



LOSSNAY HEATERS

Installation Manual

Instructions for :- KLH-TC Range

Lossnay Heaters : LGH- RVX Lossnay


Safety precautions

Before installation and electric work

Before installing the unit, make sure you read all the "Safety precautions".

The "Safety precautions" provide very important points regarding safety. Make sure you follow them.

Symbols used in the text

 Warning: Describes precautions that should be observed to prevent danger of injury or death to the user.

 Caution: Describes precautions that should be observed to prevent damage to the unit.



Warning:

- Ask the dealer or an authorised technician to install the unit.
Improper installation by the user may result in water leakage, electric shock, or fire.
- Use the specified cables for wiring. Make the connections securely so that any outside forces acting on the cables are not applied to the terminals. Inadequate connection and fastening may generate heat and cause a fire.
- Never repair the unit. If the controller must be repaired, consult the dealer. If the unit is repaired improperly, electric shock, or fire may result.
- When handling this product, always wear protective equipment. EG: Gloves, full arm protection namely boiler suit, and safety glasses. Improper handling may result in injury.
- Have all electric work done by a licensed electrician according to "Electric Facility Engineering Standard, "Interior Wire Regulations" and the instructions given in this manual and always use a special circuit.
- If the power source capacity is inadequate or electric work is performed im-properly, electric shock and fire may result. Keep the electric parts away from any water - washing water etc. Contact may result in electric shock, fire or smoke.
- Do not reconstruct or change the settings of the protection devices.
If the pressure switch, thermal switch, or other protection device is shorted or operated forcibly, or parts other than those specified by K-CON are used, fire or explosion may result.

To dispose of this product, consult your dealer. Do not use a leak detection additive.

Installation Instructions

Electric Heaters

Circular Electric Air Heaters Complete with Controls

Unpack the heater taking care to ensure items and paperwork are removed from the centre of the heater duct. The terminal box may also contain wiring instructions. If you are only installing the heater in the air duct, leave these instructions for the electrician!

The heater can be installed into an ISO standard spiral duct run, with either horizontal or vertical flow in either direction. With vertical ducts consideration must be given to items in the run above the heater which could be damaged by heat rising upwards when the fan is switched off. All heaters should be kept away from plastic conduits or materials easily damaged by heat. Allow for casing temperature of 100°C (ideal minimum air velocity = 2m/s). These heaters must not be installed outside unprotected or in areas that are washed down!

To install the heater, measure between the swaged rings and cut the spiral to suit. Use high temperature sealant and pop rivets to fix. Do not use flexible connectors directly onto the heater. The best position for the terminal box is on the side of a horizontal duct. Ensure access to the terminal box is possible! Make sure lagging etc. does not cover the terminal box.

The temperature/temperature (DTFS) sensor will be found attached to a coiled lead. This should be mounted in the duct 2m downstream from the heater or in a downstream position where the sensor cannot be damaged by heat. A 16mm hole saw will be required.

Wiring

All wiring must be carried out by a qualified electrician in compliance with the latest regulations.

These units are internally pre-wired and require only a suitable supply feed connection to operate (see rating label).

If the option to feed the fans is not used and the supply fan is not local to the heater, it is possible to use only the sensed airflow to switch on the heater. The output air temperature will be as set on the face of the panel. If you need to switch the heater off from a remote time clock, remove the link provided and wire from the clock.

Note; take care when using remote fan speed controllers not to let the air velocity drop too low. Also try to avoid using the controller to switch the system off as this can lead to nuisance tripping of the high temperature cut out in the heater.

Safety

As previously stated, every system should have an isolator switch which can be locked in the off position to prevent accidental reconnection during maintenance. When resetting the thermal cut out, the heater may suddenly switch on and element terminals etc. will become live.

Ensure the heater is correctly earth bonded. Terminal covers must be secured after inspection and should be labelled "**DISCONNECT SUPPLY BEFORE REMOVING THIS COVER**". It is the installer's responsibility to ensure the installation meets all current Health & Safety Regulations.


Safety precautions


Before installation and electric work


Before installing the unit, make sure you read all the "Safety precautions".

Symbols used in the text

 Warning: Describes precautions that should be observed to prevent danger of injury or death to the user.

 Caution: Describes precautions that should be observed to prevent damage to the unit.


 Warning: Carefully read the labels affixed to the main unit.

