DZ 2 - DZ 4

Installation-Operation-Maintenance
Date: 11.09.2006

Light oil pressure pulverizer
Fuel oil EL as per DIN 51 603, part 1

MHG Heiztechnik GmbH

Contents

Safety instructions – Please observe!

Please comply with the assembly, operation and maintenance instructions for installing and adjusting the light oil pressure pulverizer!

Please read this installation manually carefully before starting installation. We cannot assume any liability or guarantee for damage caused by failure to comply with this installation manual!

Work which is not carried out properly can cause injury to persons or damage to property!

Work on the heating system

- Installation, commissioning, maintenance and servicing work may only be carried out by an authorised firm of heating contractors.

When working on burner and boiler

- switch off the heating system emergency switch and secure it to prevent it being switched on again.
- shut off the oil feed pipe and secure it to prevent it being opened unintentionally.

This symbol refers to instructions which must be heeded for your own safety and that of other people, and to avoid damage to property.

This symbol refers to instructions which must be heeded for the rocket burner® to operate safely and function correctly. It also draws attention to statutory regulations which need to be observed.

1. Standards and regulations

1.1 Standards and regulations

The following standards and regulations are to be observed during installation and operation of the burner.

HeizAnlV
Heating system ordinance

FeuVo
Firing ordinance of the German federal states

1. BImSchV
First ordinance for implementation of the German Emission Protection Law

VDI 2035
Guidelines for preventing damage from corrosion and scale formation in hot water heating installations

VDE
Regulations and special requirements issued by the energy utility companies

EN 303, Part 1 and Part 2
Heating boilers with forced draught burners

EN 60335, Part 1
Safety of household and similar electrical appliances

DIN 4705
Calculating the dimensions of chimneys

DIN 4751
Hot water heating installations – safety requirements

DIN 4755
Oil firing installations – construction, execution, safety requirements

DIN EN 267
Automatic forced draught burners for liquid fuels – definitions, requirements, construction and testing

DIN 51603, Part 1
Fuel oils extra light

DIN 57116
Electrical equipment of firing installations

Please comply with the valid regional building code.

1.2 Exhaust system and effective heat demand

Boiler, burner and exhaust system (chimney) constitute an operating unit; account must be taken of low exhaust temperatures when reducing the output.

For exhaust temperatures below 160°C, the system must be designed so as to avoid damage from **condensation**.

It is advisable to install **draught limiters** (secondary air systems) to achieve stable combustion values under varying conditions and to reduce possible humidity in the chimney. These should be installed in the chimney where possible, to avoid any noises in the flue pipe.

1.3 Nozzle selection

Please note that trouble-free and low-pollution combustion can only be achieved with nozzles which are rated to the burner. The nozzles stated in chapter 7.1 are certified for light oil pressure pulverizer DZ 2 - DZ 4 and should be used accordingly.

2.1 Modern concept

The oil burners DZ 2 – DZ 4 are fully automatic oil pulverizers in monobloc design, made and tested to DIN EN 267 respectively DIN 4787.

The burners are equipped with automatic oil firing units for intermittent operation to DIN EN 230 respectively DIN 4787; automatic units for continuous operation are available on request.

The two-stage burners of this series consist of overpressure burners with very high fan pressing and steep characteristic curve. Together with the variable adjustment of the air intake nozzle, these features mean that these burners are ideal equally for modern U-fired heavy-duty boilers or for older natural draft boilers.

Advantages of the modern design: Load stages 1 and 2 are achieved with only one oil nozzle and two different oil quantities. Nozzle and baffle plate are fitted symmetrically in every operating state.

The performance spread of 70:100 guarantees adequate graduation of the two load stages and also safeguards an adequate exhaust temperature even in the small load stage.

2.2 Two-stage burners DZ 2 und DZ 3

Housing of die cast light metal, output-dependent burner pipes with adjustable nozzle connection, mixing system, AC motor (DZ 2 to DZ 3.0) respectively three phase motor with motor contactor (DZ 3.1 and DZ 3.2), ignition transformer, fan wheel, adjustable air intake nozzle and throttle actuator for two-stage operation, oil pump with two separately adjustable pressure ranges, solenoid valves, joint nozzle for stage 1 and 2, oil hoses, automatic oil firing unit with photo resistance, connection plug and fitting flange with fastening screws.
Burner heat-tested.

2.3 Two-stage burner DZ 4 with return nozzle

Housing of die cast light metal, output-dependent burner pipes with adjustable nozzle connection, mixing system, three phase motor with motor contactor, ignition transformer, fan wheel, adjustable air intake nozzle and throttle actuator for two-stage operation, oil pump, return pressure controller, solenoid valves, return nozzle for stage 1 and 2, oil hoses, automatic oil firing unit with photo resistance, connection plug and fitting flange with fastening screws.
Burner heat-tested.

2.4 Modern design

There are constructional advantages in using a modern, symmetrically designed combustion system with only one nozzle.

The symmetrical arrangement of nozzle and mixing system/baffle plate means that in two-stage operation with corresponding oil pressures and settings of the oil throttle, optimum combustion values can be achieved with almost soot-free operation.

Two-stage operation is achieved in DZ 2 and DZ 3 by adjusting the oil pressure in the range from 10 to 25 bar.

Two-stage operation in oil burner DZ 4 is achieved by adjusting the return pressure.

The resulting performance spread of 70:100 allows precise adjustment to current heating needs, taking account of the tolerable exhaust temperature.

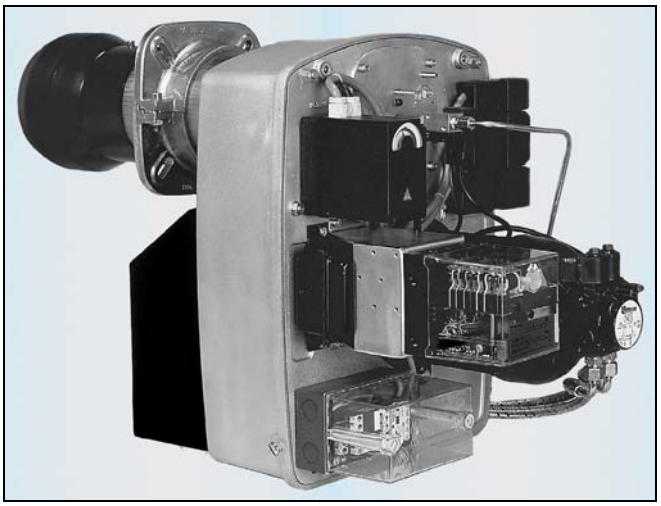


Fig. 1:

3.1 Simple installation

The clear arrangement of all parts and complete equipment with output-related nozzles and oil hoses makes it easy for the engineer to install. In the individual burner sizes (e.g. DZ 2.1-2110 to DZ 2.1-2140), the burner output can be adjusted by changing the nozzle and correcting the adjustment dimensions. The burners are ready wired to connection plugs. The necessary burner head length can be easily adjusted by a clamping flange. All maintenance work can be carried out with a minimum of tools.

The quality of the equipment, solid workmanship and a comprehensive system of production controls and subsequent heat testing guarantee a uniformly high production standard.

3.2 Instructions for using the burner

The oil-burners DZ 2 - DZ 4 are basically suitable for use in commercially available heating boilers (intermittent operation) for heating residential buildings and for service water. Product development and the test procedures have been geared to the operating conditions of these systems.

⚠ The areas of application listed below make particular requirements with special operating conditions for the burner, so that MHG Heiztechnik reserves the right to issue explicit approval in these cases:

- **dark radiators**
- **baking ovens**
- **annealing furnaces**
- **drying chambers**
- **industrial applications**

MHG Heiztechnik should also be consulted for installations with above average firing chamber or temperature loads.

⚠ In the case of rooms where the air must be expected to be contaminated by halogenated hydrocarbons, e.g. hairdressers, printers, chemical dry cleaners, laboratories, etc. the burners must only be operated if suitable measures are taken to ensure that there is an adequate supply of uncontaminated combustion air.

Always consult MHG Heiztechnik if in any doubt.

⚠ The burners must not be operated in rooms with high dust levels or high humidity (e.g. laundries). The heating room must be protected from frost and well aired.

Failure to comply with these instructions renders the warranty null and void for any damage resulting from one of these causes.

4.1 Operation and adjusting

Every burner is pre-set and heat-tested. The basic setting can be seen in chapter 7.1. The following instructions should be observed when making adjustments:

Only a qualified engineer may proceed with adjustments and initial commissioning. The oil pressure is adjusted at the oil pump; see section "adjusting the oil pressure".

When adjusting the burner, it is advisable to measure the air pressure before the baffle plate (see table values for air pressure in chapter 7.1). The measuring fitting is located next to the nozzle connection on the flange cover.

The combustion air can be adjusted in three ways:

a. Adjusting the air intake nozzle; adjustment according to burner output and local conditions:
   - position 0 - 5 (0 - 1) for natural draft boilers
   - position 6 - 9,5 (2 - 4) for counter-pressure boilers

b. Adjustment of the baffle plate in the burner pipe (see table basic setting); in this way, the air velocity in the combustion head and the flame form can be adjusted to the combustion chamber conditions.

c. Adjustment of the air throttle for the 1st and 2nd stage via cam switch for stage 1 (blue) and stage 2 (orange); turn to the left to reduce the air flow and to the right to increase the air flow. In-adequate air flow in stage 1 is changed as follows:
   - Adjust the cam switch (blue) upwards (more air)
   - Briefly switch over to stage 2 on boiler thermostat 2. After switching back, the actuator turns back to the required position.

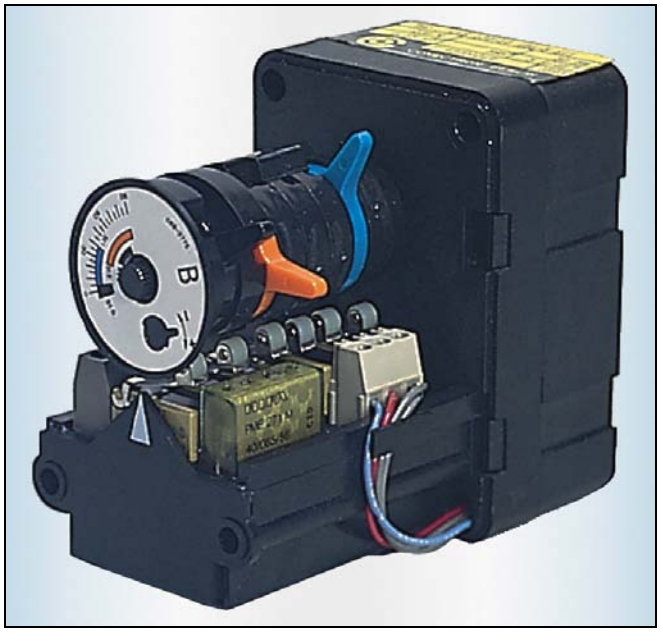


Fig. 2:

For too much air flow in stage 1 or inadequate flow in stage 2, adjust the corresponding cam switch. To reduce too much air flow, adjust the cam switch (orange) accordingly. Close the actuator briefly by changing over to the second stage at the controller, or pulling the green 4-pole connector, and then return to the operating state.

The long black cam switch can be used to change the switching point for the 2nd solenoid valve (stage 2). When the burner is switched off normally and because of faults, the air throttle can be brought to the closed position by using the actuator cam switch (black, short).

4.2 Air intake nozzle

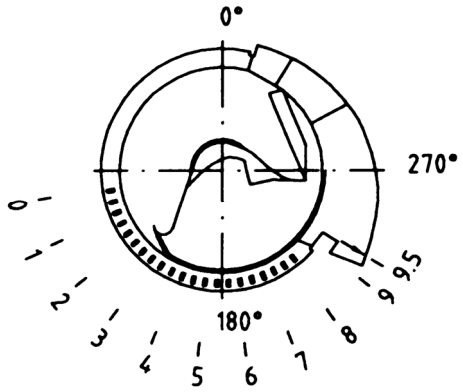


Fig. 3: Adjusting the air intake nozzle for DZ 2 and DZ 3:

The intake nozzle can be adjusted after opening the burner. For this purpose, the two screws of the air intake nozzle should only be loosened and then tightened again after the adjustment has been made.

