

# **MANUAL FOR INSTALLATION**

## **CS120i – CS150i – CS200i – CS250i**

Version 2.3 – May 2011

***This manual should be read carefully before the installation commences!***

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



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The installation of this plant must be made in accordance with the local rules and regulations on the place of installation

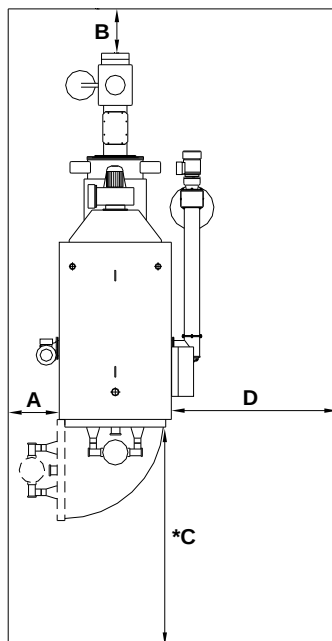
Before the plant is placed on its final place it should be inspected carefully for transport damages. Possible damages should be reported to the forwarder.

## ***How to assemble the plant***

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

1. The 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.
2. The stoker is fixated to the burner tube by means of M12 bolts. The gasket plus bolts for the fixation are included.
3. Before you fixate the stoker and burner tube to the boiler (with 2 bolts) you must adjust the height of the stoker by means of 2 adjustment screws on the leg, that it is placed horizontal and in a 90 ° angle to the boiler. It is absolutely important, that the water cooled burner tube is horizontal as you otherwise might experience air pockets in the system.
4. The water cooling of the burner tube can now be installed as shown on **diagram 1** All parts included fittings and circulation pump are in the accessories box included. *(Please note, that the circulation pump is for circulation between boiler and burner tube only)*
5. The combustion fan(s) is fitted on the square stud of the burner tube, no gasket needed.
6. The hose for pressure equalising in the stoker is fitted on the stud on the burner tube
7. 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.
8. The plugs for circulation pump and water pressure switch are pushed in.

The sketch indicates the recommended minimum distances in the boiler room.  
The room must be equipped with a ¾ inch high pressure water tap and a ventilation grille



Recomended minimum distances in boiler room

Measures i cm

|               | A  | B  | C   | D  |
|---------------|----|----|-----|----|
| <b>CS120i</b> | 50 | 20 | 176 | 80 |
| <b>CS150i</b> | 50 | 20 | 180 | 80 |
| <b>CS250i</b> | 50 | 20 | 220 | 80 |

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

## The connection to the heating system

See diagram 2

The boiler must be connected as shown in diagram 2 or as demanded by local statutes.

Further information is in the users manual, section. 5

If the heat consumption can exceed the nom. output of the boiler, the installation must be build with a valve which secures that the boiler temperature never goes below 60°C

| Boiler type | Nom. output [kW] | Min. amount of water [m³/h] | Size of ventilation grille in boiler room [cm²] |
|-------------|------------------|-----------------------------|-------------------------------------------------|
| CS120i      | 120              | 7                           | 3800                                            |
| CS150i      | 170              | 10                          | 5400                                            |
| CS200i      | 199              | 16                          | 8700                                            |
| CS250i      | 270              | 16                          | 8700                                            |

Table

The minimum amount of water passing trough the boiler is calculated from a flow temperature of 80C° and a return temperature of 65C° (see table)

The required ventilation grille is to ensure sufficient combustion air to the boiler (see table)

Water returning to the boiler must always be **min. 60°C**

If the above is not adhered to you will risk increased tear of the steel in the boiler, resulting in a shorter life expectation for the boiler.

## ***How to connect auger from extern fuel silo***

### **See diagram no 3**

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

| <b>Boiler type</b> | <b>Auger Kg/min</b> |
|--------------------|---------------------|
| CS120i             | 4,4 - 59            |
| CS150i             | 6,7 - 60            |
| CS200i             | 10,5 - 60           |
| CS250i             | 10,5 - 60           |

The connection must be made with a flexible hose. The auger must not support on the stoker unit and vibrations from the auger must not 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 must be 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 must be supplied with a start – stop signal from the boiler control unit.

