



Munters
SIAL®

Mobile Diesel Heaters
TOR / MIR

Service
Training Course



MIR

Indirect-fired Diesel Heaters



- MIR 37 WE
- MIR 55 WE
- MIR 85 WE
- MIRAGE 37 H
- MIRAGE 55 H
- MIRAGE 85 H

TOR

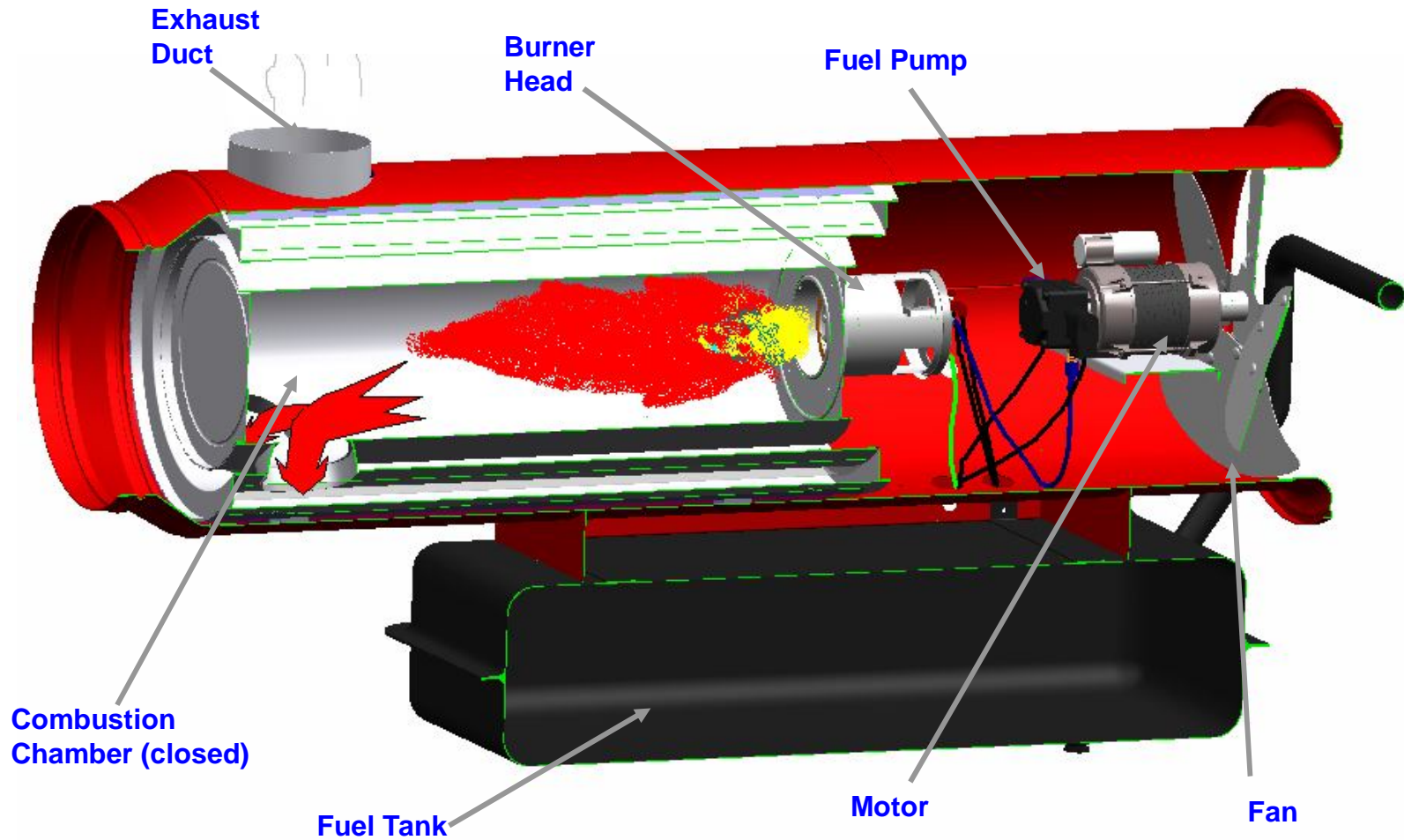
Direct-fired Diesel Heaters



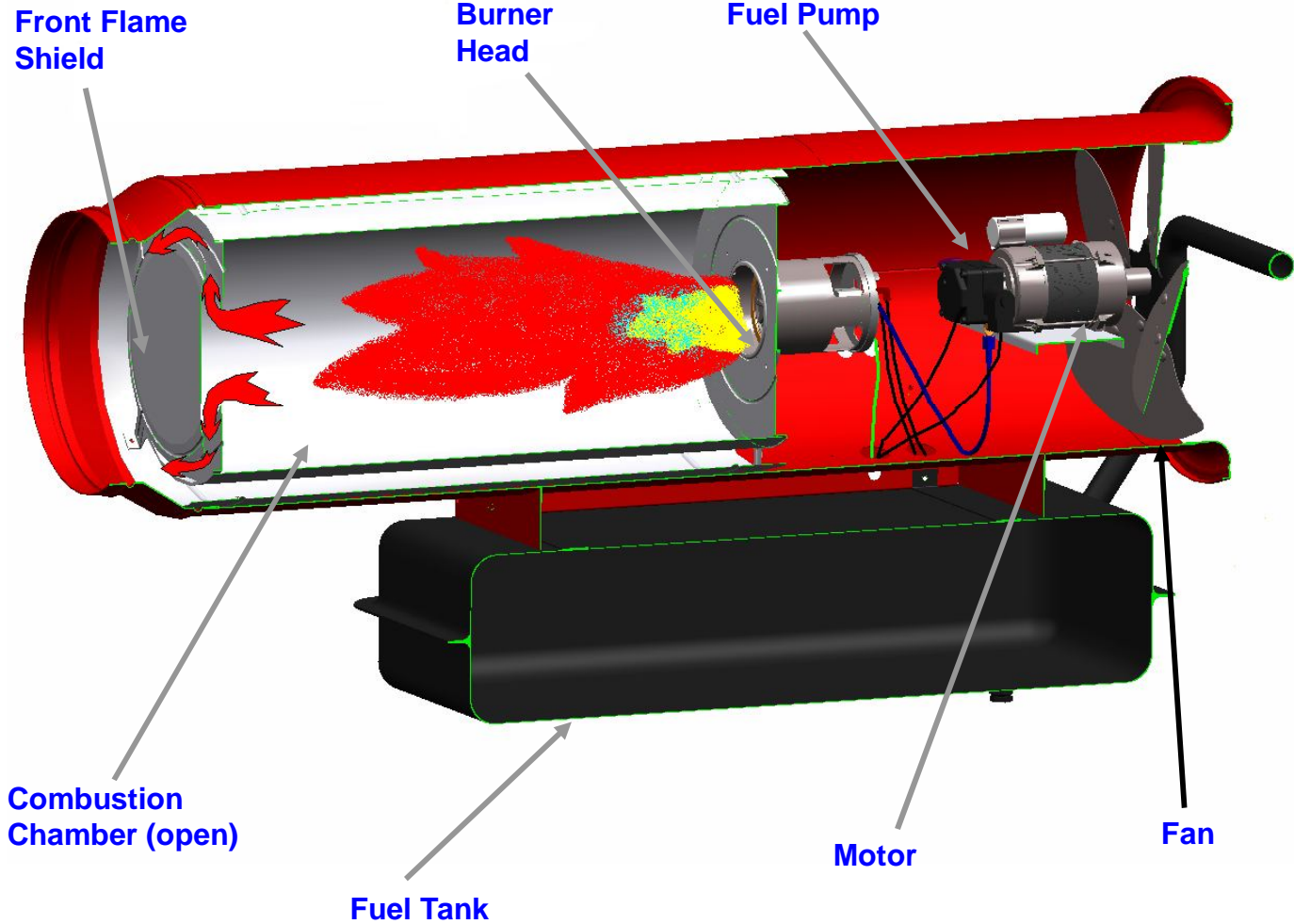
- TOR 67 WU
- TOR 115 WU
- TORNADO 67
- TORNADO 115

MIR

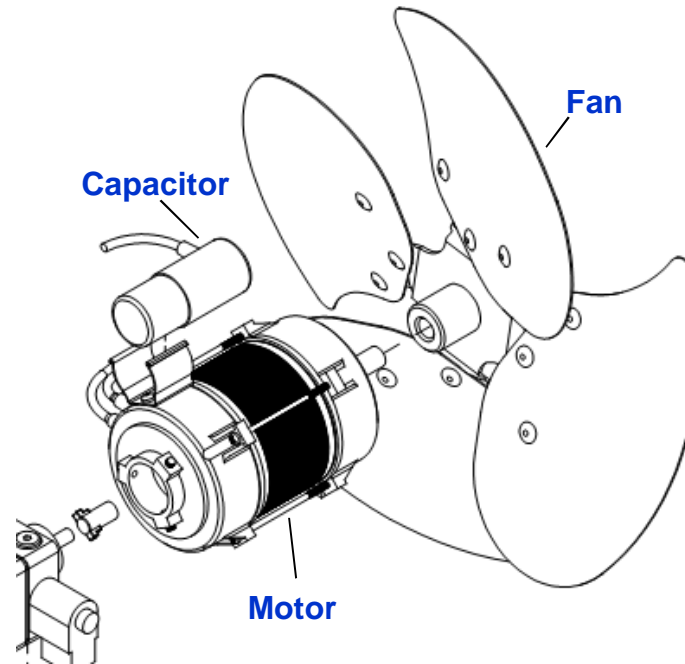
General Assembly



TOR General Assembly



FAN MOTOR ASSEMBLY



Motors

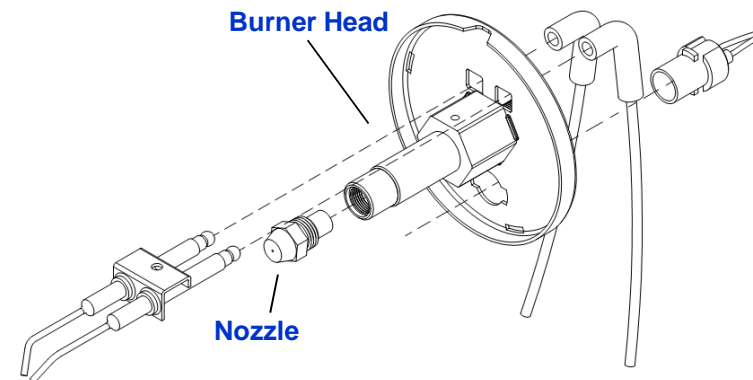
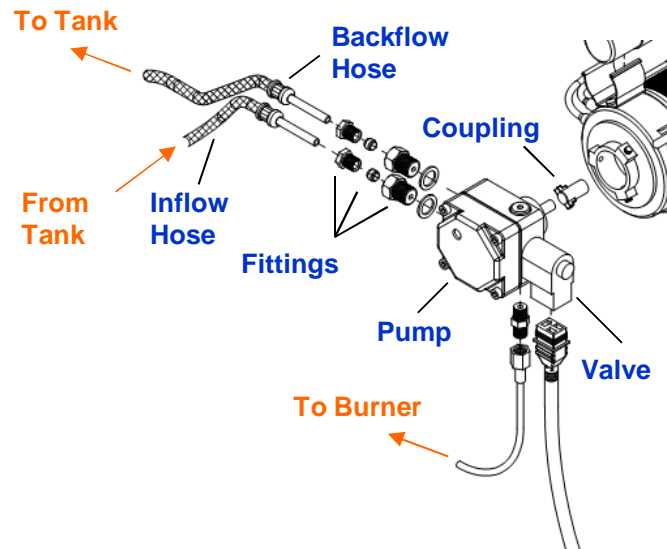
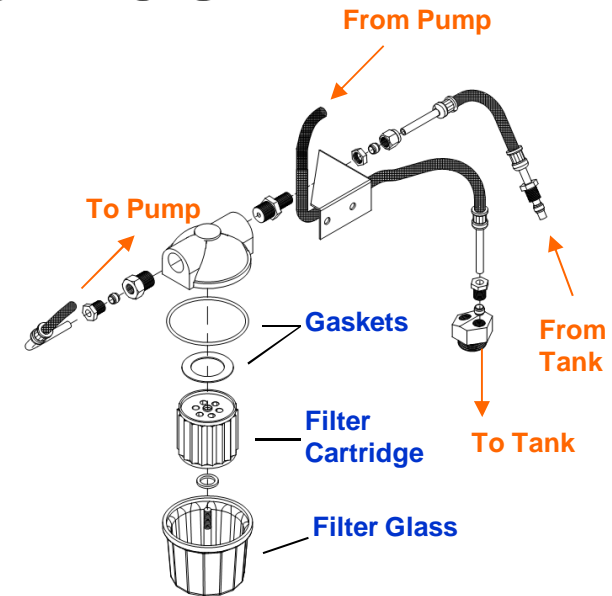
430W	2800 rpm	2 poles
750W	1300 rpm	4 poles
1100W	1300 rpm	4 poles

MIR 37 WE - MIR 55 WE - TOR 67 WE
MIR 85 WE - TOR 115 WE
TOR 175 WE

THE FUEL CIRCUIT

The fuel circuit is basically composed of :

- fuel tank
- suction and return hoses
- fuel filter (normal or heated)
- fuel pump
- fuel solenoid valve
- high pressure microhose
- burner head
- nozzle



Fuel Tank (with drain cap)



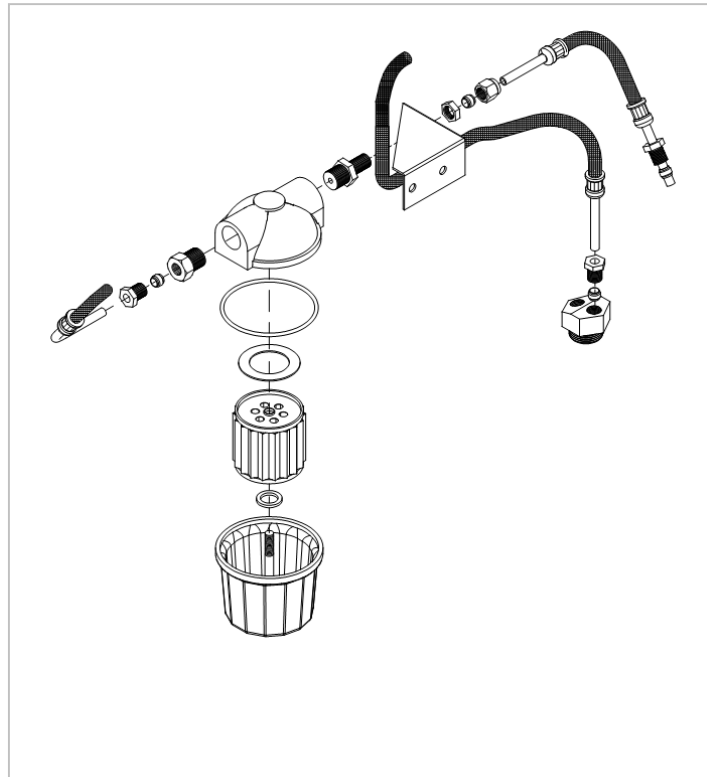
Tank Capacities

51 l
100 l
139 l

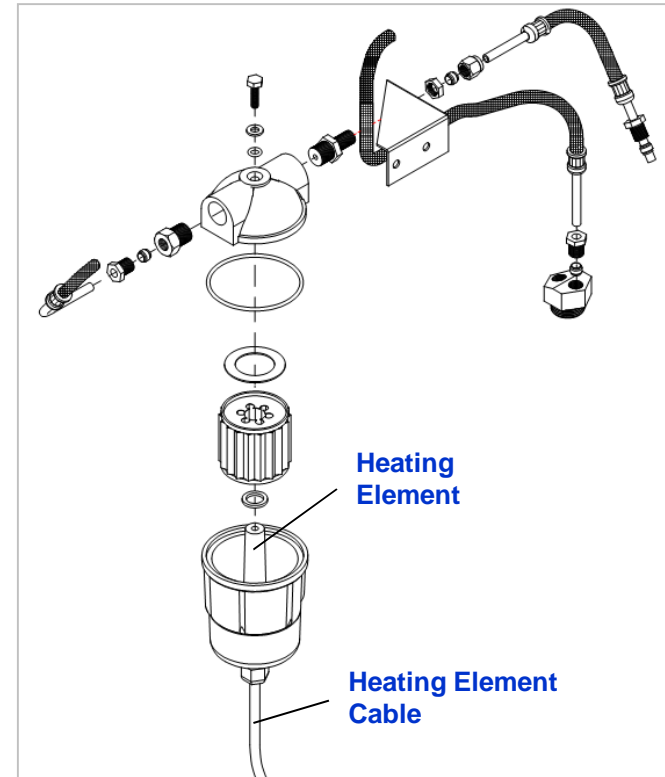
MIR 37 WE - MIR 55 WE - TOR 67 WE
MIR 85 WE - TOR 115 WE
TOR 175 WE

