DONOHOE HEATING SERVICES
PROTECTA DATA SHEETS

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PAGE 03
PROTECTA RANGE SUMMARY

PAGE 04-07
PROTECTA RANGE SPECIFICATIONS

PAGE 08
RESISTANCE DIAGRAM

PAGE 09
MOUNTING DETAILS

PAGE 10
DRILLING CHART EMITTER

PAGE 11
DRILLING CHART COVER

PROTECTA RANGE SUMMARY

DESIGNED SPECIFICALLY FOR HOMES AND OTHER BUILDINGS FREQUENTED BY CHILDREN, ELDERLY PEOPLE AND VULNERABLE ADULTS, OUR PROTECTA RANGE PUTS HEALTH AND SAFETY AT THE TOP OF THE AGENDA. **IN FACT, THEY CONFORM WITH NHS GUIDELINES FOR 'SAFE HOT WATER & SURFACE TEMPERATURE' AND HSE HEALTH SERVICES INFORMATION SHEET 'MANAGING THE RISKS FROM HOT WATER AND SURFACES IN HEALTH AND SOCIAL CARE' FOR USE IN SCHOOLS, HOSPITALS AND OTHER HEALTHCARE FACILITIES.**

- NHS SURFACE TEMP COMPLIANT
- CURVED EDGES FOR SAFETY
- LOCKABLE COVER
- LESS WATER TO HEAT
- FASTER HEAT-UP TIME
- LOWER RUNNING COSTS
- SEPARATELY PACKED COVER & EMITTER
- HINGED COVER FOR MAINTENANCE
- MANUFACTURED IN BRITAIN
- 80 SIZE OPTIONS
- SMALLER CARBON FOOTPRINT
- 10 YEAR WARRANTY

EMITTER:

HI-LO Round Top Radiator
3 heights: 300mm, 400mm, 500mm
3 types: T11, T21, T22
10 lengths: 400mm, 500mm, 600mm, 700mm, 800mm, 1000mm, 1200mm, 1400mm, 1600mm, 1800mm

COVER:

3 heights: 500mm, 650mm, 800mm
3 types: T11 (110mm wide, 120mm front grille), T21 (150mm wide, 120mm front grille), T22 (150mm wide, 140mm front grille)
10 lengths: 600mm, 700mm, 800mm, 900mm, 1000mm, 1200mm, 1400mm, 1600mm, 1800mm, 2000mm

PLINTH:

2 types: T11 72mm wide, T21/T22 110mm wide
10 lengths: 600mm, 700mm, 800mm, 900mm, 1000mm, 1200mm, 1400mm, 1600mm, 1800mm, 2000mm

ACCESSORIES:

Herz external TRV valve kit QTRV001
Herz internal TRV valve kit TRV005
Herz lock-shield valve LOCK001

LST RANGE SPECIFICATIONS

EMITTER:

The Protecta LST cover is designed to accommodate a standard HI-LO round top emitter, easy to clean with no sharp edges. Recommended connection configuration for NHS applications is bottom opposite end (BOE). All standard connections are ½" BSP.

COVER:

The Protecta LST cover comprises of a strong single piece 1.6mm gauge iron phosphate and powder coated cover that is quick and easy to install. The unique design allows it to be fitted over a standard HI-LO round top emitter. The cover is forward hinged, allowing easy access to the emitter for internal cleaning and maintenance. This can be done by one person as the weight of the cover is fully supported by the hinge. The hinge pins can be can be fully retracted to allow the cover to be completely removed for deep cleaning. There is a simple locking device to prevent unauthorised access. All external surfaces are flat wipe clean surfaces, all external corners are rounded to prevent injury.

The cover can be wall mounted either without plinth at a minimum of 50mm from the floor for types 11 and 21 and 100mm from the floor for type 22 or with a plinth at 100mm from the floor. Plinths are provided as an optional extra at floor level to conceal pipework and prevent burns from exposed pipework carrying water above 43 ° C. Any exposed pipework fitted below the LST cover without a plinth must be securely insulated or "boxed in" to comply with NHS regulations.

OUTPUTS:

All radiators have been manufactured and independently tested by an EN442 accredited test laboratory to BS EN442 and fully comply with the NHS Estates Health Guidance notes for 'Safe Hot Water and Surface Temperature' and HSE health services information sheet 'Managing the risks from hot water and surfaces in health and social care' with a maximum surface temperature below 43 ° C at a maximum flow temperature of 80 ° C / 60 ° C return or 75 ° C flow / 65 ° C return.