**See the electrical diagram in the supplied binder.**

## ***The connection of the sprinkler***

The sprinkler system for the boiler must be under constant water pressure from a ½ inch tap with a safety faucet and be connected to the dirt collector under the pressure tank.

Please make sure, that pipes / hoses are free of dirt or metal shavings.

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)

## ***The 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.

The valve on top of the burner tube (next to the safety valve) must be connected to constant water pressure from a G $\frac{3}{4}$ " pipe. The water pressure must be minimum 2 bar and the temperature maximum 15°C. There must be no shutoff valves on the pipe supplying the valve.

Please make sure, that pipes / hoses are free of dirt or metal shavings.

The return drain from the safety heat exchanger G $\frac{3}{4}$ " must 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.

## ***The connection to a chimney***

*Further information is in the users manual, section. 5*

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.

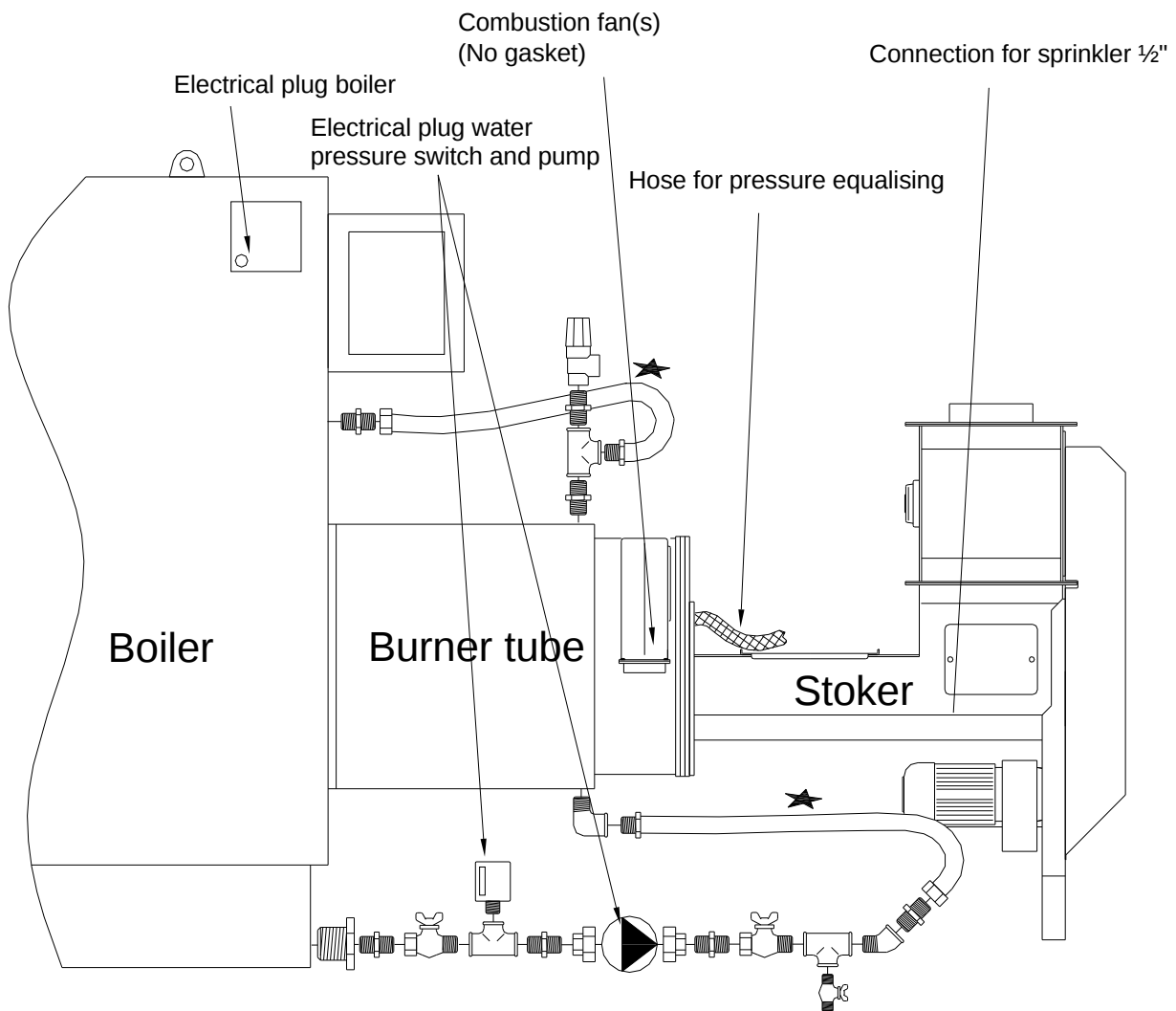
**The flue pipe must be insulated with a 50mm fire resistant mat, to avoid that the flue gasses are condensing in it**