Fuel Filter

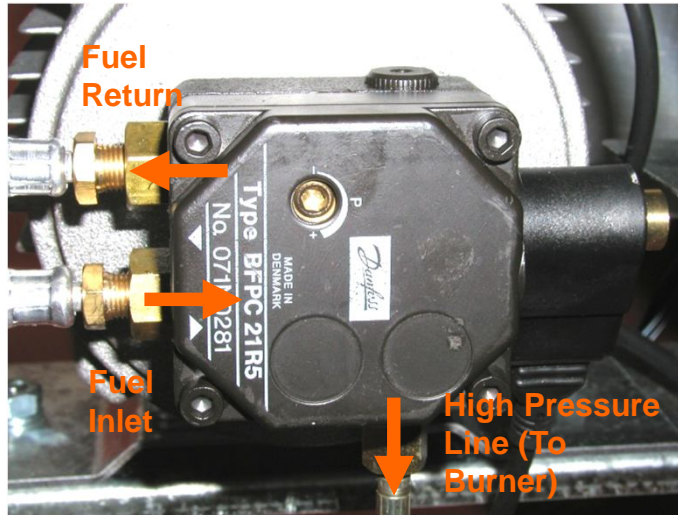
Normal Filter



Heated Filter



Fuel Pump (BFPC)



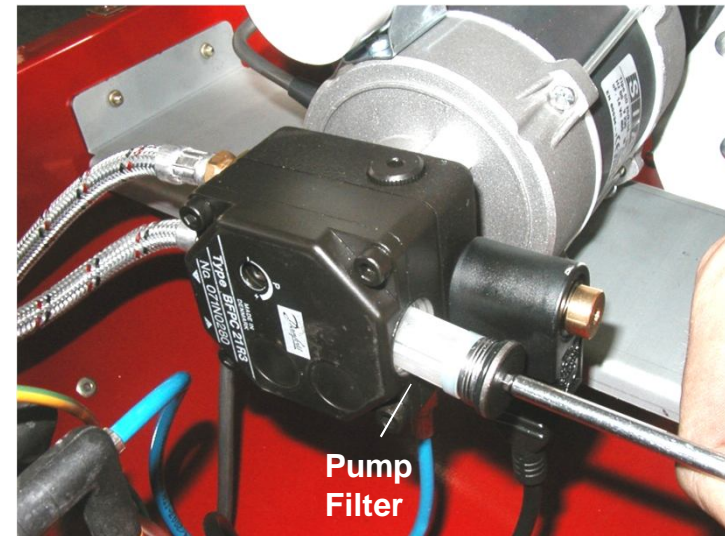
Danfoss BFPC fuel pump

BFPC 21R3
BFA 21R3

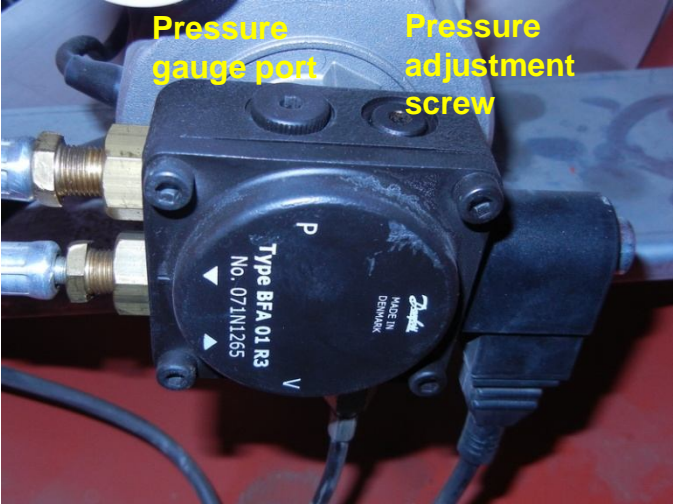
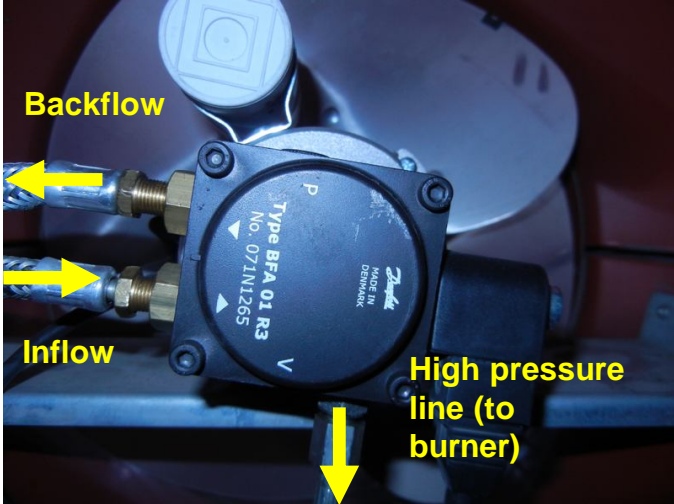
MIR 37
MIR 55
TOR 67

BFPC 21R5
BFA 21R5

MIR 85
TOR 115
TOR 175



Fuel Pump (BFA)



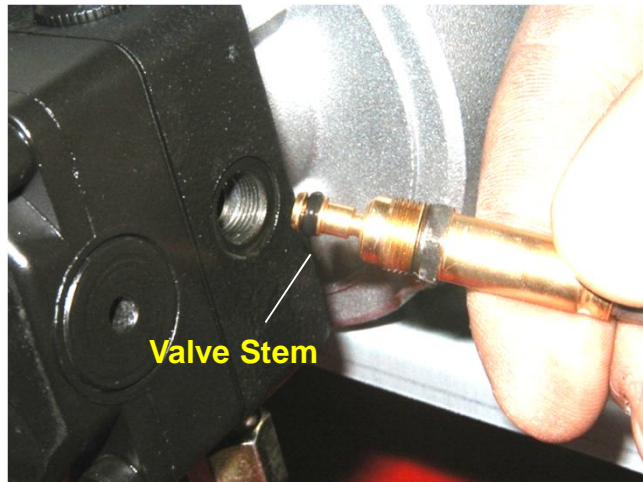
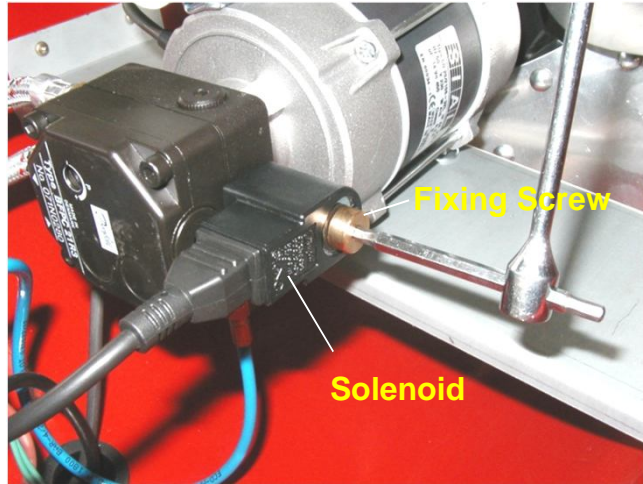
Fuel Pump Danfoss BFA

BFA 01R3 MIR 37
 MIR 55
 TOR 67

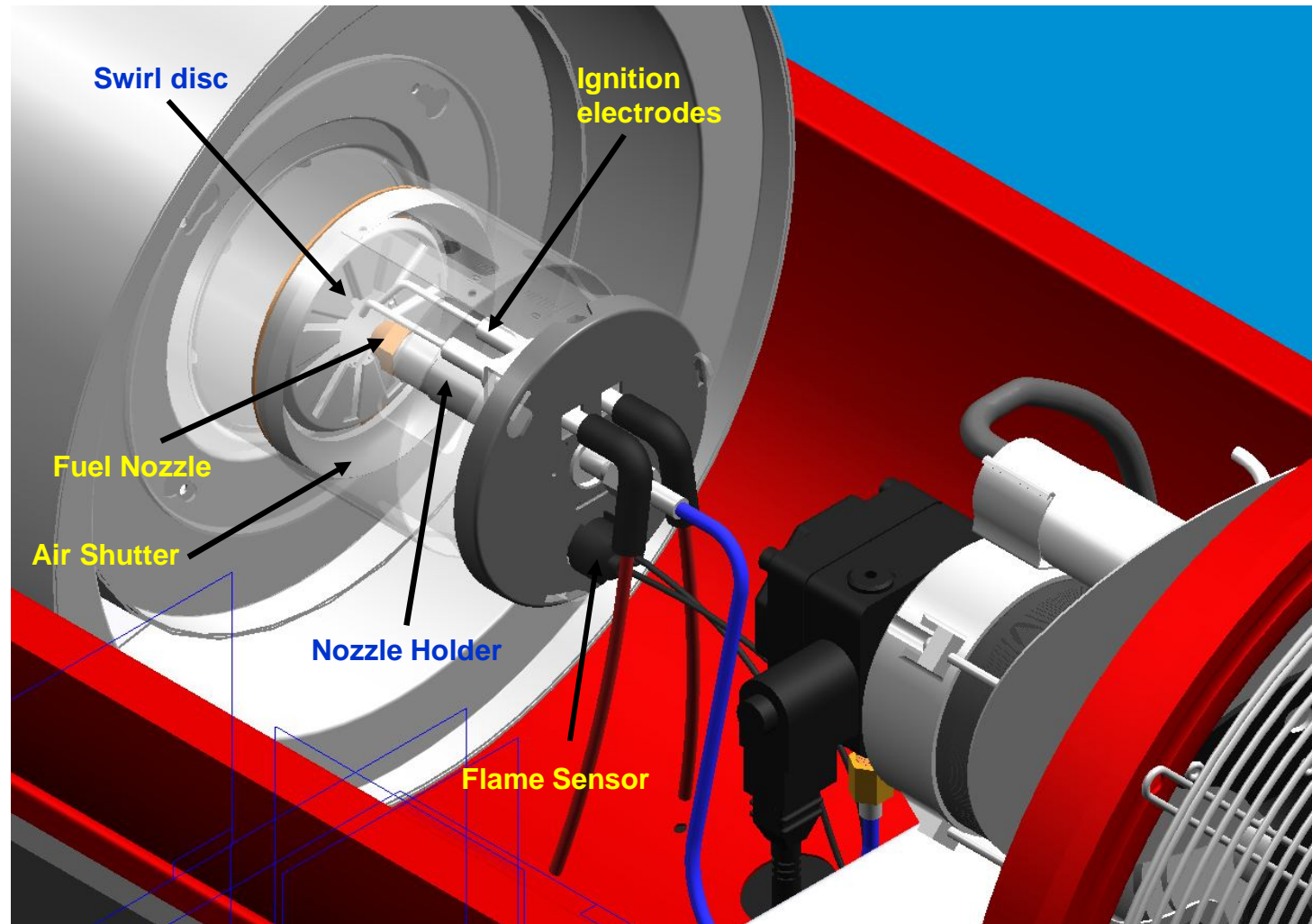
BFA 01R5 MIR 85
 TOR 115



Fuel Cutoff Valve



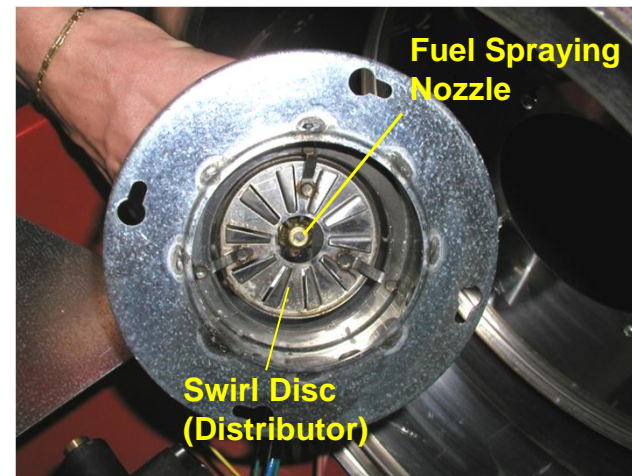
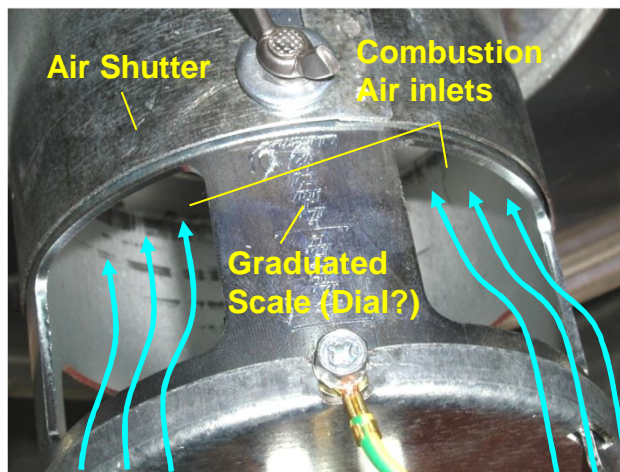
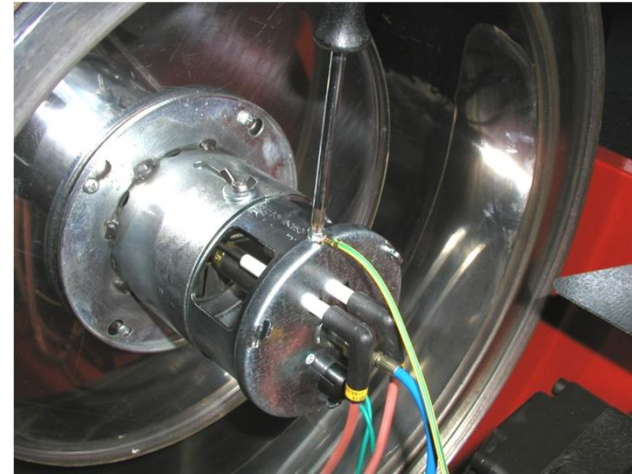
BURNER ASSEMBLY



BURNER ASSEMBLY

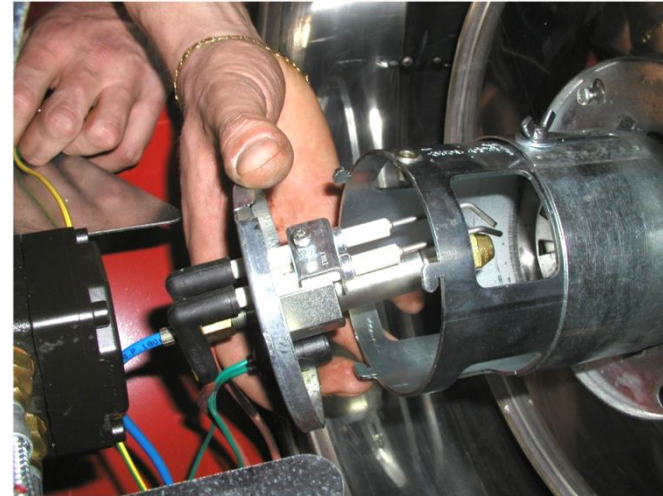
The burner assembly includes :

