is connected to the flap which is fully closed.

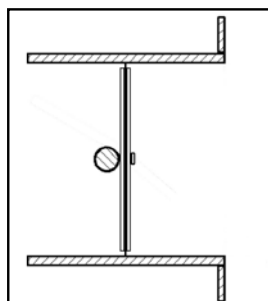
When the position of the flap fully open, the shackle is on the right stop 1 (max).



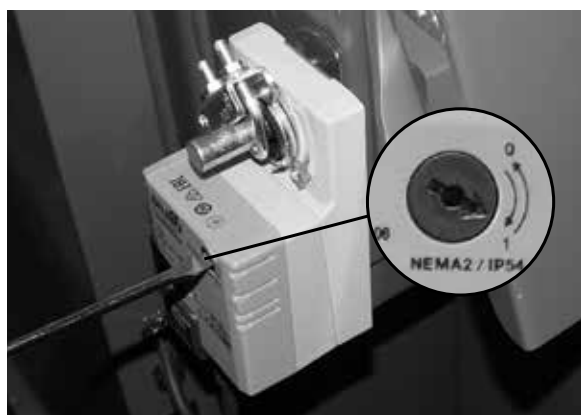
Flap position during the operation on wood.
Flap is fully open!



Flap position during heating pellets operation.
Flap is fully closed.



CAUTION - at the model DCxxSP(X) the switch /6/ on the servo flap actuator is always set to "1".



29. Boiler output and combustion setting when heating with pellets

The required power is set with the use of parameters T4 and T6.

However, the actual power is also influenced by the diameter of pellets and angle of the conveyor. Therefore, you should keep in mind that if after setting the burner you change the angle of the conveyor or diameter of pellets, you will have to readjust the burner.

Adjust the combustion quality with the air flap of the fan in such a way that the flame tips should always end 1 to 3 cm before the opposite wall.

You should also know that the setting of the burner is different if the boiler is equipped with an exhaust fan which runs together with burner operation and different if an exhaust fan not runs together with burner operation. **The combustion should be precisely tuned after 30 to 60 minutes of permanent**

operation, best with the use of a flue gas analyser. We recommend you to adjust the burner in such a way that the surplus of O₂ in the flue gas can be in the range of 8 to 10 (12) % and the average CO content can be lower than 250 mg/m³. During operation the flue gas temperature must never drop below 110 °C and rise over 250 °C (parameter S18).



INFO - Even though the burner is equipped with many functions (parameters) it is basically just the setting of the basic ones which characterize the **output of the burner - T4 and T6 and setting of air flap.**

Recommended approximate setting of the burner with the use of DA1500, DA2000, DA2500, DA3000 and DA4000 conveyors, for individual output values and pellets with the diameter of 6 mm and conveyor angle of 45°:

Boiler output	Parameter T1	Parameter T4	Parameter T6	Parameter S3	Opening of the air flap on the burner fan of a boiler with an exhaust fan	Opening of the air flap on the burner fan of a boiler without an exhaust fan
10 – 12 kW	100 s	6 s	13 s	100 %	-	1/3 (18 mm)
15 – 16 kW	100 s	8 s	10 s	100 %	1/4 (14 mm)	2/3 (37 mm)
18 – 20 kW	100 s	10 s	9 s	100 %	1/2 (27 mm)	3/4 (40 mm)

Recommended approximate setting of the burner with use of DRA25 1,3 m and DRA25 1,7 m shaft conveyors, for individual output values and pellets with the diameter of 6 mm and conveyor angle of 65° (compact pellet tanks AZPD and AZPU):

Boiler output	Parameter T1	Parameter T4	Parameter T6	Parameter S3	Opening of the air flap on the burner fan of a boiler with an exhaust fan	Opening of the air flap on the burner fan of a boiler without an exhaust fan
10 – 12 kW	60 s	3 s	15 s	70 %	1/4 (12 mm)	1/2 (25 mm)
15 – 16 kW	60 s	3 s	13 s	100 %	1/4 (14 mm)	2/3 (37 mm)
20 – 24 kW	60 s	3 s	10 s	100 %	1/2 (27 mm)	3/4 (42 mm)



INFO - **The default setting of exhaust fan is off to enable operation with pellets (parameter S6 = 11).** In case of erratic chimney draught the exhaust fan can be commissioned together with the pellet burner by setting the **parameter S6 = 4.**