FINISH:

All radiators are primed and epoxy polyester powder coated by electrophoresis to ensure all edges are coated. The covers are iron phosphate and powder coated by electrophoresis all exposed paint surfaces are finished in an antimicrobial coating to RAL9016.

PACKAGING:

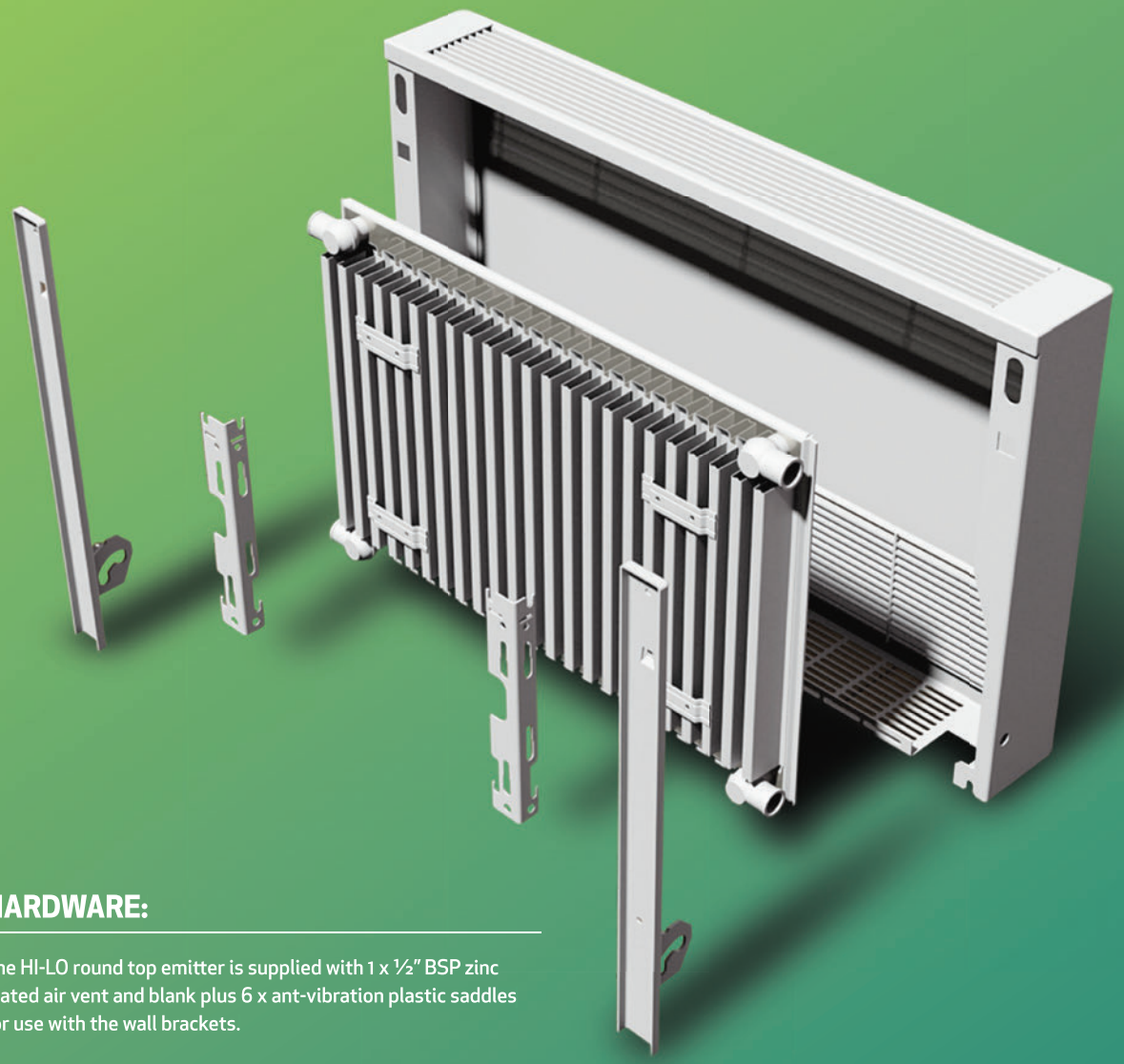
The Protecta LST is supplied in two packs, the second pack containing the cover can be supplied at the 2nd fix stage to avoid any on-site damage that could occur during the 1st fix installation stage. The HI-LO round top emitter is picture framed in heavy duty cardboard with integral hanging lug protection and vacuum sealed in heavy duty polythene. The cover is packaged in a heavy duty cardboard box and lid with internal polystyrene support to give complete protection.