 Warning:


- Ask the dealer or an authorized technician to install the unit.
Improper installation by the user may result in water leakage, electric shock, or fire.
- Use the specified cables for wiring. Make the connections securely so that any outside forces acting on the cables are not applied to the terminals. Inadequate connection and fastening may generate heat and cause a fire.
- Never repair the unit. If the controller must be repaired, consult the dealer.
If the unit is repaired improperly, electric shock, or fire may result.
- When handling this product, always wear protective equipment. EG: Gloves, full arm protection namely boiler suit, and safety glasses.
Improper handling may result in injury.
- If refrigerant gas leaks during installation work, ventilate the room.
If the refrigerant gas comes into contact with a flame, poisonous gases will be released.
- Have all electric work done by a licensed electrician according to "Electric Facility Engineering Standard", "Interior Wire Regulations" and the instructions given in this manual and always use a special circuit.
- If the power source capacity is inadequate or electric work is performed im-properly, electric shock and fire may result.
Keep the electric parts away from any water - washing water etc...
Contact may result in electric shock, fire or smoke.

To dispose of this product, consult your dealer.

Before installation

 Caution:

- Do not install the unit where combustible gas may leak.
If the gas leaks and accumulates around the unit, an explosion may result.


 Caution:

- Ground the unit.
Do not connect the ground wire to gas or water pipes, lightning rods, or telephone ground lines. Improper grounding may result in electric shock.
- Install the power cable so that tension is not applied to the cable.
Tension may cause the cable to break and generate heat which may, in turn, cause fire.
- Install a leak circuit breaker, as required.
If a leak circuit breaker is not installed, electric shock may result.
- Use power line cables of sufficient current carrying capacity and rating.
Cables that are too small may leak, generate heat, and cause a fire.
- Use only a circuit breaker and fuse of the specified capacity.
A fuse or circuit breaker of a larger capacity or a steel or copper wire may result in a general unit failure or fire.
- Be very careful regarding product transportation.
Two people should be used to carry products of 20kg or more.
- Some products use PP bands for packaging. Do not use any PP bands for a means of transportation.
- Safely dispose of the packing materials.
Packing materials, such as nails and other metal or wooden parts, may cause stabs or other injuries.
Tear apart and throw away plastic packaging bags so that children will not play with them - If children play with a plastic bag which has not been torn apart, they face the risk of suffocation.

