

MAX 1 / 1 R
MAX 4 / 4 R
MAX 8
MAX 12



Technical data
Dati tecnici
Données techniques
Datos técnicos
Технические характеристики



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



Electric and hydraulic diagrams
Schemi elettrico e idraulico
Schémas électrique et hydraulique
Esquemas eléctrico e hidráulico
Электрические и гидравлические схемы



Spare parts list
Pièces de rechange
Parti ricambi
Запчасти
Piezas de recambio

MAX 1 TC	3142709
MAX 1 TL	3142710
MAX 1 R TC	3142711
MAX 1 R TL	3142712
MAX 4 TC	3142714
MAX 4 TL	3142715
MAX 4 R TC	3142720
MAX 4 R TL	3142721
MAX 8 TC	3142716
MAX 8 TL	3142717
MAX 12 TC	3142718
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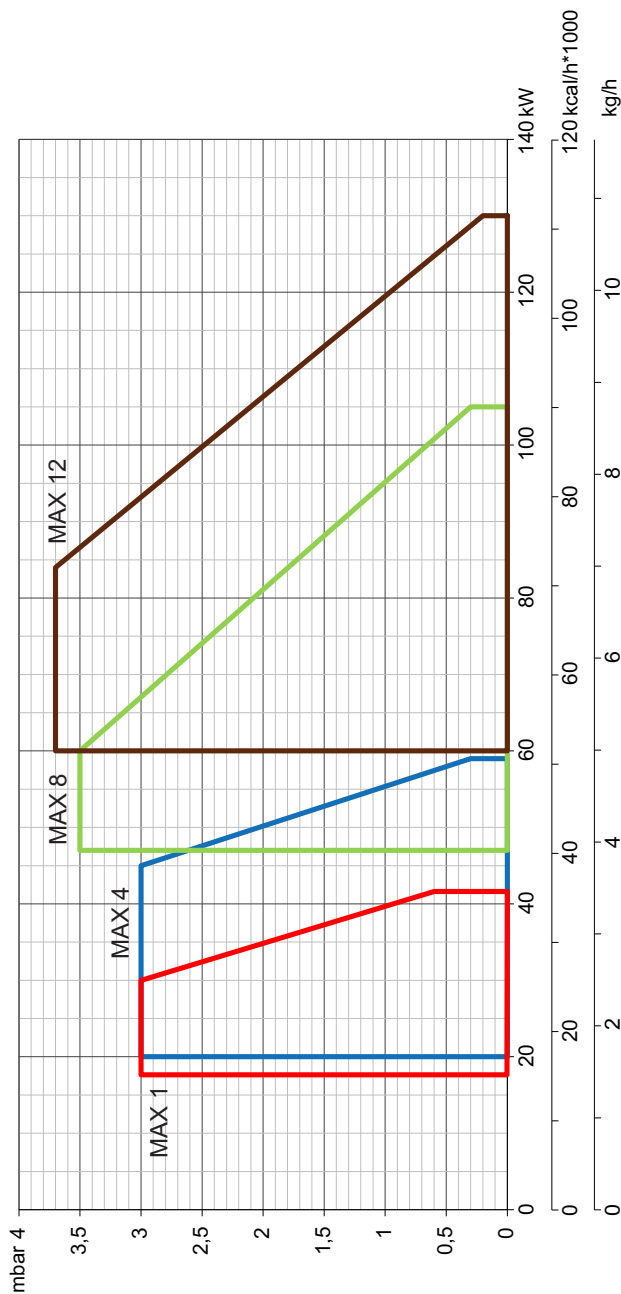
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Overview / Panoramica / Vue d'ensemble / Descripción / Обзор

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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	Мощность горелки макс./мин., кВт - ккал/час	41,4	17,6	59	20	105	47	130	60
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	Расход топлива макс./мин., кг/ч	35604	15136	50740	17200	90300	40420	111800	51600
Hydraulic system 1 stage	Sistema idraulico 1 stadio	Système hydraulique 1 allure	Sistema hidráulico 1 etapa	Гидросистема 1 ступень	3,5	1,5	5	1,7	8,9	4	11	5,1
Regulating ratio	Rapporto di regolazione	Rapport de régulation	Relación de regulación	Кэффициент регулирования	1	1	1	1	1	1	1	1
Fuel oil	Combustibile	Fuel	Combustible	Топливо	Light oil (L.C.V. 10.200 kcal/kg max. visc 1,5°E at 20°C) (EL) Hu = 11,86 kWh/kg							
Emission class	Classe di emissione	Classe d'émission	Tipo de emisión	Класс выделения загрязняющих веществ	Standard Class 2 - OIL EN267 (NOx < 185 mg/kWh)							
Control box	Apparecchiatura di controllo	Coffret de sécurité	Cajetín de seguridad	Блок управления и безопасности	E-BCU Ecoflam							
Air regulation Air flap	Regolazione aria Serranda dell'aria	Réglage de l'air Volet d'air	Ajuste del aire Válvula de aire	Настройка подачи воздуха Воздушная заслонка	-	-	-	-	-	-	-	-
Flame monitor	Rivelatore di fiamma	Surveillance de flamme	Vigilancia de llama	Контроль пламени	photoresistor	photoresistor	photoresistor	photoresistor	photoresistor	photoresistor	photoresistor	photoresistor
Ignition transformer	Trasformatore d'accensione	Allumeur	Encendedor	Устройство розжига	danfoss / cofi	danfoss / cofi	danfoss / cofi	danfoss / cofi	danfoss / cofi	danfoss / cofi	danfoss / cofi	danfoss / cofi
Fuel-oil pump	Pompa di pressione gasolio	Pompe de pulvérisation fuel	Bomba de pulverización de gasóleo	Насос распыления дизельного топлива	danfoss / suntec	danfoss / suntec	danfoss / suntec	danfoss / suntec	danfoss / suntec	danfoss / suntec	danfoss / suntec	danfoss / suntec
Electric motor rpm - watt	Motore elettrico giri motore - watt	Moteur rpm - watt	Motor rpm - watt	Электродвигатель об/мин - watt	2800 (3400) rpm	2800 (3400) rpm	2800 (3400) rpm	2800 (3400) rpm	2800 (3400) rpm	2800 (3400) rpm	2800 (3400) rpm	2800 (3400) rpm
Voltage	Tensione	Tension	Tensión	Напряжение	75 W	75 W	75 W	75 W	100 W	100 W	100 W	130 W
Power consumption (operation)	Potenza elettrica assorbita (Esercizio)	Puissance électrique absorbée (en service)	Pot. eléctrica absorbida (en funcionamiento)	Потребляемая электрическая мощность: (при работе)	300 W	300 W	300 W	300 W	350 W	350 W	350 W	400 W
Weight	Peso	Poids	Peso	Приблизительная масса	7 kg	7 kg	9 kg	9 kg	9,5 kg	9,5 kg	9,5 kg	10 kg
Protection level	Classe di protezione	Indice de protection	Indice de protección	Класс электробезопасности	IP40							
Sound pressure level dB(A)	Livello pressione sonora dB(A)	Niveau pression acoustique dB(A)	Nivel de presión acústico dB(A)	Уровень шума, dB(A)	60	60	65	65	65	65	65	65
Ambient temp. for storage	Temperatura ambiente di stoccaggio	Température ambiente de stockage	Temperatura ambiente de almacenamiento	температура хранения	-20°...+70° C							
Temperature for use	Temperatura d'utilizzazione	Température d'utilisation	Temperatura ambiente de utilización	Рабочая температура	-10°...+60° C							



Working field

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. **The efficiency rating of the boiler should be taken into account when selecting a burner.**

Calculation of burner output:

$$QF = \frac{Q_N}{\eta_K}$$

QF = Burner output (kW)

Q_N = Rated boiler output (kW)

η_K = Boiler efficiency (%)

Curva

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. **In occasione della scelta del bruciatore si deve tenere conto del rendimento energetico della caldaia.**

Calcolo della potenza del bruciatore:

$$QF = \frac{Q_N}{\eta_K}$$

QF= potenza bruciata (kW)

Q_N= potenza nominale della caldaia (kW)

η_K = rendimento energetico della caldaia (%)

Domaine de fonctionnement

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. **Pour le choix du brûleur, tenir compte du rendement de la chaudière.**

Calcul de la puissance calorifique:

$$QF = \frac{Q_N}{\eta_K}$$

QF= Puissance calorifique (kW)

Q_N= Puissance nominale chaudière (kW)

η_K = Rendement chaudière (%)

Ámbito de funcionamiento

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. **Para la elección del quemador, se ha de tener en cuenta el rendimiento de la caldera.**

Cálculo de la potencia calorífica:

$$QF = \frac{Q_N}{\eta_K}$$

QF = Potencia calorífica (kW)

Q_N = Potencia nominal de la caldera (kW)

η_K = Rendimiento de la caldera (%)

Рабочий диапазон

Рабочий диапазон соответствует значениям, измеренным при сертификации. Он соответствует максимальным значениям, измеренным в соответствии со стандартом EN 267 в стандартном канале. **При выборе горелки необходимо учитывать КПД котла.**

Расчет тепловой мощности:

$$QF = \frac{Q_N}{\eta_K}$$

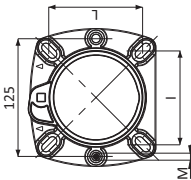
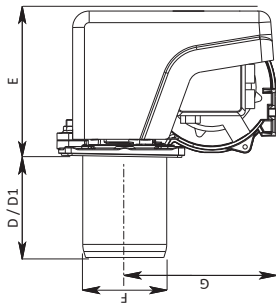
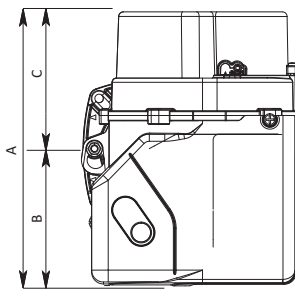
QF = Тепловая мощность, кВт

