

**MAX 15**  
**MAX 20**  
**MAX 30**



**Technical data**  
**Dati tecnici**  
**Données techniques**  
**Datos técnicos**  
**Технические характеристики**



**Operating instructions**  
**Istruzioni per l'uso**  
**Notice d'emploi**  
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**Руководство по эксплуатации**



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**Schémas électrique et hydraulique**  
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**Pièces de rechange**  
**Parti ricambi**  
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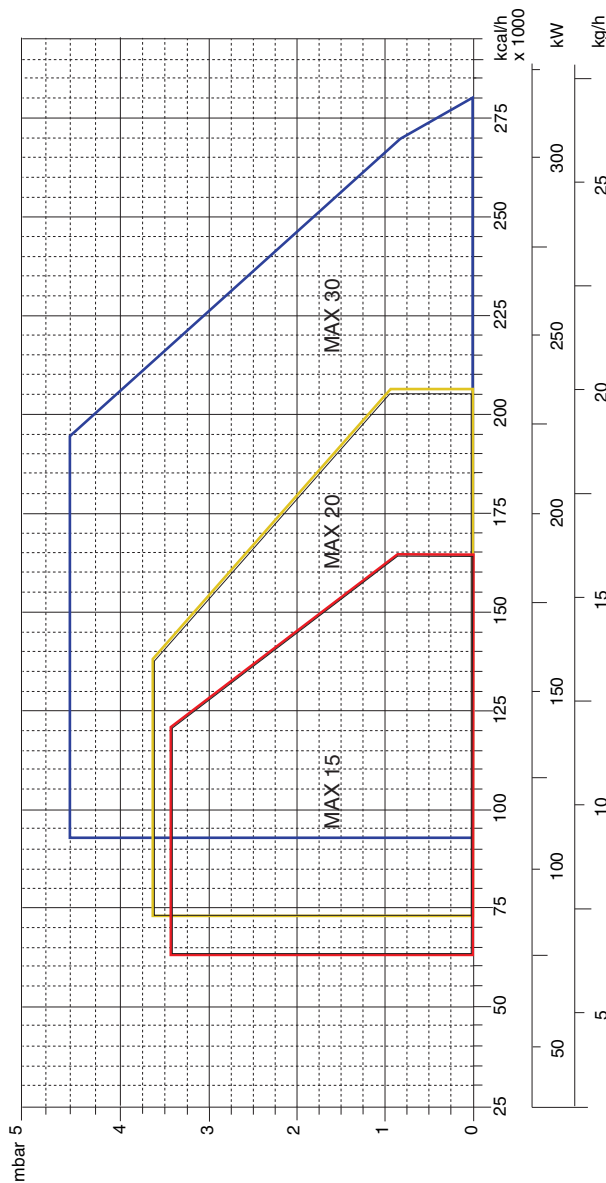
420010371901

MAX 15 TC	3142729
MAX 15 TL	3142730
MAX 20 TC	3142731
MAX 20 TL	3142732
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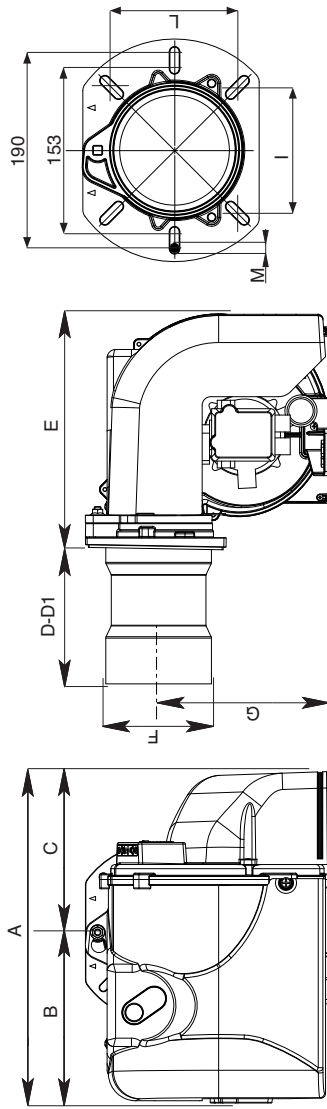
Technical data - Dati tecnici - Données techniques - Datos técnicos - Технические характеристики		MAX 15		MAX 20		MAX 30			
Burner output max/min kW - kcal/h	Potenza bruciatore max/min kW - kcal/h	Puissance du brûleur max/min kW - kcal/h	Potencia del quemador máx/min kW - kcal/h	190	73,4	237	86,4	319	110
Oil throughput max/min kg/h	Portata gasolio max/min kg/h	Débit de fuel max/min kg/h	Caudal de gasóleo máx/min kg/h	163800	63240	204000	74460	275400	94860
Hydraulic system 1 stage	Sistema idraulico 1 stadio	Système hydraulique 1 allure	Sistema hidráulico 1 etapa	16	6,2	20	7,3	27	9,3
Regulating ratio	Rapporto di regolazione	Rapport de régulation	Relación de regulación	1		1		1	
Fuel oil	Combustibile	Fuel	Combustible						
Emission class	Classe di emissione	Classe d'émission	Tipo de emisión						
Control box	Apparecchiatura di controllo	Coffret de sécurité	Cajetín de seguridad						
Air regulation Air flap	Regolazione aria Serranda dell'aria	Réglage de l'air Volet d'air	Ajuste del aire Válvula de aire	-		-			
Flame monitor	Rivelatore di fiamma	Surveillance de flamme	Vigilancia de llama						photoresistor
Ignition transformer	Trasformatore d'accensione	Allumeur	Encendedor						danfoss / cofi
Fuel-oil pump	Pompa di pressione gasolio	Pompe de pulvérisation fuel	Bomba de pulverización de gasóleo						danfoss / suntec
Electric motor rpm - watt	Motore elettrico giri motore - watt	Moteur rpm - watt	Motor rpm - watt	2800	800	2800	800	2800	800
				130	W	200	W	200	W
Voltage	Tensione	Tension	Tensión						
									230 V / 50 Hz
Power consumption (operation)	Potenza elettrica assorbita (Esercizio)	Puissance électrique absorbée (en service)	Pot. eléctrica absorbida (en funcionamiento)						
									450 W
Net weight	Peso netto	Poids net	Peso neto						
									11,6 kg
Protection level	Classe di protezione	Indice de protection	Índice de protección						
									IP40
Sound pressure level dB(A)	Livello pressione sonora dB(A)	Niveau pression acoustique dB(A)	Nivel de presión acústico dB(A)						
									70
Ambient temp. for storage	Temperatura ambiente di stoccaggio	Température ambiante de stockage	Temperatura ambiente de almacenamiento						
									-20°...+70° C
Temperature for use	Temperatura d'utilizzazione	Température d'utilisation	Temperatura ambiente de utilización						
									-10°...+60° C



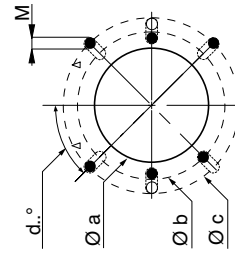
<p><b>Working field</b> The working field shows burner output as a function of combustion chamber pressure. It corresponds to the maximum values specified by EN 267 measured at the test fire tube.</p> <p><b>The efficiency rating of the boiler should be taken into account when selecting a burner.</b></p> <p>Calculation of burner output:  <math>QF = \frac{Q_N}{\eta_K}</math>                  QF = Burner output (kW)                  QN = Rated boiler output (kW)  <math>\eta_K</math> = Boiler efficiency (%)</p>	<p><b>Curva</b> Il campo di attività indica la potenza del bruciatore in funzione della pressione della camera di combustione. Corrisponde ai valori massimi previsti dalla norma EN 267 misurati sul tubo della fiamma di controllo.</p> <p><b>In occasione della scelta del bruciatore si deve tenere conto del rendimento energetico della caldaia.</b></p> <p>Calcolo della potenza del bruciatore:  <math>QF = \frac{Q_N}{\eta_K}</math>                  QF= potenza bruciata (kW)                  QN= potenza nominale della caldaia (kW)  <math>\eta_K</math> = rendimento energetico della caldaia (%)</p>	<p><b>Domaine de fonctionnement</b> Le domaine de fonctionnement correspond aux valeurs mesurées lors de l'homologation. Elle correspond aux valeurs max mesurées sur tunnel d'essai d'après l'EN 267.</p> <p><b>Pour le choix du brûleur, tenir compte du rendement de la chaudière.</b></p> <p>Calcul de la puissance calorifique:  <math>QF = \frac{Q_N}{\eta_K}</math>                  QF= Puissance calorifique (kW)                  QN= Puissance nominale chaudière (kW)  <math>\eta_K</math> = Rendement chaudière (%)</p>	<p><b>Ámbito de funcionamiento</b> El ámbito de funcionamiento corresponde a los valores registrados en el momento de la homologación. Corresponde a los valores máx medidos en el túnel de ensayo según la EN 267.</p> <p><b>Para la elección del quemador, se ha de tener en cuenta el rendimiento de la caldera.</b></p> <p>Cálculo de la potencia calorífica:  <math>QF = \frac{Q_N}{\eta_K}</math>                  QF = Potencia calorífica (kW)                  QN = Potencia nominal de la caldera (kW)  <math>\eta_K</math> = Rendimiento de la caldera (%)</p>	<p><b>Рабочий диапазон</b> Рабочий диапазон соответствует значениям, измеренным при сертификации. Он соответствует максимальным значениям, измеренным в соответствии со стандартом EN 267 в стандартном канале.</p> <p><b>При выборе горелки необходимо учитывать КПД котла.</b></p> <p>Расчет тепловой мощности:  <math>QF = \frac{Q_N}{\eta_K}</math>                  QF = Тепловая мощность, кВт                  QN= Номинальная мощность котла, кВт  <math>\eta_K</math> = КПД котла, %</p>
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Overview - Dimensions / Panoramica - Dimensioni / Vue d'ensemble - Dimensions / Descripción - Dimensiones / Обзор - Размеры

MAX 15 - 20 - 30



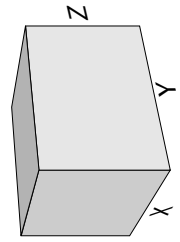
Model	A	B	C	D	D1	E	F	G	I	L	M
MAX 15	392	202	190	160	260	276	107	201	120/131	120/131	M8
MAX 20	392	202	190	160	260	276	125	201	120/131	120/131	M8
MAX 30	392	202	190	160	260	276	125	201	120/131	120/131	M8



Model	Ø a	Ø b	Ø c	d° ..
MAX 15	117	153	190	45°
MAX 20	135	153	190	45°
MAX 30	135	153	190	45°

Packaging

Model	X	Y	Z	Kg
MAX 15	450	610	390	14,8
MAX 20	450	610	390	15
MAX 30	450	610	390	15,7



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### Important notes

The MAX burners are designed for the combustion of domestic fuel oil EL in accordance with EN267 standards.