- nozzle holder
- air shutter
- swirl disc
- fuel nozzle

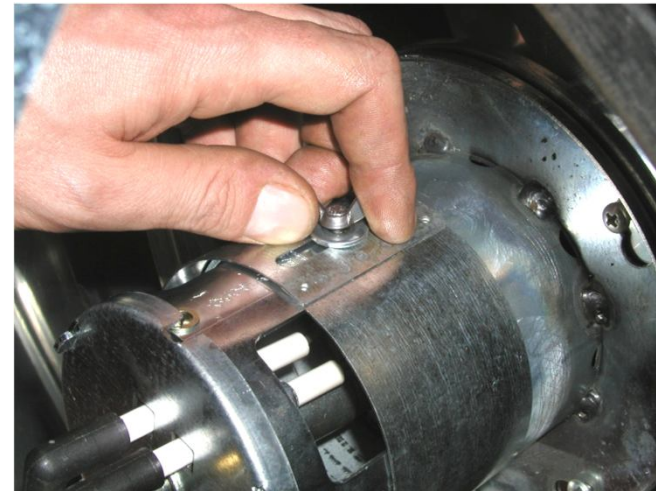


BURNER ASSEMBLY

➤ ignition electrode

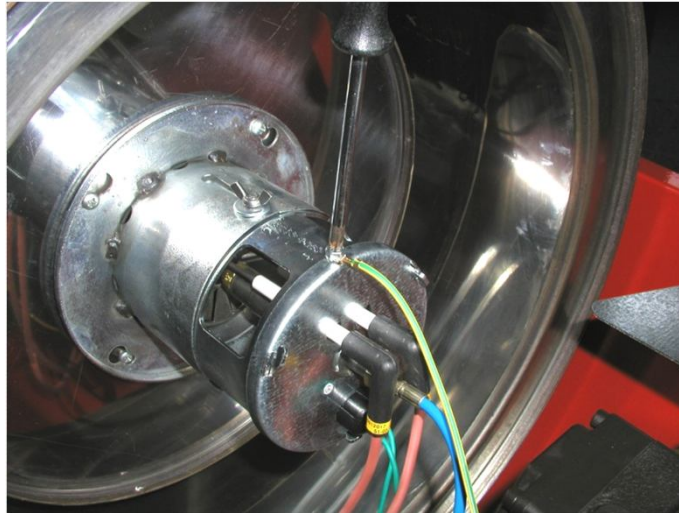


➤ air shutter



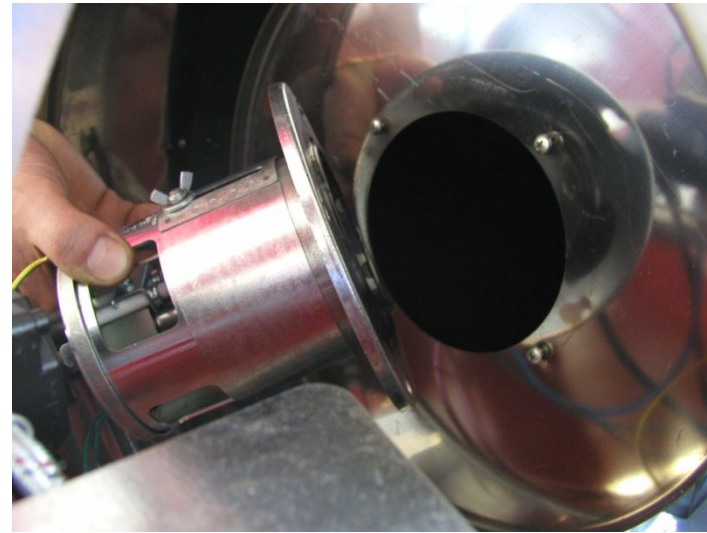
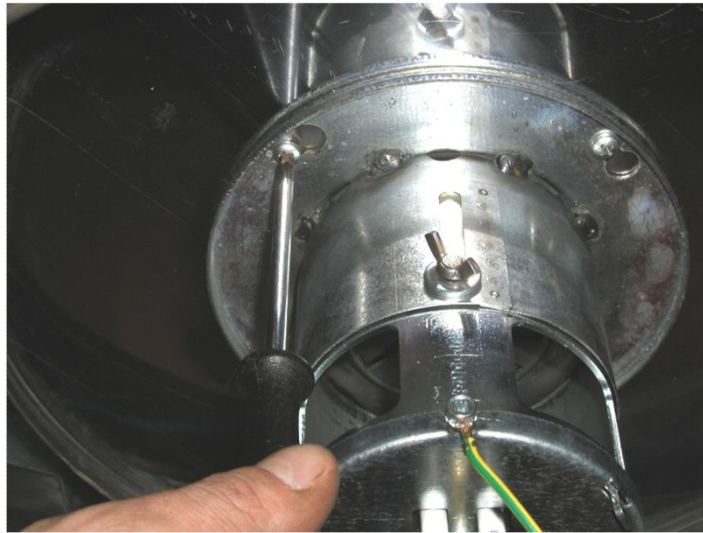
BURNER ASSEMBLY

- Burner head easy to remove for maintenance and service



CHAMBER INLET

- Chamber inlet easy to remove for maintenance/cleaning



COMBUSTION CHAMBER



Combustion chamber (MIR)



Combustion chamber inside (MIR)

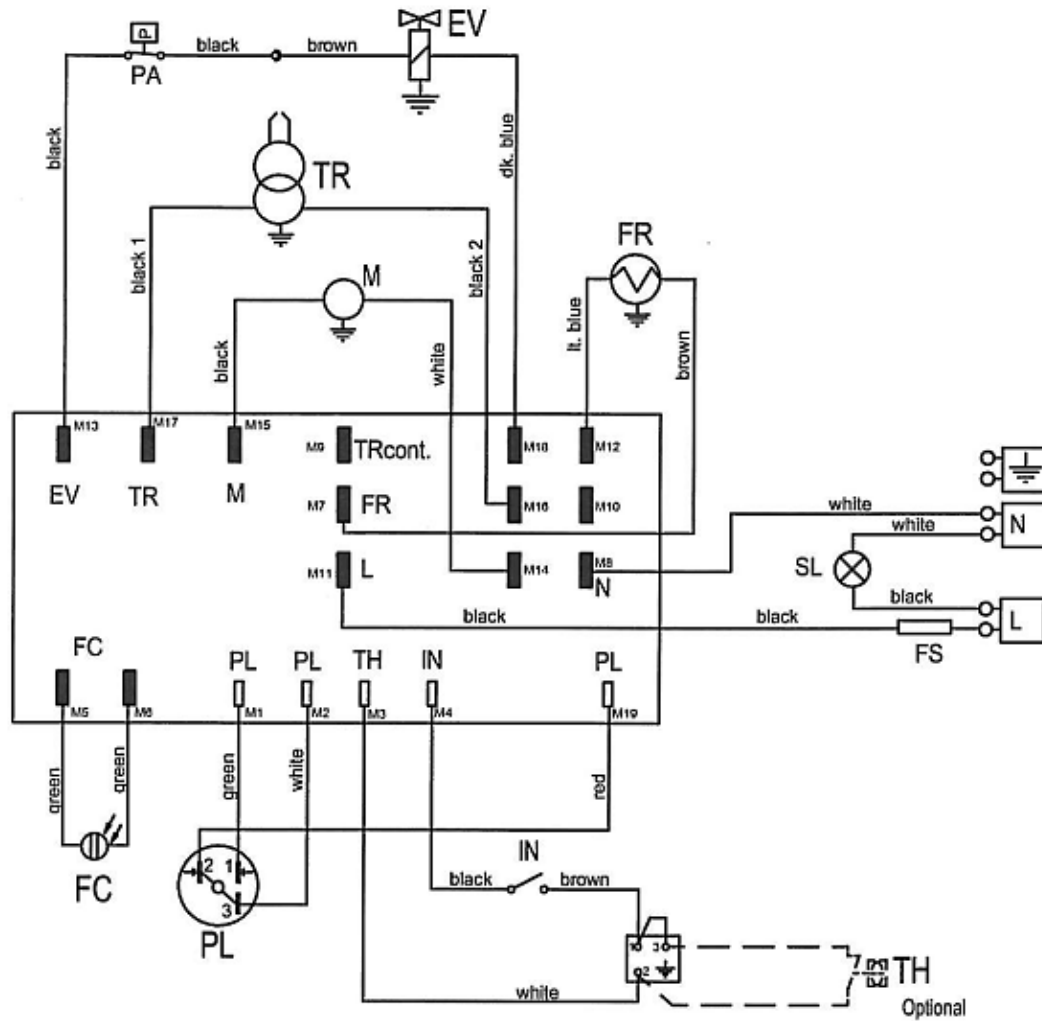


TOR Combustion Chamber

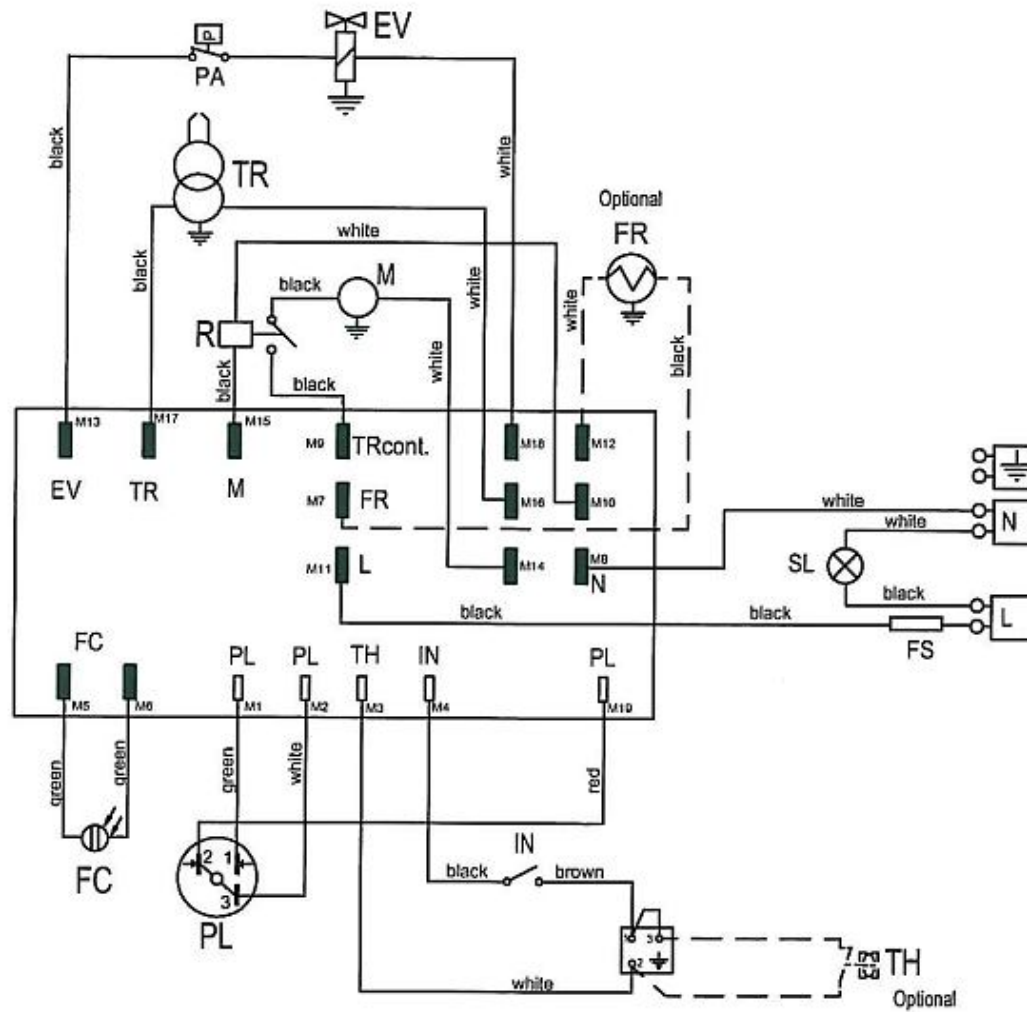


Protection Shield (TOR)

WIRING DIAGRAM (TOR 67/MIR 37/MIR55)



WIRING DIAGRAM (TOR 115/TOR 175/MIR 85)

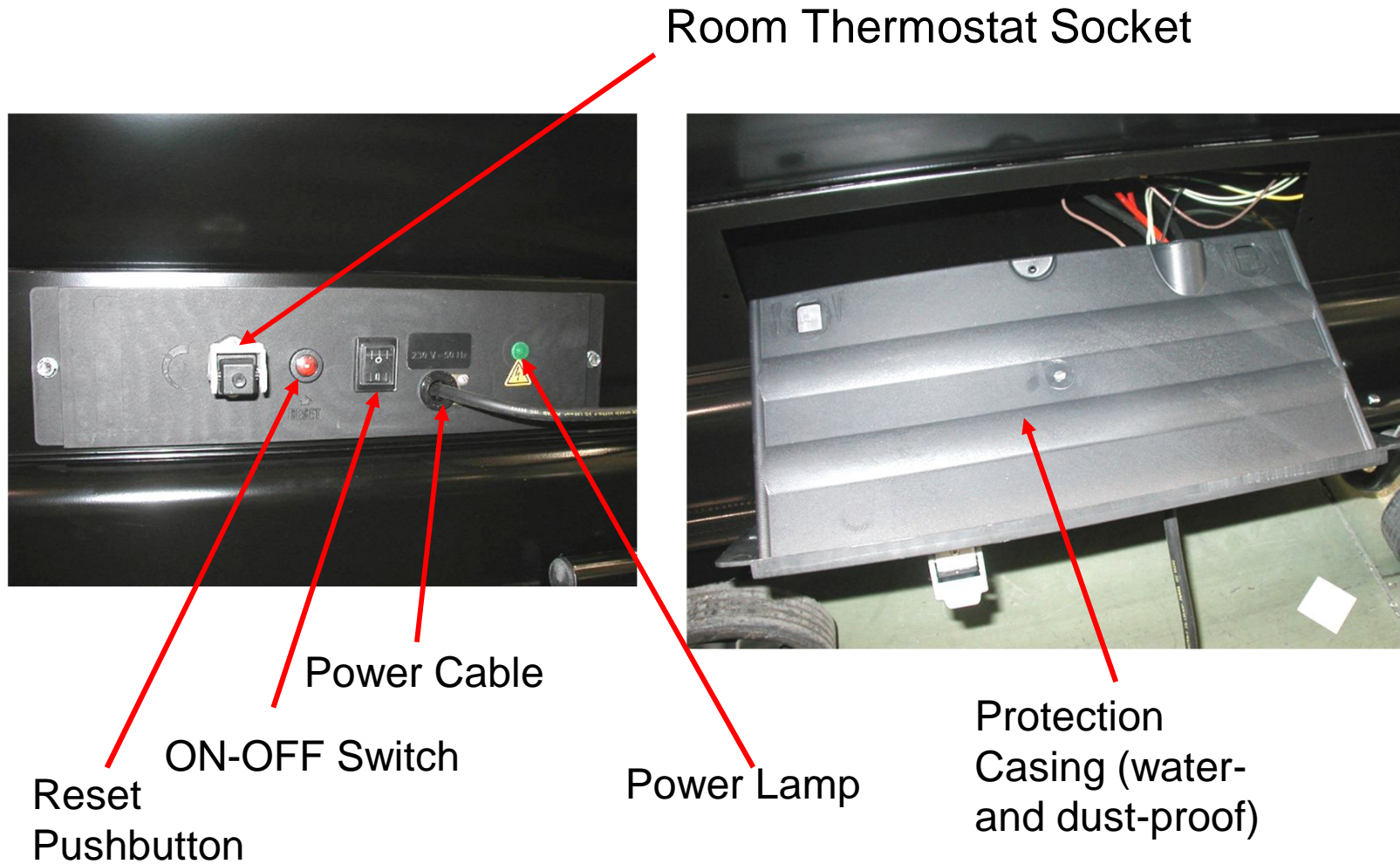


ELECTRICAL BOARD

The electrical board consists of:

- Control panel
- Protection casing (against water/dust)
- Power cable with strain relief and plug
- ON/OFF switch
- Room thermostat receptacle and cap with inner jumper (to close circuit for operation without thermostat)
- Reset pushbutton with built-in warning lamp
- High voltage ignition transformer
- Fuse with fuseholder
- Electronic burner control unit (BCU)
- Power Lamp

