

MANUAL FOR INSTALLATION

CS120i – CS150i – CS250i

Version 2.6 – September 2025

This manual is to be read carefully before the installation commences!

The installation is to be performed by a qualified installer and must comply with all the requirements of the authority having jurisdiction over the installation!

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Starting up the boiler – See users manual section 2, in the supplied binder

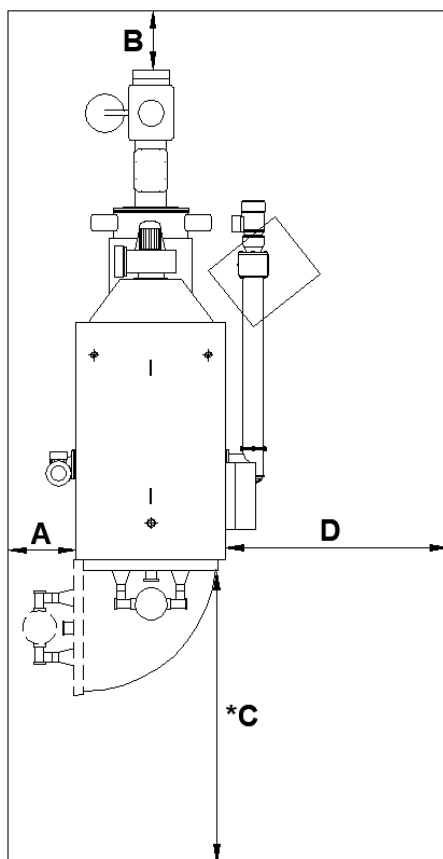


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The boiler room

Before the plant is finally placed, it should be inspected carefully for transport damages. Possible damages should be reported to the forwarder.

The sketch indicates the recommended minimum clearance in the boiler room.



Recommended minimum clearance in boiler room

Measures i cm

	A	B	C	D
CS120i	50	20	176	80
CS150i	50	20	180	80
CS200i	50	20	220	80
CS250i	50	20	220	80

*If the entrance door to the boiler room is situated in front of the boiler door, the required clearance can be reduced.

Minimum clearance to combustibles is 30cm / 12 inches

It is important to adhering to the installation clearances and restrictions.

There must be an adequate ventilation opening in the boiler room, in order to ensure sufficient air for the combustion.

Required ventilation opening:

CS120i: 3800 cm² / 589 in²

CS150i: 5400 cm² / 837 in²

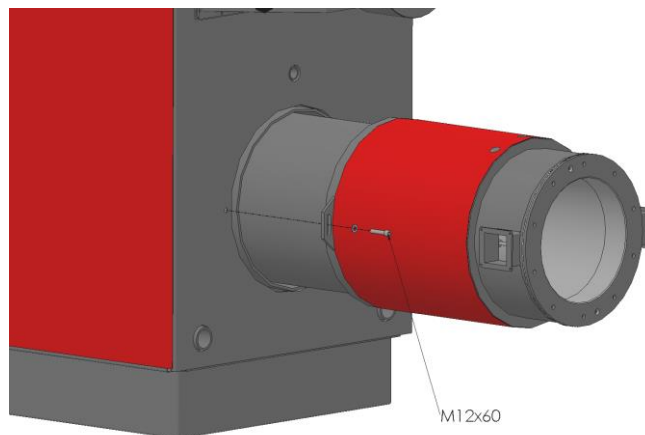
CS250i: 8700 cm² / 1349 in²

If fans are used in the boiler building, they must be installed so as not to create negative pressure in the room where boiler is installed.

Assembly of the plant

The plant is delivered in 3 units consisting of a boiler, a stoker and a burner tube. The 3 units must be assembled before the installation can begin. (In some cases boiler and burner tube are pre-assembled from the factory)

1. The water cooled burner tube is to be pushed into the pre made hole in the rear of the boiler and fixed to the boiler by 2 bolts M12x60. Wait tightening the bolts until the stoker is mounted. It is marked with a yellow mark on the burner tube which side is to face up