Q_N = Номинальная мощность котла, кВт

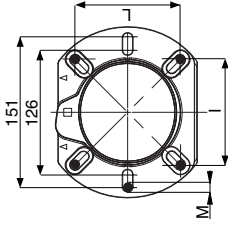
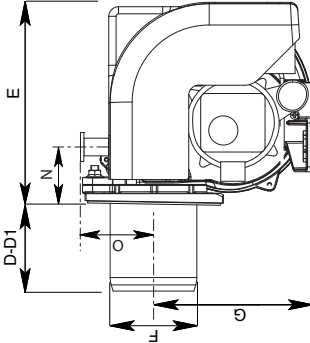
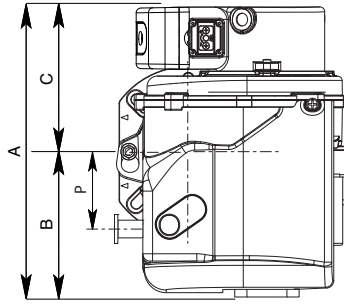
η_K = КПД котла, %

Overview - Dimensions / Panoramica - Dimensioni / Vue d'ensemble - Dimensions / Descripción - Dimensiones / Обзор - Размеры

MAX 1



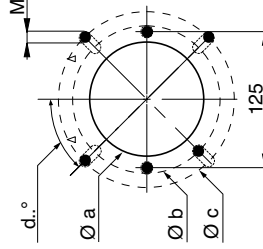
MAX 4 - 8 - 12



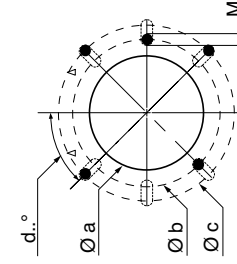
Model	A	B	C	D	D1	E	F	G	I	L	M
MAX 1	288	143	145	80	140	153	89	160	92/107	92/107	M8
MAX 4	297	149	148	90	145	204	89	160	90/107	90/107	M8
MAX 8	303	155	148	90	145	204	89	160	100/120	100/120	M8
MAX 12	317	169	148	100	155	204	98	160	100/120	100/120	M8

Model	Ø a	Ø b	Ø c	d°..
MAX 1	100	130	150	45°
MAX 4	110	126,5	151,5	45°
MAX 8	110	140	170	45°
MAX 12	110	140	170	45°

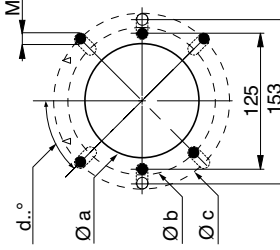
MAX 1



MAX 4

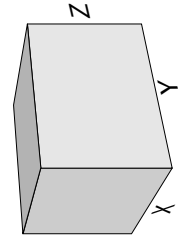


MAX 8-12



Packaging

Model	X	Y	Z	Kg
MAX 1	310	400	320	7
MAX 4	415	400	310	9
MAX 8	415	400	310	9,5
MAX 12	415	400	310	10



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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 to 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 4 LN TW TC - 230V/50-60Hz

RANGE NAME BY FUEL TYPE

MAX Light oil

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

MAX 4 4 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
 R 1 stage with preheater
 TW Thermowatt E-BCU

HEAD TYPE

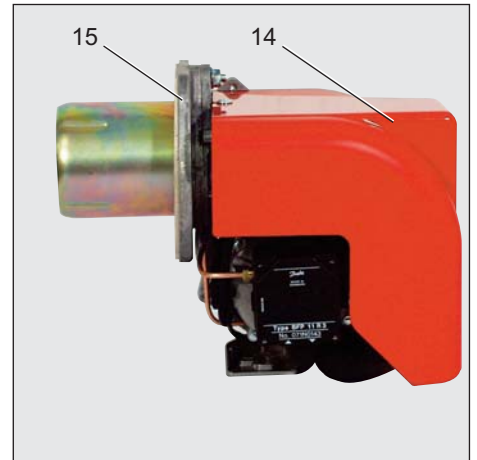
TC Short head
 TL Long head

FUEL

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

ELECTRICAL SUPPLY TO THE SYSTEM

230V/50-60Hz 230 Volt, 50-60 Hz

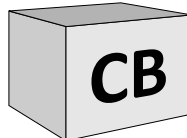


- A1 E-BCU OIL control box
- M1 Electric motor for pump and blower wheel
- T1 Ignition transformer
- Y Graduated rod
- Y1 Solenoid valve
- 3 Air regulation in the burner head
- 5 Fastening screws for equipment plate
- 9 Wieland socket
- 15 Burner flange
- 16 Release knob
- 102 Fuel-oil pump
- 103B Air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

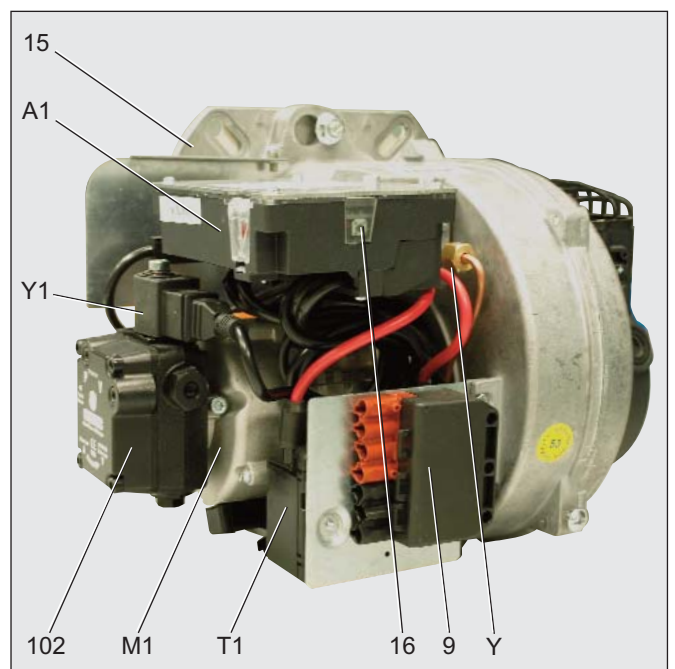
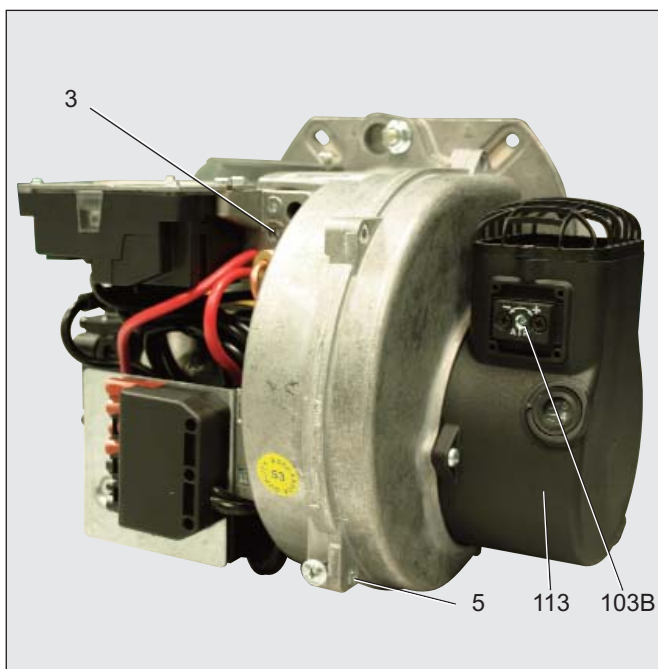
Scope of delivery

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

Light oil pre-heating (version R)

If the system demands heat, the pre-heater is switched on first. When the oil preheating temperature is reached, a thermostat in the pre-heater activates the program sequence. The heating time with cold start is approximately 1 minutes.

Operating function

- If heat is requested by the boiler regulator, the automatic oil combustion control unit starts the program sequence.
- The motor starts, the igniter is switched on and the preventilation period of 15 seconds commences.
- During the preventilation period, the furnace is monitored for flame signals.
- At the end of the preventilation 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.

