Installation
Operation
Maintenance
Controls

TEMPRATEC
TECHNOLOGIE Ltd.

TEMPRATEC C1

Compressed Air Atomizing Burner for Rapeseed Oil and Heating Oil EL

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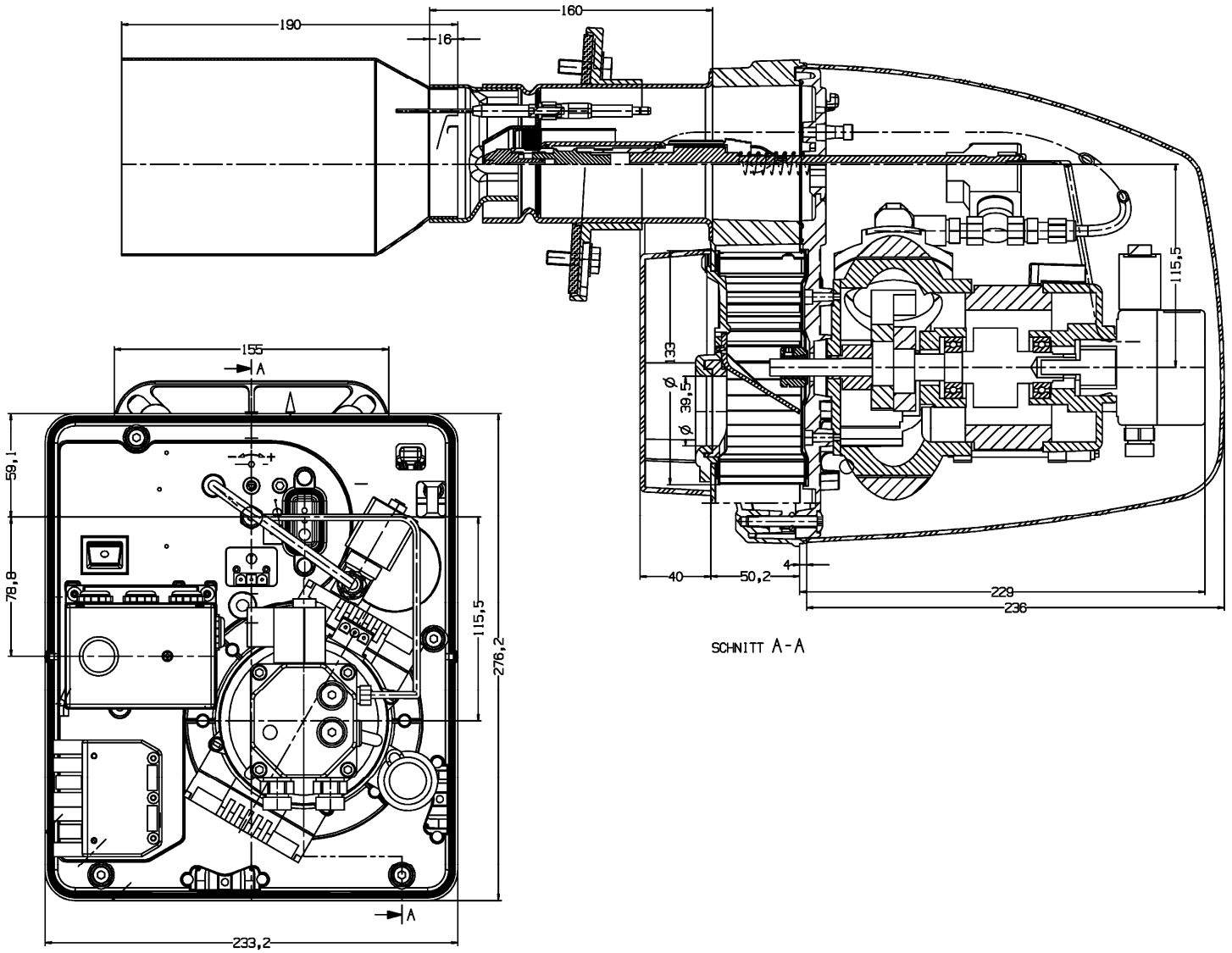
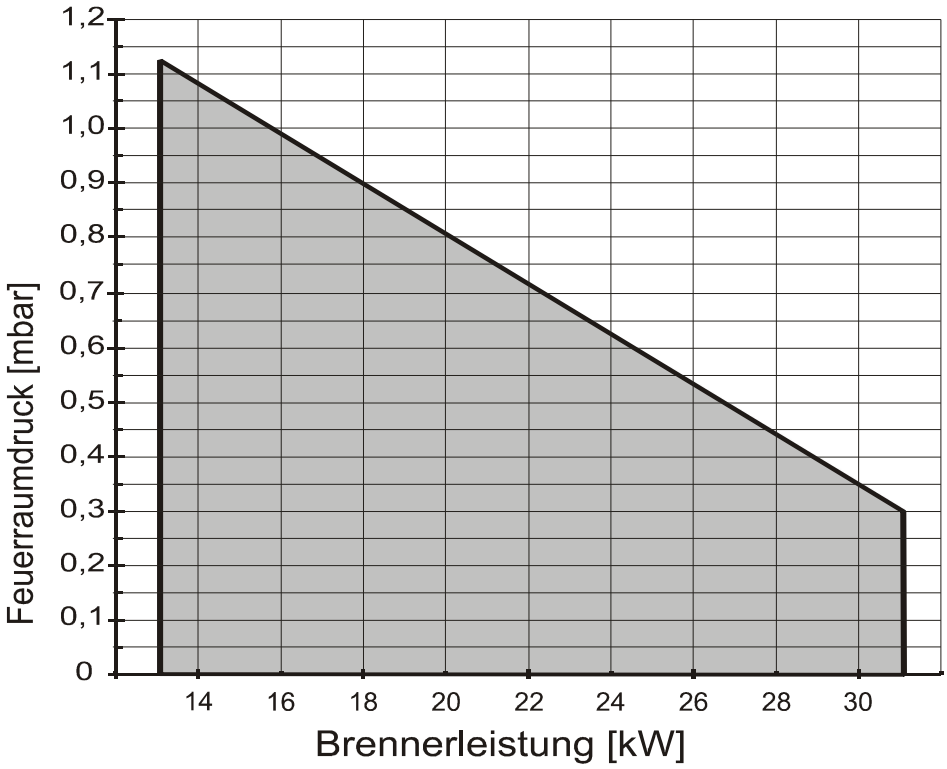
1. Technical Data



2. Dimensions

Burner type	**Tempratec C1**
Burner output	13 - 31 kW
Oil throughput, heating oil EL	1.1 - 2.6 kg/ h
Oil throughput, rapeseed oil	1.3 - 2.9 kg/ h
NOx Class	3
Electrical power consumption	305 W
Basis for testing	DIN EN 267 (99) 1. BImSchV

Performance diagram:
Combustion chamber pressure [mbar] **Burner output [kW]**



We reserve the right to make changes conducive to technical advances.