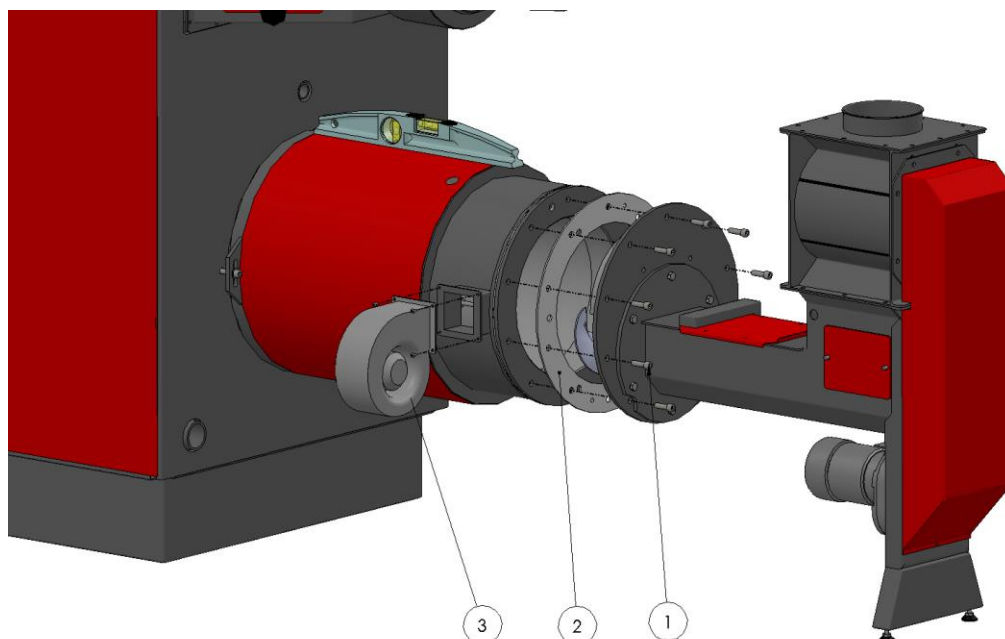


(By CS120i boiler and burner tube are pre-assembled from factory)

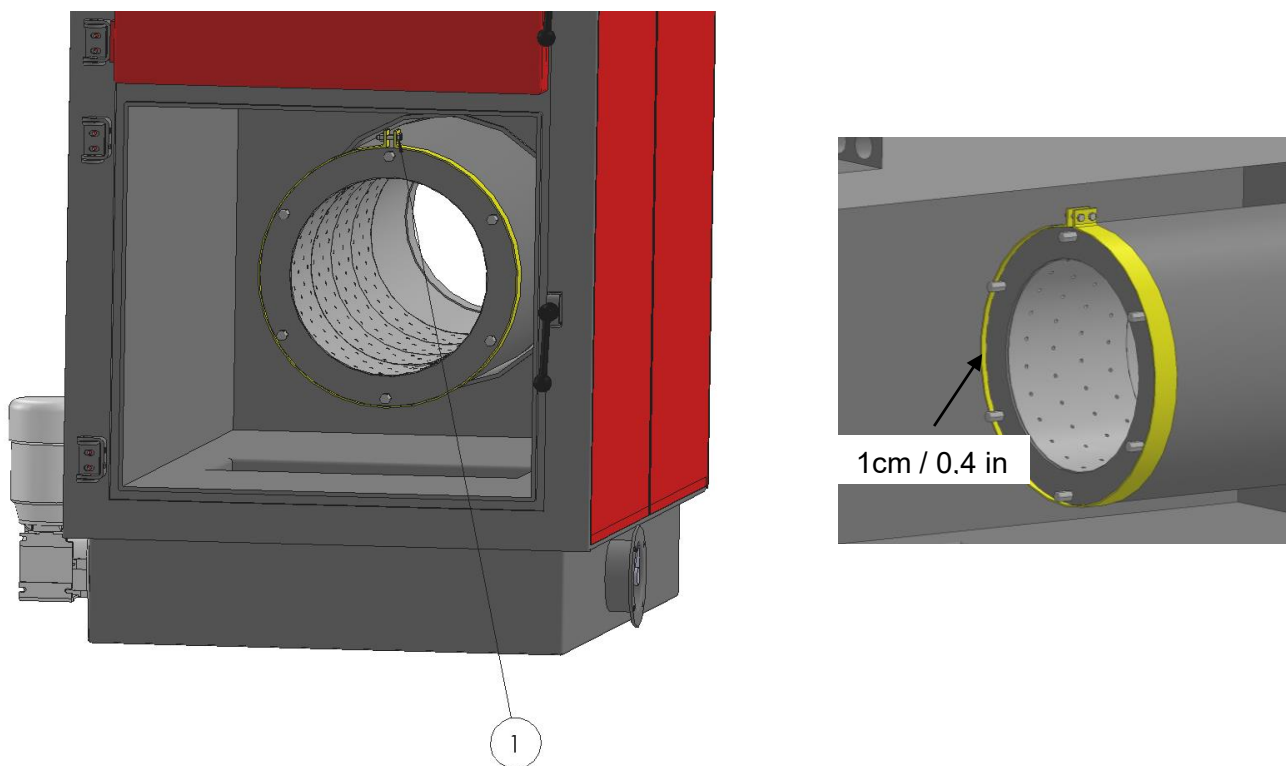
2. The stoker is fitted to the burner tube by means of M12 bolts [1]. The gasket [2] plus M12 bolts are supplied. When the stoker is fitted and the M12 bolts are tightened, the height of the stoker must be adjusted by means of the 2 adjustment screws on the leg. It is absolutely important, that the water cooled burner tube is horizontal as you otherwise might experience air pockets in the system. (Use a spirit level placed on the burner tube casing) Finally tighten the 2 M12x60 bolts securing the burner tube to the boiler.