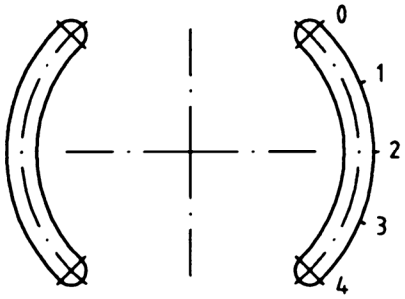


Fig. 4: Adjusting the air intake nozzle for DZ 4

The air intake nozzle can be adjusted after switching off the burner and hinging down the suction silencer. The two screws of the air intake nozzle should only be loosened and then tightened again after the adjustment has been made.

4.3 Adjusting the oil pressures DZ 2 to DZ 3

If no oil is supplied when oil is sucked in for the first time, this must be interrupted after max. 3 minutes to avoid **damage to the pump.** The operating condition has been achieved once the oil filter is filled with oil.

The oil pressure is adjusted at the oil pump.

For DZ 2 and DZ 3 at the adjustment screws
P_1 (upper screw = low pressure = stage 1) and
P_2 (lower screw = high pressure = stage 2).

The adjustment screws are located on the pump cover or on the side of the pump, depending on pump type.

The pressure in stage 1 must always be lower than in stage 2.

V = vacuum
P = oil pressure

Never turn the setting screw before venting the pump!

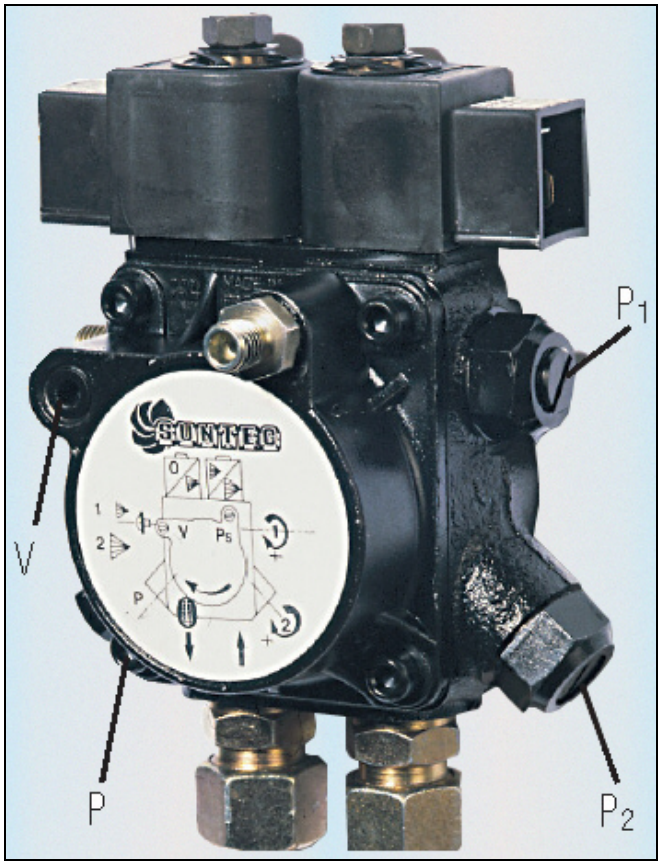


Fig. 5:

4.4 Adjusting the oil pressures DZ 4

If no oil is supplied when oil is sucked in for the first time, this must be interrupted after max. 3 minutes to avoid **damage to the pump.** The operating condition has been achieved once the oil filter is filled with oil.

When changing the oil flow, first the oil pressure P_2 (main flow) should be adjusted at the pump, as this also changes the oil pressure P_1. Once the oil flow of stage 2 is correct, stage 1 must also be checked. If it is necessary to change the oil flow of stage 1, the oil pressure P_1 (stage 2) can be adjusted at the oil pressure controller:

For example, an increase of the return pressure P_1 from 9 bar to 10 bar increases the oil flow in stage 1. A decrease has the opposite effect. But the oil pressure P_1 at the oil pressure controller should not be adjusted under 9 bar. The oil flow should not be checked (e.g. by gauging the capacity by litres) until the boiler thermostats have switched over several times between stage 1 and 2.

4.5 Control of the solenoid valves in DZ 4

All solenoid valves are closed for the program start of the automatic oil firing units. At the end of the pre-airing phase and at the start of ignition, all solenoid valves are opened so that a certain oil flow can flow back via the oil burner return pipe and is not burnt. After the boiler has demanded heat, the actuator for the air throttle moves to stage 2. On the way, the cam switch (black, long) is closed. This contact makes a relay close the solenoid valve of the return pipe, and the oil flow of stage 2 is conveyed to the combustion process (see also chapter 4.7 “Return nozzle technology”).

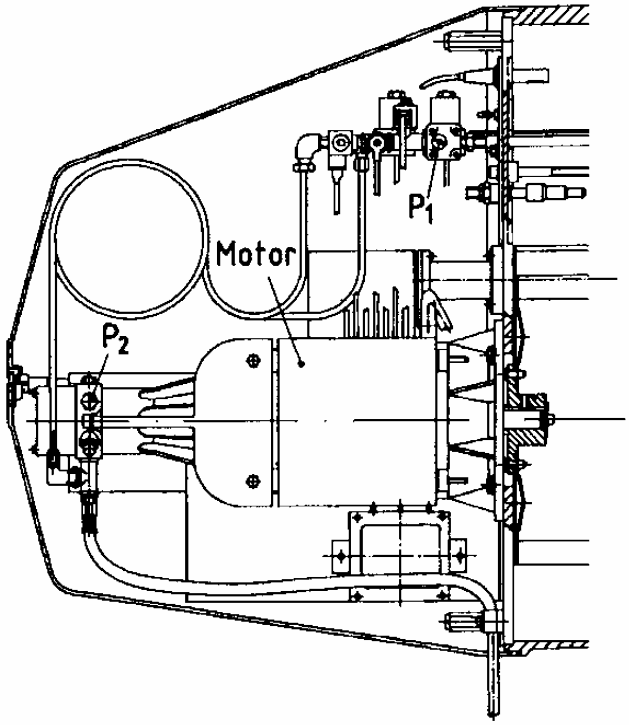


Fig. 6:

4.6 Adjustment dimensions

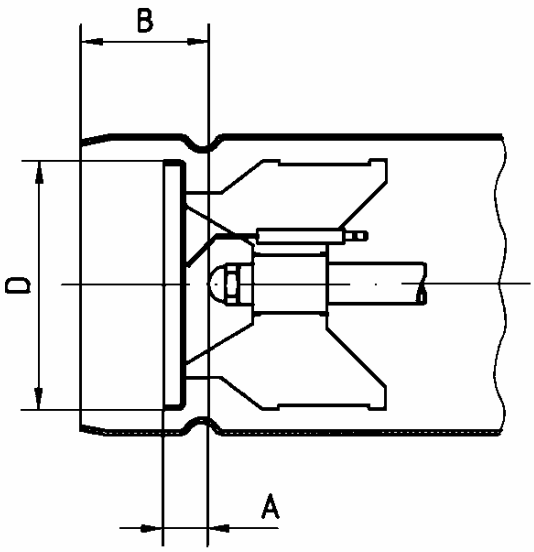


Fig. 7: Adjustment dimensions DZ 2.1, DZ 2.2 und DZ 3.0

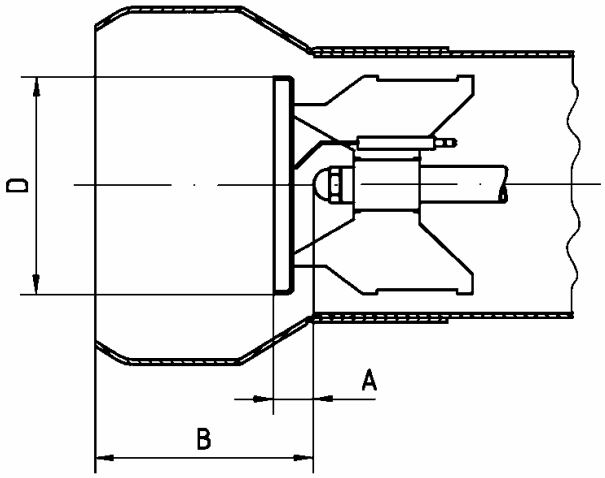


Fig. 8: Adjustment dimensions DZ 2.3, DZ 3.1, DZ 3.2 und DZ 4

4.7 Return nozzle technology

In the return nozzle technology, the oil flows of load stages 1 and 2 are achieved via a return nozzle and two different oil pressures.

The oil flows can be adjusted at the oil pump (P_2 = stage 2) and at the pressure controller (P_1 = stage 1) in the return pipe (see Fig. 9).

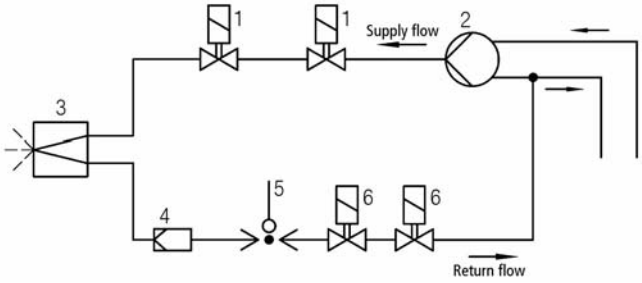


Fig. 9: Legend: 1 solenoid valve
2 oil pump
3 return nozzle
4 pressure controller
5 pressure switch
6 solenoid valve

The pressure in the pipes between oil pump and oil filter may not exceed 2 bar.

4.8 Ignition electrode setting

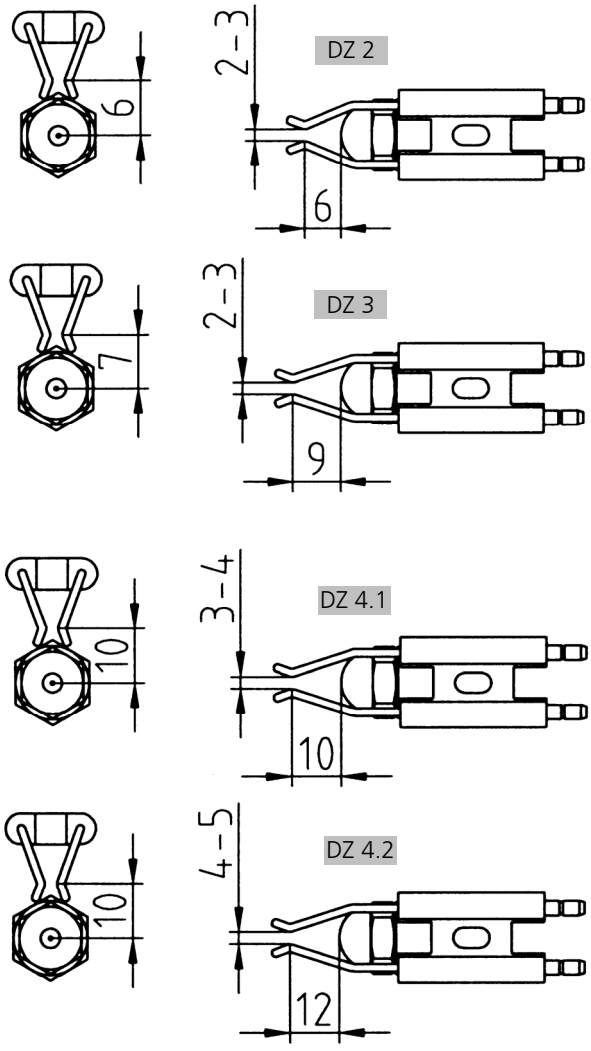


Fig. 10:

5.1 Maintenance and service

On the basis of statutory regulations, it is recommended for oil firing systems to be serviced by a qualified engineer every twelve months. The burner settings and functions must be checked, the burner cleaned (fan wheel, mixing system, ignition system) and the nozzle replaced if necessary. The bearing assembly of the air throttle axis in DZ 4 is to be oiled (see Fig. 13).

The oil hoses should be checked every year and replaced after 5 years.

In order to carry out maintenance work, the housing cover with the function parts can be separated from the burner housing by loosening the attachment screws, pulled out and hung in the service position (DZ 2 – DZ 3).

In DZ 4, the nozzle connection can be removed separately after disconnecting the ignition cable connector, loosening the ionisation cable and unscrewing the flange cover screws.

Before pulling the nozzle connection out, always ensure that the actuator has been returned to the closed position.

Check screwed unions for leaks during annual maintenance. Replace defect or worn seals.

