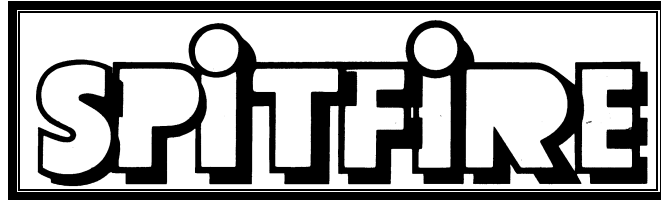


# OPERATING & MAINTENANCE MANUAL

## INDUSTRIAL INDIRECT FIRED DIESEL HEATERS



IP45 IP70



NOT FOR DOMESTIC USE – SPACE HEATING ONLY

Made By:

 **SPITWATER  
AUSTRALIA**

Spitwater Australia Pty Ltd  
953 Metry St  
North Albury , NSW , Australia

**WARNING:** **FAILURE TO FOLLOW OPERATING, SAFETY AND MAINTENANCE INSTRUCTIONS LISTED IN THIS MANUAL RELEASES THE MANUFACTURER FROM ANY RESPONSIBILITY FOR ACCIDENTS OR DAMAGES TO BOTH HUMANS AND OBJECTS AND MAY RENDER ANY WARRANTY VOID**



## TECHNICAL DATA

MODEL		IP 45	IP70
FUEL TYPE		DIESEL	DIESEL
HEAT INPUT	Kcal	45000	70000
HEAT OUTPUT	KW	52	80
NOZZLE SIZE		1.00 GPH 60° A	1.50 GPH 90° W
FUEL PRESSURE	bar	11	12
FUEL CONSUMPTION	KG/h	4.4	6.8
APPROX HEATED AIR	M <sup>3</sup> /h	1800	3300
HEAD POSITION (see diagram page 4)	mm	A:54 B:86	A: 42 B: 82
ELECTRICAL SUPPLY	V/HZ/PH	230/50/1	230/50/1
ELECTRIC MOTOR	W/A	200/1.4	750/5.7
THERMOSTAT SETTING FAN		FIXED	FIXED
LIMIT THERMOSTAT SETTING		FIXED	FIXED
TANK CAPACITY	L	41	145
WEIGHT DRY	KG	64	120
L x W x H	mm	513 X 1290 X 735	745 X 1600 X 1080

The manufacturer reserves the right to modify design features and technical data without notice.

## INTRODUCTION

The SPITFIRE range of heaters has been designed to give safe, efficient and reliable service when the correct operating sequences are followed and proper attention is given to cleaning and maintenance procedures. This manual is to provide up to date information necessary to the user/serviceperson for operating, cleaning and servicing the heaters, together with fault finding techniques and general specifications details and diagrams. Please note that the information given herein after may be subject to revision in compliance with the policy of continual improvements.

The SPITFIRE range of heaters should only be used in the manner and purpose for which they were intended and in accordance with the recommendations and safety precautions detailed in the following Manual and in the Operating Instructions stickers on the unit itself.

All SPITFIRE heaters undergo rigorous safety and operational tests before being despatched into the marketplace however it is imperative that, prior to use, all operators have read and understood all information and instructions provided and are aware of possible hazards.

## IMPORTANT SAFETY INSTRUCTIONS & PRECAUTIONS

This booklet contains important information for the use and safe operation of this heater. Please read and understand all warnings before you start using the unit.

### WARNING: When using this heater:

1. Read all instructions before using this heater.
2. Know how to start and stop the unit. Be quite familiar with the controls.
3. Follow the maintenance procedures and fault finding techniques outlined in the manuals provided.
4. Do not restrict under any circumstances either the inlet or outlet end of the heater.
5. Do not operate this heater in basements or below ground.
6. Permanent ventilation to the outside atmosphere must be provided. Allow 6.5cm<sup>2</sup> for every 293W input divided equally between floor and high levels.
7. Not for domestic use space heating only.
8. The heater must not be used in close proximity to combustible material. A guard must be placed 900mm away from the heater outlet to prevent the approach of combustible materials.
9. Read carefully the instructions concerning earthing.
10. Use only clean filtered diesel as fuel. Do not refill the fuel tank while the heater is running.
11. Do not operate the heater with the top cover removed.
12. Do not exceed the recommended ducting length listed in the technical specifications.
13. Do not pull on the electrical cord in order to unplug the unit.
14. Do not effect temporary repairs on worn or damaged electrical cords and plugs. Have worn, cut or damaged cords and plugs replaced by an authorised service person/electrician.
15. To prevent injury always disconnect the power plug before disassembling any part of the heater, effecting any servicing or when the unit is not in use.
16. Local regulations should be followed as to the installation of industrial heaters.