The combustion fan(s) [3] is fitted on the square stud of the burner tube with M6 bolts, no gasket needed.

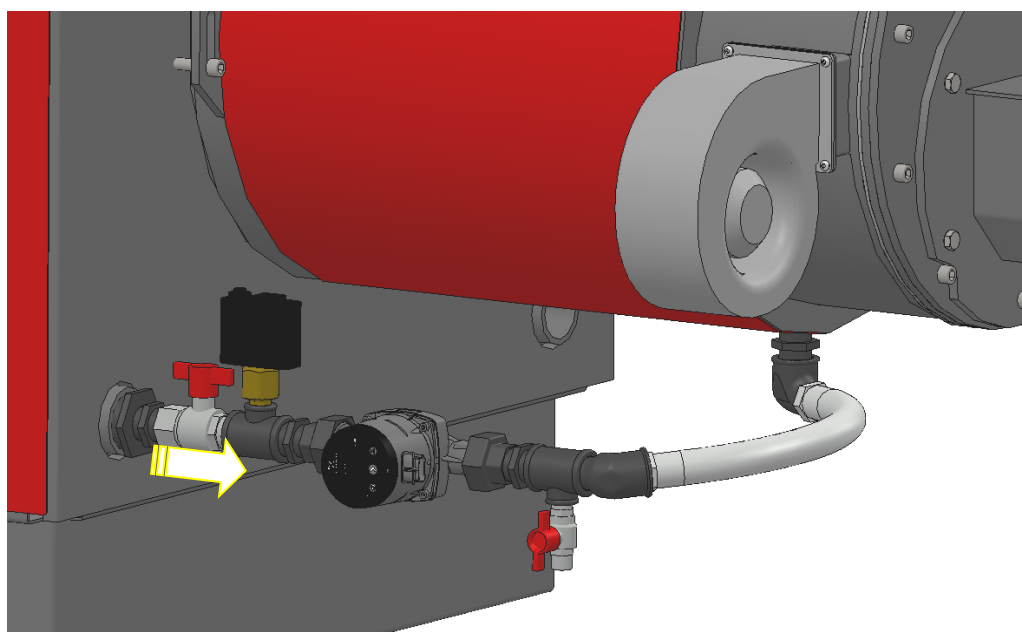
By CS120i is the joint between burner tube and stoker sealed with supplied sealant.



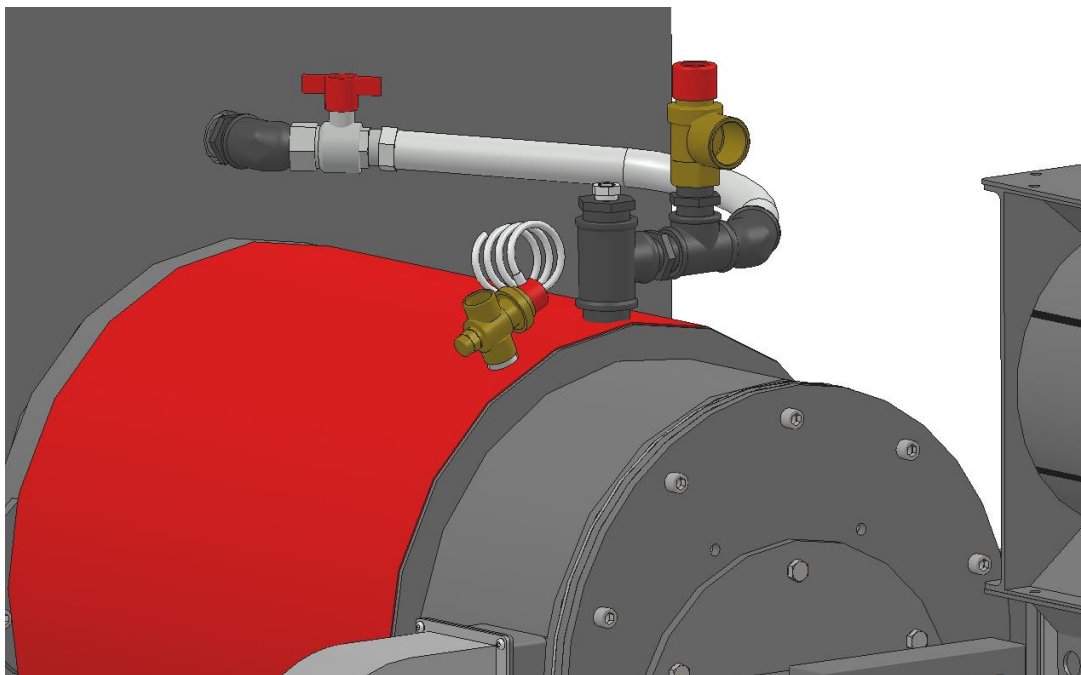
3. Mount sealing belt [1] on the burner tube. The sealing belt must be positioned 1 cm / 0,4 in outside the front flange on the burner tube. (By the CS120i, sealing belt is not included)



