LIVESTOCK HEATERS

Installation, Operation & Maintenance instructions

MODELS: - 1ZRFS; 2ZRFS/A; 3ZRFS/A; 6ZRFS/A; 8ZRFS/A; 12ZRFS/A; 16ZRFS/A

AGA APPROVAL 3712

THESE APPLIANCES SHALL BE INSTALLED BY AN AUTHORISED PERSON. FAILURE TO COMPLY WILL VOID APPLIANCE WARRANTY

These instructions shall be read in conjunction with any additional instruction sheets attached. Please read all instructions before operating the appliance/s. All installations shall be carried out in accordance with the requirements of AS5601 [Gas Installations Code], any specific requirements of the local Gas Authority and applicable Electrical Standards [for automatic ignition and multiple heater installations].

On completion of the installation, the installer must check system operation and advise user/operator of the correct use of the heater or system. Note that subject to maintenance and parts replacement information as detailed below there are no adjustable or moveable components fitted to these appliances.

WARNINGS

THESE APPLIANCES ARE DESIGNED FOR LIVESTOCK HEATING ONLY, AND ARE NOT APPROVED FOR DOMESTIC USE INDOORS

HEATERS ARE NOT APPROVED FOR, AND ARE NOT SUITABLE FOR USE ON NATURAL GAS.

HEATERS REQUIRE AND ARE APPROVED FOR MINIMUM LPG LINE PRESSURE OF 16 kPa. A standard 2.75 kPa gas regulator is not suitable and MUST NOT be used.

DO NOT OPERATE THE APPLIANCES IN AN ENCLOSED OR UNVENTILATED SPACE; THE MINIMUM ROOM SIZE FOR THIS TYPE OF APPLIANCE IS 3 CUBIC METRES PER MJ OF HEATER INPUT [REFER DATA CHART BELOW]. IF THIS REGULATION CANNOT BE MET, FLUED RADIANT TUBE HEATERS MUST BE USED. ADDITIONAL VENTILATION MAY BE REQUIRED FOR LIVESTOCK.

DO NOT PLACE ARTICLES ON OR AGAINST THESE APPLIANCES and DO NOT STORE CHEMICALS OR FLAMMABLE MATERIALS, OR SPRAY AEROSOLS NEAR THEM.

DO NOT OPERATE THESE APPLIANCES WITH ANY COMPONENTS REMOVED FROM THEM. AIR FILTERS SHALL BE FITTED AT ALL TIMES.

GENERAL

Heaters are supplied either as single units with individual gas regulators or in multiples with regulated gas control panels. Heaters may be manual start [S] type or automatic electric start [A] type. All sizes except 1Z [manual only] are available in either type. All heaters feature variable heat output, but MUST always be used with Novacomet type 1910 regulators to provide output adjustment and to operate on the required higher than standard LP gas pressure.

MINIMUM LP GAS LINE PRESSURE TO REGULATOR = 16 kPa

Single heater installations require the following:-
1. Heater
2. Approved gas hose [maximum length 3 metres]
3. Novacomet 1910 gas regulator [with POL cylinder fitting if used on single cylinder installation]
4. Gas supply cylinder. Minimum of two x 45 kg is recommended with automatic changeover device and first stage regulator with outlet pressure not less than 16 kPa.

Multiple heater systems will be either manual start high/low operation or automatic start high/low/off operation. In all cases the gas control station [regulator panel] must incorporate Novacomet type 1910 regulators with Approved gas solenoid valve/s. The heaters shall be equipped with gas hoses terminated with quarter turn shut-off valves and preferably with quick connect couplings.

Gas supply shall be reticulated from gas supply tank at a minimum pressure of 16kPa to the gas control station and then via supply lines to the heater offtake positions. Gas Authority regulations may require the installation of OPSO [over pressure shut off] devices downstream of the first stage gas regulator.

Power supply for automatic start heaters shall be controlled in such a manner that ignition time for the heaters does not exceed 60 seconds. SBM Sunmaster control is recommended.

