



ECONOTWIN KTx50-65 WELDED STEEL BOILER

**INSTALLATION, OPERATION & MAINTENANCE
DOCUMENTATION**

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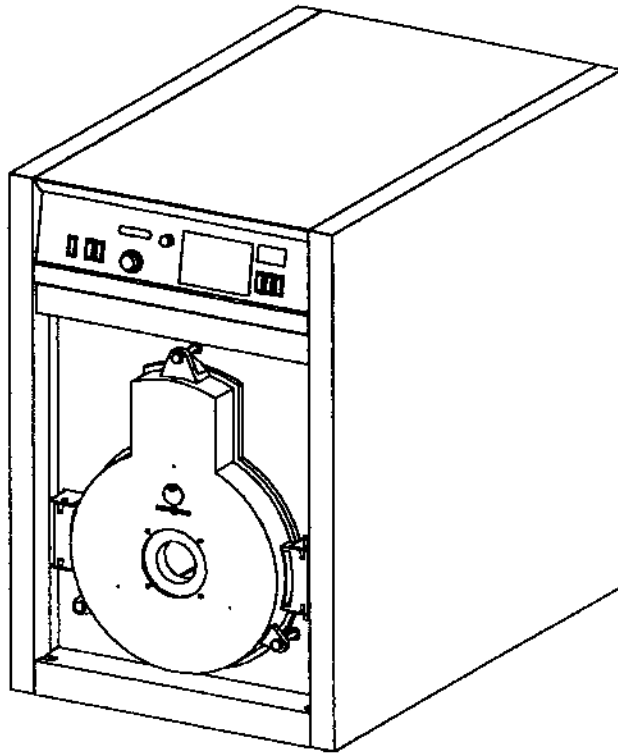
JUNE1996



Technical information -Installation instructions-

Econotwin KTx 50 - KTx 65

Low temperature boiler with dual circuit system



0272986



Safety instructions - Please observe!

Before commencing the installation, please read these installation instructions through carefully. No responsibility or liability is accepted for any damage or injury resulting from failure to observe these installation instructions!

Work which is incorrectly carried out represents a risk to both person and property!

- | | |
|---|---|
| Work on the heating installation | <ul style="list-style-type: none">• <i>Installation, commissioning, repair and maintenance work on the boiler and on the heating installation should only be undertaken by an authorised and qualified heating installer.</i> |
| When working on the boiler | <ul style="list-style-type: none">• <i>Switch off at the mains and take precautions to ensure that no-one switches on again.</i>• <i>Turn off the main gas cock or the valve in the oil feed pipe as appropriate and again take precautions to ensure that no-one turns them on again.</i> |



- Environmentally friendly heating technology printed on environmentally friendly recycled paper -

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Installation instructions

The Econotwin boiler meets the requirements of DIN 4702 and EN 303.

In installing and operating the installation, the appropriate building regulations and legal requirements must be observed. The boiler room regulations and the regulations governing the installation of gas appliances must also be observed.

The installation of the boiler, the initial start-up, the servicing and the maintenance must only be carried out by a properly qualified installer. Only genuine manufacturer's replacement parts should be used.

For commercial installations all appropriate authorisations should be displayed.

The relevant gas supply company should be informed of the intention to install a gas unit and their authorisation obtained if necessary.

In making the electrical connection, all appropriate regulations, including any of the electricity supply undertaking, must be observed.

Work on electrical equipment must only be carried out by a properly qualified and authorised person.

The following requirements must be met by the heating water:

- Inhibitors or anti frost additives should not be used without a manufacturer's guarantee that their use is safe.
- The inward diffusion of oxygen, e.g. by through insufficiently diffusion resistant underfloor heating or too small an expansion vessel, must be prevented by suitable measures.

Both for old and new installations, the heating plant must be flushed out before being put into service.

Work on the gas part of the installation may only be carried out by properly qualified and authorised installers. Confirm to the plant operator that the plant has been tested for gas-tightness.

Chimney requirements

Modern heating units such as the Econotwin KTx operate with low flue gas losses, i.e. with low flue gas temperature and with low excess air (= higher CO₂-Content). For new plants, provision is made for the appropriate modern flue gas systems which are suitable for the heating unit.

Where the plant is being modernised, there is often a reduction in the output of the heating unit as well as the reduction in the flue gas loss. The lower flue gas loss, the lower flue gas mass flow rate and the shorter „off“ periods can lead to problems with existing chimneys.

The replacement of elderly boilers by modern heating units therefore requires a careful examination of the suitability of the chimney.

In many cases an up-dating of the chimney is impractical. In borderline cases the following measures can be taken to improve matters:

- the shortest possible flue pipe with the minimum resistance to flow, and avoiding bends, leading to the chimney
- Insulation of the flue pipe
- Installation of a secondary air unit (draught limiter)

Service

The operator of the installation should arrange for a regular servicing and cleaning to be carried out by a specialist firm (annually).

Servicing should be carried out as laid down in these installation instructions (see page 14).

We recommend that a servicing contract should be signed.

Boiler room

Heating units for gaseous and liquid fuels with a total heat output of more than 50 kW should always be situated in special boiler rooms. The local regulations, including building regulations must be observed. The Econotwin should be installed in a frost-free space which can be adequately ventilated. Installation in spaces with a high dust level or high humidity, e.g. laundry or drying rooms, is not acceptable. It must not be installed in spaces where solvents, chlorinated cleaning fluids, dyes, adhesives, etc. are stored. Vapours from such materials can lead to corrosion of the boiler. Damage to the boiler resulting from such causes nullifies the guarantee.

Technical information

Please give this technical information to the plant operator. It must be displayed in a readily seen position in the boiler room. Instruct the operator in the starting-up and operation of the plant.

Please pay attention both to the operating instructions and to the instructions for the other components of the heating installation.

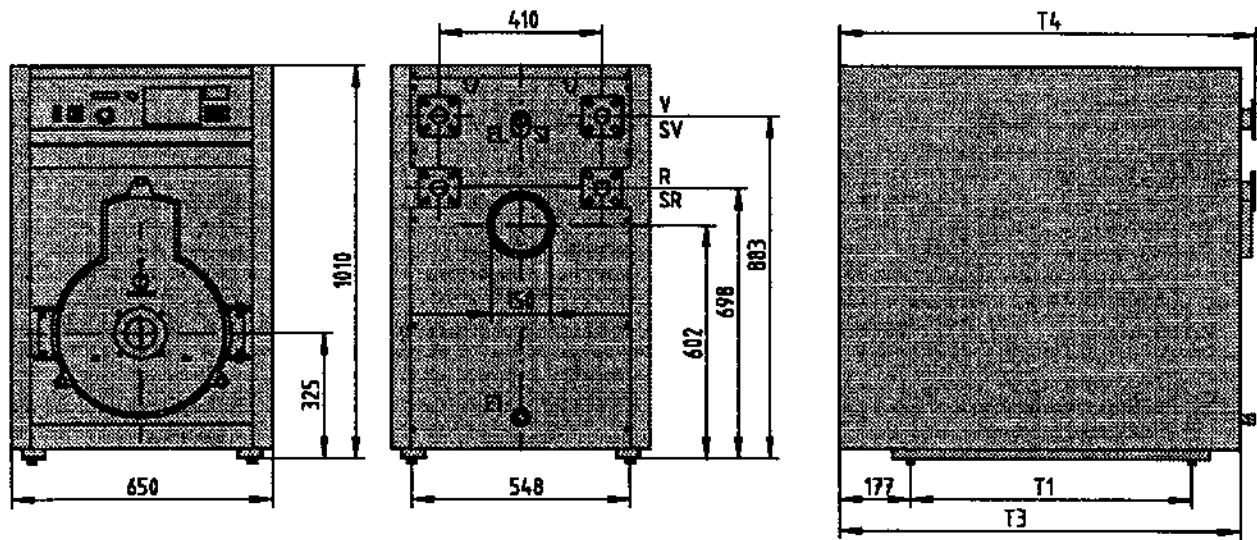
If everything is done according to these instructions and the boiler is correctly installed, a reliable, economical and environmentally friendly operation of the heating plant is assured.

Technical data

| | | | | |
|--|----|---------|-----------|---------|
| Econotwin | | KTx | 50 | 65 |
| Maximum firing rate | | kW | 54 | 70 |
| Nominal output | | kW | 50 | 65 |
| Output range | | kW | 37–50 | 50–65 |
| Boiler efficiency* | | % | 92,8 | 93,0 |
| Flue gas loss* | | % | 6,5 | |
| Stand-by loss* | | % | 0,45 | 0,37 |
| Max. permissible operating temperature | | °C | 100 | |
| Max. adjustable operating temperature | | °C | 90 | |
| Hydraulic resistance (dt=20 K) | | mbar | 40 | 68 |
| Max. pressure (gauge) | | bar | 3 | |
| Water content | | Liter | 105 | 135 |
| Combustion chamber volume | | l | 81 | 102 |
| Combustion chamber diameter (combustion chamber insert) | | mm | 335 | |
| Combustion chamber length | | mm | 650 | 820 |
| Gas content | | l | 90 | 115 |
| Gas side resistance | | Pa/mbar | 9/0,09 | 14/0,14 |
| Electrical connection | | V~/Hz/A | 230/50/10 | |
| Max. power requirement* | | VA | 450 | |
| Protection (DIN 40050) | | | IP 20 | |
| Distance between adjustable feet | T1 | mm | 540 | 710 |
| Depth of boiler | T3 | mm | 840 | 1010 |
| Depth of boiler with flange | T4 | mm | 875 | 1045 |
| Flow and return connection | | DN | 40 | |
| Transport weight | | kg | 220 | 265 |
| Values for calculating the chimney requirements | | | | |
| CO ₂ -Content | | Vol. % | 13 | 13 |
| Flue gas temperature | | °C | 170 | 170 |
| Mass flow of flue gas | | kg/h | 82,8 | 108,0 |
| Mass flow of flue gas | | g/s | 23 | 30 |
| Draught requirement | | Pa | 14 | 19 |

