



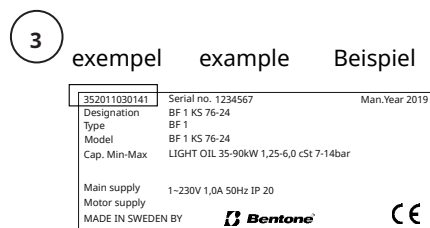
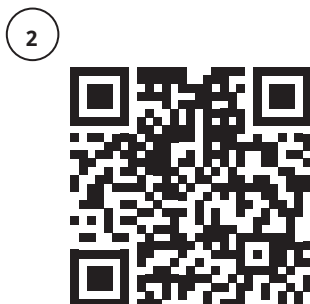
Providing sustainable energy solutions worldwide

Installation- and maintenance instruction

**B 30 A2.2H**

LMO24.255C2E

A2L 65 CK



## -sv

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2. [www.bentone.com](http://www.bentone.com)\  
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## -en

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## -da

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## -de

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Typenschild ein, (siehe Bild)  
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# 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.

## 2. Technical data

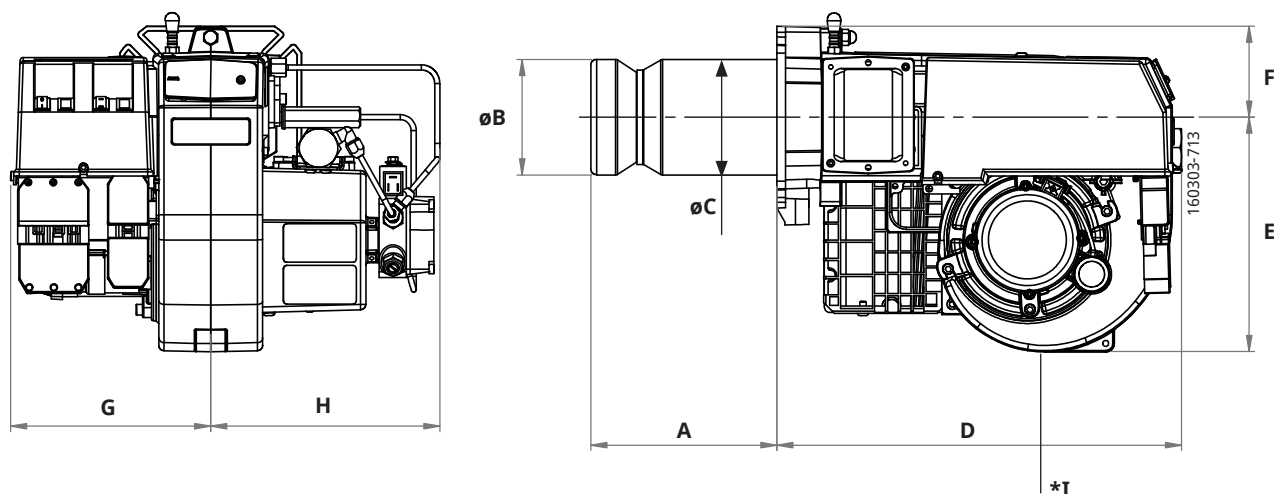
### The burner is intended for:

- 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:

- HVO/XTL according to EN 15940.
- Fuel oil according to DIN 51603-1.
- Fuel oil A Bio 10 according to DIN 51603-6.

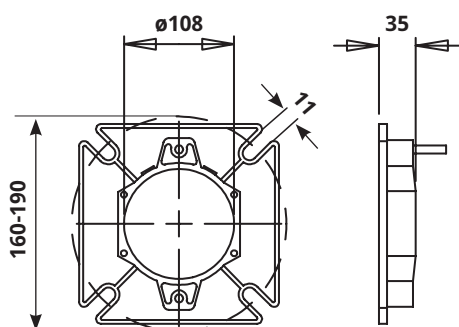
### 2.1 Dimensions B 30 A2.2H



| A       | ØB  | ØC  | D   | E   | F  | G   | H   | * I |
|---------|-----|-----|-----|-----|----|-----|-----|-----|
| 174/315 | 108 | 108 | 378 | 220 | 85 | 187 | 214 | 200 |

\* Min. recommended distance to floor.

#### 2.1.1 Dimensions flange

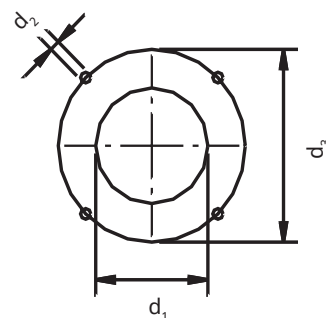


## 2.2 Burner installation

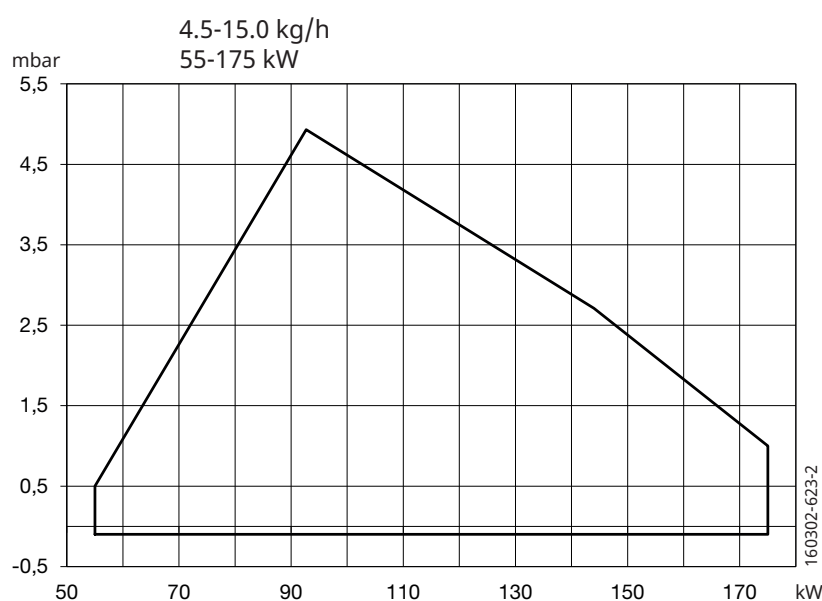
### 2.2.1 Hole patten

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

| d1    | d2 | d3        |
|-------|----|-----------|
| ø 115 | 10 | ø 160-190 |

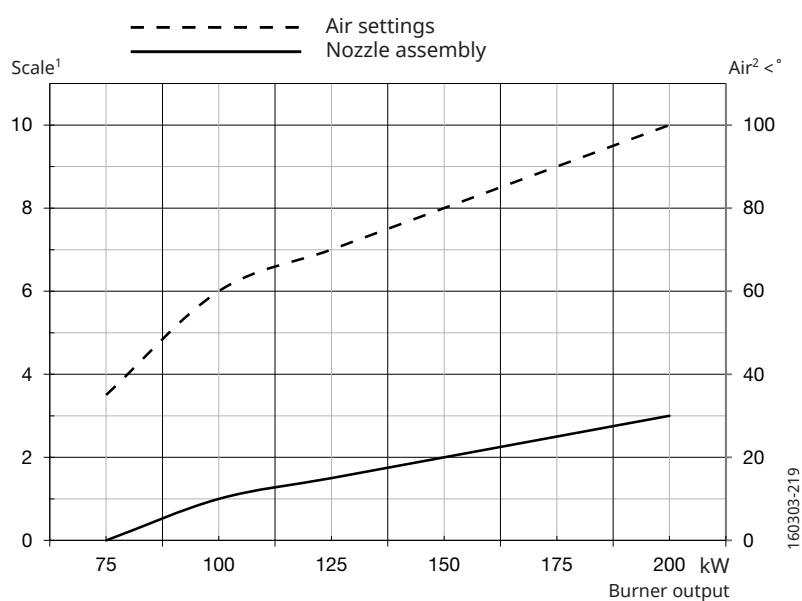


## 2.3 Working field



**!** Do not exceed working field.

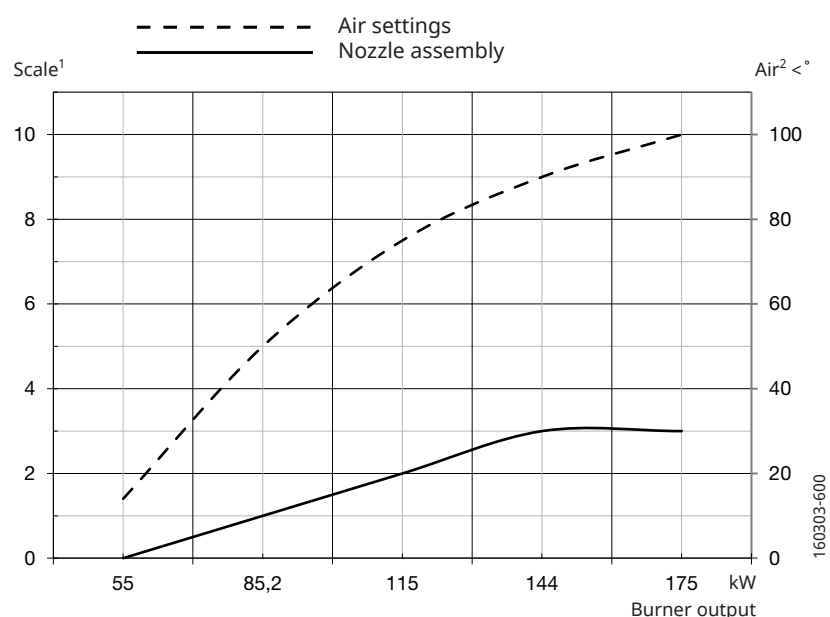
## 2.4 Basic settings - Fuel oil



<sup>1</sup> Scale nozzle assembly and air damper without damper motor.