Disclaimer

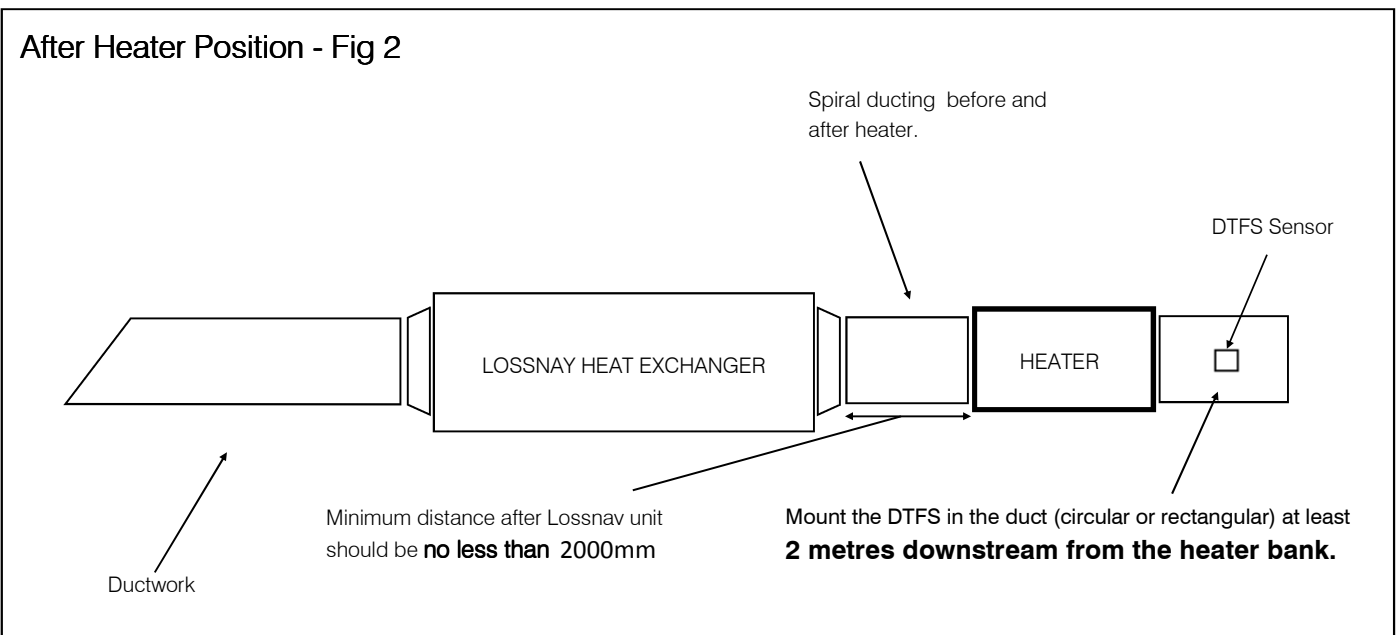
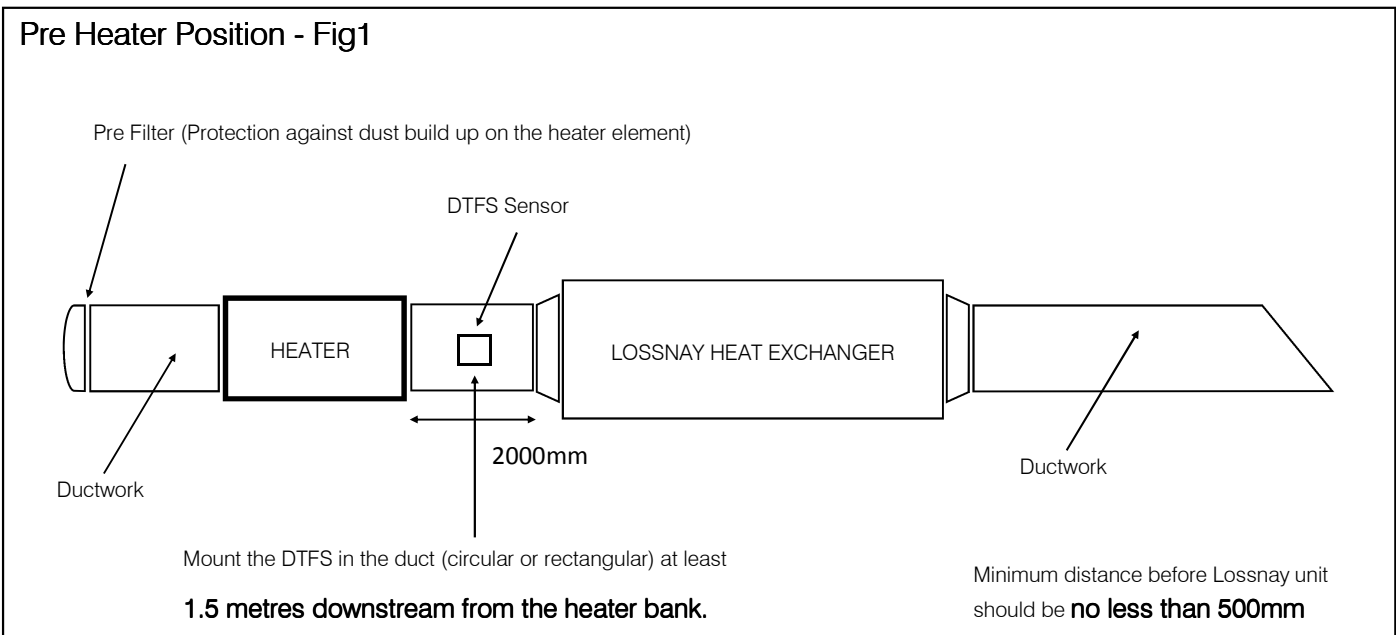
Warranty:

All products manufactured on behalf of Mitsubishi Electric UK are warranted against defective materials for a period of three years from the date of delivery to the original purchaser.

 **Warning:** Mitsubishi Electric UK assumes no liability for damages consequent to the user of this product. We reserve the right to change this manual at any time without notice. The information furnished by us is believed to be accurate and reliable. However, no responsibility is assumed by us for its use, nor for any infringements of patents or other rights of third parties resulting from its use.

Lossnay Heaters - Installation Instructions

Installation Position



WARNING

The electric resistance heater you have purchased is of robust construction and will provide reliable service for many years if correctly installed. Mount the heater in the duct system so that the terminal box is accessible and away from materials which can be damaged by heat, such as insulation inside the duct, filters and P.V.C. wiring or conduit. If flexible connections are used they must be the high temperature type. Remember the element surface temperature can be 450 degrees centigrade! Please note the position of the heater relative to the Mitsubishi Electric Lossnay Unit as shown in figure 1 and figure 2.

Lossnay Heaters - Installation Instructions

Airflow

Airflow direction is unimportant but very low velocities can lead to nuisance tripping of the high temperature cut-out. The recommended minimum airflow is **1.5m/s**, (which is below the LGH extra low fan speed LGH-25-200RVX) however element damage is unlikely even at lower velocities – the main problem is risk of heat damage to adjacent components. This must be taken into account when fans are above heaters in a vertical airstream.