TECHNICAL DATA, USAGE & GAS CONSUMPTION

MODELS 1, 2, 3, 6 & 8

GUIDELINE TO HEATER CHOICE

Heat Input
↓ **Reflector**
↓ ↓ **Air filter**
↓ ↓ ↓ **Flame safety device**
#Z R F S manual ignition
#Z R F A automatic ignition

N = Number of animals or birds
H = Height of heater above back of animal in metres

HEATER MODEL	**1ZRFS**		**2ZRFS/A**		**3ZRFS/A**		**6ZRF/A**		**8ZRFS/A**	
	N	**H**	**N**	**H**	**N**	**H**	**N**	**H**	**N**	**H**
Chicks or Quails on floor	120	0.80	200	0.90	400	1.10	600	1.20	1000	1.50
Layers					400	1.80	600	2.00	1000	2.30
Chickens in cages	60	0.75	100	0.90	200	1.00	300	1.10	500	1.40
Quails or Pheasants in cages	70	0.75	130	0.90	240	1.00	360	1.10	600	1.40
Turkeys	60	0.80	100	0.90	180	1.10	300	1.20	450	1.50
Guinea hens, Goslings & Ducks	100	0.80	170	0.90	300	1.10	450	1.20	750	1.50
Fattening rabbits					250	1.50	380	1.80	600	2.00
Rabbits breeding (adult)					24	1.40	36	1.70	60	1.90
Goats & Lambs					25	1.90	40	2.30	60	2.90
Ostrich chicks (Note 1)					10	1.50	10	2.00	-	-
Emu chicks (Note 1)					25	1.50	20	2.00	-	-
Sow & litter creep	1	0.75	2	0.90	2	0.90	-	-	-	-
Weaned piglets 3-10 weeks					36	1.60	60	2.00	-	-
Fattening pigs 10-25 weeks					24	1.60	36	2.00	-	-

HEATER MODEL	1ZRFS	2ZRFS/A	3ZRFS/A	6ZRFS/A	8ZRFS/A
Weight kg	1.1	1.25	1.4	1.8	2.2
Injector diameter mm	0.27	0.35	0.40	0.58	0.65
Heat Input Watt	550	1055	1486	3200	3944
@ 16.5 kPa (HIGH FIRE)					
Heat Input MJ/h	*1.98*	*3.80*	*5.35*	*11.53*	*14.20*
@ 16.5 kPa (HIGH FIRE)					
Gas consumption	.0157/.0395	.0385/.0756	.0412/.1060	.1195/.2288	.1592/.2819
kg/h @ 6.35 kPa (LOW FIRE) & 16.5 kPa (HIGH FIRE). See Note 2					
Heating time	*1140*	*595*	*424*	*196*	*160*
Estimated hours continuous running at high fire rate on 45 kg gas cylinder.					
Minimum enclosure volume cubic metres:-					
	6.0	11.5	16.0	36.0	43.0

Note 1: Quantity of birds is subject to their age and design of the enclosure.
Note 2: Heater output is variable between 6.35 & 16.5 kPa via adjustable regulator or optional high/low thermostat & gas station using two regulators [one set at minimum and one set at maximum].
Appliance input ratings & running times based on gas consumption tests December 2004.

MODELS 12,16

GUIDELINE TO HEATER CHOICE

Heat Input
↓ **Reflector**
↓ ↓ **Air filter**
↓ ↓ ↓ **Flame safety device**
#Z R F S manual ignition
#Z R F A automatic ignition

N = Number of animals or birds
H = Height of heater above back of animal in metres

HEATER MODEL	12ZRFS/A		16ZRFS/A	
	N	**H**	**N**	**H**
	CONTACT SUPPLIER FOR LIVESTOCK RECOMMENDATIONS ON THESE MODELS			
Weight kg	2.7		3.2	
Injector diameter mm	0.78		0.975	
Heat Input Watt	5916		8555	
@ 16.5 kPa (HIGH FIRE)				
Heat Input MJ/h	*21.3*		*30.8*	
@ 16.5 kPa (HIGH FIRE)				
Gas consumption	.2437/.4225		..376/.611	
kg/h @ 6.35 kPa (LOW FIRE) & 16.5 kPa (HIGH FIRE). See Note 2 above.				
Heating time approx	*106*		*73*	
Estimated hours continuous running on 45 kg gas cylinder.				
Minimum enclosure volume cubic metres:-				
	64.0		93.0	