3. Warnings and Safety Precautions

IMPORTANT NOTICE

Carefully read the installation instruction for the burner before installation and putting into service. Non-compliance or improper installation renders the warranty nil and void.
When installing accessory components, follow the corresponding instructions.

DANGER
WARNING!
due to electric current.
Before undertaking any work on the burner and heating equipment, cut off all electric power, e.g. by means of the heater emergency OFF switch outside the furnace room. Switching off the regulating device is not sufficient!

EQUIPMENT DAMAGE
CAUTION!
due to improper installation. Please comply with engineering standards as well as building and other legal regulations regarding construction and operation of the equipment!

EQUIPMENT DAMAGE
CAUTION!
This burner is equipped for use with biological fuels with special components.
Use **only** original spare parts.

EQUIPMENT DAMAGE
CAUTION!
due to improper cleaning and maintenance. Perform cleaning and maintenance steps as instructed, whereby the entire system must be tested for faultless functioning!
Eliminate any defects immediately to avoid damaging the equipment!

IMPORTANT NOTICE
CONCERNING OIL STORAGE

For vegetable oils, storage temperatures higher than 20℃ and lower than 8℃ must be avoided. Avoid exposure to light. Oil must be removed from storage via a floating device to guarantee sediment-free oil quality. Oil storage, including laying of the oil lines, must be realized in such a manner that the **oil temperature upstream from the burner is at least + 8℃**.

IMPORTANT NOTICE
CONCERNING OIL TANK FILLING

The oil burner must be switched off before filling the tank. To allow floating particles to settle, it is necessary to wait approx. 3 h after filling before switching on the oil burner again.
In case of leaky oil lines or an empty tank, deflagrations may occur due to air bubble formation.

Shutting down of burner for a given period

If the heating system is being run on vegetable oil, the burner must be flushed with the fuels EL (extra light) heating oil or automotive diesel for at least 10 minutes before shutting down the system for periods longer than 14 days.

We reserve the right to make technical changes!
Illustrations, functional steps and technical data may deviate slightly due to ongoing developments.

4. Installation of the Oil Burner

The sliding flange supplied with the equipment is used to affix the oil burner to the boiler by means of four bolts for attachment to the boiler plate. The jam-fit sliding flange facilitates insertion of the fire tube into the combustion chamber so as to meet the requirements of the specific boiler unit.

The slots in the sliding flange are suitable for reference diameters from 150 to 180 mm. When installing the sliding flange, take into account the tilt of 3° in the direction of the combustion chamber so that no oil will flow into the burner when the preheater is warming up. Comply with the label instruction "TOP"! Once the flange has been mounted on the boiler, the fire tube is inserted and the burner is raised slightly and fitted tight. (4 mm Allen key).

The combustion chamber door is then opened and the fire tube is fastened down using the bayonet mount.

4.1 Insertion depths

In some combustion chamber versions, predefined fire tube insertion depths must be complied with:

Threepass boiler with recirculation combustion chamber:
Insert burner until the recirculation slits project into the combustion chamber insert.

Hot reversed-operation combustion chamber:
Insert burner **only** until the recirculation slits are flush with the door insulation.

Very important:
It is important to make sure the recirculation slits project far enough into the combustion chamber to ensure exhaust gas recirculation. They must not be covered by insulation material. The distance between the rear wall of the boiler and the must be at least 100 mm.

4.2 Electrical connection

The electrical connection is realized by means of a plug-in connector acc. to DIN EN 226, the socket component of which is attached to the burner. Comply with local EVU and VDE regulations. Comply with switching diagram! Pull out burner plug before working on the burner electrical system.

4.3 Oil connection

The oil hoses provided are connected to the oil pump and affixed with the clamping device. The cutoff and filter fixtures must be arranged to provide for technically appropriate hose arrangement, i.e. the hoses must not be buckled.

Please use only the oil hoses included with the equipment and original replacement parts. Only these hoses will ensure optimized resistance to aggressive acids contained in the biological fuels. Use parts made of plastic or special steel for all parts in contact with oil.

5. Items to remember when putting equipment into service

5.1 Exhaust gas temperature

The exhaust gas temperature should be within the range of 160℃ to 200℃. At temperatures below 160℃ there is a risk of condensate sooting. It is therefore important to make sure the stack meets the relevant specifications. The instructions issued by the boiler manufacturer on minimum exhaust gas temperature must also be complied with.

5.2 Harmonization of burner, boiler and stack.

A prerequisite of faultless combustion is a constant combustion chamber pressure, since the burner fan output depends on a certain counterpressure level. Pressure variations result in air excess or deficiency. Installation of a **draught restriction valve or secondary air system** is necessary to achieve a constant combustion chamber pressure. The stack cross-section dimension must also be appropriate. Stack and burner monitoring and heating engineers can provide technical expertise concerning the dimensioning of stacks and secondary air systems.

5.3 Exhaust gas thermometer

Installation of an exhaust gas thermometer or continuous monitoring of the exhaust gas temperature using thermometers available from technical suppliers is recommended. An appropriate measuring point is the control opening for stack and burner engineers in the exhaust gas tube. A rise in exhaust gas temperature exceeding 30℃ indicates initial formation of deposits in the boiler, which result in sub-optimum operation of the heating system. The burner setting should be controlled and cleaning of the boiler considered. Reference measurements must ensure that the boiler temperatures are identical and that the burner operating times prior to measurement are approximately the same.

5.4 Operation timer

To control oil consumption, it is recommended that the C1 burner be supplied with an operation timer. When comparing oil consumption levels, it must be taken into account that the external temperature curve over given months or years influences the measurement results.

5.5 Fuels

The Tempratec C1 burner is tested and approved for the fuels heating oil EL and rapeseed oil acc. to E-DIN 51605:2005-06 (RK Quality Standard).

5.6 Information concerning the operations room

The burners may only be installed in rooms in which air contamination with halogenated hydrocarbons can be expected, such as hairdresser businesses, printing businesses, chemical dry-cleaners, laboratories, etc. if a sufficient volume of uncontaminated combustion air is available. The burners may not be operated in rooms with high levels of dust or humidity, e.g. washrooms. The heating room must be protected from frost and well ventilated. If these principles are not complied with, warranties for any damages will be nil and void.