QUALITY:

All radiators are CE marked and manufactured under a BS EN ISO 9001: 2008 quality system accepted by BSI.

WARRANTY:

All radiators are supplied under warranty for a period of 10 years in respect of defective materials or manufacture. The standard conditions of sale apply to all transactions. A copy is available on request.



HARDWARE:

The HI-LO round top emitter is supplied with 1 x ½" BSP zinc plated air vent and blank plus 6 x ant-vibration plastic saddles for use with the wall brackets.

WALL BRACKETS:

All radiators in the range are supplied with two or more brackets depending on the length of the emitter and two heavy duty hinged brackets per cover. Brackets supplied with single and double convectors provide a wall clearance of 25mm to the rear face of the radiator.

INSTALLATION:

For indirect or closed circuits only with a maximum working temperature of 80°C. The system should be designed in accordance with the British Standard Code of Practice for Water Based Heating Systems in Buildings BS EN 128:2012+A1:2014 and BS EN 12831: 2003. The installation of the system and commissioning of the system should comply with BS EN 14336:2004. On completion of the installation the system should be properly flushed and filled in accordance with the British Code of Practice for the Treatment of Water in Domestic Hot water Central Heating Systems BS 7593: 2006, Part L of the Building Regulations and Good Practice Guidance for Scotland. QRL strongly recommend the use of corrosion inhibitor for all applications. Failure to observe these standards may invalidate the manufacturer's warranty. Single feed indirect cylinders are not recommended as the possibility of aeration due to water interchange may lead to corrosion.

TAPPING TO TAPPING DIMENSIONS:

Can be obtained by subtracting 5mm from the nominal emitter length.

THERMOSTATIC RADIATOR VALVES:

External control head – consists of a 15mm angled valve body fitted to the emitter inside the LST cover and linked by capillary tube to an external TRV head. The head is secured by simply tightening the unit thru the pre-formed knock out at the top side of the LST cover. This can be positioned on the RH or LH side of the cover allowing total user flexibility. A specially designed grip on the TRV head facilitates the use by people with limited hand mobility and can be pre-set to the desired temperature required. These valves are unsuitable for single pipe systems.

Internal control head – consists of a 15mm angled valve body and control head fitted to the emitter inside the cover with an external capillary sensor attached to the underside of the cover. The control head can be pre-set to the desired temperature and is tamper proof being only accessible to authorised personnel by simply unlocking the hinged LST cover.

All valve bodies are unidirectional and must always be fitted to the flow side of the emitter