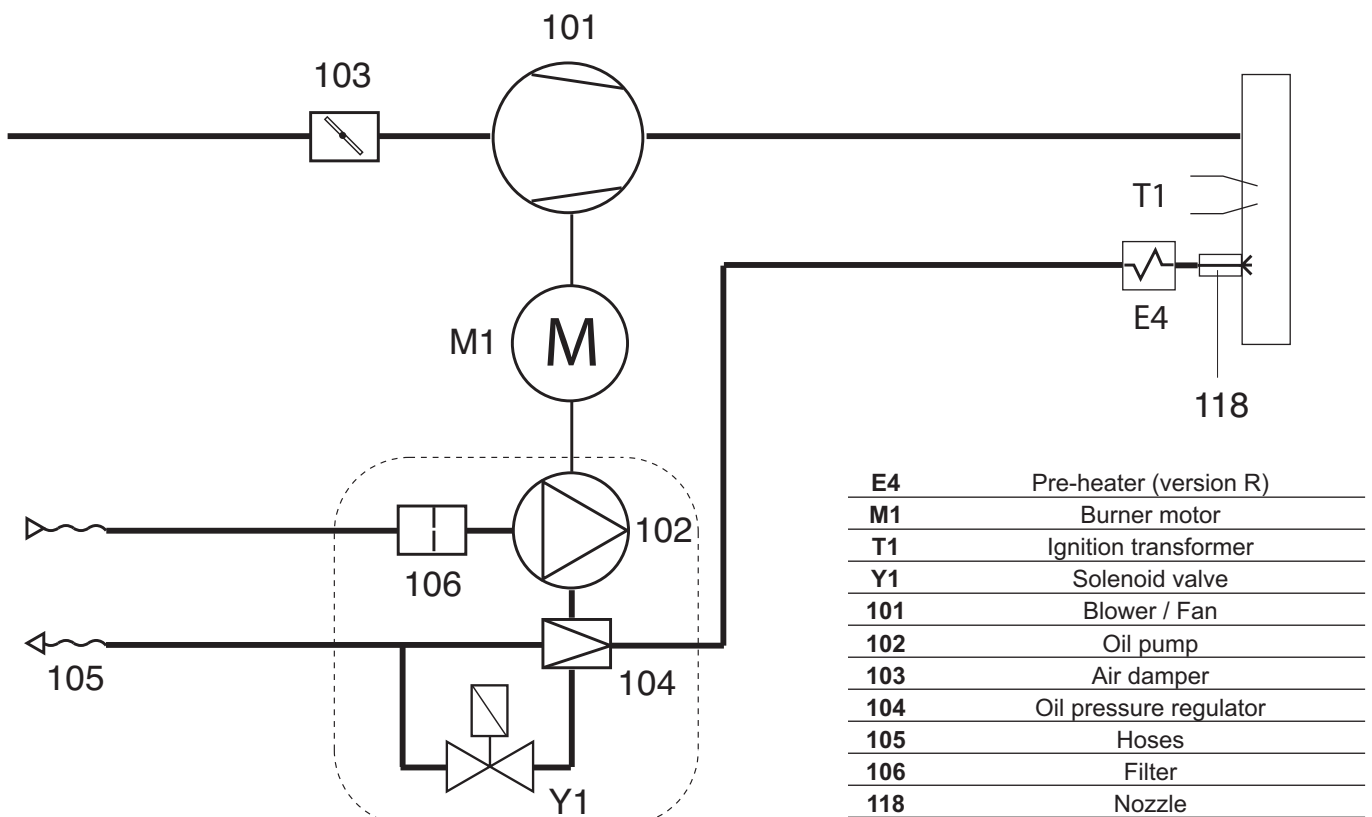
Safety function

A safety shutdown occurs:

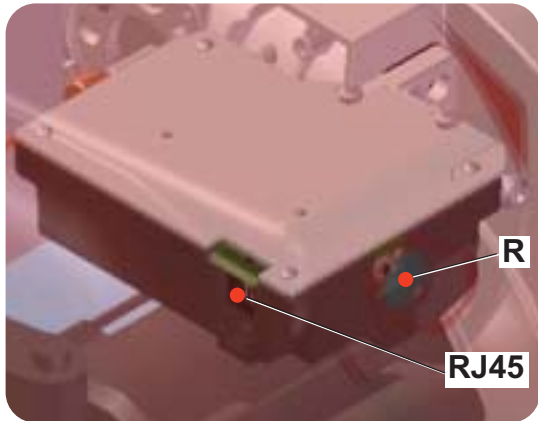
- if a flame signal is present during preventilation (parasitic flame monitoring).
- if no flame is produced within 5 seconds (safety time) of start-up (fuel authorisation).
- if no flame is produced after an unsuccessful restart attempt in the event of flame failure during operation.

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.

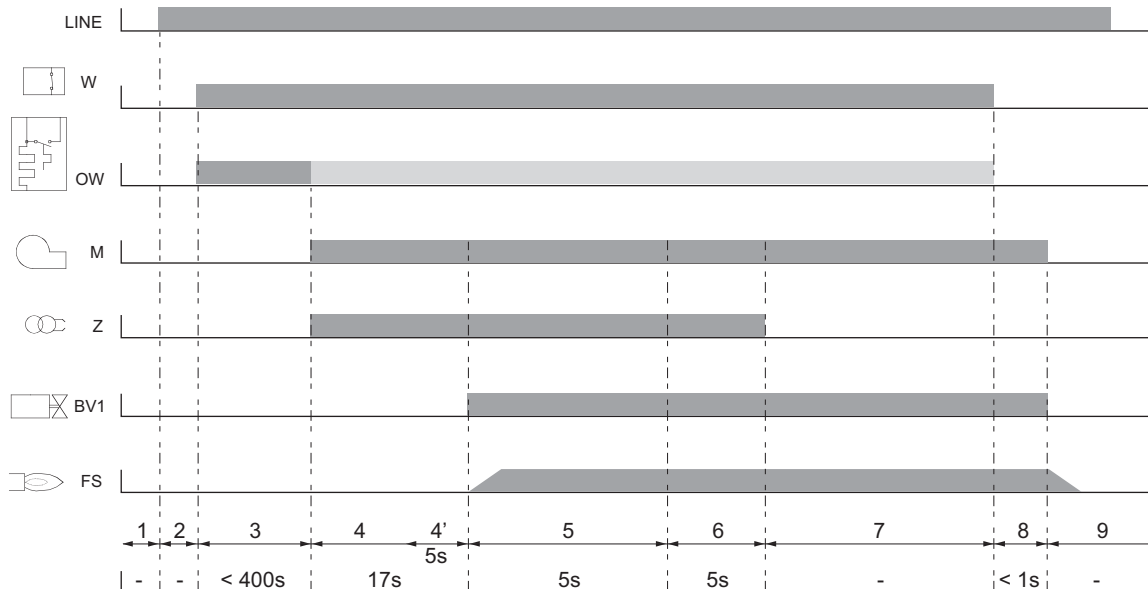
RJ45 - Connector for PC interface (diagnostic, separate item).

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.

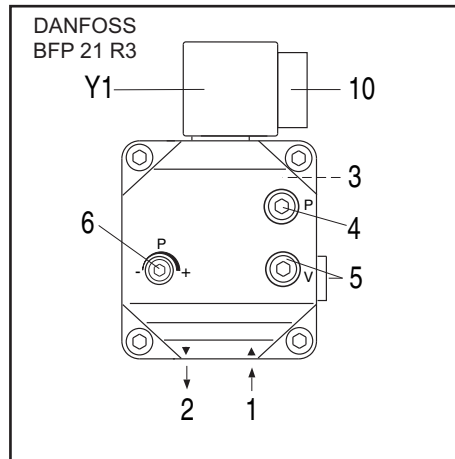
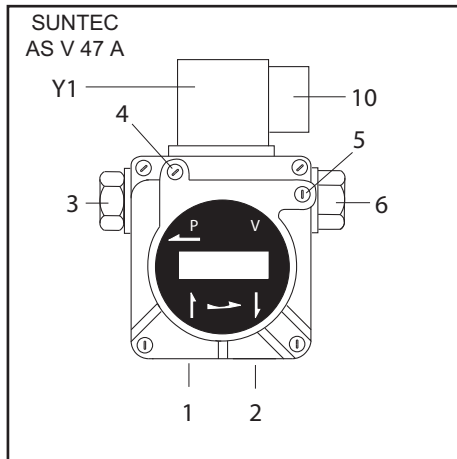


LINE Electrical supply
 BV... Fuel valve
 FS Flame signal
 M Burner motor
 OW Release contact of oil preheater
 W Control thermostat or pressurestat
 Z Ignition transformer

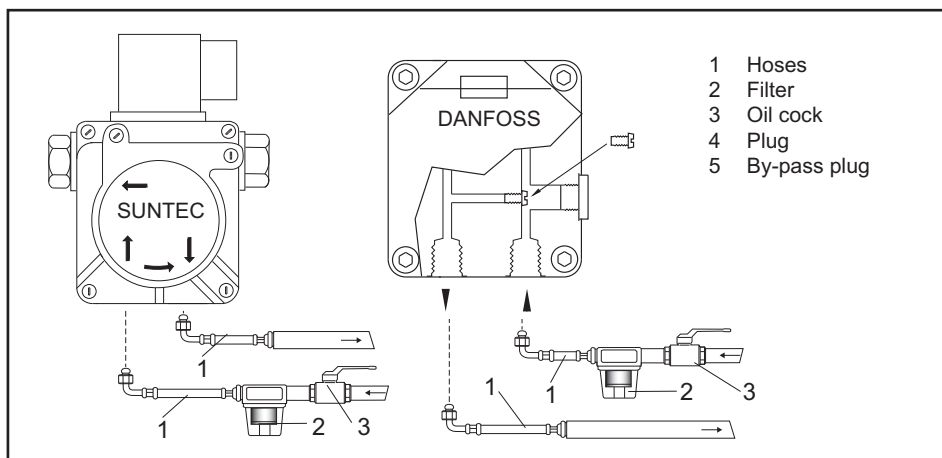
1 No voltage
 2 Power supply on, no heat request
 3 Heat request: pre-heater ON
 4 Preventilation: motor ON, ignition ON
 4' Parasitic flame monitoring
 5 Burner start: solenoid valve OFF, flame production, safety time

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

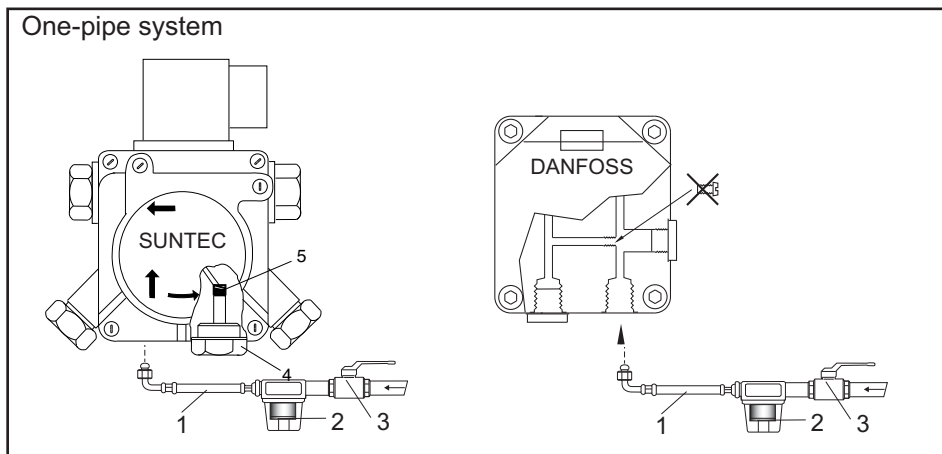


- 1 suction intake connection.
- 2 return connection.
- 3 pressure connection.
- 4 oil pressure gauge connection.
- 5 negative pressure gauge connection.
- 6 oil pressure regulator.
- 10 Solenoid valve electrical connection.
- Y1 fuel-oil solenoid valve.