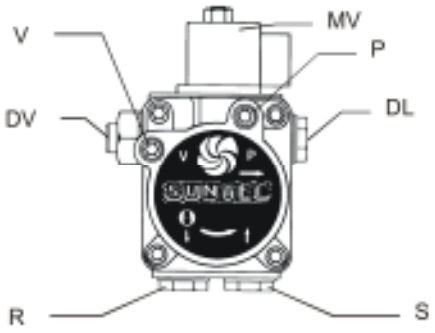
6. Burner settings:

The C1 burner features the following settings:

6.1. The pump pressure adjustment

Pump pressure adjustment (DV) is used to set the performance level over the entire performance range.

The nozzle need not be replaced to change the output performance level.



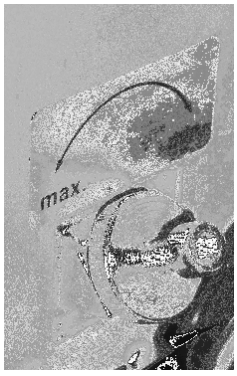
S = Suction line
P = Manometer, pump pressure
DV = Pressure adjustment
MV = Solenoid valve
R = Recirculation line
V = Vacuum meter
DL = Nozzle line

The pump pressure covers a range of:

3.0 – 13.5 bar for heating oil EL
5.5 – 18.0 bar for rapeseed oil

6.2. Air valve adjustment

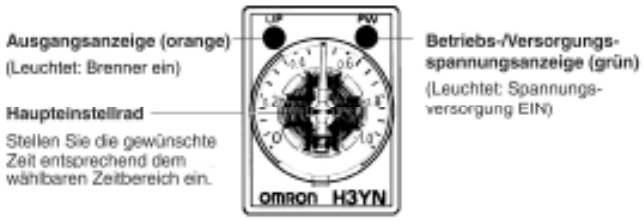
The air valve is adjusted to adapt the combustion air to the oil volume (output).



Excessive combustion air is controlled by means of the air valve using a suitable emissions metering device.

Non-binding basic settings are listed in the table “Basic Settings”.

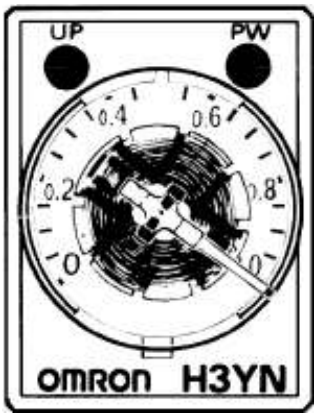
6.5. Startup delay



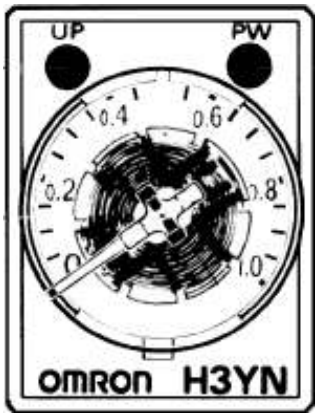
Output display (orange) (lights up: burner on)
Main adjustment wheel
Set time accordingly.

Operational / supply voltage display (green) (lights up: voltage supply ON)

During the adjustable startup delay time, the temperature of the entire nozzle holder is monitored to make sure it is high enough before the burner starts up.



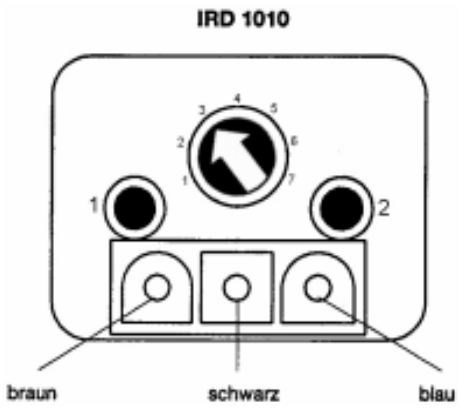
Basic setting for startup delay:
Time setting **(t): approx. 10 min**.
Turn knob to the right until it hits the stop.



To undertake **service work on the operationally warm** burner, the settings wheel can be turned to the right until it hits the stop. This reduces the startup delay to 1 min..

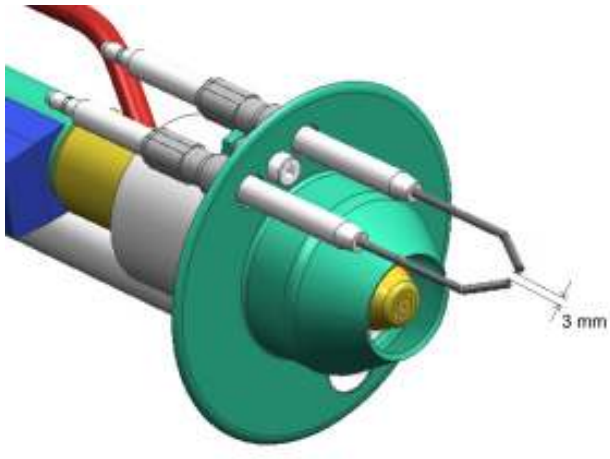
After the service work is completed, the settings wheel is always once again turned to the right until it hits the stop to avoid startup problems.

6.6 The infrared flicker detector (IRD)



The infrared flicker detector facilitates detection of blue flames. The basic setting is position "3"

6.7. Ignition electrodes



The form and gap of the ignition electrode can be determined using this drawing.

7. Basic Burner Settings

The burner output, with the corresponding, non-binding, data for pump presure and air settings, can be read off the following table.
The measured values were obtained with oil at an approx. temperature of 20℃.

Heating oil								
Non-binding data								
Output range	**[kW]**	**13**	**16**	**19**	**22**	**25**	**28**	**31**
Oil througput	[kg/h]	1.1	1.3	1.6	1.8	2.1	2.4	2.6
Pump pressure	[bar]	4	5	6	8	10	13	15
Pos. inlet nozzle	[Skala]	max.	max.	max.	max.	max.	max.	max.
Pos. air valve	[mm]	5	7	9	10	11	13	14
Mixed pressure	[mbar]	1.6	2	3	4.3	5.3	6.8	7.9