## ELECTRICITY SUPPLY

The SPITFIRE range of heaters is designed to run off 230V Single Phase 50Hz electrical supply. The unit should be plugged into a 10A outlet.

### WARNING: This appliance must be earthed.

Note: If the Plug needs to be replaced to suit local requirements a qualified electrician should carry out the replacement taking care to earth the unit and maintain the correct phase connection as per the wiring diagram.

## FUEL SUPPLY

Please only use the following fuel types in the heater:

- Class D Diesel

**WARNING:** Under no circumstances should any other fuel type be used. Do not fill the fuel tank while the heater is running.

# INSTALLATION AND OPERATING INSTRUCTIONS

## INSTALLATION

1. Identify your unit from the model description on the serial number label affixed to the heater and the exploded views contained in this manual. (ALL NUMBERED REFERENCES APPLY TO EXPLODED VIEW OF UNIT)
2. Fill the Fuel Tank using clean filtered fuel.
3. Connect a rigid stainless steel exhaust Flue (length 1M) to the draught diverter terminated with a rain cowl protection. Make sure that the flue is insulated from inflammable surfaces (Longer flues and other materials can be used please contact your authorised agent for details.)
4. Connect Power Plug to Mains Power Outlet and check that the power light is on.

## OPERATING INSTRUCTIONS

### TO START & USE

1. WHERE FITTED. This unit can be fitted with a thermostat. If required please contact your service agent for further information. Set operating temperature to the desired position on the thermostat.
2. Turn power switch to the Flame (II) position. This will start the ignition cycle for the heater.

### TO STOP (NORMAL OPERATION)

1. Turn power switch to the Off (0) position. The fan will continue to run until the cooling cycle is complete, DO NOT REMOVE THE PLUG FROM THE ELECTRICAL SUPPLY UNTIL THE FAN HAS STOPPED RUNNING AS THIS WILL CAUSE DAMAGE TO THE UNIT.
2. After the fan has stopped running remove the plug from the electrical outlet.

## OPERATING INSTRUCTIONS – SUMMER VENTILATION

1. Make sure that the diesel tank is at least  $\frac{1}{4}$  full to maintain lubrication in the pump.
2. Turn power switch to the Fan (I) position. After use turn to Off (0) position and remove plug from electrical outlet.

**Note: If the heater is to be laid up for a long period of time make sure it is stored away from the elements and that water cannot get into the chimney.**

## MAINTENANCE INSTRUCTIONS

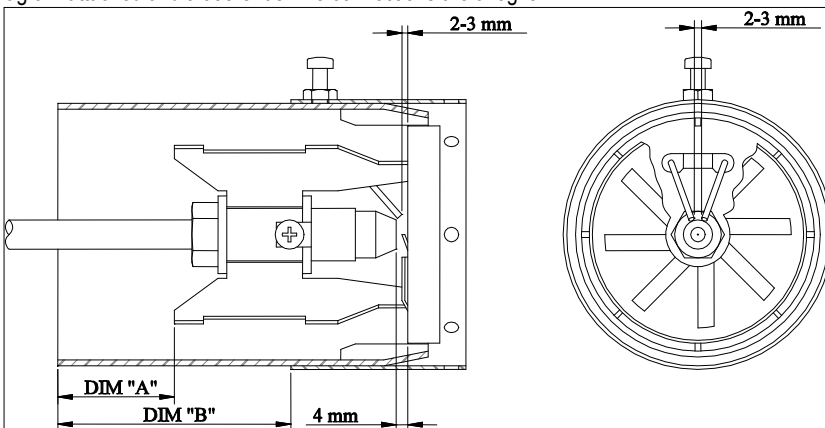
After every heating season, or sooner if used in a dirty environment, carry out the following maintenance procedures on your heater.