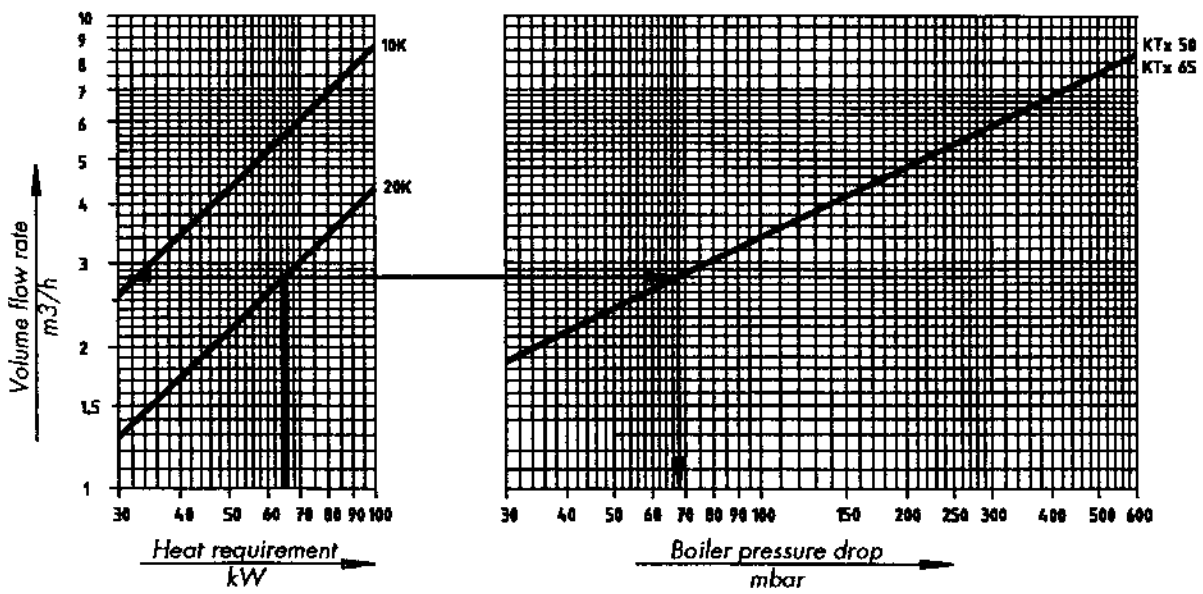
* The values apply for net calorific value, nominal output, CO₂-Content 13 %, Room temperature 20°C

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- V Boiler flow connection
- R Boiler return connection
- SV Safety flow
- SR Safety return
- EL/SI Connections Bleed/Safety valve 3/4" BSP
- E1 Filling/Drain connections 3/4" BSP

Fig. 1: Dimensions



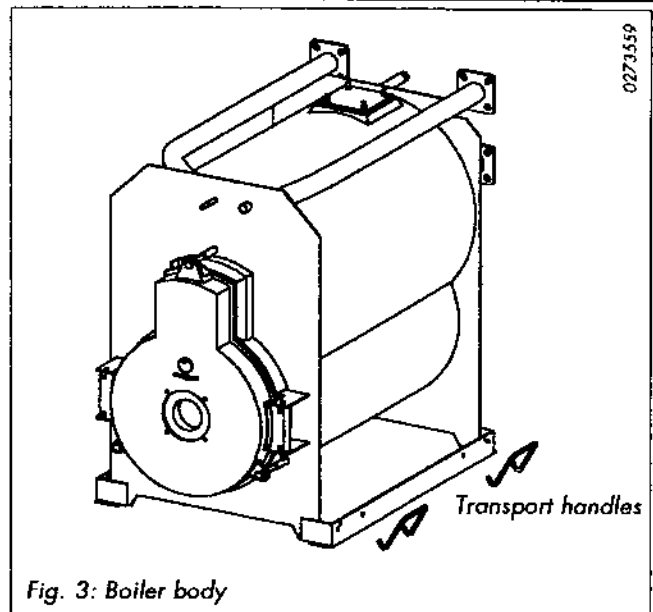
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Fig. 2: Hydraulic resistance

Delivered specification/Accessories/Application/Positioning

Oil/Gas boiler

- Econotwin KTx low temperature boiler with dual circuit system with two thermal valves.
- Output range: 37 to 65 kW
- Suitable for fully automatic on/off operation in closed heating plants as defined in DIN 4751
- Cylindrical convective heat exchange surface with water-cooled heat pocket in the primary circuit
- Cast iron hinged door for left or right handed mounting
- Stove enamelled casing
- Colour RAL 9010 yellow
- No lower temperature limiter can shut off fully when there is no heating demand
- Ready for the installation of Domotronic OET weather dependent control
- Type certification number: 08-226-248
- The Econotwin KTx is delivered in two packages, containing the boiler body and the boiler casing with pre-wired basic control panel
- A cleaning brush, two blank flanges and bolts and seals for four flanges are included in the package.



Accessories

Ordering-No.

- | | |
|--------|---|
| 261674 | Transport handles, 4 off |
| 273199 | Boiler plinth (Fig. 4) |
| 000748 | 4-Way mixing valve 1 1/4" BSP complete |
| 000053 | Water storage priority switch for KTx |
| 000056 | Water storage priority switching for OET 12 |
| 000001 | Flange 25-32 dia. |
| 000002 | Flange 32-40 dia. |
| 000032 | Threaded flange 1 1/4" BSP |
| 000071 | Flue gas acoustic silencer Ø 150 |

Weather dependent control

The required operation as a low temperature boiler is possible in conjunction with one of the following controls:

- | | |
|--------|-------------------|
| 000770 | Domotronic OET 10 |
| 000774 | Domotronic OET 11 |
| 000775 | Domotronic OET 12 |

Transport

→ In the sides of the angle plates at the bottom of the boiler (Fig. 3) are to be found two pairs of holes for the insertion of the transport handles (Accessories).

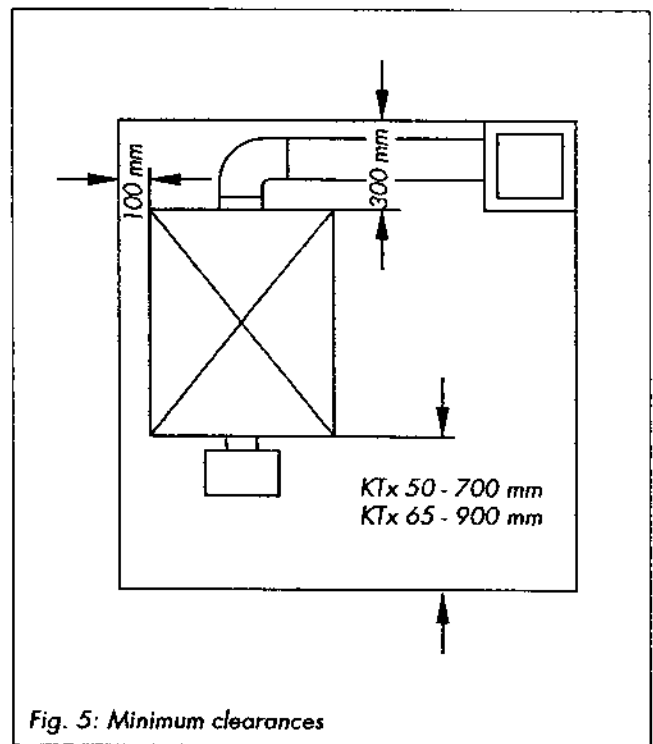
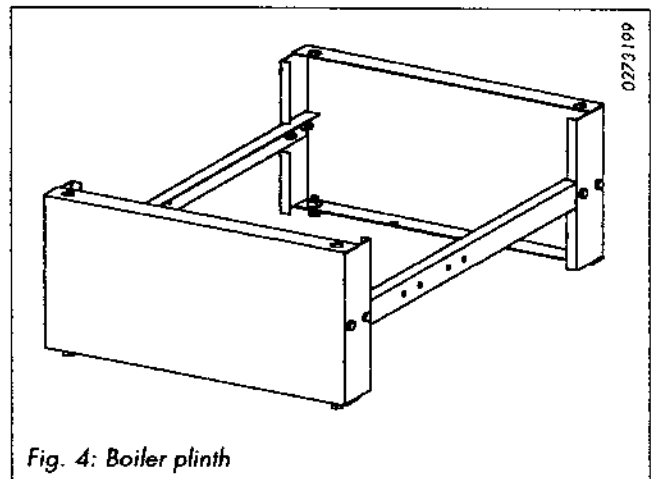
Application

Heating units for use in closed thermostatically controlled water heating installations and in combination with oil pressure jet or blown gas burners. Please also refer to the installation instructions on page 3.

Positioning

Please also refer to the installation instructions.

- Remove the cleaning brush from the boiler.
- Position the boiler close to the chimney - avoid long lengths of flue pipe.
- Observe the minimum clearances (Fig. 5).
- Pay attention to the lay-out of the boiler room as well as to its air supply and ventilation.



Fitting the boiler casing

- Lay the bottom plate **1a** and insulating mat **1b** between the angle plates at the bottom of the boiler.
- Fasten the mounting plate **2** to the rear of the boiler using the bolts provided.
- Remove the boiler door **3** - undo the bolts **A** and remove the rod **B** upwards from the hinge.
- Position the insulating mat **4a** and the casing front panel **4b** over the door frame and studs - refit the boiler door.
- Position the side panels **5** and **6** on the mounting bracket **2** and the projections in the casing front panel - fasten the side walls to the front panel with screws.
- Lay insulating mats **7a** and **7b** on the boiler.
- Lay the control panel bracket **8a** on the insulating mats, Fit the spacer supplied to the threaded stud **C** on the boiler, position the control panel bracket and fasten with hexagonal nut - fasten the control panel bracket to the side panels with screws.
- Fasten the connection bracket **8b** to the control panel bracket **8a** with screws.
- Lead the electrical connection lead and the pump lead out through the rear - Place the boiler sensor in the front pocket and the limit thermostat sensor in the pocket at the back of the boiler and fasten with spring clips.
- Hinge the front of the control panel **8c** in the side panels, swing it upwards and fasten to the side panels with screws.
- Fit insulating mats **9a** and **9b** over the boiler connections - Fit the rear casing panels **10** and **11** and fasten with the screws supplied.
- Lay the top panel of the casing **12** in place - shove it forward over the control panel and fasten with screws at the rear.
- Fasten the burner lead **13** to the right side panel with the plastic clips supplied. Insulation

