

Blackheat®

Vacuum Assisted Linear & U-Tube Gas Fired Radiant Heating Systems

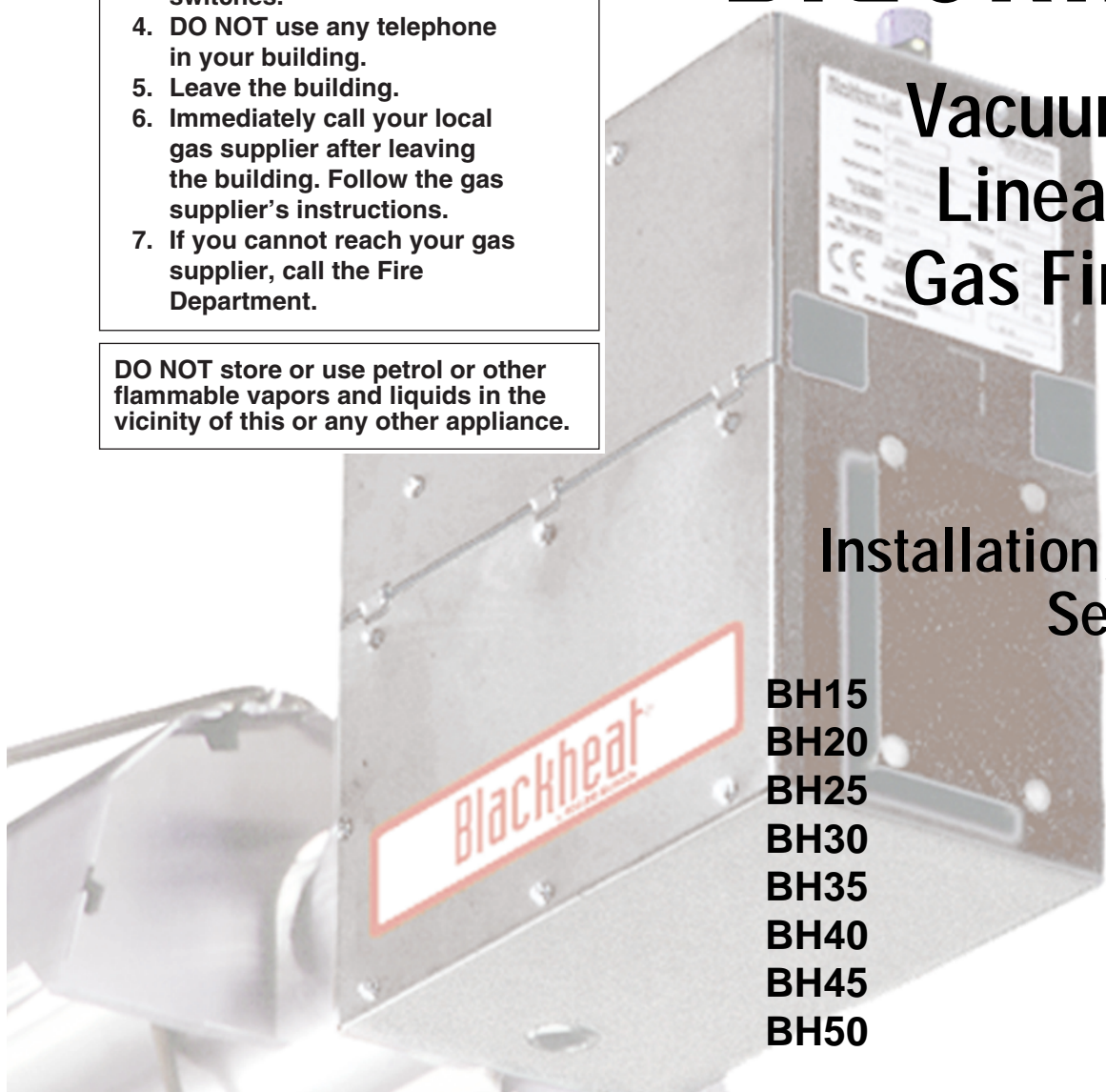
Installation, Operation & Service Manual

FOR YOUR SAFETY

If you smell gas:

1. Open windows.
2. **DO NOT** try to light any appliance.
3. **DO NOT** use electrical switches.
4. **DO NOT** use any telephone in your building.
5. Leave the building.
6. Immediately call your local gas supplier after leaving the building. Follow the gas supplier's instructions.
7. If you cannot reach your gas supplier, call the Fire Department.

DO NOT store or use petrol or other flammable vapors and liquids in the vicinity of this or any other appliance.



BH15
BH20
BH25
BH30
BH35
BH40
BH45
BH50

WARNING

Improper installation, adjustment, alteration, service or maintenance can result in death, injury or property damage. Read the installation, operation and service manual thoroughly before installing or servicing this equipment.

Installation must be done by a contractor qualified in the installation and service of gas-fired heating equipment.

Installer

Please take the time to read and understand these instructions prior to any installation. Installer must give a copy of this manual to the owner.

Owner

Keep this manual in a safe place to provide your serviceman with information should it become necessary.



Hurll Nu-Way Pty Ltd
14 Aristoc Road
GLEN WAVERLEY VIC 3150
Telephone: +61 3 9561 2100
Fax: +61 3 9560 8992

www.rg-inc.com

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SECTION 1: HEATER SAFETY

Your Safety is Important to Us!
This symbol is used throughout the manual to notify you of possible fire, electrical or burn hazards. Please pay special attention when reading and following the warnings in these sections.

⚠ WARNING

Installation, Service and Annual Inspection of heater must be done by a contractor qualified in the installation and service of gas-fired heating equipment.

Read this manual carefully before installation, operation, or service of this equipment.

Failure to follow these instructions can result in death, injury or property damage.

This heater is designed for heating non-residential indoor spaces. Do not install in residential spaces. These instructions, layouts, AS5601/AG 601, local codes and ordinances, and applicable standards that apply to gas piping, electrical wiring, venting, etc., must be thoroughly understood before proceeding with the installation.

SECTION 2: INSTALLER RESPONSIBILITY

- To install the heater, as well as the gas and electrical supplies, in accordance with applicable specifications and codes. Roberts-Gordon recommends the installer contact a local building inspector or Fire Marshal for guidance.
- To use the information given in a layout drawing and in the manual together with the cited codes and regulations to perform the installation.
- To install the heater in accordance with the Clearances to Combustibles.
- To furnish all needed materials not furnished as standard equipment.
- To plan location of supports.
- To provide access to burners for servicing on all sides, for burner removal.
- To provide the owner with a copy of this installation, operation and service manual.
- To never use heater as support for ladder or other access equipment and never hang or suspend anything from heater.

2.1 Low Level User Instructions

In all situations, clearances to combustibles must be maintained. Failure to observe clearances to combustibles can result in death, severe injury or property damage. Signs should be posted in storage areas to specify the maximum stacking height of items placed below heater to maintain required clearances to combustibles. Minimum clearances must be maintained from vehicles parked below the heater. Caution should be used when running the system near combustible materials such as wood, paper, rubber, etc. Consideration should be given to partitions, storage racks, hoists, building construction, etc.

A wall tag is supplied with the BLACKHEAT® heater as a permanent reminder of the safety instructions and the importance of the minimum required clearances to combustibles. A copy of the wall tag is illustrated on Page 2, Figure 1. Peel off the backing of the adhesive strips on the rear surface of the tag and position the tag on a wall near the BLACKHEAT® heater (e.g. thermostat or ROBERTS GORDON® BZC Microprocessor Controller).

2.2 Halogenated Hydrocarbons

⚠ CAUTION

Do not use heater in an area containing corrosive chemicals.

Avoid the use of corrosive chemicals to ensure a longer life of the burner, tubing and other parts.

Failure to follow these instructions can result in property damage.



Roberts-Gordon cannot be responsible for ensuring that all appropriate safety measures are undertaken prior to installation; this is entirely the responsibility of the installer. It is essential that the contractor, the sub-contractor, or the owner identifies the presence of combustible materials or halogenated hydrocarbons* anywhere in the premises.

* **Halogenated Hydrocarbons** are a family of chemical compounds characterized by the presence of halogen elements (fluorine, chlorine, bromine, etc.). These compounds are frequently used in refrigerants, cleaning agents, solvents, etc. If these compounds enter the air supply of the burner, the lifespan of the heater components will be greatly reduced. An outside air supply must be provided to the burners whenever the presence of these compounds is suspected. Warranty will be invalid if the heater is exposed to halogenated hydrocarbons.

2.3 National Standards and Applicable Codes

All Appliances must be installed in accordance with the latest revision of AS5601/AG 601 and other relevant codes. This refers also to the electric, gas and venting installation. Note: Additional standards for installations in Public Garages, Aircraft Hangars, etc. may be applicable.

SECTION 3: CRITICAL CONSIDERATIONS

⚠ WARNING	
	
Fire Hazard	Burn Hazard
<p>Some objects will catch fire or explode when placed close to heater.</p> <p>Keep all flammable objects, liquids and vapors the minimum required clearances to combustibles away from heater.</p> <p>Failure to follow these instructions can result in death or injury.</p>	<p>Keep all persons, especially children, away from heater.</p> <p>Do not touch any part of the heater.</p> <p>Heater is very hot.</p> <p>Failure to follow these instructions can result in severe injury.</p>

3.1 Minimum Required Clearances to Combustibles

Clearances are the required distances that combustible objects must be kept away from the heater to prevent serious fire hazards. Combustibles are materials, which may catch on fire and include common items such as wood, paper, rubber, fabric, etc. Maintain clearances to combustibles at all times for your safety.

Clearances for all heater models are located on *Page 4, Figure 2 through Page 7, Figure 15* in this manual. Check the clearances on each burner for the model heater being installed to make sure the product is suitable for your application and the clearances are maintained. Read and follow the safety guidelines below:

- Keep petrol or other combustible materials including flammable objects, liquids, dust or vapours away from this heater or any other appliance.
- Maintain clearances from heat sensitive material, equipment and workstations.
- Maintain clearances from vehicles parked below the heater.
- Maintain clearances from swinging doors, overhead cranes, vehicle lifts, partitions, storage racks, hoists, etc.
- In locations used for the storage of combustible materials, signs must be posted to specify the maximum permissible stacking height to maintain required clearances from the heater to the combustibles. Signs must be posted adjacent to the heater thermostat. In the absence of a thermostat, signs must be posted in a conspicuous location.
- Consult local Building Inspector, Fire Insurance Carrier or other authorities for approval of proposed installation when there is a possibility of exposure to combustible airborne materials or vapours.
- Hang heater in accordance to the minimum suspension requirements on *Page 9, Section 4.6 through Page 9, Section 4.8*.
- If the radiant tubes must pass through the building structure, be sure that adequate sleeving and fire stop is installed to prevent scorching and/or fire hazard.

