178 140 56-6 CR00619 2023-03-29

Installation- and maintenance instruction

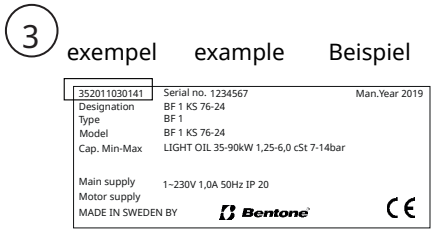
B 45-2 MF

LMO24.255C2E

E 4N CK

Translation of the original instructions.

Bentone®



-sv

1. Manualer på övriga språk

2. www.bentone.com\
nedladdning
eller scanna QR-koden.

3. Skriv in brännarens artikelnummer som finns på din
typskylt (se bild) och välj ditt språk.

Detaljerad ecodesign information kan laddas ner på:
www.bentone.com/
ecodesign.

-en

1. Manuals in other languages

2. www.bentone.com\
download
or scan QR-code.

3. Enter the burner`s article number on your data plate (see picture) and select language.

Detailed ecodesign information can be downloaded at:
www.bentone.com/
ecodesign.

-da

1. Manualer på andre sprog

2. www.bentone.com\
download eller scan QR-koden.

3. Indtast brænderens artikelnummer, der findes på typeskiltet (se billede), og vælg dit sprog.

Detaljerede oplysninger om ecodesign kan downloades på: www.bentone.com/
ecodesign.

-fr

1. Manuels dans d'autres langues

2. www.bentone.com\
download
ou scannez le code QR.

3. Saisir le numéro d'article du brûleur sur votre plaque signalétique (consultez l'illustration) et sélectionnez la langue.

Des informations détaillées sur l'écodesign peuvent être téléchargées à l'adresse:
www.bentone.com/
ecodesign.

-de

1. Gebrauchsanweisungen in anderen Sprachen

2. www.bentone.com\
download
oder scannen Sie den QR-Code.

3. Geben Sie die Artikelnummer des Brenners auf Ihrem Typenschild ein, (siehe Bild) und wählen Sie die Sprache aus.

Detaillierte Informationen zum Ecodesign können unter
www.bentone.com/ecodesign
heruntergeladen werden.

Table of contents

1. General Information

The burner may only be used for its intended purpose in accordance with the product's technical data.

We reserve the right to make design changes and cannot be held liable for any misprints or typographical errors.

Modifying the design or using accessories or components that have not been approved by Enertech in writing is strictly prohibited.

This Installation and Maintenance manual:

- is to be regarded as part of the burner and must always be kept near the installation site.
- must be read prior to installation.
- is intended for use by authorised personnel.

1.1 Delivery inspection

- Make sure everything is delivered and the goods have not been damaged during transit.
  Transport damage must be reported to the shipping company.
- If something is wrong with a delivery, report it to the supplier.

1.2 Safety

- before installation:

- Installation and work on the burner and associated system components may only be carried out by persons who have undergone relevant training.
- The product is packaged to prevent damage from occurring when handled – Handle the product with care! Lifting equipment must be used to lift larger packages.
- The products must be transported/stored on a level surface in a dry environment, max. 80% relative humidity, no condensation. Temperature -20 to +60 °C.

- installation:

- The burner must be installed in accordance with local regulations for fire safety, electrical safety, and fuel distribution.
- The premises must comply with local regulations pertaining to use of the burner, and must have adequate air supply.
- The installation site must be free of chemicals.
- Fire extinguisher with Class BE recommended.
- Make sure when installing the burner that there is enough space to service the burner.
- The electrical installation must be professionally carried out in accordance with current mains electricity regulations and in a professional manner.
- Make sure that the burner is suitable for the application (see Technical Data).
- All components must be installed without being bent, twisted or subjected to mechanical or thermal forces that affect components.

- Care must be taken by the installer to ensure that no electrical cables or fuel lines are pinched or otherwise damaged during installation or service.
- Flame tubes, fan wheels and air dampers, for example, may contain sharp edges.

- before first start:

- The burner must not be put into operation without proper safety and protection devices.
- Permitted ambient temperature during operation -10 to +60 °C. Max. 80% relative humidity, no condensation.
- The surface temperature of the burner's components may exceed 60 °C.
- Handle with caution – the burner has moving parts, and there is risk of crushing injuries.
- Seal inspections must be performed during installation and servicing to prevent leakage.
- fitting and installation work has been completed and approved.
- electrical installation has been correctly performed.
- flue gas ducts and combustion air ducts are not blocked.
- all actuators and control and safety devices are in working order and correctly set.
- If the boiler is equipped with an access hatch, this must be equipped with a hatch opening switch connected to the burner's safety system.
- When in operation, the burner's noise level can exceed 85 dBA – use hearing protection!

- Operation:

- Carry out all stipulated settings, service and inspection work within the set time.
- If the oil burner control has a solid red light, contact your installer.

1.3 General requirements FAME/RME

- The fuel must meet the requirements of standard EN 14214 for FAME.
- The fuel must be stored and used according to the manufacturer's instructions. It should typically be used within 6 months of manufacture. Fuel that is allowed to age loses its oxidation stability and produces aggressive constituents. These may cause oxidation damage to components in the oil system. The fuel should be stored in a cool and dark area.
- The RME tank must be made of metal or dark coloured plastics approved for the fuel.
- Burners fuelled by FAME (RME) are – and must be – equipped with parts designed for this fuel. This applies to oil-related parts such as the pump, solenoid valve, oil filter and hoses.
- Oil hoses must be of high-quality fluoride rubber or PTFE intended for FAME/RME, and the hoses must be fitted with fire-retardant sleeves in order to satisfy requirements according to EN-ISO 6806.
- The installation should be performed as a single-pipe system. Copper should be avoided the fuel system since the fuel and copper have an oxidising effect on each other.
- Annual cleaning and checking for the presence of water in the tank should be done to avoid corrosion and microorganisms.

2. Technical data

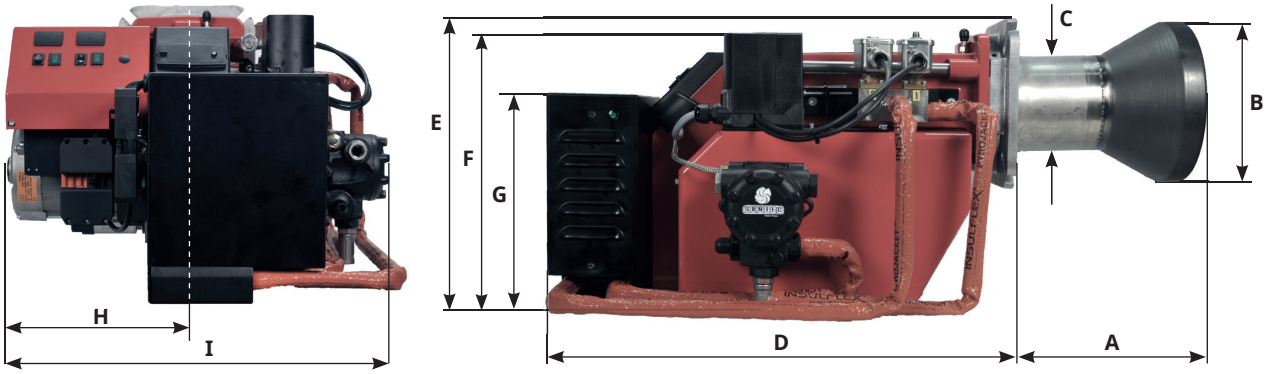
The burner is intended for:

- Operation in installations according to EN 303 and EN 267.
  When operating with a hot air boiler, the LMO24.255 or LMO44.255 control unit must be used.

Fuels:

- FAME/RME according to EN 14214.
- Fuel oil according to DIN 51603-1.
- Fuel oil A Bio 10 according to DIN 51603-6.

2.1 Dimensions B 45-2 MF



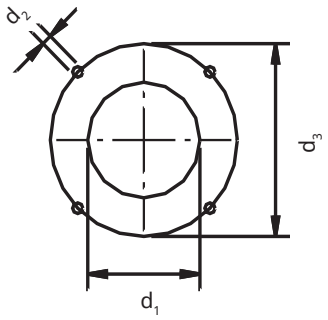
A	Ø B	Ø C	D	E	F	G	H	I	*J
246	220	134	585	375	347	265	248	513	200

* Min. recommended distance to floor.

2.2 Burner installation

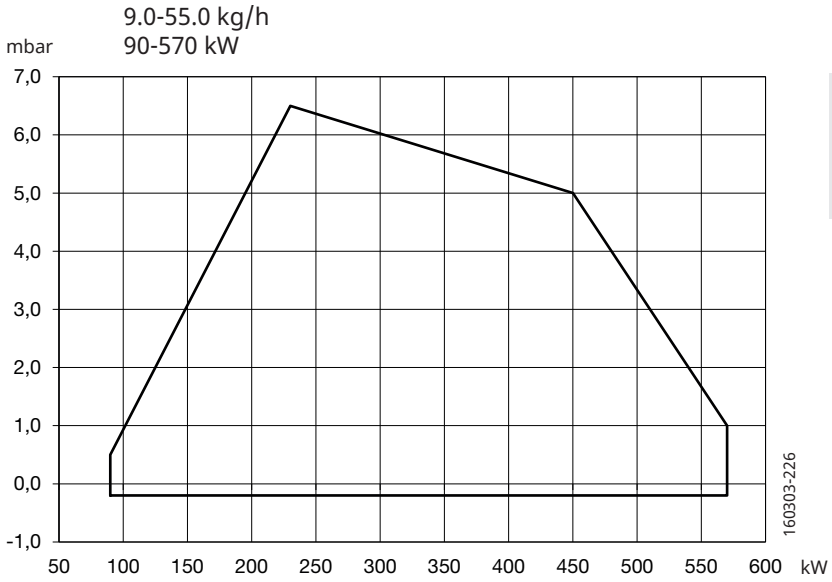
2.2.1 Hole patten

Make sure the hole pattern on the boiler is designed for burner flange.



d_1	d_2	d_3
(135) 225	14	ø (200) 224-270

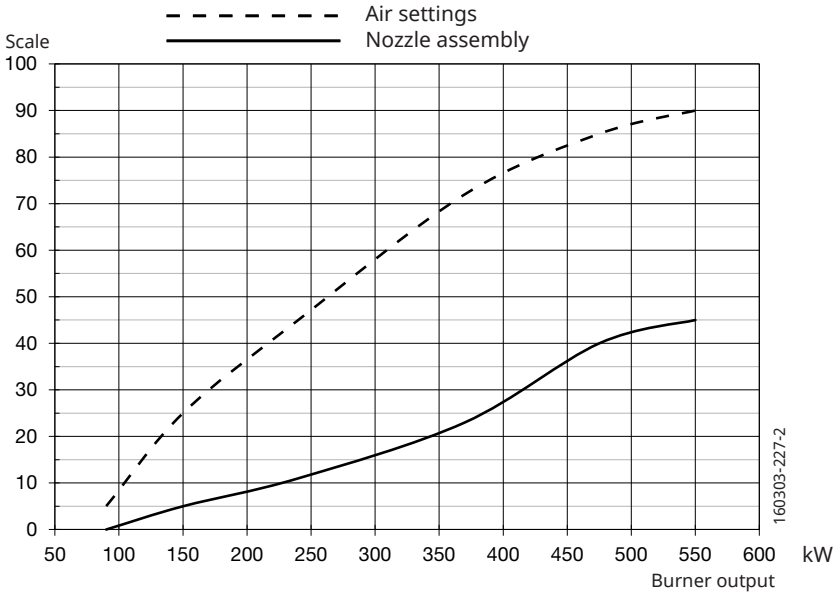
2.3 Working field



Do not exceed working field.

* Used lower calorific value of 10.00 kWh/kg for rapeseed oil in accordance with DIN 51605:2010-10.

2.4 Setting for nozzle assembly and air damper



2.5 Technical specification

	B 45-2 MF
Main supply, Operating [1)]	230V 1~ 5,1A 50Hz IP20
Main supply, Preheater	400V 3x10A
Max fuse rating, Operating	10A
Max fuse rating, Preheater	3xC10A
NO_x-class	2
Noise level	87dBA

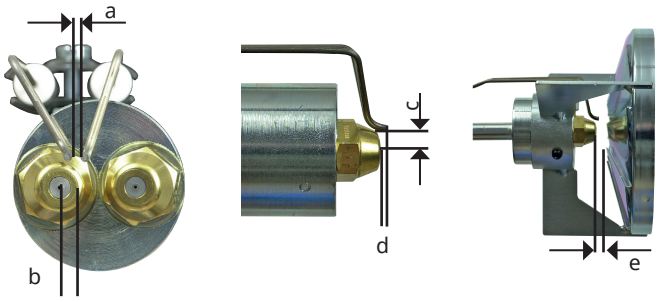
[1)] Preheater excluded.

Measurements according to EN 15036-1:2006

Alt.1 The noise level of the burner can be reduced by equipping the burner with silencer. Installation must be done so it does not prevent air supply to the burner.