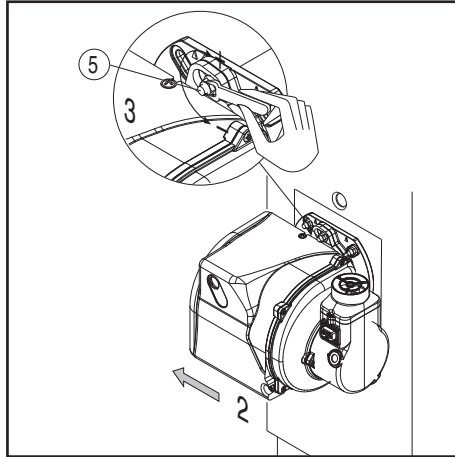
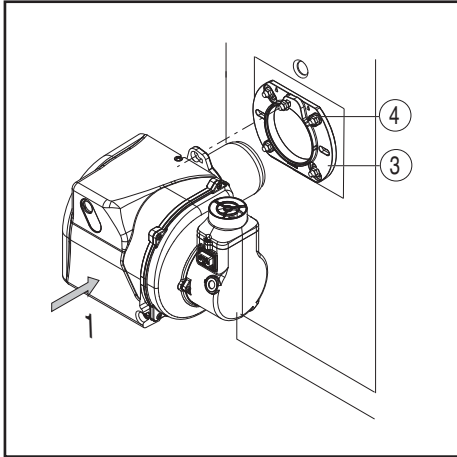
The oil burner pump used is a self-priming gear pump, which must be connected as two-line pump via a bleed filter. There is an intake filter and an oil pressure regulator integrated in the pump. Pressure gauges for pressure measurements and negative pressure measurements must be connected before the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

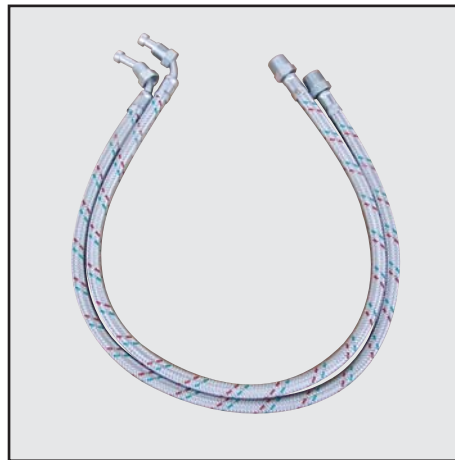
The burner is fixed by mean of connecting flange and therefore to the boiler.

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.

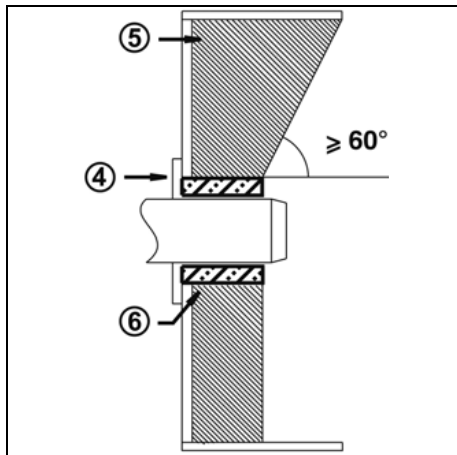
Removal:

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



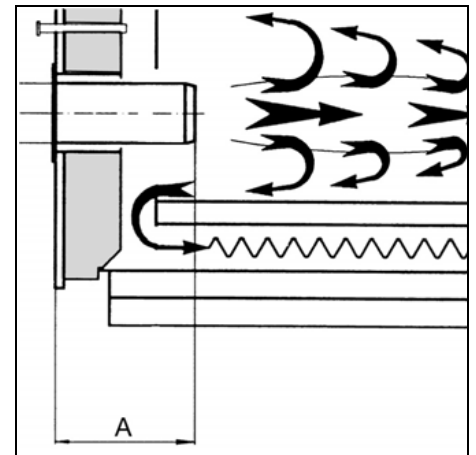
Oil connection

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

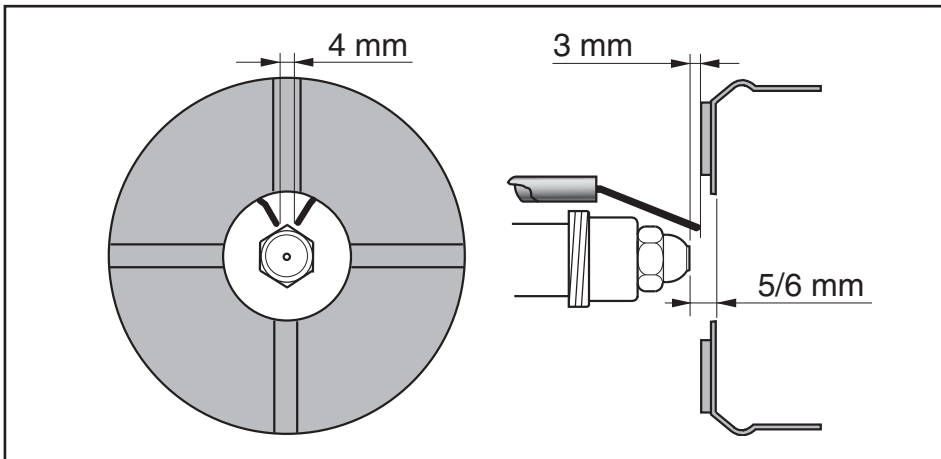
Unless otherwise specified by the boiler manufacturer, heat generators without a cooled front wall require brickwork or insulation 5 as shown in the illustration. The brickwork must not protrude beyond the leading edge of the flame tube, and should have a maximum conical angle of 60°. Gap 6 must be filled 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

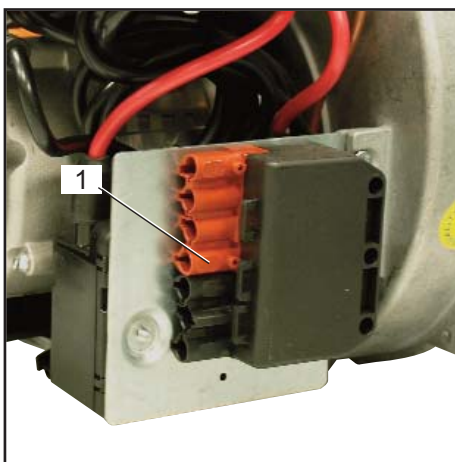
To avoid unfavourable noise emissions, right-angled connectors should not be used on the flue gas side of the boiler.

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.



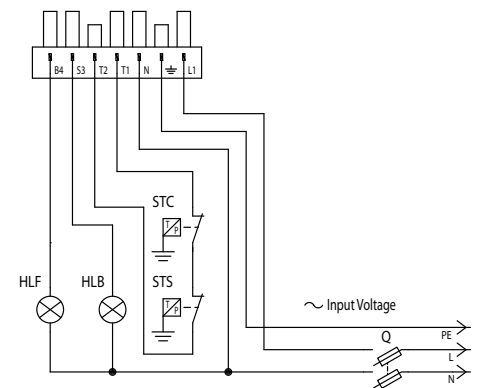
Electrical connection

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.

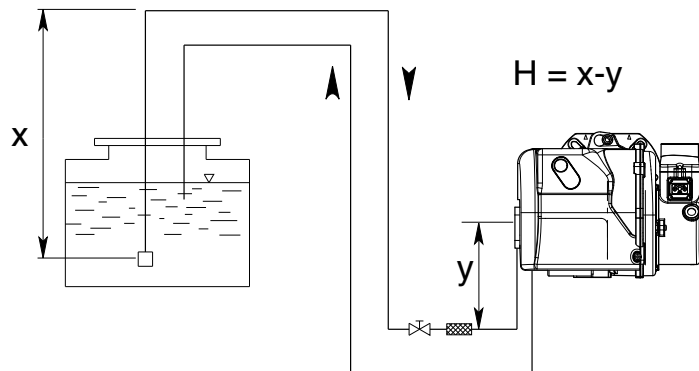
- The thermostats, pressure regulator, low water detectors and any other safety or limiting devices that might be fitted must be connected and operational.
- The exhaust gas duct must be unobstructed and the secondary air system, if available, must be operational.
- An adequate supply of fresh air must 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

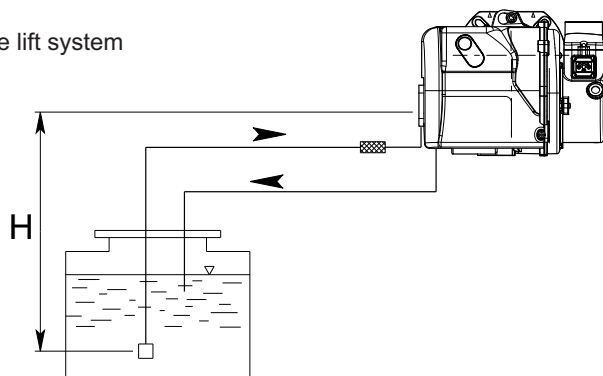
Two-pipe siphon feed system



FEEDING LINE WITH SUNTEC AS V 47 A

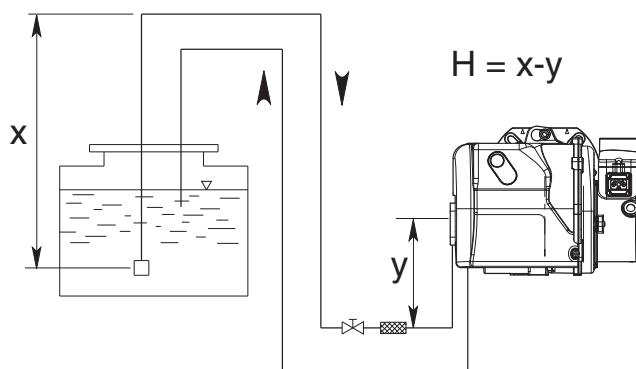
H (m)	Length pipe (m)	
	ø 8 mm	ø 10 mm
0,5	30	65
1	35	70
1,5	40	75
2	45	80
2,5	50	85
3	55	90
3,5	60	95