Assembly, commissioning and maintenance must be carried out only by authorised specialists and all applicable guidelines and regulations must be observed.

### Burner description

The MAX burner is a single-stage, fully-automatic monoblock-type burner. It is suitable for use, within its range of performance, with boilers complying with EN 303 or hot-air generators in line with DIN 4794, DIN 30697 or EN 621. Use for any other application requires the approval of Ecoflam.

The following standards should be observed in order to ensure safe, environmentally sound and energy-efficient operation:

#### EN 226

Connection of vaporising oil and forced draught gas burners to the heat generator.

#### EN 60335-2

Safety of electrical equipment for domestic use.

#### Installation location

The burner must not be operated in rooms containing aggressive vapours (e.g. spray, perchloroethylene, hydrocarbon tetrachloride, solvent, etc.) or tending to heavy dust formation or high air humidity. Adequate ventilation must be provided at the place of installation of the furnace system to ensure a reliable supply with combustion air. Variations may arise as a result of local regulations.

### Declaration of conformity for oil burners

We,

#### Ecoflam Bruciatori S.p.A.

declare under our sole responsibility that the light oil burners named

#### MAX

conform to the following standards:

EN 267: 2010  
 EN 60335-1: 2008  
 EN 60335-2-30: 2006  
 EN 60335-2-102: 2007  
 EN 55014-1: 2008 + A1: 2009  
 EN 55014-2: 1998 + A1: 2001 + A2: 2008

These products bear the CE mark in accordance with the stipulations of the following directives:

2006/95/EEC Low Voltage Directive  
 2004/108/EEC EMC Directive  
 2006/42/EC Machinery directive

Resana, 28th June 2011  
 M. PANIZZON

### We can accept no warranty liability whatsoever for loss, damage or injury caused by any of the following:

- Inappropriate use.
- Incorrect assembly or repair by the customer or any third party, including the fitting of non-original parts.

### Provision of the system and the operating instructions

The firing system manufacturer must supply the operator of the system with operating and maintenance instructions on or before final delivery. These instructions should be displayed in a prominent location at the point of installation of the heat generator, and should include the address and telephone number of the nearest customer service centre.

### Notes for the operator

The system should be inspected by a specialist at least once a year. It is advisable to take out a maintenance contract to guarantee regular servicing.

Ecoflam burners have been designed and built in compliance with all current regulations and directives.

All burners comply with the safety and energy saving operation regulations within the standard of their respective performance range. The quality is guaranteed by a quality and management system certified in accordance with ISO 9001:2008.



## Contents - Burner description

### MAX 15 LNTW TC - 230V/50Hz

#### RANGE NAME BY FUEL TYPE

MAX Light oil

#### MODEL SIZE (Gas: kW; Oil: kg/h)

MAX 15 16 kg/h

#### EMISSION COMBUSTION TYPE

MAX Low NOx Low NOx Class 3 yellow flame (<120 mg/kWh)  
 MAX Standard Class 2-OIL EN267 (<185 mg/kWh)

#### OPERATION TYPE

- 1 stage  
 TW Thermowatt E-BCU

#### HEAD TYPE

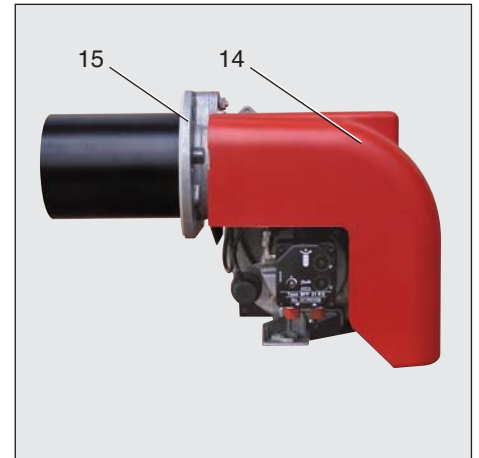
TC Short head  
 TL Long head

#### FUEL

- Light oil  
 KER Kerosene  
 BIODIESEL Biodiesel  
 D Heavy oil: max visc. 50° E at 50°C

#### ELECTRICAL SUPPLY TO THE SYSTEM

230V/50Hz 230 Volt, 50Hz

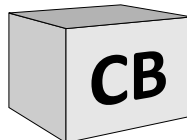


- A1 E-BCU OIL control box
- M1 Electric motor for pump and blower wheel
- T1 Ignition transformer
- Y Graduated rod
- Y1 Solenoid valve
- 3 Air regulation in the burner head
- 5 Fastening screws for equipment plate
- 9 Wieland socket
- 15 Burner flange
- 16 Release knob
- 102 Fuel-oil pump
- 103B Air regulation
- 113 Air intake

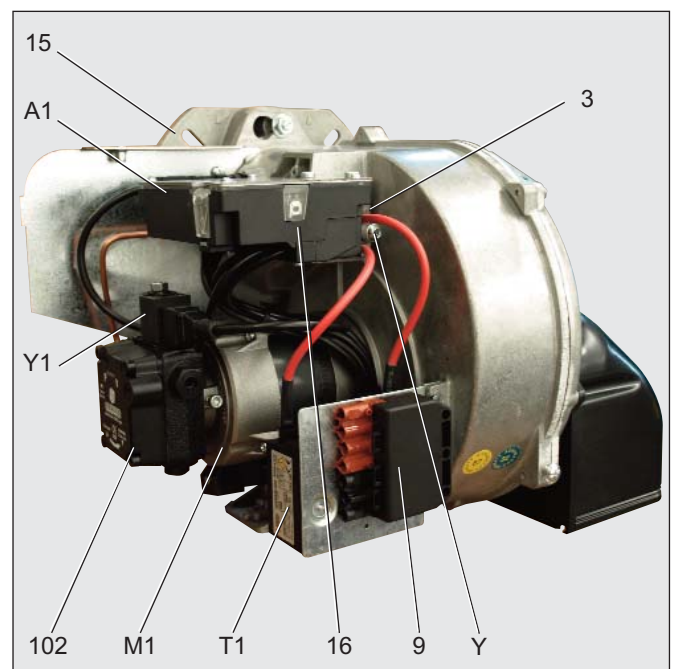
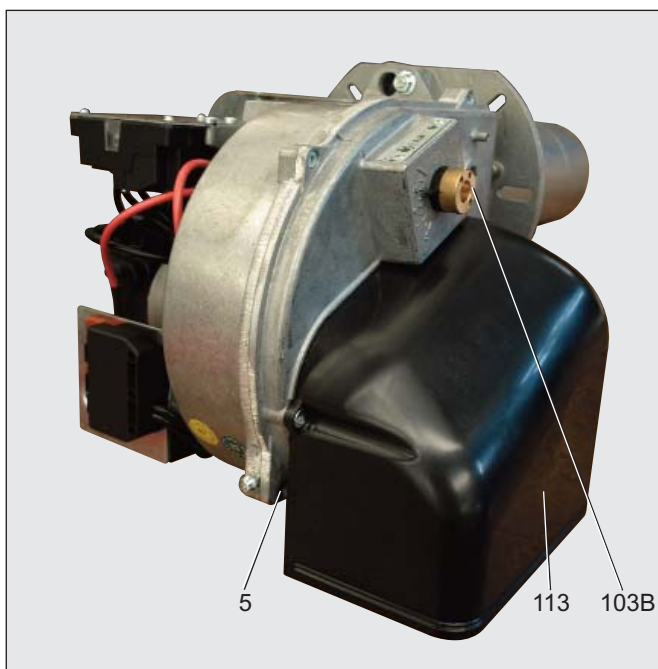
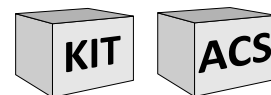
#### Scope of delivery

CB: COMPLETE BURNER

- 1 bag including :
  - multilanguage technical manual.
  - filter and hoses.
  - wieland plug.
  - nozzle and spanner.
  - screws, nuts and washer.



KIT & ACS delivered separately



## Function - General safety functions

### Operating function

- If heat is requested by the boiler thermostat, the automatic oil combustion control unit starts the program sequence.
- The motor starts, the igniter is switched on and the prevention period of 15 seconds commences.
- During the prevention period, the furnace is monitored for flame signals.
- At the end of the prevention period, the fuel-oil solenoid valve opens and the burner starts.
- The igniter remains switched off while the burner is in operation.

### Controlled shutdown

- Boiler thermostat interrupts heat request.
- The fuel-oil solenoid valve closes and the flame is extinguished.
- Burner motor switches off.
- Burner enters standby.