Alt.2 The burner's noise level can be reduced by connecting the burner's air intake to the air duct that opens into an appropriate location. Installation must be done so it does not prevent air supply to the burner.

2.6 Setting of ignition electrodes and brake plate



a	b	c	d	e
2.5-3.0	2.0	6.5-7.0	2.0	6.0

! *NB It is important that the spark does not strike against the brake plate or nozzle.

2.7 Recommended nozzle and pressure

Because of the various boiler types with varying furnace geometries and furnace loads, it is impossible to commit to a certain scattering angle or a specific distribution pattern.

It should be noted that the scattering angle and distribution pattern changes with pump pressure.

Nozzle:	45° Solid/semisolid
	60° Solid/semisolid
	80° Solid/semisolid
Pump pressure:	10 bar (8-25 bar) depending on pump model

! The burner pump is factory set at 24 bar and test operated using Roadway 80.

2.8 Oil grades

The burner is tested and approved for pure rapeseed oil that complies with standard DIN 51605:2010-10.

The burner is designed to be able to burn oils with a higher viscosity, both of biological and fossil origin. The maximum viscosity with which the burner is tested is 75 mm²/s, 0–130°c. Another way of defining which kind of oil the burner can handle is that the oil must be of such a nature that it can be pumped by the burner pump at the temperature the oil has at the point of access to the pump.

The burner, without the pump, is designed to withstand the more corrosive environment often created by oils of biological origin.

The Suntec E1069 pump is NOT designed for aggressive oils.

The burner pump has a service life of approx. 3–5 years if the oil is of a grade that complies with standard DIN 51605:2010-10. If oil of a different grade is used, especially if the oil contains contaminants such as particles, press residue, metal swarf etc., or has chemical aggression, the pump may be expected to have a significantly shorter service life.

The pump is considered to be a wearing part and is not covered by the warranty.

Pressure at the pump inlet must be -0.30 to max 2.0 bar. If there is a noise from the pump, the oil is not pumpable at the current temperature or flow. A transport oil pump combined with preheater is then needed to supply the burner's pump with oil for trouble-free operation.

The oil distribution system must be designed with the required equipment such as filters, transport oil pump, preheater and reduction valve to provide trouble -free operation. Max filter size is 120 µm and the oil may need to be filtered in several steps.

In the case of a standstill in which the oil can be expected to change structure, for example aging or phase transitions due to temperature and storage, the burner must be flushed with fuel oil after the standstill. This procedure ensures a good start after standstill.

! Altered structure of the oil can give rise to altered viscosity, pumpabilty and ignitability. This can cause the pump, valves and nozzles to get blocked.

2.9 Nozzle for bio oils, 20-28 bar

Pump pressure, bar

Gph	20		22		24		26		28	
	kg/h	kW	kg/h	kW	kg/h	kW	kg/h	kW	kg/h	kW
1,00	4,9	49	5,2	51	5,4	53	5,6	56	5,8	58
1,50	7,4	73	7,7	77	8,1	80	8,4	84	8,7	87
2,00	9,8	98	10,3	103	10,8	107	11,2	112	11,6	116
2,50	12,3	122	12,9	128	13,5	134	14,0	140	14,5	145
3,00	14,8	147	15,5	154	16,2	161	16,8	168	17,5	174
3,50	17,2	172	18,0	180	18,9	188	19,6	196	20,4	203
4,00	19,7	196	20,6	206	21,5	215	22,4	224	23,3	232
4,50	22,1	221	23,2	232	24,2	242	25,2	252	26,2	261
5,00	24,6	245	25,8	257	26,9	269	28,0	280	29,1	290
5,50	27,0	270	28,4	283	29,6	296	30,8	308	32,0	320
6,00	29,5	295	30,9	309	32,3	323	33,6	336	34,9	349
6,50	32,0	319	33,5	335	35,0	350	36,4	364	37,8	378
7,00	34,4	344	36,1	361	37,7	377	39,2	392	40,7	407
7,50	36,9	368	38,7	386	40,4	404	42,0	420	43,6	436
8,00	39,3	393	41,3	412	43,1	430	44,9	448	46,5	465
8,50	41,8	418	43,8	438	45,8	457	47,7	476	49,5	494
9,00	44,3	442	46,4	464	48,5	484	50,5	504	52,4	523
9,50	46,7	467	49,0	489	51,2	511	53,3	532	55,3	552
10,00	49,2	491	51,6	515	53,9	538	56,1	560	58,2	581
10,50	51,6	516	54,1	541	56,6	565	58,9	588	61,1	610
11,00	54,1	540	56,7	567	59,3	592	61,7	616	64,0	640
11,50	56,5	565	59,3	593	61,9	619	64,5	644	66,9	669
12,00	59,0	590	61,9	618	64,6	646	67,3	672	69,8	698

Rapeseed oil compliant with DIN 51605:2010-10 Viscosity: 36.0 mm^2/s, at 40 °C Preheater 160 °C.

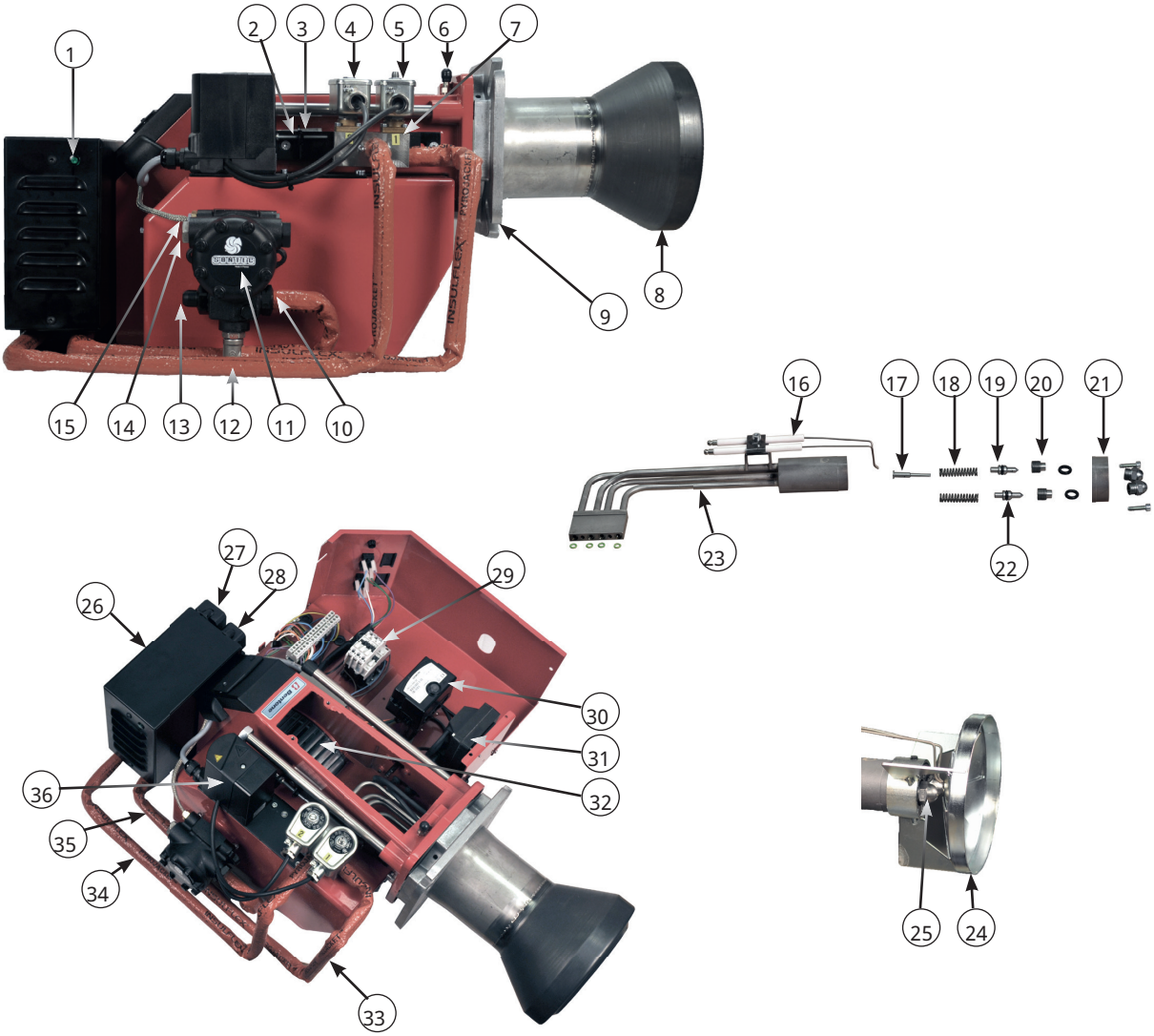
2.10 Nozzle for fossil oils, 22-28 bar

Pump pressure, bar

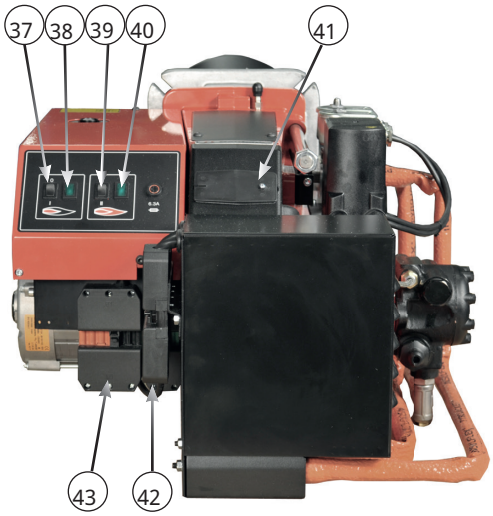
Gph	22		24		26		28	
	kg/h	kW	kg/h	kW	kg/h	kW	kg/h	kW
1,00	5,52	65,44	5,76	68,35	6	71,14	6,22	73,83
1,50	8,66	102,73	9,05	107,3	9,42	111,68	9,77	115,9
2,00	11,01	130,53	11,5	136,33	11,96	141,9	12,42	147,25
2,50	13,78	163,42	14,39	170,69	14,98	117,66	15,55	184,37
3,00	17,21	204,06	17,97	213,13	18,7	221,83	19,41	230,21
3,50	19,13	226,93	19,89	237,02	20,8	246,7	21,59	256,01
4,00	21,06	249,8	22	260,9	22,9	271,56	23,76	281,81
4,50	23,88	283,22	24,94	295,81	25,96	307,89	26,94	319,51
5,00	27,44	325,44	28,66	339,91	29,83	353,79	30,96	367,14
5,50	31	367,66	32,38	384	33,7	399,68	34,97	414,77
6,00	34,71	411,63	36,25	429,94	37,73	447,49	39,16	464,39
6,50	38,71	459,13	40,43	479,55	42,08	499,13	43,67	517,97
7,00	41,38	490,8	43,22	512,62	44,99	533,55	46,69	553,69
7,50	44,2	524,22	46,17	547,53	48,05	569,89	49,86	591,4
8,00	46,72	554,12	48,8	578,76	50,79	602,4	52,71	625,14
8,50	49,1	582,27	51,28	608,16	53,37	632,99	55,39	656,89
9,00	52,51	622,73	54,84	650,42	57,08	676,98	59,24	702,53
10,00	55,92	663,19	58,4	692,68	60,79	720,96	63,08	748,18
11,00	63,04	747,63	65,84	780,87	68,53	812,76	71,12	843,44
12,00	70,75	839,1	73,9	876,41	76,91	912,2	79,82	946,63

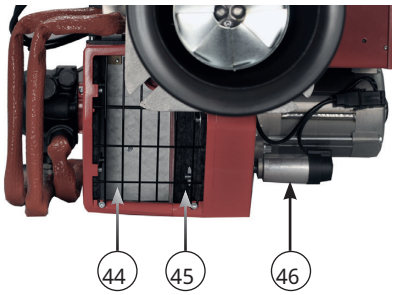
The table applies to oil with a viscosity of 4.4 mm^2/s at a density of 830 kg/m^3.