3.2 Clearance Data -

- NOTE:**
1. All dimensions are from the Tube surface.
 2. Clearances B, C and D can be reduced by 50% after 7 m of tubing downstream from the burner.
 3. All measurements are in Millimeters.

FIGURE 2: LINEAR , HORIZONTAL MOUNTS

	Model	BH15	BH20	BH25	BH30	BH35	BH40	BH45	BH50
	A	150	150	150	150	150	150	200	200
	B	890	970	970	1020	1170	1220	1280	1330
	C	1570	1650	1650	1780	1930	1970	2010	2080
	D	890	970	970	1020	1170	1220	1280	1330

FIGURE 3: LINEAR , ONE SIDE REFLECTOR

	Model	BH15	BH20	BH25	BH30	BH35	BH40	BH45	BH50
	A	150	150	150	150	150	150	200	200
	B	230	230	230	230	230	230	230	230
	C	1580	1760	1760	1930	2090	2130	2160	2240
	D	1200	1380	1380	1500	1660	1710	1760	1860

FIGURE 4: LINEAR, TWO SIDE REFLECTORS

	Model	BH15	BH20	BH25	BH30	BH35	BH40	BH45	BH50
	A	150	150	150	150	150	150	200	200
	B	590	640	640	690	820	860	890	1020
	C	1660	1810	1810	1960	2110	2160	2210	2320
	D	590	640	640	690	820	860	890	1020

FIGURE 5: LINEAR, 45° MOUNT

	Model	BH15	BH20	BH25	BH30	BH35	BH40	BH45	BH50
	A	200	200	200	250	250	275	300	300
	B	200	200	200	200	200	200	200	200
	C	1500	1660	1660	1860	1960	2030	2110	2160
	D	1370	1520	1520	1630	1750	1820	1880	2000

- NOTE:**
1. All dimensions are from the Tube surface.
 2. Clearances B, C and D can be reduced by 50% after 7 m of tubing downstream from the burner.
 3. All measurements are in Millimeters.

FIGURE 6: LINEAR , 1 FOOT AND 2 FOOT DECO GRILLE

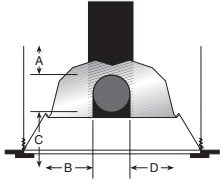
	Model	BH15	BH20	BH25	BH30	BH35	BH40	BH45	BH50
	A	150	150	150	150	150	150	150	200
B	890	970	970	1020	1170	1220	1280	1330	1330
C	1570	1650	1650	1780	1930	1970	2010	2080	2080
D	890	970	970	1020	1170	1220	1280	1330	1330

FIGURE 7: LINEAR , PROTECTIVE GRILLE

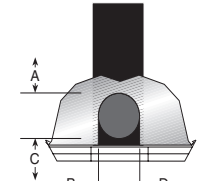
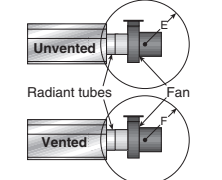
	Model	BH15	BH20	BH25	BH30	BH35	BH40	BH45	BH50
	A	150	150	150	150	150	150	150	200
B	890	970	970	1020	1170	1220	1280	1330	1330
C	1570	1650	1650	1780	1930	1970	2010	2080	2080
D	890	970	970	1020	1170	1220	1280	1330	1330

FIGURE 8: LINEAR , VENTING

	Model	BH15	BH20	BH25	BH30	BH35	BH40	BH45	BH50
	E	1000	1000	1000	1000	1000	1000	1000	1000
F	500	500	500	500	500	500	500	500	500

3.3 Clearance Data -U Tube

- NOTE:**
1. All dimensions are from the Tube surface.
 2. Clearances B, C and D can be reduced by 50% after 7 m of tubing downstream from the burner.
 3. All measurements are in Millimeters.

FIGURE 9: U-TUBE, HORIZONTAL MOUNT

	Model	BH15	BH20	BH25	BH30	BH35	BH40	BH45	BH50
	A	150	150	150	150	150	150	200	200
	B	890	970	970	1020	1170	1220	1270	1380
	C	1580	1730	1730	1910	1980	2050	2110	2210
	D	760	940	940	1000	1090	1150	1200	1300

FIGURE 10: U-TUBE, ONE SIDE REFLECTOR

	Model	BH15	BH20	BH25	BH30	BH35	BH40	BH45	BH50
	A	150	150	150	150	150	150	200	200
	B	230	230	230	230	230	230	230	230
	C	1580	1760	1760	1930	2090	2130	2160	2240
	D	1200	1380	1380	1500	1660	1710	1760	1860

FIGURE 11: U-TUBE, TWO SIDE REFLECTORS

	Model	BH15	BH20	BH25	BH30	BH35	BH40	BH45	BH50
	A	150	150	150	150	150	150	200	200
	B	590	640	640	690	820	860	890	1020
	C	1660	1810	1810	1960	2110	2160	2210	2320
	D	590	640	640	690	820	860	890	1020

FIGURE 12: U-TUBE, FULL 45° MOUNT

	Model	BH15	BH20	BH25	BH30	BH35	BH40	BH45	BH50
	A	200	200	200	200	200	200	200	200
	B	200	200	200	200	200	200	200	200
	C	1500	1650	1650	1860	1960	2040	2110	2160
	D	1070	1170	1170	1320	1550	1620	1680	1780

- NOTE:**
1. All dimensions are from the Tube surface.
 2. Clearances B, C and D can be reduced by 50% after 7 m of tubing downstream from the burner.
 3. All measurements are in Millimeters.

FIGURE 13: U-TUBE, OPPOSITE 45° TILT

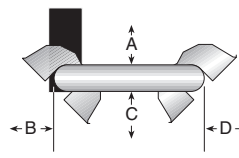
	Model	BH15	BH20	BH25	BH30	BH35	BH40	BH45	BH50
	A	200	200	200	250	250	275	300	300
B	1370	1530	1530	1630	1780	1830	1880	1930	
C	1500	1650	1650	1860	1960	2040	2110	2160	
D	560	560	560	560	560	560	560	560	

FIGURE 14: U-TUBE, PROTECTIVE GRILLE

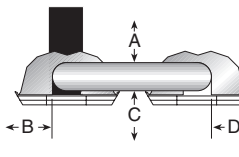
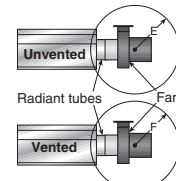
	Model	BH15	BH20	BH25	BH30	BH35	BH40	BH45	BH50
	A	150	150	150	150	150	150	200	200
B	890	970	970	1020	1170	1220	1270	1380	
C	1580	1730	1730	1910	1980	2050	2110	2210	
D	760	940	940	1000	1090	1150	1200	1300	

FIGURE 15: U-TUBE, VENTING

	Model	BH15	BH20	BH25	BH30	BH35	BH40	BH45	BH50
	E	1000	1000	1000	1000	1000	1000	1000	1000
F	500	500	500	500	500	500	500	500	500

SECTION 4: SPECIFICATIONS

4.1 Material Specifications

4.1.1 Combustion and Tubes

First 3 meters ALUMI-THERM® steel tubing.
Remaining tube 100 mm dia. 16 gauge heat treated
aluminised mild steel.

4.1.2 Reflectors

NS3 H14 aluminium or 1.4016 2R stainless
steel (option)

4.2 Heater Specifications

4.2.1 Sequence Controller

Fully automatic single try direct spark 100% shut off
ignition flame rectification module

4.2.2 Electrical

Rating: 230V, 50 Hz, single phase, 1 amp
Connection: 3 pin moulded plug

4.2.3 Gas Supply

Connection: Rc1/2 (1/2" BSP int)
Natural : Nominal - Inlet 1.13kPa
Maximum - Inlet 5.0 kPa

ULPG Gas (Propane or Propane/Butane mix):

Nominal - Inlet 2.75 kPa
Maximum - Inlet 5.00 kPa

4.3 Venting Specifications

4.3.1 Fans

BH-15, 20, 25, 30 Model: Torin DSF 133-42
BH-35, 40, 45 Model: Torin DSA 524-202
BH-50 Model: Magnetek JF1G

Consult the manufacturer for availability of alternate fans.

4.3.2 Flue

When fitted, the flue must be 100 mm, or greater in
diameter, and must conform to AS5601/AG 601. The flue
must be self supporting. Inlet must be 100 mm diameter.

4.4 Suspension Specifications

Galvanised straight link welded chain.
Working load of 340 kg (750 lbs)

4.5 Controls Specifications

Time switches, thermostats, etc. can be wired into the
electrical supply. External controls supplied as an
optional extra.

4.6 Linear Heater	BH15ST	BH20ST	BH25ST	BH30ST	BH35ST	BH40ST	BH45ST	BH50ST
Input – kW	15	20	25	30	35	40	45	50
Input – MJ	54	72	90	110	125	138	162	180
Tube Length – mm	6096	9144	9144	12192	12192	12192	15240	15240
Overall Heater Length - mm	6661	9709	9709	12757	12757	12757	15815	15815
Weight – kg	41	55	55	68	68	68	81	81
Heated Area – m ²	20-160	30-210	40-265	50-315	55-370	65-420	70-475	80-525
Minimum Installation Height* – m	2.5	2.5	3.0	3.5	4.6	5.0	5.0	5.0
Recommended Installation Height* – m	3.0	3.5	3.9	4.2	4.8	5.5	6.7	7.6