PROTECTA LST RANGE BY EMITTER TYPE

	COVER HEIGHT (MM)	COVER LENGTH (MM)	BTU/HR ΔT50	WATTS ΔT50	BTU/HR ΔT30	WATTS ΔT30	DRY WEIGHT (KG)	WATER CONTENT (L)
Single Emitter	500	600	767	225	397	116	9.82	0.72
	500	700	959	281	496	146	11.74	0.91
	500	800	1,151	337	596	175	13.65	1.09
	500	900	1,342	393	695	204	15.56	1.27
	500	1,000	1,534	450	794	233	17.47	1.45
	500	1,200	1,918	562	993	291	21.29	1.81
	500	1,400	2,301	674	1,191	349	25.12	2.17
	500	1,600	2,685	787	1,390	407	28.94	2.53
	500	1,800	3,068	899	1,589	466	32.77	2.90
	500	2,000	3,452	1,012	1,787	524	36.59	3.26
Double Emitter (single fin)	500	600	1,090	320	568	166	12.77	1.40
	500	700	1,363	400	710	208	15.36	1.75
	500	800	1,636	479	852	250	17.95	2.10
	500	900	1,908	559	994	291	20.54	2.45
	500	1,000	2,181	639	1,136	333	23.13	2.80
	500	1,200	2,726	799	1,419	416	28.31	3.50
	500	1,400	3,271	959	1,703	499	33.49	4.20
	500	1,600	3,817	1,119	1,987	582	38.68	4.90
	500	1,800	4,362	1,278	2,271	666	43.86	5.60
	500	2,000	4,907	1,438	2,555	749	49.04	6.30
Single Emitter	650	600	988	290	512	150	12.55	0.90
	650	700	1,235	362	640	188	15.02	1.12
	650	800	1,482	434	768	225	17.47	1.34
	650	900	1,729	507	896	263	19.94	1.57
	650	1,000	1,976	579	1,024	300	22.40	1.79
	650	1,200	2,470	724	1,280	375	27.33	2.24
	650	1,400	2,964	869	1,535	450	32.25	2.69
	650	1,600	3,458	1,014	1,791	525	37.18	3.14
	650	1,800	3,952	1,158	2,047	600	42.10	3.58
	650	2,000	4,447	1,303	2,303	675	47.03	4.03
Double Emitter (single fin)	650	600	1,415	415	727	213	16.31	1.75
	650	700	1,769	519	909	267	19.65	2.19
	650	800	2,123	622	1,091	320	22.98	2.62
	650	900	2,477	726	1,273	373	26.32	3.06
	650	1,000	2,831	830	1,455	426	29.66	3.50
	650	1,200	3,538	1,037	1,819	533	36.34	4.37
	650	1,400	4,246	1,244	2,182	640	43.01	5.24
	650	1,600	4,954	1,452	2,546	746	49.69	6.12
	650	1,800	5,661	1,659	2,910	853	56.36	6.99
	650	2,000	6,369	1,867	3,273	959	63.04	7.87
Double Emitter (double fin)	650	600	1,539	451	798	234	15.38	1.44
	650	700	1,924	564	998	293	18.50	1.80
	650	800	2,309	677	1,198	351	21.60	2.16
	650	900	2,694	790	1,397	410	24.72	2.52
	650	1,000	3,079	902	1,597	468	27.82	2.88
	650	1,200	3,849	1,128	1,996	585	34.04	3.60
	650	1,400	4,618	1,354	2,395	702	40.26	4.32
	650	1,600	5,388	1,579	2,794	819	46.47	5.04
	650	1,800	6,158	1,805	3,194	936	52.69	5.76
	650	2,000	6,928	2,030	3,593	1,053	58.91	6.48

PROTECTA LST RANGE BY EMITTER TYPE (CONTINUED)

	COVER HEIGHT (MM)	COVER LENGTH (MM)	BTU/HR ΔT50	WATTS ΔT50	BTU/HR ΔT30	WATTS ΔT30	DRY WEIGHT (KG)	WATER CONTENT (L)
Single Emitter	800	600	1,202	352	620	182	15.37	1.07
	800	700	1,503	441	775	227	18.40	1.34
	800	800	1,804	529	929	272	21.42	1.60
	800	900	2,104	617	1,084	318	24.45	1.87
	800	1,000	2,405	705	1,239	363	27.47	2.14
	800	1,200	3,006	881	1,549	454	33.52	2.67
	800	1,400	3,607	1,057	1,859	545	39.57	3.20
	800	1,600	4,208	1,233	2,169	636	45.63	3.74
	800	1,800	4,810	1,410	2,478	726	51.68	4.27
	800	2,000	5,411	1,586	2,788	817	57.73	4.81
Double Emitter (single fin)	800	600	1,666	488	845	248	19.91	2.09
	800	700	2,083	611	1,056	310	24.00	2.62
	800	800	2,500	733	1,267	371	28.09	3.14
	800	900	2,916	855	1,478	433	32.19	3.66
	800	1,000	3,333	977	1,690	495	36.27	4.18
	800	1,200	4,166	1,221	2,112	619	44.45	5.23
	800	1,400	4,999	1,465	2,534	743	52.63	6.28
	800	1,600	5,832	1,709	2,957	867	60.81	7.32
	800	1,800	6,666	1,954	3,379	990	68.99	8.37
	800	2,000	7,499	2,198	3,802	1,114	77.17	9.41
Double Emitter (double fin)	800	600	1,980	580	1,006	295	19.45	1.79
	800	700	2,475	726	1,257	369	23.43	2.24
	800	800	2,970	871	1,509	442	27.40	2.68
	800	900	3,466	1,016	1,760	516	31.38	3.13
	800	1,000	3,961	1,161	2,012	590	35.35	3.58
	800	1,200	4,951	1,451	2,515	737	43.30	4.47
	800	1,400	5,941	1,741	3,018	884	51.25	5.36
	800	1,600	6,931	2,031	3,521	1,032	59.21	6.26
	800	1,800	7,921	2,322	4,023	1,179	67.16	7.15
	800	2,000	8,911	2,612	4,526	1,327	75.11	8.05