<sup>2</sup> Settings air damper with damper motor.

## 2.5 Basic settings - HVO/XTL



<sup>1</sup> Scale nozzle assembly and air damper without damper motor.

<sup>2</sup> Settings air damper with damper motor.

### Flame signal

When operating at high power or low air excess and HVO/XTL is used as fuel, the flame signal may deteriorate (blue flame), the signal lamp in the reset button flashes green.

By lowering the air velocity or changing the flame detector to QRC1 A1, the flame signal can be improved.

## 2.6 Technical specification

| B 30 A2.2H                               |                                |
|------------------------------------------|--------------------------------|
| Main supply <sup>1)</sup>                | 230V, 1~, 2.6/2.8A, 50Hz, IP20 |
| Max fuse rating                          | 6.3A                           |
| El <sub>min</sub> preheater excluded     | 1.30A, 281W                    |
| El <sub>max</sub> preheater excluded     | 1.40A, 297W                    |
| P <sub>SB</sub>                          | 0                              |
| NO <sub>x</sub> -class                   | 4                              |
| NO <sub>x</sub> (GCV) preheater excluded | 119mg/kWh                      |
| Noise level                              | 82dBA                          |

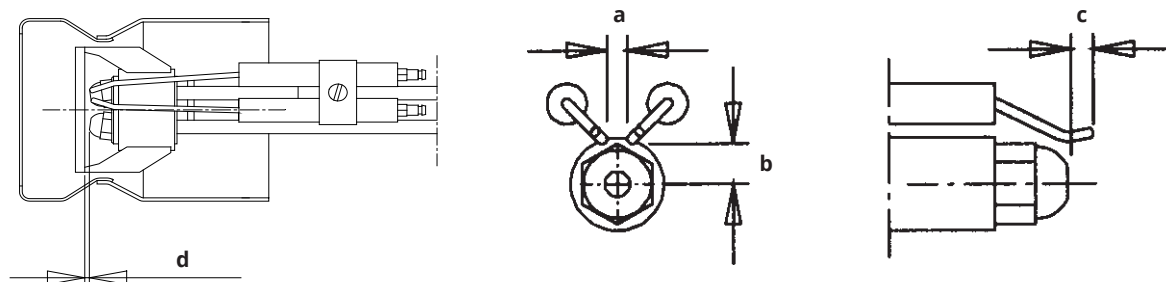
<sup>1)</sup> Max operating current, see data plate.

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.

## 2.7 Setting of ignition electrodes and brake plate



| a       | b       | c       | d       |
|---------|---------|---------|---------|
| 3.5-4.0 | 7,0-9,0 | 2.0-3.0 | 5.0-6.0 |



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

## 2.8 Nozzle and pump pressure

Due to different furnace geometries and capacities, it is not possible to recommend a nozzle model.

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

## 2.9 Nozzle table

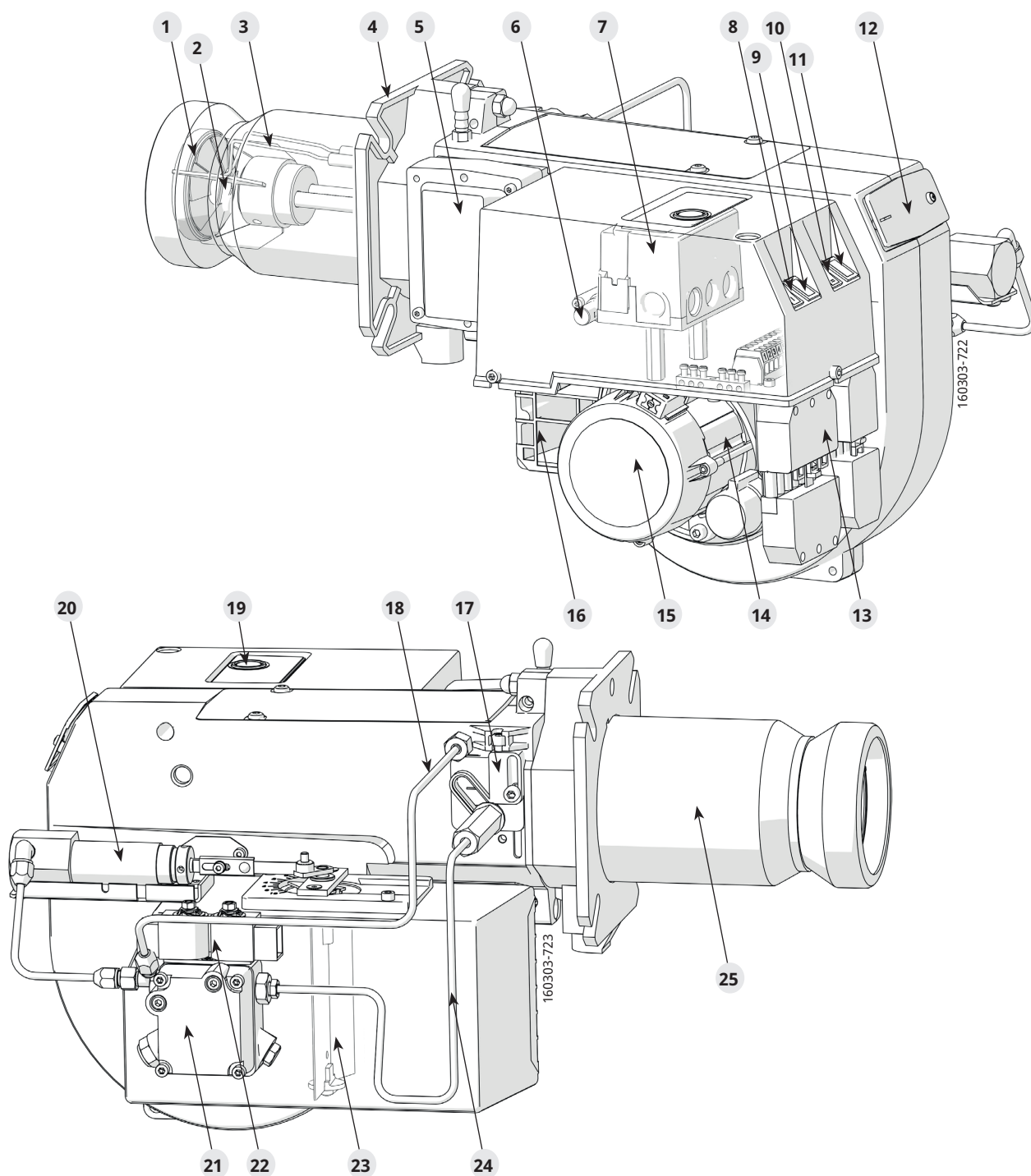
| Pump pressure bar 10 |       |      |        | 11     |      |        | 12     |      |        | 13     |      |        |
|----------------------|-------|------|--------|--------|------|--------|--------|------|--------|--------|------|--------|
| Gph                  | kg/h  | kW   | Mcal/h | kg/h   | 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 mm<sup>2</sup>/s (cSt) at a density of 830 kg/m<sup>3</sup>.

| Pump pressure bar 14 |       |      |        | 15    |      |        | 16    |      |        | 17    |      |        |
|----------------------|-------|------|--------|-------|------|--------|-------|------|--------|-------|------|--------|
| Gph                  | 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   | 1189 | 1023   | 104   | 1229 | 1057   | 107   | 1267 | 1089   |
| 24,00                | 106   | 1254 | 1078   | 109   | 1297 | 1116   | 113   | 1341 | 1153   | 116   | 1382 | 1188   |
| 26,00                | 115   | 1359 | 1168   | 119   | 1406 | 1209   | 122   | 1453 | 1249   | 126   | 1497 | 1287   |

The table applies to oil with a viscosity of 4.4 mm<sup>2</sup>/s (cSt) at a density of 830 kg/m<sup>3</sup>.