4. The water cooling of the burner tube can now be fitted. All parts supplied, fittings and circulation pump are in the accessories box supplied. (Please note, circulation pump is for circulation between boiler and burner tube only)
Note the pump flow direction (shown by arrow).
(By CS120i the water cooling is pre-assembled from factory)



Fitting flow from boiler to the water cooled burner tube

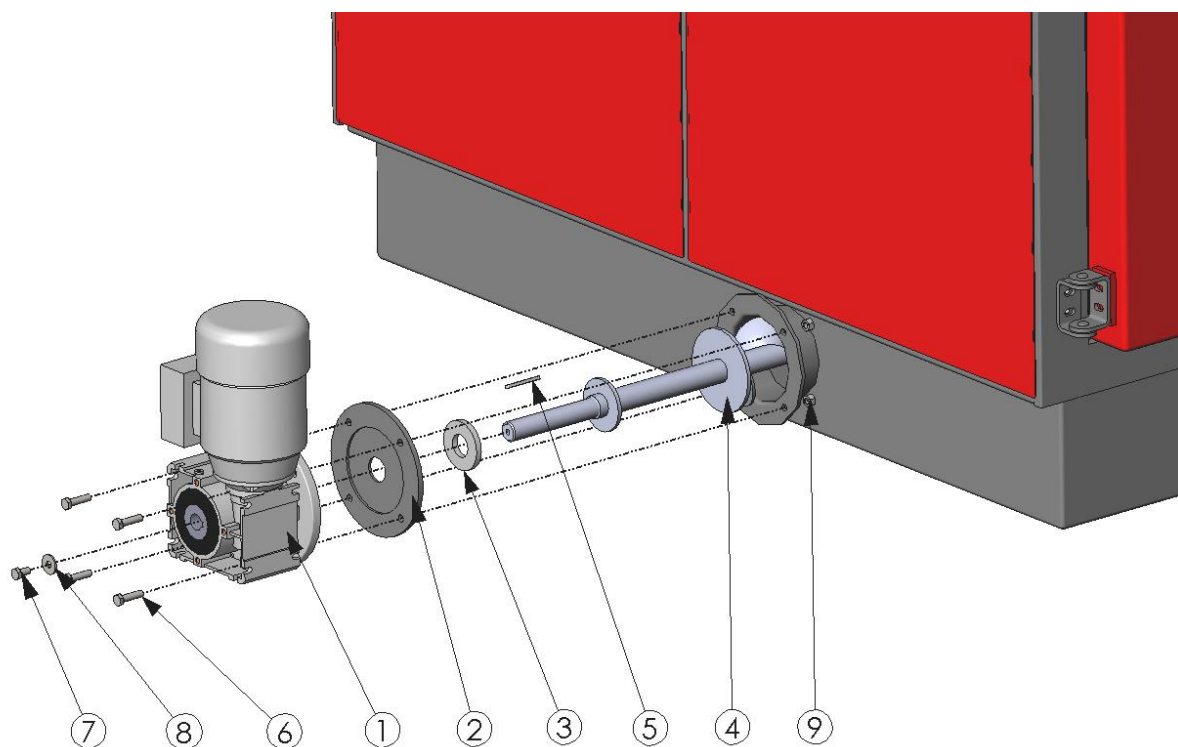


Fitting return from the water cooled burner tube to boiler

5. The hose for pressure equalising in the stoker is fitted on the stud on the burner tube.
The plug for power to the boiler is pushed in and secured by a screw. The cable is placed in the tray underneath the plug.
The plugs for circulation pump and water pressure switch are pushed in

