



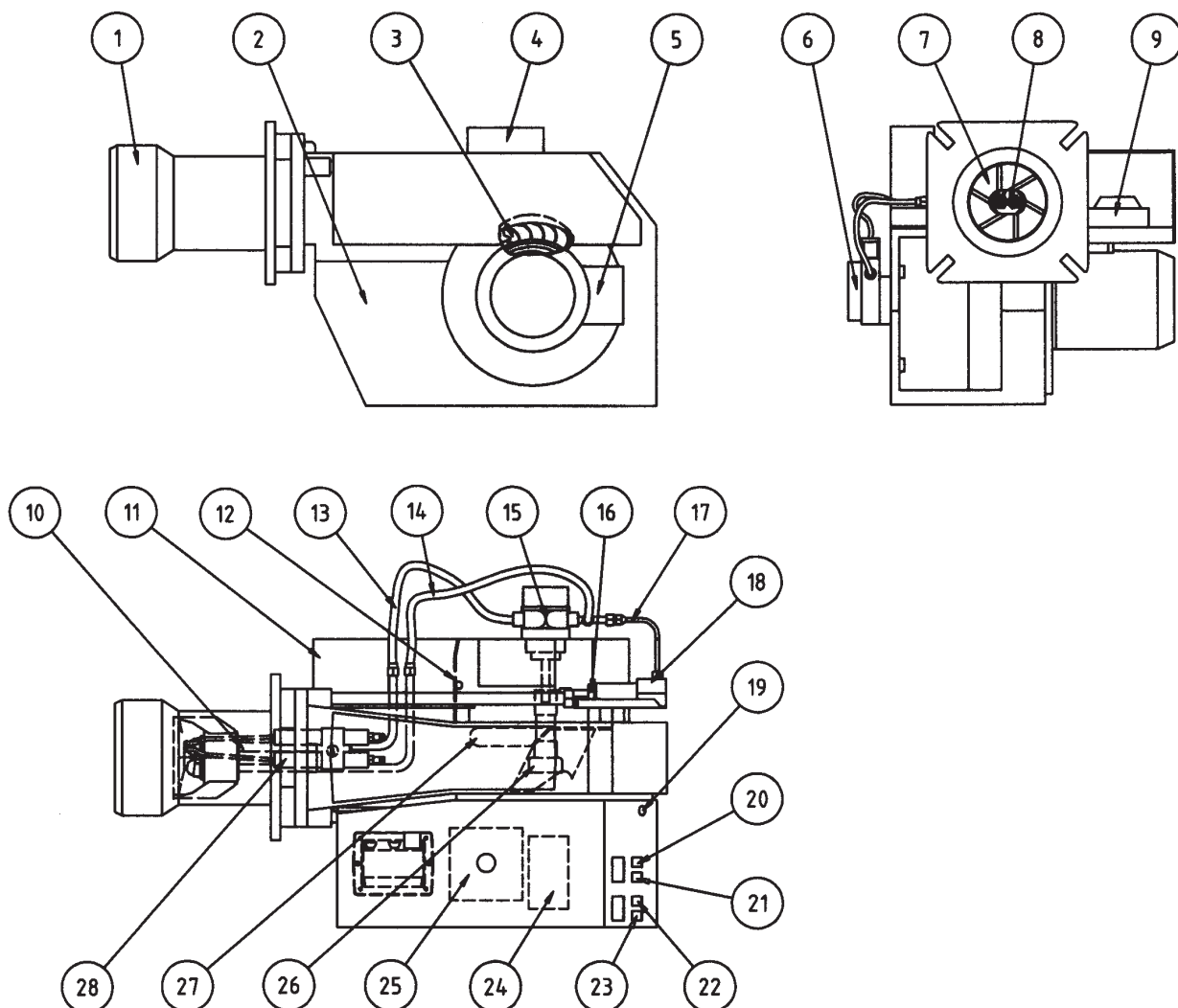
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Installation- and maintenance instruction

B 45 A2.2

DESCRIPTION

Components



- | | | |
|-------------------------|---|-----------------------------|
| 1. Flame cone | 11. Air intake | 19. Fuse |
| 2. Fan housing | 12. Air damper | 20. Indicating lamp Stage 2 |
| 3. Fan wheel | 13. Connecting pipe Stage 1 | 21. Switch I-II |
| 4. Damper motor | 14. Connecting pipe Stage 2 | 22. Indicating lamp Stage 1 |
| 5. Motor | 15. Solenoid valves | 23. Switch 0-I |
| 6. Pump | 16. Nozzle assembly adjustment | 24. Contactor |
| 7. Shrouded disc | 17. Connecting pipe, pump-adjustment device | 25. Control box |
| 8. Nozzle | 18. Adjustment device, Nozzle assembly adjustment | 26. Drive coupling |
| 9. Ignition transformer | | 27. Conical shield plate |
| 10. Nozzle assembly | | 28. Ignition electrodes |

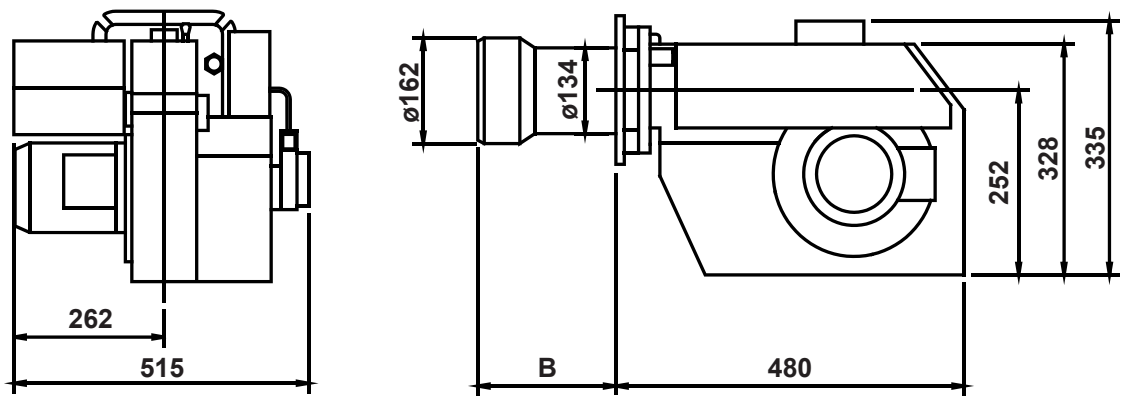


THE BURNERS MUST NOT BE FIRED WITHOUT FITTING NOZZLES SUPPLIED

TECHNICAL DATA

Type designation B45A2

Dimensions



	Length of burner tube	Flange Measure B
B45A2	270	238
B45A2	370	338

Output range and nozzles recommended

	Oil capacity		Capacity	Recommended nozzle			Recommended Pump pressure
	kg/h	kW		Angle	Danfoss	Monarch	
B45A2	8,5-45,5	101-540	87-464	45° - 60°	S, B	R, PLP	14 bar

The net calorific value of 11,86 kWh/kg for light oil has been used.

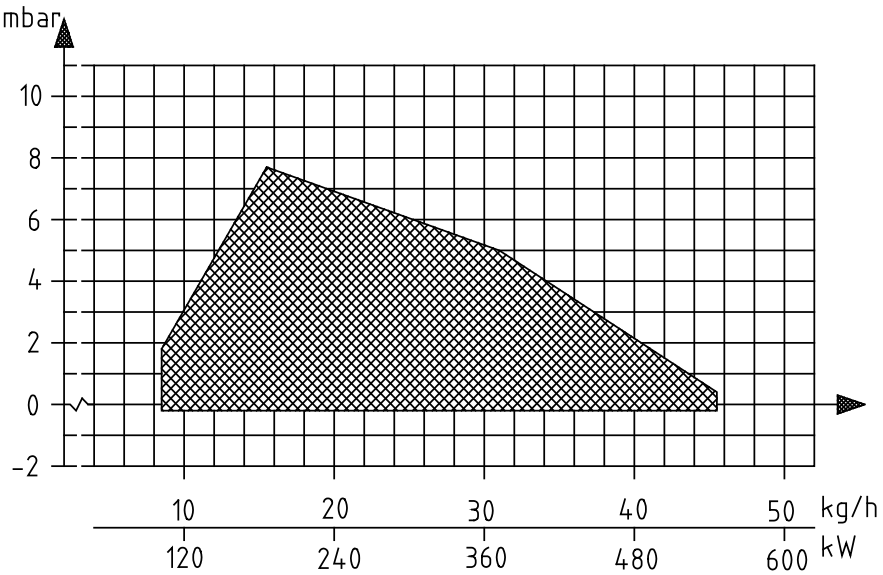
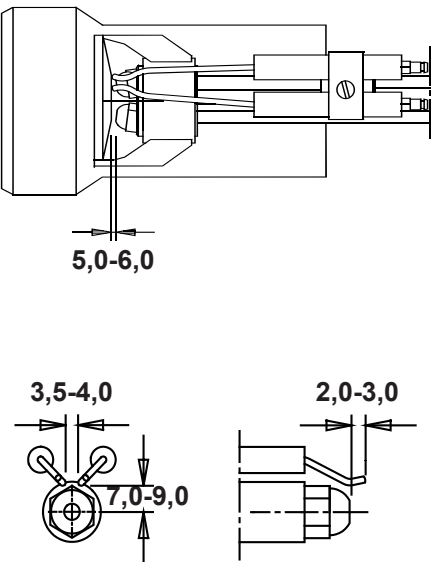
Recommended nozzle

Because of different boiler types existing on the market, with varying combustion chamber designs, it is

not possible to state a definite spray angle or spray pattern.