Control Panel and Protecting Cover

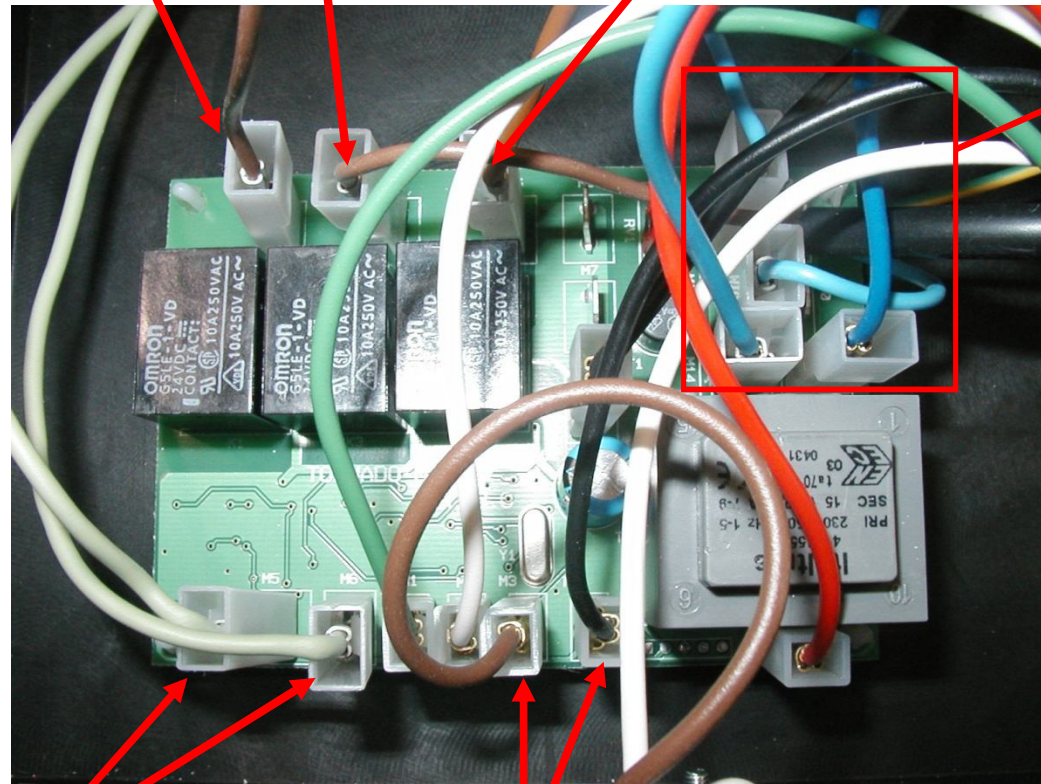


Electronic Burner Control Unit

Solenoid Valve (line)

Motor (line)

Transformer (line)



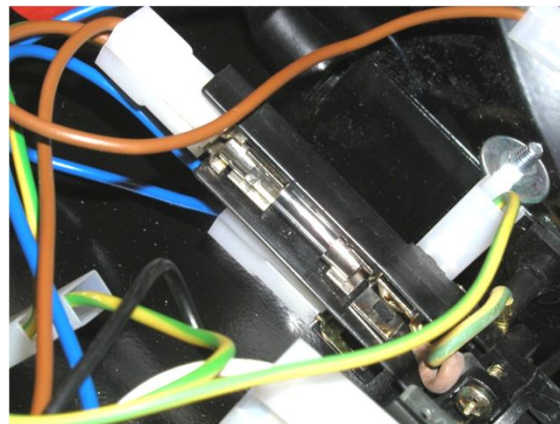
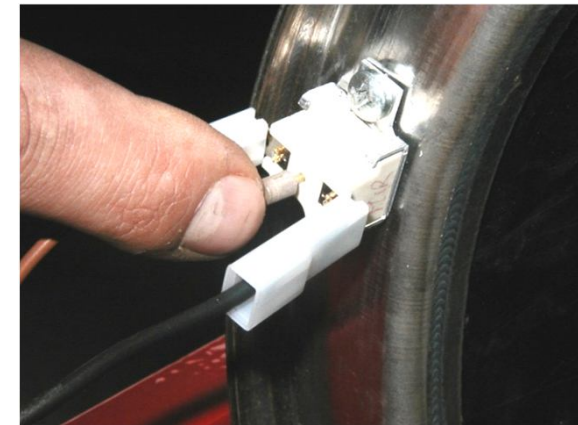
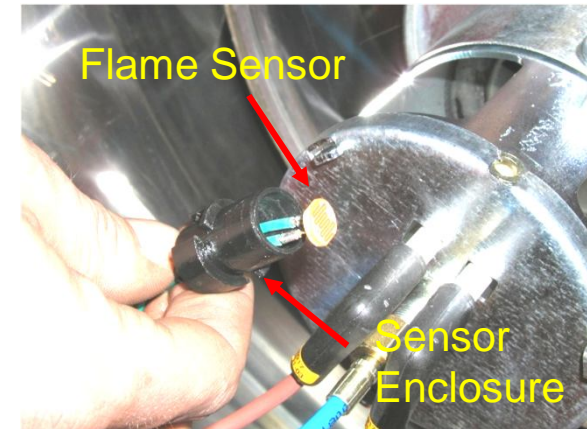
Neutral
Wires

Photocell
Contacts

Switch
Contacts

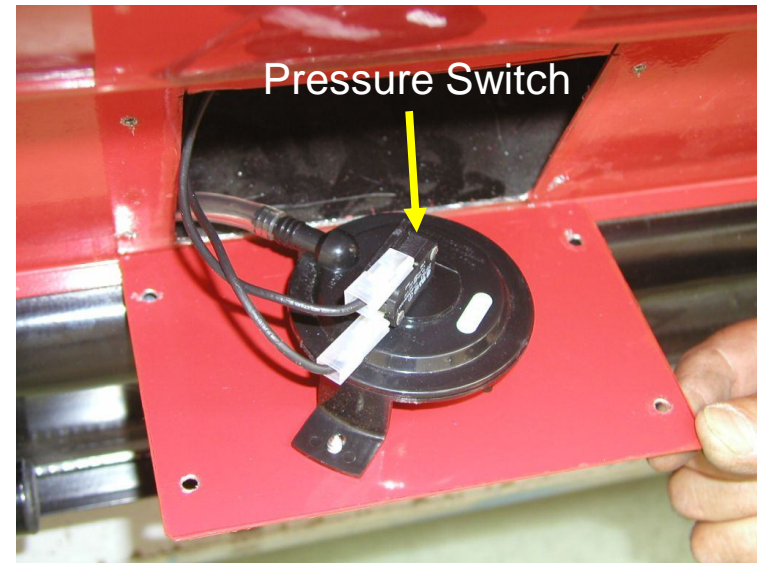
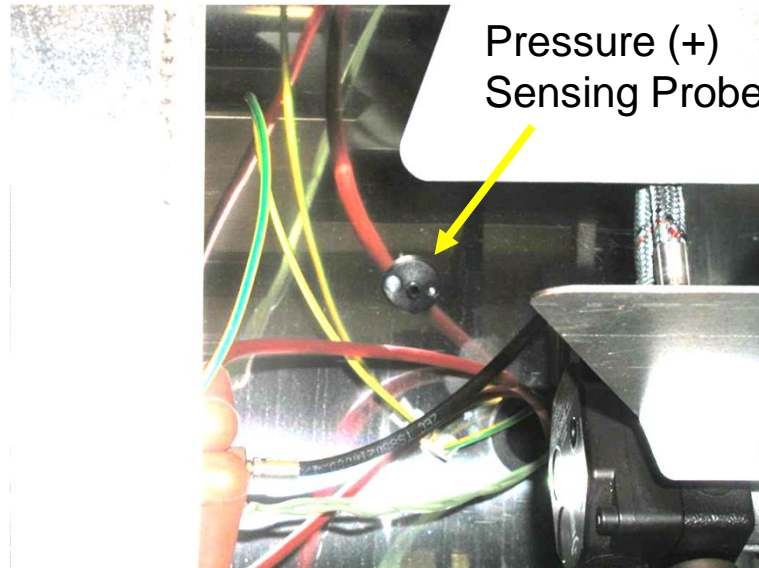
SAFETY DEVICES

- **Flame Sensor (photoresistor)**
 - Detects false flame signal or anticipated ignition
 - Monitors flame at ignition
 - Monitors flame failure during operation
- **(Safety Thermostat or Temperature Limit Control, optional)**
 - Prevents unit overheating
 - Requires manual reset
- **Line Fuse**
 - Protects unit from overcurrents

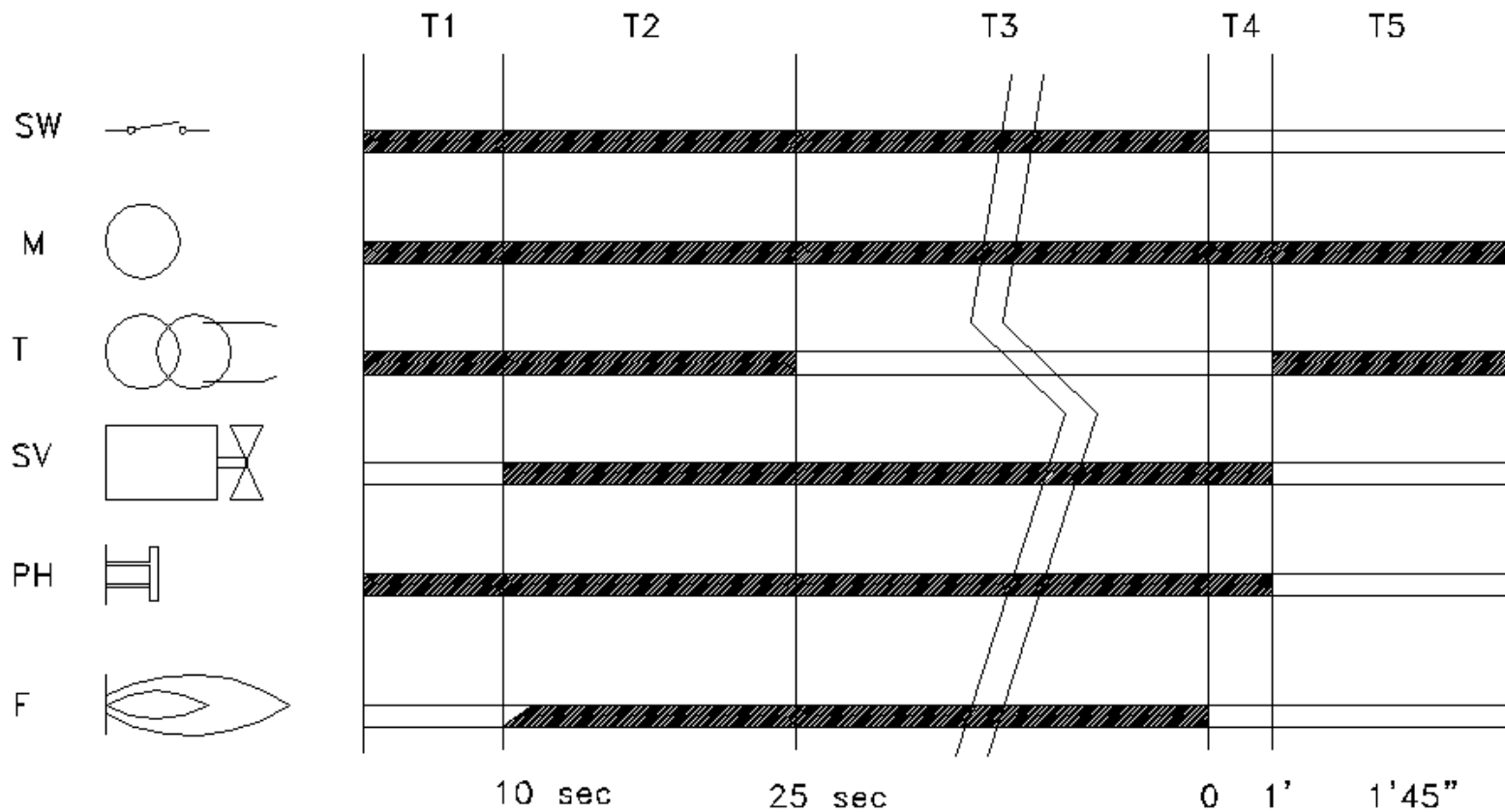


SAFETY DEVICES

- **Air Pressure Switch** Monitors fan pressure
Shuts burner off in case of reduced pressure/airflow



TOR-MIR OPERATIONAL SEQUENCE





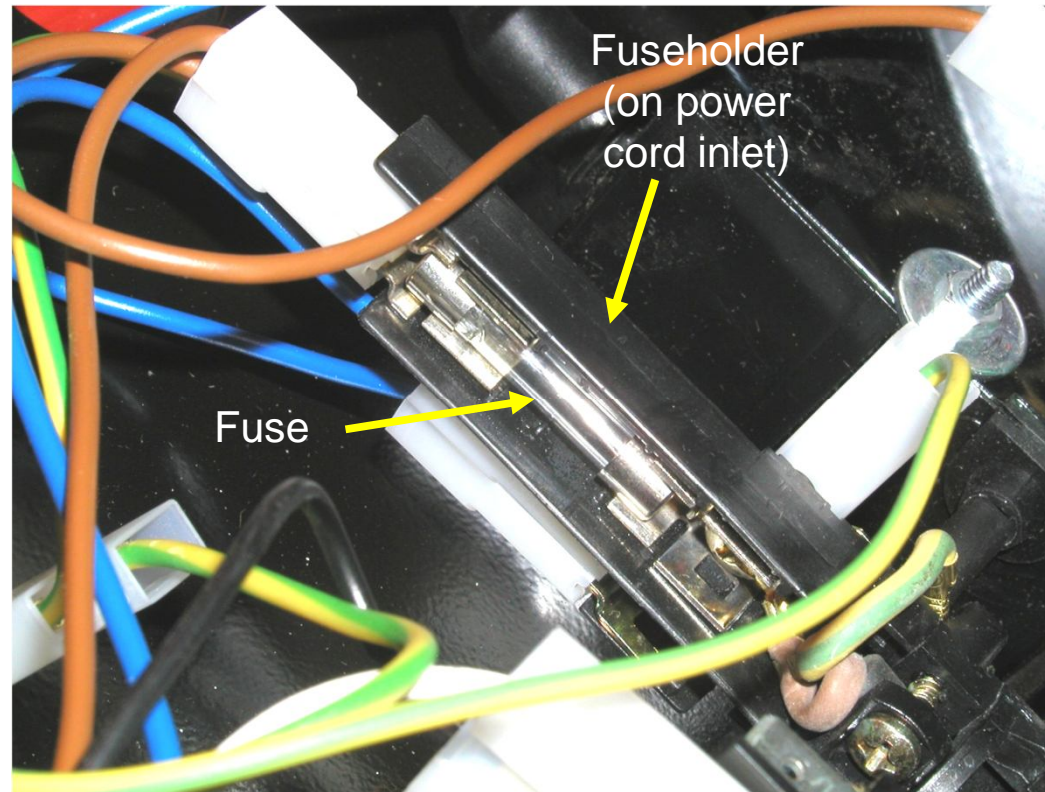
BASIC SERVICE PROCEDURES



Important Safety Warnings for Service Operators

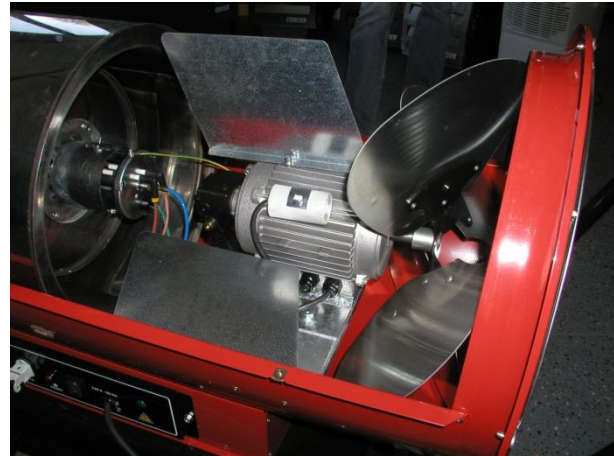
1. Shut off and unplug heater before service. **ELECTRICAL SHOCK RISK!**
2. Allow heater cooling before removing guards, panels, enclosures: **BURN RISK!**
3. Do not remove guards if any parts are moving or rotating. **INJURY RISK!**
4. Discharge capacitors by grounding before removal. **ELECTRICAL SHOCK RISK!**
5. Vent exhaust gases outdoors or provide adequate ventilation when heaters are operated indoors. **CARBON MONOXIDE POISONING RISK!**

Line Fuse Check

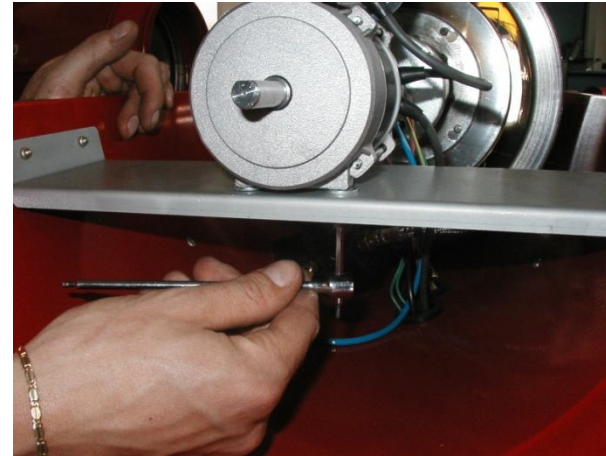


Check correct fuse rating on heater data plate!

