INTRODUCTION
This booklet provides guidance for the site activities necessary to identify, handle, install, commission and service Dunham-Bush System LST Low Surface Temperature Natural Convector.

The instructions refer to the standard product only: please refer to any additional drawings supplied for details of any special features. Please study all documentation carefully before commencing installation work.

IDENTIFICATION
Refer to diagrams for exploded views and identification of the main parts. Any reference given on the order will be marked on the casing, back plate and emitter packages for site identification.

DESCRIPTION
Each System LST natural convector consists of a back plate, emitter and casing components as shown in the Diagrams.

Lock shield valves and TRV kits are optional accessories.

HANDLING
Casings, back plates and emitters are usually packed separately. Small orders may be packed in boxes and can usually be off-loaded by hand. Larger orders are usually palletised and lifting equipment should be provided by the buyer. Care should be taken when handling to avoid damage.

STORAGE
System LST components should be stored under dry, clean conditions. Any protective packing should not be removed until the components are required for installation, unless damage in transit is suspected. (Note: The buyer must examine the goods promptly upon arrival and is not entitled to make any claim against the Company in respect of damaged goods, unless at the time of delivery the ‘delivery note’ is endorsed by the buyer and countersigned by the carrier or shipping agent with a note detailing the damage).

PREPARATION
A sound, flat, vertical surface is necessary. The screws fixing the casing to the vertical surface are integral to the structure of the casing hence suitable screws and if necessary, wall plugs must be provided by others, for fixing back plates to the vertical surface.

Any obstructions or hazards within the wall such as live electrical cables and pipework must first be identified before installation commences.

INSTALLATION
Before commencing any work identify the correct LST radiator for the location. If a radiator reference was given on the order this will be marked on the packages for site identification.

⚠️ WARNING
Some internal components have sharp edges. Care must be taken when installing this product and it is recommended that protective gloves are worn.
SYSTEM LST - PRODUCT RANGE
Dunham-Bush System LST low surface temperature radiators deliver efficient ambient heating in applications where safety is paramount. The hot central heating pipes and heat emitter are totally enclosed within the robust steel casing.

The clever casing design permits secure key access for cleaning while TRV control valves can be selected for external or internal (tamperproof) functionality.

By applying test results through a mathematical model, Dunham-Bush engineers have developed a Selection Program to help the heating designer optimise their radiator schedules for all conceivable LPHW conditions.

BSRIA tested to BS EN 442 heating performance and NHS Guidance touch temperatures, System LST is a complete solution for safe efficient heating.

FEATURES
The Dunham-Bush System LST radiators comprise:
- mild steel casing (stove finish to RAL 9010 white)
- extruded aluminium grilles (pencil proof)
- zinc coated steel backplate (heat reflective)
- integral emitter brackets
- choice of Element or Panel emitters
- stock or custom RAL and BS colour finishes - available to order.

BENEFITS
✓ NHS guidance compliance by design and test
✓ Optimum heating by natural convection
✓ Selection program for all LPHW flow/return conditions
✓ 1st and 2nd fix deliveries
✓ Rapid cost effective installation
✓ No special tools or fasteners required
✓ Pencil proof ‘closure-lock’ grilles (no screws)
✓ Reflective backplate to enhance heating efficiency
✓ Compatible with all makes of TRV and LSV
✓ Lockable access panels
✓ Easy access for cleaning
✓ BS EN 442 verified heat outputs

Style A - for ‘wet floor’ areas, or simply where casings are better sited above skirting.

Style B - for ‘wet floor’ or ‘dry floor’ areas where pipes approach from below or through walls.

Style C - for ‘dry floor’ areas where the robust floor plinth also provides extra space for pipe runs.

Style D - vertical casings delivering high performance from confined spaces.


Panels emitters - P31, P41, P61, P32, P42, P62, P72 - traditional steel panel design delivering excellent output for 2-pipe and 1-pipe systems.

TEST AND WORKING PRESSURES/TEMPERATURES
All emitters shall be suitable for maximum cold test pressure of 10.5 barg and maximum working pressure of 8.0 barg.

Radiator emitters shall be limited to a maximum working temperature of 95°C. Element emitters shall be limited to a maximum working temperature of 110°C.

Automatic airvents maximum cold test pressure is 8.5 barg; maximum working pressure 8.5 barg @ 11°C.

Manual airvents maximum cold test pressure is 10.5 bar, maximum working pressure 6.0 bar @ 110°C.

System test and working pressures/temperatures shall be adjusted should fittings and valves supplied by others have test or service conditions lower than above.
INSTALLATION SEQUENCE

Backplates
(1st Fix)

Emitters & Valves
(1st Fix)

Sideplates
(2nd Fix)

Grilles
(2nd Fix)

Casings
(2nd Fix)
CASING STYLES
Dunham-Bush System LST is available in four styles, A, B, C & D (pictured below).