## 2.10 Components



- |                            |                                |                              |
|----------------------------|--------------------------------|------------------------------|
| 1. Brake plate             | 10. Switch I-II                | 19. Reset button             |
| 2. Nozzle                  | 11. Indicator lamp, Stage 2    | 20. Air settings             |
| 3. Ignition electrodes     | 12. Cover, inspection glass    | 21. Pump                     |
| 4. Fixing flange           | 13. Electrical connection      | 22. Solenoid valves          |
| 5. Ignition transformer    | 14. Fan wheel                  | 23. Air damper               |
| 6. Flame detector          | 15. Motor                      | 24. Connecting pipe, Stage 1 |
| 7. Burner control          | 16. Air intake                 | 25. Flame tube               |
| 8. Switch O-I              | 17. Nozzle assembly adjustment |                              |
| 9. Indicator lamp, Stage 1 | 18. Connecting pipe, Stage 2   |                              |

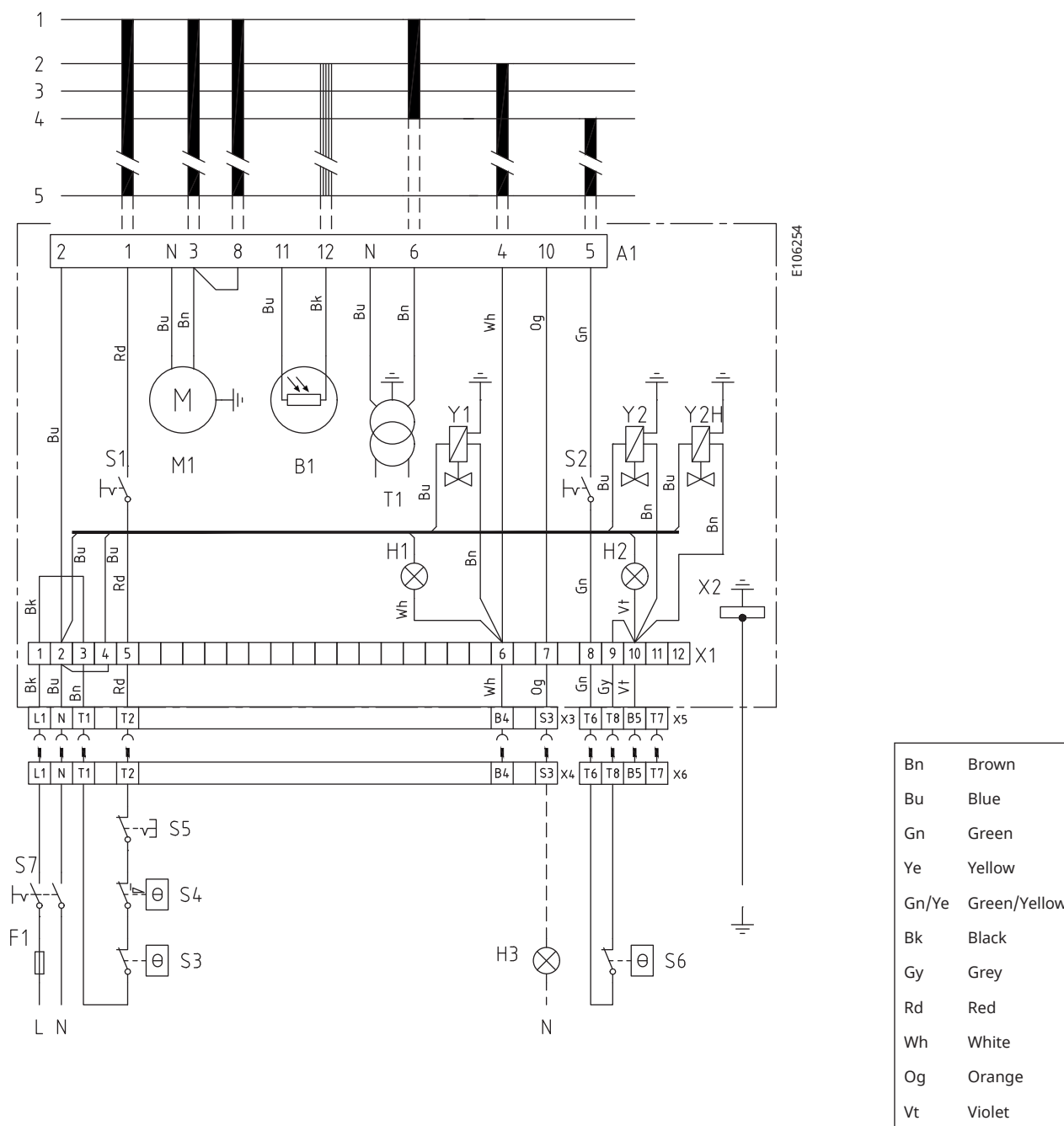
## 3. Electric equipment

### 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



### 3.2.1 Components

|    |                                     |    |                                       |     |                                                                        |
|----|-------------------------------------|----|---------------------------------------|-----|------------------------------------------------------------------------|
| A1 | Burner control                      | S3 | Control thermostat                    | X4  | Plug-in contact "Euro", boiler                                         |
| B1 | Flame detector                      | S4 | Temperature limiter                   | X5  | Plug-in contact "Euro", high/low burner                                |
| F1 | Fuse                                | S5 | Safety switch for hinged door         | X6  | Plug-in contact "Euro", high/low boiler                                |
| H1 | Lamp, low capacity                  | S6 | Control thermostat, high/low capacity | Y1  | Solenoid valve 1                                                       |
| H2 | Lamp, high capacity                 | S7 | Main switch                           | Y2  | Solenoid valve 2                                                       |
| H3 | Lamp, lock-out signal 230V          | T1 | Ignition transformer                  | Y2H | Solenoid valve, Hydraulic piston (Only 2-stage burners with 1 nozzle.) |
| M1 | Motor                               | X1 | Connection terminal board             |     |                                                                        |
| S1 | Operating switch                    | X2 | Earth terminal                        |     |                                                                        |
| S2 | Operating switch, high/low capacity | X3 | Plug-in contact "Euro", burner        |     |                                                                        |

### 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.

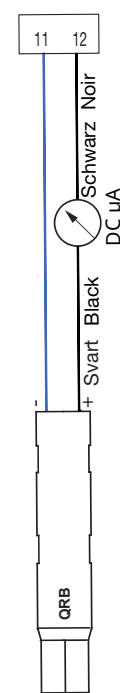
#### The oil burner control cuts out

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.

### 3.3.1 Technical data

|                                            | LMO14.113... | LMO24.255... |
|--------------------------------------------|--------------|--------------|
| Preignition 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    |



160303-333

### 3.4 Colour codes

When the burner starts, the light in the reset switch indicates the normal sequence, and also indicates whether something abnormal is happening as per 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.

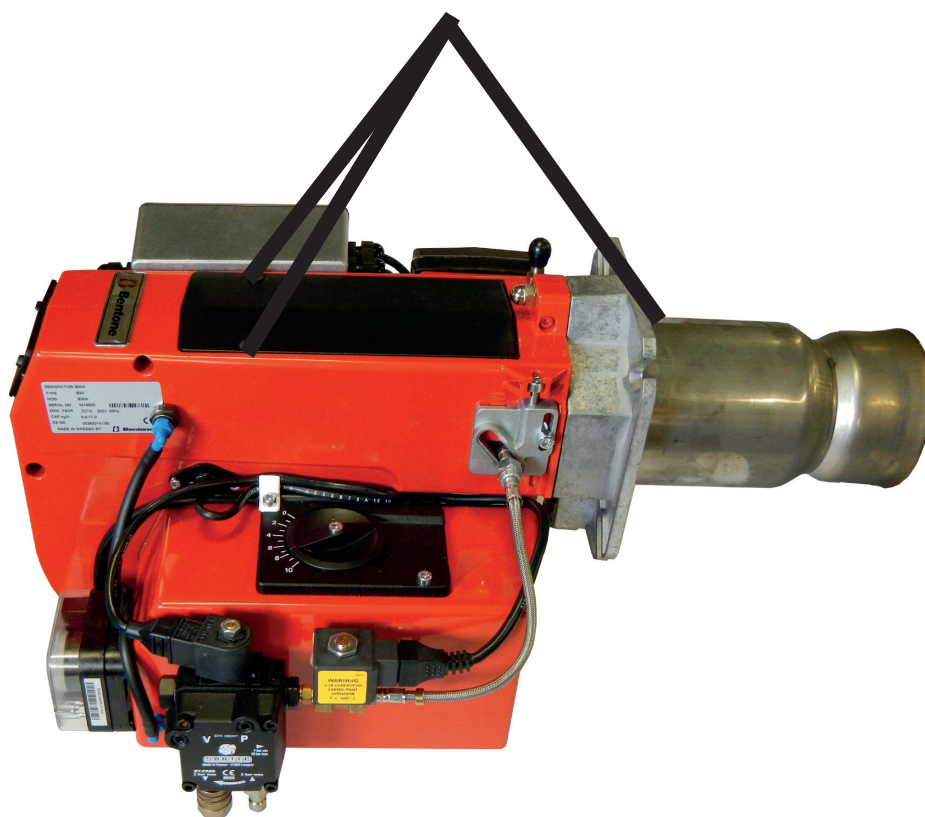
## 4.6 Electrical connection

- 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.