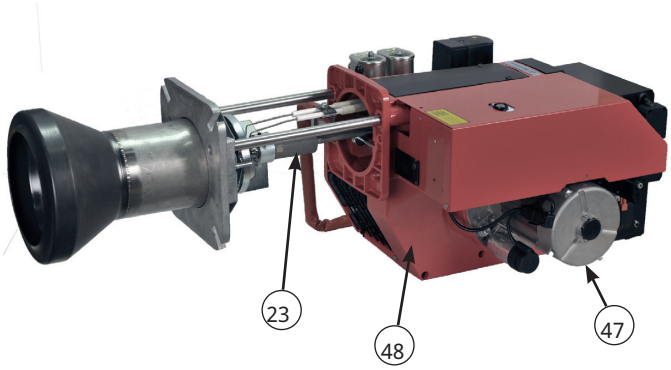
2.11 Components



1. Indicator lamp, preheater ON
2. Nozzle assembly control
3. Scale, nozzle assembly control
4. Solenoid valve NC max. load
5. Solenoid valve NO min. load
6. Measuring nipple, fan pressure
7. Valve block
8. Flame tube
9. Burner flange
10. Pressure outlet pump
11. Pump
12. Return pump
13. Pressure control pump
14. Inlet pump
15. Immersion heater, pump
16. Ignition electrodes
17. Valve needle
18. Spring pressure piston
19. Pressure piston max. load
20. Valve seat
21. Front nozzle holder
22. Pressure piston min. load
23. Air intake
24. Brake plate







25. Nozzle
26. Preheater
27. 5-pole Euro plug (feed preheater)
28. 4-pole Euro plug (control signal preheater)
29. Contactor for motor
30. Relay box
31. Ignition transformer
32. Fan wheel
33. Connecting pipe, valve block return
34. Connecting pipe, preheater valve block
35. Connecting pipe, pump preheater
36. Damper motor
37. Switch 0-I
38. Indicator, min. load
39. Switch I-II
40. Indicator lamp, maximum load
41. Inspection glass
42. 4-pole Euro plug (max. load)
43. 7-pole Euro plug (min. load feed)
44. Air damper
45. Air intake
46. Capacitor
47. Motor
48. Fan housing

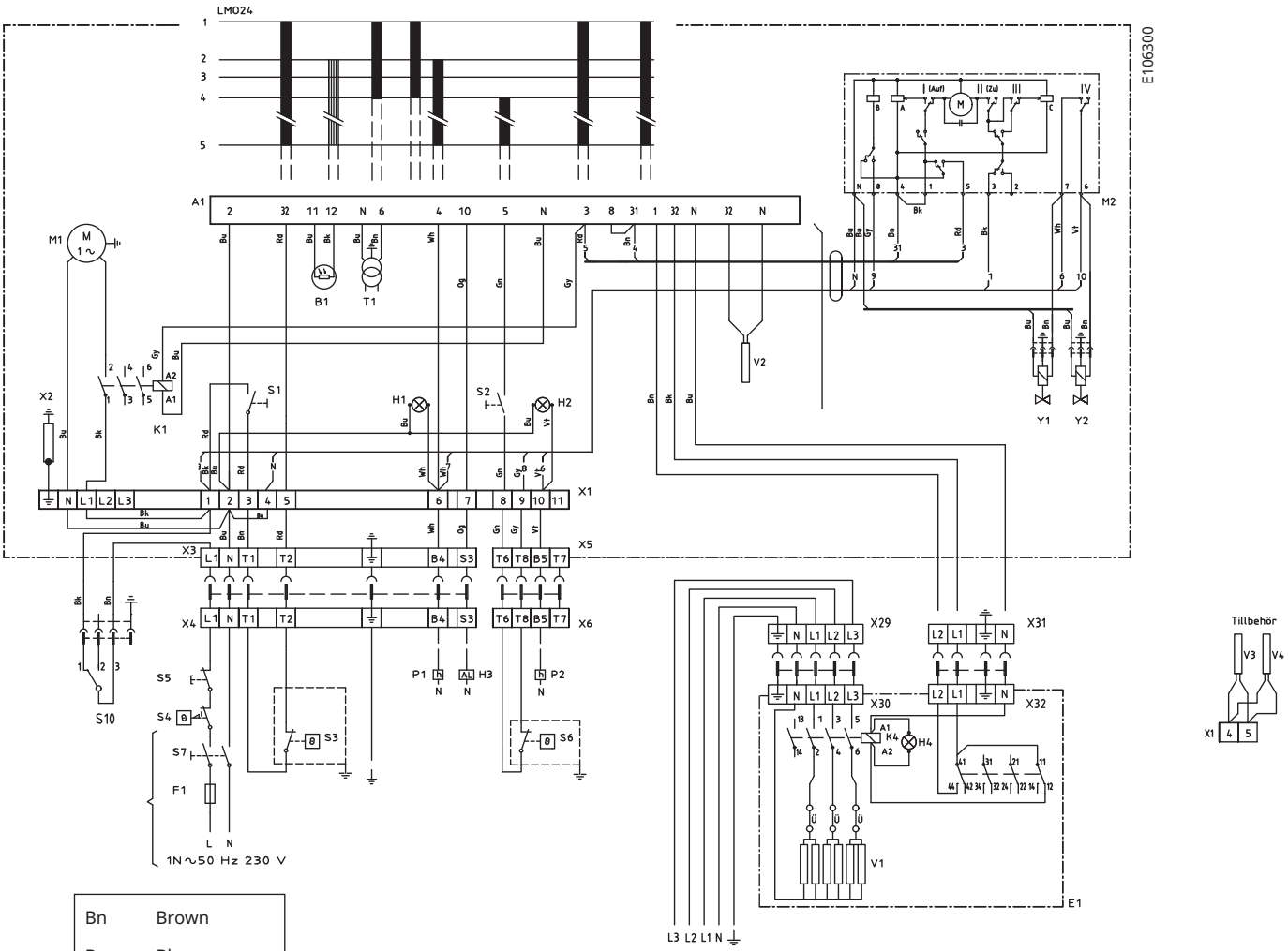
3. Electric equipment

3.1 Safety system

The safety system (safety switch for hatches, doors, water level, pressure, temperature and other safety devices) must be installed in the safety circuit in accordance with current regulations for the system.

The cables of the safety system must be separated so that the outgoing signal is not placed in the same cable as the incoming signal.

3.2 Wiring diagram



Bn	Brown
Bu	Blue
Gn	Green
Ye	Yellow
Gn/Ye	Green/Yellow
Bk	Black
Gy	Grey
Rd	Red
Wh	White
Og	Orange
Vt	Violet

165 205 76-2

3.2.1 Components

A1	Burner control	S2	Operating switch, stage 2	X3	Plug-in contact, burner
B1	Flame detector	S3	Control thermostat	X4	Plug-in contact, boiler
E1	Preheater	S4	Temperature limiter	X5	Plug-in contact, stage 2, burner
F1	Operating fuse	S5	Micro switch for hinged door	X6	Plug-in contact, stage 2, boiler
H1	Lamp, low capacity	S6	Control thermostat, stage 2	X29	3-phase supply heater, burner
H2	Lamp, high capacity	S7	Main switch	X30	3-phase supply preheater, boiler
H3	Alarm signal 230V	S10	Oil pressure switch, max/	X31	Preheater control, burner
H4	indication preheater		lockout funktion	X32	Preheater control, boiler
K1	Contactor+Overload protection	T1	Ignition transformer	V1	Element 1
K4	Directional relay	Y1	Solenoid valve 1	V2	Element 2
M1	Motor	Y2	Solenoid valve 2	V3	Element 3
M2	Damper Motor	X1	Connection terminal board	V4	Element 4
S1	Operating switch	X2	Plug-in contact, boiler		

3.3 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. The ignition spark goes out after flame indication (see Technical data oil burner control).

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.

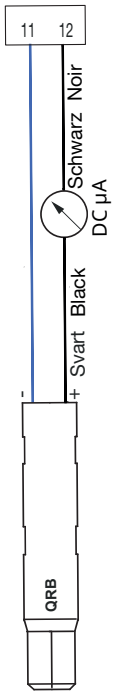
4-5 **Operating position**

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.

! Mains connection and fuse in accordance with local regulations.



160303-333

3.3.1 Technical data

	LMO14.113...	LMO24.255...
Preiginition time	15 s	25 s
Prepurge time	16 s	26 s
Postignition time	3 s	5 s
Safety lockout time	< 10 s	< 5 s
Reset time after lockout	< 1 s	< 1 s
Reaction time on flame failure	< 1 s	< 1 s
Ambient temperature	-5 - +60°C	-20 - +60°C
Min detector current required (with flame)	45 µA dc	45 µA dc
Max perm. detector current (without flame)	5.5 µA dc	5.5 µA dc

3.4 Colour codes

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

3.5 Fault codes

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.

4. Installation

4.1 General instructions

Oil burners must be installed in accordance with local regulations. The installer must therefore be knowledgeable of the regulations pertaining to oil and combustion.

Only oil suitable for the burner must be used and then in combination with a suitable oil filter installed before the burner's oil pump.

If the burner is replacing an existing burner, ensure that the oil filter is replaced or cleaned. Installation may only be performed by qualified personnel.

Care should be taken by the installer to ensure that electrical cables and oil lines are not pinched or otherwise damaged during installation or servicing.

4.2 Inspection and maintenance

The system must be maintained at the interval specified in the service schedule. If the burner is in a dirty environment, service should be done at more frequent intervals.

4.3 Start-up

In order to obtain the correct setting, a flue gas analysis and temperature measurement must be carried out. Otherwise, there is a risk of soot build up, poor efficiency or condensation in the chimney. The system must be fine-tuned at start-up. The temperature in the chimney at a depth of 0.5 m must be at least 60 °C to prevent condensation.

4.4 Preparing for installation

Check that the burner's dimensions and capacity range are suitable for the relevant boiler. The power data on the rating plate refers to the burner's minimum and maximum power.

4.5 Oil distribution

In order to achieve good reliability, it is important that the oil distribution system is designed correctly.

Take the following into account:

- Selection of pipe diameter, pipe length and height difference; see Pump instruction.
- Pipelines are to be laid with the fewest possible number of glands.
- The pipes are to be laid so that the oil supply hoses are not subjected to tensile stresses or become excessively bent when the burner is swung out or removed for servicing.
- The oil filter should be installed so that the filter cartridge can easily be replaced or cleaned.
- Parts in contact with oil must be selected in materials that are capable of withstanding the medium's physical properties.
- When installing oil hoses, check that the inlet and return hoses are fitted to the appropriate connection on the oil pump. The hoses must be located so that they do not bend or become subject to tensile load.
- Bleed the oil system. The oil pump/oil preheater may be damaged if run dry. The vacuum in the suction line should not fall below 0.3 bar during start-up.

! **The oil filter must be installed before the burner's oil pump.**

! **Be sure to fill the burner oil system before starting it for the first time.**

165 205 19-3

4.6 Electrical connection

- Before work on the electrical connection, the current must be disconnected so that the installation is isolated.
- Electrical connection must be done in accordance with the applicable regulations.
- Burners must be connected to an all-pole switch.
- Connection must conform to the wiring diagram.
- Use appropriately sized fuses.

! **If any electrical connection is used other than that recommended by Enertech, there may be a risk of damage to property and personal injury.**

4. Installation

4.1 General instructions

Oil burners must be installed in accordance with local regulations. The installer must therefore be knowledgeable of the regulations pertaining to oil and combustion.

Only oil suitable for the burner must be used and then in combination with a suitable oil filter installed before the burner's oil pump.

If the burner is replacing an existing burner, ensure that the oil filter is replaced or cleaned. Installation may only be performed by qualified personnel.

Care should be taken by the installer to ensure that electrical cables and oil lines are not pinched or otherwise damaged during installation or servicing.

4.2 Inspection and maintenance

The system must be maintained at the interval specified in the service schedule. If the burner is in a dirty environment, service should be done at more frequent intervals.

4.3 Start-up

In order to obtain the correct setting, a flue gas analysis and temperature measurement must be carried out. Otherwise, there is a risk of soot build up, poor efficiency or condensation in the chimney. The system must be fine-tuned at start-up. The temperature in the chimney at a depth of 0.5 m must be at least 60 °C to prevent condensation.

4.4 Delivery inspection

Make sure everything is delivered and the goods have not been damaged during transit. If something is wrong with a delivery, report it to the supplier. Transport damage must be reported to the shipping company.

4.5 Preparing for installation

Check that the burner's dimensions and capacity range are suitable for the relevant boiler. The power data on the rating plate refers to the burner's minimum and maximum power.

4.6 Oil distribution

In order to achieve good reliability, it is important that the oil distribution system is designed correctly.

Take the following into account:

- Selection of pipe diameter, pipe length and height difference; see Pump instruction.
- Pipelines are to be laid with a minimal number of glands.
- The pipes are to be laid so that the oil supply hoses are not subjected to tensile stresses or are excessively bent when the burner is swung out or removed for service.
- The ½ ” oil filter should be installed so that the filter cartridge can easily be replaced or cleaned. Self-cleaning filters are recommended for oils of a higher viscosity or oils that contain significant impurities.
- Oil-affected parts shall be selected in materials that are capable of withstanding the medium’s physical properties.
- When installing oil hoses, check that the inlet and return hoses are fitted to the appropriate connection on the oil pump. The hoses shall be located so that they do not bend or become subject to tensile load. To the suction line on the pump (see paragraph 7.2 pos. 3) should the supplied oil hose with 90° bend be connected.
- Bleed the oil system. The oil pump/oil preheater may be damaged if run dry. The vacuum should not fall below 0 bar in the suction line during start-up.

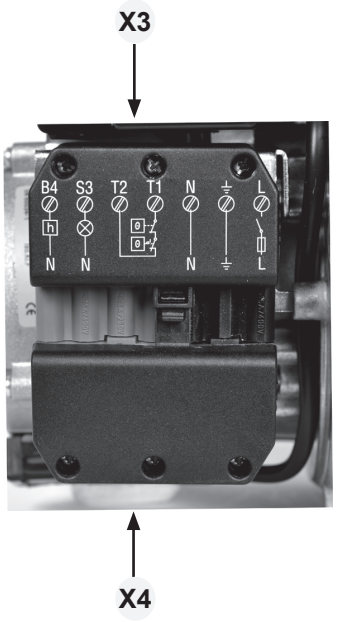
! Be sure to fill the burner oil system before starting it for the first time.