Fan motor/capacitor check



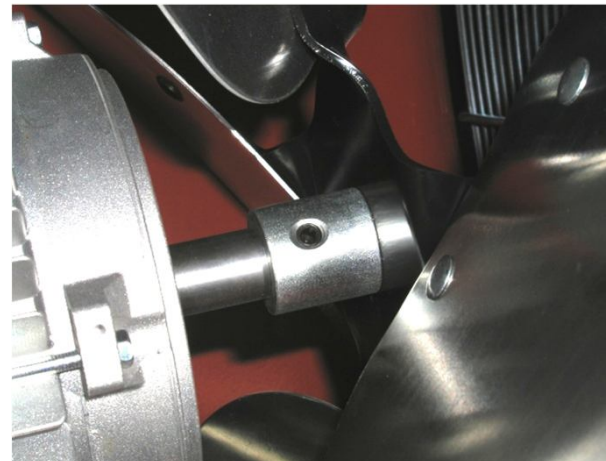
Fan/Motor Assembly



Disassembling motor from support



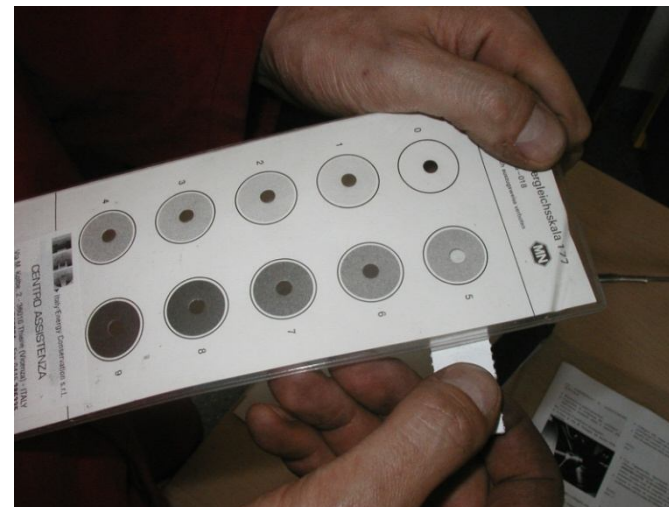
Replacing capacitor
Warning! Capacitors may hold an electrical charge and cause electrical shocks.



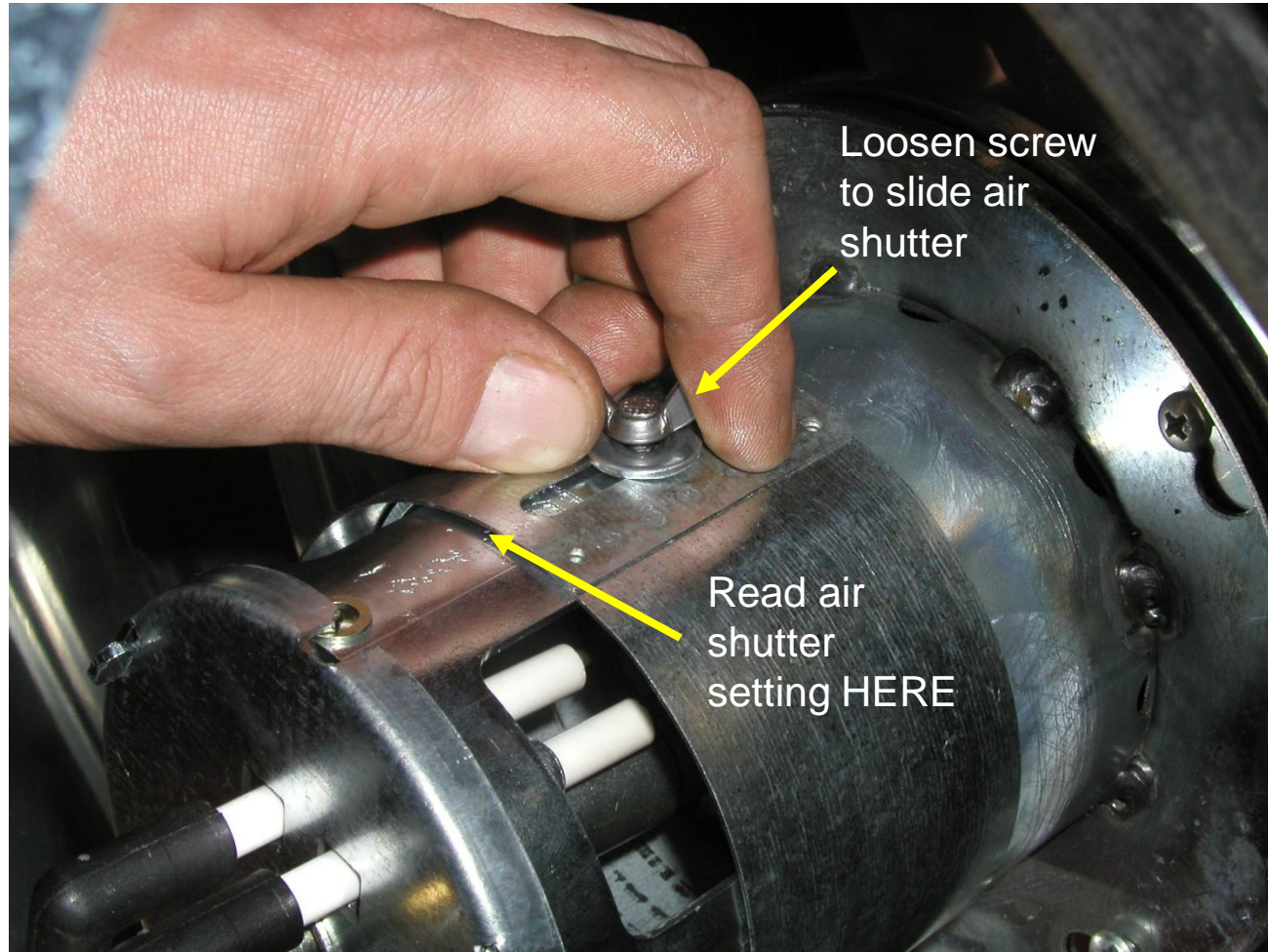
Disassembling fan from motor shaft

Smoke Index Test

(Bacharach-Shell, indirect models only)



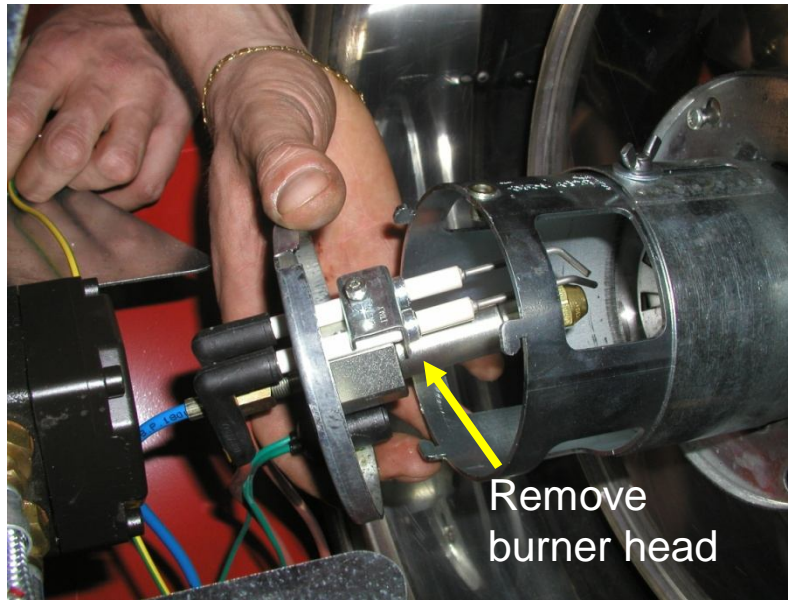
Air Shutter Adjustment



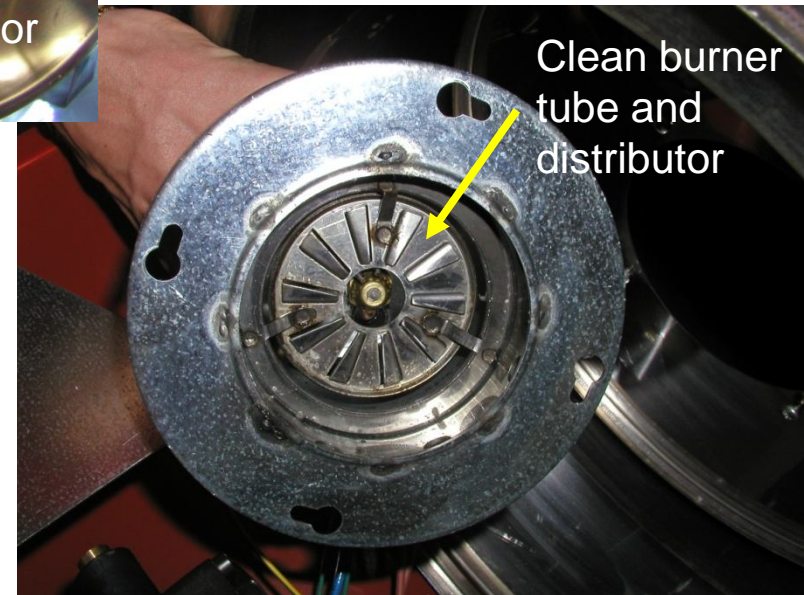
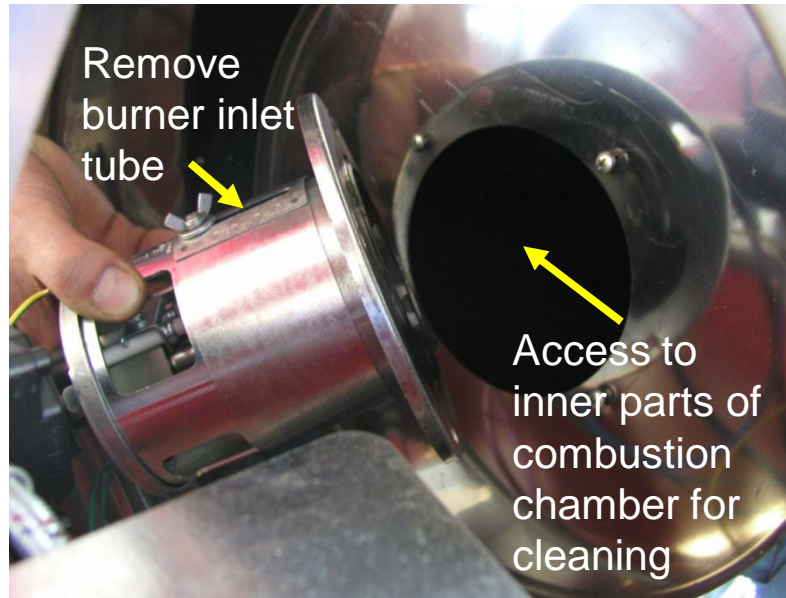
Fuel Filter Maintenance



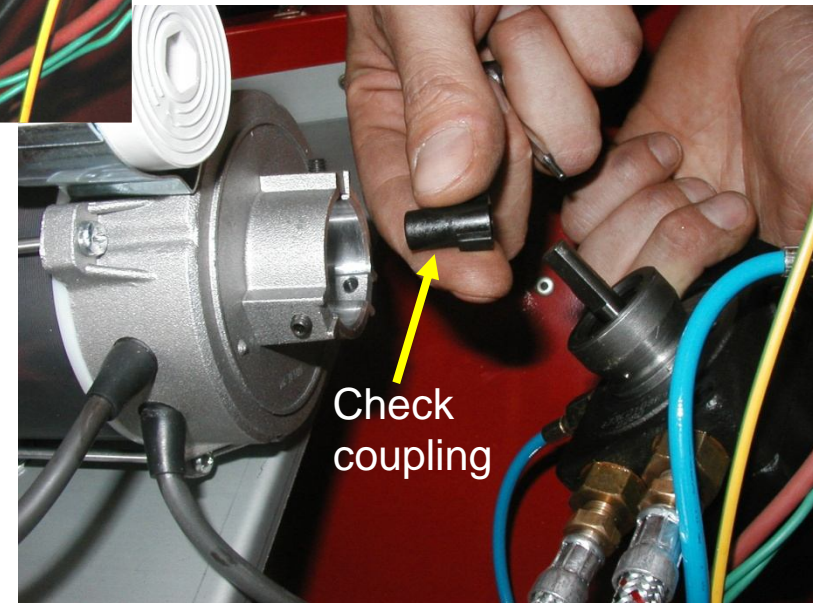
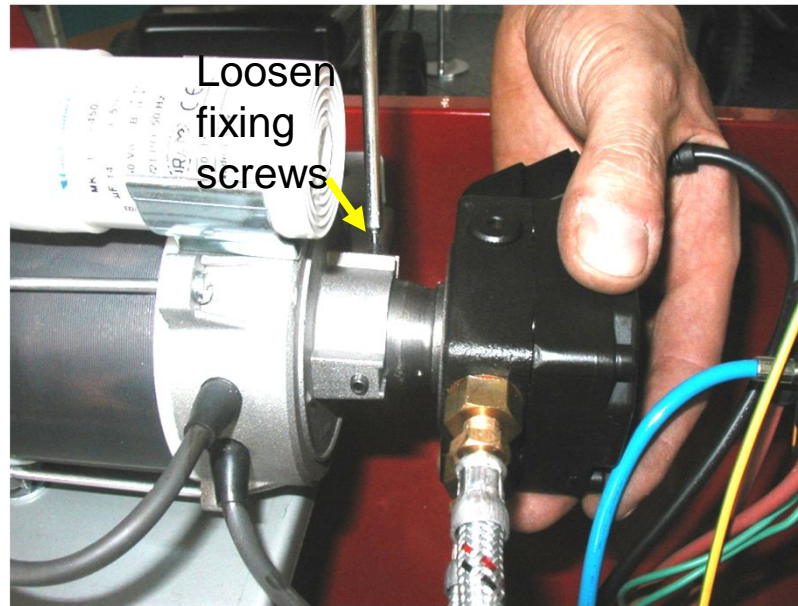
Burner Nozzle Maintenance



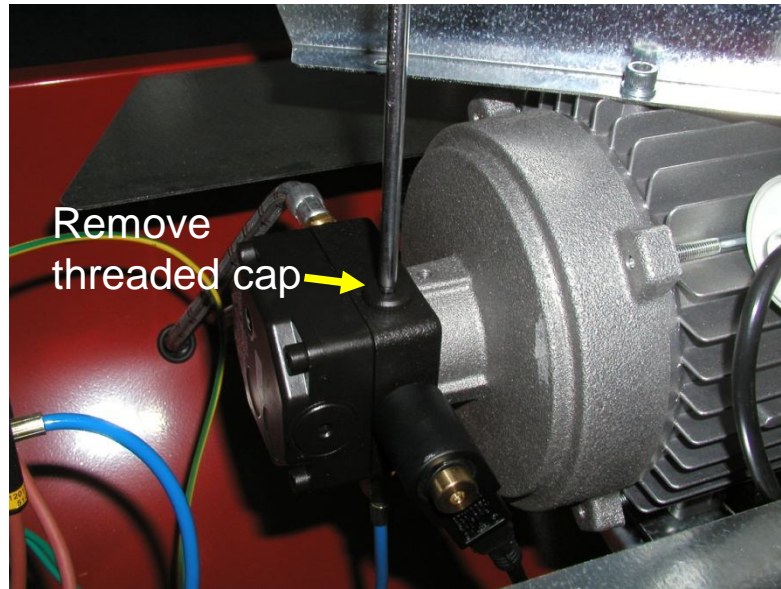
Burner Head/Chamber Maintenance



Fuel Pump Replacement



Fuel Pressure Adjustment (BFPC)