## 4.7 Handling and lifting instruction

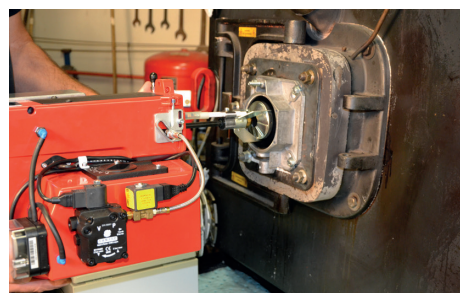


The lifting aid are available as accessories.



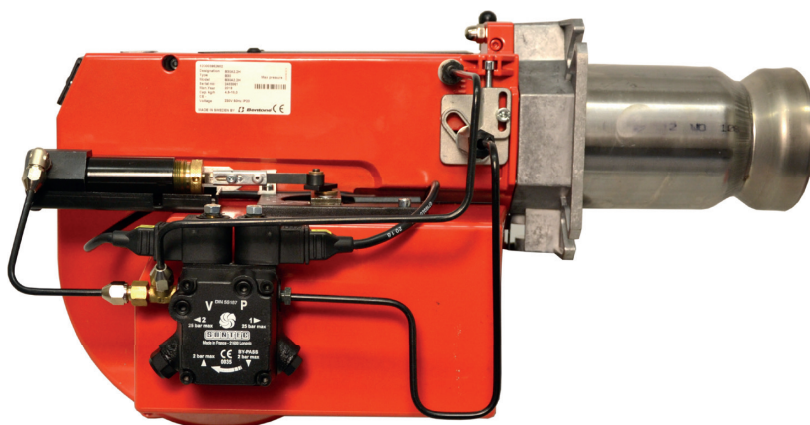
## 5. Mounting

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, (see chapter Service).
11. Connect the burner electrically, (see chapter Service).



### 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.



## 5.2 Example of Basic settings

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

### B 30 A2.2H

|                          |                                     |
|--------------------------|-------------------------------------|
| Burner output:           | 156 kW                              |
| Estimated nozzle output: | $156 / 11.86^* = 13.2 \text{ kg/h}$ |

(\* Calorific value Fuel oil = 11.86 kWh/kg)

This provides the following nozzle according to the nozzle table, (see Technical data).

|                                    |          |       |
|------------------------------------|----------|-------|
| 156 kW distributed over 2 nozzles: |          |       |
| Nozzle Stage 1:                    | 1.75 Gph | 91 kW |
| Nozzle Stage 2:                    | 1.25 Gph | 65 kW |
| Pump pressure:                     | 14.0 bar |       |

Setting values for 156 kW according to basic setting diagram, (see Technical data).

|        |         |   |     |
|--------|---------|---|-----|
| Insert | Stage 2 | = | 2.1 |
| Air    | Stage 1 | = | 5.7 |
| Air    | Stage 2 | = | 8.2 |

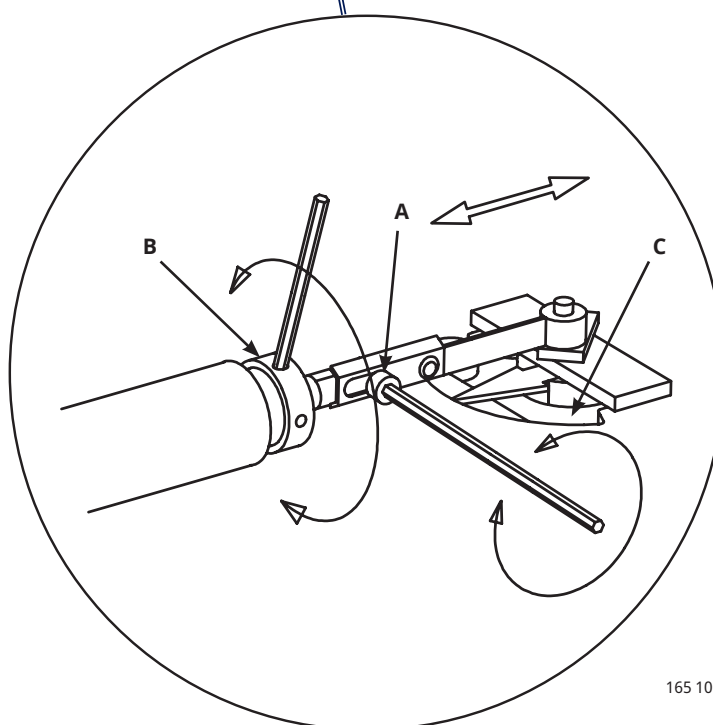
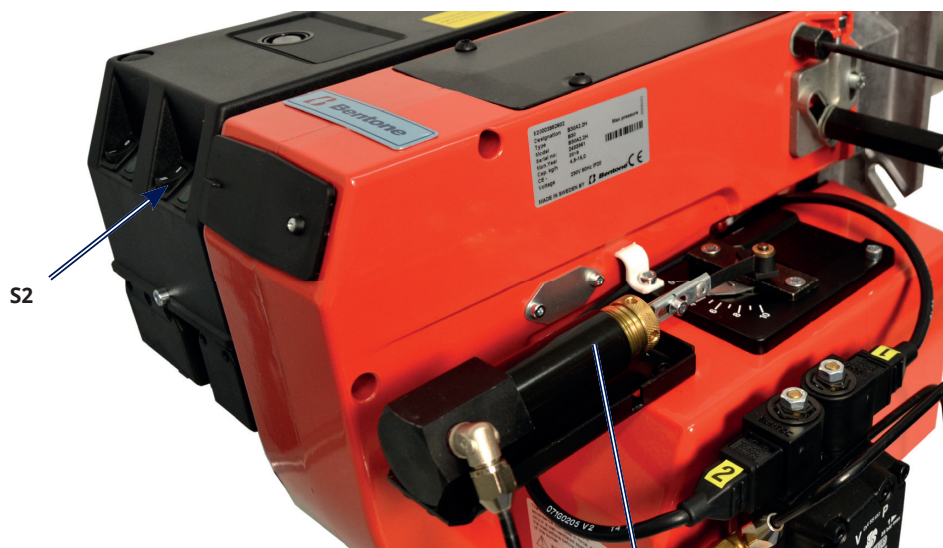
Selection of output and connection between the different power stages must be selected and adjusted so that the system achieves good functionality.

## 5.3 Air setting

1. Set the control switch (S2) to Low Load (I).
2. Loosen the screw (A), turn the damper to the desired position, and retighten the screw (A).
3. Set the control switch (S2) to High Load (II).
4. Use a hex key to screw the socket (B) in to decrease or out to increase.
5. The damper position can be read on the damper scale (C).
6. Start burner and check/adjust combustion.

### Recommended excess air

| Excess air flue gases |                              | Max. % CO <sub>2</sub> |
|-----------------------|------------------------------|------------------------|
| % O <sub>2</sub>      | % CO <sub>2</sub> Lambda 1.2 |                        |
| 3-5                   | ≈12.5                        | 15.4                   |



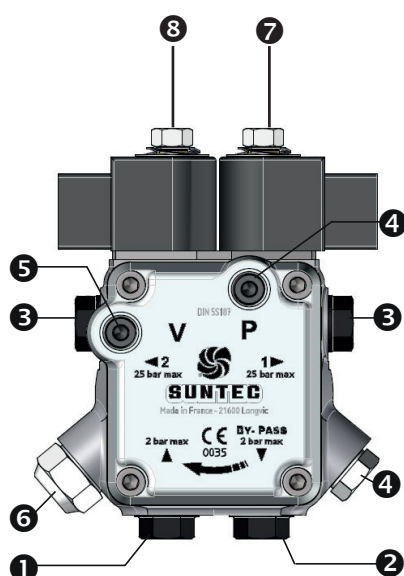
165 105 18-2

## 6. Pump A2L 65 CK/A2L 75 CK

### 6.1 Technical data

| One or two-pipe system |                         |          |
|------------------------|-------------------------|----------|
| Viscosity range::      | 2-12 mm <sup>2</sup> /s |          |
| Pressure range::       | 8-15 bar                |          |
| Rated voltage of coil: | 220/240V                | 50/60 Hz |
| Oil temperature::      | max 60°C                |          |

### 6.2 Components



1. Suction line G 1/4"
2. Return plug
3. Nozzle outlet G 1/8" Stage 2 and Stage 1
4. Pressure gauge port G 1/8"
5. Vacuum gauge port G 1/8"
6. Pressure adjustment
7. Solenoid valve 1
8. Solenoid valve 2

## 6.3 Pump operating principle

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.