4.7 Electrical connection

Before work on the electrical connection, the current must be disconnected so that the installation is isolated.

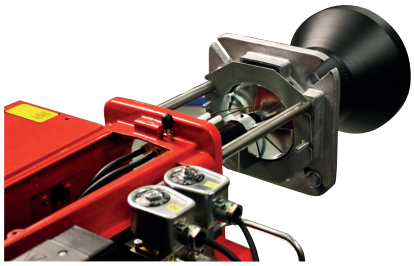
If the boiler has a 7-pole and a 4-pole Euro plug connector, they will usually connect directly to the burner. Otherwise, use the supplied connectors. The 5-pole connector supplies the burner preheater with a separate 3-phase supply. See connection under Electrical equipment.

1. Switch off the main switch.
2. Connect the Euro plugs, (see Electrical equipment).
3. Make sure the burner operations switch (S1) is off.
4. Turn on the main switch.



! If any electrical connection is used other than that recommended by Enertech, there may be a risk of damage to property and personal injury.

5. Mounting



1. Remove fan housing from fixing flange.
2. Remove the brake plate from the oil line.
3. Install the selected nozzles, (see Technical data).
4. Install the brake plate on the oil line.
5. Remove the flame tube from the flange.
6. Install the flange with gasket on the boiler.
7. Install flame tube, be sure to install the drainage hole downwards (not available on all flame tubes) so that any oil spills can drain out.
8. Insulate between flame tube and boiler door for reduced heat radiation.
9. Install the fan housing on the flange and lock with nuts.
10. Connect oil lines to the pump.
11. Connect the burner electrically.

! Because the burner tube must be installed from the inside the boiler, it must be possible to open the boiler or have a hinged flange that is designed so that it can be reconnected with the burner tube installed.

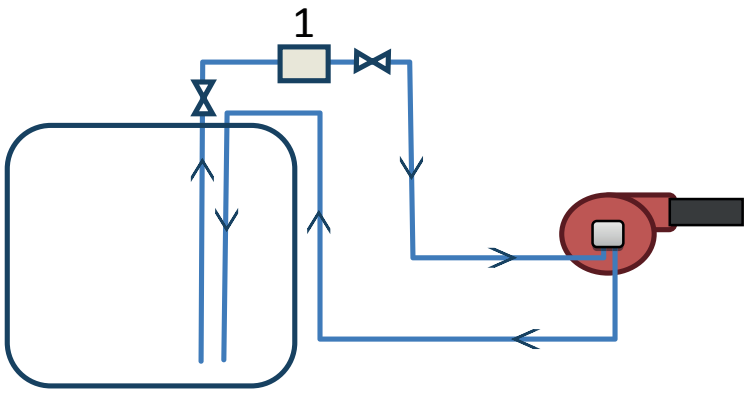
5.1 Check oil line seals

When the burner has been installed and put into operation, the tightness of the various coupling elements should be checked, in case of leakage - retighten the coupling elements.

165 205 78-2

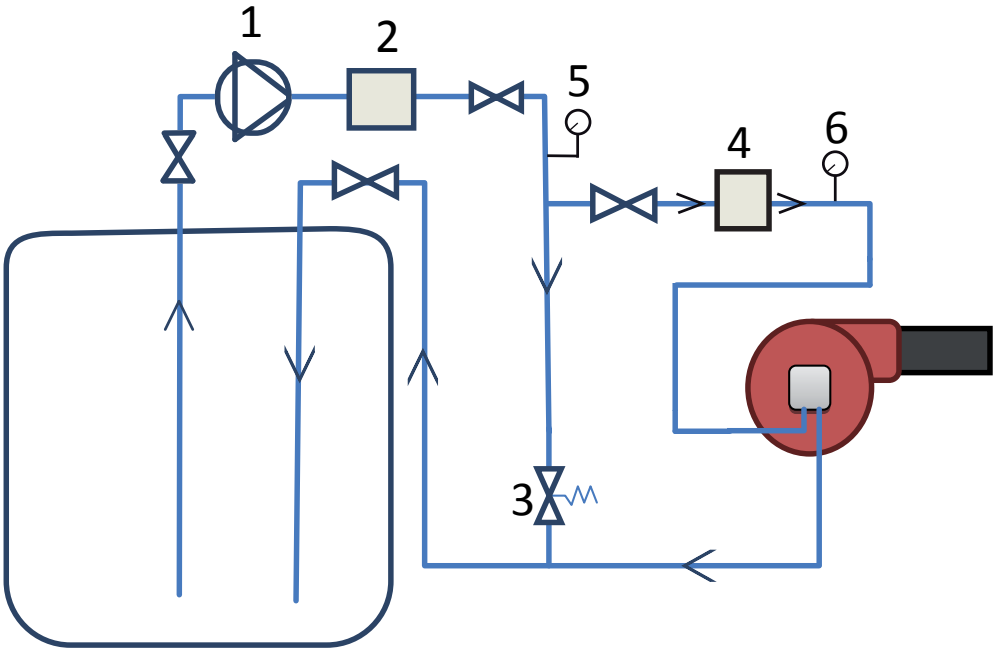
5.1.1 Proposed pipe routing for oil distribution systems without transport pump

This type of connection should be used only when the oil has a viscosity less than 30 mm²/s.



1. Self-cleaning filter

5.1.2 Proposed pipe routing for oil distribution systems with transport pump, basket filter and seal filter



1. Transport oil filter
2. Basket filter
3. Overflow valve 0.5 – 2.0 bar
4. Seal filter
5. Pressure gauge 1
6. Pressure gauge 2

7. Functional description

7.1 B45-2 MF 2-stage burner

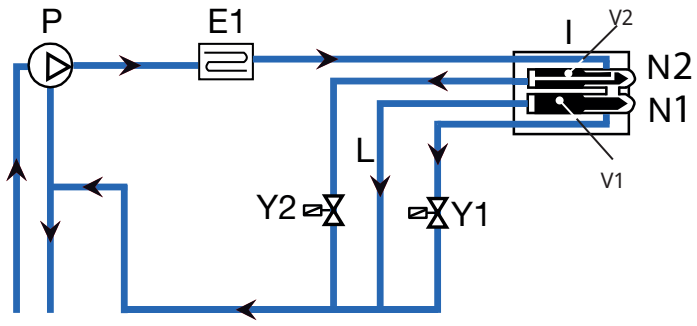
When the installation calls for heat, the burner's preheater starts to heat the oil. Once the oil reaches the set temperature, the burner receives the signal to start. Hot oil is flushed throughout the burner's oil system.

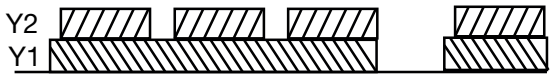
After the end of the blow period, the min. load solenoid valve (Y1) receives voltage and closes. The oil pressure builds up in the nozzle holder and the cut valve (V1) for min. load opens. The oil is atomised in the nozzle (N1) and ignited. A small amount of oil and the nozzle assembly compressed air flow is channelled back to the return side of the pump through the leak oil line (L).

Solenoid valve (Y2) for maximum load opens when the installation calls for maximum load. The pressure difference created over the cut valve (V2) for maximum load makes this valve open. The oil is atomised in the nozzle and ignited.

When the heat in the installation reaches break temperature, solenoid valve (Y2) for maximum load closes to reduce to minimum load. The pressure equalisation which then takes place over the max. load cut valve (V2) gets this to close and the flame is reduced to min. load.

Once the installation has reached the desired temperature, a solenoid valve (Y1) is rendered without power and then opened; cut valve (V1) is then subsequently closed. This process extinguishes the burner flame. In the same process, oil heating is also interrupted.





P	Oil pump
E1	Preheater
I	Nozzle assembly
L	Leak pipe
N1	Nozzle 1
N2	Nozzle 2
Y1	Solenoid valve 1 NO
Y2	Solenoid valve 2 NC
V1	Cut valve 1
V2	Cut valve 2

165 205 90

4.2 Examples of basic settings

Basic settings should only be seen as setting values to get burner to start. Once the burner has started and established a flame, it will be necessary to adjust the settings so that they are adapted to the installation in question and the fuel used at the time.

B 45-2 MF

Burner output	Max 500 kW
	Min 200 kW
Estimated nozzle output min. load	200 kW/10 kWh/kg*= 20 kg/h
Estimated nozzle output max. load	(500kW-200 kW)/10 kWh/kg*= 30 kg/h

The nozzle effect is calculated for two-stage burners with two nozzles (separately for each nozzle).

Nozzle selection in accordance with the table. (See technical data)

Nozzle selection is based on the selected pump pressure and the desired effect.

According to the nozzle table, this provides the following nozzle.

Selected pump pressure	25 bar
Nozzle min. load	3,50 gph
Nozzle max. load	5,00 gph
Power in min. load	20,61 kg/h => 20,61 kg/h x 10 kWh/kg* = 206 kW
Power in max. load	20,61 kg/h + 29,44 kg/h => 50,05 kg/h x 10 kWh/kg* = 501 kW

* Taken from the fuel in accordance with standard DIN 51605:2010-10.

Basic settings

The setting value for maximum load 500 kW and minimum load 200 kW according to the basic settings tables. For the correct procedure when implementing settings, see 4.7 Nozzle assembly control, brake plate B 45-2 MF and 4.9 Air setting B 45-2 MF

Damper motor 2-stage, (see Technical data).

Effects and nozzle selection from example

Nozzle assembly	Stage 2 = 25	
Damper motor	Closed = 0°	Blue cam
	Min. load = 45°	Orange cam
	MV max. load = 60°	Black cam
	Max. load = 90°	Red cam

Svart nock för MV (magnetventil) maxlast skall placeras mellan nockarna för min och maxlast. Positionerna på MV maxlast bestäms av pannas egenskaper vid växling mellan stegen, som grundinställning placeras svart nock mitt emellan orange och röd nock.

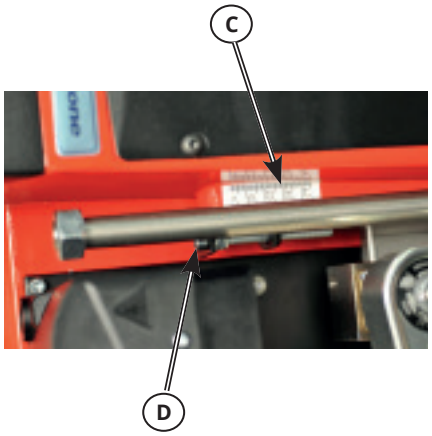
4.3 Brake plate adjustment

The nozzle assembly control is used to achieve the most favourable pressure drop across the brake plate as possible in the various power stages.

The nozzle assembly control is manually adjusted in order to achieve optimal pressure loss for good combustion. Brake plate position is controlled primarily by the second stage effect.

Set the desired position on the scale (C) using the set screw (D) (left turn reduces pressure loss, the brake plate is moved outward).

If pulsation occurs, changing the pressure drop over the brake plate may cause the pulsation to stop.



5.3 Settings Damper motor, 2-stage

Air adjustment

The damper motor rotates the air damper between three preset positions: completely closed, low load and high load. These positions are controlled in the motor by colored cam discs, the black cam disc controls the switching on/off of the solenoid valve. Adjust the amount of air by changing the position of the cam discs.

Blue cam disc is the limit position for closed air dampers and does not normally need to be changed.

Low load

- Set control switch for load position to position II (high load).
- Turn orange cam disc to 0° to reduce airflow and to 90° to increase airflow.
- Return the control switch to position I (low load) and check the combustion values.