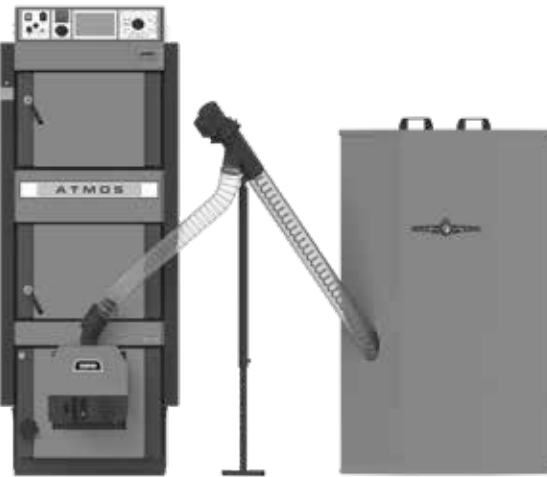
This change requires re-setting of the opening of the burner fan valve. There is no other change performed.



INFO – If necessary, if there is a limited space in the boiler room, you can shorten the length of the conveyor (screw) DAxxxx or its leg any time as desired, but the angle of the conveyor should never exceed 45°.

This does not apply to compact AZPD pellet tanks with DRA25 shaft conveyor (AZPD 240 R Set, AZPD 300 R Design Set or AZPD 400 R Design Set), which enable the installation of the pellet tank right next to the boiler.

Minimum length of hose between the burner and the conveyor must be bigger than 20 cm. Maximum hose length should not be more than 1 m.



DCxxSP(X) boiler with A25 burner, DA1500 conveyor with 1,5 m length and pellet tank with 500 l volume



DCxxSP(X) boiler with A25 burner, with AZPD 300 R Design set DRA25 conveyor with 1,7 m length and pellet tank with 300 l volume



CAUTION - due to many doors and lids on the boiler, the O₂ content (excess) in the exhaust gas measured in the flue may be about 0.5 - 2% higher than the real value. Therefore, in case of any doubts, the actual content (excess) of O₂ in the flue gas can be measured (checked) in the hole on the side of the flue gas channel (plugged by Allen screw). Never measure the quality of combustion (CO, NOx), chimney draft or flue gas temperature at this point.



A - hole for to measure actual content (excess) of O₂ when heating with pellets

30. Fuel refill when burning wood

Before fuelling, open the ignition valve /13/ with the pulling rod /17/. Do not switch the extraction ventilator off. Wait for approximately 10 seconds and slowly open the loading door /2/ so that any accumulated gases are first vented off into the flue-gas duct. For the duration of heating, always top the hopper up completely. In order to prevent excessive smoke formation, load new batch of fuel only after the previous fuel has combusted to at least one third of the loading volume. Then cover the glowing charcoals with a broad log and add the rest of the firewood. Do not pack the fuel down tightly on the nozzle. Otherwise, you may put the flame out.



CAUTION – during operation, the ignition flap pulling rod must be retracted, otherwise damage to the exhaust fan (S) and impeller will occur.

31. Slow-burning operation when burning wood

It is possible to use boilers for slow-burning operation, i.e. keeping the fire up overnight without the necessity to heat-up during the day. This is **only permitted during wintertime**. This operating method however decreases the boiler service life. Prepare the boiler for slow-burning operation in the following way:

- place several (4 – 6) larger logs on a glowing layer of partially combusted fuel
- turn the mixing valve down

After the valve has been turned down, the boiler water temperature increases to 80 - 90 °C.

- the control flap valve /8/ operated by the FR 124 Honeywell draught regulator automatically shuts down and the ventilator switches off – the boiler operates in minimum output mode

In boilers prepared as previous, the wood burns for 8 – 12 hours. The actual slow-burn combustion time depends on the amount of fuel placed in the boiler and on the actual quantity of consumed heat. **Even if the boiler operates in the slow-burn mode, it has to keep the output water temperature ranging between 80 - 90°C and returning water minimum temperature 65 °C.**

32. Boiler cleaning

It is necessary to clean the boilers regularly and thoroughly every 3 to 7 days when burning wood because the flue cinder accumulated in the fuel storage tank together with tars and acids significantly decreases the boiler's service life and output, and insulates the heat transfer surface. If excessive amounts of cinder are left to form, the burn-off area will be rendered insufficient and damage to the ceramic nozzle handle or the boiler may occur.