### Applications

- Light oil, B10 heating oil/biofuel blend (as defined in DIN V51603-6) and kerosene.
- Two nozzle outlets.
- Two independent blocking solenoid valves.
- A sole regulator for both nozzle lines

### Pump operating principle

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

In two-pipe operation, the by-pass plug must be fitted in the return port, which ensures that the oil bypassed by the regulating valve is returned to the tank and the suction line flow is equal to the gear set capacity.

In one-pipe operation (by-pass plug removed and return plugged), 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

### Bleed

Bleeding in two-pipe operation is automatic : it is assured by a bleed flat on the piston.

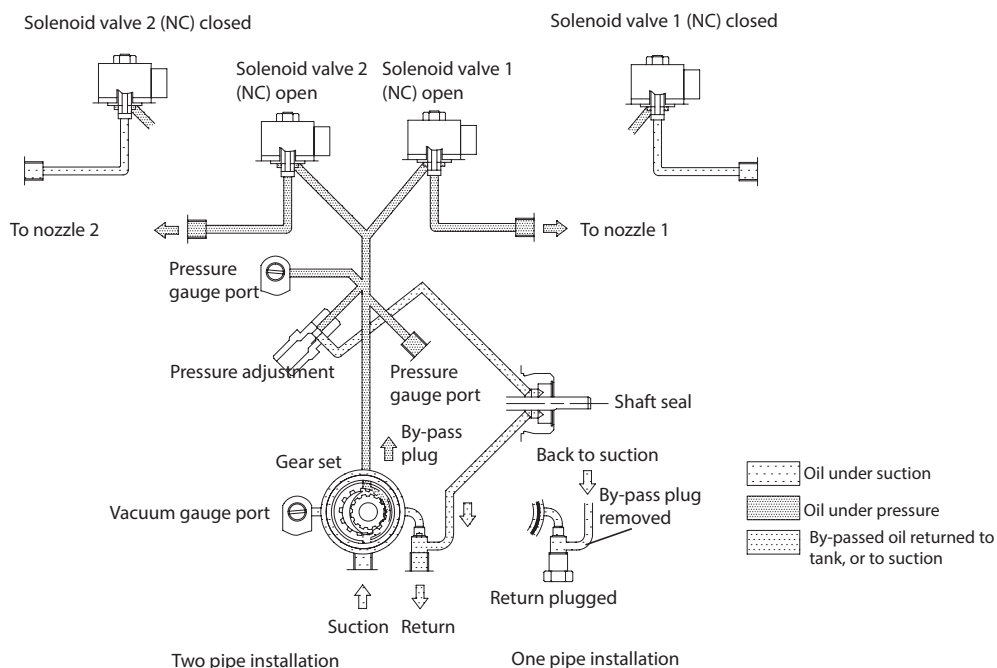
In one-pipe operation, the plug of a pressure gauge port must be loosened until the air is evacuated from the system

### Cut-of

The solenoid valves of the A2L pump are of the "normally closed" type. Each solenoid valve is situated in one nozzle line. This 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 pressurized 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. The two solenoid valves can be operated independently



## 6.4 Suction line tables

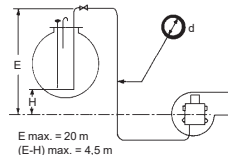
### 6.4.1 Overlying tank

#### 1-pipe system

| Nozzle*/Düse*<br>Gicleur*/Ugello*<br>(US GPH) | 0,50   |     | 0,60 | 0,80 | 1,00 | 1,50 |    | 2,00 |    | 4,00 |     |    | 6,00 |     |   | 9,50 |     |     |   |    |
|-----------------------------------------------|--------|-----|------|------|------|------|----|------|----|------|-----|----|------|-----|---|------|-----|-----|---|----|
| H (m)                                         | d (mm) |     | 4    | 4    | 4    | 4    | 4  | 6    | 4  | 6    | 4   | 6  | 8    | 4   | 6 | 8    | 4   | 6   | 8 | 10 |
| 0                                             | 90     | 75  | 56   | 45   | 30   | 150  | 22 | 113  | 11 | 56   | 150 | 7  | 37   | 119 | 4 | 23   | 74  | 150 |   |    |
| 0,5                                           | 100    | 83  | 63   | 50   | 33   | 150  | 25 | 126  | 12 | 63   | 150 | 8  | 41   | 133 | 4 | 26   | 83  | 150 |   |    |
| 1                                             | 110    | 92  | 69   | 55   | 37   | 150  | 27 | 139  | 13 | 69   | 150 | 8  | 46   | 146 | 5 | 28   | 92  | 150 |   |    |
| 2                                             | 131    | 109 | 82   | 65   | 44   | 150  | 33 | 166  | 16 | 82   | 150 | 10 | 55   | 150 | 6 | 34   | 109 | 150 |   |    |
| 3                                             | 152    | 126 | 95   | 76   | 50   | 150  | 38 | 192  | 18 | 96   | 150 | 12 | 63   | 150 | 7 | 39   | 127 | 150 |   |    |
| 4                                             | 172    | 144 | 108  | 86   | 57   | 150  | 43 | 218  | 21 | 109  | 150 | 14 | 72   | 150 | 8 | 45   | 144 | 150 |   |    |

\*A2L pumps : sum up the 2 nozzles / A2L-Pumpen : Summe der zwei Düsen  
pompe A2L : somme des 2 gicleurs / Per la pompa A2L aggiungere n.2 ugelli

One pipe siphon feed system  
Einstranginstallation - Tank höher als Pumpe  
Installation monotube en charge  
Impianti monotubo a sifone

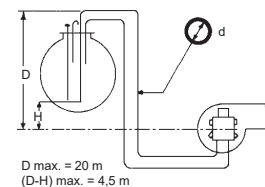


#### Two-pipe system

| Pump/Pumpe<br>Pompe/Pompa<br>Q** (l/h) |        | 35/45<br>60 |    |     |    | 55<br>77 |     |     |    | 65<br>102 |     |     |    | 75<br>130 |     |     |    | 95<br>150 |     |     |    |
|----------------------------------------|--------|-------------|----|-----|----|----------|-----|-----|----|-----------|-----|-----|----|-----------|-----|-----|----|-----------|-----|-----|----|
| H (m)                                  | d (mm) | 4           | 6  | 8   | 10 | 6        | 8   | 10  | 12 | 6         | 8   | 10  | 12 | 8         | 10  | 12  | 14 | 8         | 10  | 12  | 14 |
| 0                                      | 2      | 15          | 50 | 124 | 11 | 38       | 96  | 150 | 7  | 27        | 71  | 150 | 20 | 54        | 116 | 150 | 16 | 46        | 100 | 150 |    |
| 0,5                                    | 2      | 16          | 56 | 138 | 12 | 42       | 107 | 150 | 8  | 31        | 79  | 150 | 23 | 61        | 130 | 150 | 19 | 52        | 112 | 150 |    |
| 1                                      | 2      | 18          | 61 | 150 | 13 | 47       | 118 | 150 | 9  | 34        | 88  | 150 | 26 | 68        | 144 | 150 | 21 | 57        | 124 | 150 |    |
| 2                                      | 3      | 22          | 73 | 150 | 16 | 56       | 141 | 150 | 11 | 41        | 105 | 150 | 31 | 81        | 150 | 150 | 26 | 69        | 148 | 150 |    |
| 3                                      | 4      | 26          | 85 | 150 | 19 | 66       | 150 | 150 | 13 | 48        | 122 | 150 | 36 | 94        | 150 | 150 | 31 | 81        | 150 | 150 |    |
| 4                                      | 4      | 30          | 97 | 150 | 22 | 75       | 150 | 150 | 16 | 55        | 139 | 150 | 42 | 108       | 150 | 150 | 35 | 92        | 150 | 150 |    |

\*\*Q = pump capacity @ 0 bar / Pumpenleistung bei 0 bar  
capacité de l'engrenage à 0 bar / portata della pompa a 0 bar.