HEATER DIMENSIONS / GAS CONNECTIONS

	1ZRFS	2ZRFS 2ZRFA	3ZRFS 3ZRFA	6ZRFS 6ZRFA	8ZRFS 8ZRFA	12ZRFS 12ZRFA	16ZRFS 16ZRFA	
Length mm	185	248	312	310	374	500	625	
Width mm	172	172	172	231	231	231	231	
Height* mm	283	277	277	279	283	310	310	
Gas Connection All models, at rear, ¼"BSP male parallel thread to suit gas hose assembly.								
* Overall appliance height including filter assembly								

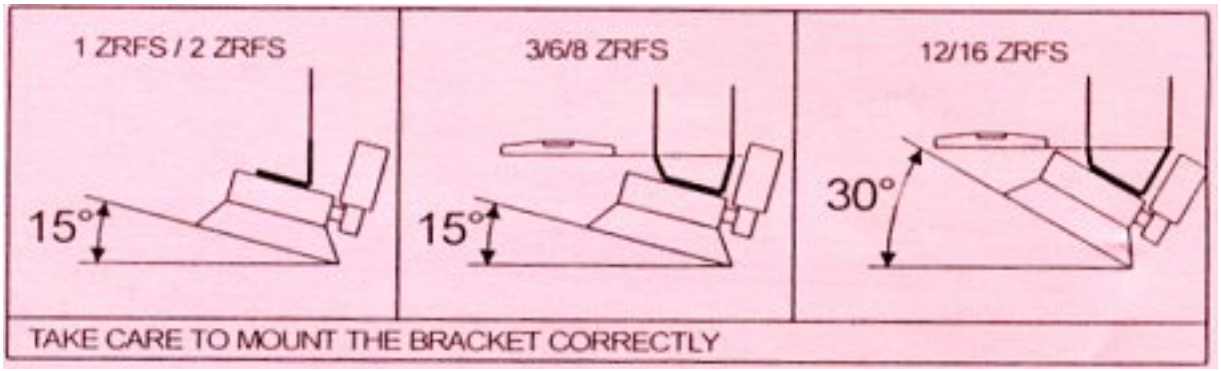
HEATER INSTALLATION

All heaters must be suspended by chain or rigid droppers attached to the suspension bracket/s provided with the heater. Suspension angles must be as illustrated below [brackets are purpose made to provide correct angle].

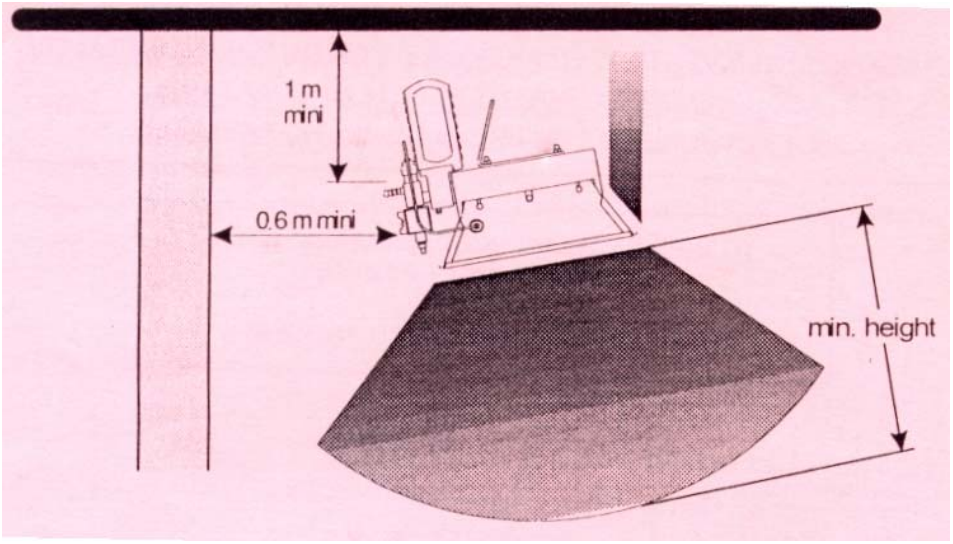
Heaters must be installed with minimum clearance from combustible material as illustrated below. For all heater models clearance of 1 metre above gas injector point is required and 0.6 metres horizontally.