'N' COEFFICIENT VALUES

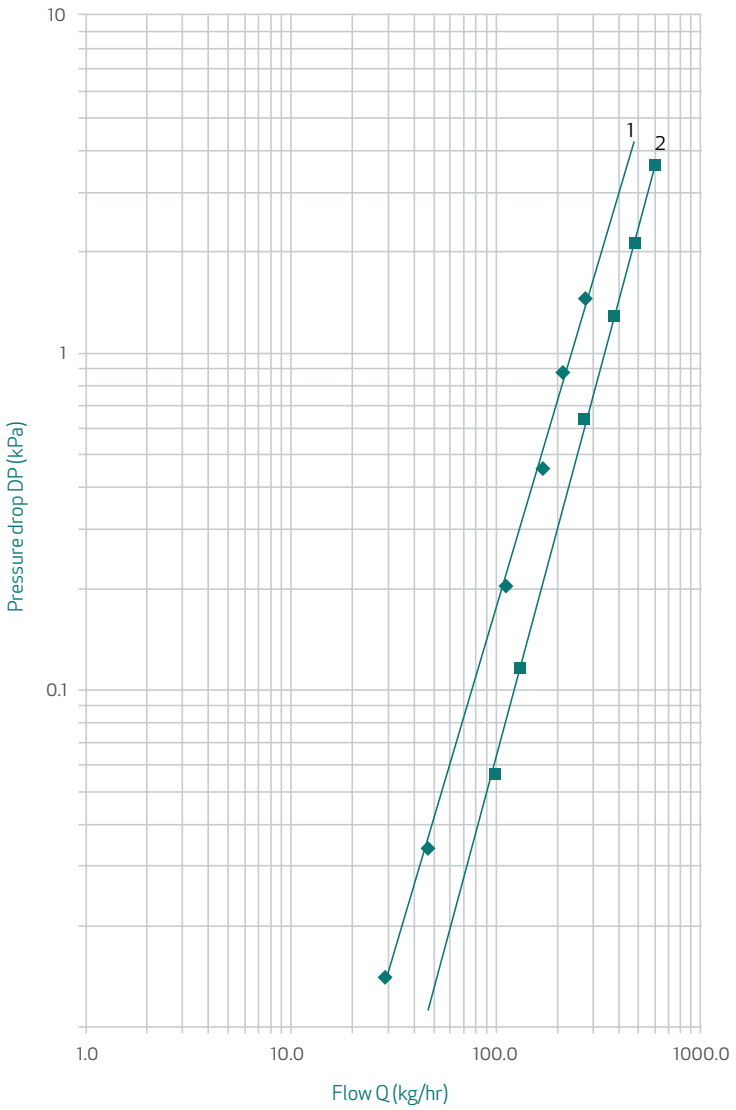
COVER HEIGHT	SINGLE EMITTER	DOUBLE EMITTER (SINGLE FIN)	DOUBLE EMITTER (DOUBLE FIN)
(mm)	Exponent 'n'	Exponent 'n'	Exponent 'n'
500	1.2880	1.2787	
650	1.2870	1.3030	1.2857
800	1.2988	1.3308	1.3262

VALVES

CODE	DESCRIPTION
QTRV001	QRL VALVE EXTERNAL TRV FOR LST QTRV001
TRV005	QRL VALVE INTERNAL TRV FOR LST TRV005
Lock001	QRL VALVE LST LOCKSHIELD LOCK001

All prices exclude VAT.