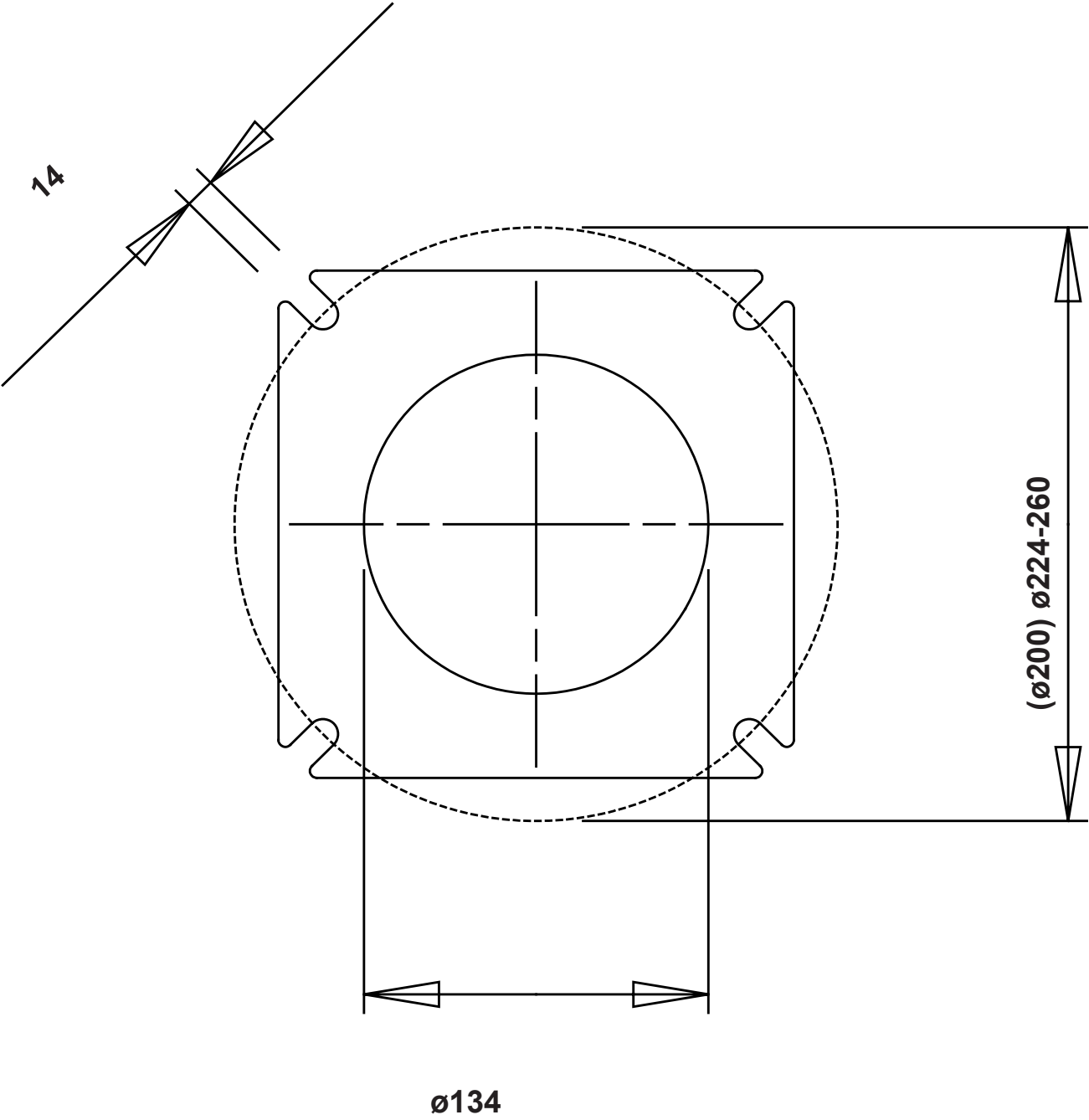
Note that the spray angle and the spray pattern change with the pump pressure.

Electrode adjustment



TECHNICAL DATA

Dimensions of flange



GENERAL INSTRUCTIONS

General rules

The installation of an oil burner should be carried out in accordance with local regulations. The installer of the burner must therefore be aware of all regulations relating to oil and combustion. Only oil suitable for the burner should be used and then in combination with a suitable oil filter before the oil pump of the burner.

If the burner is replacing an existing burner make sure that the oil filter is replaced or cleaned. The installation must only be undertaken by experienced personnel. Care should be taken by the installer to ensure that no electrical cables or fuel/gas pipes are trapped or damaged during installation or service/maintenance.

Installation instructions

General installation instructions accompany the burner and should be left in a prominent place adjacent to the burner.

Adjustment of burner

The burner is from the factory pre-set to an average value that must then be adjusted to the boiler in question. All burner adjustments must be made in accordance with boiler manufacturers instructions. These must include the checking of flue gas temperatures, average water temperature and CO_2 or O_2 concentration.

To adjust the combustion device, start by increasing the air volume and the nozzle assembly somewhat. When the burner starts it is burning with excess air and smoke number 0. Reduce the nozzle assembly adjustment until soot occurs, and then increase the adjustment to make the soot disappear again. Then the volume of air is reduced until soot occurs and increased again to reach a combustion free of soot.

By this procedure an optimum adjustment is obtained. If larger nozzles are used the preadjustment of both the air volume and the nozzle assembly must be increased.

A whistling sound may be heard which can be eliminated or reduced as follows: Increase the nozzle assembly adjustment somewhat. The CO_2 -content and consequently the air volume will then be reduced.

Condensation in chimney

A modern burner works with less excess air and often also with smaller nozzles than older models. This increases the efficiency but also the risk of condensation in the chimney. The risk increases if the area of the chimney flue is too large. The temperature of the flue gases should exceed 60°C measured 0,5 metres from the chimney top.

Measures to raise the temperature:

Insulate the chimney in cold attics

Install a tube in the chimney

Install a draught regulator (dilutes the flue gases during operation and dries them up during standstill)

Increase the oil quantity

Raise the flue gas temperature by removing turbulators, if any, in the boiler.

Pump adjustment

See separate description.

Maintenance

The boiler/burner should be examined regularly for any signs of malfunction or oil leakage.

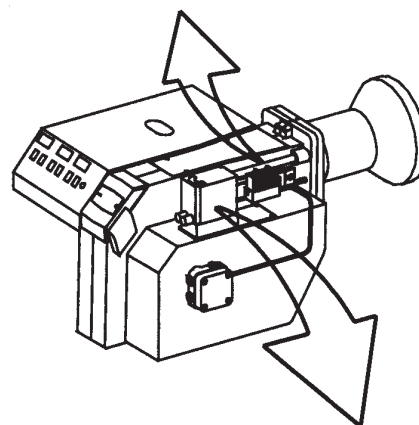
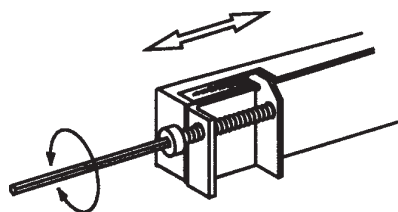
Oil supply

The oil line should be dimensioned in accordance with the pump manufacturer's instruction. In the suction line to the burner a filter should be mounted to prevent any particles in the oil from reaching the burner. If the installation consists of several burners each one should have its own suction line from the tank or a circulation system should be used.

The temperature in the oil line should be kept as constant as possible. Avoid exposing the line to excessive cold which may cause blockages of paraffin deposits.

The oil pipe and electric cable should be fitted so that the burner can be placed on the floor for inspection of the combustion device.

Adjustment of nozzle assembly



Air adjustment

See page "Air adjustment with damper motor".



AIR ADJUSTMENT WITH DAMPER MOTOR

The damper motor turns the damper between 3 preset positions: fully closed, low capacity and high capacity. These positions are controlled in the motor by cams which are set by means of the coloured disks. In addition there is a black disk controlling the connection of solenoid valve 2.

If the air volume needs changing: Remove the cover from the damper motor and change the position of the cams by turning them by hand. See fig.

Low capacity:

Adjust the operating switch to high capacity (II).

- Reduce the air volume:
Turn orange cam towards 0°.
- Increase the air volume:
Turn orange cam towards 90°.

Adjust the operating switch back to low capacity and check.

Full capacity:

Adjust the operating switch to low capacity (I).

- Reduce the air volume:
Turn red cam towards 0°.
- Increase the air volume:
Turn red cam towards 90°.