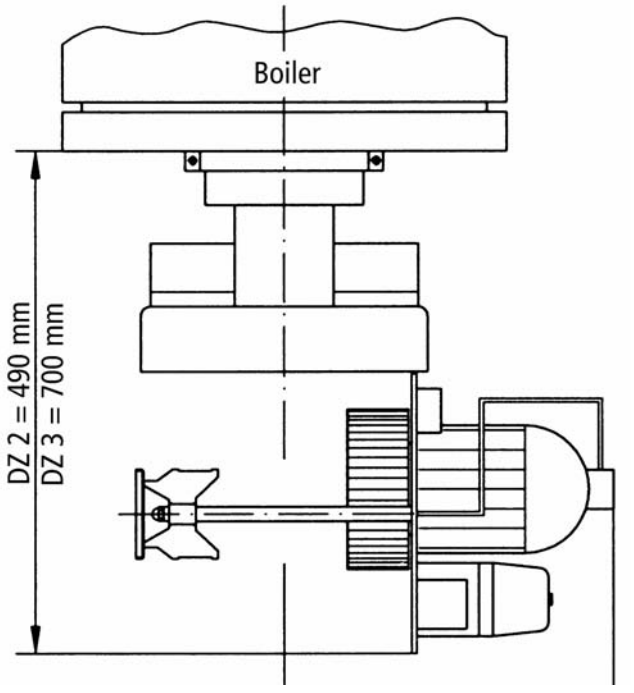


Fig. 11: Burner in service position

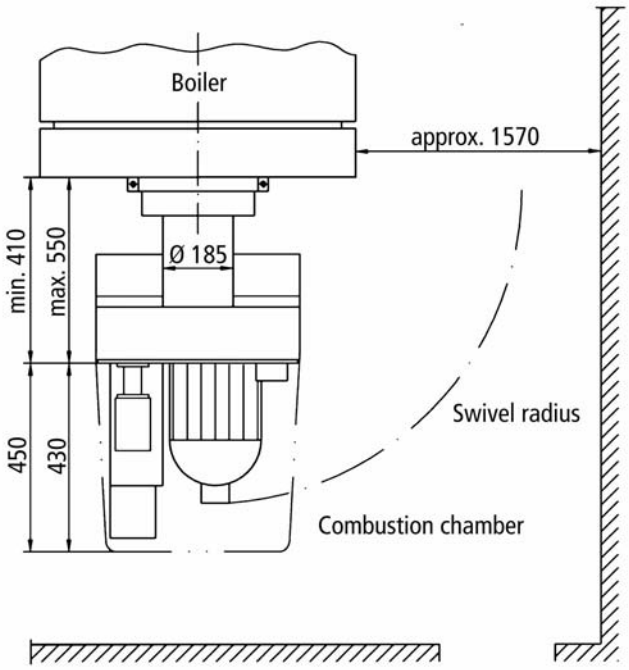


Fig. 12: Combustion chamber dimensions for DZ 4

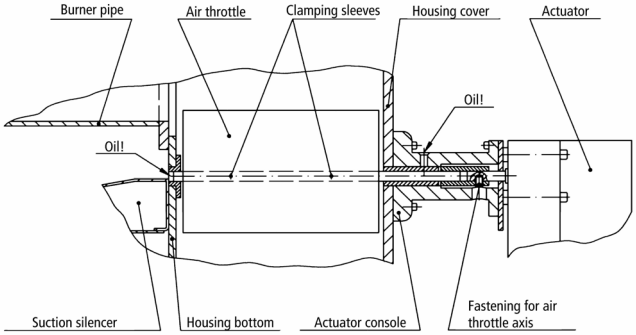


Fig. 13: Air throttle bearing assembly DZ 4

6. Troubleshooting DZ 2 - DZ 4 / 110 - 1450 kW

6.1 Troubleshooting

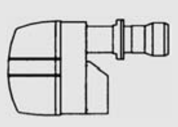
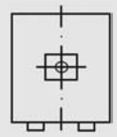
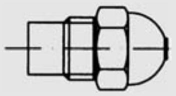
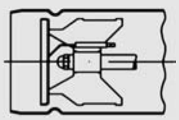
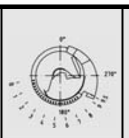
Check general operating status. Are the stated values maintained?

Fault	Cause	Remedy
Burner does not work	Power failure. Control chain closed?	Check main switch and fuses, operating switch, STB, TR
		Check burner motor and capacitor (DZ 2 - DZ 3.0), replace if necessary.
	Automatic firing unit defect.	Replace firing sequence controller
Burner starts, oil sight glass at oil filter remains empty	Plug not removed or incorrect connection during initial commissioning.	Check oil hoses in case bung not removed, check that correctly connected
	Oil pipe was not filled during initial commissioning; it takes several minutes for the oil to be sucked in.	Fill oil pipe before initial commissioning. ⚠ **Do not let the oil pump run for longer than 3 minutes without oil!**
	Fuel oil in oil tank? Suction pipe valve open?	Check oil tank display and valve in suction pipe.
	Wrong direction of flow at check valve.	Check direction of flow at check valve.
	Oil pump not working.	Check and possibly replace electric connection.
	Coupling between motor and oil pump defect	Replace coupling.
	Leaking suction pipe or vacuum too high.	See rating the oil pipe (chapter 7.5)
	Oil pipe squashed.	Check oil pipe, replace if necessary.
	Separate valve, e.g. valve outside tank closed	Open corresponding valve. Check routing of oil pipe.
Burner starts, oil level glass filled, ignition stays off, system shuts down	Ignition transformer or cable not OK.	Replace ignition transformer or cable.
	Extremely worn ignition electrodes or damaged insulators.	Replace spark electrodes.
	Incorrect setting of ignition electrodes.	Correct setting of ignition electrodes as per settings (see chapter 4.8).
	Incidence of secondary light at flame monitor	Prevent incidence of secondary light at flame monitor
	Firing sequence controller damaged.	Replace firing sequence controller

6. Troubleshooting

Fault	Cause	Remedy
Burner starts, spark visible, flame does not ignite or burner switches off during ongoing operation	Oil solenoid does not open.	Replace oil solenoid coil, check electrical connection cable.
	No passage through oil pipe, pre-heater and nozzle.	Check that oil pipe, pre-heater and nozzle are not blocked, replace if necessary
	Oil pump delivers no oil, oil tank empty.	Check oil pump and oil tank display, replace respectively top up tank if necessary.
	Filter in nozzle clogged.	Replace nozzle.
	Suction pipe leaks.	Check suction pipe, tighten unions
	Suction pipe not vented.	Vent suction pipes at pump pressure gauge connection.
	Mixing device clogged.	Check and possibly clean mixing device.
	Burner setting not OK.	Check and possibly correct burner setting.
Burner works, flame monitoring does not start.	Flame monitor clogged or defect.	Check resp. clean flame monitor. Measure sensor current.
	Defect cable connection between flame monitor and automatic firing unit.	Replace cable connection resp. flame monitor.
	Firing sequence controller damaged.	Replace firing sequence controller
Injection or burning continues after burner has shut down	Oil pipes inadequately vented.	Remedy by venting
	Leak in oil suction pipe with intake of air.	Check all sealing points in the oil piping.
	Solenoid does not close properly.	Solenoid defect.

7.1 Basic settings table and adjustment dimensions DZ 2 - DZ 4

												
Burner type	**Burner order no.**	**Suitable for boiler output kW**	**Nozzle / Make / Type USG**	**Size A mm**	**Size B mm**	**Size D mm**	**Air pressure St. 1 mbar**	**Air pressure St. 2 mbar**	**Oil pressure St. 1 bar**	**Oil pressure St. 2 bar**	**Air intake nozzle**	**Total weight kg**
DZ 2.1	-2110	110 - 130	Steinen 2,00 60°S	21	49	95	3,0	4,5	13	25	4	20
	-2120	130 - 150	Steinen 2,25 60°S	21	48	95	3,0	4,5	13	25	4,5	20
	-2130	150 - 170	Steinen 2,50 60°S	21	47	95	3,0	5,4	13	25	7,5	20
	-2140	170 - 200	Steinen 3,00 60°S	21	47	95	3,5	7,0	13	25	9,5	20
DZ 2.2	-2210	190 - 230	Steinen 3,50 60°S	21	44	95	3,2	5,8	13	25	9,5	20
	-2220	220 - 260	Steinen 4,00 60°S	21	43	95	3,5	6,5	13	25	9,5	20
DZ 2.3	-2310	250 - 290	Steinen 4,50 60°S	21	68	105	3,7	6,8	13	25	9,5	20
	-2320	290 - 315	Steinen 5,00 60°S	21	60	105	3,7	6,0	13	25	9,5	20
DZ 3.0	-3060	260 - 290	Steinen 4,50 60°S	21	62	114	4,0	7,5	17	27	2,2	45
	-3070	290 - 315	Steinen 5,00 60°S	21	62	114	5,0	8,5	17	27	3,5	45
DZ 3.1	-3150	315 - 360	Steinen 5,50 60°S	20	125	130	6,8	11,5	13	20	4	45
	-3160	360 - 420	Steinen 6,50 60°S	20	120	130	8,0	12,5	15	23	6	45
	-3170	420 - 500	Steinen 7,50 60°S	20	115	130	8,6	13,5	14	22	7,5	45
	-3180	450 - 520	Steinen 8,00 60°S	20	110	130	8,8	13,5	14	24	7,5	45
DZ 3.2	-3260	520 - 580	Steinen 9,00 60°S	20	100	134	8,8	14,0	14	26	7,5	45
	-3270	570 - 630	Steinen 10,00 60°S	20	95	134	8,0	13,0	13	25	7,5	45
	-3280	600 - 670	Steinen 11,00 60°S	20	90	134	9,0	13,0	14	23	7,5	45
	-3240	650 - 740	Steinen 11,00 60°S	20	95	134	4,5	13,0	13	25	8	45
DZ 4.1	-4120	685 - 740	CB 65 kg A3 60°	20	117	175	8,0	17,0	Return pressure (P1): stage 1 at 20 bar approx. 9 bar, at 30 bar approx. 16 bar	pump pressure (P2): between 20 and 30 bar	0	95
		710 - 810	CB 70 kg A3 60°	20	116	175	8,0	17,0			0	95
		760 - 860	CB 75 kg A3 60°	20	111	175	10,5	16,5			0	95
		810 - 950	CB 80 kg A3 60°	20	111	175	11,0	22,0			2,5	95
		950 - 1030	CB 90 kg A3 60°	20	100	175	14,0	23,0			3	95
DZ 4.2	-4220	1030 - 1110	CB 100 kg A3 60°	20	111	175	14,0	19,0			0	95
		1110 - 1260	CB 110 kg A3 60°	20	100	175	13,0	22,0			3	95
		1260 - 1335	CB 120 kg A3 60°	20	96	175	13,0	22,5			3,5	95
		1335 - 1450	CB 130 kg A3 60°	20	95	175	13,0	22,0			3,5	95

7.2 Electrical connection

Burner type	Motor-voltage	Motor-output	Connection value
DZ 2	230 V WS 50 Hz	0,25 kW	0,37 kW, ca. 1,9 A
DZ 3.0	230 V WS 50 Hz	0,45 kW	0,7 kW, ca. 3,2 A
DZ 3.1	400 V DS 50 Hz	1,1 kW	1,4 kW, ca. 3,0 A
DZ 3.2	400 V DS 50 Hz	1,1 kW	1,4 kW, ca. 3,0 A
DZ 4.1	400 V DS 50 Hz	3,0 kW	3,8 kW, ca. 6,5 A
DZ 4.20	400 V DS 50 Hz	3,0 kW	3,8 kW, ca. 6,5 A

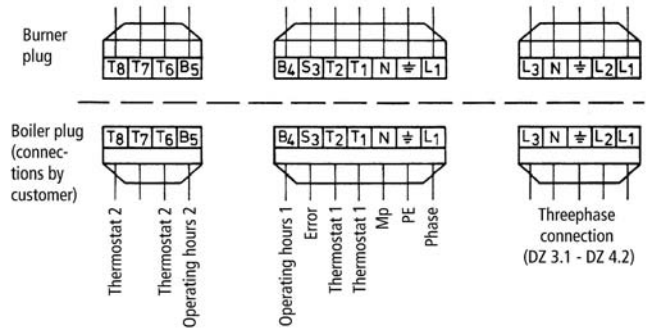
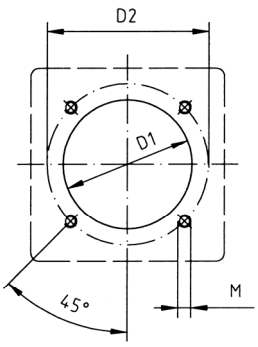


Fig. 14:

7.3 Boiler connection



Type	D1	D2	M
DZ 2.1/2	130	160 – 180	8/10
DZ 2.3	140	160 – 180	8/10
DZ 3	150	180 – 205	10
DZ 4	195	246 – 276	12

7.4 Working field

The diagrams shown here indicate approximately the output range of the various sizes as a function of the combustion chamber resistance during operation. The curves represent maximum values and correspond to the type sample testing to DIN 4787.