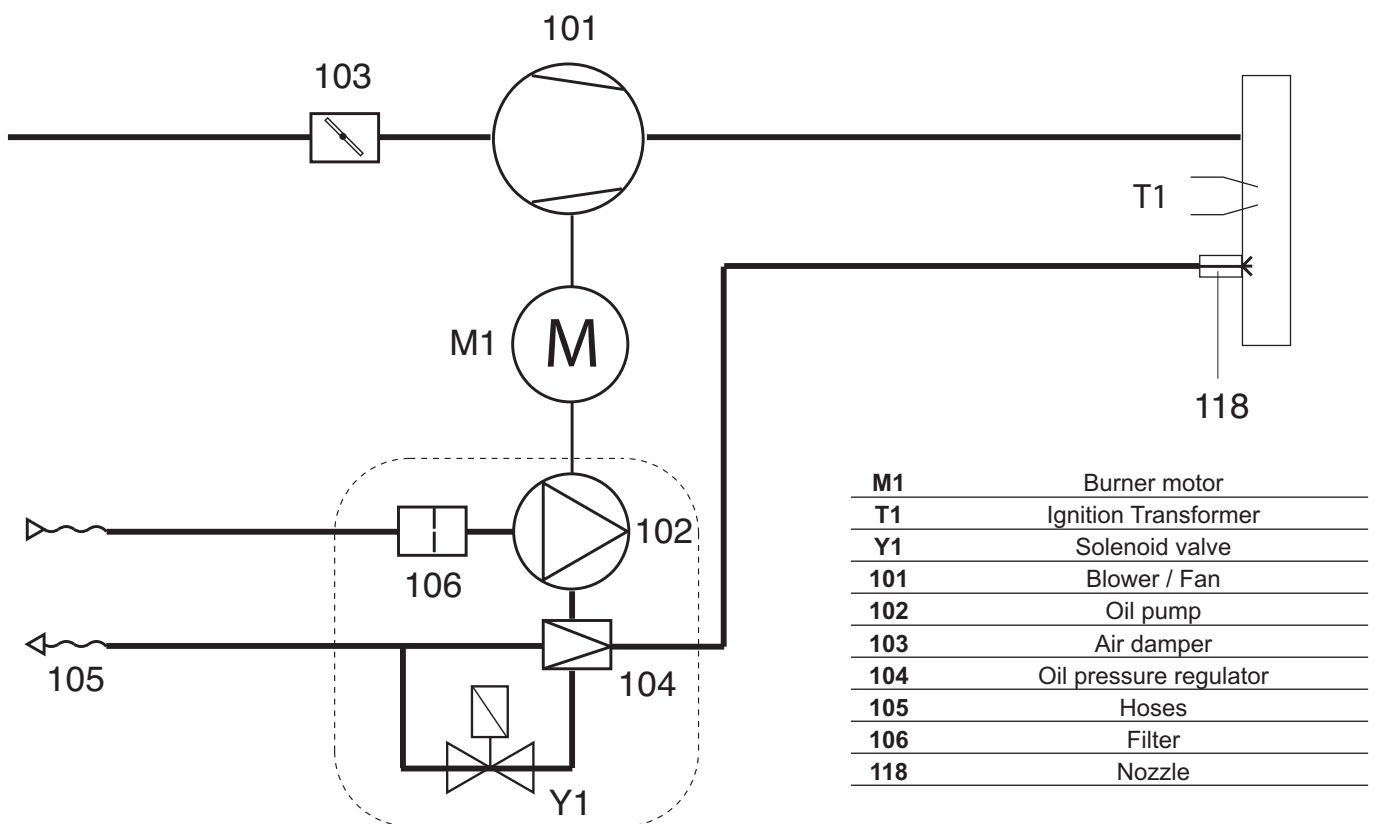
### Safety function

A safety shutdown occurs:

- if a flame signal is present during prevention (parasitic flame monitoring).
- if no flame is produced within 5 seconds (safety time) of start-up (fuel authorisation).
- if no flame is produced after an unsuccessful restart attempt in the event of flame failure during operation.

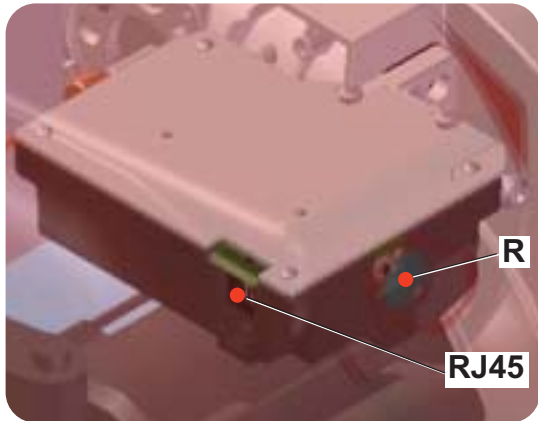
A safety shutdown is indicated by the malfunction lamp lighting up and it is then only possible to reenale the burner by pressing the reset button after the cause of the malfunction has been rectified.

For further information, see the automatic combustion control unit description.





## Function - E-BCU OIL control and safety unit



KIT E-BCU  
DIAGNOSTIC TOOL  
(not supplied)

**R** - Reset button + lock-out led.

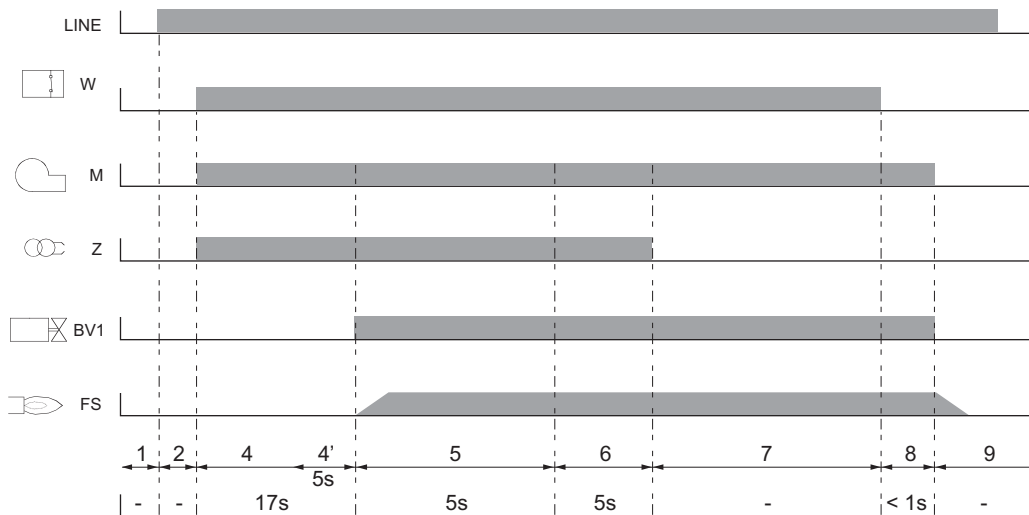
**RJ45** - Connector for PC interface (diagnostic, separate item).

The E-BCU OIL fuel oil control and safety unit controls and monitors the forced draught burner. The microprocessor- controlled program sequence ensures maximum stability of time periods, regardless of fluctuations in the power supply or ambient temperature. The design of the automatic combustion control unit protects it from the effects of brownouts. Whenever the supply voltage drops below its rated minimum level (170 V), the control unit shuts down - even in the absence of a malfunction signal. The control unit switches itself back on again once the voltage has exceeded the 178 V.

### Locking and unlocking the system

The control unit can be locked (switched to malfunction) and unlocked (malfunction cleared) by pressing the R reset button, provided the system is connected to the mains power supply.

**!** Always disconnect the power supply before installing or removing the control unit. Do not attempt to open or carry out repairs on the control unit.

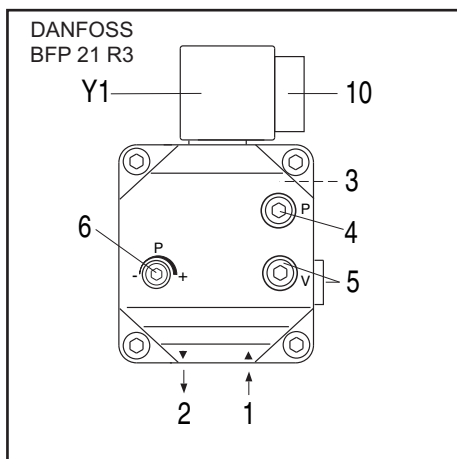
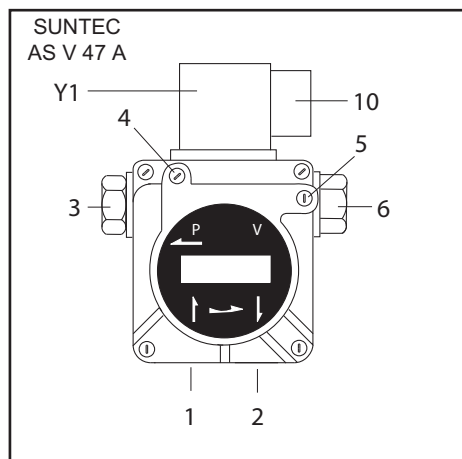


LINE Electrical supply  
 BV... Fuel valve  
 FS Flame signal  
 M Burner motor  
 OW Release contact of oil preheater  
 W Control thermostat or pressurestat  
 Z Ignition transformer

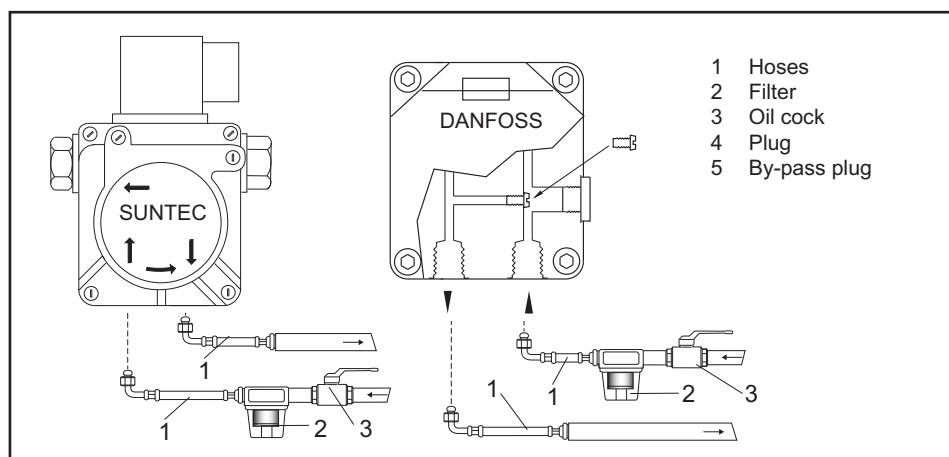
1 No voltage  
 2 Power supply on, no heat request  
 4 Prevention: motor ON, ignition ON  
 4' Parasitic flame monitoring  
 5 Burner start: solenoid valve OFF, flame production, safety time  
 6 Flame present, post-ignition period