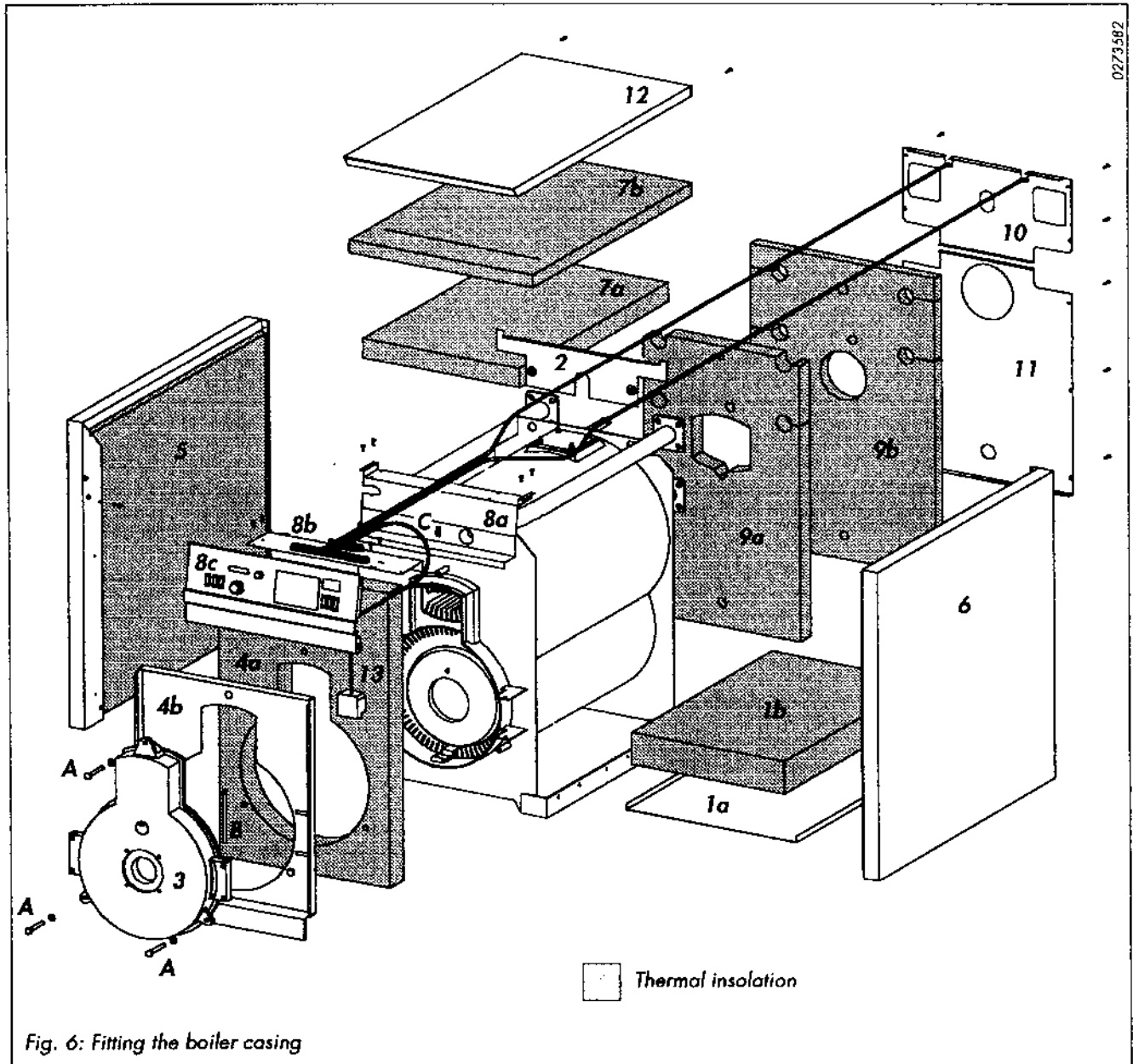


Fig. 6: Fitting the boiler casing

Boiler Installation

Hydraulic connections

The connections are made at the rear of the boiler (see Technical Data on page 4 and dimensions on page 5).

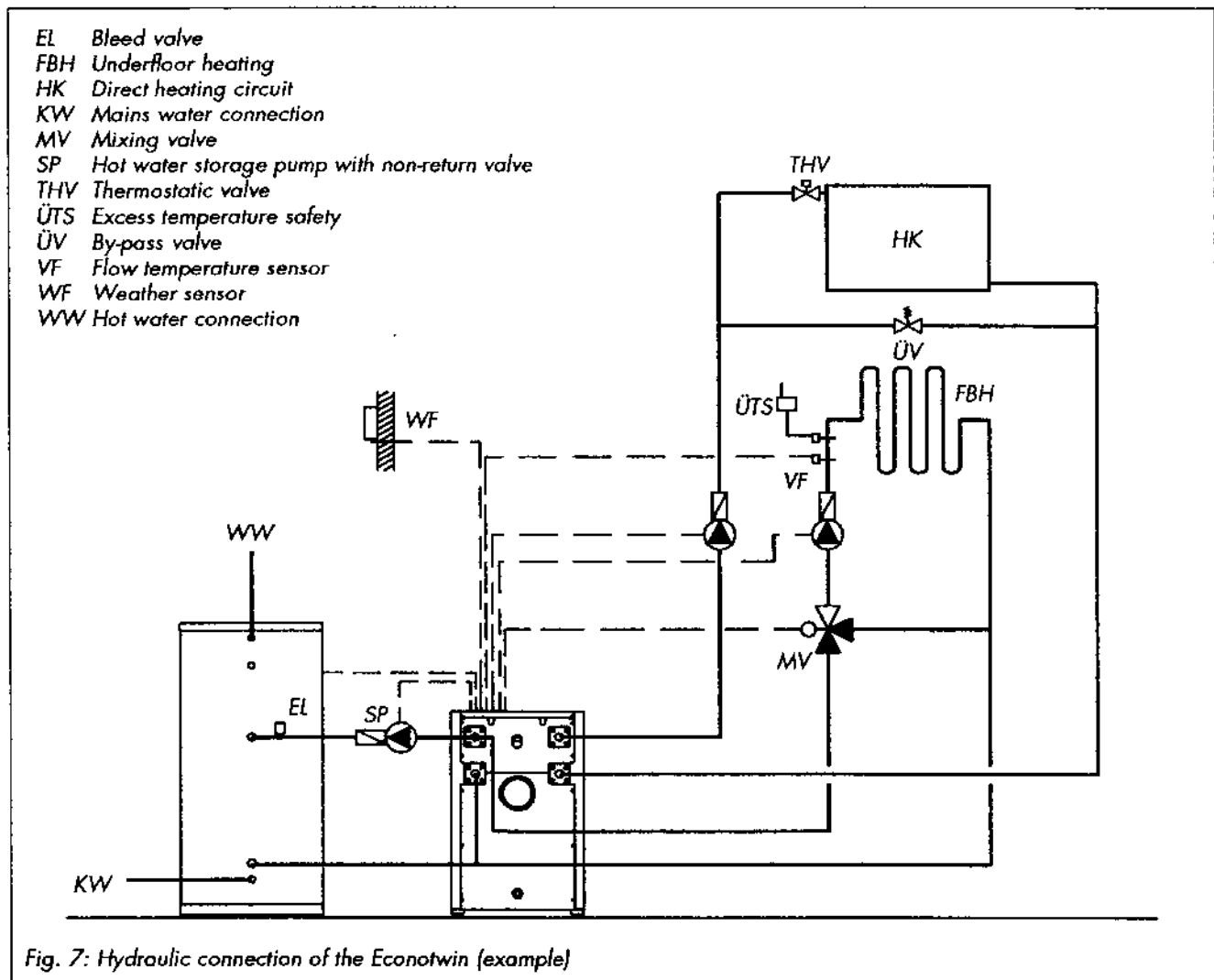
→ The casing components 8 to 10 (see Fig. 6, page 7) must be fitted before the connections are made!

→ The Econotwin may be installed in the plant without a mixer valve. The dual circuit system allows the boiler to be operated without a minimum temperature limiter.

→ To optimise the controls we recommend the installation of a mixing valve with underfloor heating.

- Before connecting the boiler, flush thoroughly.
- Connect the heating circuit in the customary manner. - Fig. 7 shows an example of the hydraulic connection of the Econotwin.
- In selecting a circulating pump, account must be taken of the hydraulic resistance of the boiler (see page 5), the resistance of the piping and the individual resistances of all the other components.
- For an installation with thermostatic radiator valves, install a by-pass valve suitable for the installation - Adjust the by-pass valve to the installation resistance - Adjust the by-pass valve so that a minimum water flow is guaranteed.
- Fit the boiler and the installation with any safety equipment necessary.

- Connect the safety valve and automatic vent valve to the boiler connection point „EL/SI“, ¼" BSP (see Dimensions, page 5) - The connecting pipe for the safety valve, minimum diameter 20 mm, must not be capable of being closed - the bleed pipe, minimum diameter 25 mm, should lead to a drain by the shortest way without restrictions or internal projections - the discharge opening must be unobstructed and clearly visible - Bleed pipes must not be discharged into the open air.
- Install an adequately sized membrane pressure expansion vessel and connect to the boiler return - minimum diameter for the connection pipe 20 mm - Isolating fittings must be protected against accidental closure (e.g. a capped valve).
- Separate protection against low water level is not necessary since this protection is already provided by the integral safety thermostat (STB).
- Install manometer, thermometer, isolating device and boiler filling/emptying valve.



Fitting the burner

The Econotwin is fitted with a boiler door with built-in burner mounting.

→ Standard dimensions (Fig. 8) for oil pressure jet and blown gas burners (as laid down in e.g. DIN 4789) are assumed.

- Carry out the installation as laid down in the burner manufacturer's installation instructions.

⚠ Only tested and approved oil or blown gas burners without their own flue gas recirculation may be used.

- Make the oil or gas, as appropriate, connection in accordance with the burner manufacturer's instructions.
- Check the fuel supply system for leakage.

