



ECONOMATIC DCN WELDED STEEL BOILER

**INSTALLATION, OPERATION & MAINTENANCE
DOCUMENTATION**

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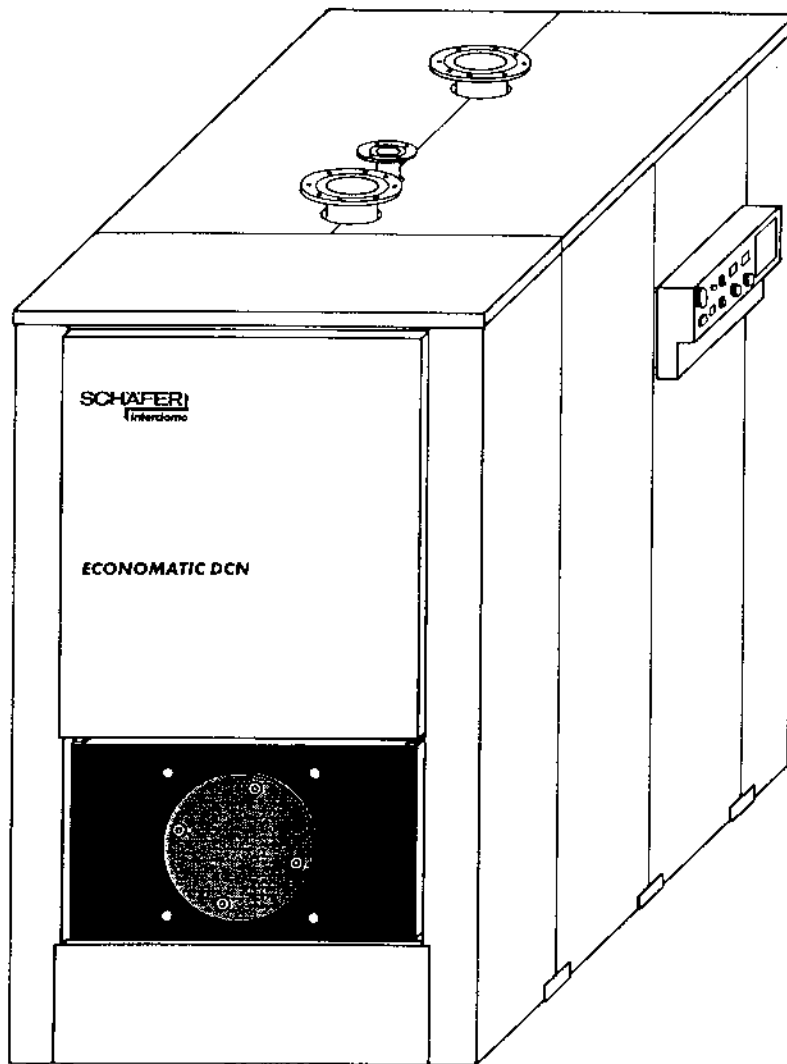
DEC1996

Technical Information Assembly and Operating Instructions

SCHÄFER
Interdomo

ECONOMATIC DCN

Heat output range 155 – 1500 kW



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Description

The ECONOMATIC DCN boiler types are efficiency tested to DIN 4702. They are approved for a maximum working pressure of 4 bars and a maximum flow temperature of 120° C. With the ECONOMATIC DCN boiler the high limit thermostat is set as standard at 110° C. The minimum boiler temperature is 50° C.

Boiler

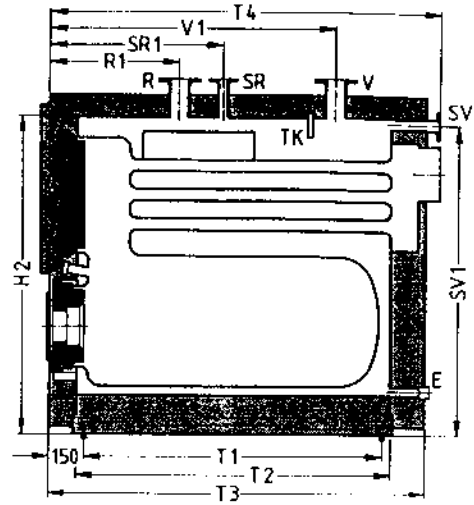
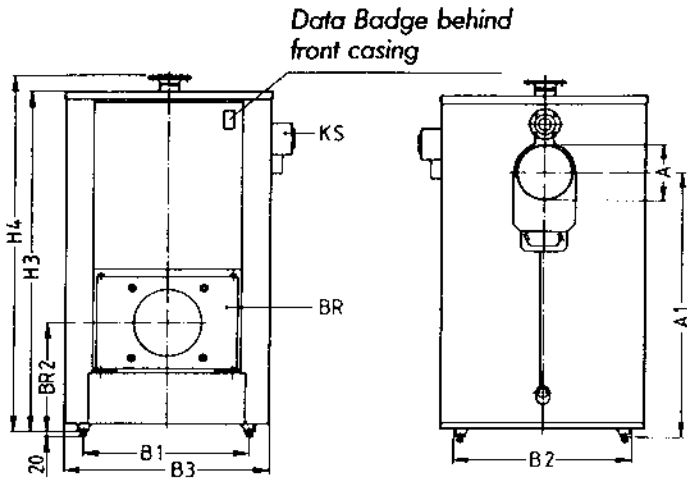
The ECONOMATIC DCN is a conventionally flued boiler of modified three pass construction with flue gas reversal and fire tubes. It is suitable for dual fuel Oil/Gas operation.

The combustion chamber is designed for each output range. This design is optimised to allow a smooth passage of the products of combustion without dead spots allowing easier burner adjustments, since the heating gases are drawn back into the combustion area and reburned. The fire tubes contain stainless steel turbulators causing the turbulent flow of heating gases thus producing extremely efficient heat exchange plus low exhaust temperatures.

Standing losses and flue losses are minimal because of the high quality steel construction plus 120 mm thick mineral wool insulation. The insulated casing may be fitted after all pipe-work has been connected.