7 Burner operation  
 8 End of heat request, solenoid valve closes, burner stop  
 9 Standby

## Function - Oil burner pump

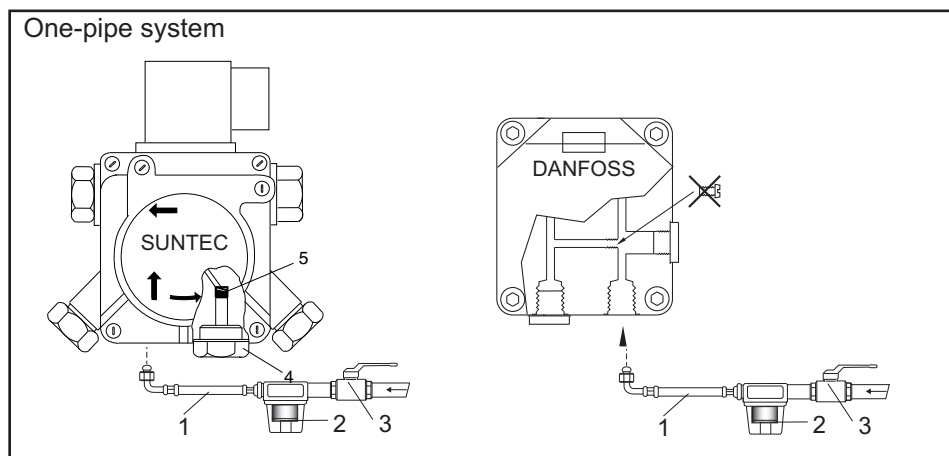


- 1 suction intake connection.
- 2 return connection.
- 3 pressure connection.
- 4 oil pressure gauge connection.
- 5 negative pressure gauge connection.
- 6 oil pressure regulator.
- 10 Solenoid valve electrical connection.
- Y1 fuel-oil solenoid valve.



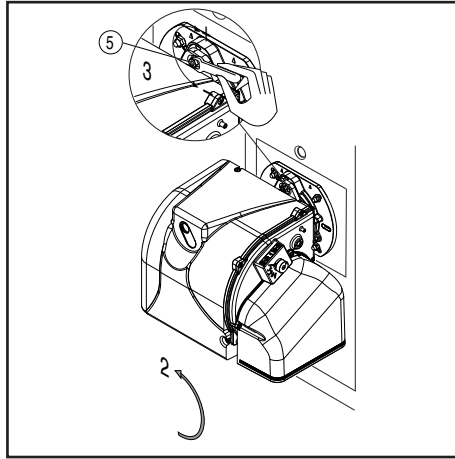
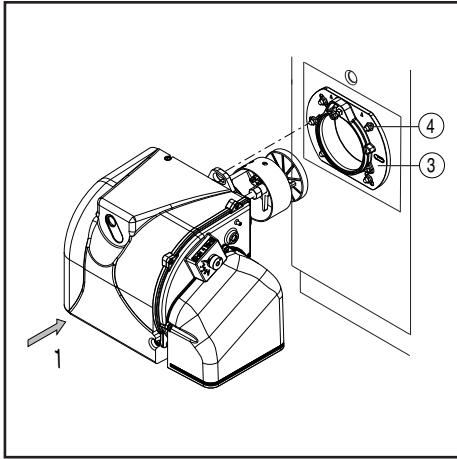
The oil burner pump used is a self-priming gear pump, which must be connected as two-line pump via a bleed filter. There is an intake filter and an oil pressure regulator integrated in the pump. Pressure gauges for pressure measurements and negative pressure measurements must be connected before the equipment is commissioned.

NB: before starting the burner, check that the return pipe is open. An eventual obstruction could damage the pump sealing device.



ONE PIPE SYSTEM: If the oil supply circuit is one-pipe system, the pump needs to be modified following instructions in the picture.

## Installation - Burner assembly



### Burner assembly

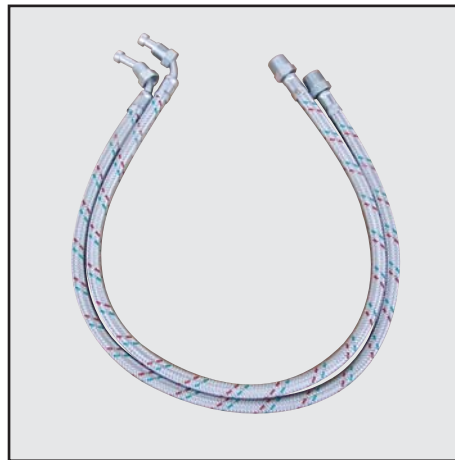
The burner is fixed by mean of connecting flange and therefore to the boiler.

### Installation:

- To fix the flange 3 to the boiler with the screws 4.
- Turn the burner slightly, guide it into the flange and secure using screw 5.

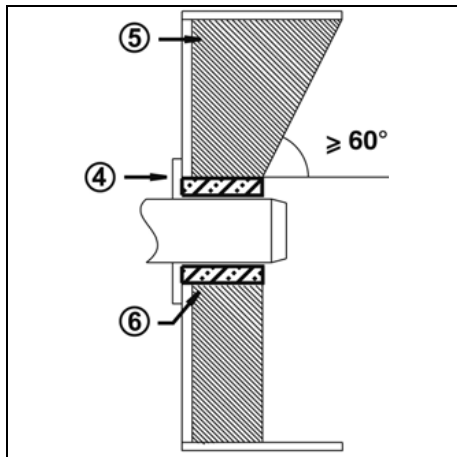
### Removal:

- Loosen screw 5.
- Turn the burner out and pull it out of the flange.



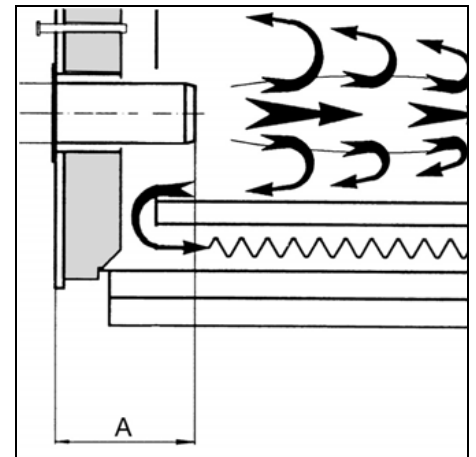
### Oil connection

The filter must be located in such a way that the correct hose routing cannot be impaired. The hoses must not kink.



### Burner pipe insertion depth and brickwork

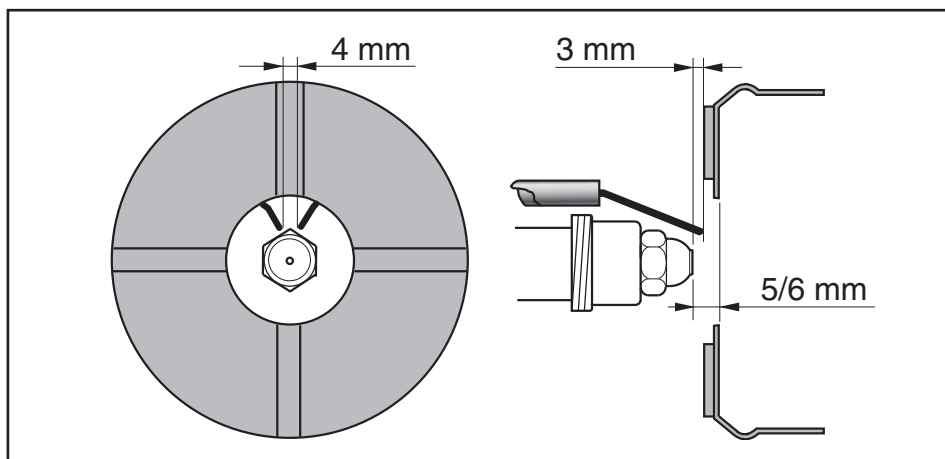
Unless otherwise specified by the boiler manufacturer, heat generators without a cooled front wall require brickwork or insulation 5 as shown in the illustration. The brickwork must not protrude beyond the leading edge of the flame tube, and should have a maximum conical angle of 60°. Gap 6 must be filled with an elastic, non-combustible insulation material. For boilers with reverse firing, the minimum burner tube insertion depth A as specified in the boiler manufacturer's instructions must be observed.



### Exhaust system

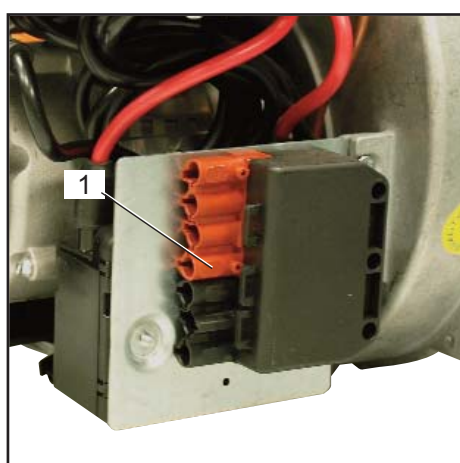
To avoid unfavourable noise emissions, right-angled connectors should not be used on the flue gas side of the boiler.

## Installation - Electrical connection - Checks before commissioning



### Position of electrodes

**Note:** Always check the position of electrodes after having replaced the nozzle (see illustration). A wrong position could cause ignition troubles.



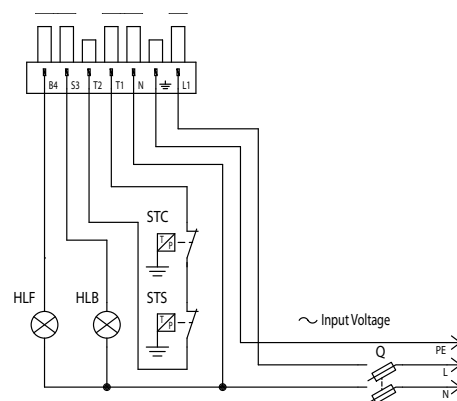
### Electrical connection

The electrical installation and connection work must only be carried out by an authorised electrical specialist. All applicable rules and regulations must be observed.