High load

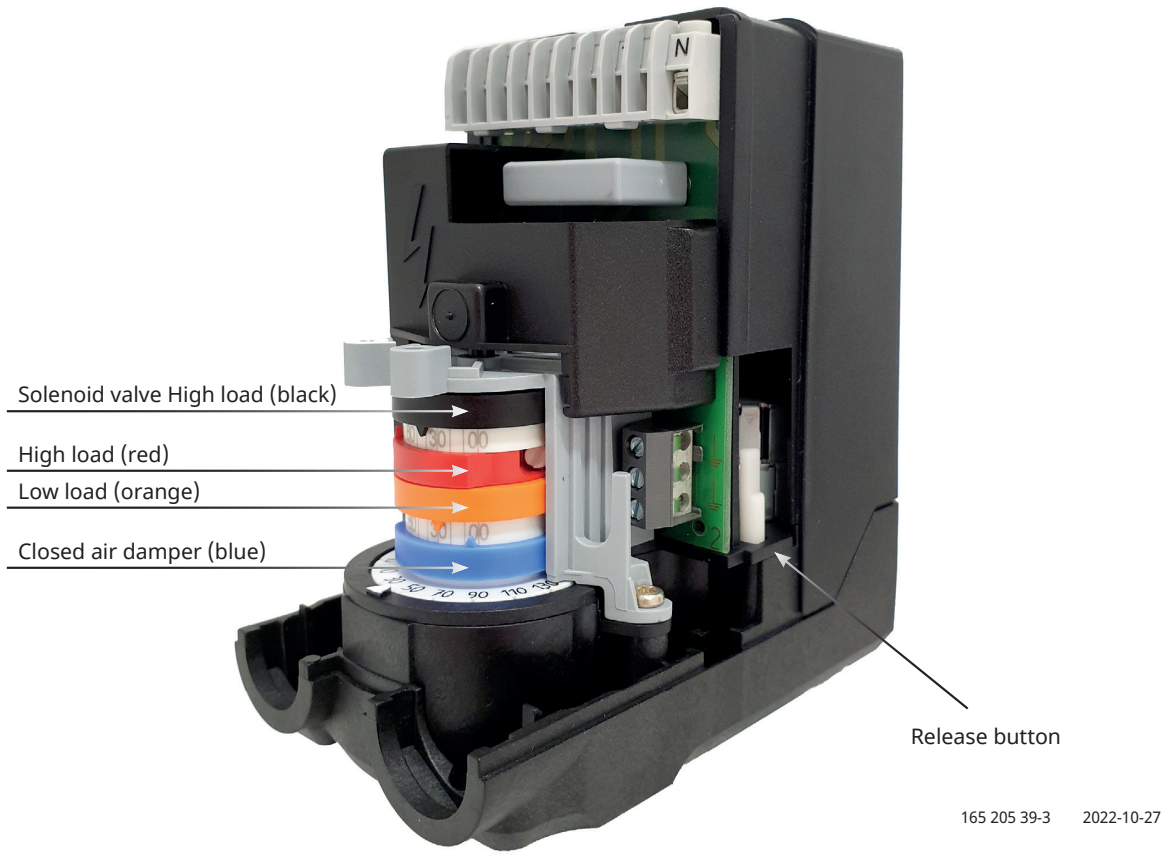
- Set control switch for load position to position I (low load).
- Turn red cam disc to 0° to reduce airflow and to 90° to increase airflow.
- Place black cam disc in a position between red and orange cam discs and adjust to obtain a good load change.
- Return the control switch to position II (high load) and check the combustion values.

Release

By pressing the button, the motor is disengaged and the air damper can be turned. The function is used when servicing air dampers.

Recommended excess air

Excess air flue gases		Max % CO_2
% O_2	% CO_2 Lambda 1.2	
3 - 5	≈12.5	15.4

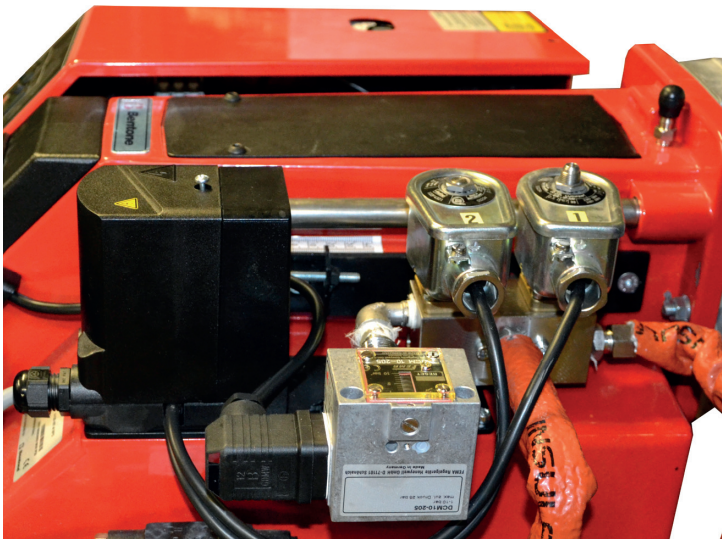


165 205 39-3 2022-10-27

5.6 Return Oil Pressure Switch

The pressure switch ensures that pressure at the return oil side of the burner does not become high enough to cause the oil valves in the nozzle holder to open and discharge oil during aeration and flushing. These valves are held closed by springs and open at a pressure of approx. 10 bar. When the pressure exceeds 3 bar, the switch will trigger and shut down the burner in order to prevent the oil from passing through the valves. The burner enters blocking mode when the pressure switch is connected to the operating circuit in the burner's electrical system. The pressure switch must be reset manually by pressing in the red button on the switch next to the pressure scale.

The pressure switch may be set to max. 3.5 bar, which is the highest pressure for which the oil pump is designed at the return side. Setting a higher pressure will damage the gaskets in the pump.

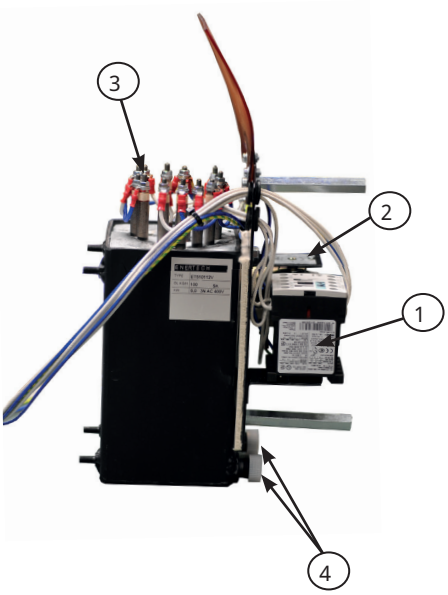


165 205 83

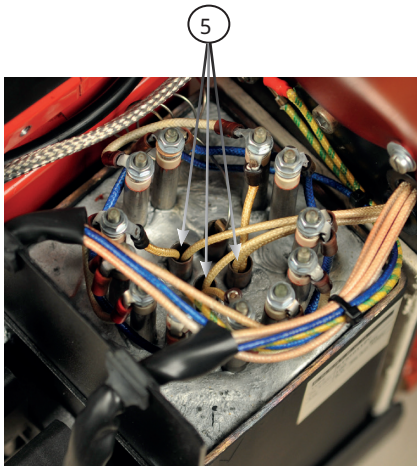
6. Preheater

6.1 Technical data

Connected output	3x2 kW
Voltage	3N ~ 400 V
Current	3x10 A
Resistance	3x22.5 Ω
Oil flow at 80 °C	100 kg/h
Overheating protector	240°C cut-off temperature



1. Contactor
2. Operating thermostat
3. Immersion heaters
4. Connection points oil
5. Overheat protection



The burner is equipped with a preheater to allow the combustion of oil with a higher viscosity.

The preheater is provided with an operating thermostat that has two cut-off temperatures. The lower of the cut-off temperatures is preset to around 30 °C lower than the second cut-off temperature, which is adjustable.

The adjustable cut-off temperature is the desired temperature of the oil in order to ensure good operation of the burner.

The lower cut-off temperature is used as a condition to enable the burner to start its motor and to start pre-ventilation and oil priming. This feature enables the burner to stop during pre-ventilation/flushing without trying to establish a flame. This sequence occurs because the temperature of the preheater has fallen below the cut-off temperature. When this occurs, the burner stops and waits for the temperature in the preheater to be sufficiently high again.

The lower cut-off temperature also has the function that, if the temperature in the preheater drops below the lower cut-off temperature when the burner is in its operational phase, the burner stops. This is a safety feature to prevent poor combustion when the preheater, for any reason, is unable to keep the oil at a sufficiently high temperature. If the burner stops during operation because the temperature in the preheater is too low, preheater function should be checked. Check, for example, safety thermostats, power to the immersion heater(s), function immersion heater(s), etc.

6.2 Adjustment of preheater operating thermostat

The check of which temperature is required to ensure proper ignition and stable operation is done by setting the preheater thermostat to its maximum temperature.

If good start is obtained, the temperature is lowered gradually until an unacceptable start or operation is no longer available. During this procedure, it is of great importance that the boiler itself is not hot. Instead, the setting procedure must be carried out with a boiler that is at a temperature that can be regarded as a cold start temperature.

Once the breakpoint temperature for when good start/operation can no longer be ensured has been found, the preheater's operating thermostat must be set to a temperature with a certain margin against the breakpoint temperature. This is done to avoid the burner having a bad start/operation when environmental factors change over time.

New oil delivery and/or substantial modification of environmental factors may necessitate an adjustment to be made to the preheater thermostat.

6.2.1 Basic settings, preheater

Fuel	Temperature °C
RME	60
Bio oils	130-160
Fossil oils with viscosity 120 mm^2/s	145
Fossil oils with viscosity 90 mm^2/s	115
Fossil oils with viscosity 60 mm^2/s	85
Fossil oils with viscosity 20 mm^2/s	60
Fossil oils with viscosity 6 mm^2/s	0

For oils not specified in the table, the temperature of the preheater should be set so that a viscosity of about 5-10 mm^2/s is after preheating. In some instances, a different temperature than that indicated in the above table may be required due to the characteristics of the oil, e.g. ignition propensity.

! When using a new oil grade, check combustion and adjust the burner settings in order to achieve good combustion.

! When servicing/replacing components that affect combustion, an analysis and soot test shall be carried out on the installation.

7. Pump E4NC-1069

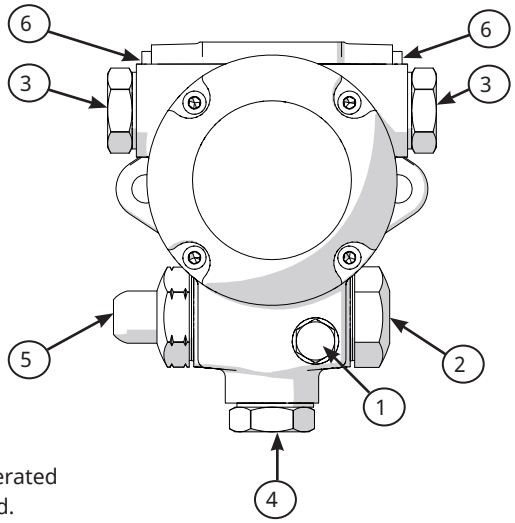
7.1 Technical data

Viscosity range: *	3.0 to 75.0 mm ^{2}/s
Pressure range:	14-30 bar
Oil temperature:	0 to+130°C
Max. pressure on the suction and return side:	3.5 bar

* Oils of higher viscosity may be used if it is pumped to the burner oil pump or if the oil viscosity is lowered to below 75 mm ^{2}/s by it being kept hot.

7.2 Components

1. Manometer connection G 1/8”
2. Connection for nozzle G 1/4”
3. Suction line G 1/2”
4. Return line G 1/2”, plug, by-pass (3/16 Allen key)
5. Pressure regulation with 4 mm Allen key
6. Holes Immersion heaters
7. Filter
8. Head gasket
9. Cover



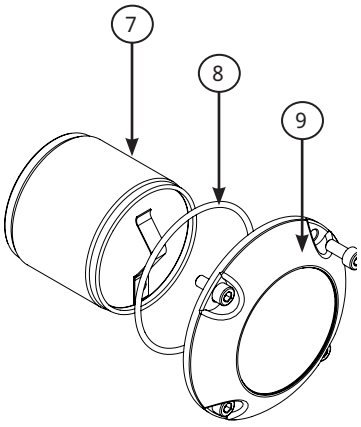
7.3 Oil connection

The pump should be connected using a two-pipe system when it is operated using oils with higher viscosity. A one-pipe system is not recommended.

7.4 Changing the filter

Change the oil pump oil filter in accordance with the following.

- Close the oil valves
- Unscrew the cover on the pump.
- Replace the oil filter.
- Replace head gasket.
- Mount the cover on the pump.
- Open the oil valves.

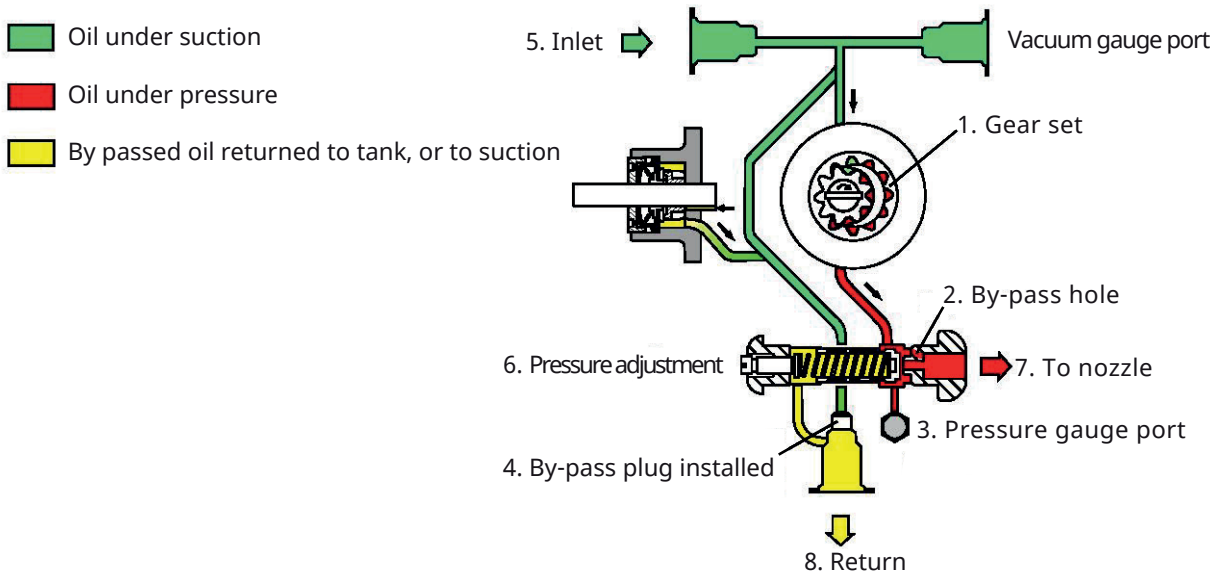


7.5 Function

The pump gear (1) draws oil through the pump suction port (5) from the tank through the filter in the pump and transports the oil to the valve (6) which controls the oil pressure to the nozzle. Oil that does not go through the outlet (7) to the nozzle will be bypassed (2) through the valve (6) back to the return port (8) on the pump.