### GENERAL

Disconnect the heater from the electricity main power socket. Remove the screws retaining the cover and remove the cover. Check the combustion chamber conditions and clean any carbon deposits as necessary.

### BURNER SERVICE

Remove the high tension leads and check. Disconnect the fuel line and remove the burner head. Check and clean burner head, photocell, burner nozzle, electrodes from carbon deposit and replace any faulty/cracked parts. Reassemble all parts following a reverse order making sure that the electrode position is as per diagram attached and that the fuel line connections are airtight.



### TRANSFORMER

The transformer produces a high voltage discharge to the electrodes (see burner scheme for their adjustments).

### FUEL SUPPLY

Drain and clean fuel tank by removing the plug fitted on the bottom of the tank. Reassemble making sure that the plug is tight. Clean and drain fuel filters replace them if necessary. Check fuel lines for leaks.

### DIESEL PUMP

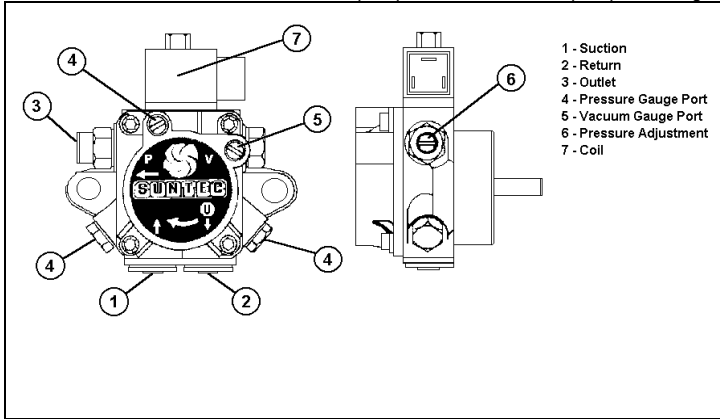
The diesel pump has a built in solenoid valve which controls the regulator cut-off valve giving fast cut-on cut-off function, independent of the rotational speed. The gear-set draws diesel from the tank through the built in filter and transfers it to the valve that regulates the diesel pressure to the nozzle line. All diesel which does not go through the nozzle line will be dumped through the valve back to the return line, or if it is a one pipe installation back to the suction port in the gear set.

### COMBUSTION

Satisfactory thermal performance of the combustion chamber may be obtained only through good combustion. Dirty fuel containing water always produces faulty combustion with soot deposits on the pipe. If, depending on the local atmospheric pressure and the length of the chimney, the combustion is not satisfactory, regulate the combustion by minimally adjusting the position of the burner head (62).

**PUMP SERVICE**

Disconnect the fuel lines from the pump and remove the socket head screws. Remove the pump body by tapping, making sure not to damage the seals. Remove and clean the fuel filter inside the pump. Reassemble the pump following a reverse order and reconnect the fuel lines making sure there are no leaks.



**ELECTRICAL**

Check that the motor fixing bolts are tight and make sure that the fan fixing screw at the fan boss is tight. Check the limit thermostat junction for continuity. Open all electrical enclosures and check that all electrical connections are tight and in good condition.

**GENERAL**

Reassemble the heater making sure all screws and fittings are tight. Reconnect and start the heater following the installation and operating instructions. Test the heater for correct operation making sure that all safety mechanisms (where fitted photocell, fan thermostat, limit thermostat) are operating correctly.

**MAINTENANCE AND FAULT FINDING PROCEDURES**

**WARNING: ALWAYS ISOLATE UNIT FROM THE ELECTRICAL SUPPLY BEFORE ATTEMPTING ANY REPAIRS OR MAINTENANCE.**

**TROUBLESHOOTING GUIDE**

FAULT		CAUSE
<b>A</b>	The Power Light is not on	1
<b>B</b>	The fan motor never starts	1-2-3-4-5-6
<b>C</b>	The burner starts but goes into lockout	7-8-9-10-11-12-13-14-15
<b>D</b>	Heater runs but excessive smoke is emitted from flue	10-16-17