The electrical installation should include a type A circuit breaker.

**The applicable guidelines and directives must be observed, as well as the electrical circuit diagram supplied with the burner!**

- Check to ensure that the power supply voltage is as specified in the electric diagram and in data plate.
- Burner fuse: 5 A.



### Electrical connection (plug-in)

It must be possible to disconnect the burner from the mains using an omnipolar shutdown device complying with the standards in force. The burner and heat generator (boiler) are connected by a 7-pin connector (fig.1).

### Checks before commissioning

The following must be checked before initial commissioning:

- That the burner is assembled in accordance with the instructions given here.
- That the burner is pre-set in accordance with the values in the adjustment table.
- Setting the combustion components.
- The heat generator must be ready for operation, and the operating regulations for the heat generator must be observed.
- All electrical connections must be correct.
- The heat generator and heating system

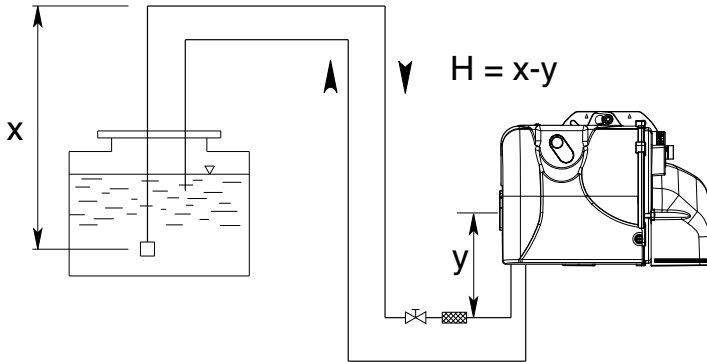
- must be filled with water and the circulating pumps must be in operation.
- The thermostats, pressure regulator, low water detectors and any other safety or limiting devices that might be fitted must be connected and operational.
- The exhaust gas duct must be unobstructed and the secondary air system, if available, must be operational.
- An adequate supply of fresh air must be guaranteed.
- The heat request must be available.
- Fuel tanks must be full.
- The fuel supply lines must be

assembled correctly, checked for leaks and bled.

- A standard-compliant measuring point must be available, the exhaust gas duct up to the measuring point must be free of leaks to prevent anomalies in the measurement results.

## Installation - Oil feeding and suction line

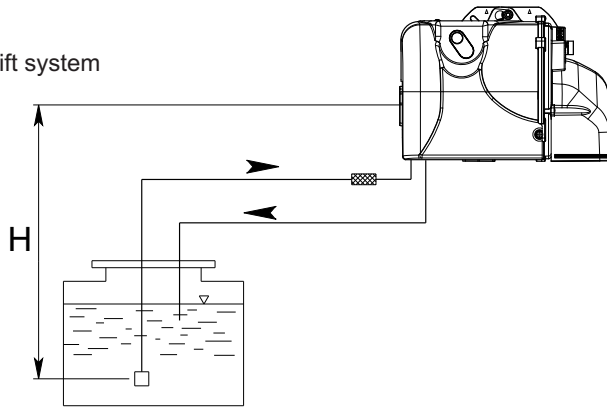
Two-pipe siphon feed system



FEEDING LINE WITH SUNTEC AS V 47 A

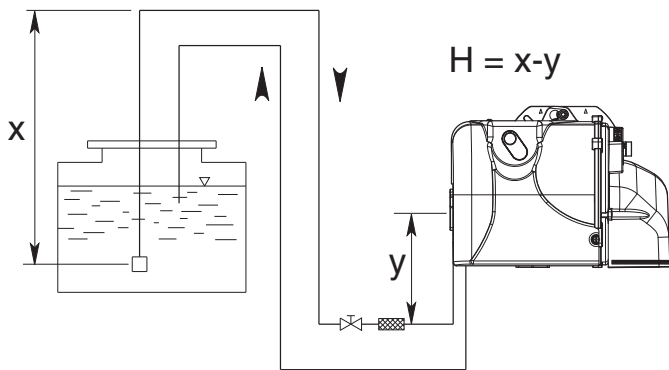
H (m)	Length pipe (m)	
	ø 8 mm	ø 10 mm
0,5	30	65
1	35	70
1,5	40	75
2	45	80
2,5	50	85
3	55	90
3,5	60	95

Two-pipe lift system



H (m)	Length pipe (m)	
	ø 8 mm	ø 10 mm
0,5	23	55
1	21	50
1,5	19	45
2	17	40
2,5	14	34
3	9	28
3,5	4	22

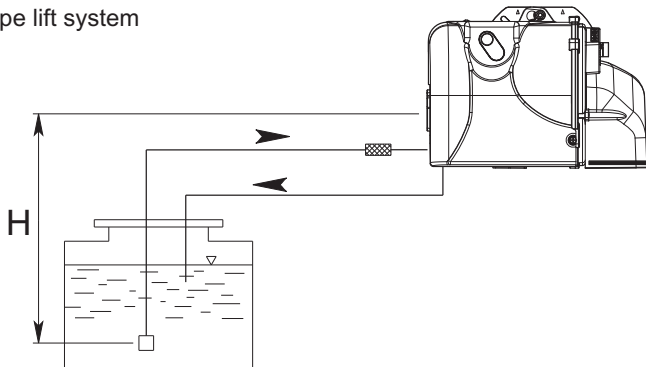
Two-pipe siphon feed system



FEEDING LINE WITH DANFOSS BFP21 R3

H (m)	Length pipe (m)		
	ø 6 mm	ø 8 mm	ø 10 mm
0,5	19	60	100
1	21	66	100
1,5	23	72	100
2	25	79	100
2,5	27	85	100
3	29	91	100
3,5	31	98	100

Two-pipe lift system



H (m)	Length pipe (m)		
	ø 6 mm	ø 8 mm	ø 10 mm
0,5	15	47	100
1	13	41	99
1,5	11	34	84
2	9	28	68
2,5	7	22	53
3	5	15	37
3,5	-	9	22

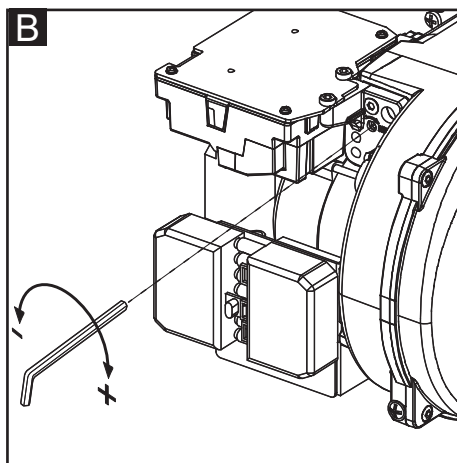
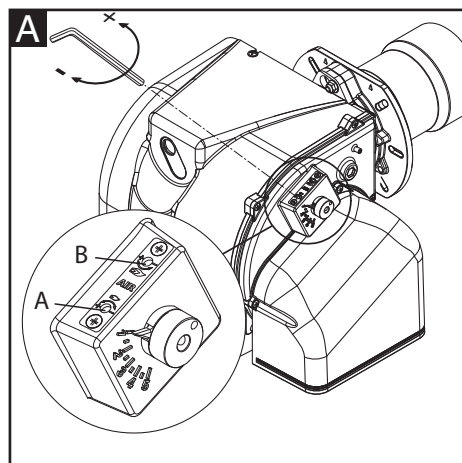
## Start up - Setting data table - Air regulation

	NOZZLE		PUMP	OUTPUT	FIRING HEAD SETTING	AIR DAMPER SETTING
	gph	spry	bar	kg/h	Pos.	Pos.
MAX 15	1,50	60°	12	6,2	0	1,5
	1,65	60°	12	7,0	1	2,0
	1,75	60°	12	7,6	2	2,5
	2,00	60°	12	8,3	2,5	3,0
	2,25	60°	12	9,3	3	3,2
	2,50	60°	12	10,4	3,5	3,5
	2,75	60°	12	11,5	4	4
	3,00	60°	12	12,5	4,5	4,5
	3,50	60°	12	14,9	5	4,5
	4,00	60°	11	16,0	5	5
MAX 20	1,75	60°	12	7,6	0	1,5
	2,00	60°	12	8,3	1	1,7
	2,25	60°	12	9,3	2	2
	2,50	60°	12	10,4	2,5	2,8
	2,75	60°	12	11,5	3	3
	3,00	60°	12	12,5	3,5	3,6
	3,50	60°	12	14,9	4,0	4,1
	4,00	60°	12	16,7	4,5	4,3
	4,50	60°	12	19,1	5	5
	2,25	60°	12	9,3	0	1,5
MAX 30	2,50	60°	12	10,4	0,5	2
	3,00	60°	12	12,5	1,5	2,2
	3,50	60°	12	14,9	2,0	2,5
	4,00	60°	12	16,7	2,5	3
	4,50	60°	12	19,1	3	3,3
	5,00	60°	12	21,8	3,5	3,8
	5,50	60°	12	23,6	4	4
	6,00	60°	12	25	4,5	4,5
	6,50	60°	11	27	5	5

The settings above are **basic settings**. These adjustment values are normally suitable for commissioning the burner. These values have been determined in our test labs and are useful for the first

switch-on as final setting must be done using a combustion analyzer. Favourable combustion values can be achieved using the following nozzles:

DANFOSS H+S 80°+60°  
DELAVAN W 60°  
STEINEN S 60°



### Air damper setting (A).

To act on the screw A in figure:

- to increase output, turn screwdriver counterclockwise.
- to reduce output, turn screwdriver clockwise.