Wiring

This should be undertaken by a competent electrician. If the heater is out of sight of its control switch, a local isolator must be fitted for the protection of maintenance personnel. The heater is of metal construction and must be connected to a substantial EARTH conductor as prescribed by current I.E.E. regulations.

Heaters are supplied either for direct connection to the element tails (see diagrams) or pre-wired to a terminal strip with special high temperature cable.

When connecting directly to the element tails, the last 100mm of P.V.C. cable can become too hot for its insulation. This must be sleeved with either fibreglass high temperature sleeving or heat shrink sleeving for extra protection. Remember to allow for separate wiring to the thermal cut-out switch.

Thermal Cut-out

Every heater is fitted with a thermal cut-out switch; (see over) this can either be connected in series with a single element heater (max. 3kW) or in the control circuit. The object of this switch is to disconnect the heater in the event of airflow failure and prevent a dangerous heat build up. It should not be used as the only precaution against airflow failure but should be used in conjunction with the fan contactor and airflow switch. If the cut-out is too sensitive for your installation, the capillary, if fitted, can be relocated.

The standard cut-out is a manual reset type, but an automatic reset cut-out can be fitted in place of, or in addition to, the standard cut-out.

A remote reset cut-out is also available using an auto cut-out and latching relay fitted to the control panel. A neon lamp can be wired across the standard cut-out terminals to signal trip conditions.