Two pipe siphon feed system  
Zweistranginstallation - Tank höher als Pumpe  
Installation bitube en charge  
Impianti bitubo a sifone



## 6.4.2 Underlying tank

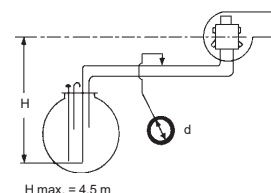
### 1-pipe system

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

### Two-pipe system

| Pump/Pumpe<br>Pompe/Pompa<br>Q** (l/h) | 35/45<br>60 |    |     |     | 55<br>77 |    |    |     | 65<br>102 |    |    |     | 75<br>130 |    |     |     | 95<br>150 |    |     |     |
|----------------------------------------|-------------|----|-----|-----|----------|----|----|-----|-----------|----|----|-----|-----------|----|-----|-----|-----------|----|-----|-----|
| H (m) \ d (mm)                         | 6           | 8  | 10  | 12  | 6        | 8  | 10 | 12  | 6         | 8  | 10 | 12  | 8         | 10 | 12  | 14  | 8         | 10 | 12  | 14  |
| 0                                      | 15          | 50 | 124 | 150 | 11       | 38 | 96 | 150 | 7         | 27 | 71 | 150 | 20        | 54 | 116 | 150 | 16        | 46 | 100 | 150 |
| 0,5                                    | 13          | 44 | 109 | 150 | 9        | 33 | 84 | 150 | 6         | 24 | 62 | 132 | 17        | 48 | 103 | 150 | 14        | 40 | 88  | 150 |
| 1                                      | 11          | 38 | 95  | 150 | 8        | 29 | 73 | 150 | 4         | 20 | 54 | 115 | 15        | 41 | 89  | 150 | 12        | 34 | 76  | 144 |
| 2                                      | 7           | 26 | 66  | 138 | 5        | 19 | 51 | 107 | 2         | 13 | 37 | 80  | 9         | 28 | 61  | 116 | 7         | 23 | 52  | 100 |
| 3                                      | 3           | 14 | 37  | 79  |          | 10 | 28 | 60  |           | 6  | 20 | 44  | 4         | 14 | 33  | 65  |           | 11 | 28  | 55  |
| 4                                      |             |    | 8   | 19  |          |    | 5  | 14  |           |    |    | 9   |           |    | 6   | 14  |           |    | 4   | 11  |

Two pipe lift system  
Zweistranginstallation - Tank tiefer als Pumpe  
Installation bitube en aspiration  
Impianti bitubo in aspirazione



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 resi-stances 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 commis- sioning 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.

## 6.5 Check oil line seals

Once the burner has been installed and commissioned, the seals of the various coupling elements should be checked.

When a leak is detected, it is usually sufficient to tighten the coupling element that is leaking.



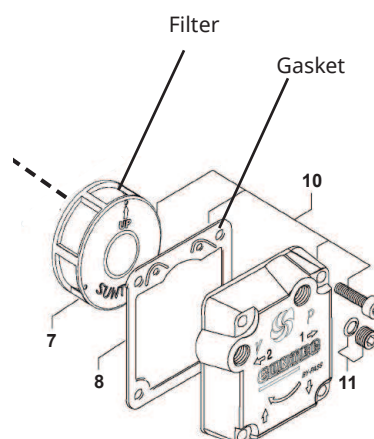
Use caution when operating the burner, surfaces may be hot.



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

## 6.6 Replacement of pump filter

1. Disconnect the main power and shut off the fuel supply.
2. Loosen the pump cover's screws.
3. Remove the filter and gasket
4. Mount new gasket and filter
5. Refit the cover
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.

## 6.7 Replacing the solenoid valve (pump)

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



Before obtaining access to electrical and fuel line components all supply circuits must be disconnected.

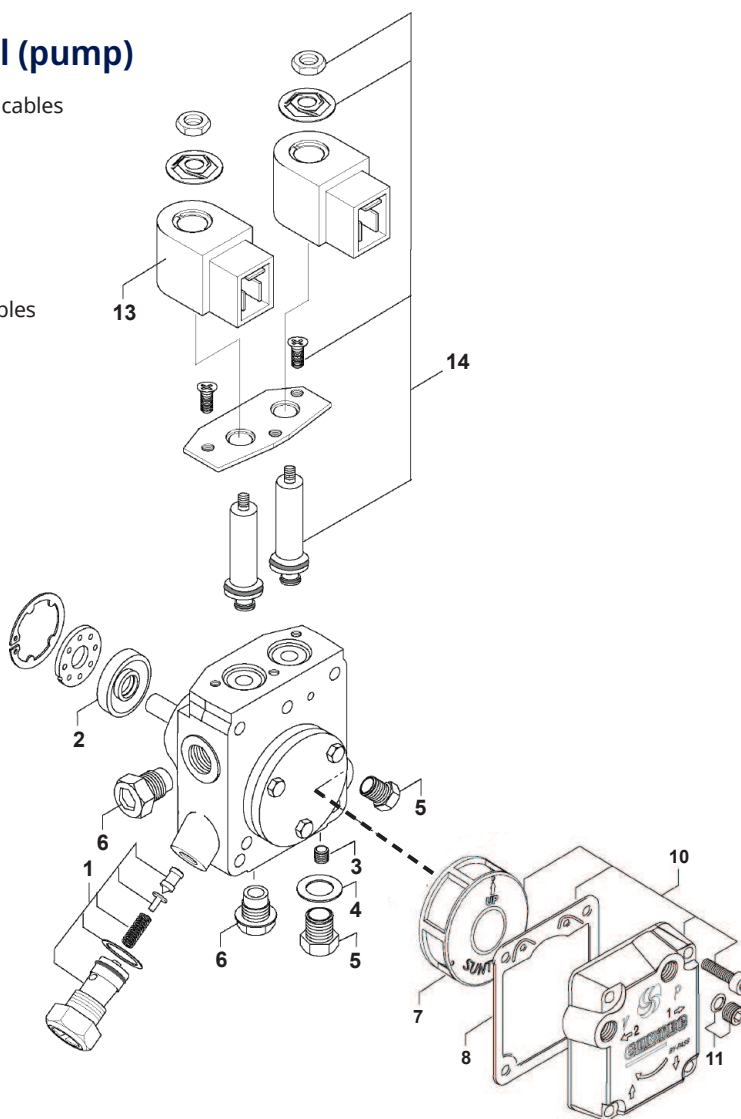
2. Disconnect the solenoid valves' electrical cables
3. Loosen the nut holding the magnet terminal
4. Loosen the screws securing the valve's mounting plate
5. Remove the valve
6. Make sure it is the right valve, NC.
7. Install the new valve and refit the other parts in the reverse order.
8. Switch on the main power and check the operation of the new component.
9. Start burner and check/adjust combustion.

## 6.8 Replacing the gasket seal (pump)

1. Disconnect hoses, oil pipes, and electrical cables
2. Loosen the pump (screw J)
3. Loosen the gasket seal's locking rings
4. Remove the old gasket seal (2)
5. Install the new gasket seal
6. Connect hoses, oil pipes, and electrical cables
7. Test run and check seals

### Oil pump component list

1. Pressure regulator kit 5 - 25 bars
2. Shaft seal kit (lip seal + protective cone)
3. By-pass plug
4. G 1/4 gasket
5. G 1/4 steel plug
6. G 1/4 plastic plug
7. Filter
8. Cover gasket
9. Cover gaskets + filter
10. "Cover + cover gasket + filter" kit
11. Pressure gauge port or vacuum gauge port screw, O-ring
- 12.
13. Coil
14. Tube assy



## 7. 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.



### 7.1 Burner Service Schedule, Oil

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

|             |                                                    |                                                    |
|-------------|----------------------------------------------------|----------------------------------------------------|
| Burner      | 1 year                                             | 3,000 h                                            |
| Filter      | 1 year replacement                                 | 3,000 h replacement                                |
| Oil hose    | 1 year inspection/replacement                      |                                                    |
| Nozzle      | 1 year replacement                                 | 3,000 h replacement                                |
| Electrodes  | Replacement/cleaning 1 year                        | Replacement/cleaning 3,000 h                       |
| Brake disc  | Replacement/cleaning 1 year                        | Replacement/cleaning 3,000 h                       |
| Motor       | 1 year                                             | 3,000 h                                            |
| Drive shaft | Check/replace in the event of damage               | Check/replace in the event of damage               |
| Fan wheel   | "1 year<br>Replace if need for cleaning/imbalance" | "3000 h<br>Replace if need for cleaning/imbalance" |
| Oil filter  | Once a year                                        | 3,000 h replacement                                |
| Oil valve   | Tightness check once a year                        | Replace if leakage detected                        |

### 7.2 Component replacement intervals

| Components                       | Service life - Recommended replacement | Service life - Recommended replacement Operating cycles |
|----------------------------------|----------------------------------------|---------------------------------------------------------|
| Control system                   | 10 years                               | 250,000 cycles                                          |
| Pressure switch                  | 10 years                               | 250,000 cycles                                          |
| Ignition system with flame guard | 10 years                               | 250,000 cycles                                          |
| UV flame sensor                  | 10,000 h                               | N/A                                                     |
| Damper motor                     |                                        | 500,000 cycles                                          |
| Contactor                        | 10 years                               | 500,000 cycles                                          |



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

## 7.3 Combustion device

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



Before obtaining access to electrical and fuel line components all supply circuits must be disconnected.