Flue connection (Fig. 9)

- Select a diameter of flue gas pipe to match the diameter of the flue gas connection on the boiler - reductions in the cross section are not permissible.
- Fit the flue pipe tightly to the boiler flue gas connection.
- Lead the flue pipe to the chimney by the shortest route and with an upward gradient - keep bends to a minimum.
- Provide openings to permit cleaning.
- Fit protective pipe into the chimney seal the flue pipe into the protective pipe with sealing cord.
- Check that the flue pipe is sufficiently supported - if necessary fit pipe brackets.
- Insulate the flue pipe.
- Make a 12 mm diameter opening for the measurement of emissions - 3 x flue pipe diameter after the boiler connection - Close the opening.
- Fit the chimney draught limiter.

Advisory note: The flue gases should be led to the chimney exit and protected against overcooling in such a way that flue gas condensation in the chimney will not lead to problems. Special measures to avoid flue gas condensation are particularly necessary in the renovation of old buildings. We recommend the fitting of a flue draught limiter. It offers the following advantages:

- Even chimney draught
- It is possible to adjust for a high-CO₂ content
- Reduction of the flue gas losses
- Good chimney ventilation
- Protection against sooting up of the chimney
- Reduction of stand-by losses.

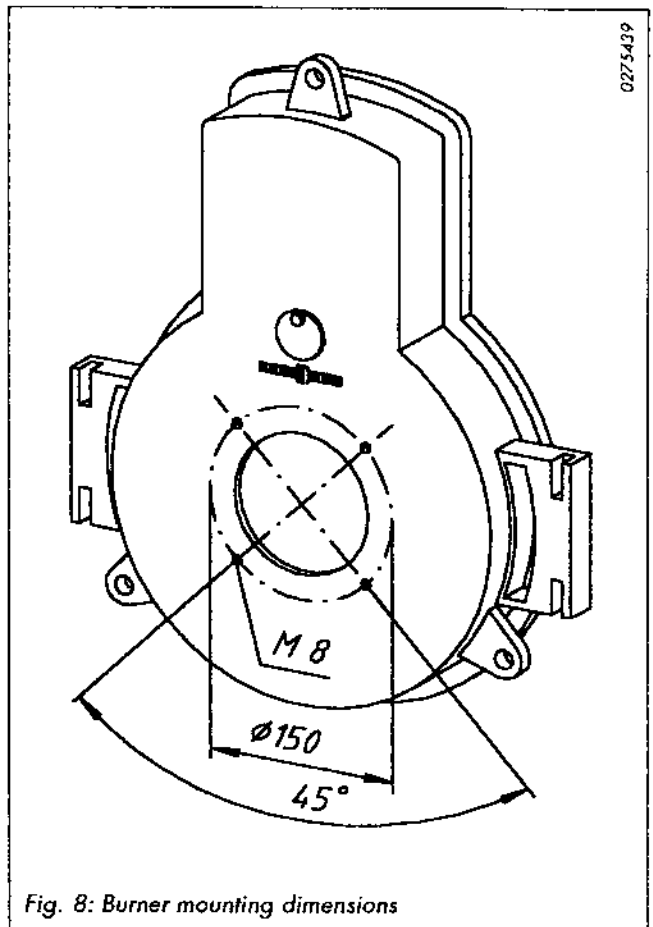


Fig. 8: Burner mounting dimensions

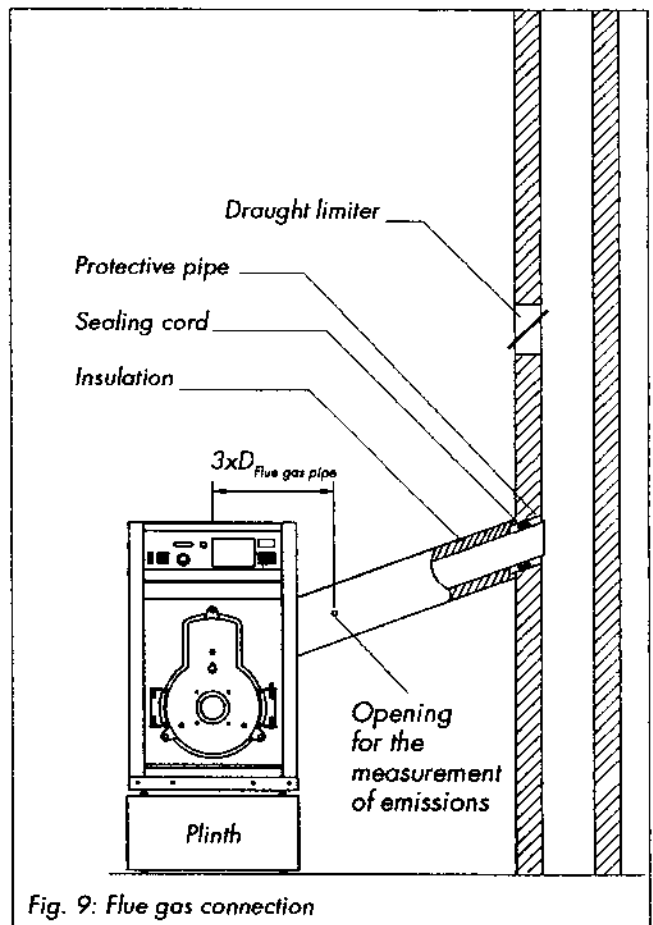


Fig. 9: Flue gas connection

Boiler Installation

Electrical connection

⚠ The electrical connection should only be made by a properly qualified and authorised person. In making the electrical connection, all appropriate regulations, including any of the electricity supply undertaking, must be observed.

When working on the electrical equipment, the voltage should be switched off from all phases.

- Make the mains connection using suitable four-core cable (see Fig. 10).
- The black wire, separated at the works, is a control phase which operates at voltage in parallel with the circulating pump. Additional pumps or heating controls can be connected here.
- The mains connection must be made through an isolating mains switch.
- Connect the circulating pump to the „Heizkreispumpe“ connections.
- Check that all electrical connections are tight and that all plugs and sockets are firmly connected.
- Carry out operational checks (see page 15).
- If a Domotronic® weather sensitive control unit is to be fitted, install and connect it (see Page 13), and put it into operation as in the operating instructions.

Electrical connection of the burner

⚠ Please also observe the burner manufacturer's technical information.

- The Econotwin KTx is fitted with a standard 6-pole burner connector - Lay out of the burner wiring connections (numbered leads) see Fig. 11.
- Connect the boiler connector to the burner connector and push firmly home.
- If required, fit operating hours meter - change the 6-pole burner connector for a 7-pole burner connector (delivered with the meter) and wire up as shown in the wiring diagram (page 16).

Note: A bridge in the burner connector connects leads 1 and 3. If this bridge is not in place, power will not reach the burner despite the boiler control being switched on and the correct mains voltage.

If the burner operation warning light (Fig. 12/2) does not light up on start-up:

- Mains wires correctly connected?
- Boiler controls switched on?
- Bridge in the burner connector in place?

If there is no burner connector, the following is the customary connection procedure:

- Remove the connector from the burner connection.
- Connect up the burner lead according to the burner manufacturer's instructions, generally:
- Connect wires 1 and 3 to a common connector.
- 4 is the switched phase for the burner
- Connect the remainder of the wiring as in Fig. 11 and the wiring diagram on page 16.

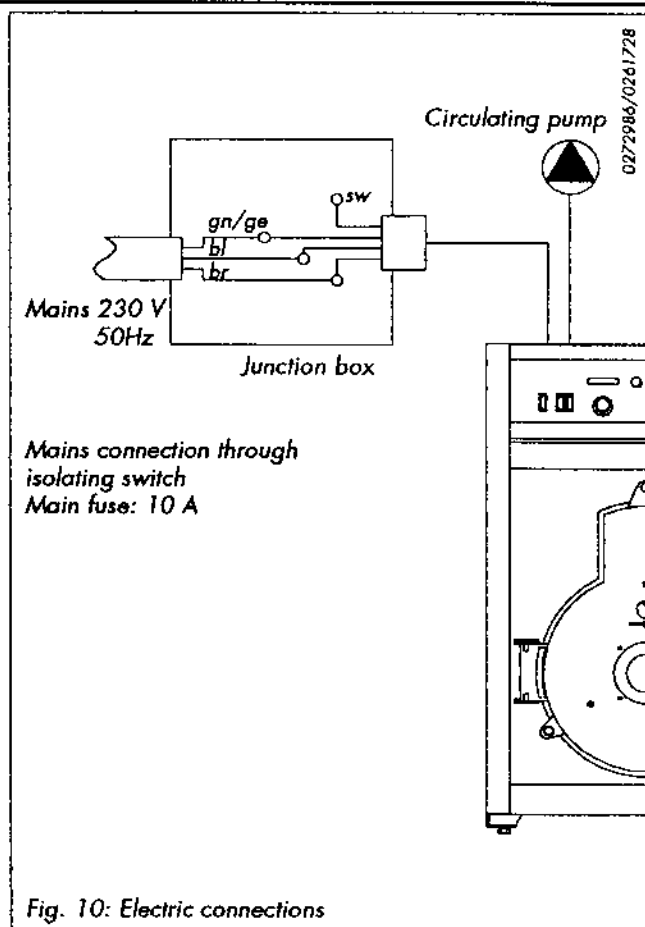


Fig. 10: Electric connections

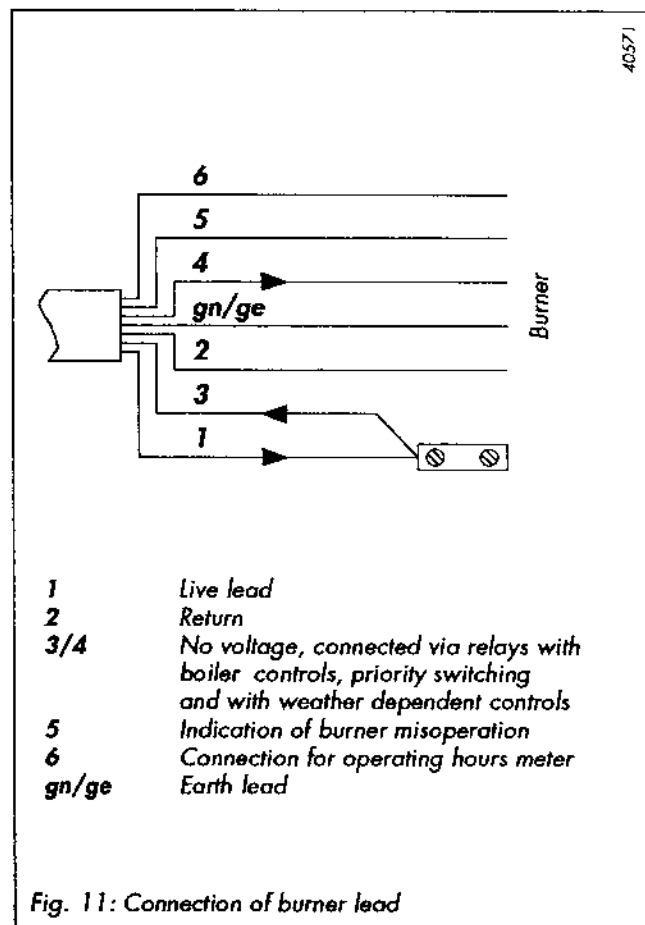





Fig. 11: Connection of burner lead

Basic control panel

The Econotwin is fitted with a basic control panel which incorporates all necessary indication, control and safety functions. It is wired for the additional fitting of a weather dependent Domotronic® OET control (see also Domotronic® OET technical information).