Minimum clearances above ground level are tabulated below, however recommended heights above livestock of different types are given in the tables above.

HEATER MOUNTING ANGLE - INCLINATION



HEATER CLEARANCES



Minimum safety heights above ground:

MODEL	MINIMUM HEIGHT [m]
1ZRFS	0.30
2ZRFS/A	0.30
3ZRFS/A	0.30
6ZRFS/A	0.50
8ZRFS/A	0.50

MODEL	MINIMUM HEIGHT [m]
12ZRFS/A	0.50
16ZRFS/A	1.00

Minimum height is measured from lowest point of the heater. Note that tables above give recommended heights to the backs of the livestock being heated.

HEATER OPERATION

IMPORTANT: For livestock operation, building / livestock stalls should be pre-heated for 24 hours prior to arrival of the animals.

To light heaters:

1. MANUAL TYPE

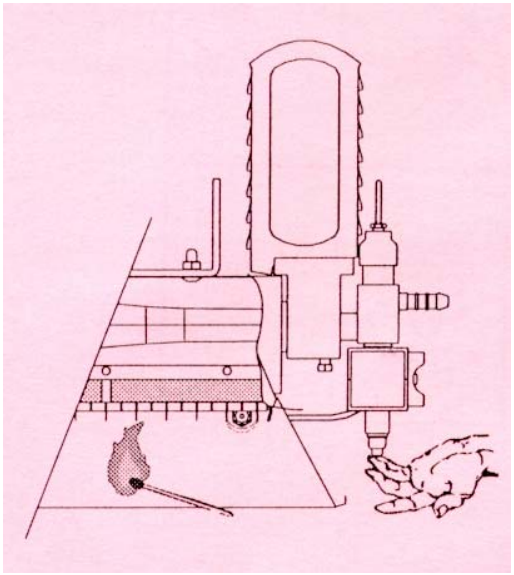
a. Open main gas supply or cylinder valve
b. If multiple installation open 1/4 turn valves at heater gas offtake points.
c. Set heater gas regulators to position '10'
d. Press heater gas valve push button while applying a flame to the ceramic plaque surface. Keep button depressed for a further 20-30 seconds after gas is lit.
e. If heater goes out, wait 1 minute then repeat step 'd' above.
f. When all heaters are lit, adjust regulator/s to required settings. On high/low control stations, 'High' regulator is normally set between 7 & 10, Low regulator between 1 & 3.

2. AUTOMATIC TYPE

a. Open main gas supply or cylinder valve
b. If multiple installation open 1/4 turn valves at heater gas offtake points.
c. Set heater gas regulators to position '10'
d. Turn on SUNMASTER controller - heaters will light automatically subject to Sunmaster settings - Refer separate instructions.
e. In case of power failure, heaters may be lit using manual system as detailed above

To shut off heaters:

For single heater installations, close cylinder valve. For multiple heater installations shut off main gas supply or close individual heater isolating valves.



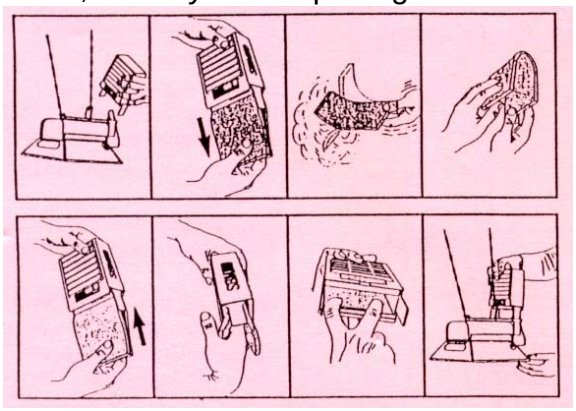
MAINTENANCE

Heater must be disconnected from gas supply before carrying out any maintenance operations.