7.6 Preheating pump

The pump has the facility to fit an immersion heater to providing preheating. The pump should be equipped with an immersion heater in order to facilitate cold starting and operation where oils of a higher viscosity are used. The burner is of a standard design and equipped with an immersion heater to preheat the pump.



8. Service

Service and maintenance work may only be performed by qualified personnel. Perform operational check of all safety systems and components at each service. Only Enertech original parts should be used when replacing components.

! **Use caution when operating the burner, surfaces may be hot.**

8.1 Burner Service Schedule, Oil

Servicing must be carried out once a year or after 3,000 hours of operation.

Burner	1 year	3,000 hrs
Filter	1 year replacement	3,000 hrs replacement
Oil hose	1 year inspection/replacement	
Nozzle	1 year replacement	3,000 hrs replacement
Electrodes	Replacement/cleaning 1 year	Replacement/ceaning 3,000 hrs
Brake disc	Replacement/cleaning 1 year	Replacement/ceaning 3,000 hrs
Motor	1 year	3,000 hrs
Drive shaft	Check/replace in the event of damage	Check/replace in the event of damage
Fan wheel	"1 year Replace if need for cleaning/imbalance"	"3000 hrs Replace if need for cleaning/imbalance"
Pressure piston max. load Pressure piston min. load	Regular checks of seal and function every 3 month. Change at leakage.	Control 2 000 hrs
Oil filter	Once a year	3,000 hrs replacement
Oil valve	Tightness check once a year	Replace if leakage detected

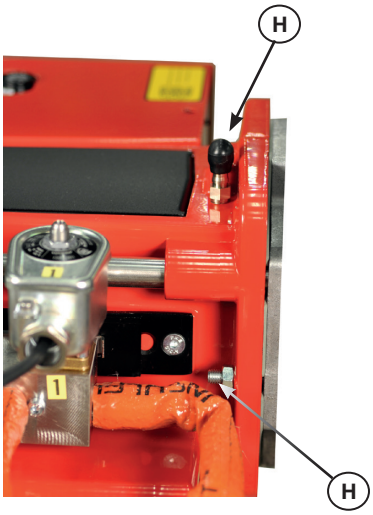
8.2 Component replacement intervals

Components	**Service life – Recommended replacement**	**Service life – Recommended replacement Operating starts**
Control system	10 years	250,000 starts
Pressure switch	10 years	250,000 starts
Ignition system with flame guard	10 years	250,000 starts
UV flame sensor	10,000 hrs	N/A
Damper motor		500,000 starts
Contactor	10 years	500,000 starts
Pressure piston max. load, Pressure piston min. load + O-ring, Valve seat	10 years	80 000 starts

The burner and its components must be recycled according to applicable regulations.

8.3 Combustion device

1. Disconnect the main power and shut off the fuel supply.
2. Loosen the nuts (H) and pull the burner backwards.
3. Remove the brake plate from the oil pipe and clean the brake plate.
4. Unscrew the nozzle/nozzles.
5. Install new nozzle/nozzles. If nozzles have filters, these must be removed before the nozzle can be installed.
6. Install the brake plate (See Brake plate setting). (see technical data)
7. Check the ignition electrodes (See Setting the ignition electrodes). (see technical data)
8. If necessary, replace the ignition electrodes.
9. Press the burner together and lock using the nuts (H).
10. Open the boiler/hinged flange to access the burner tube..
11. Remove and clean the burner tube.
12. Install the burner; make sure you install the drainage hole in the burner tube so that any spilled oil can drain out.
13. Close the boiler/hinged flange.
14. Switch on the main power and open the fuel supply.
15. Start burner and check/adjust combustion.



! The burner should be serviced at least 4 times a year.

! Use caution when operating the burner, surfaces may be hot.

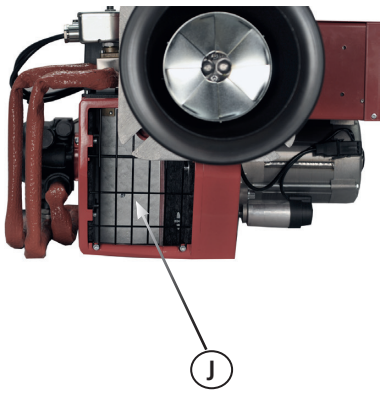
! Because the burner tube must be installed from the inside the boiler, it must be possible to open the boiler or have a spectacle flange that is designed so that it can be reconnected with the burner tube installed.

! NB: When soiled, always replace nozzles with new nozzles. Do not clean.

! When servicing/replacing components that affect combustion, flue gas analysis and soot test must be carried out following installation.

8.4 Air damper

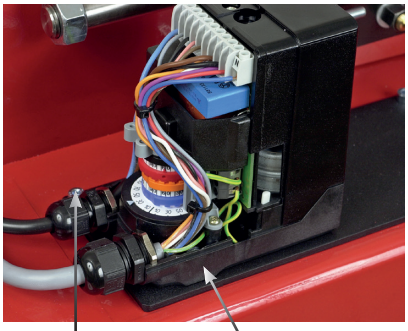
1. Disconnect the main power and shut off the fuel supply.
2. Loosen the nuts (H) and pull the burner backwards, B45-2 MF
3. Remove the intake grille at the air intake.
4. Disconnect the damper motor.
5. Clean the air damper (J) and the intake. Lubricate any damper shaft.
6. Reconnect the damper motor.
7. Install the intake grille for the air intake.
8. Fit the burner and the burner flange together and secure with the nut (H).
9. Switch on the main power and open the fuel supply.
10. Start burner and check/adjust combustion.

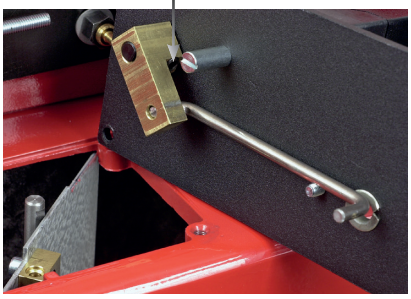


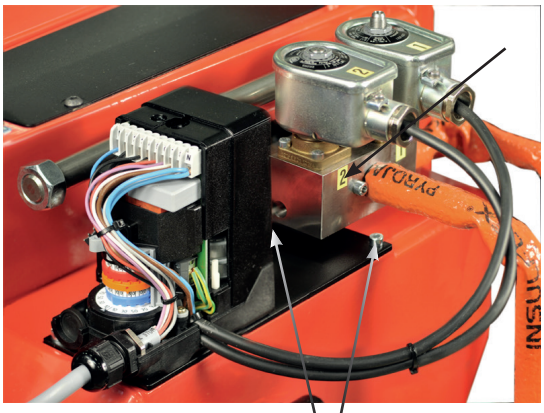
! When servicing/replacing components that affect combustion, flue gas analysis and soot test must be carried out following installation.

8.5 Replacement of damper motor

1. Disconnect the main power and shut off the fuel supply.
2. Note the position of the cables and loosen the wires in the damper motor.
3. Disengage the damper motor and lock it at 30°.
4. Loosen the screws (L) to the damper motor mounting plate. Some of the screws may be difficult to access. The valve block (K) may be loosened in order to make this easier. Observe caution when removing and installing valve block and ensure that a seal has been achieved when reinstalling.
5. Lift the damper motor carefully so that the air damper remains in the air intake. Remove (M) the control arm from the motor shaft.
6. Remove the damper motor from the mounting plate (N).
7. Reinstall the damper motor on the mounting plate.
8. Fit the control arm (m) on the damper motor shaft. It is important that the screw is perpendicular to the plane of the shaft.
9. Disengage the damper motor and lock it at 30°.
10. Install the mounting plate by guiding the control arm into the bracket on the air damper and the air damper shaft in the mounting plate (make sure the bushings between the mounting plate and the damper shaft are in place).
11. Disengage the damper motor, feel that the damper moves easily. Close the damper and reset the protractor on the damper motor.
12. Connect the damper motor electrically.
13. Set the damper motor notches as on the motor that has been replaced.
14. Switch on the main power and open the fuel supply.
15. Start burner and check/adjust combustion.



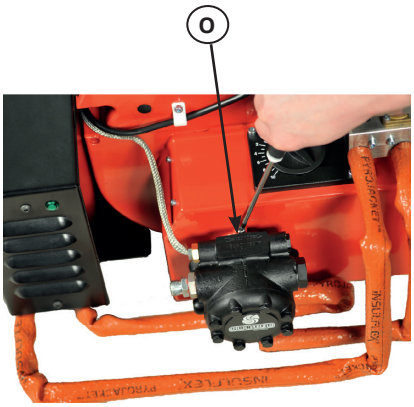


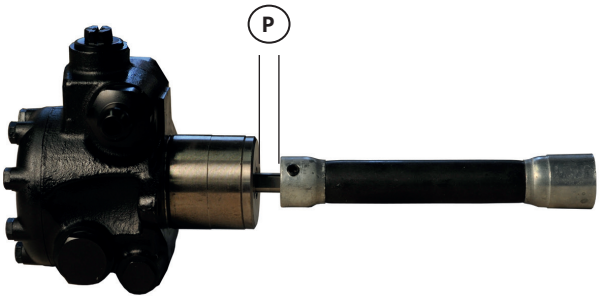


! When servicing/replacing components that affect combustion, flue gas analysis and soot test must be carried out following installation.

8.6 Replacement of oil pump

1. Disconnect the main power and shut off the fuel supply.
2. Undo the oil hoses from the pump.
3. Remove the immersion heater from the pump.
4. Loosen the screws (O) and pull out the oil pump
5. Move the pump coupling to the new pump and set the same distance between (P) the pump and the pump coupling as before in order to avoid pressure on the pump seal.
6. Install the oil pump on the burner and tighten the screws (J). (It is important that the pump shaft splines align correctly in the pump coupling).
7. Fit the immersion heater in the pump.
8. Fit the oil hoses.
9. Switch on the main power and open the fuel supply.
10. Bleed the pump.
11. Start burner and check/adjust combustion.





! The burner pump has a service life of about 3-5 years if the oil is of a grade that is compliant with standard DIN 51605:2010-10. If oil of different grade is used, and especially if it contains contaminants such as grit, pumice, metal shavings, etc. or is chemically aggressive, the pump may be expected to have a significantly shorter service life.

! Use caution when operating the burner, surfaces may be hot.

! When servicing oil bearing components, check for oil leakage when the burner is commissioned after servicing.

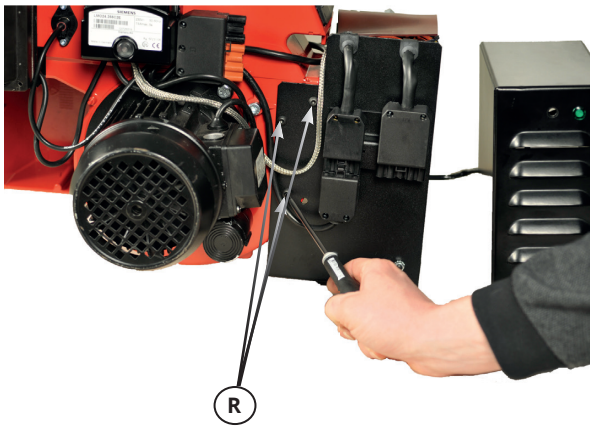
! When servicing/replacing components that affect combustion, flue gas analysis and soot test must be carried out following installation.