Technical data ECONOMATIC DCN

Oil-/Gas-special boiler ECONOMATIC DCN



KS Boiler control panel (left or right installation)
 BR Burner door
 TK Immersion sleeve for control panel and electronic control

V Boiler flow
 R Boiler return
 SV Safety flow (cold feed)
 SR Safety return (open vent)
 E Drain

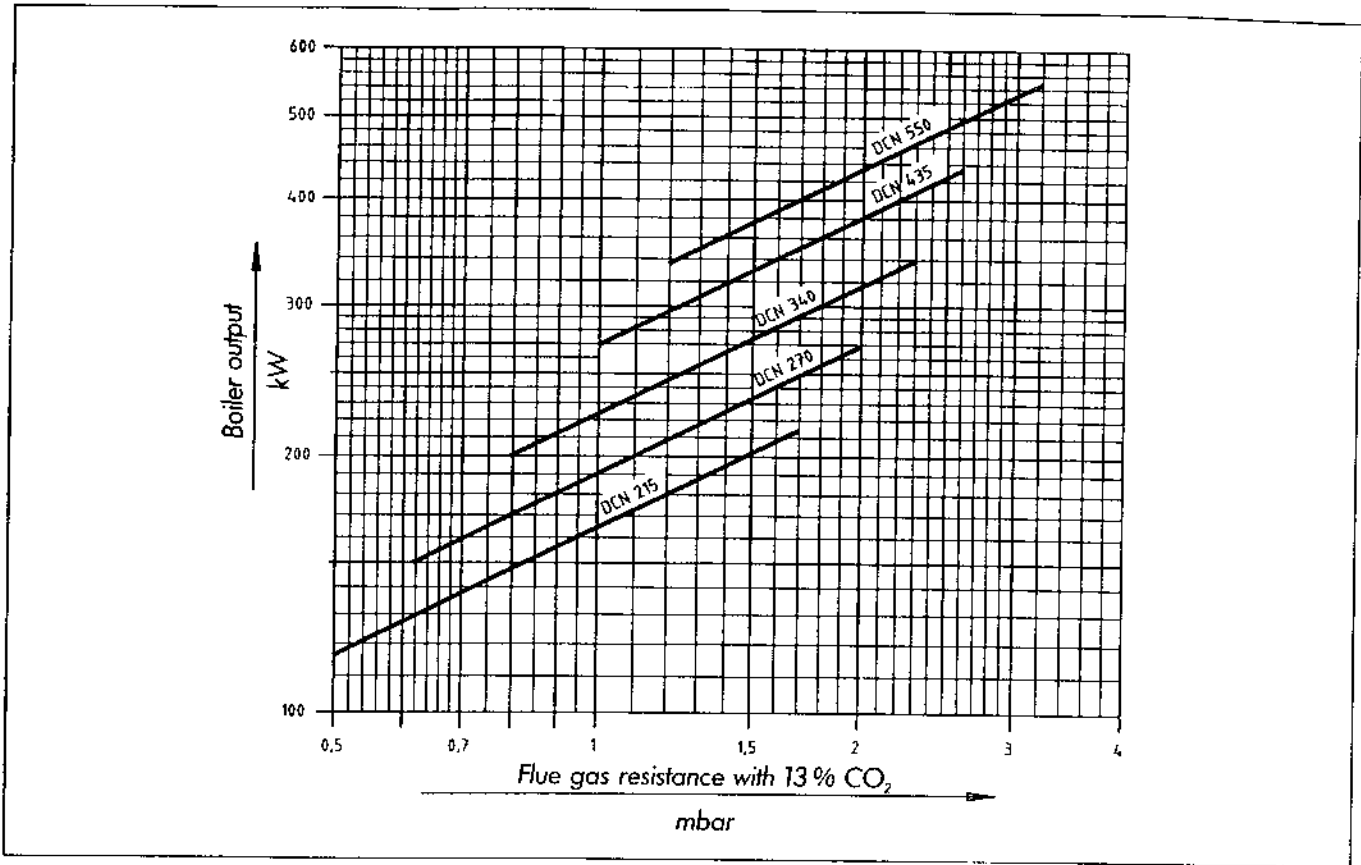
Z-Nr. 4-41690, Z-Nr. 4-41691, Z-Nr. 4-41692

ECONOMATIC DCN	Type: DCN	215	270	340	435	550	695	880	1150	1500
Heat output range	kW	155-215	200-270	250-340	320-435	410-550	520-695	660-880	800-1150	1050-1500
Boiler efficiency*	%	92,1	92,3	92,3	92,5	92,3	92,2	92,2	92,3	92,3
Flue gas temperature (measured)*	°C	187	183	183	178	183	188	188	185	185
Flue gas losses*	%	7,6	7,4	7,4	7,2	7,4	7,6	7,6	7,5	7,5
Standing losses**	%	0,17	0,16	0,14	0,12	0,11	0,1	0,1	0,09	0,09
Distance between levelling screws	B1 mm	650	730	730	840	840	950	950	1070	1070
Width of boiler body	B2 mm	720	800	800	910	910	1020	1020	1140	1140
Width including casing	B3 mm	880	960	960	1070	1070	1180	1180	1300	1300
Distance between levelling screws	T1 mm	1240	1340	1440	1530	1610	1675	1745	1840	1990
Depth of boiler body	T2 mm	1310	1410	1510	1605	1685	1750	1820	1915	2065
Depth including casing	T3 mm	1575	1675	1775	1900	1980	2080	2150	2275	2425
Depth including flange	T4 mm	1635	1735	1835	1960	2040	2170	2240	2365	2515
Height of boiler body	H2 mm	1380	1470	1470	1600	1600	1830	1830	1960	1960
Height including casing	H3 mm	1470	1560	1560	1690	1690	1920	1920	2050	2050
Height including flange	H4 mm	1565	1655	1655	1780	1780	2010	2010	2140	2140
Flue spigot diameter	A mm	200	250	250	300	300	350	350	450	450
Height to center of spigot	A1 mm	1165	1210	1210	1315	1315	1470	1470	1560	1560
Height to center of burner	BR2 mm	500	500	500	500	500	600	600	600	600
Boiler flow and return	V/R DN	65	80	80	100	100	125	125	150	150
Safety flow	SV DN	R 1 1/2"	50	50	50	50	65	65	65	65
Safety return	SR DN	R 1 1/4"	40	40	40	40	50	50	65	65
Drain	E R"	1	1	1	1	1	1 1/4	1 1/4	1 1/4	1 1/4
Distance to flow	V1 mm	1220	1270	1370	1440	1520	1520	1590	1620	1770
Distance to return	R1 mm	570	565	565	645	645	710	710	770	770
Height to safety flow	SV1 mm	1345	1430	1430	1555	1555	1775	1775	1905	1905
Distance to safety return	SR1 mm	725	765	765	855	855	950	950	1030	1030
Water capacity	ltr.	440	600	630	870	900	1130	1160	1575	1670
Maximum working pressure	bar	4	4	4	4	4	4	4	4	4
Maximum flow temperature	°C	120	120	120	120	120	120	120	120	120
Resistance on hot water side for 11°C Δt	mbar	51	39	63	41	67	43	71	55	94
Combustion chamber volume	ltr.	350	450	500	720	770	1000	1070	1430	1570
Flue gas resistance	mbar	1,7	2,0	2,3	2,6	3,2	4,0	5,0	5,2	6,8
Flue gas flow	kg/s	0,108	0,135	0,17	0,218	0,275	0,348	0,44	0,471	0,62
Weight of boiler	kg	600	740	800	1040	1100	1400	1480	1880	2030
Filled weight	ca. kg	1200	1520	1620	2130	2230	2780	2900	3950	4200