Restsauerstoffgehalt [O_2] ca. 2.5 %

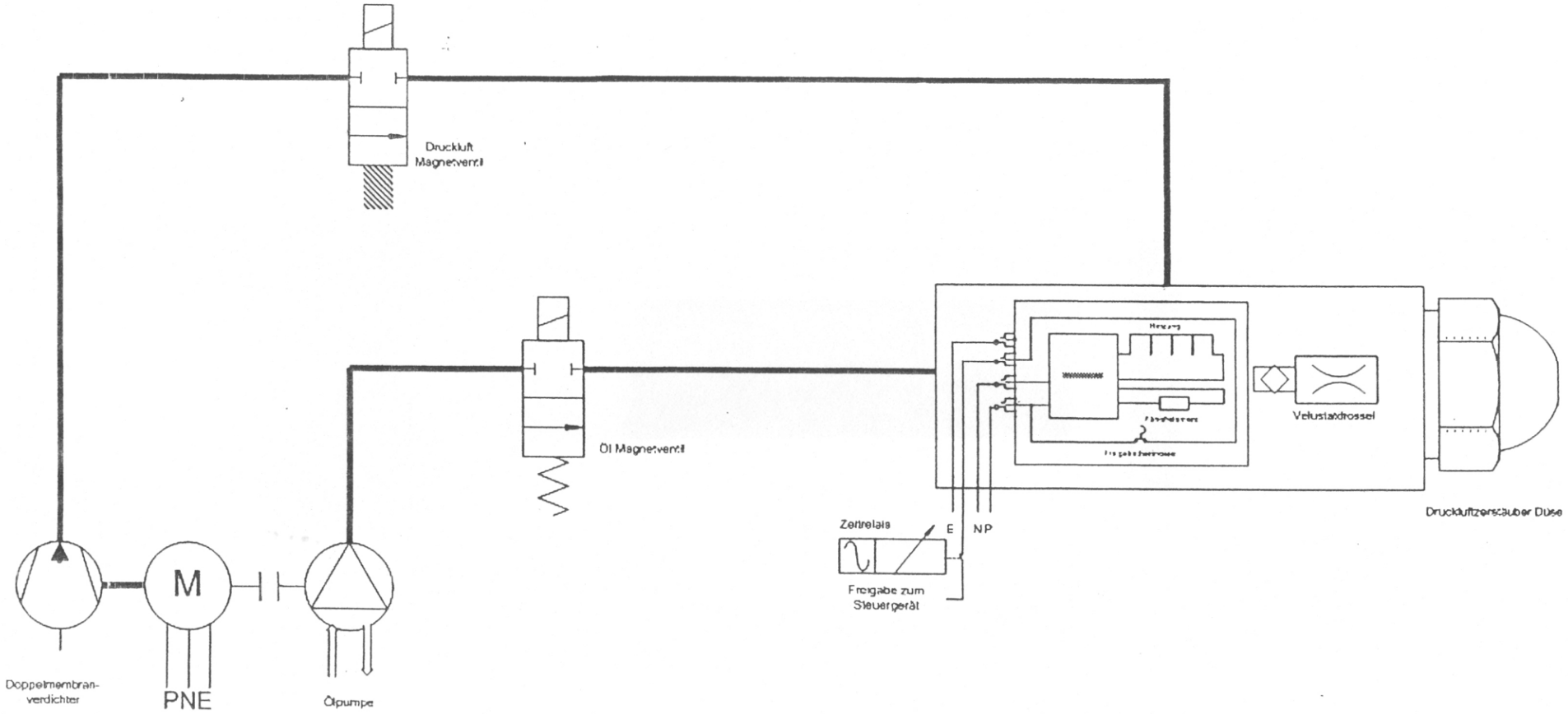
Rapeseed oil								
Non-binding data								
Output range:	**[kW]**	**13**	**16**	**19**	**22**	**25**	**28**	**31**
Oil througput:	[kg/h]	1.3	1.6	1.8	2.1	2.4	2.7	2.9
Pump pressure:	[bar]	5	8	10	11	13	16	18
Pos. inlet nozzle:	[Skala]	max.	max.	max.	max.	max.	max.	max.
Pos. air valve:	[mm]	6	9	10	11	12	13	14
Mixed pressure:	[mbar]	1.4	3	4.1	4.4	5.9	6.6	7.1

Residual oxygen content [O_2] approx. 2.5%

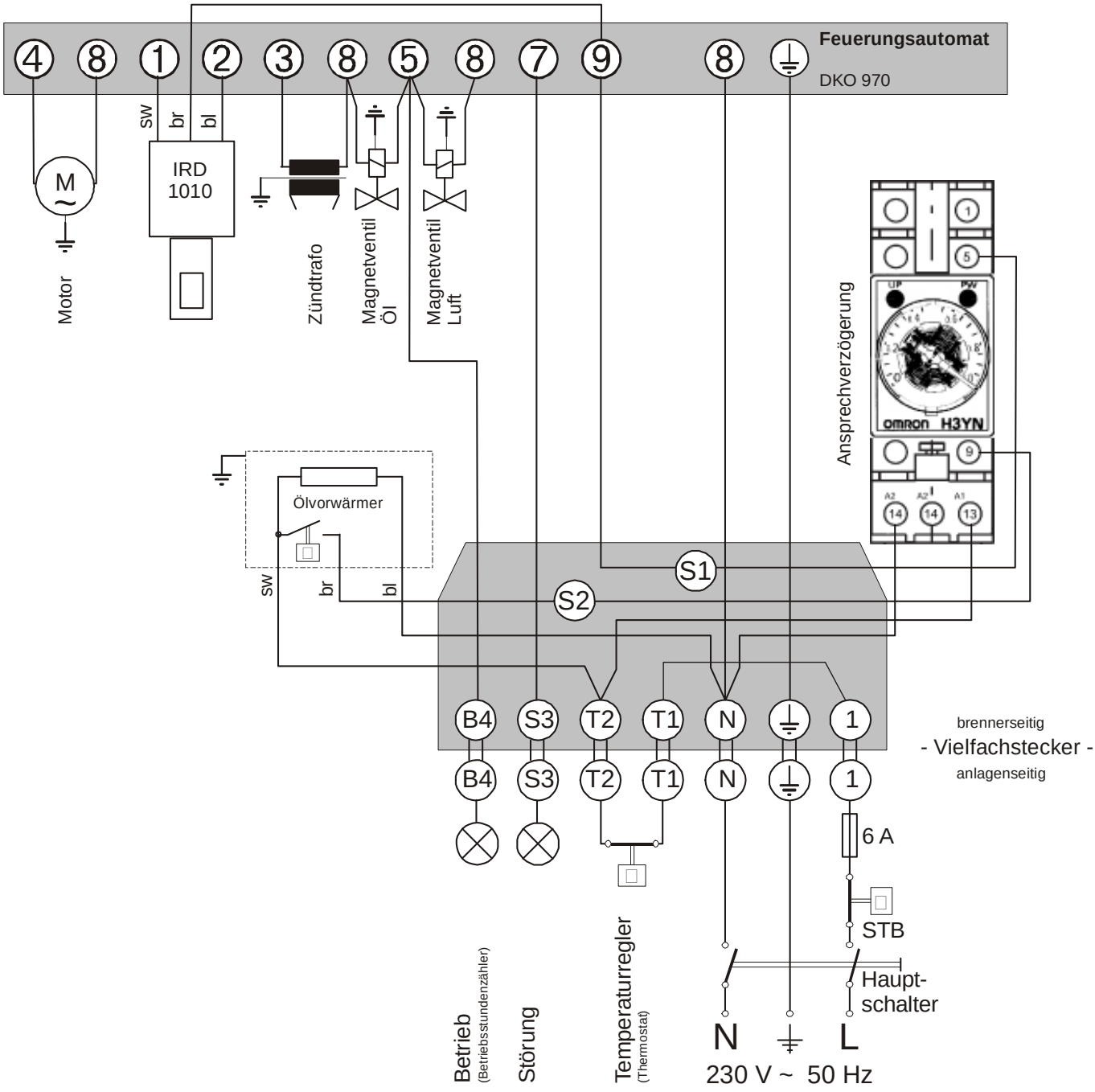
These values are used for presettings only.
An emissions measurement must be carried out in any case and the combustion air volume must be adjusted using the air valve.