## ***The connection to electrical net***

The power supply for the boiler 3x400V AC +N +PE is to be connected in the control unit.

**See the electrical diagram in the supplied binder.**

## Diagram 1 – How to fit the water cooled burner tube

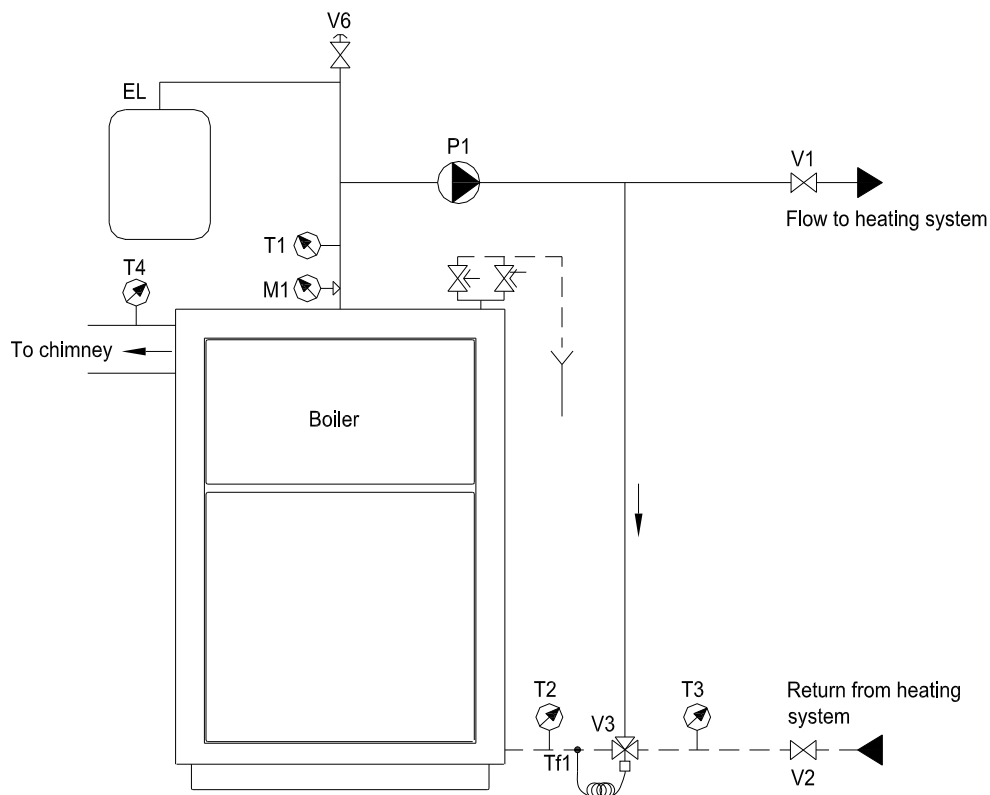


### Included fittings

- 2 pcs. 1" hose
- 1 pcs. 1" safety valve
- 1 pcs. 1/2" water pressure switch
- 1 pcs. circulation pump
- 2 pcs. 1" union joint for pump
- 2 pcs. 1" Shutoff valve
- 1 pcs. 1/2" shutoff valve (drain)
- 7 pcs. 1" Hexagon nipple
- 1 pcs. 1" tee
- 2 pcs. 1" x 1/2" x 1" tee
- 1 pcs. 2" x 1" connection nipple (CS120i-CS150i)
- 1 pcs. 2 1/2" x 1" connection nipple (CS250i)