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

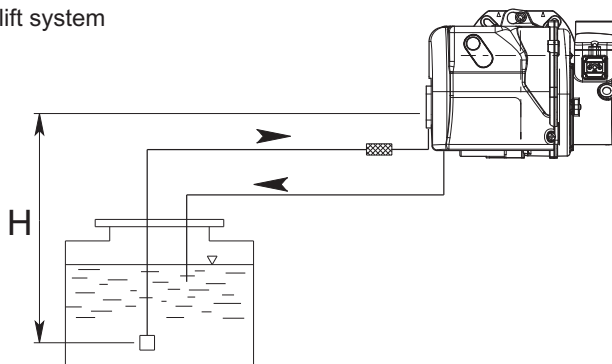
Two-pipe siphon feed system



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

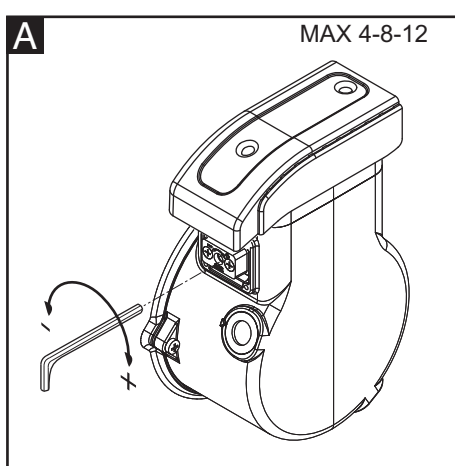
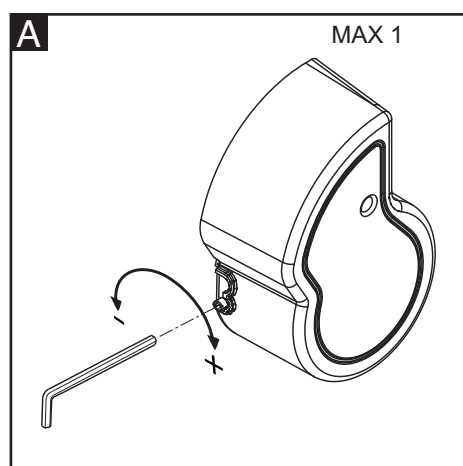
Start up - Setting data table - Air regulation

	NOZZLE		PUMP	OUTPUT	FIRING HEAD SETTING	AIR DAMPER SETTING
	gph	spry	bar	kg/h	Pos.	Pos.
MAX 1	0,40	60°S	12	1,6	0	1,8
	0,50	60°S	12	2	0,3	2,3
	0,55	60°S	12	2,3	0,5	3
	0,60	60°S	12	2,4	1	3,5
	0,65	60°S	12	2,7	1,5	4,5
	0,75	60°S	12	3,1	2	5,3
	0,85	60°S	12	3,5	2,5	6,5
MAX 4	0,50	60°S	12	2	0	3
	0,60	60°S	12	2,4	0,5	4
	0,65	60°S	12	2,7	0,5	5
	0,75	60°S	12	3,1	1	6,3
	0,85	60°S	12	3,5	3	8
	1,00	60°S	12	4,35	4	10
MAX 8	1,00	60°S	12	4,35	1	4
	1,10	60°S	12	4,5	1	5,5
	1,25	60°S	12	5	2	6,2
	1,35	60°S	12	5,6	2,5	7,3
	1,50	60°S	12	6,2	3,5	8,5
	1,65	60°S	12	7	4	9,2
	1,75	60°S	12	7,6	4,5	10,5
MAX 12	1,50	60°S	12	6,2	0	2
	1,65	60°S	12	7	1	3,5
	1,75	60°S	12	7,6	2	5
	2,00	60°S	12	8,3	3	7
	2,25	60°S	12	9,3	3,5	8,5
	2,50	60°S	12	10,4	4	9,5
	2,75	60°S	12	11,5	4,5	10,5

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:

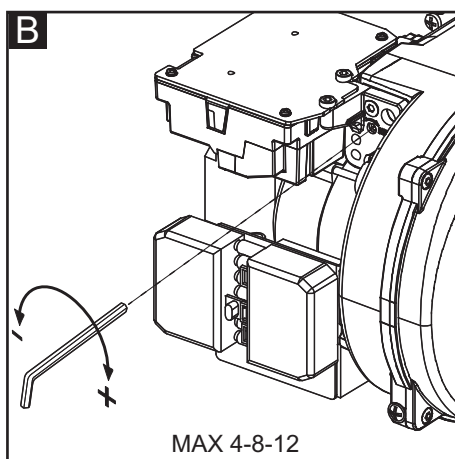
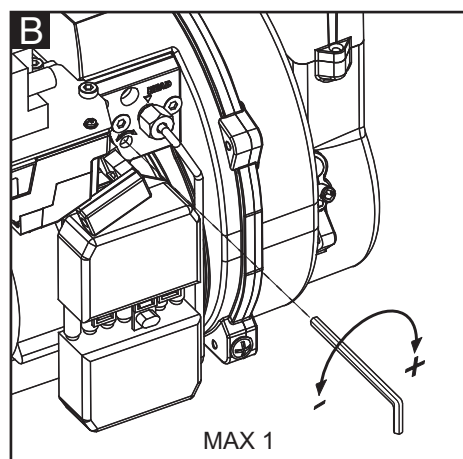
DANFOSS H+S 80°+60°
DELAVAN W 60°
STEINEN S 60°



Air damper setting (A).

To act on the screw in figure:

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



Firing head setting (B).

To act on the screw in figure:

- turn Allen key till you reach the requested value (index 0-4,5).

Start up - Adjusting burner output - Oil pressure regulation



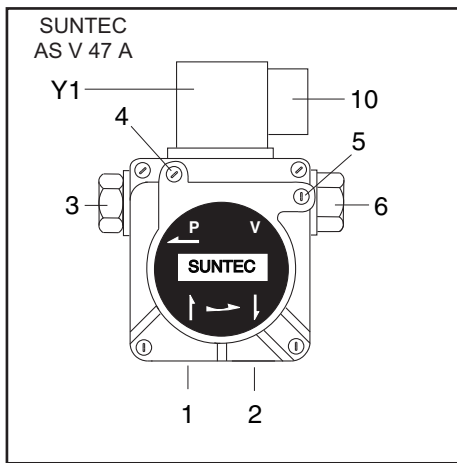
Risk of air blast!

Continuously check CO, CO₂ 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

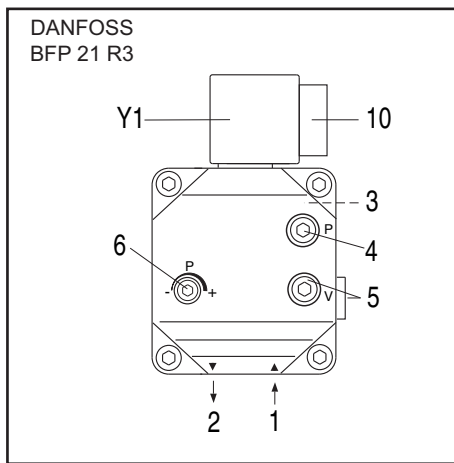
Before starting the burner, draw oil in until the filter is completely filled.

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.



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, CO₂, soot test). Adjust the airflow gradually if necessary.



- 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

- 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).

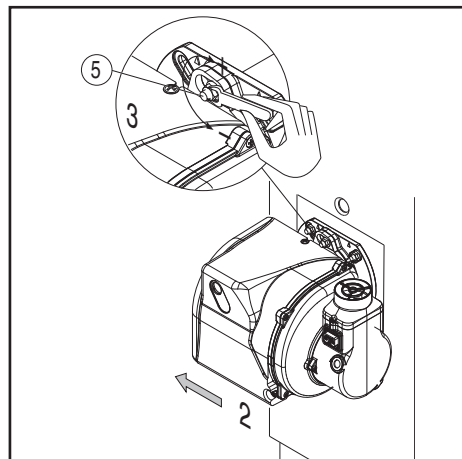
- Check the pump cover seal and replace the gasket if necessary.

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.

for maintenance.

Position 1

Maintenance line air (cleaning/substitution fan)

Position 2

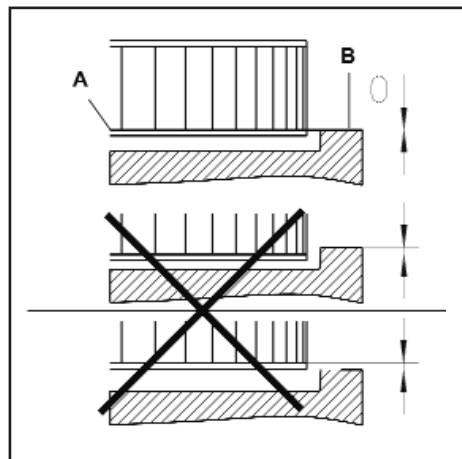
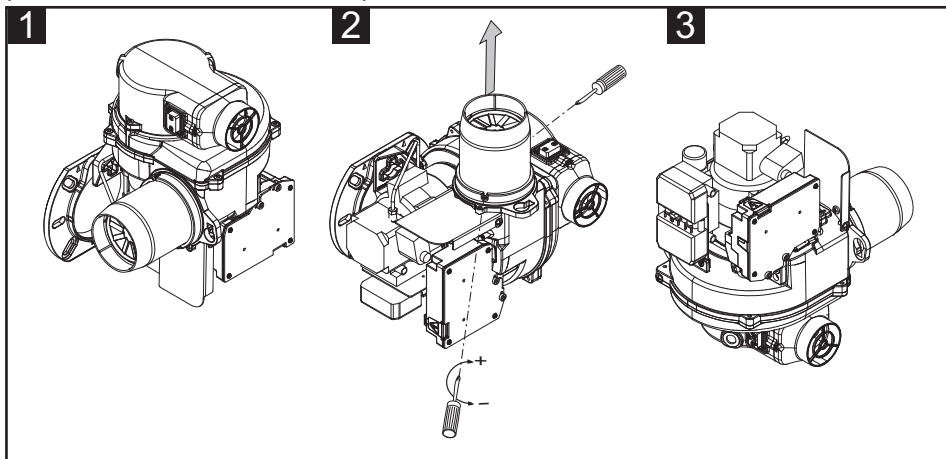
Burner head maintenance.