The starting-up resistance of the boiler is of decisive importance for the actually possible burner output.

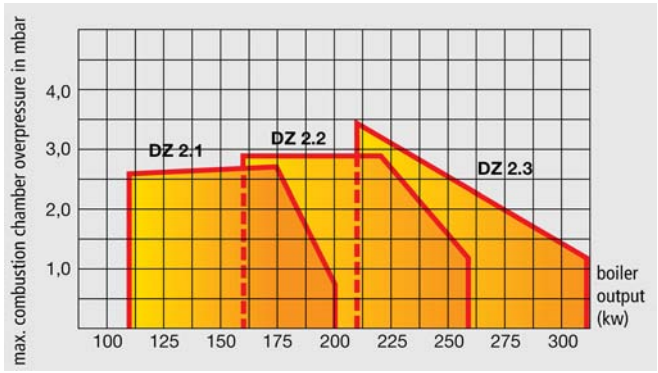


Fig. 15: Output diagram DZ 2

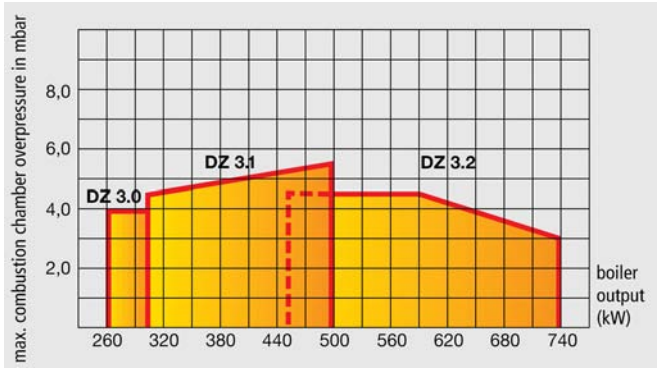


Fig. 16: Output diagram DZ 3

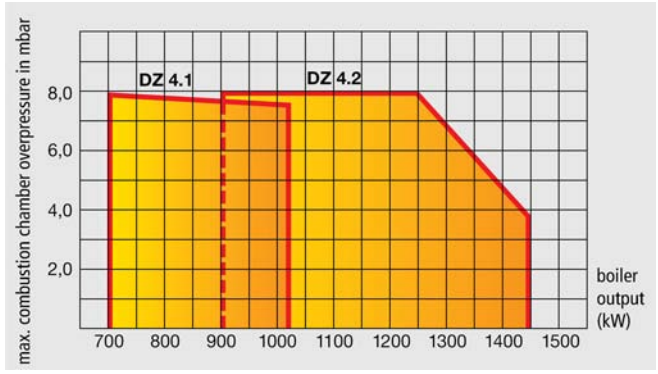


Fig. 17: Output diagram DZ 4

7.5 Defining the oil feed pipe

H = difference in height between suction point (foot valve) and burner pump

Positive H value = higher tank

Negative H value = lower tank

L = suction length (2-pipe installation) for pipe inner diameter

di = 8 to di = 16 – indicative values (including 4 elbows, filter and non-return valve)

DZ 2		
H (m)	L (m) di=8	di=10
4,0	75	100
3,0	66	100
2,0	56	100
1,0	47	100
0,5	42	100
0,0	38	96
-0,5	33	84
-1,0	29	73
-2,0	19	51
-3,0	10	28

DZ 3		
H (m)	L (m) di=8	di=10
4,0	53	100
3,0	47	100
2,0	41	100
1,0	34	88
0,5	31	79
0,0	27	71
-0,5	24	62
-1,0	20	54
-2,0	13	37
-3,0	6	20

DZ 4			
H (m)	L (m) di=10	di=12	di=16
4,0	28	53	92
3,0	24	47	80
2,0	21	40	70
1,0	17	33	58
0,5	15	30	52
0,0	13	27	47
-0,5	12	23	41
-1,0	10	20	36
-2,0	6	13	24
-3,0	3	7	13

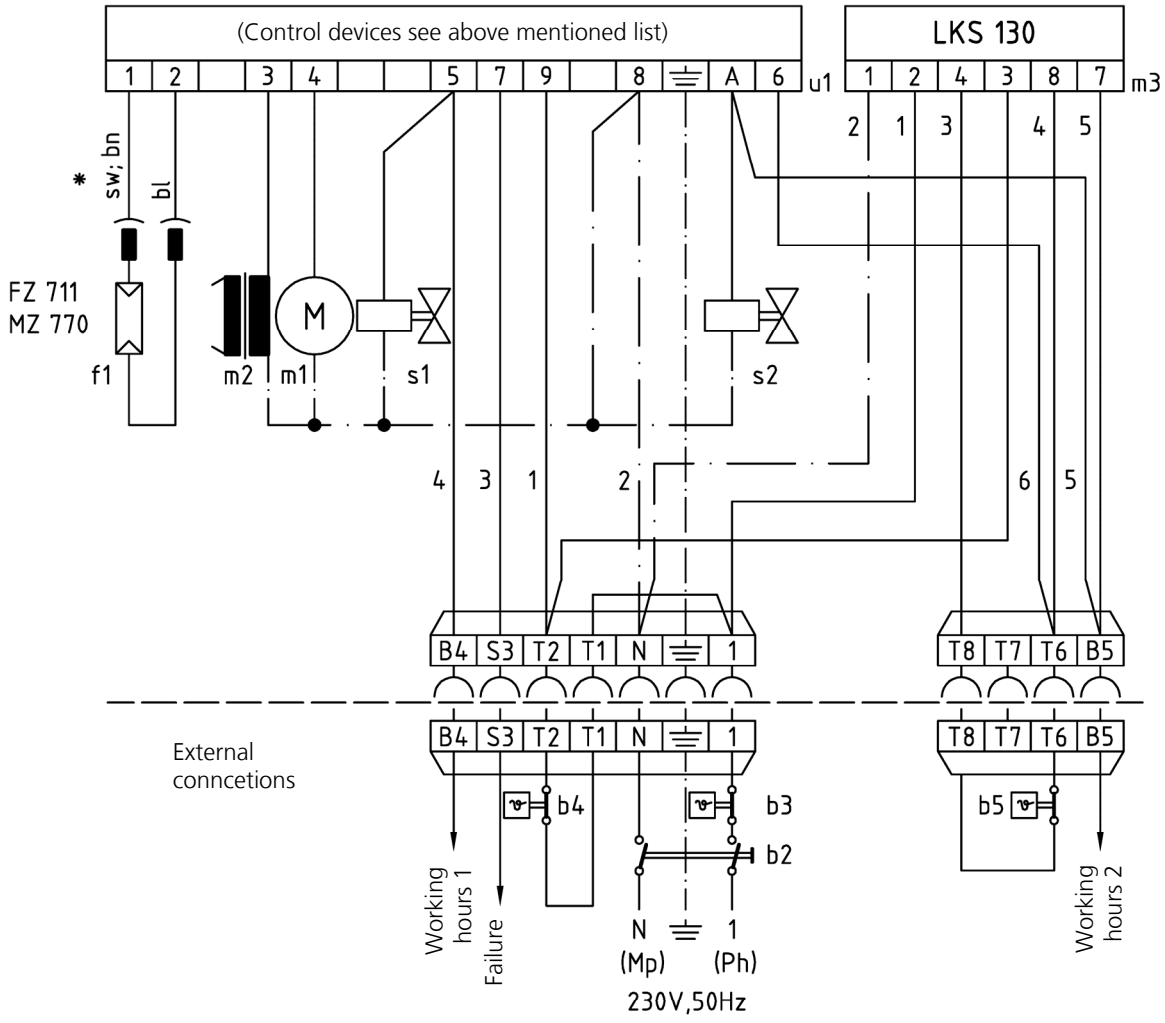
7.6 Circuit diagram DZ 2

Indication	Pos.
On-off switch	b2
Safety thermostat	b3
On-off thermostat 1	b4
On-off thermostat 2	b5
Photo resistor	f1
Motor with condenser	m1
Ignition transformer	m2
Servomotor	m3
Solenoid valve 1	s1
Solenoid valve 2	s2
control device	u1

Observe local and VDE-regulations.

Connections to earth potential being executed carefully.

Suitable automatic firing units
TF 802.1 with FZ 711 TF 802.2 with FZ 711 TF 832.3 with MZ 770 TTO 872 (WLE**) with MZ 770 MMO 872 (WLE**) with MZ 770 DKW 972 (WLE**) with MZ 770 **WLE = warm air heater



✱ A cable with 3-pin plug can also be used as photo resistance connection cable. The wire (brown) is then connected to terminal 9.

Fig. 18:

7.7 Circuit diagram DZ 3.0

Indication	Pos.
On-off switch	b2
Safety thermostat	b3
On-off thermostat 1	b4
On-off thermostat 2	b5
Photo resistor	f1
Motor with condenser	m1
Ignition transformer	m2
Servomotor	m3
Solenoid valve 1	s1
Solenoid valve 2	s2
Control device	u1

Observe local and VDE-regulations.

Connections to earth potential being executed carefully.