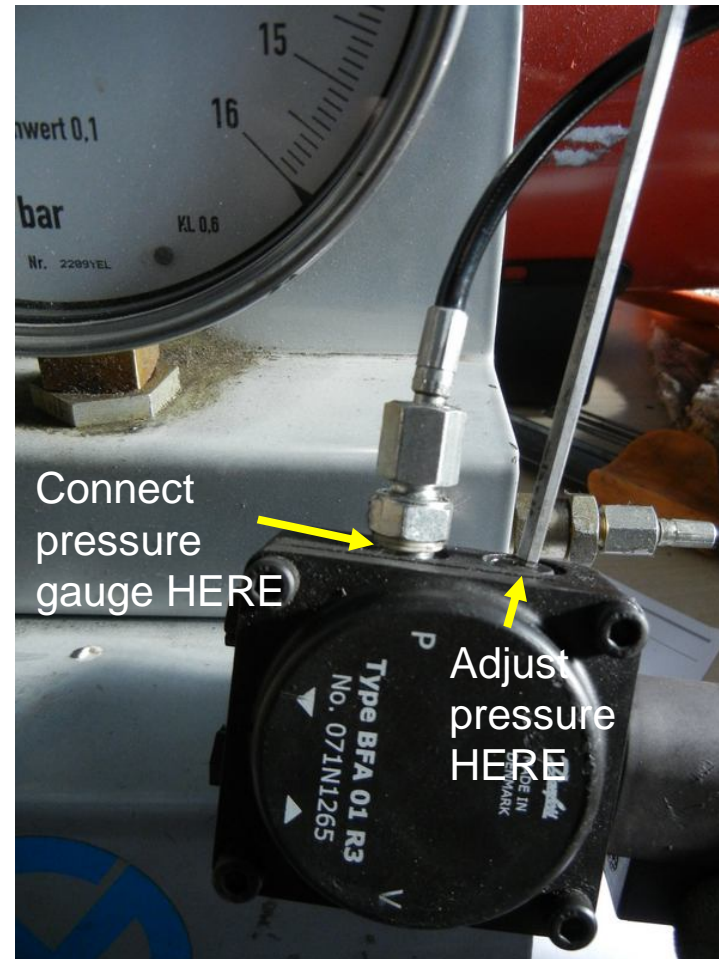


**Pump pressure
setting for all TOR/MIR:
12 (+0 -0.5 bar)**

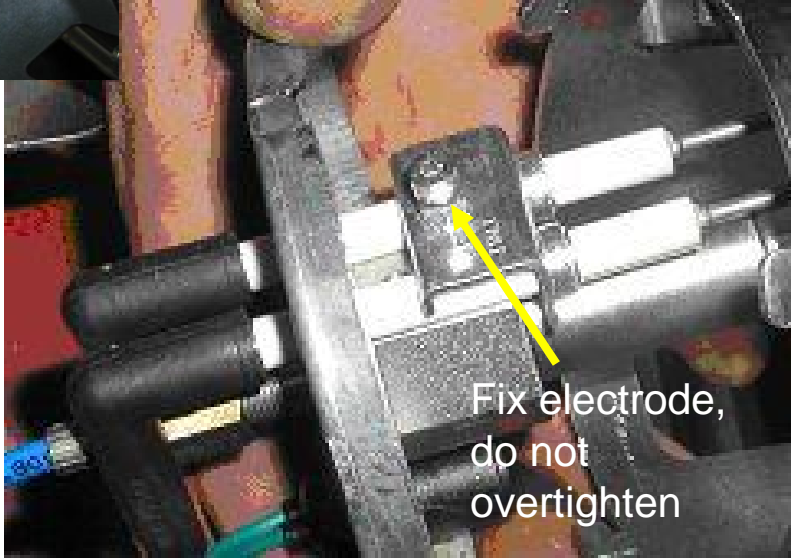
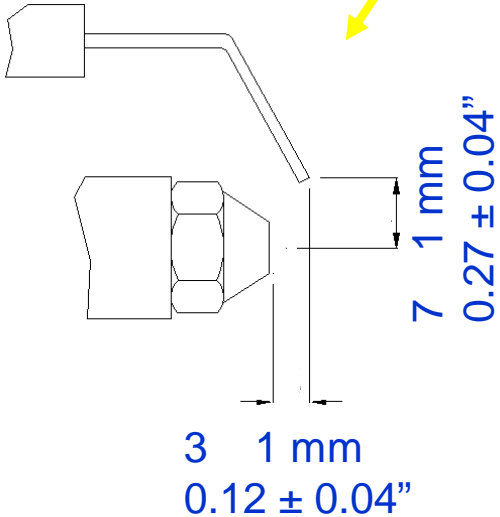
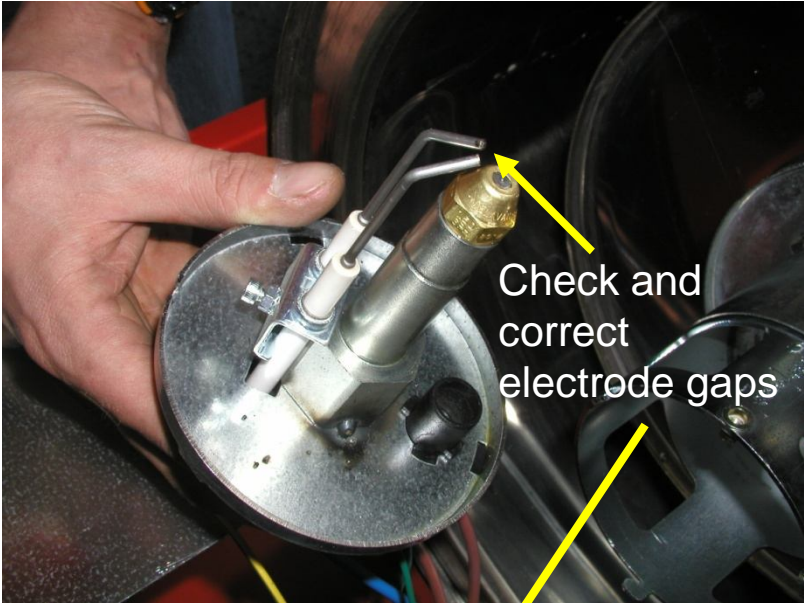


Fuel Pressure Adjustment (BFA)

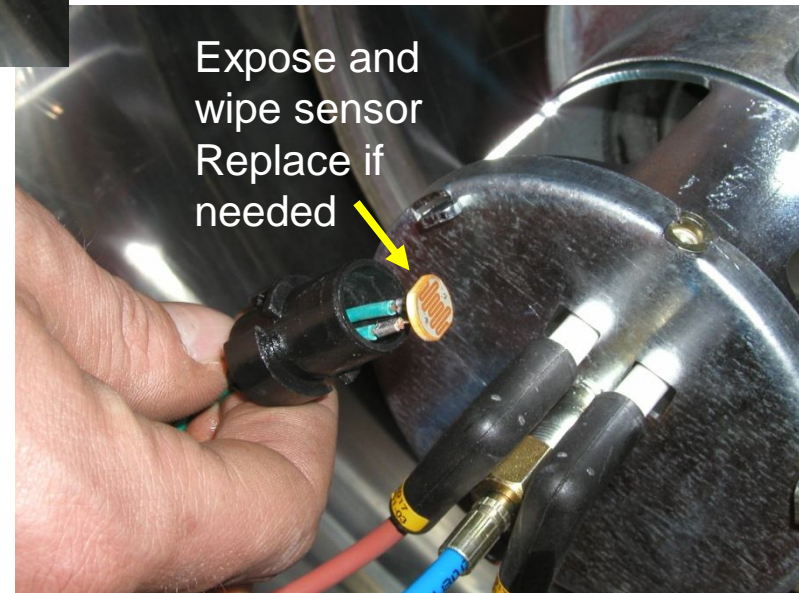
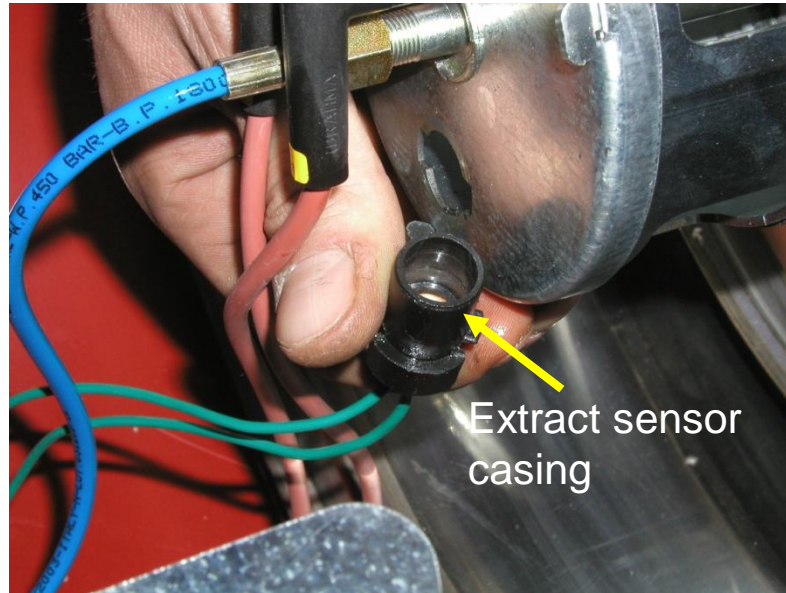
Standard pressure setting for all
TOR/MIR models:
12 (+0 / -0.5) bar



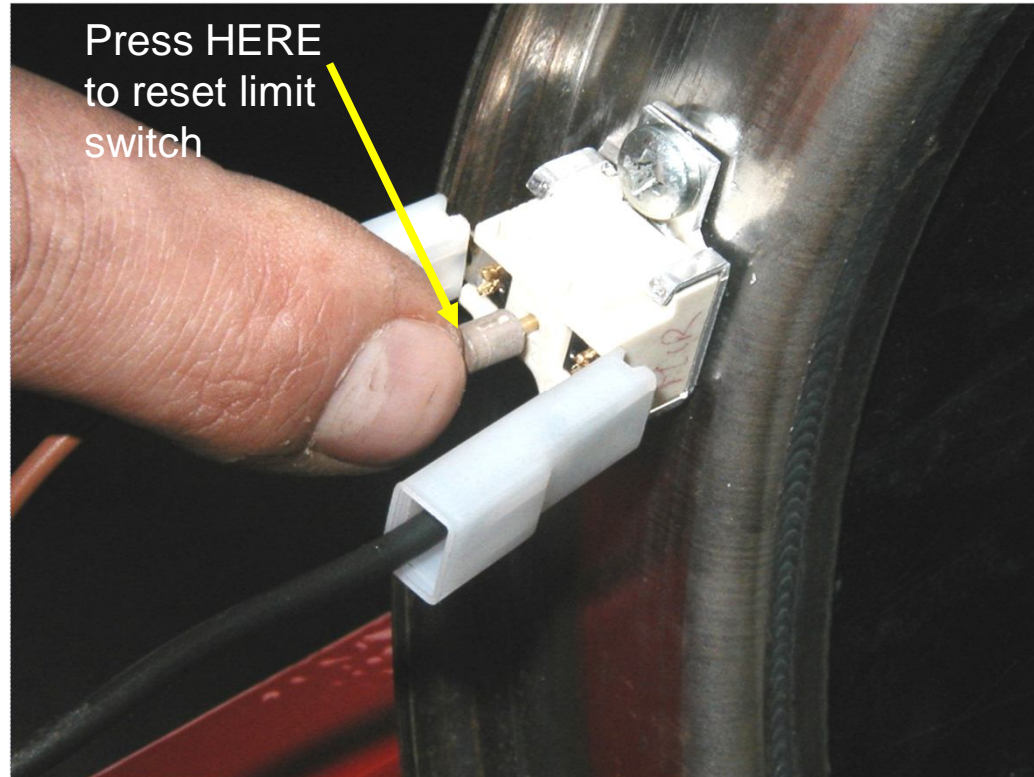
Ignition Electrode Service



Flame Sensor (Cad Cell) Service



Limit Switch Reset



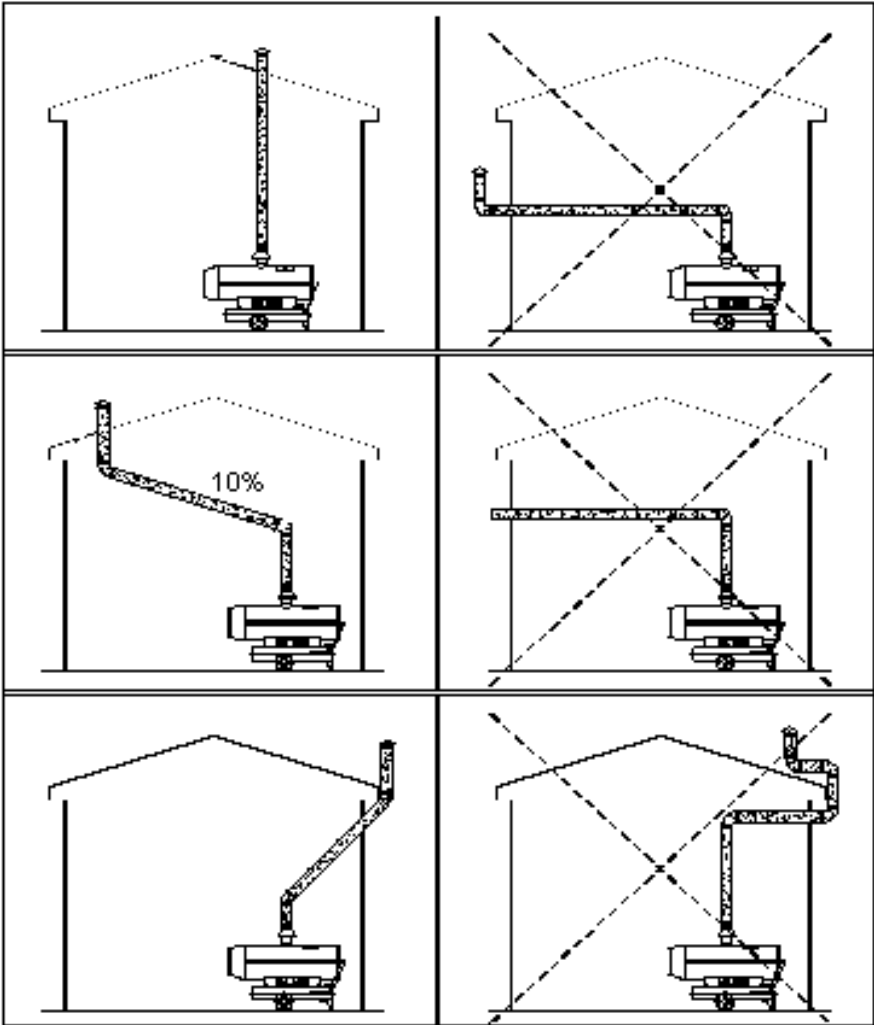
Fixed Settings
Indirect Heaters: 170°C
Direct Heaters: 100°C