Position 3

Maintenance components (filter and light oil pump).

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



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).

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.



Maintenance on the burner

Maintenance position 1

- Clean fan and housing and check for damage.

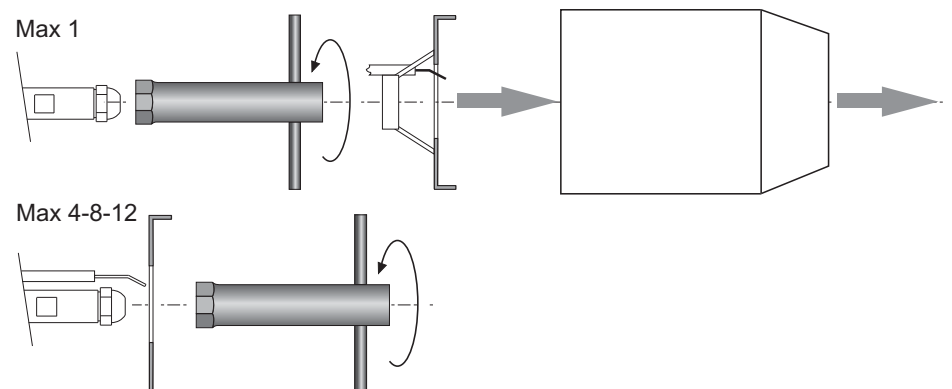
Maintenance position 2

- 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.



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.




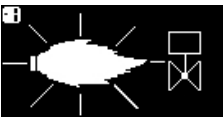
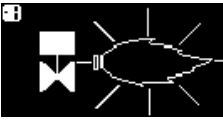

Only use original spare parts.

NB: after each operation:

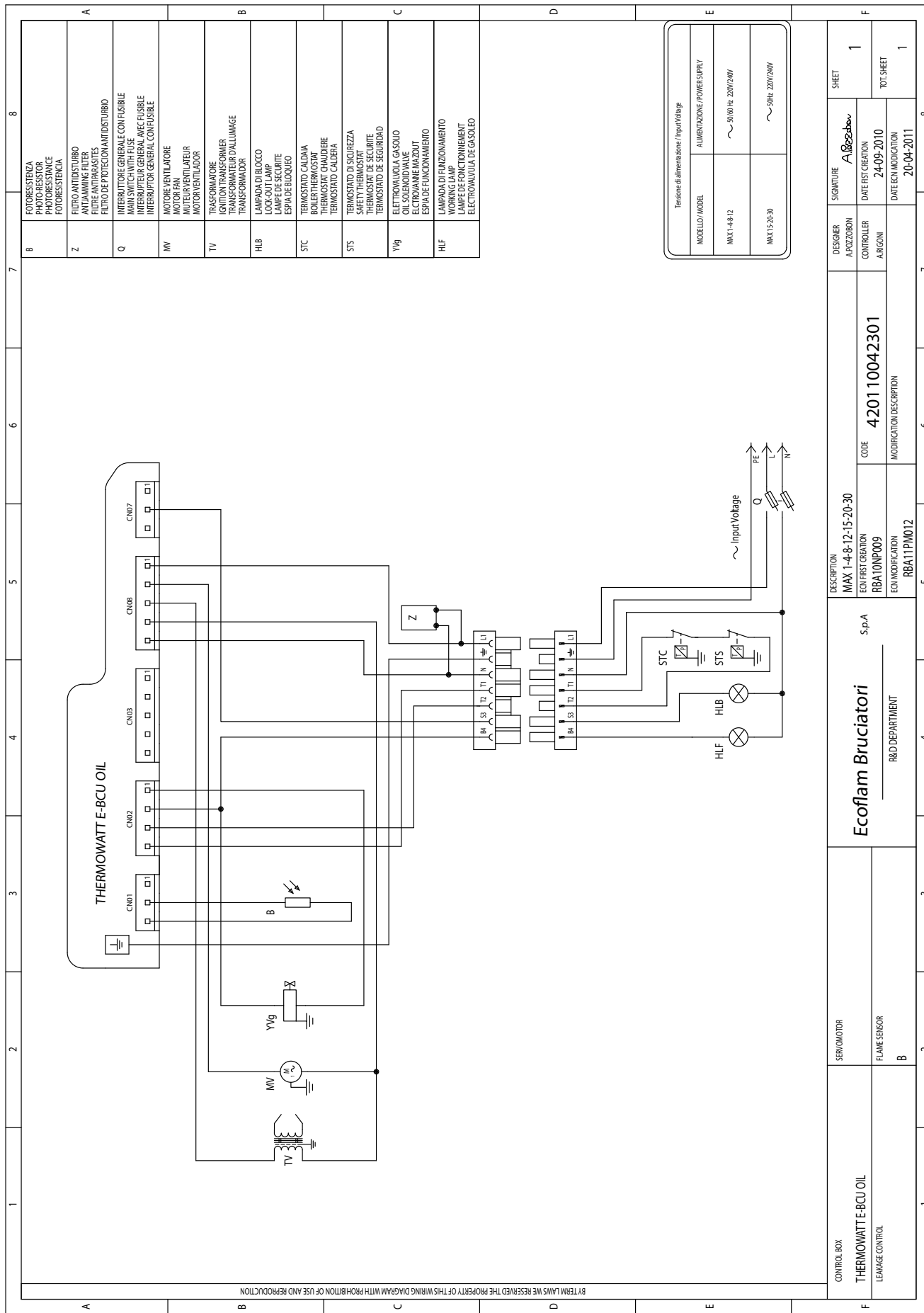
- under normal operating conditions (doors closed, hood fitted, etc.), check combustion and check the individual lines for leaks.
- Record the results in the relevant documents.

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.

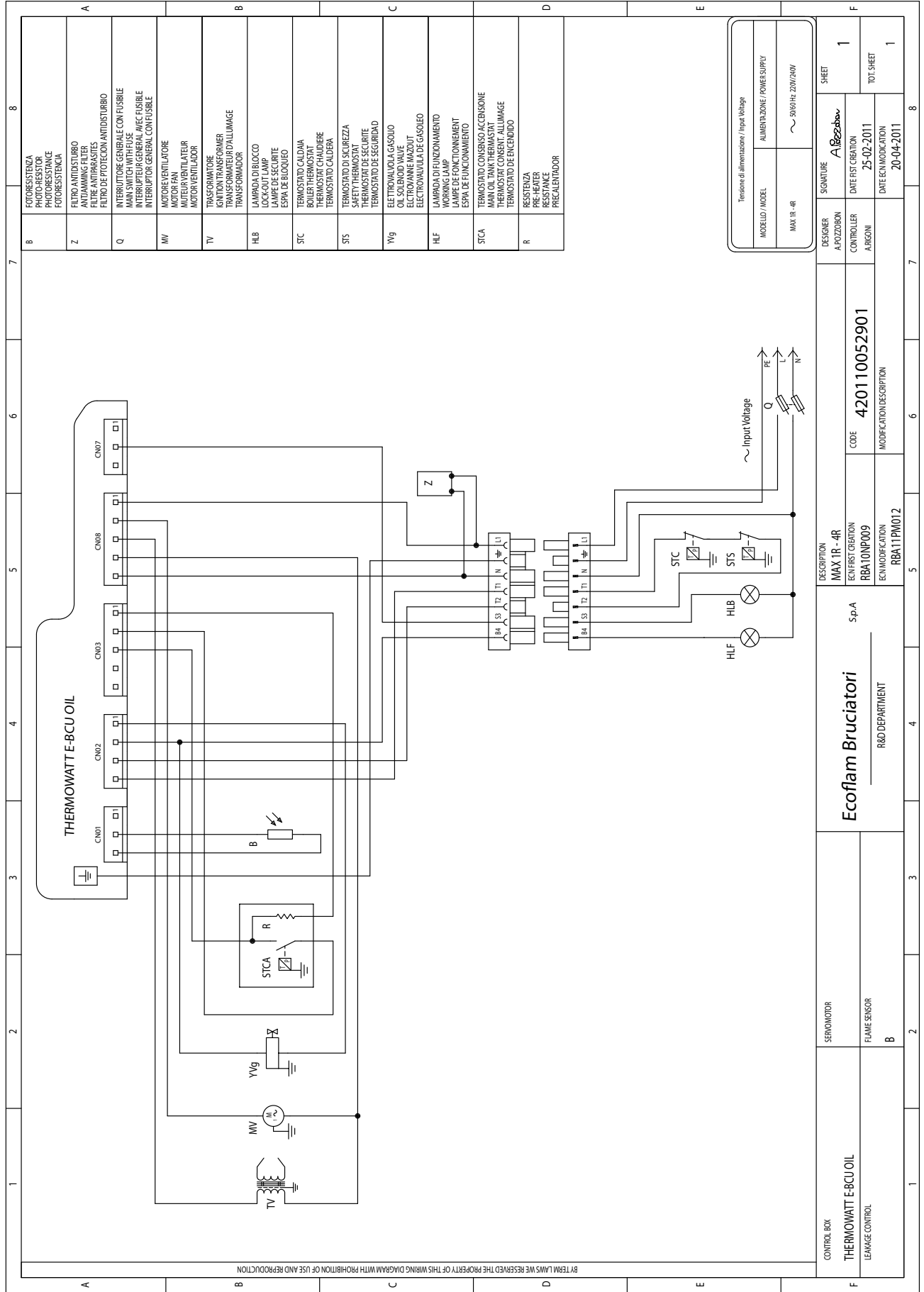
Overview - Electric diagrams / Panoramica - Schemi elettrici / Vue d'ensemble - Schémas électrique / Descripción - Esquemas eléctrico /
Обзор - Электрические схемы