If the red cam is moved, change the black cam as much. Adjust the operating switch back to high capacity and ensure that the correct air volume has been obtained.

Note!

The blue cam is the limit position for fully closed damper and it is normally not necessary to change it.

Releasing button

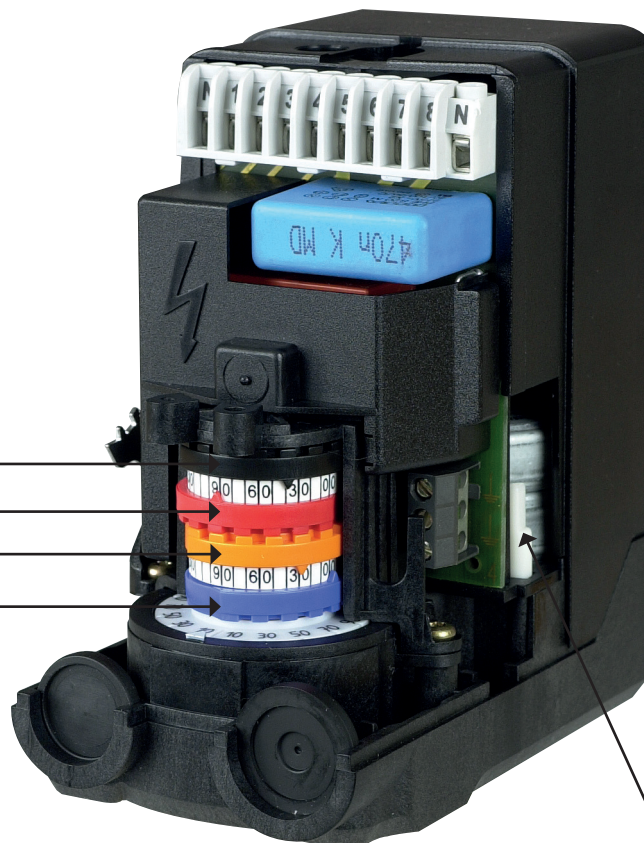
By pressing the button and snapping it down, the motor will be released and the damper can easily be turned. This function facilitates an exchange of damper motor.

Solenoid valve High capacity (black)

High capacity (red)

Low capacity (orange)

Closed damper (blue)



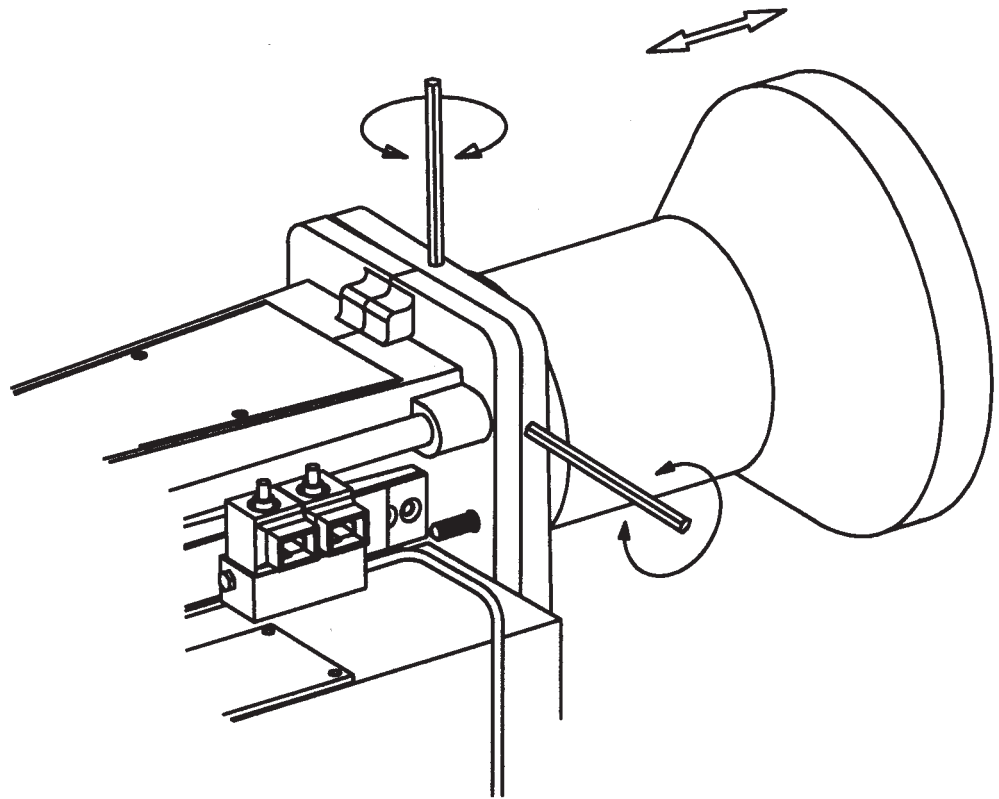
Releasing button

N.B. The upper position is the standard position

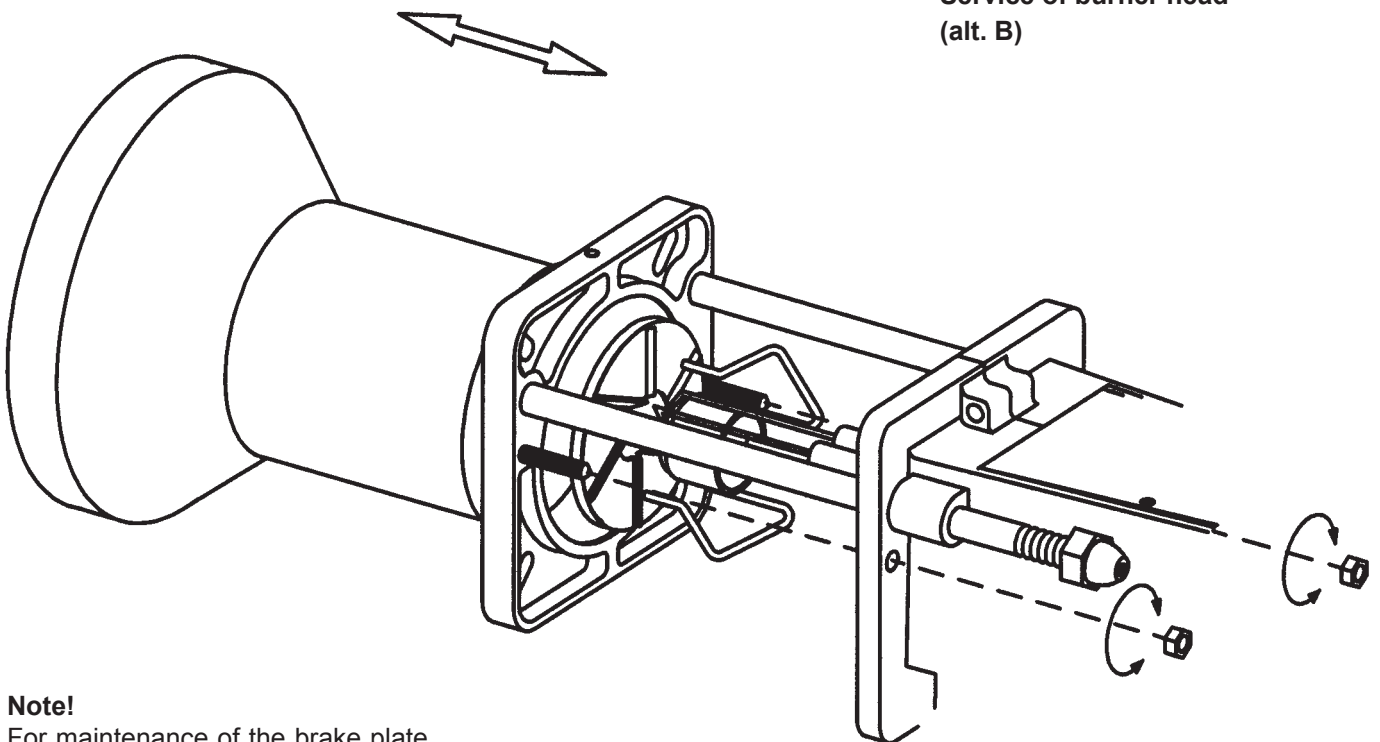
MAINTENANCE OF OIL BURNER

Warning: Before doing any service switch off power at the main switch and cut off the oil supply.