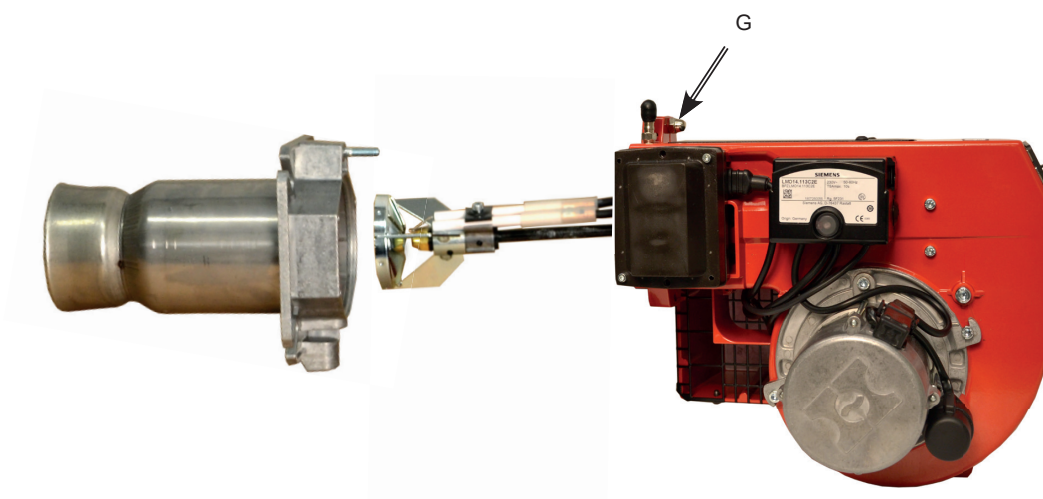
2. Loosen nut (G) and lift fan housing off fixing flange.
3. Remove brake plate and electrode holder from the oil tube and clean.
4. Replace nozzle.
5. Clean or replace brake plate.
6. Check ignition electrodes, replace if necessary (see Technical data for adjustment).
7. Fit brake plate and electrode holder, (see Technical data for adjustment).
8. Check flame tube and clean if necessary.
9. 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.
10. Refit fan housing and fixing flange, lock with nut (G).
11. Switch on the main power and open the fuel supply.
12. Start burner and check/adjust combustion.



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



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.

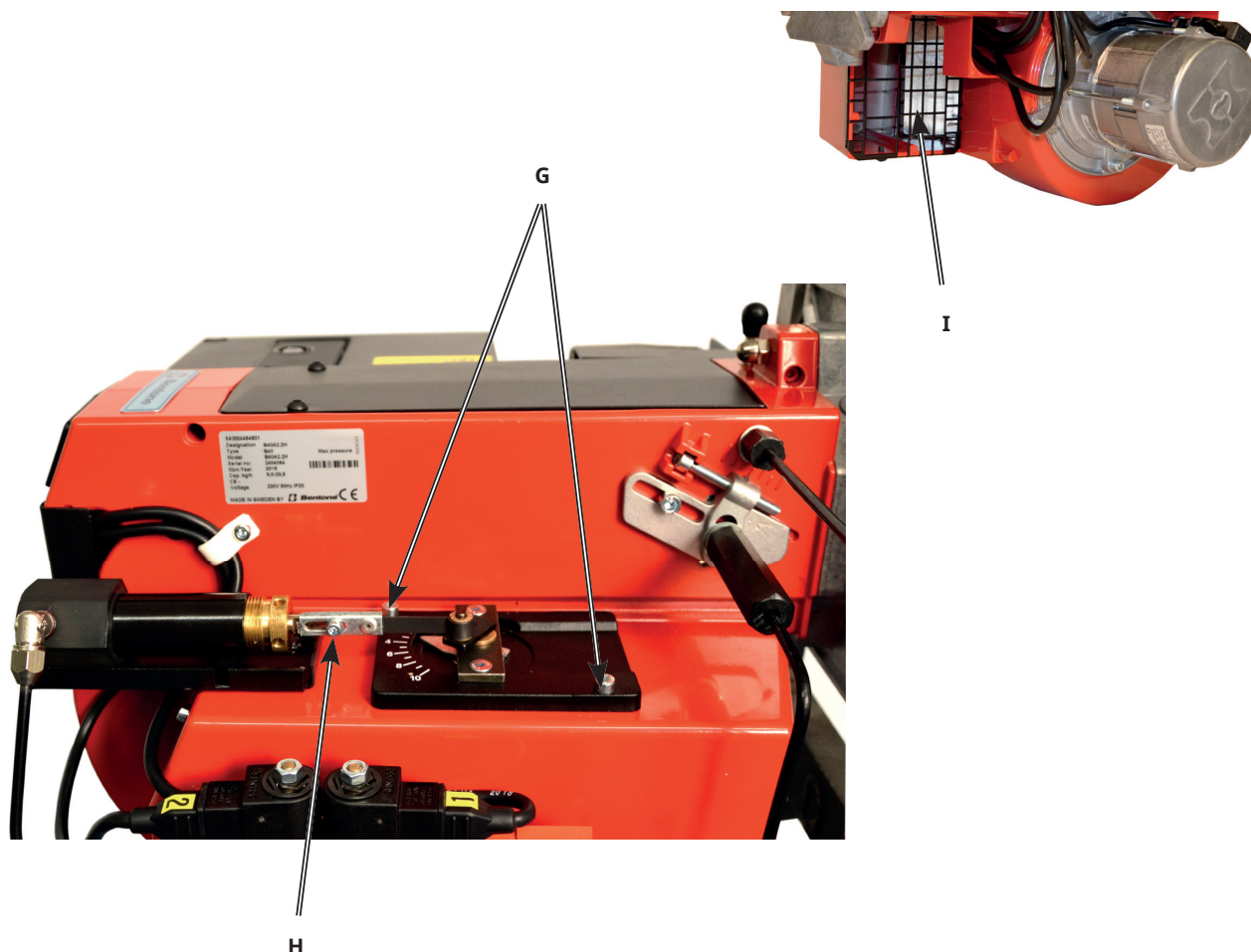
## 7.4 Air damper

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



Before obtaining access to electrical and fuel line components all supply circuits must be disconnected.

2. Note the setting of the air damper and loosen the regulator locking screw (H).
3. Loosen screws (G), set scale to 7 and lift up.
4. Remove the intake grille at the air intake.
5. Clean the air damper and air intake (I), lubricate the damper shaft if necessary.
6. Refit air damper and regulator.
7. Refit the intake grille.
8. Switch on the main power and open the fuel supply.
9. 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.

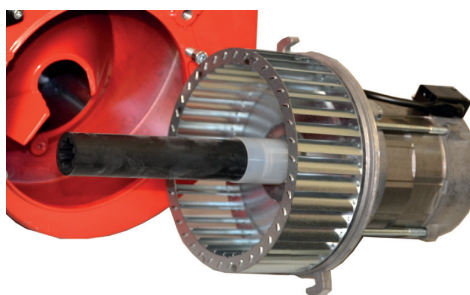
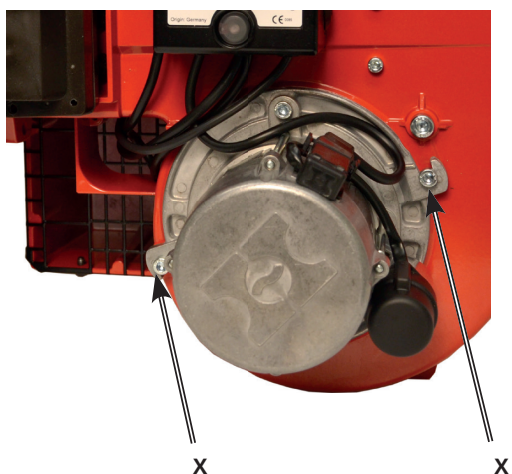
## 7.5 Fan

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



Before obtaining access to electrical and fuel line components all supply circuits must be disconnected.

2. Loosen the motor electrical connection and screws (X) enough to turn and lift out the motor.
3. Check the fan wheel attachment and any skew, replace if damaged.
4. Clean or replace the fan wheel.
5. Refit the parts, making sure that the drive shaft is correctly connected at both ends.
6. Switch on the main power and open the fuel supply.
7. Start burner and check/adjust combustion.