MMO 872 with MZ 770 for warm air heater

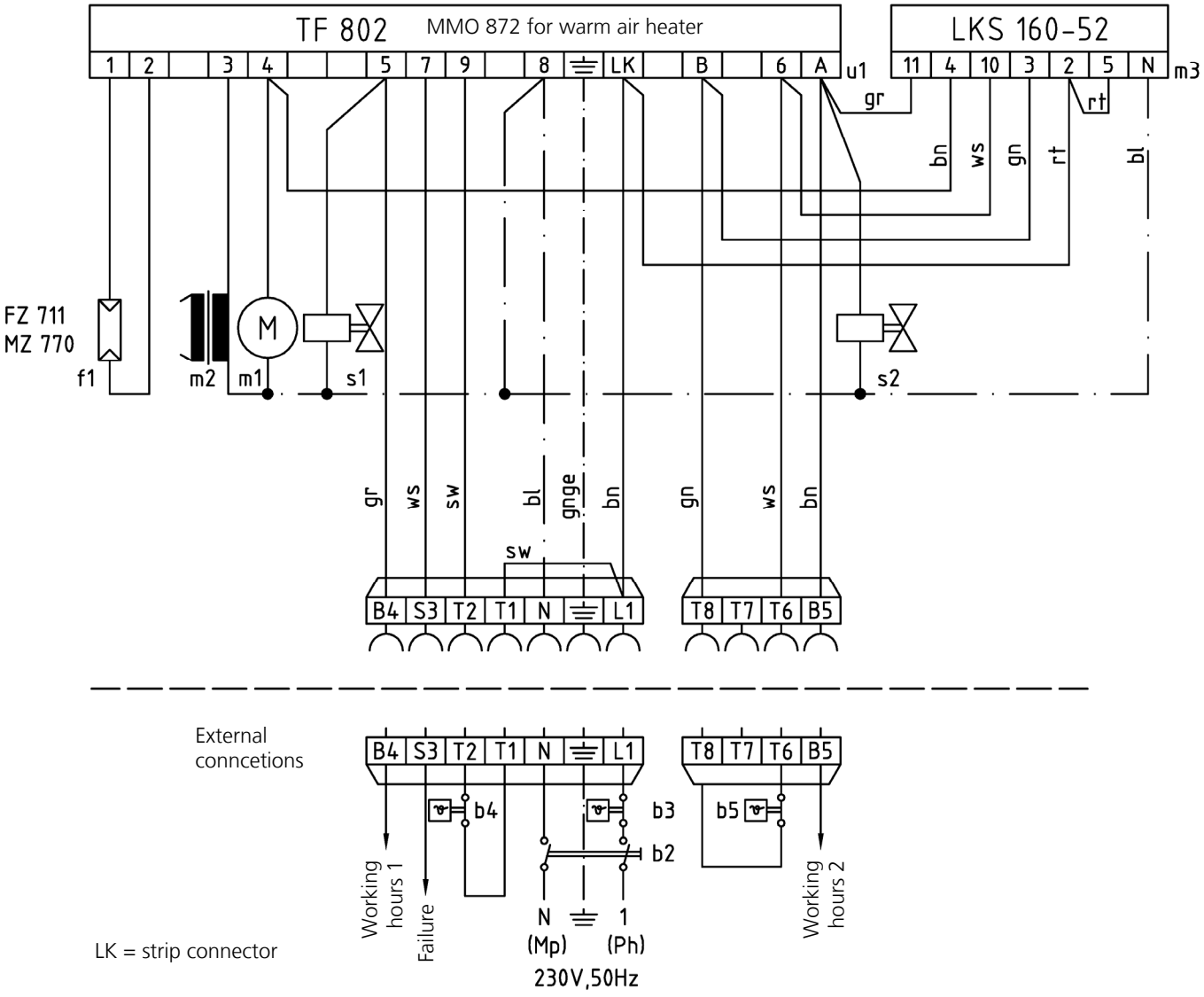
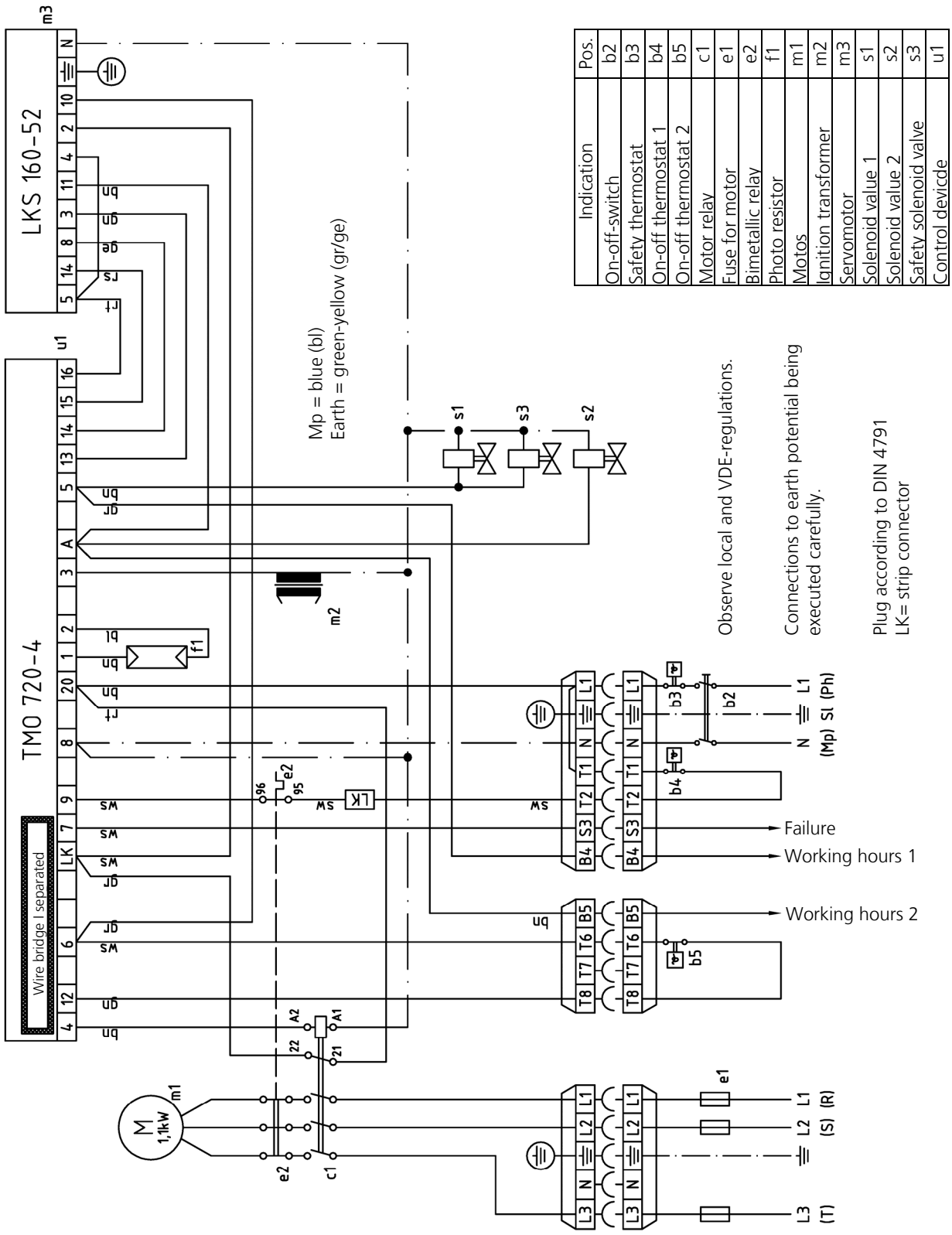


Fig. 19:

7.8 Circuit diagram DZ 3.1 - DZ 3.2



Indication	Pos.
On-off-switch	b2
Safety thermostat	b3
On-off thermostat 1	b4
On-off thermostat 2	b5
Motor relay	c1
Fuse for motor	e1
Bimetallic relay	e2
Photo resistor	f1
Motos	m1
Ignition transformer	m2
Servomotor	m3
Solenoid value 1	s1
Solenoid value 2	s2
Safety solenoid valve	s3
Control devicde	u1

Fig. 20:

7.9 Circuit diagram DZ 4

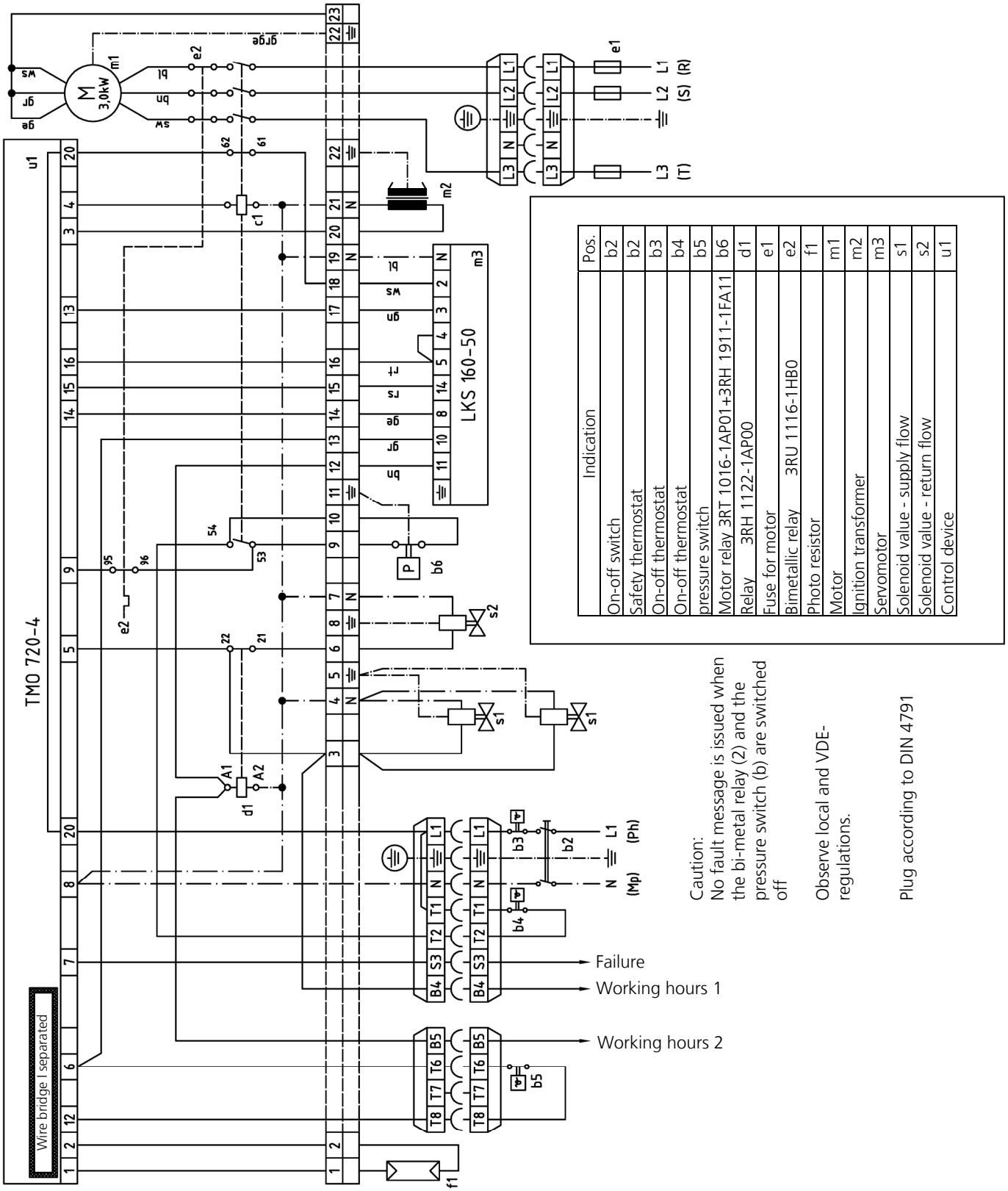


Fig. 21:

7.10 Explosion drawing DZ 2

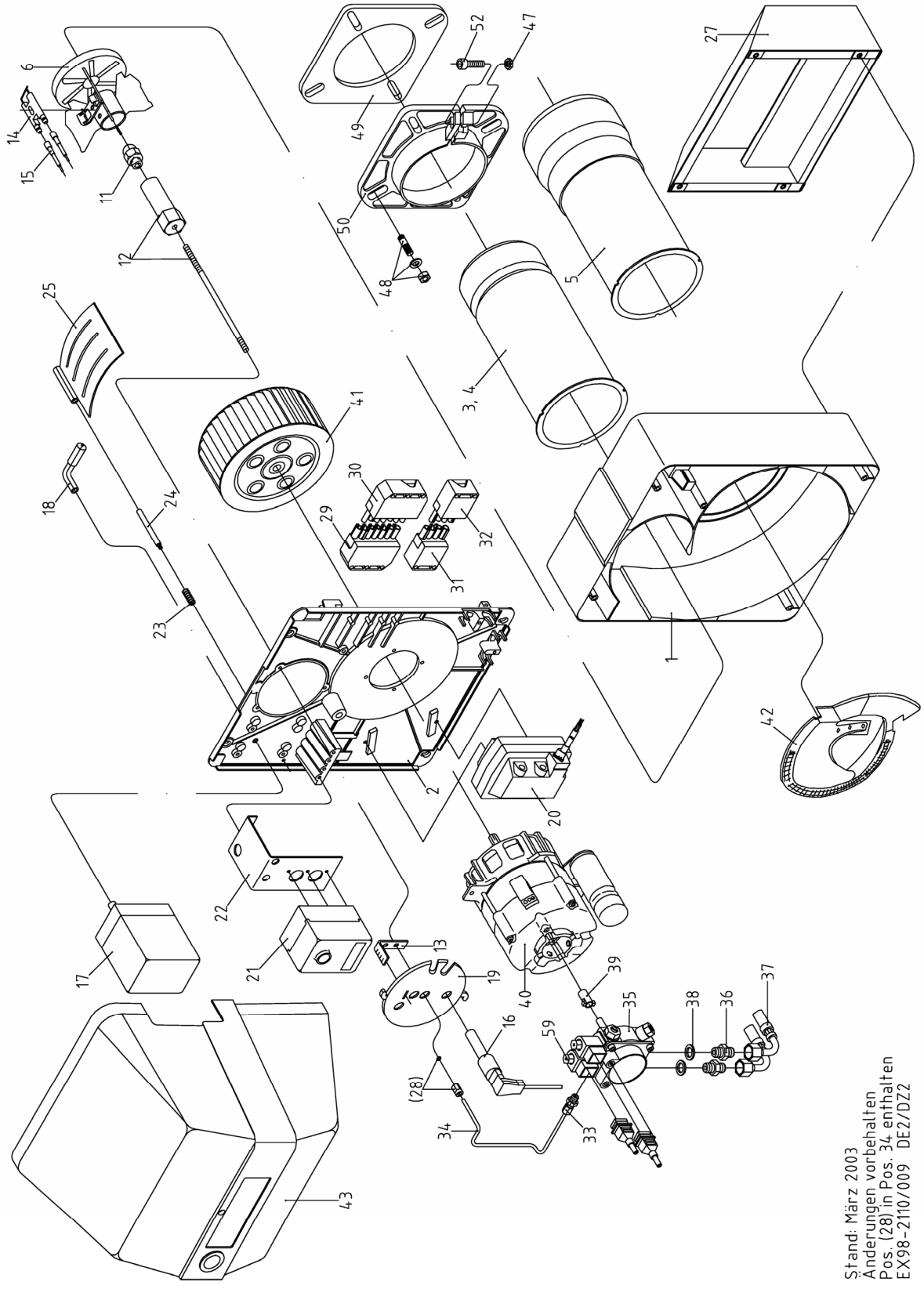


Fig. 22:

7.11 Key for explosion drawing DZ 2

Pos.	DZ 2.1-2110	DZ 2.1-2120	DZ 2.1-2130	DZ 2.1-2140	DZ 2.1-2210	DZ 2.2-2220	DZ 2.3-2310	DZ 2.3-2320	Designation (part designation)	Part number
1	1	1	1	1	1	1	1	1	Burner casing	95.21110-1001
2	1	1	1	1	1	1	1	1	Housing cover	95.21112-1001
3	1	1	1	1					Burner pipe	95.22240-1001
4					1	1			Burner pipe DZ 2.2	95.22240-1002
5							1	1	Burner pipe with head	95.22240-1003
6	1	1	1	1	1	1			Baffle plate with electrode block	95.22246-1017
6							1	1	Baffle plate with electrode block	95.22246-1018
11	1	1	1	1					Nozzle 1,50/60 Grd S	95.23117-6314
11	1	1	1	1					Nozzle 1,75/60 Grd S	95.23117-6316
11	1	1	1	1					Nozzle 2,00/60 Grd S	95.23117-6318
11	1	1	1	1					Nozzle 2,25/60 Grd S	95.23117-6319
11	1	1	1	1					Nozzle 2,50/60 Grd S	95.23117-6320
11	1	1	1	1					Nozzle 3,00/60 Grd S	95.23117-6322
11					1	1			Nozzle 3,50/60 Grd S	95.23117-6323
11					1	1			Nozzle 4,00/60 Grd S	95.23117-6324
11							1	1	Nozzle 4,50/60 Grd S	95.23117-6325
11							1	1	Nozzle 5,00/60 Grd S	95.23117-6326
12	1	1	1	1	1	1	1	1	Nozzle holder with pipe DZ 2	95.23135-1000
14	1	1	1	1	1	1	1	1	Ignition electrode block	95.24236-3004
15	2	2	2	2	2	2	2	2	Ignition cable with plug	95.24200-1003
16	1	1	1	1	1	1	1	1	Photo resistance. FZ 711S, white	95.95214-0012
16	1	1	1	1	1	1	1	1	Photo resistance MZ 770 S incl. connector cable 500 mm	95.95214-0011
17	1	1	1	1	1	1	1	1	Servomotor LKS 130	95.95263-0006
18	1	1	1	1	1	1	1	1	Lever for air flap complete	95.21174-1008
19	1	1	1	1	1	1	1	1	Flange cover	95.21112-1011
19	1	1	1	1	1	1	1	1	Sight glass blue with snap ring	95.20225-4053
20	1	1	1	1	1	1	1	1	Ignition transformer 10/20 CM with cable	95.95272-0018
21	1	1	1	1	1	1	1	1	Automatic oil firing unit TF 802.2	95.95249-0003
21	1	1	1	1	1	1	1	1	Automatic oil firing unit TF 832.3	95.95249-0037
23	1	1	1	1	1	1	1	1	Spring for air damper	95.21171-1001
24	1	1	1	1	1	1	1	1	Air throttle axis DZ 2	95.21176-1003
25	1	1	1	1	1	1	1	1	Air damper DZ 2	95.21118-1005
27	1	1	1	1	1	1	1	1	Intake silencer, compl.	95.21116-1003
29	1	1	1	1	1	1	1	1	Sleeve with cable 7-poles	95.24200-1008
30	1	1	1	1	1	1	1	1	Counter plug (boiler side)	95.95216-0002
31	1	1	1	1	1	1	1	1	Sleeve with cable 4-poles	95.24200-1010
32	1	1	1	1	1	1	1	1	Plug part, green, complete	95.95112-0040
33	1	1	1	1	1	1	1	1	Union Rp 1/8	95.99385-0085
34	1	1	1	1	1	1	1	1	Oil pipe complete	95.23144-1023
35	1	1	1	1	1	1	1	1	Oil pump AT 3/55D [ab BJ 1997]	95.91100-0050
37	2	2	2	2	2	2	2	2	Silver hose	95.91149-0029
38	2	2	2	2	2	2	2	2	Sealing rig 13 x 18, Cu	95.99187-0001
39	1	1	1	1	1	1	1	1	Coupling piece 1-surface	95.26233-0025
40	1	1	1	1	1	1	1	1	E-motor with condenser, 240 W	95.95262-0011

Pos.	DZ 2.1-2110	DZ 2.1-2120	DZ 2.1-2130	DZ 2.1-2140	DZ 2.1-2210	DZ 2.2-2220	DZ 2.3-2310	DZ 2.3-2320	Designation (part designation)	Part number
40	1	1	1	1	1	1	1	1	Condenser 8 müF	95.95276-0008
41	1	1	1	1	1	1	1	1	Fan wheel, 160 x 69 mm	95.26229-0030
42	1	1	1	1	1	1	1	1	Air intake nozzle	95.21117-1007
43	1	1	1	1	1	1	1	1	Burner hood RE/DZ2, sapphire	95.21111-1001
44	1	1	1	1	1	1	1	1	Spacer for hood	95.21199-1003
45	1	1	1	1	1	1	1	1	Push button	95.21100-0015
47	1	1	1	1	1	1	1	1	Hexagon nut, M8	95.99196-0008
48	1	1	1	1	1	1	1	1	Burner fastening set	95.90100-1001
49	1	1	1	1	1	1	1	1	Burner head seal	95.22287-1005
50	1	1	1	1	1	1	1	1	Burner head RE/RZ/DZ/GZ 2	95.22232-1001
52	1	1	1	1	1	1	1	1	Cap screw, M8x25	95.99194-0825
59	1	1	1	1	1	1	1	1	Solenoid valve, Suntec for pump AS 47/AT2-3 (1.St.)	95.95277-0029
59	1	1	1	1	1	1	1	1	Solenoid valve coil, Suntec for pump AS 47	95.95277-0004
o.A.	1	1	1	1	1	1	1	1	Clamping plate for silver hose	95.21160-0019

7.12 Explosion drawing DZ 3.0

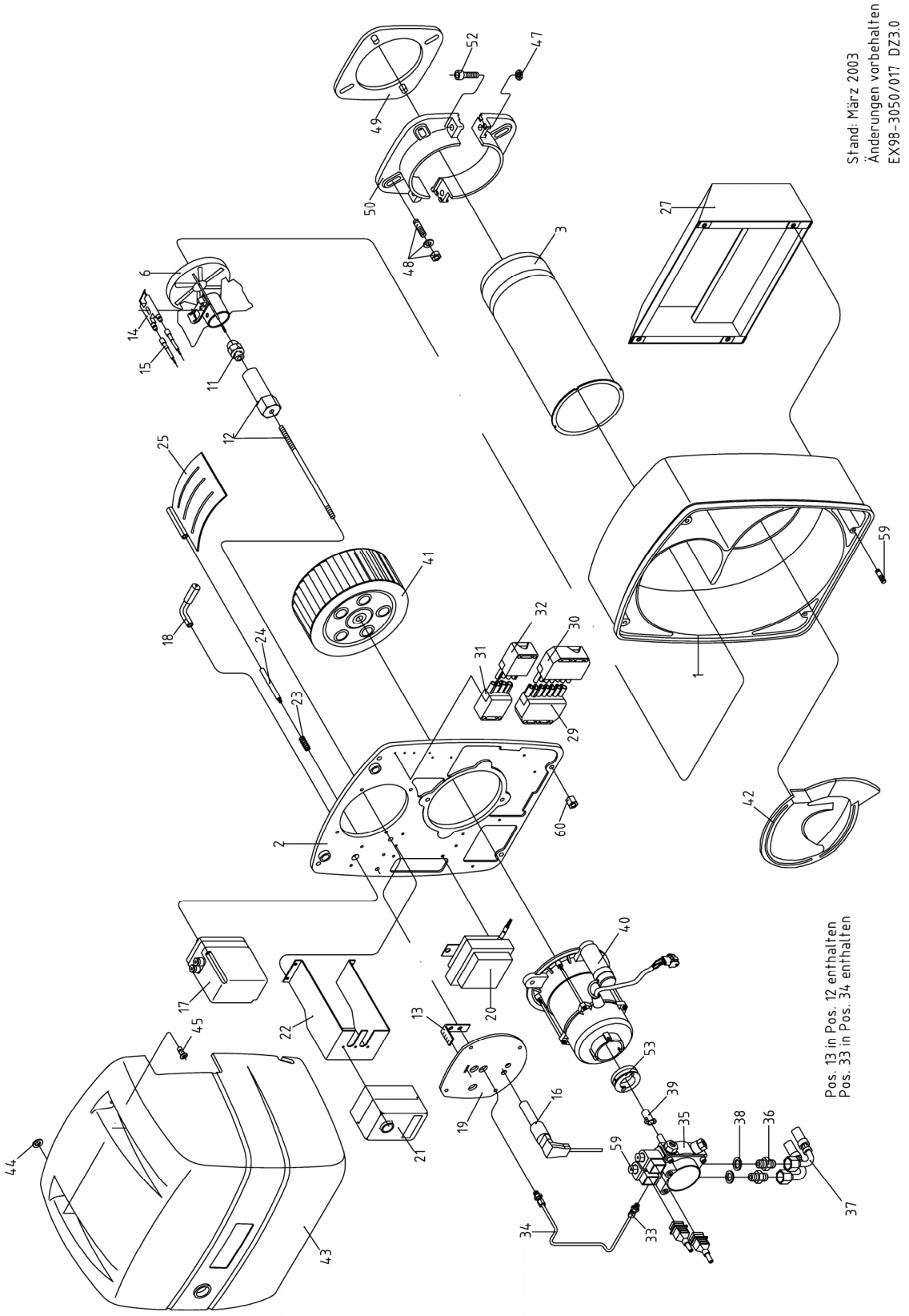


Fig. 23:

7.13 Key for explosion drawing DZ 3.0

Pos.	DZ 3.0-3060	DZ 3.0-3070	Designation (part designation)	Part number
1	1	1	Burner casing	95.21110-3003
2	1	1	Housing cover	95.21112-3009
3	1	1	Burner pipe DZ 3.0/GZ 3.0	95.22240-3035
6	1	1	Baffle plate with electrode block	95.22246-3004
11	1		Nozzle 4,50/60 Grd S	95.23117-6325
11		1	Nozzle 5,00/60 Grd S	95.23117-6326
12	1	1	Nozzle holder with pipe and scale	95.23135-3005
14	1	1	Ignition electrode block	95.24236-3004
15	2	2	Ignition cable	95.24200-3001
16	1	1	Photo resistance. FZ 711S, white	95.95214-0012
16	1	1	Photo resistance MZ 770 S	95.95214-0011
17	1	1	Servomotor LKS160-52	95.95263-0007
18	1	1	Lever for air damper, complete	95.21174-3002
19	1	1	Flange cover	95.21112-3011
20	1	1	Ignition transformer ZM 20/12-717	95.95272-0012
21	1	1	Automatic oil firing unit TF 802.2	95.95249-0003
21	1	1	Automatic oil firing unit TF 802.1	95.95249-0007
21	1	1	Automatic oil firing unit TF 832.3	95.95249-0037
22	1	1	Console for automatic oil firing unit	95.21160-3020
23	1	1	Spring for air damper	95.21171-3001
24	1	1	Air throttle axis DZ 3	95.21176-3001
25	1	1	Air damper	95.21118-3002
27	1	1	Silencer complete	95.21116-3003
30	1	1	Counter plug (boiler)	95.95216-0002
32	1	1	Plug part, green, complete	95.95112-0040
33	1	1	Union Rp 1/8, zyl., 6 mm	95.99385-0001
34	1	1	Oil pipe complete DZ 3	95.23144-3008
35	1	1	Oil pump AT 2/65	95.91100-0046
36	2	2	Double nipple, Rp ¼ x 3/8	95.99385-0116
37	2	2	Silver hose NW 8x1500,R 3/8	95.91149-0030
39	1	1	Coupling piece 1-surface	95.26233-0029
40	1	1	E-motor with condenser, 450 W	95.95262-0013
41	1	1	Fan wheel, 220 x 82 mm	95.26229-3002
42	1	1	Air intake nozzle	95.21117-3002
43	1	1	Burner hood	95.21111-3013
44	2	2	Safety cover	95.21189-0002
45	2	2	Plug pin	95.21189-0003
48	1	1	Burner fastening set	95.90100-3001
49	1	1	Burner head seal	95.22287-3010
50	1	1	Burner head seal	95.22232-3003
53	1	1	Shim lining for oil pump	95.26299-3001
59	1	1	Solenoid valve, Suntec for pump AS 47 / AT2-3 (1.St.)	95.95277-0029
59	1	1	Solenoid valve coil, Suntec for pump AS 47	95.95277-0004
60	4	4	Hexagon nut, M8	95.99196-0096