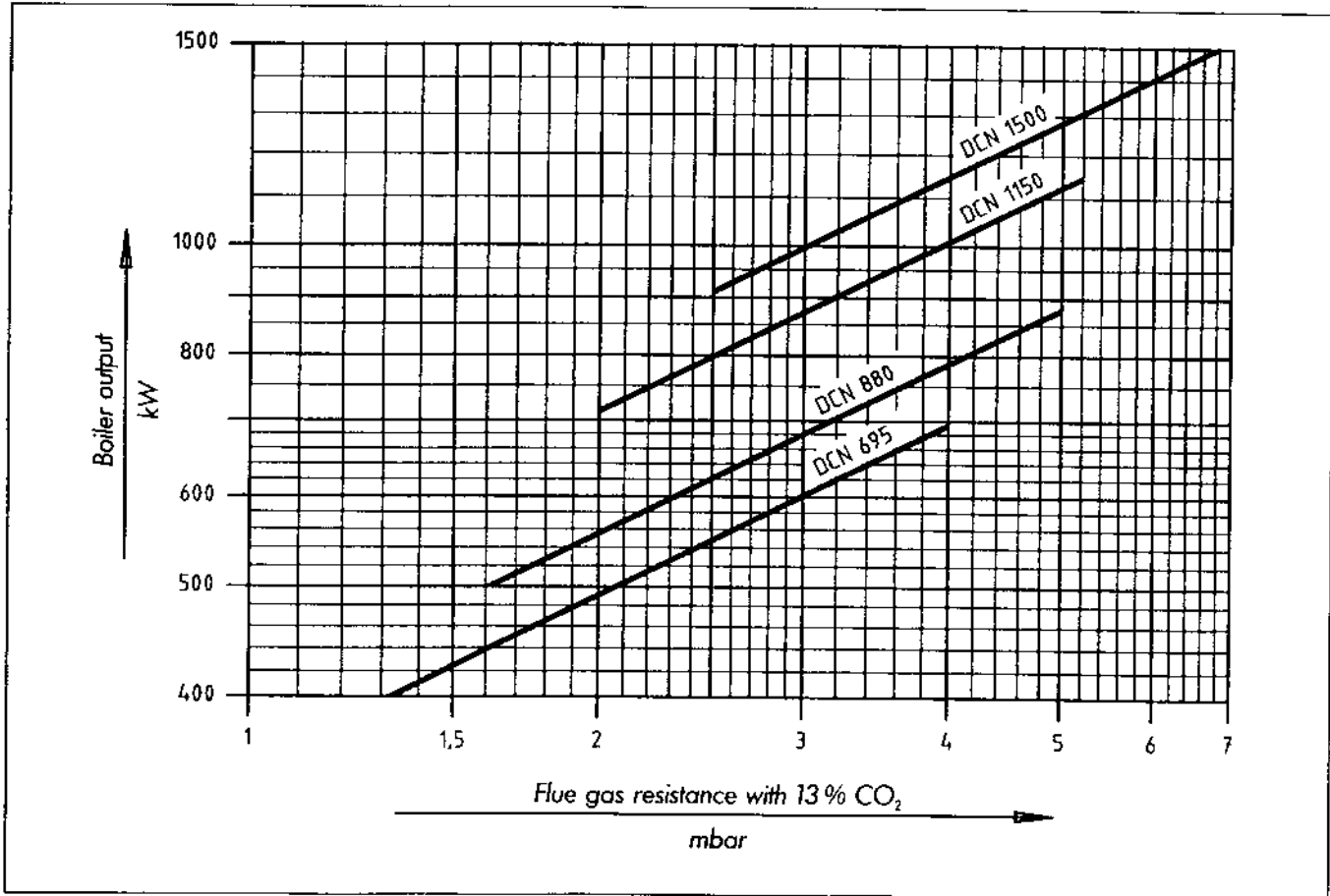
* The figures are valid for nominal output and an average annual service temperature of 60°C, CO₂-content 13%, room temperature 20°C.