### 7.5.1 Replace drive shaft

1. Disconnect the main power and shut off the fuel supply.
2. Loosen the motor electrical connection and screws (X) enough to turn and lift out the motor.
3. Remove drive shaft and drive coupling from motor.
4. Replace drive shaft coupling on pump.
5. Refit coupling, pump and motor, making sure drive shaft is connected correctly at both ends.
6. Switch on the main power and open the fuel supply.



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

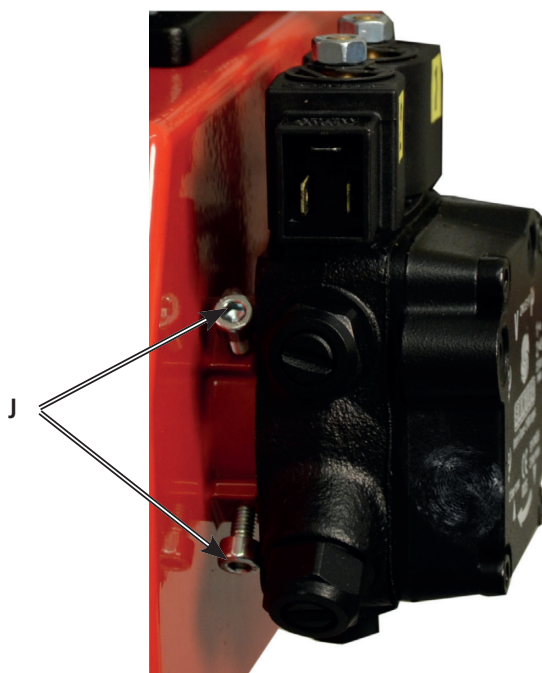
## 7.6 Replace oil pump

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



Before obtaining access to electrical and fuel line components all supply circuits must be disconnected.

2. Disconnect hoses, connection pipes and electrical connection from pump.
3. Loosen screws (J) and pull out oil pump.
4. Fit new pump coupling.
5. Refit the pump, making sure that the drive shaft is correctly connected at both ends.
6. Refit hoses, connection pipes and electrical connection.
7. Switch on the main power and open the fuel supply.
8. Bleed the pump.
9. 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.

## 13.9 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.



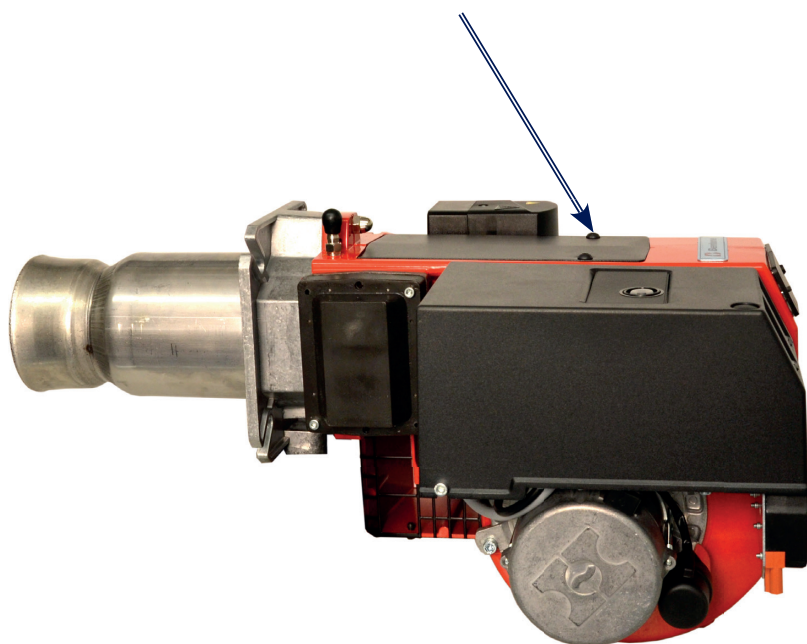
When servicing/replacing components that affect combustion, flue gas analysis and soot test must be carried out following installation.

## 7.8 Vibrations

Maximum permitted vibration level is 5.0 mm/s.

- Check tightness of fasteners.
- Check fan wheel for damage and contamination (replace if necessary).
- Check motor shaft and bearings. If they are worn, replace the motor.

Use screw to attach the  
vibration sensor.



## 8. Fault Location

### 8.1 Burner will not start

| Symptom               | Causes                                    | Remedies                                                                                                       |
|-----------------------|-------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| Motor starts          | Unstable flame                            | Adjust the damper                                                                                              |
| Burner pre-ventilates | Excess air                                | Check the oil pressure                                                                                         |
|                       | Low oil pressure                          | Check the nozzle in relation to the combustion apparatus dimensions and the ignition electrode position        |
| Flame formed          | Incorrect combustion apparatus settings   | Check the flame monitor is clean and can register light                                                        |
| Burner trips          |                                           | Check with using new photocell                                                                                 |
| Motor starts          | Flame monitor does not register light     | Check using new oil burner control (Note: replacement of photocell recommended if oil burner control replaced) |
| Burner pre-ventilates | Defective flame monitor                   | Check the oil supply to the burner and that there are no air bubbles in the pump                               |
| No flame formed       | Defective oil burner control              | Check function of solenoid                                                                                     |
| Burner trips          |                                           | Check flame monitor does not register ambient light                                                            |
|                       | No oil                                    | Check high voltage wiring and ignition electrodes                                                              |
|                       | False light                               | Check preheater function                                                                                       |
|                       | No spark                                  |                                                                                                                |
| Motor does not start  | Preheater does not get up to temperature. |                                                                                                                |

### 8.2 Burner will not start after normal use

| Symptom               | Causes                                        | Remedies                                                                                                  |
|-----------------------|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| Burner does not start | Fuse blown                                    | Check and replace fuse as necessary. Investigate cause of fault                                           |
|                       | Boiler thermostat has not reset               | Adjust thermostat                                                                                         |
|                       | Preheater does not get up to temperature      | Check preheater function                                                                                  |
| Burner pre-ventilates | Overheating protection has deployed           | Reset the overheating protection. Investigate the cause of its deploying. Remedy fault                    |
|                       | Defective preheater                           | Check by replacing with new                                                                               |
|                       | Defective oil burner control or flame monitor |                                                                                                           |
| Burner stops          | No oil supply                                 | Check that tank, oil lines, solenoid valves, pump and nozzle are in good condition                        |
|                       | Too great a pressure drop at brake plate      | Adjust the burner                                                                                         |
|                       | Too strong draught prevents flame forming     | Correct the boiler draught                                                                                |
|                       | No spark                                      | Check the ignition transformer. Check the ignition electrode settings and ceramics                        |
|                       | Preheater temperature too low                 | Check preheater function                                                                                  |
|                       | New oil type                                  | Adjust the preheater's set operating temperature                                                          |
|                       |                                               | Check that the oil used has the physical parameters that the burner is rated for. If not, change the oil. |

## 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<br>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<br>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     | Insufficient negative pressure on the suction side pump | Check the oil system in order to reduce pressure drop                                                     |
| The burner pump emits noise during operation |                                                         | 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

| Symptom                                   | Causes                                                           | Remedies                                                                                                                               |
|-------------------------------------------|------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| The burner pump can not build up pressure | No oil                                                           | Check that there is oil and that it reaches the pump                                                                                   |
|                                           | Oil viscosity too low                                            | Check that the oil reaching the pump has the physical parameters that the pump can handle. Change the oil or the pump's oil parameters |
|                                           | Pump worn                                                        | Replace the pump                                                                                                                       |
|                                           | Pump run using impure oil that has worn the pump out prematurely | Replace pump and install self-cleaning filter in the oil system                                                                        |
|                                           | Blocked pump filter                                              | Check, clean pump filter                                                                                                               |

## 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 <sub>2</sub>      |        |        |        |
| O <sub>2</sub>       |        |        |        |
| NOx                  |        |        |        |
| CO                   |        |        |        |
| Flue gas temp. °C    |        |        |        |
| Setting brake disc   |        |        |        |
| Setting Air damper   |        |        |        |
| Pump pressure<br>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](http://www.bentone.com)

Manufacturer: Enertech AB  
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SE-341 34 LJUNGBY  
Sweden

Ljungby, 2023-05-04

Joachim Hultqvist  
Technical Manager  
Enertech AB

Ola Karlsson  
Quality Manager  
Enertech AB

## 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**

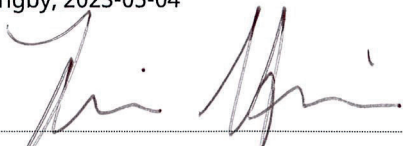
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