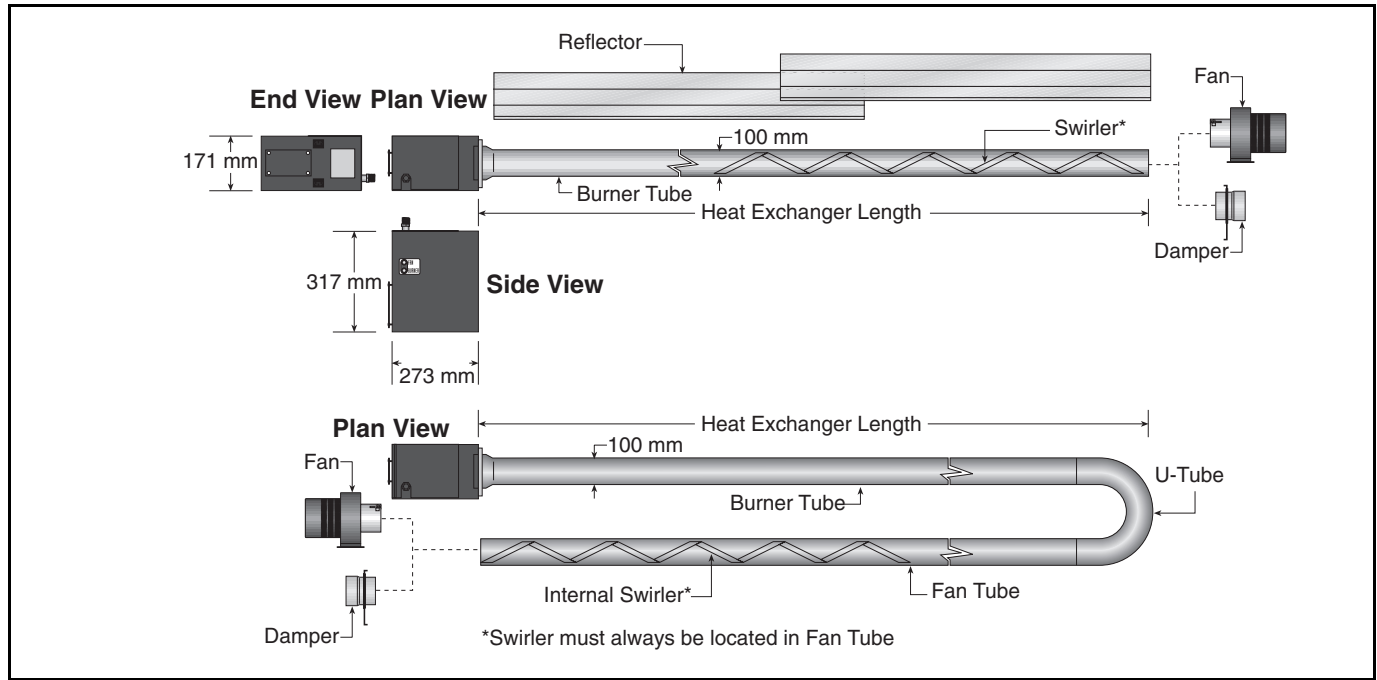
4.8 U-Tube Heater	BH15UT	BH20UT	BH25UT	BH30UT	BH35UT	BH40UT	BH45UT	BH50UT
Input – kW	15	20	25	30	35	40	45	50
Input – MJ	54	72	90	110	125	138	162	180
Tube Length – mm	3323	4843	4843	6363	6363	6363	7998	7998
Overall Heater Length - mm	3893	5417	5417	6941	6941	6941	8465	8465
Weight – kg	39	54	54	65	65	66	96	96
Heated Area – m ²	20-160	30-210	40-265	50-315	55-370	65-420	70-475	80-525
Minimum Installation Height* – m	2.5	2.8	3.5	4.0	5.0	5.0	5.0	5.0
Recommended Installation Height* – m	3.0	3.5	3.9	4.2	4.8	5.5	6.7	7.6

*Heights quoted are from ground level to bottom face of firing tube.

NOTE:- Factory recommended mounting heights are listed above as a guideline. If infra-red heaters are mounted too low, they may result in heat discomfort. It is generally recommended to observe the recommended mounting heights to optimize comfort conditions. However, certain applications such as spot heating, freeze protection, outdoor patio heating or very high ceilings may result in the heaters being mounted outside of the factory recommended mounting heights. Clearances to combustibles must always be maintained.

4.9 Burner Specifications

Figure 16: BLACKHEAT® Linear and U-Tube



4.9.1 Burner Air Plate	BH15	BH20	BH25	BH30	BH35	BH40	BH45	BH50
Marking	071300+	20	15	12	06	07	09	11

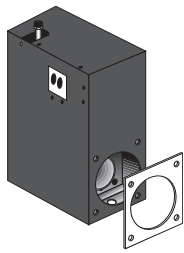
4.9.2 Jet Marking	BH15	BH20	BH25	BH30	BH35	BH40	BH45	BH50
Natural	#30	3.8 mm	#19	4.7 mm	#9	#3	#1	D
Propane/Butane	#46	2.3 mm	#37	#33	3.1 mm	3.3 mm	#29	#26

4.9.3 Gas Consumption	BH15	BH20	BH25	BH30	BH35	BH40	BH45	BH50
Natural [MJ/hr]	54	72	90	110	125	138	162	180

ULPG [kg/h]	[1.07]	[1.43]	[1.79]	[2.15]	[2.50]	[2.86]	[3.22]	[3.58]
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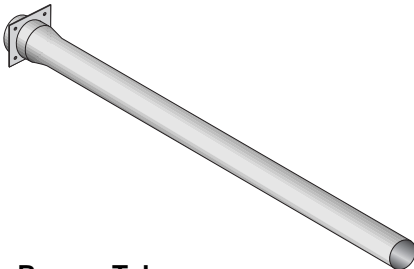
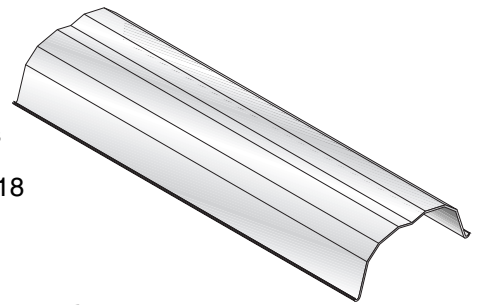
4.9.4 Governor Pressure	BH15	BH20	BH25	BH30	BH35	BH40	BH45	BH50
ULPG	All Models 2.60 kPa							
Natural Gas	All Models 0.75 kPa							

SECTION 5: MAJOR COMPONENT DESCRIPTIONS

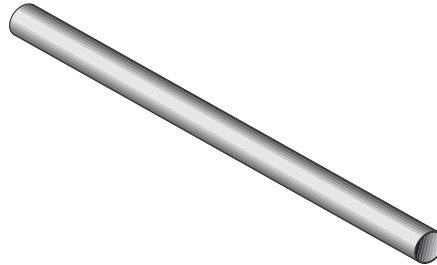


Burner (shown with Tube Gasket)
Must be installed with the flame observation window facing down.

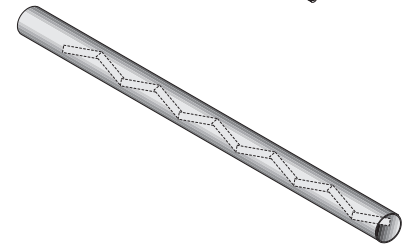
Reflector (Aluminium or Stainless Steel)
Alternate overlap as shown on overview. Minimum overlap is 18 cm.



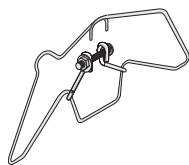
Burner Tube
Supplied in 3m lengths. Burner tube is always the first tube after the burner.



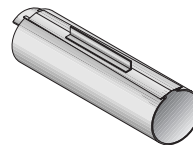
Tube
Heat Treated Aluminized Tube Supplied in 3m lengths.



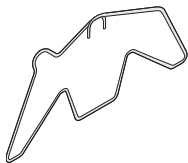
Fan Tube with Internal Swirler
Fan tube is always the last tube on the heater where the fan is attached.



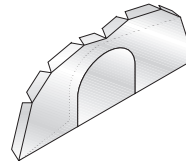
Tube and Reflector Hanger with Tube Clamp Package
Position this hanger no more than 20cm away from the burner assembly. Recommended 100mm.



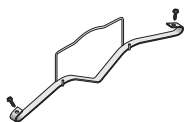
Coupling Assembly with Lock



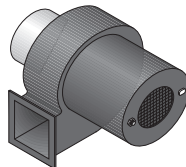
Tube and Reflector Hanger
Suspend system from these hangers.



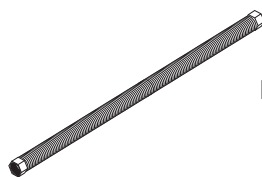
Reflector End Cap
Punch out center section to accommodate heat exchanger tube.



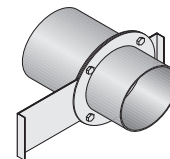
Reflector Support Strap, Wire Form & #8 x 3/4 (3.9 x 19mm) Screw



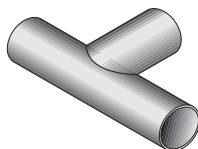
Fan Assembly (Includes Flange)
Fan Assembly is attached to the last section of heat exchanger tubing (Fan Tube).



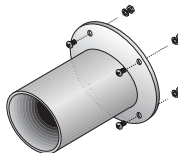
Flex Gas Line



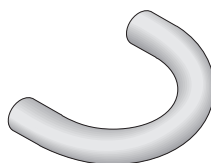
Damper Flange Assembly
For use on Multiburner Systems.