RESISTANCE DIAGRAM FOR HI-LO ROUND TOP SINGLE & DOUBLE PANEL



1. Single panel
DP = 1.429E-05Q$^{2.045}$

2. Double panel
DP = 2.018E-06Q$^{2.250}$

DETERMINATION OF PRESSURE DROP IN RADIATORS

To calculate flowrates in Kg/hr:

Output (Watts) / 4.19KJ/Kg/k (Specific heat capacity of water / °C) / Temp. Drop (°C) x 3.6

E.g. 1000W / 4.19 / 10 x 3.6 = 85.92 Kg/hr

To calculate pressure drop in kPa:

$\Delta p = K \times (qm^d)$ where
Δp = pressure drop (kPa)
K = constant from graph
qm = flowrate (Kg/hr)
d = index from graph

HI-LO Round Top

Single Panel Δp = 0.00001429 x (flowrate$^{2.045}$)
Double Panel Δp = 0.000002018 x (flowrate$^{2.250}$)

Useful Conversion Factors:

1 g/s = 3.6 L/hr
1 L/hr = 1 Kg/hr
1 mbar = 100 pa
1mm/watergauge = 9.81 pa

CONVERSION INFORMATION (DELTA T FACTORS)

The heat outputs quoted in this publication are based on ΔT50 °C to calculate other operating conditions, the following example should be used:

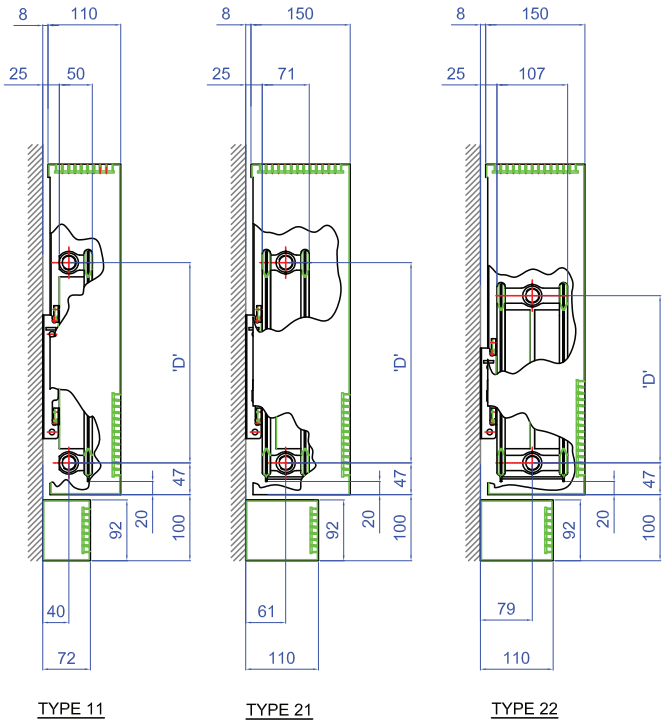
Example: Add flow water temperature (75 °C) and the return water temperature (65 °C) together (140 °C), divide by two (70 °C) and then subtract the room temperature (20 °C). This will give you a ΔT factor of 50 °C. For ΔT factors other than 50 °C multiply the catalogue figure by the conversion factor shown below:

DEGREES CENTIGRADE					
5°C	0.0501	30°C	0.5148	55°C	1.1319
10°C	0.1234	35°C	0.6290	60°C	1.2675
15°C	0.2091	40°C	0.7482	65°C	1.4065
20°C	0.3039	45°C	0.8720	70°C	1.5487
25°C	0.4061	50°C	1.0000	75°C	1.6940

DEGREES FAHRENHEIT					
10°F	0.0387	60°F	0.3975	110°F	0.8741
20°F	0.0953	70°F	0.4875	120°F	0.9787
30°F	0.1614	80°F	0.5778	130°F	1.0861
40°F	0.2346	90°F	0.6734	140°F	1.1959
50°F	0.3136	100°F	0.7722	150°F	1.3081