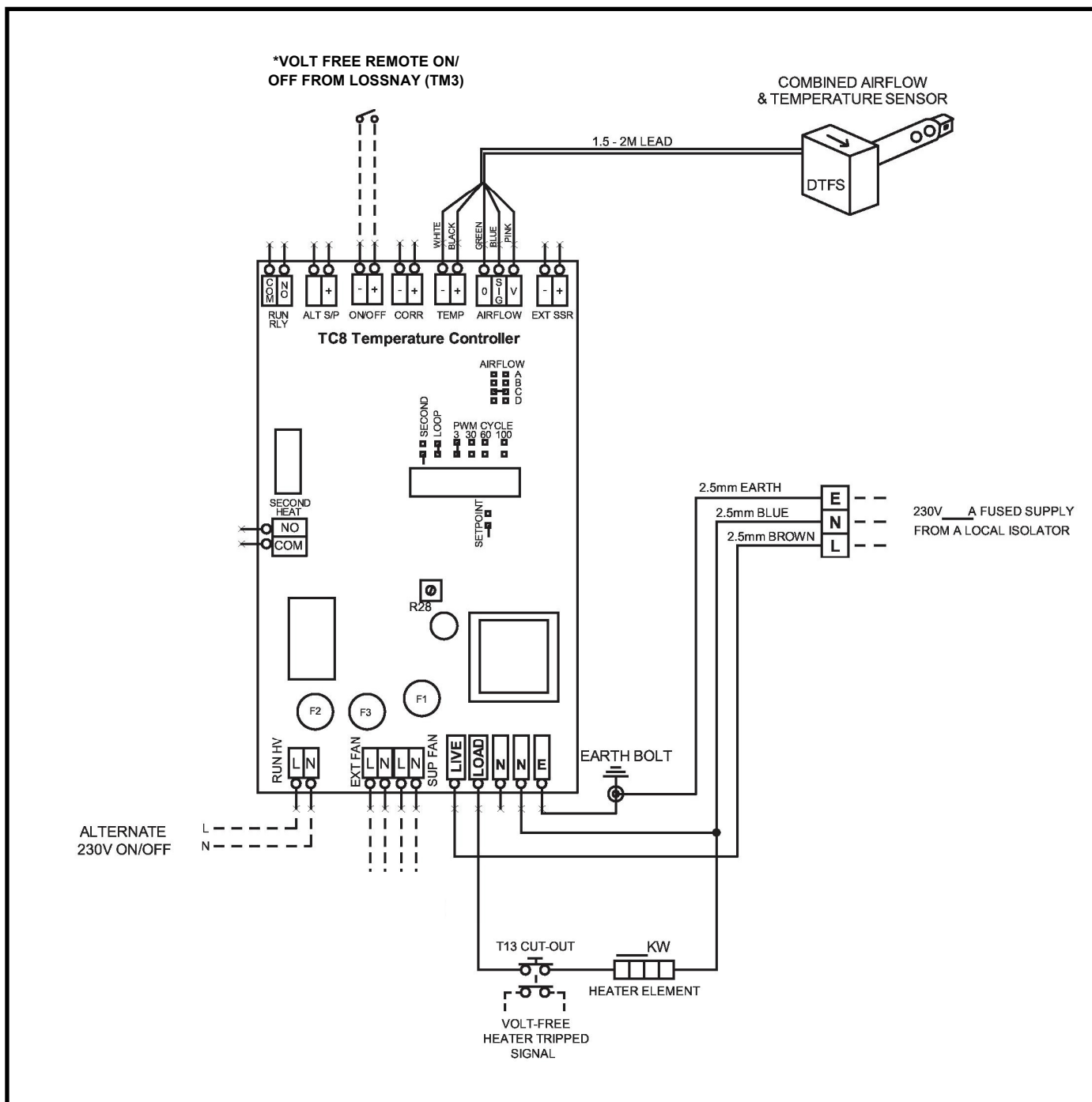
Fan Off Delay Timer

Whilst the cut-out will protect the installation from a build up of heat due to loss of airflow it cannot prevent the build up of residual heat which occurs when a large bank of elements are switched off at the same time as the airflow. Heaters within fan units or close to sensitive items should be controlled so that the heater switches off 3 minutes before the fan. **Please see configuration on page 6.**

DTFS Dual Temperature and Airflow Sensor

The DTFS is a way of detecting if air and temperature is moving over the heater independent of the fan controls. It will detect if the duct has become blocked or a fire damper has shut. Three types are available, the paddle type, pressure type and electronic type. Paddle switches can be unreliable in turbulent airflows and pressure switches require a minimum static pressure in the duct in order to operate. Make sure the switch contact current rating is adequate, most are only suitable for connection in the control circuit wiring.

Lossnay Heaters - Installation Instructions (Heater PCB termination)



Lossnay wiring and settings

The Lossnay heater can be set via the temperature setting thyristor control. Please set your set point to the desired temperature dependant on design and conditions. For further information please contact your local sales office.

	Terminals	Dip Switch	Lossnay Manual	Temp Range
*Pre-Heater Setting -	TM3 7 & 10	SW5 - 6	No:58	0°C
*After-Heater Setting -	TM3 9 & 10	SW5 - 2 SW2- 8	No:57	15-20°C

Note: Temp Range on the Pre-Heater Setting is pre-set at 0°C from the Lossnay RVX. To test heater battery link across On/Off volt free terminals on the heater PCB board.

Lossnay Heaters - Installation Instructions

Features

- Control heaters to a total of 9kW with a 240V ac supply.
- Complete mains cycle switching, no interference, meets CE requirements.
- On board Run On Timer.
- Controller start relay contact output (BMS signal).
- Low voltage 24V ac for air-flow and time switch contacts.
- Circuit breakers for heaters, fans and damper motor.
- Solid-state switching, no mechanical switching breakdown.
- Indicators for control status.
- Temperature trim terminals, +/-10% (For use with RC1 & RC2 remote controllers).

Specification

Supply Voltage:	240V ac, 50/60Hz, +/- 10%
Output Current:	19A @ 40°C for output channel.
Temperature Sensor:	4K7 thermistor
Temperature Control Range:	3 to 35°C
Supply Fan Output:	240V ac, 3.5A Max.
Extract Fan Output:	240V ac, 3.5A Max.
Damper Supply:	240V ac, 3.5A Max.
Run On Timer:	Adjustable from 1-13 minutes.
Control on/off:	Both AFS and TIME contacts close to switch on; any one of the contacts open to switch off.
Start Relay Contacts Output:	2A @ 240V ac

Indicators:

Power On – Yellow
 Supply Fan On – Green
 Extract Fan On – Green
 Heater On – Red

Lossnay Heaters - Installation Instructions

Thyristor Control

Specifically designed to mount onto the electric air heater the thyristor temperature control panel controls a 220/250V single phase heater up to 19A (4.5KW) and has 5A fused outputs for single phase supply and extract fans up to a maximum of 4.5A each.

Although the unit has been designed primarily for single phase heater loads up to 4.5KW, it has a SSR (Solid State Relay) output which can be used to control larger single phase heaters up to 9kW or three phase (380/430V) heater loads up to 22.5KW.



REAR (PCB)

Fig 4



FRONT

Fig 5

SPECIFICATION

Supply voltage	220/250Vac 50/60Hz. +/-10%
Output current (maximum)	19A @ 40°C (Ambient)
Temperature sensor	5k ohms @ 25°C (Table 502 IT)
Temperature control range	0 to 40°C / (0-10V 0-100%)
Supply Fan outputs	(5A fused) 4.5A max FLC.
Extract Fan outputs	(5A fused) 4.5A max FLC.
Run on timer	adjustable from 1 to 2 minutes (factory set at 1.5 minutes)
Control fuse	20 x 5mm 250mA
LED Indicators	Power On – Yellow Supply Fan On – Green Extract Fan On – Green Heater On – Red (solid or flashing, indicating pulsed control) Airflow Fault – Red
Dimensions Front Panel	114mm x 197mm x 2mm thick aluminium
Heat Sink	55mm x 100mm x 20mm thick aluminium
PCB	85mm x 165mm
Mounting holes	98mm x 181mm centres 5mmØ holes
Weight	550 grams (approx.)