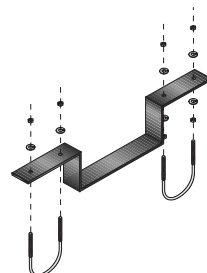
Tee Assembly



Fan Flange Assembly and Screws



U-Tube Assembly



U-Tube Support Bracket



Turnbuckle Adjuster



Bow Shackle

SECTION 6: GENERAL SUSPENSION DETAILS

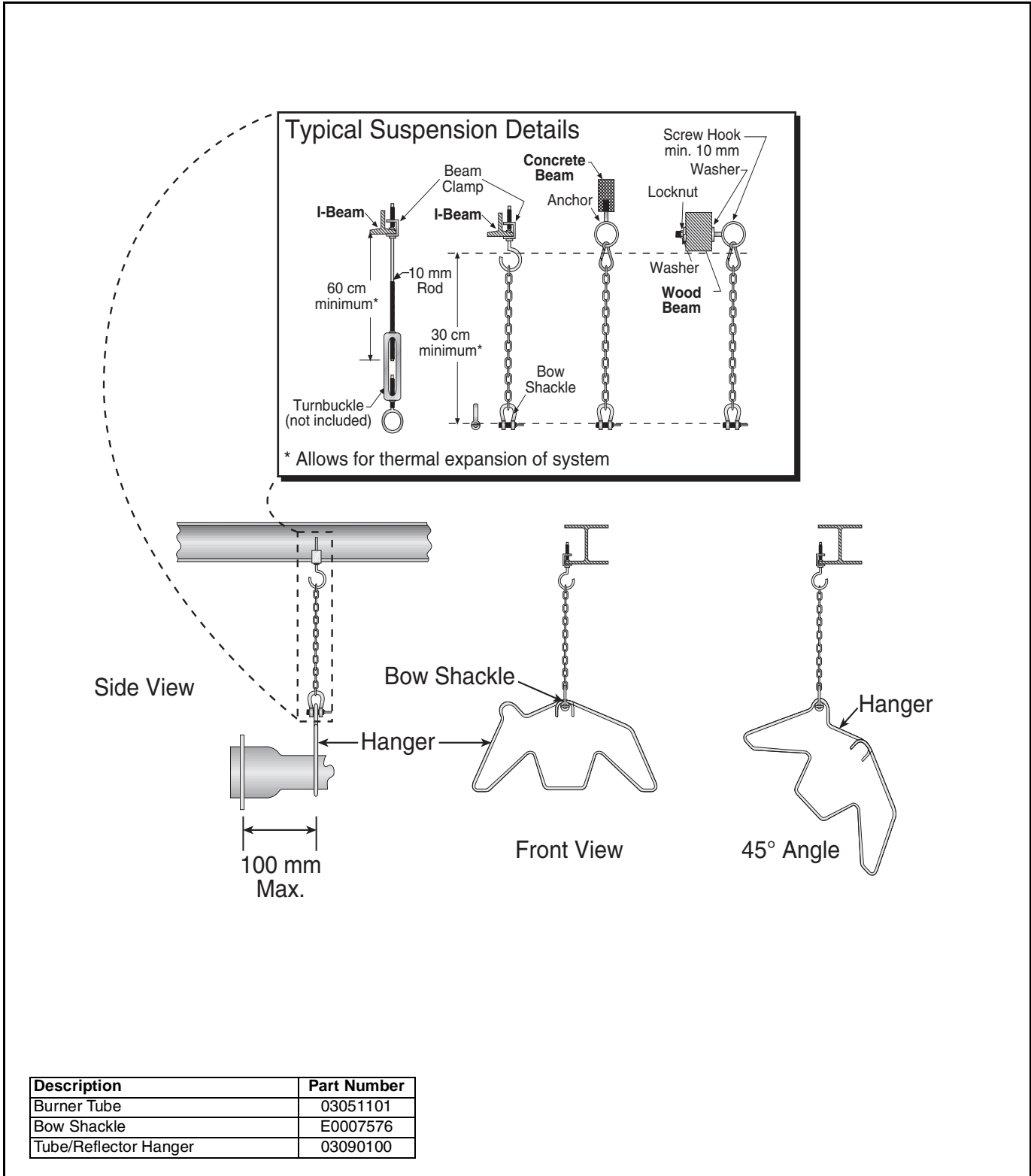
⚠ WARNING

Suspension Hazard

Hang heater with general purpose welded link steel chain, 4 mm or larger in diameter, with working load of 340 Kg.

Failure of the supports can result in death, injury or property damage.

Step 6.1 Suspension Details



SECTION 7: LINEAR HEATER INSTALLATION

The figures in this section provide a general overview of component placement in a BLACKHEAT® Linear system. The location of some components such as supports and couplings is crucial for proper installation. Assemble the heater components as shown on Page 14, Figure 17.

For optional reflector configurations for Linear heaters See Page 4, Figure 2 through Page 5, Figure 8. Install appropriate suspension hardware, beam clamps, chain or rod at predetermined locations. Adjustments of chain length will provide uniform pitch. If any step is unclear, please contact Roberts-Gordon at +61 [3]9561 2100 [Hurl Nu-Way Pty Ltd]

7.1 Linear Standard Parts List

Part No.	Description	BH15	BH20	BH25	BH30	BH35	BH40	BH45	BH50
	BLACKHEAT® Burner Assembly (Input and Fuel Varies)	1	1	1	1	1	1	1	1
07260001	Fan Package XP 1	1	1	1	1	-	-	-	-
07260002	Fan Package XP 2	-	-	-	-	1	1	1	-
07260003	Fan Package XP 3	-	-	-	-	-	-	-	1
03051101	Burner Tube, 100 mm x 3048 mm	1	1	1	1	1	1	1	1
91409408	Tube, 100 mm x 3048 mm	-	1	1	2	2	2	3	3
S5127W	Fan Tube, 100 mm x 3048 mm, with 3048 mm Swirler	1	1	1	1	1	1	1	
S5134W	Fan Tube, 100 mm x 3048 mm with 2134 mm Swirler	-	-	-	-	-	-	-	1
01329600	Standard Coupling Assembly	1	2	2	3	3	3	4	4
01329700	Coupling Lock	1	2	2	3	3	3	4	4
02750303	Reflector, Aluminium, 2439 mm	3	4	4	6	6	6	7	7
S5163W	Reflector, Stainless Steel, 2439 mm (Optional)*	3	4	4	6	6	6	7	7
02750800	Reflector End Cap, Aluminium	2	2	2	2	2	2	2	2
C2332B	Reflector End Cap, Stainless (Optional)*	2	2	2	2	2	2	2	2
03090100	Tube and Reflector Hanger	3	4	4	5	5	5	6	6
01318901	Tube Clamp Package (including Nut, Washer & Bolt)	1	1	1	1	1	1	1	1
91908004	Wire Form	2	3	3	5	5	5	6	6
94320812	Screw #8 x 3/4 (3.9 x 19mm), (goes with 91908004)	4	6	6	10	10	10	12	12
03050000	Reflector Support Strap	2	3	3	5	5	5	6	6
E0007576	Bow Shackle	3	4	4	5	5	5	6	6
91107720	U-Clip Package (20 Pieces)	1	1	1	1	1	1	1	1

* PVC coating must be removed prior to installation.

Figure 17: BLACKHEAT® Linear General Assembly Overview

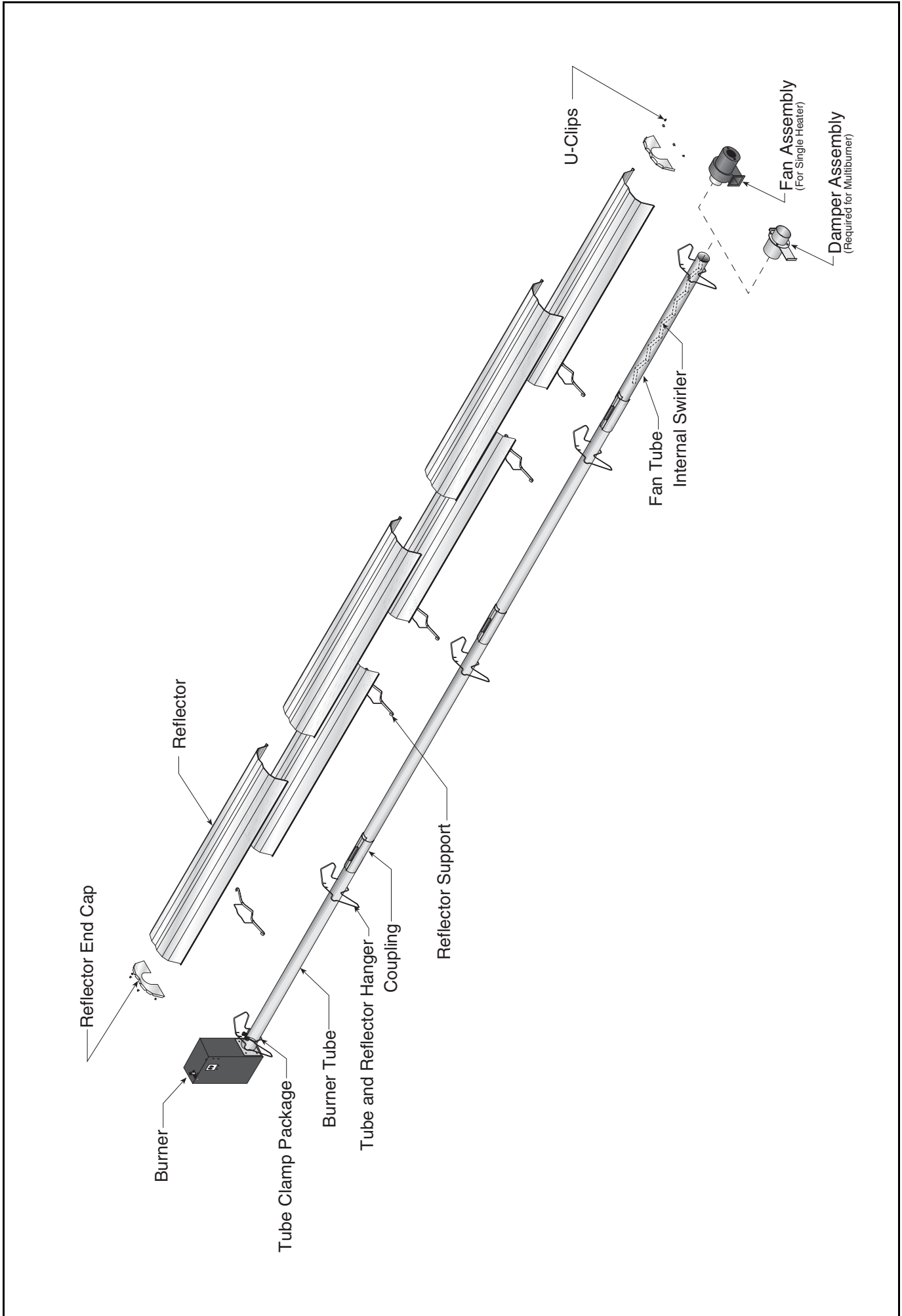
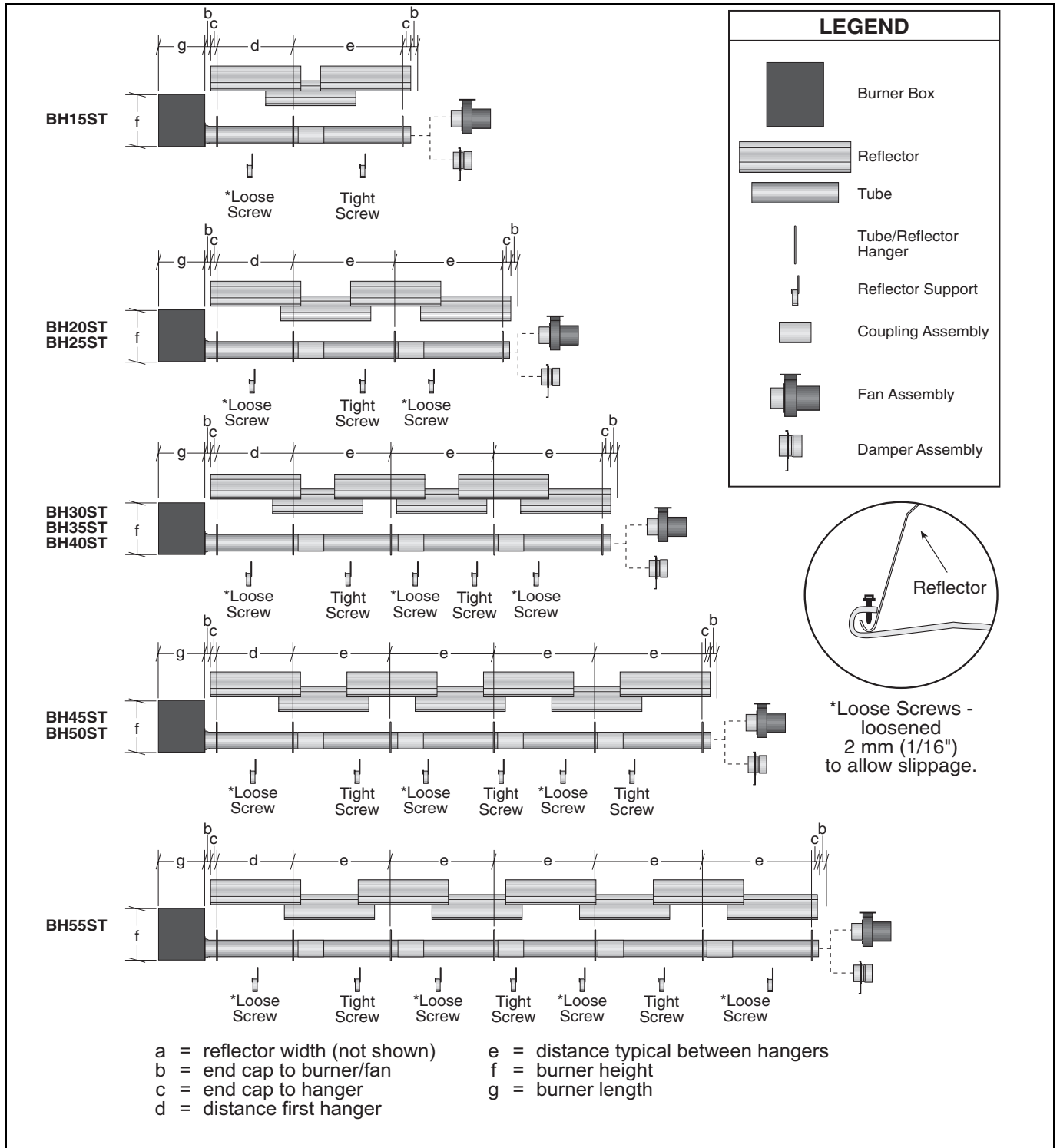