Flue gas resistance

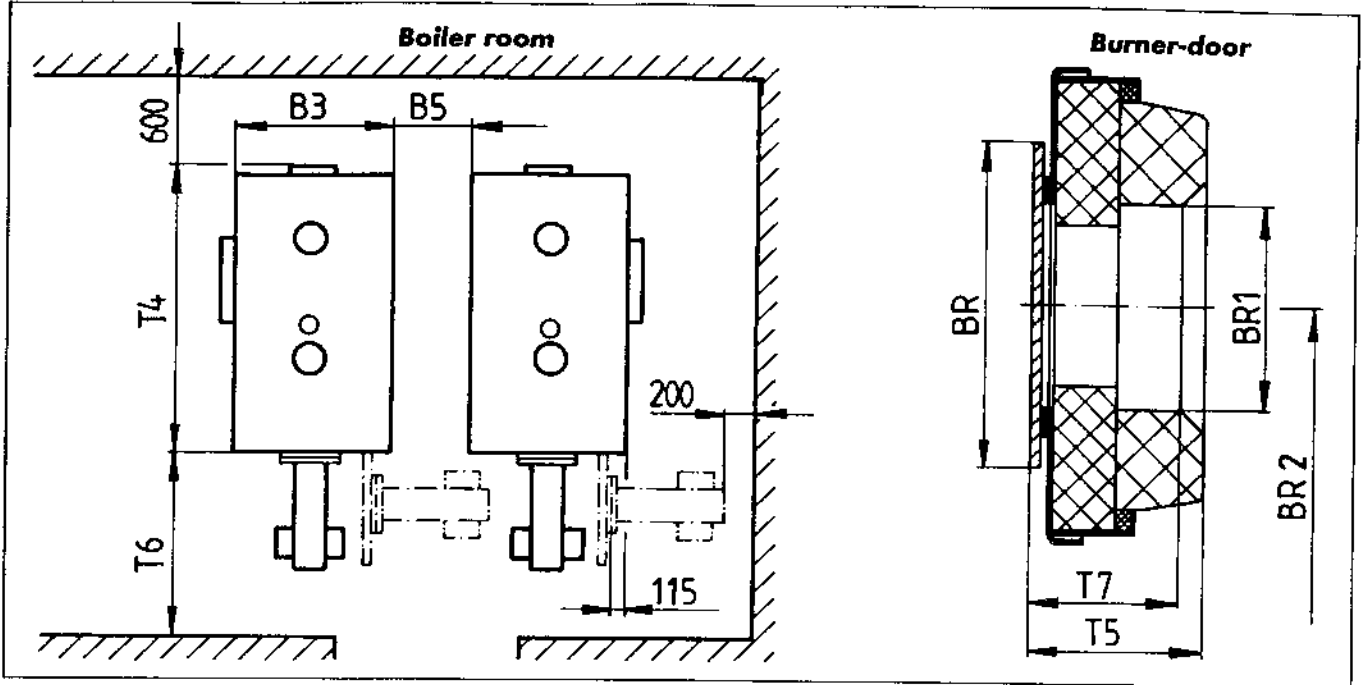
ECONOMATIC
DCN 215 to 340



ECONOMATIC
DCN 435 to 1500



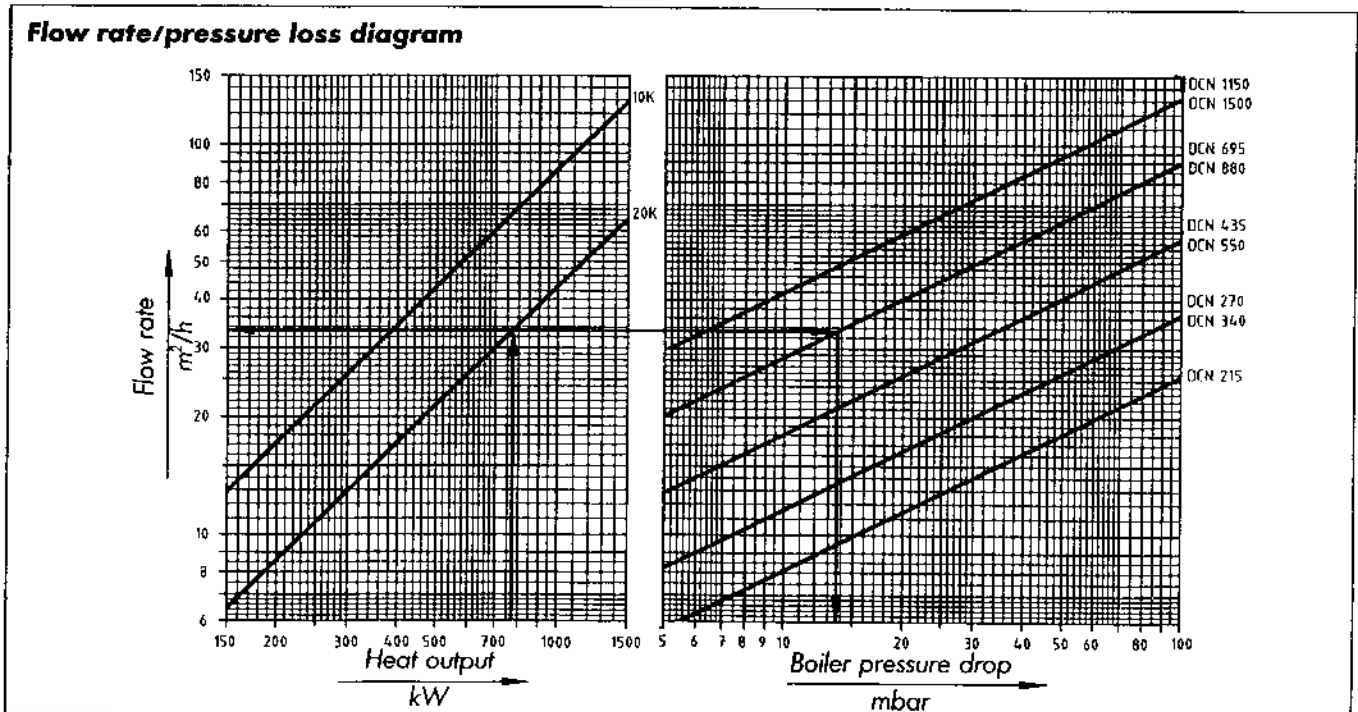
Installation



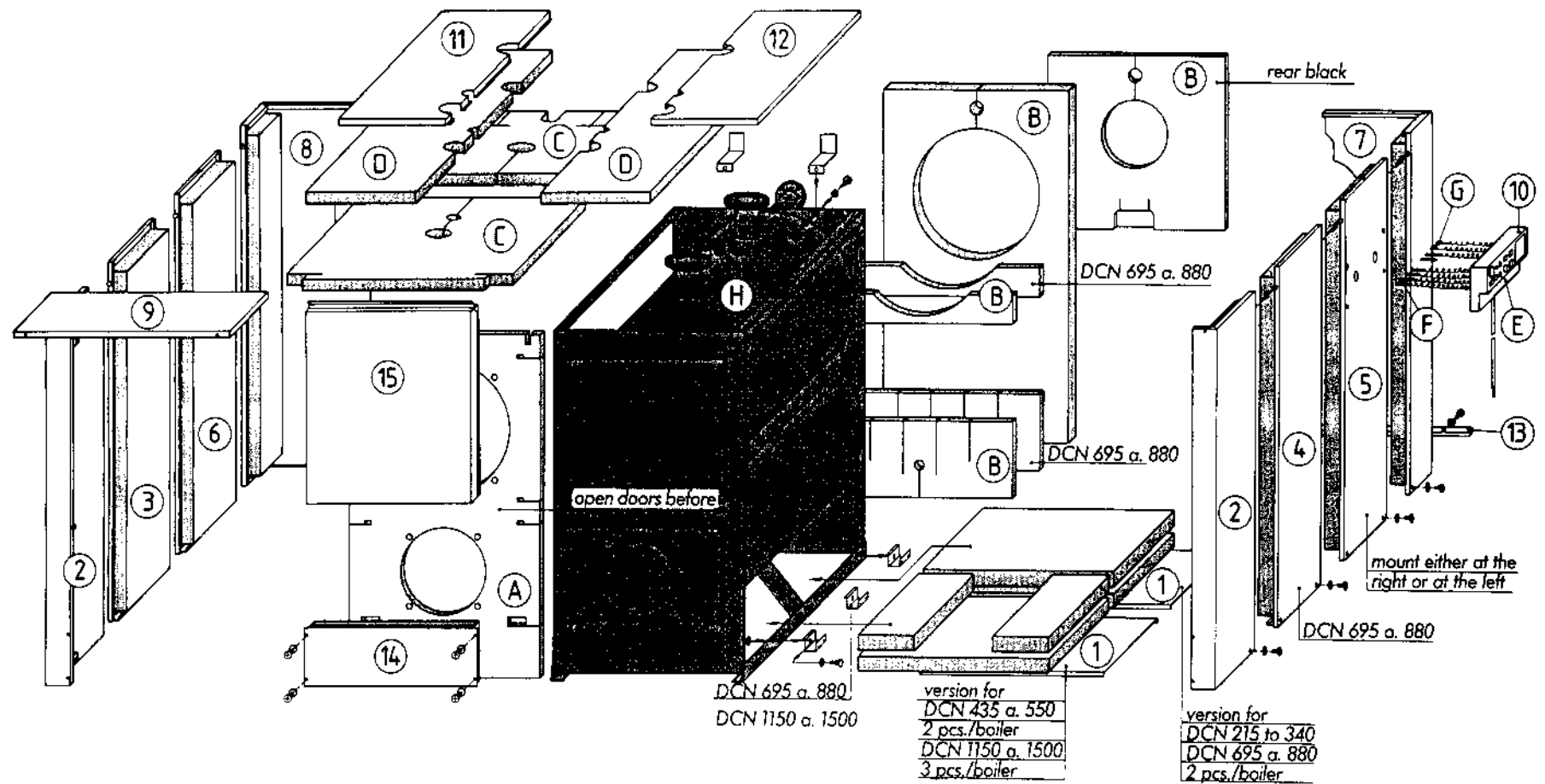
ECONOMATIC DCN	Type: DCN	215	270	340	435	550	695	880	1150	1500
Boiler width (inc. casing)	B3 mm	840	920	920	1030	1030	1140	1140	1300	1300
Boiler clearance	B5 mm	500	500	500	500	500	600	600	800	800
Boiler depth (incl. flange)	T4 mm	1635	1735	1835	1960	2040	2170	2240	2365	2515
Front clearance	T6 mm	1000	1100	1100	1250	1250	1400	1400	1600	1600
Burner-door thickness	T5 mm	150	150	150	165	165	185	185	185	185
Burner-door thickness	T7 mm	130	130	130	140	140	155	155	155	155
Diameter of burner-plate	BR mm	310	310	310	340	340	370	370	410	410
Diameter of burner-opening	BR1 mm	180	180	180	200	200	220	220	250	250
Height of center of the burner	BR2 mm	500	500	500	500	500	600	600	600	600
Diameter of combustion chamber	mm	550	600	600	700	700	800	800	900	900
Depth of combustion chamber	mm	1200	1300	1400	1490	1570	1630	1700	1800	1950