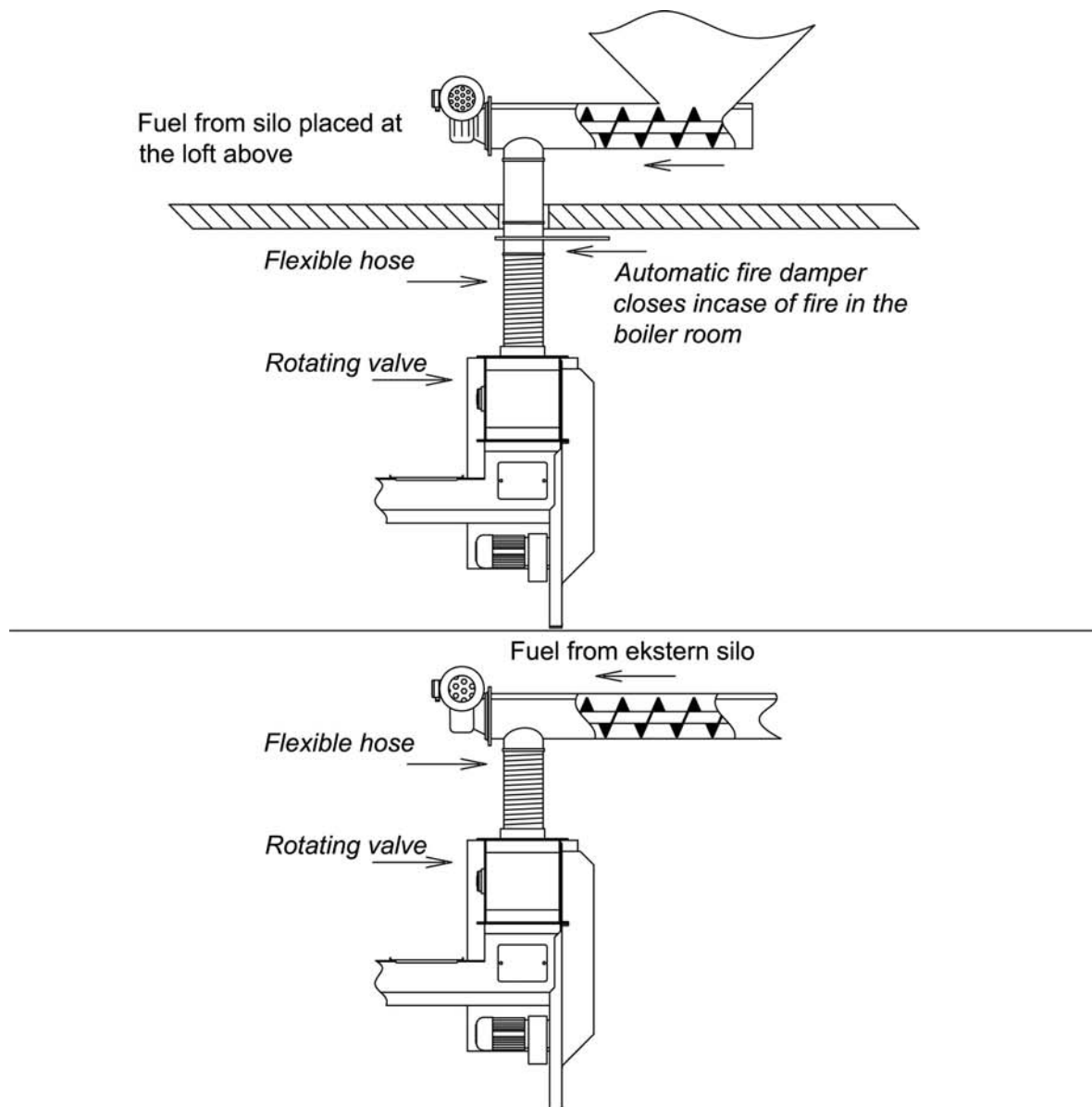
★ **Hoses are to be mounted in a way that secures that airpockets are avoided!**

## Diagram 2 – Connection to heating system



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

### Diagram 3 – How to connect the external auger



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