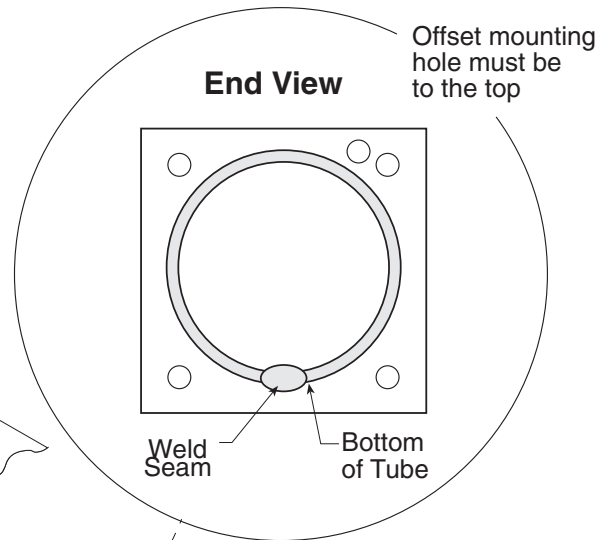
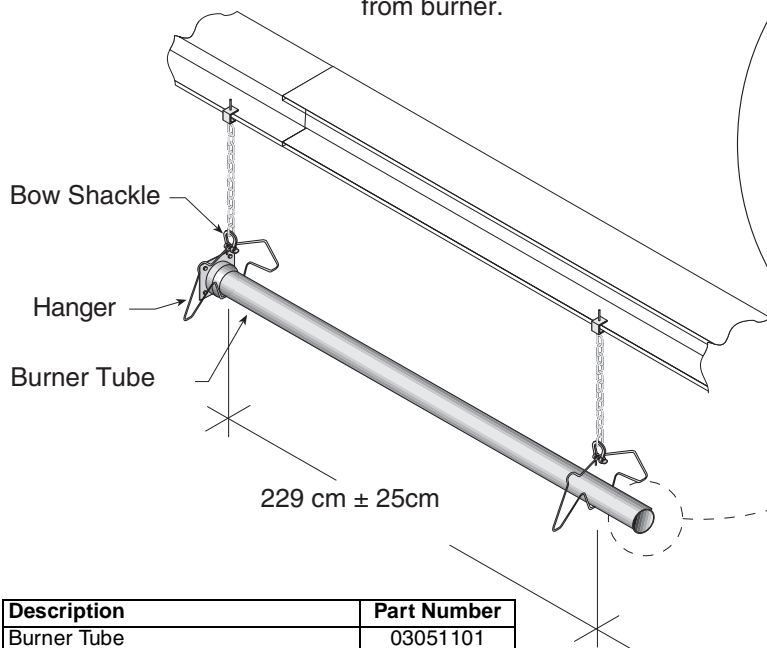
Figure 18: BLACKHEAT® Linear Layout Overviews -[BH55 Not Available]



Model	Reflector Overlap (approx.)	a	b	c	d	e	f	g
BH15	700 mm	365 mm	50 mm	50 mm	2290 mm	3050 mm	366 mm	291 mm
BH20..	250 mm	365 mm	50 mm	50 mm	2290 mm	3050 mm	366 mm	291 mm
BH25	250 mm	365 mm	50 mm	50 mm	2290 mm	3050 mm	366 mm	291 mm
BH30..	530 mm	365 mm	50 mm	50 mm	2290 mm	3050 mm	366 mm	291 mm
BH35	530 mm	365 mm	50 mm	50 mm	2290 mm	3050 mm	366 mm	291 mm
BH40..	530 mm	365 mm	50 mm	50 mm	2290 mm	3050 mm	366 mm	291 mm
BH45	330 mm	365 mm	50 mm	50 mm	2290 mm	3050 mm	366 mm	291 mm
BH50..	330 mm	365 mm	50 mm	50 mm	2290 mm	3050 mm	366 mm	291 mm
BH55	200 mm	365 mm	50 mm	50 mm	2290 mm	3050 mm	366 mm	291 mm

Step 7.3 Burner Tube Installation

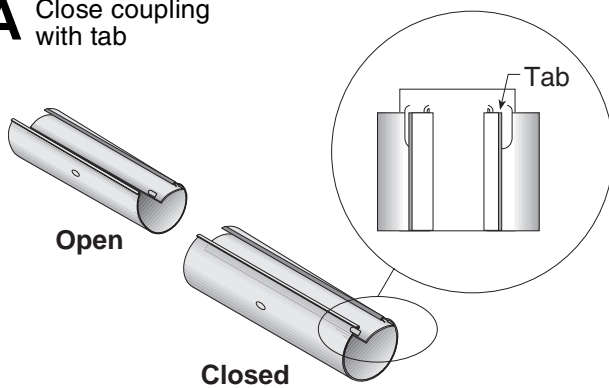
NOTE:
Tubing requires a downward slope of 13 mm per 6 m away from burner.



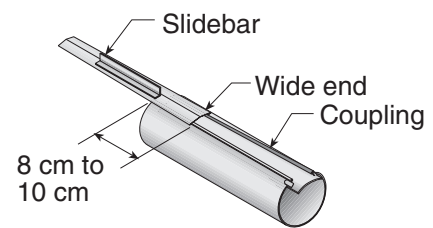
Description	Part Number
Burner Tube	03051101
Bow Shackle	E0007576
Tube/Reflector Hanger	03090100

Step 7.4 Coupling and Tube Assembly

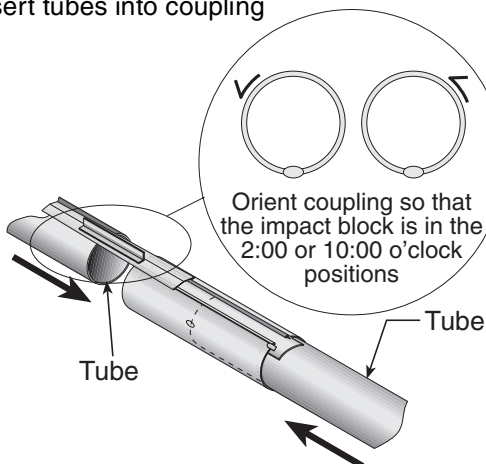
A Close coupling with tab



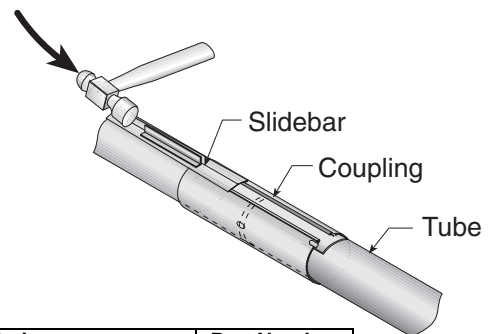
B Start Slidebar/Coupling Lock onto coupling



C Insert tubes into coupling



D Tighten coupling to join tubes

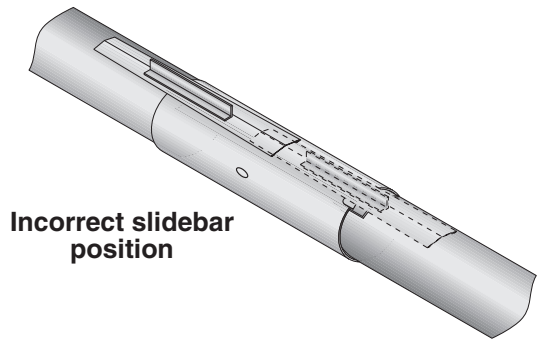
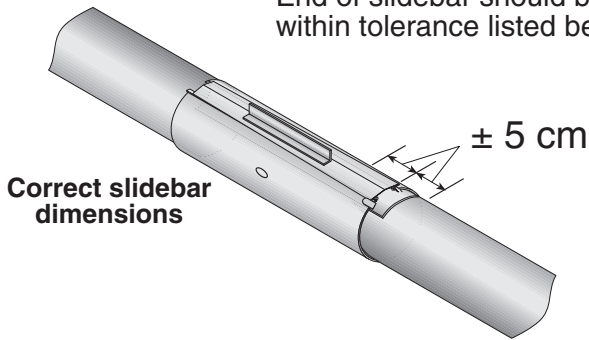


Description	Part Number
Coupling	01329600
Slidebar/Coupling Lock	01329700
Tube	91409408

Step 7.4.1 Coupling and Tube Assembly (Continued)

⚠ WARNING
 Tighten slidebar as shown below.
 Tubes will fall down if slidebar is incorrect.
 Failure to follow these instructions can result in death,
 injury or property damage.