Functions

- 1 Operating switch**
Main switch for the boiler and the weather dependent control.
I = On - normal position
0 = Off - the entire control unit is disconnected, only for service work.
- 2 Burner operation lamp**
Gives optical indication that burner should be operating.
Note: The burner may only start after the oil pre-heating by the jet block heater.
- 3 Burner fault lamp**
Indicates that the burner has shown a fault and gone to lockout.
- 4 Boiler thermostat**
For setting the maximum boiler temperature. Range of operation 25-90°C, limited to 75°C at the factory. Can be set to 90°C by pulling out the control knob.
 - Without weather sensitive control:
Set the desired boiler temperature - For water heating, the boiler will be heated to a stand-by temperature of 90°C.
 - With weather sensitive control:
Set the desired maximum temperature for heating and hot water.
- 5 Boiler thermometer**
Shows the actual boiler temperature (secondary circuit) in °C.

- 6 Safety thermostat (STB)**
Shuts the burner down and locks it out if a temperature of 120°C is reached in the primary circuit. To restart unscrew the protective cap and depress the safety button.
Note: Different temperatures can arise in the primary (STB measuring point) and secondary (shown by the thermometer) circuits as a result of the dual system operation. The STB also locks out at ca. -20°C (e.g. during storage, transport)
- 7 Installation openings for the Domotronic®**
For installing the weather dependent control Domotronic® OET.
- 8 Summer-/Winter switch**
 -  Burner, circulating pump, mixer operational. Water heating possible.
 -  Burner, circulating pump and mixer shut down for heating. Mixer remains in its current position. Water heating possible.**Exception:** No water heating if the weather dependent control Domotronic® OET 12 is fitted together with the priority switching 0056.
- 9 Measurement switch**
For flue gas measurements - With the switch depressed the boiler reaches the temperature set on the thermostat - Summer-/Winter switch to be switched off  - if necessary open the mixer by hand.
- 10 Test switch for the safety thermostat (STB)**
Cuts out the STB - Only for test purposes.
Note: The sensor for the safety thermostat is situated in the primary circuit of the boiler - Differences from the thermometer reading possible - To check the temperature accuracy of the STB, measure the temperature by means of a thermostat in the STB pocket.
- 11 Installation opening for operating hours meter (accessories)**

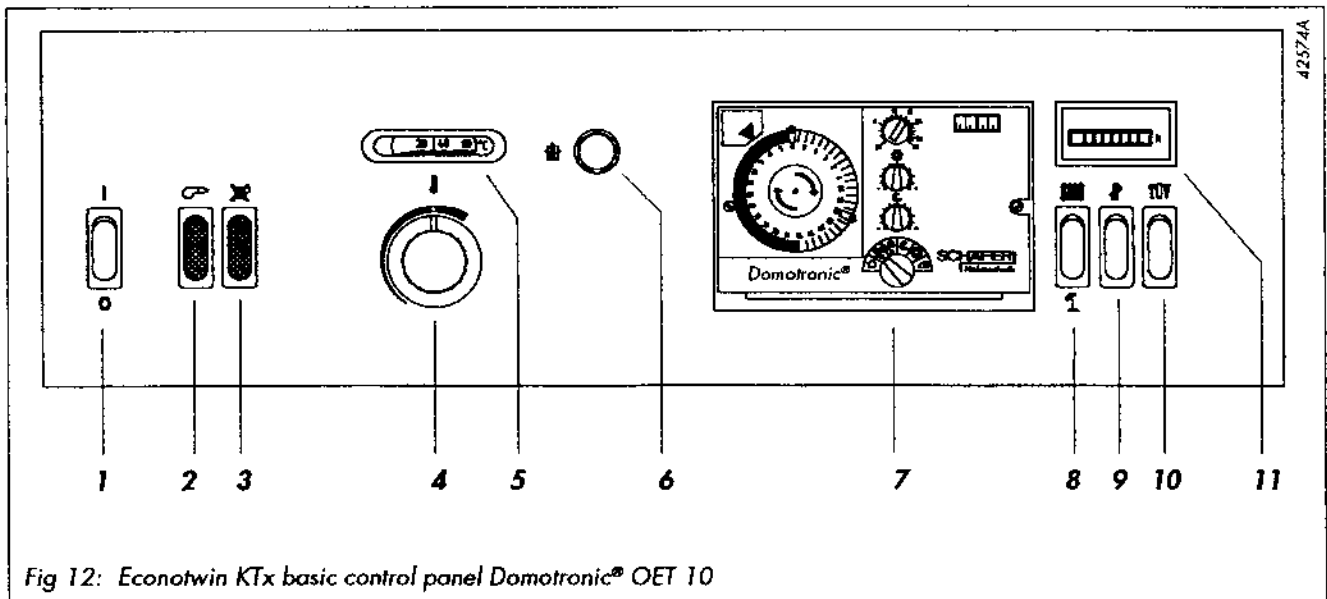


Fig 12: Econotwin KTx basic control panel Domotronic® OET 10

Preparing for operation

Preparations

 The commissioning should only be done by an approved firm of installers.

- Check the pre-pressurisation of the membrane pressure expansion vessel - see the manufacturer's instructions.
- Connect a hose between the water source and the boiler filling/drain cock.
- Fill the installation and vent it - The circulating pump should be off while this is being done - Set the operating switch to „0“.
- Check the pressure in the installation on the manometer - if necessary top up with water and re-vent.
- Close the boiler filling/drain cock - remove the filling hose.


Gas burner


- Open the gas main cock.
- De-aerate the gas pipe.
- Check the connected gas pressure and compare it with the gas burner manufacturer's specification.

Oil burner

- Check that there is oil available and open the oil supply pipe.
- For single pipe systems, vent the suction pipe.

Commissioning

 All the work involved in starting up the plant must be carried out by the installer of the plant or by his nominated deputy. A commissioning record form must be completed.

- Check the electric plugs.
- Switch on the main heating switch.
- Set the operating switch to „1“.
- Set the summer/winter switch to .
- Set the boiler thermostat to the required maximum boiler temperature (we recommend 75°C).
- If room thermostats are connected, set these to heat requirement.
- If a Domotronic® control is installed, set this according to the instructions for use.
- Boiler starts up - „Burner operation“ lamp illuminates - starting process dependent on the boiler installed - Delays e.g. for oil heating or leakage controls are possible.
- Carry out the adjustment of the burner in accordance with the burner manufacturer's instructions.
- Set the oil or gas throughflow so that the boiler is operating inside of its declared operating range and that the nominal output of the boiler is not exceeded - Check that the chimney is suitable for the flue gas temperature (see Fig. 13).
- As an aid to adjustment and burner choice, a technical advice sheet „Trying to match the oil burner“ is enclosed with the boiler.
- Gently tighten the fastening bolts in the boiler door when warm.
- Complete the commissioning form (Page 18).

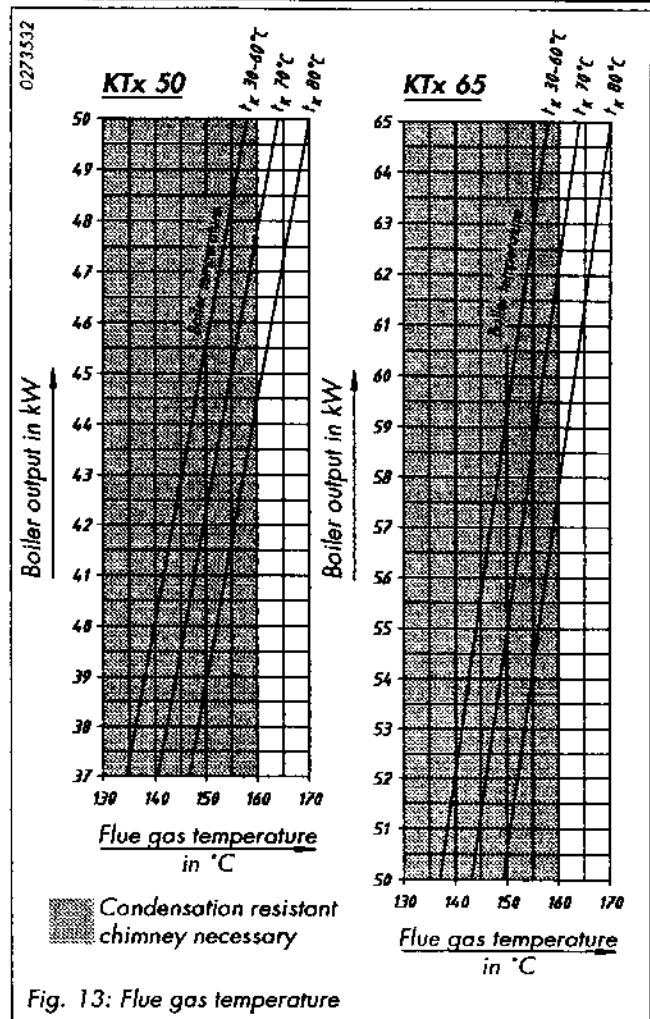


Fig. 13: Flue gas temperature

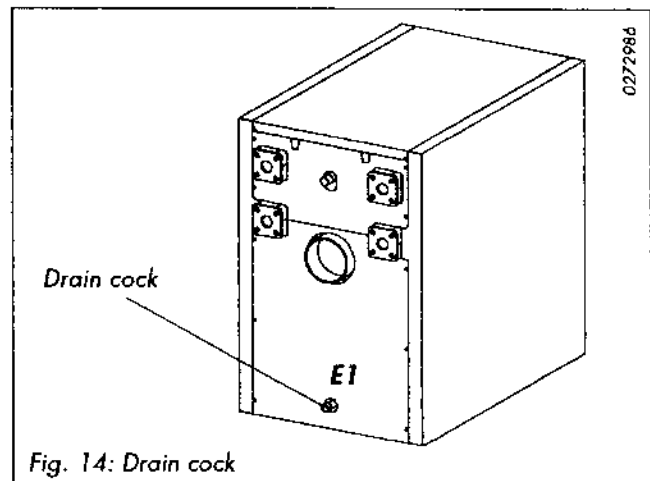


Fig. 14: Drain cock

Decommissioning

- Switch of the main and operating switches.
- Close the main oil or gas valve.
- If to be out of commission for long, e.g. for boilers not supplying hot water out of the heating season, clean the boiler - see under service.
- If out of commission when there is a risk of frost, drain the installation - drain the boiler at the drain cock E1 (Fig. 14).