Installation Instructions

Thyristor Control

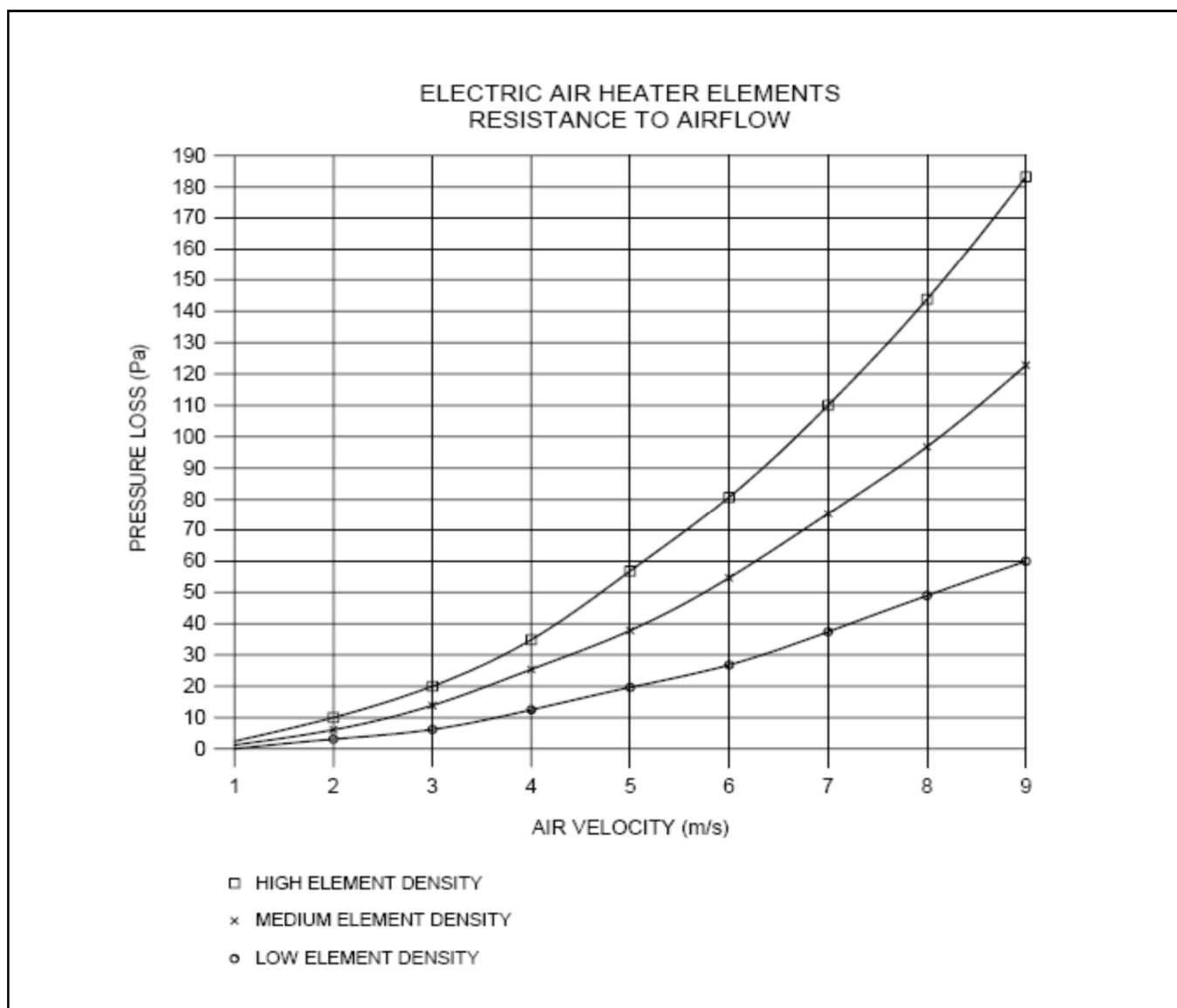
Power Terminals (see Fig 6) are provided for:-

- Earth - NB - A 6mm earth bolt is also provided in all heaters.
- 2 x Neutral - Power supply and heater neutral.
- Live - Power supply live (incoming 220/250V A/C)
- Load - Heater load live terminal
- 2 x Fan Live & Neutral - 5A fused outputs for single phase fans
- Timer Volt free - Volt free connection to TM4 of the Lossnay.