Service of burner head (alt. A)



Service of burner head (alt. B)

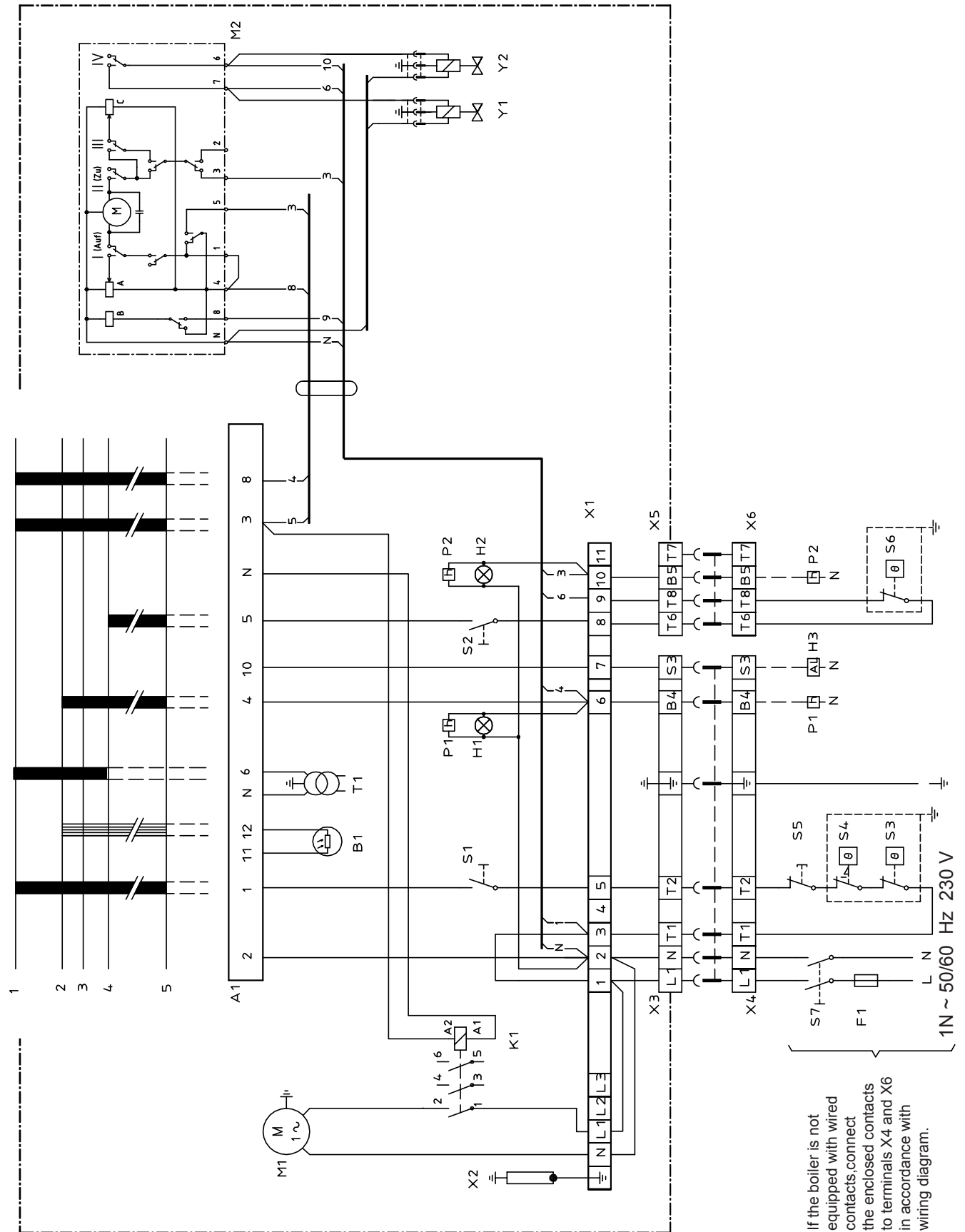


Note!

For maintenance of the brake plate, nozzles, electrodes etc, when using a long design of the burner tube, you have to **remove the nozzle assembly from the connecting pipe and move the assembly backwards** in the fan housing (from the boiler).

Oil burner control: LMO24.255

Wiring diagram



Oil burner control: LMO24.255

Max loading K1
Connection A1,A2 / 95, 96 / 97, 98
Max 0,2A/15W

List of components

A1	Oil burner control	S3	Control thermostat
B1	Photoresistor	S4	Temperature limiter
F1	Fuse	S5	Micro switch for hinged door
H1	Lamp, low capacity	S6	Control thermostat, high/low
H2	Lamp, high capacity	S7	Main switch
H3	Lamp, lock-out signal 230 V	T1	Ignition transformer
K1	Thermal overload protection	X1	Connection terminal board
M1	Burner motor	X2	Earth terminal
M2	Damper motor SQN75.244A21B	X3	Plug-in contact, burner
P1	Time meter, low capacity (optional)	X4	Plug-in contact, boiler
P2	Time meter, high capacity (optional)	X5	Plug-in contact high/low capacity burner
S1	Operating switch	X6	Plug-in contact high/low capacity boiler
S2	Operating switch, high/low capacity	Y1	Solenoid valve 1
		Y2	Solenoid valve 2

If S6 is missing connection between T6 and T8.
Mains connection and fuse in accordance with local regulations.

Function

1. Switch on operating switch and twin thermostat

A spark is formed. The air damper motor opens the damper to low load position. The burner motor starts, the prepurge goes on till the prepurge period expires and the solenoid valve 1 opens (2).

2. Solenoid valve 1 opens

Oil mist is formed and ignited. The photocell indicates a flame.

3. The safety time expires

- a. If no flame is established before this time limit the control cuts out.
- b. If for some reasons the flame disappears after this time limit, the burner will make an attempt to re-start.

4. High/Low thermostat ON

The burner is in operating position and can now change between full load and low load.

4-5. Operating position

If the burner operation is interrupted by means of the main switch or the thermostat, a new start takes place when the conditions in accordance with point 1 are fulfilled.

The oil burner control cuts out

A red lamp in the control is lit. Press the reset button and the burner re-starts.

Technical data

Pre-ignition time:	25 s
Pre-purge time:	26 s
Post-ignition time:	5 s
Safety lock-out time:	< 5 s
Reset time after lockout:	< 1 s
Reaction time on flame failure:	< 1 s
Ambient temperature:	from - 20 to +60°C
Min. current with flame established:	45µ A
Max. photo current at start:	5,5µ A
Enclosure:	IP 40

Control of photo current

Current through photo unit is measured with a d.c. ammeter (a moving coil instrument connected in series with the photo unit).

Colour codes LMO14/24

When the burner starts, three signal lights in the reset switch indicate the normal sequence, as well as provide indication if something abnormal is happening in accordance with the following table:

Preheater in operation	Solid yellow
Ignition switched on	Flashing yellow
Normal operation	Solid green
Operation, poor flame signal	Flashing green
Undervoltage	Flashing yellow-red
Fault, alarm	Solid red
False light	Flashing red-green
Communication mode	Fluttering red

Fault codes LMO14/24

When the red light for a blocked relay box comes on, you can get information about what has caused the problem by pressing and holding the reset button for 3 seconds.

The number of flashes below is repeated with a pause in between.

2 flashes	No flame signal when safety time expires
4 flashes	False light during start
7 flashes	3 x Losses of flame during operation
8 flashes	Time-out for preheater *
10 flashes	Incorrect wiring, internal fault or simultaneous occurrence of two faults

* In order for this fault code to occur, the preheater shall not reach its cut-off temperature within 10 mins. from switch on.

To return to normal operation: Press the reset button for 1 second.
If the reset button is instead kept pressed a second time for at least 3 seconds, you can, via an interface, obtain the corresponding information on a computer or flue gas analyser.

To return to normal operation: Press the reset button for 1 second

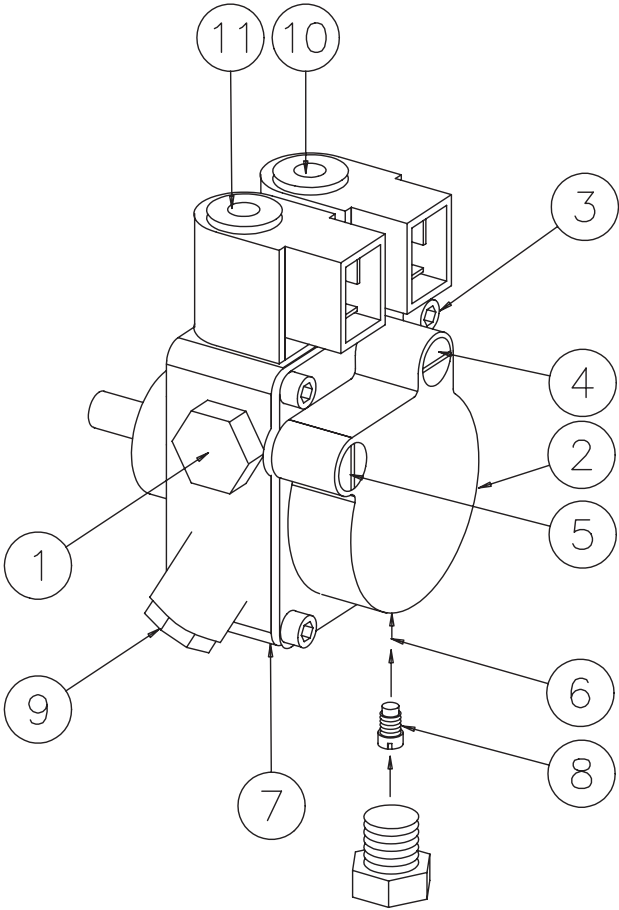
INSTRUCTIONS PUMP TYPE SUNTEC A2L 65C - 75C

Technical data

One or two-pipe system.
Viscosity range: 2-12 mm²/S
Pressure range: 8-15 bar
Rated voltage of coil: 220/240V
50/60 Hz
Oil temperature: max 60°C

Components

1. Nozzle outlet G 1/8" Stage 2
2. Pressure gauge port G 1/8"
3. Nozzle outlet G 1/8" Stage 1
4. Pressure gauge port G 1/8"
5. Vacuum gauge port G 1/8"
6. Return line G 1/4" and internal by-pass plug
7. Suction line G 1/4"
8. Return plug
9. Pressure adjustment
10. Solenoid valve 1
11. Solenoid valve 2



Suction line tables

The suction line tables consist of theoretically calculated values where the pipe dimensions and oil velocity have been matched so that tur-bulences will not occur. Such tur-bulences will result in increased pressure losses and in acoustic noise in the pipe system. In addition to drawn copper piping a pipe system usually comprises 4 elbows, a non-return valve, a cut-off valve and an external oil filter.