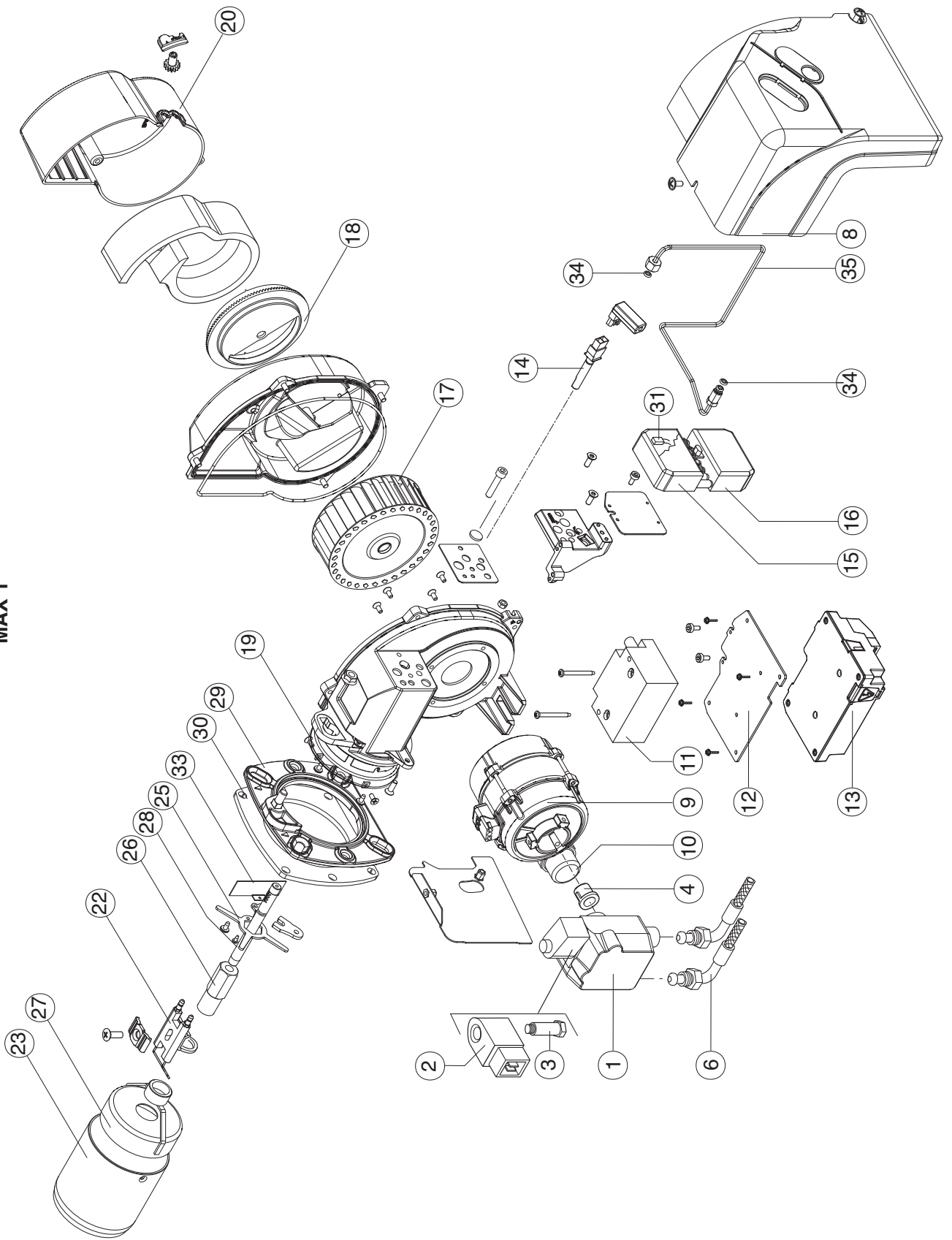
Tensione di alimentazione / Input Voltage	
MODELLO / MODEL	ALIMENTAZIONE / POWER SUPPLY
MAX1-4-8-12	~ 50/60 Hz 200V/240V
MAX15-20-30	~ 50Hz 200V/240V

CONTROL BOX THERMOWATT E-BCU OIL LEAKAGE CONTROL	SERVOMOTOR	Ecoflam Bruciatori		S.p.A		R&D DEPARTMENT	
	FLAME SENSOR	B		4201 10042301		RBA11PM012	
	DESIGNER	AF-POZZOBON	CONTROLLER	AIRGONI	CODE	4201 10042301	DESCRIPTION
	SIGNATURE	Aligebbe		DATE/FIRST CREATION	24-09-2010	MODIFICATION DESCRIPTION	RBA11PM012
	SHEET	1		DATE/EVN MODIFICATION	20-04-2011		
	TOT.SHEET	1					

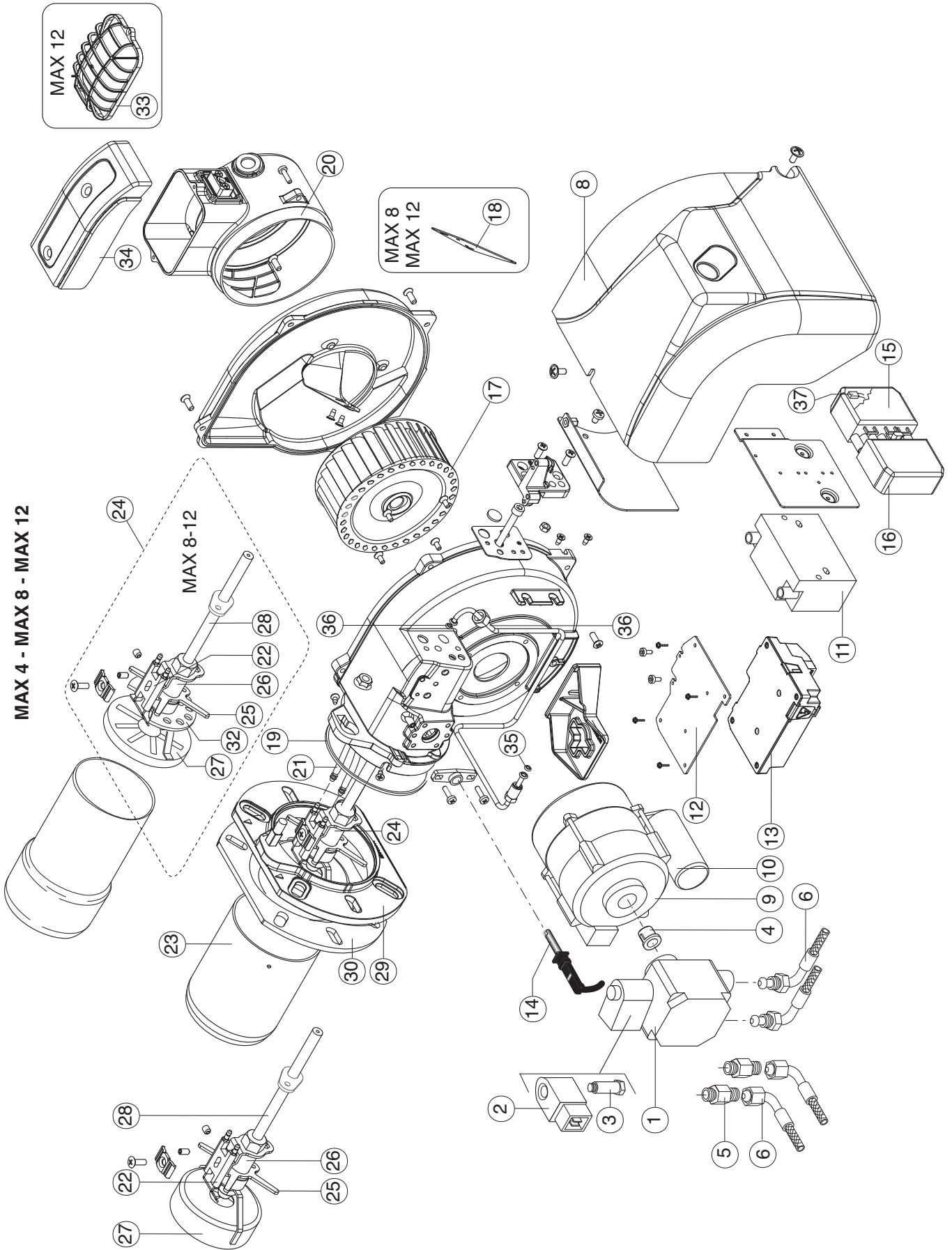
Overview - Electric diagrams / Panoramica - Schemi elettrici / Vue d'ensemble - Schémas électrique / Descripción - Esquemas eléctrico / Обзор - Электрические схемы