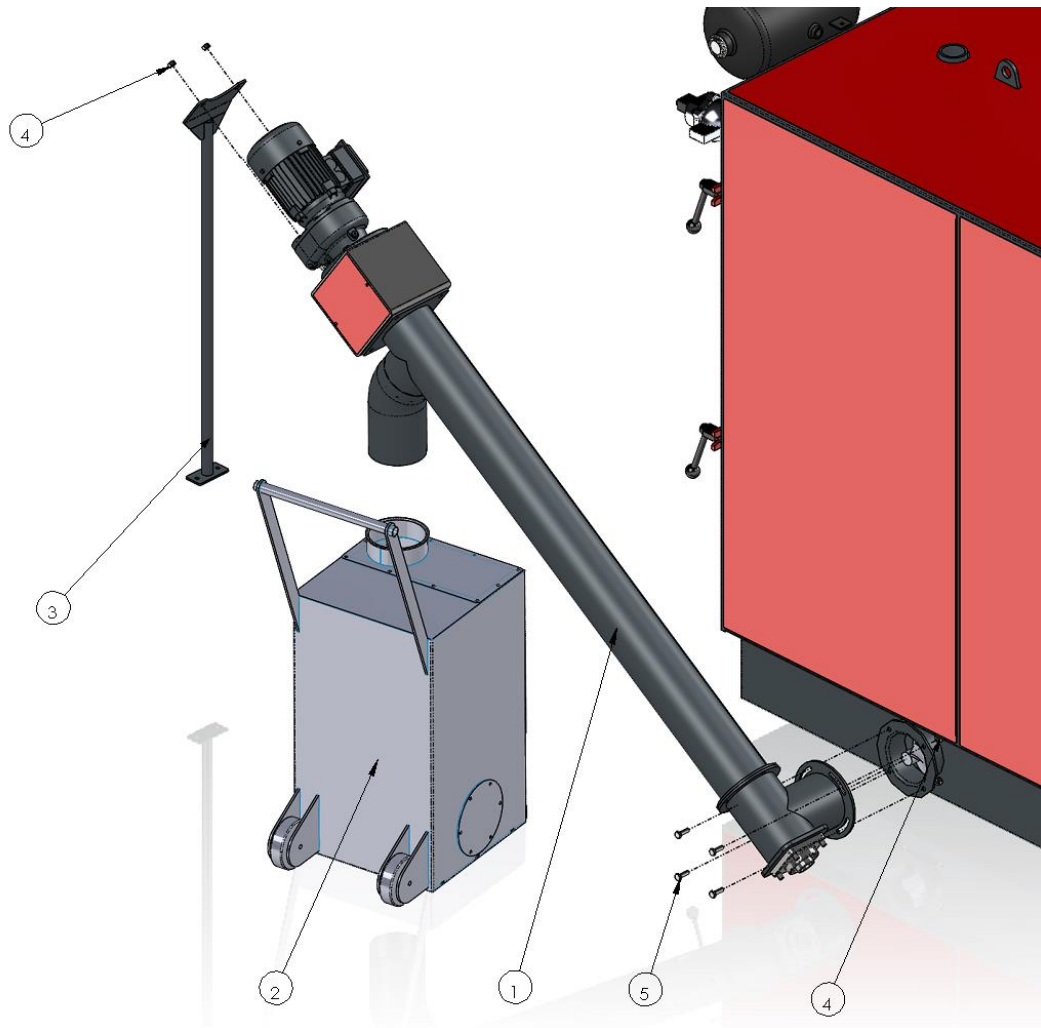
6. Parts for ash ejector are mounted as shown below. Cable for supply is mounted in the terminal box on the gear motor.

When the plant was ordered, it was considered which side of boiler ash should come out. Cable lengths and placement of cable trays are adapted to this.



1	Gearmotor
2	Flange
3	Bronze bearing
4	Ash auger
5	Key
6	4 pcs. bolt M10x40
7	Bolt M10x20
8	washer
9	4 pcs. M10 nut

7. Ash transport auger is mounted as shown below. Cable for supply is mounted in the terminal box on the gear motor.



1	Ash transport auger
2	Ash bin
3	Stand
4	6 pcs. M10 nut
5	4 pcs. bolt M10x40

Connection to the heating system

See diagram 1

The boiler must be connected as shown in diagram 1

Further information is in the Users manual, section. 5

The boiler must be connected with a 3 way mixing valve, which must prioritize the boiler and secure that return water to the boiler never comes below **60°C / 140°F**

The minimum flow of water passing through the boiler is calculated from a flow temperature of 80°C / 176°F and a return temperature of 65°C / 149°F (see table)

	Heat output		Minimum flow of water		Water volume in boiler	
	[kW]	[BTU]	[m³/h]	[gal/h]	[L]	[Gal]
CS120i	120	410000	6,9	1823	660	174
CS150i	170	580000	9,7	2562	750	198
CS250i	250	853000	14,3	3778	920	243

The open vented expansion tank must contain minimum 4 % of the total water volume in the heating system.

The boiler must be in non-blockage connection to the expansion tank.

DO NOT PLUG, BLOCK, OR SEAL VENT OPENING. SEALING CAN RESULT IN A DANGEROUS BUILDUP OF PRESSURE!