Installation Guidelines

Exhaust Pipe Design

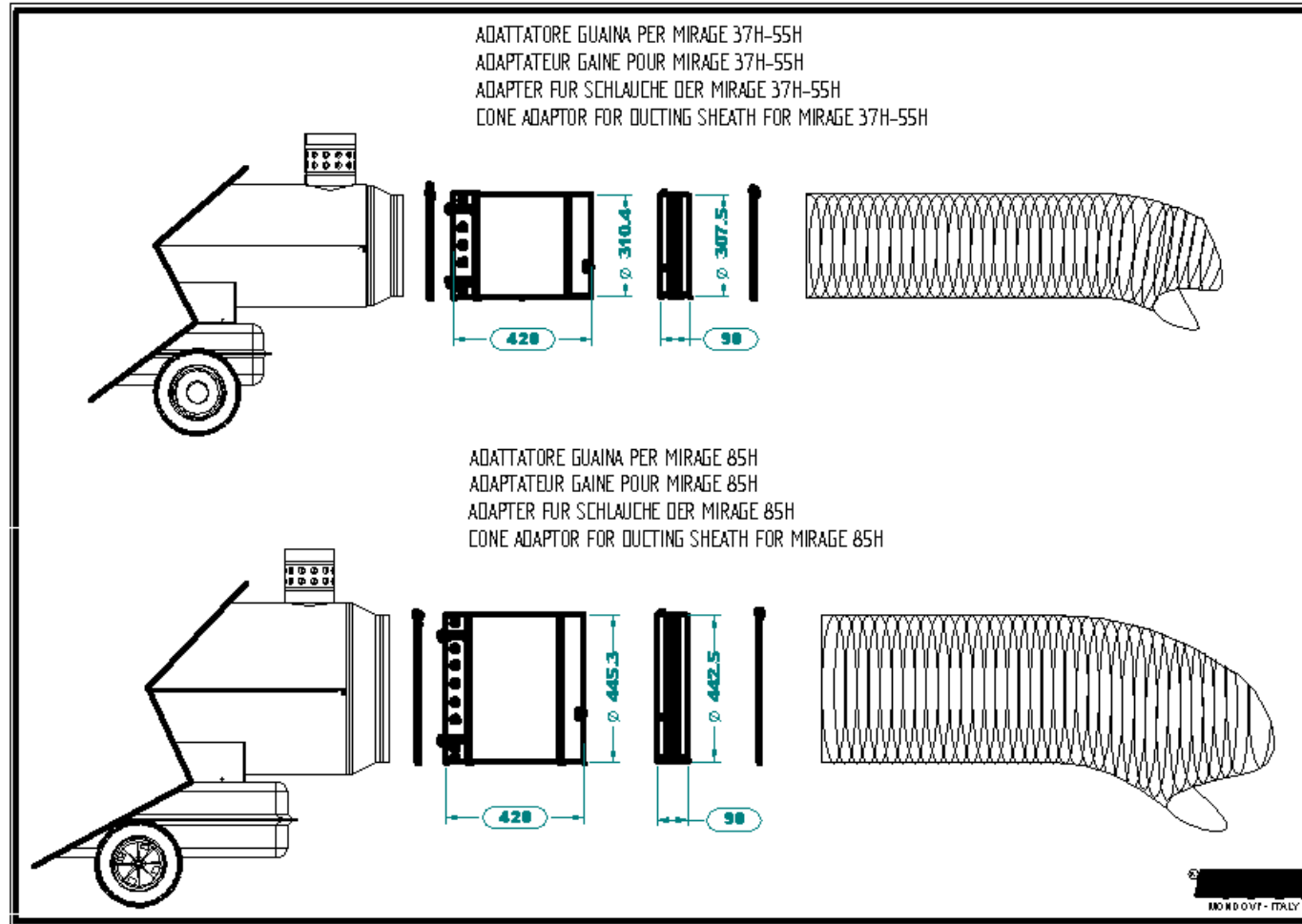
CORRECT

INCORRECT



Installation Guidelines

Air Ducting



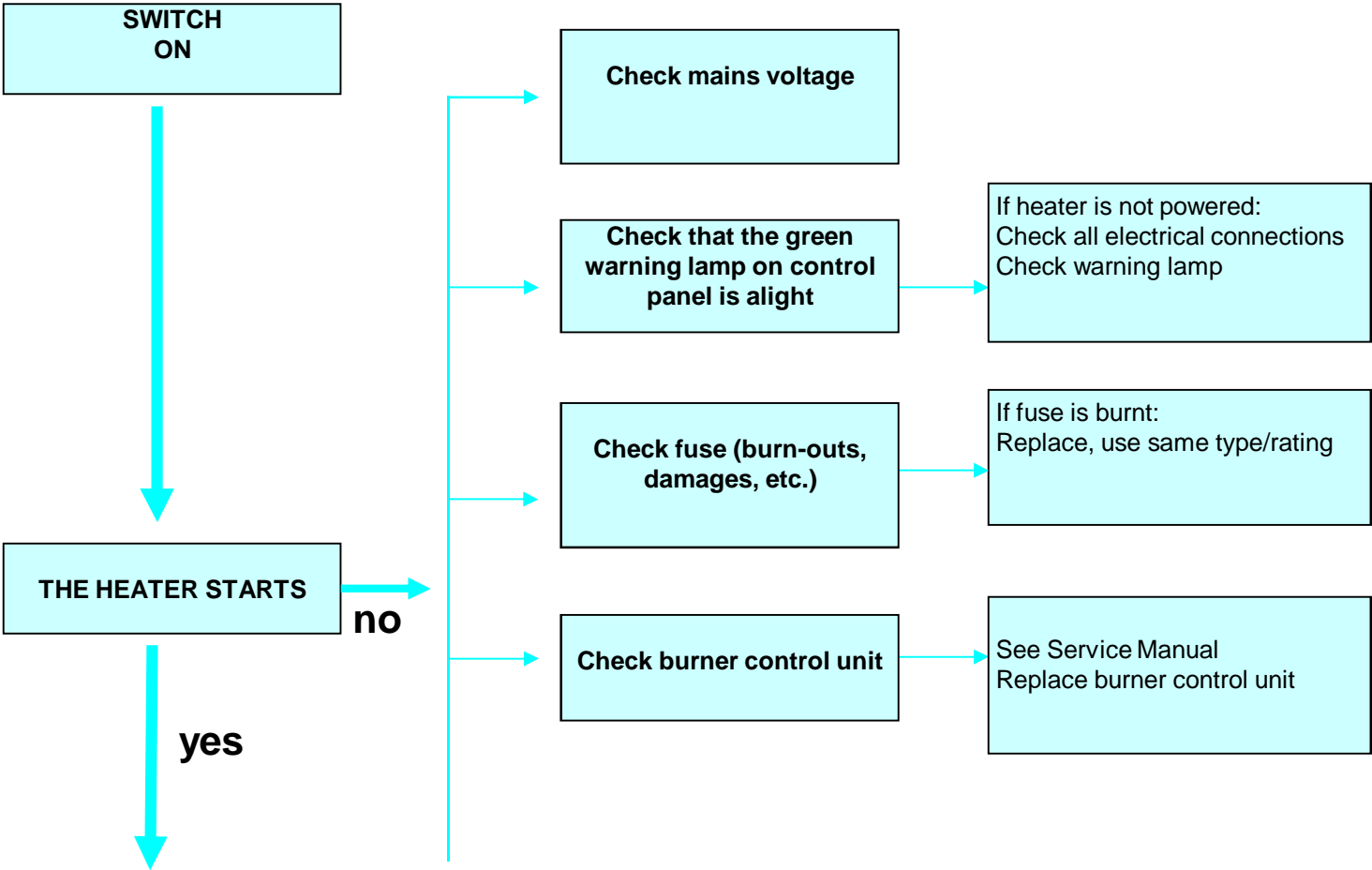
Installation Guidelines

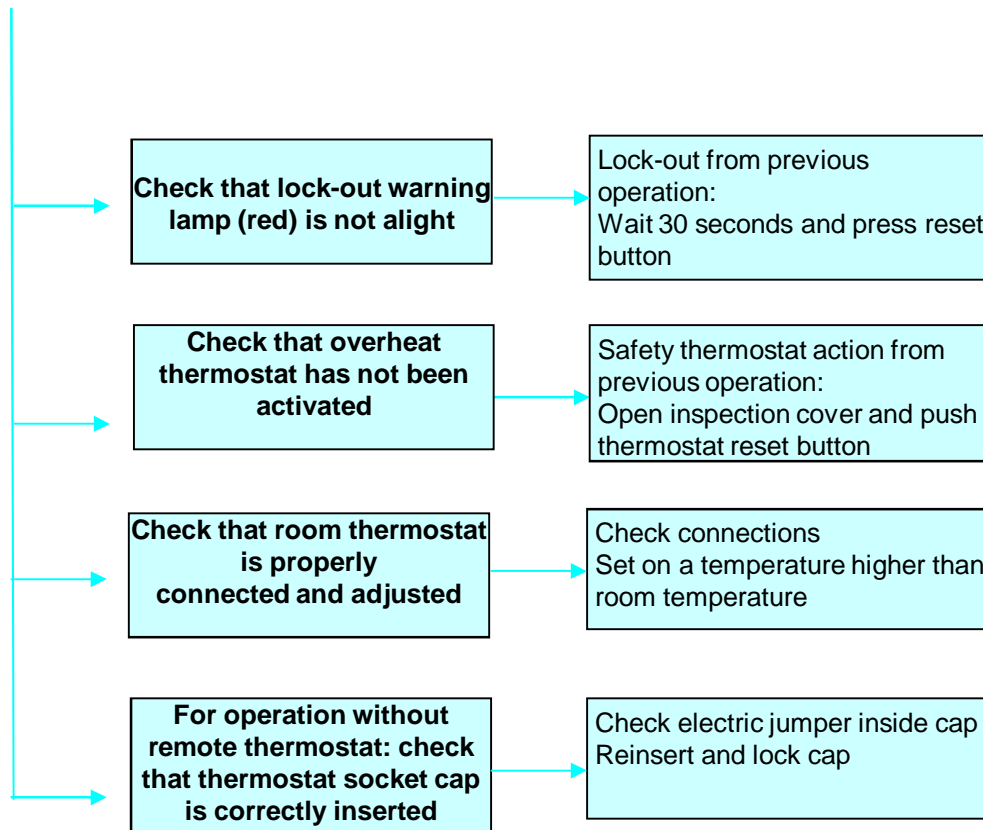
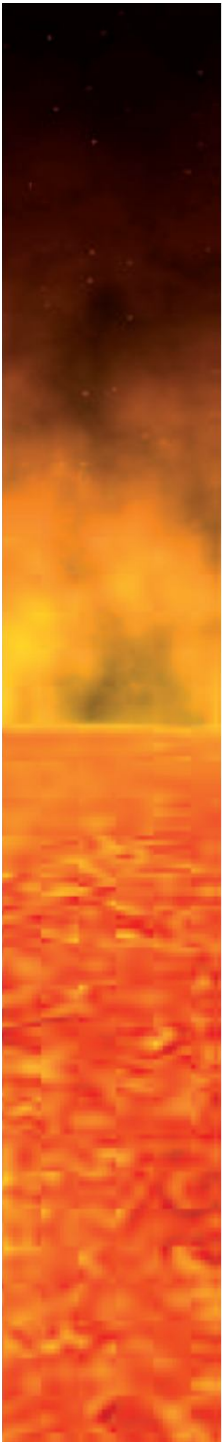
Air Ducting Accessories

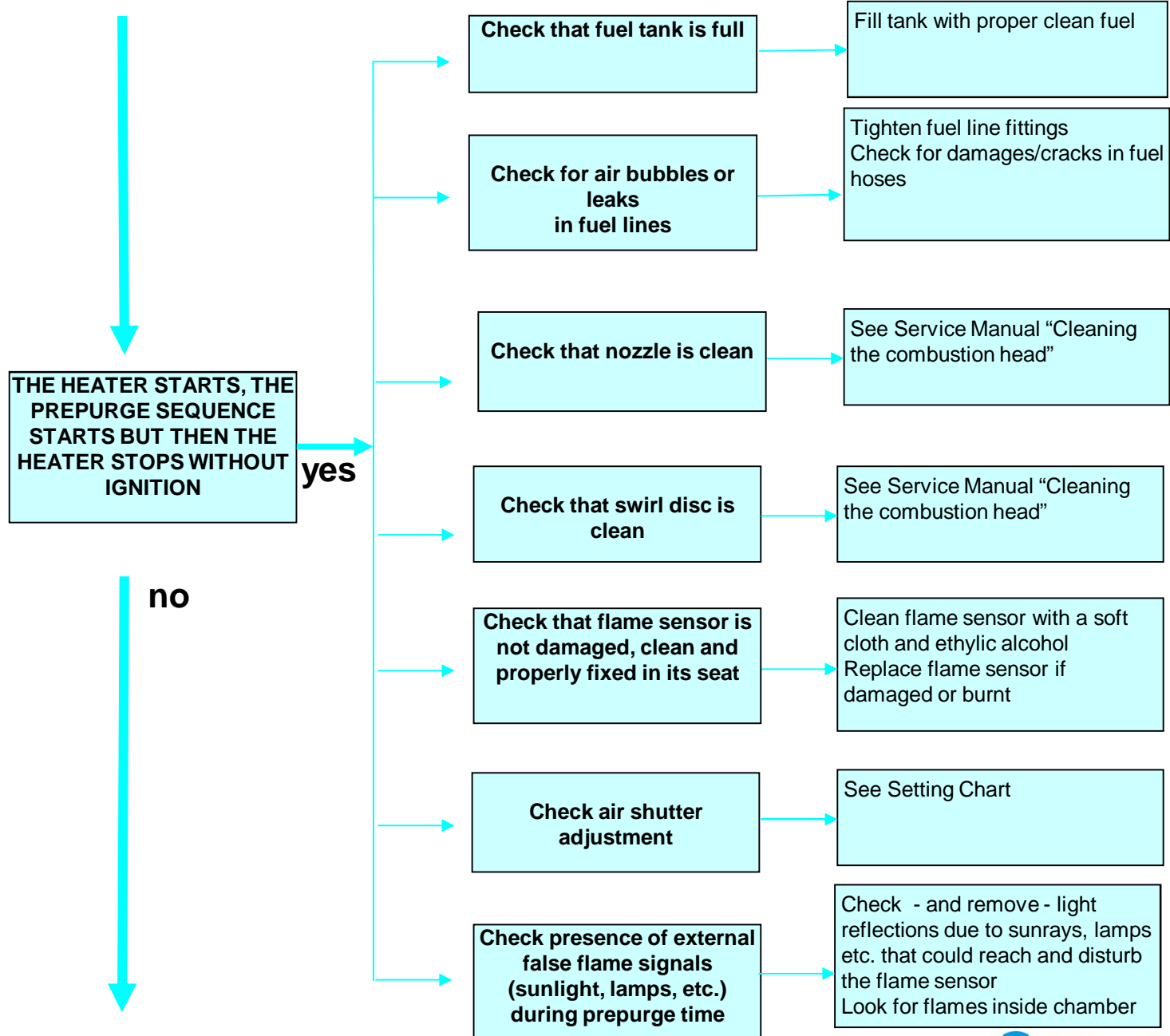
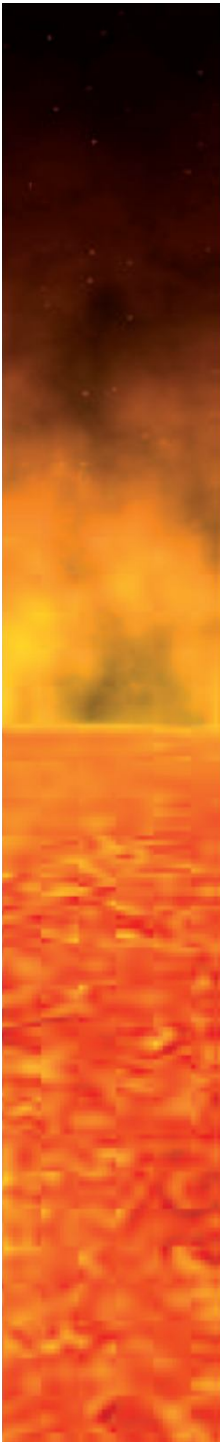