Emissions must be remeasured when the fuels are changed.

8. Hydraulics Diagram



9. Electrical Connections and Switching Diagram



10. Oil Connection

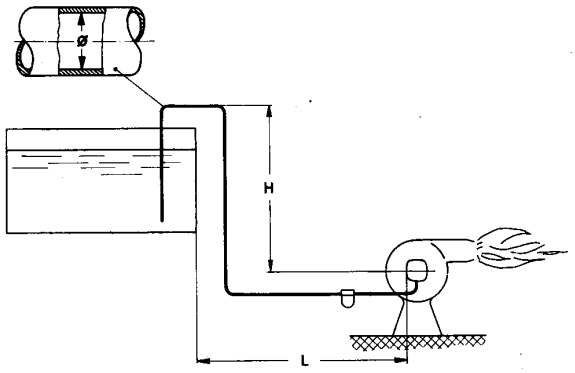
VORSICHT!

EQUIPMENT DAMAGE CAUTION!
This burner is suitable for use with biological fuels.
Handle these fuels using suitable materials **(e.g. plastic or special steel).**

Carry out installation in accordance with the valid engineering regulations, applying the specified safety devices, e.g. anti-lift valve.
In general, a onepass oil supply with an automatic onepass deaeration filter is recommended.

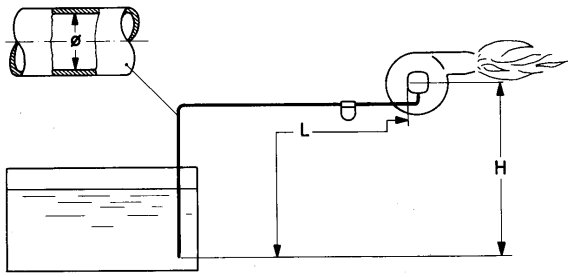
10.1 Pipe dimensioning for heating oil EL with a viscosity of 4.8 mm²/s (20℃)

1-pass system with elevated tank



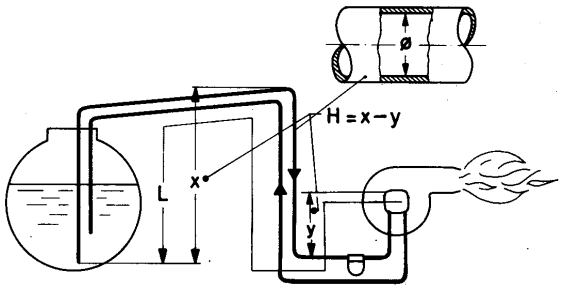
H [m]	4.0	3.5	3.0	2.5	2.0	1.5	1.0	0.5
Ø 4 [mm]	51	45	38	32	26	19	13	6
Ø 6 [mm]	100	100	100	100	100	97	65	32

1-pass system with tank at lower level



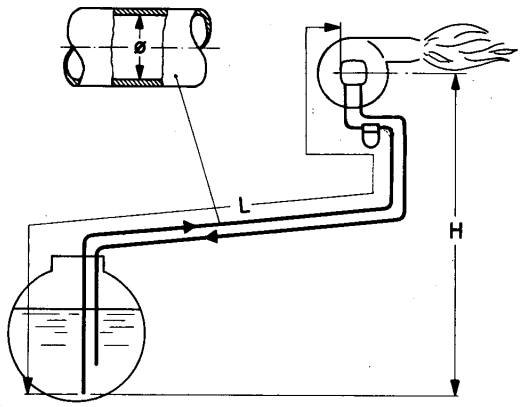
H [m]	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
Ø 4 [mm]	52	46	40	33	27	21	15	9	2
Ø 6 [mm]	100	100	100	100	100	100	75	44	12

2-pass system with elevated tank



H [m]	4.0	3.5	3.0	2.5	2.0	1.5	1.0	0.5
Ø 6 [mm]	33	31	29	27	25	23	21	19
Ø 8 [mm]	100	98	91	85	79	72	66	60

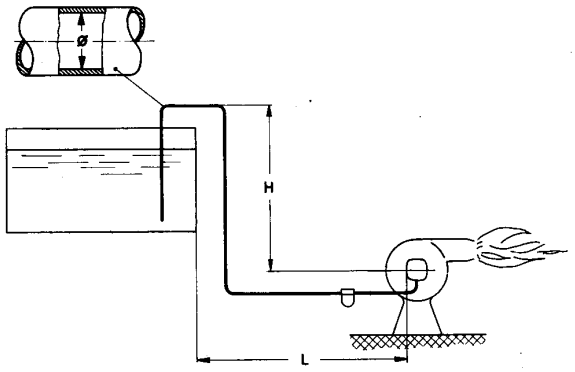
2-pass system with tank at lower level



H [m]	-0.0	-0.5	-1.0	-1.5	-2.0	-2.5	-3.0	-3.5	-4.0
Ø 6 [mm]	17	15	13	11	9	7	5	3	1
Ø 8 [mm]	53	47	41	34	28	22	15	9	3
Ø 10 [mm]	100	100	99	84	68	53	37	22	6

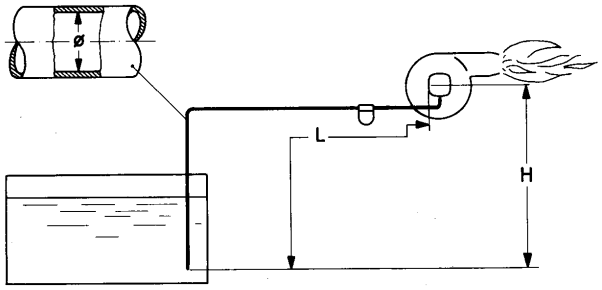
10.2 Pipe dimensioning for rapeseed oil with a viscosity of 80 mm²/s (20℃)