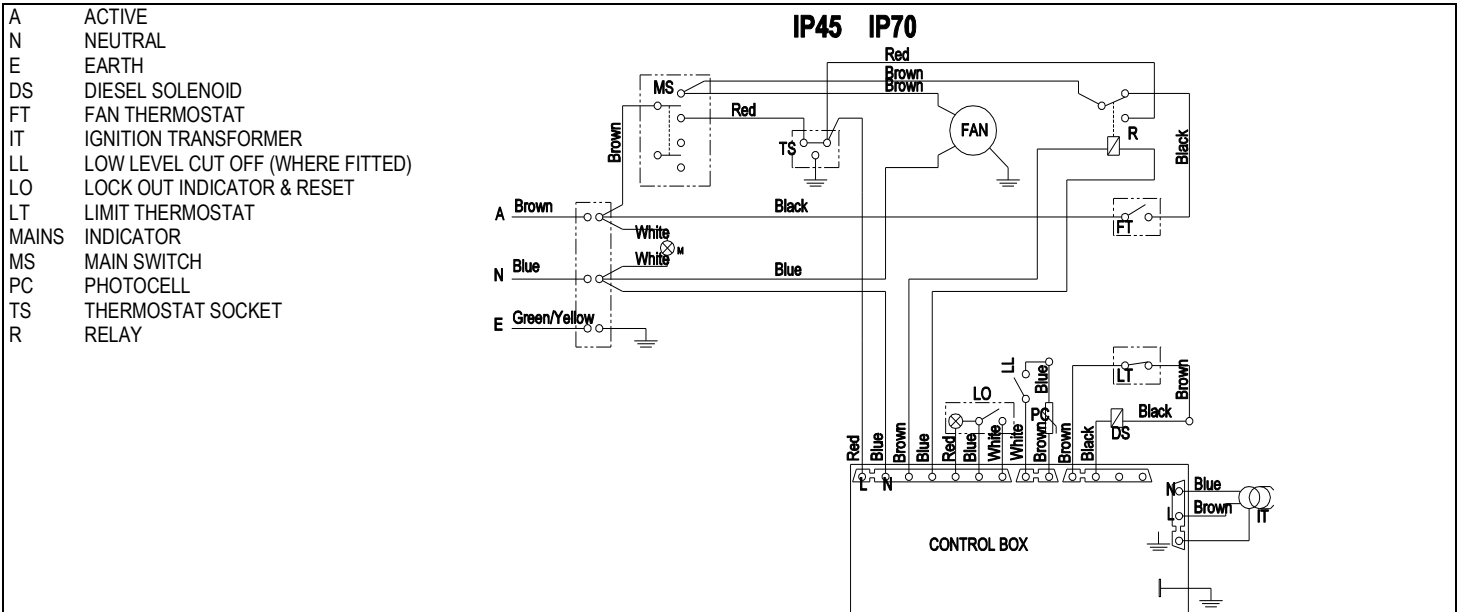
**FAULT CORRECTION**

**THE MANUFACTURER RECOMMENDS THAT ALL REPAIRS AND MAINTENANCE WORK BE CARRIED OUT BY A QUALIFIED TECHNICIAN.**

**CAUSE**

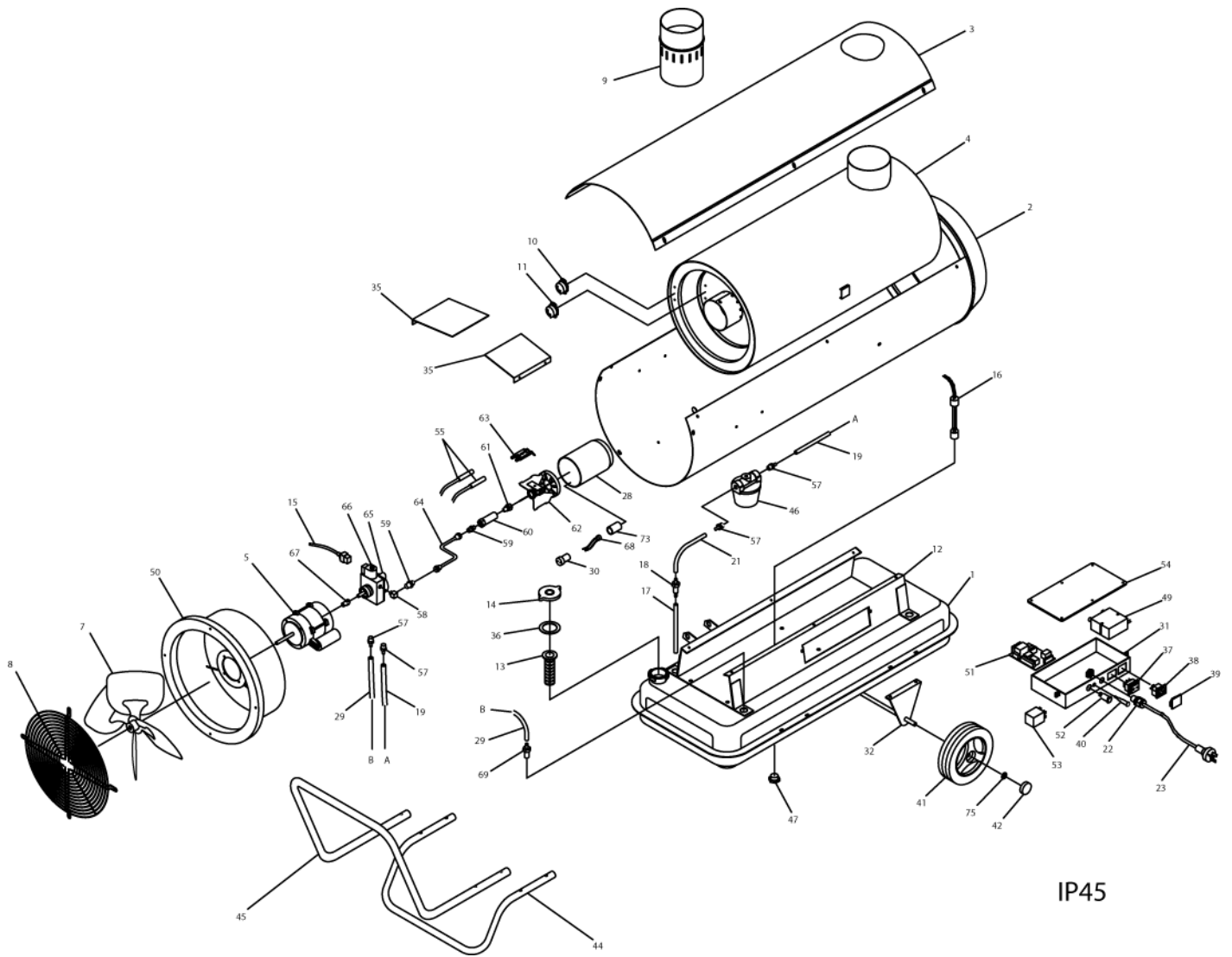
1.	Electricity Supply is faulty	<ul style="list-style-type: none"> <li>• Check the power plug is plugged in.</li> <li>• Check that electricity supply is available</li> <li>• Check that all wiring connections are secure and all terminals properly connected</li> </ul>
2.	The motor is blocked/faulty	• Check and replace as necessary
3.	The fan is blocked/damaged	• Check and replace as necessary
4.	The fan thermostat is incorrectly set/faulty	• Check and adjust or replace as necessary
5.	Switch/switch connections is/are faulty/loose	• Check and replace as necessary
6.	If fitted: <ul style="list-style-type: none"> <li>* The thermostat setting is incorrect</li> <li>* The thermostat plug is not plugged in</li> <li>* The thermostat/thermostat connection is loose/faulty</li> </ul>	<ul style="list-style-type: none"> <li>• Adjust thermostat accordingly</li> <li>• Plug the thermostat plug into the appropriate socket</li> <li>• Check and replace as necessary</li> </ul>
7.	Limit thermostat is faulty	• Check for continuity in Limit thermostat connection