The sum of these individual resistances is so insignificant that they can be disregarded. The tables do not include any lengths exceeding 100 m as experience shows that longer lengths are not needed.

The tables apply to a standard fuel oil of normal commercial quality according to current standards. On commissioning with an empty tube system the oil pump should not be run without oil for more than 5 min. (a condition is that the pump is being lubricated during operation).

The tables state the total suction line length in metres at a nozzle capacity of 9,5 Gph. Max. permissible pressure at the suction and pressure side is 2,0 bar.

A schematic diagram of a 1-pipe system. It shows a horizontal pipe connected to a vertical pipe that leads down to a pump. The pump is connected to a vertical pipe that leads up to a tank. The tank is connected to a horizontal pipe that leads back to the pump. A pressure gauge is mounted on the vertical pipe between the pump and the tank. The height of the tank is labeled 'H'.

1-pipe system

Height	Pipe diameter		
H	ø6 mm	ø8 mm	ø10 mm
m	m	m	m
4,0	45	144	150
3,0	39	127	150
2,0	34	109	150
1,0	28	92	150
0,5	26	83	150
0,0	23	74	150

Two-pipe system

Height	Pipe diameter			
H	ø8mm	ø10mm	ø12mm	ø14mm
m	m	m	m	m
4,0	42	108	150	150
3,0	36	94	150	150
2,0	31	81	150	150
1,0	26	68	144	150
0,5	23	61	130	150
0,0	20	54	116	150

A schematic diagram of a 1-pipe system. It shows a horizontal pipe connected to a vertical pipe that leads down to a pump. The pump is connected to a vertical pipe that leads up to a tank. The tank is connected to a horizontal pipe that leads back to the pump. A pressure gauge is mounted on the vertical pipe between the pump and the tank. The height of the tank is labeled 'H'.

1-pipe system

Height	Pipe diameter
H	ø6 mm
m	m

With an underlying tank a 1-pipe-system is not recommended

Two-pipe system

Height	Pipe diameter			
H	ø8mm	ø10mm	ø12mm	ø14mm
m	m	m	m	m
0,0	20	54	116	150
-0,5	17	48	103	150
-1,0	15	41	89	150
-2,0	9	28	61	116
-3,0	4	14	33	65
-4,0	0	0	6	14

INSTRUCTIONS PUMP TYPE SUNTEC A2L 65C - 75C

Pump operating principle for A2L 65C - 75C

The **SUNTEC A2L** oil pump has two nozzle outlets. It incorporates two blocking solenoid valves with in-line-cut-off function, one for each nozzle outlet.

The gear set draws oil from the tank through the built-in filter and transfers it to the nozzle line via the cut-off solenoid valves. A pressure regulating valve is used to dump all oil which is not required at the nozzle.

In one-pipe operation, the oil which does not go through the nozzle lines is returned directly to the gear inlet and the suction line flow is equal to the sum of the 2 nozzle flows. In two-pipe operation, the by-pass plug must be fitted in the return port, which ensures that the oil dumped by the regulating valve is returned to the tank and the suction line flow is equal to the gear set capacity.

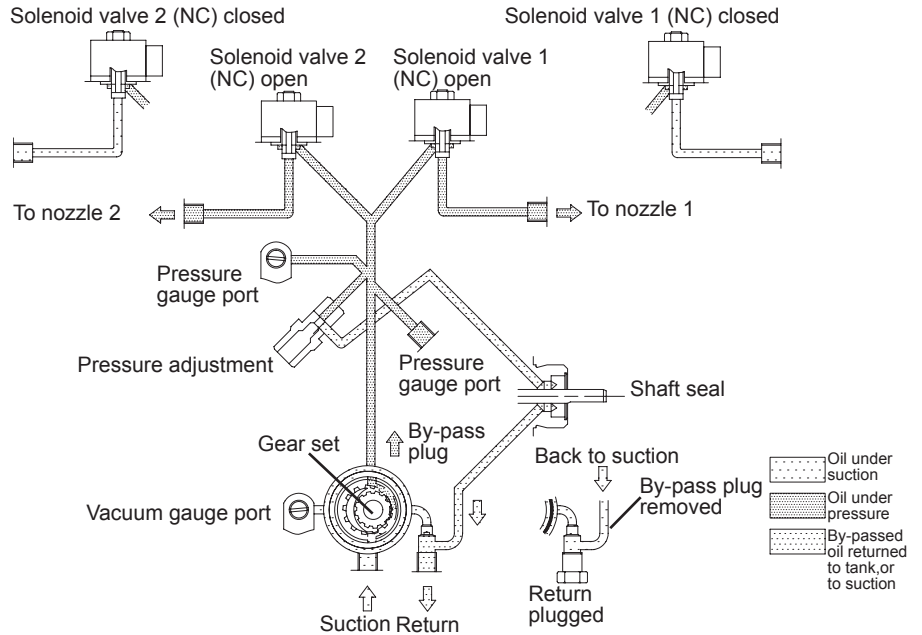
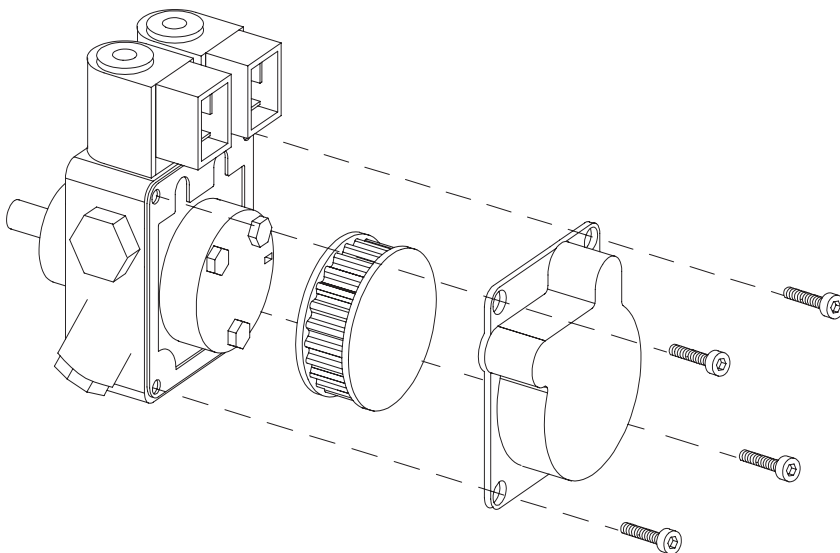
Bleed

Bleeding in two-pipe operation is automatic: it is assured by a bleed flat on the piston. In one-pipe operation, a high pressure connection must be loosened until the air is evacuated from the system.

Cut-Off

The solenoid valves of the A2L pump are of the "normally closed" type and are situated in the nozzle lines. This

Exchange of filter



Two pipe installation
design ensures extremely fast response and the switching can be selected according to the burner operating sequence and is independent of motor speed.

When the solenoids are non-activated, the valves are closed and all oil pressurised by the gear set passes through the regulator to suction or to the return line, depending upon pipe arrangement.

As soon as the solenoids are activated, oil passes to the nozzle lines at the pressure set by the pressure regulating valve.