Carry out the cleaning procedure by first switching the extraction ventilator on. Then open the upper loading door /2/ and sweep the cinder down through the slot into the lower chamber. The selector switch is in position I. so the extract ventilator is in operation. Leave long pieces of wood which have not fully combusted (charcoals) in the hopper for the next time the boiler is used.

Open the cleaning lid /15/ and clean the duct with a brush. Remove all soot and cinder after opening the lower lid. Open the middle and lower door /3/ and clean the lower chamber from cinder and soot. The cleaning interval depends on the fuel quality (wood moisture content), heating intensity, chimney draught and other factors. Do not pull out the fireclay shaped section /10/ when cleaning. At

least once a year, clean the extraction ventilator rotating wheel and via the cleaning hole, inspect the state of the primary to secondary air ratio regulation. If it is necessary, clean using a screwdriver. This influences the combustion quality (p. 41 - 43).

When burning pellets in the lower combustion chamber a certain amount of ash forms. This ash needs to be removed once in 3 – 10 days. When cleaning the middle chamber, it is necessary to open the middle door together with the lower door. Remove the ash from the whole combustion chamber. At the same time clean (remove and shake out) the pellet burner chamber. As the last step, always clean the rear flue-gas duct and remove cinder from the lower lid. The actual cleaning interval depends on the fuel quality, chimney draught and consumption. It is necessary for oneself to determine this interval. It may be longer than the recommended interval.



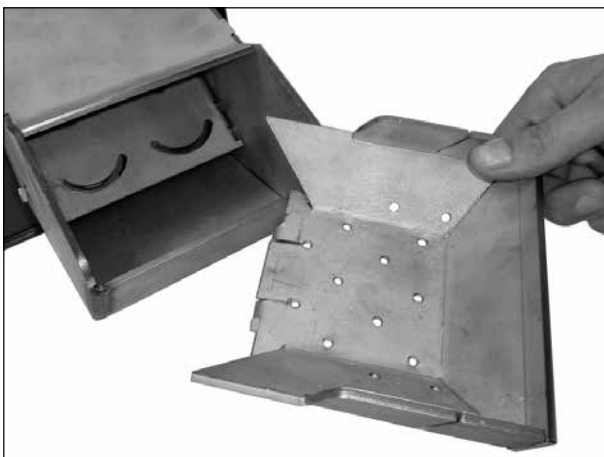
NOTE - Regular and thorough cleaning is important for permanent stabilised output and a long service life of your boiler. If not cleaned properly, damage to the boiler may occur – the manufacturer’s guarantee is rendered invalid.



Pellet burner ATMOS A25 in bottom combustion chamber of the boiler



Open bottom door of the boiler during cleaning of the combustion chamber of the burner ATMOS A25



Removable combustion chamber - must be regularly cleaned



Open bottom door of the boiler during cleaning of the combustion chamber of the boiler when burning pellet.



Cleaning the upper stoking chamber with the scraper (poker)



Sweeping the ash through the nozzle down into the bottom (cleaning) chamber.
The opening in the nozzle must be always clean and free!



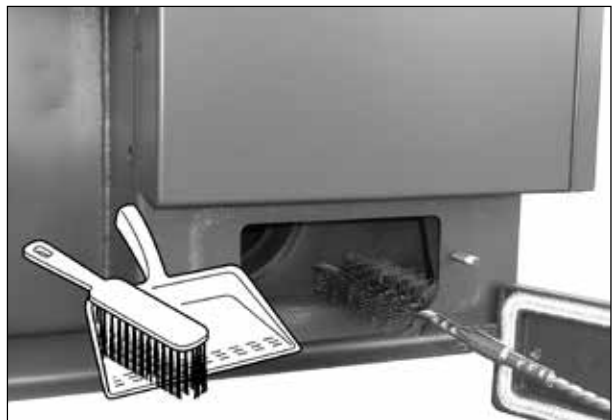
Open middle space of the boiler with a roof and example of ash removal with a poker



Sample cleaning of the flue way with a wire brush - upper lid
Remove flue gas brake before cleaning.
(* flue gas brake only DC30SPX)