8.	Diesel flow absent before solenoid valve	<ul style="list-style-type: none"> <li>• Check that the fuel tank is full. Fill if necessary.</li> <li>• Check that the fuel filters are not blocked or faulty. Clean or replace as necessary.</li> <li>• Check fuel lines for blockages /air leaks. Tighten or replace as necessary.</li> <li>• Check the fuel pump for correct operation and rotation. Adjust and replace as necessary.</li> </ul>
9.	Solenoid valve does not open	<ul style="list-style-type: none"> <li>• Check the solenoid valve and its connection .Adjust or replace as necessary</li> <li>• Check the Limit thermostat</li> </ul>
10.	Diesel nozzle Blocked /faulty	• Check and clean/replace as necessary
11.	Photocell flame detecting device dirty or not working properly	• Check, clean and adjust or replace as necessary
12.	Inlet/outlet grill or inside of heater is dirty or partially blocked	• Check and clean as necessary
13.	Limit thermostat cuts in interrupting the heater	<ul style="list-style-type: none"> <li>• Check if the inlet/outlet grill are dirty or blocked, clean as necessary</li> <li>• Check that airflow in and out of the heater is not impeded</li> </ul>
14.	Diesel is not igniting	<ul style="list-style-type: none"> <li>• Check Transformer and replace if necessary</li> <li>• Check High Tension leads and adjust/replace as necessary</li> <li>• Check electrodes and adjust and replace as necessary</li> </ul>
15.	Burner Control box faulty	• Check and replace if necessary
16.	Air adjustment and/or burner head position is incorrect	• Check and adjust as necessary following settings in the technical specifications.
17.	Pump pressure incorrect	• Check and adjust/replace as necessary