Style A casing

Style B casing

Style C casing

Style D casing
Style A - 97mm Element Emitter

Style A - 97mm Radiator Panel

Style A - 161mm Element Emitter

Style A - 161mm Radiator Panel
Style D - 161mm Element Emitter

Style D - 161mm Panel Emitter

Style D - 260mm Element Emitter
**System LST Installation - First Fix**

Mark positions of fixings on the wall using the back plate as a template. Note: recommended fixing height of 100mm above FFL (Style A), styles B, C & D can be fixed at FFL or onto pipe boxing/trunking. There are a large number of holes provided, as minimum we recommend fixing to every fourth hole along the top and bottom edges plus 2 to 3 fixings down the sides.

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**Diagram 1**

Drill holes to take the fixings in the wall and insert suitable wall plugs or anchors (by others). Screw the back plate to the wall using the top and bottom rows of screws holes only excluding the corners ("A" in diagram 1 above). The side screw holes "B" are used for fixing the side plates and can be prepared ready but are not required at this stage. Alternatively the larger holes "C" may be used as these can be drilled and wall plugs or anchors affixed into them after the back plate has been fixed.

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**Diagram 2**

Using a large flat-bladed screw driver fold out the emitter brackets “X”. If the convector is to have a fitted internal TRV the phial brackets “Z” will also need to be folded out. See diagrams 2a & 2b for details on which brackets to fold out for each emitter.
Diagram 2a
Styles A, B & C. Refer to bracket table for details of required brackets for each emitter type.

Diagram 2b
Style D. Refer to bracket table for details of required brackets for each emitter type.
Diagram 3
Hang the panel radiator or finned element on the brackets as centrally as possible. Fit any lock shield valves and/or TRV valve body. *(When fitting a Herz TRV; fit pipe insert (provided) and valve fittings must be assembled using spray silicone oil and compression nuts must be tightened clockwise ¾ of a turn / 270 degrees).* Note only casings styles B, C & D can accommodate integral flow & return pipework. With the system filled, vent the emitter to expel all air and check for leaks. If fitted adjust lock shield valve to give design water flow rate.

Diagram 4
Style A unit fitted with emitters and internal Herz TRV valve/head.
System LST Installation - Second Fix
Ensure panel radiator is clean or that the finned element is clean and fins are not crushed, before fitting casing.

Diagram 5
Position the side plates at either end of the back plate using the studs for alignment (see detail in Diagram 4). Please note that the studs are for alignment only and no fixings are required to be attached to these studs. Screw the side plates through the back plate into holes “B” prepared during first fix stage.

Diagram 6
Fit the Bottom rail between the side plates. To do this you may need to gently push the side plate outward (being careful not to permanently deform it) in order to get the rail to clear the side plate (Detail 1 in Diagram 5). The bottom rail should be engaged with the studs (Detail 2). Two M4 nylock nuts, provided should be threaded onto the studs and screwed down to secure it.
Remove the TRV Blanking plate from the side plate nearest the TRV valve body.

Wind the surplus length of the capillary around the TRV dial into the groove provided ensuring that it will not be tight when fitted.

Insert the bellows housing through the aperture in the side plate of the casing.
Affix the Sensor/Set point TRV Dial to the side of the casing using the screws provided.

Attach the bellows housing to the TRV valve body using the knurled nut.

Clip on the cover to the TRV dial
Fit the grilles. On the top grille insert the tab into the slot at an angle with the large rectangular notch towards the front of the heater.

Pull the grille towards you so that the edge of the slot is in the notch.

Then tilt the grille so it is level.

Finally slide the grille back to lock it into place.

The bottom grille is fitted in a similar manner with the rectangular notches in the tabs facing upward.

Note: -
Casing style A  Inlet grille is the same as bottom plate.
Casing style B  Inlet grille only.
Casing style C  Inlet grille & plinth.
Casing style D  Large grille.
Once the grilles are fitted the front plate can be put on. The corner tabs can be distorted in transit hence they may need to be straightened. Insert the tabs at the corners into the slots in the side plates then push the top of the access panel home and lock it into place using the two locks and key provided.

**MAINTENANCE**

Every 3-6 months the front panel should be removed, the grilles removed (in the reverse of the method on the previous pages) and the casing inspected for dust and debris. The casing and grilles should be cleaned using a soft brush, damp cloth and warm soapy water. Any dust and debris should be vacuumed from the casing, and the finned element. Care should be taken not to damage the finned element a soft brush attachment should be used.

![Diagram 9](image)

**WARNING**

Some internal components may have sharp edges. Care must be taken when servicing this product and it is recommended that protective gloves are worn.

**SPARES/SERVICE**

Spare parts/service - Please contact our office, contact information shown below.

Manufacturers reserves the right to change any product specification without notice.

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