The clearance B 5 applies for boilers with burner-doors hinged in the same direction.

Flow rate/pressure loss diagram



Assembly instructions
Insulating casing



Attention! Before assembling the insulating casing open the burner- and cleaning-door.
Fix the U-shaped clips, included in the box of small parts, by means of the hexagon screws, nuts and washers onto the boiler angle supports and rear boiler wall.

Insulating mat (A)	Open burner- and cleaning-doors. Push mat under the open doors and hang from the boiler front.
Bottom insulation (1)	Insert the bottom insulating plates and the insulating mats forming part of it from the side and between the angle supports.
First side casing, left and right (2)	Place them into the U-clips and hook them into the clips of the boiler front.
Side casing (3) and (4) (DCN 695 and DCN 880)	Place them into the U-clips and hook them using the rivet into the slot of the first side casing (2).
Side casing (5)	Mount either at the right or the left hand side of the boiler, depending on the position of the control panel.
Side casing (6)	Mount at the opposite side.
Insulating mats (B)	Place them at the boiler rear in the order shown in the drawing.
Rear casing (7)	Place into the lower U-clips, push the upper edge over the clip angle at the boiler rear and hook the slot onto the rivet of the rear side casing.
Rear casing (8)	Mount it like rear casing (7). The rear casing (8) should overlap the rear casing (7) (Fixing).
Insulating mats (C)	Place them on top of the boiler and push them from the side under the boiler angle supports. With boiler types DCN 435 to DCN 880 place the insulating mat projecting backwards and down between boiler and insulating mat (B) at the rear of the boiler.
Insulating mats (D)	Place them over the insulating mats of the side casings.
Font cover plate (9)	Place it on the boiler and screw it to the side casings. Then screw up the rear and side casings with the lower U-clips by means of self tapping screws and washers.
Boiler control (10)	Remove cover plate (E). Lead capillary tube and earth wire through the openings of the side casing. Hook the control panel with the rivets into the slots of the side casing and screw it up in the lower part with self tapping screws and washers. Lead the probes (F) under the boiler angles and over the insulating mats (C) and introduce them into the immersion sleeves (H).
Attention!	Do not buckle the capillary tube. Fix the earth wires (G) to the cable connections (boiler angles and sidewall).
Cover plate left (11)	Place on top.
Cover plate right (12)	Place so that it lies in the edge of cover (11). Screw together rear casings (7) and (8).
Angle (13)	Screw it to the rear casing.
Protecting plate (14)	Screw it to the side casings below the burner door by means of self tapping screws and washers.
Front casing (15)	Push the upper edge under the cover (9) and put the lower edge on the clips of the side casings (2).

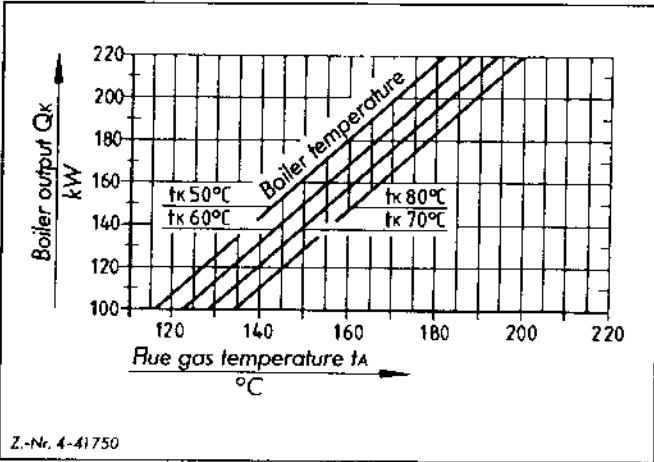
Flue gas temperature

Connection of the flue outlet spigot to the chimney

The flue gases have to be discharged through the chimney. The temperature must be maintained at a temperature which

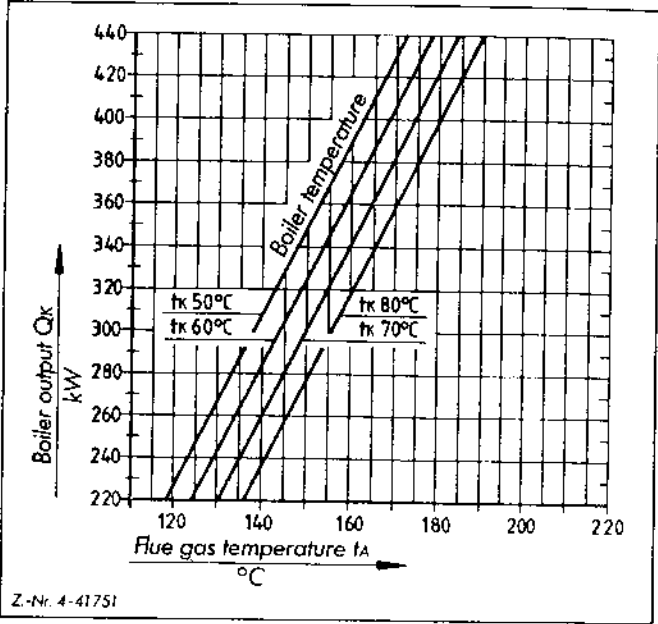
prevents the products of combustion condensing and so causing damage to the chimney. Therefore boiler and chimney have to be matched. This particularly concerns replacement installations where the existing chimney is to be used. The flue temperature can only be set to a temperature high enough for that chimney. If in doubt a chimney expert should be consulted.