# ELECTRICAL DIAGRAM



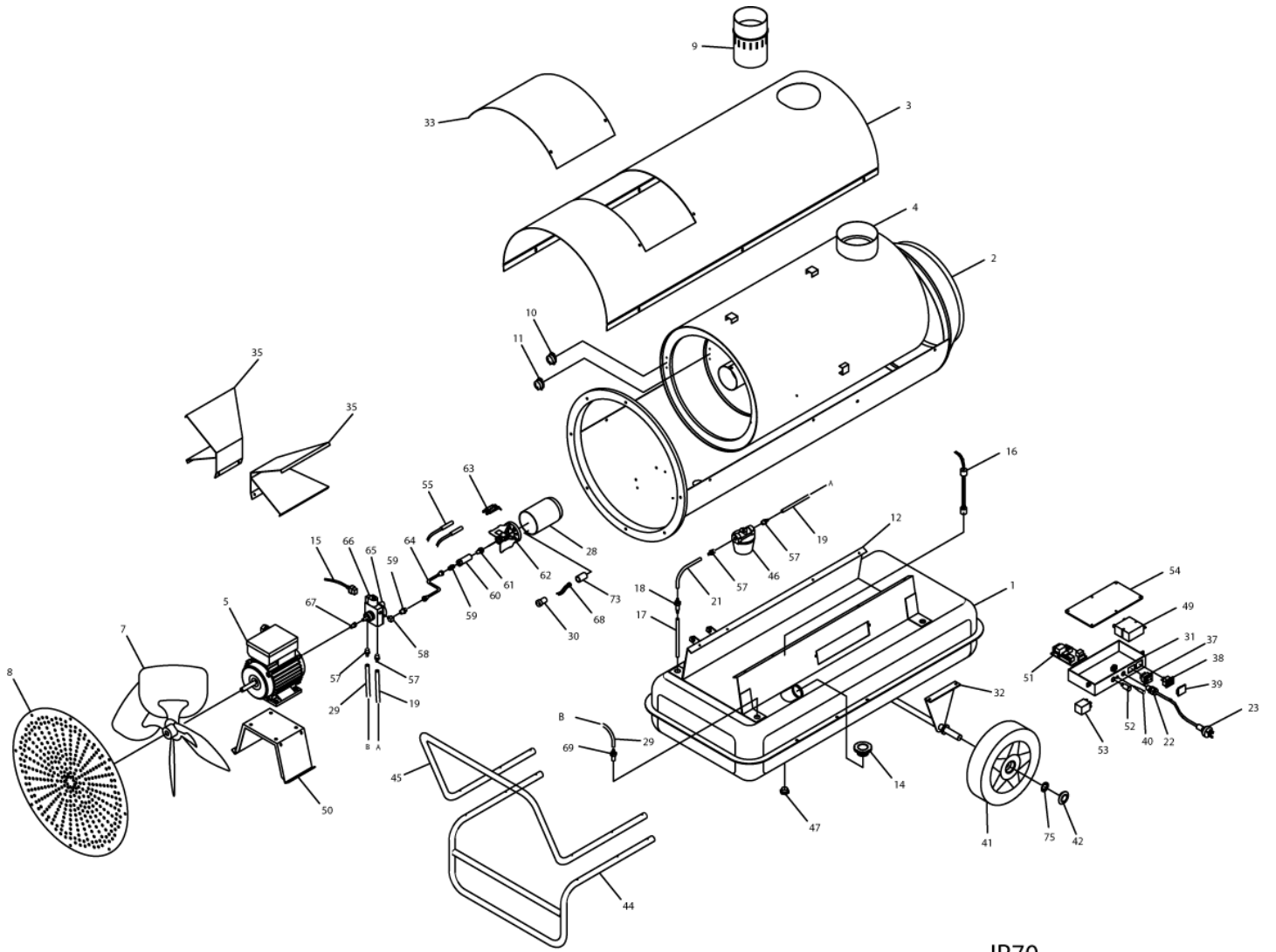
## PARTS LISTING

NO	DESCRIPTION	IP45	IP70	NO	DESCRIPTION	IP45	IP70
1	TANK WELD ASSEMBLY	530001	175001	39	PLUG T.A.	100126	100126
2	BOTTOM CASING	530002	550010	40	LIGHT	33125	33125
3	TOP COVER	530004	550011	41	WHEEL	33231	175030
4	COMBUSTION CHAMBER	530003	550020	42	HUB CAP COVER	33230/C	33265/B
5	MOTOR	50008	550002/A	43	WASHER	70200/I	70200/P
6	CAPACITOR	530008	550027	44	TROLLEY	250125	550022
7	FAN	450003/A	550001	45	HANDLE	250122/A	550023
8	AIR INLET GUARD	33431	550028	46	LINE FILTER	48701	48701
9	STACK BREAK ASSY	260005	550025	47	DRAIN PLUG	100157	175002
10	LIMIT THERMOSTAT	550036	550036	49	TRANSFORMER	100221	100221
11	FAN THERMOSTAT/BRACKET	550037	550037	50	MOTOR MOUNTING BR.	530007	550014
12	PLINT	530005	550015	51	CONTROL BOX 230VOLT	300133	300133
13	FILTER	44680	44680	52	RESET BUTTON	33205	33205
14	FILLER CAP	44720	44720	53	RELAY	33253	33253
15	LEAD SOLENOID VALVE	550004	550004	54	PLASTIC BOX COVER	100124	100124