WEEKLY [or more frequently if flame becomes blue]:-

-Remove filter box

-Remove dust from the filter media. Wash the filter media if necessary, in warm soapy water, and dry before putting it back.

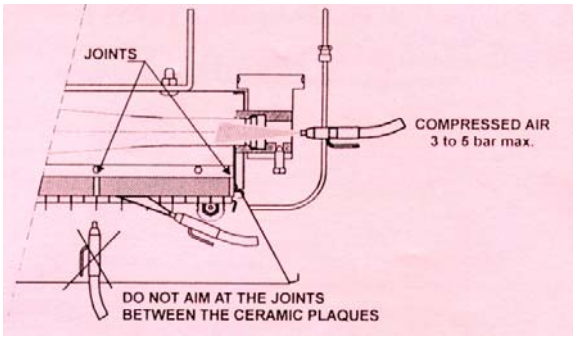


ANNUALY [or more frequently in dusty environments]

-Remove the injector block [gas valve assembly] - See below

-Clear the injector using a soft wire [Injector should be replaced every 2 years]

-Blow compressed air inside the burner body as shown below.



-Carry out a visual check of the ceramic plaques. Replace any heater which has cracked or broken plaques.

-Check heater attachments. Check that regulator control knobs rotate freely. Check flexible gas hoses for cuts or other damage. Replace any defective hoses immediately and do not operate any heaters with damaged hoses. If quick-connect couplings are in use, check that there is no dirt on seats or on push in coupling adaptor. Check all fittings are gas tight.

FAULT FINDING

1. HEATER/S WON'T LIGHT:

Ensure gas supply to heater or gas cylinder is turned on.

Check there is gas in cylinder / tank.

No ignition sequence [Automatic heaters] - Check operation of Sunmaster and that power is on;

Check BA [ignition] block is not faulty.

2. HEATER IS DIFFICULT TO LIGHT; FLAME IS BLUE OR FLUTTERY

Ensure regulator set to #10. [High fire regulator on gas control station].

Gas supply pressure too low; cylinder or tank may be almost empty.

Heater filter may be choked with dust.

Heater air intake may be choked with dust.

3. HEATER LIGHTS BUT GOES OUT AFTER PUSH-BUTTON IS RELEASED or AFTER IGNITION SEQUENCE TERMINATES [AUTOMATIC LIGHT HEATERS]

Gas valve button not depressed for long enough - always hold for 20 seconds after gas has ignited. [Manual light heaters or Automatic type lit by hand]

Safety thermocouple may have failed - replace.

Thermo-electric valve magnetic coil may have failed - replace.

4. HEATER LIGHTS BUT BURNS WITH NOISY FLAME

Heater filled with dust and dirt - Clean heater as above

Heater ceramic panels cracked or broken - replace heater

Air intake blocked or restricted.* Shut-off heater and allow to cool. Look in air intake and remove any restriction. If problem persists contact supplier.

*[*Note this problem usually occurs after a heater has been out of use for a period of time - Insects may have built their nest in the heater intake tube*].

PARTS REPLACEMENT

1. THERMOCOUPLE

Disconnect thermocouple from gas valve by unscrewing nut on top of valve. Remove other end from heater body by unscrewing thermocouple nut.

Fit new thermocouple following above. Connection at gas valve shall be hand tight + quarter turn only.

2. VALVE MAGNETIC COIL

Disconnect thermocouple from gas valve by unscrewing nut on top of valve. Unscrew aluminium or brass cap from gas valve. Pull out mag valve assembly.

Replace with new coil assembly, refit valve cap and thermocouple.

3. GAS INJECTOR

Disconnect thermocouple from gas valve by unscrewing nut on top of valve.
Unscrew valve locking bolt and remove valve.
Unscrew gas injector and discard.

Fit new injector and re-assemble.

3. VALVE COMPLETE

Disconnect thermocouple from gas valve by unscrewing nut on top of valve.
Unscrew valve locking bolt and remove valve.
On automatic units unscrew BA block retaining nut, pull HT lead off terminal on BA block and slide off BA block.