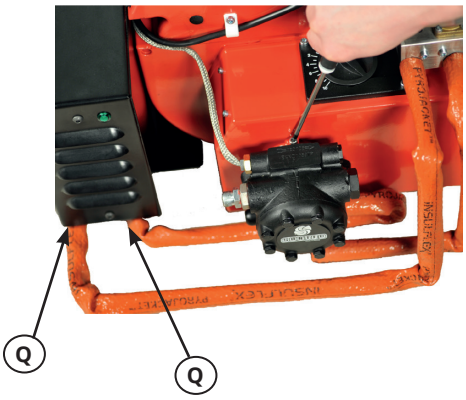
8.7 Replacement of preheaters

1. Disconnect the main power and shut off the fuel supply.
2. If the preheater is hot, let it cool in order to avoid burning yourself.
3. Remove the connection pipes (Q) from the preheater. The pipes should be released first from its second attachment point in order to make removal easier.
4. Note the thermostat setting.
5. Loosen the screws (R) and remove the preheater from the burner.
6. Install the new preheater on the burner.
7. Attach the connection pipes. Be careful when tightening the connection points to avoid subsequent leakage.
8. Adjust the thermostat to the same temperature as the replaced preheater.
9. Switch on the main power and open the fuel supply.
10. Commission the motor only to fill the system with oil. Commissioning the motor can be easily done by using the test equipment, internal test.
11. Start burner and check/adjust combustion.

! Use caution when operating the burner, surfaces may be hot.

! When servicing oil bearing components, check the oil density when the burner is commissioned after servicing.





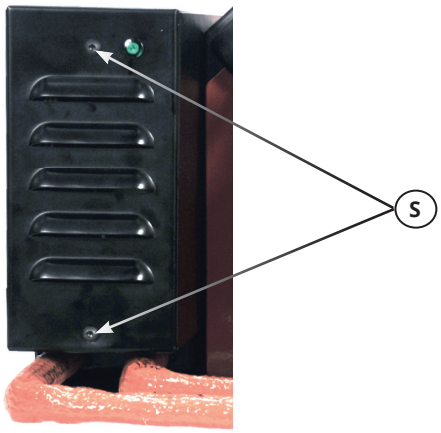
! When servicing/replacing components that affect combustion, flue gas analysis and soot test must be carried out following installation.

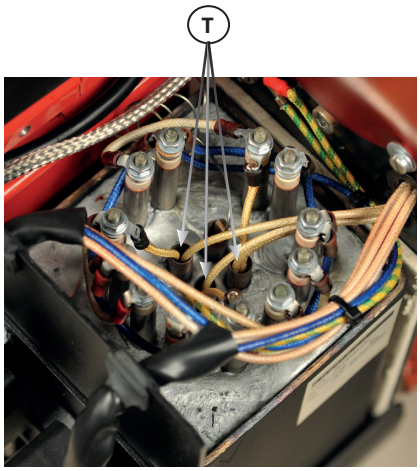
8.8 Replacement of preheater overheating protector

It is usually apparent that the preheater overheating protector needs replacing when the preheater finds it difficult to maintain a sufficiently high temperature, resulting in problems in retaining stable combustion.

1. Disconnect the main power and shut off the fuel supply.
2. Remove the preheater hood, loosen the screws (K).
3. Measure out which overheating protectors (T) need replacing. (A broken overheating protector has broken conductivity).
4. Note the overheating protector connection points.
5. Remove the overheating protector.
6. Install and connect the new overheating protector. During installation, the overheating protector shall simply be inserted fully into its sensor tube on the preheater.
7. Fit the preheater hood using the screws (S).
8. Switch on the main power and open the fuel supply.
9. Start burner and check/adjust combustion.

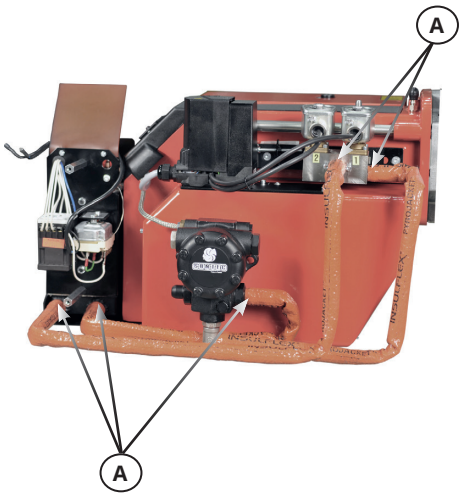
! Use caution when operating the burner, surfaces may be hot.





! When servicing/replacing components that affect combustion, flue gas analysis and soot test must be carried out following installation.

8.9 Check oil line seals



Where there are temperature fluctuations in the burner oil system due to the preheater being on the burner, this may result, after a period of operation, in oil leaks occurring in the connection pipe's coupling element.

Therefore, check the tightness of the coupling element (A) after a period of operation after installation of the burner and at each service.

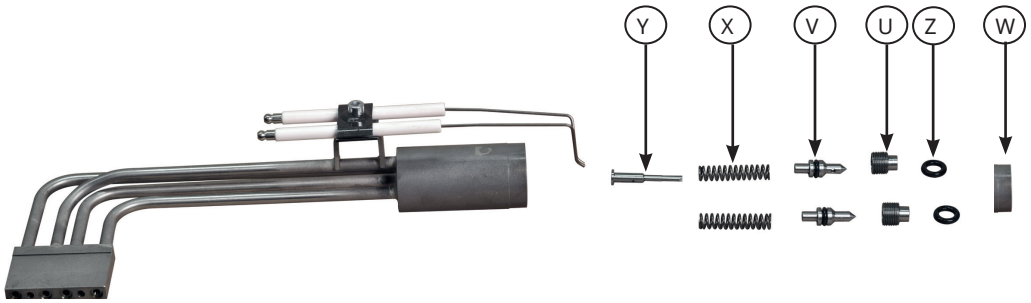
If leakage has occurred, it is usually sufficient to tighten the leaking coupling element.

8.10 Check pressure piston nozzle holder seals

As the pressure piston in the nozzle holder (see figure) constitutes a safety component, the seal/function of the pressure piston should be checked on a regular basis.

1. Allow the burner to begin its start-up sequence.
2. Turn off the burner just before it shall release oil through the nozzle.
3. Disconnect the main power and shut off the fuel supply.
4. Open the boiler/burner so that the burner tube/brake plate can be checked.
5. Check whether the burner tube/brake plate is wet with oil.
   a. If no oil can be seen, there is no leak
   b. If there is oil, replace the seat (U) and pressure piston (V) and the o-ring (Z), (see 5.10).
6. Restore the burner to operating condition.
7. Switch on the main power and open the fuel supply.
8. Start burner and check/adjust combustion.

! **Pressure piston (V) and O-ring (Z) should be replaced at least every 10 year.**

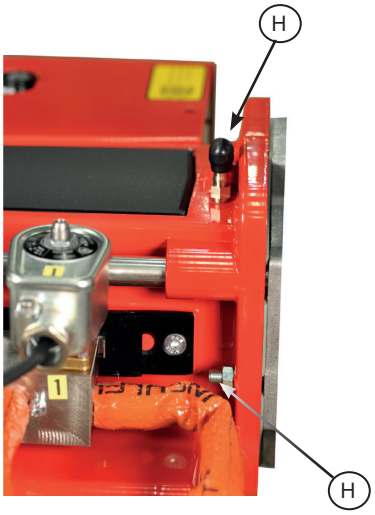


! **When servicing/replacing components that affect combustion, flue gas analysis and soot test must be carried out following installation.**

8.11 Replacement of pressure piston and seat

1. Disconnect the main power and shut off the fuel supply.
2. Loosen the nuts (H) and pull the burner body out of the guides.
3. Remove the brake plate from the oil pipe.
4. Remove the front nozzle holder (see figure)
5. Remove the seat(s) (U) and pressure piston(s) (V) (see figure)
6. Install new pressure piston(s) (see figure). Take care to ensure that springs (X) and needles (Y) are correctly fitted. During fitting, make sure that the o-rings are not damaged.
7. Install the seat(s)
8. Install the front nozzle holder (W); exercise caution when installing so that o-ring(s) (Z) is/are not damaged. Ideally, installation should be done using o-rings inserted in the groove on the front nozzle holder in order to minimise the risk of damage to the o-ring.
9. Install the brake plate (See Setting the brake plate). (see technical data)
10. Check the ignition electrodes (See Setting the ignition electrodes). (see technical data)
11. Fit the burner and the burner flange together and secure with the nut (H).
12. Switch on the main power and open the fuel supply.
13. Start burner and check/adjust combustion.

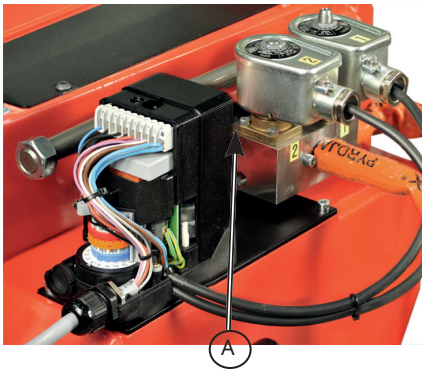
! During servicing, all affected o-rings must be replaced.



! When servicing/replacing components that affect combustion, flue gas analysis and soot test must be carried out following installation.

8.12 Immersion heaters for extra preheating

If the burner is used with certain types of oils such as high viscosity, or where the oil at a certain temperature changes state from liquid to solid, problems with the operation of the burner may occur. Operational problems can sometimes be overcome by applying extra preheating to the burner's internal oil system on the valve block and nozzle holder.



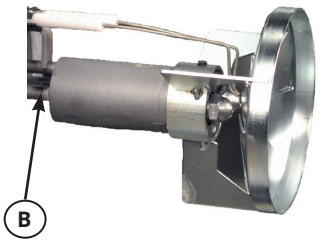
8.12.1 Installation of valve block immersion heater

1. Disconnect the main power and shut off the fuel supply.
2. Install the immersion heater in its intended hole (A) on the valve block.
3. Lock the immersion heater in the hole using the supplied nipple.
4. Route the cable in the same track as the immersion heater to the pump.
5. Plug the immersion heater electrically, see Wiring diagram.
6. Switch on the main power and open the fuel supply.
7. Start burner and check/adjust combustion.

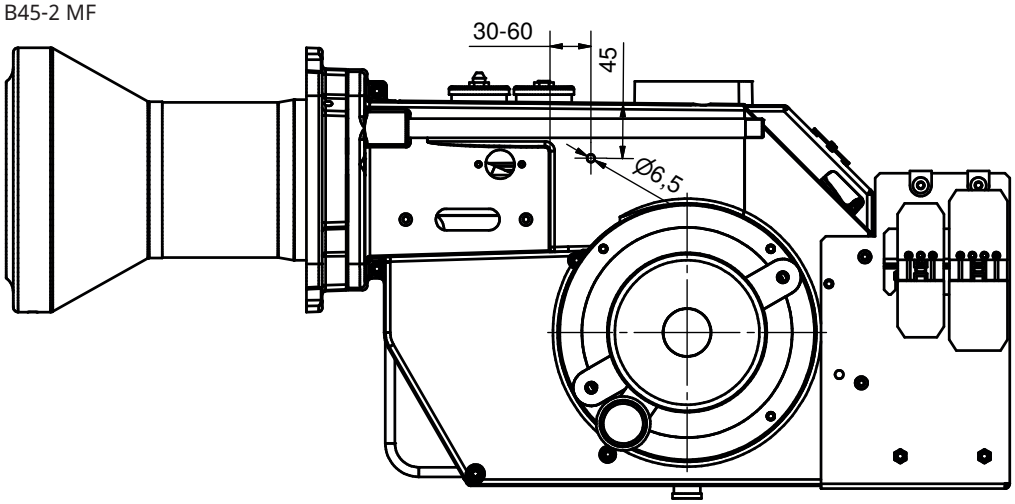
! When servicing/replacing components that affect combustion, flue gas analysis and soot test must be carried out following installation.

8.12.2 Installation of immersion heater, nozzle holder

1. Disconnect the main power and shut off the fuel supply.
2. Work the fan housing as shown.
3. Install the immersion heater in its intended hole (B) on the nozzle holder.
4. Lock the immersion heater in the hole using the supplied nipple
5. Plug the immersion heater electrically, see wiring diagram.
6. Route the cable through the new hole specifically intended for the purpose and on into the connection point.
7. Switch on the main power and open the fuel supply.
8. Start burner and check/adjust combustion.



B45-2 MF



! When servicing/replacing components that affect combustion, flue gas analysis and soot test must be carried out following installation.

8.13 Check/service oil pre-filter

In order to ensure that oil-bearing components enjoy satisfactory operation, avoid breakdowns and have a good service life, pre-filters shall be checked/serviced at service intervals adapted according to the grade of oil used.

1. Disconnect the main power and shut off the fuel supply.
2. Close the oil valves.
3. Remove the filter.
4. Clean/replace the filter.
5. Install the filter.
6. Open the oil valves.
7. Switch on the main power and open the fuel supply.
8. Start burner and check/adjust combustion.

Where a self-cleaning filter is used, there is the option to clean the filter surfaces during operation. Cleaning is done by turning a knob on the filter that scrapes the surface of the filter. Where a self-cleaning filter is installed, the reliability of the burner may be increased without having to perform a complete service of the filter.

! **When servicing/replacing components that affect combustion, flue gas analysis and soot test must be carried out following installation.**

7.7 Replacement of electrical components

1. Disconnect the main power and switch off the fuel supply.

Before obtaining access to terminals, all supply circuits must be disconnected.