Power Supply

The unit should be powered from a local isolator with the full load of the heater and fans taken into account when sizing the supply cable. If used in conjunction with a larger pre-wired heater, power terminals will be provided.

Resistance to Air-Flow



Installation Instructions

DTFS Dual Temperature and Airflow Sensor

APPLICATION

The DTFS is designed for use in H&V applications where it is necessary to detect airflow and temperature for controlling electric heater batteries. It is especially suited for ductwork systems with low air velocities where a pressure switch would not operate. Designed for use specifically with the K-CON TC-8 temperature controller.

Having both temperature and airflow measurement in 1 package reduces the installation time. The sensor utilizes "state of the art" MEMS technology to give outstanding performance over a wide range of air flows.

DESCRIPTION

A grey polystyrene box (size 80mm diameter x 55mm high) with a twist lock cover and an integral 12mm cable entry will meet IP65 standards. A 20mm diameter sampling tube (90mm long) protrudes from the top of the base. 2 integral lugs with 4.5mm holes are provided for securely fixing the sensor to the duct.

INSTALLATION

Mount the unit in the duct (circular or rectangular) **at least 2 metres downstream from the heater bank**. The two fixing lugs must be parallel with the duct so the sampling tube is in the correct position and air passes through the hole for both the MEMS and temperature sensors. The airflow sticker on the sensor denotes the correct orientation of the sensor and must be compatible with the direction of airflow.

To install drill a 25mm hole centrally in the duct, insert the airflow monitor and using PK screws fix firmly in position. A neoprene gasket supplied with the unit will give a good seal between the duct and the unit.

WIRING DTFS

Supplied with a 2 metre length of multi-cored screened cable and wired in accordance with the following colour coding:

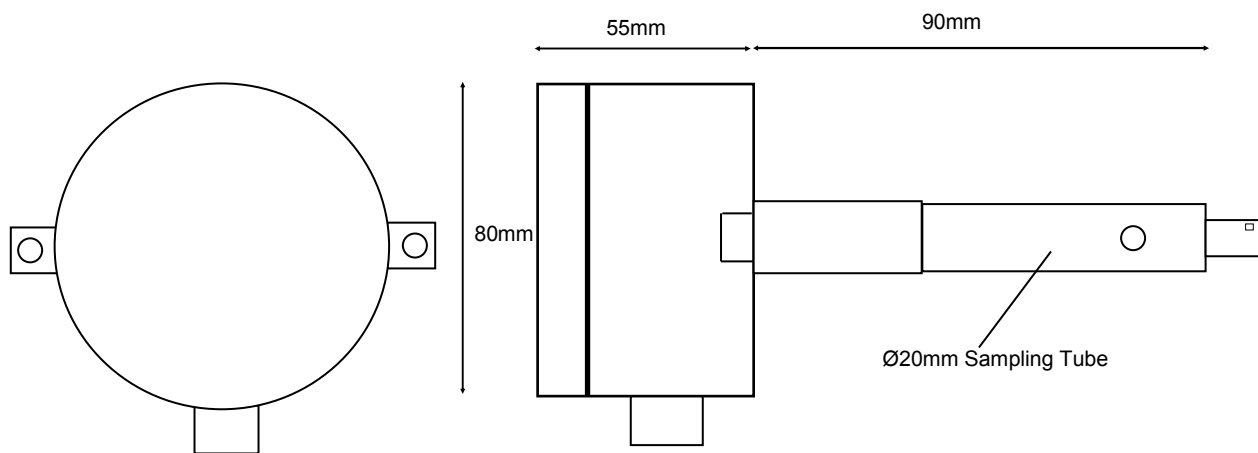
Connection 1 (Mems sensor +ve)	-	PINK
Connection 2 (Mems sensor signal)	-	BLUE
Connection 3 (Mems sensor -ve)	-	GREEN
Connection 4 (Temperature sensor)	-	BLACK
Connection 5 (Temperature sensor)	-	WHITE
Connection 6 (Earth)	-	SCREEN/FOIL

All wiring should be carried out by qualified personnel to IEE regulations.