Delta T factors in °C and °F other than 50 °C (122 °F), Exponent n = 1.3

MOUNTING DETAILS

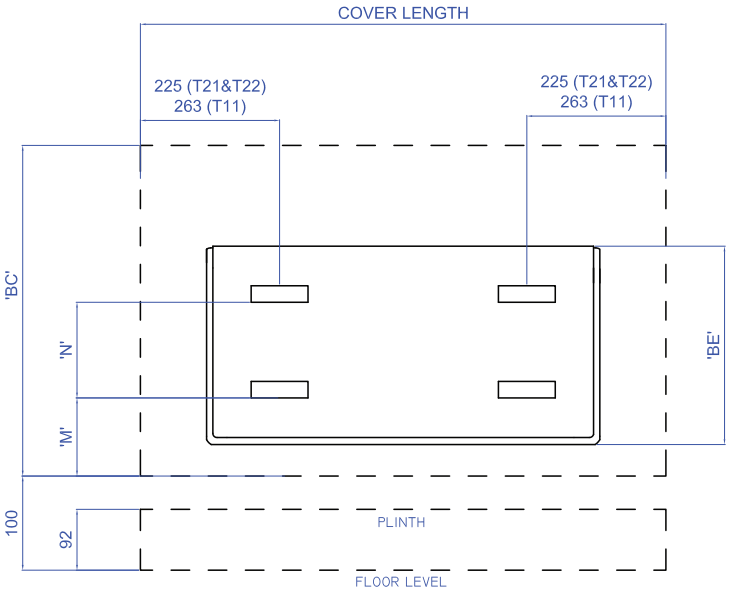


NOTE:

The length of the radiator is 200mm less than the cover.

Tapping to tapping dimension is 5mm less than the nominal radiator length.

CONNECTION CENTRES	
BE	D
300	253
400	353
500	453



NOTE:

Lug positions on 600mm cover length for T11 will be 238mm from each end.

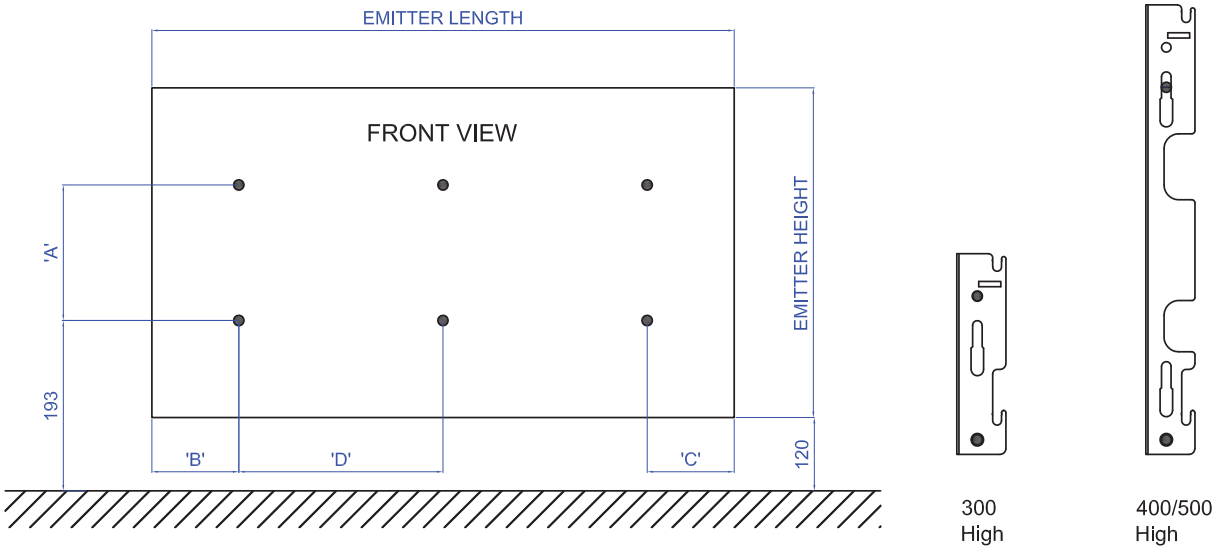
A third pair of lugs are fixed centrally on radiators 1800mm long and above.

BRACKET LUG HEIGHTS			
BC	500	650	800
BE (T11/T21)	300	400	500
BE (T22)	N/A	300	400
M	105	105	105
N (T11/T21)	105	205	305
N (T22)	N/A	105	205

NOTE:

If fitted without a plinth, the minimum cover distance from the floor must be 50mm for types 11 and 21 and 100mm for type 22.

DRILLING CHART - PROTECTA EMITTER



NOTE:

Drill position for 400mm long T11 emitter will be 152mm at pos. B and 124mm at pos. C.