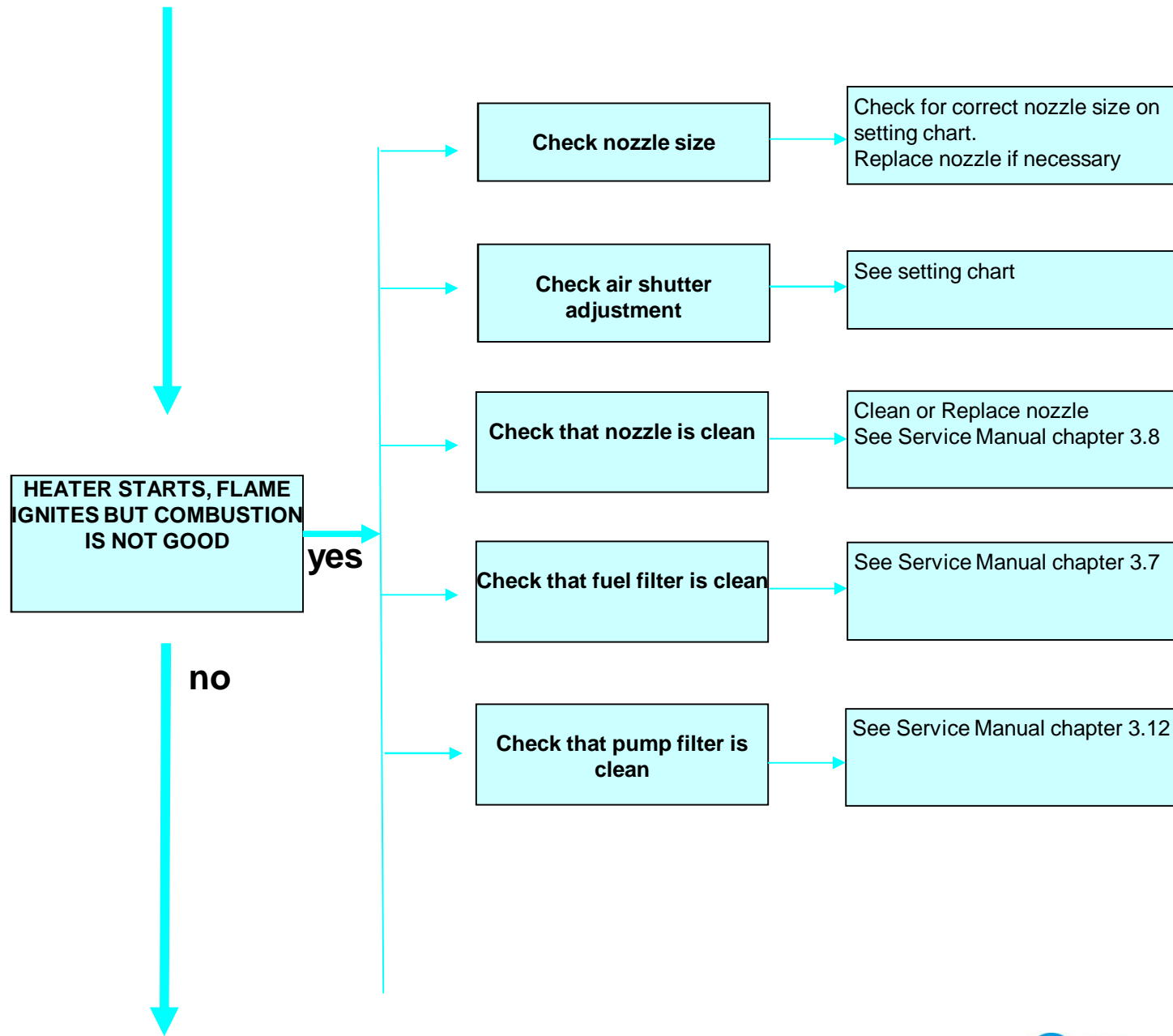
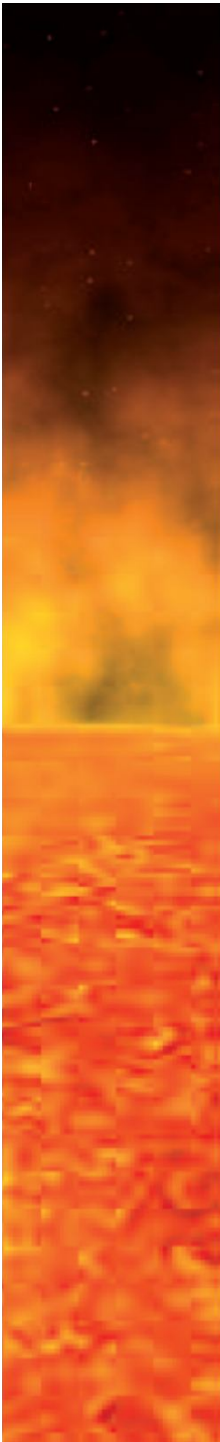
MIR 37/55 dia. 315 mm (12.4") max duct length: 40 ft
MIR 85 dia. 457 mm (18") max duct length: 60 ft

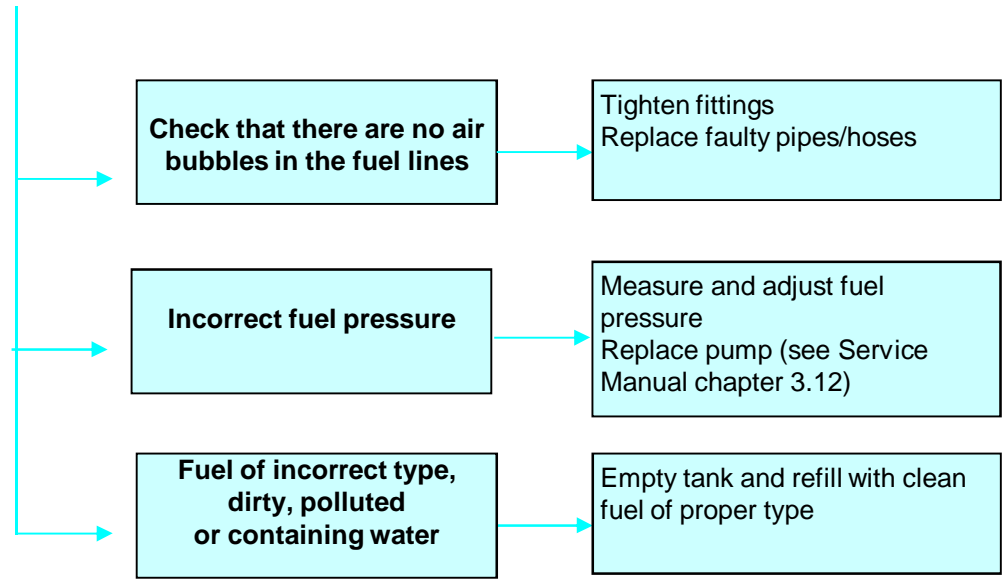
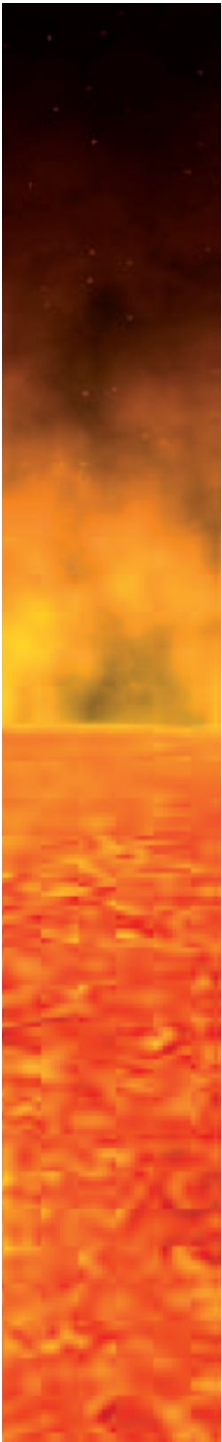
TROUBLESHOOTING

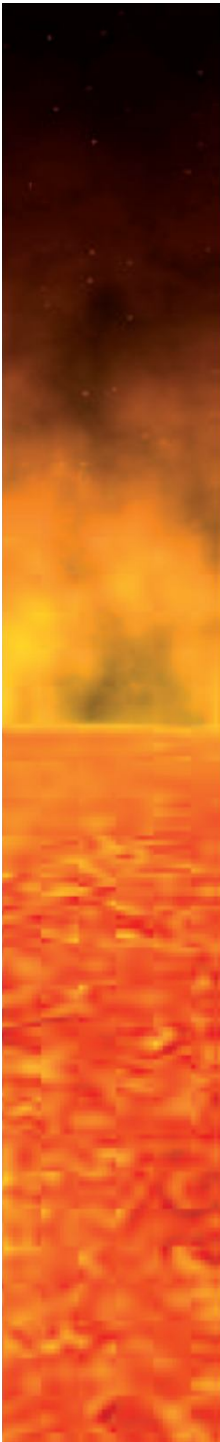












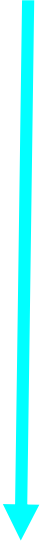
**THE BURNER SHUTS OFF
DURING OPERATION AND
THE FAN CONTINUES TO
ROTATE**

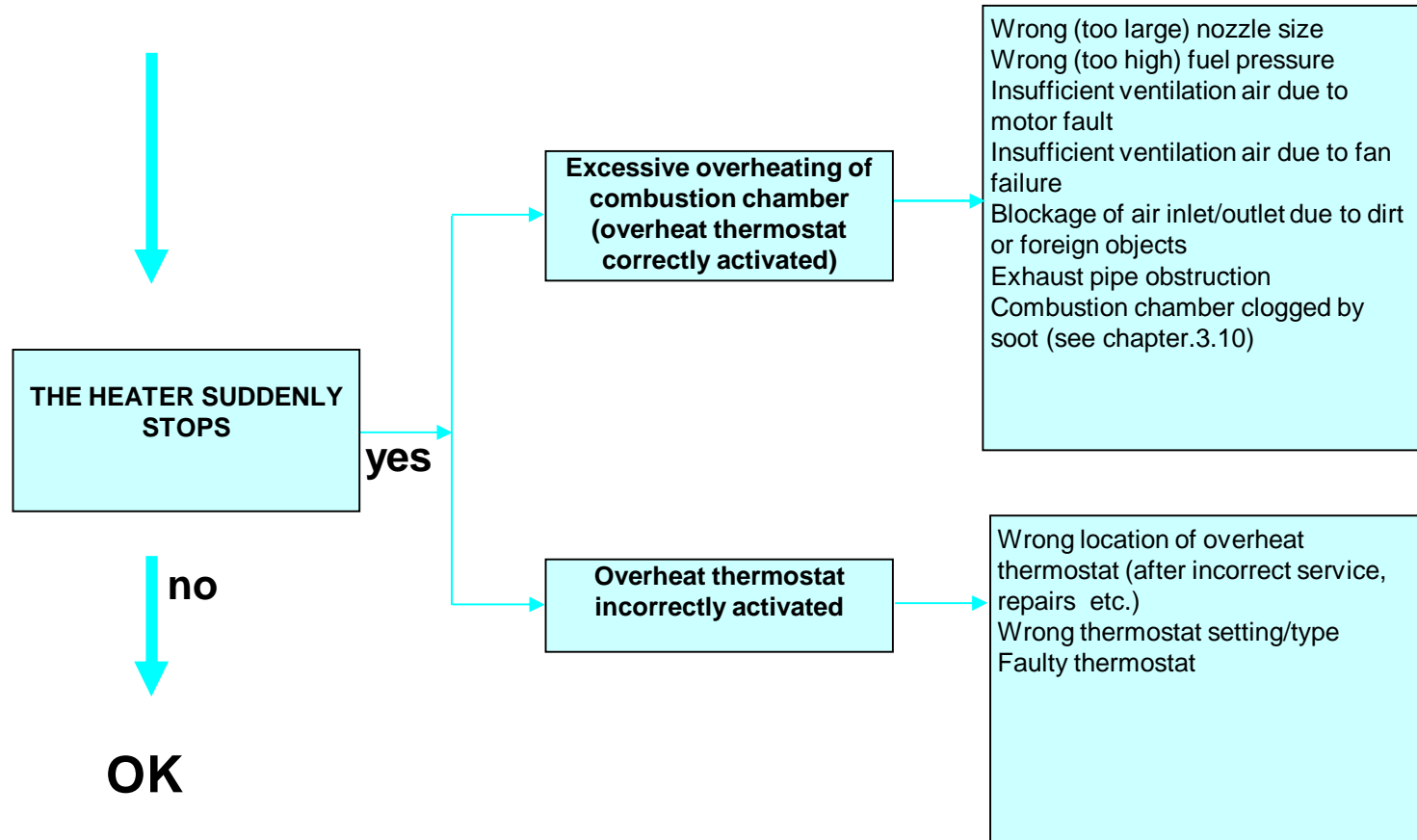
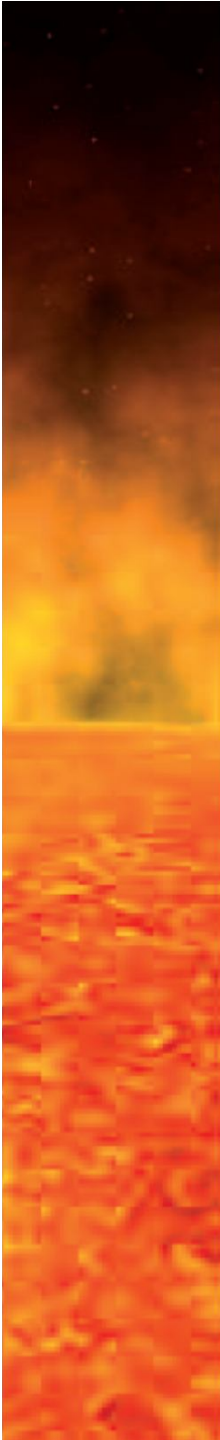
yes

**Tripping of air
pressure switch**

**Check air inlet/outlet for blockage,
restrictions, etc.
Check supply voltage, motor fan
rpm, fan blades, fan/shaft coupling**

no





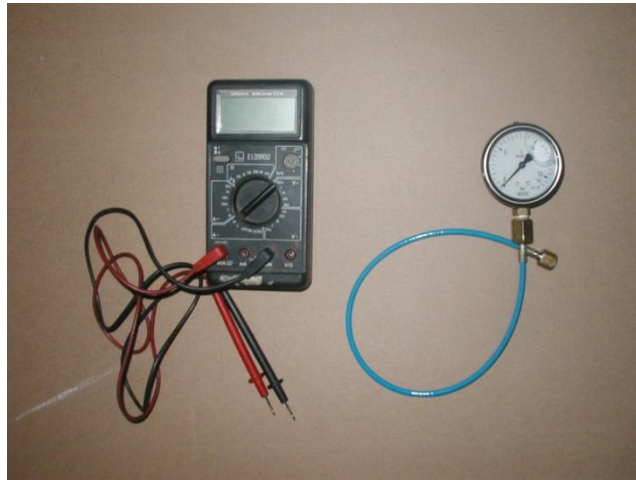
MIR WE - SETTING CHART

	VENTOLA	DEFLETTORE	POMPA GASOLIO	PRESSIONE GASOLIO	UGELLO GASOLIO	APERTURA SERRANDA ARIA	TERMOSTATO DI SICUREZZA
MIR 37 WE	Øe=350mm 3 PALE 22°	Øe=76mm Øi=27mm 10 tagli	DANFOSS R3	12 bar	DANFOSS 0.65 60° H	3 mm pos. Serranda 1	170 °C (scritte rosse)
MIR 55 WE	Øe=350mm 4 PALE 18°	Øe=76mm Øi=27mm 10 tagli	DANFOSS R3	12 bar	DANFOSS 1.00 60° H	11 mm pos. Serranda 3	170 °C (scritte rosse)
MIR 85 WE	Øe=500mm 4 PALE 33°	Øe=76mm Øi=22mm 10 tagli	DANFOSS R5	12 bar	DELAVAN 1.50 60° W	20 mm pos.serranda 5.5	170 °C (scritte rosse)

TOR WE - SETTING CHART

	VENTOLA	DEFLETTORE	POMPA GASOLIO	PRESSIONE GASOLIO	UGELLO GASOLIO	APERTURA SERRANDA ARIA	TERMOSTATO DI SICUREZZA
TOR 67 WE	Øe=350mm 4 PALE 18°	Øe=76mm Øi=27mm 10 tagli	DANFOSS R3	12 bar	DANFOSS 1.25 60° H	10 mm pos. Serranda 2.5	100 °C (scritte nere)
TOR 115 WE	Øe=500mm 4 PALE 33°	Øe=76mm Øi=27mm 10 tagli	DANFOSS R5	12 bar	DELAVAN 2.25 80° W	28 mm pos.serranda 8.5	100 °C (scritte nere)

SERVICE & MAINTENANCE EQUIPMENT



Measuring devices

Electric Multimeter (V, A, Ω)

PC Flame Sensor Tester Kit

Pressure Gauge Kit
(incl. hose and fitting)

Smoke Index Tester



SERVICE & MAINTENANCE EQUIPMENT

Basic handtools

Type	Application
17 mm hex key	motor fixing screws
16 mm hex key	nozzle head
13 mm hex key	fuel hose fittings
10 mm hex key	upper shell, inspection door, control panel
8 mm hex key	burner head fixing screw
2.5 mm Allen key	pump fixing screws
4 mm Allen key	pressure adjustment screw
5 mm Allen key	air blades fixing screws (MIR 85)
Phillips screwdriver	various, different sizes required
Slotted screwdriver	various, different sizes required