Sample cleaning middle part of the flue way - middle lid



Sample cleaning of the flue way - bottom lid



Sample cleaning of impeller and checking uprightness of vane on extract ventilator

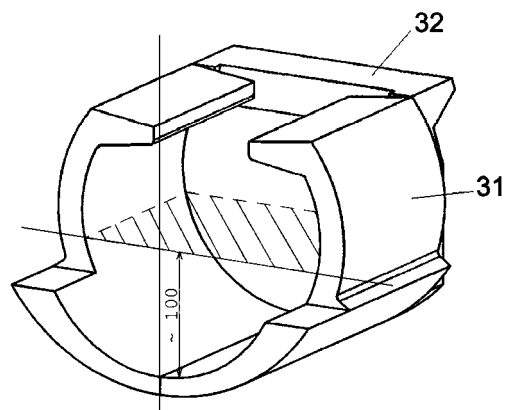


Checking and cleaning regulation of primary-secondary air ratio via cleaning lid

Maximum ash quantity – in the middle and lower combustion chambers

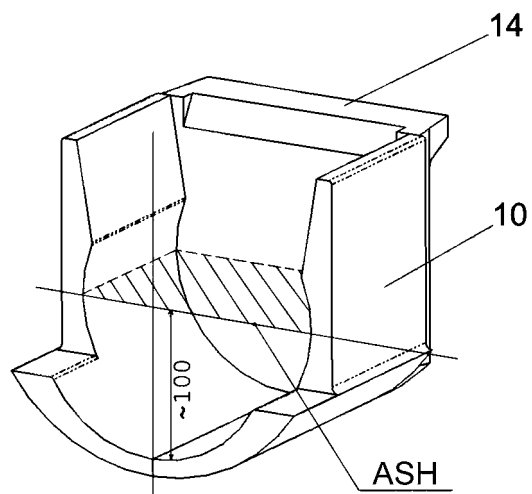
For **DC18SP**
DC25SP
DC30SPX
DC32SP

- middle combustion chamber
- for wood



For **DC18SP**
DC25SP
DC30SPX
DC32SP

- lower combustion chamber
- for pellets



General safety instructions - recapitulation and residual risks



CAUTION - Improper use of the product during operation of the device gives rise to certain residual risks, which must be pointed out. These are mainly caused by the improper attention of the operator and non-compliance with safety principles during operation and maintenance.

Electrical risks

The connection, maintenance and repair of electrical equipment and boiler may only be performed by persons who are professionally qualified in accordance with all applicable national regulations.

The supply cable and the electrical installation of the boiler must be regularly checked and maintained in the prescribed condition (according to the valid regulations).

In case of any damage to the electrical equipment, it is necessary to shut down the equipment (disconnect the equipment from the electricity mains) and provide professional repair.

It is forbidden to interfere with the connection of safety elements that are related to the safety and reliability of the device.

Follow basic safety regulations to avoid the risk of fire, electric shock, and personal injury. Avoid contact with grounded parts.

Do not expose the device to rain and do not use it in wet environment.

Prevent the device from being switched on unintentionally.

Thermal risks

The device must not be operated at a higher working water-pressure than specified.

It is forbidden to overheat or overload the device.

The device must be protected against low-temperature corrosion.

Only the prescribed fuel can be burned in the boiler.

It is forbidden to store flammable substances near the boiler (device).

When operating the device, it is necessary to pay increased attention to the risk of burns from heat sources.

Do not use the device near flammable liquids or gases.

Risks when handling fuel or ash

When handling fuel or ash, solid particles are emitted (dusting). Therefore, the operator should use protective equipment according to the dust level. In general, always use protective equipment.

The applicable fire regulations must be observed when handling fuel and ash.

In accordance with legislation in force, there must be a suitable fire extinguisher provided within the reach.

Ergonomic risks

It is forbidden to insert your hands into rotating or moving parts of the device (fan impeller, fuel auger feeder, ash removal auger).

When operating the equipment, all doors, lids and covers must be properly closed and tightened.

Keep the boiler room in order! Mess in the boiler room can result in injuries.

Take into account the influence of the surrounding environment and provide proper lighting.

Keep other people at a safe distance!

Be careful and check the device for damage.

In case of a defect, contact a professionally qualified person.

Before commissioning device, read the operating instructions carefully and follow all instructions!