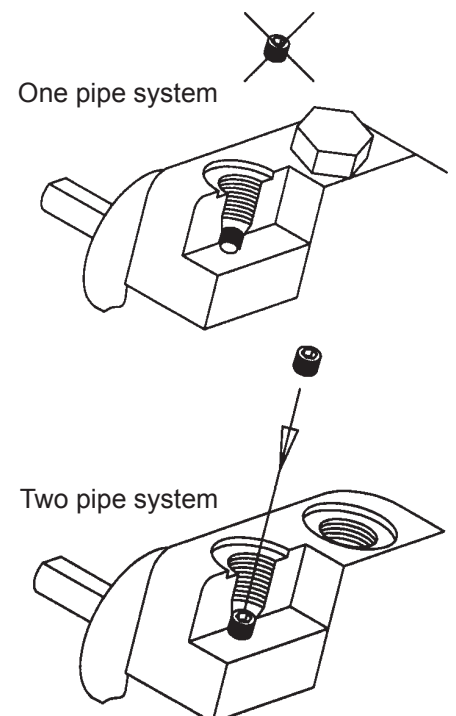
One pipe installation
Shaft rotation and nozzle location seen from shaft end

Gear set capacity

A2L: 2 nozzle outlets

A2LXX C

Mounting/dismounting return plug



NOZZLE TABLE

Pump pressure bar

Gph	8			9			10			11		
	kg/h	kW	Mcal/h	kg/h	kW	Mcal/h	kg/h	kW	Mcal/h	kg/h	kW	Mcal/h
0,40	1,33	16	13	1,41	17	14	1,49	18	15	1,56	18	16
0,50	1,66	20	17	1,76	21	18	1,86	22	19	1,95	23	20
0,60	2,00	24	20	2,12	25	22	2,23	26	23	2,34	28	24
0,65	2,16	26	22	2,29	27	23	2,42	29	25	2,54	30	26
0,75	2,49	29	25	2,65	31	27	2,79	33	28	2,93	35	30
0,85	2,83	33	29	3,00	36	31	3,16	37	32	3,32	39	34
1,00	3,33	39	34	3,53	42	36	3,72	44	38	3,90	46	40
1,10	3,66	43	37	3,88	46	39	4,09	48	42	4,29	51	44
1,20	3,99	47	41	4,24	50	43	4,47	53	46	4,68	55	48
1,25	4,16	49	42	4,40	52	45	4,65	55	47	4,88	58	50
1,35	4,49	53	46	4,76	56	48	5,02	59	51	5,27	62	54
1,50	4,98	59	51	5,29	63	54	5,58	66	57	5,85	69	60
1,65	5,49	65	56	5,82	69	59	6,14	73	63	6,44	76	66
1,75	5,82	69	59	6,18	73	63	6,51	77	66	6,83	81	70
2,00	6,65	79	68	7,06	84	72	7,45	88	76	7,81	93	80
2,25	7,49	89	76	7,94	94	81	8,38	99	85	8,78	104	89
2,50	8,32	99	85	8,82	105	90	9,31	110	95	9,76	116	99
2,75	9,15	108	93	9,71	115	99	10,24	121	104	10,73	127	109
3,00	9,98	118	102	10,59	126	108	11,16	132	114	11,71	139	119
3,50	11,65	138	119	12,35	146	126	13,03	154	133	13,66	162	139
4,00	13,31	158	136	14,12	167	144	14,89	176	152	15,62	185	159
4,50	14,97	177	153	15,88	188	162	16,75	198	171	17,57	208	179
5,00	16,64	197	170	17,65	209	180	18,62	221	190	19,52	231	199
5,50	18,30	217	187	19,42	230	198	20,48	243	209	21,47	255	219
6,00	19,97	237	204	21,18	251	216	22,34	265	228	23,42	278	239
6,50	21,63	256	220	22,94	272	234	24,20	287	247	25,37	301	259
7,00	23,29	276	237	24,71	293	252	26,06	309	266	27,33	324	279
7,50	24,96	296	254	26,47	314	270	27,92	331	285	29,28	347	298
8,00	26,62	316	271	28,24	335	288	29,79	353	304	31,23	370	318
8,50	28,28	335	288	30,00	356	306	31,65	375	323	33,18	393	338
9,00	29,95	355	305	31,77	377	324	33,59	398	342	35,14	417	358

The table applies to oil with a viscosity of 4,4 mm²/s (cSt) with density 830 kg/m³.

Burner with preheater

Consider that on preheating the oil quantity is reduced by 5-20% depending on.

- Rise in temperature at the nozzle
- Design of nozzle
- Capacity (high capacity - small difference)

NOZZLE TABLE

Pump pressure bar

Gph	12			13			14			15		
	kg/h	kW	Mcal/h	kg/h	kW	Mcal/h	kg/h	kW	Mcal/h	kg/h	kW	Mcal/h
0,40	1,63	19	17	1,70	20	17	1,76	21	18	1,82	21	18
0,50	2,04	24	21	2,12	25	22	2,20	26	22	2,28	27	23
0,60	2,45	29	25	2,55	30	26	2,64	31	27	2,73	32	28
0,65	2,65	31	27	2,75	33	28	2,86	34	29	2,96	35	30
0,75	3,08	36	31	3,18	38	32	3,30	39	34	3,42	40	35
0,85	3,47	41	35	3,61	43	37	3,74	44	38	3,87	46	39
1,00	4,08	48	42	4,24	50	43	4,40	52	45	4,56	54	46
1,10	4,48	53	46	4,67	55	48	4,84	57	49	5,01	59	51
1,20	4,89	58	50	5,09	60	52	5,29	63	54	5,47	65	56
1,25	5,10	60	52	5,30	63	54	5,51	65	56	5,70	68	58
1,35	5,50	65	56	5,73	68	58	5,95	70	61	6,15	73	63
1,50	6,11	72	62	6,36	75	65	6,60	78	67	6,83	81	70
1,65	6,73	80	69	7,00	83	71	7,27	86	74	7,52	89	77
1,75	7,14	85	73	7,42	88	76	7,71	91	79	7,97	94	81
2,00	8,18	97	83	8,49	101	86	8,81	104	90	9,12	108	93
2,25	9,18	109	94	9,55	113	97	9,91	117	101	10,26	122	105
2,50	10,19	121	104	10,61	126	108	11,01	130	112	11,39	135	116
2,75	11,21	133	114	11,67	138	119	12,11	144	123	12,53	148	128
3,00	12,23	145	125	12,73	151	130	13,21	157	135	13,67	162	139
3,50	14,27	169	145	14,85	176	151	15,42	183	157	15,95	189	163
4,00	16,31	193	166	16,97	201	173	17,62	209	180	18,23	216	186
4,50	18,35	217	187	19,10	226	195	19,82	235	202	20,51	243	209
5,00	20,39	242	208	21,22	251	216	22,03	261	225	22,79	270	232
5,50	22,43	266	229	23,34	277	238	24,23	287	247	25,07	297	256
6,00	24,47	290	249	25,46	302	260	26,43	313	269	27,49	326	280
6,50	26,51	314	270	27,58	327	281	28,63	339	292	29,63	351	302
7,00	28,55	338	291	29,70	352	303	30,84	366	314	31,91	378	325
7,50	30,59	363	312	31,83	377	324	33,04	392	337	34,19	405	349
8,00	32,63	387	333	33,95	403	346	35,25	418	359	36,47	432	372
8,50	34,66	411	353	36,07	428	368	37,45	444	382	38,74	459	395
9,00	36,71	435	374	38,19	453	389	39,65	470	404	41,02	486	418

The table applies to oil with a viscosity of 4,4 mm²/s (cSt) with density 830 kg/m³.

Burner with preheater

Consider that on preheating the oil quantity is reduced by 5-20% depending on.

- Rise in temperature at the nozzle
- Design of nozzle
- Capacity (high capacity - small difference)

NOZZLE TABLE

Pump pressure bar

Gph	10			11			12			13		
	kg/h	kW	Mcal/h	kg/h	kW	Mcal/h	kg/h	kW	Mcal/h	kg/h	kW	Mcal/h
1,00	3,72	44	38	3,90	46	40	4,08	48	42	4,24	50	43
1,10	4,09	48	42	4,29	51	44	4,48	53	46	4,67	55	48
1,20	4,47	53	46	4,68	55	48	4,89	58	50	5,09	60	52
1,25	4,65	55	47	4,88	58	50	5,10	60	52	5,30	63	54
1,35	5,02	59	51	5,27	62	54	5,50	65	56	5,73	68	58
1,50	5,58	66	57	5,85	69	60	6,11	72	62	6,36	75	65
1,65	6,14	73	63	6,44	76	66	6,73	80	69	7,00	83	71
1,75	6,51	77	66	6,83	81	70	7,14	85	73	7,42	88	76
2,00	7,45	88	76	7,81	93	80	8,16	97	83	8,49	101	87
2,25	8,38	99	85	8,78	104	90	9,18	109	94	9,55	113	97
2,50	9,31	110	95	9,76	116	100	10,19	121	104	10,61	126	108
2,75	10,24	121	104	10,73	127	109	11,21	133	114	11,67	138	119
3,00	11,16	132	114	11,71	139	119	12,23	145	125	12,73	151	130
3,50	13,03	154	133	13,66	162	139	14,27	169	146	14,85	176	151
4,00	14,89	176	152	15,62	185	159	16,31	193	166	16,97	201	173
4,50	16,75	199	171	17,57	208	179	18,35	218	187	19,10	226	195
5,00	18,62	220	190	19,52	231	199	20,39	242	208	21,22	252	216
5,50	20,48	243	209	21,47	255	219	22,43	266	229	23,34	277	238
6,00	22,34	265	228	23,42	278	239	24,47	290	250	24,46	302	260
6,50	24,20	287	247	25,37	301	259	26,51	314	270	27,58	327	281
7,00	26,06	309	266	27,33	324	279	28,55	339	291	29,70	352	303
7,50	27,92	331	285	29,28	347	299	30,59	363	312	31,83	377	325
8,00	29,79	353	304	31,23	370	318	32,63	387	333	33,95	403	346
8,50	31,65	375	323	33,18	393	338	34,66	411	353	36,07	428	368
9,00	33,59	398	343	35,14	417	358	36,71	435	374	38,19	453	389
9,50	35,37	419	361	37,09	440	378	38,74	459	395	40,31	478	411
10,00	37,23	441	380	39,04	463	398	40,78	484	416	42,44	503	433
11,00	40,96	486	418	42,94	509	438	44,86	532	457	46,68	554	476
12,00	44,68	530	456	46,85	556	478	48,94	580	499	50,92	604	519
14,00	52,12	618	531	54,65	648	557	57,10	677	582	59,41	705	606
16,00	59,57	706	607	62,46	741	637	65,26	774	666	67,90	805	692
18,00	67,02	795	683	70,27	833	717	73,41	871	749	76,39	906	779
20,00	74,47	883	759	78,08	926	796	81,57	967	832	84,87	1007	865
22,00	81,91	971	835	85,89	1019	876	89,73	1064	915	93,36	1107	952
24,00	89,36	1060	911	93,70	1111	956	97,88	1161	998	101,85	1208	1039
26,00	96,81	1148	987	101,50	1204	1035	106,04	1258	1081	110,33	1308	1168