1-pass system with elevated tank



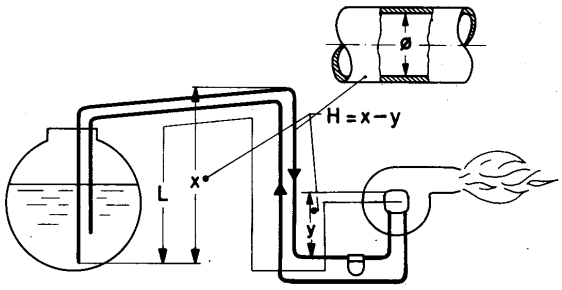
H [m]	4.0	3.5	3.0	2.5	2.0	1.5	1.0	0.5
Ø 6 [mm]	46	43	40	38	35	32	29	27
Ø 8 [mm]	100	100	100	100	100	100	93	84

1-pass system with tank at lower level



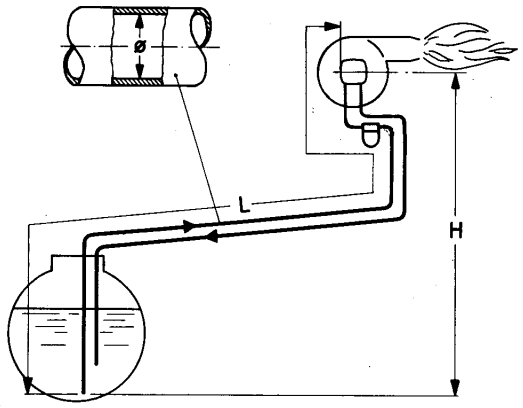
H [m]	-0.0	-0.5	-1.0	-1.5	-2.0	-2.5	-3.0	-3.5	-4.0
Ø 6 [mm]	22	19	17	14	12	9	7	4	-
Ø 8 [mm]	68	60	53	45	37	29	22	14	6
Ø 10 [mm]	100	100	100	100	91	72	53	34	15

2-pass system with elevated tank



H [m]	4.0	3.5	3.0	2.5	2.0	1.5	1.0	0.5
Ø 10 [mm]	16	15	14	13	12	11	11	10
Ø 12 [mm]	34	32	30	28	26	24	22	20

2-pass system with tank at lower level



H [m]	-0.0	-0.5	-1.0	-1.5	-2.0	-2.5	-3.0	-3.5	-4.0
Ø 12 [mm]	16	14	13	11	9	7	5	-	-

11. Burner Malfunctions and Possible Causes

Ask your heating engineer if you require further information.

Malfunction	Cause	Elimination
Motor does not start	Fuse defective Safety thermostat "off" Motor defective Electric power supply line defective Oil-preheater defective Startup delay maladjusted Startup delay defective	Replace Switch on thermostat Replace Check Replace Test Replace
System starts, but switches off (to "defect" mode) after safety margin time has elapsed	**1. With flame production** : Flame monitory soiled, defective or with incorrect setting Control device defective 2. **Without flame production** : Sensor "sees" ignition sparks (LEDs light up) Ignition cable influences sensor line Ignition defective Ignition electrodes defective Ignition cable connections loose External light setting IRD too sensitive External light on flame sensor System is not supplied with oil: Oil line valves closed Oil tank empty Filter soiled Oil line leaky Pump defective Solenoid valve / control unit defective Membrane compressor defective	 Clean, replace, set Replace Block direct line of sight to sparks Do not run cable parallel Replace transformer Replace electrodes Check cable connections Reduce IRD sensitivity Switch off external light Open Replenish oil Clean Seal Replace Replace Replace
Flame goes out during operation	Oil depleted Oil filter or oil feeder line clogged Oil pump defective Air inclusions in oil line Solenoid valve defective Membrane compressor defective Volustat filter clogged	Replenish oil Clean filters, lines Replace Deaerate Replace Replace Clean, replace
Sparking malfunctions	Ignition sparkovers to nozzle or mixing device Ignition defective	Correct ignition electrode position Replace transformer

Malfunction cause diagnosis with Satronic DKO automatic firing device
The diagnostic system provides continuous information concerning the current program phase of the device. External communications are realized by means of a blink code. Additional information can be read out with the help of a "SatroPen".

Program progression display
The integrated microprocessor controls both the program progression and the information system. The individual phases of the program progression are displayed as blink codes. The following messages are used:

☒ = Short pulse
⌘ = Long pulse
• = Short pause
_ = Long pause
*) = If present

Malfunction cause diagnosis
The LED lights up continuously in case of a malfunction. This is interrupted every 10 seconds and a blink code is sent that provides information concerning the cause of the malfunction. This results in a sequence as follows, which is repeated until the error is acknowledged, i.e. until the malfunction is eliminated.

Lighting phase	Dark phase	Blink code	Dark phase
		☒ ⌘ ⌘ ⌘ ⌘	
10 sec.	0.6 sec.		1.2 sec.

Message	Blink code
Controlled preventilation (DKW)	☒ ☒ ☒ •
Pre-ignition time	☒ ☒ ☒ ☒ •
Safety marging and post-ignition time	⌘ ☒ •
Operation	☒ •
Mains undervoltage	☒ ⌘ ⌘ _

Malfunction message	Blinkcode	Malfunction cause
Malfunction cutoff	☒ ⌘ ⌘ ⌘ ⌘	No flame recognition during safety margin time
External light disturbance	☒ ☒ ⌘ ⌘ ⌘	External light during pre-ventilation, possibly defective sensor
Manual malfunction cutoff	☒ ☒ ⌘ ⌘ ⌘ _ ⌘ ⌘ ⌘ ⌘ ⌘	

12. Care and Maintenance

EQUIPMENT DAMAGE CAUTION!
due to a lack of or faulty cleaning and maintenance.
Have entire heating system maintained by a specialized company once a year.
We recommend concluding a contract for the annual maintenance work.

12.1 Burner care

A moist towel an gentle household cleaning agent or dishwashing liquid will suffice to cleaning the burner surfaces. Do not use scouring agents. Switch off current when cleaning the system.

12.2 Burner maintenance

Once a year, preferably before the heating period, the burner and oil supply must be subjected to detailed maintenance.
Switch off current when maintaining the system.

Maintenance items:

1. Clean all parts through which air flows to remove dust, greasy coatings, etc.
2. Replace main oil filter units
3. Check all parts through which oil flows for leakage.
4. Clean combustion residues out of the mixing equipment.
5. Clean or check the ignition electrodes. Set gaps.
6. Blow out oil nozzle using compressed air.
7. Clean or replace throttle filter.
8. Clean photocell.