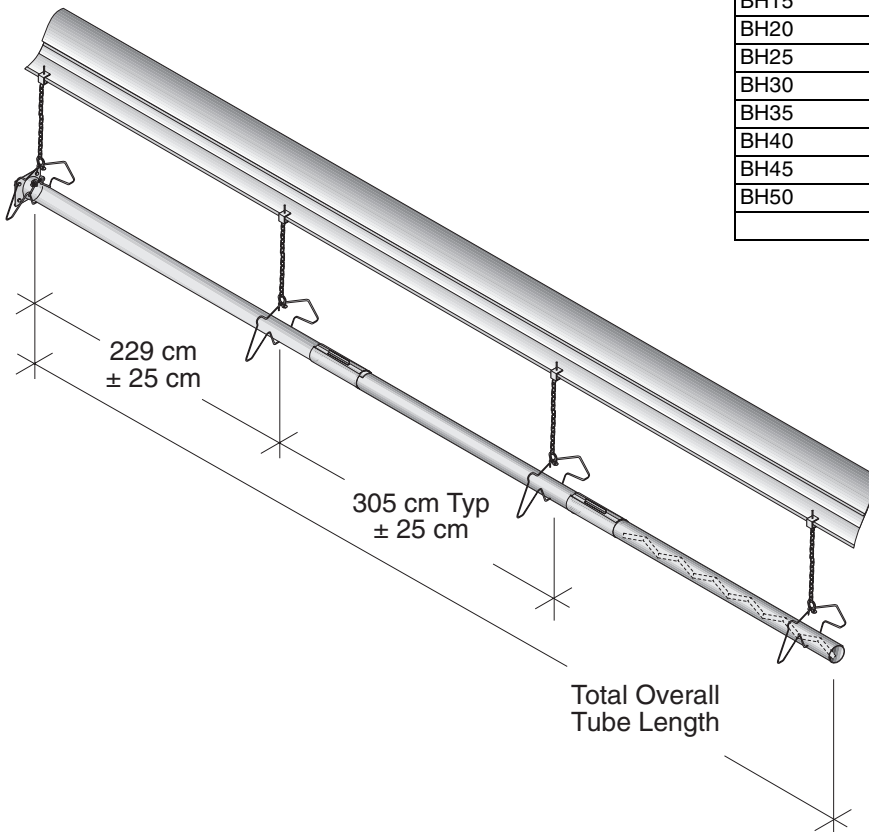
Drive Slidebar until tight.
 End of slidebar should be
 within tolerance listed below.



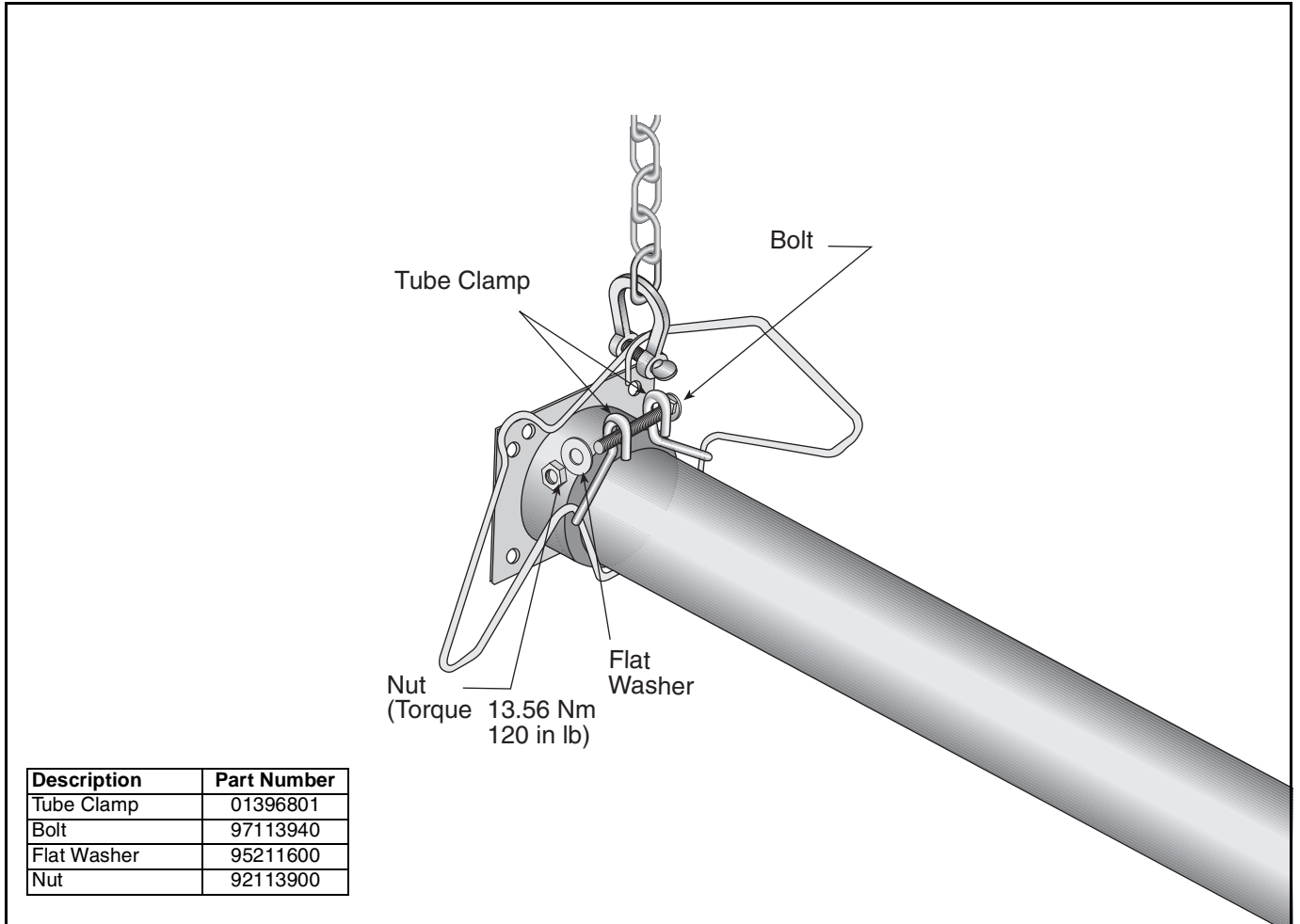
- Repeat Step 7.4 A - D until all tubes are assembled, See Page 20, Section 7.4.2 shown below.

Step 7.4.2 Coupling and Tube Assembly (Continued)

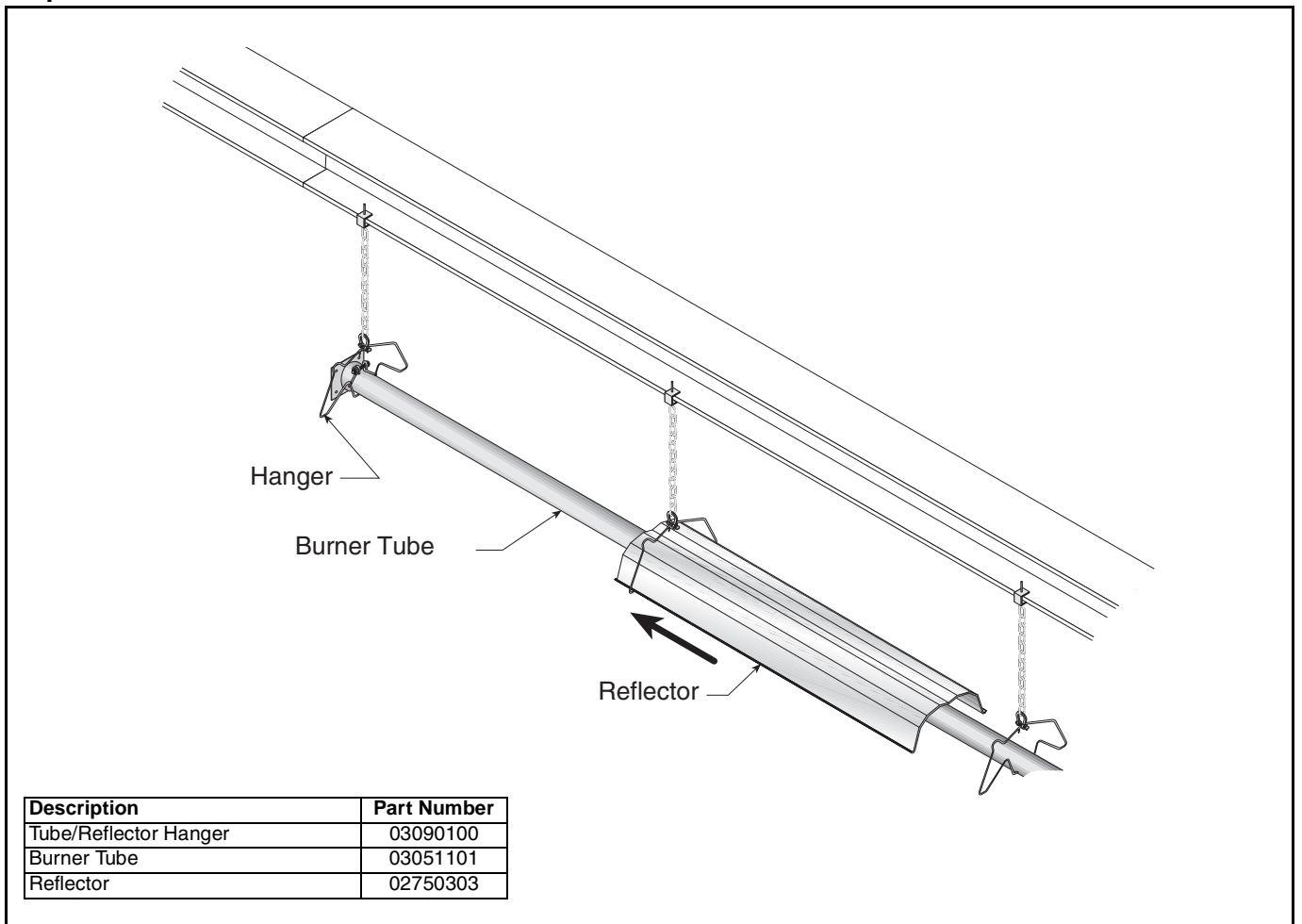
Model	Heat Exchanger Overall Tubing Length (m)	Number of Tubes
BH15	6	2
BH20	9	3
BH25	9	3
BH30	12	4
BH35	12	4
BH40	12	4
BH45	15	5
BH50	15	5