The table applies to oil with a viscosity of 4,4 mm²/s (cSt) with density 830 kg/m³.

NOZZLE TABLE

Pump pressure bar

Gph	14			15			16			17		
	kg/h	kW	Mcal/h	kg/h	kW	Mcal/h	kg/h	kW	Mcal/h	kg/h	kW	Mcal/h
1,00	4,40	52	45	4,56	54	46	4,71	56	48	4,85	57	49
1,10	4,84	57	49	5,01	59	51	5,18	61	53	5,34	63	54
1,20	5,29	63	54	5,47	65	56	5,65	67	58	5,82	69	59
1,25	5,51	65	56	5,70	68	58	5,89	70	60	6,07	72	62
1,35	5,95	70	61	6,15	73	63	6,36	75	65	6,55	78	67
1,50	6,60	78	67	6,83	81	70	7,06	84	72	7,27	86	74
1,65	7,27	86	74	7,52	89	77	7,77	92	79	8,01	95	82
1,75	7,71	91	79	7,97	95	81	8,24	98	84	8,49	101	87
2,00	8,81	104	90	9,12	108	93	9,42	112	96	9,71	115	99
2,25	9,91	118	101	10,26	122	105	10,60	126	108	10,92	130	111
2,50	11,01	131	112	11,39	135	116	11,77	140	120	12,13	144	124
2,75	12,11	144	123	12,53	149	128	12,95	154	132	13,35	158	136
3,00	13,21	157	135	13,67	162	139	14,13	168	144	14,56	173	148
3,50	15,42	183	157	15,95	189	163	16,49	196	168	16,99	201	173
4,00	17,62	209	180	18,23	216	186	18,84	223	192	19,42	230	198
4,50	19,82	235	202	20,51	243	209	21,20	251	216	21,84	259	223
5,00	22,03	261	225	22,79	270	232	23,55	279	240	24,27	288	247
5,50	24,23	287	247	25,07	297	256	25,91	307	264	26,70	317	272
6,00	26,43	313	270	27,49	326	280	28,27	335	288	29,13	345	297
6,50	28,63	340	292	29,63	351	302	30,62	363	312	31,55	374	322
7,00	30,84	366	314	31,91	378	325	32,98	391	336	33,98	403	374
7,50	33,04	392	337	34,19	405	349	35,33	419	360	36,41	432	371
8,00	35,25	418	359	36,47	433	372	37,69	447	384	38,80	460	396
8,50	37,45	444	382	38,74	459	395	40,04	475	408	41,26	489	421
9,00	39,65	470	404	41,02	486	418	42,40	503	432	43,69	518	446
9,50	41,85	496	427	43,30	514	442	44,75	531	456	46,11	547	470
10,00	44,06	523	449	45,58	541	465	47,11	559	480	47,11	559	480
11,00	48,46	575	494	50,14	595	511	51,82	615	528	53,40	633	545
12,00	52,87	627	539	54,70	648	558	56,53	670	576	58,25	691	594
14,00	62,68	732	629	63,81	757	651	65,95	778	669	67,96	806	693
16,00	70,49	836	719	72,93	865	744	75,38	894	769	77,67	921	792
18,00	79,30	940	809	82,05	973	837	84,80	1006	865	87,38	1036	891
20,00	88,11	1045	899	91,17	1081	930	94,22	1117	961	97,09	1151	990
22,00	96,92	1149	988	100,28	1189	1023	103,64	1229	1057	106,79	1267	1089
24,00	105,74	1254	1078	109,40	1297	1116	113,06	1341	1153	116,50	1382	1188
26,00	114,55	1359	1168	118,52	1406	1209	122,49	1453	1249	126,21	1497	1287

The table applies to oil with a viscosity of 4,4 mm²/s (cSt) with density 830 kg/m³.

NOZZLE TABLE

Pump pressure bar

Gph	18			19			20			21		
	kg/h	kW	Mcal/h	kg/h	kW	Mcal/h	kg/h	kW	Mcal/h	kg/h	kW	Mcal/h
1,00	4,99	59	51	5,13	61	52	5,26	62	54	5,40	64	55
1,10	5,49	65	56	5,64	67	57	5,79	69	59	5,93	70	60
1,20	5,99	71	61	6,16	73	63	6,32	75	64	6,47	77	66
1,25	6,24	74	64	6,41	76	65	6,58	78	67	6,74	80	69
1,35	6,74	80	69	6,93	82	71	7,11	84	72	7,28	86	74
1,50	7,48	89	76	7,69	91	78	7,89	93	80	8,08	96	82
1,65	8,24	98	84	8,47	100	86	8,69	103	89	8,90	105	91
1,75	8,78	104	90	8,98	106	92	9,21	109	94	9,44	112	96
2,00	9,99	118	102	10,26	122	105	10,53	125	107	10,79	128	110
2,25	11,24	133	115	11,55	137	118	11,85	140	121	12,14	144	124
2,50	12,48	148	127	12,83	152	131	13,16	156	134	13,49	160	138
2,75	13,73	163	140	14,11	167	144	14,48	171	148	14,84	176	151
3,00	14,98	178	153	15,39	182	157	15,79	187	161	16,18	192	165
3,50	17,48	207	178	17,96	213	183	18,43	218	188	18,89	224	193
4,00	19,98	237	204	20,53	243	209	21,06	250	215	21,59	256	220
4,50	22,47	266	229	23,09	274	235	23,69	281	242	24,28	288	248
5,00	24,97	296	255	25,65	304	262	26,33	312	268	26,98	320	275
5,50	27,47	326	280	28,22	335	288	28,96	343	295	29,68	352	303
6,00	29,97	355	306	30,79	365	314	31,59	374	322	32,38	384	330
6,50	32,46	385	331	33,35	395	340	34,22	406	349	35,07	416	358
7,00	34,96	415	356	35,92	426	366	36,86	437	376	37,77	448	385
7,50	37,46	444	382	38,49	456	392	39,49	468	403	40,47	480	413
8,00	39,96	474	407	41,05	487	419	42,12	499	429	43,17	512	440
8,50	42,45	503	433	43,62	517	445	44,75	531	456	45,87	544	468
9,00	44,95	533	458	46,18	548	471	47,39	562	483	48,57	576	495
9,50	47,45	563	484	48,75	578	497	50,02	593	510	51,26	608	523
10,00	49,94	592	509	51,32	609	523	52,66	624	537	53,96	640	550
11,00	54,94	652	560	56,45	669	576	57,92	687	591	59,36	704	605
12,00	59,93	711	611	61,58	730	628	63,19	749	644	64,76	768	660
14,00	69,92	829	713	71,84	852	733	73,72	874	752	75,55	896	770
16,00	79,91	948	815	82,11	974	837	84,25	999	859	86,34	1024	880

The table applies to oil with a viscosity of 4,4 mm²/s (cSt) with density 830 kg/m³.