Installation

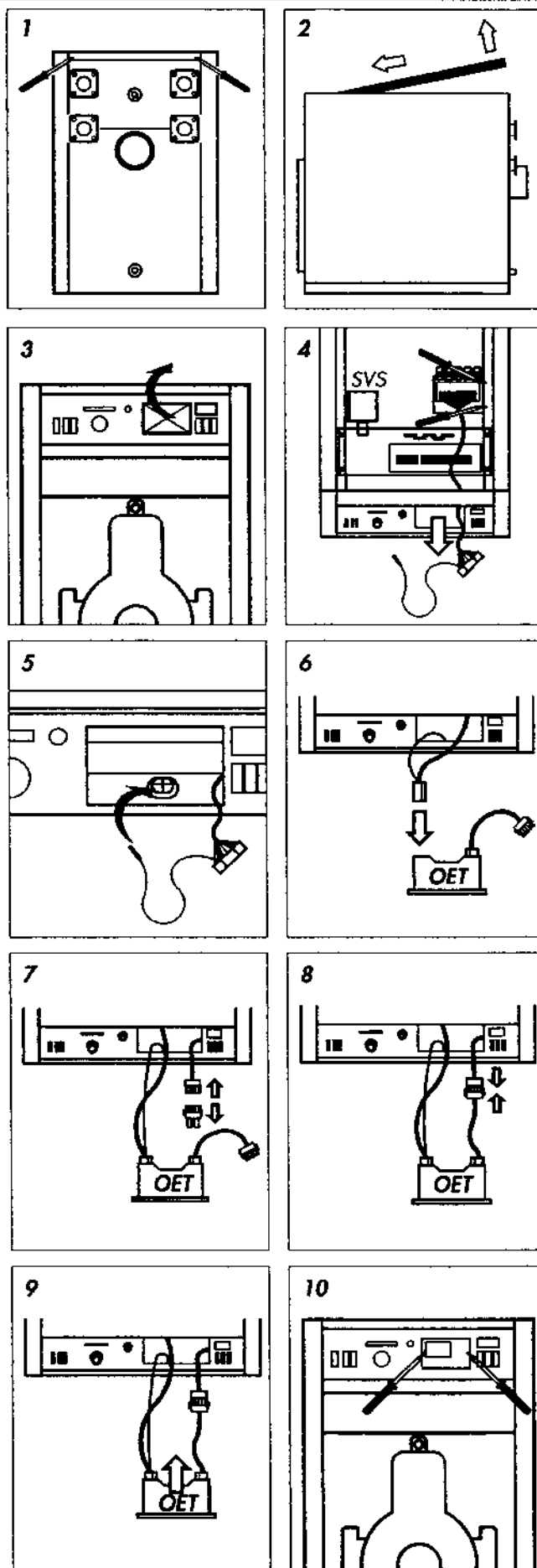
! The electrical connection should only be made by a properly qualified and authorised person. Before beginning the installation, switch off all power from the installation.

- Main switch switched off - operating switch at „0“.
- At the rear of the boiler remove both screws from the top of the casing 1.
- Remove the top of the casing 2.
- Remove the blanking piece from the mounting hole 3.
- Mount the sensor box bracket on the upper corner of the side casing - Insert the sensor box and fasten under the boiler side panel - lead the connector through the mounting hole 4.
- If required install the water storage priority switching, Ordering-No. 0053, 4, and connect according to its installation instructions.

- Lead the boiler sensor through the mounting hole and insert in a free position the sensor pocket. 5 - Clamp the sensor in position.
- Plug in the sensor connector to the Domotronic® 6.

- Remove the 15-pole bridging connector from the cable harness in the boiler control panel 7 - Place the bridging connector in the control panel.
- Make the mains connection 8.

- Place the Domotronic® in the mounting hole 9.
- Tighten the mounting screws 10.
- Connect all necessary sensors, and additional units if required, to the sensor connector box - Tighten the cable clamps.
- Replace the boiler top casing and fasten with the two screws.
- Set up the Domotronic® as laid down in its operating instructions and put it into operation.



Service



The boiler must be serviced regularly (at least once a year). This service should only be carried out by a qualified installer. We recommend taking out a maintenance contract.

Neglecting the servicing introduces a safety risk and also the optimal operation can no longer be guaranteed.

Only the manufacturer's original replacement parts should be used.

- Before the service carry out and record flue gas measurements - Operate the measurement switch - Bring the boiler to operating temperature.

Boiler cleaning

- Switch the boiler off - Main and operating switches "OFF" and secured against accidental switching on.
- Close the gas or oil supply valve.
- Undo the bolts from the boiler door - Swing out the door complete with burner - if necessary remove the boiler door, to do this, withdraw the pin upwards from the hinge (Fig. 15).
- Clean the combustion chamber 1, secondary heating surface 2 and combustion chamber insert 3 with the brush (delivered with the boiler) - do not use cleaning chemicals!
- Remove the dirt from the combustion chamber, secondary heating surface and flue pipe (through the cleaning port) - use a vacuum cleaner.
- Check the flue gas passages for freedom from obstruction.
- Replace the boiler door, close and gently tighten the bolts.

Cleaning the burner

- Clean, service and adjust the burner according to the manufacturer's instructions.
- The notes in the section on „Preparing for Operation“ should be remembered.
- Carry out flue gas measurements and complete the service record form (Page 20).

Checking the installation

- Check for water leaks - Check the servicing cover of the thermal valve for leakage.
- Check the water level.
- Check the operation of the pressure expansion vessel.
- Check the safety valve and the blow-off piping.

Changing a thermal valve (Fig. 17, page 15)

When a defective thermal valve has been diagnosed (see under „Problem solving“):

- Drain the boiler - remove the top of the boiler casing and its insulation - open the servicing cover - remove the distributor cap, thermostat unit and O-ring seals - install a new thermostat unit with distributor cap and O-rings - renew the seal for the cover - close the cover - tighten the nuts - fill the boiler - check the servicing cover for leakage - replace the insulation and casing top.

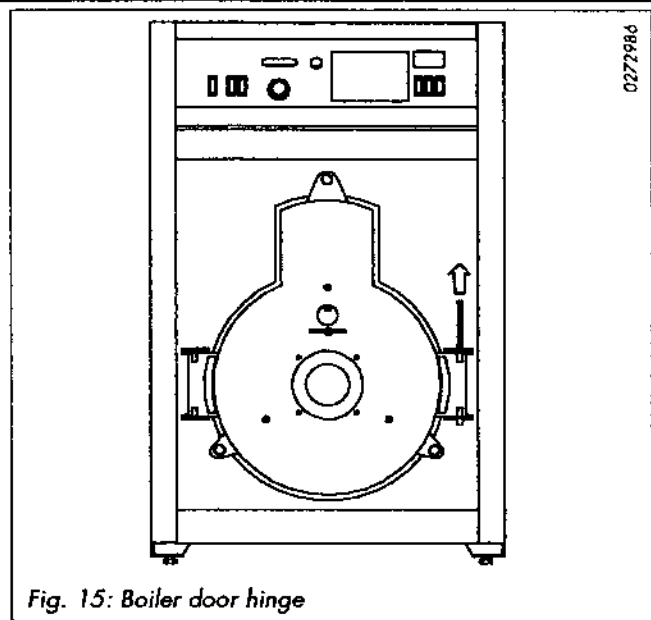


Fig. 15: Boiler door hinge

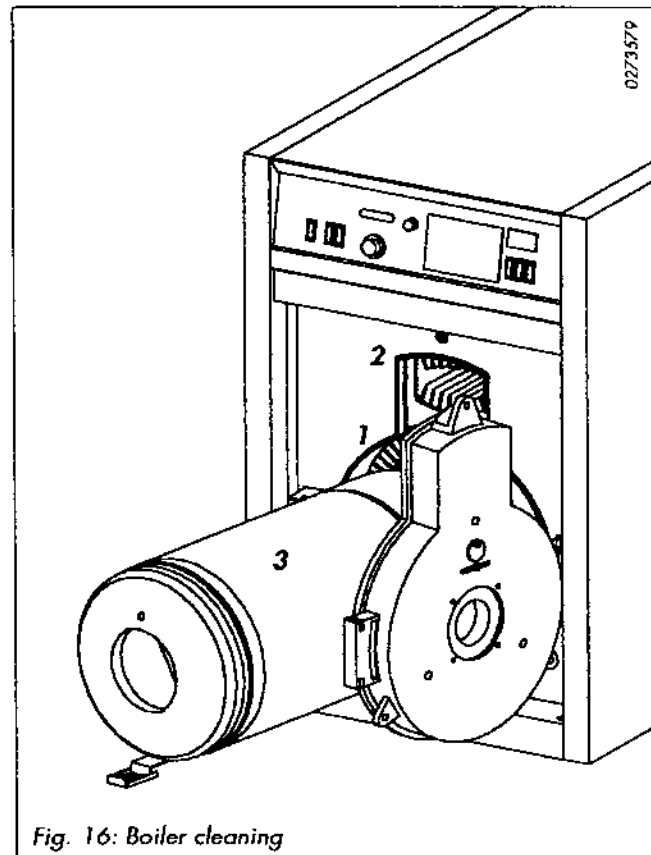


Fig. 16: Boiler cleaning

Operational checks

- Start the boiler up.
- Check all control and safety components for their operation.
- Check the switching point of the thermostat - turn the control knob down till the burner switches off - Re-adjust the thermostat to the desired maximum boiler temperature.
- Carry out a safety thermostat (STB) test - Turn the thermostat up until it meets the stop - if the burner switches off, press the TÜV test switch until the STB locks out - reset the STB after the boiler temperature has dropped by ca. 20 K - Return the thermostat to its original setting.