33. Heating system maintenance - including boilers

Inspect at least once every 2 weeks. If necessary, refill the system with water. If the boilers are out of operation during wintertime, a risk of water freezing in the system arises. Therefore, we recommend letting all the water out from the system or fill it with an anti-freeze. In other situations, only let water out if necessary and keep without water for as little time as possible. After the heating season is over, clean the boiler thoroughly and replace damaged parts. **Do not leave parts replacement for the last moment; prepare your boiler for the heating season as early as Spring.**

34. Use and inspections

Boiler operators must always follow the operation and maintenance instructions. Interventions into boilers that could endanger the health of the operators or other persons in the vicinity are prohibited. Boilers may only be operated by a person that is more than 18 years old, that has been acquainted with the instructions and operation of the equipment and that complies with the requirements of § 14 of the Directive no. 24/1984 Coll.

The boiler operation needed increased attention to safety in terms of potential burns from hot boiler parts and systems. You must never leave unattended children near boiler that is in operation.

During the operation of solid fuel boilers it is prohibited to use any flammable liquids for lighting the fire and it is also prohibited to increase the nominal output of the boiler during operation (overheating).

You must not put flammable objects on the boiler and near the fuel feeding and ash pan openings and ash must be stored in non-flammable containers with a lid. When handling fuel and ash, wear protective equipment (gloves, dust mask). Boilers in operation must be under occasional supervision of the operator.

The user may only carry out repair consisting in simple replacement of a spare part (e.g. a sealing cord, etc.). During the operation check the doors and cleaning openings for tightness and always tight-

en them properly. The user must not alter the structure and electric installation of boilers. The boiler must always be cleaned properly and in time so that free passage of all the ways can be guaranteed. Cleaning doors must always be properly closed.

Personnel training before the first start-up is carried out by the pre-trained company (person) that has installed or commissioned the device.



CAUTION - Follow valid fire regulations and have in reach portable fire extinguisher. If any non-standard behavior of the boiler shut down the boiler from operation and call the service.



INFO - Replacement of sealing cords in boiler doors (18 x 18) and cleaning caps (12 x 12) must be performed as needed to ensure perfect tightness. Replace the sealing cords at least every 5 years.

35. Possible failures and troubleshooting

Failure	Reason	Solution
The “mains” indicator not lit up	<ul style="list-style-type: none"> - no voltage in network - plug incorrectly inserted to el. socket - defective power supply switch - defective electric cord 	<ul style="list-style-type: none"> - check - check - replace - replace
Boilers do not reach their required outputs and the pre-set water temperatures	<ul style="list-style-type: none"> - not enough water in the system - excessive pump output - the boiler output is not sufficiently rated for the particular heating system - low quality fuel (high moisture content, over sized logs) - ignition valve leaking - insufficient chimney draught - excessive chimney draught - extraction ventilator blades are bent - ignition too long or boiler operated with the ignition flap open - insufficiently cleaned boiler - combustion-air inlet to loading chamber is clogged 	<ul style="list-style-type: none"> - refill - adjust the pump’s switching and flow rate - design issue - use dry firewood and split logs into halves - repair - new chimney; unsuitable connection - place a throttle valve (draught limiter) in the flue-gas duct - straighten blades (to a 90° angle) - replace - clean - clean

Failure	Reason	Solution
Doors leaking	<ul style="list-style-type: none"> - defective fibreglass cord - the nozzle becomes clogged - insufficient chimney draught 	<ul style="list-style-type: none"> - replace - adjust the door hinges - do not burn small-particle wood, sawdust, bark - chimney defect
Ventilator does not turn	<ul style="list-style-type: none"> - boiler overheated – safety thermostat fuse out - rotating wheel clogged - defective capacitor - defective motor - bad contact in plug of motor cable lead 	<ul style="list-style-type: none"> - press the thermostat push-button (using a pencil) - clean the ventilator including the ducting from tar and sediments - replace - replace - check - measure
Defects and shortcomings of the burner, conveyor	<ul style="list-style-type: none"> - no more fuel - the fuel is cindered and blocks the chamber on the burner - the hose between the conveyor and the burner gets clogged - the burner does not provide the required output - the worm conveyor does not run (stops) - other defects of the burner 	<ul style="list-style-type: none"> - replace and before the new star draw pellets to the conveyor - clean the combustion chamber and hose replace pellets - clean the combustion chamber of the burner once a day until you burn all the poor-quality pellets - low calorific value of the pellets, change the setting - check and if necessary, replace the gearbox of the conveyor - defect - check the quality of pellets, high resistance = hard pellets, large diameter of pellets, long pellets - follow the operation instructions of the burner



INFO - In case of failure, check the device and correct the defect.