Should the open expansion tank be placed in a non-frost safe place, the tank itself must be protected against frost. The circulation to the tank must be controlled by a thermostatic valve or similar in order to secure, that the boiler water is getting minimum access to oxygen.

Connection of the sprinkler

The sprinkler system is to be connected to constant water pressure from a minimum 20mm / ½in pipe. Connect to the dirt strainer at the pressure tank.

There must be no shutoff valves on the pipe supplying the system.

Flush the pipes before connecting. Dirt or metal shavings can cause the valve to malfunction. You must test the system, when it has come under pressure.

The easiest way to test the sprinkler system is to unscrew the hose from the thermostatic valve to the auger channel. Then press the red cap under the valve to activate it After testing the sprinkler system, it is important to check that the valve is closing properly! (Dirt ore the like, in the valve seat, can prevent this)

Connection of the safety heat exchanger in burner tube

The burner tube has a build-in safety heat exchanger which cools the burner tube in case of pump failure or the like. The system will be activated if the water temperature, in the burner exceeds 95°C / 203°F

The valve on top of the burner tube (next to the safety relief valve) must be connected to constant water pressure from a minimum 25mm / ¾in pipe. The water pressure must be minimum 2bar / 29psi and the temperature maximum 15°C / 59°F There must be no shutoff valves on the pipe supplying the safety heat exchanger.

Flush the pipes before connecting to the thermal safety valve. Dirt or metal shavings can cause the valve to malfunction.

The return drain from the safety heat exchanger 25mm / ¾in is to be connected to a drain. The return drain is placed at the bottom of the burner tube. The pipe used to connect to the drain must have a sufficient size to avoid the emergence of backpressure.

Connection to the chimney

See diagram no 3

Further information is in the Users manual, section. 5

WARNING: Chimney, flue pipe and draft inducer (if applicable) must be clean and in good condition!

In order to get a good heating economy and to avoid smoke problems, you must connect the boiler to a suitable chimney. The boiler should be placed as close to the chimney as possible. An easy accessible cleaning door should be placed between boiler and chimney. Cleaning doors and the like must be absolutely tight to avoid false draft and smoke problems in the boiler room.

The flue pipe is to be insulated with a 5 cm / 2 inch thick fire resistant mat, to avoid flue gasses from condensing in it.

Requirements for suitable draft measured after boilers flue gas fan and before chimney is:
Minimum 10pa / 0,4in Wc and Maximum 20pa / 0,8in Wc

If the draft measured at the flue collar exceeds 20pa / 0,8in Wc, a draft stabilizer/reducer must be installed.

Connection to electrical net

All electrical work on the boiler must be conducted by a professional electrician. The power supply for the boiler is to be connected in the control unit.

See the electrical diagram in the supplied binder.

Connection of auger from extern fuel silo

See diagram no 2

The auger must give a certain amount, compared to the boiler type. See table below.

If you try to enter an amount, which lies outside the area listed in the table, the control unit will write "Error in weight". It is described in section 2 in the Users guide how to weigh the fuel amount and key it into the control unit.

Permissible fuel amount for auger

	Auger amount	
	[kg/m]	[lb/m]
CS120i	1,1 - 33	2,4 - 73
CS150i	1,6 - 56	3,5 - 123
CS250i	2,5 - 60	5,5 - 132

The connection is to be made with a flexible hose. The auger must not support on the stoker unit and vibrations from the auger are not to be transmitted to the stoker unit.