Note: As a result of the dual circuit system different temperatures can arise in the primary (STB measuring point) and secondary (thermometer reading) circuits. The position of the STB sensor pocket is shown in Fig. 17. The sensor is accessible after removing the rear panel and insulation from the boiler.

- Check the operation of the burner as laid down in the burner manufacturer's instructions.
- Check the air supply and ventilation openings of the boiler room.
- Confirm the servicing in the service record form.

Adjusting the combustion chamber insert

The Econotwin is equipped with an adjustment to the combustion chamber insert. This permits it to accept different burner types as well as to match the requirements of plant and chimney (e.g. stainless steel flue). The position of the combustion chamber insert determines the proportion of the flue gas which is recirculated and mixed in with the combustion air.

→ The combustion chamber insert is a recirculation unit specific to the boiler and the use of burners with their own in-built recirculation is not possible.

→ The combustion chamber insert is factory adjusted.

A = 60mm

A re-adjustment is not necessary in most installations.

- Start up the boiler.
- Carry out flue gas measurements.
- If the operation is free from problems and the flue gas values are acceptable, leave the setting as it is.

If an adjustment is necessary:

- Shut down the boiler and open the boiler door.
- Undo the bolts 1 of the insert adjustment.
- Insert both bolts in the slots.
- Adjust the combustion chamber insert to the required distance

A (= combustion chamber insert to boiler door) adjust:

A = Reduced flue gas recirculation

A = Increased flue gas recirculation

- Tighten the adjustment bolts.
- Push the combustion chamber insert up to the stop on the adjustment - Turn the insert so that the viewing port is situated top centre.
- Shut the boiler door and tighten the fastening bolts by hand.
- Carry out flue gas measurements.
- If necessary, correct the adjustments.
- Complete the commissioning form noting the changes in settings.

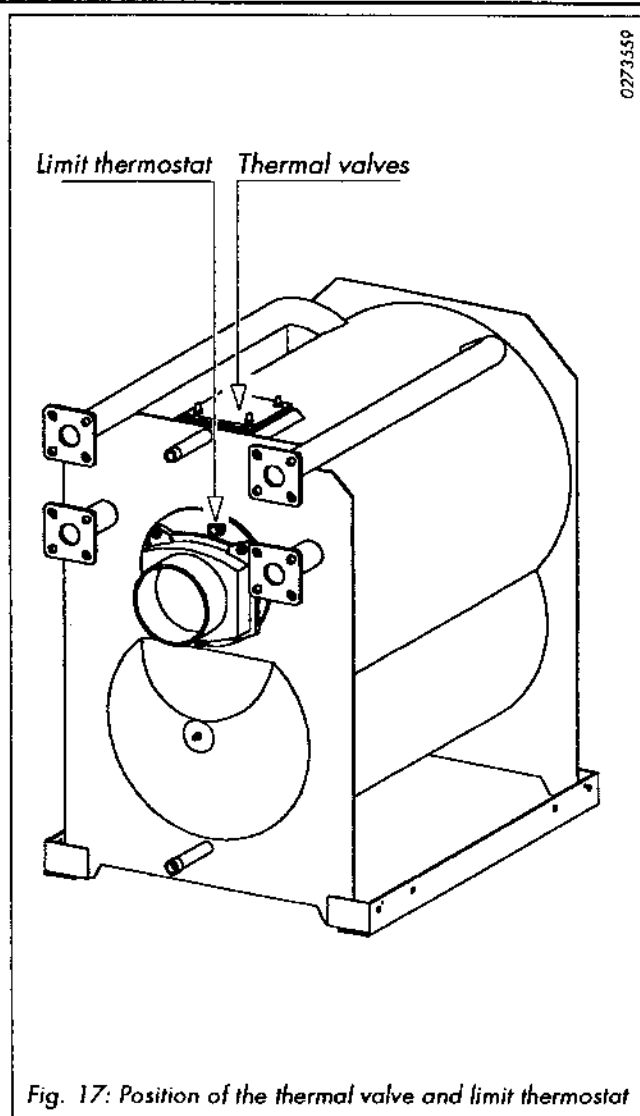


Fig. 17: Position of the thermal valve and limit thermostat

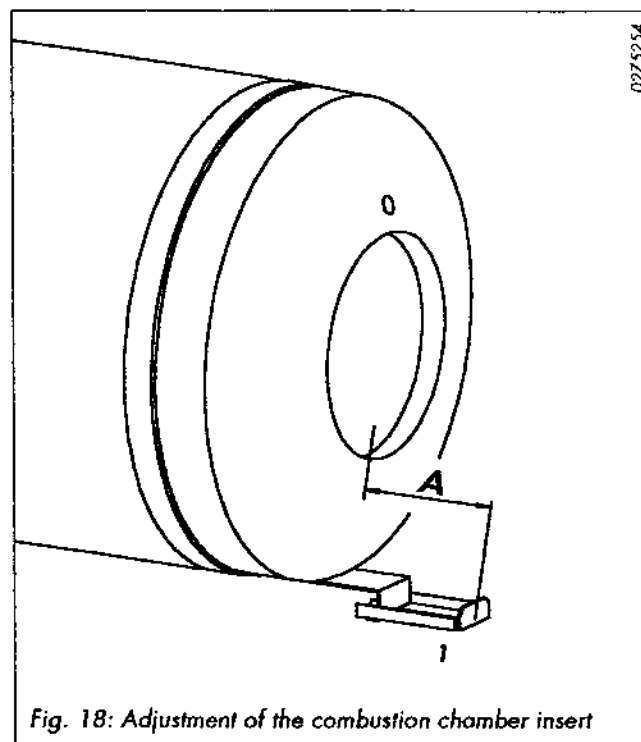
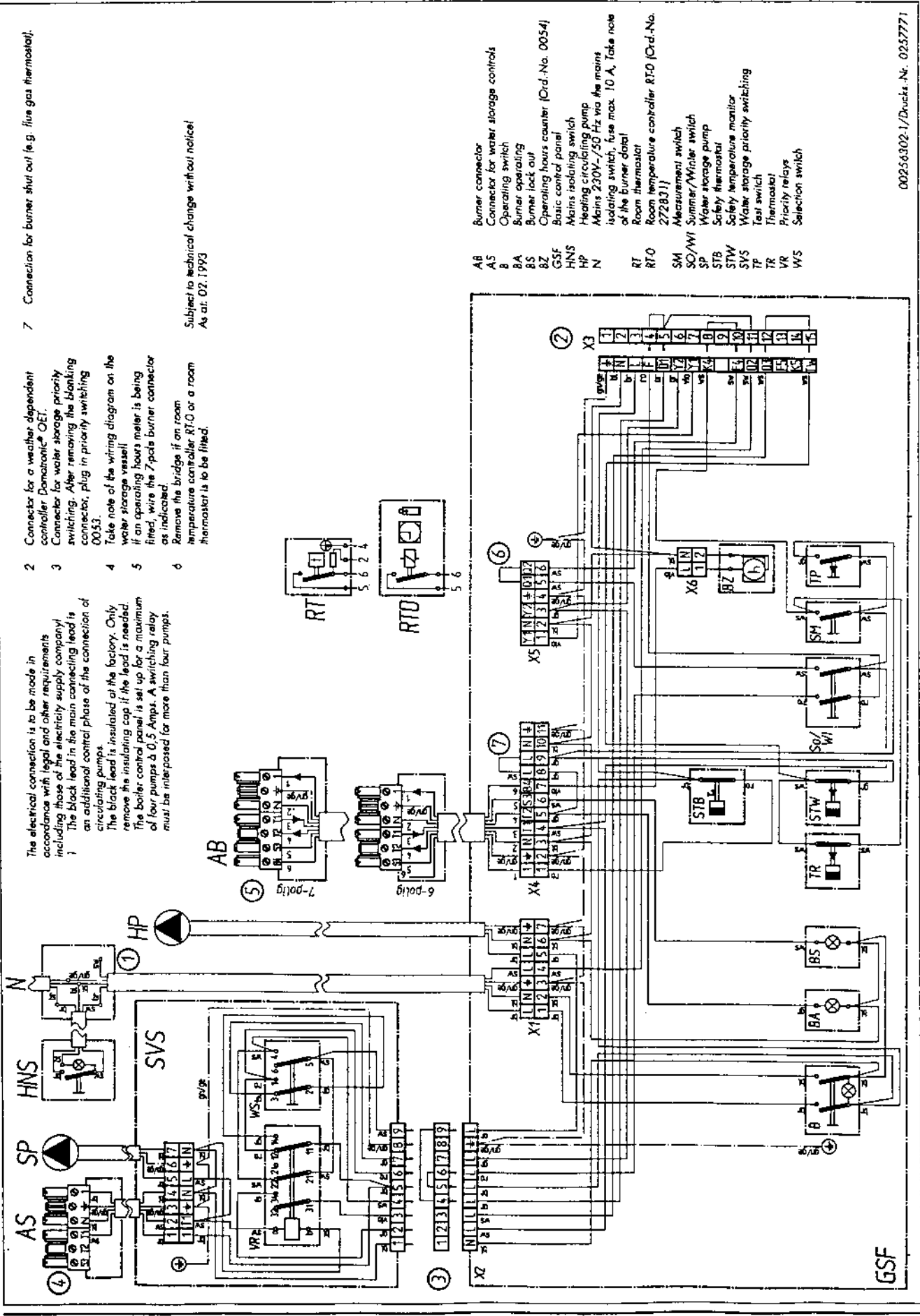