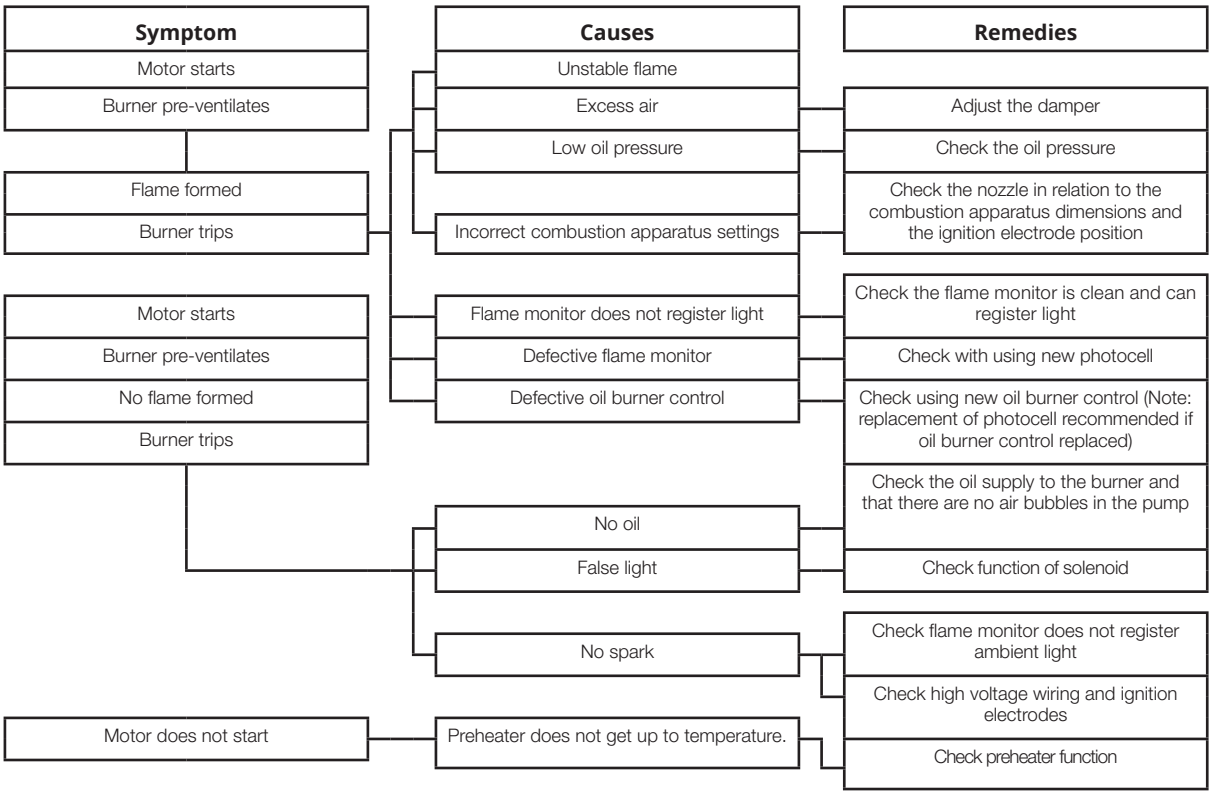
2. Note the connection of the existing component and disassemble.
3. Fit new component with same connection or with specified alternative connection.
4. Switch on the main power and check the operation of the new component.
5. Start burner and check/adjust combustion.

When servicing/replacing components that affect combustion, flue gas analysis and soot test must be carried out following installation.

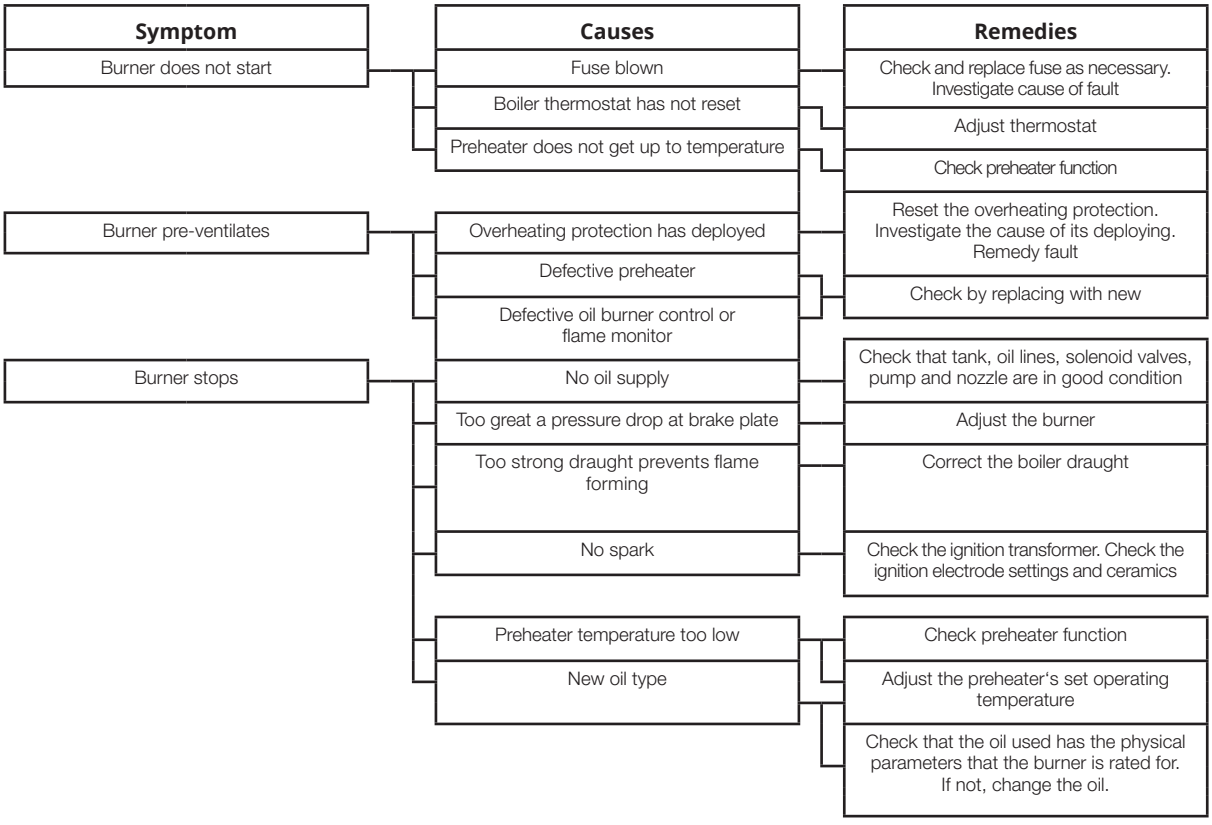
165 105 11-3

8. Fault Location

8.1 Burner will not start



8.2 Burner will not start after normal use



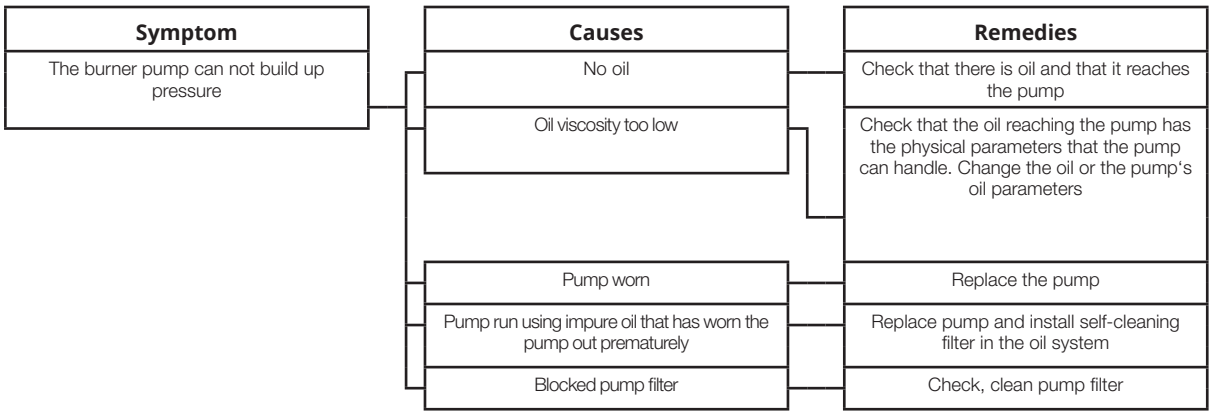
8.3 Delayed ignition

Symptom	Causes	Remedies
Burner pulsates at start with hot flue gases	Excessively strong draught	Correct boiler draught
	Excessive pressure drop across the brake plate	Adjust the burner
	Preheater temperature too low	Check preheater function
	New oil type	Adjust the preheater's set operating temperature
		Ensure that the new oil's physical parameters are within the limits for which the burner is designed. If not, change the oil.
Burner pulsates at start	Nozzle partially blocked	Replace nozzle
	Oil pressure too low	Check and adjust
	Flue is blocked or damaged	Check and correct
	The fan wheel is slipping on the shaft	Check and tighten
	Pump coupling loose or worn	Replace
	Preheater blocked	Check the ignition electrode setting, (see technical data)
	Delayed ignition	Check that the ignition electrodes are not damaged
	Excessively strong draught	Check high voltage cables
		Check position of nozzle assembly setting
		Correct boiler draught
	Excessive pressure drop across the brake plate	Adjust the burner
	Preheater temperature too low	Check preheater function
	New oil type	Adjust the preheater's set operating temperature
		Ensure that the new oil's physical parameters are within the limits for which the burner is designed. If not, change the oil.

8.4 Noise in pump

Symptom	Causes	Remedies
The burner pump emits noise during start		Check the oil system in order to reduce pressure drop
The burner pump emits noise during operation	Insufficient negative pressure on the suction side pump	Rebuild the oil system to form a solution with a transport oil pump
		Check that the oil used has the physical parameters that the burner is rated for. If not, change the oil.
		Temperature of the oil from the tank is too low, increase the temperature of oil from tank
		Clean the pump filter

8.5 Pump pressure



9. Log of flue gas analysis

Owner	Adresss	Tel. no:
Installation		Tel. no:

Boiler

Type	Make	Power kW

Burner

Type	Model	Serial no.	Fuel

	Step 1	Step 2	Step 3
Draught in fireplace			
Fan Press mbar			
Filter smoke number			
CO_2			
O_2			
NOx			
CO			
Flue gas temp. °C			
Setting brake disc			
Setting Air damper			
Pump pressure bar			
Nozzle			

Test performed / 20	Address
Test performed by:	Postal address
Company name:	Tel. no:

EU Declaration of conformity

Bentone Oil Burners

Type:

BF 1	**ST 133**	**B 40**	**B 65**
ST 108	**ST 146**	**B 45**	**B 70**
ST 120	**B 30**	**B 55**	**B 80**

This declaration of conformity is issued under the sole responsibility of the manufacturer.
The object of the declaration described above is in conformity with:

- **Machinery Directive 2006/42/EC**
- **EMC 2014/30/EU**
- **The Restriction of the Use of Certain Hazardous Substances (RoHS) Directive 2011/65/EU**

References to the relevant harmonised standards used or references to the other technical specifications in relation to which conformity is declared:

EN 267:2020	Excluding the requirements of Annex J/K. Automatic forced draught burners for liquid fuels.

Additional information can be downloaded at: www.bentone.com

Manufacturer: Enertech AB
Näsvägen 8
SE-341 34 LJUNGBY
Sweden

Notified Body: TUV SÜD Product Service GmbH
Ridlerstaße 65
D-80339 München, Germany

Notified Body Number: 0123

Ljungby, 2022-10-10

Joachim Hultqvist
Technical Manager
Enertech AB

Ola Karlsson
Quality Manager
Enertech AB

Bentone®

UK Declaration of conformity

Bentone Oil Burners

Type:

BF 1	**ST 133**	**B 40**	**B 65**
ST 108	**ST 146**	**B 45**	**B 70**
ST 120	**B 30**	**B 55**	**B 80**

This declaration of conformity is issued under the sole responsibility of the manufacturer.
The object of the declaration described above is in conformity with:

- **Supply of Machinery (Safety) Regulations 2008**
- **Electromagnetic Compatibility Regulations 2016**
- **The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012**

References to the relevant harmonised standards used or references to the other technical specifications in relation to which conformity is declared:

BS EN 267:2020	Excluding the requirements of Annex J/K. Automatic forced draught burners for liquid fuels.

Additional information can be downloaded at: www.bentone.com

Manufacturer: Enertech AB
Näsvägen 8
SE-341 34 LJUNGBY
Sweden

Approved Body: TUV SÜD BABT Unlimited
Octagon House,
Concorde Way, Segensworth North,
Fareham, Hampshire,
PO 15 5RL, United Kingdom

Approved Body Number: 0168

Ljungby, 2022-10-10

Joachim Hultqvist

Technical Manager
Enertech AB

Ola Karlsson

Quality Manager
Enertech AB

Enertech AB. P.O Box 309, SE-341 26 Ljungby.
www.bentone.com

Bentone®