NOZZLE TABLE

Pump pressure bar

Gph	22			23			24			25		
	kg/h	kW	Mcal/h	kg/h	kW	Mcal/h	kg/h	kW	Mcal/h	kg/h	kW	Mcal/h
1,00	5,53	66	56	5,65	67	58	5,77	68	59	5,89	70	60
1,10	6,07	72	62	6,21	74	63	6,34	75	65	6,47	77	66
1,20	6,62	78	67	6,77	80	69	6,92	82	71	7,06	84	72
1,25	6,90	82	70	7,05	84	72	7,21	85	73	7,35	87	75
1,35	7,45	88	76	7,62	90	78	7,78	92	79	7,94	94	81
1,50	8,27	98	84	8,46	100	86	8,64	102	88	8,82	105	90
1,65	9,11	108	93	9,31	110	95	9,51	113	97	9,71	115	99
1,75	9,66	115	98	9,88	117	101	10,09	120	103	10,30	122	105
2,00	11,04	131	113	11,29	134	115	11,53	137	118	11,77	140	120
2,25	12,43	147	127	12,70	151	129	12,98	154	132	13,25	157	135
2,50	13,81	164	141	14,12	167	144	14,42	171	147	14,72	175	150
2,75	15,19	180	155	15,53	184	158	15,86	188	162	16,19	192	165
3,00	16,18	192	165	16,93	201	173	17,30	205	176	17,65	209	180
3,50	19,33	229	197	19,77	234	202	20,19	239	206	20,61	244	210
4,00	22,10	262	225	22,59	268	230	23,08	274	235	23,56	279	240
4,50	24,85	295	253	25,41	301	259	25,96	308	265	26,49	314	270
5,00	27,61	327	282	28,24	335	288	28,84	342	294	29,44	349	300
5,50	30,38	360	310	31,06	368	317	31,73	376	324	32,38	384	330
6,00	33,14	393	338	33,89	402	346	34,62	411	353	35,33	419	360
6,50	35,90	426	366	36,70	435	374	37,49	445	382	38,26	454	390
7,00	38,56	457	393	39,53	469	403	40,38	479	412	41,21	489	420
7,50	41,42	491	422	42,35	504	434	43,26	513	441	44,16	524	450
8,00	44,19	524	451	45,18	536	461	46,15	547	471	47,10	559	480
8,50	46,95	557	479	48,00	569	489	49,03	581	500	50,05	594	510
9,00	49,71	589	507	50,83	603	518	51,92	616	529	52,99	628	540
9,50	52,47	622	535	53,65	636	547	54,80	650	559	55,93	663	570
10,00	55,23	655	563	56,47	670	576	57,69	684	588	58,88	698	600
11,00	60,76	721	620	62,12	737	633	63,46	753	647	64,77	768	660
12,00	66,28	786	676	67,77	804	691	69,23	821	706	70,66	838	721
14,00	77,33	917	789	79,09	938	806	80,77	958	824	82,43	978	841
16,00	88,37	1048	901	90,36	1072	921	92,30	1095	941	94,20	1117	961

The table applies to oil with a viscosity of 4,4 mm²/s (cSt) with density 830 kg/m³.

FAULT LOCATION

Burner fails to start

Situation	Possible causes	Remedies
Motor runs	Flame instability	Check nozzle to burner head dimension and electrode position
Burner pre-purges	Incorrect head settings	Check oil pressure
	Low oil pressure	Adjust air damper
Flame occurs	Excess air	Check that photocell is clean and unobstructed
Burner locks out	Photocell not seeing light	Confirm with new photocell
	Photocell failed	Confirm with new control. (NB. it is advisable to change the photocell if also changing control)
	Control faulty	Check that photocell is not seeing ambient light
Motor runs	False light	Check that H.T. leads are sound and are not arcing other than at electrode gap
Burner pre-purges		Check oil supply to burner - check that pump is not airlocked
No flame occurs		Check operation of magnetic valve
Burner locks out	No spark	
	No oil	

Burner fails to start after normal operation

Burner fails to start	Fuse has blown	Check or replace fuse if necessary. Check reason for failure
	Appliance thermostat has not reset	Adjust thermostat
Lamp not lit	Appliance overheat device has operated	Reset overheat device. Find reason for its operation and rectify
	Control relay or photocell defective	Check by replacement
	No oil being delivered	Check that tank, oil lines, fire valve, pump and nozzle are all in good order
Motor runs	Excessive flue draught is preventing flame establishment	Rectify condition
Burner runs to lockout	No spark	Check ignition transformer. Check electrode gap and porcelain

Delayed ignition, burners starts violently

Burner pulsates on start-up only with hot flue	Excessive draught	Adjust the burner
Burner pulsates on start-up	Nozzle partly blocked	Replace nozzle
	Oil pressure too low	Check and adjust
	Flue blocked or damaged	Check and rectify
	Fan slipping on shaft	Check and retighten
	Pump coupling loose or worn	Check and replace
Burner starts violently	Delayed ignition	Check the electrode adjustment, see diagram
		Check electrodes for damage
		Check H.T. leads for damage and disconnection

Försäkran om överensstämmelse
Declaration of conformity
Konformitätserklärung
Déclaration de conformité



Brännare, Burner, Ölbrenner, Brûleur

Certifikat TÜV Süddeutschland

Certifikat nr.	Typ, Type:	Certifikat nr.	Typ, Type:
08128915006	BF 1	02119815003	B 20, B 30, B 40, B 45
0111110535004	B 1	02119815004	B 50, B 60, B 70, B 80
0207110535005	B 2	040588622001	B 55
02119815001	ST 97, ST 108, ST 120, ST 133, ST 146	040588622002	B 65
02119815002	B 9, B 10, B 11	13129815007	B 45 MF, B 45-2 MF

Enertech AB försäkrar under eget ansvar att ovannämnda produkter är i överensstämmelse med följande standarder eller andra regelgivande dokument och uppfyller tillämpliga delar i EU direktiv.

Enertech AB declares under sole responsibility that the above mentioned product is in conformity with the following standards or other normative documents and follows the provisions of applicable parts in the following EU Directives.

Enertech AB erklärt in eigener Verantwortung, dass obenstehende Produkte mit folgenden Normen oder anderen normativen Dokumenten und anwendbare Teile in EU-Direktiven in Übereinstimmung stehen

Enertech AB déclare sous sa seule responsabilité que les produits désignés ci-dessus sont conformes aux normes et aux documents normatifs suivants et satisfont aux critères applicables des directives CE suivantes:

Dokument: EN 267
EN 60335

EU direktiv. EU Directives, EU-Direktiven, CE suivantes:

2004/108/EC	Elektromagnetisk kompatibilitet, Electromagnetic compatibility EC-Richtlinie, Compatibilité électromagnétique
2006/95/EC	Lågspänningsdirektivet, Low-voltage directive, Niederspannungs-Richtlinie, Directive sur les basses tensions
2006/42/EC	Maskindirektivet, Machinery directive, Maschinen-Richtlinie, Directive sur les machines
92/42/EEC	Verkningsgradsdirektivet, Efficiency directive, Wirkungsgrad-Richtlinie, Directive sur les exigences de rendement

Genom att brännaren uppfyller ovannämnda standarder och direktiv erhåller brännaren CE - märkningen.

In that the burner conforms to the above mentioned standards it is awarded the CE mark.

Indem der Brenner die obengenannten Normen und Richtlinien erfüllt, erhält der Brenner die CE-Kennzeichnung.

Du fait de leur conformité aux directives mentionnées ci-dessus, les brûleurs Bentone bénéficient du marquage CE.

Enertech AB, Bentone Division/
är kvalitetscertifierat enligt/
is quality certified according to/
ist nach dem Qualitätsmanagement /
est certifiée à la norme de qualité
SS-EN ISO 9001:2008

Ljungby, Sweden, 150227 (27/02/15)

ENERTECH AB Bentone Division

Box 309
SE-341 26 Ljungby Sweden

Håkan Lennartsson

OIL BURNERS MAINTENANCE INSTRUCTIONS

General information

Keep the boiler room clean. Ensure that the boiler room has permanent fresh air intake. Switch off before dismantling the oil burner.

At hinged mounting, make sure that an automatic safety switch is fitted, so that the burner cannot start when the swing door is open.

Don't use the oil fired boiler to burn paper or rubbish, unless the boiler is especially fitted with a hinged door to make this possible.

Don't fill tank while burner is working.

Starting precautions

Make sure that the oil tank is not empty

Make sure that the valves on oil and water supply pipes are open.

Make sure that the boiler flue damper is open.

Make sure that the boiler thermostat is set at the correct temperature.

Switch on the current. Most relay systems have a delayed action so that the burner will not start for perhaps 20 seconds.

With heavy oil the delay will be longer as the burner will not start until the oil in the preheater reaches the required temperature.

If the burner will not start

Press the reset button on the relay. Check that the thermostats are correctly adjusted.

Don't forget the room thermostat, check that any fuses are intact and main switch is on.

Installed by:

.....

Tel:

If the burner starts but does not ignite

Make an attempt to start the burner.

Never make close repeated start attempts.

Don't restart the burner until the boiler is free from oil gases.

If the burner still does not ignite send for the service engineer.

When switching off during summer

Always use the main switch to cut out the burner even when adjusting the burner or cutting off the heating for a short time. For longer periods of shut down, close all valves and the oil supply stop-cock.

Clean the filter and nozzle by washing in petrol or paraffin.

Make sure the filter medium is not damaged or defective.

Protect electrical gear from damp.

Warning

Never stand too near or put your face to the inspection or fire door, when the burner is about to start.

Never use a naked flame to ignite oil if the electrical ignition fails.

Always wait for about 10 minutes for the unburnt gases to disperse before restarting the oil burner if it has failed to ignite previously.