Step 7.5 Tube Clamp Package Installation



Step 7.6 Reflector Installation



Step 7.6.1 Reflector Installation (Continued)

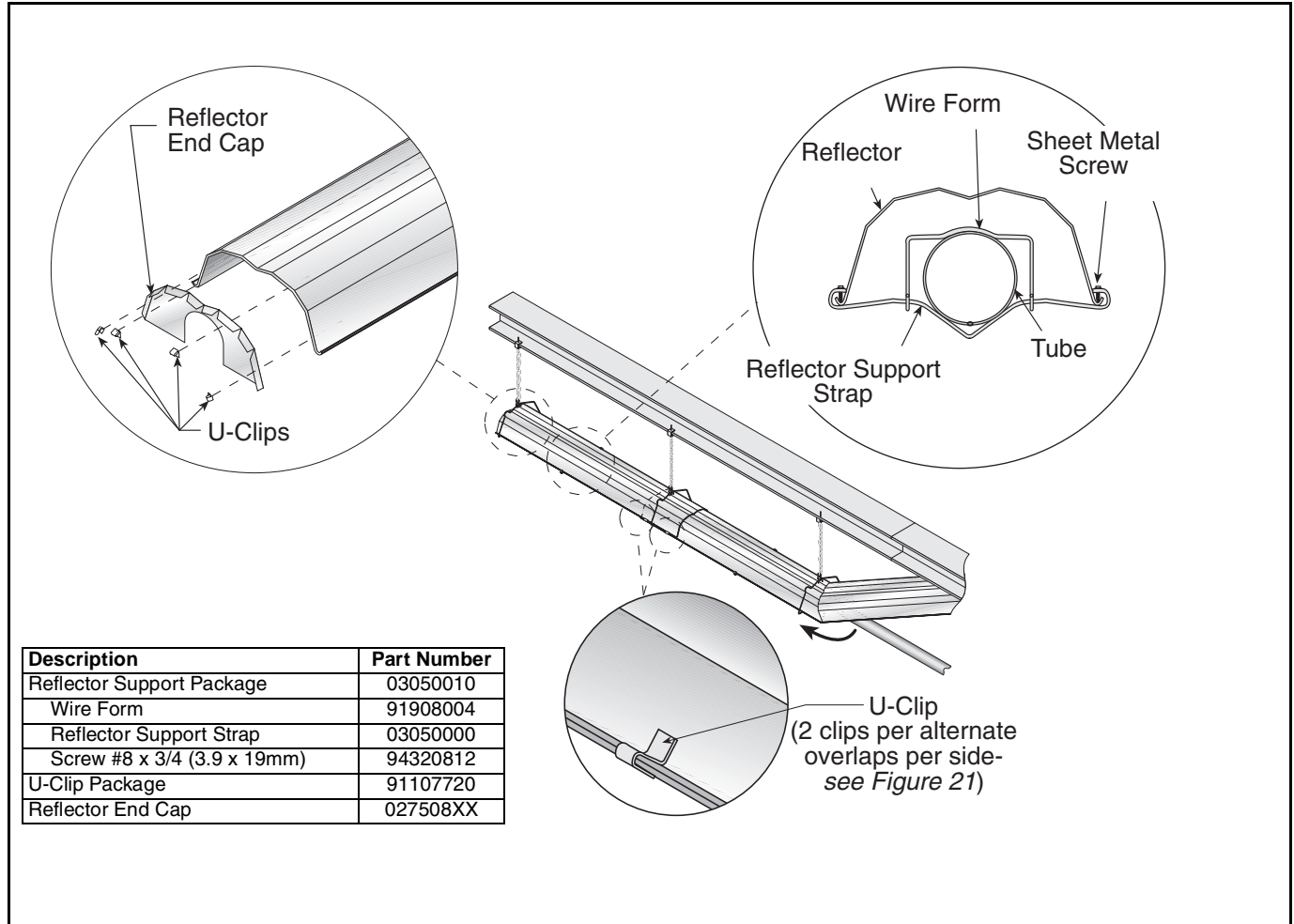
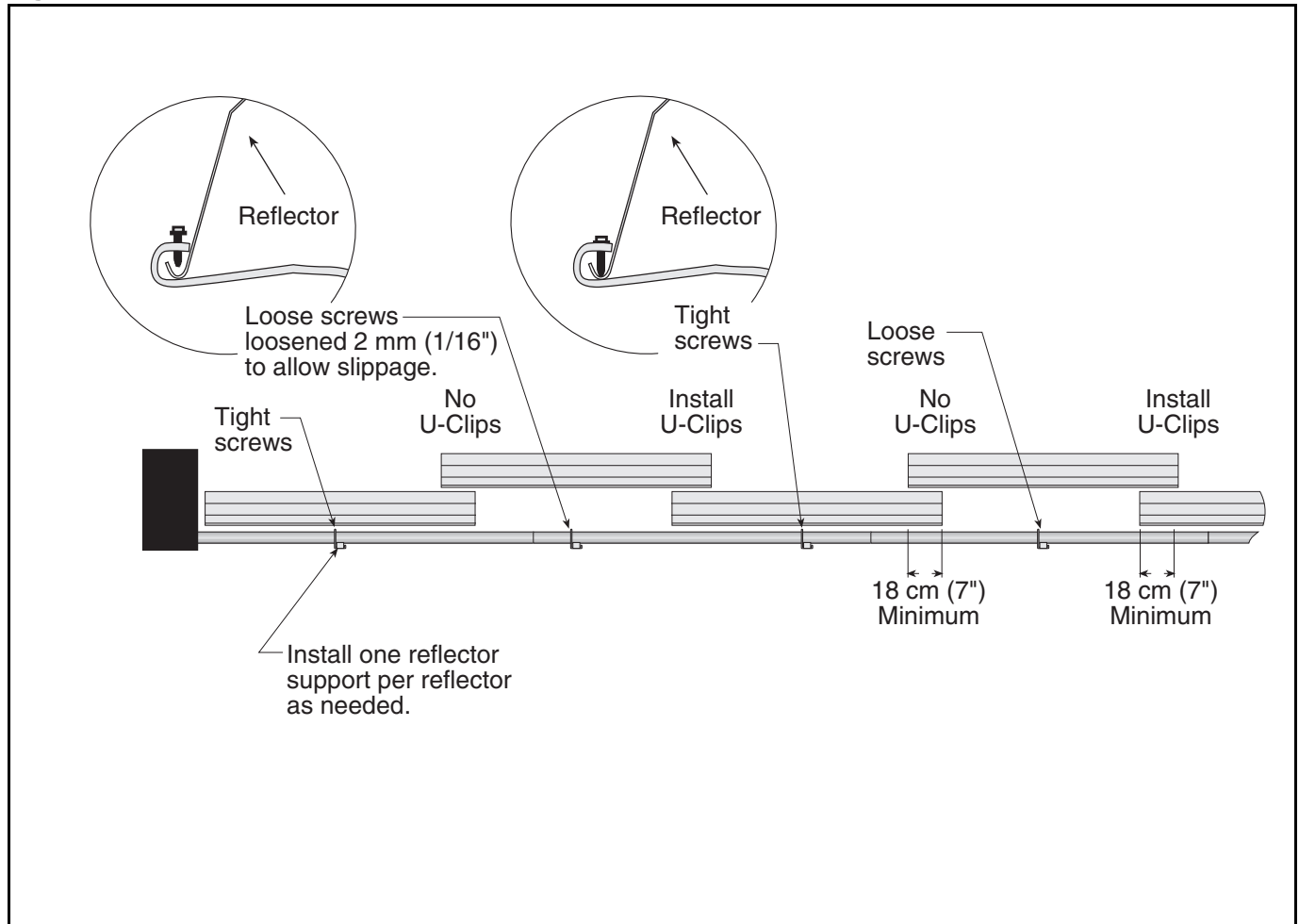


Figure 21: Reflector Overlap Detail



SECTION 8: U-TUBE HEATER INSTALLATION

The figures in this section provide a general overview of component placement in a BLACKHEAT® U-Tube system. The location of some components such as supports and couplings is crucial for proper installation. Assemble the heater components as shown on *Page 14, Figure 17*.

For optional reflector configurations for U-tube heaters See *Page 6, Figure 9 through Page 7, Figure 15*. Install

appropriate suspension hardware, beam clamps, chain or rod at predetermined locations. Adjustments of chain length will provide uniform pitch.

If any step is unclear, please contact Roberts-Gordon at +44 (0) 1902 494425 or +61 [3]9561 2100

8.1 U-Tube Standard Parts List

Part No.	Description	BH15	BH20	BH25	BH30	BH35	BH40	BH45	BH50
	BLACKHEAT® Burner Assembly (Input and Fuel Varies)	1	1	1	1	1	1	1	1
07260001	Fan Package XP1	1	1	1	1	-	-	-	-
07260002	Fan Package XP2	-	-	-	-	1	1	1	-
07260003	Fan Package XP3	-	-	-	-	-	-	-	1
03051101	Burner Tube, 100 mm x 3048 mm	1	1	1	1	1	1	1	1
91409408	Tube, 100 mm x 3048 mm	-	-	-	2	2	2	2	2
91409423	Tube, 100 mm x 1524 mm	-	2	2	-	-	-	2	2
S5127W	Fan Tube, 100 mm x 3048 mm, with 3048 mm Swirler	1	1	1	1	1	1	1	
S5134W	Fan Tube, 100 mm x 3048 mm with 2134 mm Swirler	-	-	-	-	-	-	-	1
01335901	U-Bend	1	1	1	1	1	1	1	1
01329600	Standard Coupling Assembly	2	4	4	4	4	4	6	6
01329700	Coupling Lock	2	4	4	4	4	4	6	6
02750303	Reflector, Aluminium, 2439 mm	4	4	4	6	6	6	8	8
S5134W	Reflector, Stainless Steel, 2439 mm (Optional)*	4	4	4	6	6	6	8	8
02750800	Reflector End Cap, Aluminium	4	4	4	4	4	4	4	4
C2332B	Reflector End Cap, Stainless (Optional)*	4	4	4	4	4	4	4	4
03090100	Tube and Reflector Hanger	4	6	6	6	6	6	8	8
01318901	Tube Clamp Package (including Nut, Washer & Bolt)	1	1	1	1	1	1	1	1
91908004	Wire Form	2	4	4	4	4	4	6	6
03050000	Reflector Support Strap	2	4	4	4	4	4	6	6
03020501	U-Bend Support Bracket	1	1	1	1	1	1	1	1
E0007576	Bow Shackle	4	6	6	6	6	6	8	8
91107720	U-Clip Package (20 Pieces)	2	2	2	2	2	2	2	2
91912501	U-Bolt M6	2	2	2	2	2	2	2	2
C0090B	Nut M6	6	6	6	6	6	6	6	6
96411500	Lockwasher 6mm	6	6	6	6	6	6	6	6
94320812	Screw #8 x 3/4 (3.9 x 19mm), (goes with 91908004)	4	8	8	8	8	8	12	12
S7199K	Damper Flange Assembly (For use on Multiburner Systems)					1 Per Heater			

*PVC coating must be removed prior to installation.