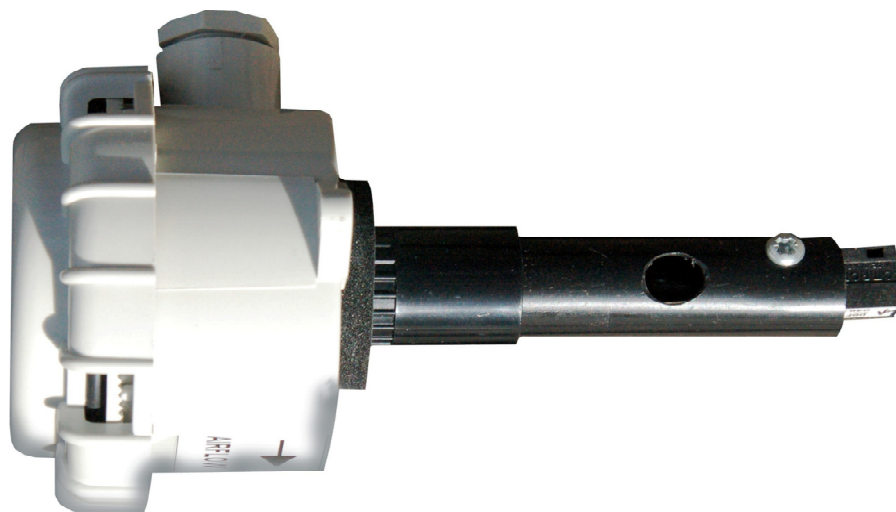
SPECIFICATION

Part code	DTFS
Supply voltage	0 to 3V DC
Minimum operating range	1m/s
Enclosure	IP65 (gland filled)
Probe	90mm long x 25mm diameter max.

Installation Instructions Dimensional.



DTFS Sensor Image



Installation Instructions

Dimensional Range/fuse Rating (K-CON)

1	TERMINAL BOX	1	GALVATITE STEEL		4	THYRISTOR CONTROLLER	1	TC8
2	HEATER CASEWORK	1	GALVATITE STEEL		5	DUAL AIRFLOW & TEMP. SENSOR	1	DTFS2
3	HEATER ELEMENT	A/R			6	HIGH TEMPERATURE CUTOUT	1	MANUAL RESET

MODEL	CODE	KW	FLC (A)	FUSE (A)	A	B	C	D	E	L	H
KLH-TC15-0.75	10070300	0.75	3.1	6.0	100	80	115	250	75	400	205
KLH-TC15-1.0	10070301	1.0	4.2	6.0	100	80	115	250	75	400	205
KLH-TC25/35-1.0	10070305	1.0	4.2	6.0	150	80	150	250	75	400	255
KLH-TC25/35-1.5	10070306	1.5	6.3	10.0	150	80	150	250	75	400	255
KLH-TC25/35-2.0	10070307	2.0	8.3	10.0	150	80	150	250	75	400	255
KLH-TC25/35-2.5	10070308	2.5	10.4	16.0	150	80	150	250	75	400	255
KLH-TC50/65-2.0	10070310	2.0	8.3	10.0	200	80	180	250	75	400	305
KLH-TC50/65-2.5	10070311	2.5	10.4	16.0	200	80	180	250	75	400	305
KLH-TC50/65-3.0	10070312	3.0	12.5	16.0	200	80	180	250	75	400	305
KLH-TC80/100-2.5	10070315	2.5	10.4	16.0	250	80	180	250	75	400	355
KLH-TC80/100-3.0	10070316	3.0	12.5	16.0	250	80	180	250	75	400	355
KLH-TC80/100/150/200-4.5	10070320	4.5	18.8	20.0	250	80	180	250	75	400	355
KLH-TC80/100/150/200-6.0	10070321	6.0	25.0	25.0	250	80	180	250	75	400	355
KLH-TC150/200-7.5	10070325	7.5	31.3	32.0	250	80	180	250	75	400	355

NOTE(S):
 1. DIMENSIONS IN mm
 2. ALL HEATERS 230V 1ph

ELECTRIC HEATER BATTERY c/w INBUILT TC8 CONTROLLER
ISSUE: B 21/10/14

Installation Instructions

Electric Heater TC8 / Lossnay Fault Diagnostics

PROBLEM	CHECK THE FOLLOWING
The yellow power LED is not lit	Check that there is a power supply to the unit.
The yellow power LED is on but no other light are on	Check that an enable signal is present. Check connection to the Lossnay unit.
Airflow failed red LED is lit	Check that the DTFS2 sensor has been fitted correctly in direction of airflow.
No heat output	Check the high temperature cut-out has not tripped. Check the temperature set-point is set correctly. Check that the DTFS is fitted correctly.
The high temperature cut-out has tripped.	Check that the minimum velocity through the heater is 1.5m/s. Check system filters are not blocked. Check that the system is allowed to run on once turned off to take the heat away.
The red heater on LED flashes	The system is working correctly and is near it's set point.

Please be sure to put the contact address/telephone number
on this manual before handing it to the customer.



433-437 Hillington Road, Hillington Park, Glasgow, G52 4BL