Fig. 18: Adjustment of the combustion chamber insert

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Wiring diagram



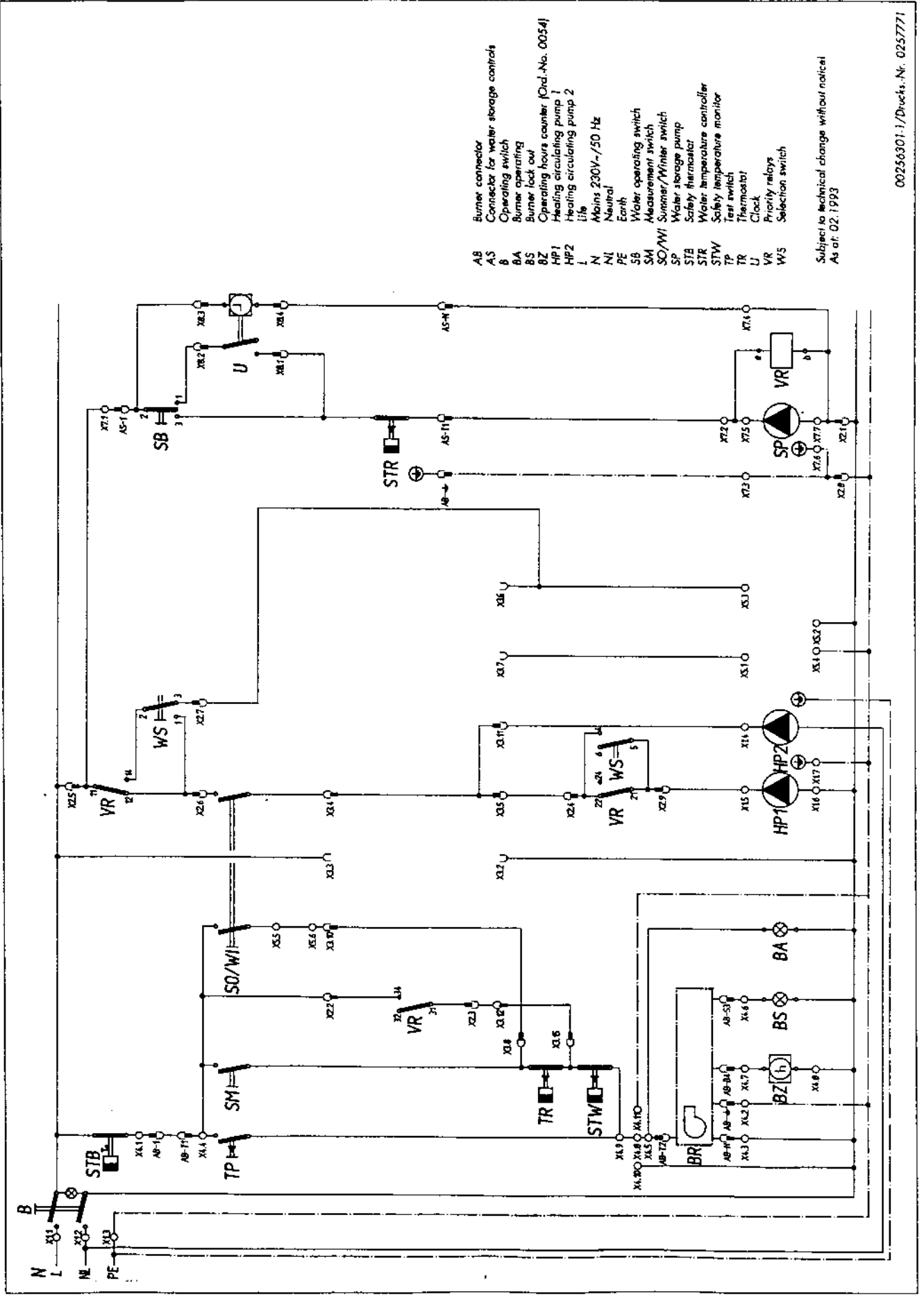
- 1 The electrical connection is to be made in accordance with legal and other requirements including those of the electricity supply company! The black lead in the main connecting lead is an additional control phase of the connection of circulating pumps. The black lead is insulated at the factory. Only remove the insulating cap if the lead is needed. The boiler control panel is set up for a maximum of four pumps & 0.5 Amps. A switching relay must be interposed for more than four pumps.
 - 2 Connector for a weather dependent controller Domatron[®] OET.
 - 3 Connector for water storage priority switching. After removing the blanking connector, plug in priority switching 0053.
 - 4 Take note of the wiring diagram on the water storage vessel if an operating hours meter is being fitted, wire the 7-pole burner connector as indicated.
 - 5 Remove the bridge if an room temperature controller RT-O or a room thermostat is to be fitted.
- 7 Connection for burner shut out (e.g. flue gas thermostat).

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As of: 02.1993

- | | |
|-------|--|
| A6 | Burner connector |
| A5 | Connector for water storage controls |
| B | Operating switch |
| BA | Burner operating |
| BS | Burner lock out |
| BZ | Operating hours counter (Ord.-No. 0054) |
| GSF | Basic control panel |
| HNS | Mains isolating switch |
| HP | Heating circulating pump isolating switch, fuse max. 10 A, Take note of the burner data! |
| N | Mains 230V~/50 Hz via the mains |
| RT | Room thermostat |
| RT-O | Room temperature controller RT-O (Ord.-No. 272831) |
| SM | Measurement switch |
| SO/WI | Summer/Winter switch |
| SP | Water storage pump |
| STB | Safety thermostat |
| STW | Safety temperature monitor |
| SVS | Water storage priority switching |
| TR | Test switch |
| VR | Thermostat |
| WS | Priority relays |
| | Selection switch |

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Current flow diagram



- AB Burner connector
- AS Connector for water storage controls
- B Operating switch
- BA Burner operating
- BS Burner lock out
- BZ Burner lock out
- HP1 Heating circulating pump 1
- HP2 Heating circulating pump 2
- L Mains 230V~/50 Hz
- NL Neutral
- PE Earth
- SB Water operating switch
- SM Measurement switch
- SO/WI Summer/Winter switch
- SP Water storage pump
- STB Safety thermostat
- STR Water temperature controller
- STW Water temperature monitor
- TP Test switch
- TR Thermostat
- U Priority relays
- VR Selection switch
- WS Selection switch

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Commissioning form

| <i>As appropriate, put a cross opposite work carried out or enter the values measured</i> | | | |
|--|--------|---------|--------|
| Date | | | |
| Installer | | | |
| Installation | | | |
| Check the fuel supply/feed pipes | | | |
| Check all flue gas passages | | | |
| Tighten the fastening bolts for the burner door | | | |
| Check the electrical connections | | | |
| Carry out flue gas measurements | | Control | Actual |
| Boiler temperature | °C | | |
| Flue gas temperature | °C | | |
| Room temperature | °C | | |
| Flue gas temperature | °C | | |
| Measure the carbon dioxide content of the flue gas | Vol. % | | |
| Measure the carbon monoxide of the flue gas | ppm | | |
| Measure the smoke number (Bacharach) | | | |
| Measure the chimney draught | mbar | | |
| Calculate the flue gas loss | % | | |
| Carry out operational checks | | | |
| Adjust the boiler thermostat | | | |
| Adjust the water storage thermostat | | | |
| Adjust weather dependent control or room thermostat as applicable | | | |
| Instruct the operator of the installation in its use and hand over the technical information | | | |
| Signature/Company stamp | | | |

Problem solving

| Problem | Possible cause | Remedial action |
|---|---|---|
| Burner does not operate | No electric power | Check the main and operating switches, the electrical connections and the fuse |
| | Safety thermostat at lock-out Minimal temperature of the STB sensor has dropped below its minimum due to storage/transport at low outside temperatures | Reset safety thermostat Warm the STB sensor |
| Burner runs - ignition operates - sight glass on the oil filter remains empty or no oil pressure - goes to lock-out | Suction pipe locked, oil hose blanking pieces not removed | Check the suction pipe, remove the blanking pieces, check the connections, check the non return valve |
| | Hose wrongly connected, non return valve wrongly installed | Check the connections, check the non return valve |
| | Oil tank empty, valve in the suction pipe at the tank or at the filter closed | Check the oil level, open the valves |
| | Pre-filter or pump filter blocked | Check the filter and clean or change if necessary |
| | Airlock in the oil pipe, oil pipe not properly vented and filled on commissioning | Vent the oil pipe at the manometer connection |
| | Suction pipe leaks | Check for leakage |
| | Vacuum too high on the suction side | Check the sizing of the oil pipe, clean the filter or change if necessary |
| Burner started very sharply, explosive misfiring | Unsuitable draught conditions, burner wrongly adjusted | Check the flue passages and chimney, control the burner adjustment |
| Flame lifts off during operation | Burner wrongly adjusted | Correct the burner adjustment |
| | Air in the suction pipe | Check the oil supply, seal if necessary |
| Carbon dioxide content too low | Burner adjustment incorrect | Correct the burner adjustment |
| | Inwards air leakage | Seal the fuel pipe, tighten the boiler door fastenings |
| Too high a flue gas temperature | Too high an oil throughput | Adjust the throughput to the boiler output |
| | Boiler dirty | Clean the boiler |
| Burner start-up does not commence although boiler temperature too low | Thermostat too low or defective | Raise the setting, change if necessary |
| | Thermal valve defective | Change the thermal valve |

Service record form (Sample for copying)

| Please complete the service form carefully and confirm the service | | | |
|--|--------------------------|------|--|
| Day serviced | Date | | |
| Carry out flue gas measurements before the service (chimney draught <0,1 mbar) | Boiler temperature | °C | |
| | Flue gas temperature | °C | |
| | Carbon dioxide content | % | |
| | Carbon monoxide content | ppm | |
| | Smoke number (Bacharach) | | |
| | Chimney draught | mbar | |
| | Flue gas losses | % | |
| Clean the boiler | | | |
| Check flue gas passages | | | |
| Clean the burner | | | |
| Change the burner jet | | | |
| Check the ignition electrodes | | | |
| Check the electrical connections | | | |
| Check the fuel supply system | | | |
| Carry out operating checks | | | |
| Check the installation | | | |
| Carry out flue gas measurements after the service (chimney draught <0,1 mbar) | Boiler temperature | °C | |
| | Flue gas temperature | °C | |
| | Carbon dioxide content | % | |
| | Carbon monoxide content | ppm | |
| | Smoke number (Bacharach) | | |
| | Chimney draught | mbar | |
| | Flue gas losses | % | |
| Signature/Company stamp | | | |

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