16	LOW FUEL/L SWITCH	530006	550026	55	H.T.CABLE	530016	550034
18	PICK UP TUBE ASSY	530011	550033	57	HOSE TAIL	47039	47039
19	HOSE BUR/PUMP-FILTER	530012	550029	58	ELBOW	33047	33047
21	HOSE TANK/FILTER	530013	550030	59	NIPPLE	33089	33089
22	CABLE GLAND	48417/E	48417/E	60	NOZZLE HOLDER	530017	530017
23	MAIN CABLE	33018	33018	61	NOZZLE	44571/F	44571/E
30	PHOTOCELL PROTECTION	100119	100119	62	BURNER HEAD	100227	100228
28	BURNER TUBE	100226	100226	63	ELECTRODE	100225/A	100225/A
29	HOSE RETURN	530014	550031	64	PIPE PUMP/BURNER	530015	550032
31	PLASTIC BOX	100122/A	100122/A	65	FUEL PUMP	550003	550003
32	AXLE WITH BRACKET	100163	550024	66	SOLENOID VALVE	44937	44937
33	ACCES COVER	=	550012	67	PUMP DOG	300022	300022
34	THERMINAL BLOCK	33121	33121	68	PHOTOCELL	300006/A	300006/A
35	DIFFUSER	530010	550021	69	HOSE TAIL	47039/C	47039/C
36	TANK CAP SEAL	44908	44908	73	PHOTOCELL BRACKET	100120/B	100120/B
37	SWITCH	33124	33124	75	HUB CAP	33230/B	33265/C
38	THERMOSTAT SOCKET	33070	33070				



IP45





IP70