Replace with new valve, which MUST be fitted with a new gas injector, and refit locking screw and thermocouple.

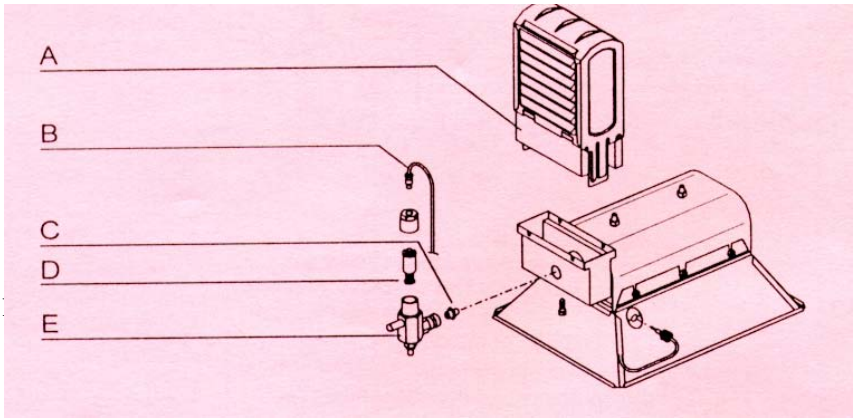
IF VALVE IS TO BE REPLACED, NEW INJECTOR MUST ALSO BE FITTED. OLD INJECTORS MAY HAVE GAS RESIDUE WHICH MAY REDUCE THROUGHPUT AND HEATER OUTPUT.

4. BA [IGNITION BLOCK]

Unscrew BA block retaining nut, pull HT lead off terminal on BA block and slide off BA block complete with earth lead and block frame.

5. HT [IGNITION] LEAD]

Pull red lead off BA block terminal and unscrew electrode retaining nut.



SPARE PARTS

For any spare parts order, please specify the following:-
Heater Model Number eg: 6ZRFS
Type of gas eg: PROPANE
Appliance rating, either MJ/h or g/h

This information is displayed on data plate attached to the appliance.

Description	Part N°	
A Filter Media	380123621	[1, 2, 3, 6 ZRFS / ZRFA]
	383800012	[8, 12, 16 ZRFS / ZRFA]
A Filter Housing	380123612	[1, 2, 3, 6 ZRFS / ZRFA]
	383800014	[8, 12, 16 ZRFS / ZRFA]
B Thermocouple	380123123	All Models
C Gas Injector	380132000-27	[1ZRFS]
	380132000-35	[2ZRFS / 2ZRFA]
	380132000-40	[3ZRFS / 3ZRFA]
	380132000-58	[6ZRFS / 6ZRFA]
	380132000-68	[8ZRFS / 8ZRFA]
	380132000-78	[12ZRFS / 12ZRFA]
	380132000-975	[16ZRFS / 16ZRFA]
D Valve Magnetic Coil	380123153	
E Valve complete	383802003	Manual Heaters - Excludes Injector
E Valve complete	383804003	Automatic Heaters - Excludes Injector
F BA Block	380123235	All Automatic Ignition Heaters
G Electrode & Lead	380123314	All Automatic Ignition Heaters
H BA Block Clamp	389801000	All Automatic Ignition Heaters
I BA Block Clamp Nut	389801001	All Automatic Ignition Heaters
J Valve locking Screw [30mm M6 pointed]	389804005	All Models
K* Ceramic Tile	383020002	2ZRFS / 2ZRFA
	383060002	6ZRFS / 6ZRFA
L* Fin Kit	383020017	2ZRFS / 2ZRFA
	383060003	6ZRFS / 6ZRFA
M* Ceramic Joint	383080003	

*The availability of these parts is limited to Hurll Nu-Way authorized repair personnel only.

GAS CONVERSION

Appliances are Approved for LPG operation only. Natural Gas appliances are available but must be ordered complete ex factory and require Approval by local gas authority prior to installation.

WARRANTY

All equipment is supplied with a 12 months parts only warranty. Ceramic plaque warranty 5 years from date of invoice.
Refer to Hurll Nu-Way for full conditions of sale.

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