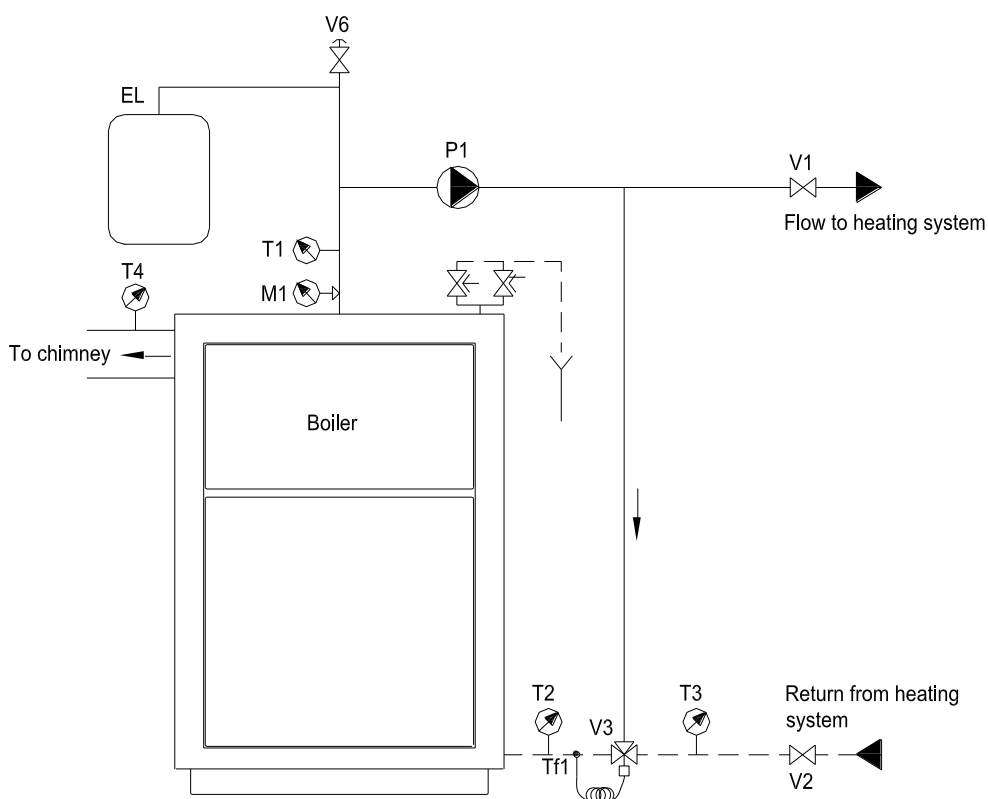
In case the plant is connected to a silo placed at the loft above you should also use a flexible hose, which must be emptied after each filling. The hole through the ceiling must be made fire-proof.

The auger motor is connected to the boiler control unit in one of the following two ways:

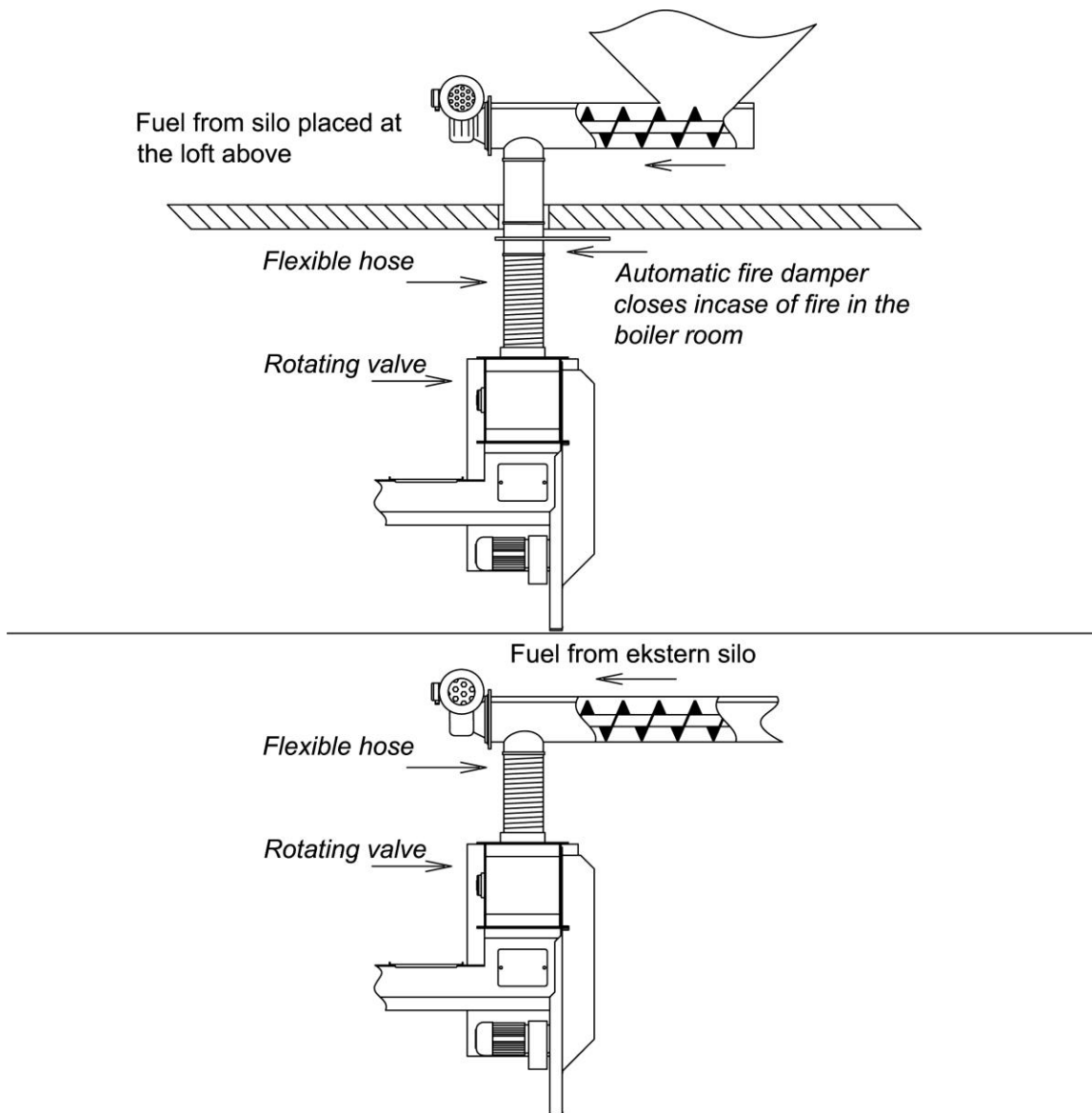
1. The auger motor is supplied directly from the boiler control unit by 3x400V AC+N+PE. The motor is to be connected to the terminal block in the control unit. Remember to adjust the amps at the motor protection relay according to the data plate on the auger motor.
2. The auger motor is supplied from an externally placed contact. The contact is to be supplied with a start/stop signal from the boiler control unit.