DCN 215



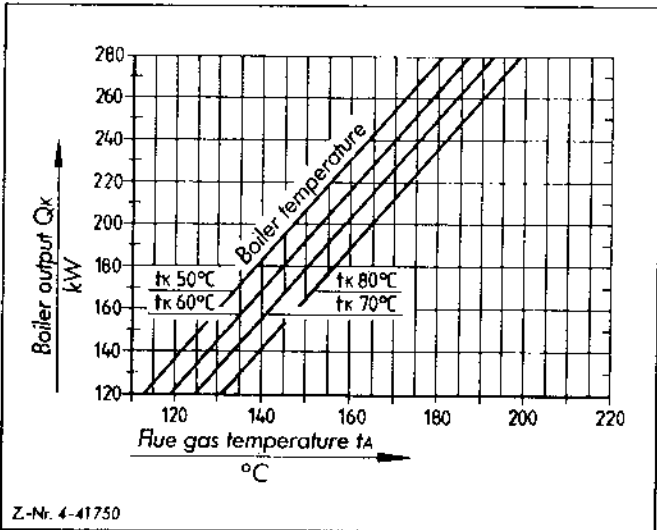
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DCN 435



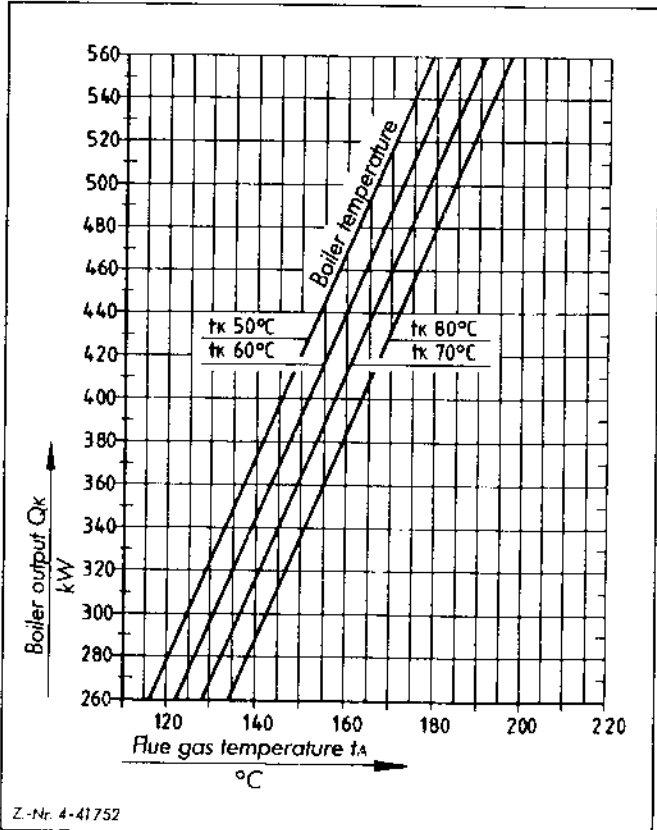
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DCN 270



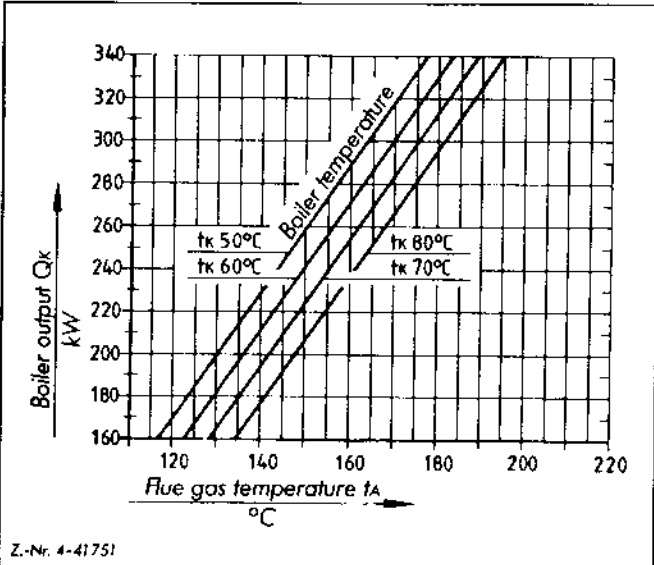
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DCN 550



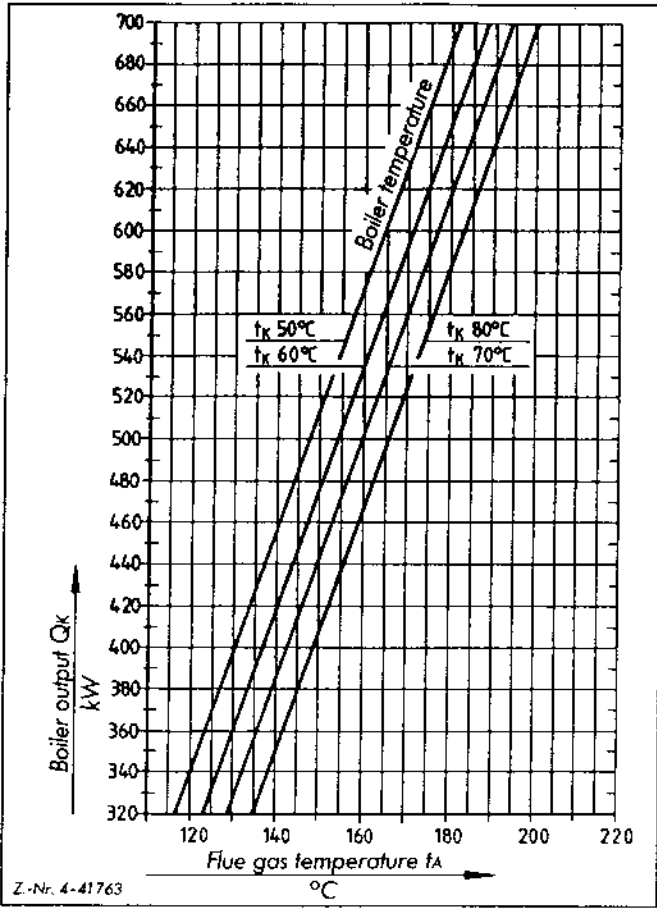
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DCN 340