7.14 Explosion drawing DZ 3.1 – 3.3

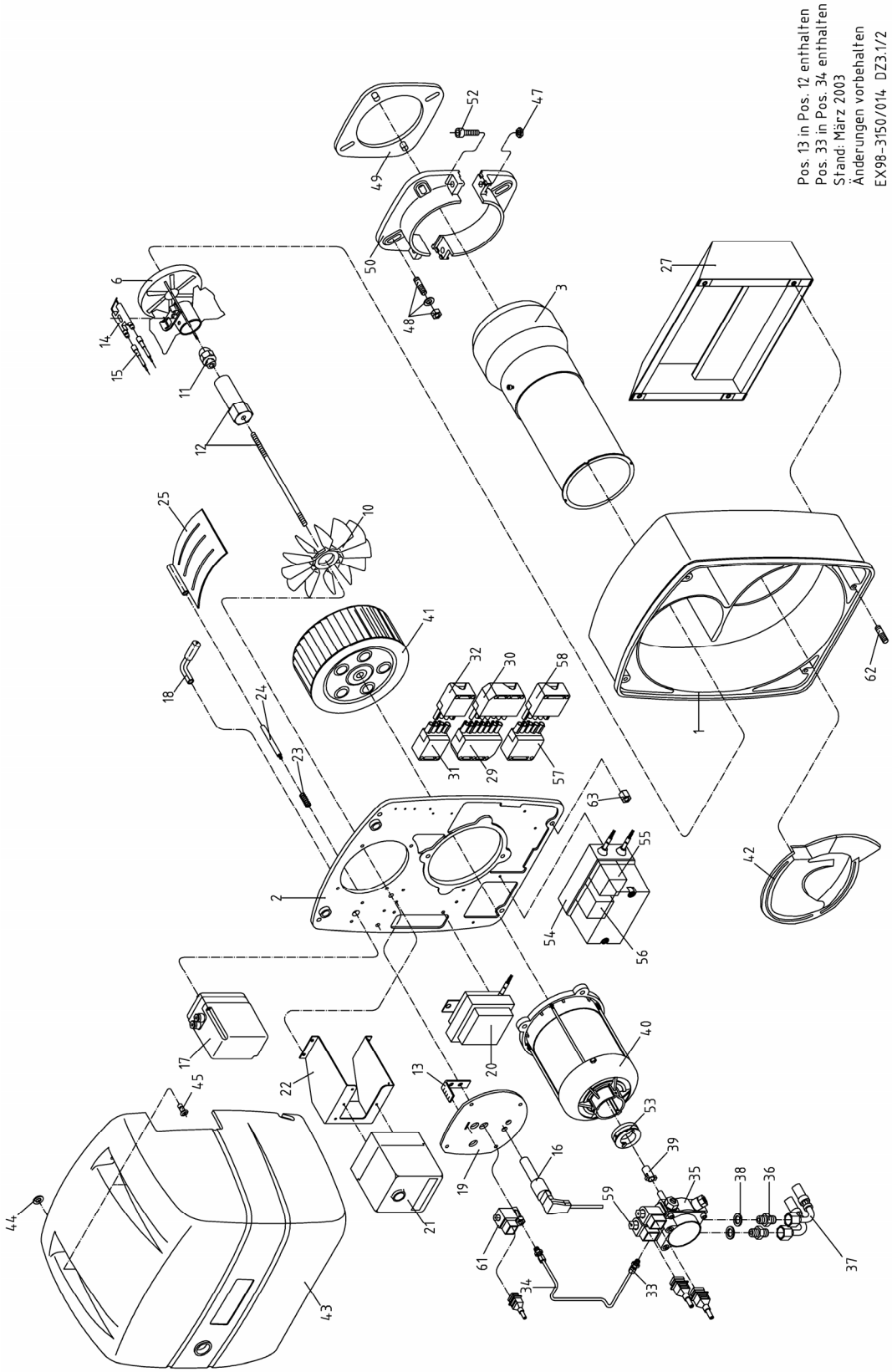


Fig. 24:

7.15 Key for explosion drawing DZ 3.1 – 3.3

Pos.	DZ 3.1-3110 – DZ 3.1-3130	DZ 3.1-3150 –DZ 3.1-3180	DZ 3.2-3210 –DZ 3.2-3230	DZ 3.2-3260 –DZ 3.2-3280	DZ 3.2-3240	Designation (part designation)	Part number
1		1		1		Burner casing	95.21110-3003
2		1		1		Housing cover	95.21112-3009
3	1	1	1	1	1	Burner pipe with head	95.22240-3036
6	1	1	1	1		Baffle plate with electrode block	95.22246-3005
6					1	Baffle plate D=134, DZ3.2 -3240	95.22246-3006
10					1	Air conductance device 15Grd	95.21160-3018
11	1	1				Nozzle 5,50/60 Grd S	95.23117-6327
11	1	1				Nozzle 6,50/60 Grd S	95.23117-6329
11	1	1				Nozzle 7,50/60 Grd S	95.23117-6331
11		1	1			Nozzle 8,00/60 Grd S	95.23117-6332
11			1	1		Nozzle 9,00/60 Grd S	95.23117-6333
11			1	1		Nozzle 10,00/60 Grd S	95.23117-6334
11				1	1	Nozzle 11,00/60 Grd S	95.23117-6335
12	1	1	1	1	1	Nozzle holder with pipe and flange	95.23135-3001
14	1	1	1	1	1	Ignition electrode block	95.24236-3004
15	2	2	2	2	2	Ignition cable	95.24200-3001
16	1	1	1	1	1	Photo resistance. FZ 711S, white	95.95214-0012
17	1	1	1	1	1	Servomotor LKS160-52	95.95263-0007
18	1	1	1	1	1	Lever for air damper, complete	95.21174-3002
20	1	1	1	1	1	Ignition transformer ZM 20/12-717	95.95272-0012
21	1	1	1	1	1	Automatic oil firing unit TMO 720-4	95.95249-0012
22		1		1		Console for automatic oil firing unit	95.21160-3022
23	1	1	1	1	1	Spring for air damper	95.21171-3001
24	1	1	1	1	1	Air throttle axis DZ 3	95.21176-3001
25	1		1		1	Air damper	95.21118-3001
25		1		1		Air damper	95.21118-3002
27	1		1		1	Silencer	95.21116-3001
27		1		1		Silencer complete	95.21116-3003
29	1	1	1	1	1	Lining part, brown/black, complete	95.95112-0043
30	1	1	1	1	1	Counter plug (boiler)	95.95216-0002
31	1	1	1	1	1	Lining part, green, complete	95.95112-0041
32	1	1	1	1	1	Plug part, green, complete	95.95112-0040
33	1	1	1	1	1	Union Rp 1/8, zyl., 6 mm	95.99385-0001
34	1	1	1	1	1	Oil pipe complete DZ 3	95.23144-3008
35	1	1	1	1	1	Oil pump AT 2/75C	95.91100-0055
36		2		2		Double nipple, Rp ¼ x 3/8	95.99385-0116
37	2	2	2	2	2	Silver hose NW 8x1500,R 3/8	95.91149-0030
38	2	2	2	2	2	Sealing rig 13 x 18; Cu	95.99187-0001
39	1	1	1	1	1	Coupling piece 1-surface	95.26233-0029
40	1	1	1	1	1	E-Motor, 1,1 kW	95.95262-0012
41	1	1	1	1	1	Fan wheel, 220 x 82 mm	95.26229-3002
42		1		1		Air intake nozzle	95.21117-3002
43	1		1		1	Burner hood with push button	95.21111-3004
43	1		1		1	Spacer for hood DZ 3	95.21199-3006

Pos.	DZ 3.1-3110 –DZ 3.1-3130	DZ 3.1-3150 –DZ 3.1-3180	DZ 3.2-3210 –DZ 3.2-3230	DZ 3.2-3260 –DZ 3.2-3280	DZ 3.2-3240	Designation (part designation)	Part number
43	1		1		1	Push button	95.21100-0013
43		1		1		Burner hood	95.21111-3013
44		2		2		Safety cover	95.21189-0002
45		2		2		Plug pin	95.21189-0003
48	1	1	1	1	1	Burner fastening set	95.90100-3001
49	1		1		1	Burner head seal	95.22287-3008
49		1		1		Burner head seal	95.22287-3010
50	1		1		1	Burner head	95.22232-3001
50		1		1		Burner head seal	95.22232-3003
53	1	1	1	1	1	Shim lining for oil pump	95.26299-3001
55		1		1		Power contactor 3TF2001-OAL2	95.95244-0013
55		1		1	1	Power contactor 3RT1016-1AP02 [ab BJ 2003]	95.95244-0014
56		1		1		Bimetal relay 3UA7021-1E	95.95248-0011
57	1	1	1	1	1	Lining part, black, complete	95.95112-0045
58	1	1	1	1	1	Connector part, black, complete	95.95112-0044
59	1	1	1	1	1	Solenoid valve, Suntec for pump AS 47 / AT2-3 (1.St.)	95.95277-0029
59	1	1	1	1	1	Solenoid valve coil, Suntec for pump AS 47	95.95277-0004
61	1	1	1	1	1	Solenoid valve SV 01	95.95277-0031
62		4		4		Threaded pin, M6x25	95.99195-0825
63		4		4		Hexagon nut, M8	95.99196-0096

7.16 Explosion drawing DZ 4

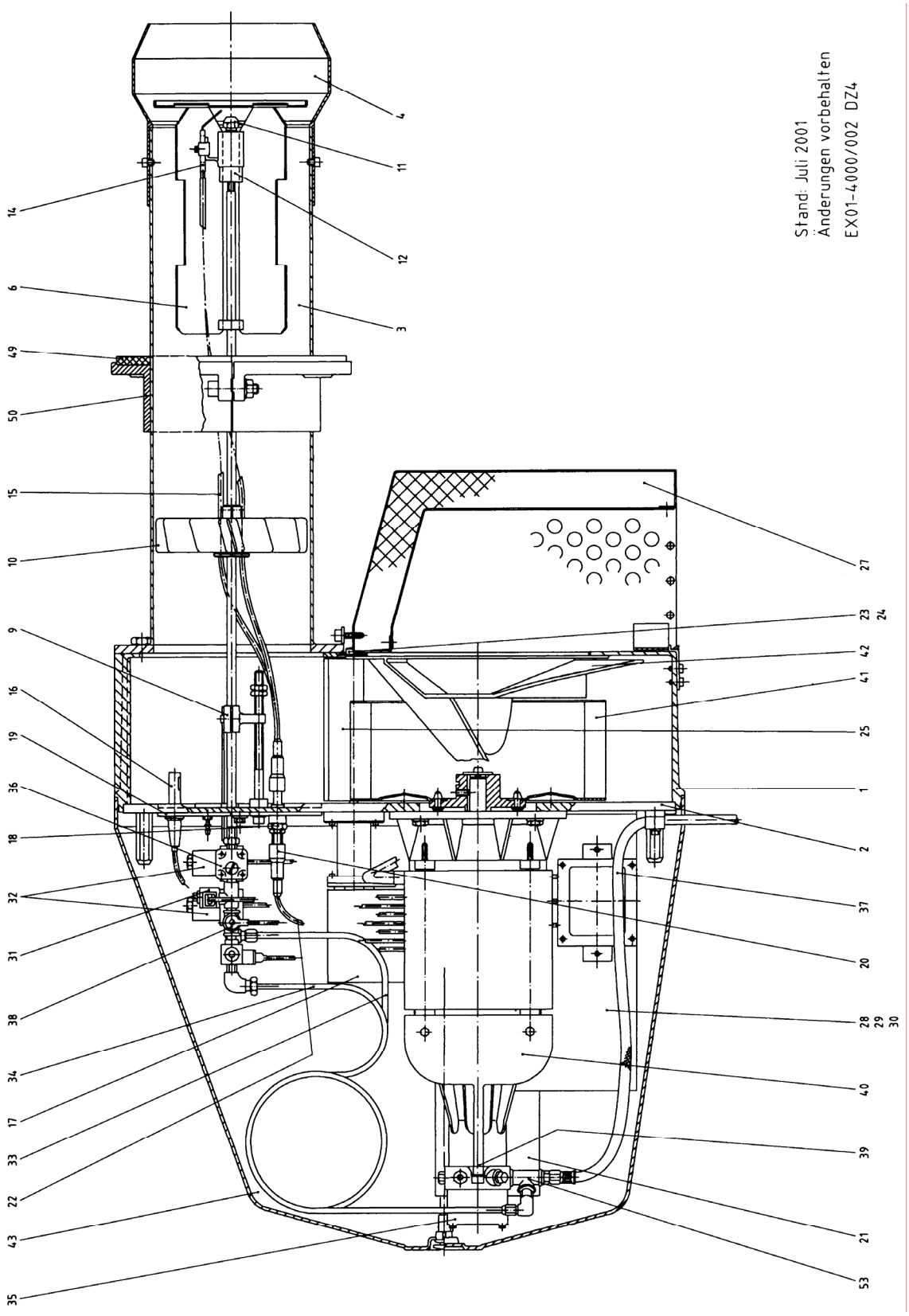


Fig. 25:

7.17 Key for explosion drawing DZ 4

Pos.	DZ 4.1-4120	DZ 4.2-4220	Designation (part designation)	Part number
1	1	1	Burner casing	95.21110-4000
2	1	1	Housing cover	95.21112-4002
3	1	1	Burner pipe	95.22240-4046
4	1		Burner pipe head DZ 4.1	95.22240-4047
4		1	Burner pipe head DZ 4.2 / GZ 4.1	95.22240-4048
6	1	1	Baffle plate with holder	95.22246-4009
9	1	1	Nozzle connection adjustment with scale	95.23700-4023
10	1		Air conductance device	95.21160-4002
10		1	Air conductance device	95.21160-4003
11	1		Return nozzle A3, 60 kg/h, 60 Grd	95.23217-4060
11	1		Return nozzle A3, 65 kg/h, 60 Grd	95.23217-4065
11	1		Return nozzle A3, 70 kg/h, 60 Grd	95.23217-4070
11	1		Return nozzle A3, 75 kg/h, 60 Grd	95.23217-4075
11	1	1	Return nozzle A3, 80 kg/h, 60 Grd	95.23217-4080
11	1	1	Return nozzle A3, 90 kg/h, 60 Grd	95.23217-4090
11		1	Return nozzle A3, 100 kg/h, 60 Grd	95.23217-4100
11		1	Return nozzle A3, 110 kg/h, 60 Grd	95.23217-4110
11		1	Return nozzle A3, 120 kg/h, 60 Grd	95.23217-4120
11		1	Return nozzle A3, 130 kg/h, 60 Grd	95.23217-4130
12	1	1	Return nozzle bracket DZ 4	95.23135-4001
12	1	1	Nozzle pipe supply flow cranked	95.23744-4001
12	1	1	Nozzle pipe return flow	95.23744-4002
13	1	1	Ignition transformer ZM 20/12-717	95.95272-0012
14	1	1	Ignition electrode block	95.24236-3004
15	2	2	Ignition cable with plug	95.24200-4003
16	1	1	Photo resistance FZ 711S, white	95.95214-0012
17	1	1	Servomotor LKS160-50	95.95263-0008
18	2	2	Ignition cable cutter	95.24200-4001
20	2	2	Spark plug socket 6,5 mm	95.95112-0060
21	1	1	Automatic oil firing unit TMO 720-4	95.95249-0012
22	2	2	Ignition cable with plug	95.24200-4002
24	1	1	Air throttle axis	95.21176-4001
25	1	1	Air damper	95.21118-4001
27	1	1	Intake silencer, compl.	95.21116-4001
28	1	1	Power contactor DIL00 M-11	95.95244-0009
28	1	1	Auxiliary switch 3RH19 11-1FA11	95.95244-4002
28	1	1	Power contactor 3RT1016-1AP01	95.95244-3001
29	1	1	Power contactor DIL M01	95.95244-0007
29	1	1	Auxiliary contactor 3RH11 22-1AP00	95.95244-4001
30	1	1	Bimetal relay ZOO-10,	95.95248-0007
30	1	1	Bimetal relay 3RU, 5,5-8,0 A	95.95248-4001
31	1	1	Solenoid valve DZ 4, return flow	95.95277-0017
32	1	1	Solenoid valve DZ 4, supply flow	95.95277-0016
33	1	1	Oil pipe supply flow	95.23144-4001
34	1	1	Oil pipe return flow	95.23144-4002
35	1	1	Oil pump AJ 6	95.91100-0048

Pos.	DZ 4.1-4120	DZ 4.2-4220	Designation (part designation)	Part number
36	1	1	Oil pressure controller SP	95.93200-4001
37	2	2	Silver hose NW 8x2000, R 3/8	95.91149-0036
37	2	2	Silver hose NW 8x1500, R 3/8	95.91149-0030
38	1	1	Pressure switch DZ 4	95.95247-0008
39	1	1	Coupling piece	95.26233-0031
40	1	1	E-Motor 3,0 kW	95.95262-0015
41	1	1	Fan wheel, D=290 mm	95.26229-4002
42	1	1	Air intake nozzle	95.21117-4002
43	1	1	Burner hood	95.21111-4001
49	1	1	Burner head seal	95.22287-4010
50	1	1	Burner head seal	95.22232-4002
99	1	1	Connector part, black, complete	95.95112-0044

7.18 Burner dimensions

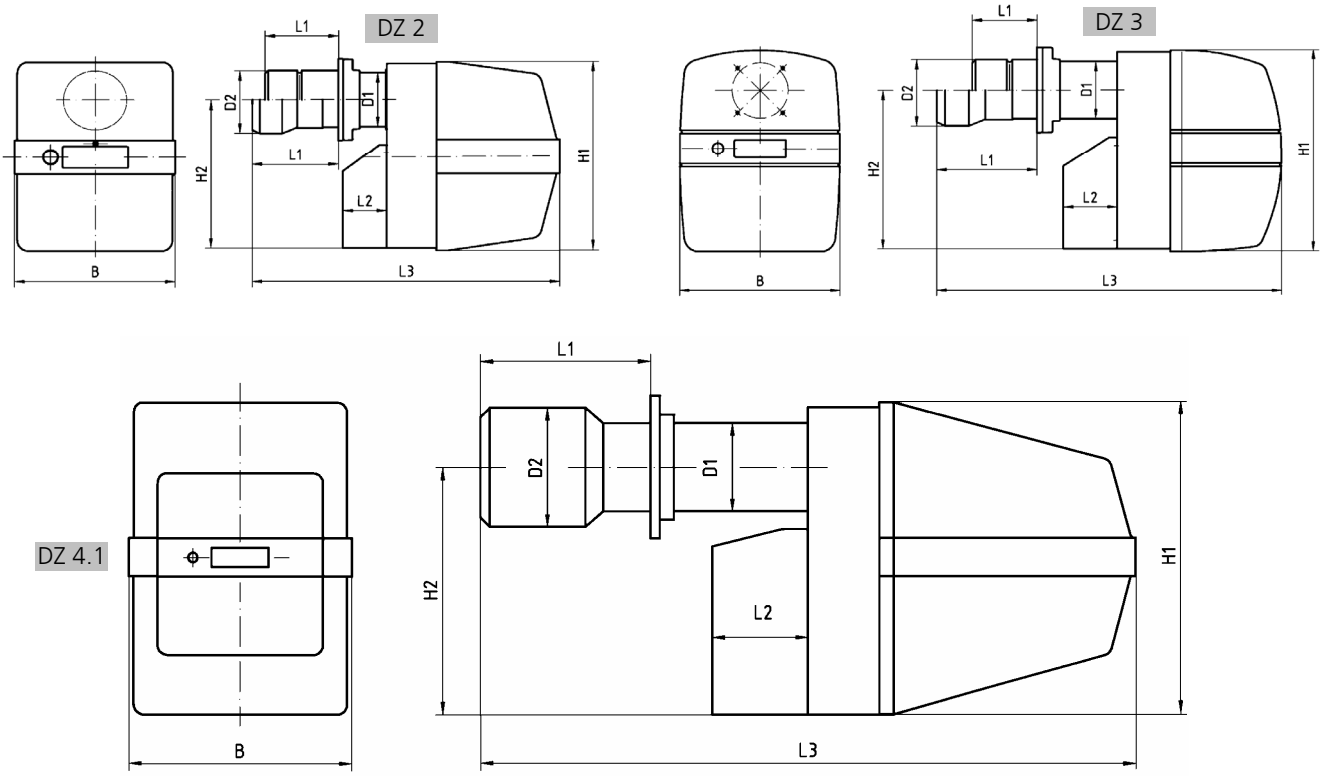


Fig. 26:

Burner type	Dimension L1 approx.	Dimension L2 approx.	Dimension L3 approx.	Dimension D1 ø	Dimension D2 ø	Dimension H1	Dimension H2	Dimension B
DZ 2.1	150	80	570	115	115	355	295	305
DZ 2.2	150	80	570	115	115	355	295	305
DZ 2.3	180	80	600	115	130	355	295	305
DZ 3.0	200	130	830	140	140	490	380	386
DZ 3.1	265	130	850	140	175	490	380	386
DZ 3.2	265	130	850	140	175	490	380	386
DZ 4.1	430	210	1380	186	230	650	515	470
DZ 4.2	430	210	1380	186	280	650	515	470

8.1 Guarantee

The burner by MHG functions perfectly when installed and operated correctly and when using fuel oil EL as per DIN 51 603, Part 1.

The guarantee is valid for 24 months after initial Operation but maximum 27 months after the date of dispatch and is restricted to the replacement of defect parts.

For details please consult the burner card.

8.2 Oil tank and oil pipes

When filling the tank, switch the burner off and leave off subsequently for 3 hours so that suspended particles can settle.

Deflagration can be caused by the formation of air bubbles as a result of leaky oil pipes and an empty tank.

Do not tolerate any oil leaks!
Fire risk!

8.3 Spare parts

Only use original spare parts from MHG when replacing parts. Some components, e.g. flame monitor, oil pump, preheater, are specially designed and manufactured for MHG burners.

Please always state the burner number when ordering spare parts.

All dimensions in mm.
Subject to technical modifications and changes in components.

Manufacturer's certificate

as per § 7 (2) 1. BImSchV (first ordinance for implementation of Germany's Emission Protection Law)

Hamburg, 14.10.2005

MHG Heiztechnik GmbH herewith certifies for the oil burners stated below:

Product	Oil burner
Trade name	Light oil pressure pulverizer
Type / Baumuster-Nr.	DZ 2 / 5G812/02
	DZ 3 / 5G852/02
	DZ 4 / 5G813/97
Test standards	DIN EN 267
Test agency	TÜV Hannover / Sachsen-Anhalt e.V.
Quality management system	DIN EN ISO 9001
Certified by	Germanischer Lloyd (GLC)

that these products fulfil the requirements of the stated directives and standards, and correspond to the design tested by the above stated testing agency. However, this declaration does not constitute a warranty of any qualities.

In addition, these burners from 120 kW output fulfil the requirements of the 1. BImSchV.

The oil burners designed above are intended only for the installation in boilers which have also been certified to the corresponding directives and standards.

The contractor assembling the system shall guarantee that all regulations relating to the interaction of oil burner and boiler have been observed.

EC design declaration of conformity

Hamburg, 14.10.2005

MHG Heiztechnik GmbH herewith certifies that the oil burners stated below:

Product	Oil burner
Trade name	Light oil pressure pulverizer
Type	DZ 2, DZ 3, DZ 4

have been tested and manufactured in compliance with the following standards and directives:

Low voltage directive 73/23 EWG - 01.1973
EMC directive 89/337 EWG - 05.1989
Machinery directive 98/37/EG - 22.06.1998
with reference to the oil burner standard DIN EN 267

GERMANISCHER LLOYD GLC QUALITY MANAGEMENT SYSTEMS CERTIFICATION

Zertifiziert nach ISO 9001
Germanischer Lloyd Certification

MHG Heiztechnik GmbH

i.V.

M. Niedermayer i.V. R. Gieseler

Your notes

Stamp of trader

Printed in Germany 0906

MHG Heiztechnik GmbH
Postfach 11 09 11
D-20409 Hamburg
kontakt@mhg.de
www.mhg.de