**Note:** screw B not used.

### Firing head setting (B).

To act on the screw in figure:

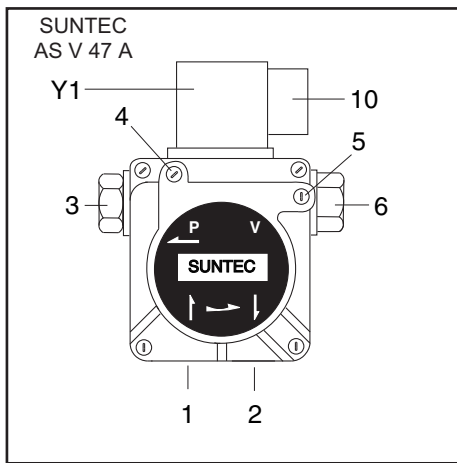
- turn Allen key till you reach the requested value (index 0-5).

## Start up - Adjusting burner output - Oil pressure regulation

**!** Risk of air blast!  
Continuously check CO, CO<sub>2</sub> and soot emissions when adjusting the output of the burner. Optimise combustion values in the event of CO formation. CO must not exceed 50 ppm.

### Burner start

Before starting the burner, draw oil in until the filter is completely filled. Then start the burner by switching on the boiler regulator. Open the bleed screw on the oil filter to allow the oil line to bleed fully during the prevention phase. The negative pressure must not fall below 0.4 bar. Close the bleed screw when the filter is completely filled with oil and oil is flowing out without bubbles.



- 1 suction intake connection.
- 2 return connection.
- 3 pressure connection.
- 4 oil pressure gauge connection.
- 5 negative pressure gauge connection.
- 6 oil pressure regulator.
- 10 Solenoid valve electrical connection.
- Y1 fuel-oil solenoid valve.

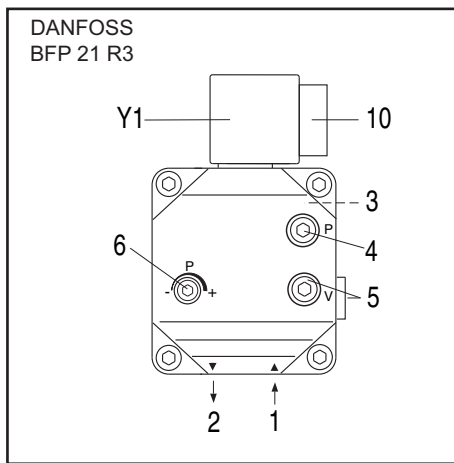
### Operating check

Flame monitoring must be checked for safety as part of initial commissioning and also after servicing or if the system has been out of operation for any significant period of time.

- Starting attempt with flame monitor unlit: the automatic combustion control unit must switch to malfunction at the end of the safety time

### Burner output adjustment

Use the pressure regulator to adjust the oil pressure in accordance with the burner output desired. Monitor the combustion values continuously as you do so (CO, CO<sub>2</sub>, soot test). Adjust the airflow gradually if necessary.



- Start with flame monitor lit: the automatic combustion control unit must switch to malfunction after 10 seconds of prevention
- Normal start-up: flame monitor goes out when burner in operation; the automatic combustion control unit must switch to malfunction after the restart and end of the safety time

### Optimising combustion values

If the combustion values are not satisfactory modify the position of the combustion head. By doing this the burner ignition conditions and the combustion values change. Compensate for the change in airflow if necessary by adjusting the air flap position.

**Note: observe the minimum required flue gas temperature specified by the boiler manufacturer and the requirements demanded of flue gas ducts for avoiding condensation.**

### Oil pressure regulation

The oil pressure, and therefore burner output, is adjusted using oil pressure regulator 6 in the pump.

Turn to

- right: to increase pressure
- left: to reduce pressure

Connect a pressure gauge at point 4 (with R1/8" thread).

### Checking negative pressure

The vacuum meter for checking negative pressure must be connected to point 5, R1/8". Maximum permissible negative pressure is 0.4 bar. At higher negative pressures, the fuel oil gasifies, which causes scraping noises in the pump and ultimately leads to pump damage.

### Cleaning the pump filter

The filter is located under the pump cover (SUNTEC) or in appropriate cartridge (DANFOSS). To be able to clean the filter, it is necessary to loosen the screws and remove the cover first (SUNTEC) or to unscrew the screw (DANFOSS).

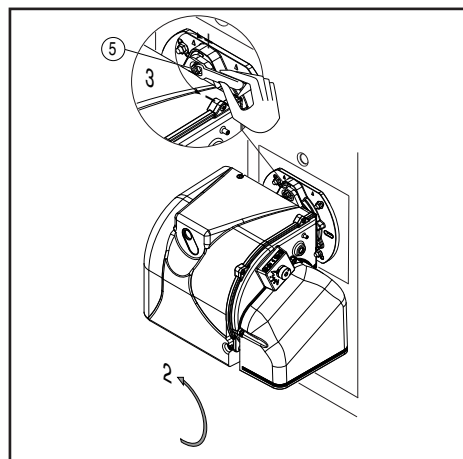
- Check the pump cover seal and replace the gasket if necessary.

## Service - Maintenance

**Burner and boiler servicing must only be carried out by qualified personell. The system operator is advised to take out a service contract to guarantee regular servicing.**

### Attention

- Disconnect the electrical supply before carrying out any maintenance or cleaning work.
- The blast tube and firing head may be hot.



### Checking the exhaust gas temperature

- Check the flue gas temperature at regular intervals.
- Clean the boiler if the flue gas temperature is more than 30°C above the value measured at the time of commissioning.
- To simplify the check, use a flue gas temperature indicator.

### Burner maintenance positions

- After removing the screws 5 turn the burner and pull it out of the flange. It is possible to fix the burner in three positions

for maintenance.

#### Position 1

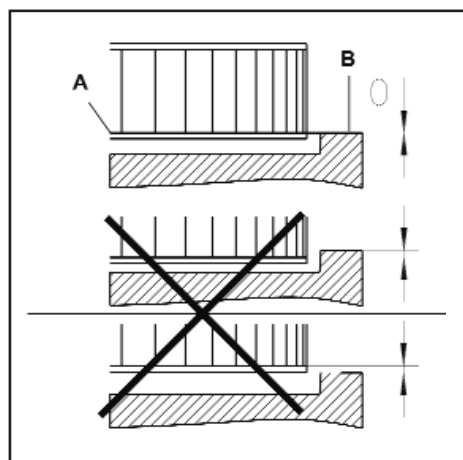
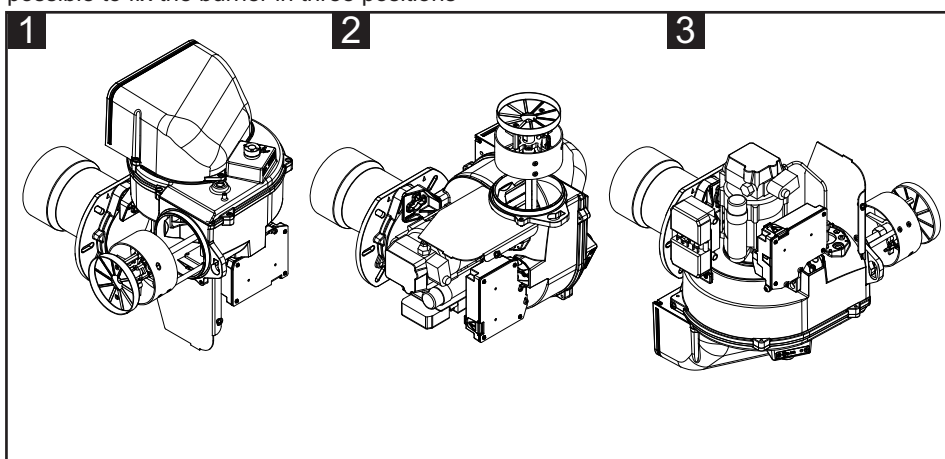
Maintenance line air (cleaning/substitution fan)

#### Position 2

Burner head maintenance.

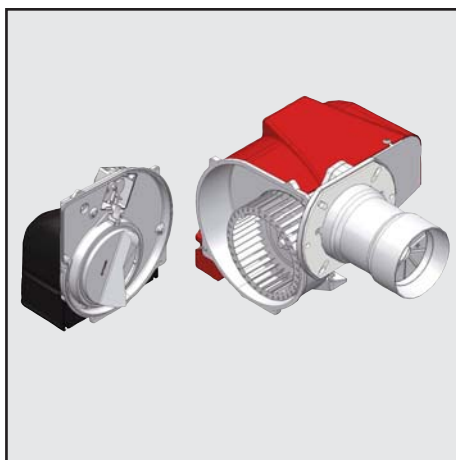
#### Position 3

Maintenance components (filter and light oil pump).



### Fan assembly

Observe the positioning diagram below when replacing the motor and blower wheel. The inside flange **A** of the blower wheel must be fitted at the same level as the equipment plate **B**. Insert a straight edge between the wing of the blower wheel and set **A** and **B** to the same height, tighten the set screw on the blower wheel (maintenance position 1).



### Maintenance on the burner

#### Maintenance position 1

- Clean fan and housing and check for damage.

#### Maintenance position 2

- Check and clean the combustion head.
- Replace oil nozzle.
- Check ignition electrodes, readjust or replace as necessary.
- Fit combustion head. Observe adjustment dimensions.
- Fit burner.

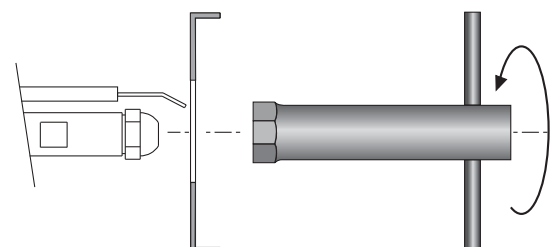
- Start burner, check flue gas data, correct burner settings if necessary.

#### Maintenance position 3

- Check oil supply components (tubes, pumps, oil feed tube) and their connections for leaks or signs of wear, replace if necessary.
- Check electrical connections and connection cables for damage, replace if necessary.
- Check pump filter and clean if necessary.

### Nozzle and cleaning replacement

Use only the suitable box wrench provided for this operation to remove the nozzle, taking care to not damage the electrodes. Fit the new nozzle by the same care. Note: Always check the position of electrodes after having replaced the nozzle (see illustration). A wrong position could cause ignition troubles.