If you are unable to remove the failure, contact the company that installed or commissioned the product (service).

36. Spares parts

Heatproof shaped piece - nozzle	/5/
Heatproof shaped piece	/9/, /10/, /14/, /27/, /31/, /32
Exhaust fan (ventilator) (code: S0131)	/4/
Main switch with an indicator light - green (code: S0091)	/20/
Selector switch I-O-II (code: S0096)	/36/
Thermometer (code: S0041)	/18/
Control (operation) thermostat (code: S0021)	/24/
Safety thermostat - 2 circuit (code: S0068)	/7/
Flue gas thermostat - 2 circuit (code: S0078)	
boiler with 6-pin connector - model AC07X	/35/
Door sealing cord 18 x 18 - two upper doors - small doors (code: S0241)	/26/
Door sealing cord 18 x 18 - bottom chamber for burner ATMOS A25 - big door (code: S0240)	/26/
Limit switch with a push-button (code: S0094)	/37/
Pump thermostat (code: S0065)	/33/
Fuse (6,3A) 5x20/T6,3A/1500 - type H (code: S0200)	/34/
Actuator Belimo for closing flap (code: P0086)	/41/
Impeller for extract ventilator Ø150 - small (code: S0141)	
Impeller for extract ventilator Ø175 - big (code: S0151)	
AD03 module (code: P0436)	



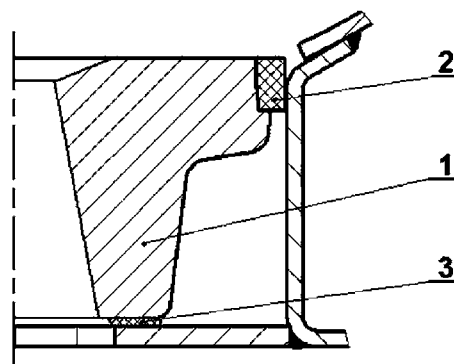
CAUTION – type UCJ4C52 of the exhaust fan with **150 mm** diameter rotating wheel (impeller) is used for boilers **DC18SP, DC25SP, DC30SPX**.

Exhaust fan for type UCJ4C52 with a **175 mm** diameter open rotating wheel (impeller) is used for boiler **DC32SP**.

Heatproof shaped piece (nozzle) replacement

- Material list
1. heatproof shaped piece
 2. sealing cord (3 pcs)
 3. boiler sealant (white)

Procedure: Remove or break up the old heatproof nozzle (further referred to as „nozzle“). Thoroughly clean the nozzle holder, which the nozzle was seated on, from tar and old sealant. Roll slim strands of boiler sealant. Place these continuously round the nozzle holder aperture in such a way which would prevent any penetration of secondary air underneath the nozzle later on. Take the new nozzle in your hand, stand in front of the boiler and position the nozzle in such a way that its recess (cut-out) is



positioned in a direction away from you and downwards (the recess is positioned inside the boiler; a mark on the nozzle - if present – is positioned backwards). The secondary air is brought to the nozzle from the rear section of the boiler. Place the nozzle on its holder and fully push towards the rear of boiler. Position it in such a way that free play between nozzle and holder is the same on both - the left and right side. Shape the sealing cords with a hammer so that their cross-section changes from square to trapezoid shape. Then spread them along the sides and front of the nozzle and by gently tapping calk them evenly round its circumference so that they are level with the nozzle. Cover the sealing cord connections with a small amount of the boiler sealant.

Door sealing cord replacement

Procedure: Use a screwdriver to remove the old sealing cord and to clean the groove in which it was seated. Lightly shape the cord from a square into a trapeze cross-section using a hammer. Press the sealing cord along the door circumference (place the narrower base into the groove first) in such a way to ensure that the cord sticks well in the groove (if necessary use a hammer). Position the lock's handle upwards, and with several gentle, careful taps of the door against the boiler, press the cord into the groove until the door can be closed smoothly. Fine-tune the position of the wheel that engages the lock's cam. This is the only procedure that can ensure good door seal!