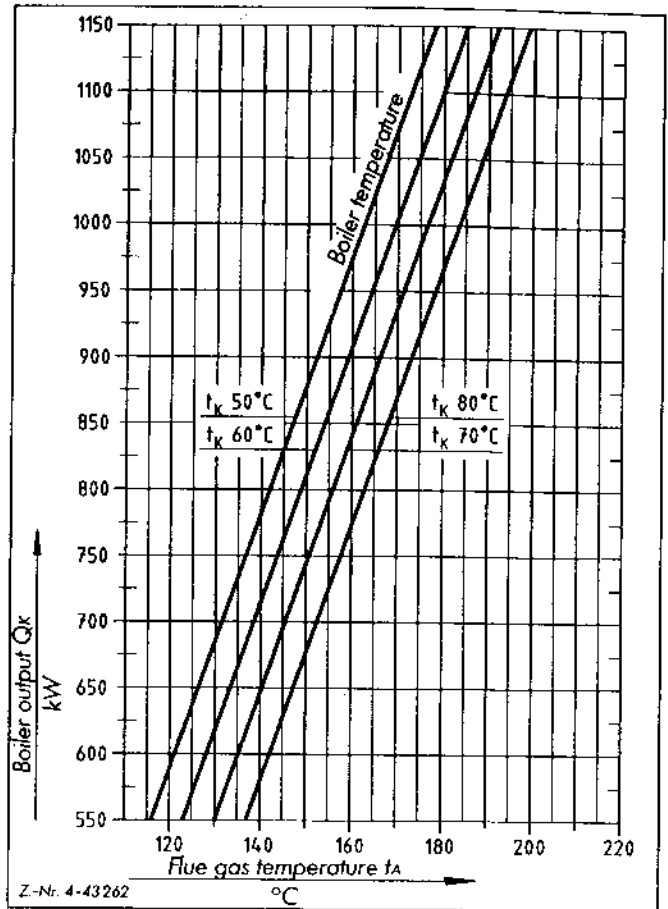


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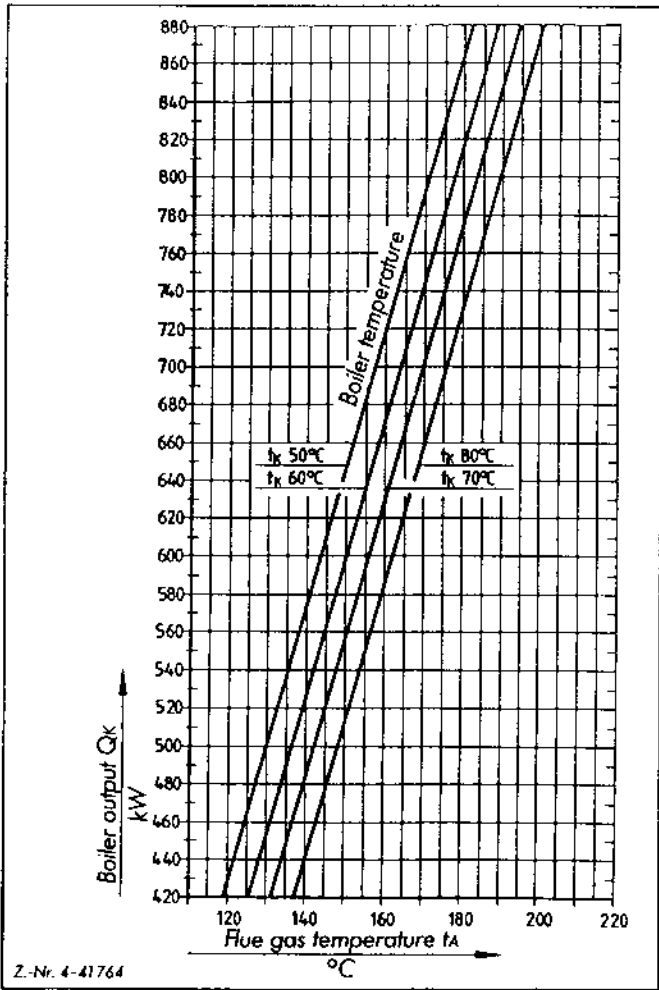
DCN 695



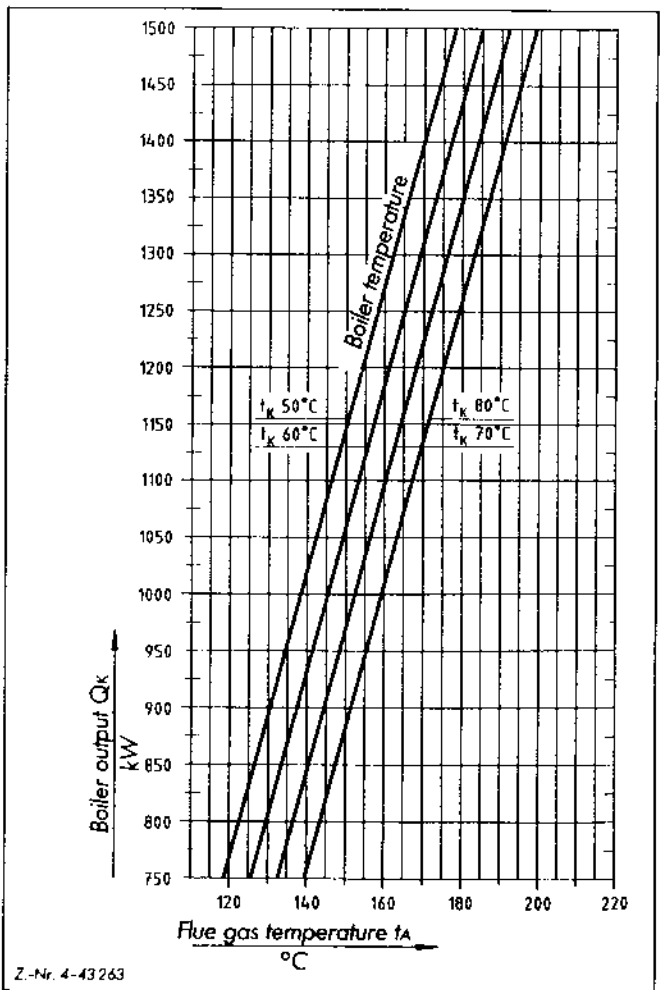
DCN 1150



DCN 880



DCN 1500





Control box Economatic DCN



Safety Recommendations - Please observe!

Please read these instructions through carefully before commencing the installation. No responsibility can be accepted nor claims entertained for matters arising from the non-observance of these installation instructions! Work which is not correctly carried out poses a risk to health and safety!

Work on the heating installation

- Installation, commissioning, repair and maintenance work on the appliance and on the heating installation should only be carried out by an authorised and qualified heating installer.