## Service - Troubleshooting

### Fault diagnosis and repair

In the event of a malfunction, first check that the prerequisites for correct operation are fulfilled:

1. is the system connected to the power supply?
2. is there oil in the tank?
3. are all shut-off valves open?
4. are all control and safety devices, such as the boiler thermostat, low-water detector, limit switch, etc. adjusted correctly?

If the malfunction persists, use the following table.

It is not permitted to repair any components relevant to safety. These

components must be replaced by parts with the same order number.




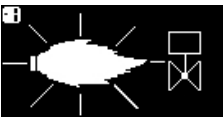
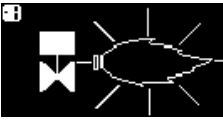

### Only use original spare parts.

#### NB: after each operation:

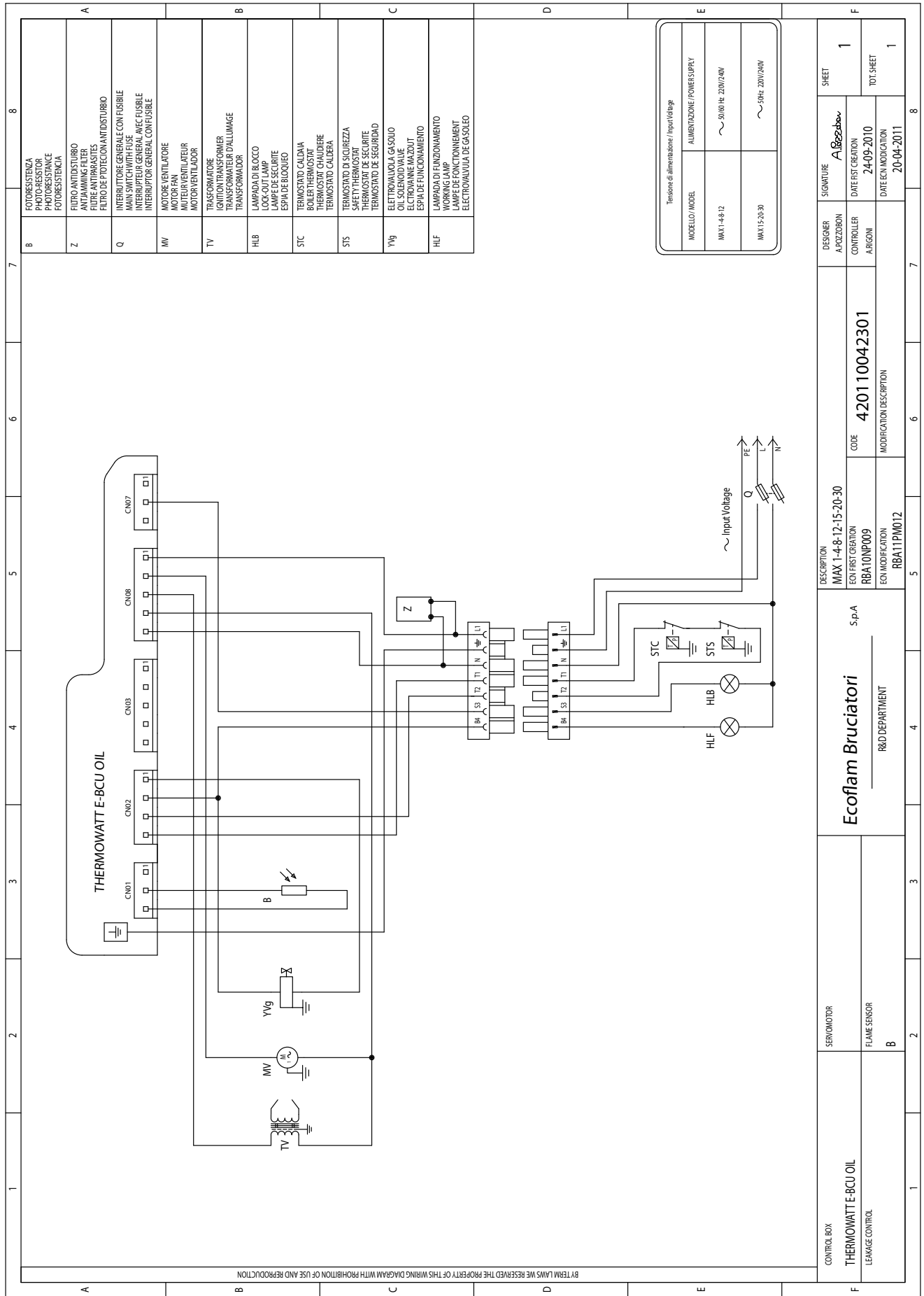
- under normal operating conditions (doors closed, hood fitted, etc.), check combustion and check the individual lines for leaks.
- Record the results in the relevant documents.

**E-BCU display interface must be used to read the faults by service personell.**



Fault	Symbol fault	Cause	Remedy
	No heat request	Thermostats defective or incorrectly adjusted	Adjust the thermostats, replace if necessary.
	Burner does not start after thermostat shutdown. No malfunction indicated on the automatic combustion control unit.	Drop in supply voltage or power failure. Control unit malfunction	Check the cause of the fall in voltage or the power failure. Replace the control unit.
	Burner starts at switch-on for very short period and then shuts down and the red LED lights up	The control unit has been intentionally locked	Reset control unit.
	Burner starts and then shuts down after pre-ventilation	Flaring during pre-ventilation or pre-ignition	Check ignition sparks/adjust or replace electrode Check/replace fuel-oil solenoid valve
	Burner starts and then shuts down after the solenoid valves have opened	No flame signal at end of safety time	Check the oil level in the tank. Top tank up as required. Open the valves. Check the oil pressure and the operation of the pump, coupling, filter, solenoid valve. Check ignition circuit, electrode adjustment. Clean/replace electrodes. Clean/replace flame monitor.
	Flame extinguishing during operation	Flame goes out during operating phase	Replace the following items as required: Ignition electrodes/ignition cables/ignition transformer/nozzle/pump/solenoid valve/ automatic combustion control unit.

Overview - Electric diagrams / Panoramica - Schemi elettrici / Vue d'ensemble - Schémas électrique / Descripción - Esquemas eléctrico /  
Обзор - Электрические схемы



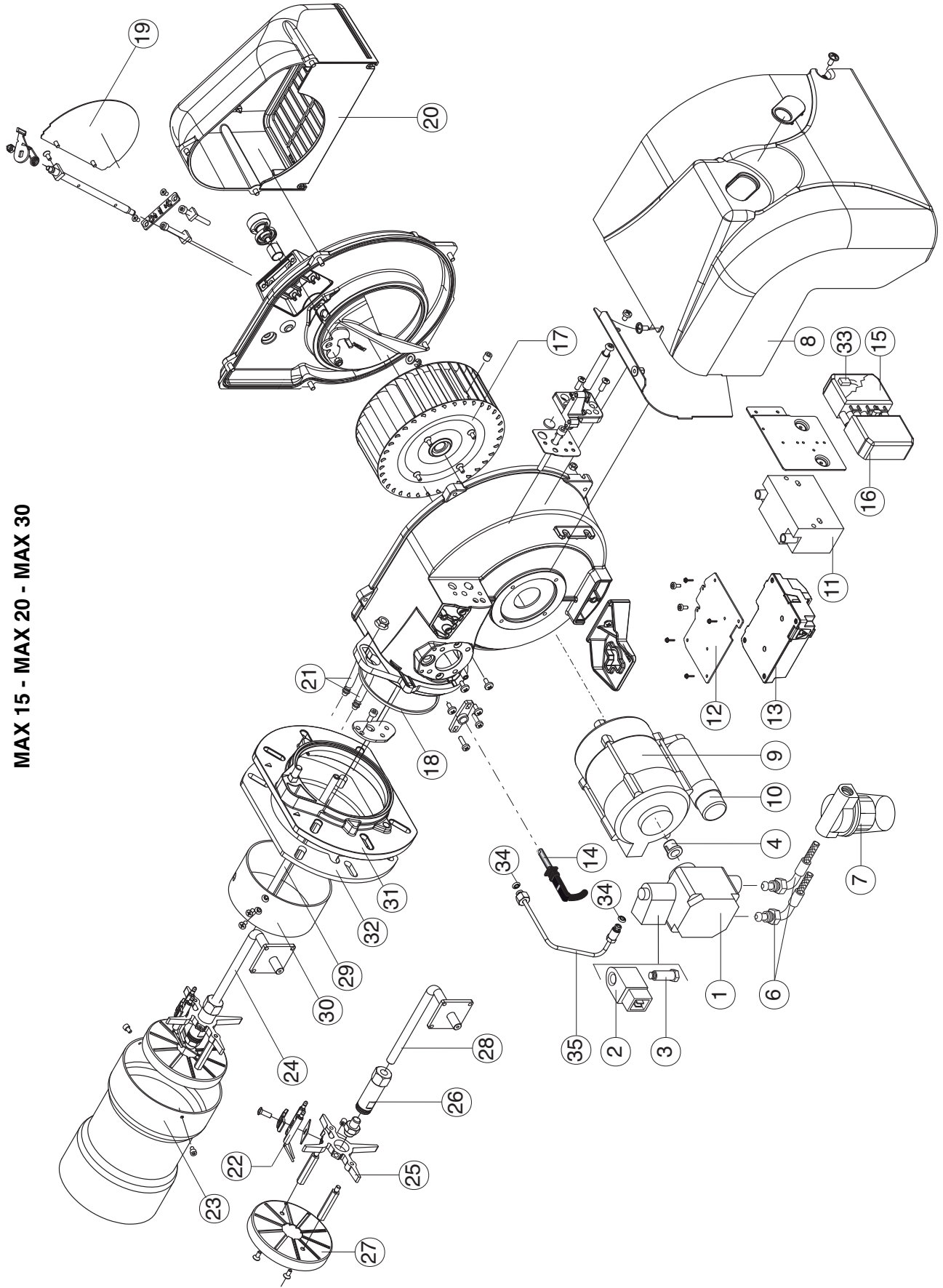
B	FOTORESISTENZA PHOTO-RESISTOR PHOTORESISTANCE FOTORESISTENCIA
Z	FILTRO ANTIDISTURBO ANTI-JAMMING FILTER FILTRE ANTIPARASITES FILTRO DE PROTECCION ANTIDISTURBO
Q	INTERRUTTORE GENERALE CON FUSIBILE MAIN SWITCH WITH FUSE INTERRUPTEUR GENERAL AVEC FUSIBLE INTERRUPTOR GENERAL CONFUSIBLE
MV	MOTORE VENTILATORE MOTOR FAN MOTEUR VENTILATEUR MOTOR VENTILADOR
TV	TRASFORMATORE IGNITION TRANSFORMER TRANSFORMATEUR D'ALLUMAGE TRANSFORMADOR
H1B	LAMPADA DI BLOCCO LOCK-OUT LAMP LAMPE DE SECURITE ESPA DE BLOQUEO
STC	TERMOSTATO CALDMA BOILER THERMOSTAT THERMOSTAT CHAUDIERE THERMOSTATO CALDERA
STS	TERMOSTATO DI SICUREZZA SAFETY THERMOSTAT THERMOSTAT DE SECURITE THERMOSTATO DE SEGURIDAD
YVg	ELETTROVALVOLA GAS/OIL OIL SOLENOID VALVE ELECTROVANNE MAZOUT ESPA DE FUNCIONAMIENTO
H1F	LAMPADA DI FUNZIONAMENTO WORKING LAMP LAMPE DE FONCTIONNEMENT ELECTROVALVULA DE GAS/OIL