Figure 22: BLACKHEAT® BH15UT Assembly Overview

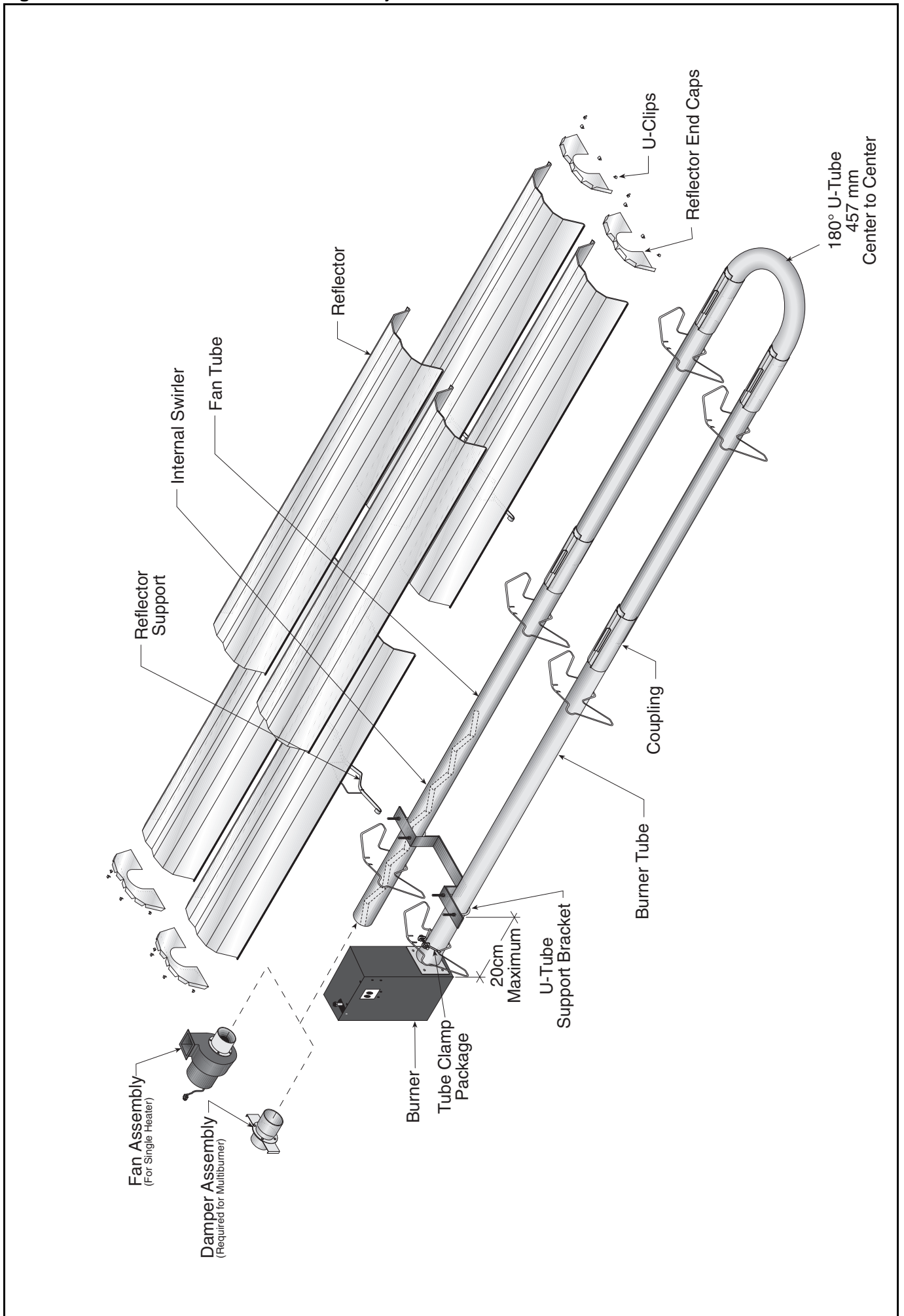
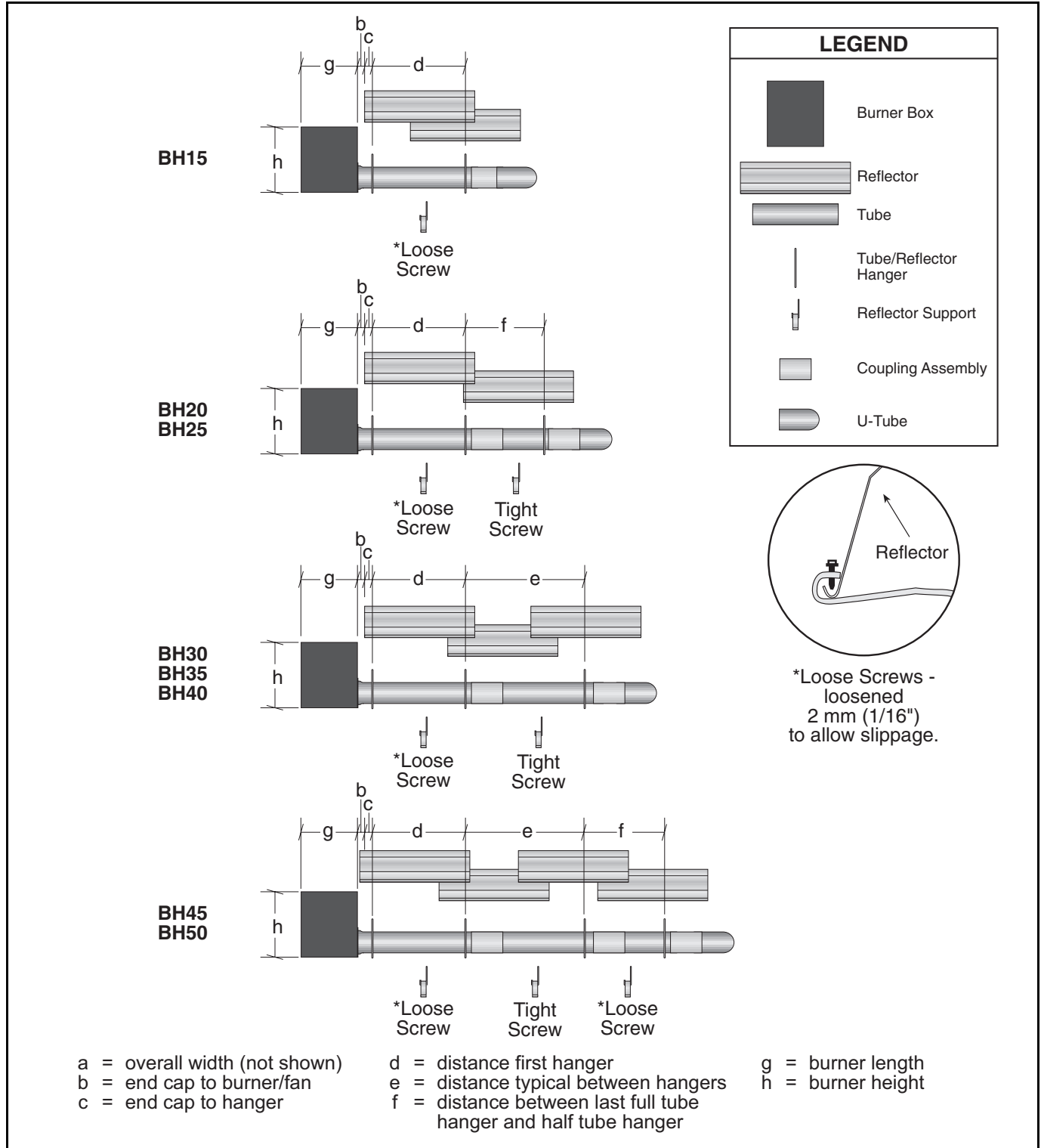


Figure 23: BLACKHEAT® U-Tube Layout Overviews



Model	Reflector Overlap (approx.)	a	b	c	d	e	f	g
BH15	1780 mm	850 mm	50 mm	50 mm	2290 mm	3050 mm	366 mm	291 mm
BH20....	250 mm	850 mm	50 mm	50 mm	2290 mm	3050 mm	366 mm	291 mm
BH25	250 mm	850 mm	50 mm	50 mm	2290 mm	3050 mm	366 mm	291 mm
BH30....	580 mm	850 mm	50 mm	50 mm	2290 mm	3050 mm	366 mm	291 mm
BH35	580 mm	850 mm	50 mm	50 mm	2290 mm	3050 mm	366 mm	291 mm
BH40....	580 mm	850 mm	50 mm	50 mm	2290 mm	3050 mm	366 mm	291 mm
BH45	690 mm	850 mm	50 mm	50 mm	2290 mm	3050 mm	366 mm	291 mm
BH50....	690 mm	850 mm	50 mm	50 mm	2290 mm	3050 mm	366 mm	291 mm

Step 8.2 Critical Hanger Placement

NOTE: Spreader bar must be used on single suspension point installations. Do not hang heater from spreader bar.

Description	Part Number
Bow Shackle	E0007576
Tube/Reflector Hanger	03090100
Spreader Bar	07260010

Step 8.3 Burner Tube and Fan Tube Installation

End View
Offset mounting hole must be to the top

Description	Part Number
Burner Tube	03051100
Fan Tube	S5127W

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