Adjusting the door hinges and locks

The loading door and ash-pan door are firmly connected to the boiler drum by two sets of hinges. Each hinge consists of a nut, which is welded to the boiler drum, and a screw to which the door is connected by means of a pin. If you want to adjust the hinge settings, first take off the upper hood (control panel) and remove both pins. Then remove the door and slightly turn the screw with a right-hand thread, as necessary. By following these steps in reverse order, you can replace the door.

The door lock consists of a lever with a handle and a cam which engages a wheel that is screwed into the boiler and secured by a nut preventing its turning. After a certain time, the sealing cord gets pushed out from the door and therefore it becomes necessary to screw the wheel further into the boiler. First, loosen the wheel's nut and screw the wheel into the boiler in such a way that after firmly closing the door, the lock's handle is in the 20 minutes past the hour position. Then tighten the nut.

37. Environmental protection

The ATMOS gasifying boilers comply with the most demanding environmental requirements and were awarded the “Environmentally friendly product” mark, in compliance with directive No. 13/2002 of the Ministry of Environment of the Czech Republic. The boilers are certified in compliance with the European standard EN 303-5 and they fall within class 5 and comply with EU Regulation 2015/1189.

Seasonal space heating emission limits: Pellets

$$\text{CO} \leq 500 \text{ mg/m}^3$$

$$\text{OGC} \leq 20 \text{ mg/m}^3$$

$$\text{NO}_x \leq 200 \text{ mg/m}^3$$

$$\text{PM} \leq 40 \text{ mg/m}^3$$

(at $\text{O}_{2\text{ref}} = 10 \%$)

Seasonal space heating emission limits: Wood

$$\text{CO} \leq 700 \text{ mg/m}^3$$

$$\text{OGC} \leq 30 \text{ mg/m}^3$$

$$\text{NO}_x \leq 200 \text{ mg/m}^3$$

$$\text{PM} \leq 60 \text{ mg/m}^3$$

(at $\text{O}_{2\text{ref}} = 10 \%$)

Disposal of the boiler after expiration of its service life

It is necessary to provide an ENVIRONMENTALLY FRIENDLY DISPOSAL of the boiler's individual parts.

Before disposal, clean all the flue cinder and place it in a refuse bin.

Then take the boiler to a collection point (collection yard) in accordance with the applicable legislation of the country and the EU and the Directive 2012/19/EU of the European Parliament and of the Council.

If there are no clear rules for handling used products in the country, take the boiler drum and hood to a scrap-metal collection site.

Take all the ceramic (fireclay) parts to an approved refuse site or to another designated place.



NOTE – In order to comply with the environmentally friendly operation requirements, it is prohibited to burn any other substances than specified for the boiler. Plastic bags, various plastic materials, paints, textiles, laminate are substances which should be particularly avoided but also avoid burning sawdust, sediment and coal dust.

GUARANTEE CONDITIONS

Hot-water boiler

EN

1. If adhered to the product's use, operation and maintenance as described in the instruction manual, we guarantee that the product will maintain the characteristics as stipulated by the corresponding technical standards and terms for the duration of a guarantee period – of 24 months after the product's acquisition by the user, a maximum of 32 months after the manufacturer sells it to the sales representative. If the boiler is installed with Laddomat 22 or with a TV 60 °C (65/70/72/77 °C) thermoregulatory valve in combination with the accumulation storage tanks (see attached schematics), the guarantee period for the boiler drum is extended from 24 to 36 months. The guarantee period for other parts remains unaffected.
2. If a defect not caused by the user, appears on the product during the guarantee period, the defect will be repaired free of charge.
3. The guarantee period is extended by the period of time for which has the product been under repair.
4. A claim to provide a guarantee period repair shall be made by the customer at the service company.
5. The guarantee claim is justified only in cases where the boiler installation was carried out by a person trained by the manufacturer and in compliance with valid standards and the instruction manual. A necessary condition for justifying a guarantee claim is possession of a legible and complete record identifying the company who installed the boiler. If the installation was not carried out in a professional manner, the subsequent costs are borne by the company that carried out the installation.
6. The purchaser was familiarised with the use and operation of the product – in a provable way.
7. A claim to provide an after-guarantee period repair shall be made by the customer at the service company, too. In this case, the customer bears the repair costs.
8. The user is obliged to adhere to instructions from the operation and maintenance manual. If the operation and maintenance manual is not adhered to, in cases of negligent or unprofessional handling, or burning prohibited substances, the guarantee expires and the repair costs are borne by the customer.
9. Boiler installation and operation must be in compliance with the instruction manual where the outgoing water temperature is in the 80 - 90 °C range and the temperature of water returning to boiler at least 65 °C in all its operation modes.
10. There is an obligation to have the boiler inspection carried out including its controls settings, structural elements and extraction system by an expert company at least once a year – confirmed in a warranty card.