MAX 1



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



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

n°	Description	Description	НАИМЕНОВАНИЕ	MAX 1	MAX 1R
				code	code
1	OIL PUMP	POMPA COMPLETE	НАСОС	65325015	65325015
2	COIL	BOBINA	КАТУШКА	65323773	65323773
				DANFOSS	
				SUNTEC	65323767
3	OIL VALVE	VALVOLA	КЛАПАН	65323751	65323751
				DANFOSS	
				SUNTEC	65323744
4	COUPLING	GIUNTO	МУФТА	65322920	65322920
		RACCORDO PER FLESSIBILE	ФИТИНГ ДЛЯ ГИБК. ШЛАНГА		
5	NIPPLE	MAMELONS	ТУЕРКА		
6	HOSES	TUBO FLESSIBILE	ГИБКИЙ ШЛАНГ	65323216	65323216
7	FILTER	FILTRO	ФИЛЬТР	65325046	65325046
				ART.70451-006AV	
8	COVER	COPERCHIO	КРЫШКА	65320569	65320569
9	MOTOR	MOTORE	ДВИГАТЕЛЬ	65322868	65322868
				75 W AEG	
10	CAPACITOR	CONDENSATORE	КОНДЕНСАТОР	65321857	65321857
				3 µF AEG	
				5 µF SIMEL	65325038
11	IGNITION TRANSFORMER	TRASFORMATORE	ТРАНСФОРМАТОР	65323257	65323257
12	SUPPORT	SUPPORTO	ПОДДЕРЖКА	65325251	65325251
13	CONTROL BOX WITH CABLES	APPARECCHIATURA CON CAVI	КОНТРОЛЬНАЯ АППАРАТУРА С КАБЕЛЯМИ	65325255	65325255
				THERMOWAT E-BOU OIL	
14	PHOTORESISTOR	FOTORESISTENZA	ФОТОРЕЗИСТОР	65320083	65320083
15	SOCKET WIELAND	PRESA WIELAND	РАЗЪЕМ WIELAND	65322070	65322070
16	PLUG WIELAND	SPINA WIELAND	ВИЛКА WIELAND	65322069	65322069
17	FAN	VENTOLA	ВЕНТИЛЯТОР	65323826	65323826
				120 x 42	
18	AIR DAMPER	SERRANDA	ДЕФЛЕКТОР	65320523	65320523
19	ORING	GUARNIZIONE	УПЛОТНИТЕЛЬНАЯ ПРОКЛАДКА	65321066	65321066
20	COVER AIR INLET	CUFFIA	ВОЗДУХОЗАБОР	65320522	65320522
21	CABLES	CAVI ACCENSIONE	ПРОВОДА РОЗЖИГА	65325252	65325252
				TC	
				TL	65325253
22	ELECTRODES	ELETTRODI	ЭЛЕКТРОДЫ	65320924	65320924
23	BLAST TUBE	BOCCAGLIO	СТАКАН	65320333	65320333
24	FIRING HEAD	TESTA DI COMBUSTIONE	ОГНЕВАЯ ГОЛОВКА	65320339	65320339
				TC	
				TL	
25	NOZZLE HOLDER SUPPORT	CROCIERA	КРЕСТОВИНА	65320695	65320698
				TC	
				TL	65108818
26	NOZZLE HOLDER	PORTA UGELLO	ДЕРЖАТЕЛЬ ФОРСУНКИ	65320708	-
				TC	
				TL	
				FRNB 3 DANFOSS	65323009
27	DIFFUSER	DIFFUSORE	РАССЕКАТЕЛЬ	65320760	65320760
28	ROD	ASTA DI REGOLAZIONE TESTA	РЕГУЛИРОВОЧНЫЙ ШТОК ОГНЕВОЙ ГОЛОВКИ	65324056	65324057
				TC	
				TL	65108820
29	FLANGE	FLANGIA	ФЛАНЕЦ	65320973	65320973
30	GASKET	GUARNIZIONE BRUCIATORE	ПРОКЛАДКА ГОРЕЛКИ	65321110	65321110
31	ANTIPLUMMING FILTER	FILTRO ANTIPARASITI	ФИЛЬТР ПОДАВЛЕНИЯ ПОМЕХ		
32	REAR DISC	DISCO POSTERIORE	ЗАДНИЙ ДИСК		
33	FAN SCOOP	DEFLETTORE	ДЕФЛЕКТОР	65320505	65320505
				TC	
				TL	65320506
34	PIPE GASKET	GUARNIZIONE TUBO	НАБИВКА ТРУБЫ	65321065	65321065
35	PIPE	TUBO	ТРУБА	65321508	65321508

TC = Testa corta / Short Head / Tete courte / Cabeza corta / КОРОТКАЯ ОГНЕВАЯ ГОЛОВКА TL = Testa lunga / Long Head / Tete longue / Cabeza larga / ДЛИННАЯ ОГНЕВАЯ ГОЛОВКА
R= Versione preriscaldata / Version pre-heater / Version rechauffeur / Version con precalentador / МОДЕЛЬ С ПРЕДВАРИТЕЛЬНЫМ ПОДОГРЕВОМ

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

n°	Description	Désignation	Description	MAX 4 code	MAX 8 code	MAX 12 code
1	OIL PUMP	POMPA COMPLETE	BOMBA	65325015	65325015	65325015
2	COIL	BOBINA	BOBINA	65323773	65323773	65323773
3	OIL VALVE	VALVOLA	VALVULA	65323767	65323767	65323767
4	COUPLING	GIUNTO	ACOPPLAMENTO	65323744	65323744	65323744
5	NIPPLE	RACCORDO PER FLESSIBILE	TUERCA	65322920	65322920	65322920
6	HOSES	TUBO FLESSIBILE	FLEXIBLES	65323216	65323216	65323216
7	FILTER	FILTRO	FILTRO	65325046	65325046	65325046
8	COVER	COPERCHIO	TAPA	65325254	65325254	65325254
9	MOTOR	MOTORE	MOTOR	65322867	-	-
			75 W	-	-	-
			100 W	65324998	-	-
10	CAPACITOR	CONDENSATORE	CONDENSADOR	65321857	-	65321857
			3 µF AEG	-	-	-
			5 µF SIMEL	65325038	-	-
			4 µF AEG	-	-	-
			6.3 µF SIMEL	65321848	-	-
11	IGNITION TRANSFORMER	TRASFORMATORE	TRANSFORMADOR	65325000	-	65325000
12	SUPPORT	SUPPORTO	SOPORTE	65323257	65323257	65323257
13	CONTROL BOX WITH CABLES	APPARECCHIATURA CON CAVI	EQUIPO CONTROL LLAMA CON CABLES	65325251	65325251	65325251
14	PHOTORESISTOR	FOTORESISTENZA	FOTORRESISTENCIA	65325255	65325255	65325255
15	SOCKET WIELAND	PRESA WIELAND	ESPINA WIELAND	65320083	65320083	65320083
16	PLUG WIELAND	SPINA WIELAND	TOMA WIELAND	65322070	65322070	65322070
17	FAN	VENTOLA	TURBINE	65322069	65322069	65322069
18	FAN SCOOP	SURPRESSORE	VOLET FIXE	65321770	65321770	65321770
19	ORING	GUARNIZIONE	ORING	65320621	65320621	65320621
20	COVER AIR INLET	CUFFIA	VOLET D'AIR	65321061	65321061	65321061
			UPLOTNITEL'NAYA PROKLADKA	65320131	65320130	65320130
			ВОЗДУХОЗАБОР	65322247	-	-
21	CABLES	CAVI ACCENSIONE	CABLES	65325252	65325252	65325252
			PROBODA ROZJHIGA	65325253	65325253	65325253
22	ELECTRODES	ELETTRODI	ELECTRODOS	65320924	65320924	65320924
23	BLAST TUBE	BOCCAGLIO	TUBO LLAMA	65320325	65320325	65320325
24	FIRING HEAD	TESTA DI COMBUSTIONE	TETE DE COMBUSTION	65320327	65320327	65320327
			CABEZA DE COMBUSTION	65322554	65322556	65322558
25	NOZZLE HOLDER SUPPORT	CROCIERA	SUPPORT PORTE GICLÉUR	65322555	65322557	65322559
			КРЕСТОВИНА	65320687	65320687	65320687
26	NOZZLE HOLDER	PORTA UGELLO	PORTE GICLÉUR	65320689	-	-
			ДЕРЖАТЕЛЬ ФОРСУНКИ	65320707	65320707	65320707
27	DIFFUSER	DIFFUSORE	DEFLECTEUR	65323009	-	-
			РАСРЕКАТЕЛЬ	65320747	65320750	65320753
28	ROD	ASTA DI REGOLAZIONE TESTA	SUPPORT	65320181	65320183	65320187
			РЕГУЛИРОВОЧНЫЙ ШТОК ОГНЕВОЙ ГОЛОВКИ	65320185	-	-
			TC (R)	-	-	-
			TL	65320182	65320184	65320188
			TL (R)	65320186	-	-
29	FLANGE	FLANGIA	BRIDE	65320968	65320972	65320972
30	GASKET	GUARNIZIONE BRUCIATORE	JOINT DE BRULEUR	65321104	65321109	65321109
31	REAR DISC	DISCO POSTERIORE	DISCO POSTERIOR	65320723	65320723	65320726
32	SNORKEL	SNORKEL	SNORKEL	-	-	-
33	GRATE	GRIGLIA	GRINCER	-	-	-
34	CARTER	CARTER	CARTER	65320518	65320518	65320517
35	PIPE GASKET	GUARNIZIONE TUBO	JOINT DE TUYATERIE	65321065	65321065	65321065
36	PIPE	TUBO	TUYATERIE	65321500	65321500	65321500
37	ANTIPLAMMING FILTER	FILTRO ANTIDISTURBO	FILTRO ANTIPARASITES	65320518	65320518	65320517
			ФИЛЬТР ПОДАВЛЕНИЯ ПОМЕХ	-	-	-

TC = Testa corta / Short Head / Tete courte / Cabeza corta / КОРОТКАЯ ОГНЕВАЯ ГОЛОВКА TL = Testa lunga / Long Head / Tete longue / Cabeza larga / ДЛИННАЯ ОГНЕВАЯ ГОЛОВКА
 R= Versione preriscaldata / Version pre-heater / Version rechauffeur / Version con precalentador / МОДЕЛЬ С ПРЕДВАРИТЕЛЬНЫМ ПОДОГРЕВОМ