When working on the appliance

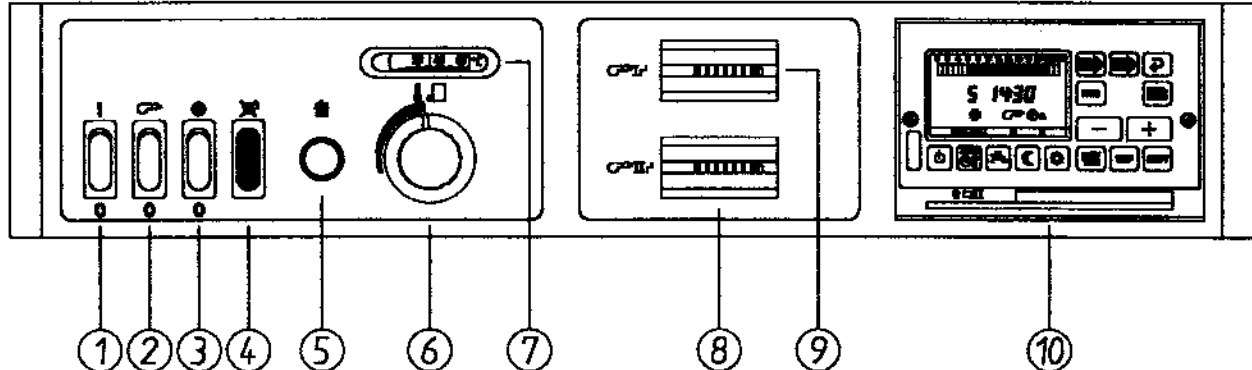
- Switch off the mains supply to the appliance and ensure that it cannot be accidentally switched on.
- Please also observe the additional technical information regarding the boiler.

Application

- Boiler control box for the control and regulation of the Economatic DCN oil/gas boiler.

Function

- The control box is equipped with a two-stage temperature controller for the load-dependent operation of the two burner stages. The control range is ca. 60-90°C (55-85°C) for the second stage of the burner. If the boiler temperature falls during operation, then the first burner stage comes into operation. If the temperature falls a further 5 K, then in addition the second burner stage is automatically switched on. If the temperature goes below a critical value, the Ministop thermostat switches the circulation pump off and, in so doing, protects the boiler against the effects of going below the dew point. All pumps must therefore be connected through the boiler control. All pumps must therefore be connected through the boiler control.



- 1 Operating switch
- 2 Burner switch
- 3 Pump switch
- 4 Burner failure light
- 5 Safety limit thermostat (STB)
Eitheco RAK 75
- 6 Thermostat (two stage)
Emerson 722RU
- 7 Remote thermometer
- 8 Provision for operating hour meter
Stage 1

- 9 Provision for operating hour meter
Stage 2
- 10 Provision for controller
(E.g.: Domotronic OEX-3)

Other thermostats behind the panel:

- Safety thermometer (STW)
Eitheco RAK 71.1
- Ministop thermostat
EGO 55.13313.010

Installation

Parts

Ordering No.

000723 Domotronic OEX-3 controller
Microcomputer regulated, two-stage boiler and heating circuit control with integral sanitary hot water priority switching.

000059 Sanitary hot water sensor.

000054 Operating hours meter

000084 Switching relay

Only necessary in connection with the Domotronic OEX-3 when a burner is used that requires a switching contact for the control of the second burner stage.

Technical Data

Nominal voltage : 230V/50Hz

Fuse : Max. 10A (building side)
(Take note of the burner data)

Type of protection : IP40 as in DIN 40050

Contact loading : Burner max. 2A
Pump max. 2A

Take note of the data in the Technical Information for the weather compensated control.

Installation location/Boiler room

Combustion units using liquid and gaseous fuels and with a total heat output of more than 50 kW should only be installed in special rooms. The local fire regulations and the Building Regulations must be observed. In exceptional cases, it may be possible to obtain dispensations from the appropriate authorities when the operating conditions are such that no problems are anticipated from the nature of the installation space nor from the supply of air and ventilation.

The Economatic DCN boiler is to be installed in a frost-free and well-ventilated space.

Installation in areas with a high incidence of dust or a high air humidity is not permissible.

Electrical connection



The electrical connection must only be made by a qualified electrician. It must comply with all current legal and other requirements (including any of the local electricity distribution company). When working on electrical equipment, it should be fully isolated from the supply. The main cable should be connected through the main switch according to all current regulations.

- Make the electrical connections as shown in the adjacent diagram.

Installation of the control box

- Feed the capillary and earth leads through the opening in the side wall.
- Fit the boiler control with the rivets in the holes of the side wall and fasten in place with the self-tapping screws provided.
- Lay the sensor under the corner of the boiler above the insulation layer and push into the pocket.
Caution! Take care not to kink the capillary tube.
- Insert the earthing wire in the connections provided on the side wall and on the boiler corner.

Circulating pump connection

Important!

All circulating pumps must be controlled through the control box.

→ The connection in the control box allows, through the built-in control, a maximum load of 2A (Take note of the data in the Technical Information for the weather compensated control). Three phase pumps or multiple pumps with a higher total load requirement are to be controlled via an additional protection.

The pumps connected to the control box must meet the VDE requirements.

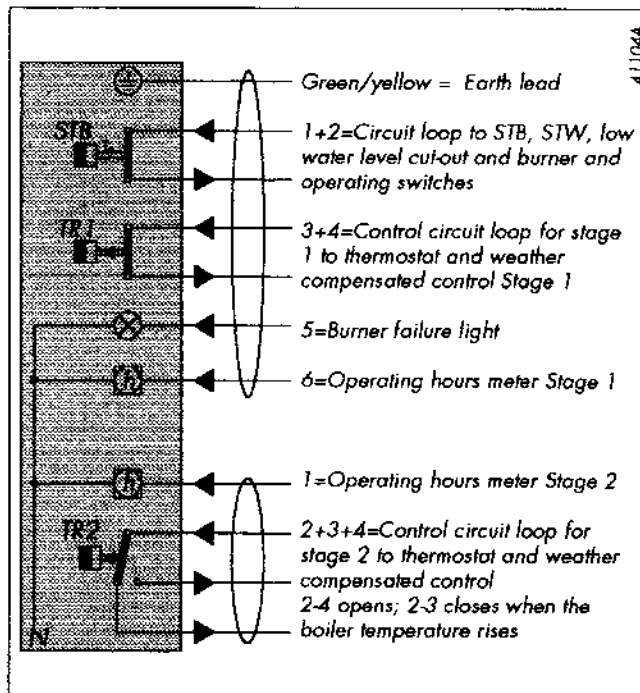
- Connect the circulating pumps to the terminal block of the control box.

Burner connection

Take note of the technical information supplied by the burner manufacturer.

→ The control box is fitted with two burner connecting cables, with a 7-core cable for the first stage and with a 4-core cable for the second stage.

→ The following diagram shows in simplified form the function of the control box as well as the numbering of the connections.



The manufacturer reserves the right to make technical alterations without notice.

(0280149/06.96/en)

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