See the electrical diagram in the supplied binder.

Diagram 1 – Connection to the heating system



	Closed expansion vessel	EL	
	Shutoff valve	V1-V2	Shutoff valves on flow and return, in the boiler room. More can be installed if needed.
	3 way thermostat controlled mixing valve (shunt valve)	V3	Boiler shunt valve secure that the return water to the boiler always is over 60°C.
	Temperature sensor	Tf1	Temperature sensor to regulate shunt valve
	Airing	V6	Airing, possible automatic, placed where needed.
	Safety valve 2,5 bar	VS	Safety valves to be used by plants connected to water under pressure (closed system)
	Thermometer	T1-T4	Thermometer for water flow, water return before and after shunt pump and for flue temperature
	Manometer	M1	Manometer for boiler pressure.
	Pump	P1	Circulation pump

Diagram 2 – Connection of auger from extern fuel silo

The auger must not support on the stokerunit, and vibrations from the auger must not be transmitted to the stokerunit

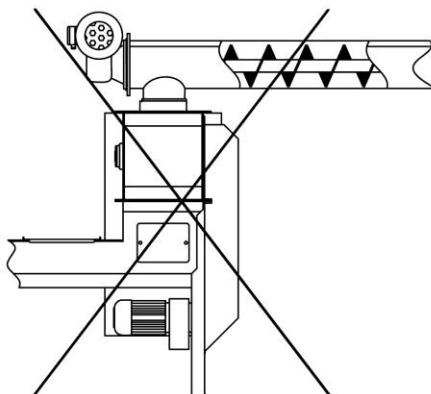


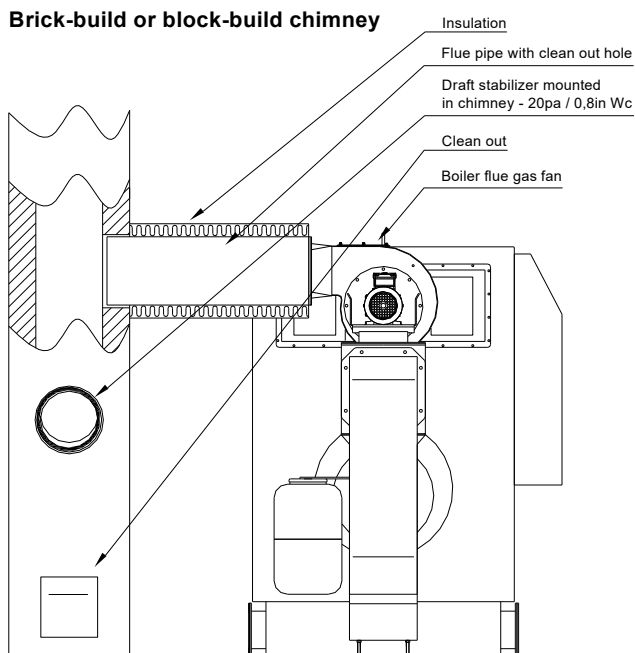
Diagram 3 – Connection to the chimney

Minimum cross section of chimney and minimum height

	Cross section area		Round chimney		Square chimney		Height from boiler base	
	[cm ²]	[in ²]	[cm]	[in]	[cm]	[in]	[m]	[ft]
CS120i	314	49	Ø20	Ø8	18x18	7x7	5	16
CS150i	363	57	Ø21,5	Ø9	19x19	7,5x7,5	5	16
CS250i	491	76	Ø25	Ø10	22x22	8,7x8,7	5	16

Prefabricated module chimneys are not to be placed directly on top of the flue gas fan outlet, as this allows rainwater or possible condense water to run directly down into the flue gas fan, where it will cause corrosion !

Brick-build or block-build chimney



Prefabricated chimney with stainless steel or ceramic liner