For boilers designated for the Czech Republic, Slovakia, Poland, Russia, Romania, Lithuania, Latvia and Hungary no guarantee conditions or insurance policies from outside these countries apply.

Guarantee and post-guarantee period repairs are carried out by:

- **company representing ATMOS in the particular country for the particular region**
- **installation company that carried out the installation**

Jaroslav Cankář a syn ATMOS,

Velenského 487, 294 21 Bělá pod Bezdězem, Czech Republic, Tel. +420 326 701 404

INSTALLATION RECORD OF THE BOILER AND BURNER

The installation was performed by:

Company:
 Street: Town:
 Telephone: Country:

Ascertained data:

Chimney:

Flue-gas duct:

Dimensions: Diameter:
 Height: Length:
 Chimney draught:* Number of elbow pieces:
 Date of last inspection: Waste gas temperature:*

Boiler connected with mixing valves and fittings (brief description of connection):

.....

Fuel:

Measured data:

Type: Waste gas temperature:/..... °C*
 Size: Emissions in stabilised state: CO/.....*
 Moisture content:* CO₂/.....*
 O₂/.....*
 Ash/.....*

Person responsible for the inspection: Date:

Stamp: Customer's signature:
 (Responsible person's signature)

* measured values

RECORDS OF GUARANTEE PERIOD AND POST-GUARANTEE PERIOD REPAIRS

Repair:

Repair:

Repair:

Repair:

.....
repair carried out by, date

Repair:

Repair:

Repair:

Repair:

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repair carried out by, date

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repair carried out by, date

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Repair:

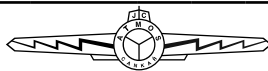
Repair:

.....
repair carried out by, date

Informační list - Kotle na pevná paliva / Product sheet - Solid fuel boilers

Kotle teplovodní s ruční dodávkou paliva na dřevo / Hot-water boilers for wood with manual fuel supply

Název nebo ochranná známka dodavatele:
Supplier's name or trademark:



Jaroslav Cankař a syn ATMOS

ATMOS

Značka modelu Model identifier	Třída energetické účinnosti Energy efficiency class	Jmenovitý tepelný výkon Rated heat output	Index energetické účinnosti Energy Efficiency Index	Sezonní energetická účinnost Seasonal space heating energy efficiency	Sezonní emise - CO Seasonal emissions - CO	Sezonní emise - OGC Seasonal emissions - OGC	Sezonní emise - NOx Seasonal emissions - NOx	Sezonní emise - Prach Seasonal emissions - Dust	Preferované palivo Preferred fuel	Preventivní opatření Specific precautions
		kW		%	mg/m ³	mg/m ³	mg/m ³	mg/m ³		
DC 18 SP	A+	20	115	78	163	6	192	16/1,7*	dřevo - wood	
DC 25 SP	A+	27	115	78	298	17	195	9/1,1*	dřevo - wood	Provozní teplota kotle / Operation temperature of the boiler 80 °C - 90 °C Maximální provozní tlak / Maximal operation pressure 250 kPa Minimální teplota vratné vody / Minimal temperature of returning water into the boiler 65 °C
DC 30 SPX	A+	30	115	78	298	15	195	9/1,1*	dřevo - wood	
DC 32 SP	A+	35	114	78	248	16	163	13/1,5*	dřevo - wood	

* hodnota emisí prachu pro provoz kotle s odlučovačem prachu při 30 kW

Emise prachu, plyných organických sloučenin, oxidu uhelnatého a oxidů dusíku jsou specifikovány ve standardizované formě na bázi suchých spalín s obsahem kyslíku 10 % a za standardních podmínek při 0 °C a 1013 milibarech.