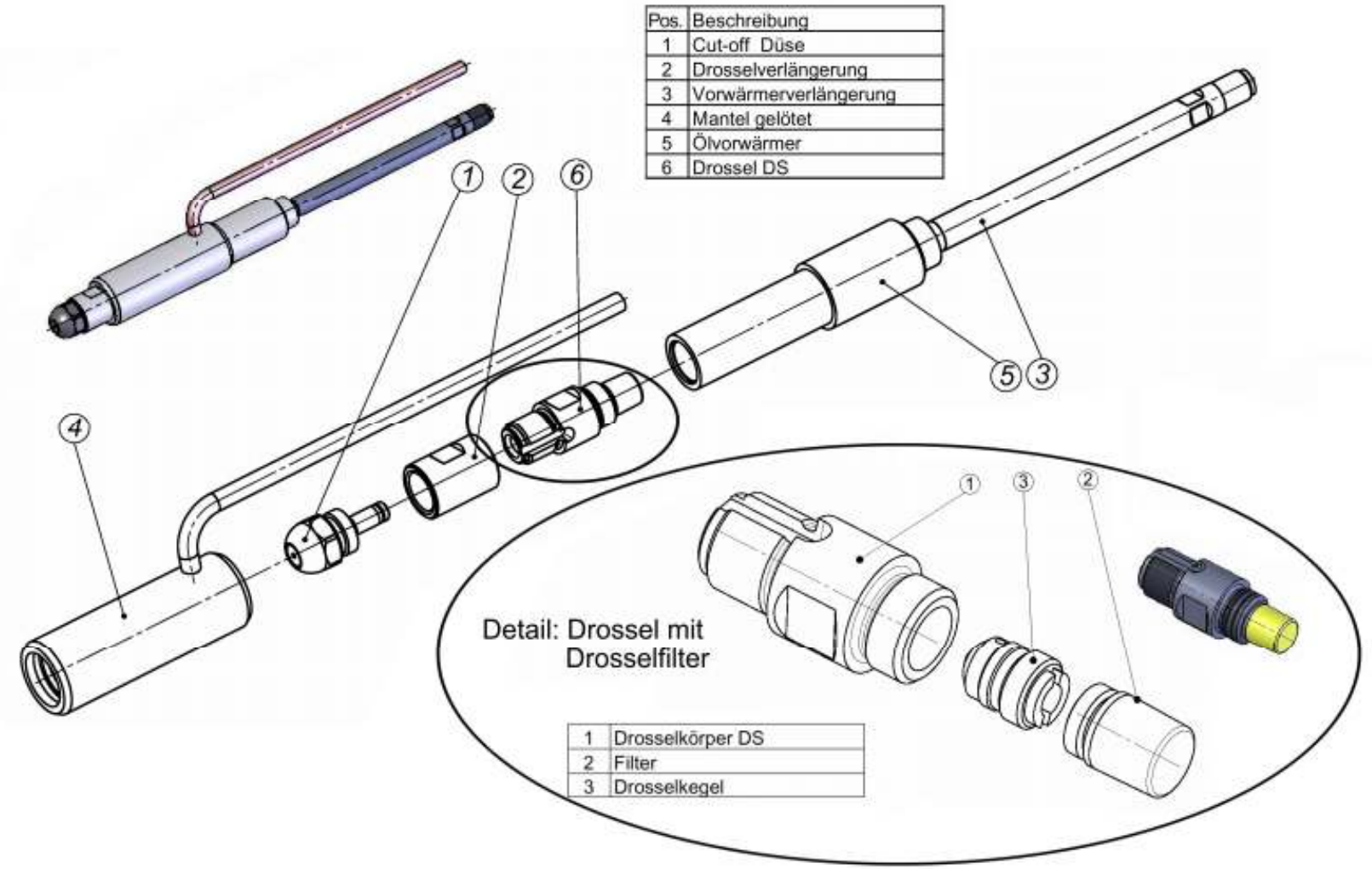
IMPORTANT

If the burner is run on rapeseed oil, the maintenance intervals are 3 months. An automatic heating oil deaerator with integrated filter and underpressure manometer is recommended (e.g. Afriso FloCo-Top-M, suitable for rapeseed oil). This filter unit can be ordered as an accessory.

Shutting down of burner for a given period

If the heating system is being run on vegetable oil, the burner must be flushed with the fuels EL (extra light) heating oil or automotive diesel for at least 10 minutes before shutting down the system for periods longer than 14 days.

13. Nozzle Holder



14. Putting Equipment Out of Service

EQUIPMENT DAMAGE due to frost.
CAUTION!
The heating system may freeze when exposed to frost if it is not in operation. Protect the heating system from frost. To do this, drain out the heating water at the lowest point on the heating system.

Points to remember when putting the equipment out of service:

14.1 Putting out of service or during maintenance:

Switch off the mains switch on the switching console. Cut off the oil supply. Drain water out of system if there is a danger of frost.

14.2 Emergency cutoff:

In emergencies, switch off the heater at the emergency cutoff switch and stop fuel feed at the next accessible cutoff valve.

IMPORTANT

If the burner is run on rapeseed oil, brief operation with EL heating oil or automotive diesel fuel is recommended during putting out of service to preserve the parts through which oil passes (approx 10 minutes).

Due to its components, rapeseed oil tends to resinify and clog up the machine components over longer standstill periods.

15. Guarantee Conditions

The general guarantee period for our equipment is 24 months after delivery, beginning with the billing date.

All guarantee claims lose their validity:

- **If the device is not put into service in the technically correct manner** (must be confirmed by measurement protocol).
- If regular maintenance as per the TEMPRATEC Operating Instructions have not been carried out an documented.

- **Maintenance intervals:**

  - Annually if run on heating oil
  - Quarterly if run on rapeseed oil (Weihenstephan Quality Standard)

- If any fuel besides heating oil EL, DIN 51603-1 or rapeseed oil Quality Standard Weihenstephan has been used.
- If heating oil or rapeseed oil has been stored or used at below +8°C.
- If changes or manipulations of the equipment have been carried out.
- If repair work has been done by persons who are not specifically qualified.
- If the safety instructions and installation instructions have not been complied with
- If the equipment is used in darkrooms, baking ovens, annealing furnaces, drying cabinets or for industrial purposes

LÄNDTECHNIK WEIHENSTEPHAN	**LTV-Arbeitskreis Dezentrale Pflanzenölgewinnung, Weihenstephan** **Qualitätsstandard für Rapsöl als Kraftstoff (RK-Qualitätsstandard)** 05/2000	in Zusammenarbeit mit:

Eigenschaften / Inhaltsstoffe	Einheiten	Grenzwerte min.	Grenzwerte max.	Prüfverfahren
für Rapsöl charakteristische Eigenschaften				
Dichte (15 °C)	kg/m³	900	930	DIN EN ISO 3675 DIN EN ISO 12185
Flammpunkt nach P.-M.	°C	220		DIN EN 22719
Heizwert	kJ/kg	35000		DIN 51900-3
Kinematische Viskosität (40 °C)	mm²/s		38	DIN EN ISO 3104
Kälteverhalten				Rotationsviskosimetrie (Prüfbedingungen werden erarbeitet)
Zündwilligkeit (Cetanzahl)				Prüfverfahren wird evaluiert
Koksrückstand	Masse-%		0,40	DIN EN ISO 10370
Iodzahl	g/100 g	100	120	DIN 53241-1
Schwefelgehalt	mg/kg		20	ASTM D5453-93
variable Eigenschaften				
Gesamtverschmutzung	mg/kg		25	DIN EN 12662
Neutralisationszahl	mg KOH/g		2,0	DIN EN ISO 660
Oxidationsstabilität (110 °C)	h	5,0		ISO 6886
Phosphorgehalt	mg/kg		15	ASTM D3231-99
Aschegehalt	Masse-%		0,01	DIN EN ISO 6245
Wassergehalt	Masse-%		0,075	pr EN ISO 12937

TEMPRATEC TECHNOLOGIE Ltd.

TEMPRATEC, Durlacher Str. 1, 75172 Pforzheim

17. Manufacturer Declaration and Declaration of Conformity

Manufacturer Declaration

Pforzheim, 26.04.2010

The company Tempratec Technologie Limited hereby declares that the following oil burners:

Product	Oil burner
Type	C1
Test standards	DIN EN 267
Test location	TÜV Nord Hannover
Product ID	

comply with the specifications of the guidelines and standards listed and correspond to the design types listed with the above test location.

This declaration does not, however, imply any warranted properties.

The oil burners listed above are intended solely for installation in boilers that are also approved in accordance with the relevant guidelines and standards.

The equipment manufacturer must ensure that all regulations applying to the harmonization of the oil burning with the boiler have been complied with.

Paul Schmidt
Executive Management

Declaration of Conformity

Pforzheim, 26.04.2010

The company Tempratec Technologie Limited hereby declares that the following oil burners:

Product	Oil burner
Type	C1

have been manufactured in accordance with the following standards and guidelines:

Low-voltage Guideline 73 / 23 EEC – 01.1973
EMV Guideline 89 / 337 EEC – 05.1989

Machine Guideline 87 / 392 EEC – 05.1989
With reference to the Oil Burners – Standard DIN EN 267

Paul Schmidt
Executive Management

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Freiburg HRB 703807
Geschäftsführer: Paul Schmidt

Hauptsitz Great Britain:
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Calleva Park
Adlermaston, Reading
Berkshire, Rg7 8NN

19. Putting into service

Step 1: 	Loosen **fastening bolt** on C1 burner hood with screwdriver and remove burner hood. Please remember Use large screwdriver.
Step 2 	Connect **electrical power line** from boiler to Euro plug on C1 burner.
Step 3 	**Burner oil pump:** Screw out plug on the pump lid using the Allen key provided (P) and screw in manometer for purposes of monitoring and alteration of pressure settings changes.
Step 4	Switch on boiler system and start up burner.
Step 5:	Allow ten minutes for oil preheating.

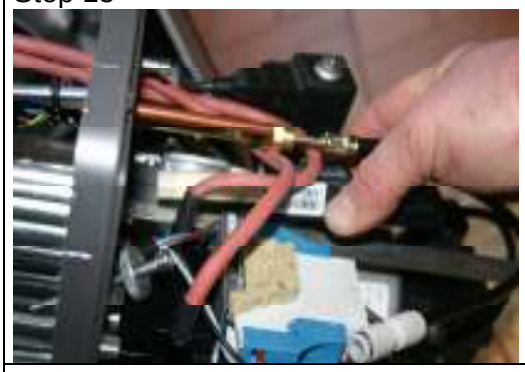
Step 6: 	**Upon burner startup** – Insert measuring probe from the emissions device into the measuring opening on the exhaust gas tube and observe exhaust gas values.
Step 7 	As required, open or close air valve for combustion air in relation to measured data. **Please remember:** Using the Allen key provided, turn the cheesehead bolt at the top left of the burner housing. Loosen counter-wheel and turn Allen key, as required: to the right: reduce air volume to the left: increase air volume. **Important:** Tighten down counter-wheel.
Step 8 	Pressure setting on the Suntec oil pump is realized parallel to setting of the output and measurement data. This is done on the right side of the upper edge of the oil pump with a large flat-blade screwdriver. **Please remember:** Observe pressure gauge on screwed-in manometer. **Turn to the right** – Raise pump pressure and burner output. (see table on p. 9) **Turn to the left** – Reduce pump pressure and burner output. (see table on p. 9)
Step 9: 	After setting the measurement data and burner output, switch off burner, screw out manometer, screw in plug and put burner into service.

20. Service Instructions

Step 1: 	Use screwdriver to loosen the fastening bolt on the C1 burner hood and remove burner hood. **Please remember:** Use large screwdriver.
Step 2 	Remove electrical connection from boiler at burner Euro socket and switch off boiler system.
Step 3: 	Loosen four cheesehead bolts on burner housing and remove housing lid. Please remember: Attach burner housing at the upper right.
Step 4 	**Compressor air supply coupling:** Press ring towards the back and pull off.

Step 5 	Pull ignition cable off of the ignition electrodes.
Step 6: 	Pull off air cover.
Step 7 	Clean residues off air cover using a brass wire brush. Clean flicker detector tubes.
Step 8 	Clean ignition electrodes and reset to 3 mm gap.

Step 9 	Pull off compressed air mantle forwards. Check gasket rings in mantle for damage.
Step 10 	Clean turbulator with cloth.
Step 11 	Replace oil nozzle. **Please remember:** Size 16 open-end spanner, whereby a size 16 open-end wrench is used to restrain the nozzle holder to keep it from turning.
Step 12 	Replace or clean throttle filter. **Please remember:** Size 16 open-end spanner on throttle body, whereby a size 16 open-end wrench is used to restrain the throttle extension to keep it from turning.
Step 13	

	Clean blower turbine with cloth.
Step 14	Bolt on blower lid. (see figure, Step 3.)
Step 15 	Pull off photocell and clean it.
Step 16 	**Oil pump:** Loosen four cheesehead bolts on the oil pump lid. Clean pump sieve and inner housing.
Step 17 	Open boiler door, pull off flame tube with bayonet mount and clean it.
Step 18	Check all cheesehead bolts and tighten them. Connect electrical supply line at burner Euro plug and put into service.