Tensione di alimentazione / Input Voltage	
MODELLO / MODEL	ALIMENTAZIONE / POWER SUPPLY
MAX1-4-8-12	~ 50/60 Hz 200V/240V
MAX15-20-30	~ 50Hz 200V/240V

CONTROL BOX THERMOWATT E-BCU OIL LEAKAGE CONTROL	SERVOMOTOR FLAME SENSOR B	Ecoflam Bruciatori		S.p.A		R&D DEPARTMENT	
		DESCRIPTION MAX 1-4-8-12-15-20-30 ECON FIRST CREATION RBA10NP009		CODE 4201 10042301		MODIFICATION DESCRIPTION RBA11PM012	
DESIGNER A.FOZZADON		SIGNATURE A.Bozzon		SHEET 1		TOTAL SHEET 1	
CONTROLLER A.RIGNI		DATE FIRST CREATION 24-09-2010		DATE ECN MODIFICATION 20-04-2011			

Overview - Spare parts list / Panoramica - Parti di ricambio / Vue d'ensemble - Pièces de rechange / Descripción - Piezas de recambio /  
Обзор - Запчасти

MAX 15 - MAX 20 - MAX 30



# Overview - Spare parts list / Panoramica - Parti di ricambio / Vue d'ensemble - Pièces de rechange / Descripción - Piezas de recambio / Обзор - Запчасти

N°	DESCRIPTION	DESCRIZIONE	DESIGNATION	DESCRIPCIÓN	НАИМЕНОВАНИЕ	MAX 15	MAX 20	MAX 30
						code	code	code
1	OIL PUMP	POMPA	POMPE COMPLETE	POMPA	НАСОС	65322971	DANFOSS BFP21 R3	65322971
						65325111	SUNTEC ASV 47 A	65325111
2	COIL	BOBINA	BOBINE ELECTROVANNE	BOBINA	КАТУШКА	65323773	DANFOSS	65323773
						65323767	SUNTEC	65323767
3	OIL VALVE	VALVOLA	VANNE	VALVULA	КЛАПАН	65323751	DANFOSS	65323751
						65323744	SUNTEC	65323744
4	COUPLING	GIUNTO	JOINT D'ACCOUPLIEMENT	ACOPLAMIENTO	МУФТА	65322920	65322920	65322920
5	NIPPLE	RACORDO PER FLESSIBILE	MAMELONS	TUERCA	ФИТИНГ ДЛЯ ГИБК. ШЛАНГА	-	-	-
6	HOSES	TUBO FLESSIBILE	FLEXIBLES	LATIGUILLLOS	ГИБКИЙ ШЛАНГ	65323216	PARIGI INW 4 MG	65323216
7	FILTER	FILTRO	FILTRE	FILTRO	ФИЛЬТР	65325046	ART.70451-006AV	65325046
8	COVER	COPERCHIO	COUVERCLE	TAPA	КРЫШКА	65325278	65325278	65325278
9	MOTOR	MOTORE	MOTEUR	MOTOR	ДВИГАТЕЛЬ	65322873	130 W	-
						200 W	65322876	65322876
10	CAPACITOR	CONDENSATORE	CONDENSATEUR	CONDENSADOR	КОНДЕНСАТОР	65321857	3 µF AEG	-
						65325000	6,3 µF SIMEL	65325000
						-	6 µF AEG	65321850
11	IGNITION TRANSFORMER	TRASFORMATORE	TRANSFORMATEUR	TRANSFORMADOR	ТРАНСФОРМАТОР	65323257	65323257	65323257
12	SUPPORT	SUPPORTO	SOCLE DE COFFRET	BASE DEL EQUIPO	МОНТАЖНАЯ ПЛАСТИНА	65325251	65325251	65325251
13	CONTROL BOX	APPARECCHIATURA	COFFRET DE SECURITE	EQUIPO CONTROL LLAMA	КОНТРОЛЬНАЯ АППАРАТУРА	65325255	Thermomat E-BCU OIL	65325255
14	PHOTORESISTOR	FOTORRESISTENZA	CELLULE	FOTORRESISTENCIA	ФОТОРЕЗИСТОР	65320083	SATRONIC	65320083
15	SOCKET WIELAND	PRESA WIELAND	BORNES	REGLETA DE CONEXIÓN	КЛЕММНИК	65322070	65322070	65322070
16	PLUG WIELAND	SPINA WIELAND	COUVERCLE DE BORNES	CAJA DE PROTECCIÓN	КРЫШКА КЛЕММНИКА	65322069	65322069	65322069
17	FAN	VENTOLA	TURBINE	VENTILADOR	ВЕНТИЛЯТОР	65323819	160 x 52	-
						-	160 x 62	65323820
18	ORING	GUARNIZIONE	ORING	ORING	УПЛОТНИТЕЛЬНАЯ ПРОКЛАДКА	65321061	65321061	65321061
19	AIR DAMPER	SERRANDA	VOLET D'AIR	REGISTRO AIRE	ВОЗДУШНАЯ ЗАСЛОНКА	65321223	65321223	65321223
20	COVER AIR INLET	CASSETTO	BOITE D'AIR	CIERRE EN ASPIRACIÓN	ВОЗДУХОЗАБОР	65320126	65320126	65320126
21	CABLES	CAVI ACCENSIONE	CABLE HT	CABLES	ПРОВОДА РОЗЖИГА	65325264	65325264	65325264
						65325277	65325277	65325277
22	ELECTRODES	ELETTRODI	ELECTRODE	ELECTRODOS	ЭЛЕКТРОДЫ	65320924	65320924	65320924
23	BLAST TUBE	BOCCAGLIO	GUEULARD	TUBO LLAMA	СТАЖАН	65320376	65320376	65320396
						65320377	65320377	65320397
24	FIRING HEAD	TESTA DI COMBUSTIONE	TETE DE COMBUSTION	CABEZA DE COMBUSTIÓN	ОГНЕВАЯ ГОЛОВКА	TC	TC	TC
						TL	TL	TL
25	NOZZLE HOLDER SUPPORT	OROCIERA	SUPPORT PORTE GICLÉUR	SOPORTE PORTAINYECTOR	КРЕСТОВИНА	65320692	65320690	65320690
26	NOZZLE HOLDER	PORTA UGELLO	PORTE GICLÉUR	PORTAINYECTOR	ДЕРЖАТЕЛЬ-ФОРСУНКИ	65320707	65320707	65320707
27	DIFFUSER	DIFFUSORE	DEFLECTEUR	DIFUSOR	РАСРЕКАТЕЛЬ	65320759	65320759	65320790
28	ROD	ASTA SUPPORTO TESTA	SUPPORT	SOPORTE CABEZA DE COMBUSTIÓN	КРЕПЕЖНАЯ ТРЯСКА ГОЛОВКИ	65320191	65320191	65320191
						65320192	65320192	65320192
29	WAISTBAND ROD	ASTA SUPPORTO FASCIA	TIGE DE SUPPORT POUR CHAPE	SOPORTE DEL CILINDRO DE AJUSTE DEL AIRE	КРЕПЕЖНАЯ ТРЯСКА МАШЖЕТЫ	65320195	65320195	65320195
						65320196	65320196	65320196
30	WAISTBAND	FASCIA	CHAPE METALLIQUE	CILINDRO DE AJUSTE DEL AIRE	МАШЖЕТА	65320225	65320224	65320224
31	FLANGE	FLANGIA	BRIDE	BRIDA	ФЛАНЦ	65320970	65320971	65320971
32	GASKET	GUARNIZIONE BRUCIATORE	JOINT DE BRULEUR	JUNTA	ПРОКЛАДКА ГОРЕЛКИ	65321105	65321106	65321106
33	ANTI-FLAMMING FILTER	FILTRO ANTIDISTURBO	FILTRE ANTIPARASITES	FILTRO ANTITRATORNO	ФИЛЬТР ПОДАВЛЕНИЯ ПОМЕХ	65321065	65321065	65321065
34	PIPE GASKET	GUARNIZIONE TUBO	JOINT DE TUYATERIE	JUNTA DE TUBO	PIPE GASKET	65321504	65321504	65321504
35	PIPE	TUBO	TUYATERIE	TUBO	PIPE	65321504	65321504	65321504

TC = Testa corta / Short Head / Tete courte / Cabeza corta / КОРТКАЯ ОГНЕВАЯ ГОЛОВКА TL = Testa lunga / Long Head / Tete longue / Cabeza larga / ДЛИННАЯ ОГНЕВАЯ ГОЛОВКА