'D' Dimension refers to 1800mm length only

EMITTER - TYPE 11				
Height	A	B	C	D
300	98	174	146	764
400	171	174	146	764
500	271	174	146	764

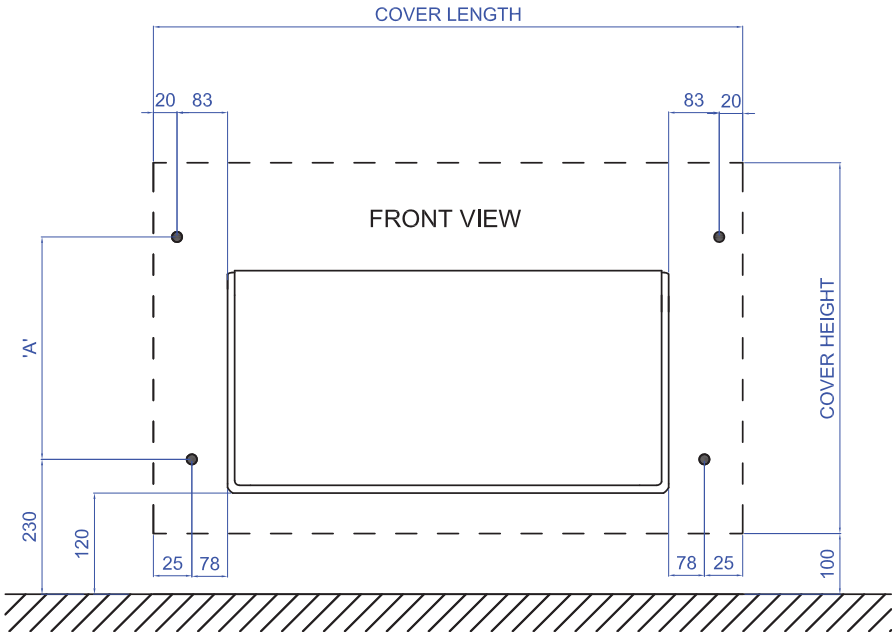
EMITTER - TYPE 21 & 22				
Height	A	B	C	D
300	98	137	109	789
400	171	137	109	789
500	271	137	109	789

LST EMITTER FIXING DETAILS

1. Allow 150mm (6") wall clearance on both sides of the emitter to allow fitting of the LST cover. If an external TRV head is fitted, a further 100mm (4") clearance is required on the side where the TRV head is to be fitted.
2. Allow 400mm (800 cover), 350mm (650 cover), 200mm (500 cover) wall clearance on the top of the emitter to allow fitting of the LST cover.
3. The bottom of the LST cover must be 100mm from the floor if fitted with a plinth, or minimum 50mm from the floor for types 11 and 21 and 100mm from the floor for type 22 without plinth to allow for effective convection.
4. If the cover is fitted in an alcove or below a shelf, minimum clearance from the top of the cover must be 100mm.
5. All emitters must be hung on the short side of the bracket maintaining 25mm away from the wall.
6. Please refer to emitter drilling chart for screw fix positions. Fix the brackets to the wall, then adjust the height of the emitter to achieve 120mm from the floor.
7. The emitter drilling chart is set up to achieve a floor distance of 100mm to the bottom of the LST cover. For other dimensions, adjust '193mm' accordingly.

   E.g. To achieve a floor distance of 50mm to the bottom of the LST cover, reduce the '193mm' dimension by 50mm to 143mm.

DRILLING CHART - PROTECTA LST COVER



LST COVER FIXING DETAILS

1. Check the emitter has been correctly fitted and set 120mm from the floor.
2. Please refer to the cover drilling chart for screw fix positions, fix the cover brackets to the wall as vertically level as possible

   Note: The screw position from the side of the emitter is 83mm at the top and 78mm at the bottom so that the screw head clears the rear flange of the cover when closed.
3. Unscrew the hinge pins from the outside of the cover using a flat head screwdriver, fit the cover then re-tighten the hinge pins to secure the cover.
4. For security purposes the cover can be locked by using the nuts provided on the studs at the bottom of the bracket.
5. The cover drilling chart is set up to achieve a floor distance of 100mm to the bottom of the LST cover. For other dimensions adjust dimension '230mm' accordingly.

   E.g. To achieve a floor distance of 50mm to the bottom of the LST cover, reduce the '230mm' dimension by 50mm to 180mm.

COVER	
HEIGHT	A
500	328
650	478
800	628

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